21048
Maury

STATE OF OHIO
DEPARTMENT OF HIGHWAYS

S-335 (5)

SEC. NO.	STATE	PROJECT	
2	OHIO	S-335 (5)	

JEF-164-5.97

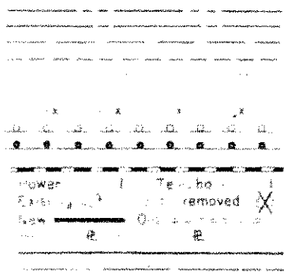
1
20

JEF-164-5.97

VILLAGE OF BERGHOLZ
JEFFERSON COUNTY

CONVENTIONAL SIGNS

State Line
County Line
Township Line
Section Line
Center Line
Corporation Line
Fence Line
Guard Rail (existing)
Guard Rail (proposed)
Railroad Line
Poles
Trees and Stumps
Drain Pipe
Property Line
Right of Way Line
Existing Right of Way Line

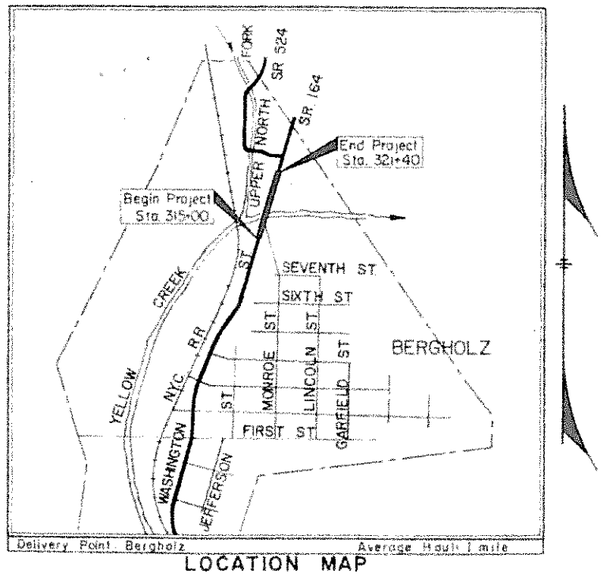


INDEX OF SHEETS

LINE DATA

Begin Project		Sta. 315+00	
End Project		Sta. 321+40	
Gross Length Project		=	640 Lin. Ft.
Addition or Deductions		None	
Net Length Project	=	640 Lin. Ft. or	0.121 Miles
Begin Work		Sta. 314+00	
End Work		Sta. 321+40	
Net Length of Work	=	740 Lin. Ft. or	0.140 Miles

Revised sheet 16. (12-26-63)



LOCATION MAP

SCALE OF MILES

0 800' 1600'

Portion to be Improved
State Roads
Other Roads

SCALE

Plan
Profile Horizontal
Profile Vertical
Cross Sections

1963 SPECIFICATIONS

The standard specifications of the State of Ohio, Department of Highways, including changes and supplemental specifications listed in the proposal shall govern this improvement

The right of way for this improvement will be provided by the State of Ohio

I hereby approve these plans and declare that the making of this improvement will not require the closing to traffic of the highway and that provisions for the maintenance and safety of traffic will be as set forth on these plans and estimates.

Approved Earl H. Wilson
Date 6-28-63 Division Deputy Director

Approved J. W. Wilson
Date 10-22-63 Deputy Director of Planning & Programming

Approved B. K. Emerson
Date 10-4-63 Engineer of Bridges

Approved R. D. Lakotta
Date 10-8-63 Engineer of Location & Design

Approved R. E. Shultz
Date 10-9-63 Deputy Director of Design & Construction

Approved T. H. Bovard
Date 10-7-63 Deputy Director of Right of Way

Approved
Date First Assistant Director

Approved P. E. Mashuda
Date 10-22-63 Director of Highways

PLANS PREPARED BY
GANNET, FLEMING, CORDDRY AND CARPENTER,
CONSULTING ENGINEERS
600 NORTH SECOND STREET, HARRISBURG, PENNSYLVANIA

DEPARTMENT OF COMMERCE
BUREAU OF PUBLIC ROADS
APPROVED:

DIVISION ENGINEER DATE

File No.	JEFFERSON COUNTY	JEF-164-5.97
	Date of Letting	196
	Contract No	

STANDARD DRAWINGS

DR-1	I-3-55	AR-1-57	4-2-62	F.A.C.I-1	3-8-63
G-7.07	6-1-56	AS-1-54	7-5-62	F.A.C.I 2	3-5-63
L-3	4-1-50	CSB-2-56 Revised 2-1-63	2-2-59	FSB-1-62	1-15-63
L-3-A	4-1-50	P-1-54	2-2-59		
RI-1	7-15-56	I-15 N°1	11-15-60		
I-1	11-15-60	I-15 N°2-A	8-17-60		
T-35	1-2-34	L-1	4-1-50		

SUPPLEMENTAL SPECIFICATIONS

S-101		7-12-62
I-124	R.	3-20-61

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

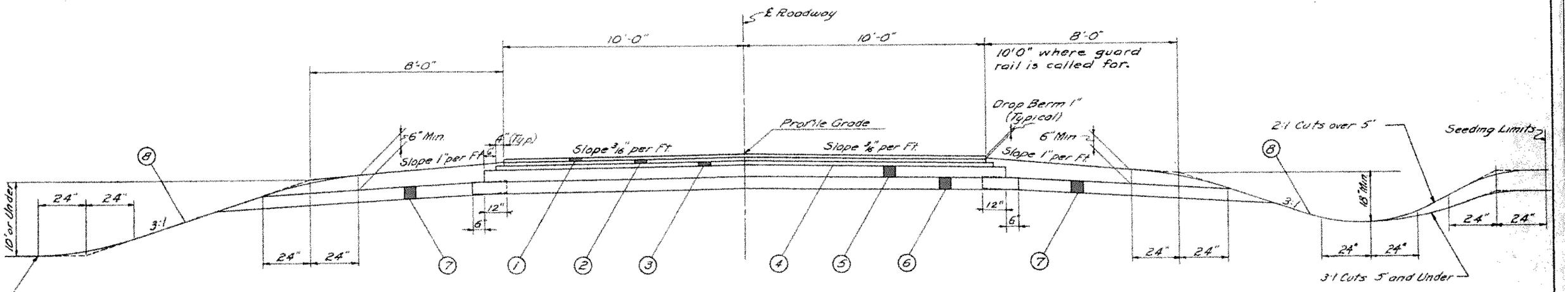
2/20

JEF-164-5.97

TYPICAL SECTION

TYPE T-35 ON B-19

SCALE: ½" = 1'



NORMAL SECTION

Limiting Stations

Sta 314+00	Sta 315+82.60	=	1826 Lin Ft
Sta 317+93.40	Sta 321+40	=	346.6 Lin Ft
	Total	=	529.2 Lin Ft

LEGEND

1	Item	T-35 †	1½" Asphaltic Concrete Surface Course Type "C" (70-85)
2	Item	B-35 †	1½" Asphaltic Concrete Second Leveling Course (70-85)
3	Item	B-35 †	1½" Asphaltic Concrete First Leveling Course (70-85)
4	Item	T-30	Bituminous Prime Coat Sec M-5.7, RT-2 or RT-3 applied at the rate of 0.40 gals per Sq Yd
5	Item	B-19	6" Aggregate Base Course
6	Item	I-22	6" Subbase
7	Item	I-9	Stone Underdrains No.2
8	Item	L-9	Seeding and Protecting

† Thicknesses shown are "designed" thicknesses as described in Section T-35.01 and B-35.01.

FOR DETAILS NOT SHOWN SEE STANDARD DRAWING RI-1

FED. HWY. DIVISION	STATE	PROJECT		3/20
2	OHIO			

JEF-164-5.97

GENERAL NOTES

ALL ELEVATIONS BASED ON USGS DATUM

ROUNDING OF CORNERS SHOWN ON CROSS SECTIONS

The rounded corners shown on standard Drawing RI-1 shall apply to all cross sections, even though otherwise shown on these plans.

UTILITY ADJUSTMENT

Any or all work required for Public or Private Utilities will be done by and at the expense of their respective owners, unless otherwise noted on these plans.

UNDERGROUND UTILITIES

The locations of the underground utilities shown on the plans have been obtained by diligent field checks and searches of available records. It is believed that they are essentially correct, but the State of Ohio makes no guarantees as to their accuracy or completeness.

PRIVATE SEWER TAPS

This plan makes no provision for connecting, nor shall the Engineer or Contractor connect, any existing or new private drainage to the new highway drainage system when such private drains carry effluent or drainage from leaching bed outlets, cellar drains, or sink drains, or polluted water of any kind. Connections may be made to the existing or new highway drainage system when the water carried to the project drainage system does not come within the category outlined above. Acceptable water includes flow from roof drains, field drains, and enclosed natural drainage sources which would reach the road through natural channels if such water was not conducted artificially. Existing sewer taps which do not carry acceptable water as defined above shall be plugged at the right-of-way line. Plugging specified shall be by means of Class "E" Concrete and payment therefor shall be included in the unit price bid for Item E-1, Roadway Excavation.

FIELD OFFICE

The contractor shall, in accordance with Sec. S-0.01(b), provide, for the exclusive use of the State's employees, a suitable field office having a minimum of 150 sq. ft. of floor space. The Contractor shall have a telephone installed and maintained in this field office during the construction of this project. The Contractor shall also provide and install wiring and outlets suitable for connecting electric lights and office equipment in the field office and provide 110-volt alternating current to the office during the entire period of construction of this project. This office shall be provided within 10 days after work is started on the project.

REMOVAL OF EXISTING PIPE

The removal of all existing pipe drains within the limits of proposed excavation items shall be included for payment in unit prices bid for the respective excavation items, unless otherwise itemized in the plans.

SEEDING

Quantities for seeding are calculated for the soil areas between the work limits, as shown on the cross sections.

SCARIFICATION OF EXISTING FLEXIBLE PAVEMENT

Within the limits of construction where the existing flexible pavement will have less than six (6) inches of fill placed upon it, the pavement shall be thoroughly scarified for its full depth, mixed with sufficient soil and properly recompacted to insure the elimination of any planes of separation between it and the embankment placed thereon. Payment for scarification as described above shall be included in the unit price bid for Item E-1, Roadway Excavation.

DESIGN SPEED

The geometrics for this project have been planned for a design speed of 40 miles per hour.

REMOVAL OF TREES AND STUMPS

All trees and stumps lying within the construction limits of this project shall be removed under the lump sum price bid for Item E-9, Removal of Trees and stumps, except that those trees and stumps for which protection and preservation work is indicated elsewhere in these plans shall not be removed.

The following is an estimate of the number of trees and stumps to be removed.

SIZES		12"-18"	18"-24"	24"-30"	30"-36"	36"-42"
NO. TREES		11	1	0	0	0
NO. STUMPS						

The above estimate is approximate and the State of Ohio reserves the right to order the removal of additional trees or stumps outside of the limits of construction but within the right-of-way and/or easement lines. Payment for the removal of these additional trees or stumps shall be included in the lump sum price bid for Item E-9, Removal of Trees and Stumps.

DRAINAGE OF BASE MATERIAL

Where the base material is drained by I-9 Stone Underdrains, the Contractor shall finish, seed, and mulch the slopes so as not to impede drainage of the base material.

ITEM I-9 STONE UNDERDRAIN, NO. 2

Stone Underdrains shall be placed at fifty (50) foot intervals on each side of normal crowned sections and at twenty-five (25) foot intervals on the low side only of superelevated sections.

NON-RIGID PAVEMENT REMOVAL

Removal and disposal of existing non-rigid pavement, unless otherwise indicated on these plans, shall be measured and paid for as Item E-1 Roadway Excavation.

ESTIMATED QUANTITIES

Specific locations and usage of estimated quantities set up on this plan to be used "as directed by the Engineer" shall be made a matter of record by incorporation into the final change order governing completion of this project.

PART WIDTH CONSTRUCTION

Because of the necessity of building this project under traffic and constructing the pavement part at a time, extreme care shall be taken to prevent the construction of a butt joint on centerline in the B-19 and I-22 courses.

This shall be accomplished by building the B-19 and I-22 courses, placed with the first portion of the pavement built, at least eighteen (18) inches beyond the centerline and by surfacing no closer than eighteen (18) inches to this edge of the above courses. When the second portion of the pavement is built, at least twelve (12) inches of these projecting courses shall be broken down and thoroughly keyed in with the newly placed corresponding courses in the second portion of the pavement built. Payment for this operation shall be included in the unit price bid for the pertinent pavement items.

GUARD RAIL REMOVED AND STORED, AS PER PLAN

This item shall include storage only of the rail elements and incidental hardware. The posts shall become the property of the Contractor and be disposed of by him.

S-15 MODIFIED:

This item shall consist of furnishing No. 3 or No. 34 aggregate, when directed by the Engineer, in lieu of the grading specified under Item S-15. All other provisions of Item S-15 shall apply. The weights to be used in calculating the yardage to be paid for under this item shall be the same as those indicated in the Construction and Material Specifications for crusher run or bank run materials.

GUARD RAIL FLARES:

Where proposed guard rail flares are constructed of rail elements which have not been fabricated exactly to fit the curvature shown on the plans, the two end posts of each flared section shall be encased in a minimum 4 inch thickness of Class "E" concrete for the full depth of the post below the ground line. Payment for encasement, if required, shall be included in the unit price bid for the guard rail.

MAINTAINING TRAFFIC

The contractor shall maintain traffic at all times in accordance with the requirements of Item I-3. The length of one way traffic zones shall be kept to a minimum consistent with the requirements of the work. Maximum use shall be made of the existing pavement for traffic maintenance, holding the length and duration of use of temporary traffic lanes to a minimum.

Temporary traffic lanes shall be surfaced with S-15 material, treated with calcium chloride and the surface maintained daily in a manner satisfactory to the Engineer. Two way traffic lanes shall be surfaced with aggregate at least 20 feet wide and one way traffic lanes shall have the surfacing aggregate not less than 12 feet wide.

Payment for constructing, maintaining and removing traffic lanes and for all other items required for the maintenance of traffic, except furnishing and placing calcium chloride, traffic compacted surface course and temporary runaround bridge and approach embankment shall be included in the lump sum bid for Maintaining Traffic, Item I-3.

PLACEMENT OF ASPHALTIC CONCRETE:

Two way traffic shall be maintained at all times except that one way traffic will be permitted for minimum periods of time consistent with the requirements of the specifications for protection of completed asphaltic concrete courses.

FEDERAL AID CONSTRUCTION IDENTIFICATION SIGNS:

The Contractor shall furnish, erect, maintain and subsequently remove Federal Aid Construction Identification Signs at each of the following locations:

1. At the beginning of work.
2. At the end of work.

Sign details shall be as specified on Standard Drawing FACI-1, "Code N-45 (4) 78"

The signs shall be erected in accordance with Standard Drawing FACI-2. Additional requirements shall be in accordance with notes in the Proposal.

GUARD RAIL ADJACENT TO BRIDGE:

One (1) additional guard rail post shall be provided in the center of each panel of guard rail adjacent to the bridge, payment for which shall be included in the unit price bid for Item I-15 Guard Rail.

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

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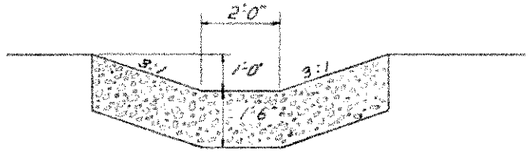
GENERAL NOTES

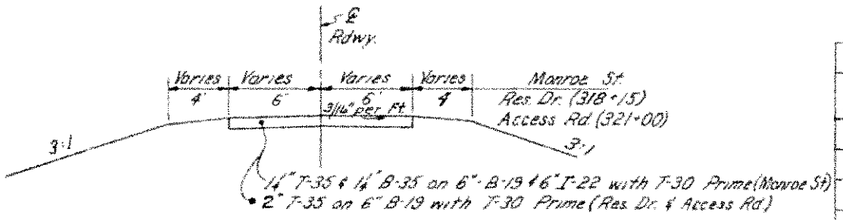


I-10 DUMPED ROCK CHANNEL PROTECTION

PAVEMENT CALCULATIONS (Main Line)

From Sheet	From Sta.	To Sta.	T-35, B-35	Sq. Yds.	B-35	Sq. Yds.	B-19, T-30	Sq. Yds.	I-22	Sq. Yds.	E-1	Sq. Yds.
6	314+00	315+82.60	182.6 Lin Ft × 20.0 ÷ 9 =	405.8	182.6 Lin. Ft. × 20.67 ÷ 9 =	419.4	182.6 Lin. Ft. × 21.67 ÷ 9 =	439.7				
6	317+93.40	321+40	346.6 Lin Ft × 20.0 ÷ 9 =	770.2	346.6 Lin. Ft. × 20.67 ÷ 9 =	796.0	346.6 Lin. Ft. × 21.67 ÷ 9 =	834.5				
6	314+00	316+05.50							205.5 Lin. Ft. × 22.67 ÷ 9 =	517.6	205.5 Lin. Ft. × 20.0 ÷ 9 =	456.7
6	317+70.50	321+40							369.5 Lin. Ft. × 22.67 ÷ 9 =	930.7	369.5 Lin. Ft. × 20.0 ÷ 9 =	821.1
Totals				1176.0		1115.4		1274.2		1448.3		1277.8

T-35 1¼" thick = 1176.0 × 1.25 ÷ 36 = 41 Cu. Yds.
B-35 1¼" thick = 1176.0 × 1.25 ÷ 36 = 41 Cu. Yds.
B-35 1½" thick = 1115.4 × 1.5 ÷ 36 = 47 Cu. Yds.
B-19 6" thick = 1274.2 × 6 ÷ 36 = 212 Cu. Yds.
T-30 0.46 als/Sq. yd. = 1274.2 × 0.4 = 510 Gals
I-22 6" thick = 1448.3 × 6 ÷ 36 = 241 Cu. Yds.
E-1 Compacted subgrade = 1277.8 use 1278 Sq. Yds.



TYPICAL SECTION RESIDENT, ACCESS, MONROE ST.

• 2" T-35 to be placed in two 1" Courses.

EXCAVATION & EMBANKMENT SUMMARY

From Sheet	From Sta.	To Sta.		E-1 Exc.	Emb	Emb + 15%	L-9 SEEDING
6	311+00	321+40		449	668	768	2899
	Totals			449 Cu Yds.	668 Cu Yds.	768 Cu Yds.	2899 Sq. Yds.

E-11 WATER

Embankment using 5 gals per cu. yd = 668 cu yds × 5 ÷ 1000 = 3.4 M. Gals.
B-19 Base using 5 gals per cu yd. = 212 cu. yds. + *92 cu yds. × 5 ÷ 1000 = 1.5
I-22 Subbase using 5 gals per cu. yd. = 241 cu. yds. + *41 cu yds. × 5 ÷ 1000 = 1.4
* From Sheet #5 Total E-11 Water 6.3 M. Gals. Use 7 M. Gals.

L-9 Seeding & Protecting. = 2899 Sq. Yds.
L-9 Commercial Fertilizer (12-12-12) - Pay rate 20 lbs/1000 Sq. Ft. = 2899 × 9 × 20 ÷ (1000)(2000) = 0.26 Tons
L-9 Agricultural Liming Material - Pay rate 100 lbs/1000 Sq. Ft. = 2899 × 9 × 100 ÷ (1000)(2000) = 1.30 Tons

E-4 BORROW
768 - 449 = 319 Cu Yds.

I-4 For Dust Control
700 ÷ 50 = 14 Tons

S-15 For Maintaining Traffic
Sta. 314+00 to Sta. 321+40 = 740 Lin. Ft.

Total: S-15 = 740 × 100 ÷ 100 = 740 use 700 Cu Yds.
S-15 = 700 × 25% = 175 Cu. Yds.
S-15 Modified = 700 × 75% = 525 Cu. Yds.

FED. NO. DIVISION	STATE	PROJECT	
2	OHIO		

JEF-164-5.97

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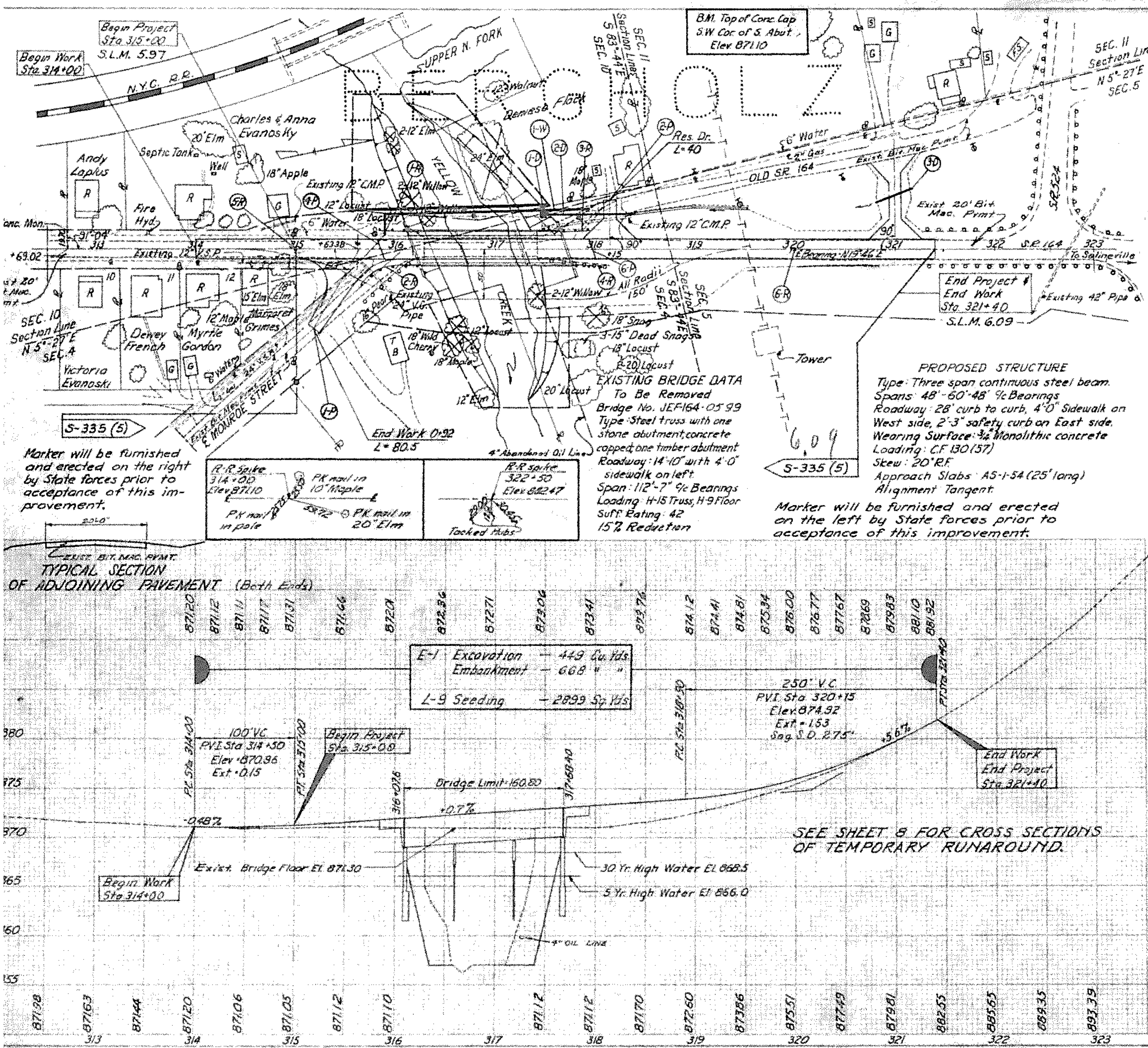
GENERAL SUMMARY

ITEM	FROM SHEET NUMBERS												ITEM	QUAN.	UNIT	DESCRIPTION
			3	4		6										TYPE CODE 6201
																ROADWAY
E-1				449									E-1	449	Cu. Yds.	Roadway Excavation, Method "B" as per plan
E-1				1278		259							E-1	1537	Sq. Yds.	Compacted Subgrade
E-4				319									E-4	319	Cu. Yds.	Borrow.
E-9			Lump										E-9	Lump	Lump	Removal of Trees and Stumps
E-11				7									E-11	7	M. Gals.	Water
E-12						91							E-12	91	Lin. Ft.	12" Pipe Removed for Re use
I-15						1375							I-15	1375	Lin. Ft.	Guard Rail, Steel Beam Standard Type (deep)
I-8						2							I-8	2	Each	Standard Monument Assemblies
L-9				2899									L-9	2899	Sq. Yds.	Seeding and Protecting
L-9				0.26									L-9	0.26	Tons	Commercial Fertilizer (12-12-12)
L-9				1.30									L-9	1.30	Tons	Agricultural Liming Material
I-15						1875							I-15	1875	Lin. Ft.	Guard Rail Removed and Stored, as per plan.
S-15				175									S-15	175	Cu. Yds.	Furnishing and Placing Aggregate for Traffic Bound Surface Course
I-4				14									I-4	14	Tons	Calcium Chloride for Dust Control
S-15				525									S-15	525	Cu. Yds.	Furnishing and Placing Aggregate for Traffic Bound Surface Course, using Size No. 3 or No. 34 Aggregate, as per plan.
																DRAINAGE
I-1						30							I-1	30	Lin. Ft.	12" Pipe Class F-4
I-6						91							I-6	91	Lin. Ft.	Relaying 12" pipe, using Type 4 Backfill
I-9						240							I-9	240	Lin. Ft.	Stone Underdrains No. 2
I-10						10							I-10	10	Cu. Yds.	Dumped Rock Channel Protection
																PAVEMENT
T-35				41		22							T-35	63	Cu. Yds.	Asphaltic Concrete Surface Course Type "C" (70-85)
B-35				88		9							B-35	97	Cu. Yds.	Asphaltic Concrete Leveling Course (70-85)
T-30				510		217							T-30	727	Gals.	Bituminous Prime Coat Sec. M-5.7, AT-2 or RT-3
B-19				212		92							B-19	304	Cu. Yds.	Aggregate Base Course
I-22				241		41							I-22	282	Cu. Yds.	Subbase
I-7						112							I-7	112	Sq. Yds.	Reinforced Concrete Approach Slabs (T-13")
																STRUCTURE OVER 20' SPAN
																Br. No. JEF-164-0599 For quantities see Sheet No. 12
																WATER LINE
																For Water Line Quantities, See Sheet No. 19.
I-3			Lump										I-3	Lump	Lump	Maintaining Traffic


Begin Project Sta. 315+00
Begin Work Sta. 314+00
S.L.M. 5.97
N.Y.C. R.R.
UPPER N. FORK
BERGHOLZ
B.M. Top of Conc. Cap S.W. Cor. of S. Abut. Elev. 871.10
SEC. 11 Section Line N 5°-27' E SEC. 5
SEC. 11 Section Line S 83°-44' E SEC. 10
Charles & Anna Evanosky
Andy Laplus
Septic Tank
Well
Fire Hyd.
Existing 12" C.M.P.
6" Water
Res. Dr. L=40
OLD S.R. 164
Exist. Bit. Mac. Pvmt.
S.R. 524
Exist. 20' Bit. Mac. Pvmt.
S.R. 164
To Salineville
End Project End Work Sta. 321+40
S.L.M. 6.09
Existing 42" Pipe
SEC. 10 Section Line N 5°-27' E SEC. 4
Section Line S 83°-44' E SEC. 4 SEC. 5
Dewey French
Myrtle Gordon
Margaret Grimes
Victoria Evanoski
E. MONROE STREET
CREEK
YELLOW
Tower
End Work 0+92 L=80.5
S-335 (5)
Marker will be furnished and erected on the right by State forces prior to acceptance of this improvement.
R-R Spike 314+00 Elev. 871.10
P.K. nail in 10" Maple
P.K. nail in pole
P.K. nail in 20" Elm
R-R Spike 322+50 Elev. 882.47
Tacked Hubs
EXISTING BRIDGE DATA
To Be Removed
Bridge No. JEF-164-0599
Type: Steel truss with one stone abutment, concrete capped; one timber abutment
Roadway: 14'-10" with 4'-0" sidewalk on left.
Span: 112'-7" c/c Bearings
Loading: H-15 Truss, H-9 Floor
Suff. Rating: 42
15% Reduction
PROPOSED STRUCTURE
Type: Three span continuous steel beam.
Spans: 48'-60'-48' c/c Bearings
Roadway: 28' curb to curb, 4'-0" Sidewalk on West side, 2'-3" safety curb on East side.
Wearing Surface: 3/4 Monolithic concrete
Loading: C.F. 130 (57)
Skew: 20° R.F.
Approach Slabs: AS-1-54 (25' long)
Alignment: Tangent.
S-335 (5)
Marker will be furnished and erected on the left by State forces prior to acceptance of this improvement.
EXIST. BIT. MAC. PVMT.
TYPICAL SECTION OF ADJOINING PAVEMENT (Both Ends)
E-1 Excavation — 449 Cu. Yds.
Embankment — 668 " "
L-9 Seeding — 2899 Sq. Yds.
100' V.C.
P.V.I. Sta. 314+50
Elev. 870.86
Ext. +0.15
P.C. Sta. 314+00
P.T. Sta. 315+00
Begin Project Sta. 315+0.0
Bridge Limit 160.80
316+07.6
317+68.40
+0.7%
-0.48%
250' V.C.
P.V.I. Sta. 320+15
Elev. 874.92
Ext. +1.53
Sag. S.D. 275'
P.C. Sta. 318+90
P.T. Sta. 321+40
+5.6%
End Work End Project Sta. 321+40
Exist. Bridge Floor El. 871.30
30 Yr. High Water El. 868.5
5 Yr. High Water El. 866.0
4" OIL LINE
Begin Work Sta. 314+00
SEE SHEET 8 FOR CROSS SECTIONS OF TEMPORARY RUNAROUND.

ESTIMATED QUANTITIES

REF. NO.	STATION TO STATION	SIDE	I-10 Dumped Rock Chan. Prot. Cu. Yds.	T-35 Cu. Yds.	B-35 Cu. Yds.	T-30 Prime 0.46 Gal/Sq.Yd. Gals.	B-19 Cu. Yds.	I-22 Cu. Yds.	I-1 12" Pipe Class F-4 Lin. Ft.	I-15 Guard Rail Removed & Stored Lin. Ft.	E-12 Pipe Removed for Reuse Lin. Ft.	I-6 Relaying Pipe Lin. Ft.	E-1 Compacted Subgrade Sq. Yds.	I-9 Stone U-drain No. 2 Lin. Ft.	I-15 Guard Rail Steel Beam Deep Lin. Ft.	I-7 Rein. Conc. App. Slab Cu. Yds.	I-8 Standard Monument Assemblies Each	SEE SHEET NO.
1-D	317+26 → 317+45	Lt.	10															18
2-D	317+44 → 318+33	Lt.									91	91						10
3-D	320+76 → 321+21	Lt.							50									10
Stone U-drain	314+25 → 321+25	Lt.&Rt.												240				6
1-W	315+85.5 → 317+92.5	Lt.	(Water Line Layout, See Sheet No. 19)															19
1-P	315+63.38 (Monroe St.)	Rt.		9	9	100	42	41					259					10
2-P	318+15 (Res. Drive)	Lt.		4		37	16											10
3-P	321+00 (Access Road)	Lt.		9		80	34											10
4-P	315+82.6 → 316+07.6	℄														56		6
5-P	317+68.4 → 317+93.4	℄														56		6
1-R	315+72 → 315+97	Lt.													25			6
2-R	0+43 Monroe St. → 316+11	Rt.								75					62.5			6
3-R	317+64 → 317+89	Lt.								50					25			6
4-R	317+77 → 318+02	Rt.								62.5					25			6
5-R	315+00	℄															1	6
6-R	320+00	℄															1	6
TOTALS			10	22	9	217	92	41	50	187.5	91	91	259	240	137.5	112	2	

70 60 50 40 30 20 10 ℄ 10 20 30 40 50

JEF-164-5.97

56
9
22
0

Temporary Runaround

871.31
315+00
871.1

Begin Project Sta. 315+00

871.11
314+50
871.1

871.20
314+00
871.2

Begin Work Sta. 314+00

313+50
871.4

313+00
871.6

312+50
872.0

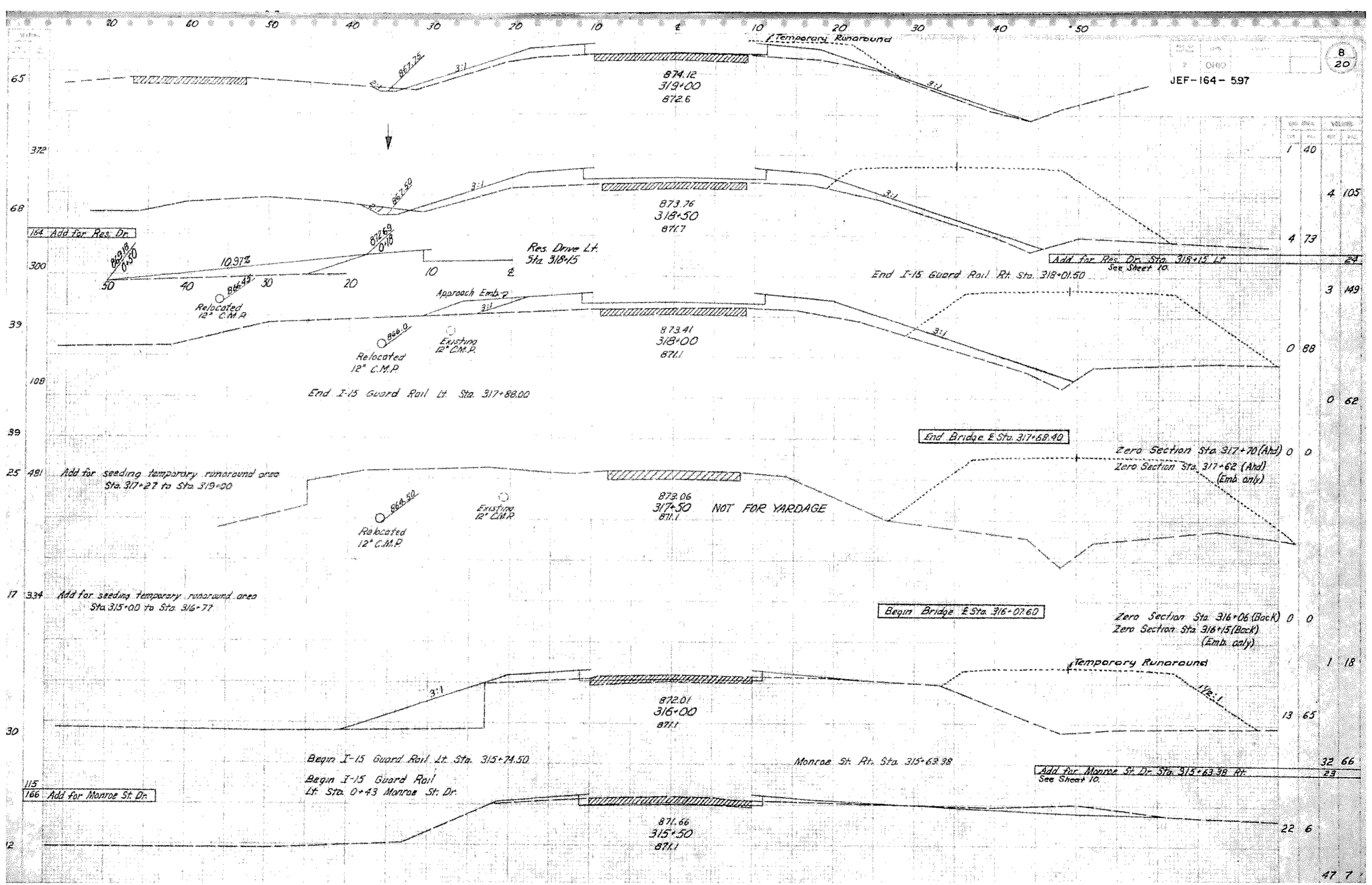
312+00
872.0

30	1	
		56 1
31	0	
		57 0
Ahead only 31	0	

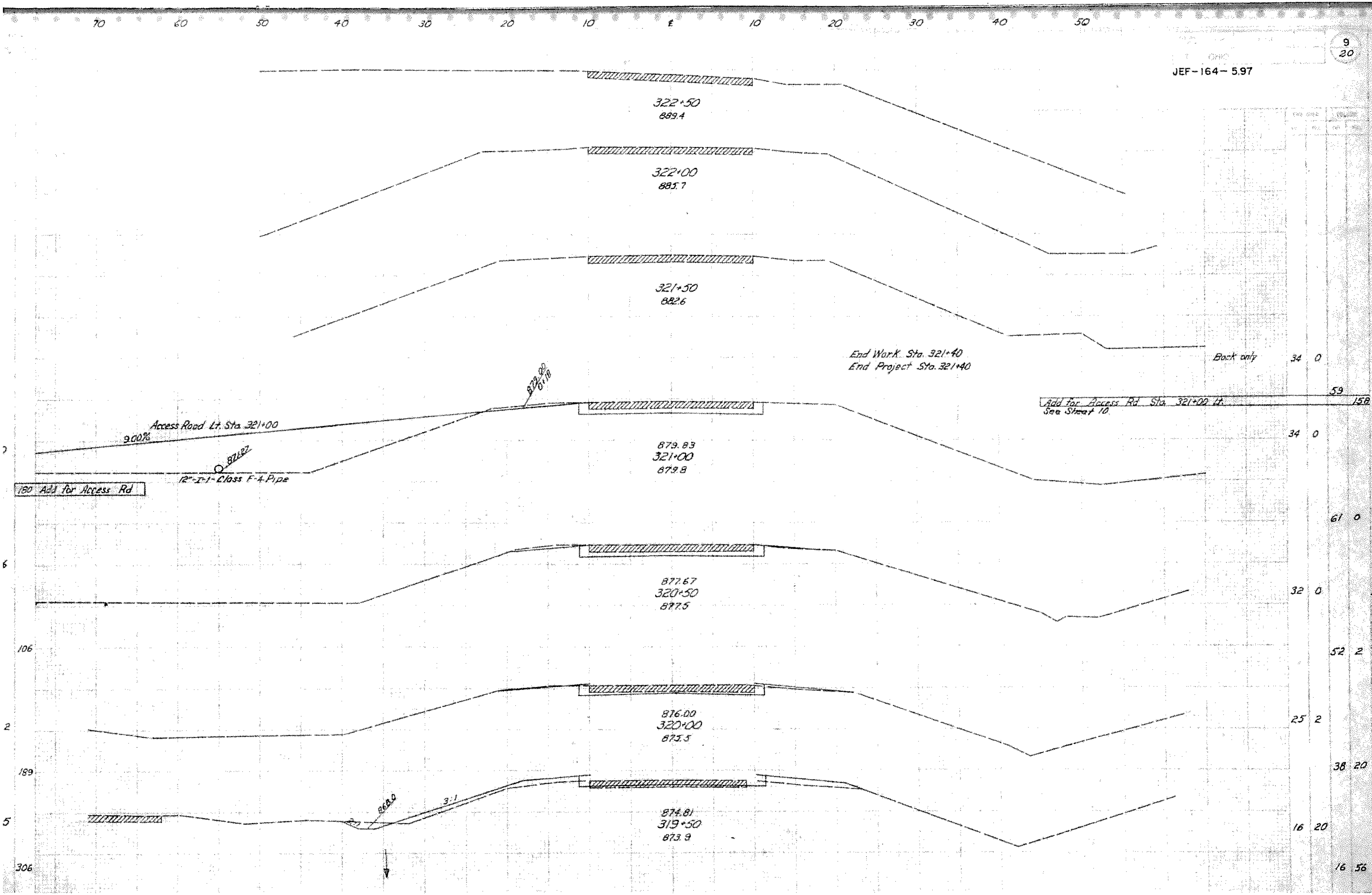
70 60 50 40 30 20 10 ℄ 10 20 30 40 50 60 70

