

INDEX OF SHEETS

- 1. TITLE SHEET
- 2. GUARD RAIL LUG
- 3. FLARED CURB AND GUTTER
- 4. 8" PIPE SLOPE DRAINS
- 5. STANDARD NOTES
- 6. STANDARD DETAILS
- 7. BRIDGE PLAN & PROFILE - GILLS CREEK
- 8. BRIDGE PLAN & PROFILE - BRIDGE CREEK
- 9. BRIDGE PLAN & PROFILE - CEDAR CREEK
- 10. BRIDGE PLAN & PROFILE - DRY BRANCH
- 11. 14" SQ. PRESTR. CONCRETE PILING
- 12.-13. END & INT. BENTS
- 14.-15. SUPERSTRUCTURE DETAILS
- 16. END & INT BENTS - BRIDGE CREEK, CEDAR CREEK, & DRY BRANCH
- 17. SUPERSTRUCTURE DETAILS - BRIDGE CREEK & CEDAR CREEK
- 18. SUPERSTRUCTURE DETAILS - DRY BRANCH
- 19.-22. EXISTING ROAD PLAN & PROFILE
- 23.-26. EXISTING BRIDGES
- 27.-34. PLAN & PROFILE
- 35.-42. R. C. BOX CULVERTS
- 43. CROSS SECTION
- 44. UNTREATED TIMBER CUT-OFF WALL

SOUTH CAROLINA  
STATE HIGHWAY DEPARTMENT  
COLUMBIA

PLAN AND PROFILE OF PROPOSED  
STATE HIGHWAY

STATE PROJECT NO. A-720  
FILE NO. 40.720  
RICHLAND COUNTY  
ROUTE 48

WIDENING BRIDGES OVER  
GILLS CREEK, BRIDGE CREEK,  
CEDAR CREEK, AND DRY BRANCH  
AND  
EXTENDING 8 CULVERTS

FED. ROAD DIV. NO.	STATE	COUNTY	FILE NO.	STATE PROJ. NO.	ROUTE NO.	SHEET NO.	TOTAL SHEETS
3	S. C.	RICHLAND	40.720	A-720	48	1	44

SUMMARY OF ESTIMATED QUANTITIES							
ITEM	UNIT	CULVERTS	GILLS CREEK	BRIDGE CREEK	CEDAR CREEK	DRY BRANCH	TOTALS
CONCRETE, CLASS 'A'	C.Y.	411.7	181.2	161.5	237.5	122.9	1,114.8
REINFORCING STEEL	LBS	51,655	37,436	35,989	53,231	27,350	205,661
14" SQ. PRESTR. CONCRETE PILING	L.F.		784	910	1,330	760	3,784
8IN. PIPE SLOPE DRAINS	L.F.		40	40	40	40	160
INTAKE SPILLWAY ASSY.	EA.		4	4	4	4	16
UNTREATED TIMBER CUT OFF WALL	L.F.	397					397
UNCLASSIFIED EXCA. FOR CULVERTS	C.Y.	700					700

WIDEN 125' R.C. BRIDGE OVER GILLS CREEK S.B.L.  
FROM STA. 202+58.00 TO STA. 203+83.00

SINGLE 4'X4'X65.0' R.C. CULVERT STA. 275+15  
TO BE EXTENDED 4'-0" LT.

DOUBLE 10'X10'X52.0' R.C. CULVERT STA. 31+00  
TO BE EXTENDED 8'-6" LT. & 8'-6" RT.

QUADRUPLE 8'X4'X45.2' R.C. CULVERT STA. 68+50  
TO BE EXTENDED 9'-6" RT.

WIDEN 101' R.C. BRIDGE OVER BRIDGE CREEK  
FROM STA. 351+86.50 TO STA. 352+87.50

WIDEN 151' R.C. BRIDGE OVER CEDAR CREEK  
FROM STA. 500+34.50 TO STA. 501+85.50

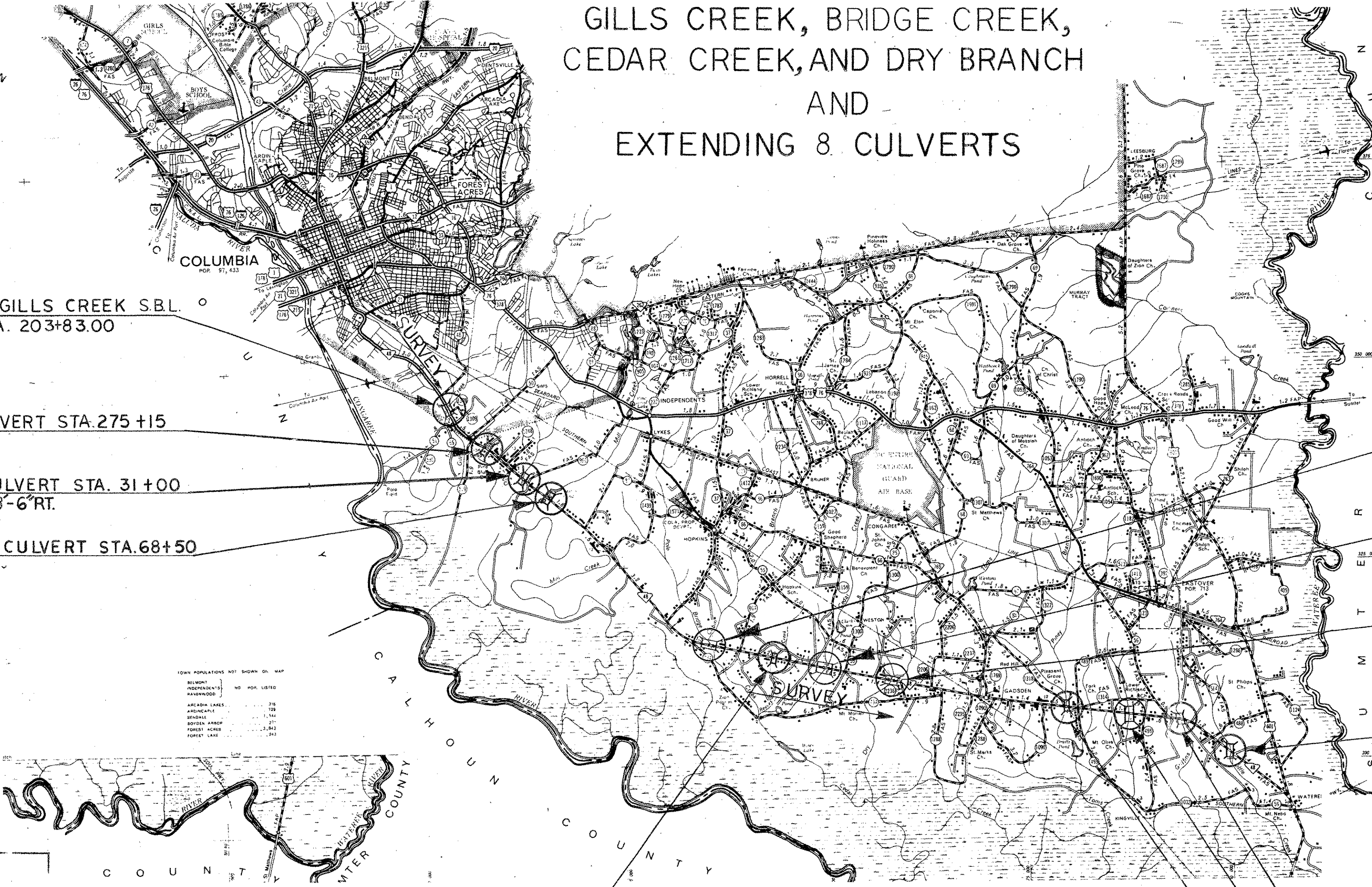
WIDEN 76' R.C. BRIDGE OVER DRY BRANCH  
FROM STA. 585+12.00 TO STA. 585+88.00

DOUBLE 8'X8'X32.0' R.C. CULVERT STA. 1028+00  
TO BE EXTENDED 9'-0" LT. & 9'-0" RT.

QUADRUPLE 10'X8'X32.0' R.C. CULVERT STA. 958+40  
TO BE EXTENDED 9'-0" LT. & 9'-0" RT.

DOUBLE 6'X6'X36.0' R.C. CULVERT STA. 889+65  
TO BE EXTENDED 8'-0" LT. & 8'-0" RT.

QUADRUPLE 12'X11'X31.8' R.C. CULVERT STA. 810+75  
TO BE EXTENDED 9'-0" LT. & 9'-0" RT.



CONVENTIONAL SIGNS	
State Line	Trolley Poles
County Line	Power Poles
City or Town Limits	Telephone or Telegraph Poles
Property Line	Marsh
Fence	Trees
Retaining Wall	Brush
Existing Road	Stumps
℄ and R.O.W. Lines of	Buildings
Proposed Road	Bridge
Railroad	Concrete Box Culvert
Levee or Embankment	Pipe Culvert
Guard Rail	Drop Inlet and Culvert
Point of Intersection (P.I.)	Hub on Center Line

SINGLE 6'X6'X50.0' R.C. CULVERT STA. 437+40  
TO BE EXTENDED 5'-0" LT. & 5'-0" RT.

LEGEND	
PROPOSED PROJECT	
OTHER ROADS	

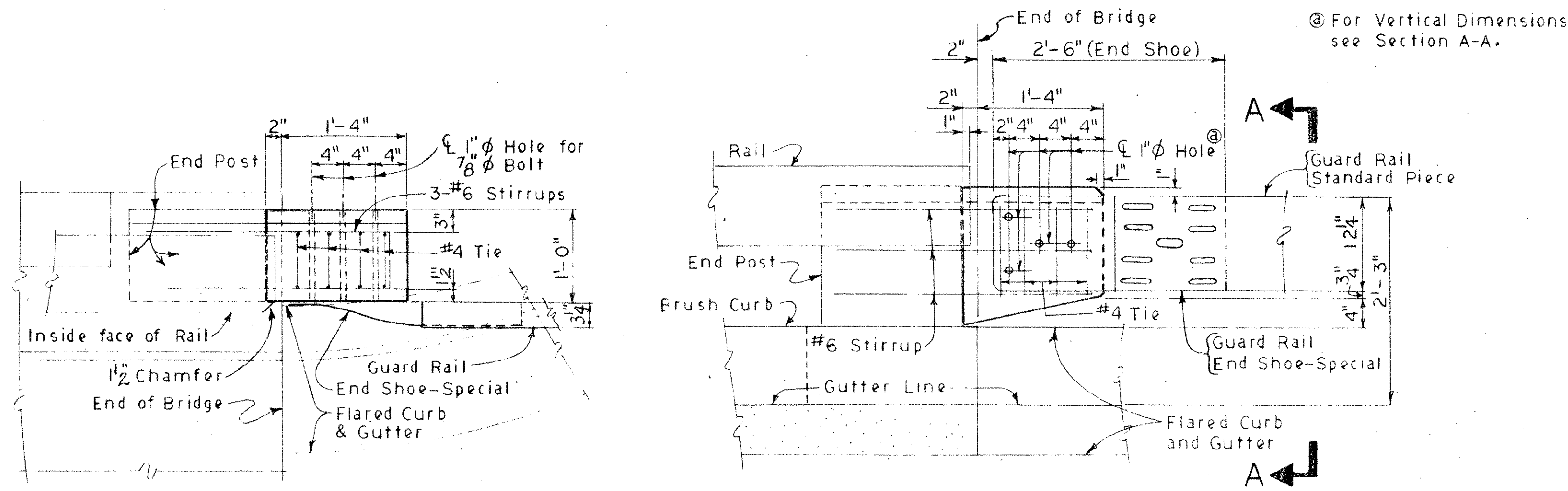
	CULVERTS	BRIDGES	TOTALS
Net Length of Roadway	0.008	0.000	0.008 Miles
Net Length of Bridges	0.029	0.085	0.114 Miles
Net Length of Project	0.037	0.085	0.122 Miles
Length of Exceptions	0.000	0.000	0.000 Miles
Gross Length of Project	0.037	0.085	0.122 Miles

Note: All workmanship and material on this project to conform with South Carolina State Highway Department Standard Specifications for Highway Construction dated 1964.

APPROVED: *[Signature]* 6/11/70  
STATE HIGHWAY ENGINEER DATE

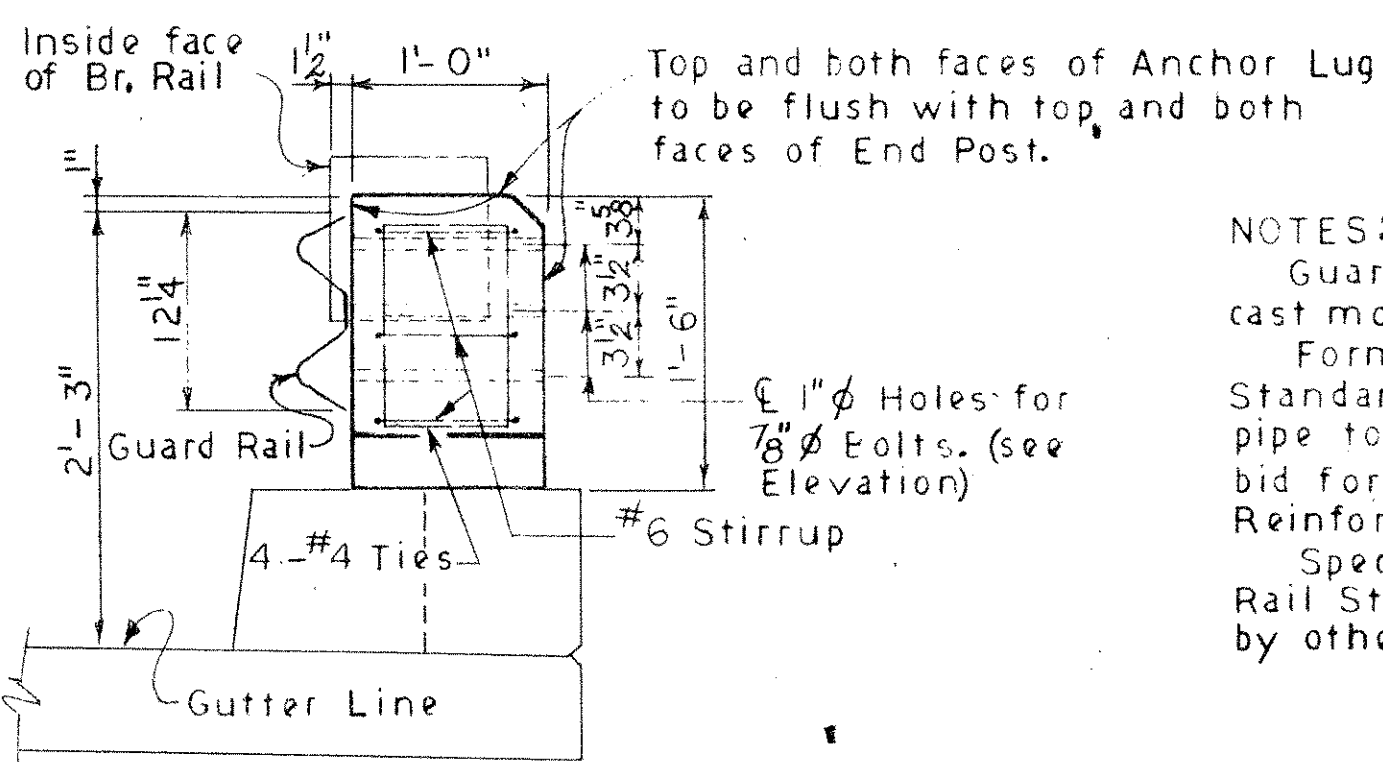
DEPARTMENT OF COMMERCE  
BUREAU OF PUBLIC ROADS  
APPROVED: *[Signature]*  
DISTRICT ENGINEER DATE

FED. RD. DIV. NO.	STATE	COUNTY	FILE NO.	ROUTE NO.	SHEET NO.	TOTAL SHEETS
3	S. C.	RICHLAND	40.720	48	2	44



PLAN

ELEVATION



SECTION A-A

NOTES:

Guardrail Anchor Lug to be cast monolithic with End Post. Form 1" holes with 1" Standard Weight Pipe. Cost of pipe to be included in prices bid for Class "A" Concrete and Reinforcing Steel. Pipe to remain in place. Special End Shoe and Guard Rail Standard Piece furnished by others.

