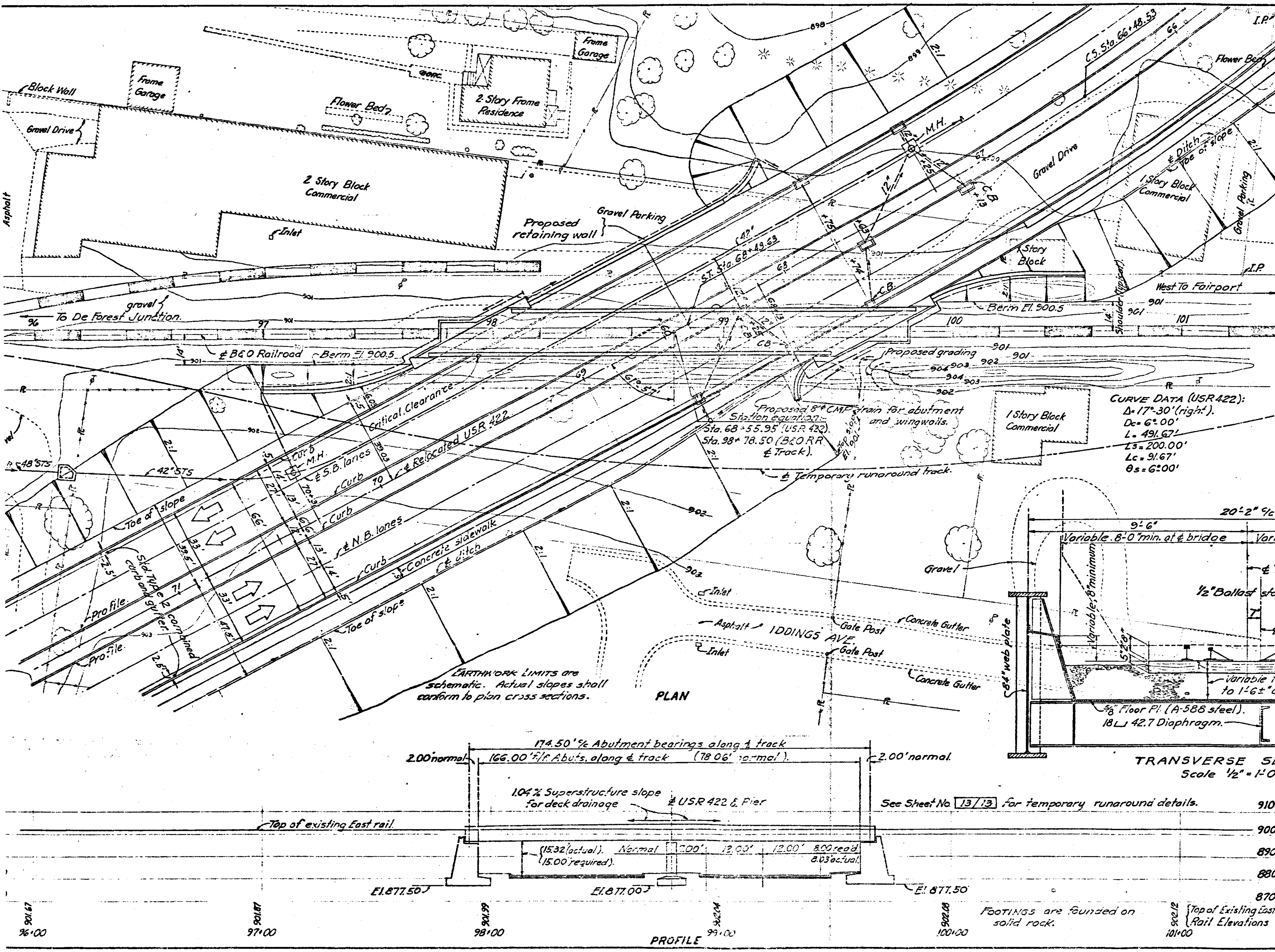
FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	TYPE FUNDS
2	OHIO		

TRUMBULL COUNTY
TRU- 422- 12.58



Block Wall
Frame Garage
Gravel Drive
Flower Bed
2 Story Frame Residence
2 Story Block Commercial
Asphalt
Inlet
Proposed retaining wall
Gravel Parking
To De Forest Junction
gravel
℄ B&O Railroad
Berm El. 900.5
C.S. Sta. 66+48.53
S.T. Sta. 68+49.53
M.H.
C.B.
Gravel Drive
1 Story Block Commercial
Story Block
Shoulder (Typical)
West To Fairport
Ditch
Toe of slope
Proposed grading
Proposed 8" CMP drain for abutment and wingwalls.
Station equation:
Sta. 68+55.95 (USR 422)
Sta. 98+78.50 (B&O RR ℄ Track).
1 Story Block Commercial
℄ Temporary runaround track.
Critical Clearance
℄ Relocated USR 422
℄ S.B. lanes
℄ N.B. lanes
Curb
Concrete sidewalk
℄ ditch
Std. Type 2 combined curb and gutter
Profile
Toe of slope
48" STS
42" STS
Gravel
Inlet
Asphalt
IDDINGS AVE.
Gate Post
Concrete Gutter
Earthwork limits are schematic. Actual slopes shall conform to plan cross sections.
PLAN
174.50' c/c Abutment bearings along ℄ track
166.00' F/F Abuts. along ℄ track (78.06' normal).
2.00' normal
1.04% Superstructure slope for deck drainage
℄ USR 422 & Pier
Top of existing East rail
(15.32 (actual). (15.00 required).
Normal 7.00' 12.00' 12.00' 8.00 req'd 8.03 actual
El. 877.50
El. 877.00
El. 877.50
See Sheet No. 13/13 for temporary runaround details.
Footings are founded on solid rock.
Top of Existing East Rail Elevations
901.67 96+00
901.87 97+00
901.99 98+00
902.04 99+00
902.08 100+00
902.12 101+00
910
900
890
880
870
PROFILE
20'-2" c/c Girders.
9'-6"
10'-8"
Variable 8'-0" min. at ℄ bridge
Variable 8'-10+" min. at ℄ bridge.
Variable, 8" minimum
℄ Track
1/2" Ballast stop plate
Face of Knee brace (A-588 steel).
AREA minimum clearance
℄ Bridge
5'-2 3/8"
7"
Variable from 3" min. at ℄ to 1'-6± over abutments.
84" web plate
5/8" Floor Pl. (A-588 steel).
18 ⊔ 42.7 Diaphragm.
24 WF Floor Beam
TRANSVERSE SECTION (Looking upstation)
Scale 1/2" = 1'-0"

PROPOSED STRUCTURE
TYPE: 2 span continuous through girder with ballast floor on reinforced concrete substructure.
SPANS: 2 of 87'-3" c/c bearings.
LOADING: Cooper's E-80 with diesel
ALIGNMENT: Tangent.
SKEW: 61°-57' Left Forward.
STRUCTURAL STEEL: ASTM A36

BENCH MARK:-
Railroad spike in south side of power pole on west side of Railroad at Ohio Glass Co.
Elev. 901.45.

CURVE DATA (USR 422):
Δ = 17°-30' (right).
Dc = 6°-00'
L = 491.67'
Ls = 200.00'
Lc = 91.67'
θs = 6°-00'

TRAFFIC:
Railroad: 2 through freight trains and 6 local or switching moves per day, max. authorized speed = 30 m.p.h.
USR 422: 1985 ADT = 9217, 1985 DHV = 752.

AKRON-CHICAGO DIVISION FAIRPORT BR.
WARREN, OHIO
B.&O. R.R. BRIDGE No. 304 1/2

BURGESS & NIPLE LIMITED — CONSULTING ENGINEERS
COLUMBUS 12, OHIO
1/13

SITE PLAN
BR. NO. TRU-422-1297
UNDER
THE BALTIMORE AND OHIO RAILROAD
SCALE 1" = 20'
TRUMBULL COUNTY STA. 68+55.95

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED DATE	REVISED
WER	WER	KED	KEC	WER 6/12/70	

FED. RD. DIV. NO.	STATE	PROJECT	
2	OHIO		

72-A
-0

TRUMBULL COUNTY
TRU-422-12.58

Item-Special, Coal tar pitch-epoxy coating

1. Scope and Classification:

1.1 Scope:- This specification covers a catalyzed Coal Tar Pitch-Epoxy Coating for use on exterior and interior metal, ceramic and masonry surfaces. It is not necessary that a surface be previously primed with any other material.

1.2 Classification:

1.2.1 Type and Class:- The coating covered by this specification is of one type. It is self curing at temperatures between 50°F and 225°F.

2. Requirements:

2.1 Color:- The color of this material shall be a characteristic coal tar black.

2.2 Coating:- The coating shall consist of two components. One component shall consist of all of the epoxy resin, pitch, mineral pigments and, if required, solvent. The second component shall contain all of the hardener or catalyst and, if desired, solvent. Minor percentages of other constituents may be included with one or the other of the components.

2.3 Vehicle:

2.3.1 The vehicle shall consist of a refined Coal Tar Pitch-Epoxy resin combination, based on epoxies produced from Bis-Phenol A and Epichlorohydrin. The epoxy resin solids shall constitute 25% to 35% by weight of the total coating.

2.4 Pigments:- Pigments shall be of the carbonaceous and/or inert mineral variety such as aluminum magnesium silicates, talc, and/or powdered mica.

2.5 Quantitative Requirements:- The Coal Tar Pitch-Epoxy Coating shall meet the following quantitative requirements:

Table I

Typical Formula:	Coal Tar Pitch-Epoxy Coating
Coating Component:	118-124 fluid ounces to combine with catalyst to make one gallon total.

	% (by Weight)
Epoxy Resin	25 - 35
Coal Tar Pitch	25 - 30
Solvent	18 - 22
Pigment	23 - 27

Curing Component: 4-10 fluid ounces to combine with coating component to make one gallon total.

Selected Poly-functional amine with or without solvent. Sufficient amine to cure the epoxy.

2.6 Condition in Container:- The coating component shall show no curdling or pigment flotation in a freshly opened full container and shall show no settling or caking. The material shall be thixotropic and readily reduced in apparent viscosity by vigorous agitation. The material shall be packaged with five gallons in a six gallon container with a divided compartment at the top to contain the catalyst in a separate metal container. The above requirements must also be met by material stored six months at 77°F.

2.7 Brushing properties and appearance when dry:- After adequate agitation and admixture of the catalyst, the material will be of a brushable consistency. Moderate pulling under the brush is permissible. Material applied by brush shall dry to a glossy film, free from running, sagging or streaking when applied in a single coat to a thickness of 10 to 12 mils on a vertical surface. A moderate amount of brush marking, but no gross irregularities, is permissible.

2.8 Spraying properties and appearance when dry:- After proper agitation and admixture of the catalyst, the material shall be sprayable without heating. It shall be sprayed according to the recommended procedure of the manufacturer. The coating film upon inspection after application shall show no dusting, floating, fogging, or mottling.

2.9 Sagging - Requirement and Test Method:- The material submitted under this specification shall show no sagging when tested by the following method:

A one inch wide strip of masking tape is tightly pressed across the center of the face of a 2-1/2" x 6" sandblasted steel coupon, the masked area being 1" x 2-1/2". The face of the coupon is then coated with catalyzed material sufficient to result in a 10-15 mil thick film when dry. Immediately upon completion of the coating operation, the tape is removed and the panel supported vertically with the long axis of the uncoated area horizontal. The panel remains in this position until the film has cured to an immobile solid. Sagging is indicated by any reduction in the width of the area not originally coated or by the formation of a bead of cured material bordering this area.

2.10 Odor:- The coating before application and after curing shall have a mild, typical coal tar odor.

2.11 Adhesion:- The material applied on sand or grit blasted steel shall have such adhesion to the steel, after curing of the coating, that it cannot be removed except by blasting or powder brushing.

2.12 Recoating:- A second coat of this material applied over a first coat which has cured for 24 hours shall show complete adhesion of the second coat when tested 72 hours after application of the second coat.

B&O R.R. Bridge No. 304½

BURGESS & NIPLE LIMITED — CONSULTING ENGINEERS
COLUMBUS, OHIO 1A 1/3

COAL TAR PITCH-EPOXY COATING

Br. No. TRU-422-1297
UNDER B&O R.R.
TRUMBULL COUNTY STA 68+55.95

DESIGNED	DRAWN	TRACED	CHECKED	REVISED DATE	REVISED
B&O	ABP			WCR 8-7-72	

2.13 Toxicity:- The coating shall contain no benzol or chlorinated solvents.

2.14 Curing Time:- The coating, at the time of manufacture and after 6 months shelf storage, shall have the following maximum set-up time vs. temperature.

Set-Up Time vs. Temperature

Set-up time of the mixed coating in the container (1 gal.)

Temperature of Coating in Container	Approximate Set-Up Time - Hours
40 - 60°F	6 - 8
60 - 80°F	4 - 6
80 -100°F	1 - 2
100 -120°F	1/2 - 1

Set-up time of Applied Film (10-12 mils)

Temperature of Coated Surface	Approximate Set-Up Time - Hours	
	Inside Exposure	Outside Exposure (1)
40 - 60°F	48	36
60 - 80°F	24	16
80 -100°F	16	12
100 -120°F	8	6
120 -140°F	6	4

(1) In sunlight

2.15 Physical Constants - Typical Values

Component "A" (122 fluid ounces)	Minimum	Maximum
Specific Gravity 25°C	1.22	1.28
Weight per gallon - pounds	10.2	10.7
Volatiles, Distillate to 235°C ASTM D-20, % by weight	15.00	25.00
Total Solids, % by weight Federal Specification TT-P-141B Method 404.1	75.00	85.00
Pigments, % by weight on Total Solids	23.00	28.00
Ash, % by weight on Total Formula ASTM Method D-271	18.00	22.00
Viscosity - Brabender Heavy Spring, wide paddle (50 RPM, 77°F)	200	300
Flash Point, Cleveland Open Cup	150°F	
Appearance	Glossy, Black, Smooth	

Component "B"

Amine Catalyst - 6 fluid ounces

2.16 Conversion:- The Material provided under this specification shall have a weight conversion of not less than 90% from liquid to solid when applied in a 20 mil dry film thickness on a test surface. The drying period shall be 30 days at 25°C.