FROM STA 312+00 TO STA 315+00

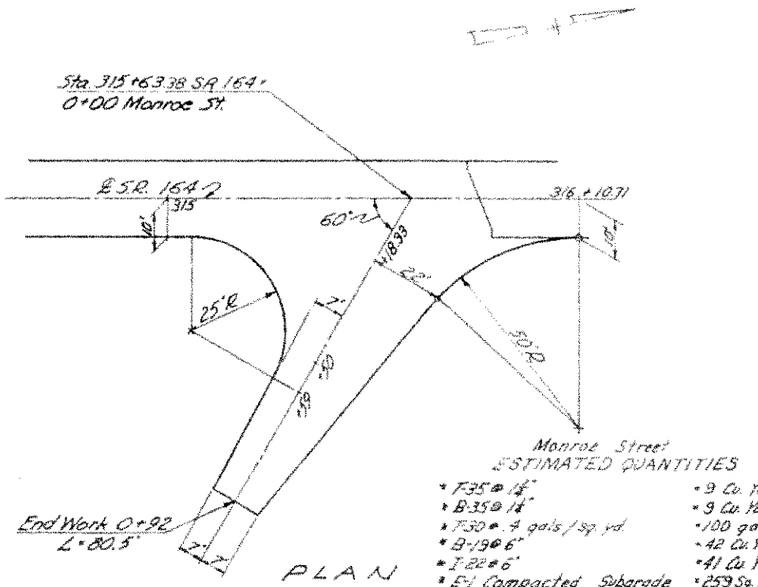
JEF-164-5.97



1	40	
4	73	105
		24
3	149	
0	88	
0	62	
0	0	
0	0	
1	18	
13	65	
32	66	
		23
22	6	
		47 7


70 60 50 40 30 20 10 ℄ 10 20 30 40 50
322+50
889.4
322+00
885.7
321+50
882.6
End Work Sta. 321+40
End Project Sta. 321+40
Back only
34 0
59
Add for Access Rd Sta. 321+00 Lt.
See Sheet 10
158
879.00
0.10
Access Road Lt. Sta. 321+00
9.00%
871.87
12"-I-1-Class F-4 Pipe
180 Add for Access Rd
879.83
321+00
879.8
34 0
61 0
877.67
320+50
877.5
32 0
106
52 2
876.00
320+00
875.5
25 2
189
38 20
868.0
3:1
874.81
319+50
873.9
16 20
306
16 56

JEF – 164 – 5.97



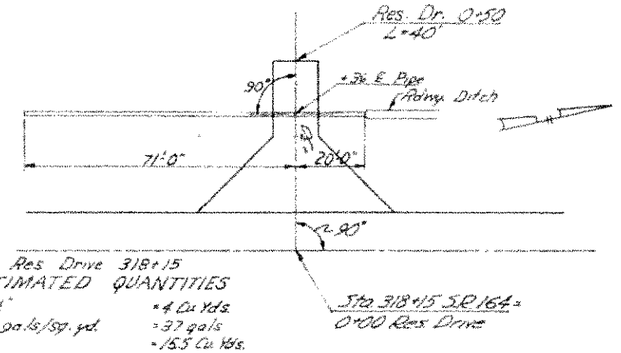
ESTIMATED QUANTITIES

* T-35 @ 18"	* 9 Cu. Yds.
* B-35 @ 18"	* 9 Cu. Yds.
* T-30 @ .4 gals/sq. yd.	* 100 gals.
* B-19 @ 6"	* 42 Cu. Yds.
* I-22 @ 6"	* 41 Cu. Yds.
* E-1 Compacted Subgrade	* 259 Sq. Yds.
** E-1 Excavation	* 23 Cu. Yds.

PLAN
Scale 1"=20'

* Quantities carried to plan & Profile Sheet #6
** Quantities carried to cross sections Sheet #8

MONROE ST. RT. STA. 315+63.38



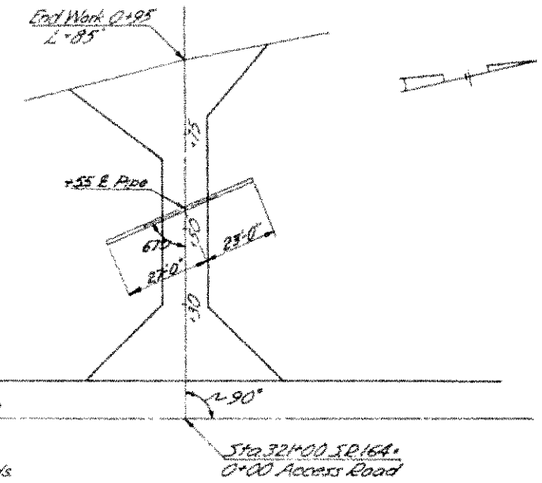
ESTIMATED QUANTITIES

* T-35 @ 18"	* 4 Cu. Yds.
* T-30 @ .4 gals/sq. yd.	* 37 gals.
* B-19 @ 6"	* 15.5 Cu. Yds.
** E-1 Embankment	* 24 Cu. Yds.
* I-6 Relaying Pipe (12" CMP)	* 91 Lin. Ft.

PLAN
Scale 1"=20'

* Quantities carried to plan & profile Sheet N°6
** Quantities carried to cross sections Sheet N°8

RES. DRIVE LT. STA. 318+15



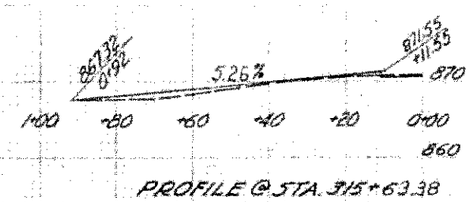
Access Road 321+00
ESTIMATED QUANTITIES

* T-35 @ 18"	* 9 Cu. Yds.
* T-30 @ .4 gals/sq. yd.	* 80 gals.
* B-19 @ 6"	* 34 Cu. Yds.
** E-1 Embankment	* 158 Cu. Yds.
* I-1 12" Class F-4 Pipe	* 50 Lin. Ft.

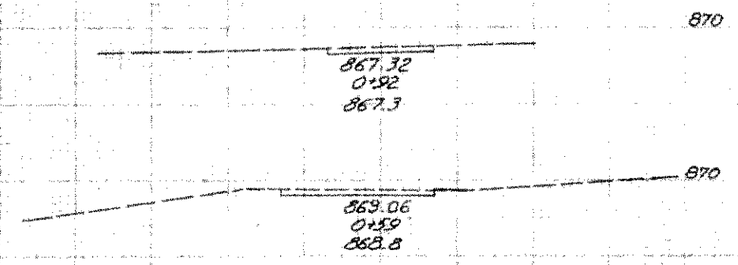
PLAN
Scale 1"=20'

** quantities carried to cross section Sheet N°9
* Quantities Carried to Plan & Profile Sheet N°6

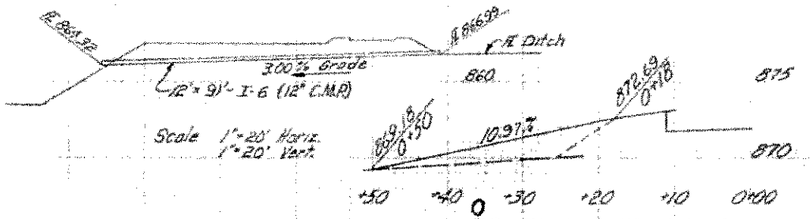
ACCESS ROAD LT. STA. 321+00



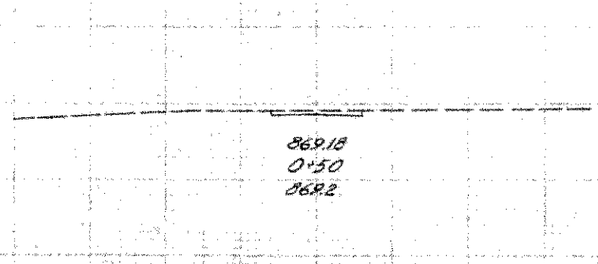
PROFILE @ STA. 315+63.38
Scale 1"=20' Horiz.
1"=10' Vert.



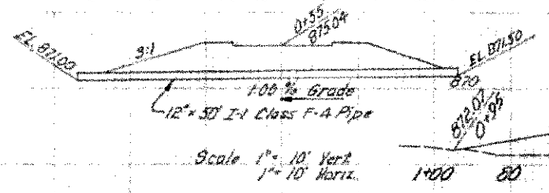
CROSS SECTIONS
Scale 1"=10'



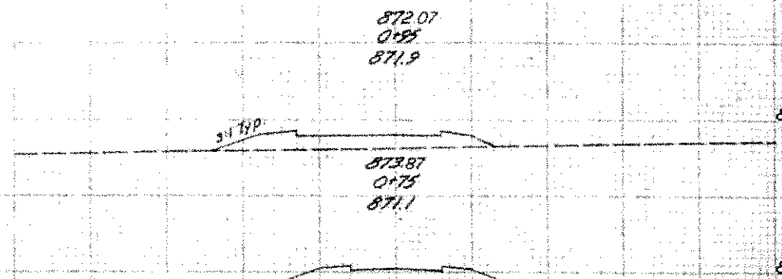
PROFILE @ STA. 318+15
Scale 1"=5' Vert.
1"=10' Horiz.



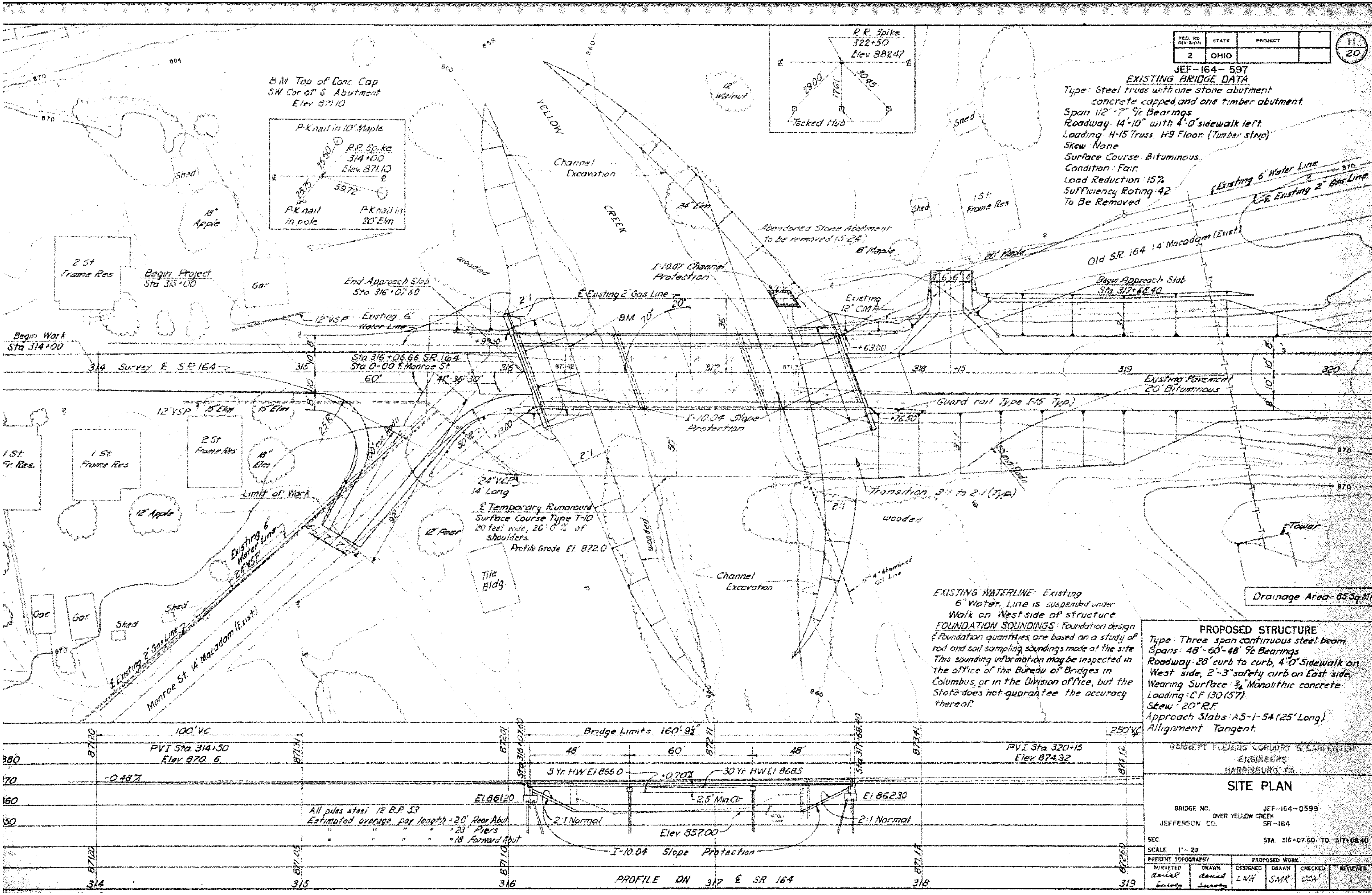
CROSS SECTIONS
Scale 1"=10'



PROFILE @ STA. 321+00
Scale 1"=20' Horiz.
1"=10' Vert.



CROSS SECTIONS
Scale 1"=10'



B.M. Top of Conc. Cap
SW Cor. of S. Abutment
Elev. 871.10
P-K nail in 10" Maple
R.R. Spike
314+00
Elev. 871.10
P-K nail in pole
P-K nail in 20" Elm
R.R. Spike
322+50
Elev. 882.47
Tacked Hub
12" Walnut
Shed
18" Apple
2 St. Frame Res.
Begin Project
Sta. 315+00
Gar.
End Approach Slab
Sta. 316+07.60
Channel Excavation
YELLOW CREEK
24" Elm
Abandoned Stone Abutment to be removed (S-24)
18" Maple
20" Maple
1 St. Frame Res.
Old SR 164 14' Macadam (Exist.)
Existing 6" Water Line
Existing 2" Gas Line
Begin Approach Slab
Sta. 317+68.40
I-10.07 Channel Protection
Existing 2" Gas Line
Existing 12" CMP
12" VSP
Existing 6" Water Line
BM
Begin Work
Sta. 314+00
Survey ℄ SR 164
Sta. 316+06.66 SR 164
Sta. 0+00 ℄ Monroe St.
Existing Pavement
20' Bituminous
Guard rail Type E-15 (Typ.)
I-10.04 Slope Protection
Transition 3:1 to 2:1 (Typ.)
15" Elm
2 St. Frame Res.
1 St. Frame Res.
1 St. Fr. Res.
18" Elm
12" Apple
Limit of Work
24" VCP
14' Long
℄ Temporary Runaround
Surface Course Type T-10
20 feet wide, 26' 6" % of shoulders.
Profile Grade El. 872.0
12" Pear
Tile Bldg.
Existing 6" Water Line
24" VSP
Existing 2" Gas Line
Monroe St. 14' Macadam (Exist.)
Gar.
Gar.
Shed
Shed
wooded
Channel Excavation
4" Abandoned Oil Line
Tower
Drainage Area - 85 Sq. Mi.
100' V.C.
PVI Sta. 314+50
Elev. 870.6
-0.48%
Bridge Limits 160'-9¾"
48'
60'
48'
5 Yr. HW El. 866.0
+0.70%
30 Yr. HW El. 868.5
El. 861.20
El. 862.30
2.5' Min. Clr.
2:1 Normal
2:1 Normal
Elev. 857.00
I-10.04 Slope Protection
250' V.C.
PVI Sta. 320+15
Elev. 874.92
All piles steel 12 B.P. 53
Estimated average pay length = 20' Rear Abut.
" " " " = 23' Piers
" " " " = 18 Forward Abut.
PROFILE ON ℄ SR 164

FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

11/20

JEF-164-597

EXISTING BRIDGE DATA

Type: Steel truss with one stone abutment concrete capped and one timber abutment.
Span: 112'-7" c/c Bearings
Roadway: 14'-10" with 4'-0" sidewalk left.
Loading: H-15 Truss, H-9 Floor (Timber strip)
Skew: None
Surface Course: Bituminous
Condition: Fair
Load Reduction: 15%
Sufficiency Rating: 42
To Be Removed

EXISTING WATERLINE: Existing 6" Water Line is suspended under Walk on West side of structure.

FOUNDATION SOUNDINGS: Foundation design & Foundation quantities are based on a study of rod and soil sampling soundings made at the site. This sounding information may be inspected in the office of the Bureau of Bridges in Columbus, or in the Division office, but the State does not guarantee the accuracy thereof.

PROPOSED STRUCTURE

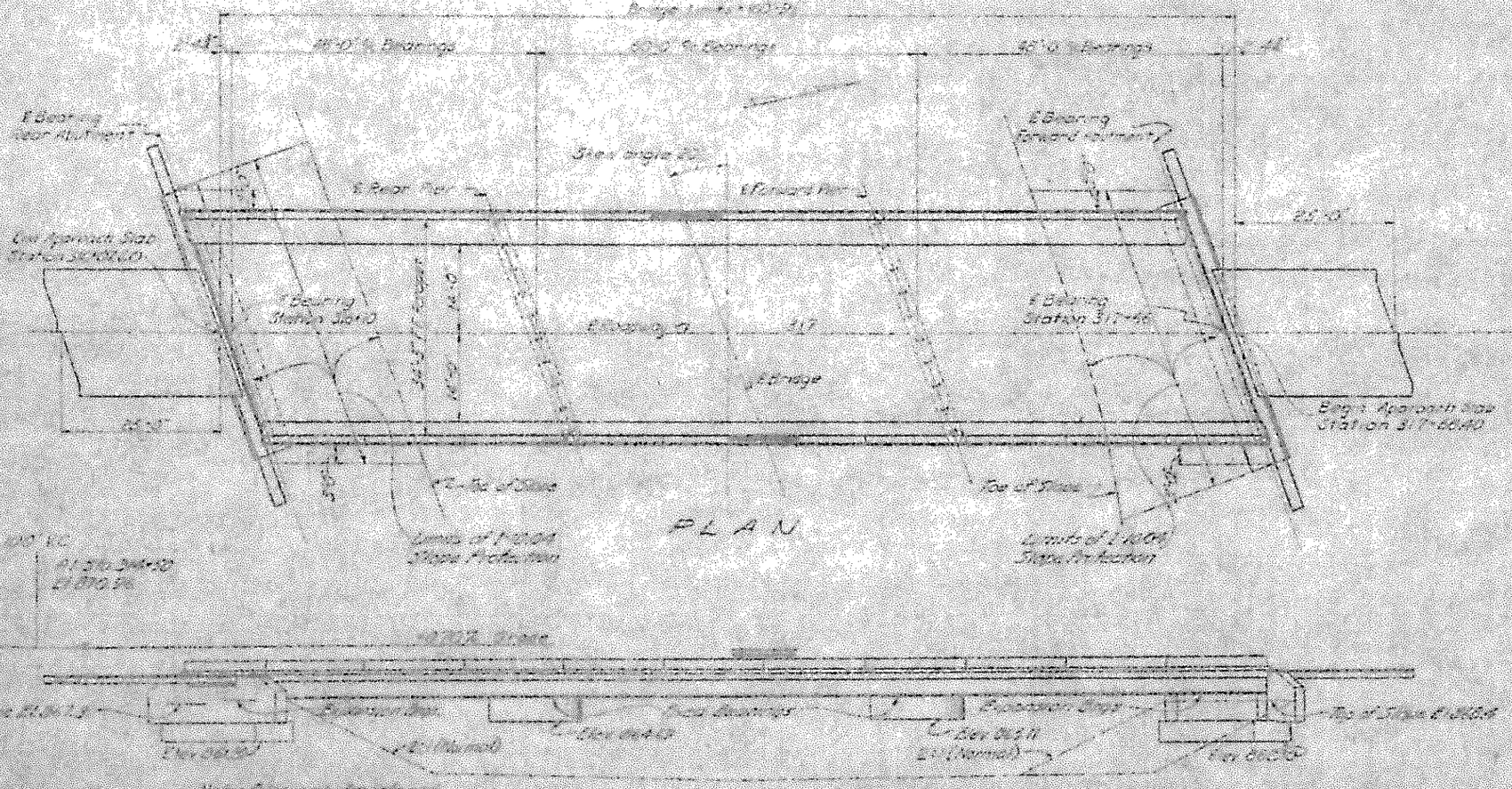
Type: Three span continuous steel beam.
Spans: 48'-60'-48' c/c Bearings
Roadway: 28' curb to curb, 4'-0" Sidewalk on West side, 2'-3" safety curb on East side.
Wearing Surface: ¾" Monolithic concrete
Loading: C.F. 130 (57)
Skew: 20° R.F.
Approach Slabs: AS-1-54 (25' Long)
Alignment: Tangent.

GANNETT FLEMING CORDDRY & CARPENTER
ENGINEERS
HARRISBURG, PA.

SITE PLAN

BRIDGE NO. JEF-164-0599
OVER YELLOW CREEK
JEFFERSON CO. SR-164
SEC. STA. 316+07.60 TO 317+68.40
SCALE 1" = 20'

PRESENT TOPOGRAPHY		PROPOSED WORK			
SURVEYED	DRAWN	DESIGNED	DRAWN	CHECKED	REVIEWED
Aerial Survey	Aerial Survey	LWH	SMR	COW	



PLAN

ELEVATION

GENERAL NOTES

REFERENCE shall be made to the following Standard Drawings:
[illegible] Dated [illegible] Revised [illegible]
[illegible] Dated [illegible] Revised 4-2-62
[illegible] Dated [illegible] Revised [illegible]
[illegible] Dated [illegible] Revised [illegible]
Supplemental Specification [illegible] Dated [illegible]

DESIGN SPECIFICATIONS: This structure conforms to the requirements of "Design Specifications for Highway Structures of the State of Ohio, Department of Highways, dated [illegible], together with current revisions thereof.

TEMPORARY RUN-AROUND, BRIDGE AND APPROACH EMBANKMENT. [illegible] with unit stresses increased [illegible] as per the provisions for temporary bridges in the "Design Specifications for Highway Structures". [illegible] surface courses on the approaches.

REMOVAL OF EXISTING STRUCTURE: When no longer needed to maintain traffic, the existing structure shall be removed.

EXCAVATION QUANTITY for the abutments, in addition to that outlined in Section [illegible], includes the removal of material [illegible] and by finished slope of the cut.

PIER PILE ENCASEMENT as shown [illegible] is not required. The painting of the piles shall extend to the [illegible] elevation.

WELDING of structural steel shall be Class "A" except as otherwise shown. Welds shown as field welds may, at the option of the contractor, be made in the shop.

BEAM WEB WELDS: Butt welds in webs of beams may have convex reinforcement in accordance with Section [illegible]; finishing flush by grinding is not required.

CONCRETE DECK PLACING: In order to facilitate water curing of the concrete of the deck slab, the placing of concrete shall progress [illegible]. The slab may be placed in [illegible] transverse construction joints which are [illegible] reinforcing steel and are located near the center of [illegible] span.

MACHINE FINISH: At the contractor's option the concrete deck may be finished by the use of [illegible] machine.

REINFORCING STEEL CLEARANCE: Unless otherwise noted the clearance of reinforcing steel to the face of concrete is 2".

PILES SHALL BE DRIVEN TO FIRM CONTACT WITH ROCK.

PILES shall be driven to firm contact with rock. If the length of penetration is approximately equal to the depth to rock according to the bridge foundation investigation report, the firm contact shall be considered as attained when the capacity according to the formula in Sec. [illegible] is not less than the following value for a pile hammer of the indicated energy rating:

for the abutment piles:
35 tons per pile using a 7000 ft. lb. hammer
30 tons per pile using a 11000 ft. lb. hammer
25 tons per pile using a 15000 ft. lb. or greater hammer
for the pier piles:
50 tons per pile using a 7000 ft. lb. hammer
45 tons per pile using a 11000 ft. lb. hammer
40 tons per pile using a 15000 ft. lb. or greater hammer

If the energy rating of the hammer is between the ratings as shown above, the required capacity shall be determined by interpolation. The [illegible] tons per pile for the abutment piles and [illegible] tons per pile for the pier piles.

ESTIMATED QUANTITIES

Item	Total	Unit	Description	Super.	Abut.	Piers	General
[illegible]	[illegible]	[illegible]	[illegible]		[illegible]		
[illegible]	[illegible]	Cu. Yd.	Channel excavation				[illegible]
[illegible]	[illegible]	Cu. Yd.	Class C concrete, superstructure	[illegible]			
[illegible]	[illegible]	Cu. Yd.	Class C concrete, pier caps			[illegible]	
[illegible]	[illegible]	Cu. Yd.	Class C concrete, abutments		[illegible]		
[illegible]	[illegible]	Lb.	Reinforcing steel	[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	Structural steel	[illegible]			
[illegible]	[illegible]	[illegible]	Field painting of structural steel	[illegible]			
[illegible]	[illegible]	Lin. Ft.	[illegible] Type [illegible]				
[illegible]	[illegible]	[illegible]	Temporary run-around bridge and approach embankment				[illegible]
[illegible]	[illegible]	[illegible]	[illegible]				[illegible]
[illegible]	[illegible]	[illegible]	Steel piles [illegible]		[illegible]	[illegible]	
[illegible]	[illegible]	[illegible]	[illegible]				[illegible]
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]			
[illegible]	[illegible]	[illegible]	[illegible] including supports	[illegible]			
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]			
[illegible]	[illegible]	[illegible]	[illegible] slope protection	[illegible]			
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]			

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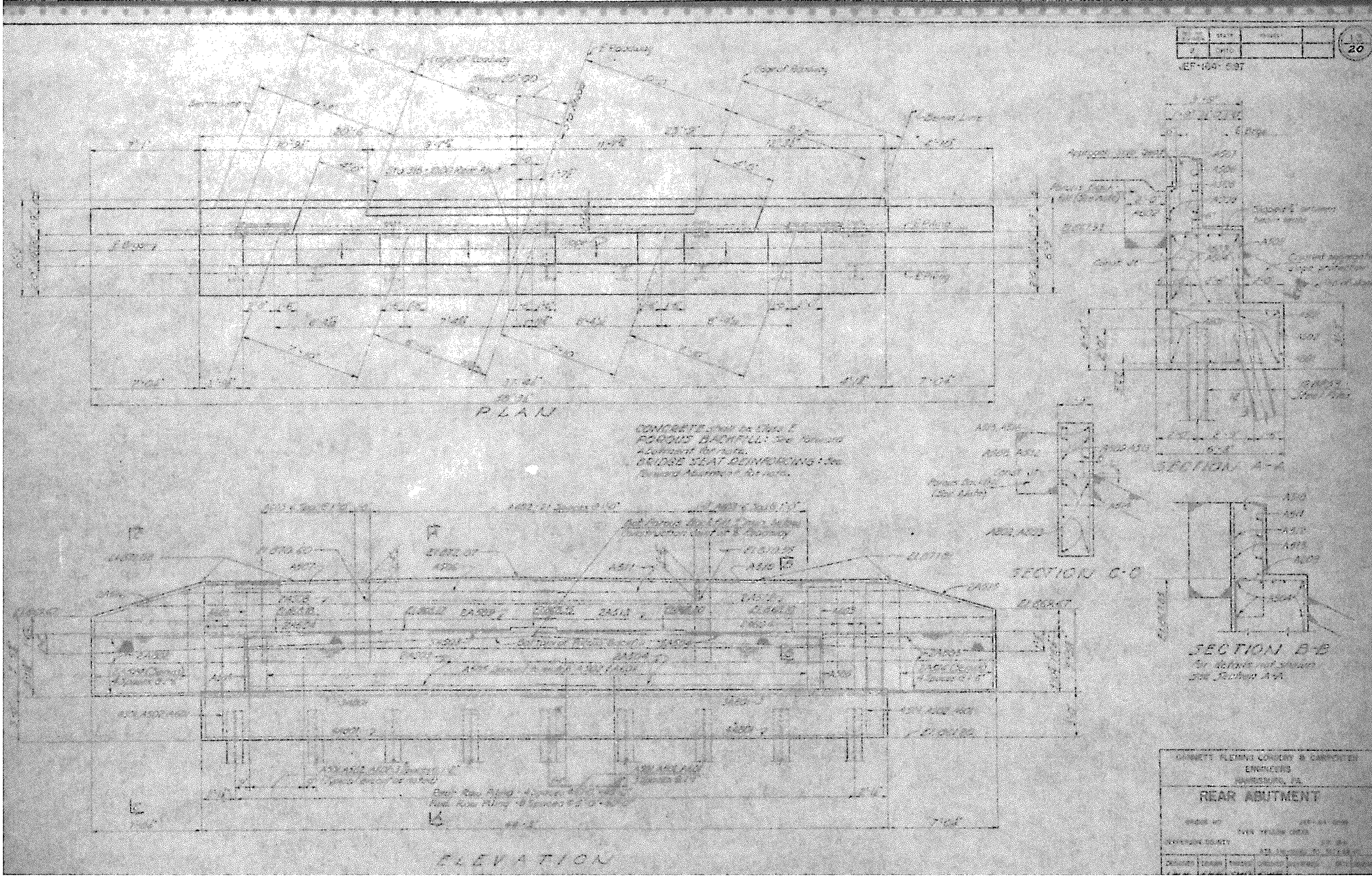
ENGINEERS
HARRISBURG, PA.

GENERAL PLAN & ELEVATION
ESTIMATED QUANTITIES & NOTES

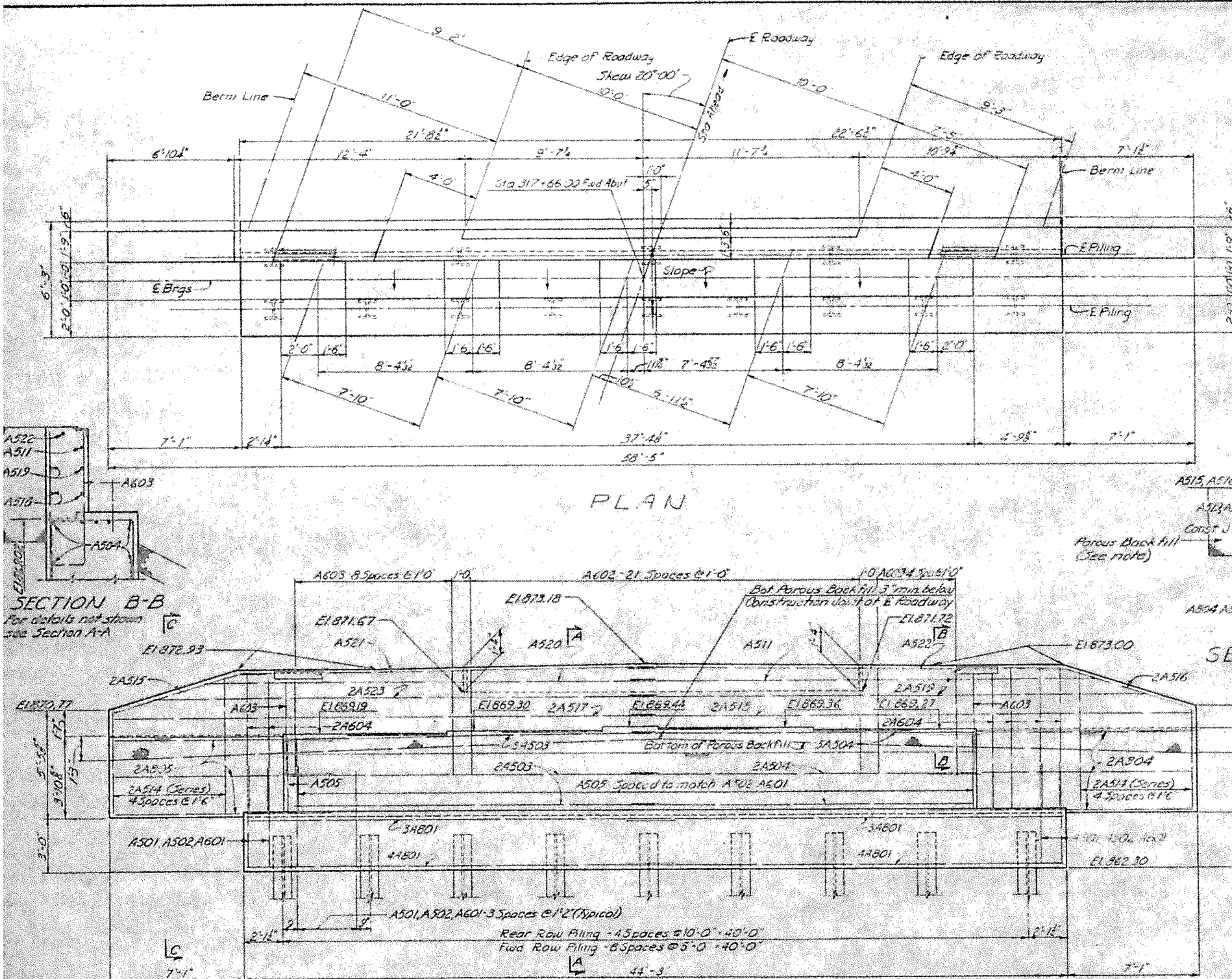


20
PLAN
CONCRETE shall be Class A
POROUS BACKFILL: See Forward Abutment for note.
BRIDGE SEAT REINFORCING: See Forward Abutment for note.
SECTION A-A
SECTION C-C
SECTION B-B
For details not shown see Section A-A.
ELEVATION
GANNETT FLEMING CORDDRY & CARPENTER
ENGINEERS
HARRISBURG, PA.
REAR ABUTMENT

FED. RD DIVISION	STATE	PROJECT	
2	OHIO		

14/20

JEF-164-5.97



CONCRETE shall be Class E

POROUS BACKFILL shall extend upward to the approach slab and to the surface of the dirt shoulders and outward to the surface of the embankment slopes. Excavation therefor, in excess of that required for construction of the abutment, shall be considered as paid for in the bid price per cu yd paid for porous backfill.

