LAWRENCE COUNTY	OHIO
LAW-650-07.16	FHWA REGION 5
STATE	FEDERAL PROJECT

1/7

STATE OF OHIO
DEPARTMENT OF TRANSPORTATION
LAW-650-0716

PLAN NO. BR-4-81

LAWRENCE COUNTY
STRUCTURE IMPROVEMENT-BRIDGE MAJOR REPAIR

CONVENTIONAL SIGNS

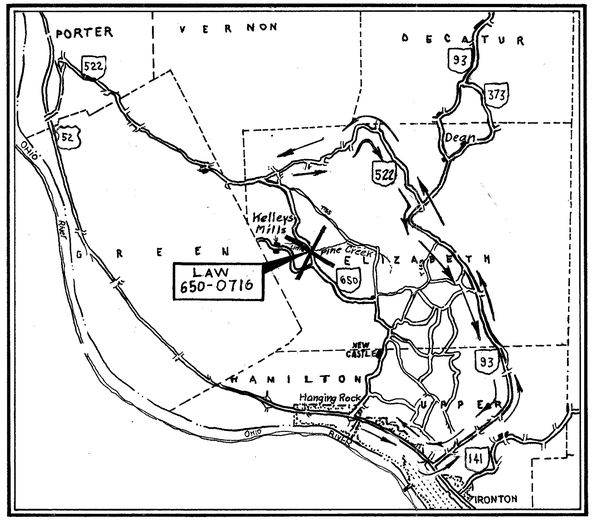
County Line
Township Line
Section Line
Corporation Line or
Fence Line (existing) (proposed)
Center Line 352 353
Trees, Stumps, (to be removed)
Utility Poles: Telephone, Power, Light.

Limited Access (only) LA
Right of Way (only) RW
Limited Access & Right of Way LA & RW
Existing Right of Way
Property Line (in existing fence)
Railroad or
Guardrail (existing) (proposed)

INDEX OF SHEETS

LINE DATA

Begin Work Sta.	37+12
End Work Sta.	40+00
Length of Work	288 ft. or .055 mi.
Begin Project Sta.	37+51.83
End Project Sta.	38+06.50
Length of Project	54.67 ft. or .010 mi.



LOCATION MAP

SCALE IN MILES
0 1 2 3 4 5 6 7 8

Portion to be improved
State & Federal Routes
Other Roads

SCALES

Plan 0' 20' 0'
Profile: Horizontal 0' 20' 0', Vertical 0' 1' 0'
Cross Section: Horizontal 0' 10' 0', Vertical 0' 10' 0'

1979 SPECIFICATIONS

The standard specifications of the State of Ohio, Department of Transportation, 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 provisions for the maintenance and safety of traffic will be as set forth on the plans and estimates.

SUPPLEMENTAL SPECIFICATIONS		
1001	1-3-77	

Approved James H. Watkins
Date 1-15-81 District Deputy Director of Transportation

Approved Robert B. Pfeifer
Date 2-6-81 Engineer, Bureau of Bridges and Structures

Approved Harold E. Hamm
Date 2-12-81 Chief Engineer, OPERATIONS

Approved David L. Miller
Date 2-13-81 Director, Department of Transportation

SUPPLEMENTAL PRINTS OF STANDARD CONSTRUCTION DRAWINGS					
BP5	4-16-79	Resurfacing			
DBR-2-73	4-10-73	Tubular Backup Br. Rail			
GR4A	7-26-76	Anchor Assembly, Type T			
GR2B	12-6-76	Type 5 Guard Rail			
GR3	12-6-76	Bridge Terminal Asbly			
GR4	12-6-76	Anchor Assembly Type A			
MC3	6-1-73	Barricades & Gates			
PSBD-1-71	9-1-71	Prestressed Beams			

Plan Prepared By:

SEAL

DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

APPROVED:

DIVISION ADMINISTRATOR DATE

Project:
Date of Letting 19, Contract No.

LD 0300 Rev. 11-1-78

Notes:

1. Left Rear - Drive sheet piling from end of existing & proposed wing end to El. 571 and fill area between piling and roadway with 203 Embankment (to El. 573) topped with 601 Rock Channel Protection or as directed by the Engineer.
2. Right Rear - Drive sheet piling from end of existing & proposed abutment to El. 569 and place 203 Embankment and 601 Rock Channel Protection as directed by the Engineer.
3. Left Fwd. - Form and place footing & extended beam seat & concrete wing.
4. Right Fwd. - Drive sheet piling. Place 203 Embankment, and anchors & dead men, and 601 Rock Channel Protection as directed by the Engineer.