2.21 Prior to submitting material under this specification, the material shall have successfully passed the following test, conducted by either a naval laboratory or by an independent laboratory or by an independent laboratory under naval supervision.

Each cycle shall consist of two operations as follows:

1. Synthetic Sea Water Immersion for One Week

Immerse panels totally for one week in 3.3 per cent synthetic sea water solution comprising (quantity of salts in grams): 0.75 KCl, 3.40 KBr, 42.00 $MgCl_2 6H_2O$, 8:30 $CaCl_2 \cdot 6H_2O$, 87.20 NaCl, 30.40 Na_2SO_4. $10H_2O$ dissolved in distilled water to a total of one gallon of solution.

2. Hot Sea Water Immersion for Two (2) Hours

Following the one week synthetic sea water immersion, immerse panels totally in hot synthetic sea water for two hours at 175°F.

At the completion of each cycle the coating is examined to determine the extent of deterioration. A satisfactory material shall successfully pass 25 such cycles.

2.22 In addition to meeting the other qualifications, the manufacturer shall certify that:

1. He has been a producer of coatings of this class for a period of at least two years.
2. The coating being offered under this specification is the same formulation which has been manufactured and distributed by him during this two year period.
3. The coating being offered under this specification has been successfully used in sea water immersion service for at least two years.
4. If the material being offered under this specification is not the material which complied with the qualification tests, the formulation offered must be re-qualified.

2.23 The material supplied under this specification shall comply in every respect with the requirements of Bu Ships instruction 9190.26A, Ser. 633P-750, April 1959 for Coal Tar-Epoxy Coatings.

B&O R.R. Bridge No. 304 1/2

BURGESS & NIPLE LIMITED — CONSULTING ENGINEERS
COLUMBUS, OHIO — AS 13

COAL TAR PITCH - EPOXY COATING

Br. No. TRU-422-1297
UNDER B&O R.R.
TRUMBULL COUNTY — STA. 68+55.95

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED DATE	REVISED
B&O	ABP			WRP 8-7-72	

FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	TYPE FUNDS
2	OHIO		

73
140

TRUMBULL COUNTY
TRU-422-12.58

GENERAL PLAN

GENERAL ELEVATION

REAR ABUTMENT

FORWARD ABUTMENT

B. & O. R. R. BRIDGE No. 304 ½

BURGESS & NIPLE LIMITED — CONSULTING ENGINEERS
COLUMBUS 12, OHIO

2/13

GENERAL PLAN AND ELEVATION

BR. No. TRU-422-1297
UNDER B. & O. R. R.

TRUMBULL COUNTY STA. 68+55.95

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED DATE	REVISED
KED	KED	KED	LEC	6/12/70 NRR 8/10/70	

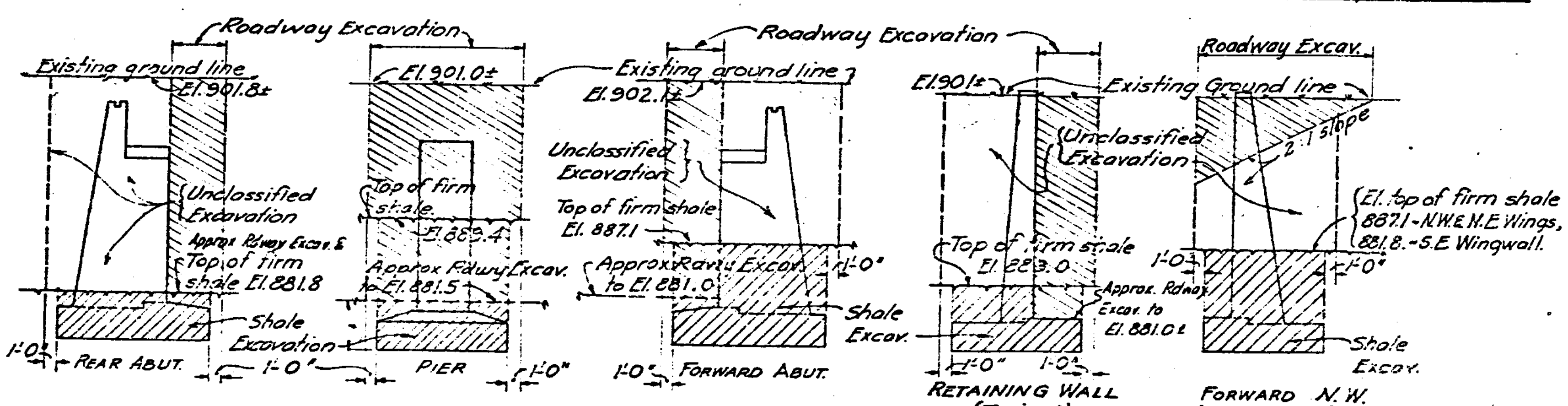
FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	TYPE FUNDS
3	OHIO		

74 / 140

TRUMBULL COUNTY
TRU-422-12.58

ESTIMATED QUANTITIES (BRIDGE No. TRU-422-1297).

Item	Total	Unit	Description	Super-structure	Abuts.	Wing-walls	Retain-ing wall	Pier	Gen-eral
SPEC.	Lump	Sum	Temporary runaround						Lump
503	Lump	Sum	Cofferdams, cribs and sheeting						Lump
503	2,292	Cu. yds.	Unclassified excavation		826	804	662		
503	1,192	Cu. yds.	Shale excavation		354	547	243	48	
509	79,633	Lbs.	Reinforcing steel		27,116	24,139	19,975	8,403	
511	23	Cu. yds.	Class "C" concrete, pier above footings.					23	
511	576	Cu. yds.	Class "C" concrete, abutments above footings.		576				
511	549	Cu. yds.	Class "C" concrete, wingwalls and retaining wall above footings.			334	215		
511	639	Cu. yds.	Class "C" concrete, footings.		188	254	163	34	
512	73	Lin. ft.	Premolded sealing strip			33	40		
512	867	Sq. yds.	Type "A" waterproofing		308	293	266		
512	35	Sq. yds.	Type "B" waterproofing, 36" wide			21	14		
514	454,000	Lbs.	Field painting of structural steel.	454,000					
516	401	Sq. ft.	1" Preformed expansion joint filler.		22	241	138		
516	84	Lin. ft.	Type "A" folded copper waterstop (24 oz., 15" wide).		84				
516	896	Lin. ft.	Type "B" copper waterstop (16 oz., 6" wide).		336	320	240		
518	482	Cu. yds.	Porous backfill.		146	184	152		
518	485	Lin. ft.	8"φ Perforated C.M.P. incl. specials. 707.01 bit. coated per 707.04, 14 ga.		210	152	123		
518	141	Lin. ft.	8"φ Non-perforated C.M.P. 707.01 bituminous coated as per 707.04, 14 gage.		68	50	23		
SPEC.	460	Sq. yds.	Coal tar pitch-epoxy coating, two field coats. (see proposal)	460					
810	454,000	Lbs.	Structural steel for structure carrying R.R. traffic	454,000					



STRUCTURAL EXCAVATION LIMITS

GENERAL NOTES:

DESIGN SPECIFICATIONS: This structure conforms to the requirements of "Specifications for Steel Railway Bridges" of the American Railway Engineering Association, 1969 edition.

REFERENCE shall be made to SUPPLEMENTAL SPECIFICATIONS:

810 dated 1-1-71

927 dated 1-1-71

CONSTRUCTION AND MATERIAL SPECIFICATIONS: State of Ohio, Department of Highways, dated Jan. 1, 1971.

DESIGN DATA:
Design Loading: Cooper E-80 with (diesel) impact.

Concrete Class C-unit stress 1333 p.s.i. for substructure

Structural Steel-ASTM A36-unit stress 20,000 p.s.i.
Reinforcing Steel-ASTM A615-unit stress 20,000 p.s.i.
Structural Steel-ASTM A588-unit stress:
27,500 p.s.i. thickness to 4" inclusive
25,300 p.s.i. thickness over 4" to 5" inclusive
23,100 p.s.i. thickness over 5" to 8" inclusive.

POROUS BACKFILL two feet thick, shall extend up to the railroad ballast and to the fill line back of the remainder of the abutment, wingwalls and retaining wall as shown on plans and outward to the ends of the wingwalls and retaining wall and surface of embankment slopes. The porous backfill shall extend down to base of C.M.P. (Perforated). Impervious fill beneath C.M.P. with Poly-Vinyl barrier under C.M.P., 2'-0" minimum width.

FOOTINGS shall be placed in bed rock (firm shale) at the elevations shown.

WATERPROOFING:-
Type "A" waterproofing shall be used for dampproofing the back surfaces of the abutments wing walls and retaining wall. Type "A" waterproofing shall cover all underground surfaces on the wingwalls and retaining wall from the top of the footings to the top of the walls, and on all surfaces on the back of the abutment wall from the top of the footing to the end of the superstructure floor plate.

SHOP DRAWINGS: Upon completion of the structure, the B. & O. R.R. shall be furnished reproduced tracings on linen cloth or approved film of all shop drawings for the steel work.

FOUNDATION BEARING PRESSURE: Footings are designed for a maximum bearing pressure of 5.0 tons per sq. ft.

SPECIAL ITEM:
TEMPORARY RUNAROUND:- The earthwork for the excavation and embankment of the temporary runaround track shall be constructed, drained, maintained and removed as noted in Item 615.03 with a 28 ft. width of roadbed out to out of shoulders and side slopes of 2:1.
The subballast (subbase) shall be constructed with materials and construction methods described in "Item 310 subbase" to the dimensions shown on the "Temporary Runaround Typical Section" on sheet 13/13 of the bridge plans.
The temporary runaround roadbed and subballast (subbase) shall be included with "Item Special, Temporary runaround" for payment. This lump sum payment shall be full compensation to the Contractor for all materials, excavation, backfill, and disposal of surplus materials when no longer needed to maintain traffic.

RAILROAD AERIAL LINES will be relocated by the Railroad. The Contractor shall use all precautions necessary to see that the lines are not disturbed during the construction stage and shall cooperate with the Railroad in the relocation of these lines. The cost of the relocation shall be included in the railroad force account work.

UTILITY LINES: All expense involved in relocating (installing) the affected utility lines shall be borne by the Owner(s). The Contractor and Owner(s) are requested to cooperate by arranging their work in such a manner that inconvenience to either would be held to a minimum.

SUGGESTED CONSTRUCTION PROCEDURE:
See Sh. No. 4/13

B. & O. R.R. BRIDGE No. 304½

BURGESS & NIPLE LIMITED — CONSULTING ENGINEERS
COLUMBUS 12, OHIO
3/13

ESTIMATED QUANTITIES AND GENERAL NOTES ~
BRIDGE No. TRU-422-1297
UNDER B. AND O. R. R.