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

GANNETT FLEMING CORDDRY & CARPENTER
ENGINEERS
HARRISBURG, PA.

FORWARD ABUTMENT

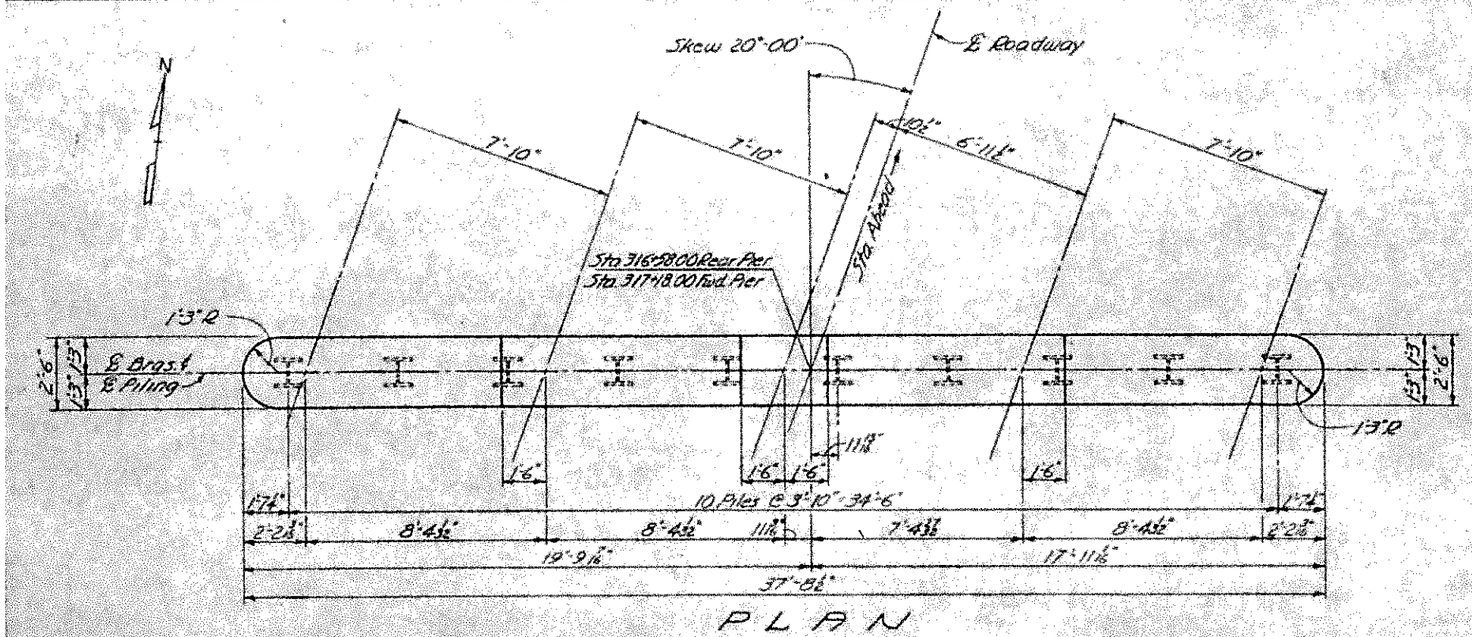
BRIDGE NO. JEF-164-5599
OVER YELLOW CREEK
JEFFERSON COUNTY ER 164
STA 316+0760 TO 317+66.00

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
LWH	ENA	SMR	GWB			

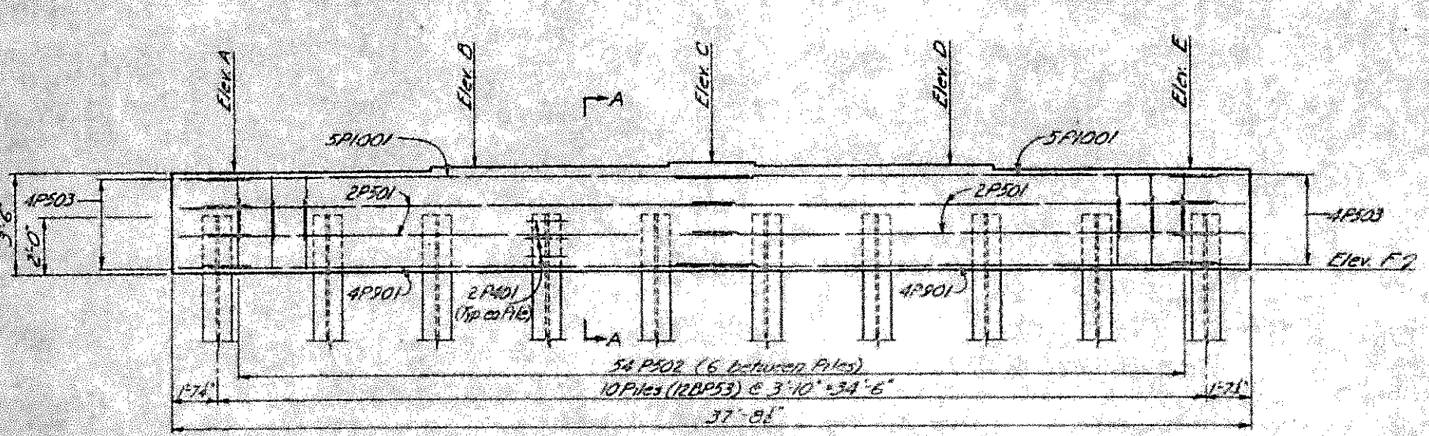
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

15/20

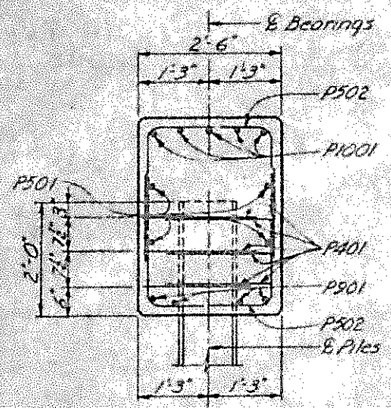
JEF-164-597



PLAN



ELEVATION



SECTION A-A

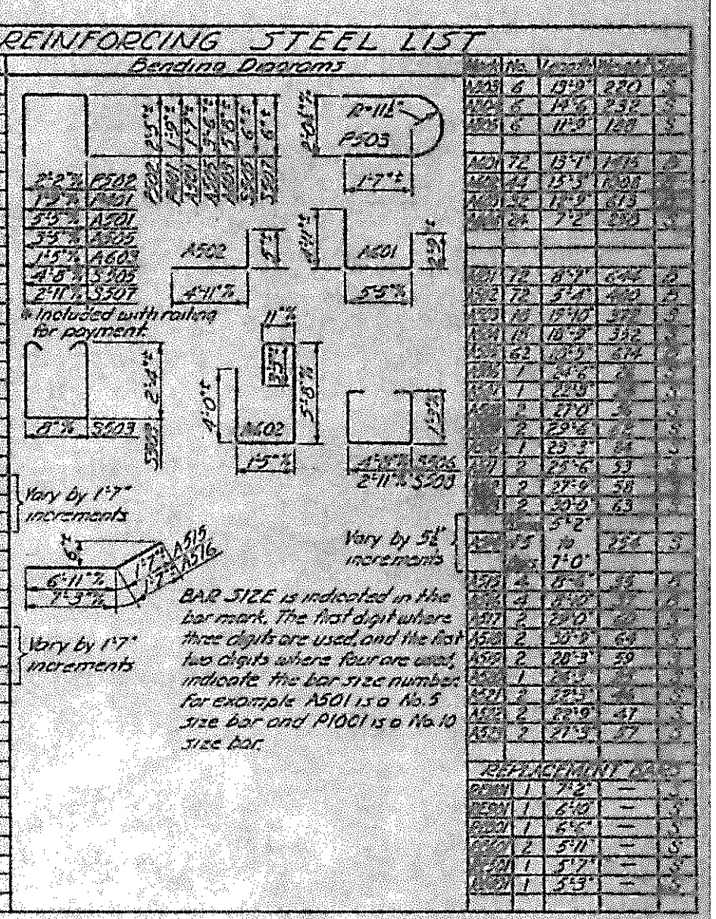
Elevation	A	B	C	D	E	F
Rear Pier	868.19	868.29	868.43	868.36	868.27	864.69
Forward Pier	868.61	867.71	868.85	868.78	868.69	865.11

BRIDGE SEAT REINFORCING: See Forward Abutment for note.
CONCRETE shall be Class C.

REINFORCING STEEL LIST

Mark	No.	Length	Weight	Sha.
PIERS				
P201	20	19'-3"	1657	S
P301	16	18'-0"	1234	S
P201	16	18'-6"	709	S
P202	104	7'-0"	789	B
P203	16	6'-4"	106	B
R101	120	3'-5"	421	D
RAILING				
R201	80	15'-6"	*	S
				S
				S
				S
				S
				S
SUPERSTRUCTURE				
S601	247	36'-0"	19356	S
S602	25 Sets of 20 Bars	4'-4" to 34'-5"	1164	S
S603	126	35'-3"	6671	S
S604	189	31'-7"	9013	S
S605	58	24'-0"	2091	S
S501	247	36'-0"	9274	S
S502	25 Sets of 20 Bars	4'-4" to 34'-5"	808	S
S515	224	5'-11"	1382	D
S505	104	5'-0"	615	B
S506	104	7'-11"	859	B
S507	104	3'-11"	425	B
S508	104	6'-2"	669	B
ABUTMENTS				
A501	28	23'-3"	1738	S
A502	6	12'-3"	186	S

Bending Diagrams



BAR SIZE is indicated in the bar mark. The first digit where three digits are used, and the last two digits where four are used, indicate the bar size number. For example A501 is a No. 5 size bar and P1001 is a No. 10 size bar.

Mark	No.	Length	Weight	Sha.
A503	6	13'-9"	270	S
A504	6	14'-6"	232	S
A505	6	11'-9"	141	S
A601	72	13'-7"	1415	S
A602	44	13'-3"	1018	S
A603	32	11'-9"	613	S
A604	24	7'-2"	235	S
P1001	72	8'-9"	644	D
P1002	72	5'-4"	419	D
A501	14	15'-10"	373	S
A502	14	18'-9"	342	S
A503	62	13'-5"	544	S
A504	1	24'-6"	8	S
A505	1	25'-0"	8	S
A506	3	27'-0"	34	S
A507	2	29'-6"	39	S
A508	1	29'-3"	24	S
A509	2	29'-6"	39	S
A510	2	29'-9"	39	S
A511	2	29'-0"	38	S
A512	2	30'-3"	64	S
A513	2	28'-3"	59	S
A514	1	24'-6"	16	S
A517	2	22'-5"	74	S
A518	2	22'-9"	47	S
A519	2	21'-3"	37	S
REPLACEMENT BARS				
P1001	1	7'-2"	—	S
P1001	1	6'-10"	—	S
P1001	1	6'-6"	—	S
P1001	2	5'-11"	—	S
P1001	1	5'-7"	—	S
P1001	1	5'-3"	—	S

GANNETT FLEMING CORDDRY & CARPENTER
ENGINEERS
HARRISBURG, PA.

PIERS

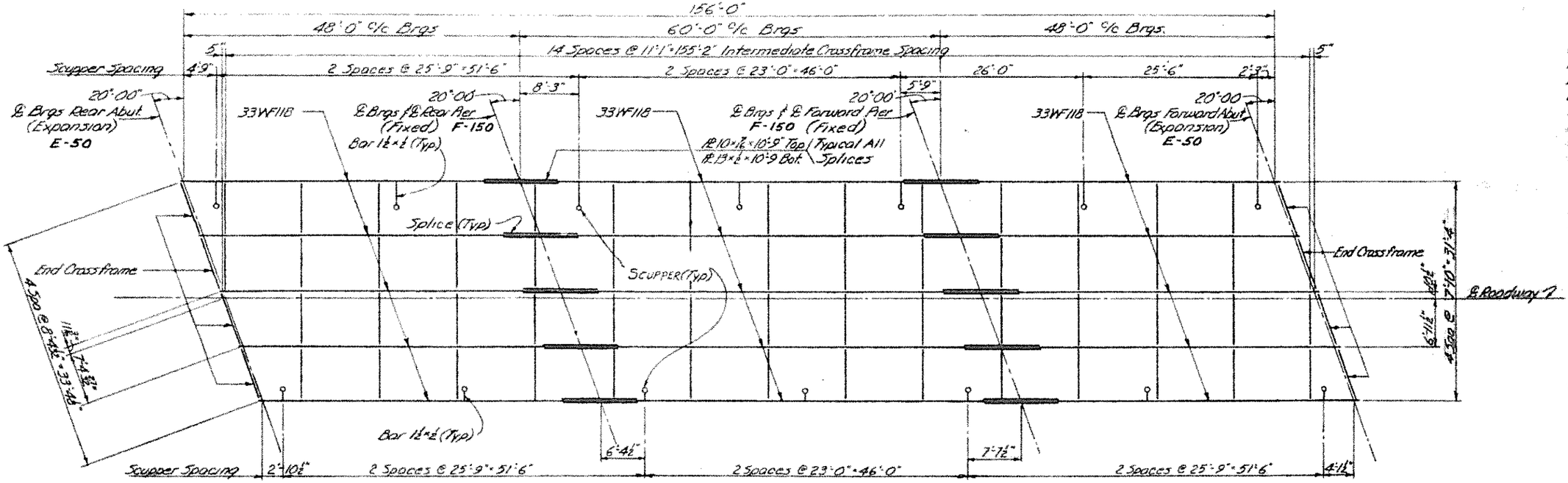
BRIDGE NO. JEF-164-0589
OVER YELLOW CREEK
JEFFERSON COUNTY S.R. 164
STA 316+07.60 TO 317+68.40

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
LWH	ENA	ENA	GWB			

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

16/20

JEF-164-5.97



STRUCTURAL STEEL FRAMING PLAN

GENERAL NOTES: See Sheet #12.
REFERENCE shall be made to Standard Drawing FSB-1-62 for Bearing Details.
REFERENCE shall be made to Standard Drawing CSB-2-56 for details not shown such as crossframes, end finish, scuppers, welds, etc.

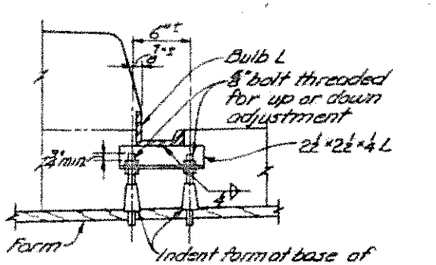
BEAM SPLICE WELDING PROCEDURE

1. Raise the abutment ends of the beams 8".
2. Butt-weld the beam flanges and web, using the following sequence: make one pass on each flange, then two on the web, repeat using one pass at each location, until welds are completed.
3. Weld the bottom and top moment plates.
4. Lower the beam ends to final position.

TRANSVERSE SECTION and SLAB PLAN see Sheet #17 for Typical Transverse Section and Slab Plan.

DEFLECTION AND CAMBER						
	Left Fascia		Inside Beams		Right Fascia	
	End Span	Middle Span	End Span	Middle Span	End Span	Middle Span
Deflection due to weight of steel	0	0	0	0	0	0
Deflection due to remaining dead load	¼"	¼"	¼"	¼"	¼"	¼"
Sum of deflections	¼"	¼"	¼"	¼"	¼"	¼"
Required Camber	0	0	0	0	0	0

Note: Bridge on straight grade.



Indent form at base of cone and set cone perpendicular. Clamp cone firmly to form. Remove cone with removal of form and fill hole with grout.

GUTTER SUPPORT DETAIL

GANNETT FLEMING CORDDRY & CARPENTER
ENGINEERS
HARRISBURG, PA.

STEEL FRAMING PLAN

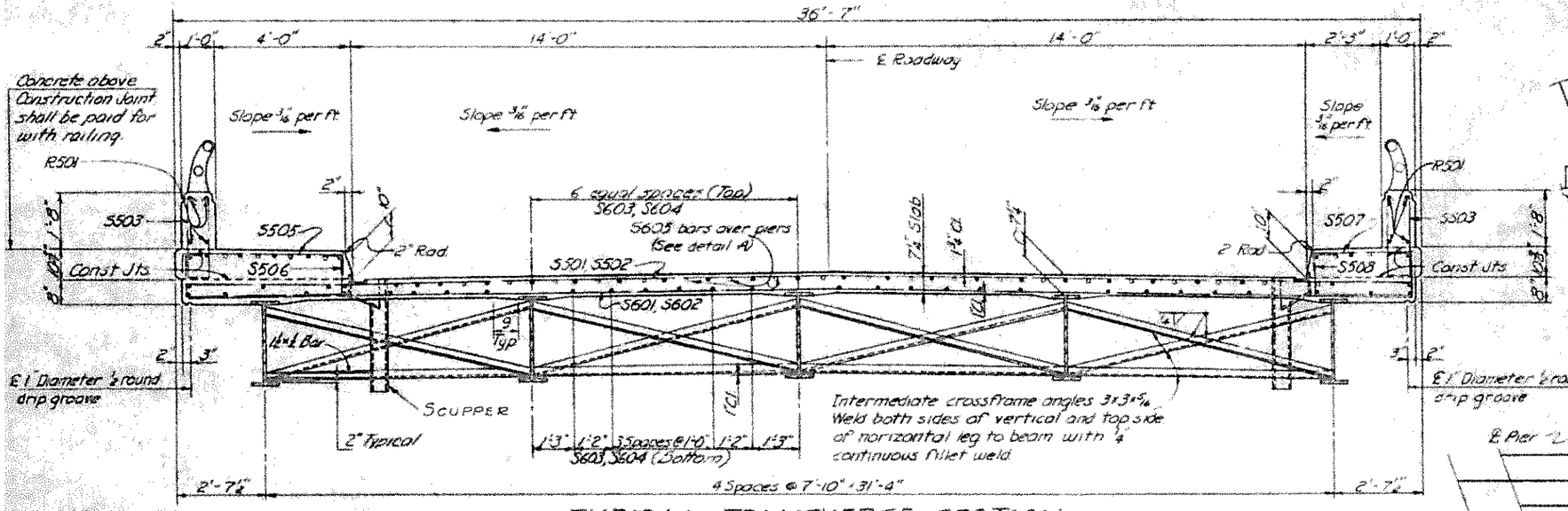
BRIDGE NO. JEF-164-0599
OVER YELLOW CREEK
JEFFERSON COUNTY SR 164
STA. 308+07.60 TO 317+68.40

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
LWH	ENA	ENA	GWB			12-24

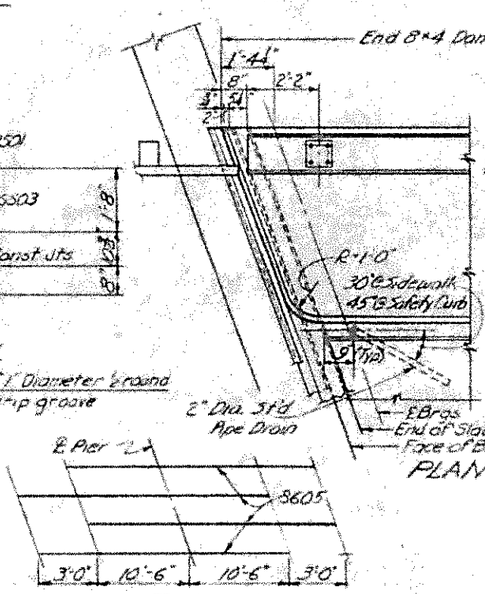
FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

17
20

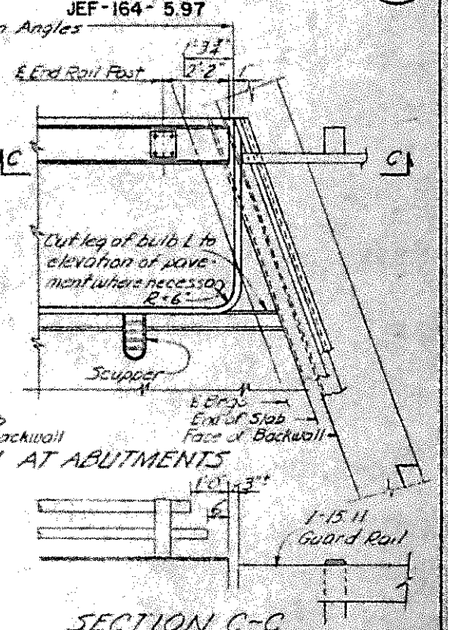
JEF-164-5.97



TYPICAL TRANSVERSE SECTION

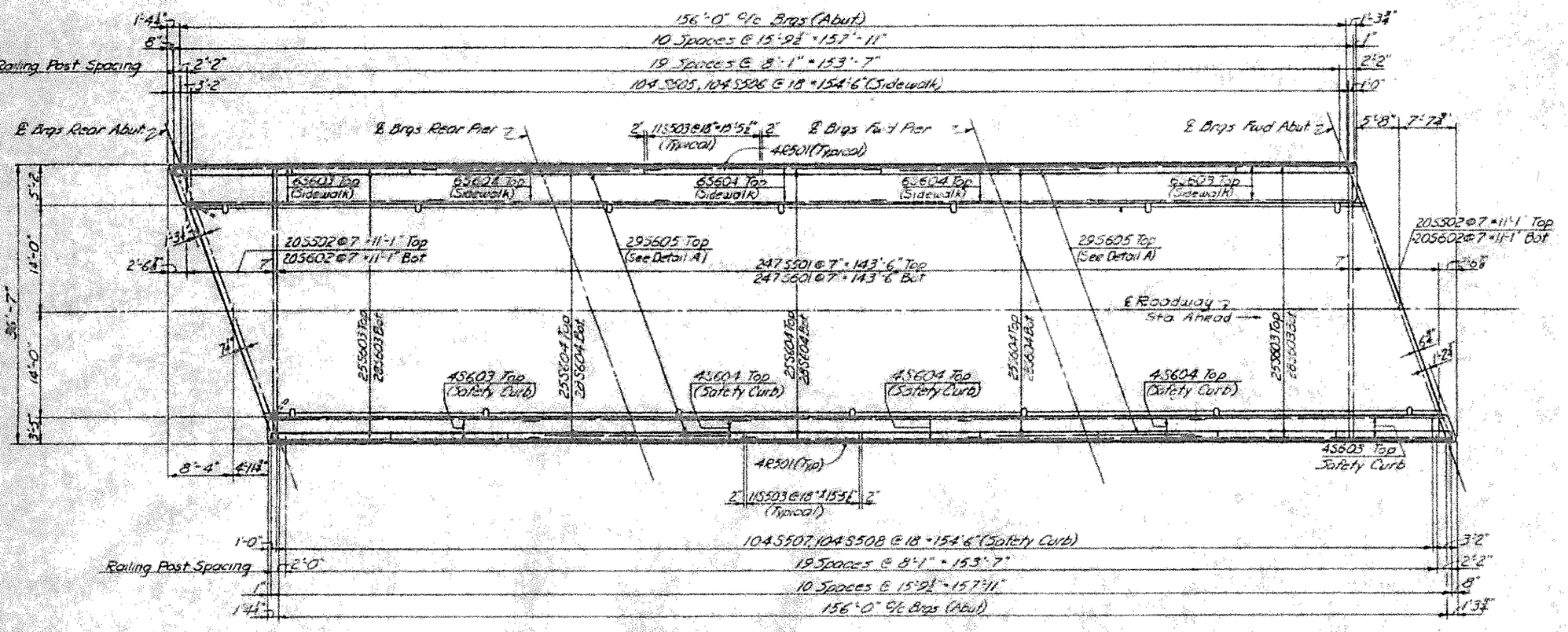


DETAIL A



PLAN AT ABUTMENTS

SECTION C-C



SLAB PLAN

GENERAL NOTES: See Sheet # 12.

DECK SLAB DEPTH: The distance shown from top of deck slab to top of steel beam is the nominal dimension. The plan final deck concrete to be paid for shall be based on this dimension, even though deviation from it may be necessary because the top flange of the beam may not have the exact camber or deformation required to place it parallel to the finished grade.

DECK SLAB HAUNCH The haunch in the deck slab adjacent to the top of the steel beams which is shown as 9" wide, may vary from the dimension between the limits of 6" and 12", except that the maximum slope shall not exceed 3" per foot. Payment for the deck slab concrete shall be based on the 9" width.

SLAB THICKNESS shown includes ½" for monolithic wearing surface.

SUPERSTRUCTURE CONCRETE shall be Class "C"

ALUMINUM RAILING shall be Type C on sta dwg. AR-1-57.

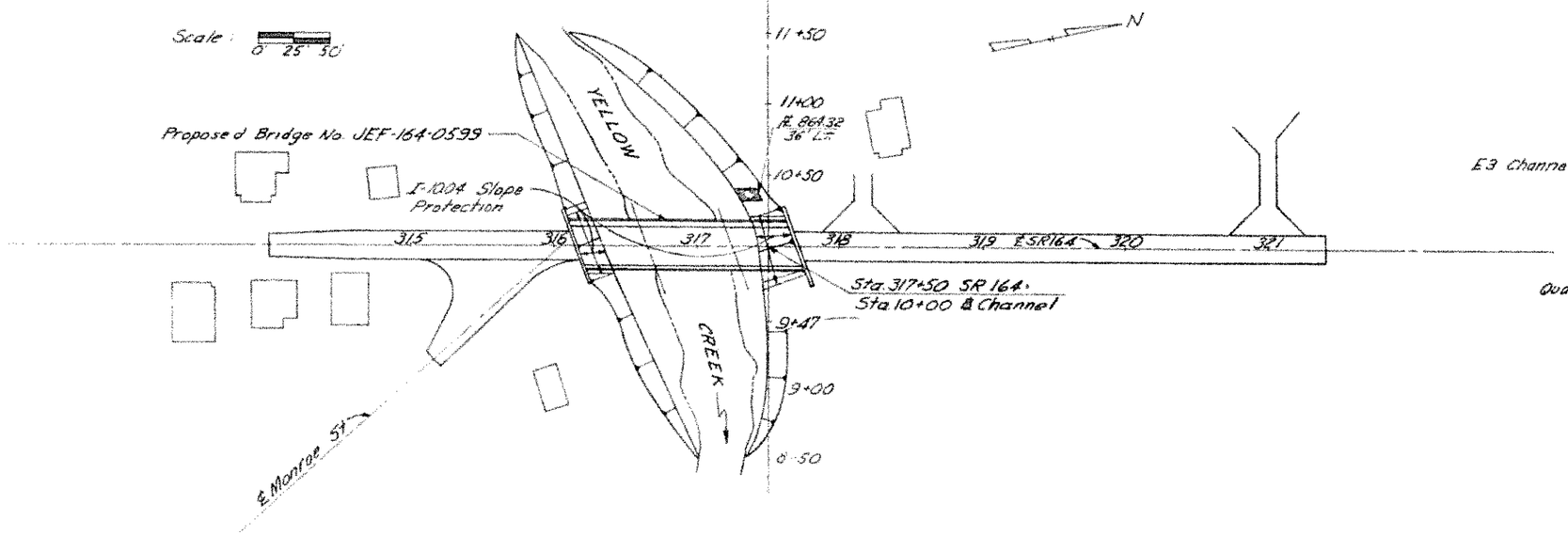
GUTTER SUPPORT: for Gutter Support Detail see Sheet # 16.

GANNETT FLEMING CORDDRY & CARPENTER
ENGINEERS
HARRISBURG, PA.

TRANSVERSE SECTION & SLAB PLAN

BRIDGE NO JEF-164-0.99
OVER YELLOW CREEK
JEFFERSON COUNTY SR 164
STA. 316+07.60 TO 317+68.40

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
LWH	FHA	SMR	GWB			

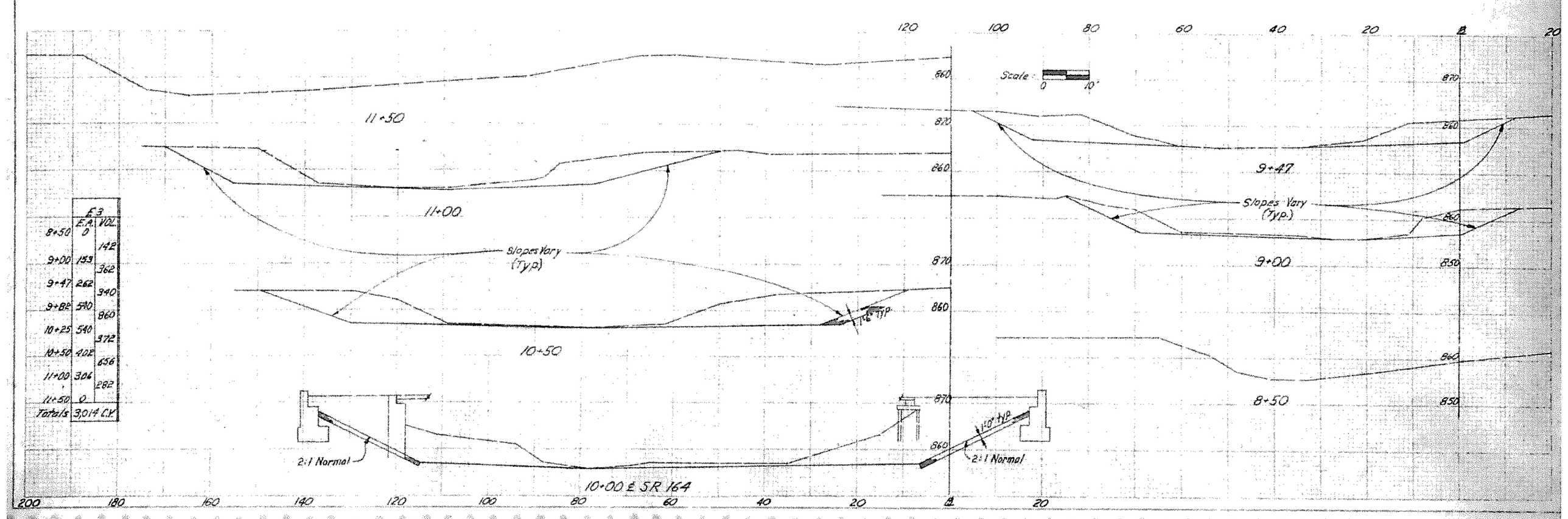


ESTIMATED QUANTITIES

E3 Channel Excavation ..... 3,014 C.Y.

Quantity carried to bridge plan sheet No. 12.

E3		
	E.A.	Vol.
8+50	0	
		142
9+00	153	
		362
9+47	262	
		340
9+82	540	
		860
10+25	540	
		372
10+50	402	
		656
11+00	306	
		282
11+50	0	
Totals	3,014 C.Y.	



CHANNEL SECTIONS

NOTE: Seal Gasket Cost to be included in unit price bid per 6" Water Line.

2	OHIO		

JEF-164-5.97

B.M. Top of Conc. Cap
S.W. Corr. of S. Abutment
El. 871.10

Sta. 0+58 = ℄ Sta. 316+21 – 35.8' Lt.
6"–11¼° Bend (Vert.)

Sta. 0+87 = ℄ Sta. 316+49 – 36.5' Lt.
Concrete Block Anchor

Sta. 1+43 = ℄ Sta. 317+05 – 37.8' Lt.
Concrete Block Anchor

Sta. 1+82.6 = ℄ Sta. 317+45.5 – 38.7' Lt.
6"–45° Bend (Vert.)

Exist. 6" C.I.P. Waterline

Sta. 2+30.6 = ℄ Sta. 317+92.5 – 40.5' Lt.
6"–22½° Bend (Horz.)

Sta. 0+26 = ℄ Sta. 315+89 – 35' Lt.
6"–90° Bend (Vert. & Horz.)

Sta. 0+03.5 = ℄ Sta. 315+89 – 12.5' Lt.
6"–90° Bend (Vert. & Horz.)

Proposed Relocated 12" C.M.P.

Sta. 1+70 = ℄ Sta. 317+33 – 38.4' Lt.
6"–45° Bend (Vert.)

Exist. 12" C.M.P.

Sta. 0+00 = ℄ Sta. 315+85.5
12.8' Lt. Valve

Walk

Exist. 6" C.I.P. Waterline

315 316 317 318 319

Sta. 315+49.6 – 27.1' Rt.
Raise Valve to

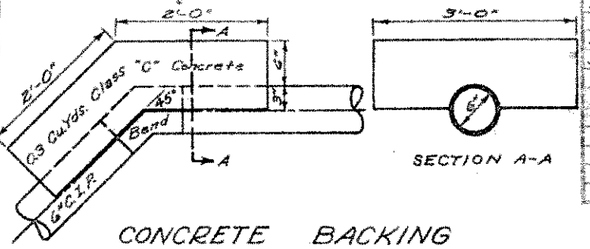
Exist. 6" C.I.P. Waterline

YELLOW CREEK

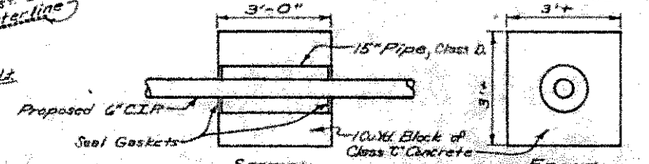
1st Fr. Rec.

S

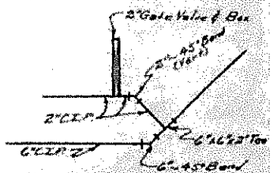
PLAN
Scale: 1"=20'



CONCRETE BACKING



DETAIL OF CONCRETE BLOCK ANCHOR



BLOWOUT CONNECTION

Code Y060
No Federal Participation

ESTIMATED QUANTITIES

ITEM	TOTAL	UNIT	DESCRIPTION
I-124	230	Lin. Ft.	6" Cast Iron Pipe, With Mechanical Joints, Class 150, as per plan
I-124	10	Lin. Ft.	2" Cast Iron Pipe, With Mechanical Joints, Class 150.
I-124	1	Each	2"–45° Cast Iron Bend, With Mechanical Joints.
I-124	2	Each	6"–90° Cast Iron Bend, With Mechanical Joints.
I-124	2	Each	6"–45° Cast Iron Bend, With Mechanical Joints.
I-124	1	Each	6"–22½° Cast Iron Bend, With Mechanical Joints.
I-124	1	Each	6"–11¼° Cast Iron Bend, With Mechanical Joints.
I-124	1	Each	6"x6"x2" Cast Iron Tee, With Mechanical Joints.
I-124	1	Each	2" Gate Valve With Operating Nut on Stem and Box, With Mechanical Joints.
I-124	1	Each	Valve box adjusted to grade.
I-1	6	Lin. Ft.	15" Pipe, Class D, Sec. M-6.8(6).
I-2	2.3	Cu. Yds.	Masonry.

~ WATER LINE NOTES ~

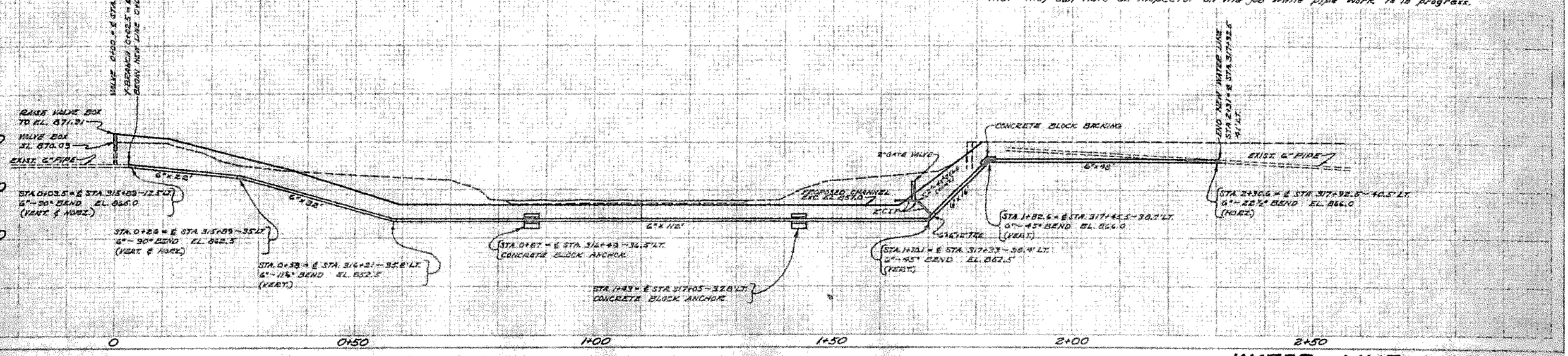
CONNECTIONS TO EXISTING PIPE: At places where the plans provide for proposed water pipe to be connected to existing pipes, it shall be the responsibility of the Contractor to locate the existing pipe both as to line and grade before he starts to lay the proposed pipe. The cost of this operation shall be included in the unit price bid for the pertinent pipe item.