For details of anchors & deadmen see Plan Sheet 5/7 & 6/7

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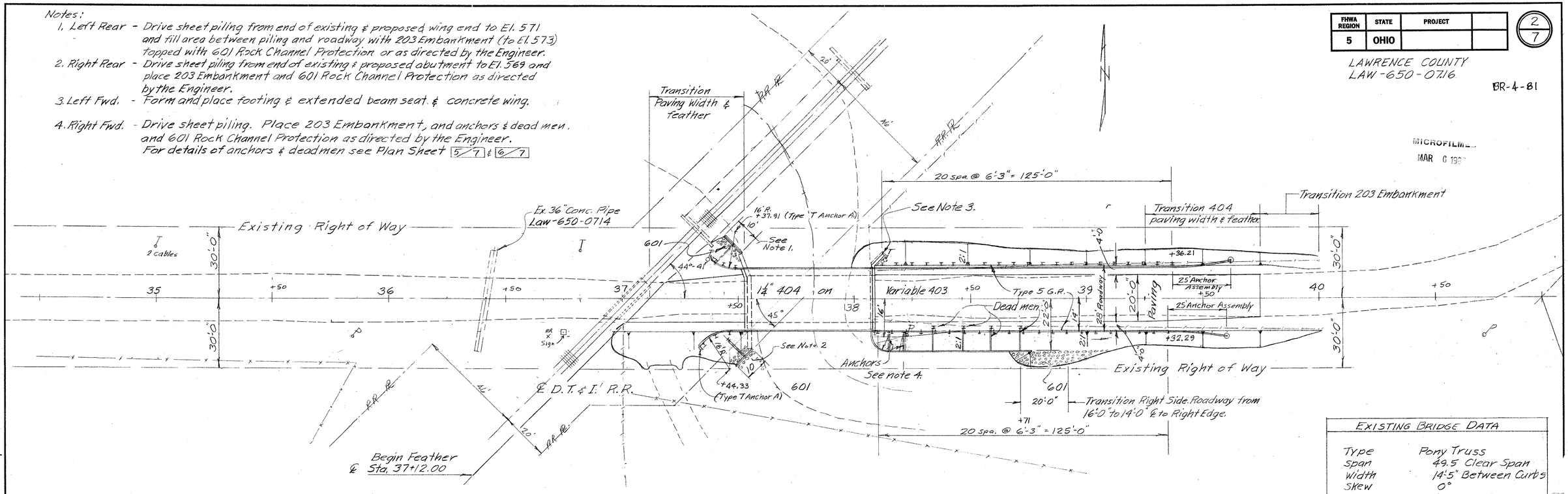
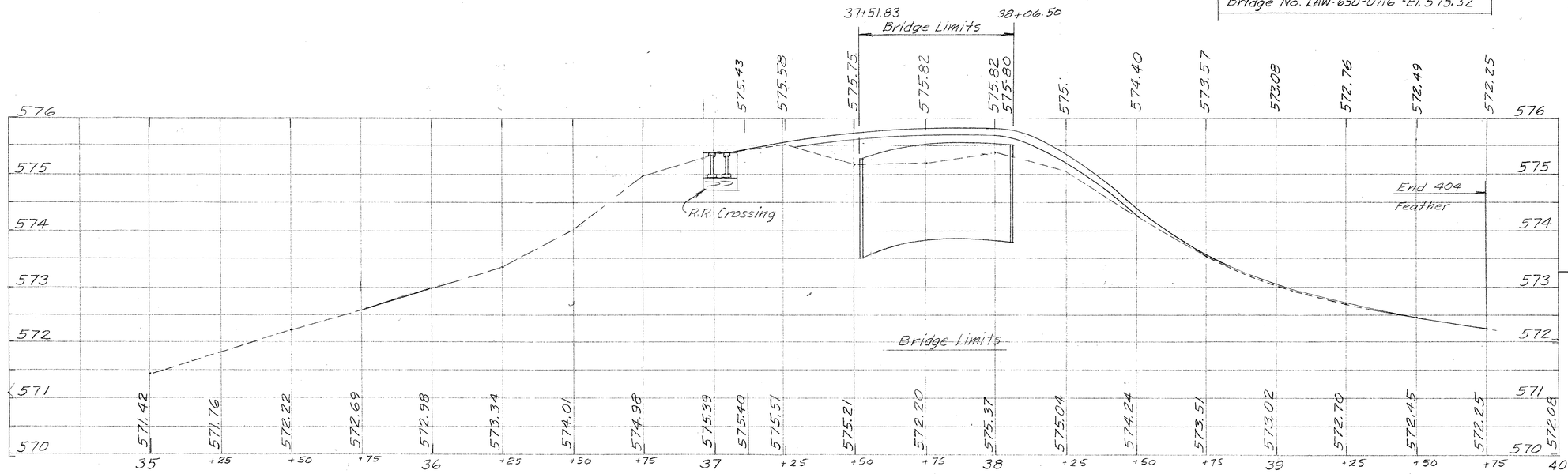
LAWRENCE COUNTY
LAW-650-07.16.

BR-4-81





EXISTING BRIDGE DATA

Type	Pony Truss
Span	49.5 Clear Span
Width	14'-5" Between Curbs
Skew	0°
SFN	4404297

PROPOSED BRIDGE DATA

Type	Prestressed Conc. Beams
Span	51'-6" c/c Brgs.
Width	26'-0" c/c Deck
Skew	0°
Loading	HS-20-44

STATE OF OHIO
DEPARTMENT OF TRANSPORTATION
DIST. 9 BRIDGE OFFICE

2/7

SITE PLAN

BRIDGE NO. LAW-650-0716
OVER LITTLE PINE CREEK

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
MSE	MSE	MSE	MPB	MPB	2-4-81	

FHWA REGION	STATE	PROJECT	
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LAWRENCE COUNTY
LAW-650-07.16 BR-4-81

DESIGN DATA:

LOADING: HS-20-44

CONCRETE CLASS "C" Unit Stress 1,200 p.s.i. Superstructure
Unit Stress 1,333 p.s.i. Substructure

CONCRETE FOR PRESTRESSED BOX BEAMS: Unit Stress 2,200 p.s.i. Compression
444 p.s.i. Tension

REINFORCING STEEL ASTM A615, A616 or A617
Unit Stress 20,000 p.s.i.

PRESTRESSED BEAMS

Design Loading
Live Load — HS-20-44 with Interstate Alternate Loading
Superimposed Dead Load 225 lbs per lin. ft.

Concrete Stresses
Minimum concrete strength @ 28 days f'c = 5,500 p.s.i.
Minimum concrete strength @ time of initial prestress.
f'c = 4,000 p.s.i.

Prestressing Strands, ½" Dia. 270 K seven wire, uncoated, ASTM A416
Stress relieved strand As = 0.154 Sq. In., Initial Stress 0.70 fs'
Initial Tension = 28,900 lbs. per strand.