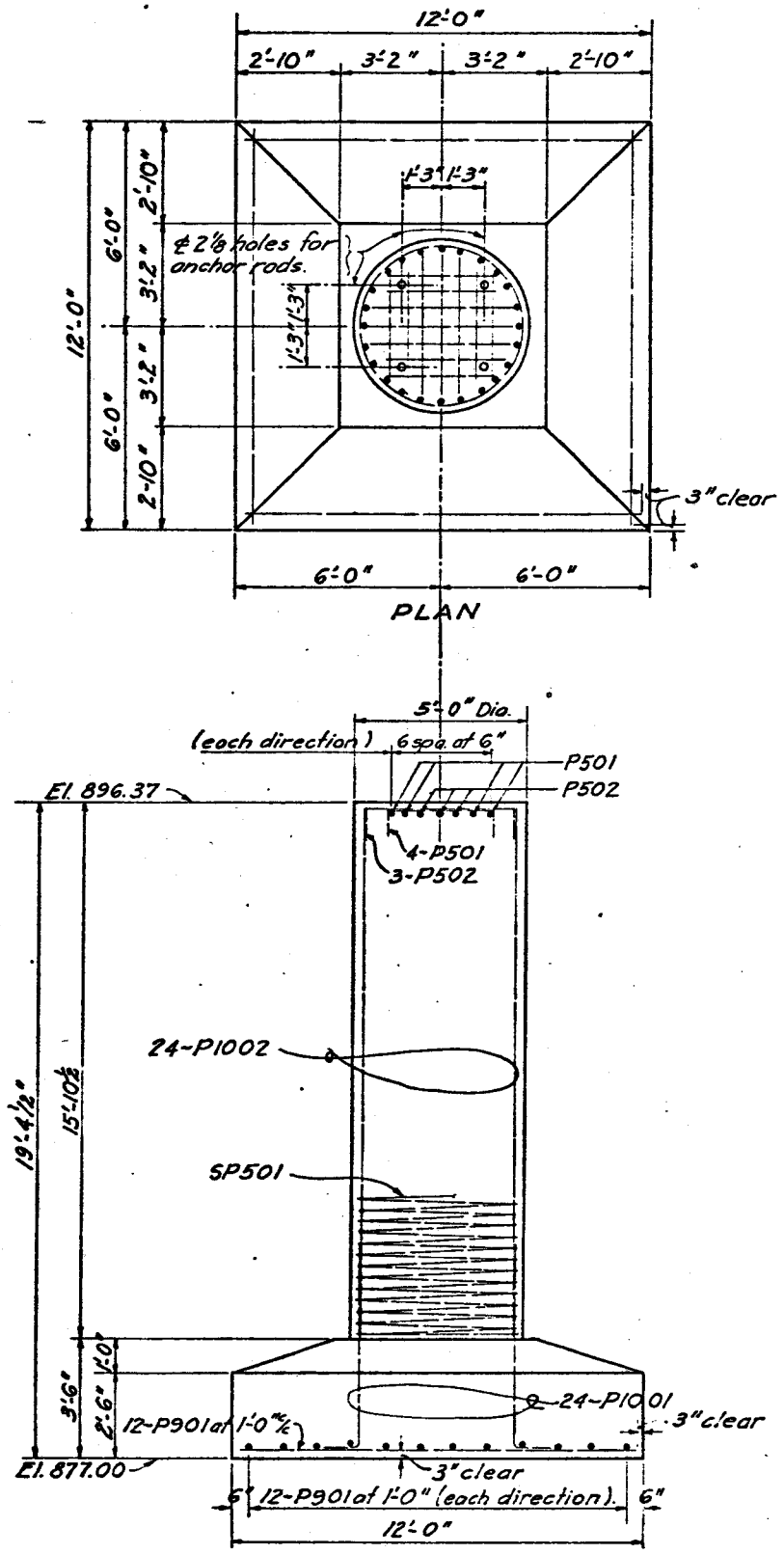
TRUMBULL COUNTY STA. 68+55.95

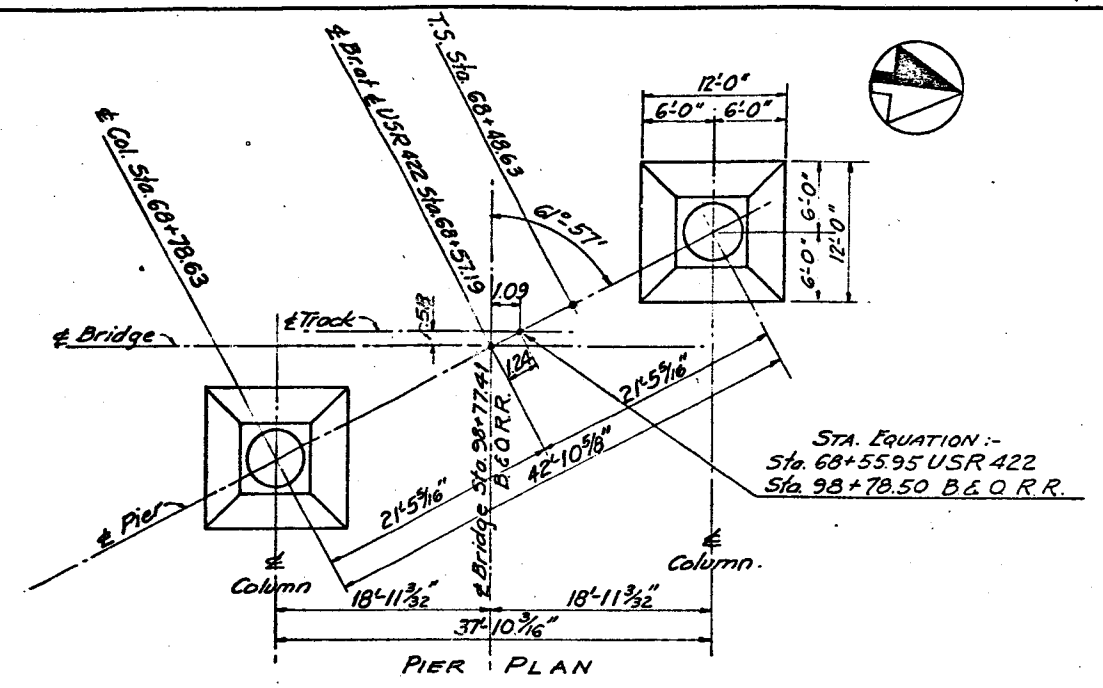
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED DATE	REVISED
KED	KED	KED	LEC 6-1-68	WAR 6/12/70	

FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	TYPE FUNDS
2	OHIO		

75
140

TRUMBULL COUNTY
TRU-422-12.58





STA. EQUATION :-
Sta. 68+55.95 USR 422
Sta. 98+78.50 B & O R.R.

BRIDGE SEAT REINFORCING : Special care shall be taken in placing reinforcing steel in the vicinity of the bridge seat so as to avoid interference with the drilling of the anchor bar holes.

SUGGESTED CONSTRUCTION PROCEDURE :-

1. The Contractor shall prepare the subgrade and place the subballast for the temporary runaround as per plan.

2. The Contractor shall furnish and place the ballast and runaround track.

3. Plans for sheeting and bracing of roadway and structure excavation adjacent to the temporary runaround track shall have been approved by the Director and by the railroad company before work on this excavation shall begin. For such approval, eight copies of the plans shall be submitted to the Director. Such plans shall be prepared by a registered professional engineer and shall bear his signature and number or professional engineering seal. The plans shall be accompanied by one copy of the design computations.

4. After the cofferdams, cribs and sheeting have been placed to protect the temporary runaround track adjacent to the excavations, the abutments, piers, retaining wall and northwest wingwall shall be constructed and the superstructure erected.

5. The Railroad Company shall place the ballast and track over the proposed bridge and transfer R. R. traffic to original alignment.

6. The Contractor shall remove the temporary runaround track and ballast.

7. The Contractor shall remove or relocate portions of the cofferdams, cribs and sheeting adjacent to the former temporary runaround location that are necessary to construct the N.E. and S.E. Wingwalls.

8. After the N.E. and S.E. Wingwalls are completed, the Contractor shall remove the subbase and proceed with roadway excavation, grading and construction.

B. & O. R. R. BRIDGE No. 304½

BURGESS & NIPLE LIMITED — CONSULTING ENGINEERS
COLUMBUS 12, OHIO

13

PIER

BRIDGE No. TRU-422-1297
UNDER B. & O. R. R.
TRUMBULL COUNTY STA. 68+55.95

DESIGNED	DRAWN	TRACED	CHECKED	REVISED DATE	REVISED
KED	KED	KED	LEC.	6/12/70 WKR 3/10/70	

FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	TYPE FUNDS
2	OHIO		

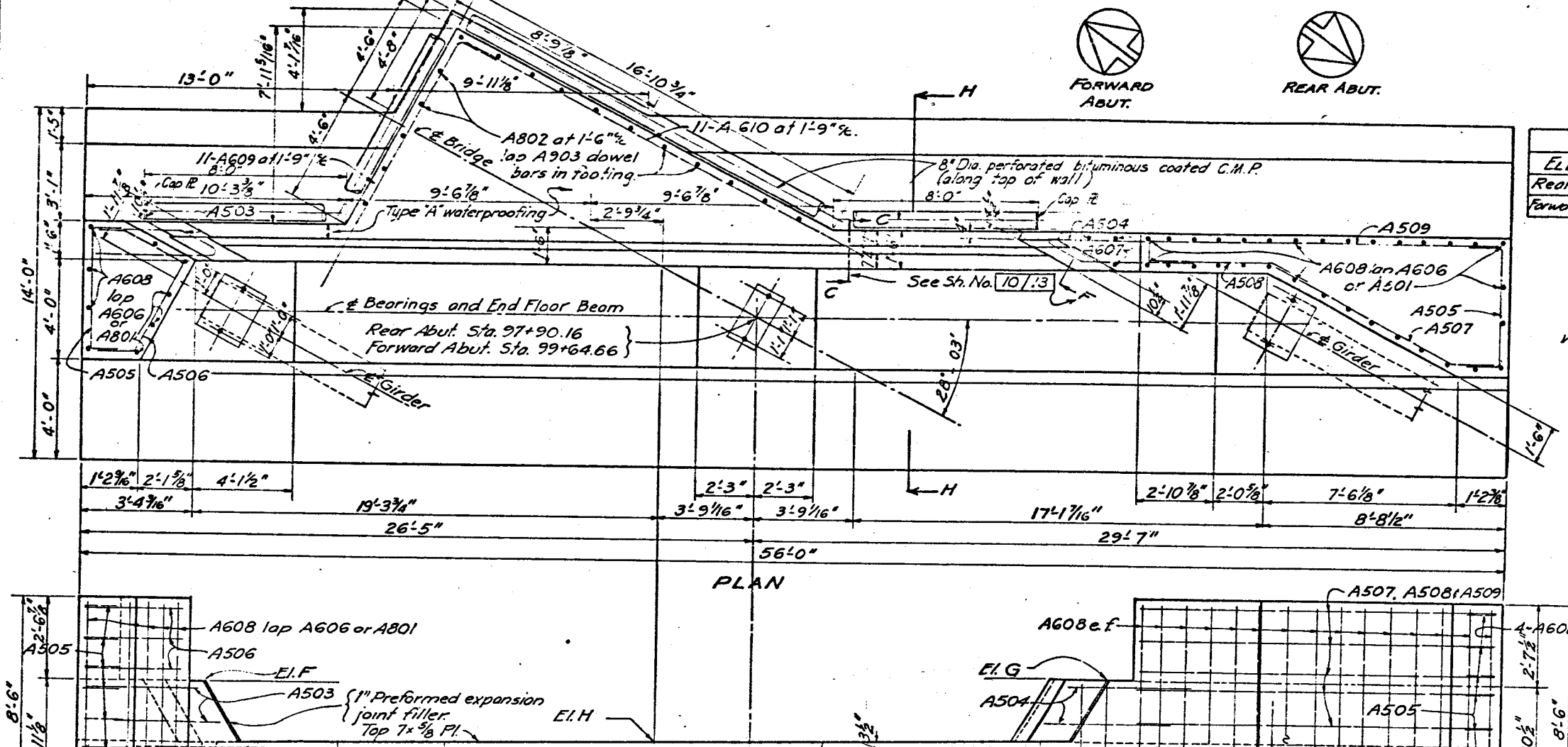
75
1:0

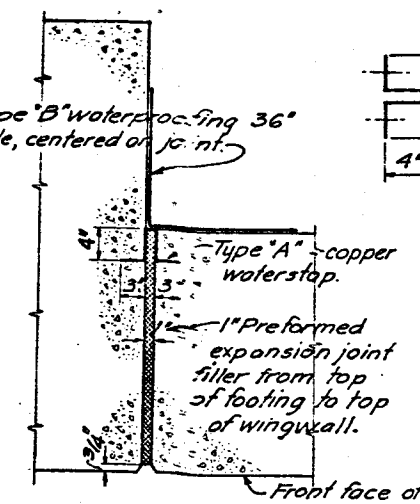
TRUMBULL COUNTY
TRU-422-12.58

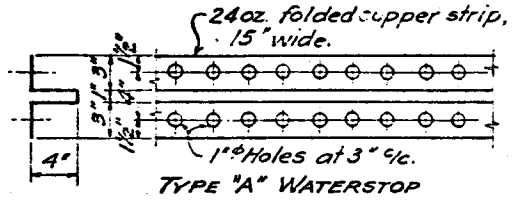
FORWARD ABUT.

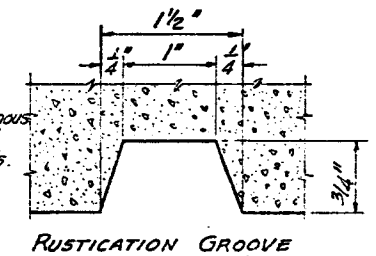
REAR ABUT.

TABLE OF ABUTMENT ELEVATIONS								
ELEVATION	EL. A	B	C	D	E	F	G	H
Rear Abut.	877.50	886.01	894.50	895.32	896.41	901.94	902.29	899.19
Forward Abut.	877.50	886.01	894.50	895.32	896.41	901.94	902.29	899.19





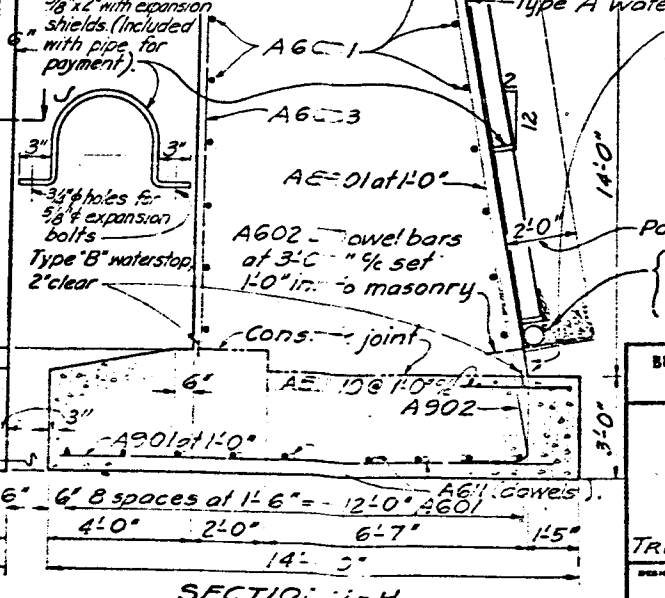




BRIDGE SEAT REINFORCING:- Special care shall be taken in placing bridge seat reinforcing in order to miss the anchor rod holes.

POROUS BACKFILL, 2 ft. thick, full length of abutment and wings, shall extend up to the subgrade or to the finished ground surface.

LEGEND
n.f. = near face
f.f. for face
e.f. = each face
*Included with porous backfill for payment.