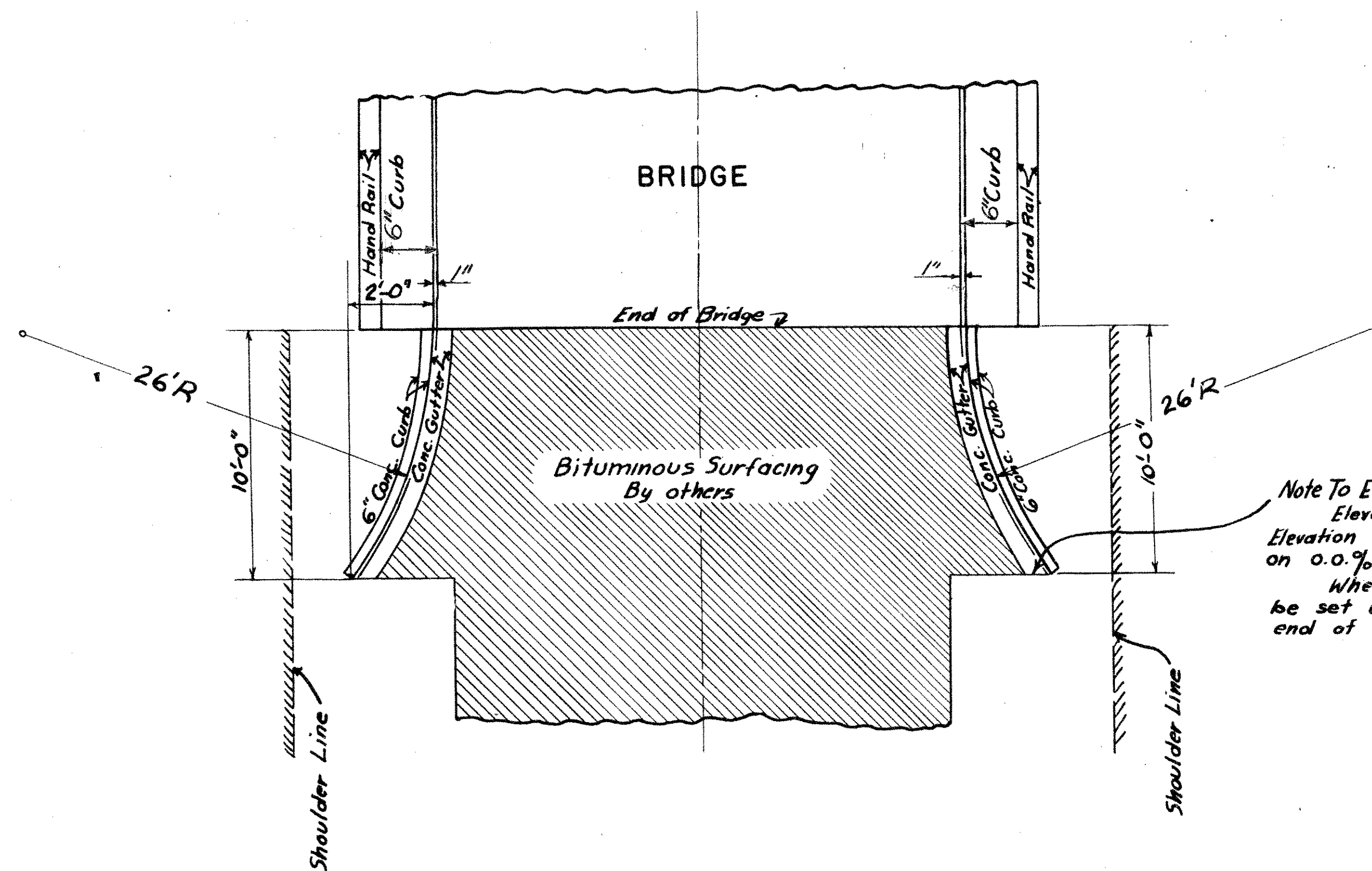
QUANTITIES ONE LUG	
Class "A" Concrete	.07 C.Y.
Reinforcing Steel	37 Lbs.

GUARDRAIL ANCHOR LUG DETAILS  
SCALE: 1"=1'-0"

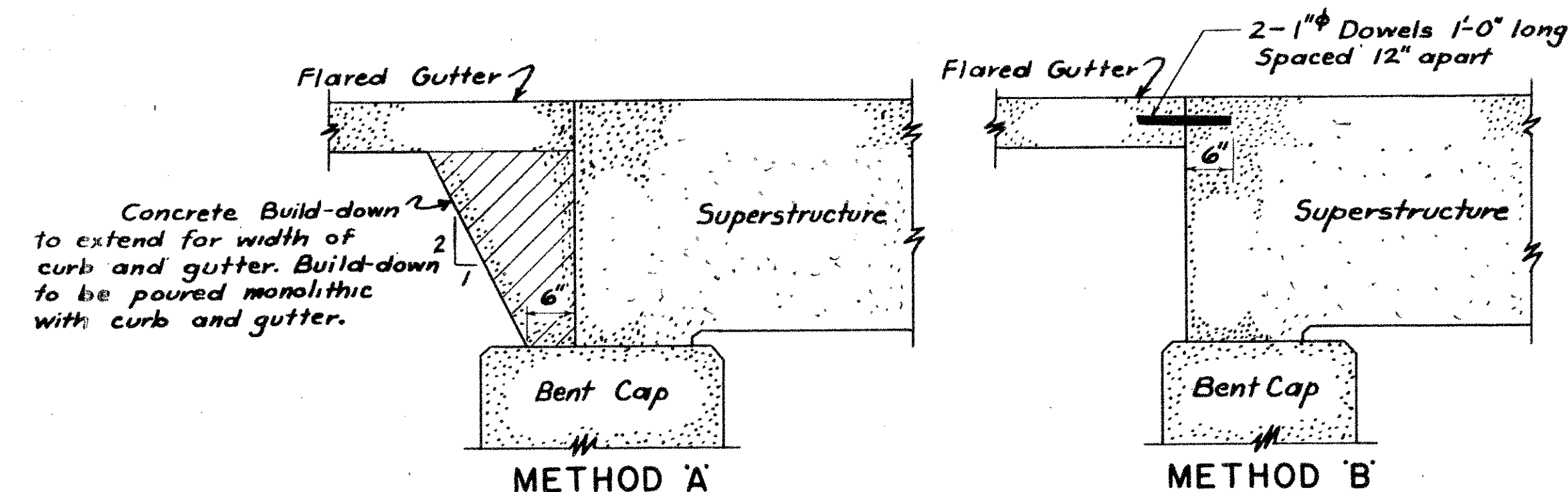
REV.		S. C. STATE HIGHWAY DEPARTMENT BRIDGE DIVISION COLUMBIA S. C.			
REV.		STANDARD DETAILS STANDARD CONNECTION OF GUARD RAIL TO END POST			
REV.					
REV.	W. K. H. M. 4-70	FILE NO. COUNTY ROUTE NO. DATE			
REV.	For File: 40.720	40.720 RICHLAND 48 4-70			
REVIEWED		APPROVED BY DESIGN			
IN CHARGE		APPROVED BY BRIDGE ENGINEER			
QUAN. KHM	11-68	BRIDGE DESIGN & PLANS ENGINEER			
TR.		DESIGN			
DR. KHM	11-68	ASS'T			
DES.		BRIDGE ENGINEER			



Fed Road Div. No.	State	County	File No.	Route No.	Sheet No.	Total Sheets
3	S.C.	RICHLAND	40.720	48	3	44



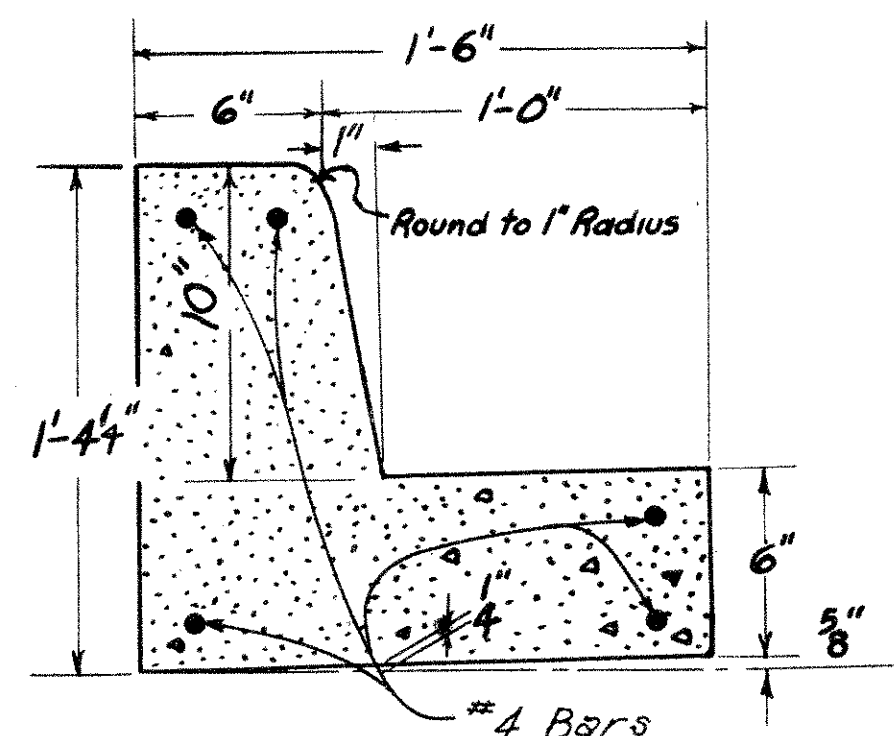
PLAN OF FLARED CURBS



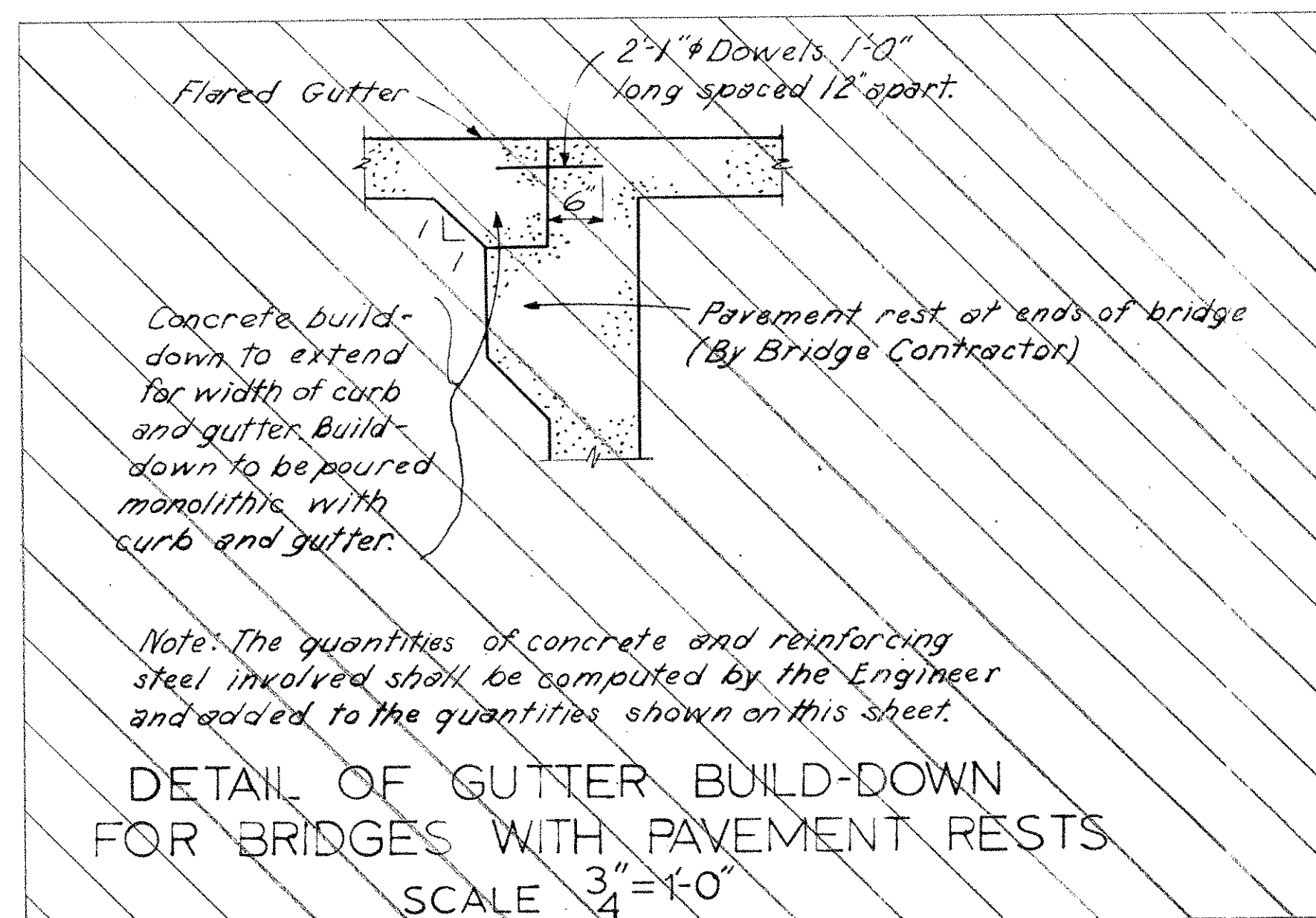
Note:— Ends of Curb and Gutter adjacent to bridge to be supported by one of the methods shown above. Use Method "A" when there is sufficient width and length of bent cap to support concrete build-down. Otherwise, use Method "B". The quantity of concrete or reinforcing steel involved shall be computed by the Engineer and added to the quantities shown on this sheet.

### CURB AND GUTTER SUPPORT

SCALE  $\frac{3}{4}$ " = 1'-0"



DETAIL OF CONG. CURB AND GUTTER  
SCALE  $\frac{1}{2}$ " = 1'-0"



DETAIL OF GUTTER BUILD-DOWN  
FOR BRIDGES WITH PAVEMENT RESTS  
SCALE  $\frac{3}{4}$ " = 1'-0"

