

CURVE DATA	
P1	= 1028+31.65
D	= 12°
Δ	= 76°-26' Lt.
Ts	= 452.45
Es	= 9'
ts	= 150'
LT	= 100.13
Es	= 132.7'

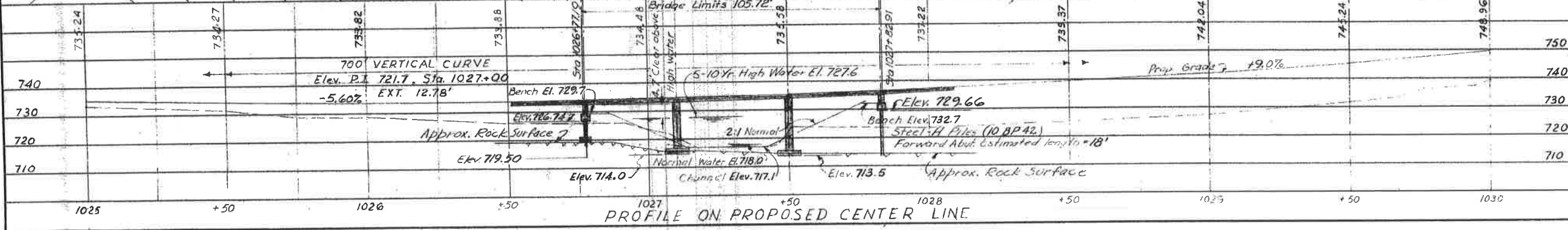
Drainage Area	= 17.4 Sq. Miles
Q ₂₅	= 5,330 CFS
Q ₁₀	= 4,250 CFS

EXISTING BRIDGE DATA	
Type	Pony Truss
Span	42'-0" c/c bearings
Roadway width	13'-0"
Skew	0°
Loading	H-6 Reduced
Wearing Surface	Bituminous
Suff. Rating	4-1
Channel Bottom	Mud
Abutments	Stone
Alignment	On curve
Date Built	After 1900
	WAS 555-1946 to be removed.

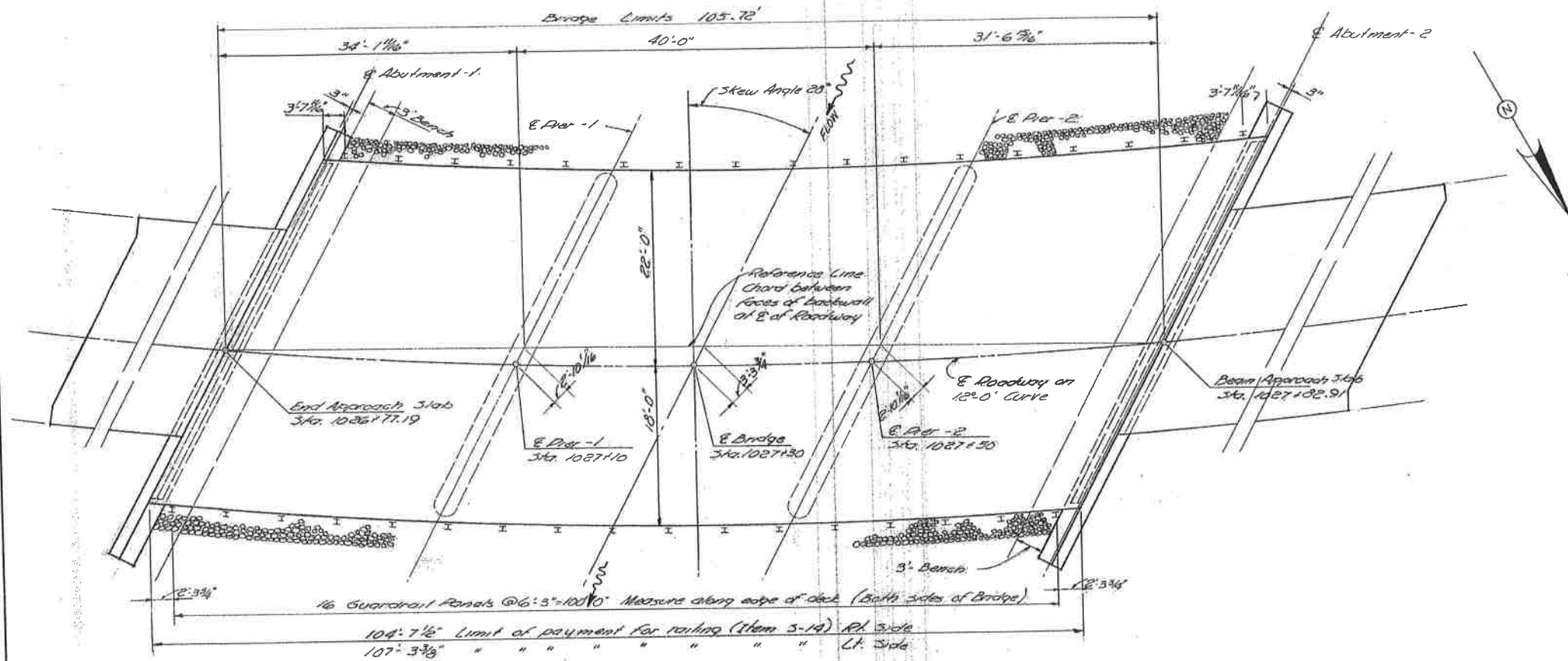
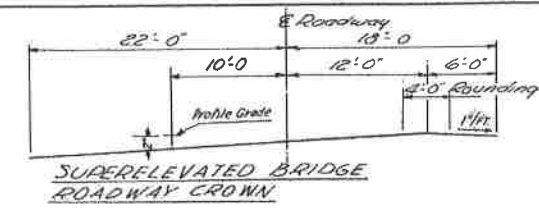
NOTES:
The watershed area of Coal Run is predominantly steep terrain and wooded with little cultivation. Cross Section of the stream channel is well defined and stable both above and below the proposed crossing. The channel bed is mud with some stones and gravel. Banks are steep, brushy and partially wooded. 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	Continuous Concrete slab with capped pile abutments & solid shaft piers
Roadway	40' face to face guardrail
Load Frequency	CF 130
Skew	28° Left Fwd.
Wearing Surface	3/4" Monolithic Concrete
Approach slabs	As-1-54 (25' long)
Alignment	12° Curve Left
Super-elevation	0.083%
Span	32'-40'-32" c/c Bearings
Curve Widening	4'

STATE OF OHIO DEPARTMENT OF HIGHWAYS BUREAU OF BRIDGES	
SITE PLAN	
BRIDGE NO.	WAS-555-1946
OVER COAL RUN	
WASHINGTON CO.	SR-555
STA. 1026+77.19 TO 1027+82	



SCALE 1"=20'	
PRESENT TOPOGRAPHY	
SURVEYED	DRAWN
Actual Survey	Actual Survey
PROPOSED WORK	
DESIGNED	DRAWN
AJM	KM
CHECKED	REVIEWED
AJM	AJM
10-12-61	



GENERAL NOTES

REFERENCE: shall be made to Standard Drawings CS-1-54, Sheets 1&2, and AS-1-54 all being dated July 1, 1954, with revision dates of 7-8-56 and 10-1-58 respectively.

