V DESIGN SPEED 60 M.P.H.

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO	STATE	

1/7

POR.-224-1.04

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APR 29 1985

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REPRODUCTION

STATE OF OHIO
DEPARTMENT OF HIGHWAYS

POR.-224-1.04

SUFFIELD TOWNSHIP
PORTAGE COUNTY
RECONSTRUCTION OF EXISTING SEPARATED CROSSING WITH NORFOLK AND WESTERN RAILWAY

CONVENTIONAL SIGNS

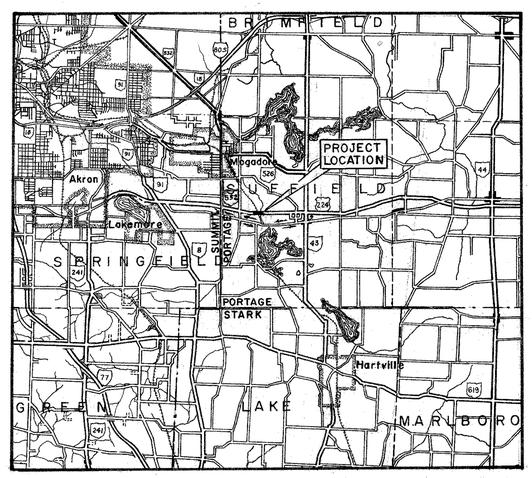
COUNTY LINE
TOWNSHIP LINE
SECTION LINE
CENTER LINE
CORPORATION LINE
FENCE LINE
GUARD RAIL (Exist.)
GUARD RAIL (Prop.)
RAILROAD
POWER POLES
TELEPHONE POLES
TREES (Exist.)
TREES (To Be Removed)
RIGHT-of-WAY

INDEX OF SHEETS

TITLE SHEET	1
TYPICAL SECTIONS	2
GENERAL SUMMARY	2
PLAN & PROFILE	3
GENERAL NOTES	4-5
STRUCTURE over 20 Ft. SPAN	6-7

LINE DATA

BEGIN PROJECT	149+90
END PROJECT	152+60
LENGTH OF PROJECT	270 LIN. FT. OR 0.051 MI.
BEGIN WORK	149+71
END WORK	152+76
LENGTH OF WORK	305 LIN. FT. OR 0.057 MI.



0 2 4 6
LOCATION MAP

Portion to be improved
State Roads
Other Roads
Detour

SCALE
Plan 0' 20'
Profile Horizontal 0' 20'
Profile Vertical 0' 20'

1967 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 require the closing to traffic of the highway and that detours will be provided as indicated on the plans.

Approved [signature]
Date 1-16-68 Division Deputy Director.

Approved Thomas M Major
Date 3-20-68 Deputy Director of Planning & Programming.

OR 1-18-67 1-29-67

Approved C. H. Altwater
Date 2-26-68 Engineer of Bridges.

Approved R. E. Gatlin
Date 2-29-68 Engineer of Location & Design.

Approved R. E. Shultz
Date 2-29-68 Deputy Director of Design & Construction.

Approved
Date Deputy Director of Right of Way

Approved E. W. Wilson
Date 3-20-68 First Assistant Director.

Approved P. E. Masheter
Date 3-20-68 Director of Highways.

STANDARD DRAWINGS						SUPPLEMENTAL SPECIFICATION	
BP-1	6-1-65	MC-3	5-1-66	SD-1-65, Sheets 1 & 2	11-8-65	808	1-13-67
BP-2	1-17-68	MC-4	6-1-65	AS-1-67	1-11-68	825	12-19-67
BP-3	1-10-67					828	1-1-67
BP-4	1-10-67					832	5-25-67
GR-1	1-1-67					927	8-7-67
GR-2-A	1-1-67					929	3-28-67
MC-1	10-1-67						

FILE Nº	Portage County POR-224-1.04
	Date of letting
	Contract Nº

TITLE SHEET

UTILITIES
Norfolk and Western Railway
700 Public Square Bldg.
Cleveland, Ohio

FED. RD. DIVISION	STATE	PROJECT	
2	OHIO		

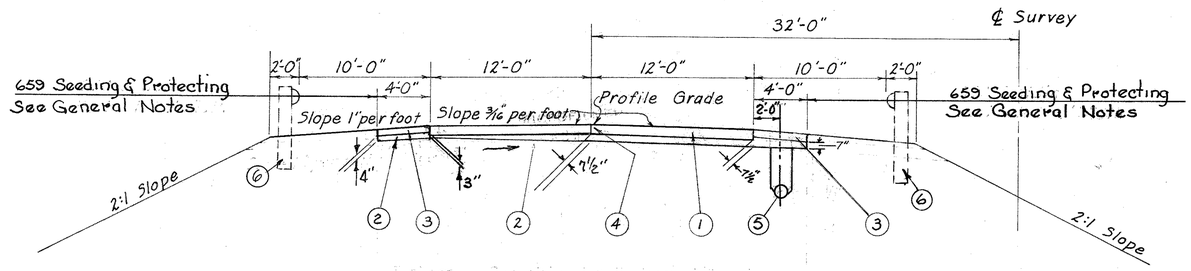
POR - 224 - 1.04

TYPICAL SECTION

TYPE 451

Scale 3/16" = 1'-0"

Design Speed 60 M.P.H.