Applicable PSBD-1-71 Details
1. Beam Lifting Inserts
2. Anchor Dowels (Fixed, Expansion, Dowel Clear of Brg. Pad)
3. Beam End Reinforcement, Transverse Tie Rods & Diaphragms.
4. Tie Rod Anchorage, Beam Dimensional Tolerances.
5. Non Composite Beams; B21-48, B21-36

Camber
Calculated camber at time of paving, including allowance for camber growth due to creep is 2¼". This is 2¼ in excess of the required value. See Paving Note.

Deck Width - The deck width dimensions will vary from 26'-0" to 26'-3" within the allowable beam width tolerance. The backwall & haunch at each abutment shall be constructed to correspond to the actual width of deck.

Existing Structure Verification: Details & dimensions shown on these plans pertaining to the existing structure have been obtained from plans of the existing structure and/or from field observations and measurements. Consequently, they are indicative of the existing structure and the proposed work but they shall be considered tentative and approximate. The Contractor is referred to CMS Sections 102.05 and 105.02.

Contract bid prices shall be based upon a recognition of the uncertainites described above and upon a prebid examination of the existing structure by the Contractor. However, all project work shall be based upon actual details and dimensions which have been verified by the Contractor in the field.

UTILITY LINES
The expense involved in relocating the affected utility lines shall be borne by the owners. The Contractor & Owners are requested to cooperate arranging their work in such a manner that inconvenience to either would be minimum.

EXISTING STRUCTURE REMOVAL
When no longer needed to maintain traffic the existing structure shall be removed. Suitable waste masonry may be placed as bank protection as directed by the Engineer.

EARTHWORK LIMITS, EMBANKMENT CONSTRUCTION & BERMS
The earthwork limits shown on the Site Plan are approximate. Actual slopes shall conform to the Plan Cross Sections and the berm area shall be placed so that the 617 compacted aggregate shall conform to the Edge Detail shown on the Plan Cross Section Sheet.

STEEL SHEET PILING
Steel sheet piling shall be INLAND I-22 Sections or equivalent and shall be supplied in 20 ft. lengths. It shall be driven so that the tops are at the Elevations shown on the plans.

DEAD MAN PILES:
Shall be supplied in 20 ft. lengths and driven to the depth specified. The bearing capacity requirements shall be waived but additional piling lengths shall be added if, in the opinion of the Engineer, they are inadequate to perform in the manner required.

ROCK CHANNEL PROTECTION - This is intended to line that portion of the embankment which spills around the forward end of the steel sheet piling and beyond, between the sheet piling and the low water line of the creek and the toe of the proposed fill and in other locations as directed by the Engineer. An estimated quantity of 27 C.Y. is provided.

NON-SHRINKING MORTAR: In lieu of the requirements for non shrinking mortar and grout given on Std. Dwg. PSBD-1-71, non shrinking mortar shall be made of materials & proportions as follows:
2680 lbs. Sand, 703.02 @ 6% Moisture
9 Bags Cement, 701.05
40 Gallons Water, 499.02
9 Lbs. Expanding Grouting Aid Admixture, Intraplast-N by Sika Chemical Corporation or approved equal.

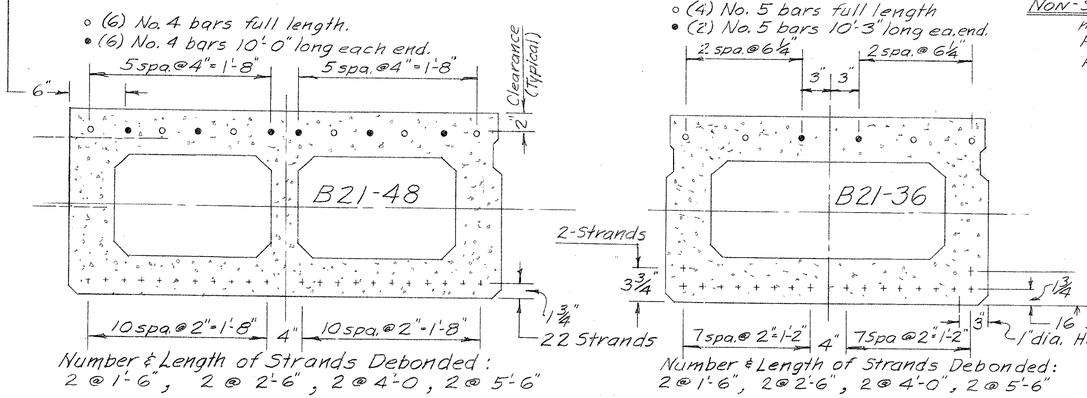
The cement sand & water shall be mixed first, after which the admixture shall be added. Batch size shall be limited so placement can be completed within 30 minutes. Water shall not be added to increase flowability which has been decreased by delayed use of mortar. Non-shrinking grout used to fill the beam keyway, tie rod recesses in the facia beams and the dowel holes shall be included with Item 515 for payment.

ROD BRACING TO DEAD MAN PILES
The steel sheet piling shall be attached to the 6 Dead Men provided under Item 507 and the 2 existing forward bearing piles by bolting rod braces to each. The cost of the above work including all labor, equipment and materials necessary shall be included in the unit cost bid for Item 507, steel sheet piling left in place. The minimum section modulus of 5.4 in³ per foot of wall.