DESIGN SPECIFICATIONS: This structure conforms to the requirements of "Design Specifications for Highway Structures" of the State of Ohio, Department of Highways, dated September 1, 1957, together with current revisions thereof.

BAR SIZE: For reinforcing steel is indicated in the bar mark. The first digit indicates bar size num. For example, #60 is a No. 6 size bar and #120 is a No. 12 size.

EXCAVATION QUANTITY: for the abutments includes the removal of fill material required for the construction of the abutments.

PILES: shall be driven to firm contact with shale. If the length of penetration is approximately equal to the depth of shale according to the bridge foundation investigation report, the firm contact shall be considered as attained when the capacity according to the formula in Sec. 8 is not less than the following value for a pile hammer of the indicated energy rating:
 For the Abutment 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. hammer
 If the energy rating of the hammer is between the ratings as shown above, the required capacity shall be determined by interpolation. The design load is 31 tons per pile for the abutment piles.

FOOTINGS: shall extend a minimum of 3" into the undisturbed clay bedrock, or to the elevation shown whichever is lower.

FOUNDATION BEARING PRESSURE: Pier footings are designed for a maximum bearing pressure of 2 tons per square foot. Abutment footings are designed for a maximum bearing pressure of 3 tons per square foot.

REMOVAL OF EXISTING STRUCTURE: When no longer needed to maintain traffic the existing structure shall be removed and disposed of in accordance with Item 3-24. Grading of existing abutment area as indicated on the site plan and as shown on sheet 7 shall be included in the Lump Sum price bid for this item.

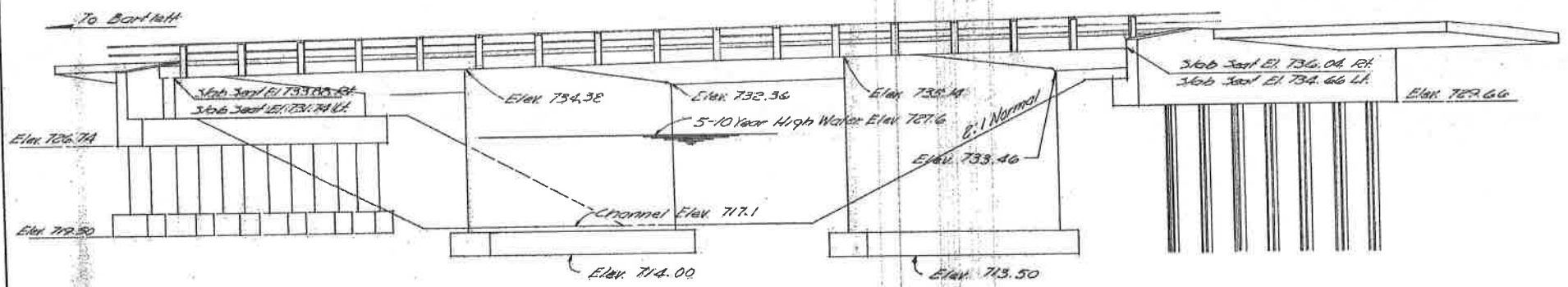
GENERAL PLAN
 Continuous Slab Bridge
 Type CS-1-54
 40' Roadway

Note:
 Slab thickness is 16 1/4" which includes 3/4" monolithic wearing surface.

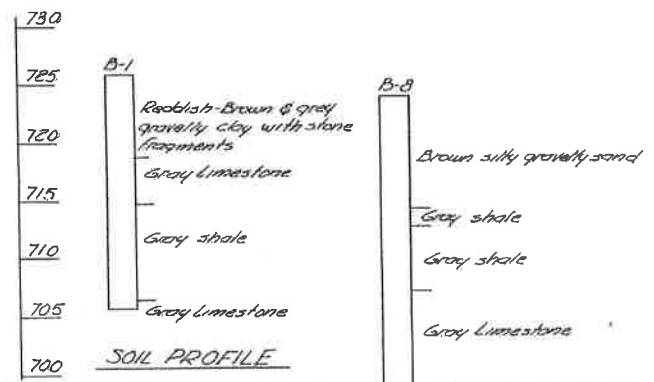
ESTIMATED QUANTITIES

Item	Total	Unit	Description	Super	Abut 1	Abut 2	Pier-1	Pier-2	Gen'l.
E-2	202	Cu. Yd.	Unclassified Excavation	56	34	40	72		
E-2	225	Cu. Yd.	Rock Excavation		7		7.5	8	
E-2		Lump	Sum Cofferdams, cribs & sheeting						Lump
S-1	214	Cu. Yd.	Class "C" Concrete (Superstructure)	214					
S-1	145	Cu. Yd.	Class "C" Concrete (Pier Shafts)				68	77	
S-1	39	Cu. Yd.	Class "C" Concrete (Abut. 1 above footing)		39				
S-1	46	Cu. Yd.	Class "E" Concrete (Pier & Abut-1 footing)		7		19	20	
S-1	35	Cu. Yd.	Class "E" Concrete (Abut-2 Cap)			35			
S-4	67,114	Lbs.	Reinforcing Steel	52,426	5458	2,846	3058	3326	
S-14	21,890	Lin. Ft.	Reinforcing (Type I-15.11 with dark steel posts & bolts)	21,890					
S-18	144	Lin. Ft.	Steel H Piles (108-P42)			144			
S-16		Lump	Sum First test pile						Lump
S-24		Lump	Removal of Existing Structure						Lump
S-29	29	Cu. Yd.	Removal Backfill		14	15			
I-10	418	Sq. Yd.	Crushed Aggregate Slope Protection		177	241			
S-20	214	Each	Water retaining, self retaining structure	214					