GENERAL: All applicable provisions of Item 614 shall apply to this work. The Contractor shall be responsible for continuous service at all times.

When the new system is completed and service restored, the existing pipe from Sta. 316+00 to Sta. 317+70 shall be removed and became the property of the Contractor. The remaining existing pipe may remain in place. Cost of removal of existing pipe shall be included in price bid for new 6" water line.

When water line is being laid, the Bergholz Water Board shall be notified, so that they can have an inspector on the job while pipe work is in progress.

PROFILE
Vert.: 1"=10'
Horz.: 1"=10'



WATER LINE LAYOUT

FED. NO. DIVISION	STATE	PROJECT		20
2	OHIO			20

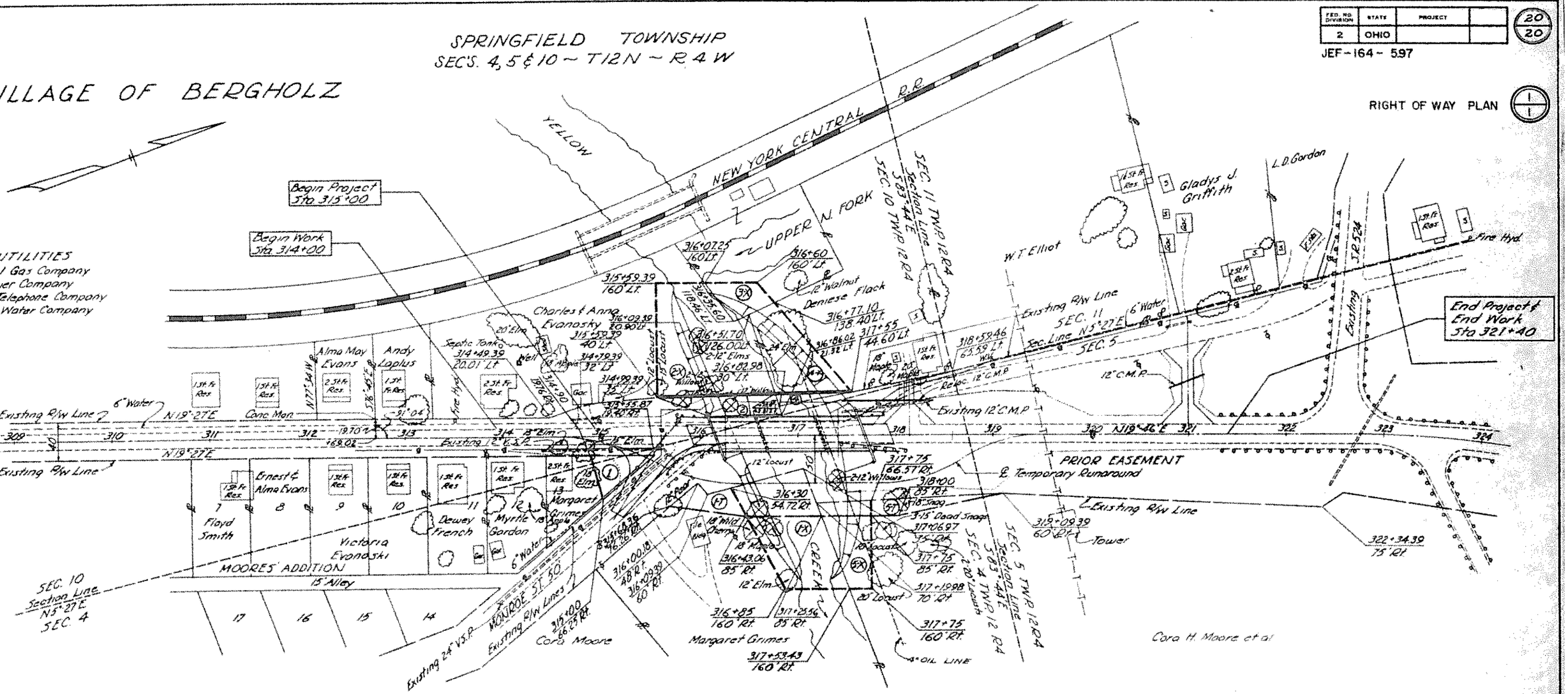
JEF-164-597

RIGHT OF WAY PLAN 1/1

SPRINGFIELD TOWNSHIP
SEC'S. 4, 5 & 10 ~ T12N ~ R4W

VILLAGE OF BERGHOLZ

UTILITIES
Ohio Fuel Gas Company
Ohio Power Company
General Telephone Company
Bergholz Water Company



SUMMARY OF ADDITIONAL RIGHT OF WAY REQ'D.

Parcel No.	OWNERS	Deed Record Volume	Deed Record Page	Deed Area	To Be Acquired Land	To Be Acquired Bldgs	Residue Left	Residue Right	Sheet No.	REMARKS
1	Margaret Grimes	355	402	1.27A±	0.04A±			1.23A±	1	
1-T	" "				0.11 A±				1	
1-X	" "				0.20A±				1	
2	Charles & Anna Evanosky	171	217	1.00A±	0.05 A±		0.95A±		1	
2-X	" "				0.25 A±				1	
3-X	New York Central Railroad	102	281	0.31A±	0.04A±		0.31A±		1	
4-X	Deniese Flack	384	559	0.69 A±	0.11 A±		0.69A±		1	Tract #2 affected
5-T	Cora H Moore et al	241	196	28300A±	0.05 A±		28300A±	R+L Lt	1	Parcel #6 affected
5-X	" " " "				0.08A±				1	
4	Deniese Flack	384	559	0.69A±	0.01 A±		0.68A±		1	

(1) MARGARET GRIMES
1-T.B.A. ——— 0.04 A±
1-T ——— 0.11 A±
1-X ——— 0.20 A±

(2) CHARLES & ANNA EVANOSKY
2-T.B.A. ——— 0.05A±
2-X ——— 0.25A±

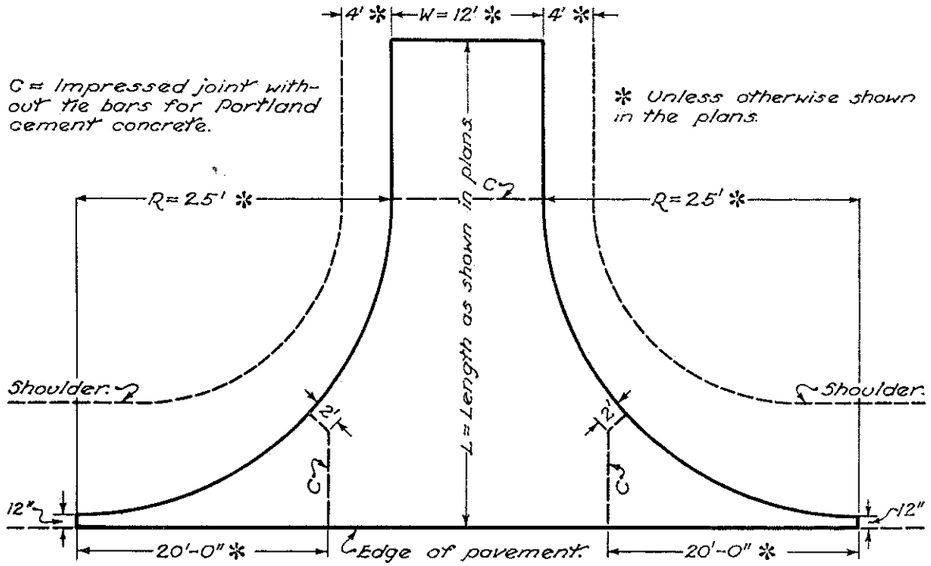
(3) NEW YORK CENTRAL RAILROAD
3-X ——— 0.04 A±

(4) DENIESE FLACK
4-T.B.A. ——— 0.01 A±
4-X ——— 0.11 A±

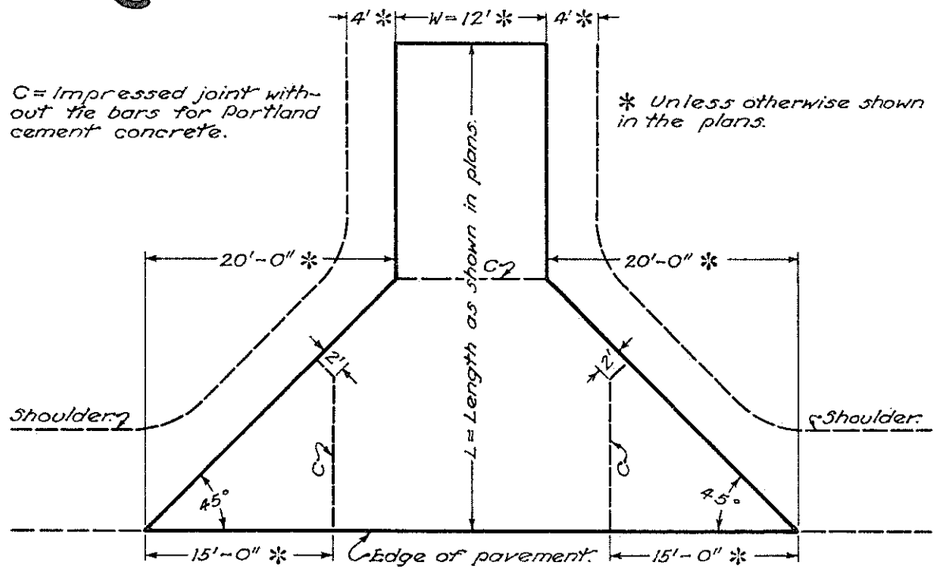
(5) CORA H. MOORE et al
5-T ——— 0.05A±
5-X ——— 0.08 A±

JEF-164-597
COMPLETION DATE
REVISIONS:

DRIVEWAYS



TYPE 1 DRIVEWAY



TYPE 2 DRIVEWAY

NOTES

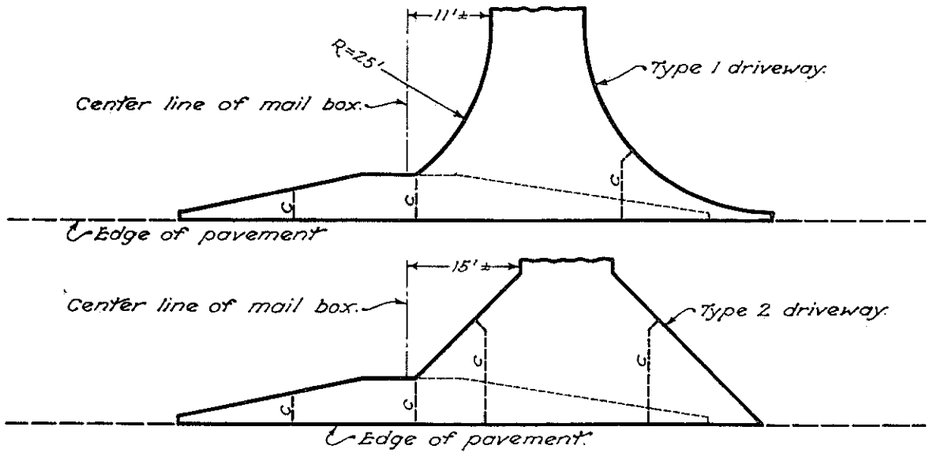
GENERAL:— The design details shown hereon shall govern the construction of driveways unless otherwise shown in the project plans. Intersecting roads or streets shall be detailed in the project plans.

The pavement type and thickness shall be specified in the project plans.

Driveway and mail box approaches shall be combined when feasible.

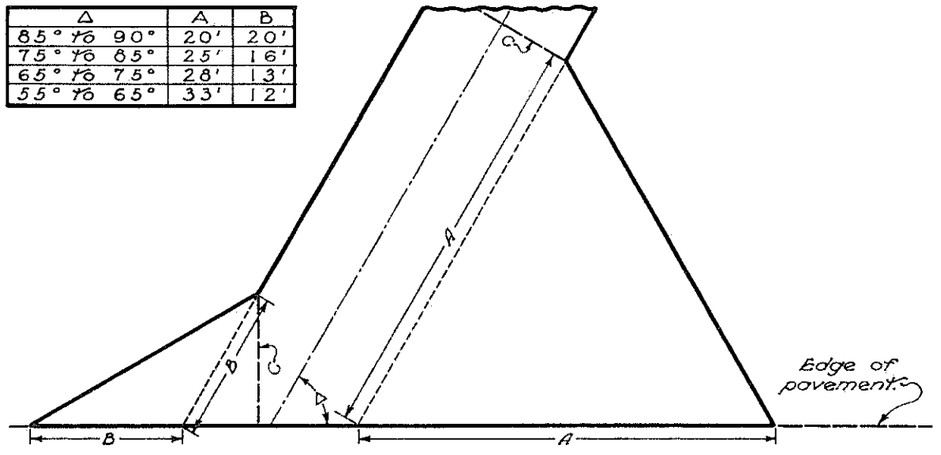
JOINTS:— Impressed joints for portland cement concrete driveways shall be ¼" minimum width by 3"± depth and shall be sealed with Sec. M-10.23 or Sec. M-10.26 material.

In addition to the joints shown hereon, impressed joints without tie bars shall be placed in portland cement concrete driveways at intervals not to exceed twenty feet in the portion of the driveway back of the flare.

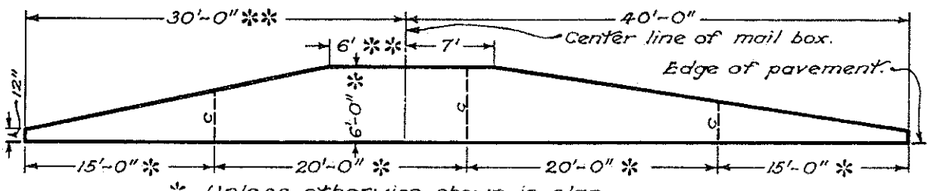


COMBINED DRIVEWAY & MAIL BOX APPROACH

Δ	A	B
85° to 90°	20'	20'
75° to 85°	25'	16'
65° to 75°	28'	13'
55° to 65°	33'	12'

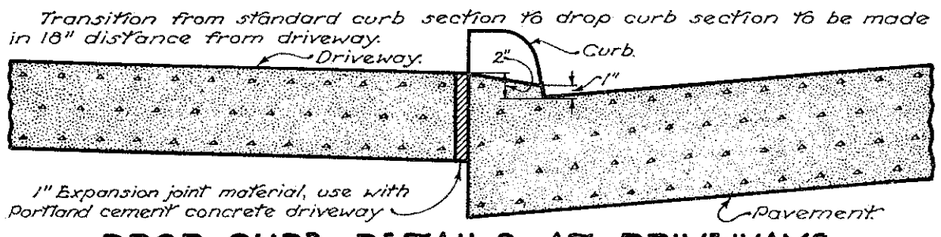


TYPE 2 SKEWED DRIVEWAY



* Unless otherwise shown in plan.
** Add 2 feet for each additional mail box.

TYPICAL MAIL BOX APPROACH



DROP CURB DETAILS AT DRIVEWAYS

BUREAU OF LOCATION AND DESIGN
OHIO DEPARTMENT OF HIGHWAYS

DATE 1-3-55

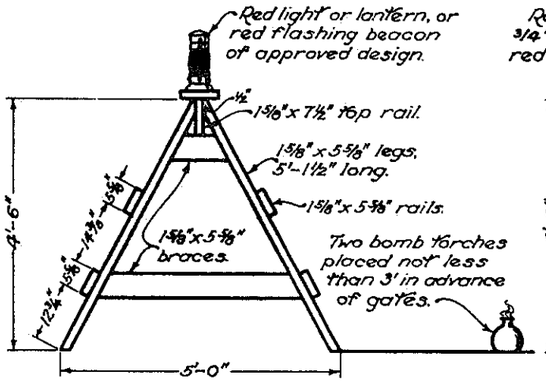
DRIVEWAYS

STANDARD CONSTRUCTION DRAWING

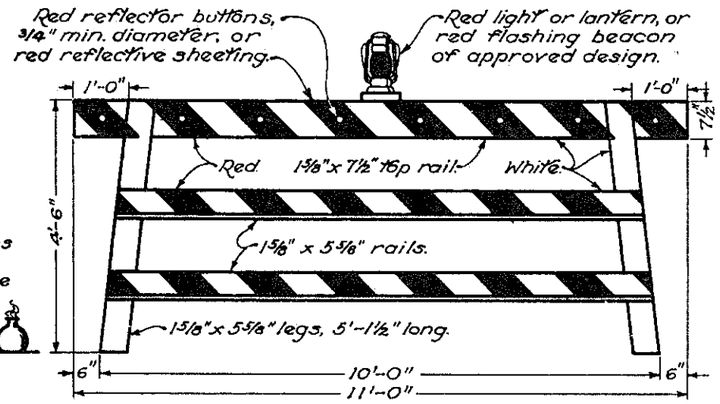
DR-1

APPROVED _____ ENGR. L. & D.

STANDARD BARRICADES AND GATES

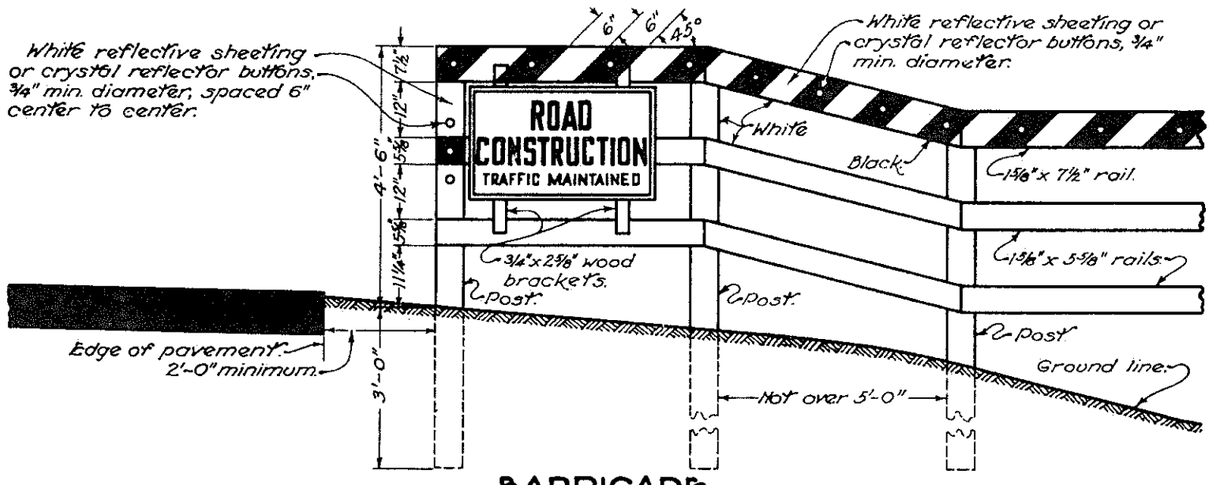


END VIEW



ELEVATION

GATE



BARRICADE

NOTES

LUMBER used in the construction of the gates and barricades shall be No. 1 common yellow pine or No. 1 common Douglas Fir, or other materials approved by the Engineer, surfaced on four sides standard, in accordance with the requirements of the Specifications.

GATES:—The movable gate shall be constructed according to the details shown. Alternate 6" stripes shall be applied on all three rails at a 45° angle, and shall be red and white in color. If all three rails are painted with alternating stripes of red and white, red reflector buttons shall be mounted in the red stripes on the top rail. The top rail may be reflectorized with 6" stripes of red reflective sheeting alternated with 6" stripes of white paint (or white reflective sheeting) in lieu of red reflector buttons. One gate shall be erected for each traffic lane. The gates shall be well spiked, using spikes long enough to clinch.

The hinged gate shall be an approved farm type having 12' length, 48" height, with steel frame or a type approved by the Engineer. The gate shall be hung on hinge screw hooks or as otherwise approved. Striping similar to that used on the movable gate shall be accomplished with lumber 1" nominal thickness or with metal strips fastened to the gate. The gate shall be supported at the center in an approved manner.

BARRICADES shall be constructed according to the details shown. The top rail shall be painted on both sides with alternate 6" black and white stripes on a 45° angle sloping toward the roadway. The two lower rails and posts shall be painted white on both sides.

The barricade shall have an opening of a minimum width of 24 feet. For pavement widths greater than 20 feet, the minimum widths of the barricade openings shall be the pavement width plus 4 feet. The barricade shall remain in place following the re-opening of the road if berm or other work is not completed.

POSTS shall be 6"x6" sawed or 8" round posts and shall conform to the Specifications for Guard Rail Posts.

RAILS of the barricade shall be bolted to the posts with ⅝" bolts.

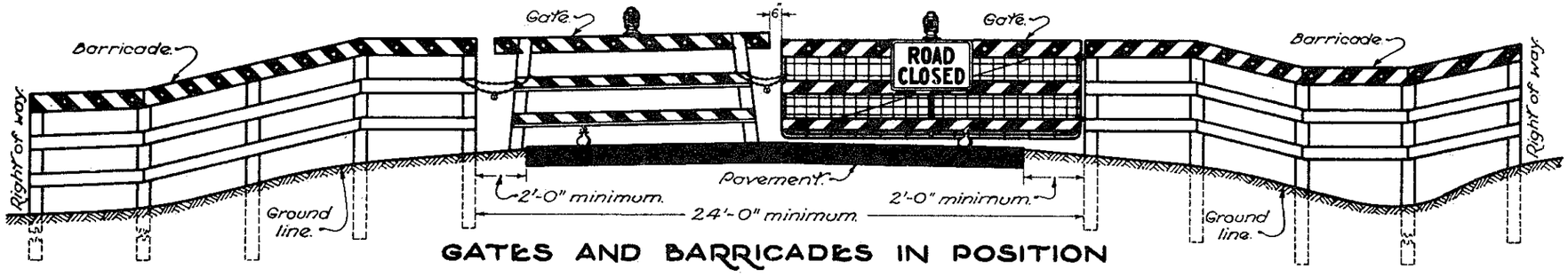
CHAINS:—Gates shall be chained and padlocked to one another and to adjacent posts of the barricades. Chains shall be of ⅜" stock with welded links.

BARRICADE REFLECTORS:—The top rail of the barricades shall be reflectorized with reflective sheeting or with crystal reflector buttons of ¾" minimum diameter placed in the black stripes. When traffic is maintained, the top rail of the barricades shall be reflectorized on both sides, and reflectorized sheeting or three crystal reflector buttons of ¾" minimum diameter shall be mounted as shown on each side of the two posts adjacent to the traveled roadway.

SIGNS:—Upon the erection of the gates and barricades according to the above standards, the Division Traffic Engineer shall furnish ROAD CLOSED sign, size 40" x 24", which shall be mounted on the gate as shown. When three gates are used for closing 3-lane roads, the sign shall be mounted on the middle gate facing traffic approaching the closed section.

Where traffic is maintained a ROAD CONSTRUCTION TRAFFIC MAINTAINED sign, size 40" x 24", will be furnished for mounting on the barricade at the right-hand side of the roadway adjacent to the pavement, facing traffic approaching the construction section. An END OF CONSTRUCTION sign, size 40" x 24", shall be mounted on the back of the barricade at the right-hand side of the road facing traffic leaving the construction section.

MODIFIED DESIGN:— The barricade shown hereon is primarily for use in rural areas. In urban areas and at locations where it is impracticable to extend the barricade to the right of way line because of a sidewalk or other obstruction, the ends of the barricade shall be located as directed by the Engineer to effect the desired closing of the highway.



GATES AND BARRICADES IN POSITION

BUREAU OF LOCATION AND DESIGN
OHIO DEPARTMENT OF HIGHWAYS

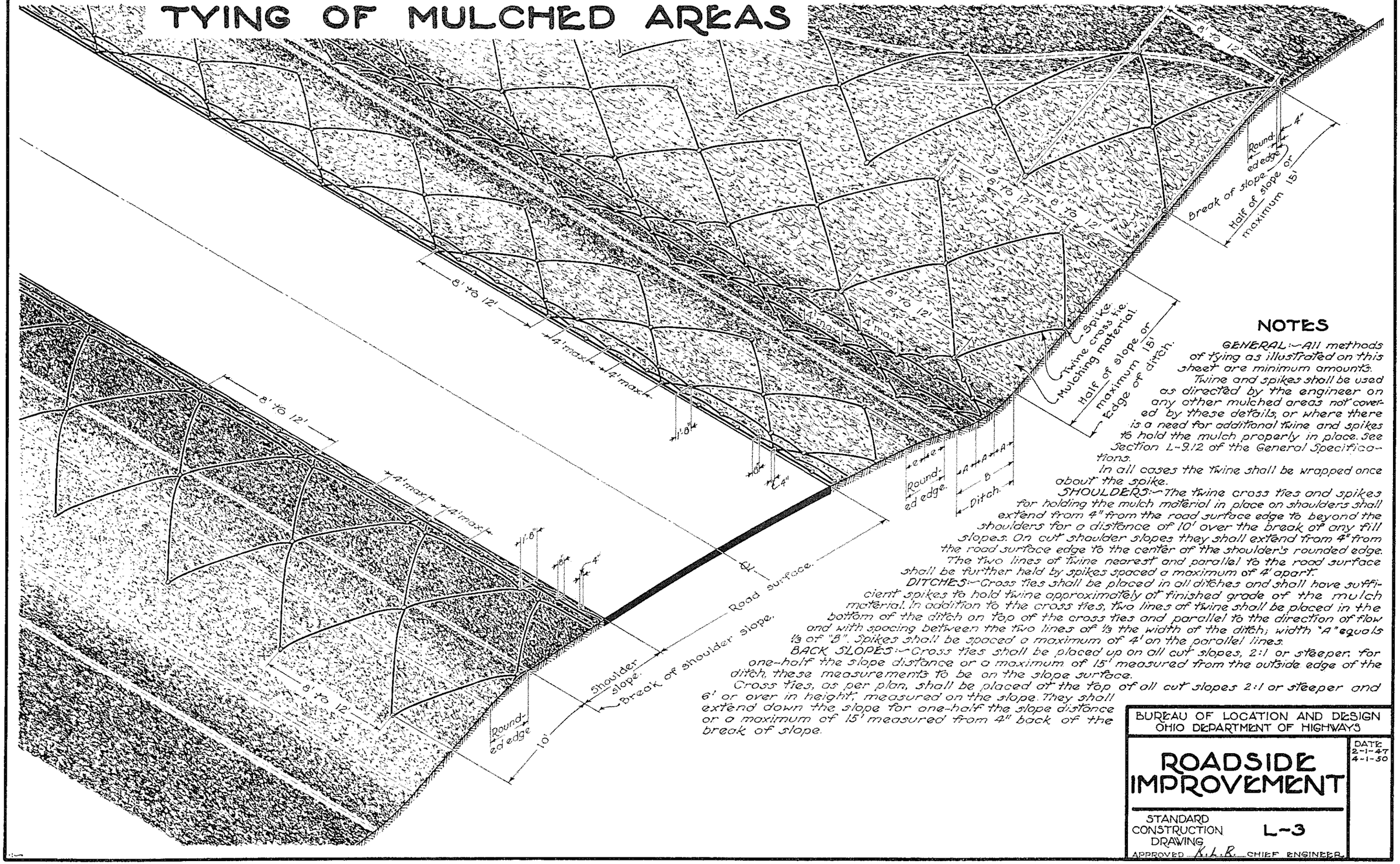
BARRICADES AND GATES

STANDARD CONSTRUCTION DRAWING G-7.07

APPROVED _____ ENGR. L. & D.

DATE
10-1-33
6-1-42
2-1-47
12-7-50
5-1-51
1-2-53
4-2-56
6-1-56

TYING OF MULCHED AREAS



NOTES

GENERAL:—All methods of tying as illustrated on this sheet are minimum amounts. Twine and spikes shall be used as directed by the engineer on any other mulched areas not covered by these details, or where there is a need for additional twine and spikes to hold the mulch properly in place. See Section L-9.12 of the General Specifications.

In all cases the twine shall be wrapped once about the spike.

SHOULDERS:—The twine cross ties and spikes for holding the mulch material in place on shoulders shall extend from 4" from the road surface edge to beyond the shoulders for a distance of 10' over the break of any fill slopes. On cut shoulder slopes they shall extend from 4" from the road surface edge to the center of the shoulder's rounded edge. The two lines of twine nearest and parallel to the road surface shall be further held by spikes spaced a maximum of 4' apart.

DITCHES:—Cross ties shall be placed in all ditches and shall have sufficient spikes to hold twine approximately at finished grade of the mulch material. In addition to the cross ties, two lines of twine shall be placed in the bottom of the ditch on top of the cross ties and parallel to the direction of flow and with spacing between the two lines of ⅓ the width of the ditch; width "A" equals ⅓ of "B". Spikes shall be spaced a maximum of 4' on the parallel lines.

BACK SLOPES:—Cross ties shall be placed up on all cut slopes, 2:1 or steeper, for one-half the slope distance or a maximum of 15' measured from the outside edge of the ditch, these measurements to be on the slope surface.

Cross ties, as per plan, shall be placed at the top of all cut slopes 2:1 or steeper and 6' or over in height, measured on the slope. They shall extend down the slope for one-half the slope distance or a maximum of 15' measured from 4" back of the break of slope.

BUREAU OF LOCATION AND DESIGN
OHIO DEPARTMENT OF HIGHWAYS

DATE
2-1-47
4-1-50

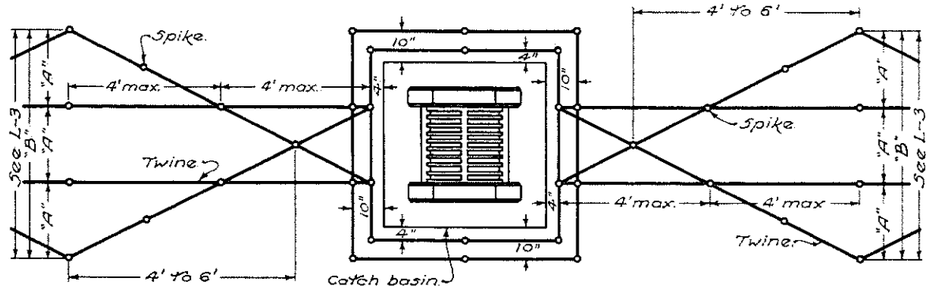
ROADSIDE IMPROVEMENT

STANDARD CONSTRUCTION DRAWING

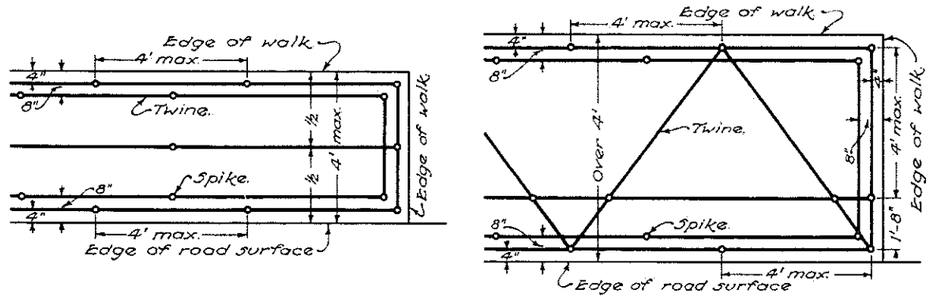
L-3

APPROVED K.L.R. CHIEF ENGINEER

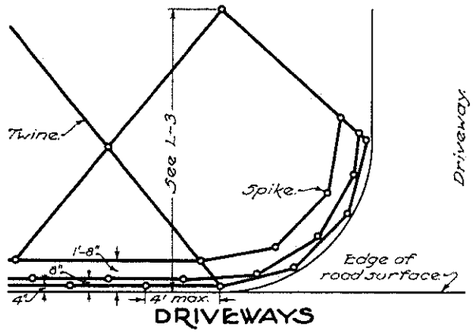
TYING OF MULCHED AREAS



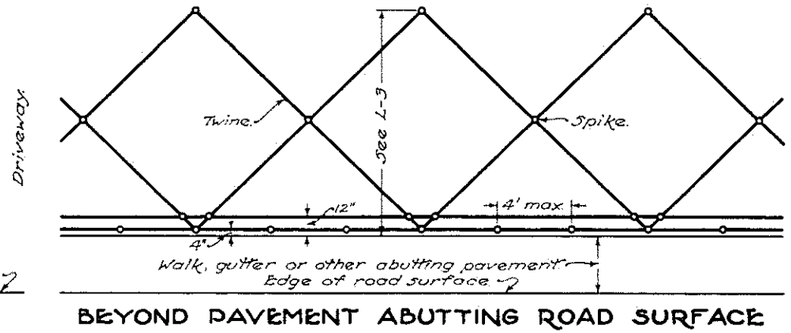
AROUND CATCH BASIN IN SIDE DITCH



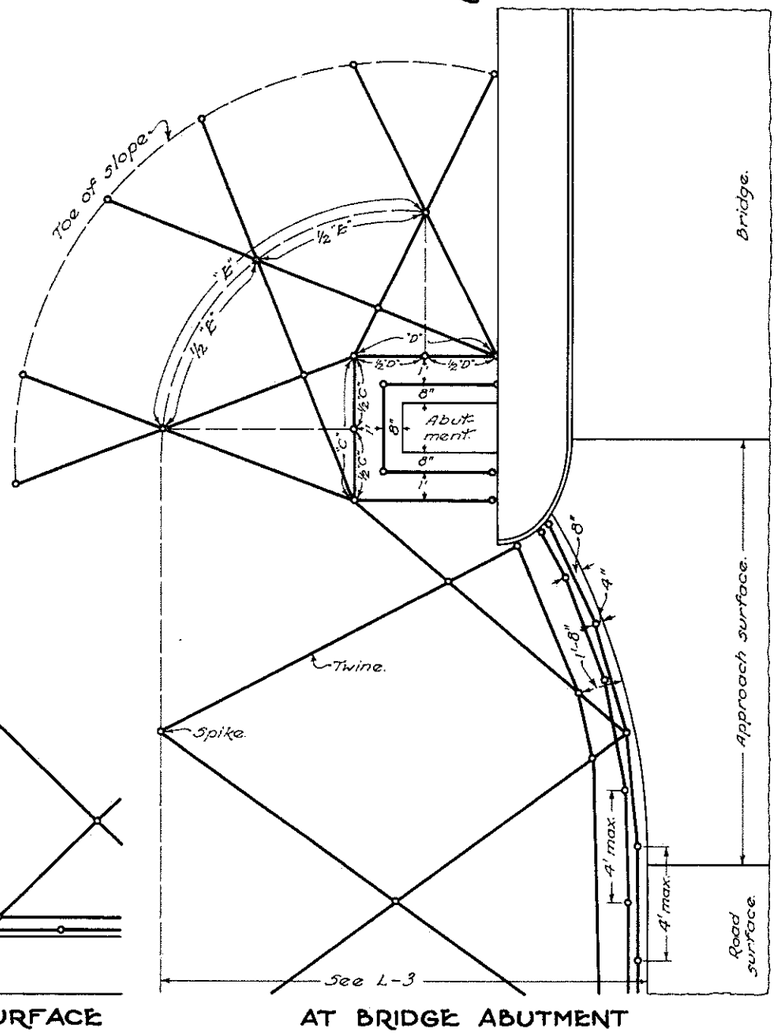
PARKWAY STRIP BETWEEN WALK AND ROAD SURFACE



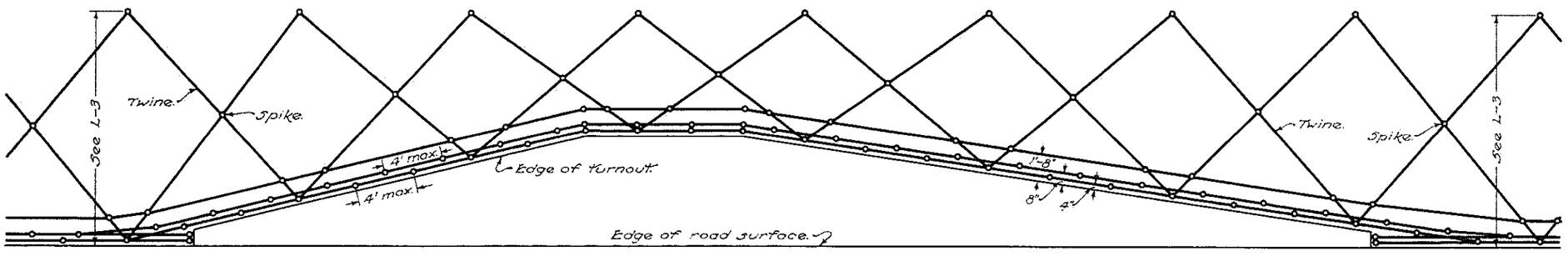
DRIVEWAYS



BEYOND PAVEMENT ABUTTING ROAD SURFACE



AT BRIDGE ABUTMENT



MAILBOX TURNOUTS

NOTES

GENERAL:- All methods of tying as illustrated on this sheet are minimum amounts.