STATION FROM	STATION TO	LIN. FT.	DESCRIPTION
149+90	150+47.82	57.82	
150+47.82	151+95.36	147.54	Bridge
151+95.36	152+60	64.64	

1. 451 - 9" Reinforced Portland Cement Concrete Pavement.
2. 310 - Sub-base
3. 411 - 6" Stabilized Crushed Aggregate
4. Standard Longitudinal Joint
5. 605 - 6" Pipe Underdrain Unclassified
6. Existing Guard Rail

SUBGRADE PREPARATION

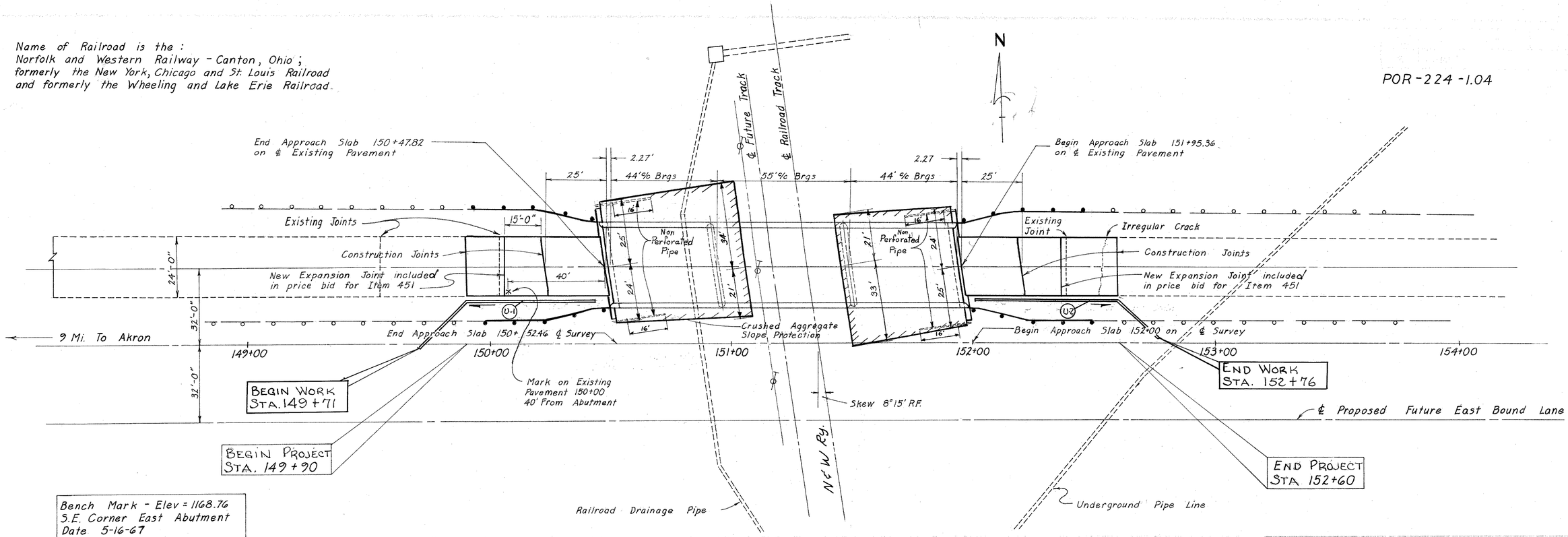
The subgrade under the proposed Portland Cement concrete pavement Item 451 and approach slabs Item 611 shall be compacted in accordance with the requirements of the third paragraph of 203.13 (a). Payment for the above shall be included in the price bid for item 310 Subbase.

General Summary

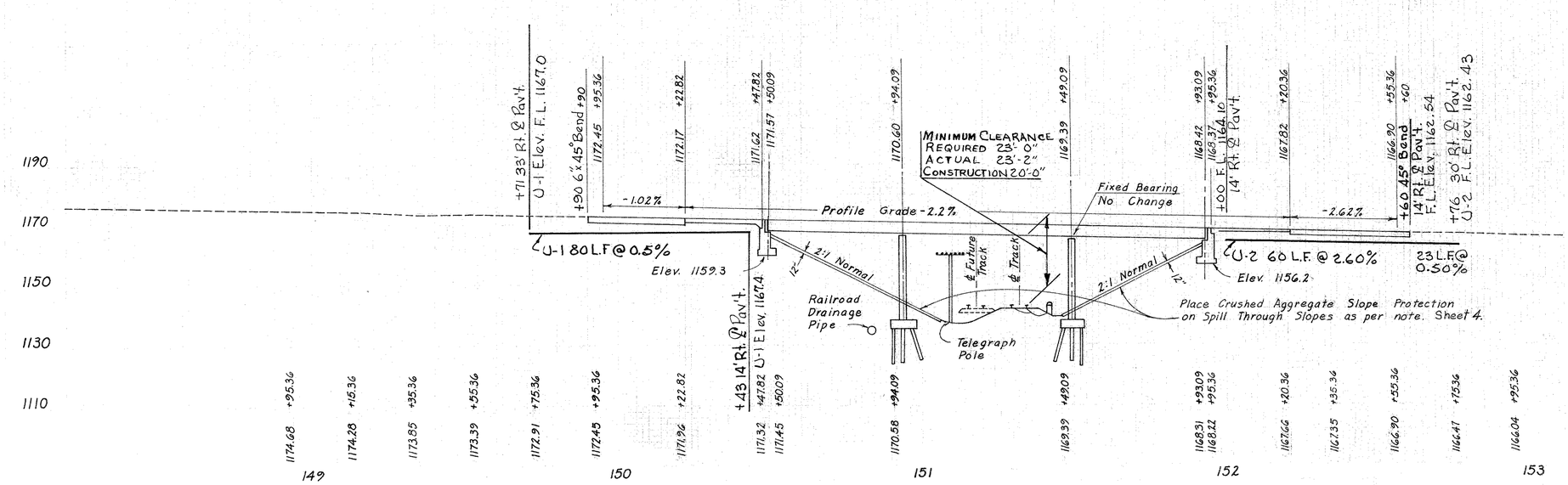
Sheet Numbers 3	4	5	6	7			Item	Quan	Unit	Description
										Roadway
326							202	326	Sq. Yd	Existing pavement Removed and Disposed of
200							202	200	Lin. Ft.	Guard Rail Removed for Re-Use
200							606	200	Lin. Ft.	Guard Rail Rebuilt, Type 4
200							659	200	Sq. Yd	Seeding and Mulching
										Pavement
78							310	78	Cu. Yd	Subbase, as per plan
17							411	17	Cu. Yd	Stabilized Crushed Aggregate
194							451	194	Sq. Yd	9" Reinforced Portland Cement Concrete Pavement.
133							611	133	Sq. Yd	Reinforced Concrete Approach Slabs, (T=13")
										Drainage
143							605	143	Lin. Ft.	6" Pipe Underdrains: Unclassified
20							603	20	Lin. Ft.	6" Conduit Type "F"
										Structure over 20 Ft. Span
										Quantities on Sheet 4.
							614	Lump	Lump	Maintaining Traffic
		LUMP						Lump	Lump	Field office

POR-224-1.04

Name of Railroad is the :
Norfolk and Western Railway - Canton, Ohio ;
formerly the New York, Chicago and St. Louis Railroad
and formerly the Wheeling and Lake Erie Railroad.