* See proposal



ELEVATION



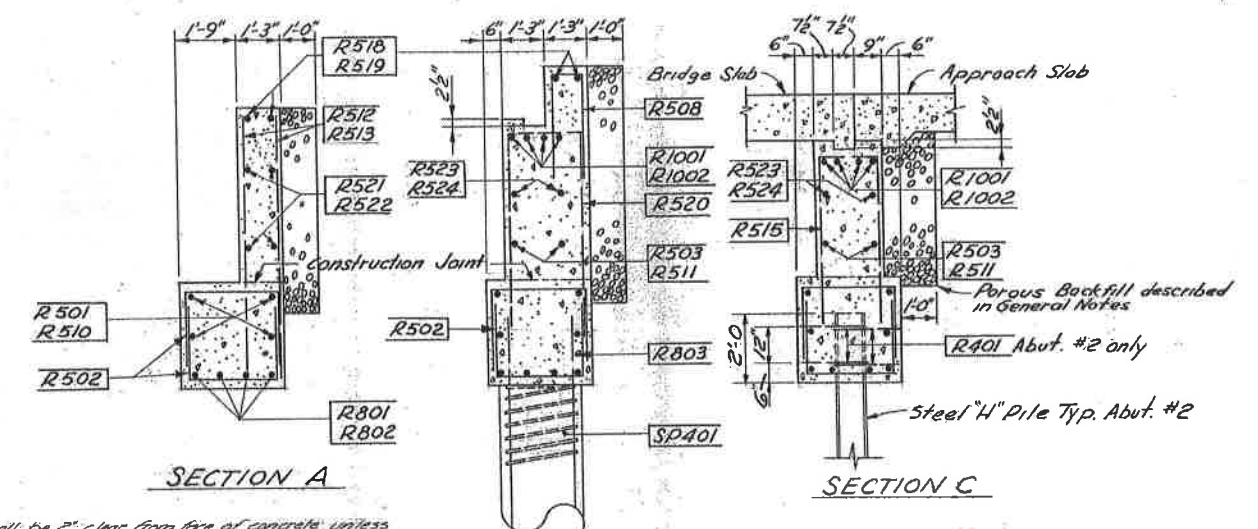
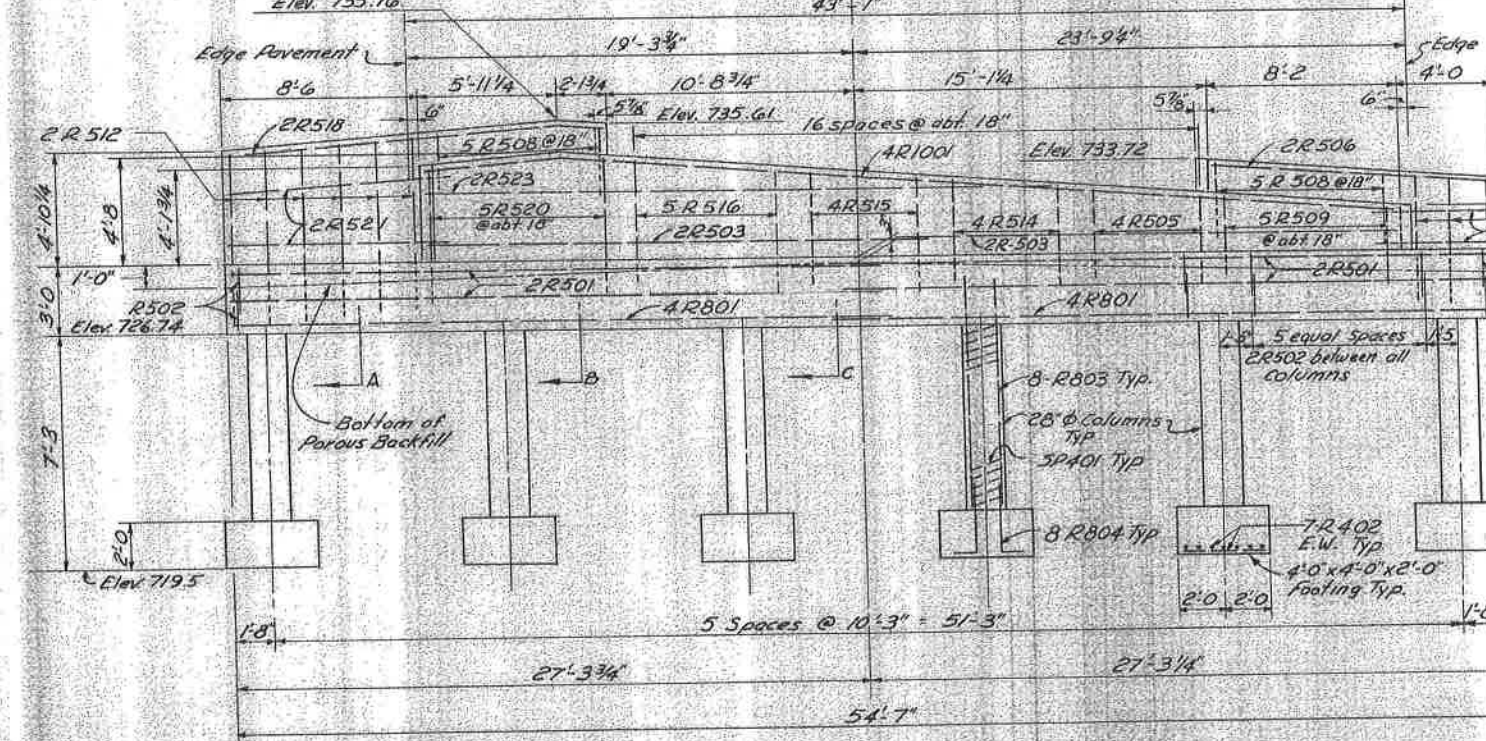
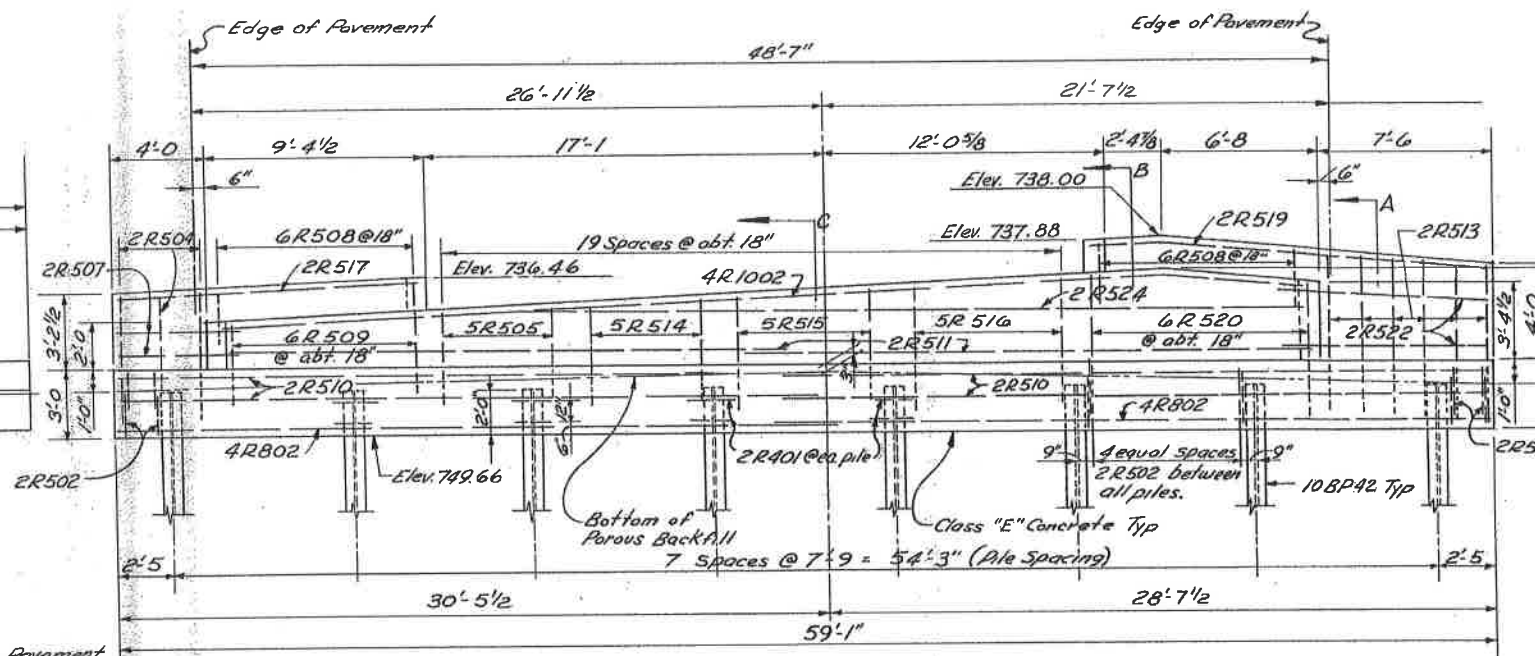
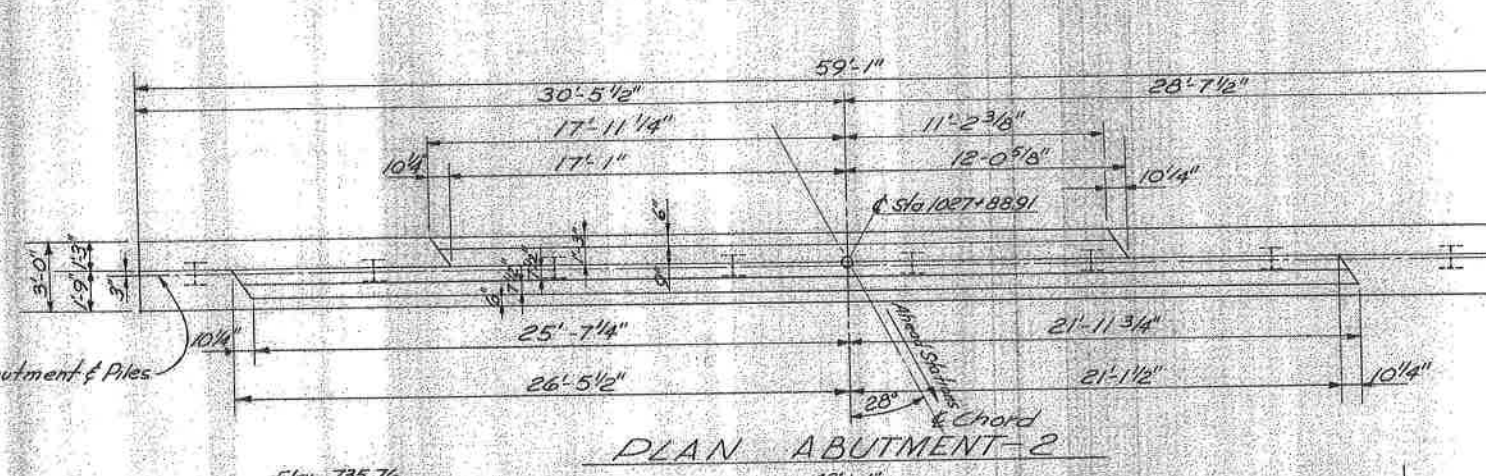
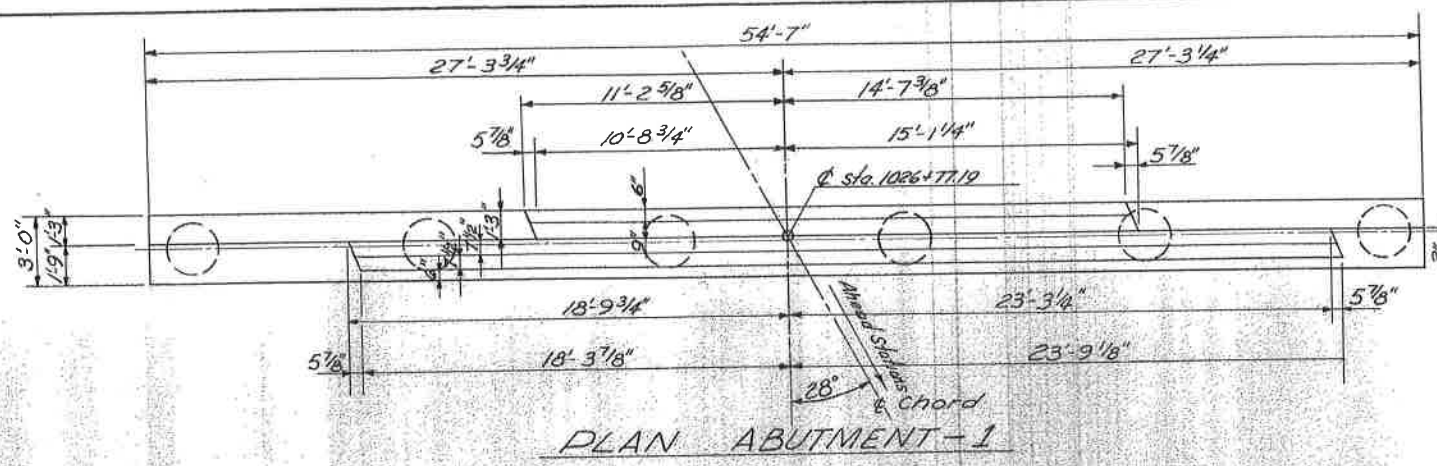
HARRY BALKE ENGINEERS
 990 NASSAU ST.
 CINCINNATI 6, OHIO