Twine and spikes shall be used as directed by the engineer on any other mulched areas not covered by these details, or where there is a need for additional twine and spikes to hold the mulch properly in place. See Section L-9.12 of the General Specifications.

In all cases the twine shall be wrapped once about the spike.

SHOULDERS:- The twine cross ties and spikes for holding the mulch material in place on shoulders shall extend from 4" from the road surface edge to beyond the shoulders for a distance of 10' over the break of any fill slopes. On cut shoulder slopes they shall extend from 4" from the road surface edge to the center of the shoulder's rounded edge.

The two lines of twine nearest and parallel to the road surface shall be further held by spikes spaced a maximum of 4' apart.

DITCHES:- Cross ties shall be placed in all ditches and shall have sufficient spikes to hold twine approximately at finished grade of the mulch material. In addition to the cross ties, two lines of twine shall be placed in the bottom of the ditch on top of the cross ties and parallel to the direction of flow and with spacing between the two lines of 1/3 the width of the ditch; width "A" equals 1/3 of "B". Spikes shall be spaced a maximum of 4' on the parallel lines.

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OHIO DEPARTMENT OF HIGHWAYS

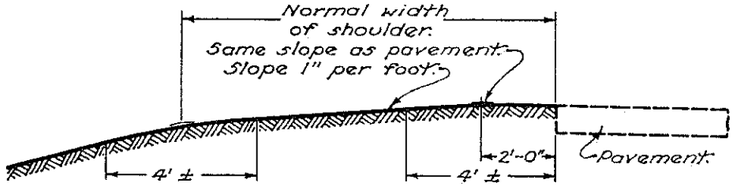
DATE 4-1-50

ROADSIDE IMPROVEMENT

STANDARD CONSTRUCTION DRAWING **L-3-A**

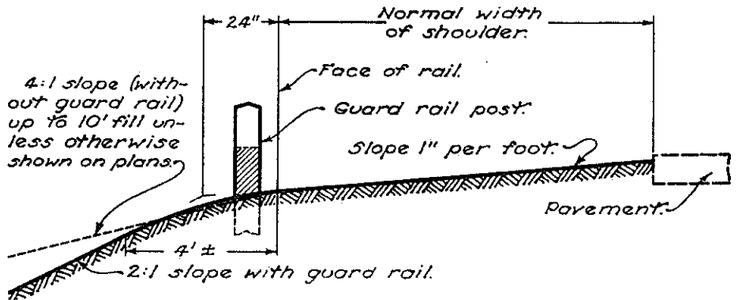
APPROVED K.L.R. CHIEF ENGINEER

ROADWAY ITEMS



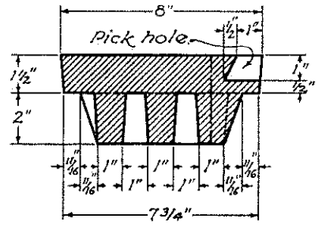
* All angles at change of slope shall be rounded as shown.
* Unless otherwise shown on plan.

SHOULDER TREATMENT ON HIGH SIDE OF SUPERELEVATED CURVES

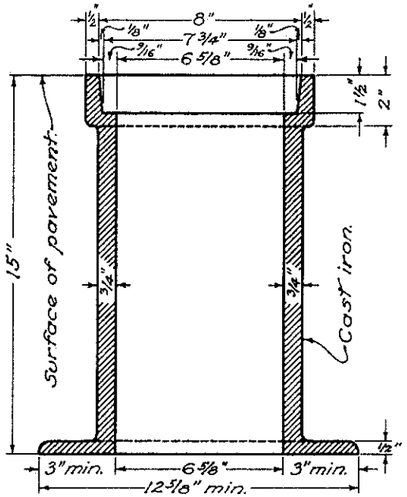


* Shoulders shall be constructed 2 feet wider than the normal section where guard rail is required.
* Angle at change of slope shall be rounded as shown.
* Unless otherwise shown on plan.

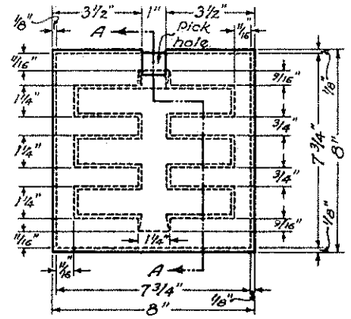
LOCATION OF GUARD RAIL



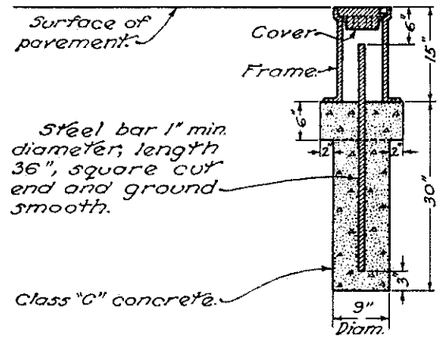
MONUMENT BOX COVER SECTION A-A



MONUMENT BOX FRAME SECTION



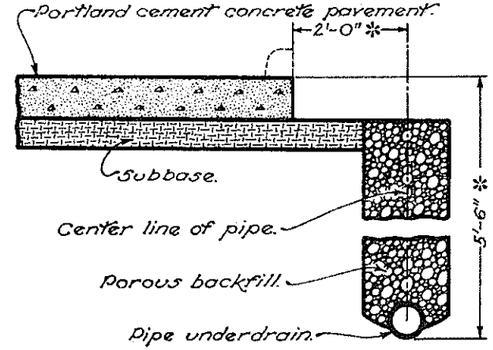
MONUMENT BOX COVER PLAN



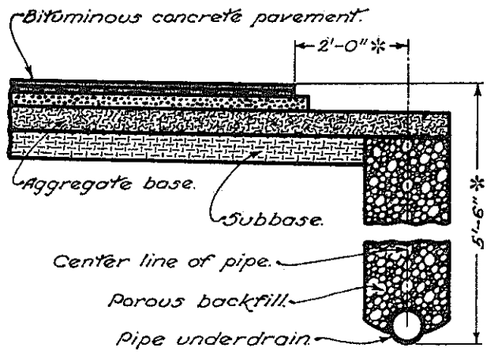
MONUMENT ASSEMBLY SECTION

Cost of furnishing and placing monument box, steel bar and class "C" concrete included in price bid for Item I-8 Monument Assembly.

MONUMENT ASSEMBLY



WITH PORTLAND CEMENT CONCRETE PAVEMENT

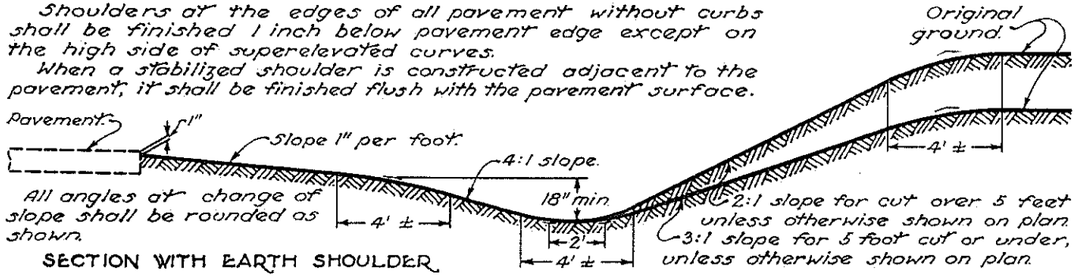


WITH FLEXIBLE PAVEMENT

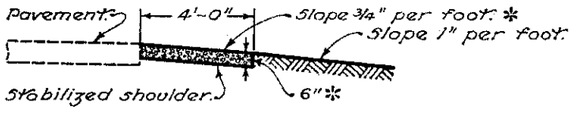
* Unless otherwise shown on plan.

PIPE UNDERDRAIN CONSTRUCTION

Shoulders at the edges of all pavement without curbs shall be finished 1 inch below pavement edge except on the high side of superelevated curves.
When a stabilized shoulder is constructed adjacent to the pavement, it shall be finished flush with the pavement surface.



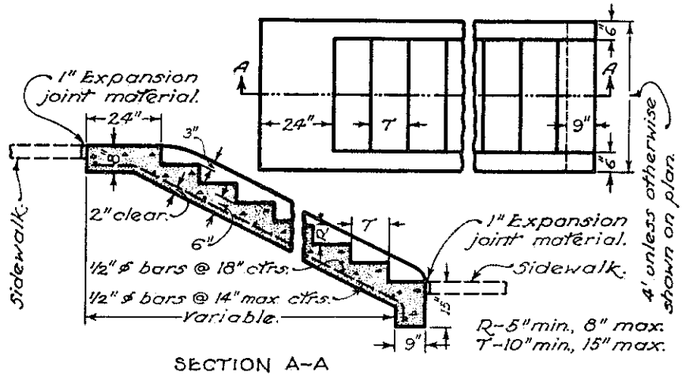
SECTION WITH EARTH SHOULDER



* Unless otherwise shown on plan.

SECTION USING STABILIZED SHOULDER

NORMAL SHOULDER AND DITCH CONSTRUCTION



SECTION A-A

Steps to be reinforced as shown when specified on plan.
Ground line to be located 1" to 3" below top of integral wall.

CONCRETE STEPS

BUREAU OF LOCATION AND DESIGN
OHIO DEPARTMENT OF HIGHWAYS

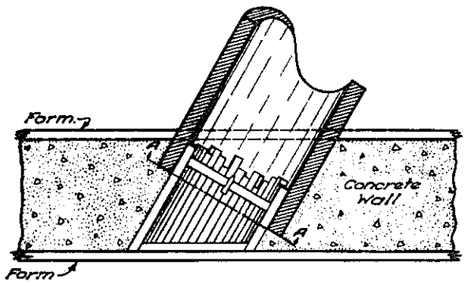
ROADWAY ITEMS

STANDARD CONSTRUCTION DRAWING RI-1

APPROVED _____ ENGR. L. & D.

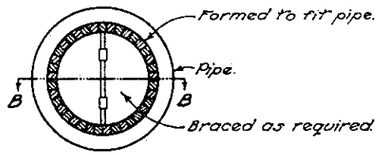
DATE
5-16-51
6-1-53
1-3-56
7-15-58

CONSTRUCTION METHODS

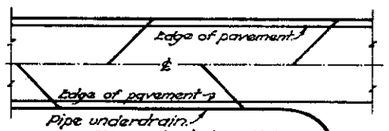


SECTION B-B
Through wall and pipe.

BARRELLING CONCRETE WALL

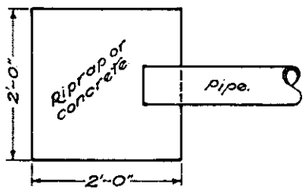


SECTION A-A

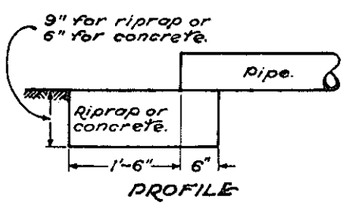


PLAN

SECTION

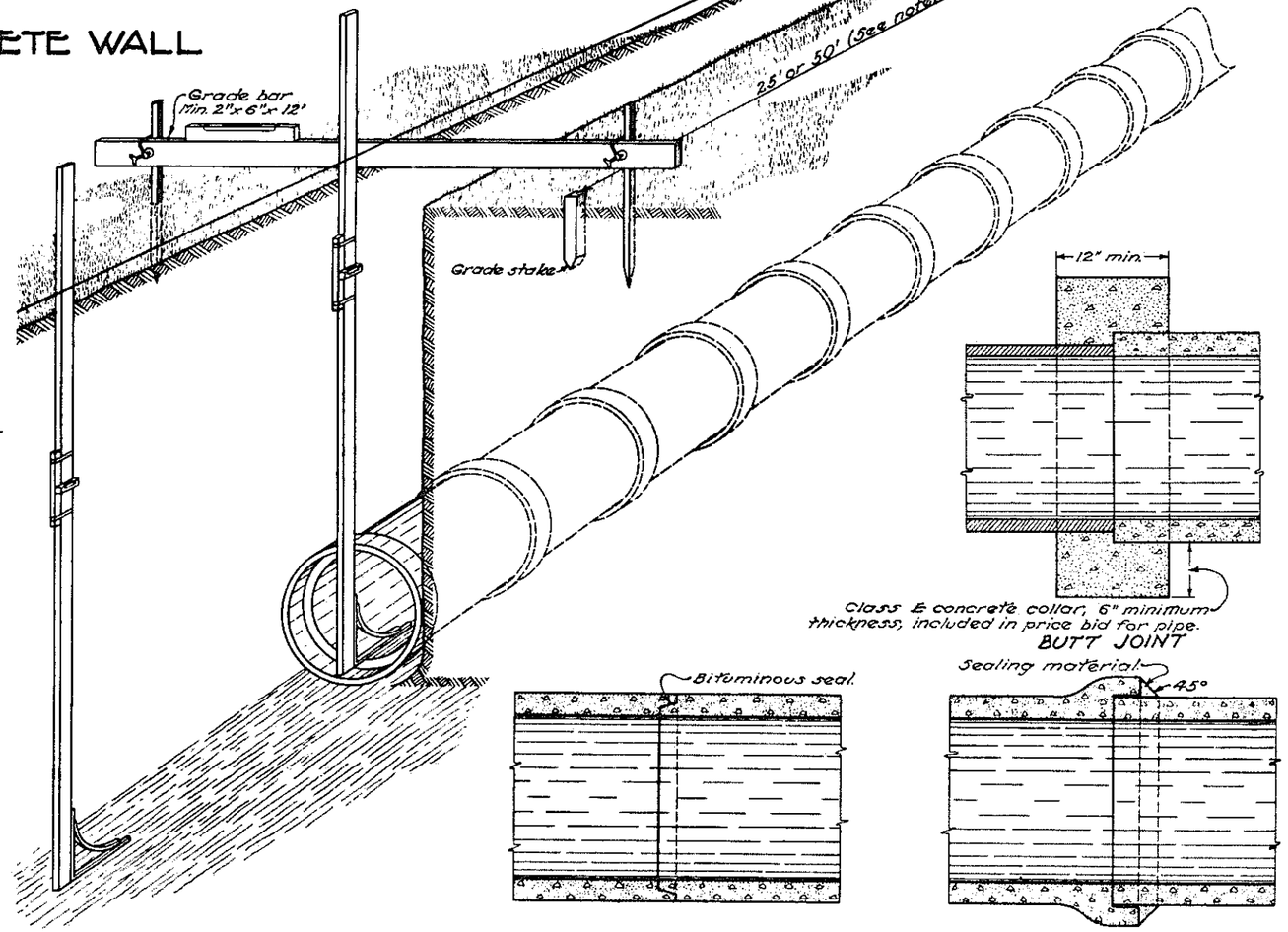


PLAN



PROFILE

PIPE UNDERDRAIN OUTLET



LAYING PIPE

Class E concrete collar, 6" minimum thickness, included in price bid for pipe.

BUTT JOINT

TONGUE AND GROOVE JOINT

BELL AND SPIGOT JOINT

SEALED PIPE JOINTS

NOTES

BARRELLING OUT CONCRETE WALL:- When necessary that the pipe be barrelled out to the required lengths, it shall be done according to the details shown hereon.

GRADE STAKES shall be set at the following intervals:- For grades less than 0.70% - 25 feet. For grades of 0.70% and over - 50 feet.

GRADE POLE shall be a straight pole dressed with corners rounded, size depending on the length but approximately 1"x 2". The pole shall be equipped with a metal bracket on the bottom with a projecting length of 12". Notches shall be cut on the pole for the depth of the flow line below the grade string and for the depth of trench. A spirit level shall be used on the pole to determine when the pole is vertical.

PIPE JOINTS:- When the construction item calls for sealed joints they shall conform to the details shown hereon and to the appropriate sections of the Construction and Material Specifications.

Where called for on the plans, in the proposal or the specifications, pipe of the type and size specified, shall be encased with a minimum of five inches of Class "E" concrete meeting the requirements of Item 5-L. Payment for furnishing and placing the concrete, and for any additional excavation required, shall be included in the price bid per linear foot of the pertinent pipe item.

PIPE UNDERDRAIN OUTLET: Place grouted riprap 9" thick or Class "E" plain concrete slab 6" thick at the outlet end of underdrain pipe as shown. Cost of furnishing and placing riprap or concrete slab shall be included in price bid per lineal foot of outlet pipe.

BUREAU OF LOCATION AND DESIGN
OHIO DEPARTMENT OF HIGHWAYS

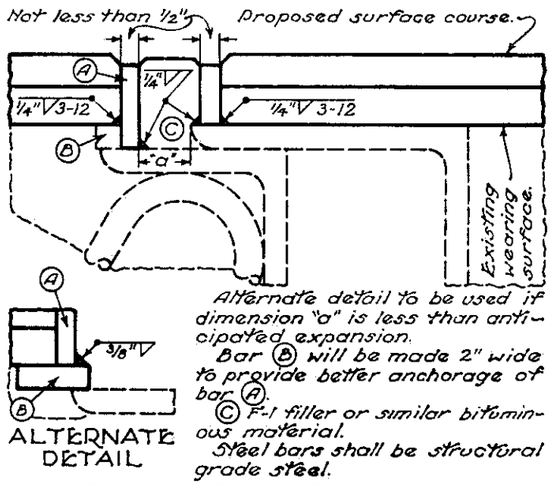
DRAINS AND SEWERS

DATE: 11-15-60

STANDARD CONSTRUCTION DRAWING I-1

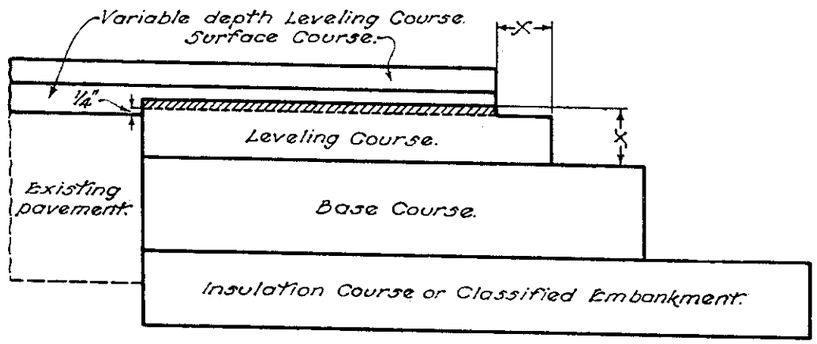
APPROVED _____ ENGR. L. & D.

RESURFACING



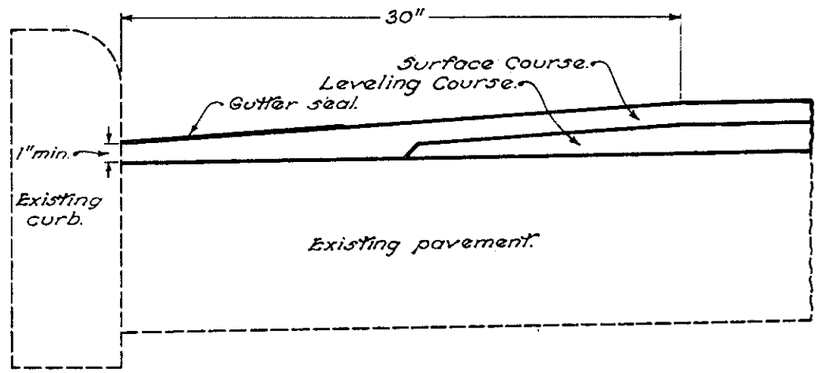
Alternate detail to be used if dimension "a" is less than anticipated expansion.
Bar (B) will be made 2" wide to provide better anchorage of bar (A).
(C) F-1 filler or similar bituminous material.
Steel bars shall be structural grade steel.

RAISING EXPANSION JOINTS AT BRIDGE



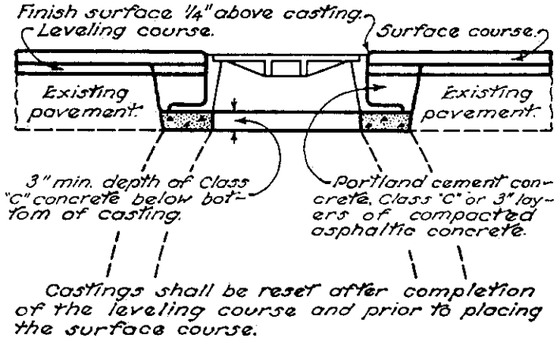
Where the leveling course in the widened area would finish more than 1/4 inch above the edge of the existing pavement, that portion below the dashed line shall be placed and compacted in a separate operation. The hatched portion above the dashed line shall be placed simultaneously with the full width leveling course.

COURSE DETAIL FOR WIDENING



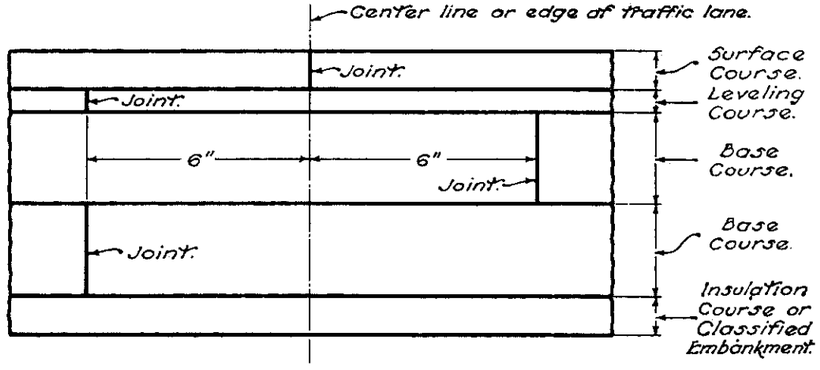
Special care shall be exercised during construction to obtain maximum compaction of bituminous concrete in all gutters.

GUTTER FINISH

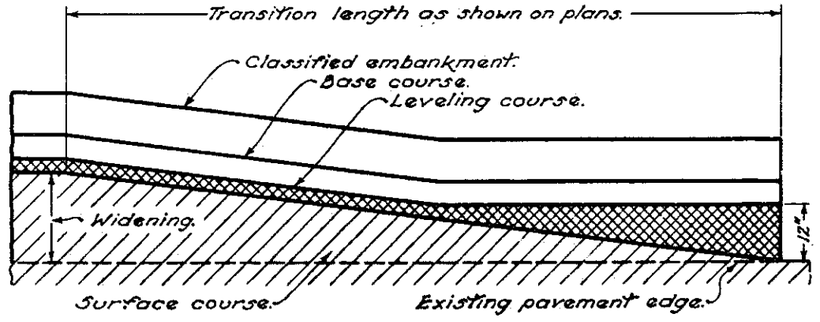


Castings shall be reset after completion of the leveling course and prior to placing the surface course.

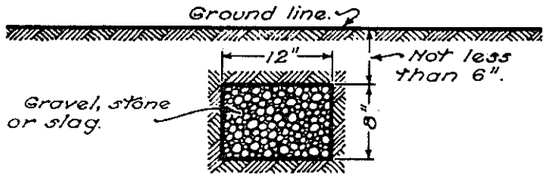
CASTINGS ADJUSTED TO GRADE



LAPPING LONGITUDINAL JOINTS

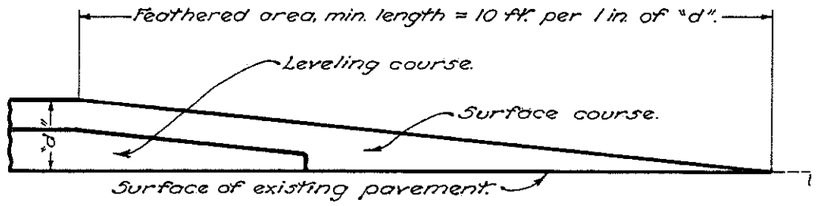


MERGING EDGE OF PAVEMENT WIDENING WITH EDGE OF EXISTING PAVEMENT

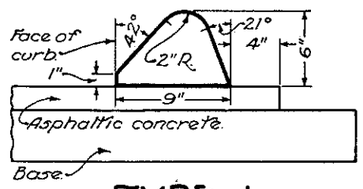


Underdrains to be placed where and as directed by the Engineer.

STONE UNDERDRAIN No. 2



PLACING FEATHERED AREAS



TYPE I ASPHALTIC CONCRETE CURB

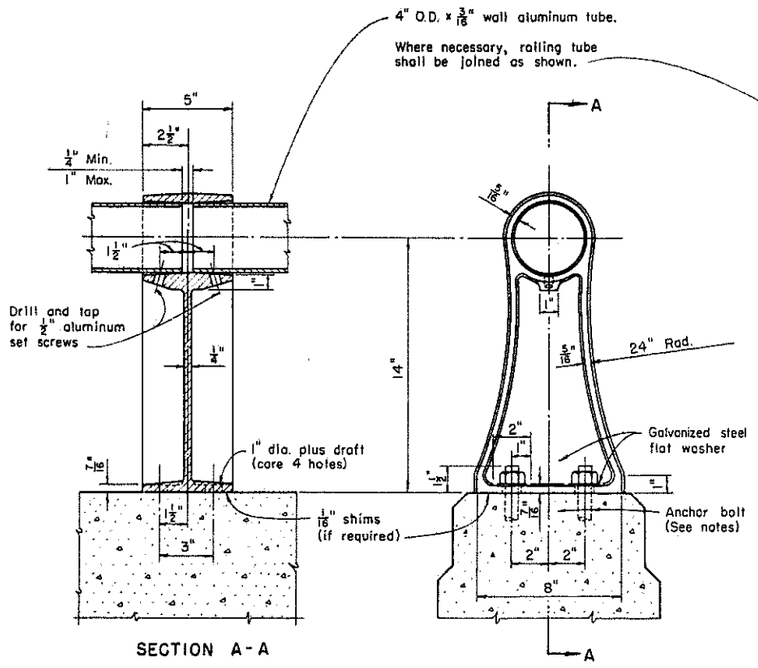
BUREAU OF LOCATION AND DESIGN
OHIO DEPARTMENT OF HIGHWAYS

RESURFACING

DATE
3-16-51
10-1-52
1-2-56

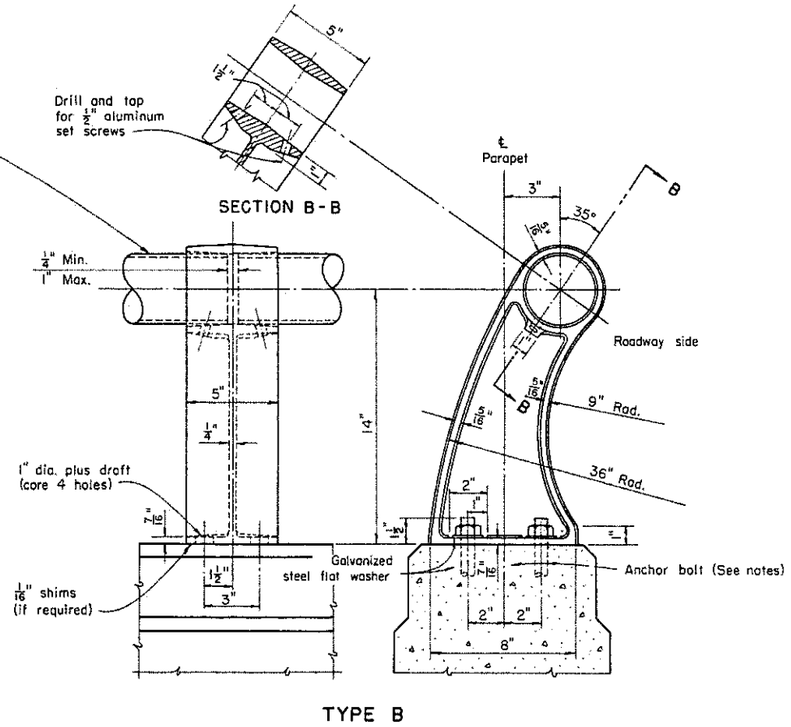
STANDARD CONSTRUCTION DRAWING T-35

APPROVED _____ ENGR. L. & D.

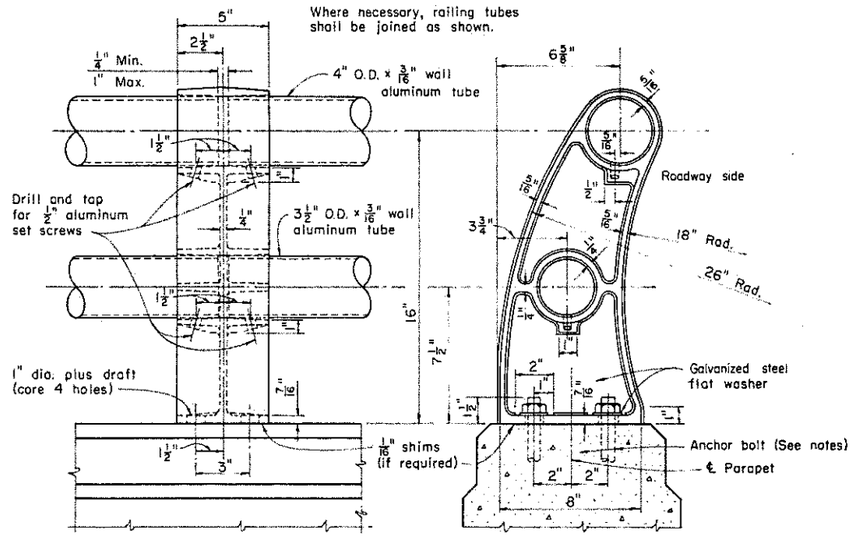


SECTION A-A

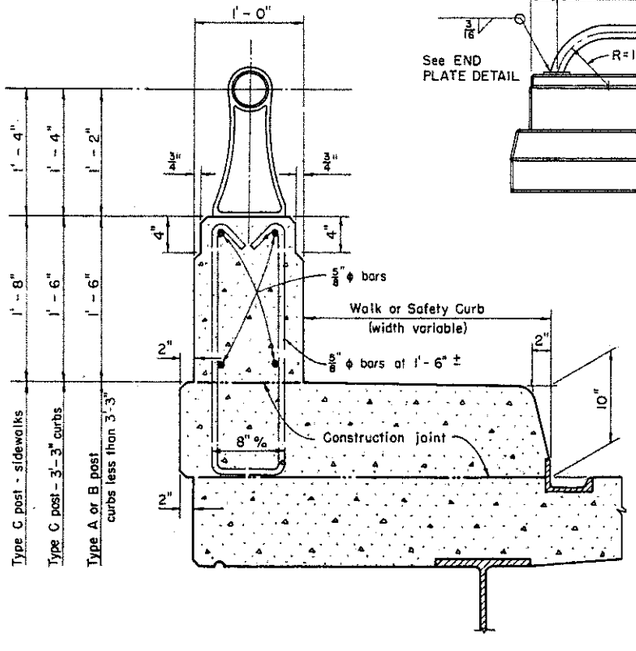
TYPE A



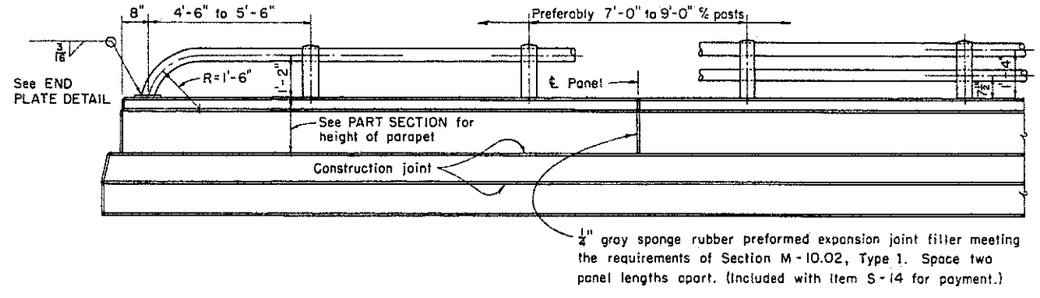
TYPE B



TYPE C

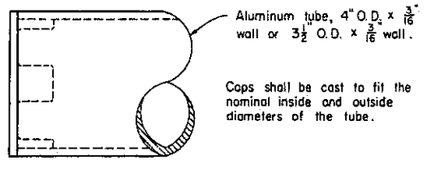


PART SECTION
(Type A post shown)

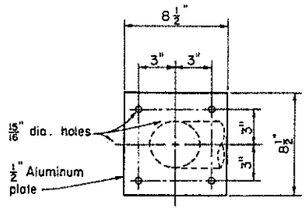


ELEVATION

TREATMENT OF PARAPET AND FASCIA



RAIL CAP DETAIL



END PLATE DETAIL

NOTES

GENERAL: This drawing provides design and construction details. The project plans for each structure will indicate the type of aluminum post (A, B or C), height of parapet, panel lengths, details at ends of railing, reinforcing steel details, reinforcing steel list, estimated quantities, and other necessary information including special notes and details.

In the determination of the type of railing posts to be specified, as well as the other details of the railing to be shown on the project plans, the the following criteria generally will govern:

Either Type A or Type B railing posts will be used for bridges with curbs less than 3'-3" in width. Type C posts will be used for bridges with safety curbs 3'-3" in width, with a parapet height of 1'-6", and may be used for sidewalk railing, with a parapet height of 1'-8". The cast aluminum posts shall conform to alloy SG 70 B and to the other requirements for cast posts and post bases for full-height railings as specified in Sec. M-7.19 Aluminum for Railings.

The railing tubes shall terminate with a cap (as detailed) at the ends unless they are curved downward to the concrete parapet as shown.

Rails will not be bent downward where either Type B or C posts are used.

Railing shall be in lengths of not less than two panels on abutments and at ends of superstructures and of not less than three panels elsewhere. On abutments, a 1" wall aluminum pipe may be substituted for the 3½" wall aluminum tube, at the same price.

FINISH: The extreme outer surfaces of cast railing posts shall be given a 60 grit finish.

SHIMS shall be provided under the railing posts, where necessary, to assist in vertical aligning. They shall be of aluminum alloy, 2⅜" x 1/16" x 8", and shall be slotted for anchor bolts to permit insertion after the posts are in place.

SET SCREWS shall be furnished with each casting and shall be included in the unit price bid per linear foot of railing.

ANCHOR BOLTS shall be galvanized steel, 1'-0" long plus a 2½ 90° bend or a head at the bottom end, and shall have a minimum diameter of 0.62" at the root of the thread.

CONCRETE PARAPETS shall be placed in alternate sections by use of bulkheads. Closing sections shall be placed after removal of bulkheads and after placement of sponge rubber. Rubber shall be flush with surface of concrete and exposed edges shall be free of mortar.