ESTIMATED QUANTITIES

Item	Total	Unit	Description
202	Lump	Sum	Portions of Structure Removed, Pony Truss
202	5	Cu. Yds	Portions of Structure Removed, Abutment Conc.
203	562	Cu. Yds.	Embankment, As per plan
301	13	Cu. Yds.	Bituminous Aggregate Base
304	16	Cu. Yds.	Aggregate Base
403	34	Cu. Yds.	Asphalt Concrete (AC-20)
404	19	Cu. Yds.	Asphalt Concrete (AC-20)
407	66	Gals.	Tack Coat, SS-1, SS-1H, MS-2, RS-1 or RC-250
407	2	Tons	Cover Aggregate
503	9	Cu. Yds.	Unclassified Excavation
503	Lump	Sum	Cofferdams, cribs & sheeting
504	1,500	Sq. Ft.	Steel Sheet Piling left in place (minimum Section Modulus of 5.4 in³ per foot of wall.
507	120	Lin. Ft.	Steel Piles 10 BP42 x 20' long.
509	834	Lbs.	Reinforcing steel
510	130	Ea.	Dowel Holes
511	10	Cu. Yds.	Class C Concrete, Abutments & Wings
512	23	Sq. Yds.	Type B Waterproofing, Backwalls
512	158	Sq. Yds.	Type D Waterproofing, Prestressed Beams
513	1,550	Lbs.	Structural Steel Backup Beam
515	6	Ea.	Prestressed Conc. Bridge Members B21x36x52'-6"
515	1	Ea.	Prestressed Conc. Bridge Member B21x48x52'-6"
515	1	Ea.	Prestressed Conc. Bridge Member B21x48x54'-0"
516	8	Ea.	1" Elastomeric Bearing Pads 1"x5"x18"
516	24	Ea.	1" Elastomeric Bearing Pads 1"x5"x11"
516	32	Sq. Ft.	⅛" Preformed Bearing Pads ⅛"x5"x11"
517	109.34	Lin. Ft.	Railing - Deep Beam Railing with steel Tubular Backup & Steel Type 2 Posts & Bolts.
518	12	Cu. Yds.	Porous Backfill
519	10	Sq. Ft.	Patching Concrete Structures
601	27	Cu. Yds.	Rock Channel Protection Type C Without Bedding
606	4	Ea.	Bridge Terminal Assembly, Type B, As per plan.
606	2	Ea.	Anchor Assemblies, Type A
606	2	Ea	Anchor Assemblies, Type T, As per plan.
606	250	Lin. Ft.	Guardrail, Type 5, As Per Plan
617	10	Cu. Yds.	Compacted Aggregate
619	Lump	Sum	Field Office
623	Lump	Sum	Construction Layout Stakes
614	Lump	Sum	Maintaining Traffic
624	Lump	Sum	Mobilization
Special	73	Sq. Ft.	Steel Drip Strip

PRESTRESSED BEAM SECTIONS



STATE OF OHIO
DEPARTMENT OF TRANSPORTATION
DIST. 9 — BRIDGE OFC. — 3/7

GENERAL NOTES ESTIMATED QUANTITIES & BEAM SECTIONS

BRIDGE NO. LAW-650-0716
OVER LITTLE PINE CREEK

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
MSE	MSC	MSE	M.P.B.	M.P.B.	2-4-81	

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LAWRENCE COUNTY
LAW-650-07.16

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TYPE 5 GUARD RAIL 606, As Per Plan

Location of Guard Rail Runs

The location of guard rail runs, as shown in these plans are subject to adjustment to assure that the planned installations will afford maximum protection to traffic.

Guard Rail Posts on approaches shall be 6'-9" long including those in the Bridge Terminal Assembly, with minimum embedment of 3'-5".

Payment for the above shall be included in the unit price bid for Guard Rail, Type 5, As per plan.

BRIDGE TERMINAL ASSEMBLY - Type B, As per plan: Assembly shall be as per GR-3 except all posts encased in concrete shall be W6x25 Lb. galvanized steel posts. Payment for the above shall be included in unit price bid for Bridge Terminal Assembly, Type B, as per plan.

ANCHOR ASSEMBLY, Type T, As per plan: Assembly shall be as GR4A with the following modifications:

1. Posts shall be W6x15.5 Lb. galvanized steel with 4" minimum concrete encasement.
2. Brace rod plate shall have 5- 1⅛" dia. holes instead 3- 1⅛" dia. holes so that it can be used on either end of a run of guardrail. Payment for the above shall be included in the unit price bid for Anchor Assembly, Type T, As per plan.

DIMENSIONS & ELEVATIONS

The Contractor shall verify & confirm all dimensions and elevations which are shown on the plans.

519 CONCRETE PATCHING - An estimated quantity of 10 square feet has been provided to be used as directed by the Engineer.

BRIDGE SEAT REINFORCING

Reinforcing steel and anchor rods in the bridge seats shall be placed to avoid interference with the drilling of prestressed beam anchor dowels.

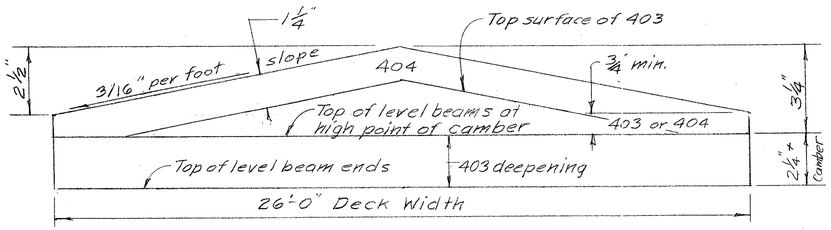
POROUS BACKFILL - shall be placed 1'-6" thick and to a depth of one foot below the beam seat, behind both the rear and forward proposed backwalls and shall extend up to the plane of the subgrade and laterally to the ends of the wing walls.

WATERPROOFING - The waterproofing to be applied to the tops of the prestressed beams shall be applied to the tops of the backwalls and included for payment in 512 Waterproofing, Type D.