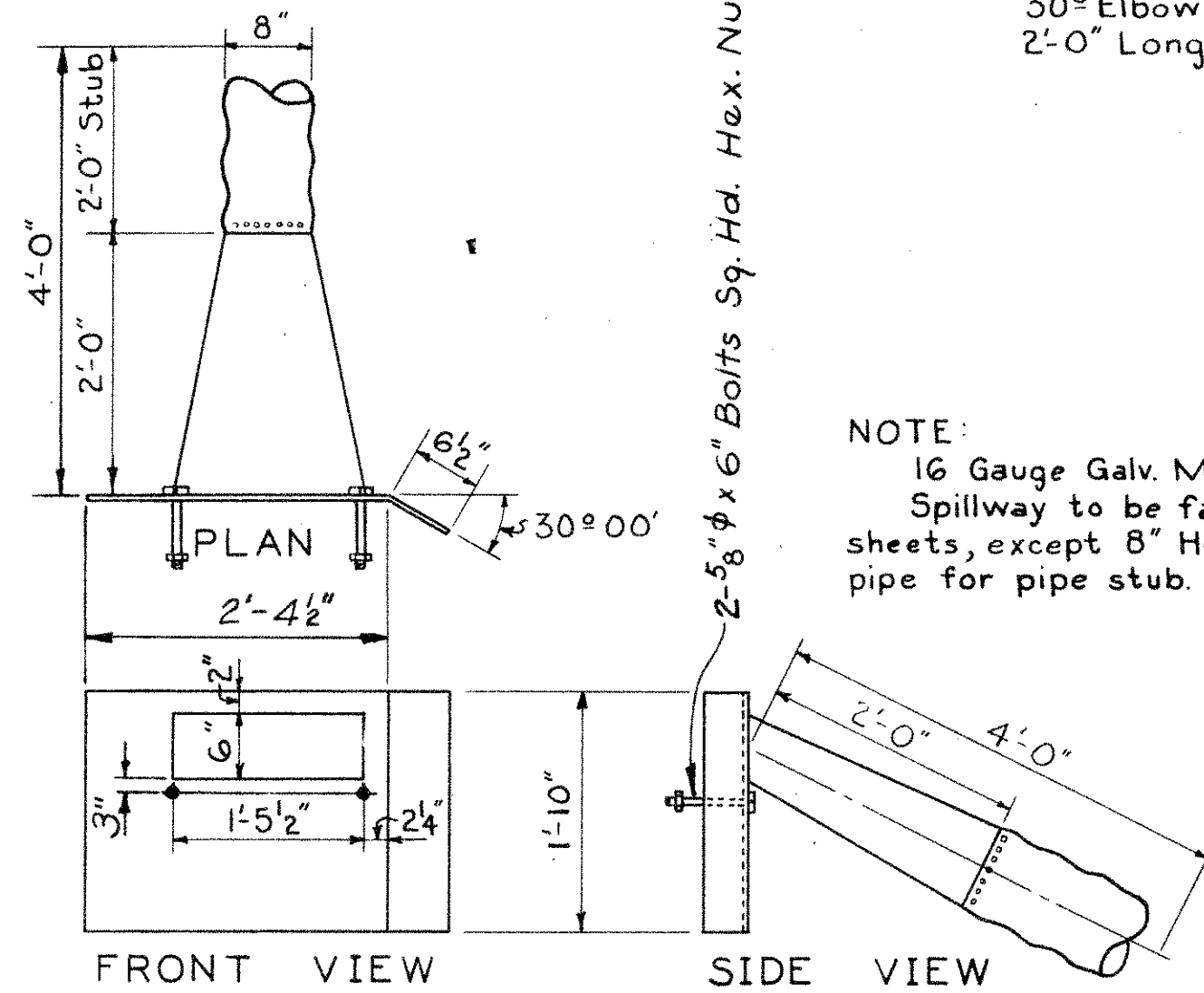
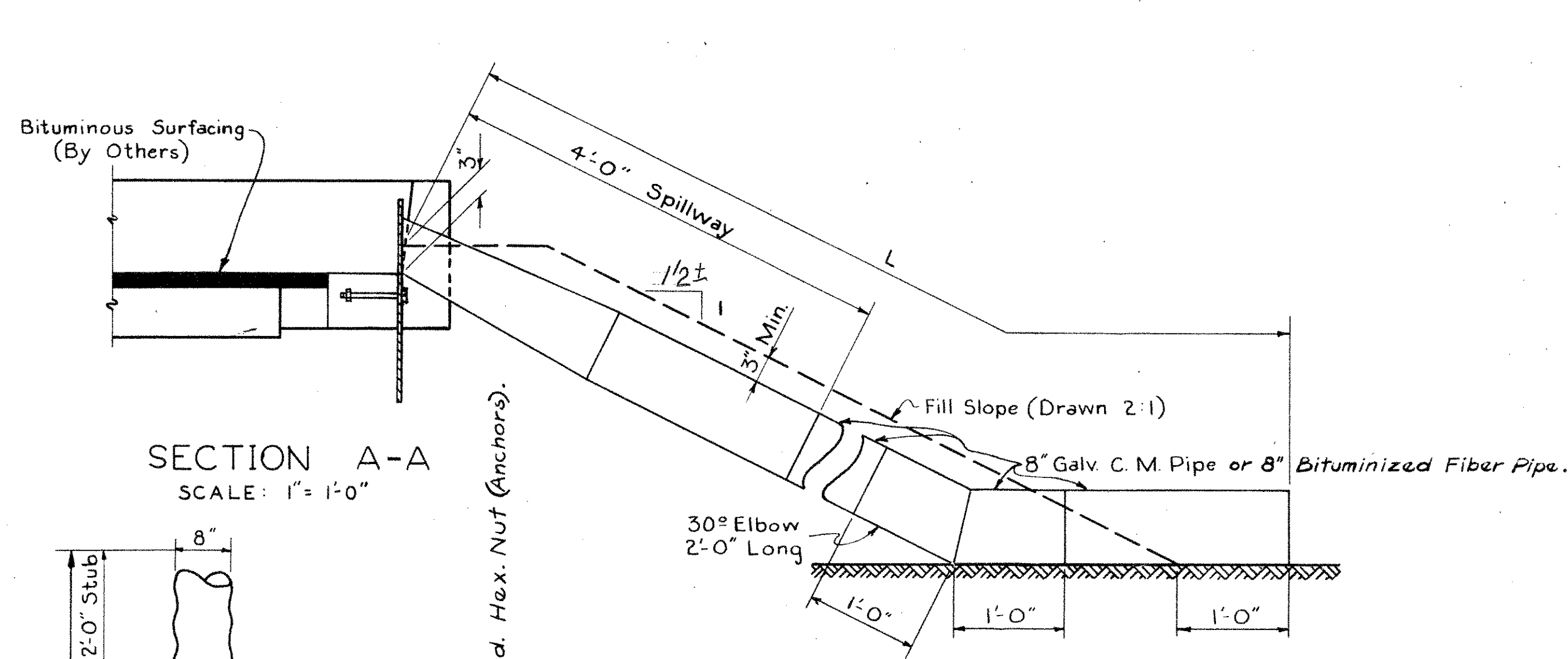
### CURB AND GUTTER QUANTITIES-ONE END ONE BRIDGE

CLASS 'A' CONCRETE FOR ONE END OF BRIDGE-0.9 C.Y.  
(Reinforcing Steel for one end of Bridge-65 Lbs.)  
(Reinforcing consists of 10 #4 Bars 9'-9" long.)

All costs of constructing the concrete curb and gutter at the ends of the bridge will be included in payment for the concrete and steel involved at the Unit Price Bid for those items.

Rev.	Quant.	Tr.	Dr.	Des.	chkd.	Gr.	Date
		J.L.B.	R.A.B.				

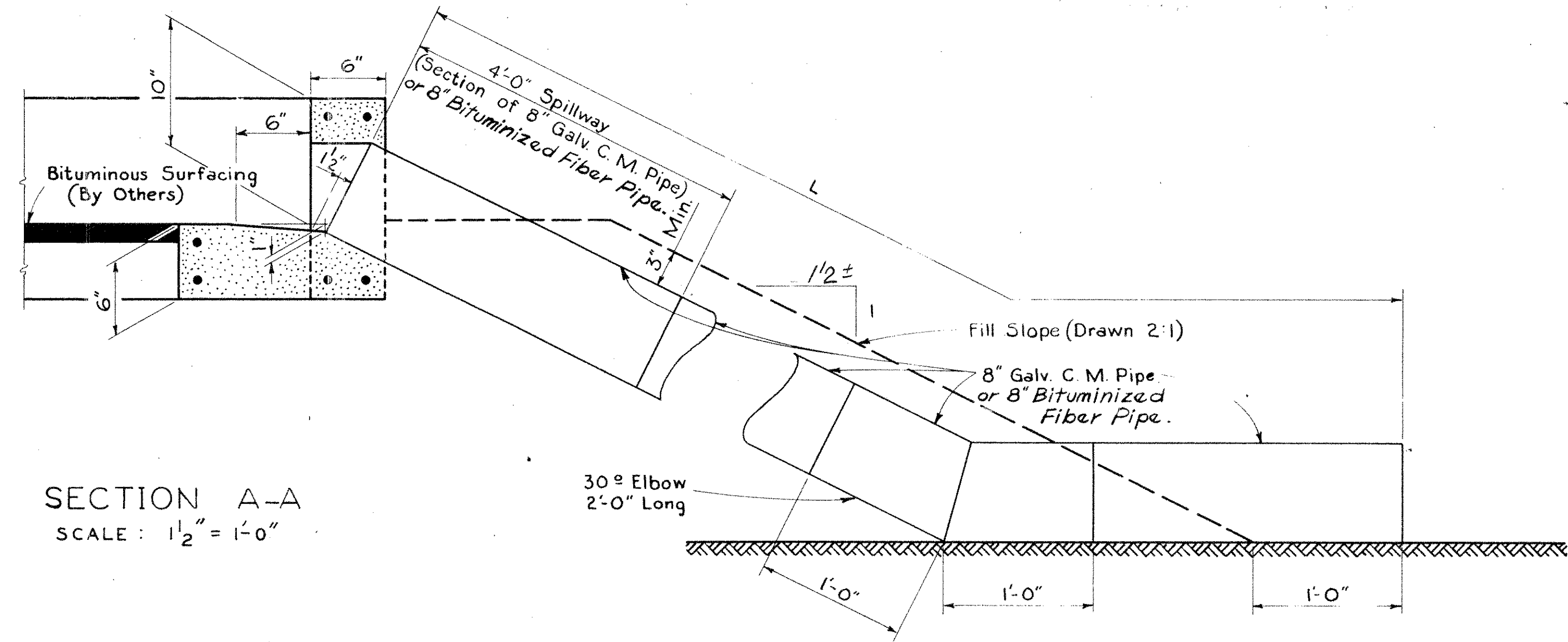
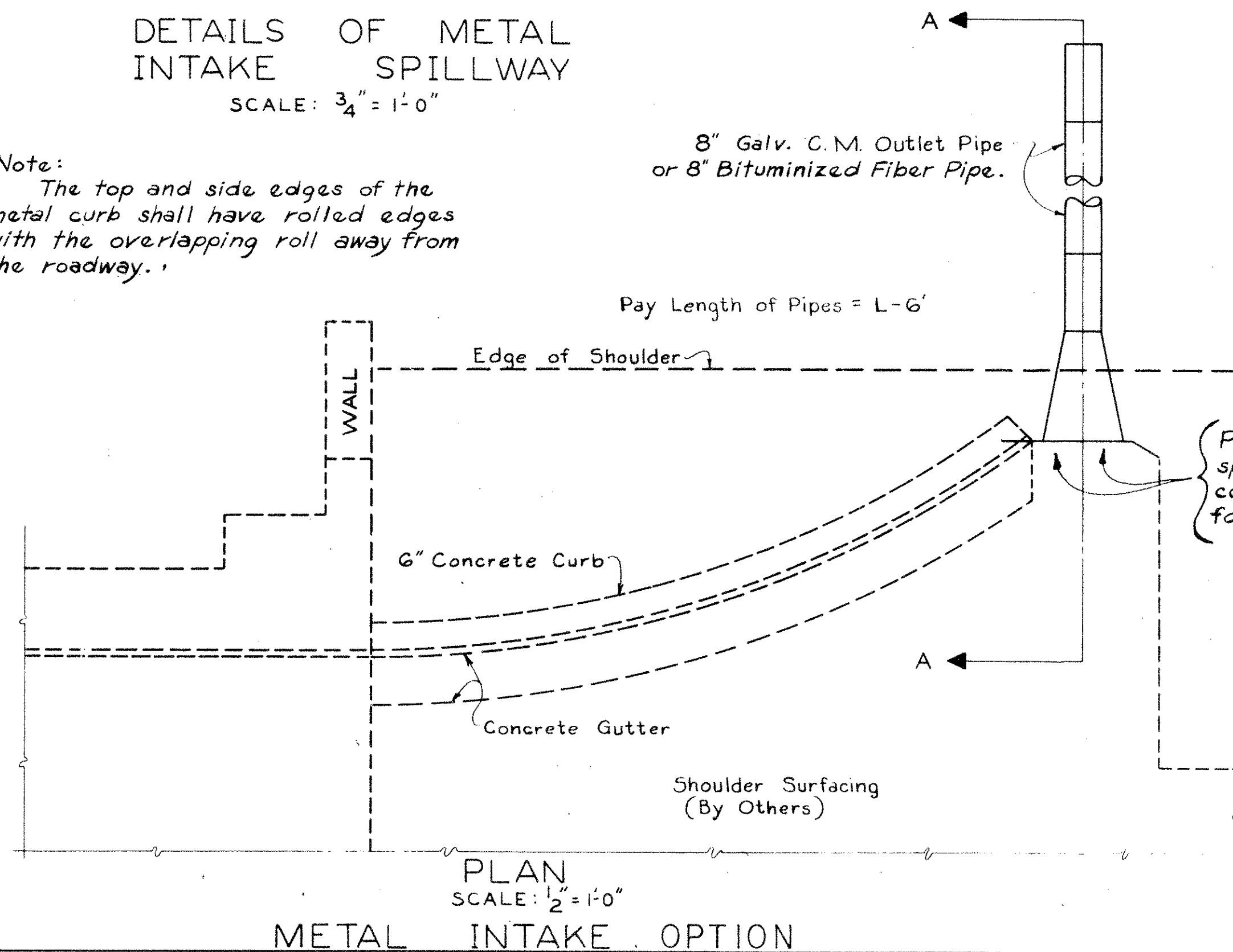
S. C. STATE HIGHWAY DEPARTMENT BRIDGE DIVISION COLUMBIA, S.C.			
REV.	WKH/M.G.M. 4-70	FILE NO.	
REV.	For File: 40.720	COUNTY	
REV.	L.L.T./R.C.B.-67	ROUTE NO.	
REV.	P.V.M.T. REST B.D.	DATE	
REV.	G.K.B. WEB 6-58	48	
REV.	FOR REINF.	4-70	
REVIEWED	IN CHARGE	APPROVED BY	
QUAN.	TR. RAB/JLB	DESIGN	
DR.	DES.	BRIDGE DESIGN	
BY	CHKD DATE	PLANS ENG.	



NOTE:  
16 Gauge Galv. Metal to be used thruout.  
Spillway to be fabricated from flat smooth sheets, except 8" Hel-Cor or equal non-perforated pipe for pipe stub.

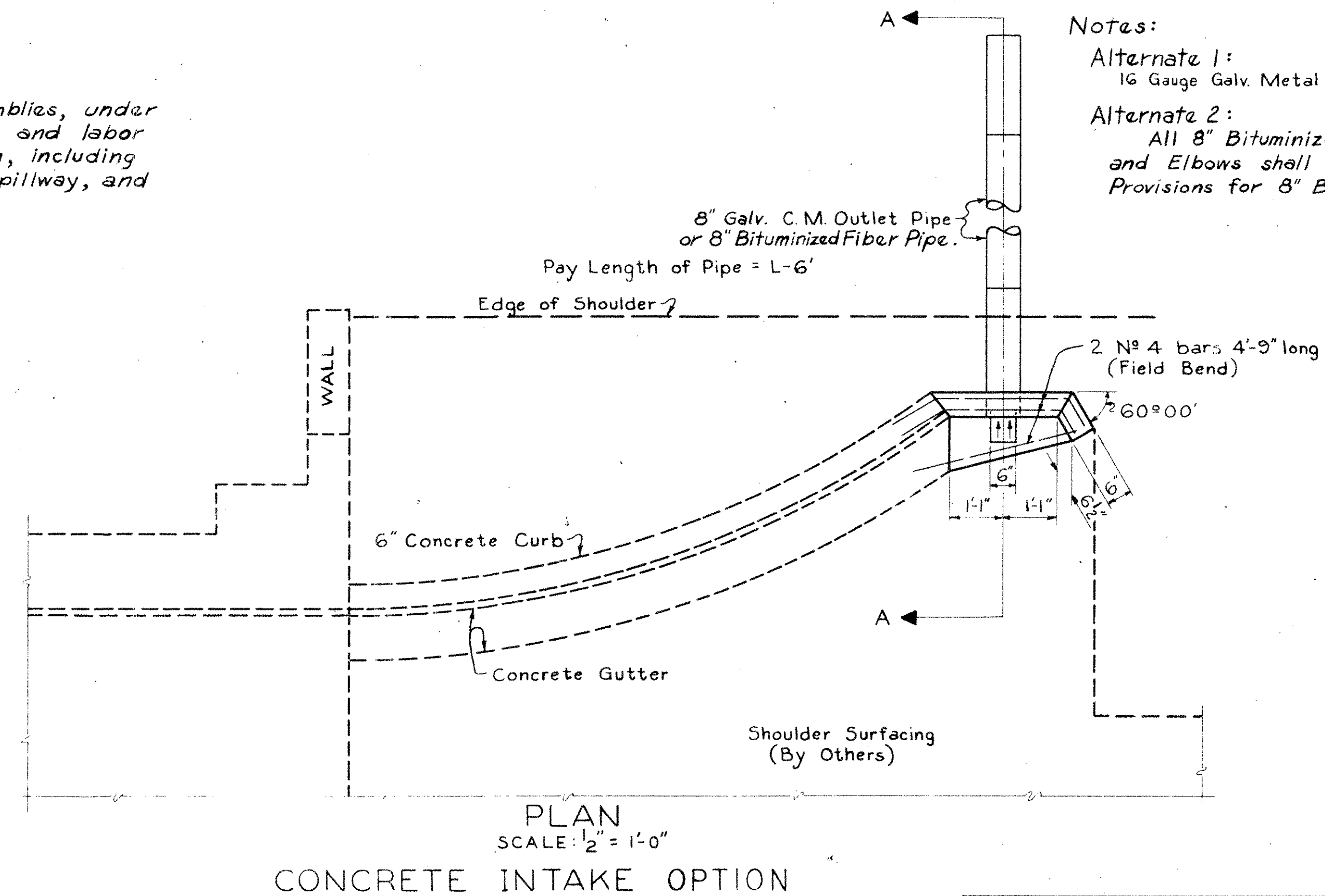
Note:  
The price bid for Intake Spillway Assemblies, under either option, shall include all materials and labor necessary for construction of this item, including 4 feet of pipe, which is a part of the spillway, and one 30° elbow 2'-0" long.

Note:  
The top and side edges of the metal curb shall have rolled edges with the overlapping roll away from the roadway.