REVISIONS
3 - 1 - 58
2 - 2 - 59
12 - 12 - 60
4 - 2 - 62

STATE OF OHIO
DEPARTMENT OF HIGHWAYS
DIVISION OF DESIGN AND CONSTRUCTION
BUREAU OF BRIDGES

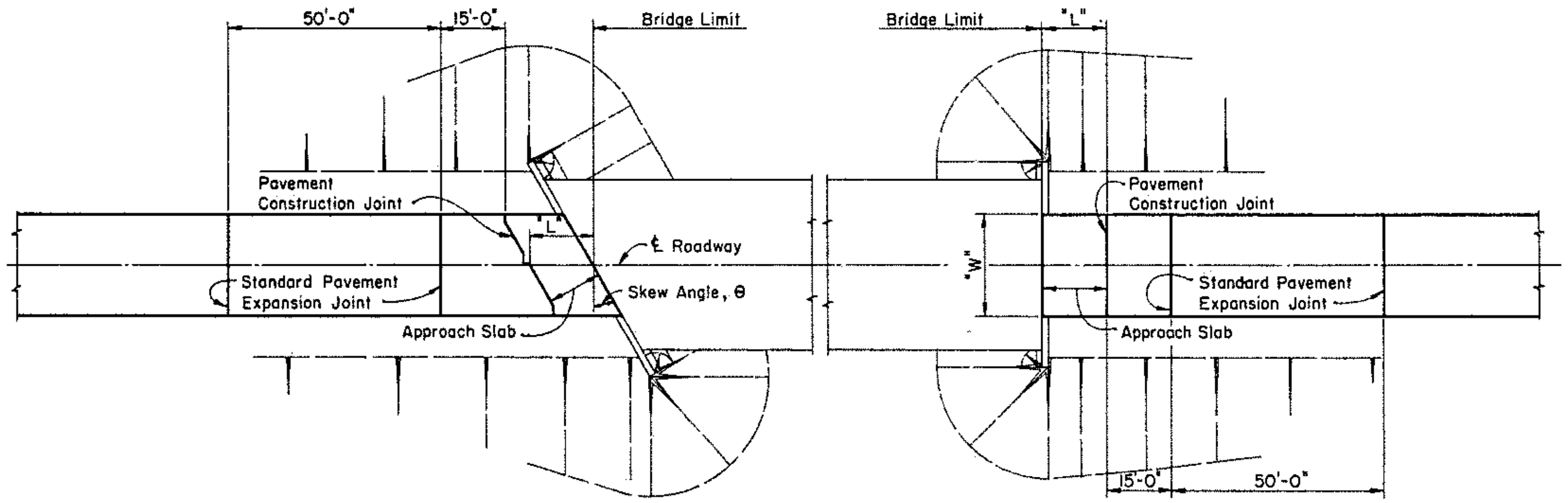
STANDARD

ALUMINUM RAILING WITH CONCRETE PARAPET

APPROVED: M. Sherman, ENGINEER OF BRIDGES
DATE: 4-5-57

PREPARED	TRACED	CHECKED	REVIEWED
DHO NEY JVP	JVP JCR	CSD DWI	BFG AJF WHR DHO

DRAWING NUMBER
AR-1-57

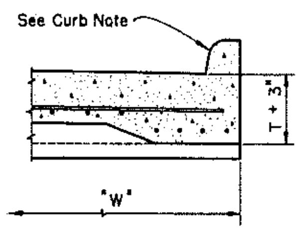


SKEWED BRIDGE

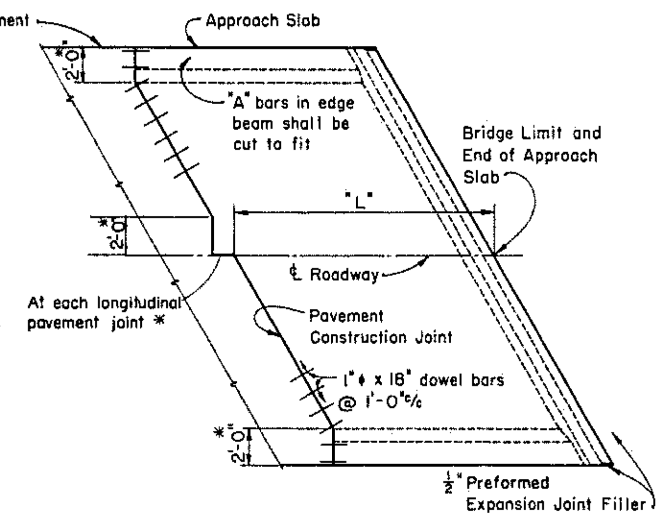
SQUARE BRIDGE

GENERAL PLAN

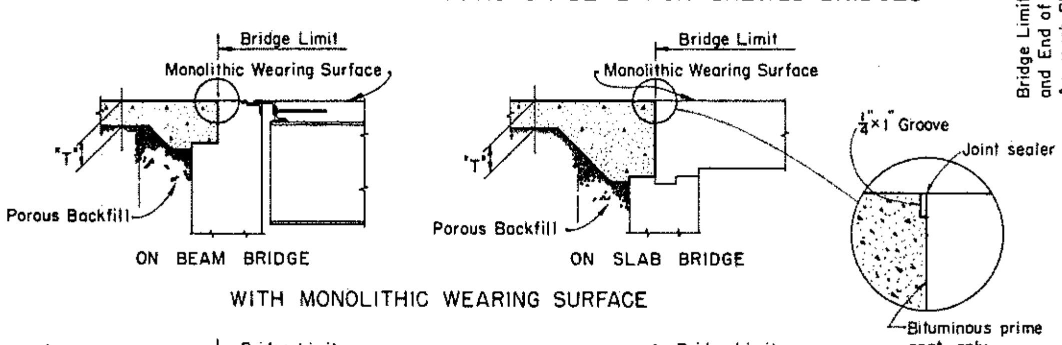
Showing Skewed and Square Approach Slabs



APPROACH SLAB WITH CURBS



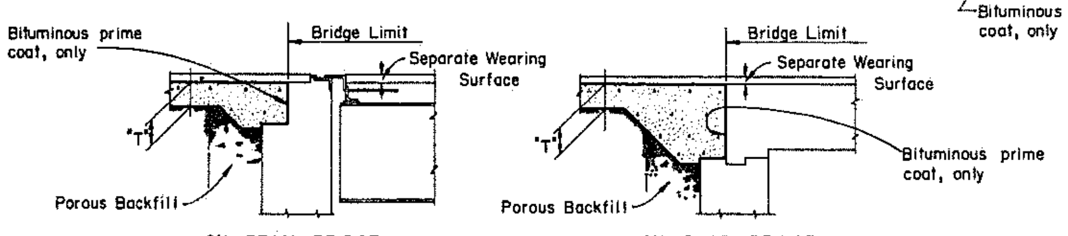
APPROACH SLAB FOR SKEWED BRIDGES



ON BEAM BRIDGE

ON SLAB BRIDGE

WITH MONOLITHIC WEARING SURFACE

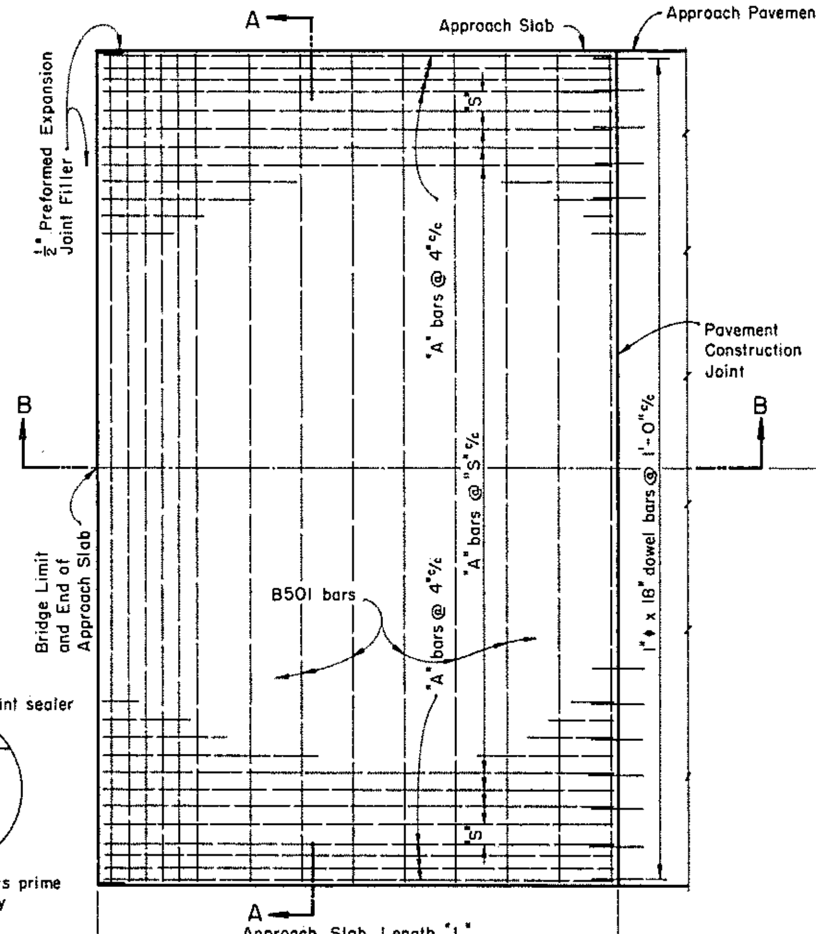


ON BEAM BRIDGE

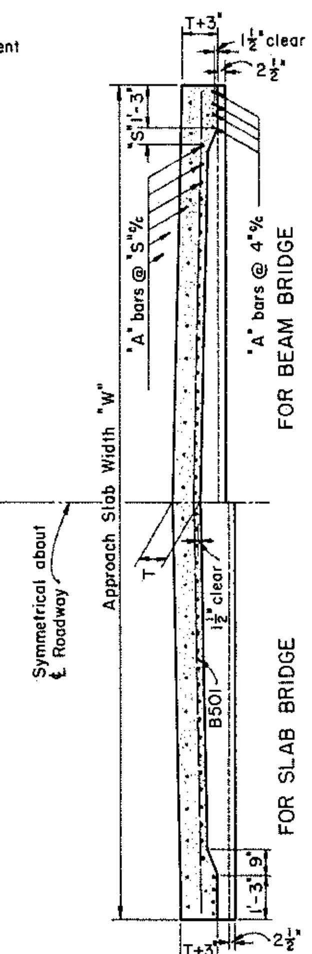
ON SLAB BRIDGE

WITH SEPARATE WEARING SURFACE

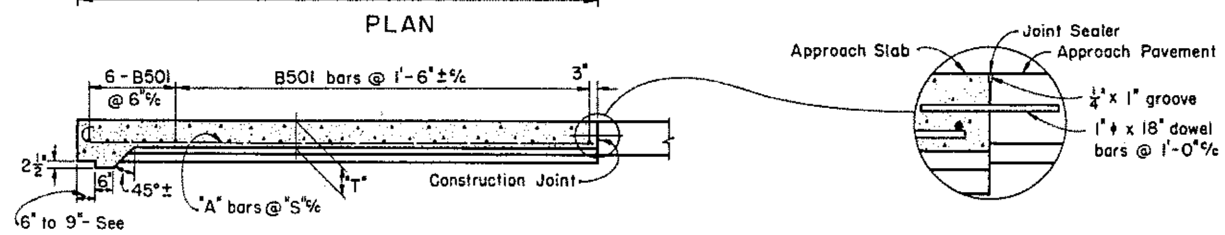
TYPICAL SECTIONS SHOWING JUNCTION OF APPROACH SLAB WITH BRIDGE



PLAN



SECTION A-A



SECTION B-B

GENERAL: This drawing provides design and general construction details. The project plans will show length, skew, curbs (if any), estimated quantity (sq. yds.), and special notes and details where necessary. For conditions other than those indicated hereon, the approach slab shall be adapted to fit the ends of the bridge and the approach pavement.

WIDTH of approach slabs shall be the same as the width of the approach pavement unless otherwise indicated on the project plans.

LENGTH of approach slabs shall be 20 ft., 25 ft., or 30 ft., as called for on the project plans. The length specified will depend upon the height of abutments, the height of embankment at the ends of the bridge, and the angle of skew.

CROWN shall conform to the rate of crown of the approach pavement and bridge deck. If the rate of crown of the bridge deck differs from that of approach pavement, a smooth transition shall be provided within the limits of the approach slab.

CONCRETE shall be Class "C" or Class "D".

REINFORCING STEEL: For skewed bridges the "A" bars shall be placed parallel to the centerline of roadway and the "B" bars shall be placed parallel to the abutments.

BAR SIZE is indicated in the bar mark. The first digit indicates the bar size number. For example, A801 is a No. 8 size bar.

PREFORMED EXPANSION JOINT FILLER at the edges of the approach slab shall be included with the approach slab for payment.

CURBS: If there are raised curbs on the approach pavement, curbs on the approach slab shall be transitioned in height and shape between the curbs of the approach pavement and those of the bridge.

CONSTRUCTION JOINT details shown hereon (at the approach pavement end of the approach slab) apply only in case of concrete approach pavement or concrete base course. Payment for the construction joints, including dowel bars, is included in the price per sq. yd. bid for the approach pavement.

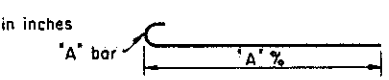
WEARING SURFACE: If a bituminous wearing surface is specified for the bridge, it also shall be used on the approach slabs.

EXPANSION JOINTS shall be provided in concrete approach pavement or concrete base course at the locations shown on this drawing.

REINFORCING STEEL
(FOR ONE APPROACH SLAB)

Length "L"	Thickness "T"	"A" BARS					B501	
		Spcg. "S"	Mark	Length	Dimension "A"	No. req'd.	Length	No. req'd.
20'-0"	12"	7"	A801	20'-7"	19'-6"	* $12\left[\frac{W-2.5}{S}\right]+7$	* (W-0.5)(sec.θ)	17
25'-0"	13"	6"	A802	25'-7"	24'-6"			20
30'-0"	13"	6"	A803	30'-7"	29'-6"			23

* W = Approach Slab Width, out-to-out, in feet
θ = Angle of Skew
S = "A" bar spacing in inches



REVISIONS
12 - 1 - 54
7 - 5 - 62

STATE OF OHIO
DEPARTMENT OF HIGHWAYS
DIVISION OF DESIGN AND CONSTRUCTION
BUREAU OF BRIDGES

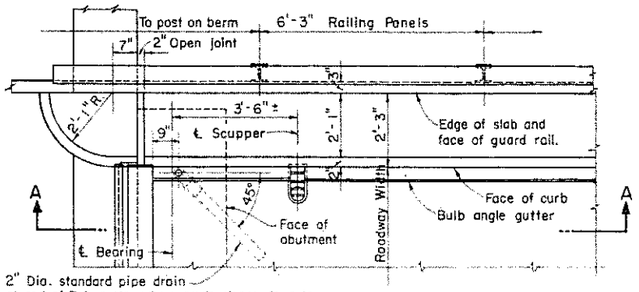
STANDARD

REINFORCED CONCRETE APPROACH SLABS

LENGTHS - 20'-0", 25'-0" AND 30'-0"

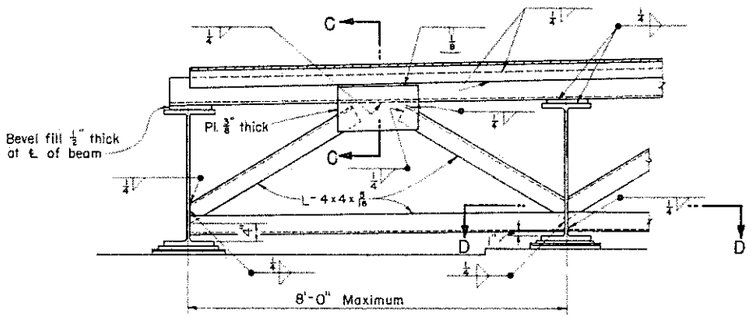
APPROVED: Richard Ortt
ENGINEER OF BRIDGES
DATE: 7-1-54

PREPARED BY	TRACED	CHECKED	REVIEWED	DRAWING NUMBER
MPB CFB JCM WHR	CEJ	GSD	BFG CHA AJF DHO	AS-1-54



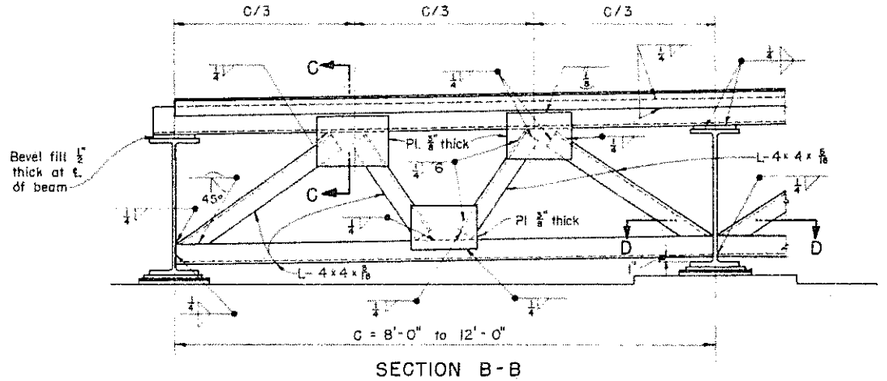
2" Dia. standard pipe drain at end of B.A. gutter where grade slopes down to end dam. Use standard elbow and coupling. A welded bend may be used where space does not permit use of standard elbow.

PART PLAN AT ABUTMENT



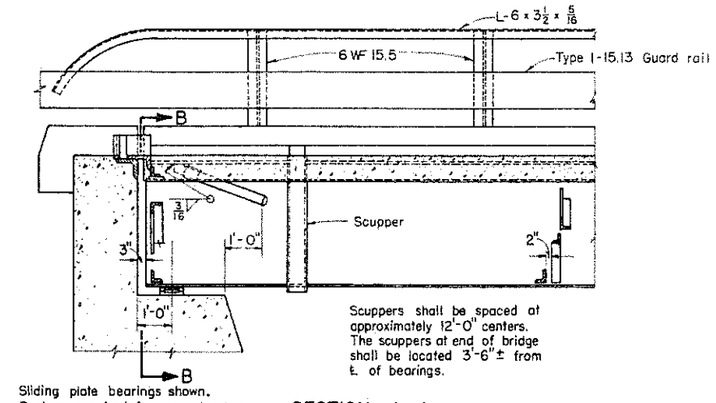
SECTION B-B

For beam spacing of 8'-0" or less, measured parallel to end dam.



SECTION B-B

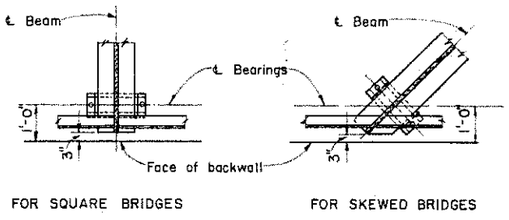
For beam spacing of 8'-0" to 12'-0", measured parallel to end dam.



Sliding plate bearings shown. Rockers required for superstructures having a total length of more than 200 feet.

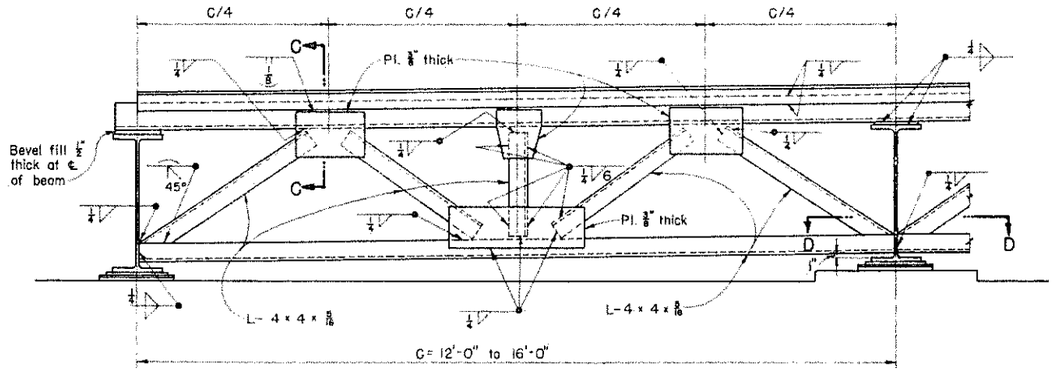
Scuppers shall be spaced at approximately 12'-0" centers. The scuppers at end of bridge shall be located 3'-6" ± from ℄ of bearings.

SECTION A-A



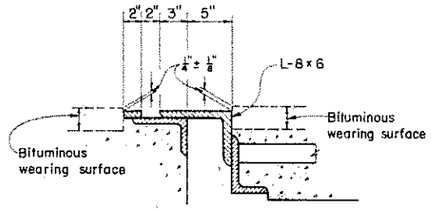
FOR SQUARE BRIDGES FOR SKEWED BRIDGES

SECTION D-D



SECTION B-B

For beam spacing of 12'-0" to 16'-0", measured parallel to end dam.



SECTION C-C

SHOWING ROADWAY END DAM FOR BITUMINOUS WEARING SURFACE
Same as SECTION C-C for monolithic wearing surface except as shown.

ROADWAY END DAM DATA				
Member	Thickness or spacing of member for load frequency of:			
	CF=30	CF=130	CF=400	CF=2000
Main angle: 8x4 or 8x6	5/8"	3/4"	7/8"	1"
2" edge bar				
2 x ½ x 1'-6" anchor bars - Spacing	18" Sp.	18" Sp.	15" Sp.	12" Sp.
Supporting angle: 6 x 4	3/8"	1/2"	5/8"	3/4"

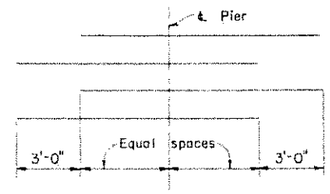
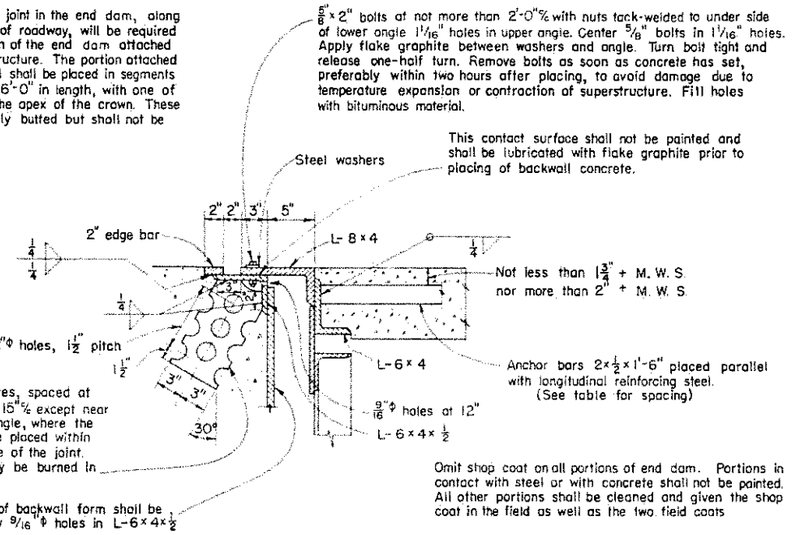


DIAGRAM SHOWING STAGGER OF S603 BARS OVER PIERS

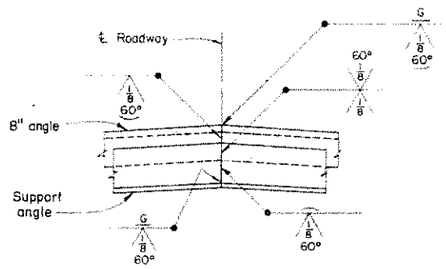
A welded butt joint in the end dam, along the centerline of roadway, will be required for that portion of the end dam attached to the superstructure. The portion attached to the backwall shall be placed in segments not less than 6'-0" in length, with one of the joints at the apex of the crown. These shall be closely butted but shall not be welded.



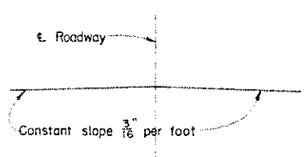
Omit shop coat on all portions of end dam. Portions in contact with steel or with concrete shall not be painted. All other portions shall be cleaned and given the shop coat in the field as well as the two field coats

SECTION C-C

SHOWING ROADWAY END DAM FOR MONOLITHIC WEARING SURFACE



WELDED BUTT JOINT IN SUPERSTRUCTURE END DAM ANGLES AT ℄ OF ROADWAY



BRIDGE ROADWAY CROWN

REVISIONS
3-1-58
2-2-59

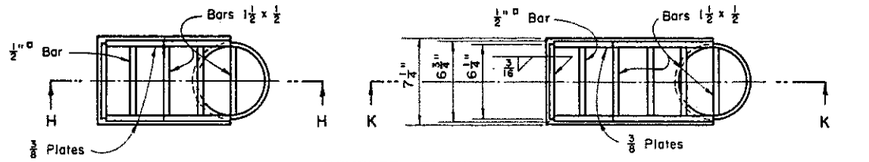
STATE OF OHIO
DEPARTMENT OF HIGHWAYS
DIVISION OF DESIGN AND CONSTRUCTION
BUREAU OF BRIDGES

STANDARD
CONTINUOUS STEEL BEAM BRIDGE
WITH 2'-3" SAFETY CURBS
MIDDLE SPAN 30 FEET TO 90 FEET
LOAD FREQUENCY:
CF = 30, CF = 30, CF = 400, CF = 2000

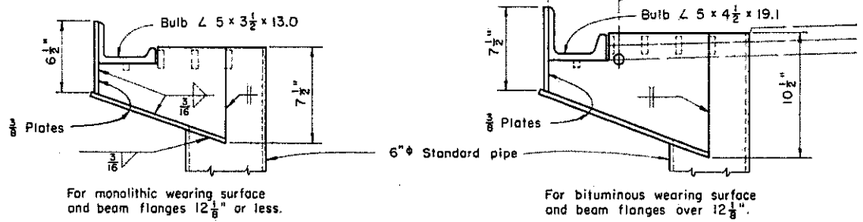
APPROVED:
DATE: 12-3-56 W. H. Overman ENGINEER OF BRIDGES

DRAWING NO CSB-2-56

PREPARED	TRACED	CHECKED	REVIEWED	SHEET NO. 2
CEM RG CFB KED WHB	JDJ JVP	AJC	CSD BFG CHA BJT	OF 6 SHEETS



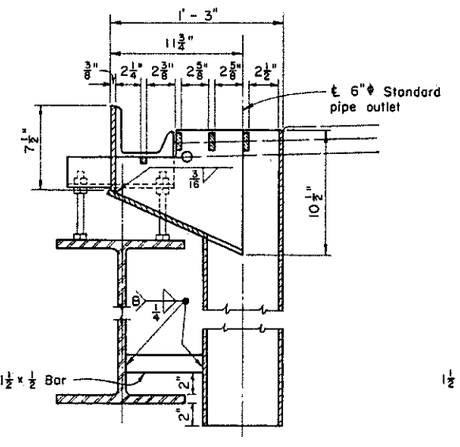
SCUPPER PLAN



For monolithic wearing surface and beam flanges 12⅛" or less.

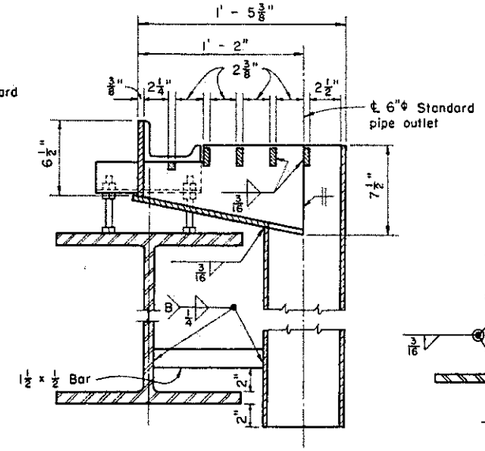
For bituminous wearing surface and beam flanges over 12⅛".

SCUPPER ELEVATION



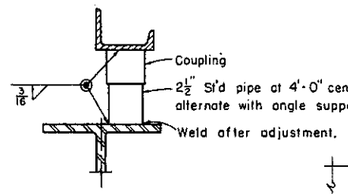
SECTION H - H

For bituminous wearing surface and beam flanges 12⅛" or less.



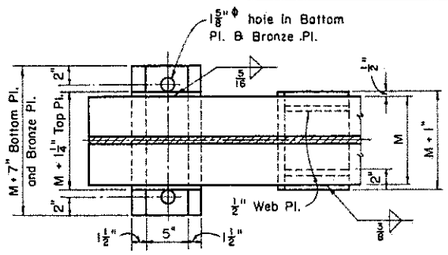
SECTION K - K

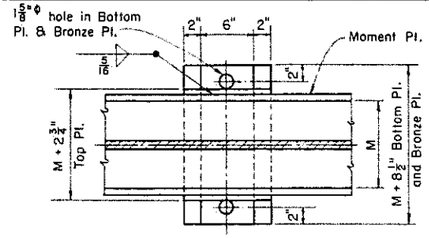
For monolithic wearing surface and beam flanges over 12⅛"

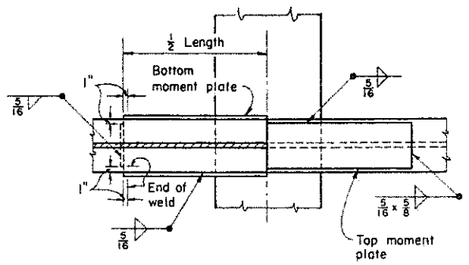


INTERMEDIATE GUTTER SUPPORT

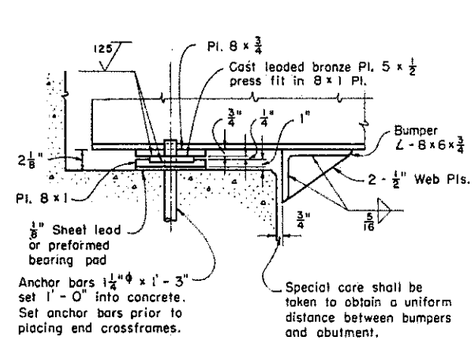
For decks on which machine finishing of concrete is to be used. Weight should be added to the tabulated weight of structural steel.

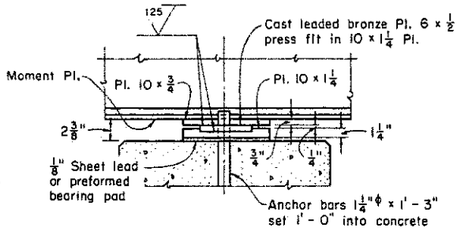




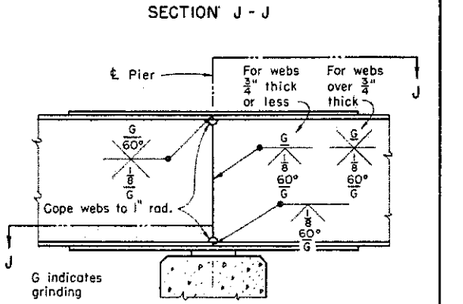


SECTION J - J





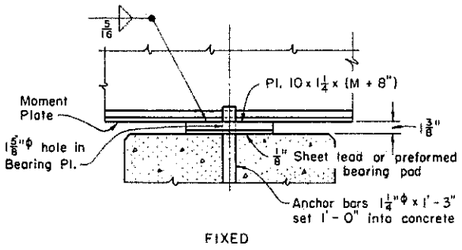
EXPANSION



WITH MOMENT PLATES

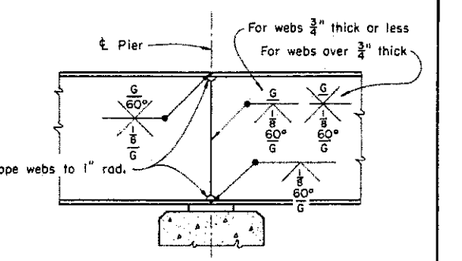
ABUTMENT BEARING PLATES

Bumper angles shall be used only if called for on project plans.



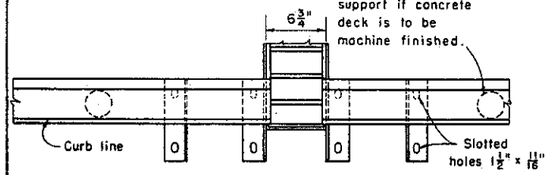
FIXED

PIER BEARING PLATES

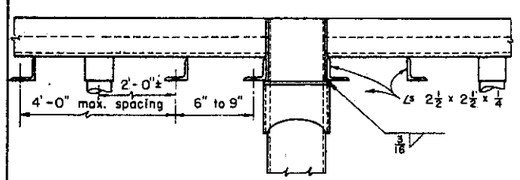


WITHOUT MOMENT PLATES

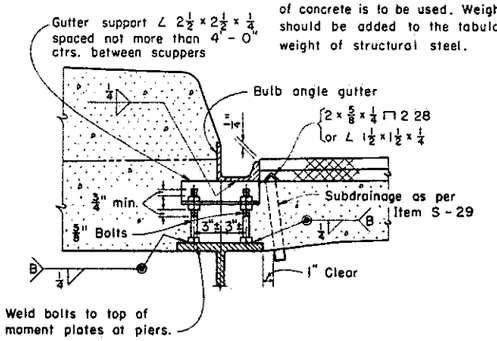
BEAM SPLICE DETAILS



PART PLAN



ELEVATION

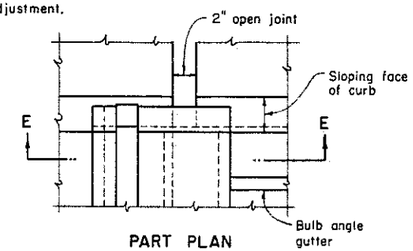


GUTTER SUPPORT

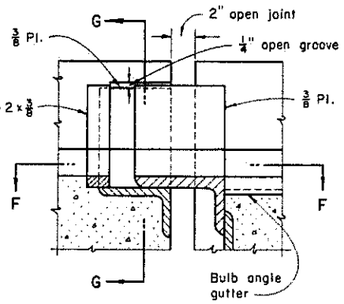
Scuppers shall be spaced at approximately 12' - 0" except as required to meet clearance requirements. Scupper must clear crossframes by at least 6" and piers by at least 5' - 0".

Gutters shall be accurately adjusted for alignment and grade, with allowance for dead load deflection, before concrete is placed.

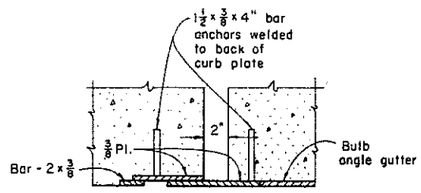
GUTTER AND SCUPPER DETAILS



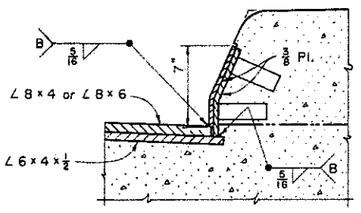
PART PLAN



SECTION E - E



SECTION F - F



SECTION G - G

CURB PLATE DETAILS

REVISIONS
3-1-58
2-2-59

STATE OF OHIO
DEPARTMENT OF HIGHWAYS
DIVISION OF DESIGN AND CONSTRUCTION
BUREAU OF BRIDGES

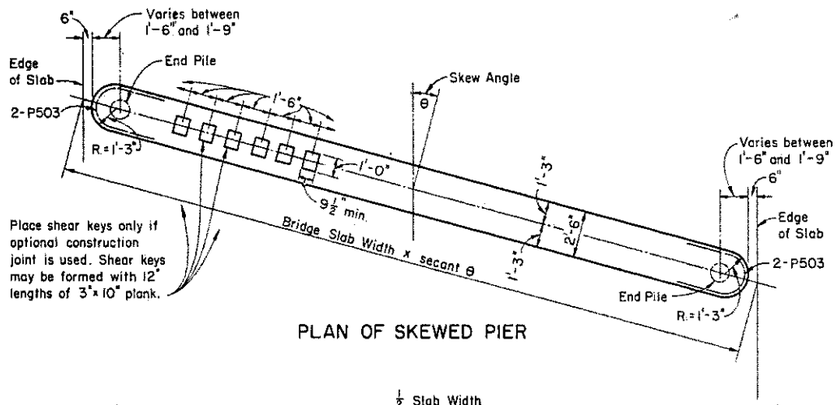
STANDARD
CONTINUOUS STEEL BEAM BRIDGE
WITH 2'-3" SAFETY CURBS
MIDDLE SPAN 30 FEET TO 90 FEET
LOAD FREQUENCY:
CF = 30, CF = 130, CF = 400, CF = 2000

APPROVED: _____ ENGINEER OF BRIDGES
DATE: 12-2-56

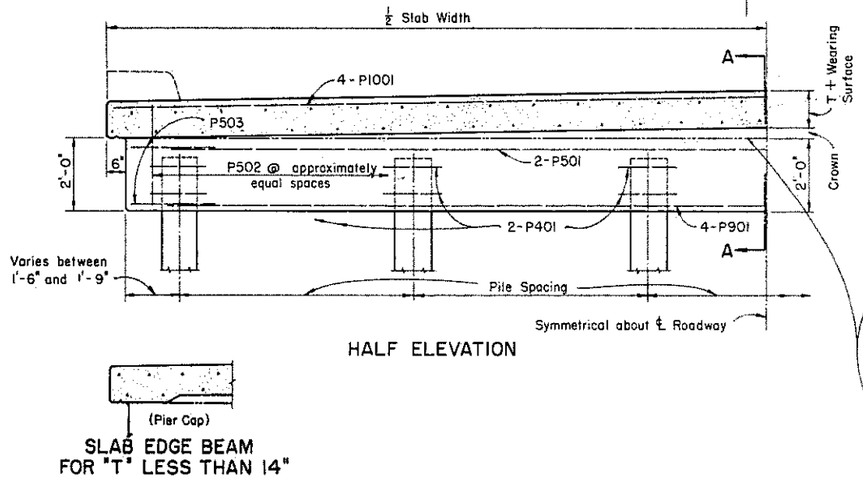
DRAWING NUMBER CSB-2-56

PREPARED	TRACED	CHECKED	REVIEWED
CEM RG CFB KED JVP WHR	JVP	AJC HEY	CSD BFG CHA AJF

SHEET NO. 3 OF 6 SHEETS

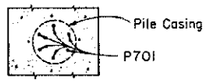


PLAN OF SKEWED PIER

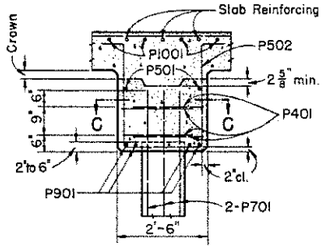


HALF ELEVATION

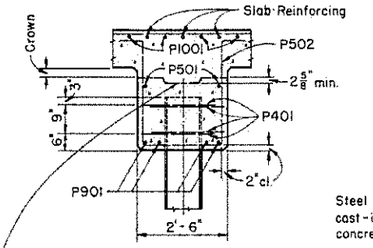
SLAB EDGE BEAM FOR "T" LESS THAN 14"



SECTION C-C

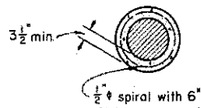


SECTION A-A
SHOWING CAST-IN-PLACE CONCRETE PILES

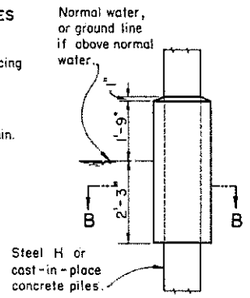


SECTION A-A
SHOWING STEEL H PILES

Construction joint to be provided in case of machine finishing of concrete deck, otherwise joint is optional.