BURGESS & NIPLE LIMITED — CONSULTING ENGINEERS
COLUMBUS 12, OHIO
5/13

ABUTMENTS

BRIDGE NO. TRU-422-1297
UNDER B. & O. R. R.

TRUMBULL COUNTY STA. 68+55.95

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED DATE 6/24/70	REVISED
KED	KED	KED	LEC	WRS 9/10/70	

FED. AID DIVISION	STATE	PROJECT	
2	OHIO		

77
140

TRUMBULL COUNTY
TRU-422-12.58

FORWARD ABUTMENT

PLAN

N.W. AND S.E. WINGWALL LAYOUT

ELEVATION OF N.W. AND S.E. WINGWALLS (DEVELOPED ALONG FRONT WALL FACE)

DEVELOPED WINGWALL SECTION-K (N.W. AND S.E. WINGWALLS)

ABUTMENT ELEVATION (Typical)

VIEW-L

SECTION-M

SECTION-N

ELEVATION OF N.E. WINGWALL (DEVELOPED ALONG FRONT WALL FACE)

ADJUSTABLE TYPE ELBOWS meeting specification requirements for gage and coating are acceptable for making bends in perforated corrugated metal pipe. Elbows and the stem of tees need not be perforated.

LEGEND
e.f. . . . each face
n.f. . . . near face
f.f. . . . far face

NOTE: See Sheet No. 5/13 for Elev. A, B, C, D, E, F, and G.

BURGESS & NIPLE LIMITED — CONSULTING ENGINEERS
COLUMBUS, OHIO 6/13

WINGWALL DETAILS
BR. NO. TRU-422-1297
UNDER
B&O R.R.

TRUMBULL COUNTY STA. 68+55.95

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED DATE	REVISED
KED	KED	C.W.B.	LEC	WRP 5/14/70	

FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	TYPE FUNDS
2	OHIO		

78
140

TRUMBULL COUNTY
TRU-422-12.58

Premolded sealing strip in 13"x¾" recess (top of footing to 1'-0" below top of wall).

CONTRACTION JOINT DETAIL

Front face

EXPANSION JOINT DETAIL

1" Preformed expansion joint filler (Full height).

RUSTICATION GROOVE

8" ϕ Perforated bituminous coated CMP drain sloped at 1% grade to F.L. El. 881.10 at end of S.E. wingwall. See Sheet No. 2 13.

8" ϕ Perforated bituminous coated CMP drain sloped at 1% grade to F.L. El. 881.26 at end of retaining wall.

F.L. El. 882.50

Cap

Expansion Joint

Expansion joint

Ground

Special Contraction joint

4-1¼"x40" Anchor Bolt

Contraction joint

2" conduit

Construction joint in footing.

PLAN

120'-0" measured along front face of wall at top of footing.

32'-0" Section-1. 32'-0" Section-2. 32'-0" Section-3. 24'-0" Section-4

29-Rustication grooves at 4'-0" c/c = 112'-0"

18-W619 n.f. @ 1'-9" c/c = 29'-9"

℄ Light Pole (68+50 D)

11-R504 n.f. at 3'-0" = 30'-0"

Reinforcing in Section-3 same as shown in Section-2. Bend R502, R503, R504 in field to fit.

2'-0" 8-bar R505 series n.f. at 3'-0" c/c

6" 8-bar R506 series f.f. of 2'-8" c/c

El. 902.29

1" Expansion joint with Type "A" copper waterstop)

For Section-J See Sh. No. 5 13

32-W705 f.f. @ 1'-0" c/c = 31'-0"

12-C611 at 1'-9" c/c = 19'-3"

W620

W901

W902

Constr. joint in footing

El. 877.50

6-C611 @ 2'-0" c/c

4-W502

32-W902 @ 1'-0" c/c = 31'-0" (in footing)

32-W901 @ 1'-0" c/c = 31'-0"

32-W620 @ 1'-0" c/c = 31'-0"

R503 f.f.

8" 12-R503 f.f. at 2'-8" = 29'-4" (lap alt. R902) 8"

2'-8" 11-R903 at 2'-8" = 26'-8" (lap alt. R902). 2'-8"

Special Contraction joint

2" conduit

11-R502 e.f. at 1'-3" = 20'-0"

4-R502 at 2'-0"

3" clear

7-R501 centered on joint (typical).

6-R501 centered on joint (typical).

El. 877.00

5'-0"

39-R801 & 39-R701 at 10" c/c at 31'-8" (in footing)

23-R902 f.f. at 1'-4" = 29'-4"

24-R901 f.f. at 1'-4" = 30'-8"

ELEVATION

Expansion joint.

Contradion joint

Rustication groove

C507 e.f.

C506 e.f.

C504 series n.f.

C505 series f.f.

C502 n.f. C503 f.f.

10 spa. at 1'-0" = 10'-0" 5-R801 at 2'-8" f.f.

El. 888.00

R505 series

R506 series A602 at 3'-0" c/c

4-C501 R701 R801

20-R801 & 20-R701 at 10" c/c at wall face

15-R803 f.f. at 1'-4" = 18'-8"

16-R802 f.f. at 1'-4" = 20'-0"

Measured on back face at top of footing.

END VIEW

SPECIAL CONTRACTION JOINT DETAIL

Type 'B' waterproofing 36" Wide, centered on joint.

Front face

F.L. El. 881.26

Construction joint

Dullbox Sta 67+75

24'-0" measured on front face of footing

8" ϕ Non-perforated bituminous coated CMP drain from end of retaining wall to catch basin.

Proposed curb

Catch basin

Sta 67+75

El 901.50

Fill line

Type 'A' waterproofing

Porous backfill

W705

Type 'B' waterstop, 2" clear

A602 @ 3'-0" c/c

W502

W620

W901

W902

C611

8" clear

4'-6" 6'-9" 4'-0"

15'-3"

SECTION-P

Impervious soil with * Poly-Vinyl barrier under drain 2'-0" Min width.

*Included with porous backfill for payment.

Provide Pilaster for Light Pole - See Plan

Fill Line

HL501

HL502

R504 R503

Wall batter 5/8" per ft.

R903

Porous backfill

R502 R901

Type "A" waterproofing

Impervious soil with * Poly-Vinyl barrier under drain 2'-0" Min width.

A602 @ 3'-0" c/c

R701 at 10" c/c

R801 at 10" c/c

R902 R501

3" clear

R502

10 spa. at 1'-0" = 10'-0"

2" Conduit

Type 'B' waterstop, 2" clear

SECTION-O

*Included with porous backfill for payment.

B. & O. R. R. BRIDGE No. 304 2/2

LEGEND
e.f. = each face.
n.f. = near face.
f.f. = far face.

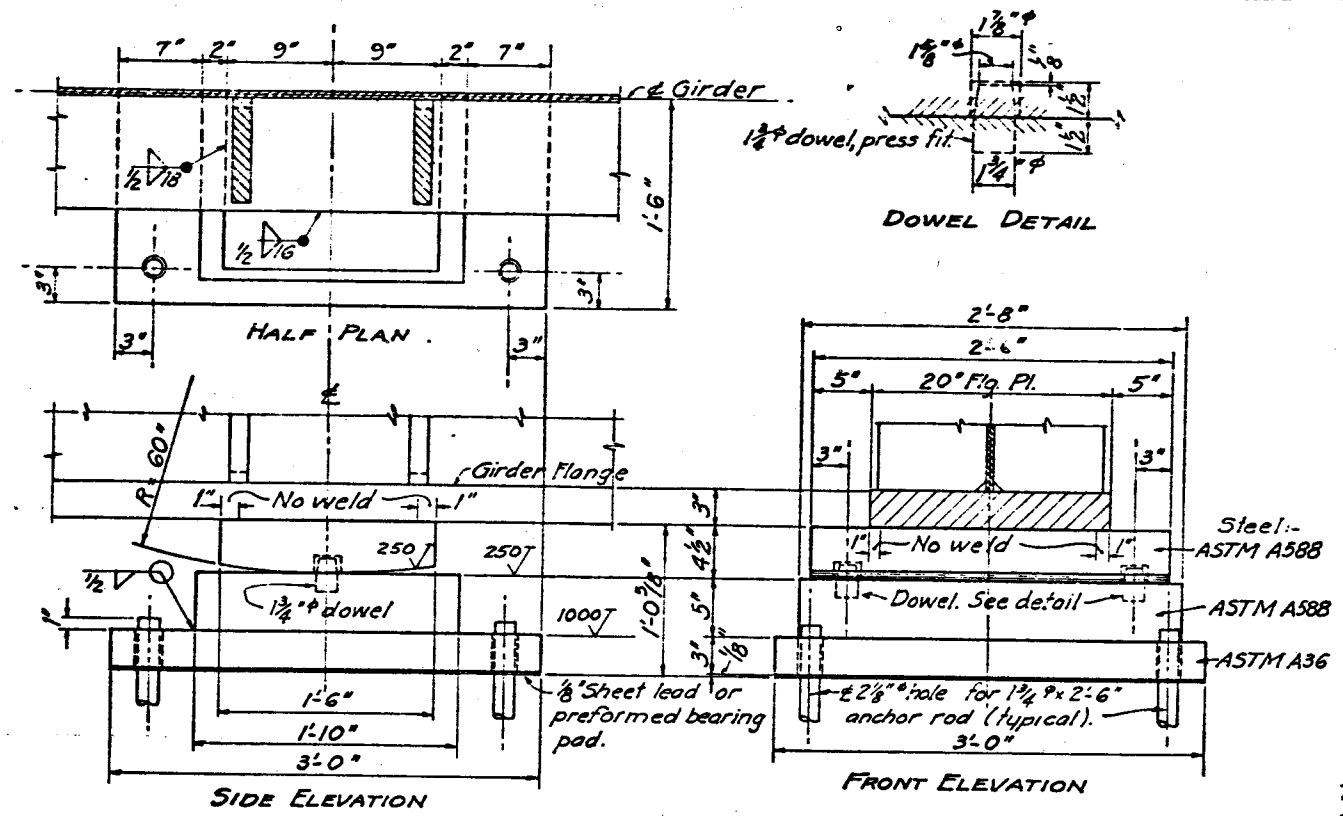
BURGESS & NIPLE LIMITED — CONSULTING ENGINEERS
COLUMBUS 12, OHIO

S.W. RETAINING WALL

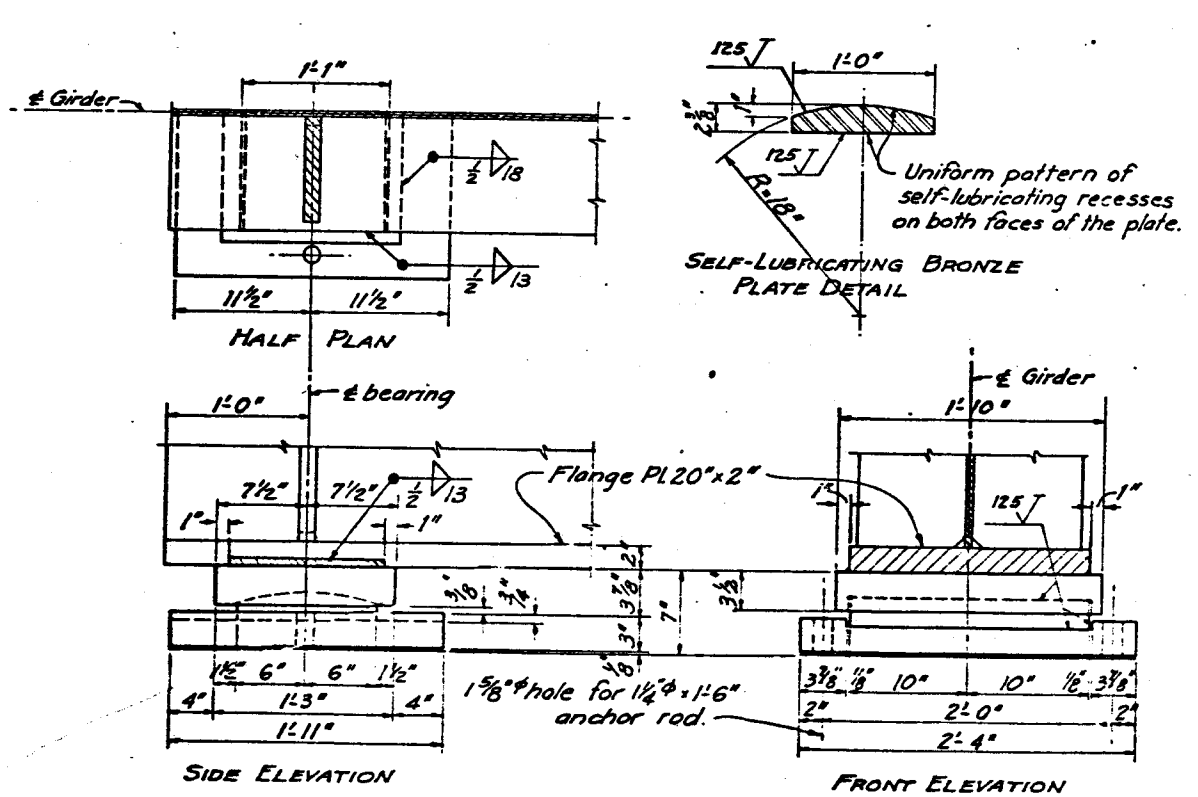
BRIDGE No. TRU-422-1297
UNDER B. & O. R. R.