SECTION A-A  
SCALE: 1 1/2" = 1'-0"

Notes:  
Alternate 1:  
16 Gauge Galv. Metal to be used thruout.  
Alternate 2:  
All 8" Bituminized Fiber Pipe, Couplings, and Elbows shall comply with the Special Provisions for 8" Bituminized Fiber Pipe.



	Intake Spillway Assembly	Pipe Slope Drains
	Ea.	L.F.
Gills Creek	4	40
Bridge Creek	4	40
Cedar Creek	4	40
Dry Branch	4	40
Totals	16	160

BID ITEMS	
Intake Spillway Assembly	16 Each
8" Galv. C. M. Pipe Slope Drain - Alternate 1	160 L.F.
8" Bituminized Fiber Pipe Slope Drain - Alternate 2	160 L.F.

REV. WKHM 4-70 For File 40.720	S. C. STATE HIGHWAY DEPARTMENT BRIDGE DIVISION COLUMBIA, S.C.
REV. NFH/WFL 9-66 Bid Items	
REV. WFL/LEW 11-62 Anchor Bolts added	
REV. WAE/WFL 7-62 Apron Added	
REVIEWED IN CHARGE	
QUAN.	FILE NO. COUNTY ROUTE NO. DATE
TR.	40.720 RICHLAND 48 4-70
DR. WAE/WFL 12/60	APPROVED BY
DES.	APPROVED BY DESIGN
BY CK'D DATE	BRIDGE ENGINEER



## WIDENING EXISTING CONCRETE STRUCTURES

Existing structure is indicated on the plans by light lines, new structure by heavy lines.

All dimensions of new construction are subject to existing conditions.

Connecting surfaces of the old concrete shall be thoroughly roughened, cleaned of loose material, wetted and flushed with 1:2 cement mortar immediately before pouring new concrete, except as noted on other sheets of these plans.

All reinforcing steel protruding beyond surface after chipping shall be left in place and imbedded in new concrete if feasible. Reinforcing steel which can not be imbedded in new concrete shall be cut off flush with surface of concrete where asphalt surfacing will cover. Where exposed the old reinforcing shall be cut off 1/2" below the exposed concrete surface and the hole patched with dry 1:3 mortar to the satisfaction of the Engineer.

The Contractor shall repair or replace at his own expense, and in a manner satisfactory to the Engineer, any portion of the existing structure damaged as a result of his carelessness or negligence.

The entire cost of the above work including all drilling and chipping, and removing and disposing of portions of old structure necessary to construct new structure, shall be included in the unit price bid for Class "A" Concrete.

If expansion anchor bolts are called for they shall be similar and equal to Rawl's Multi-Calk Anchor or American Exp. Bolt and shall be installed in accordance with the manufacturer's directions.

Expansion anchor bolts will be paid for at unit price bid for reinforcing steel.

Unless otherwise specified in these plans or Special Provisions the contractor shall provide necessary temporary supports for utilities attached to the bridge to maintain service during construction.

The owner will make all necessary changes in alignment and elevation of the utility and furnish permanent supports which shall be placed in the concrete by the Contractor.

All costs of the work to be performed by the Contractor shall be included in the unit price bid for Class "A" Concrete.

Any necessary repairs to the existing structure, in the opinion of the Engineer, are to be paid for as extra work.

## SPECIAL NOTE

Generally, in case of discrepancy, this standard sheet of notes shall govern over the Specifications, but the remainder of the plans shall govern over notes hereon, and Special Provisions shall govern over all. See Standard Specifications paragraph 5.04.

## EXCAVATION FOR PILE TYPE END BENT

All cost of excavation necessary to construct end bents and to remove material under superstructure to an elevation 1'-0" below tops of end bent caps shall be included in the unit price bid for Class "A" Concrete.

## EXCAVATION FOR CONCRETE END BENT

If a concrete flooring is used for the end bent, the excavation below that included for the cap and berm in the above paragraph will be paid for at the unit price bid for excavation. Excavation above this shall be included in the unit price bid for Class "A" Concrete.

## DRIVING PILES THROUGH FILL

Where piles occur in fill exceeding 10 ft. in height, the fill shall be in place before piles are driven.

## HAMMER FOR STEEL PILES

Steel piles where required bearing exceeds 30 tons shall be driven with a diesel, steam or air hammer having a minimum energy of 14,000 ft. lbs.

## ALLOWANCE FOR DEAD LOAD DEFLECTION AND SETTLEMENT

Bridges shall be built on the grade or vertical curve shown on plans. Handrails, slabs and curbs shall conform to the grade, or curves.

In setting forms for structural steel or prestressed concrete beam bridges, an allowance shall be made for dead load deflections in addition to the elevations shown.

In setting falsework and forms for reinforced concrete spans an allowance shall be made for dead load deflections, settlement of falsework, and permanent camber which shall be provided for in addition to the elevations shown. After removal of the falsework, the finished structure shall conform to the elevations shown, plus the allowance for permanent camber specified by the Engineer.

## BRONZE EXPANSION PLATES

Bronze R's to be self-lubricating Exp. R's manufactured from rolled bronze alloy complying with A.S.T.M. B100-Alloy 1, or A.S.T.M. B22-Alloy B casting, and to have special inserts consisting of graphite and metallic substances with a lubricating binder in both faces. The coeff. of friction shall not exceed 0.1. The Bronze R's shall be similar to those manufactured by Merriman Bros. Inc., 183 Amory St., Boston 30, Mass., or Whiteley Bearing Corporation Chicago, Ill., or an approved equal.

The bronze R's shall not be painted. Both steel surfaces in contact with the bronze R shall be left unpainted but coated with a hot mixture of white lead and tallow. Immediately prior to installation on the bents or piers the plates shall be thoroughly cleaned and a graphite material, as recommended by the manufacturer of the bronze R's, shall be applied to both surfaces of the steel R's in contact with the bronze R.

## STRUCTURAL STEEL

Beams shall be cambered for vertical curve and dead load deflection either in mill or shop.

Layout dimensions and standard lengths of beams shown are horizontal dimensions and must have the additional lengths added for lengths along grade.

All rivets shall be 3/4" unless noted. All high-tensile strength bolts shall be 3/4" unless noted.

Holes in all main member splices shall be sub-punched, the connecting members shop assembled in their proper positions, and the holes reamed to full size while assembled.

Floor beam connections shall be reamed to a metal template.

All stiffeners at floor beams and at pier reactions shall have fills. All interior stiffeners between floor beams shall be crimped or filled.

Shims shall be placed between beam flange and rocker plate where required and shall be adjusted to bring top of beam to theoretical grade.

Bearing plates and rocker plates to be rolled steel.

Nuts on Anchor Bolts at Expansion Ends to be tightened 1/2" clear to allow for movement.

Anchor Bolt assemblies will be paid for as reinforcing steel and are included in the bent quantities unless specifically stated elsewhere as included in the structural steel quantities.

Mill and shop inspection of the structural steel will be performed by Froehling & Robertson, Inc., 814 West Cory St., Richmond, Virginia. The contractor shall notify that company of the name and address of the fabricator of the structural steel as soon as the fabricator has been given the contract to fabricate so that the inspection procedure can be set up. The contractor shall also stipulate in his order to the fabricator that Froehling & Robertson, Inc., will perform the mill and shop inspection of the structural steel.

## COMPOSITE BEAMS

A 5 day interval shall be allowed between time of pouring slab and sidewalk.

Tops of beam flanges shall not be painted.

All equipment, materials and workmanship for electric arc welded stud shear connectors shall be in accordance with the recommendations of the manufacturer and Special Provisions.

Alternate for welded studs: an approved alternate method of securing composite action between beams and slab may be used, at no additional cost to the Dept. Details must be submitted for approval in advance of making the change.

3/4" studs may be substituted for 1/2" studs. The 3/4" studs shall be placed with the same number in each transverse row as the 1/2" studs. The pitch of the 3/4" studs shall be equal to 1.36 times the pitch of the 1/2" studs. The 3/4" studs must be welded within the recommended area of an approved arc stabilizer cart.

## PRESTRESSED BEAMS

Tops of beams shall be rough floated. At the approximate time of initial set, entire top of beam shall be scrubbed with a coarse wire brush to remove all surface, and to produce a roughened surface for bonding slab. Membrane curing compound shall not be used on tops or ends of beams.

Concrete in prestressed beams shall be Class "X" as described in the Standard Specifications. The prestressing strands, wire or bars, must be thoroughly cleaned of any loose rust, dirt, grease, form lubricant, or other deleterious substances, to the satisfaction of the Engineer, before the concrete is placed.

Beams shall not be transported to the bridge site until concrete has cured for at least 6 days.

Beam lengths given are based on horizontal span only. These lengths shall be increased to correct for concrete shrinkage, concrete shortening when the strands are cut, and for beams being on a grade.

## CONCRETE

All concrete shall be Class "A" unless noted below or on other sheets of these plans.

Build-ups on bent caps shall be cast monolithic with cap unless shown or noted elsewhere on these plans.

Top of each build-up shall be level.

Payment for Concrete in slab will be based on theoretical plan quantity.

Any necessary adjustment for Camber shall be at the Contractor's expense.

Simple spans 80 ft. and less shall be poured without a transverse construction joint.

For simple spans over 80 ft. in length, the center portion (approximately 1/3 of the length) of the slab shall be poured first and allowed to cure for not less than 4 days before the remaining end sections are poured. However, when the temperature permits (in the opinion of the engineer) the entire slab may be poured provided a suitable retarding agent is used in such amounts that the slab concrete shall not have had its initial set prior to the completion of the casting of the slab concrete.

All exposed edges shall be chamfered 1/2" unless otherwise noted.

## BEARINGS

For concrete slabs bearing on concrete, the top of caps, or tops of build-ups, under bearing areas of slabs shall receive a steel trowel finish to insure a smooth and level bearing surface. See Standard Specifications paragraph 7.1D14.

FED. RD. DIV. NO.	STATE	COUNTY	FILE NO.	ROUTE NO.	SHEET NO.	TOTAL SHEETS
3	S.C.	RICHLAND	40.720	48	5	44

## DESIGN DATA

SPECIFICATIONS: A.A.S.H.O. 1969 with rev. thru

LIVE LOAD: HS 20-44 ~~Includes provision for alternate loading of 2 axles 4' apart with each axle weighing 7.5% of normal load, for spans under 40'~~

## UNIT STRESSES:

STRUCTURAL STEEL & REINFORCED CONCRETE:

$f_s$  (struct.) = 20,000 psi

$f_s$  (reinf.) = 20,000 psi

CLASS "A" CONCRETE:

$f_c$  = 1,200 psi;  $n$  = 10;  $v$  = 225 psi;  $u$  = 300 psi

CLASS "X" CONCRETE:

~~$f_c$  = 2,000 psi;  $n$  = 6;  $v$  = 375 psi;  $u$  = 350 psi~~

PRESTRESSED CONCRETE:

$f_c$  = 5,000 psi;  $f_{ci}$  = 4,000 psi;  $f_c$  = 2,000 psi

PRESTRESSING STEEL:

$f_s$  = 250,000 psi;  $f_{si}$  = 175,000 psi

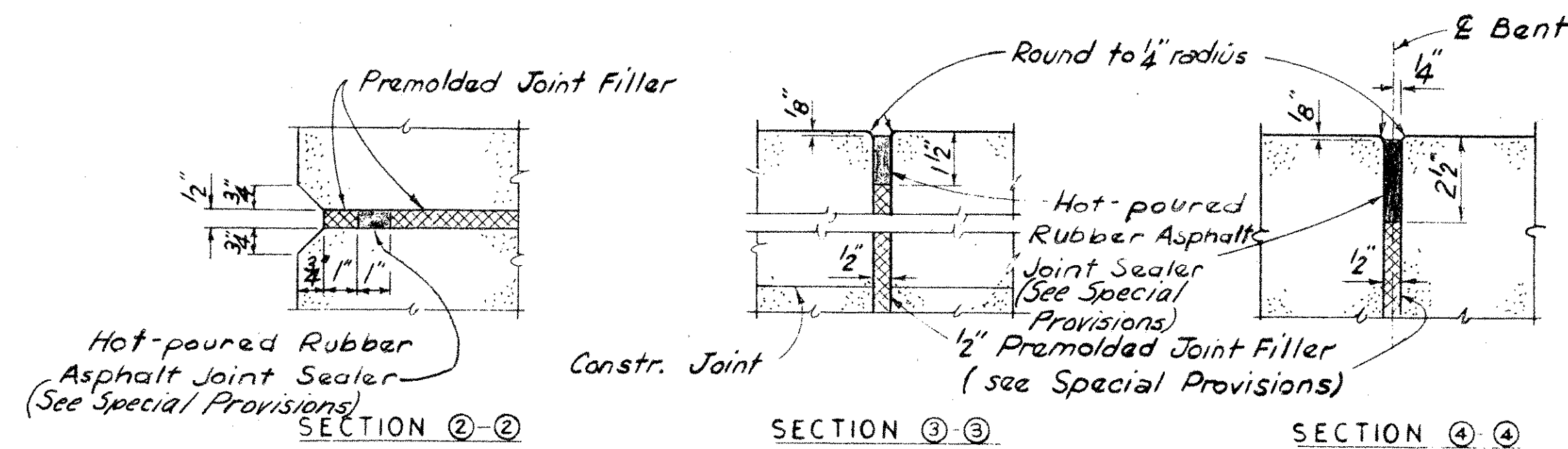
## MATERIAL AND WORKMANSHIP

Except as may otherwise be specified on plans or in the Special Provisions, all material and workmanship shall be in accordance with the South Carolina Highway Department Standard Specifications for Highway Construction, Edition of 1964.

REV.		S.C. STATE HIGHWAY DEPARTMENT BRIDGE DIVISION COLUMBIA, S.C.
REV.		STANDARD NOTES
REV.	WK H.M. 4-70 For File 40.720	
REV.	FMR/RWH/7-67 Bronze Exp. R	
REVIEWED:	IN CHARGE	
QUAN.		FILE NO. COUNTY ROUTE NO. DATE
TR.	FMR/RAB/1-67	40.720 RICHLAND 48 4-70
DR.	FMR/RAB/1-67	APPROVED BY: DESIGN
DES.	BY CHK/DAT	APPROVED BY: BRIDGE ENGINEER