GENERAL PLAN & ELEVATION
ESTIMATED QUANTITIES & NOTES

BRIDGE NO. WAS.-555-1946
 OVER COAL RUN
 WASHINGTON COUNTY S.R. 555
 STA. 1026+77.19 TO 1027+82.1

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE
LTT	JKP	-	LTT	A. J. NEW	10-12-61

WASHINGTON COUNTY
 WAS.-555-19.35
 MRG-555-0.00



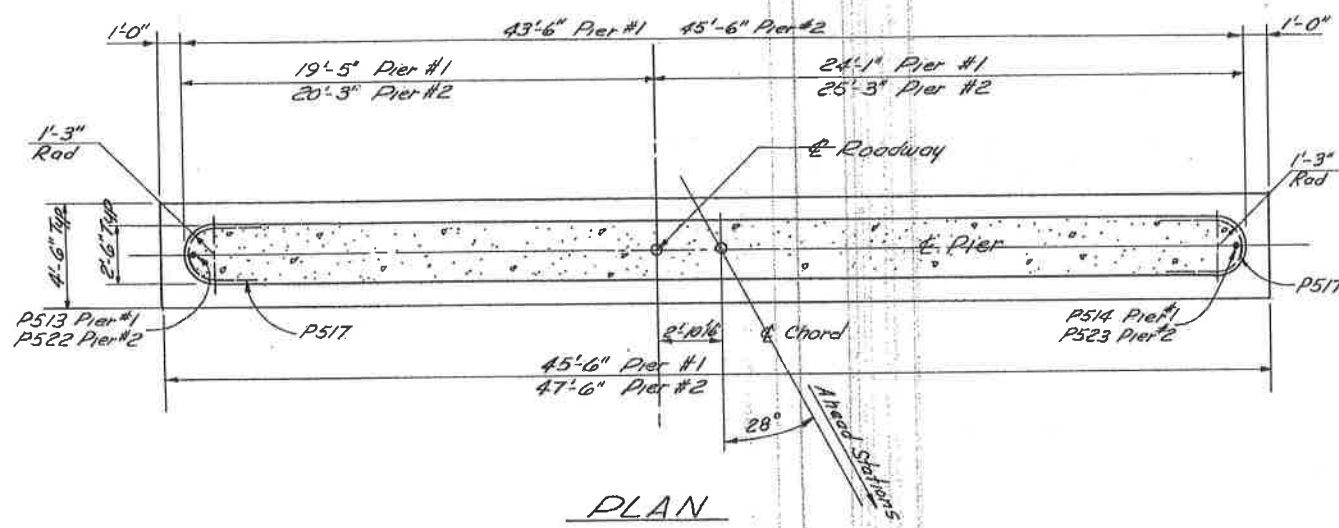
Note: REINFORCING STEEL shall be 2" clear from face of concrete unless otherwise shown.
 POROUS BACKFILL shall extend up to the underside of the approach slab and to the finished ground surface and out ward to the surface of the embankment slopes. Excavation therefore in excess of that required for the construction of the abutments shall be considered as paid for in the bid price per cu yd. paid for porous backfill.
 PROCEDURE: The embankment shall be placed and compacted to the height of the earth bench after which excavation shall be made for the abutments and the piles driven.