TRUMBULL COUNTY STA. 68+55.95

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED DATE	REVISED
KED	KED	KED	LEC	WER 3/10/70	

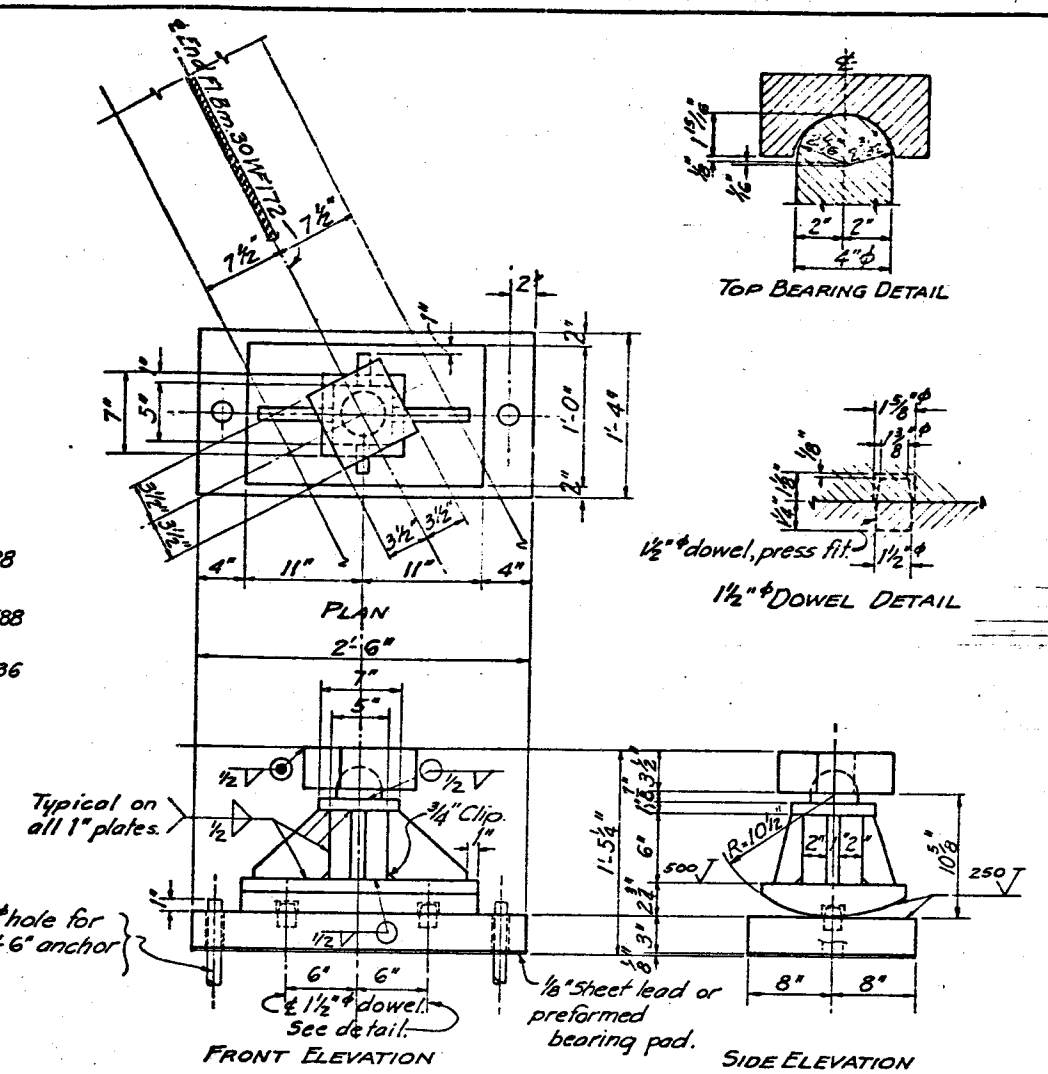


PIER BEARING DETAILS (TWO REQUIRED).



ABUTMENT BEARING DETAILS (FOUR REQUIRED).

Before final assembly the surface of the bronze plate and the opposing steel plates shall be coated with a lubricant similar to that in the recesses. The three parts shall be banded together for shipment. The self-lubricating bronze plates are included with the structural steel, Item 810, for payment.



1½"ϕ DOWEL DETAIL

END FLOOR BEAM BEARING DETAILS (TWO REQUIRED).

FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	TYPE FUNDS
2	OHIO		

79
140

TRUMBULL COUNTY
TRU-422-12.58

B & O R.R BRIDGE No. 304½

BURGESS & NIPPLE LIMITED — CONSULTING ENGINEERS
COLUMBUS 12, OHIO

8/13

SUPERSTRUCTURE DETAILS
BEARINGS

BRIDGE No. TRU-422-1297
UNDER B & O. R. R.

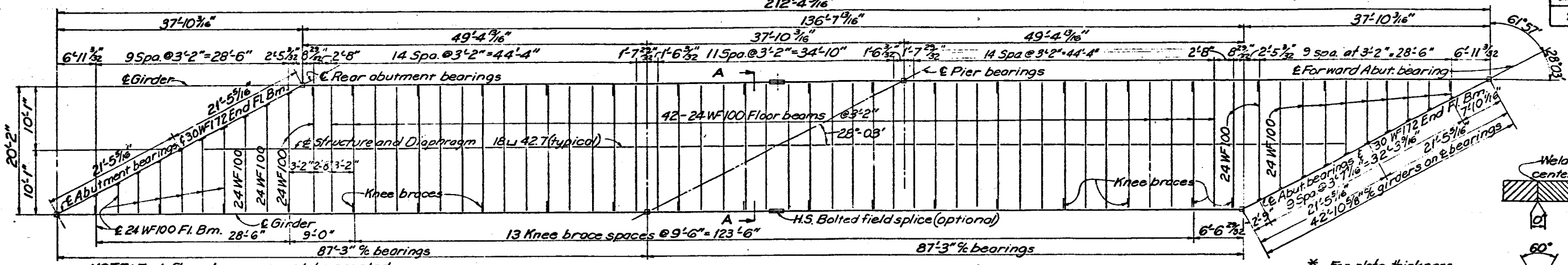
TRUMBULL COUNTY STA. 68+55.95

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED DATE 6/15/70	SECTION
KED	KED	KED	LEC	WLP 7/10/70	

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

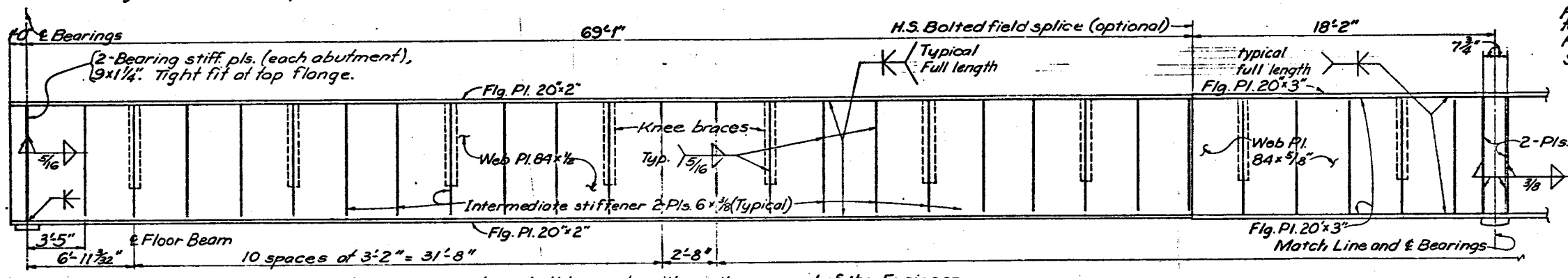
BO 140

TRUMBULL COUNTY
TRU-422-12.58

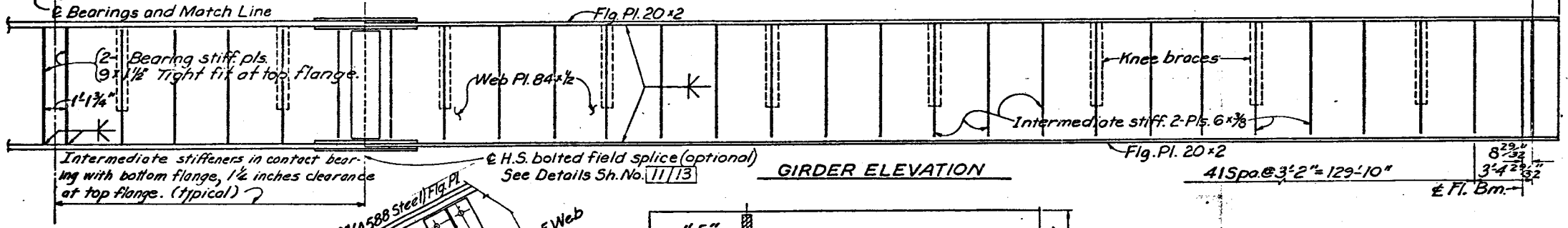


NOTE: End floor beam cannot be erected after girders are in final position.

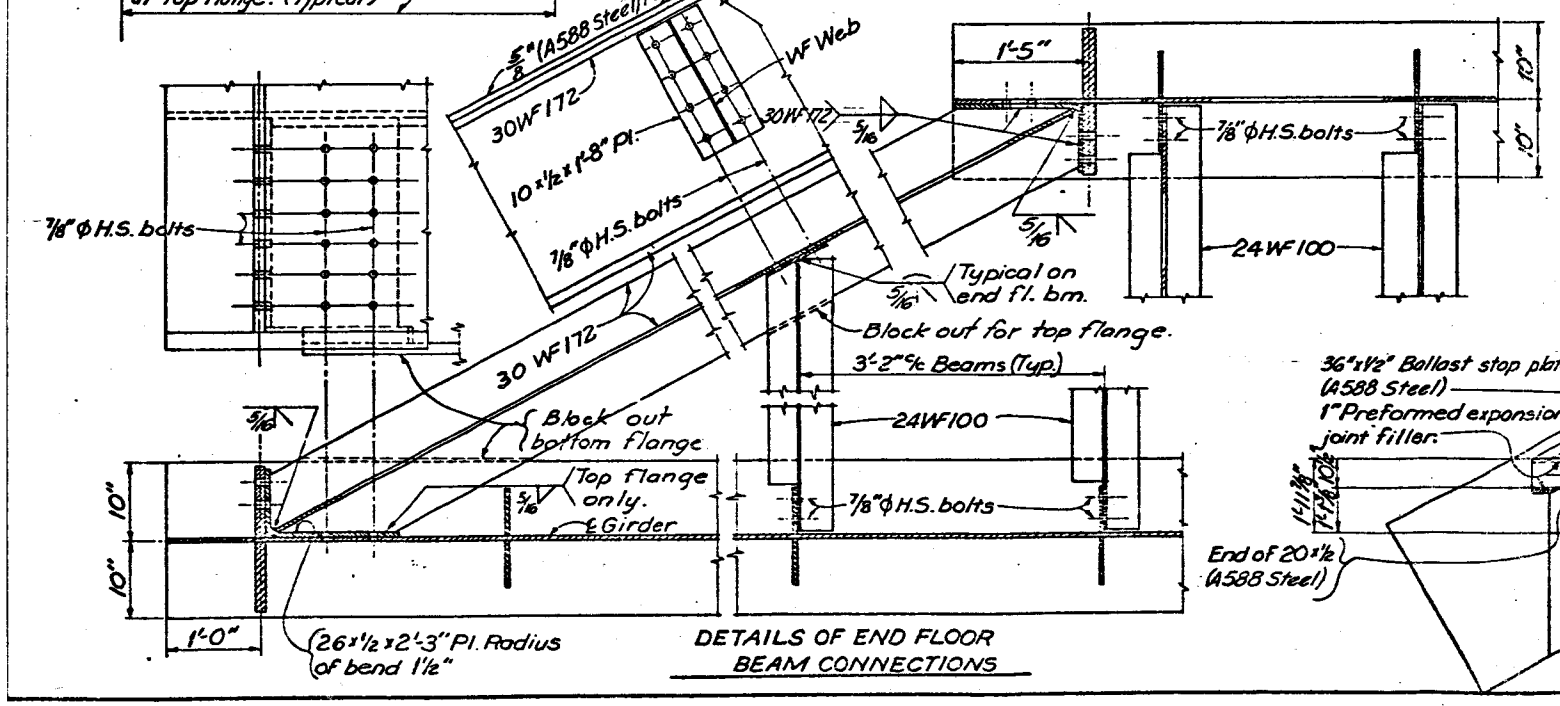
STRUCTURAL STEEL FRAMING PLAN



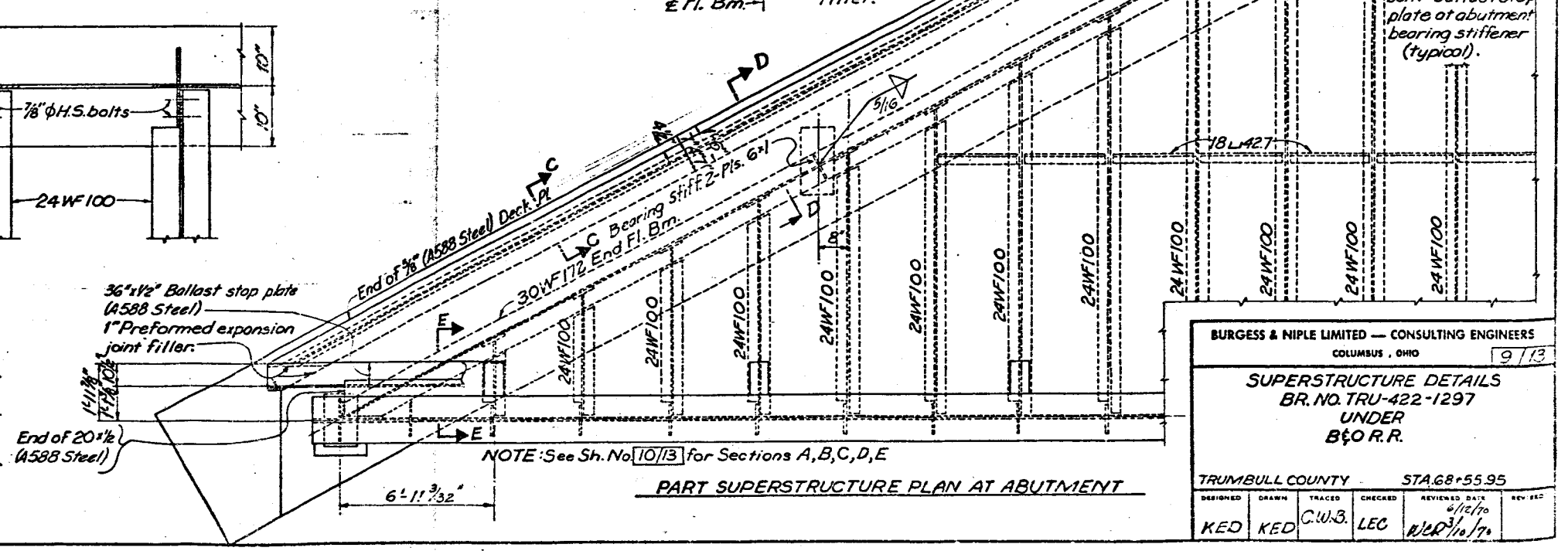
NOTE: No girder splices except as show shall be made without the approval of the Engineer.