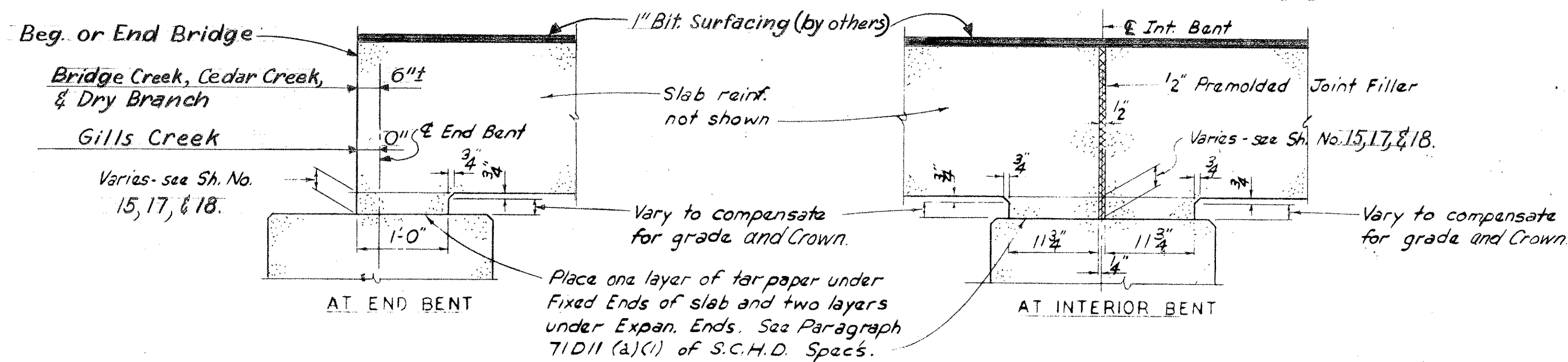


FED. RD. DIV. NO.	STATE	COUNTY	FILE NO.	ROUTE NO.	SHEET NO.	TOTAL SHEETS
3	S.C.	RICHLAND	40.720	48	6	44



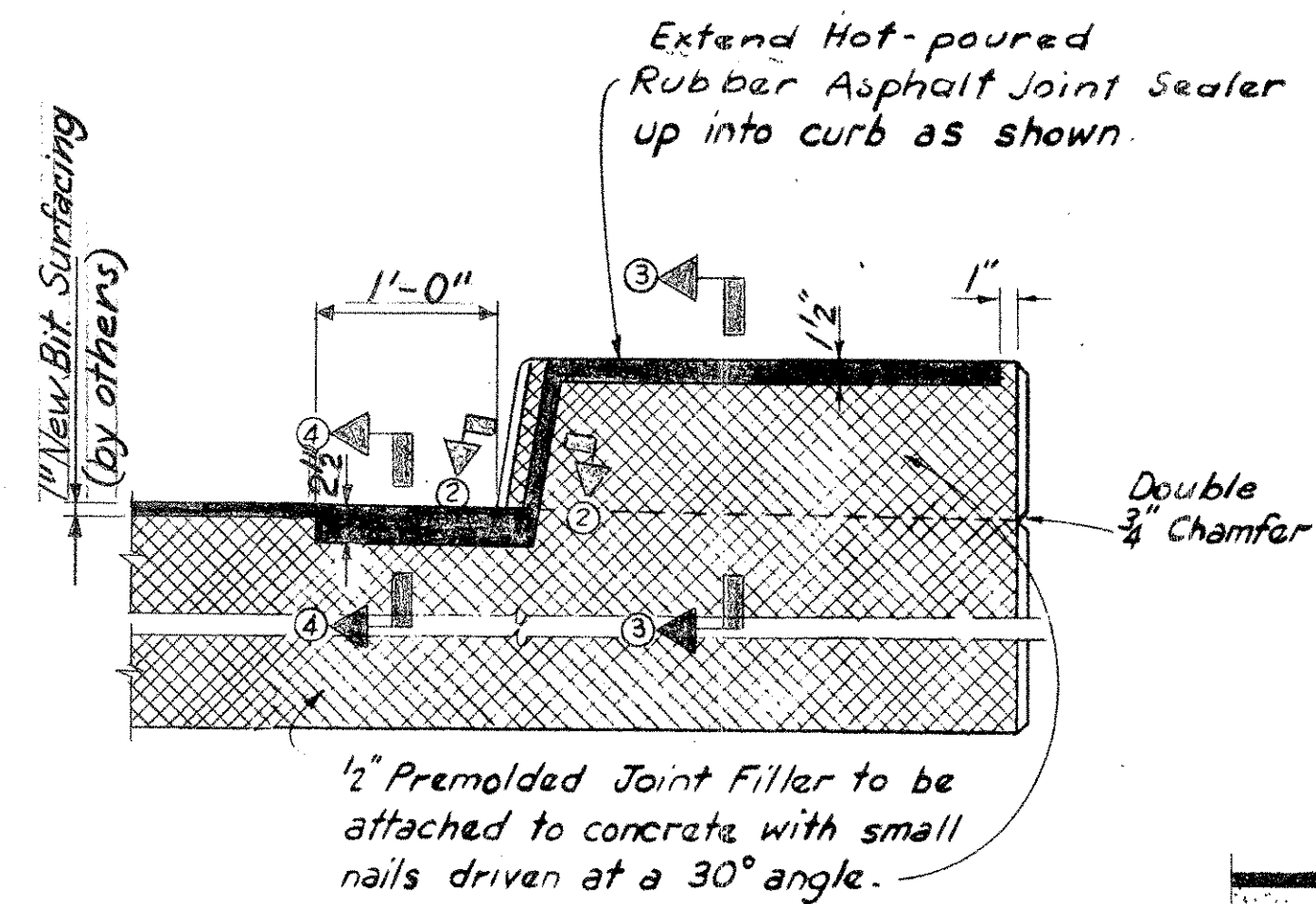
SCALE, SECTIONS 2-2 THRU 4-4: 3"=1'-0"

## JOINT DETAILS



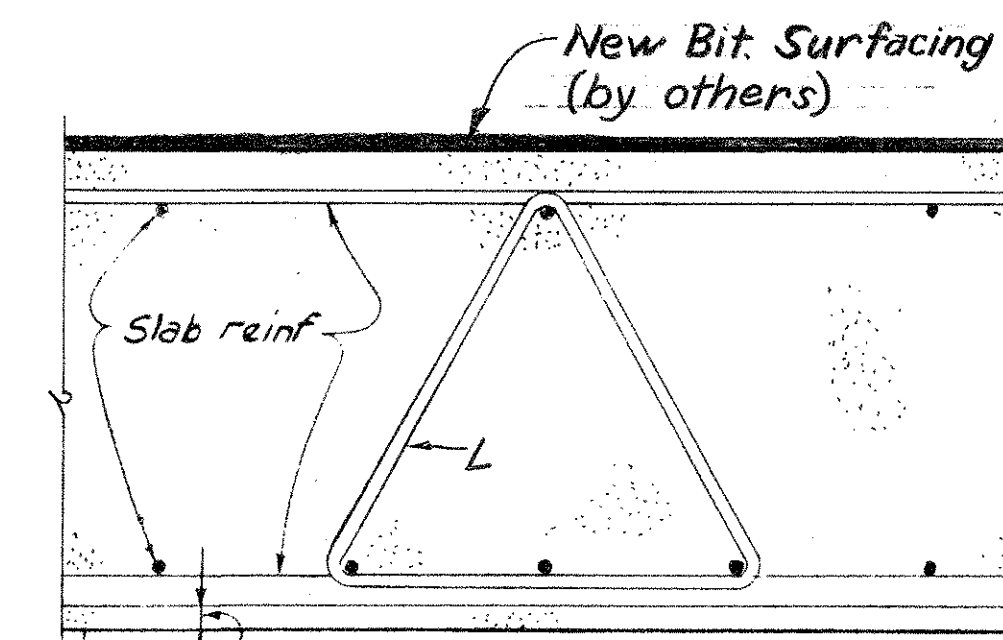
## SLAB BUILD-DOWN DETAILS

SCALE: 1"=1'-0"



## SECTION ALONG EXPANSION JOINT

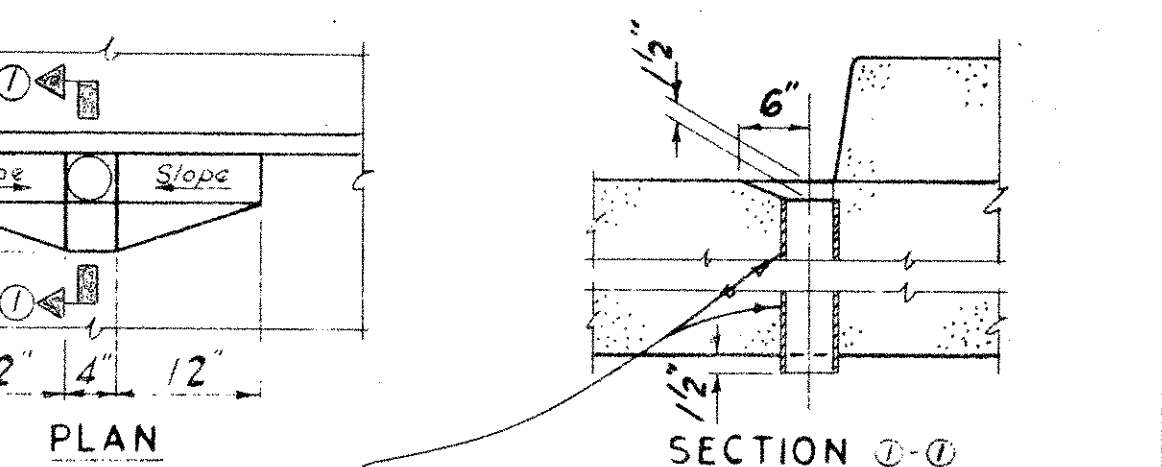
SCALE: 1"=1'-0"



## BOLSTER DETAIL

SECTION PARALLEL TO Q R'D'Y  
SCALE: 1 1/2"=1'-0"

Note: Concrete Blocks shall be placed with one row near each end of slab and with a maximum spacing of approx. 3'-0" between.

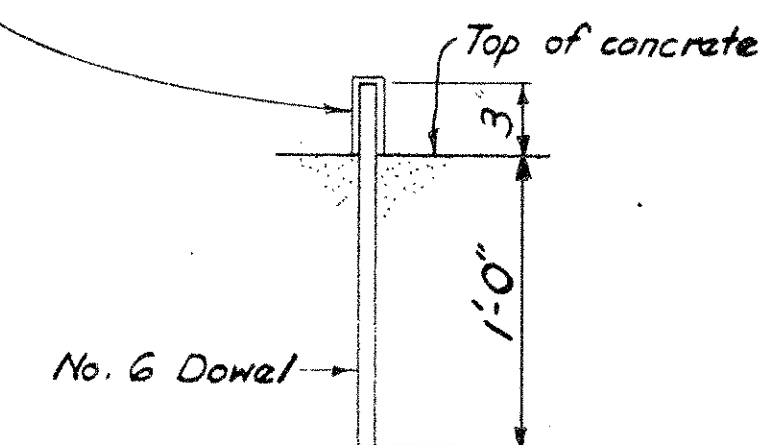


## DRAIN DETAILS

SCALE: 3/4"=1'-0"

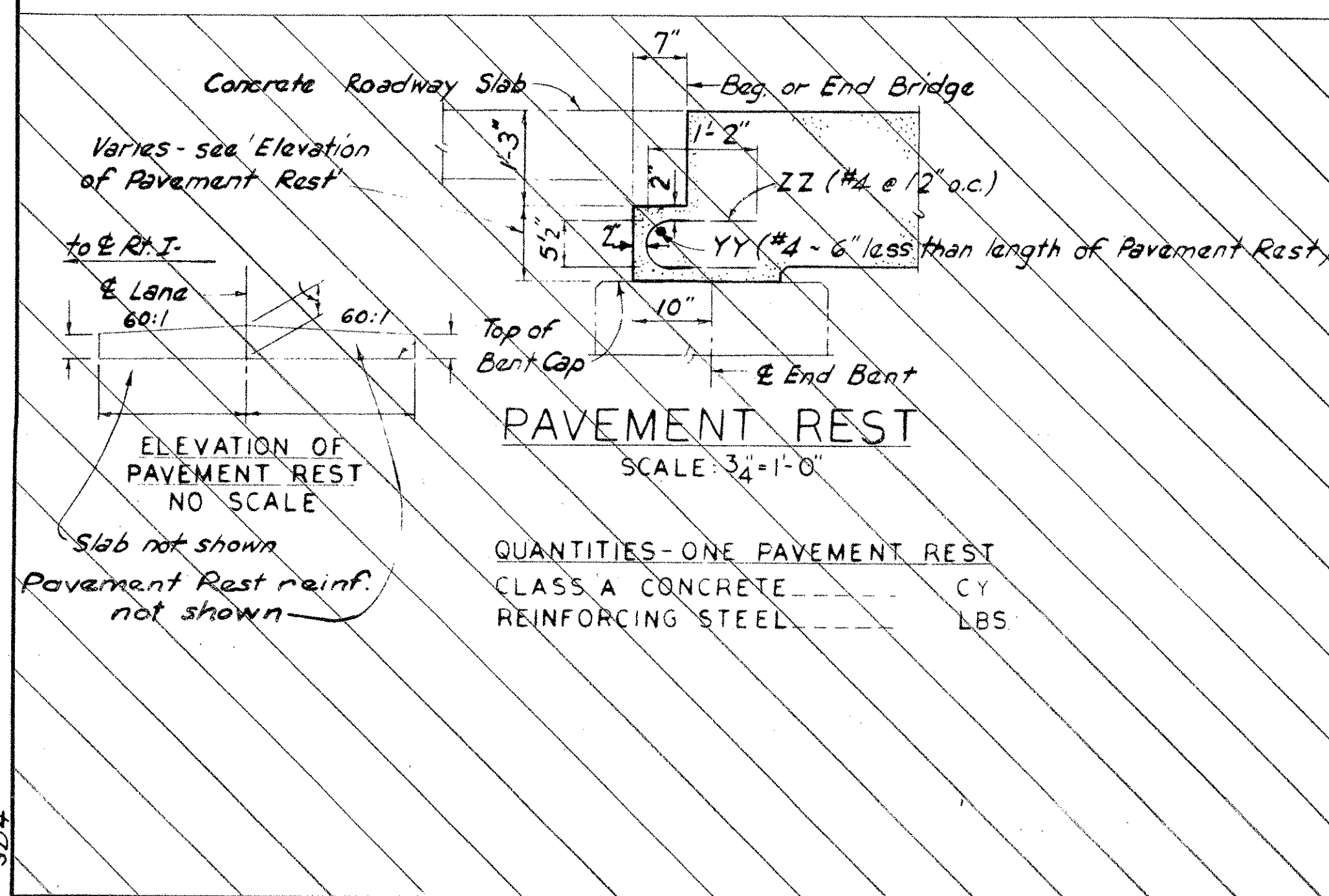
Note: For location of drains see Sheet No. 7, 8, 9, & 10.

Dowel to be wrapped with tar paper, rubber or other seepage-proofed compressible material to allow 1/4" of compressible material between concrete and dowel, both above and all around



## DOWEL DETAIL

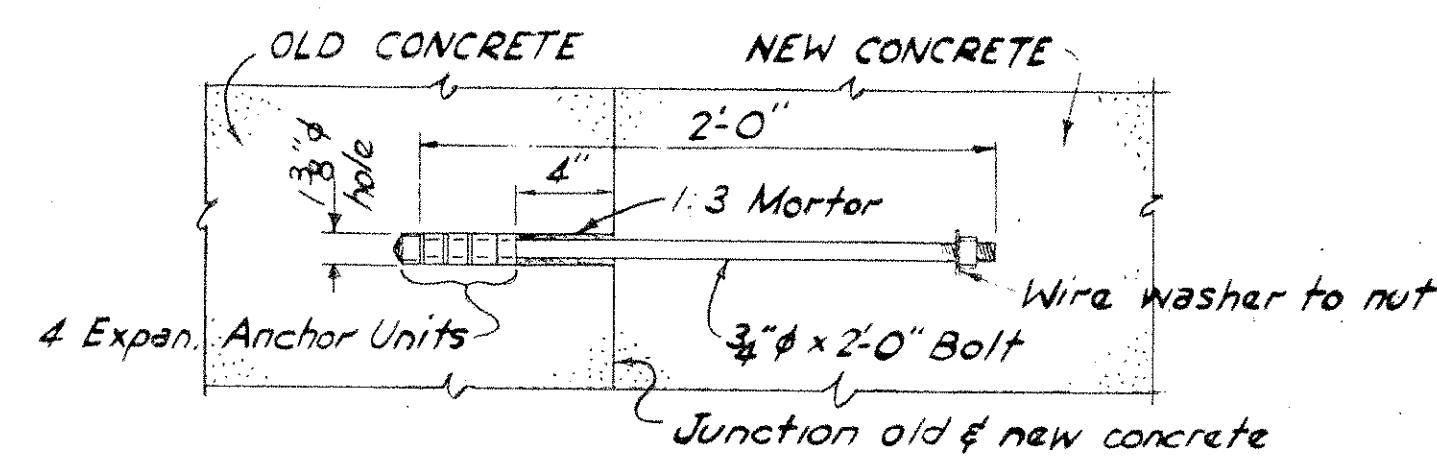
SCALE: 1 1/2"=1'-0"



## PAVEMENT REST

SCALE: 3/4"=1'-0"

QUANTITIES-ONE PAVEMENT REST  
CLASS A CONCRETE ----- CY  
REINFORCING STEEL ----- LBS



## EXPANSION BOLT DETAIL

SCALE: 1 1/2"=1'-0"

Expansion Bolts may be either Plain Standard Cinch Anchor-Type 1A, Plain Standard Ram Anchor-Type 1A, Rawl Multi-Calk Anchor, Star Slugin Anchor, or equal.  
Expansion Bolt Assembly: 3/4" x 2'-0" bolt, hex, head & nut, std. cut washer and 3/4" Rawl Multi-Calk Anchors or equal.  
Weight = 5 lbs per assembly.

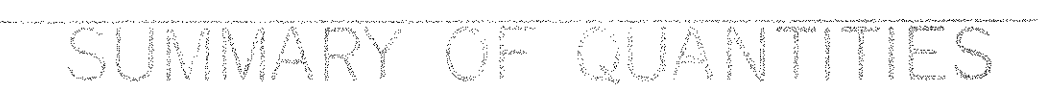
1/2"	2 3/4"	For No. 4 & smaller add 6" per hook.
2"	3 3/4"	For No's 5 & 6 add 8" per hook.
3"	4 1/2"	For No. 7 & larger add 12" per hook.