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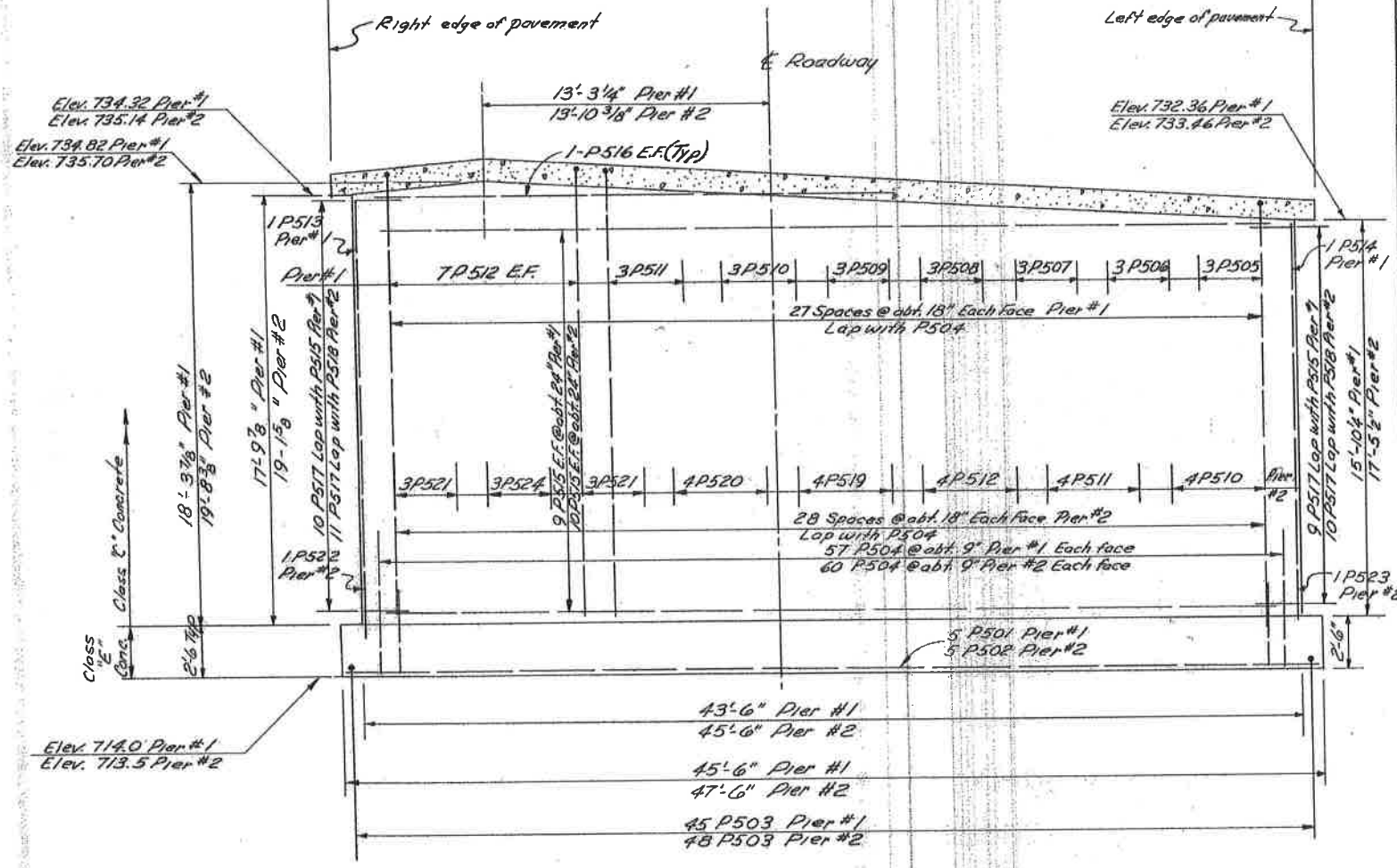
ABUTMENT DETAILS

BRIDGE NO. OVER COAL RUN WAS.-555-19.46
 WASHINGTON COUNTY S.R. 555
 STA. 1026+77.19 TO 1027+82

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE	REV.
LJT	JKD	NRK	LTT	A. J. Miller	10-12-61	



PLAN



ELEVATION
 LOOKING TO REAR

REINFORCING STEEL LIST

ABUTMENTS							PIERS						
Mark	Length	Shape	No.	Abut-1	Abut-2	Weight	Mark	Length	Shape	No.	Pier-1	Pier-2	Weight
R1001	41'-10"	Bent	4	4	—	720	P501	45'-0"	Str.	5	5	—	235
R1002	47'-3"	Bent	4	—	4	815	P502	47'-0"	Str.	5	—	5	245
R801	28'-4"	Str.	8	8	—	605	P503	4'-0"	Str.	93	45	48	388
R802	30'-7"	Str.	8	—	8	652	P504	4'-7"	Bent	234	114	120	1122
R501	27'-10"	Str.	8	8	—	233	P505	17'-7"	Bent	6	6	—	110
R502	6'-7"	Bent	142	64	78	975	P506	17'-11"	Bent	6	6	—	113
R503	21'-6"	Str.	4	4	—	90	P507	18'-3"	Bent	6	6	—	115
R504	5'-4"	Str.	12	6	6	66	P508	18'-7"	Bent	6	6	—	116
R505	8'-11"	Bent	9	4	5	84	P509	18'-11"	Bent	6	6	—	119
R506	11'-10"	Str.	2	2	—	25	P510	19'-3"	Bent	14	6	8	282
R507	4'-11"	Str.	8	4	4	42	P511	19'-7"	Bent	14	6	8	287
R508	6'-8"	Bent	22	10	12	154	P512	19'-11"	Bent	22	14	8	458
R509	8'-5"	Bent	11	5	6	97	P513	17'-8"	Str.	1	1	—	19
R510	30'-0"	Str.	8	—	8	241	P514	15'-8"	Str.	1	1	—	17
R511	24'-4"	Str.	4	—	4	102	P515	41'-0"	Str.	18	18	—	770
R512	7'-4"	Str.	12	12	—	92	P516	26'-0"	Str.	4	2	2	55
R513	6'-8"	Str.	12	—	12	84	P517	6'-0"	Bent	40	19	21	252
R514	9'-11"	Bent	9	4	5	94	P518	43'-0"	Str.	20	—	20	898
R515	10'-11"	Bent	9	4	5	103	P519	20'-3"	Bent	8	—	8	169
R516	11'-11"	Bent	10	5	5	126	P520	21'-7"	Bent	8	—	8	181
R517	13'-0"	Str.	2	—	2	27	P521	20'-11"	Bent	12	—	12	262
R518	16'-3"	Bent	2	2	—	35	P522	18'-10"	Str.	1	—	1	20
R519	16'-3"	Bent	2	—	2	35	P523	17'-3"	Str.	1	—	1	18
R520	12'-5"	Bent	11	5	6	143	P524	21'-3"	Bent	6	—	6	133
R401	5'-5"	Bent	32	—	32	116							
R402	3'-6"	Str.	84	84	—	197							
R521	9'-5"	Str.	4	4	—	39							
R522	8'-5"	Str.	4	4	—	35							
R523	26'-0"	Str.	2	2	—	54							
R524	35'-0"	Str.	2	2	—	73							
R803	7'-3"	Str.	48	48	—	930							
R804	5'-6"	Bent	48	48	—	705							