SECTION B-B



DETAIL OF PILE ENCASEMENT

GENERAL: This drawing provides design and general construction details and is intended to be used with Standard Drawings CS-1-54 and CS-2-54. The project plans for each structure will show spans; roadway width; skew; elevations; type, size and capacity of piles; estimated quantities; reinforcing steel list; and other necessary notes and details.

The pier design shown on this drawing should not be used if:

a. Sloped embankment would cause appreciable horizontal force against the pile bent. In such case, a pier of different type, in which battered piles may be incorporated, should be used.
b. Rock or other firm material would prevent driving piles at least ten feet below stream bed.
c. The length of piles, from ground to bottom of cap, would exceed fifteen feet.

DESIGN SPECIFICATIONS: This standard drawing conforms to the "Design Specifications for Highway Structures" of the State of Ohio, Department of Highways, dated October 1, 1951, together with revisions dated July 15, 1952 and April 1, 1954.

PILE SIZE: Cast-in-place reinforced concrete piles shall be 14" diameter if the piles are exposed above the concrete encasement, and 12" diameter if the encasement extends to the bottom of the pier cap. Steel H piles shall be 12BP53.

PILE SPACING: In case of skew, the number of piles shall be the same as shown but the tabulated spacing dimension shall be multiplied by the secant of θ (the angle of skew).

PILE CAPACITY shall be as specified on the project plans. The required capacity according to the formula in Sec. S-18.05 of the "Construction and Material Specifications", generally will be the same as the design load listed in the table, except for steel H piles that are to be driven to firm contact with rock or other hard material, in which case the required formula capacity generally will be greater than the design load and will be dependent upon the relative magnitude of the design load and size of hammer, and upon the kind and relative depth of the penetrated soil.

PILE CASINGS: The casings of cast-in-place concrete piles shall be of the type that is left in place and is designed to resist both direct compression and bending. The portion above the circular concrete encasement shall be of uniform diameter (not tapered) and shall have a thickness of metal not less than No. 7 gauge.

PILE ENCASEMENT, as shown hereon, shall be provided for each pier pile. If the distance from the bottom of the pier cap to normal water elevation, or ground line if above normal water, is less than approximately 6 feet, the encasement shall be extended to the bottom of the concrete cap for all the piles in that pier, if so specified on the project plans. It shall consist of Class "C" or "E" concrete and may be placed in water as per Sec. S-1.18, care being taken to remove all dirt between the piles and the forms. Metal forms, if used, may be left in place if the exposed portion is painted or galvanized. Corrugated metal may be used. Metal forms with irregular deformations, such as oil drums, will not be permitted. If metal forms meeting the requirements of Sec. M-6.4(a) are left in place, no spiral reinforcement in the concrete will be required.

PILE PAINTING: The exposed portion of the piles, above the encasement, shall be painted in accordance with Item S-8, applying two coats as per Secs. M-9.9, M-9.20 or M-9.21 and two coats as per Sec. M-9.12. Metal forms, left in place on the encasement, unless galvanized, shall be similarly painted.

PAYMENT FOR PILES, per lin. ft., includes payment for the encasement (concrete, reinforcement, forms, painting, galvanizing and excavating) and the pile painting. The elevation of cut-off, as per Sec. S-18.13, shall be considered as 4" above the bottom of the concrete cap for cast-in-place concrete piles and 1'-6" for steel H piles.

FALSEWORK SUPPORT: The pier cap shall not be used to support falsework for the deck slab.

REINFORCING STEEL: The P1001, P901, and P501 bars, at the option of the Contractor, may be furnished in one length as shown, or in pairs lapped 30 diameters at or near the centerline of the roadway. Determination of the pay quantity will be according to the number and length of bars as shown hereon, unless otherwise called for on the project plans.

HORIZONTAL CONSTRUCTION JOINT between the top of pier cap and bottom of slab will be permitted if keys, as shown, are provided at the top of the cap. If such a joint is not provided, the concrete in the slab and cap shall be placed in a continuous operation.

CONCRETE shall be Class "C"

PIER CAP CONCRETE QUANTITY will be added to the quantity of superstructure concrete when listed on the project plans.

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, indicate the bar size number. For example P901 is a No. 9 size bar and P1001 is a No. 10 size.

NUMBER, SPACING AND DESIGN LOAD (IN TONS) OF PILES FOR ONE NON-SKEWED PIER

SPANS (IN FEET)

LOAD FREQUENCY	SLAB WIDTH	16-20-16			18-22.5-18			20-25-20			22-27.5-22			24-30-24			26-32.5-26			28-35-28			30-37.5-30			32-40-32			34-42.5-34			36-45-36			38-47.5-38			40-50-40			42-52.5-42			44-55-44		
		No.	Spcg.	Load	No.	Spcg.	Load	No.	Spcg.	Load	No.	Spcg.	Load	No.	Spcg.	Load	No.	Spcg.	Load	No.	Spcg.	Load	No.	Spcg.	Load	No.	Spcg.	Load	No.	Spcg.	Load	No.	Spcg.	Load	No.	Spcg.	Load	No.	Spcg.	Load	No.	Spcg.	Load	No.	Spcg.	Load
CF = 30	24'	5	5'-0"	18	5	5'-0"	20	5	5'-0"	22	5	5'-0"	24	5	5'-0"	26	5	5'-0"	28	5	5'-0"	30	5	5'-0"	33	5	5'-0"	35	5	5'-0"	38	6	4'-0"	33	6	4'-0"	36	6	4'-0"	39	6	4'-0"	43	6	4'-0"	46
	28'	5	6'-0"	21	5	6'-0"	24	5	6'-0"	26	5	6'-0"	29	5	6'-0"	31	5	6'-0"	34	5	6'-0"	36	6	4'-9"	32	6	4'-9"	34	6	4'-9"	36	7	4'-0"	33	7	4'-0"	36	7	4'-0"	39	7	4'-0"	43	7	4'-0"	46
	32'	6	5'-7"	19	6	5'-7"	22	6	5'-7"	25	6	5'-7"	27	6	5'-7"	29	6	5'-7"	31	6	5'-7"	34	6	5'-7"	37	7	4'-8"	33	7	4'-8"	36	7	4'-8"	39	8	4'-0"	36	8	4'-0"	39	8	4'-0"	43	8	4'-0"	46
	34'	6	6'-0"	21	6	6'-0"	24	6	6'-0"	26	6	6'-0"	29	6	6'-0"	31	6	6'-0"	34	6	6'-0"	36	7	5'-0"	33	7	5'-0"	35	7	5'-0"	38	8	4'-3"	36	8	4'-3"	42	8	4'-3"	45	8	4'-3"	49	8	4'-3"	49
	36'	6	6'-4"	22	6	6'-4"	25	6	6'-4"	28	6	6'-4"	30	6	6'-4"	33	6	6'-4"	36	6	6'-4"	38	7	5'-4"	35	7	5'-4"	38	8	4'-6"	35	8	4'-6"	38	8	4'-6"	41	9	4'-0"	39	9	4'-0"	43	9	4'-0"	46
	40'	7	6'-0"	21	7	6'-0"	24	7	6'-0"	26	7	6'-0"	29	7	6'-0"	31	7	6'-0"	34	7	6'-0"	36	8	5'-1"	34	8	5'-1"	37	8	5'-1"	39	8	5'-1"	43	9	4'-6"	41	9	4'-6"	44	10	4'-0"	43	10	4'-0"	46
	44'	8	5'-8"	20	8	5'-8"	22	8	5'-8"	25	8	5'-8"	27	8	5'-8"	30	8	5'-8"	32	8	5'-8"	34	8	5'-8"	37	8	5'-8"	40	9	5'-0"	38	9	5'-0"	41	10	4'-5"	40	10	4'-5"	43	11	4'-0"	43	11	4'-0"	46
CF = 130	24'	5	5'-0"	18	5	5'-0"	20	5	5'-0"	23	5	5'-0"	25	5	5'-0"	27	5	5'-0"	29	5	5'-0"	32	5	5'-0"	34	5	5'-0"	37	6	4'-0"	32	6	4'-0"	34	6	4'-0"	38	6	4'-0"	41	6	4'-0"	44	6	4'-0"	48
	28'	5	6'-0"	22	5	6'-0"	25	5	6'-0"	27	5	6'-0"	30	5	6'-0"	33	5	6'-0"	35	6	4'-9"	33	6	4'-9"	35	6	4'-9"	38	7	4'-0"	34	7	4'-0"	38	7	4'-0"	41	7	4'-0"	44	7	4'-0"	48	7	4'-0"	48
	32'	6	5'-7"	21	6	5'-7"	23	6	5'-7"	25	6	5'-7"	28	6	5'-7"	30	6	5'-7"	33	6	5'-7"	35	6	5'-7"	38	7	4'-8"	34	7	4'-8"	37	8	4'-0"	34	8	4'-0"	38	8	4'-0"	41	8	4'-0"	44	8	4'-0"	48
	34'	6	6'-0"	22	6	6'-0"	25	6	6'-0"	27	6	6'-0"	30	6	6'-0"	33	6	6'-0"	35	6	6'-0"	38	7	5'-0"	34	7	5'-0"	37	7	5'-0"	40	8	4'-3"	37	8	4'-3"	40	8	4'-3"	43	8	4'-3"	47	8	4'-3"	51
	36'	6	6'-4"	23	6	6'-4"	26	6	6'-4"	29	6	6'-4"	31	6	3'-4"	34	6	6'-4"	37	7	5'-4"	34	7	5'-4"	37	7	5'-4"	39	8	4'-6"	36	8	4'-6"	39	9	4'-0"	38	9	4'-0"	41	9	4'-0"	44	9	4'-0"	48
	40'	7	6'-0"	22	7	6'-0"	25	7	6'-0"	27	7	6'-0"	30	7	6'-0"	33	7	6'-0"	35	7	6'-0"	38	8	5'-1"	36	8	5'-1"	38	8	5'-1"	41	9	4'-6"	39	9	4'-6"	42	10	4'-0"	41	10	4'-0"	44	10	4'-0"	48
	44'	8	5'-8"	21	8	5'-8"	23	8	5'-8"	26	8	5'-8"	28	8	5'-8"	30	8	5'-8"	33	8	5'-8"	36	8	5'-8"	39	9	5'-0"	37	9	5'-0"	40	9	5'-0"	43	10	4'-5"	41	10	4'-5"	45	11	4'-0"	44	11	4'-0"	48
CF = 400	24'	5	5'-0"	19	5	5'-0"	21	5	5'-0"	24	5	5'-0"	26	5	5'-0"	28	5	5'-0"	31	5	5'-0"	33	5	5'-0"	36	5	5'-0"	39	6	4'-0"	34	6	4'-0"	36	6	4'-0"	39	6	4'-0"	43	6	4'-0"	46	6	4'-0"	50
	28'	5	6'-0"	23	5	6'-0"	26	5	6'-0"	28	5	6'-0"	31	5	6'-0"	34	5	6'-0"	37	6	4'-9"	32	6	4'-9"	34	6	4'-9"	37	7	4'-0"	34	7	4'-0"	36	7	4'-0"	39	7	4'-0"	43	7	4'-0"	46	7	4'-0"	50
	32'	6	5'-7"	21	6	5'-7"	24	6	5'-7"	27	6	5'-7"	29	6	5'-7"	31	6	5'-7"	34	6	5'-7"	37	7	4'-8"	33	7	4'-8"	36	7	4'-8"	39	8	4'-0"	36	8	4'-0"	39	8	4'-0"	43	8	4'-0"	46	8	4'-0"	50
	34'	6	6'-0"	23	6	6'-0"	26	6	6'-0"	28	6	6'-0"	31	6	6'-0"	34	6	6'-0"	37	7	5'-0"	33	7	5'-0"	36	7	5'-0"	39	7	5'-0"	42	8	4'-3"	38	8	4'-3"	41	8	4'-3"	45	8	4'-3"	49	8	4'-3"	53
	36'	6	6'-4"	24	6	6'-4"	27	6	6'-4"	30	6	6'-4"	32	6	6'-4"	35	6	6'-4"	39	7	5'-4"	35	7	5'-4"	38	7	5'-4"	42	8	4'-6"	39	8	4'-6"	41	9	4'-0"	39	9	4'-0"	43	9	4'-0"	46	9	4'-0"	50
	40'	7	6'-0"	23	7	6'-0"	26	7	6'-0"	28	7	6'-0"	31	7	6'-0"	34	7	6'-0"	37	8	5'-1"	34	8	5'-1"	37	8	5'-1"	40	8	5'-1"	43	9	4'-6"	41	9	4'-6"	44	10	4'-0"	43	10	4'-0"	46	10	4'-0"	50
	44'	8	5'-8"	22	8	5'-8"	24	8	5'-8"	27	8	5'-8"	29	8	5'-8"	32	8	5'-8"	35	8	5'-8"	37	8	5'-8"	40	9	5'-0"	39	9	5'-0"	42	10	4'-5"	40	10	4'-5"	43	11	4'-0"	43	11	4'-0"	46	11	4'-0"	50
CF = 2000	24'	5	5'-0"	19	5	5'-0"	21	5	5'-0"	24	5	5'-0"	26	5	5'-0"	29	5	5'-0"	31	5	5'-0"	33	5	5'-0"	36	5	5'-0"	39	6	4'-0"	34	6	4'-0"	36	6	4'-0"	39	6	4'-0"	43	6	4'-0"	46	6	4'-0"	50
	28'	5	6'-0"	23	5	6'-0"	26	5	6'-0"	28	5	6'-0"	31	5	6'-0"	34	5	6'-0"	37	6	4'-9"	32	6	4'-9"	34	6	4'-9"	37	7	4'-0"	34	7	4'-0"	36	7	4'-0"	39	7	4'-0"	43	7	4'-0"	46	7	4'-0"	50
	32'	6	5'-7"	22	6	5'-7"	24	6	5'-7"	27	6	5'-7"	29	6	5'-7"	32	6	5'-7"	34	6	5'-7"	37	7	4'-8"	33	7	4'-8"	36	7	4'-8"	39	8	4'-0"	36	8	4'-0"	39	8	4'-0"	43	8	4'-0"	46	8	4'-0"	50
	34'	6	6'-0"	23	6	6'-0"	26	6	6'-0"	28	6	6'-0"	31	6	6'-0"	34	6	6'-0"	37	7	5'-0"	33	7	5'-0"	36	7	5'-0"	39	7	5'-0"	42	8	4'-3"	38	8	4'-3"	41	8	4'-3"	45	8	4'-3"	49	8	4'-3"	53
	36'	6	6'-4"	24	6	6'-4"	27	6	6'-4"	30	6	6'-4"	33	6	6'-4"	36	6	6'-4"	39	7	5'-4"	35	7	5'-4"	38	7	5'-4"	42	8	4'-6"	39	8	4'-6"	41	9	4'-0"	39	9	4'-0"	43	9	4'-0"	46	9	4'-0"	50
	40'	7	6'-0"	23	7	6'-0"	26	7	6'-0"	28	7	6'-0"	31	7	6'-0"	34	7	6'-0"	37	8	5'-1"	34	8	5'-1"	37	8	5'-1"	40	8	5'-1"	43	9	4'-6"	41	9	4'-6"	44	10	4'-0"	43	10	4'-0"	46	10	4'-0"	50
	44'	8	5'-8"	22	8	5'-8"	24	8	5'-8"	27	8	5'-8"	30	8	5'-8"	32	8	5'-8"	35	8	5'-8"	37	8	5'-8"	40	9	5'-0"	39	9	5'-0"	42	10	4'-5"	40	10	4'-5"	43	11	4'-0"	43	11	4'-0"	46	11	4'-0"	50

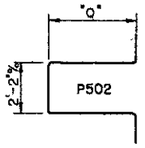
DATA FOR ONE NON-SKEWED PIER

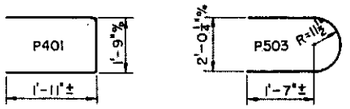
Slab Width	REINFORCING STEEL							CONCRETE QUANTITY Add to Deck Concrete
	P1001 Straight 4 req'd.	P901 Straight 4 req'd.	P701 Straight 4'-0"	P501 Straight 2 req'd.	P502 Bt. 8'-0" or 9'-0"	P503 Bent 6'-4"	P401 Bent 5'-5"	
	Length *	Length *	Number	Length *	Number	Number	Number	Cu. Yds.
24'	23'-6"	20'-6"	6 x Number of Piles	20'-6"	18	4 Required	4 x Number of Piles	4.2
28'	27'-6"	24'-6"		24'-6"	20			4.9
32'	31'-6"	28'-6"		28'-6"	24			5.6
34'	33'-6"	30'-6"		30'-6"	26			6.0
36'	35'-6"	32'-6"		32'-6"	28			6.4
40'	39'-6"	36'-6"		36'-6"	30			7.1
44'	43'-6"	40'-6"		40'-6".	34			7.9

*For skewed piers multiply tabulated length by secant of skew angle.

"Q" dimension = 2'-10"± for bridges with deck slab over 16" thick and for bridges having 14" thick edge beam on deck slab

"Q" dimension = 2'-4"± for bridges with deck slab 16" thick or less and without 14" edge beam on deck slab.





REVISIONS
12 - 1 - 54
2 - 2 - 59

STATE OF OHIO
DEPARTMENT OF HIGHWAYS
DIVISION OF DESIGN AND CONSTRUCTION
BUREAU OF BRIDGES

STANDARD

CAPPED PILE PIERS FOR CONTINUOUS CONCRETE SLAB BRIDGES

LOAD FREQUENCY:
CF = 30, CF = 130, CF = 400, CF = 2000

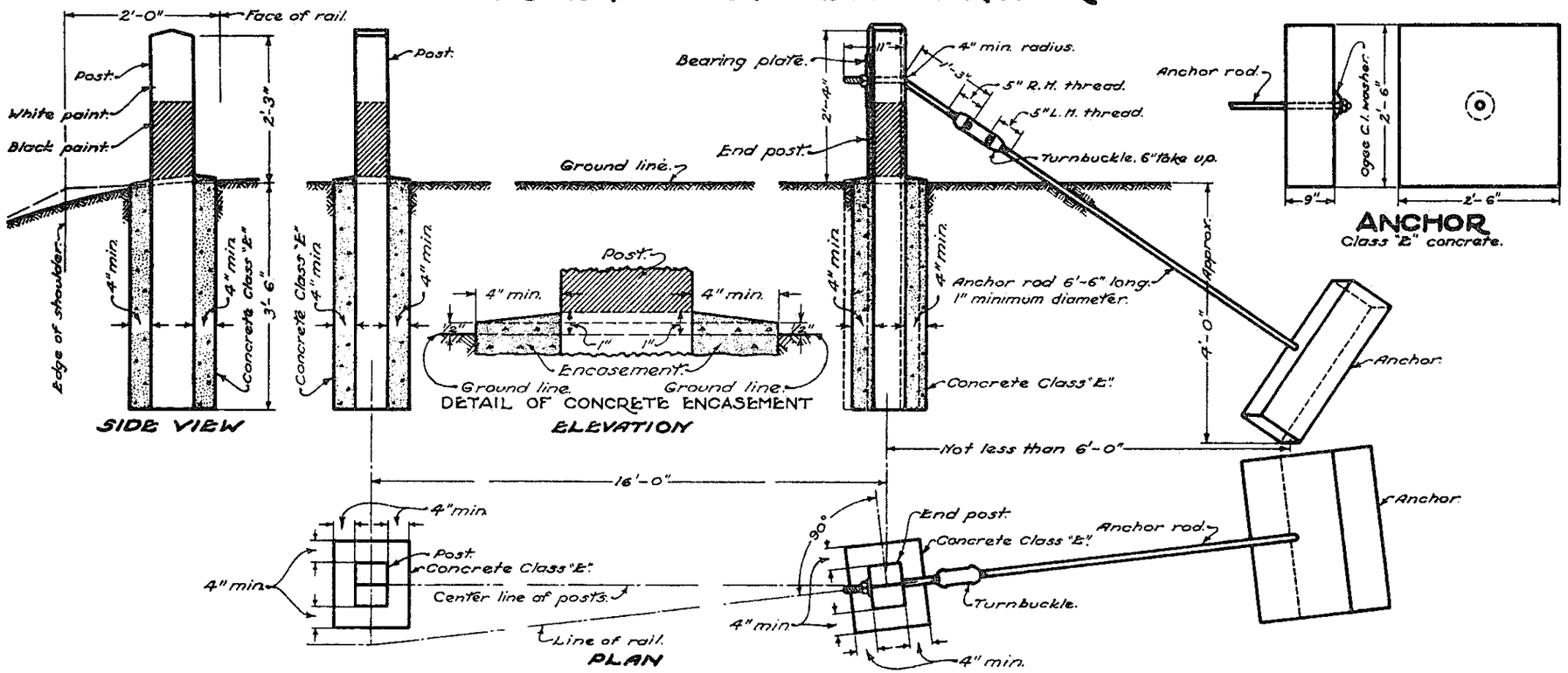
APPROVED: Richard D. Bish, ENGINEER OF BRIDGES
DATE: 7-1-54

DRAWING NUMBER: P-1-54

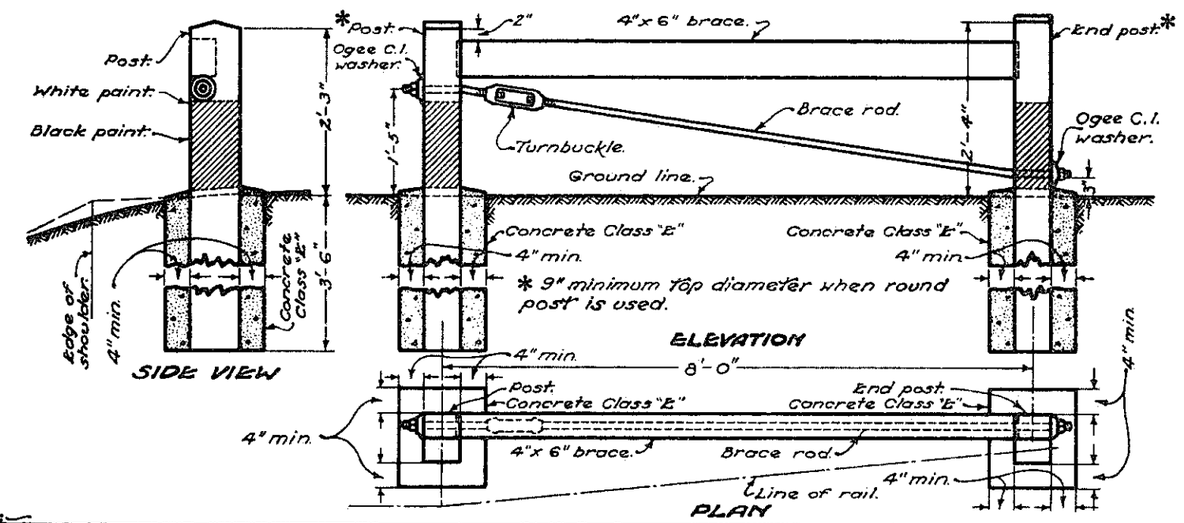
PREPARED	TRACED	CHECKED	REVIEWED
LJE CFB JCM WHR	CEJ	DHS	CSD BFQ CHA AJF DHO

STANDARD GUARD RAIL

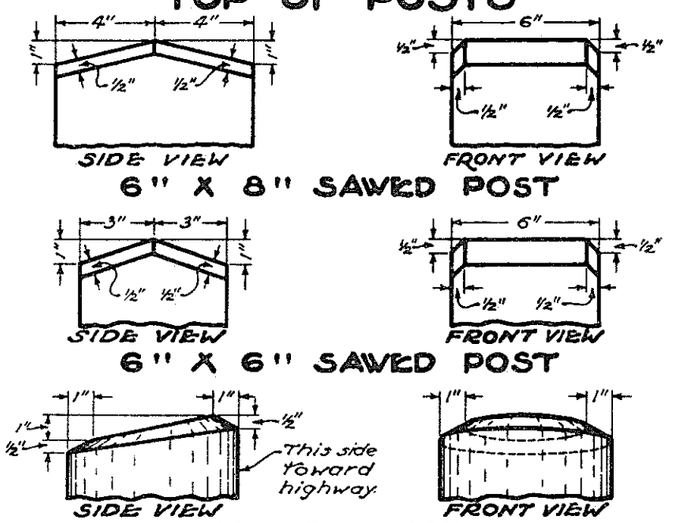
TWO END POSTS WITH ANCHOR



TWO END POSTS WITH BRACING



TOP OF POSTS



NOTES

GENERAL:— Standard Construction Drawings showing rail types shall be used in conjuction with this drawing.

POSTS:— Wood posts may be either round or square sawed and shall be either butt treated or pressure treated. See drawings I-15 No 2 and 2-A. For flexible plate, steel beam and 4 cable types, square sawed posts, when used, shall be full 6" x 8" and round wood posts, when used, shall have a minimum top diameter of 7". For 3 cable type, square sawed posts, when used, may be full 6" x 6", and round wood posts, when used, shall have a minimum top diameter of 6".

Bolt holes shall be bored and top of posts trimmed after posts are set.

Posts shall be spaced 16 feet on centers for all types of rail except steel beam, measured along the center line of the rail except where otherwise noted in the specifications for curves. Posts for steel beam type shall be spaced 12'-6" on centers measured along the center line of the rail.

END ANCHORAGE:— Where end anchorage is required deadmen shall be used except where physical features such as bridges, drives, road intersections, etc. make this impractical, in which case the end anchorage shall be of the bracing type with the two end posts spaced 8 feet on centers.

The two posts at each end of each run shall be encased in concrete when end anchorage is used. Top of concrete encasement shall be 1/2" minimum above shoulder and shall have a slope of 1/2" away from the post.

PAINTING:— For butt treated posts, the portion of the post above the ground shall have two coats of paint in addition to the prime coat. The point below the lower edge of the rail shall be black and the paint above the lower edge of the rail shall be white. Pressure treated posts shall not be painted.

BUREAU OF LOCATION AND DESIGN
OHIO DEPARTMENT OF HIGHWAYS

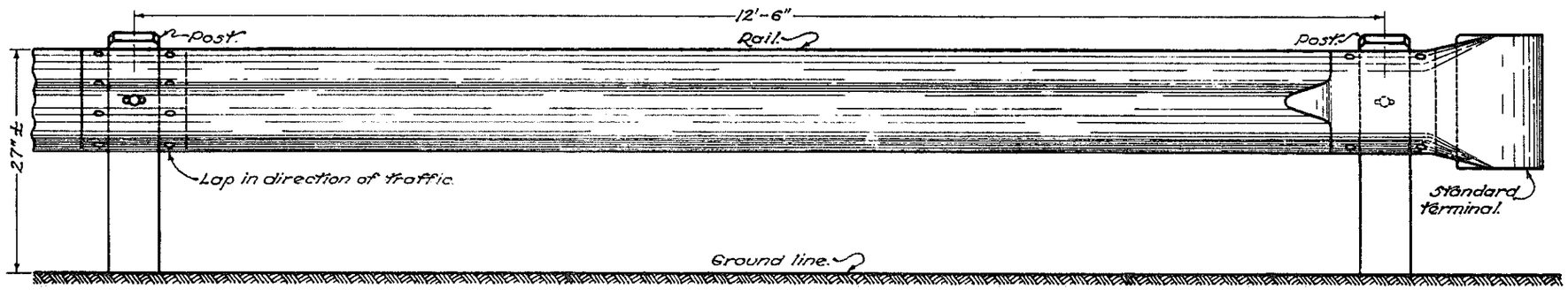
DATE 11-15-60

GUARD RAIL

STANDARD CONSTRUCTION DRAWING I-15 No 1

APPROVED: _____ ENGR. L. & D.

STEEL BEAM DEEP GUARD RAIL



ELEVATION

NOTES

GENERAL:—The details shown hereon shall apply when steel beam deep guard rail is specified.

Standard design shall be used unless otherwise specified.

Barrier design shall be used when this type is specifically required by the plan or proposal.

When steel beam deep guard rail is used as bridge railing, the 6'-3" spacing between posts shall be used for a distance of 12'-6" beyond each end of the bridge.

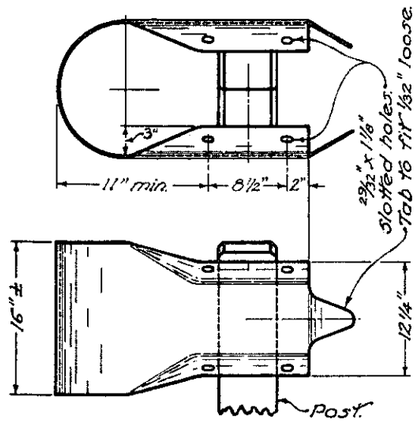
BOLTS:—Bolts for rail splice and for fastening rail to posts to be 5/8" diameter with button head, oval shoulder and hexagon nuts.

POSTS:—Shall be either wood or steel except that the same type of post shall be used throughout the length of a project unless otherwise permitted by the Engineer. For details not shown hereon, see Standard Drawing I-15 No 1.

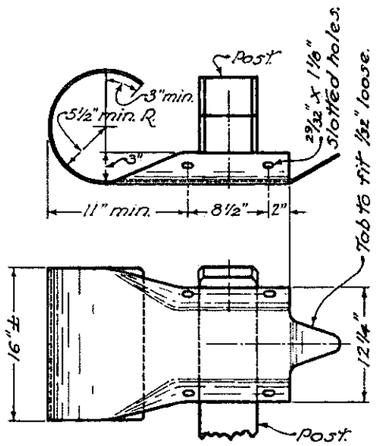
Wood posts may be either round or square sawed and shall be either creosote pressure treated or pentachlorophenol pressure treated and shall not be painted.

Steel posts shall be 6 8 x 8½ pounds.

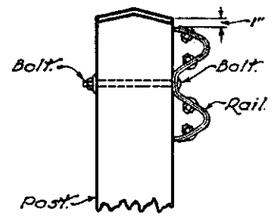
TERMINALS shall be made from 12 gage minimum thickness steel.

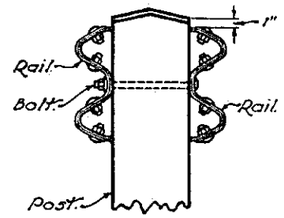


BARRIER TERMINAL

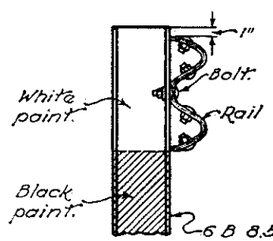


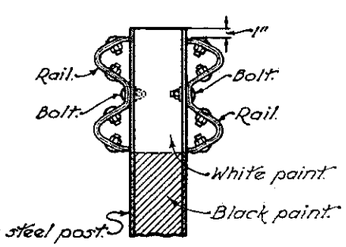
STANDARD TERMINAL



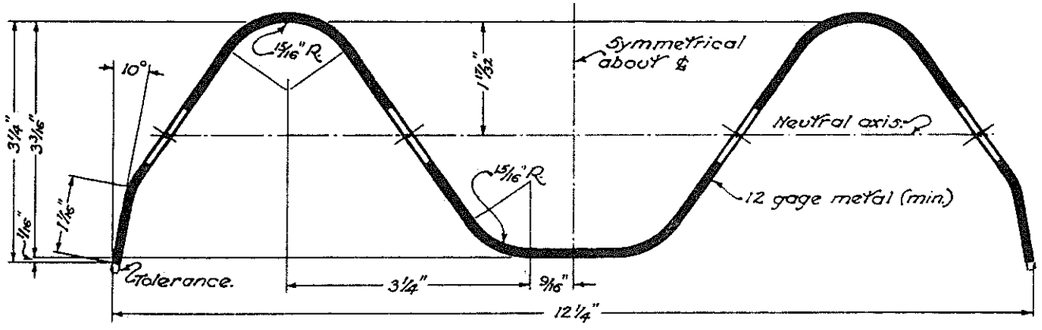


STANDARD DESIGN BARRIER DESIGN
USING WOOD POSTS

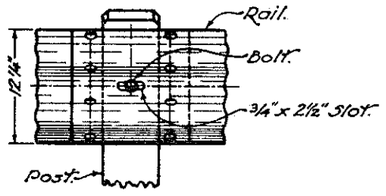




STANDARD DESIGN BARRIER DESIGN
USING STEEL POSTS



SECTION THRU RAIL ELEMENT



RAIL SPLICE

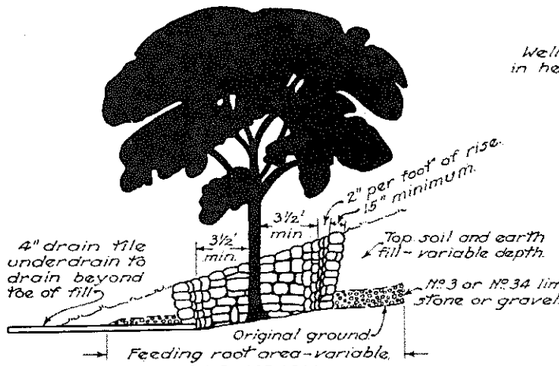
BUREAU OF LOCATION AND DESIGN
OHIO DEPARTMENT OF HIGHWAYS

GUARD RAIL

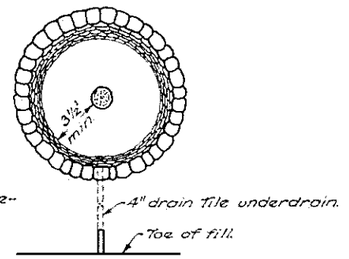
DATE
7-2-56
6-1-57
5-21-59
8-17-60

STANDARD CONSTRUCTION DRAWING I-15 No 2-A

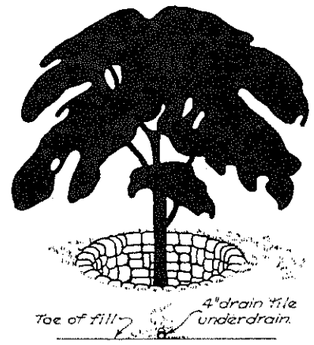
APPROVED _____ ENGR. L. & D.



ELEVATION



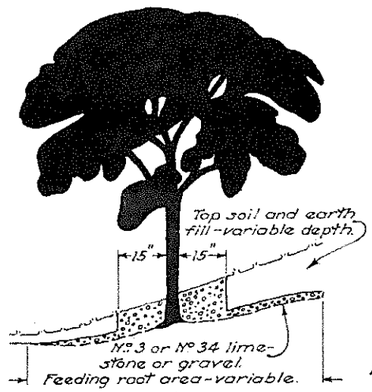
PLAN



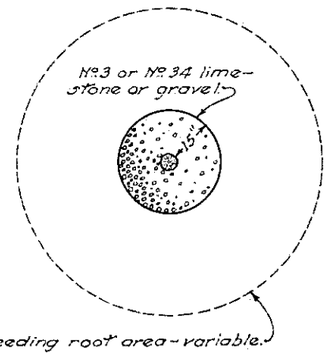
FRONT VIEW

Where fill around tree is 12" or more in depth over any part of feeding root area or periphery of the tree, wells are to be constructed as shown, augmented by Specifications for Roadside Improvement.