## HOOK DETAILS

FOR STEEL REINFORCING BARS  
NO SCALE

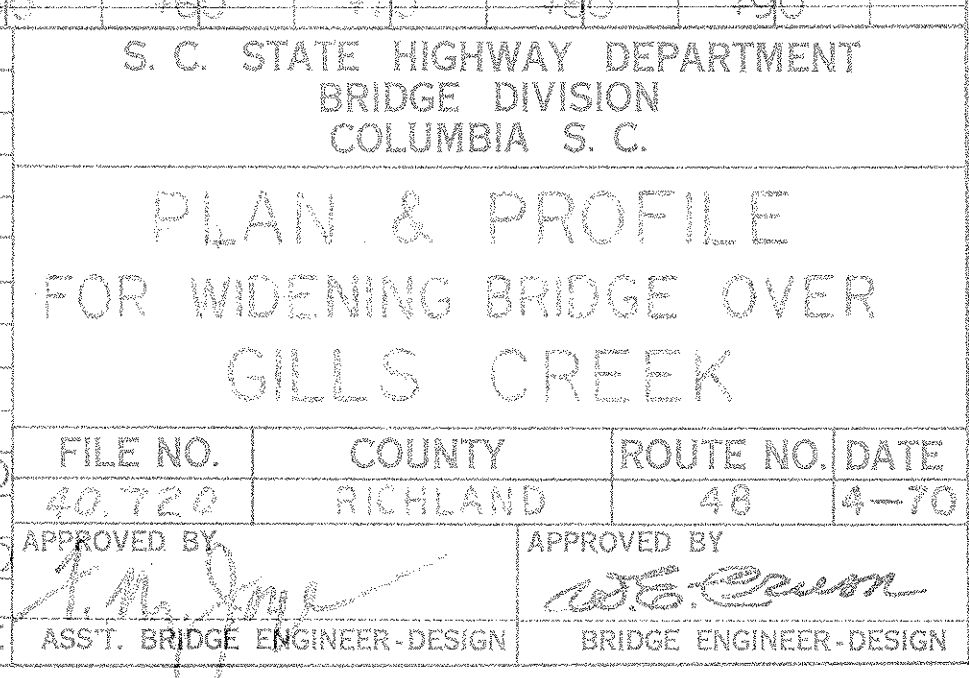
S.C. STATE HIGHWAY DEPARTMENT BRIDGE DIVISION COLUMBIA S.C.			
STANDARD DETAILS FOR FLAT SLAB BRIDGE			
REV.	FILE NO.	COUNTY	ROUTE NO. DATE
REV. WKH/MC/M4-70	40.720	RICHLAND	48 4-70
REV. J.C. JRC 19-69			
REV. COL JWB 11-68			
REV. BOLSTER DETAIL			
REVIEWED	IN CHARGE		
QUAN.	APPROVED BY	APPROVED BY	DESIGN
TR.	JRC	JWB	2-67
DES.	BY	CHK'D DATE	BRIDGE DESIGNER & PLANS ENGINEER
			BRIDGE ENGINEER





Notes:  
For Standard Notes see Sht.5.  
For Standard Details see Sht.8.  
The Resident Engineer shall obtain  
Exist. P.I. elev. at the 4 Rods on the East  
Bridge and the adjacent road (at about  
25 intervals for about 100' back from  
each end of Bridge) for the pur-  
pose of establishing a new F.G.  
for the new Bridge. The new F.G. shall  
be set approx. 18" above the Exist.  
F.G.  
The resurfacing shall have a Min.  
thickness of 1" over the East Surfacing for the  
full length of the Bridge and shall  
be tapered to the Exist. F.G. by ex-  
tending the new 8 1/2" Surf. on the adjacent  
road for an appropriate distance. All  
resurfacing shall be done by others.

Maintenance of Traffic: During the actual driving of piles, or pouring of concrete, the contractor may reduce traffic to one-lane with adequate advance signs, barricades, and flagmen, so as to safeguard traffic. At all other times two-lane traffic shall be maintained and the existing flow shall not be reduced.

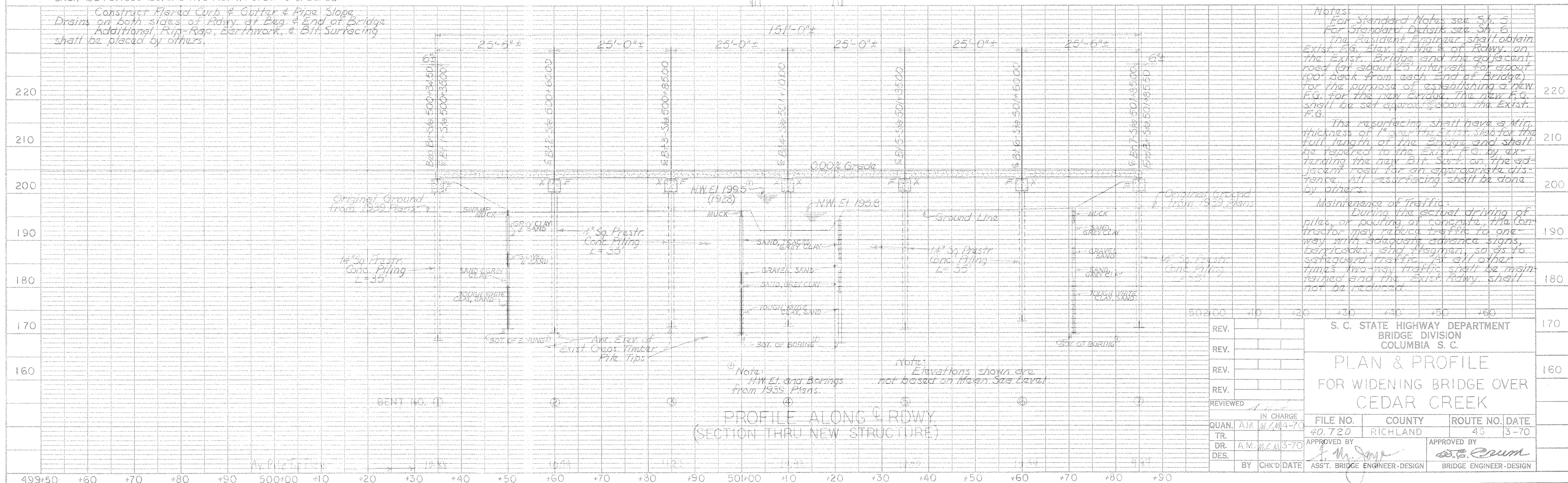








Notes:  
The span lengths shown are approximate. The Contractor shall measure existing spans and if appreciable differences are found, the Reinf. Steel Sched. shall be revised before the Reinf. Steel is ordered.

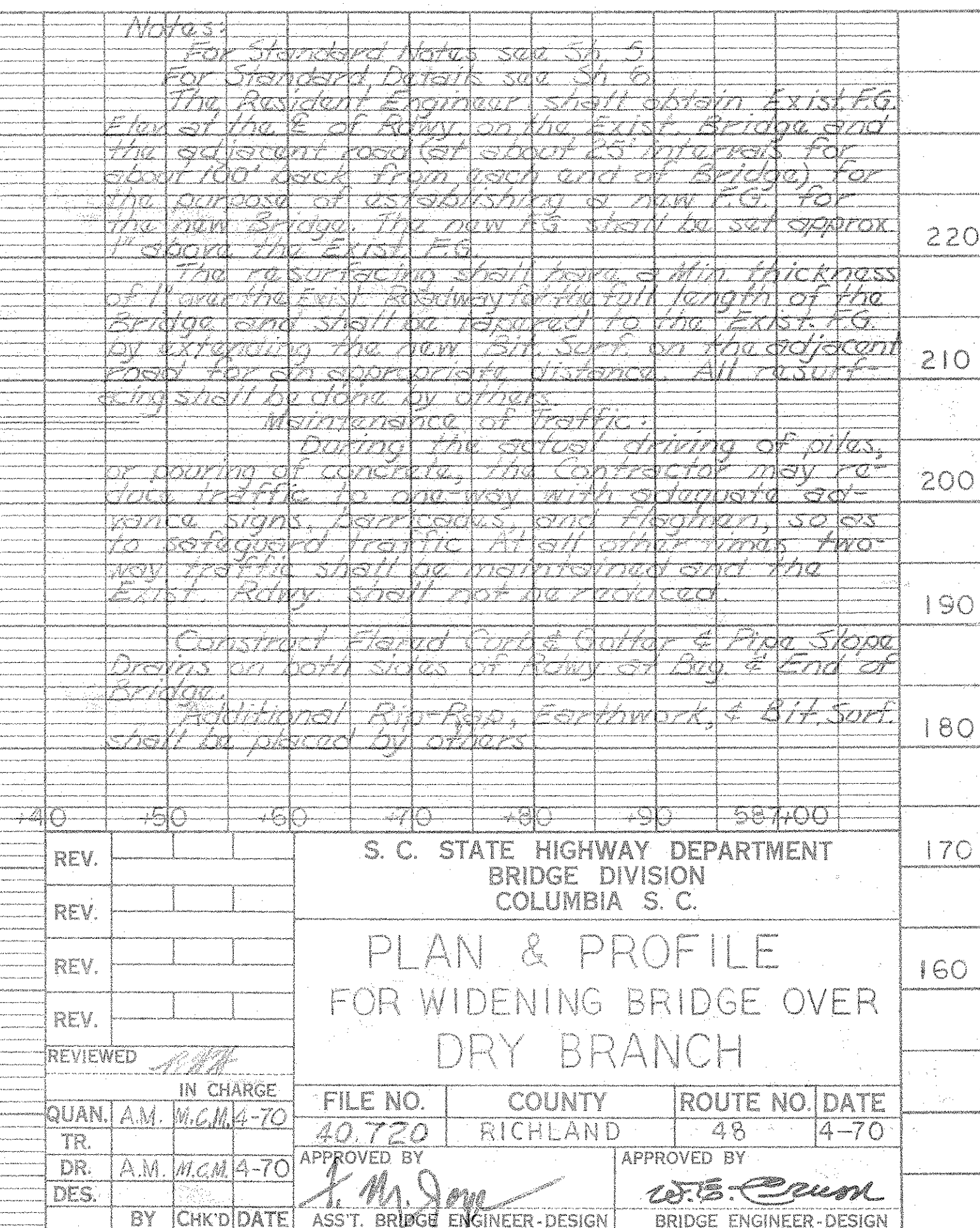


Notes:  
For Standard Notes see Sp. 5.  
For Standard Details see Sp. 6.  
The Resident Engineer shall obtain  
Exist. F.G. Elev. at the E. of Rwy. on  
the Exist. Bridge and the adjacent  
road (at about 25' intervals for about  
100' back from each end of Bridge)  
for the purpose of establishing a new  
F.G. for the new Bridge. The new F.G.  
shall be set approximately 1' above the Exist.  
F.G.  
The resurfacing shall have a min.  
thickness of 1" over the Exist. subgrade  
full length of the Bridge and shall  
be tapered to the Exist. F.G. by ex-  
tending the new Bit. Surf. on the ad-  
jacent road for an appropriate dis-  
tance. All resurfacing shall be done  
by pavers.  
Maintenance of Traffic:  
During the actual driving of  
piles, or pouring of concrete, the Con-  
tractor may reduce traffic to one-  
way with adequate advance signs,  
barricades, and flagmen, so as to  
safeguard traffic. At all other  
times two-way traffic shall be main-  
tained and the Exist. Rwy. shall  
not be reduced.

S. C. STATE HIGHWAY DEPARTMENT				
BRIDGE DIVISION				
COLUMBIA S. C.				
PLAN & PROFILE				
FOR WIDENING BRIDGE OVER				
CEDAR CREEK				
FILE NO.		COUNTY		ROUTE NO. DATE
40-720		RICHLAND		45 3-70
APPROVED BY <i>J. M. Jones</i>			APPROVED BY <i>W. S. Crum</i>	
ASST. BRIDGE ENGINEER-DESIGN			BRIDGE ENGINEER-DESIGN	



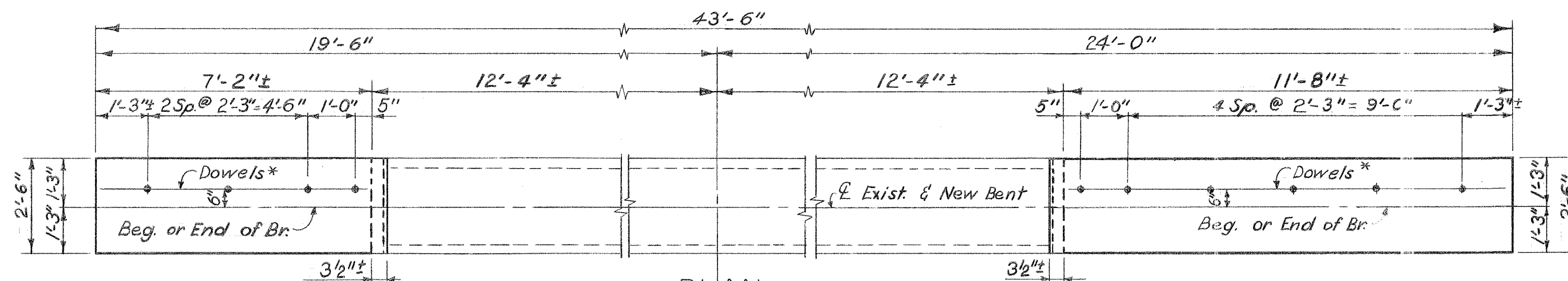
SUMMARY OF QUANTITIES						
ITEM	NO.	CONCRETE CLASS "A" C.Y.	REINF. STEEL LBS.	14" SQ. PRESTR. CONC. PILING L.F.	8" PIPE SLOPE DRAINS L.F.	INTAKE SPILLWAY ASSY. EA.
End Bents 1 & 4	2	11.0	1804.	304	—	—
Int. Bents 2 & 3	2	11.0	1781.	456	—	—
25.5' End Span	2	66.8	15,922.	—	—	—
25.0' Int. Span	1	32.3	7,713.	—	—	—
Curb & Gutter	2	1.8	130	—	40	4
TOTALS		122.9	27,350	760	40	4





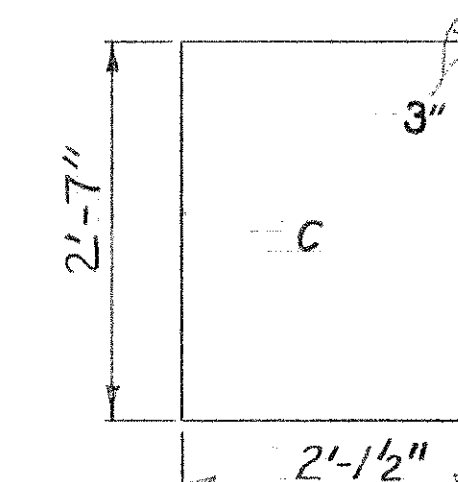


FED. RD. DIV. NO.	STATE	COUNTY	FILE NO.	ROUTE NO.	SHEET NO.	TOTAL SHEETS
3	S. C.	RICHLAND	40.720	48	12	44



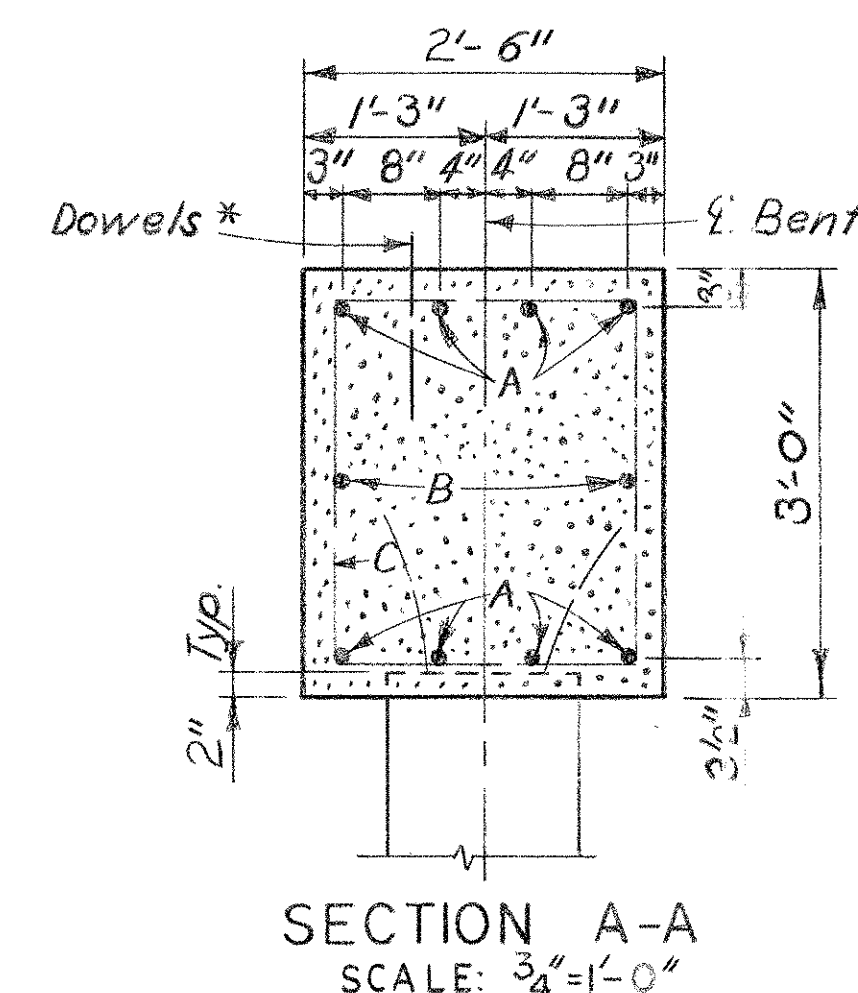
\* Place Dowels at Fixed end of spans only.