GIRDER ELEVATION

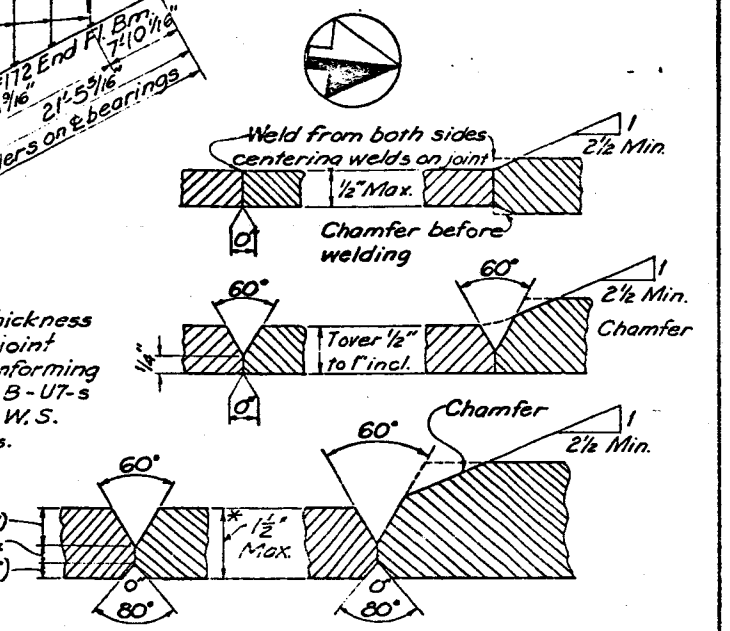


DETAILS OF END FLOOR BEAM CONNECTIONS



PART SUPERSTRUCTURE PLAN AT ABUTMENT

* For plate thickness over 1 1/2", use joint preparation conforming to B-U3a-s or B-U7-s Figure 216 A.W.S. Specifications.



All of the above full penetration welds shall be back-gouged and welded after welding for side. Butt welds on beam and girder flange plates shall be ground flush, the finish grinding being parallel to the direction of stress.

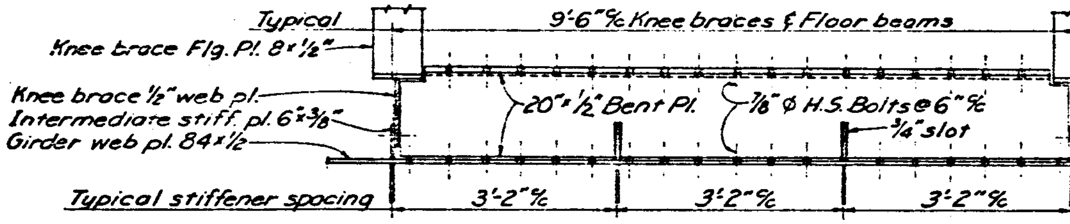
JOINT PREPARATION FOR SUBMERGED ARC WELDMENTS

BURGESS & NIPLE LIMITED — CONSULTING ENGINEERS
COLUMBUS, OHIO 9/13

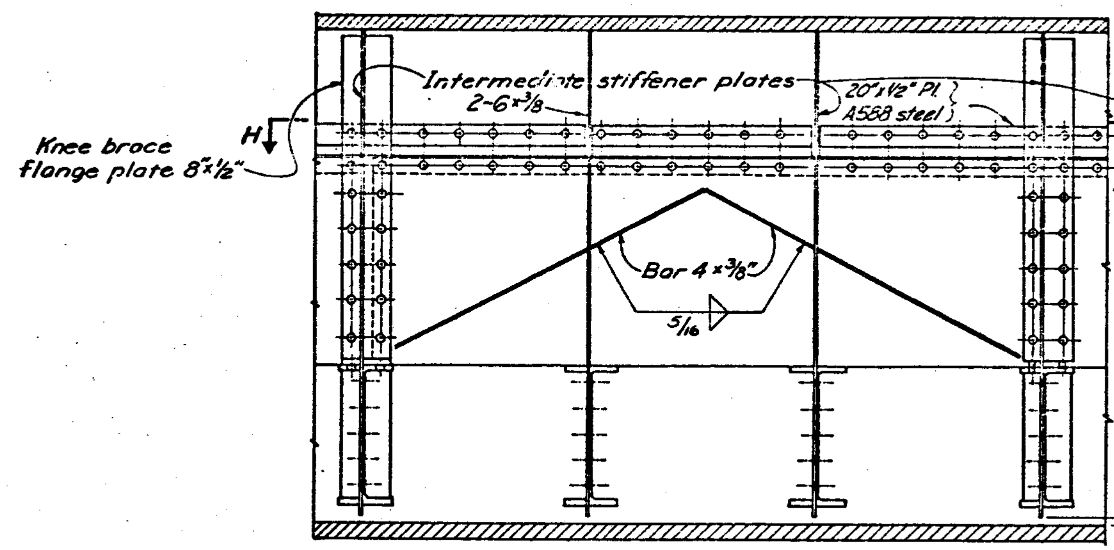
SUPERSTRUCTURE DETAILS
BR. NO. TRU-422-1297
UNDER
B&O R.R.

TRUMBULL COUNTY STA. 68+55.95

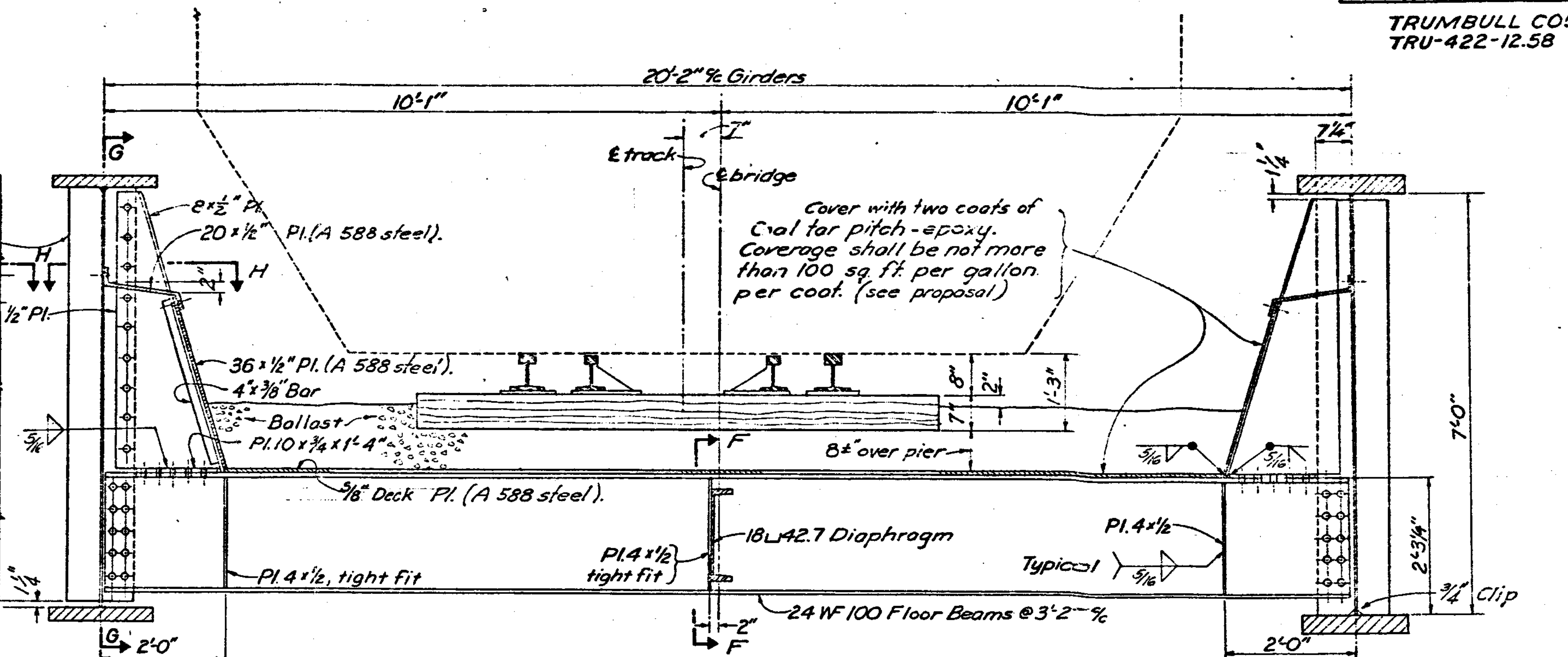
DESIGNED	DRAWN	TRACED	CHECKED	REVISED DATE	REVISED
KED	KED	C.W.B.	LEC	6/12/70 3/10/71	



SECTION-H

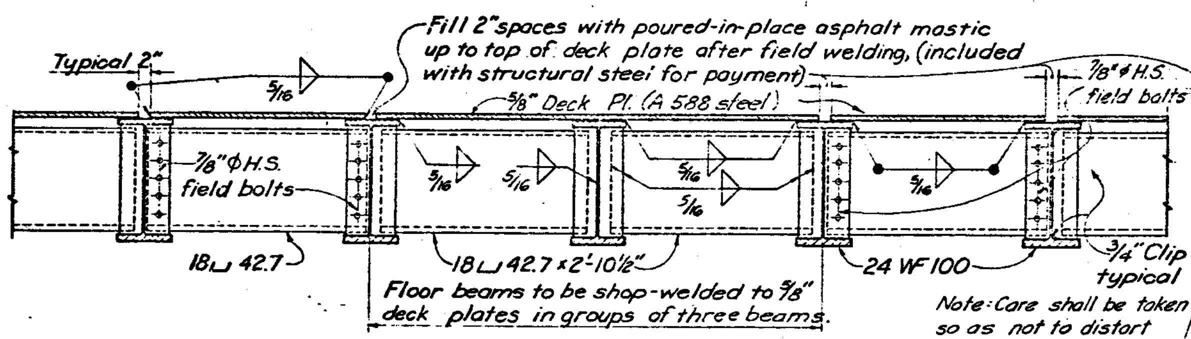


SECTION-G

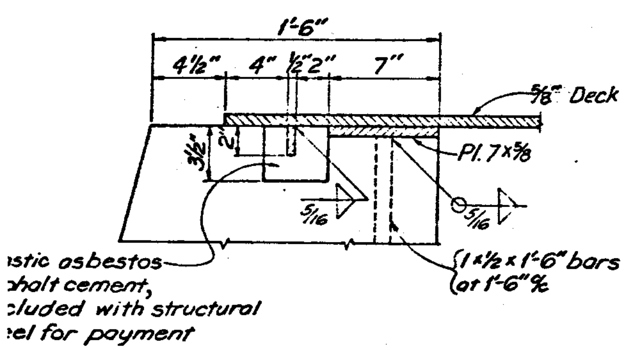


SECTION-A
Looking Upstation.

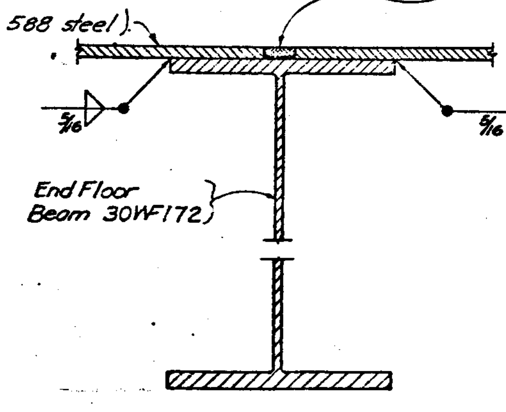
Note: Floor beams cannot be erected after girders are in final position.