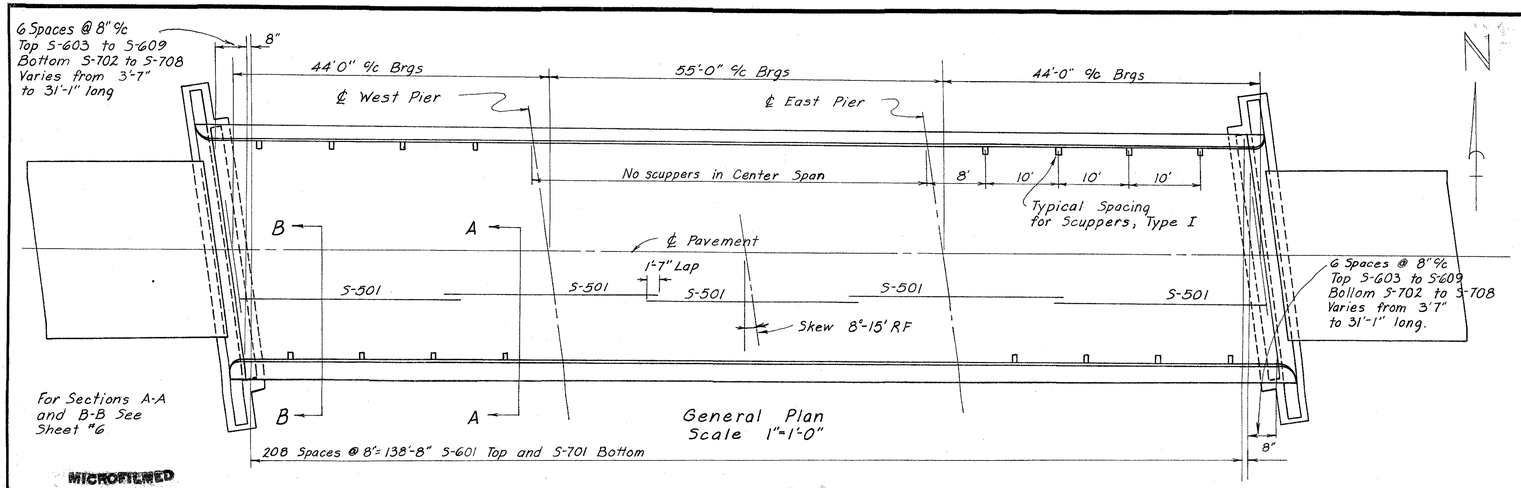


Bench Mark - Elev = 1168.76
S.E. Corner East Abutment
Date 5-16-67



Station From	Station To	SIDE	202 Guard Rail Removed For Re-Use L.F.	202 Pavement Removed & Disposed of S.Y.	310 Sub-Base C.Y.	411 Stabilized Aggregate Shoulders C.Y.	451 Reinforced Concrete 9" Pavement S.Y.	605 6" Pipe Underdrains Unclassified L.F.	606 Guard Rail Re-Built L.F.	611 Approach Slabs, T=13" S.Y.	659 Seeding and Mulching S.Y.	603 6" Type "F" Outlet L.F.	6" Bends 45°
149+90	150+47.82	℄		153.2									
151+95.36	152+60	℄		172.4									
150+00	150+50	L&R	100						100				
151+95	152+45	L&R	100						100				
149+71	150+43	R						70				10	1
152+00	152+76	R						73				10	1
149+90	150+47.32	℄			368.8								
151+95.86	152+60	℄			41.2		87.5						
149+90	150+22.82	℄					105.7						
152+20.36	152+60	℄								66.7			
150+22.82	150+47.82	℄								66.7			
151+95.36	152+20.36	℄									200		
149+71	152+76	℄											
Totals			200	325.6	78	17	193	143	200	133.4	200	20	

LINE SHEET



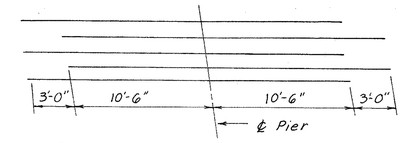


Diagram Showing Stagger of S-602 Bars over Piers

FED. RD. DIVISION	STATE	PROJECT	
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General Notes

Plans of Existing Bridge - Original contract construction plans dated February 25, 1955 are available in Division 4 office of State Highway Department Ravenna, Ohio, and in the Bureau of Bridges in Columbus. Structural details were based on 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.

Construction and Materials - Use State of Ohio Department of Highways Construction and Material Specifications dated January 1, 1967.

Reference Shall Be Made To - AS-1-67, 1-11-68 & Standard Drawing SD-1-65, Sheet 1 & 2, dated 11-8-65 and to Supplemental Specifications:
808 dated 1-13-67, 825 dated 12-1967
828 dated 1-1-67, 832 dated 5-25-67
927 dated 8-7-67, 929 dated 3-28-67

Work Required - Barricade highway to traffic. Remove and store for re-use, portions of guardrail and bridge railing. Remove reinforced concrete deck, bulb angle gutters and scuppers and end dams. Jack up and shore up steel beams in all spans. Remove concrete approach slabs and portions of adjacent roadway concrete pavement. Remove and dispose of existing reinforced concrete abutments entirely. Excavate unsuitable embankment material, build new abutments to bridge seat construction joint, and set new bearing plates. Adjust beam seats at West Pier as per note on sheet 7. Lower beams to final position. Bearing seats on the East Pier are fixed and no change expected there.

Replace reinforced concrete bridge deck, including new scuppers and end dams. Build abutment back walls. Build new concrete approach slabs and replace adjacent roadway pavement. Re-shape berms and embankment slopes. Place crushed aggregate slope protection on spill through slopes; seed and mulch disturbed areas. Erect guardrail and bridge rail. Paint all structural steel except galvanized posts one prime coat and one field coat of corrosion resistant green finish paint, except guardrail which is white. All disturbed areas beyond the stabilized berm and slope protection areas shall be shaped to conform with the adjacent ground and seeded as directed by the Engineer. A quantity of 200 Square Yards, 659 Seeding and Mulching is included in the Plans and all work needed to perform this operation shall be included under this item.