EMBANKMENT, As per plan: The Contractor shall grade the slopes and break up any clods above the rock channel protection or the toe of the slope, and leave in a condition suitable for later seeding by State Forces. Include for payment in Item 203, Embankment, As Per Plan.

PAVING -

On Bridge - After the prestressed beams are placed on the level beam seats the 403 levelling course shall be placed on top of the level beams. The governing condition is the requirement that 3¼" minimum thickness of asphalt be placed at high point of camber at center of beam which comprises 2½" thickness to obtain standard crown in the half width of 13'-0" + a ¾" minimum thickness at edge. The 403 shall be deepened as required at the beam ends to compensate for beam camber and placed so that the top surface of the variable 403 is 1¼ below the proposed final grade, and on the standard crown of 3/16 per foot.



PAVING SCHEMATIC

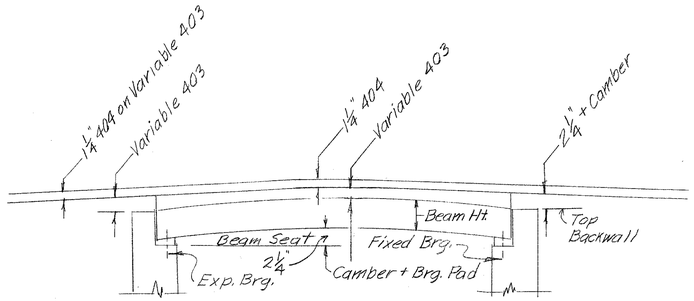
PAVING & Compacted Aggregate:

On Approaches:

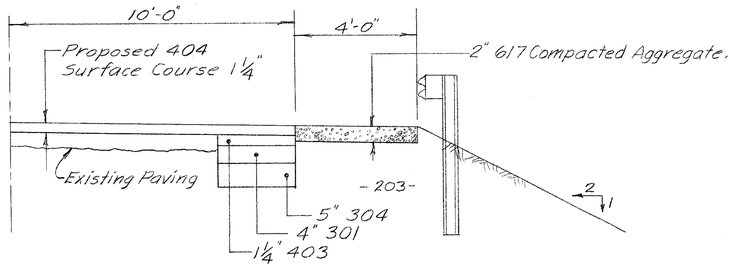
Asphalt Concrete Paving shall consist of a variable thickness of 403 placed so that the top surface is 1¼" below the proposed grade at the centerline and 1¼ below the ¾" per foot standard crown. The standard crown shall then extend to the edges of the pavment and conform to the Edge Detail Below. The work at the edge of the existing pavement shall be according to 617.04 and shall be included for payment in 617 Compacted Aggregate.

ROAD CLOSURE LIMIT

The road shall not be closed to detour until all material needed is on order or is in writing from supplier to be at job on proposed scheduled time. Road closure limit shall be 45 working days or 70 calendar days, whichever is the lesser.



CAMBER SCHEMATIC



EDGE DETAIL

PROPOSED WORK PROCEDURE

1. After Detour is set up remove pony truss.
2. Remove all concrete above bridge seats & remove & patch all deteriorated concrete below. All areas of bridge seat to be repaired shall be extended in depth so that no portion of replaced concrete shall be less 8" in thickness.
3. Rear Abutment - Drill & grout R601 bars to full depth of 12" on steps and beam seat and place proposed concrete beam seat and concrete above top of existing wings. Extend beam seat to support back wall if necessary.
4. Forward Abutment - Excavate for footing of abutment extension, place forms & reinforcing steel and concrete footing to construction joint.
5. Drill anchor holes in existing concrete for A1001 bars, grout in bars. Form & place extended beam seat back under backwall area leaving AN-601 bars to extend into wing area.
6. Place prestressed beams, mount bridge rail posts, attach drip strips, waterproof & place 1¼" wearing course for tempory use of bridge during subsequent operations.
7. Drive dead men anchors and sheet piling at Left Rear, Right Rear & Right Fwd.
8. Widen proposed roadway full length thru project.
9. Prepare shoulders in pavement widening areas and pave to 1¼" below final wearing course.
10. Place Bridge Rail and Guard Rail thru structure and on approaches.
11. Place 403 bituminous material in varying thicknesses to an elevation which is 1¼" below the proposed final wearing course elevation deepening the 403 as required over the ends of beams. (See Paving Schematic)
12. Place 601 Rock Channel Protection at Left & Right Rear & Right Forward and prepare slopes for seeding.

STATE OF OHIO
DEPARTMENT OF TRANSPORTATION
DISTRICT 9 BRIDGE OFFICE

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DETAIL NOTES & WORK PROCEDURE

BRIDGE NO. LAW-650-0716
OVER LITTLE PINE CREEK

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
MSE	MSE	MSE	M.P.B.	MPB	2-4-81	