RIPRAP AND AGGREGATE FOR TREE PROTECTION AND AERATION IN FILL

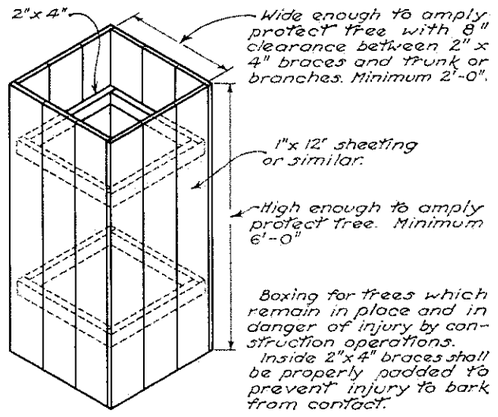


ELEVATION

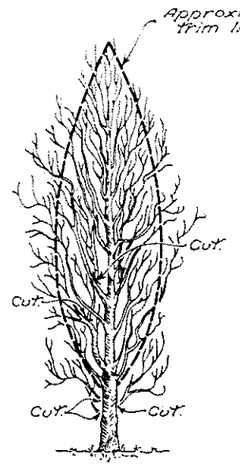


PLAN

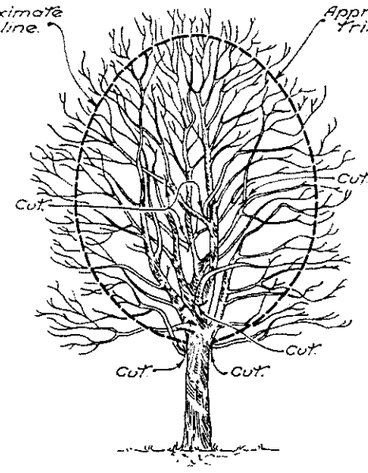
AGGREGATE FOR TREE ROOT AERATION IN FILL



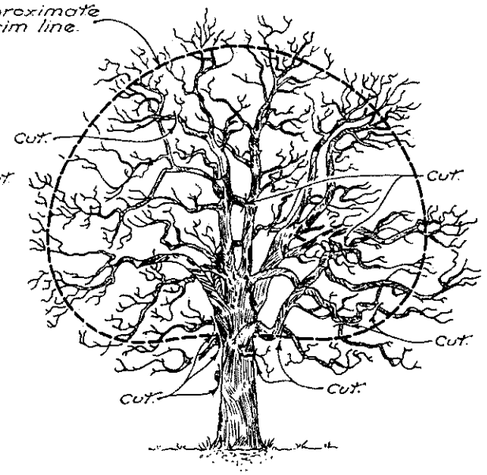
TREE PROTECTION BOX



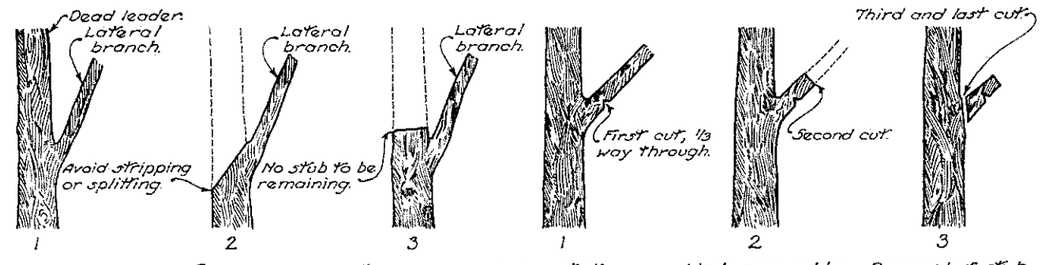
PYRAMIDAL TYPE



ROUND-HEADED TYPE

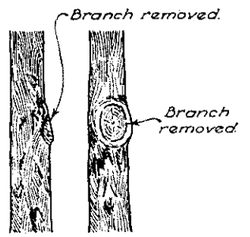


SPREADING TYPE



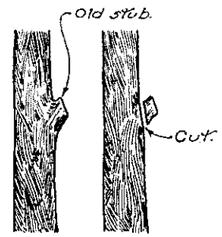
PART OF LEADER OR BRANCH TO BE REMOVED

PROPER REMOVAL OF BRANCHES



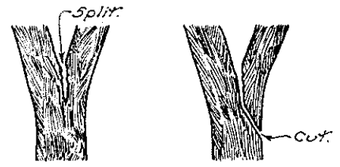
4

Cuts made flush with remaining limb or trunk and ready for painting if diameter exceeds ½" -1" as specified.



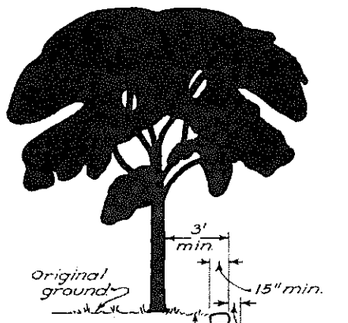
Remove wire, nails etc.

REMOVING STUBS



PROPER CROTCH TREATMENT

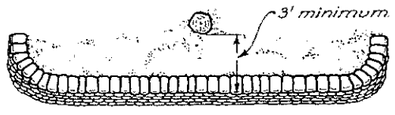
PRUNING



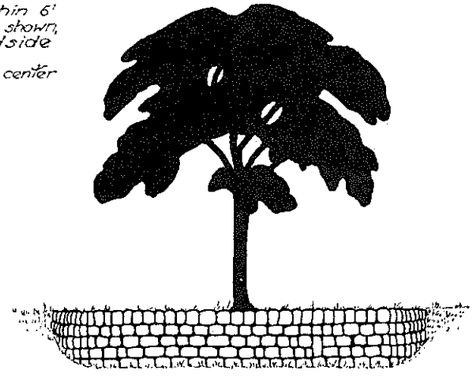
ELEVATION

Where the top of slope in cut is within 6' or less of tree, riprap is to be placed as shown, augmented by Specifications for Roadside Improvement.

Walls are to extend far enough from center of tree to amply cover roots.



PLAN



FRONT VIEW

RIPRAP FOR TREE PROTECTION IN CUT

BUREAU OF LOCATION AND DESIGN
OHIO DEPARTMENT OF HIGHWAYS

ROADSIDE IMPROVEMENT

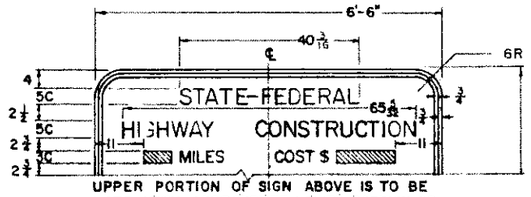
STANDARD CONSTRUCTION DRAWING L-1

APPROVED K. L. R. CHIEF ENGINEER

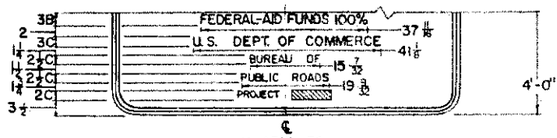
DATE
2-20-36
7-10-36
2-16-38
12-1-41
10-1-45
4-1-50

FEDERAL-AID CONSTRUCTION IDENTIFICATION SIGNS

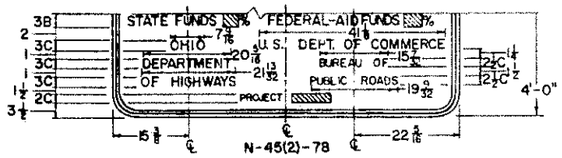
CODE N-45(X)-78



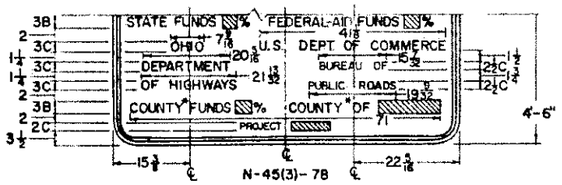
UPPER PORTION OF SIGN ABOVE IS TO BE USED WITH APPROPRIATE LOWER PORTION OF SIGN FOUND BELOW.



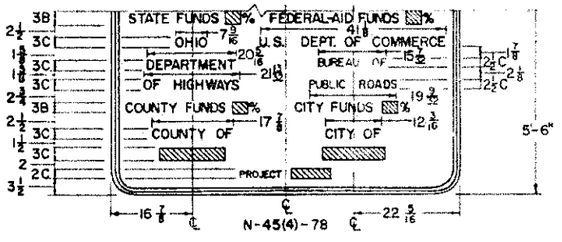
N-45(1)-78



N-45(2)-78

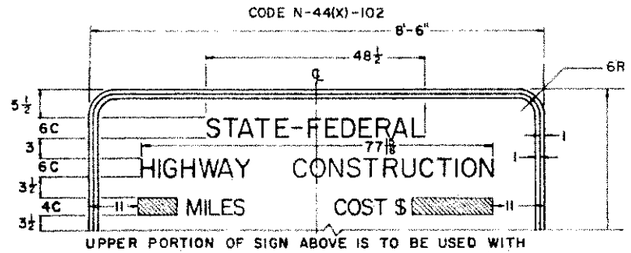


N-45(3)-78

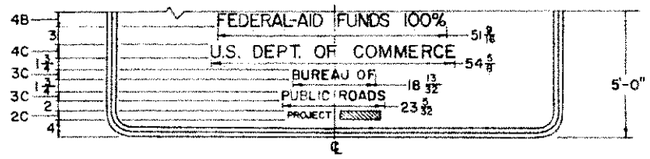


N-45(4)-78

CODE N-44(X)-102



UPPER PORTION OF SIGN ABOVE IS TO BE USED WITH APPROPRIATE LOWER PORTION OF SIGN FOUND BELOW.



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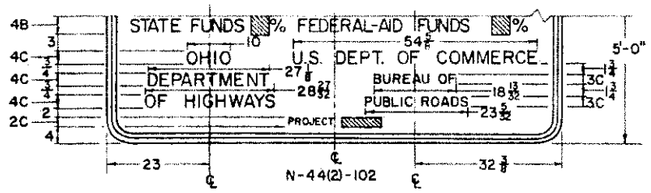
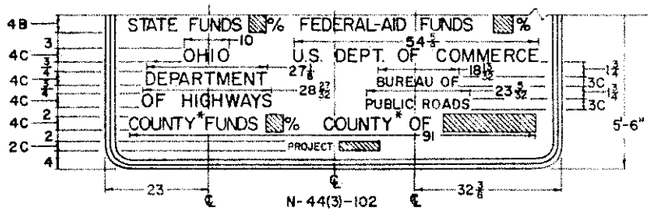


N-44(2)-102



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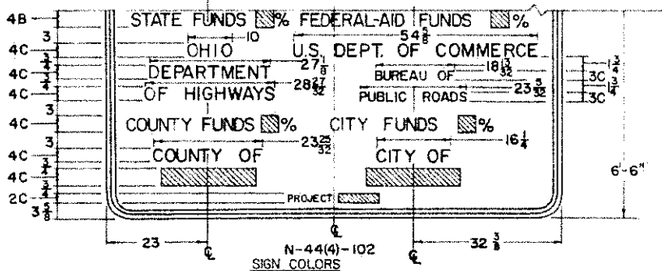

N-44(4)-102

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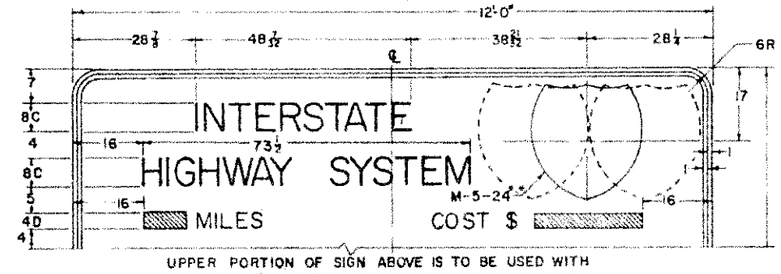
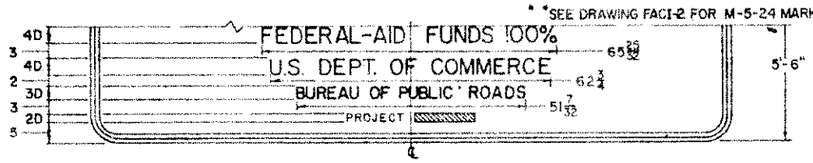
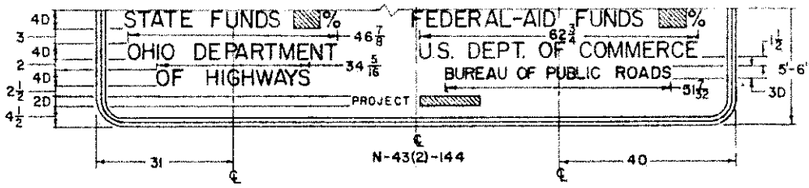


UPPER PORTION OF SIGN ABOVE IS TO BE USED WITH APPROPRIATE LOWER PORTION OF SIGN FOUND BELOW.

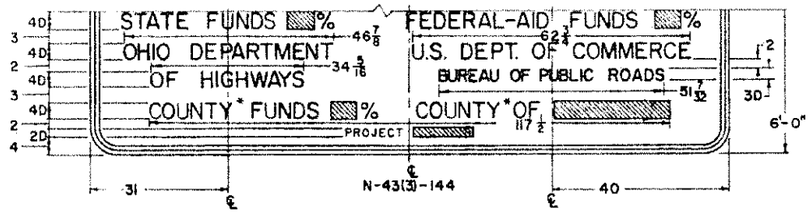
**SEE DRAWING FACI-2 FOR M-5-24 MARKER.



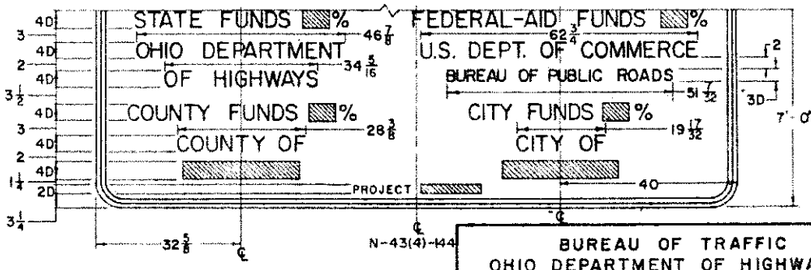
N-43(1)-144



N-43(2)-144



N-43(3)-144



N-43(4)-144

NOTES:

ALPHABET AND LETTER SPACING

SIGN LETTERING, WHEN INDICATED ON THE PLANS AS A SERIES TYPE SUCH AS 4C OR 4D, SHALL BE DESIGNED IN ACCORDANCE WITH THE "STANDARD ALPHABETS FOR HIGHWAY SIGNS OF THE BUREAU OF PUBLIC ROADS" THE SPACING BETWEEN LETTERS IS INDICATED IN THE "OHIO MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES" AND IS TO BE INCREASED OR DECREASED PROPORTIONALLY SO THAT THE LEGEND OCCUPIES THE DIMENSION INDICATED ON THE PLANS. COPIES OF THE ABOVE REFERENCE ARE ON FILE IN THE OFFICE OF THE DEPARTMENT OF HIGHWAYS, BUREAU OF TRAFFIC, 450 E. TOWN ST, COLUMBUS, OHIO.

SIGN MATERIAL

SIGN MATERIAL SHALL BE 1/2 INCH HIGH OR MEDIUM-DENSITY RESIN IMPREGNATED FIBER OVERLAID PLYWOOD. IT SHALL BE DOUGLAS FIR EXTERIOR TYPE AND SHALL CONFORM TO COMMERCIAL STANDARD CS45-60, GRADE B OR BETTER.

SIGN COLORS

SIGN BACKGROUND COLOR SHALL BE WHITE USING TWO COATS OF ENAMEL MEETING SEC. M-9.13 MODIFIED AS FOLLOWS:
PIGMENT- ALL PIGMENT SHALL BE RUTILE NON-CHALKING TITANIUM DIOXIDE (MEETING FEDERAL SPECIFICATION TT-T-425a TYPE III).

FINISHED ENAMEL -	MAXIMUM	MINIMUM
PIGMENT	26%	23%
LIQUID (CONTAINING AT LEAST 40% NON-VOLATILE)	77%	74%
WEIGHT PER GALLON	—	9.1 lbs.

SIGN LEGEND AND BORDER SHALL BE BLACK USING A HIGH QUALITY BLACK OPAQUE SILK SCREEN PASTE OR BLACK ENAMEL MEETING SEC.M-9.14.

QUANTITY, LOCATION, AND TYPE OF FEDERAL-AID CONSTRUCTION IDENTIFICATION SIGNS IS SPECIFIED IN THE GENERAL NOTES.

▨ CROSSHATCHED AREA DENOTES A VARIABLE THAT SHALL BE FURNISHED AT THE TIME OF CONSTRUCTION.

ALL DIMENSIONS ARE IN INCHES UNLESS OTHERWISE NOTED.

*THE WORD COUNTY SHALL BE REPLACED BY THE WORD CITY WHEN APPROPRIATE.

BUREAU OF TRAFFIC
OHIO DEPARTMENT OF HIGHWAYS

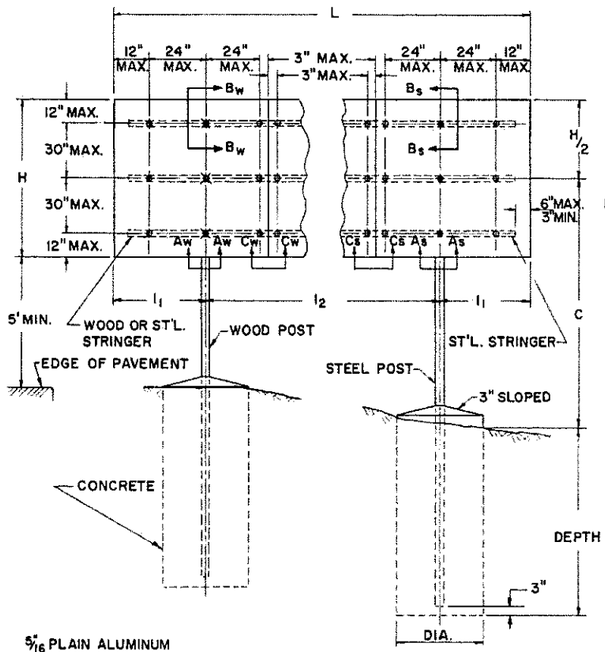
FEDERAL AID CONSTRUCTION IDENTIFICATION SIGNS

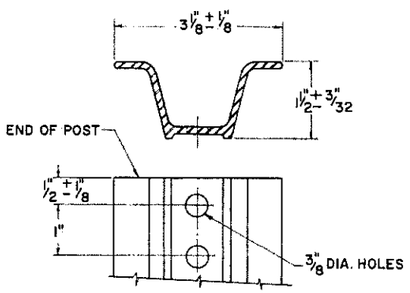
DATE 3-8-63

STANDARD CONSTRUCTION DRAWING FACI - 1

APPROVED Fred Blair
ENGINEER OF TRAFFIC

FEDERAL-AID CONSTRUCTION IDENTIFICATION SIGNS

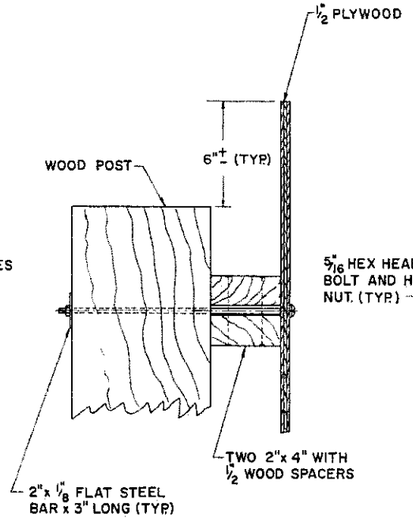


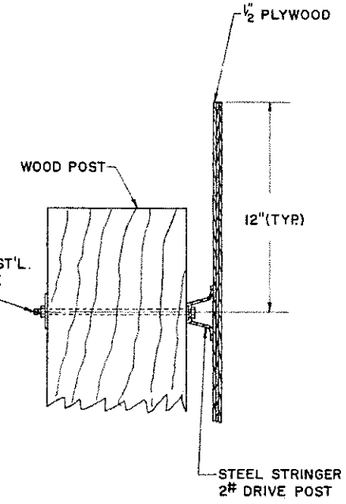


STEEL STRINGER 2# DRIVE POST

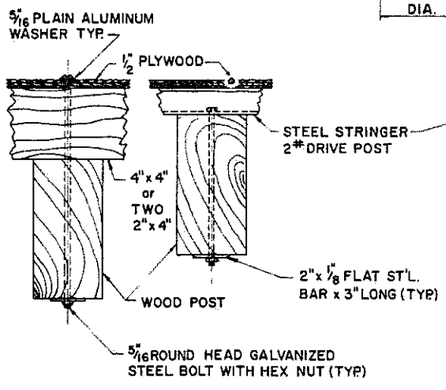
LEGEND

- ⊠ BOLTS THROUGH FACE, STRINGER & POST
- ○ BOLTS THROUGH FACE & STRINGER
- ● BOLTS THROUGH STRINGER & POST

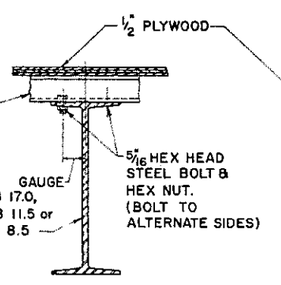




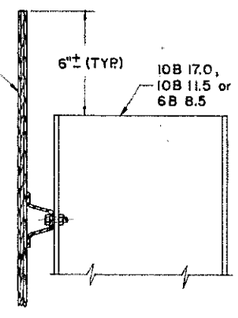
SECTION Bw-Bw



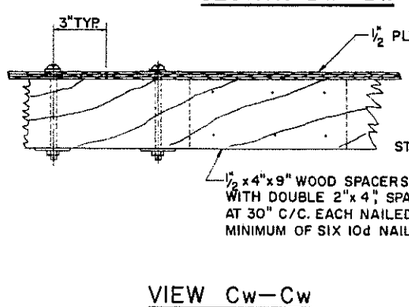
SECTION Aw-Aw



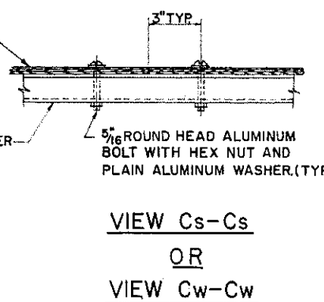
SECTION As-As



SECTION Bs-Bs



VIEW Cw-Cw



VIEW Cs-Cs OR VIEW Cw-Cw

SUPPORT SPACING

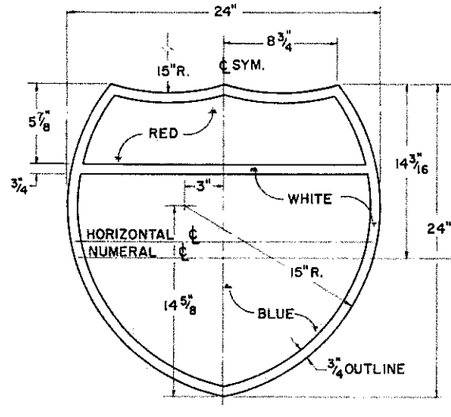
L	2 SUPPORTS		3 SUPPORTS	
	l_1	l_2	l_1	l_2
6'-6"	1'-5"	3'-8"	0'-11"	2'-4"
8'-6"	1'-10 1/2"	4'-9"	1'-2"	3'-8"
12'-0"	2'-7 1/2"	6'-9"	1'-8"	4'-4"

SUPPORT SIZE

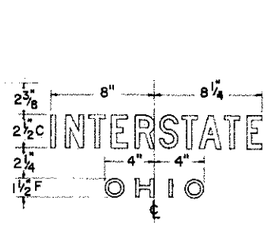
SIGN AREA Ft.² / C FEET	STEEL SUPPORTS 2 POST 20-40	40-60	60-90	3 POST 40-60	60-90	WOOD SUPPORTS 2 POST 20-40	40-60	60-90	3 POST 40-60	60-90
LESS 10	6B 8.5			6B 8.5		4"x 8"	4"x 10"	4"x 12"	4"x 8"	4"x 10"
10 — 12										
12 — 14		10B 11.5				4"x 10"	4"x 12"	6"x 12"	4"x 10"	4"x 12"
14 — 16										
16 — 18			10B 17	10B 11.5		4"x 12"	6"x 12"	6"x 14"	4"x 12"	6"x 12"
18 — 20										

SUPPORT FOUNDATIONS

SUPPORT TYPE	SUPPORT SIZE	FOUNDATION DEPTH	FOUNDATION DIA.
STEEL	6B 8.5	4'-0"	18"
STEEL	10B 11.5	5'-6"	18"
STEEL	10B 17.0	6'-3"	18"
WOOD	4" x 8" or 4" x 10"	4'-0"	18"
WOOD	4" x 12" or 6" x 12"	4'-6"	24"
WOOD	6" x 14"	5'-6"	24"



M-5-24



1 & 2 DIGIT NUMERAL 8" D SERIES
3 DIGIT NUMERAL 7" B SERIES

NOTE:
SIGN COLORS SHALL BE ALL WEATHER RESISTING HIGH QUALITY ENAMEL.

NOTES

GENERAL: SIGN SUPPORTS MAY BE STEEL, WOOD OR A COMBINATION OF STEEL AND WOOD.

MATERIALS: THE MATERIALS LISTED BELOW SHALL BE IN ACCORDANCE WITH THE OHIO CONSTRUCTION AND MATERIAL SPECIFICATIONS.

DRIVE POST: OHIO SPEC. SEC. M-7.1 (HARD GRADE), M-7.2 OR M-7.18 (HARD GRADE). WEIGHT SHALL BE 2 POUNDS PER FOOT PLUS OR MINUS 3.5% BEFORE HOLES ARE PUNCHED.

STRUCTURAL SHAPES: OHIO SPEC. SEC. M-7.4.

WOOD POSTS AND STRINGERS: OHIO SPEC. SEC. M-8.2, DOUGLAS FIR DENSE CONSTRUCTION, SOUTHERN YELLOW PINE DENSE STRUCTURAL OR BETTER (NATIONAL LUMBER MFG. ASSOC. 1962)

THE POSTS AND STRINGERS SHALL BE PAINTED WITH ALL-WEATHER RESISTING HIGH QUALITY DARK GREEN ENAMEL. OHIO SPEC. SEC. M-9.23

FABRICATION: ALL BOLT HOLES SHALL BE DRILLED FROM THE FACE THROUGH THE BACK OF THE SIGN USING A BACKING PANEL.

ALL JOINTS IN THE PLYWOOD SIGN PANELS SHALL BE VERTICAL AND SHALL BE PLACED WITHIN THE MIDDLE HALF OF THE SIGN PANEL.

ERECTION: THE STRINGERS SHALL BE EITHER 4"x4" OR DOUBLE 2"x 4" WOOD WALES OR 2# DRIVE POSTS.

THE SIGN SUPPORT POST SIZE AND SPACING SHALL BE SELECTED FROM TABLES BASED ON SIGN AREA AND ACTUAL MOUNTING HEIGHT.

ON PROJECTS OF 6 MONTHS DURATION OR LESS THE CONTRACTOR, WITH THE ENGINEERS APPROVAL MAY OMIT CONCRETE FOUNDATION PROVIDED STRUCTURAL SUPPORT IMBEDMENT IS INCREASED BY 100 PER CENT.

BUREAU OF TRAFFIC
OHIO DEPARTMENT OF HIGHWAYS

FEDERAL AID CONSTRUCTION IDENTIFICATION SIGNS

DATE 3-8-63

STANDARD CONSTRUCTION DRAWING FACI-2

APPROVED Fred Parker
ENGINEER OF TRAFFIC

SPECIFICATION FOR SELF-LUBRICATING BRONZE BEARING PLATES

Self-Lubricating bronze bearing plates shall be made by an established manufacturer of these products and shall conform to the following requirements:

(a) Cast phosphor bronze shall conform to Sec. M-7.11 of the Construction and Material Specifications, ASTM Designation B22, Alloy B, and shall have an allowable unit stress of 2,500 psi in compression.

(b) The lubricant shall be of the solid type and shall consist of graphite, metallic substances having lubricating properties and a lubricating binder. Materials which do not have lubricating qualities or which promote chemical or electrolytic reactions, will not be acceptable. The lubricant shall be compressed into the lubrication recesses with hydraulic pressure of at least five times the design unit loading to form a dense, non-plastic lubricant.

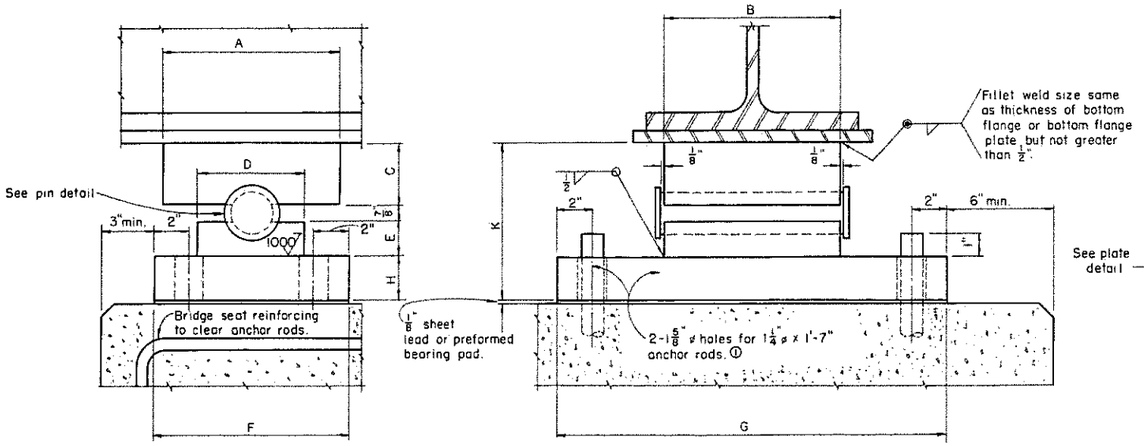
(c) The recesses for the lubricant shall consist either (1) of annular rings with or without central circular recess with a depth at least equal to the width of the ring or diameter of hole or (2) of circular recesses approximately $\frac{5}{16}$" in diameter and $\frac{3}{16}$" to $\frac{1}{4}$" deep.

(d) The recesses shall be arranged in a geometric pattern such that successive rows shall overlap in the direction of motion and the distance between extremities of recesses shall be closer in the direction of motion than that perpendicular to motion. The entire bearing area of all surfaces which have provision for motion shall be lubricated by means of these lubricant filled recesses. The total area of these recesses shall comprise not less than 25 per cent nor more than 35 per cent of the total bearing area of the plate.

(e) Bearing surfaces of the bronze bearing plates and opposing steel plates shall be machine finished to the surface roughness shown on this Standard Drawing. The lay of the tool marks shall be in the direction of motion. All machine surfaces shall be flat within 0.005 inch per inch of length and width.

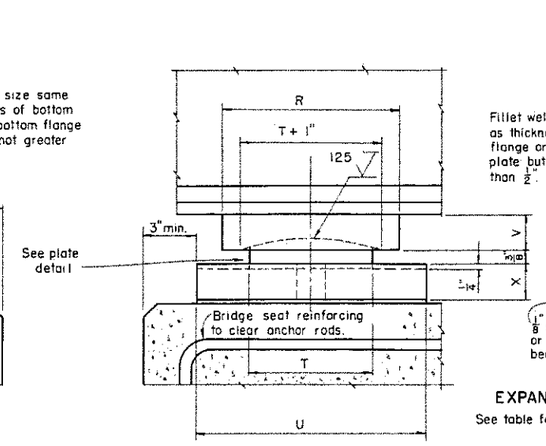
(f) For mating curved surfaces of steel and bronze, the concave surface shall have a positive tolerance not exceeding .010 inch and the convex surface a negative tolerance of .010 inch.

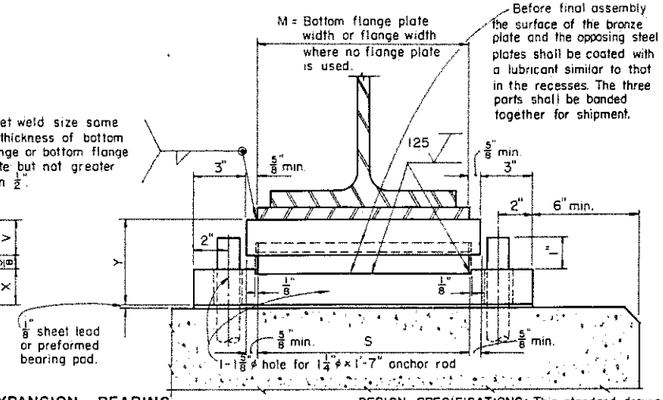
(g) The coefficient of friction between the bronze self-lubricating plates and the steel plates in contact with them shall not exceed 0.10 when subjected to the design loading.



FIXED BEARING

See table for additional dimensions.





EXPANSION BEARING

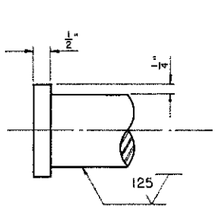
See table for additional dimensions.

Fixed Bearing No.	Expansion Bearing No.	Fixed Bearings Dimensions (inches) A	B	C	D	E	F	G	H	K	d	Weight ea. (lb.)	Expansion Bearings Dimensions (inches) R	S	T	U	V	W	X	Y	Weight ea. (lb.)	Maximum Load (lb.)
①F-50	E-50	6	6	1½	3	1¼	8	16	1½	5⅛	2	100	10	6	6	12	2	1⅛	2	4⅜	152 + 13.10 (M-S)	50,000
①F-100	E-100	7	9	1¾	4	1½	9	18	1½	5⅝	2	143	10	8	6	12	2	1⅛	2	4⅜	180 + 13.10 (M-S)	100,000
F-150	E-150	9	9	2½	5	1½	11	20	2	6⅞	2½	244	10	9	7	13	2	1 5/16	2	4⅜	205 + 13.72 (M-S)	150,000
F-200	E-200	10	10	3	6	2	11	22	2	7⅞	2½	300	10	12	7	13	2	1 5/16	2	4⅜	250 + 13.72 (M-S)	200,000
F-250	E-250	11	10	3½	7	2	12	24	2½	8⅞	3	400	12	13	8	14	2½	1½	2¼	5⅛	337 + 18.16 (M-S)	250,000
F-300	E-300	12	11	3¾	8	2½	14	25	2½	9⅝	3	502	12	15	8	15	2½	1½	2¼	5⅛	389 + 18.85 (M-S)	300,000
②F-350	②E-350	12	11	3¾	8	2½	16	25	2½	9⅝	3	540	12	16	9	17	2½	1¾	2¼	5⅛	443 + 20.23 (M-S)	350,000
②F-400	②E-400	12	12	3¾	8	2½	18	26	2½	9⅝	3	610	12	17	10	18	2½	1 5/16	2¼	5⅛	484 + 20.92 (M-S)	400,000

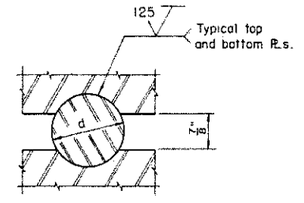
① Only 2 anchor rods required, placed in diagonally opposite corners.

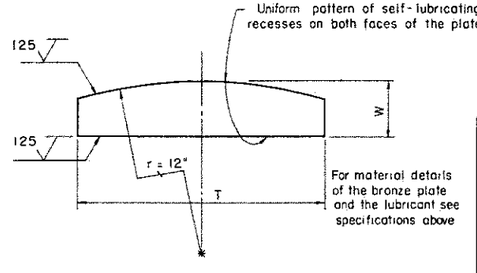
② Bearing stiffeners are required.

Weights given are for one complete bearing (including sheet lead, anchor rods and self-lubricating bronze plate for the expansion bearing).



BEARING PIN DETAIL





SELF-LUBRICATING BRONZE PLATE DETAIL

DESIGN SPECIFICATIONS: This standard drawing conforms to the requirements of "Design Specifications for Highway Structures" of the State of Ohio, Department of Highways, dated September 1, 1957, together with revisions thereof dated February 21, 1958, and February 15, 1961, except that the masonary plates for the fixed bearings are designed on the basis of a 50% increase in allowable bending stress assuming uniform distribution of bearing on the concrete.

STEEL: Plates and rods shall conform to ASTM Designation A 36-62 T, and pins to ASTM A-108.

LIMITATIONS: The expansion bearings shall not be used where the anticipated total movement (expansion plus contraction) exceeds 3 inches.

When the roadway gradient at a bearing is over 4.0 %, the top of the upper steel plate shall be beveled to match the roadway gradient.

COEFFICIENT OF FRICTION: For design purposes a value of 0.10 shall be used.

LATERAL EXPANSION: All bearings must be accurately placed in order that proper clearance will be provided at all bearings for lateral expansion of the superstructure.

REVISIONS
1-15-63

STATE OF OHIO
DEPARTMENT OF HIGHWAYS
DIVISION OF DESIGN AND CONSTRUCTION
BUREAU OF BRIDGES

STANDARD

FIXED AND SLIDING BEARINGS

FOR STEEL BEAM AND GIRDER BRIDGES

REACTIONS 50,000 lb. TO 400,000 lb.

APPROVED: D. H. Berryman, ENGINEER OF BRIDGES
DATE: 4-19-62

DRAWING NO. FSB-1-62

PREPARED	TRACED	CHECKED	REVIEWED
JM	MKH	WCK	HHH