Slope Protection - Cost of reshaping eroded spill through slopes under bridge shall be included in the Unit Price Bid for Crushed Aggregate Slope Protection, item 601.

Item 513 A quantity in pounds of additional structural steel is provided for unexpected structural alterations which may be necessary but not specifically itemized for repair.

Elevation Datum - Bench mark 1168.76 on South east corner of East Abutment may have changed since May 16, 1967 when profile elevations were made and therefore all should be checked again. No change in elevation is expected over fixed bearing at east pier, except possibly its centerline profile value of 1169.39 which is basis of elevations on Sheet 5.

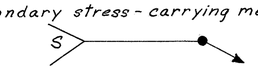
Item 601 - For details refer to Sheet 3.

503 Excavation - Excavate embankment fill to elevations shown on Abutment Details sheet 7 or to greater depth if necessary to remove water-softened or otherwise unsuitable embankment. Space below foundation plan elevation as well as behind abutments shall be filled with properly compacted porous backfill material as directed by the Project Engineer

Portions of Structure Removed - Includes reinforced concrete deck and abutments, bulb-angle gutters, scuppers and end dams.

Painting of Structural Steel - Shall be in accordance with Supplemental Specification 832, <u>except</u> finish paint shall be 929 Corrosion Resistant Green Paint.

Welding - Welds on secondary stress-carrying members are shown thus:



Railroad Aerial Lines: The Contractor shall use all precautions necessary to prevent disturbing the railroad aerial lines during the construction stage and shall cooperate with the railroad in the relocation of the lines if such is necessary. Relocation of lines will be done by the railroad and the cost of the relocation shall be included in the railroad force account work.

Refer to Sheet 7 - for notes pertaining to payment for:
- Item 503 - Unclassified Excavation
- Item 518 - Porous Backfill
- Item 518 - Perforated Pipe
- Item 518 - Corrugated Metal Drain Pipe

Estimated Quantities

Item	Total	Unit	Description	Superstr.	Abut	Piers	Gen'rl.
202	Lump	Sum	Portions of Existing Structure Removed				Lump
503	232	Cu Yds	Unclassified Excavation		232		
503	Lump	Sum	Cofferdams, Cribs and Sheeting				Lump
509	49,375	Lbs.	Reinforcing steel	41,523	7,852		
511	150	Cu. Yds	Class "C" Concrete, Superstructure	150			
511	145	Cu. Yds	Class "E" Concrete, Abutments		145		
513	Lump	Sum	Jacking up, and shoring up and re-seating existing superstructure	Lump			
513	100	Lbs	Structural Steel, as per plan				100
516	6000	lbs.	Structural Expansion and Contraction Joints	6000			
516	10	Each	Bearing Devices on Abutments		10		
516	5	Each	Bearing Devices on Pier adjusted as per plan			5	
517	295.08	Lin. Ft.	Railing, re-erected as per plan	295.08			
518	16	Each	Scuppers including supports	16			
518	191	Cu. Yds.	Porous Back fill		191		
518	125	Lin. Ft.	6" Diameter Helical Perforated Corrugated Metal Pipe		125		
			including specials, 707.06				
601	656	Sq. Yds	Crushed Aggregate Slope Protection, as per plan				656
808	150	Units	Water reducing, set retarding admixture	150			
825	600	Sq. Yds	Concrete surface treatment,	585	15		
828	61	Lin. Ft.	Joint Sealer, (End dam)	61			
832	Lump	Sum	Cleaning and Field Painting of existing structural				Lump
			steel (one complete prime coat; one finish Coat)				
518	64	Lin. Ft.	6" Diameter NON Perforated Corrugated Metal Pipe as per plan (707.06, helical)				64

Bridge Number Por-224-0104
Over Norfolk and Western Railway
U.S.-224 Portage County

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CONTINUATION OF GENERAL NOTES

Construction Clearance - Above top of the railroad company's existing rails maintain a clearance of 20'-0" vertically and 8'-0" horizontally from center of tracks.

Schedule of work - Before construction is started, Contractor's schedule of repair work above and at piers adjacent to railroad tracks shall be submitted by the Contractor to the department of Highway, and to the Railroad Company.

Field Office
The Contractor shall, in addition to the requirements of 105.152, provide 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 maintain sanitary provisions per 107.06. All the above is included in the lump sum price for field office.

Design Speed
The Geometrics for this project have been planned for a design speed of 60 Miles Per Hour.

Utility Owners
Following is a list of owners affected by the project.

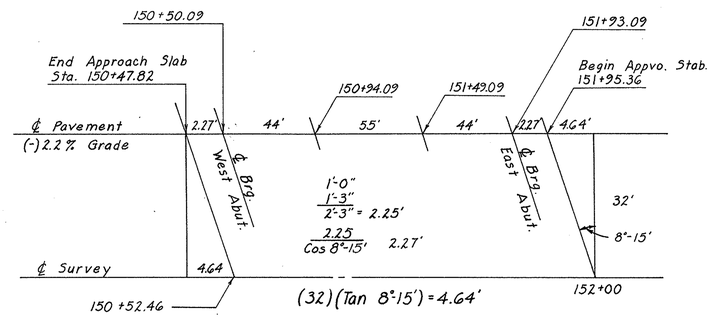
Norfolk and Western Railway Canton, Ohio

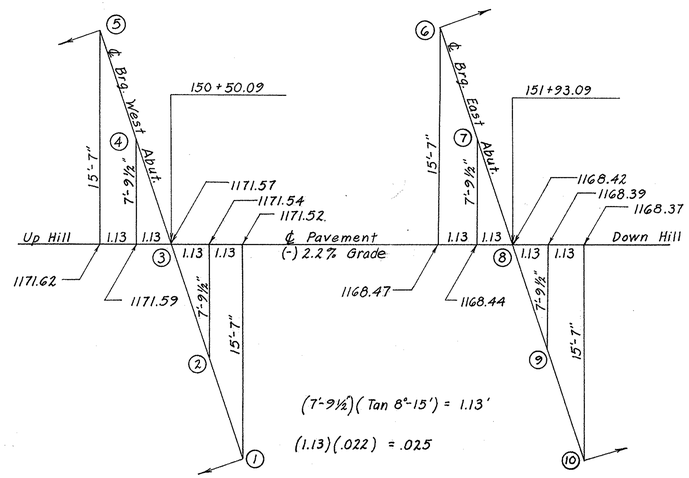
Maintaining Traffic:
Closure of bridge to traffic during certain phases of construction will be necessary, but there will be also periods when traffic can be maintained to hold to a minimum the period of closure and detour of traffic. The Project Engineer in consultation with the Contractor shall resolve this matter.