FHWA REGION	STATE	PROJECT	
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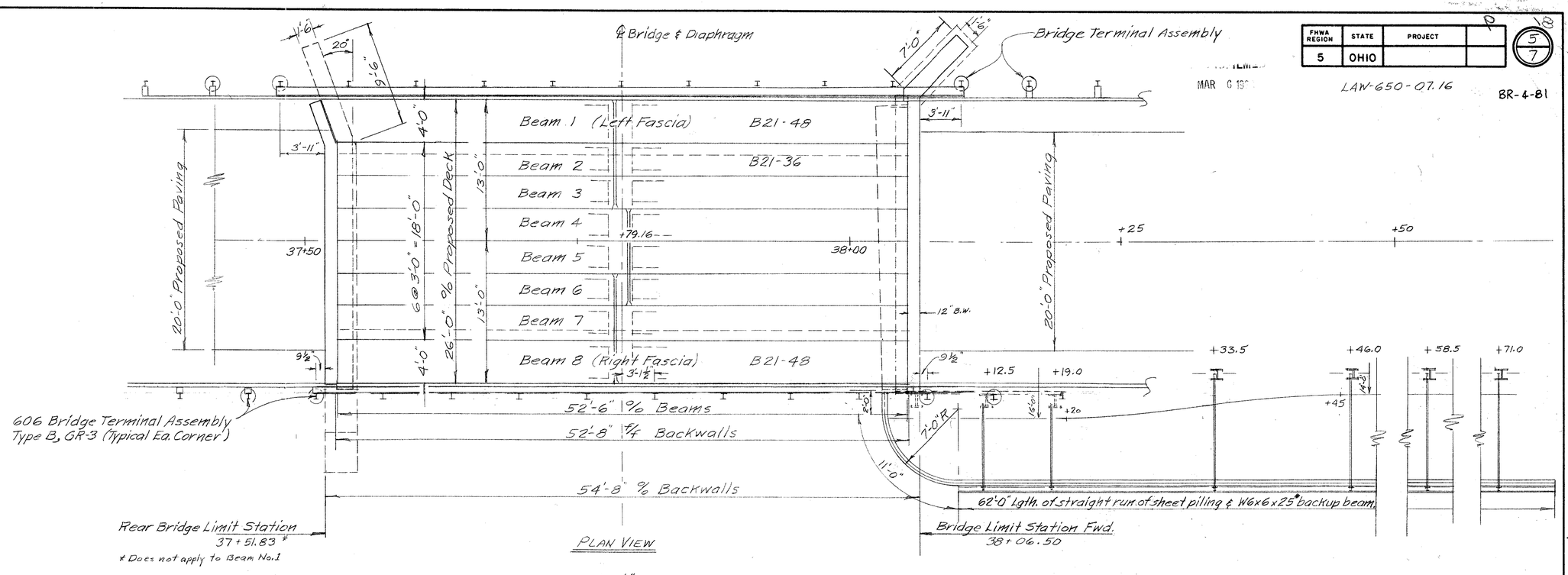

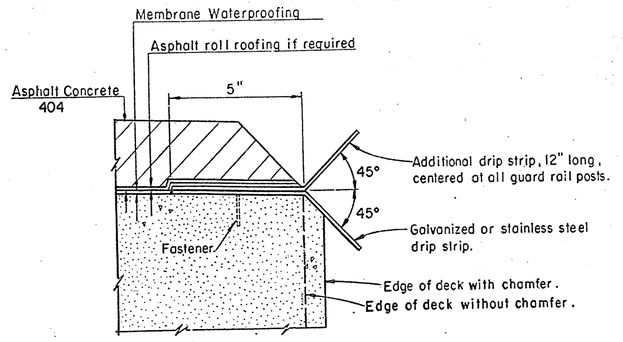

DRIP STRIP

DRIP STRIP: Prior to applying deck membrane waterproofing, a bent drip strip shall be installed along the edges of the deck as shown. The strips shall be fastened at 1'-6" ℄ maximum with $1\frac{1}{4}$"x$\frac{5}{32}$"x$\frac{1}{4}$" flat head drive pin and washer. (Length x Shank Dia. x Head Dia.) or #10 galvanized screws and expansion anchors, subject to the approval of the Engineer. The strips shall be placed the full length of the deck, ending at the face of the abutment wingwall or steel end dam angle. Where splices are required a 3" (Min.) lap shall be used with a fastener through the lap. Steel for galvanized strips shall be 8"x0.105" and shall meet the requirements of ASTM A568. Galvanizing shall be in accordance with 711.02. Stainless steel shall be 20 gauge ASTM A167, Type 304, mill finish. Payment shall be at the contract price bid for item Special, Sq. Ft., Steel Drip Strip, which shall include all materials, labor, tools and incidentals necessary to complete the item.

For additional details see PSBD-1-71 Sheets 1 thru 3 and Std. Dwg. DBR-2-73

STATE OF OHIO
DEPARTMENT OF TRANSPORTATION
DISTRICT 9 BRIDGE OFC.

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DETAIL PLAN & PRESTRESSED BEAMS