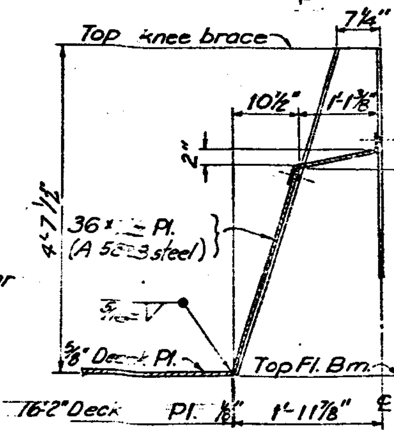
SECTION-F SHOWING FLOOR BEAM FABRICATION



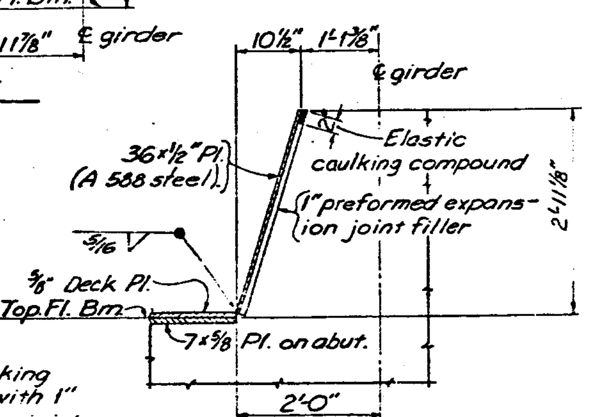
SECTION-C



SECTION-D



SECTION-E



SECTION-B

COMPUTATIONS

DESIGN: In accordance with AREA 1969 – LL Coopers E-80 – Diesel Impact.

Intermediate Floor Beams – 20'-2" span

	Moment K'	Shear K
LL+I	364	49
DL	41	7
Total	405	56

Section Modulus required = 243
Section used = 24 WF 100
Section Modulus provided = 248.9
Allowed unit stress = 20,000 p.s.i.
Actual unit stress = 19,500 p.s.i.

End Floor Beam 2 spans at 21'-5⅝"

	Max. Pos. Mom.	Max. End Shear
LL+I+DL Reaction Interior Fl. Bms. Unif. D.L. End Fl. Bm. Total	867 K'	160 K

	Max Neg. Mom.	Max. Reaction at ctr. brg.
LL+I+DL Reaction Interior Fl. Bms. Unif. D.L. End Fl. Bm. Total	-625 K'	306 K

Sec. Modulus required = 520
Sec. used = 30 WF 172
Sec. Modulus provided = 528
Allowed unit stress = 20,000 p.s.i.
Actual unit stress = 19,700 p.s.i.

GIRDER

Sec. Mod. required for pos. mom. = 3,819
Sec. Mod. provided for pos. mom. = 3,924

Sec. Mod. required for neg. mom. = 5,614
Sec. Mod. provided for neg. mom. = 5,730

GIRDER – (Two continuous 87'-3" spans)

	Max. Pos. Mom.	Max. Neg. Mom.	Pier Reaction	Abut. Reaction
Dead Load	1400 K'	-2895 K'	311 K	89 K
Live Load	3870 K'	-5036 K'	564 K	242 K
Impact	1095 K'	-1425 K'	160 K	68 K
Total	6365 K'	-9356 K'	1035 K	399 K
allowed unit fs	20,000 psi	20,000 psi		
actual fs	19,500 psi	19,600 psi		

TABLE OF ADDITIONAL BENDING STRESSES AT PIER DUE TO SETTLEMENT

SETTLEMENT	ADDITIONAL STRESSES AT PIER
1" at Pier	2,869 psi
½" at Pier	1,434 psi
¼" at Pier	717 psi
1" at Abutments	1,434 psi
½" at Abutments	717 psi
¼" at Abutments	358 psi

Maximum diagonal tension at 14+26 = 10,635 psi.
Maximum diagonal tension at 20 = 14,836 psi.

NOTE: Elastic caulking compound included with 1" preformed expansion joint filler for payment.

...astic asbestos ...phalt cement, ...cluded with structural ...eel for payment

NOTE:- See Sheet No. 9/13 for locations of Sections A, B, C, D and E.

BURGESS & NIPLE LIMITED — CONSULTING ENGINEERS
COLUMBUS, OHIO
10/13

SUPERSTRUCTURE DETAILS
BR. NO. TRU-422-1297
UNDER
B&O R.R.

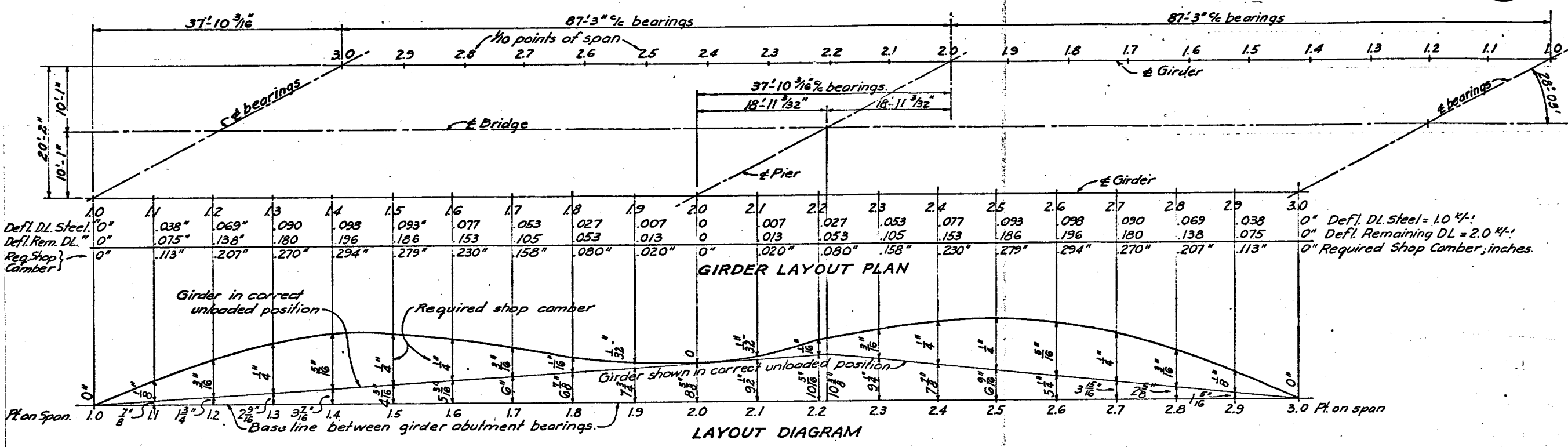
TRUMBULL COUNTY STA 68+55.95

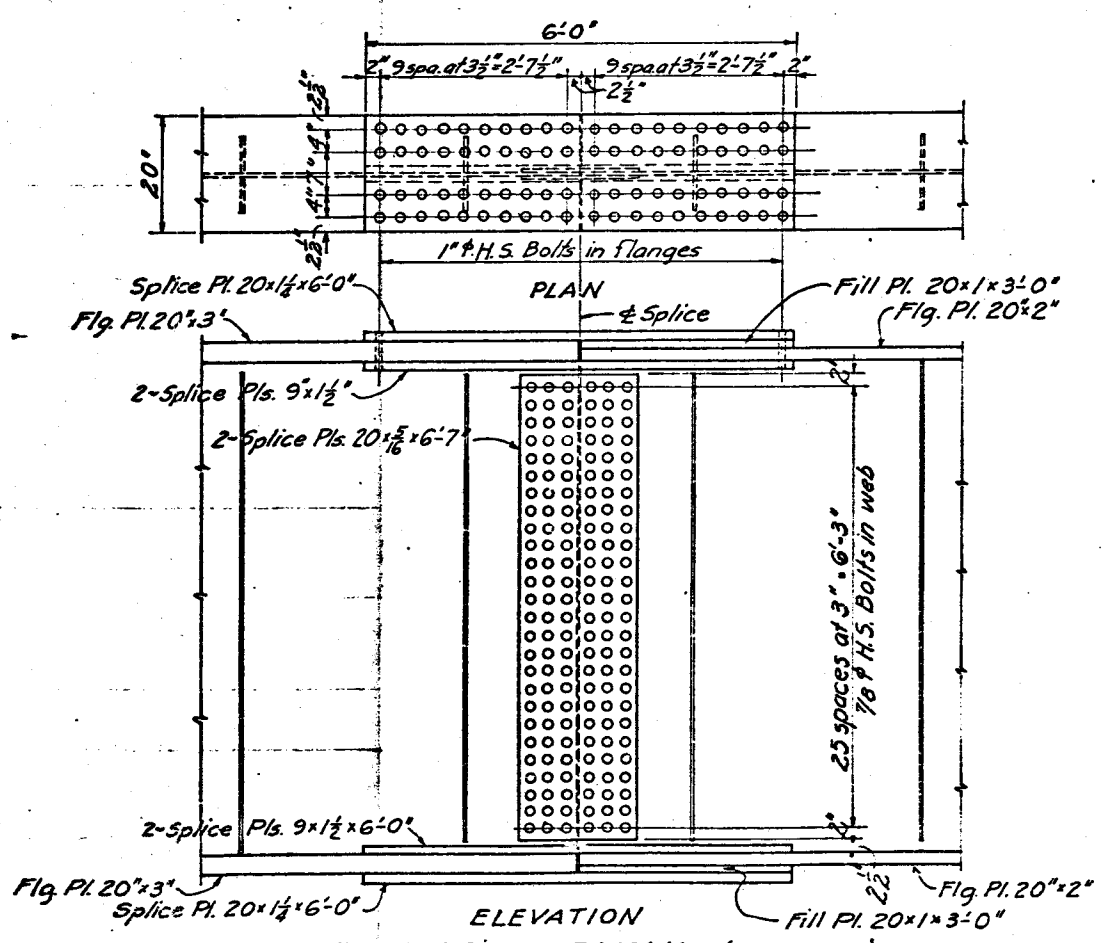
DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED DATE	REVISED
KED	JWB	JWB	LEC	4/1/70	

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

82
140

TRUMBULL COUNTY
TRU-422-12.58





B. & O. R. R. BRIDGE No. 304 1/2

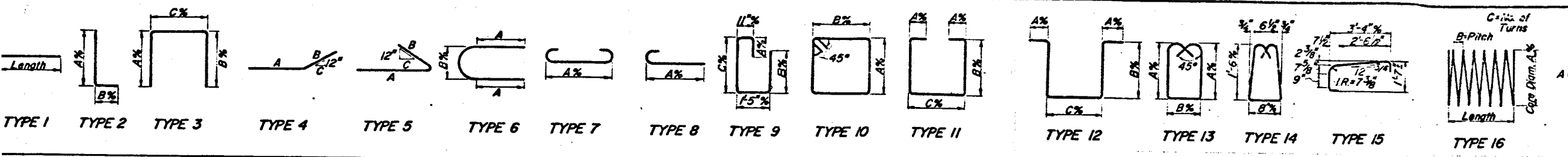
BURGESS & NIPLE LIMITED — CONSULTING ENGINEERS
COLUMBUS, OHIO 11/13

GIRDER CAMBER & SPLICE DETAILS

BR. No. TRU-422-1297
UNDER B. & O. R. R.

TRUMBULL COUNTY STA. 68+55.95

DESIGNED	DRAWN	TRACED	CHECKED	REVISED DATE	REVISED
KED	KED	KED	LEC	9/12/10 WER 9/10/70	

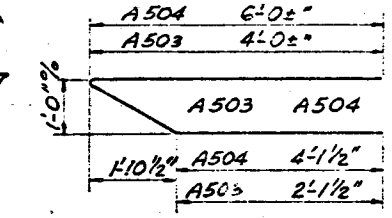


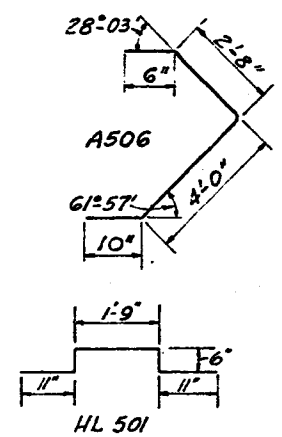
TYPE 1 TYPE 2 TYPE 3 TYPE 4 TYPE 5 TYPE 6 TYPE 7 TYPE 8 TYPE 9 TYPE 10 TYPE 11 TYPE 12 TYPE 13 TYPE 14 TYPE 15 TYPE 16 TYPE 17

FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	TYPE FUNDS
2	OHIO		

83
140

TRUMBULL COUNTY
TRU-422-12.58





HL 501

ABUTMENTS

MARK	NUMBER	LENGTH	TYPE	A	B	C	WEIGHT
4901	112	12'-9"	1				4855
4902	112	6'-11"	5	5'-11"	1'-3"	2"	2634
4903	32	6'-7"	2	5'-7"	1'-3"		716
4801	112	18'-2"	1				5433
4802	32	17'-11"	1				1531
9601	128	28'-9"	1				5527
9602	38	2'-0"	1				114
9603	42	13'-4"	1				841
9604	10	14'-10"	1				223
9605	12	15'-2"	1				273
9606	122	6'-6"	2	5'-10"	10"		1,791
9607	6	5'-4"	1				48
9608	84	8'-4"	1				1051
9609	22	12'-6"	2	10'-9"	1'-11"		413
9610	22	17'-9"	1				587
9611	28	6'-0"	1				252
1501	48	6'-9"	3	10"	10"	5'-4"	338
1502	24	4'-0"	1				400
1503	4	8'-0"	(Special Bending Diagram).				33
1504	4	12'-0"	(Special Bending Diagram).				50
1505	28	6'-0"	3	0'-7½"	0'-7½"	5'-0"	175
1506	6	7'-9"	(Special Bending Diagram).				49
1507	10	9'-6"	4	8'-6"	1'-1½"	1'-10½"	99
1508	10	6'-7"	4	5'-0"	1'-8½"	1'-10½"	69
1509	10	15'-9"	3	1'-9"	13'-3"	1'-0"	164
1510	112	3'-0"	1				350