State Safety Requirements:
State safety requirements outlined in the Construction Safety Code for this type of work, will be enforced and the Contractor shall comply with the provisions of Bulletin 202, issued as a General Order by the Industrial Commission of Ohio.

Cooperation of Contractor:
The Contractor shall leave his ladders, platforms or scaffold in place for a sufficient length of time and in such a manner to permit the Engineer or Inspector to examine the work performed.

Calculations For Abutment Seat Elevations:





①	②	⑥	⑩
1171.57	1171.570	1168.420	1168.420
+ .025	(-).025	(+).025	.025
1171.595	1171.545	1168.445	1168.395
(+).025	(-).025	(+).025	(-).025
1171.620	1171.520	1168.470	1168.370

@ ℄ = 3⅜ plus 3⅜ plus 8¾" = 3'-9¼ = 3.77'
@ 7'-9½" = 1½ plus 3'-9¼" ——— 3'-10¾" = 3.89'
@ 15'-7" = 3" plus 3'-9¼" ——— 4'-0¼ = 4.02'

West Abutment

① 1171.52 - 4.02 = 1167.50
② 1171.54 - 3.89 = 1167.65
③ 1171.57 - 3.77 = 1167.80
④ 1171.59 - 3.89 = 1167.70
⑤ 1171.62 - 4.02 = 1167.60

East Abutment

⑥ 1168.47 - 4.02 = 1164.45
⑦ 1168.44 - 3.89 = 1164.55
⑧ 1168.42 - 3.77 = 1164.65
⑨ 1168.39 - 3.89 = 1164.50
⑩ 1168.37 - 4.02 = 1164.35

151+49.09 ~ 1169.39
.022 x 44' ~ (-).97
151+93.09 ~ 1168.42

151+93.09 ~ 1168.42
.022 x 143' ~ (+) 3.15
150+50.09 ~ 1171.57

Thickness of:
E-100 Expansion Bearing = 3⅜"
Concrete Slab Deck = 8¾"
33" WF 130# Beam = 33⅛"
3/16"/Foot slope crown:
@ 7'-9½" from ℄ = 1½"
@ 15'-7" from ℄ = 3"

Refer to Sheet 7 for Abutment Details.

Refer to Sheets 4, 5, 6 for Deck Details.

BRIDGE NUMBER POR-224-0104
Over Norfolk and Western Railway

US-224 Portage County

Reinforcing Steel List - Deck

Bending Diagram

Mark	Spacing	No.	Length	Weight	Shape
S-701	0'-8"	209	33'-8"	14,383	S
S-702	0'-8"	2	3'-7"	15	S
S-703	0'-8"	2	8'-2"	33	S
S-704	0'-8"	2	12'-9"	52	S
S-705	0'-8"	2	17'-4"	71	S
S-706	0'-8"	2	21'-11"	90	S
S-707	0'-8"	2	26'-6"	108	S
S-708	0'-8"	2	31'-1"	127	S
S-601	0'-8"	209	33'-8"	10,569	S
S-602	shown	64	24'-0"	2307	S
S-603	0'-8"	2	3'-7"	11	S
S-604	0'-8"	2	8'-2"	24	S
S-605	0'-8"	2	12'-9"	38	S
S-606	0'-8"	2	17'-4"	52	S
S-607	0'-8"	2	21'-11"	66	S
S-608	0'-8"	2	26'-6"	80	S
S-609	0'-8"	2	31'-1"	93	S
S-501	shown	405	30'-0"	12,673	S
S-401	1'-6"	194	1'-6"	94	S
S-402	1'-6"	194	4'-11"	637	B
Total				41,523	

Bar Size is Indicated in the bar mark. The first digit indicates the bar size number. For example, S-701 is a number 7 bar.

Mark	No.	Length	Weight	Shape
Re-701	1	6'-3"	-	S
Re-601	1	5'-11"	-	S
Re-501	1	5'-7"	-	S
Re-401	1	5'-3"	-	S

FED. RD. DIVISION	STATE	PROJECT	
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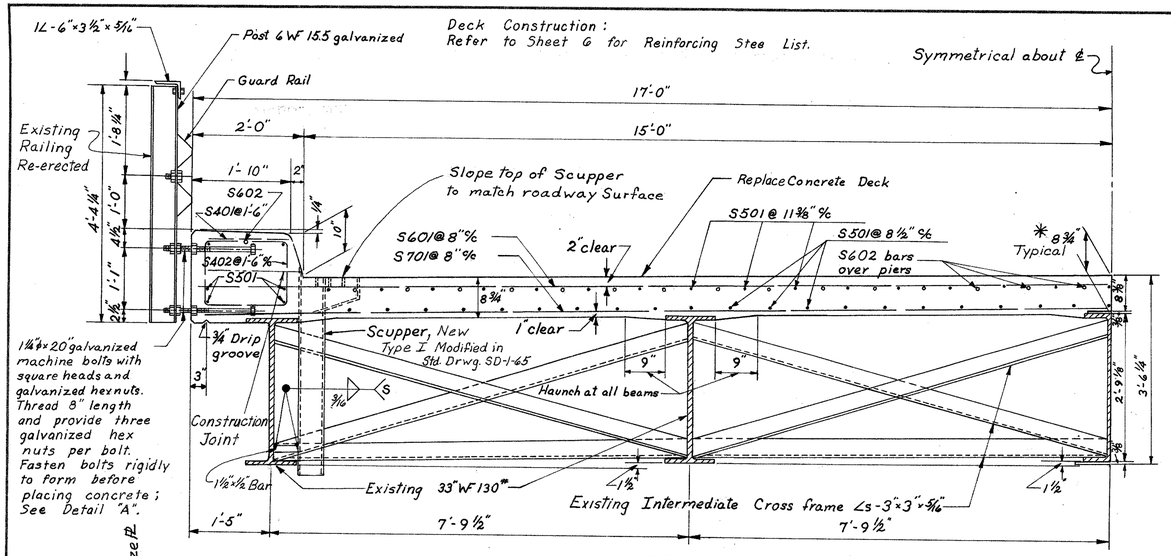
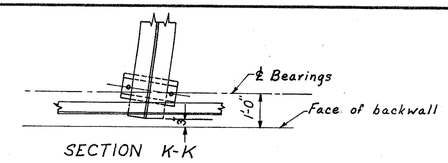
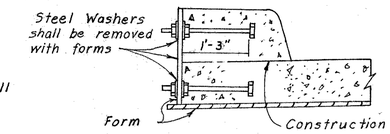
Deck Construction: Refer to Sheet 6 for Reinforcing Stee List.