BRIDGE NO. LAW-650-07.16
OVER LITTLE PINE CREEK

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
MSC	MSC	MSC	MPB	MPB	2-4-81	

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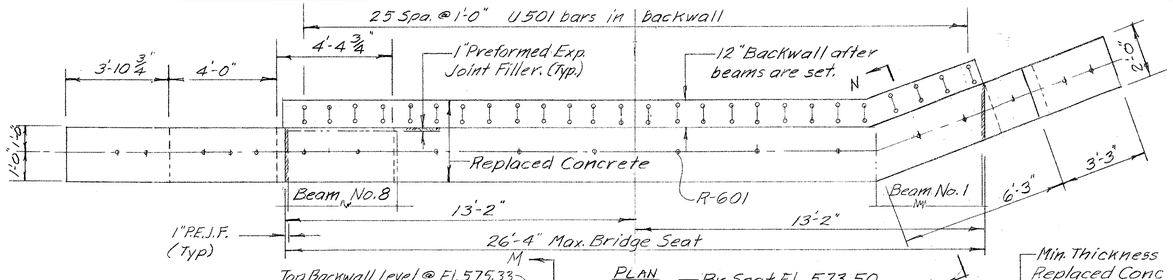
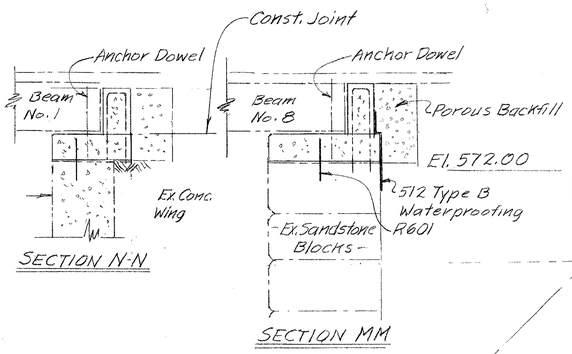
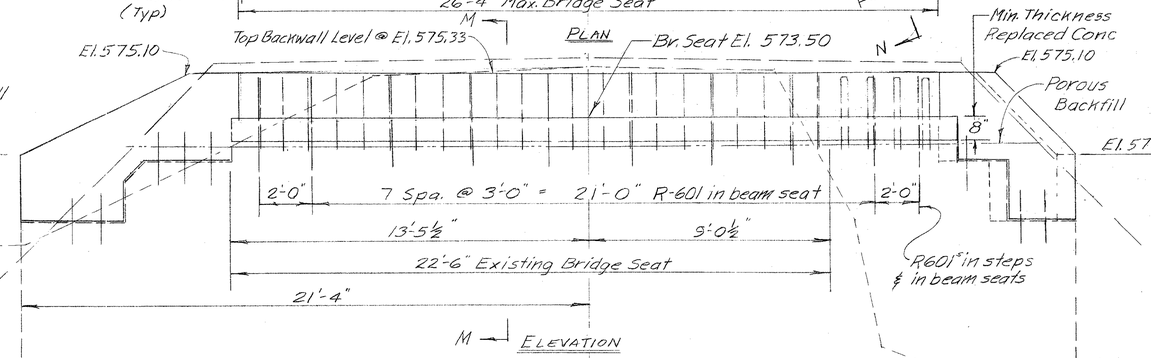
Notes:
1. Include any excavation or backfill at backwalls (exclusive of porous backfill) in 203 or 503 respectively.





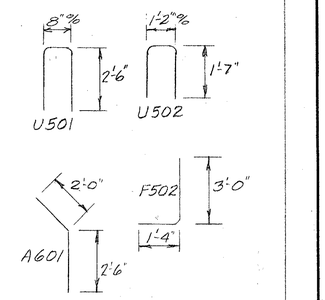


REAR ABUTMENT DETAIL

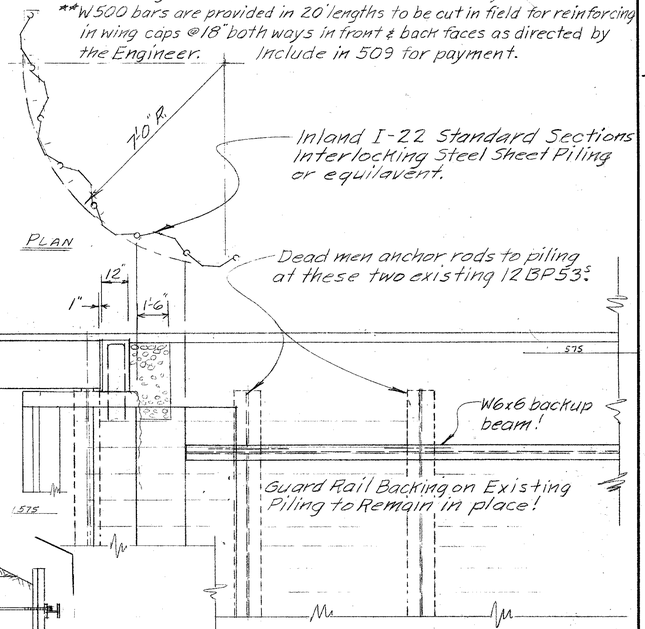
BACKWALL CONCRETE:
Backwall concrete above the bridge seat shall not be placed until after the beams are set.

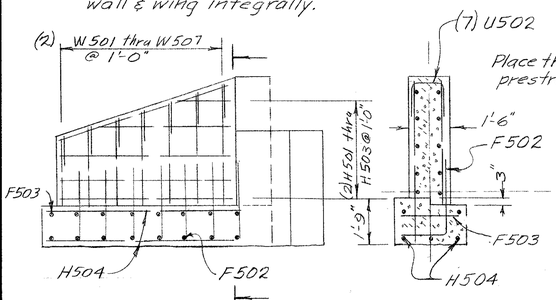
REINFORCING STEEL LIST

	Mark	No	Length	Weight	Shp	Description
*	U501	53	5'-5"	300	B	26 in Rear Abut., 27 in Fwd. Abut.
	U502	7	4'-4"	32	B	
	F503	8	2'-4"	20	S	
	F502	7	3'-8"	27	B	
	H504	5	7'-0"	37	S	
**	W500	6	20'-0"	125	S	
	W501	2	2'-6"	5	S	
	W502	2	2'-10"	6	S	
	W503	2	3'-2"	7	S	
	W504	2	3'-6"	7	S	
	W505	2	4'-0"	8	S	
	W506	2	4'-3"	9	S	
	W507	2	4'-6"	9	S	
	H501	6	6'-6"	41	S	
	H502	2	5'-0"	10	S	
	H503	2	2'-0"	4	S	
*	R601	18	1'-6"	41	S	
*	A601	10	4'-6"	68	B	
*	A1001	6	3'-0"	78	S	



*Bars to be grouted 1'-0" Minimum into existing concrete.
**W500 bars are provided in 20' lengths to be cut in field for reinforcing in wing caps @ 18" both ways in front & back faces as directed by the Engineer. Include in 509 for payment.