S.W. RETAINING WALL (Section 2-3-4)

2901	48	14'-3"	5	11'-8"	2'-10"	0'-0 5/8"	2,326
2902	46	8'-2"	5	5'-7"	2'-10"	0'-0 5/8"	1,277
2903	22	14'-10"	1				1,110
3901	98	6'-10"	1				1,788
3902	16	7'-6"	5	5'-2"	2'-6"	0'-0 5/8"	320
3903	15	12'-6"	5	10'-2"	2'-6"	0'-0 5/8"	501
3904	5	11'-6"	1				154
4701	98	6'-7"	1				1,319
A602	30	2'-0"	1				90
A501	4	1'-1"	Special Bending Diagram				19
A502	2	8'-0"	1				17
B101	39	10'-0"	1				407
B102	86	31'-6"	1				2,825
B103	28	21'-0"	1				613
B104	22	20'-8"	1				474
B105	1 set / 8	8'-3"/18'-2"	1	Vary by 1'-5" increment.			110
B106	1 set / 8	9'-3"/19'-2"	1	Vary by 1'-5" increment.			119
C101	8	16'-0"	1-c				134
C102	6	23'-6"	1-c				147
C103	6	33'-0"	1-c				138
C104	1 set / 6	21'-2"/32'-7"	1-c	Vary by 2'-7" increment.			97
C105	1 set / 6	24'-11"/29'-0"	1-c	Vary by 2'-5" increment.			87
C106	2	19'-0"	1-c				15
C107	2	25'-0"	1-c				52

N.E. WINGWALL

MARK	NUMBER	LENGTH	TYPE	A	B	C	WEIGHT
W601	3	20'-9"	1				93
W602	3	17'-8"	1				80
W603	3	16'-0"	1				72
W604	3	14'-4"	1				65
W605	3	12'-8"	1				57
W606	3	11'-0"	1				50
W607	1 set / 14	10'-6/20'-3"	1	Vary by 9" increment			323
W608	18	7'-0"	1				189
W618	18	8'-0"	5	7'-4"	0'-10"	0'-2"	216
W620	18	7'-0"	1				189
C508	4	20'-0"	1-c				83
C601	6	23'-0"	1-c				207
C602	1 set / 4	8'-0"/20'-0"	1-c	Vary by 4'-0" increment			84
C603	1 set / 6	8'-0"/19'-8"	1-c	Vary by 4" increment			170
C604	1	17'-0"	1-c				26
C605	1	13'-0"	1-c				20
C606	1	9'-2"	1-c				14
C607	3	5'-8"	1-c				26
C608	2	24'-0"	1-c				72
C610	4	20'-0"	1-c				120
A602	5	2'-0"	1				15
HL 501	2	1'-1"	Special Bending Diagram (N.W. Wingwall)				10
HL 502	2	8'-0"	1				17

N.W. AND S.E. WINGWALLS

A602	44	2'-0"	1				132
W901	112	9'-0"	5	8'-0"	1'-3"	0'-3"	3,427
W902	138	11'-0"	1				5,161
W609	36	20'-9"	1				1122
W614	2 sets / 11	15'-2"/16'-10"	1	Vary by 2" increment.			529
W615	2 sets / 11	17'-3"/19'-9"	1	Vary by 3" increment.			611
W616	34	14'-10"	1				757
W617	12	24'-0"	1				433
W620	138	7'-0"	1				1,451
W501	8	24'-0"	1				200
C609	24	16'-9"	1-c				419
C 609	168	16'-9"	1-c				4,227
W701	2 sets / 17	15'-4"/18'-0"	1	Vary by 2" increment			1,152
W702	2 sets / 15	13'-3"/15'-0"	1	Vary by 1½" increment			366
W703	20	13'-3"	1				542
W704	28	15'-10"	1				908

PIER

MARK	NUMBER	LENGTH	TYPE	A	B	C	WEIGHT
P1001	48	7'-6"	2	6'-5"	1'-4½"		1549
P1002	48	15'-6"	1				3201
P901	48	11'-6"	1				1877
P501	16	4'-4"	3	0'-7½"	0'-7½"	3'-4"	72
P502	12	5'-5"	3	0'-7½"	0'-7½"	4'-5"	68
SP501	2	15'-8"	16	4'-8"	0'-4"	50	1636

S.W. RETAINING WALL (Section

W901	32	9'-0"	5	8'-0"	1'-3"	0'-3"	979
W902	32	11'-0"	1				1,197
W705	32	18'-3"	1				1,194
C611	30	31'-6"	1				1,419
W619	18	20'-3"	1				547
W620	32	7'-0"	1				336
W502	4	31'-6"	1				131
A602	11	2'-0"	1				33

REPLACEMENT BARS

MARK	NUMBER	LENGTH	TYPE	A	B	C	WEIGHT
RE1000	1	8'-2"	1				
RE900	2	7'-10"	1				
RE800	1	7'-8"	1				
RE750	1	7'-2"	1				
RE600	2	6'-11"	1				
RE500	1	6'-7"	1				
RE501	1	6'-7"	17	6'-7"	2'-1"		

BAR SIZE is indicated in the bar mark. The first digit where three digits are used, and the first two digits where four are used, indicates the bar size number. For example, A601 is a No.6 size bar and P1101 is a No.11 size bar.

SPIRAL REINFORCING BARS: The "Length" shown in the steel list for the spiral bars is the length of the spiral along the axis of the spiral. The "No. of Turns" shown is the length divided by the pitch plus 3 turns (total number of closed coils). Spiral reinforcing bars shall not have deformations but shall in other respects conform to Item 509. 1½ Closed coils shall be provided at the ends of each spiral unit. Four steel channel, tee or angle spacers, weighing approximately 1.01 lb. per lin. ft. of spacer, shall be provided for each spiral unit. They shall be equally spaced along the periphery of the coil. The number of pounds of these spacers, based on 1.01 lbs. per lin. ft. will be paid for as reinforcing steel and is included in the tabulated quantities of spiral bars.

BARS marked Type "1-c to be bent in field. Bending shall be included with Item 509 "Reinforcing steel" for payment.

B. & O. R.R. BRIDGE No. 30.4½

BURGESS & NIPLE LIMITED — CONSULTING ENGINEERS
COLUMBUS, OHIO

REINFORCING STEEL LISTS

BRIDGE NO. TRU-422-1297
UNDER B. AND O. R. R.

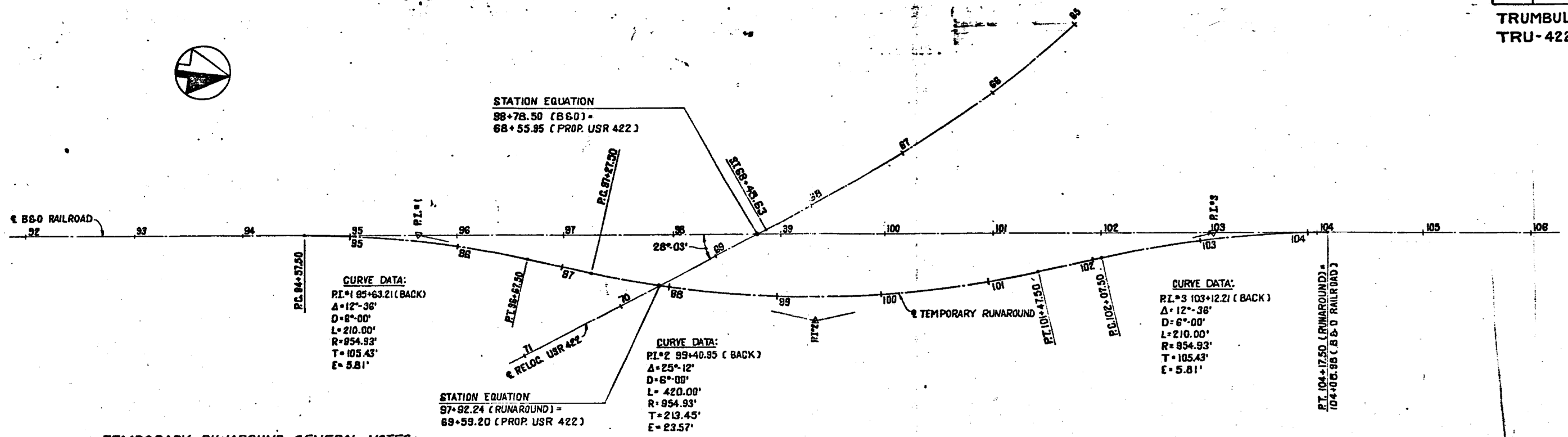
TRUMBULL COUNTY STA. 68+55.95

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED DATE	SHT. NO.
MED	MED	MED	LEC	WJR 9/10/70	

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

84/140

TRUMBULL COUNTY
TRU-422-12.58



TEMPORARY RUNAROUND ALIGNMENT PLAN

TEMPORARY RUNAROUND GENERAL NOTES:

THE RAILROAD COMPANY will furnish labor and materials, including ballast for the construction of connections to the temporary runaround track and the removal of same when existing track can be restored to original position as indicated on Force Account Plan Drawing No. 992.

THE RAILROAD COMPANY will be responsible for removal, restoration and necessary readjustment of existing track including furnishing and placing ballast on the new railroad structure.

THE RAILROAD COMPANY will furnish labor and materials for maintenance of entire runaround track arrangement and connections while in service.

THE RAILROAD COMPANY will furnish labor and materials for lining and surfacing permanent track when restored to original position.

THE CONTRACTOR shall be responsible for furnishing, placing and removal, as necessary, of embankment, subballast and ballast for railroad temporary runaround track and the construction and removal of that portion of temporary runaround track as indicated on Force Account Plan Drawing No. 992. All furnishing, placing and removal, as necessary, of embankment, subballast and ballast for the railroad temporary runaround by the Contractor shall be included with the Temporary Runaround for payment.

BALLAST shall be crushed stone or crushed air-cooled blast furnace slag conforming to American Railway Engineering Association specifications as follows:

(a) The percentage of wear of the prepared ballast, as tested in the Los Angeles machine, shall not be greater than 40%.

(b) The soundness of the prepared ballast shall be such that when tested in the sodium sulphate soundness test, the weighed average loss shall not be in excess of 10% after five cycles.

(c) The weight per cubic foot of prepared slag ballast shall not be less than 70 pounds per cubic foot.

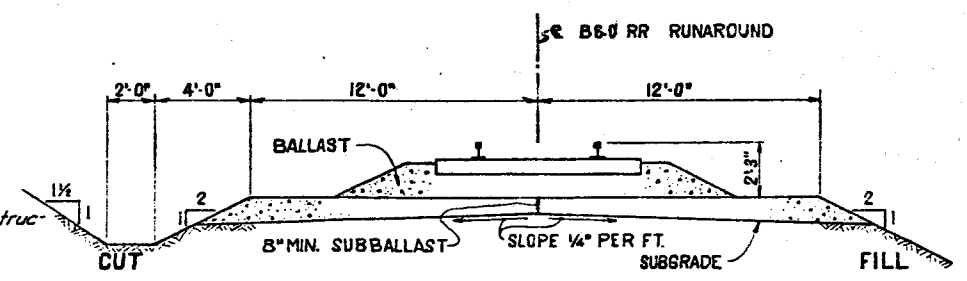
(d) Crushed air-cooled blast furnace slag or crushed stone for prepared ballast shall meet the following requirements for grading when tested by means of laboratory sieves having square openings:

Passing a 2" sieve	*100 per cent*
Passing a 1½" sieve	*90-100 per cent*
Passing a 1" sieve	*20-55 per cent*
Passing a ¾" sieve	*0-15 per cent*
Passing a ⅜" sieve	*0-5 per cent*

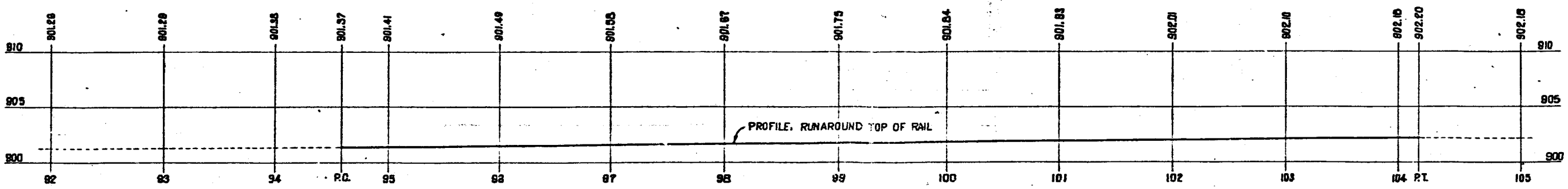
Size No. 4 as adopted from National Bureau of Standards Simplified Practice Recommendation R.163-48.

SUBBALLAST shall conform with Item 310, Subbase of the State of Ohio Department of Highways Construction and Material Specifications.

SUBGRADE shall be prepared as specified in Item 203.13, Subgrade of the State of Ohio Department of Highways Construction and Material Specifications.



TEMPORARY RUNAROUND TYPICAL SECTION



TEMPORARY RUNAROUND PROFILE

B&O R.R. BRIDGE NO. 304½

BURGESS & NIPLE LIMITED — CONSULTING ENGINEERS
COLUMBUS, OHIO 13/15

TEMPORARY RUNAROUND DETAILS

BR. NO. TRU-422-1297
UNDER
THE BALTIMORE AND OHIO RAILROAD

TRUMBULL COUNTY STA 68+55.95

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED DATE	REVISED
WCR	WCR		REO	WCR 6/27/70 3/10/70	