SPIRAL REINFORCING LIST

Mark	No.	Size	Core dia.	Length	Pitch	No. Turns	Weight
SP101	6	1/2" φ	2'-1"	5'-3"	4'-2"	17	513

NOTE:
 Spiral Reinforcing bars shall not have deformations, but shall in other respects conform to Item S-4.
 Three steel channel, tee or angle spacers weighing approximately 0.68 lb. per in. ft. of spacer shall be provided for each spiral unit. They shall be equally spaced around the periphery of the coil. The number of pounds of these spacers based on 0.68 lb. per ft. will be paid for as reinforcing steel and is included in the tabulated quantity of spiral bars.
 The length shown in the steel list is the distance from the top of the footing to the bottom of the abutment cap.
 One and one-half coils shall be provided at the ends of each spiral unit.
 The "No. of Turns" shown in the steel list is the "length" divided by the "Pitch" plus 3 turns (total number of closed coils) expressed as the nearest whole number.
 "M" and "N" bars in superstructure shall be field bent to contour of superstructure section.

SUPERSTRUCTURE

Mark	Length	Shape	No.	Weight
A928	37'-0"	Str.	117	14700
B928	26'-5"	Bent	38	3420
C928	23'-7"	Bent	38	3040
D928	24'-0"	Str.	19	1550
E928	17'-2"	Str.	19	1110
F1028	32'-0"	Str.	72	9840
G1028	18'-5"	Str.	34	2690
H1028	14'-6"	Str.	36	2240
J601	21'-2"	Str.	36	1142
K601	12'-2"	Str.	18	329
M701	44'-9"	Str.	87	7860
N601	44'-9"	Str.	67	4505
Total				67114

REPLACEMENT BARS

Mark	Length	Shape	No.
RE1001	7'-3"	Str.	2
RE901	6'-10"	Str.	2
RE801	6'-6"	Str.	1
RE701	6'-3"	Str.	1
RE601	5'-11"	Str.	1
RE501	5'-7"	Str.	1
RE401	3'-6"	Str.	1

NOTE:
 Replacement Bars. If reinforcing bars are fabricated from stock which has been previously tested and approved by the Ohio Highway Testing Laboratory test samples as provided in Sec. S-402 need not be furnished if replacement bars will not be required.

HARRY BALKE ENGINEERS
 990 NASSAU ST.
 CINCINNATI 6, OHIO

PIER DETAILS

BRIDGE NO. OVER COAL RUN WAS.-555-19.46
 WASHINGTON COUNTY S.R. 555
 STA. 1026+77.19 TO 1027+8

DESIGNED	DRAWN	TRACED	CHECKED	REVIEWED	DATE
LTT	NRK	LTT	A.J. MURPHY		10-12-41

SLAB DATA

LOAD FREQUENCY	SPANS	A, B, C, D, and E bars												F, G, and H bars												J-bars		K-bars		M-bars		N-bars					
		A - bars			B - bars			C - bars			D - bars			E - bars			F - bars			G - bars			J-60I		K-60I		M-60I		N-60I								
		Spccg	Lgth	dim b	Spccg	Lgth	dim b	Spccg	Lgth	dim b	Spccg	Lgth	dim b	Spccg	Lgth	dim b	Spccg	Lgth	dim b	Spccg	Lgth	Spccg	Lgth	Spccg	Lgth	Spccg	Lgth	Spccg	Lgth								
CF = 30	16'-20" - 16'	9	A 700	14 1/2	18-3	B 700	29	15-0	14-2	C 700	29	13-4	12-6	D 700	29	10-8	F 700	12 1/2	12-6	6-8	G 700	25	8-0	4-0	H 700	25	7-0	3-6	J	12-0	25	11-0	M 60I	48	16	41	44

LOAD FREQUENCY	SPANS	QUANTITIES PER FOOT OF WIDTH						GUARD RAIL	
		Concrete (Cu Yd)		Bitum Wearing Surface (Cu Yd)		Type "C" Waterproofing	Reinf. Steel	No. of Full Panels	Lin Ft Both Sides
		Mono Wearing Surface	Separate Wearing Surface	2 1/2" Thick	1 1/2" Thick	Sq. Yds.	Lbs		
CF = 30	16'-20" - 16'	1.62	1.54	0.41	0.31	5.9	404	8	107

Length = (R - 6") x secant of skew angle

Length = (R - 6") x secant of skew angle

* Dimension "t" does not include monolithic wearing surface.

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, A700 is a No. 7 size bar and A1014 is a No. 10 size.

GENERAL: This drawing provides design and general construction details. The project plans for each structure will show span lengths, roadway width, load frequency, skew, curve and super-elevation (if any), elevations, wearing surface, substructure details, estimated quantities, reinforcing steel list and other necessary details and special notes.

DESIGN SPECIFICATIONS: This standard drawing conforms to the requirements of "Design Specifications for Highway Structures" of the State of Ohio, Department of Highways, dated October 1, 1951, together with revisions thereof dated July 15, 1952, April 1, 1954 and February 1, 1955.

ADDITIONAL INTERIOR SPANS, similar to middle span, may be incorporated into the structure without change in slab thickness or area of reinforcing steel. In case of added spans, the project plans will show revised details and estimated quantities.

EXPANSION: Where the greatest distance between diagonally opposite corners of the superstructure, taking into account the sum of the spans, the width and the skew (if any), exceeds 175 feet, provision shall be made for expansion of the deck.

SKREW: For bridges with skew, longitudinal bars shall be placed parallel to centerline of roadway and transverse bars parallel to piers and abutments. For skews of 10° or less, longitudinal reinforcement as shown for non-skewed bridges may be used. For skews from 10° to 30°, "F", "G", and "H" bars shall be lengthened and "K" bars shortened an amount equal to 1/50 x R x S x tan θ. "F", "G", and "H" bars shall be placed as shown in Placement Diagram. (For skew greater than 30° another type of bridge should be used.)

SUPERELEVATION: For bridges on curves the concrete slab shall be super-elevated for full width of deck at the same rate as the approach pavement. The bituminous wearing surface shall be of uniform thickness for the full width of the slab.

MONOLITHIC WEARING SURFACE shall be 1/2" for Load Frequency of CF=30, 3/4" for CF=130, and 1" for CF=400 and CF=2000. Concrete quantities have been computed on this basis.