* Dowels	6	5	10	1'-3"
Exp. Bolts	3 1/4" $\phi$	-	8	2'-0"



① Reinf Steel Schedule and Quantities are for both sides of Roadway.  
② Includes 40 lbs. for Exp. Bolt Assemblies and 19 lbs for Dowels.\*

Notes:



SECTION THRU CAP  
(SHOWING LOCATION OF EXP.  
BOLTS IN EXISTING CAP)  
SCALE:  $\frac{3}{4}'' = 1'-0''$

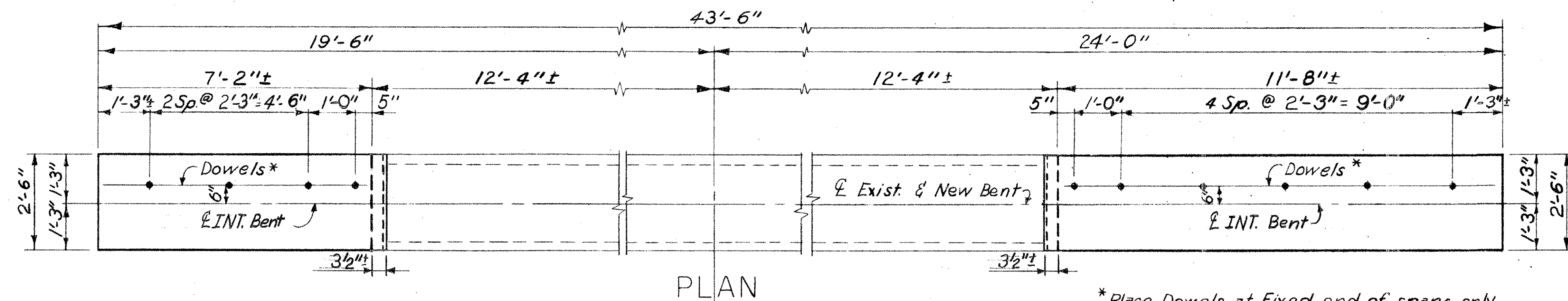
Approx. scale:  $\frac{1}{2}'' = 1'-0''$  or as noted.

END BENTS  
FOR WIDENING BRIDGE OVER  
GILLS CREEK

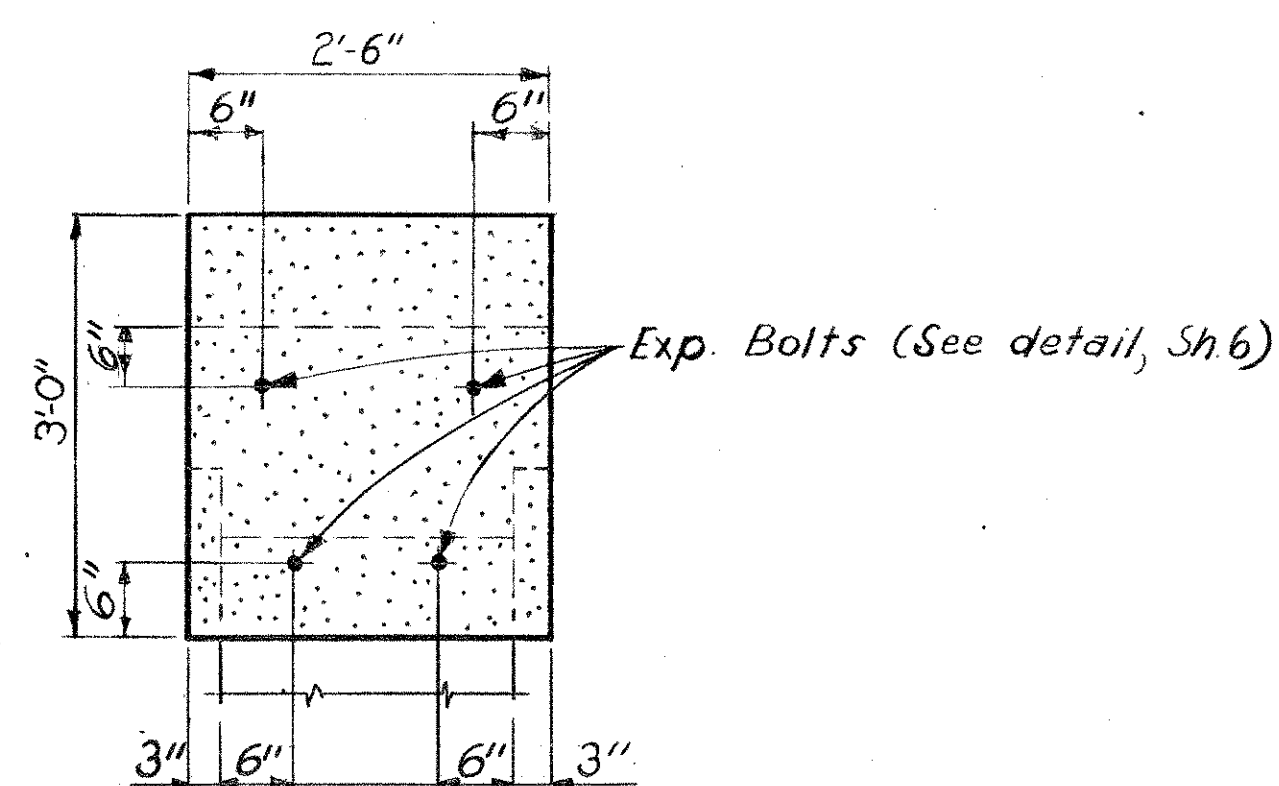
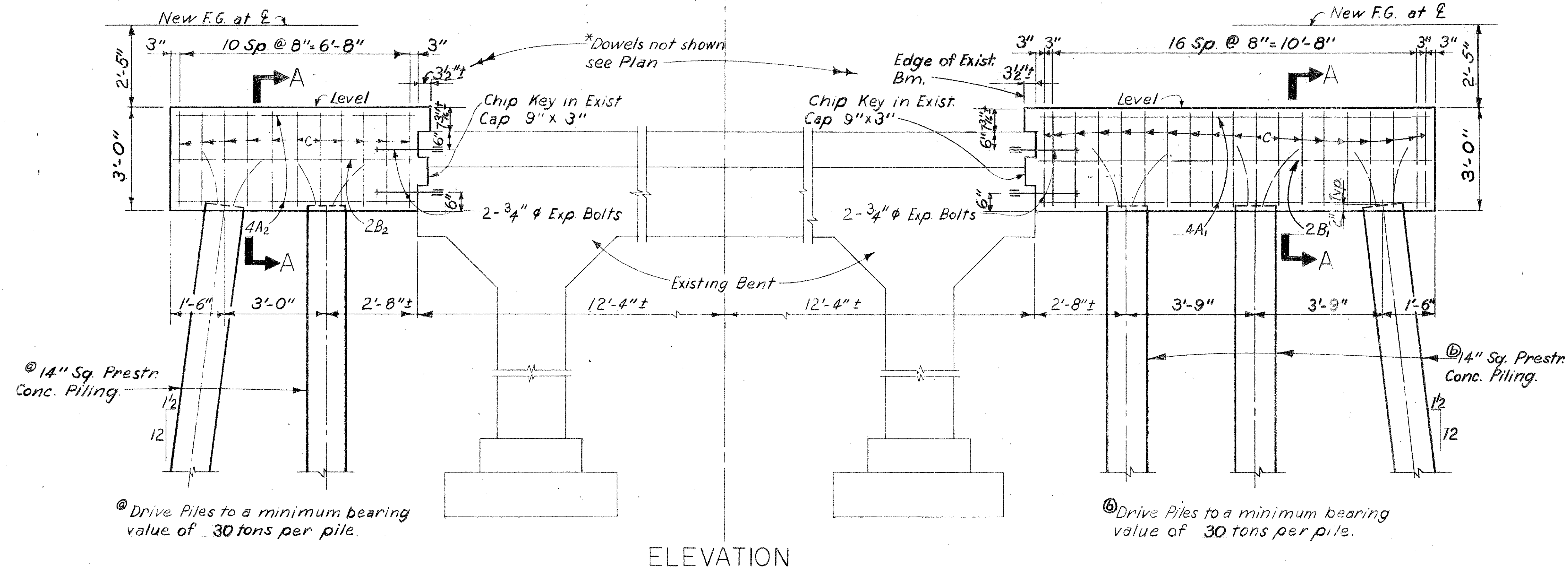
IN CHARGE		FILE NO.	COUNTY	ROUTE NO.	DATE
QUAN.	AM. M.C.M. 4-70	40.720	RICHLAND	48	4-70
TR.		APPROVED BY		APPROVED BY DESIGN	
DR.	WKH EAM 4-70	J. M. Jones		W. B. Cram	
DES.	RWH BAM 4-70	ASS'T		BRIDGE ENGINEER	
BY CHK'D DATE		BRIDGE DESIGN & PLANS ENGINEER		BRIDGE ENGINEER	



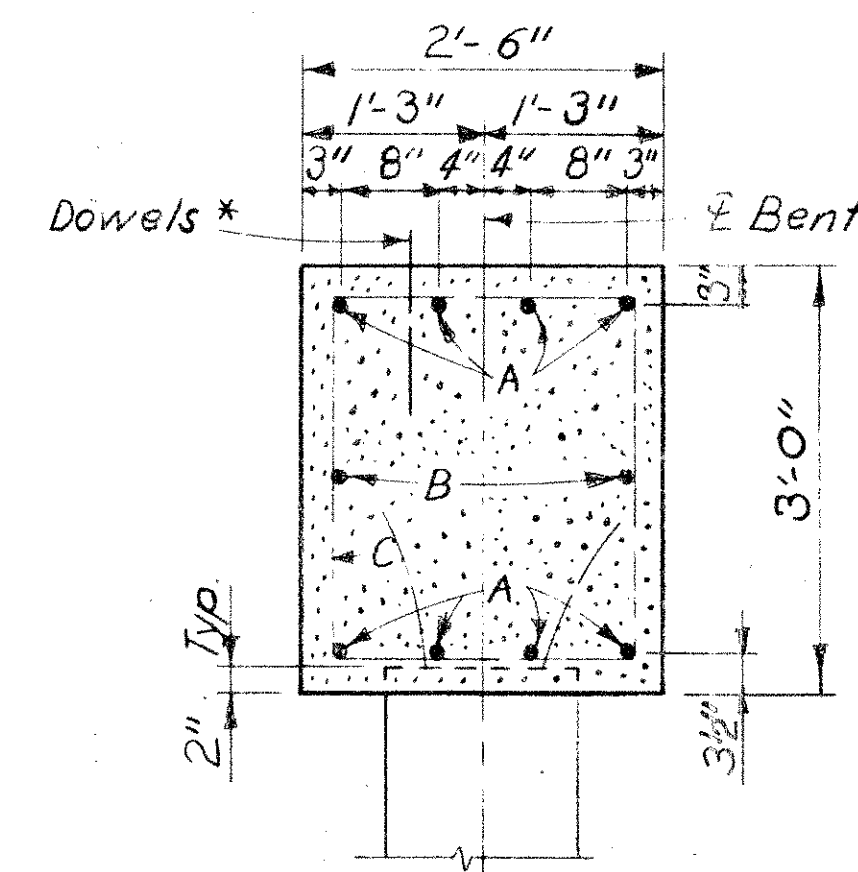
FED. RD. DIV. NO.	STATE	COUNTY	FILE NO.	ROUTE NO.	SHEET NO.	TOTAL SHEETS
3	S. C.	RICHLAND	40.720	48	13	44



\* Place Dowels at Fixed end of spans only.  
The Engineer will determine which End  
of Old Superstructure is Fixed & match  
the New Superstructure accordingly.



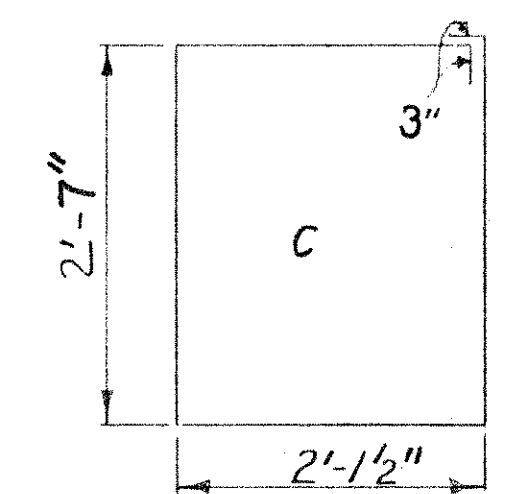
SECTION THRU CAP  
(SHOWING LOCATION OF EXP.  
BOLTS IN EXISTING CAP)  
SCALE:  $3\frac{1}{2}"=1'-0"$



SECTION A-A  
SCALE:  $\frac{3}{4}" = 1' - 0"$

ONE BENT					NO.	
MARKS	SIZE	D	REQ'D	LENGTH	REQ'D	LENGTH
A <sub>1</sub>	8	S	8	11'-4"		
A <sub>2</sub>	8	S	8	6'-10"		
B <sub>1</sub>	4	S	2	11'-4"		
B <sub>2</sub>	4	S	2	6'-10"		
C	4	B	30	9'-11"		
<hr/>						
*Dowels	6	S	10	1'-3"		
Exp. Bolts	3/4" φ	-	8	2'-0"		

## BENDING DETAILS



① QUANTITIES		ONE BENT
Class "A" Concrete	C.Y.	53
Reinforcing Steel @	lbs.	670
14" Sq. Prestr. Conc. Piling	L.F.	(See Summary Sh 7)

① Reinf Steel Schedule and Quantities are for both sides of Roadway.  
② Includes 40 lbs. for Exp. Bolt Assemblies and 19 lbs for Dowels.\*

Notes:

For Standard Notes see Sh. 5  
For Standard Details see Sh. 6  
For Pile Details see Sh. 11

Approx. scale: 2" = 1'-0" or as noted.		S.C. STATE HIGHWAY DEPARTMENT BRIDGE DIVISION COLUMBIA S.C.			
REV.		INT. BENTS FOR WIDENING BRIDGE OVER GILLS CREEK			
REV.					
REV.					
REV.					
REVIEWED	<i>RWH</i>				
IN CHARGE		FILE NO.	COUNTY	ROUTE NO.	DATE
QUAN.	A.M. M.C.M. 4-70	40.720	RICHLAND	48	4-70
TR.		APPROVED BY <i>A.M. Jones</i>		DESIGN <i>W.E. Crum</i>	
DR. WKH	EAM 4-70	ASST.		BRIDGE ENGINEER	
DES.	RWH EAM 4-70	BRIDGE DESIGN & PLANS ENGINEER		BRIDGE ENGINEER	
BY	CHK'D DATE				