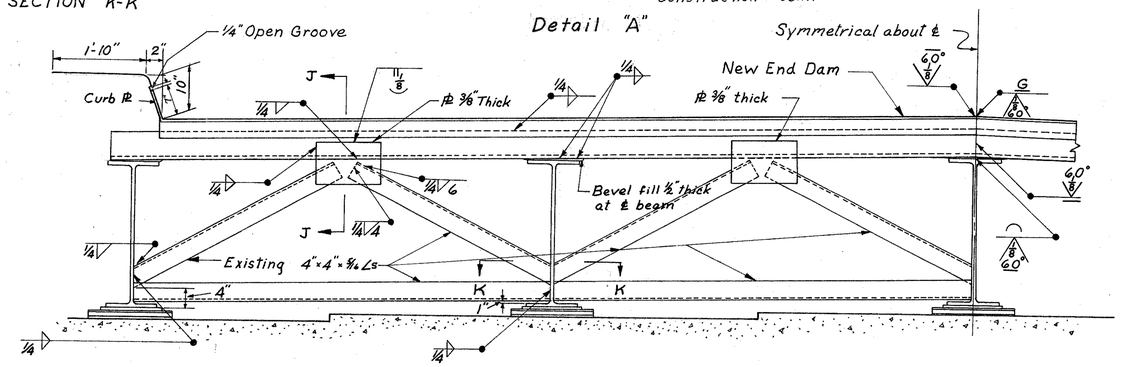
SECTION A-A



SECTION K-K



Detail "A"



TRANSVERSE SECTION B-B

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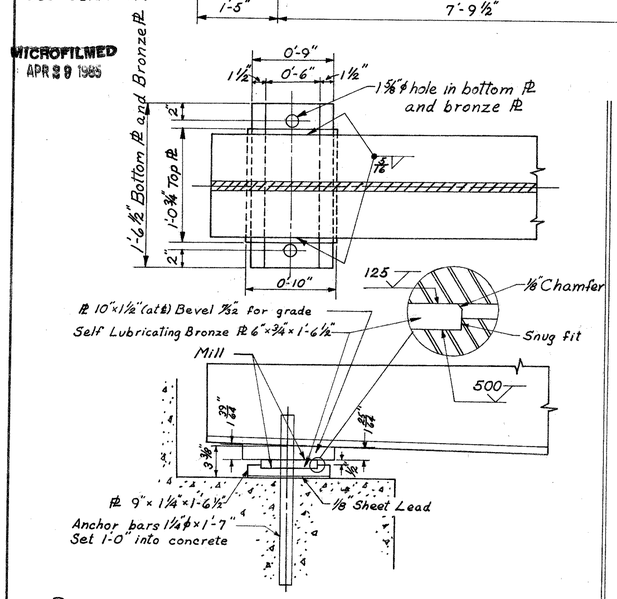
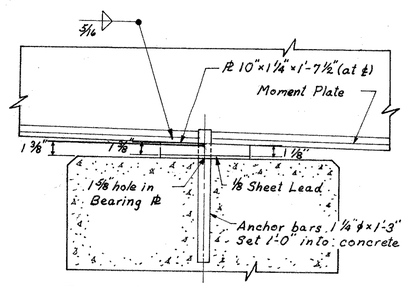
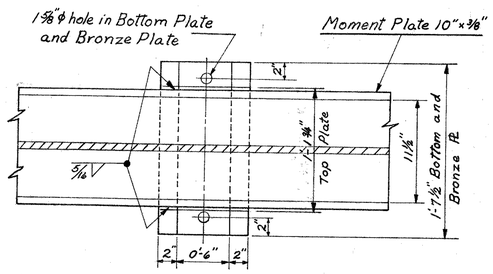
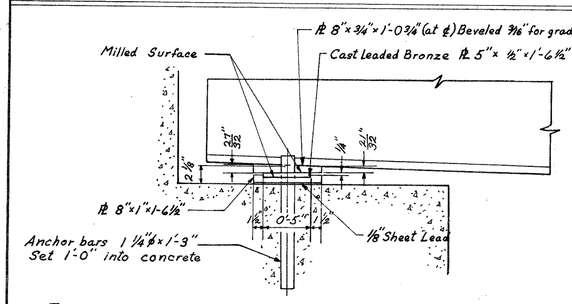


PROPOSED ABUTMENT BEARING PLATES

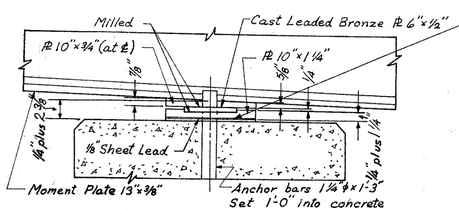


FIXED (EAST PIER) NO CHANGE





EXISTING ABUTMENT BEARING PLATES

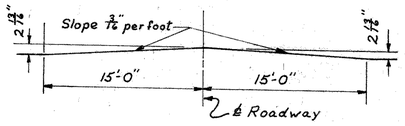


EXPANSION (WEST PIER)

EXISTING PIER BEARING PLATES

* This is the nominal dimension. The quantity of deck concrete to be paid for shall be based upon this dimension even though deviation from it may be necessary because the top flange of the girder may not have the exact camber or conformation required to place it parallel to the finished grade. Deduction shall be made for volume of encased steel plates as per 511.19 of the Contruction and Material Specifications.