RAILING: Transition between guard rail height on bridge and on approaches shall be made in a distance of 100 feet from each end of bridge.

An upper hand rail and longer posts shall be provided if called for on the project plans. Guard rail and hand rail shall be painted white in accordance with section I-15.07 of the Construction and Material Specifications.

Galvanized posts and anchor bolts shall not be painted. Tabulated railing quantity is for the length of railing within the overall length of slab. The price per linear foot of railing includes payment for guard rail, hand rail (if called for), posts, anchors, connections, galvanizing and painting.

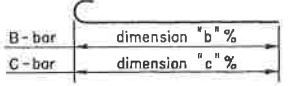
CONCRETE shall be class "C".

CONSTRUCTION JOINTS: One construction joint in bridge slab shall be placed on transverse centerline of middle span or 1'-0"± off transverse centerline if necessary to miss railing posts and transverse reinforcing bars. One longitudinal joint will be permitted on centerline of roadway.

REINFORCING STEEL CLEARANCE from face of concrete shall be 1 1/2" for #11 bars, 1 1/4" for #9 and #8 bars and 1" for all smaller bars. (The above clearances do not include monolithic wearing surface). Where two bars of different size are lapped, the clearance requirement for the larger bar shall also apply to the smaller bar.

REINFORCING STEEL: The "M" bars and "N" bars may be furnished in pairs of equal length, lapped thirty diameters at the centerline of roadway, or they may be furnished in pairs of different length in order to place the lap beyond a longitudinal construction joint at the centerline of roadway, at the option of the contractor. 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.

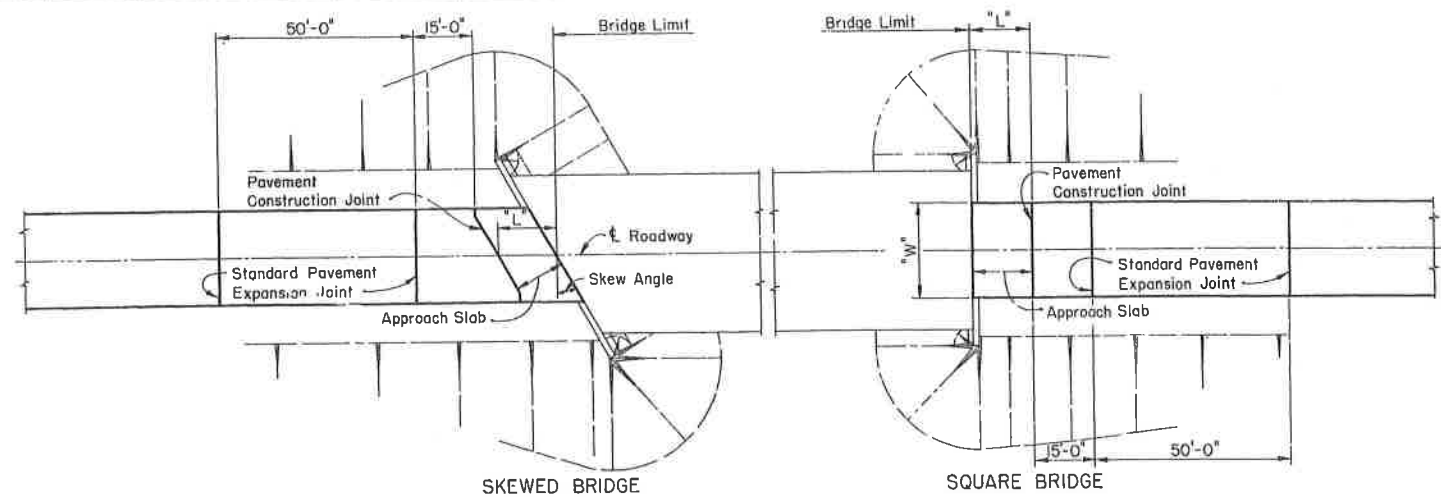
CAMBER of 1/800 of the span shall be provided in each span (in addition to any required for conformance with the profile of the highway) to allow for dead load deflection. This is the amount of camber required before falsework is released. To obtain this, proper allowance shall be made for the deflection of falsework members.



TYPE "C" WATERPROOFING QUANTITY as determined from the table shall have added to it the number of sq. yds on fascia of slab

REVISIONS	12-1-54	7-16-56
STATE OF OHIO DEPARTMENT OF HIGHWAYS DIVISION OF DESIGN AND CONSTRUCTION BUREAU OF BRIDGES	STANDARD	
CONTINUOUS SLAB BRIDGE WITHOUT CURBS AND WITH HIGHWAY GUARD RAIL MIDDLE SPAN 20 FEET TO 55 FEET LOAD FREQUENCY: CF = 30, CF = 130, CF = 400, CF = 2000		
APPROVED:	DATE: 7-1-54	DRAWING NUMBER: CS-1-54
PREPARED: RHL, CEJ, GFB, JOM, WHR	TRACED: CEJ	CHECKED: DW, MFB, FRH
REVISED: RICHARD DICK	DESIGNED: RICHARD DICK	ENGINEER OF BRIDGES
SHEET NO. 2		OF 2 SHEETS

RECORDED
MAR 09 1954
GENERAL NOTES



GENERAL PLAN
Showing Skewed and Square Approach Slabs

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 15 ft., 20 ft., or 25 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.

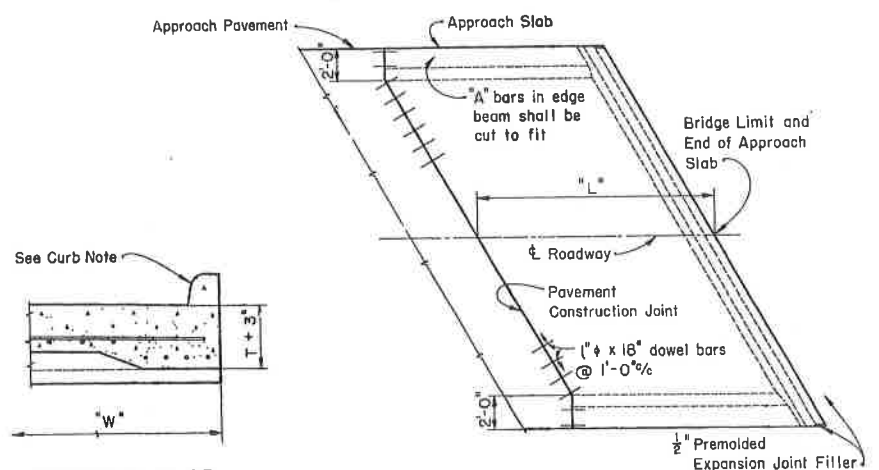
PREMOLDED EXPANSION JOINT FILLER at the edges of the approach slab shall be included with the approach slab for payment.

CURBS: If raised curbs on approach slab are called for on the project plans, they shall be of the same shape and height as the curbs on the approach pavement unless otherwise shown on such plans.

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.