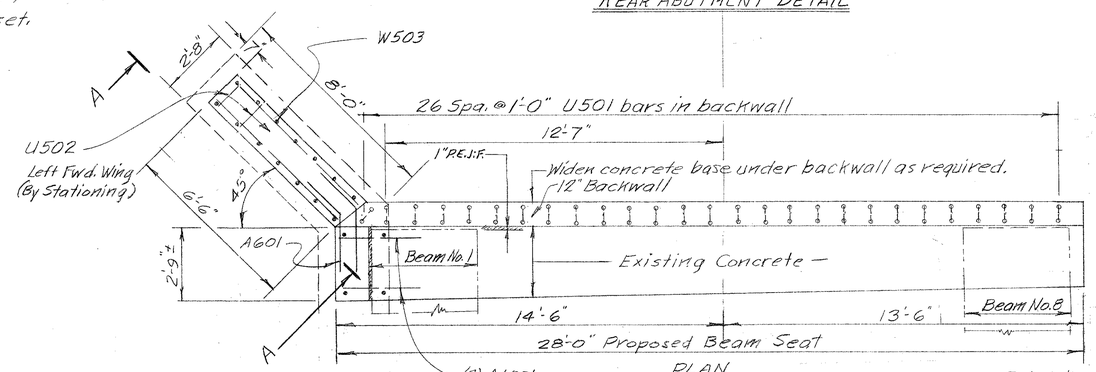


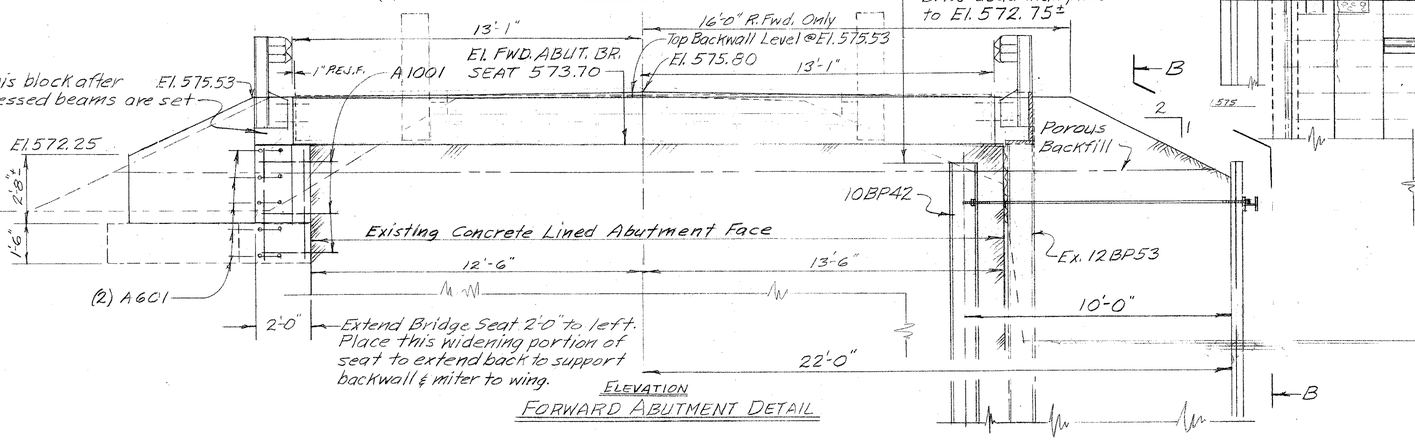


VIEW A-A
Left Forward Wing Wall

Left Forward Wing Placing Procedure:

1. Excavate for entire footing, cofter dams as required
2. Drill for & grout 6 footing ties A1001 and form & place entire footing.
3. Form & place only the portion of beam seat extended 2'-0" to left.
4. After beams are placed form backwall & wing integrally.





FORWARD ABUTMENT DETAIL

STATE OF OHIO
DEPARTMENT OF TRANSPORTATION
DISTRICT 9 BRIDGE OFFICE
6/7

ABUTMENT DETAILS

BRIDGE NO. LAW-650-0716
OVER LITTLE PINE CREEK

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REVISED
mse	mse	mse	MPB	MPB	2-4-81	

50 40 30 20 10 ℄ 10 20 30 40 50

375.43
37+12
575.40

Zero Quantities @ 37+12

36+75
574.98

574.01
Ex. 36" DIA R.C.P.
36+42

36+25
573.34

36+00
572.98

60'-0" Typical Right of Way

35+75

50 40 30 20 10 0 10 20 30 40 50

℄ 50 40 30 20 10 0 10 20 30 40 50

573.57
38+75
573.51

℄ 58 S.F.

64 C.Y.

574.40
38+50
574.24

℄ 80 S.F.

Note: Transition width of 20' at R.P. from
16'-0" ℄ to Right Edge at 38+20 to
14'-0" ℄ to Right Edge at 38+45
(See Site Plan)

AHEAD

161 C.Y.

575.61
38+06.50
575.04

℄ 120 S.F.

575.65
38+00
575.37

571

575.68
37+53.68
575.21

℄ 164 S.F.

Sheet Piling on Left
between Stations
37+46 to 37+50

BACK

141 C.Y.

Existing Paving Width Varies

575.58
37+25
575.51

℄ 101 S.F.

24 C.Y.

℄ 10 20 30 40 50

60'-0" Typical Right o..

40+00

11 C.Y.

Zero Quantities @ 40+00

572.25
℄ 24 S.F.
39+75
End Paving Feather
572.25

28 C.Y.

572.49
39+50
℄ 36 S.F.
572.45

38 C.Y.

4'-0" 20'-0" 4'-0"

572.76
℄ 46 S.F.
39+25

572.70

45 C.Y.

Proposed paving wid
20'-0" through e
length of p

573.08
39+00
573.02

50 C.Y.

40 30 20 10

LAW-65

10 X 10 TO THE INCH
KEUFFEL & ESSER CO.
MADE IN U.S.A.