Slab Thickness includes 1" monolithic wearing surface.



BRIDGE ROADWAY CROWN

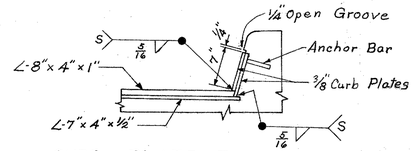
West Pier Note:
Difference between existing profile elevation 1170.58 and proposed elevation 1170.60, shown on sheet 3 at west pier, indicate need for raising each beam bearing assembly ¼ inch using steel shim plate 10"×¼"×1'-7½". Contractor shall verify accuracy of ¼ inch lift and adjust each beam bearing if more or less than the ¼ inch here shown, so as to effect a 2.2% grade and ¾" per foot crown in roadway deck. Shim plate may be separated into halfs along line of anchor holes for their insertion between existing ⅛" sheet lead and bottom plate. Tack weld halfs of shim plate together at sides.

Deck Reinforcing Steel - Refer to sheets 4, 5, 6.

Cross Framing - Partial Removal and re-installation of structural steel end cross framing to facilitate construction of new abutments will be optional with the contractor, the expense of which shall be included in Item 202 for payment.

Bridge Railing - The temorary removal and subsequent re-erection of existing handrail, guardrail and galvanized Steel posts, shall also include replacement of galvanized machine bolts anchored in concrete curbs together with galvanized nuts, bolts and washers.

Abutment Bearing - If in good condition and upon approval of Project Engineer, the existing top bearing plate 8"×¾"×1'-0¾" may be used in place of proposed 10"×1½"×1'-0¾" plate provided, however that a corresponding difference in thickness of ¾" is added to bottom plate, 9"×1¼"×1'-6½". Top plates are beveled for 2.2% grade.



CURB PLATE DETAIL

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Unclassified Excavation Item 503 shall also include excavation to limits of porous backfill shown under, behind and along sides of new abutments, less the volume occupied by removal of existing abutments.

Earthen Backfill along face of abutments is included in Item 503 for payment. See Section E-E and F-F on Sheet 7.

Porous Backfill Item 518 and 6" Perforated Pipe Item 518 are separately itemized for payment under, behind, and along sides of new abutments that are within the limits of Item 503.

6" Corrugated Metal Drain Pipe Item 518 measured from toe of abutments to outlet on spill through slope, is separately itemized for payment and includes 18" width trench excavation and backfill with porous material. 16'×4=64 Linear Feet.

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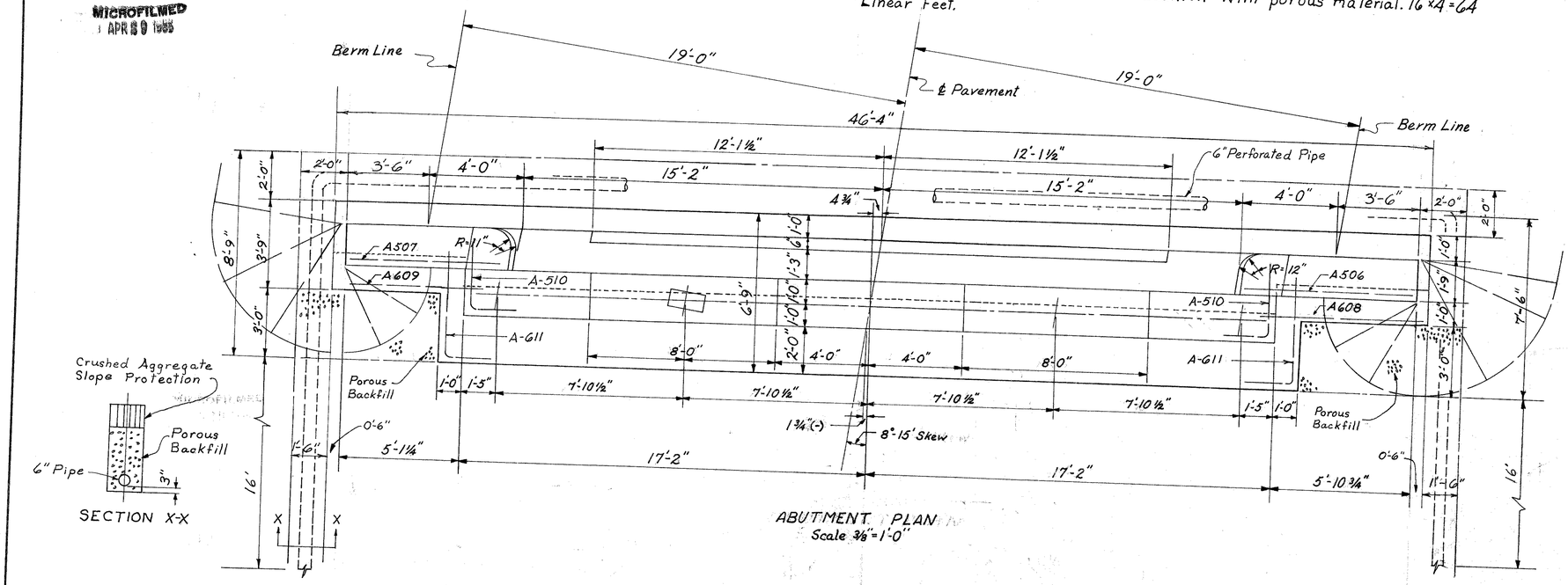
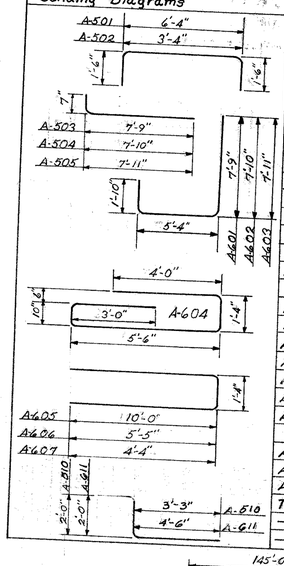
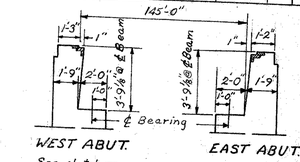