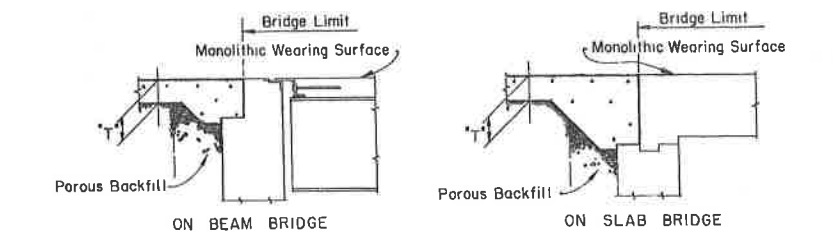
WEARING SURFACE: If a bituminous wearing surface is specified for the bridge, it also shall be used on the approach slabs.

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

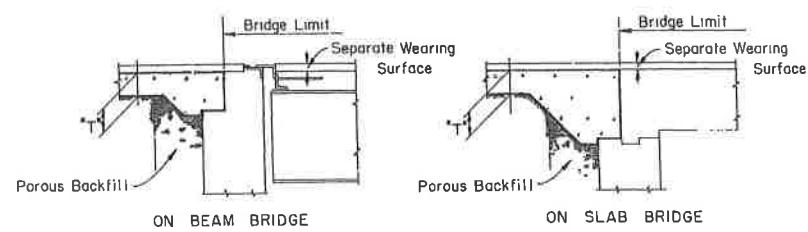


APPROACH SLAB WITH CURBS

APPROACH SLAB FOR SKEWED BRIDGES

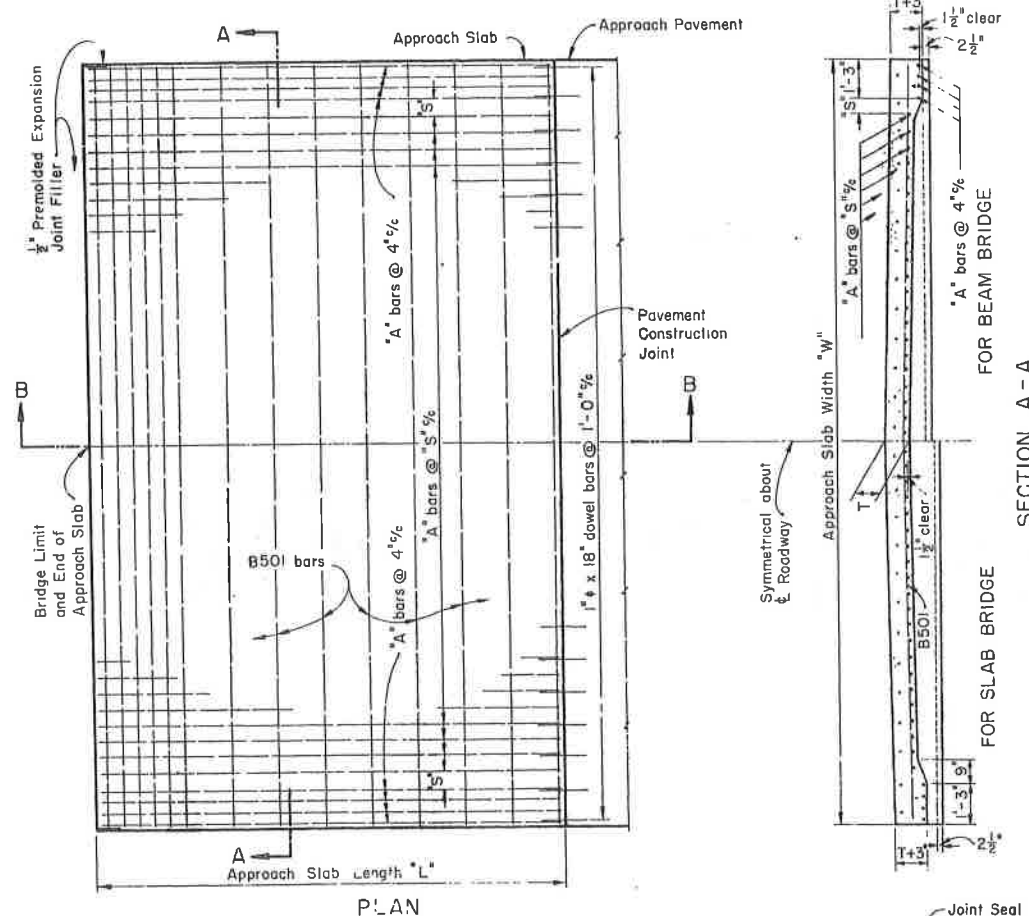


WITH MONOLITHIC WEARING SURFACE

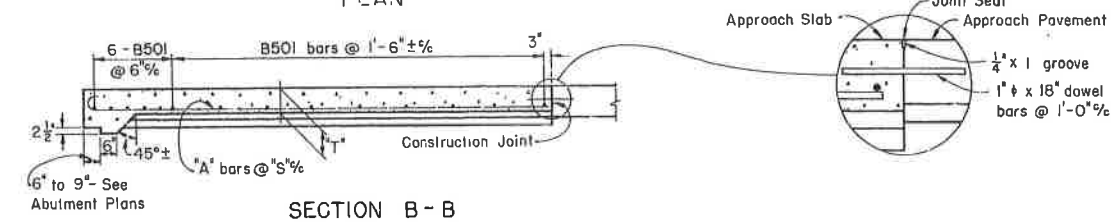


WITH SEPARATE WEARING SURFACE

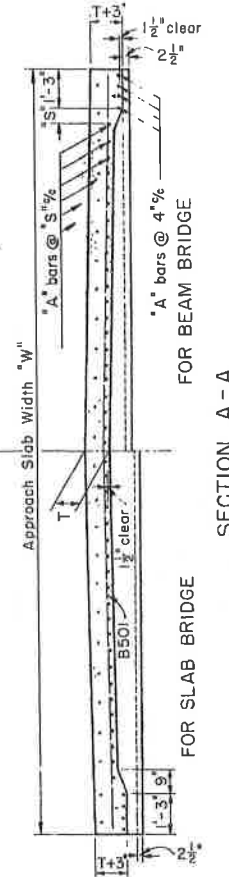
TYPICAL SECTIONS SHOWING JUNCTION OF APPROACH SLAB WITH BRIDGE



PLAN



SECTION B - B



SECTION A - A

REINFORCING STEEL (FOR ONE APPROACH SLAB)							
Length "L"	Thick- ness "T"	"A" BARS				B501	
		Spcc "S"	Mark	Length	Dimension "A"	No. req'd.	Length No. req'd.
15'-0"	10"	6"	A801	15'-7"	14'-6"	$\frac{W}{2} + 7$	14
20'-0"	11 1/2"	7"	A802	20'-7"	19'-6"	$\frac{W-2.5}{2} + 5$	17
25'-0"	13"	6"	A803	25'-7"	24'-6"	$\frac{W-0.5}{2} + 7$ (W-0.5)(sec. 6)	20

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

REVISIONS 12-1-54	STATE OF OHIO DEPARTMENT OF HIGHWAYS DIVISION OF DESIGN AND CONSTRUCTION BUREAU OF BRIDGES
STANDARD REINFORCED CONCRETE APPROACH SLABS LENGTHS - 15'-0", 20'-0" AND 25'-0"	
APPROVED: DATE: 7-1-54 PREPARED BY: MPS CFB JCM WRR	ENGINEER OF BRIDGES TRACED CEJ CHECKED CSD REVIEWED BFG OHA AJP OHG
DRAWING NUMBER AS-1-54	