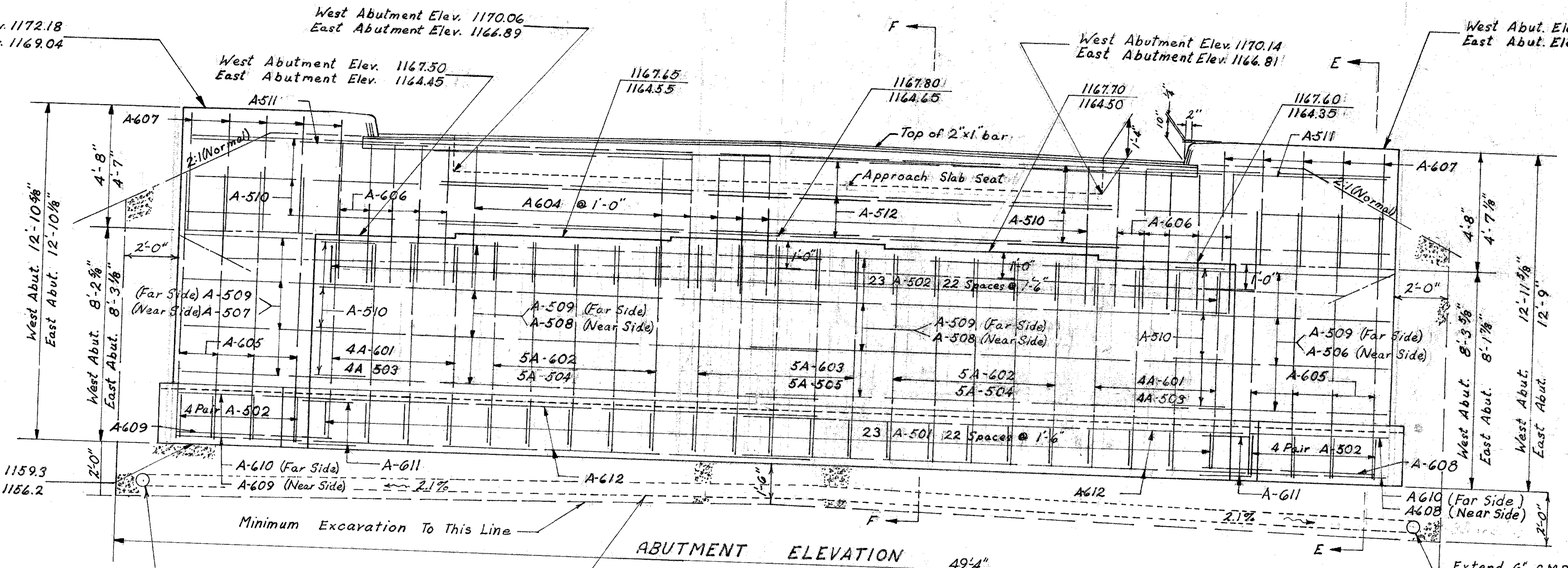
REINFORING STEEL LIST - ABUTMENTS

Bending Diagrams

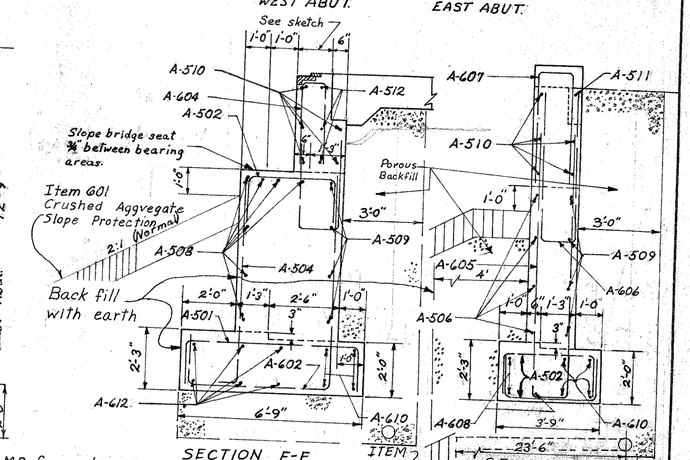


MARK	SPACING	No.	LENGTH	WEIGHT	SHAPE
A-501	1'-6"	46	9'-2"	440	B
A-502	1'-6"	78	6'-2"	502	B
A-503	1'-6"	16	8'-3"	138	B
A-504	1'-6"	20	8'-4"	174	B
A-505	1'-6"	10	8'-5"	88	B
A-506	1'-9"	8	7'-2"	60	S
A-507	1'-9"	8	6'-4"	53	S
A-508	SHOWN	28	19'-0"	555	S
A-509	1'-9"	16	23'-4"	389	S
A-510	1'-9"	16	5'-2"	87	B
A-601	1'-6"	16	14'-9"	355	B
A-602	1'-6"	20	14'-10"	445	B
A-603	1'-6"	10	14'-11"	224	B
A-604	1'-0"	48	14'-4"	1033	B
A-605	1'-0"	16	21'-2"	509	B
A-606	1'-0"	20	12'-0"	361	B
A-607	1'-6"	20	9'-10"	295	B
A-608	SHOWN	6	6'-11"	63	S
A-609	SHOWN	6	6'-2"	56	S
A-610	SHOWN	16	24'-0"	577	S
A-611	SHOWN	8	6'-5"	77	B
A-612	SHOWN	24	19'-0"	685	S
A-510	SHOWN	20	23'-4"	487	S
A-511	SHOWN	4	10'-0"	42	S
A-512	SHOWN	6	25'-0"	157	S
TOTAL				7,052	S
	RE 501	1	5'-7"		S
	RE 601	1	5'-11"		S





NOTE Calculations for Abutment Bridge Seat Elevations are shown on page 5.



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