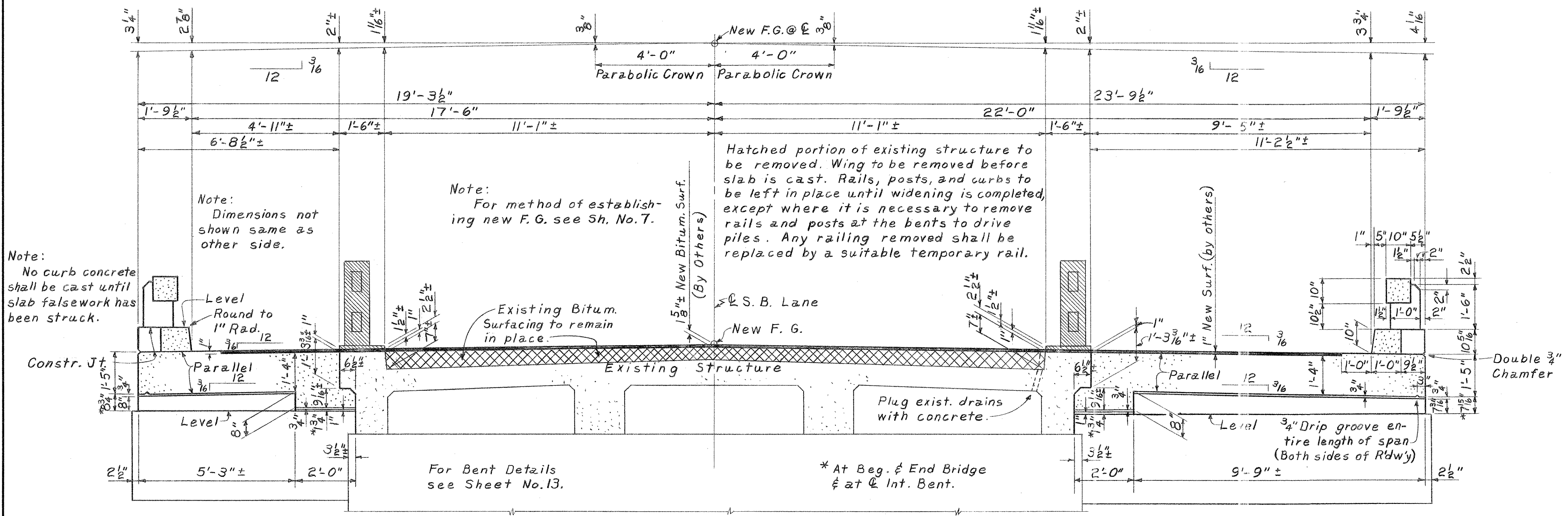




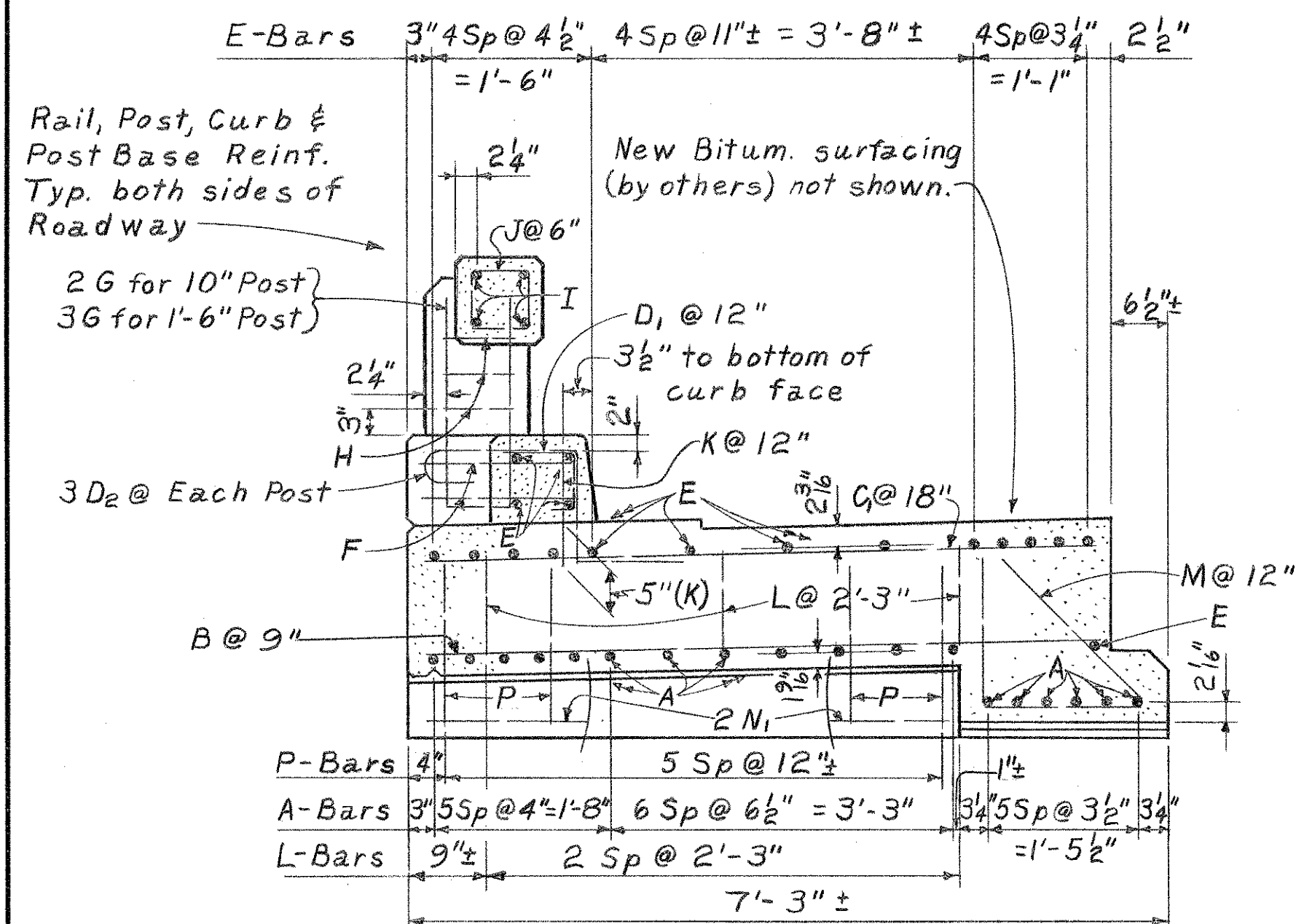
FED. RD. DIV. NO.	STATE	COUNTY	FILE NO.	ROUTE NO.	SHEET NO.	TOTAL SHEETS
3	S.C.	RICHLAND	40.720	48	15	44

# REINFORCING STEEL SCHEDULE BOTH SIDES

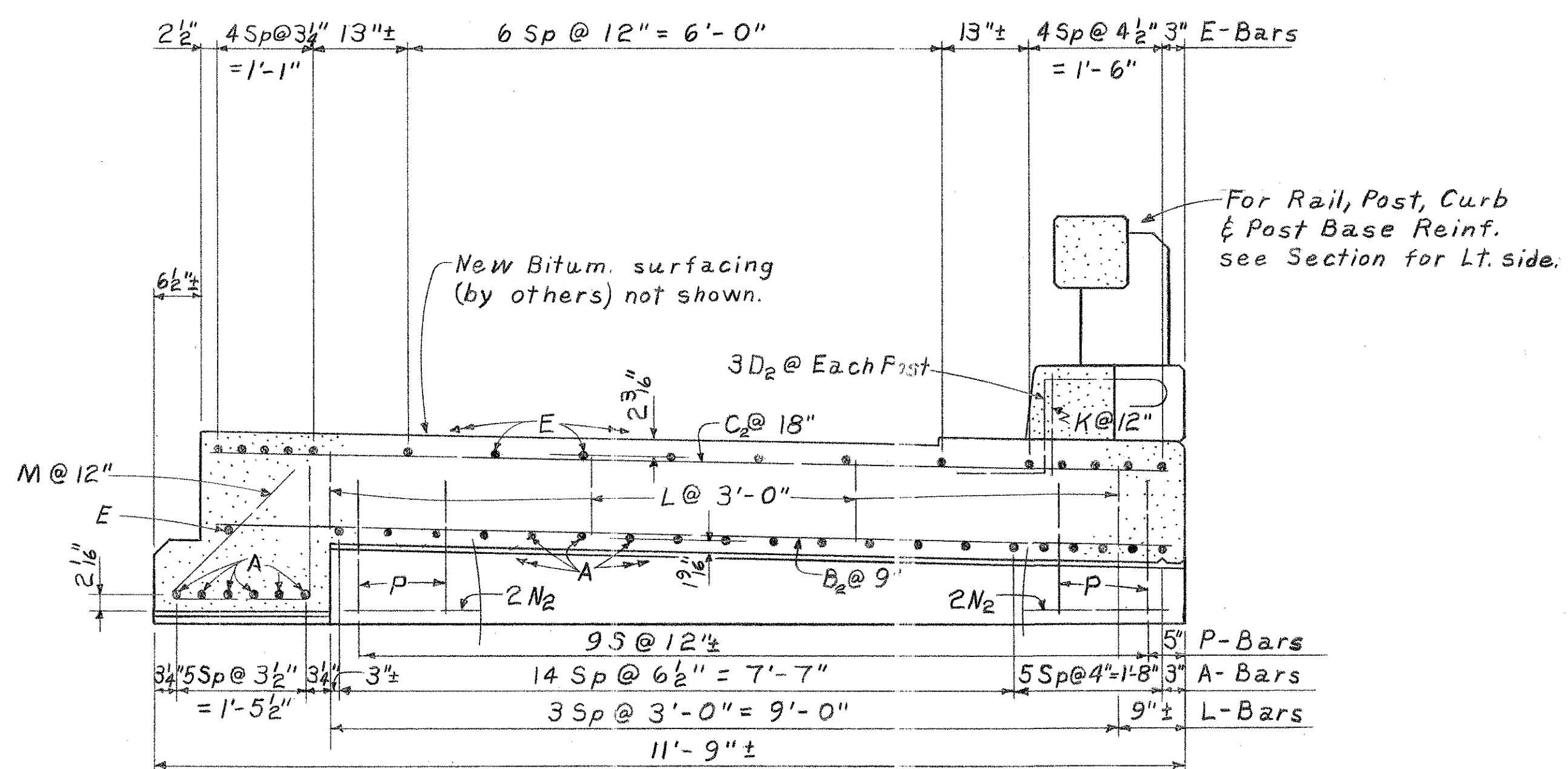
		ONE END SPAN		ONE INT. SPAN	
MARK	SIZE	D NO.	LENGTH	D NO.	LENGTH
A	9	S 44	24'-7"	44	24'-7"
B <sub>1</sub>	5	S 35	6'-4"	35	6'-4"
B <sub>2</sub>	5	S 35	10'-10"	35	10'-10"
C <sub>1</sub>	4	S 20	6'-4"	20	6'-4"
C <sub>2</sub>	4	S 20	10'-10"	20	10'-10"
D <sub>1</sub>	4	B 42	1'-4"	42	1'-4"
D <sub>2</sub>	5	B 24	4'-1"	24	4'-1"
E	4	S 40	24'-7"	40	24'-7"
F <sub>1</sub>	4	B 12	3'-7"	16	3'-7"
F <sub>2</sub>	4	B 4	4'-3"		
G	6	B 18	4'-8"	16	4'-8"
H <sub>1</sub>	3	B 18	3'-1"	24	3'-1"
H <sub>2</sub>	3	B 6	4'-5"		
I	8	S 8	24'-6"	8	24'-6"
J	3	B 84	2'-10"	84	2'-10"
K	5	S 50	1'-1"	50	1'-1"
L	4	B 42	4'-10"	42	4'-10"
M	4	B 50	5'-3"	50	5'-3"
N <sub>1</sub>	4	S 4	4'-11"	4	4'-11"
N <sub>2</sub>	4	S 4	9'-5"	4	9'-5"
P	4	B 32	3'-7"	32	3'-7"
R	4	S 12	3'-6"		
S <sub>1</sub>	4	B 4	7'-10"		
S <sub>2</sub>	4	B 2	7'-0"		
T	4	S 4	1'-0"		



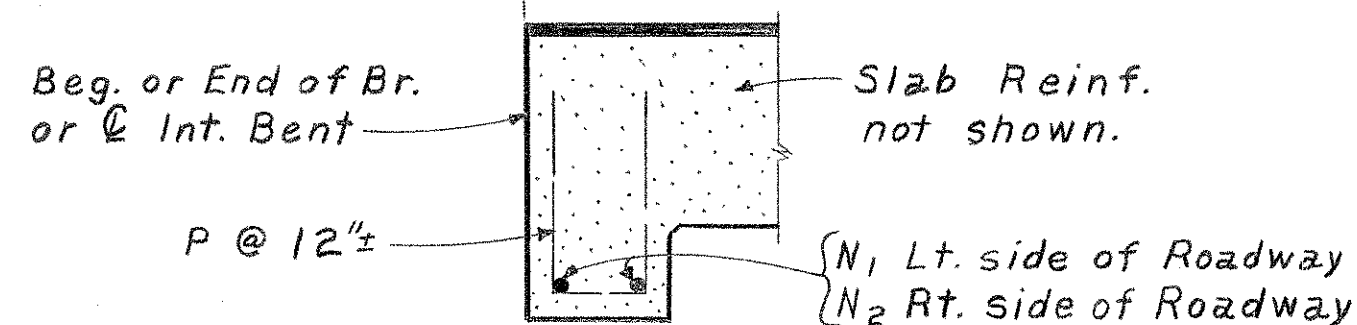
SECTION A-A  
SCALE: 1/2"=1'-0"  
LOOKING IN DIRECTION OF STATIONING



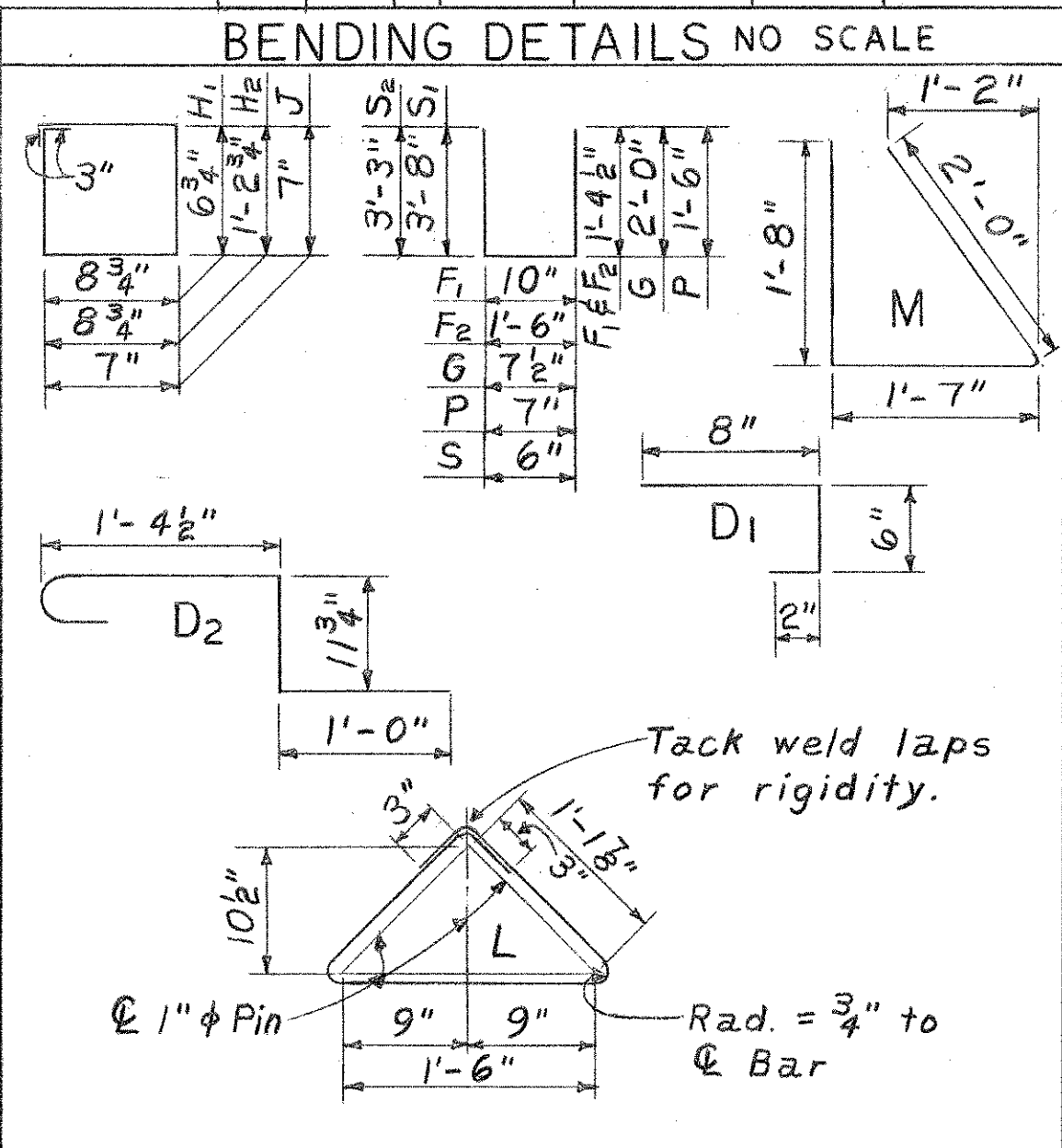
SECTION SHOWING REINF. STEEL LEFT SIDE  
SCALE: 3/4"=1'-0"



SECTION SHOWING REINF. STEEL RIGHT SIDE  
SCALE: 3/4"=1'-0"



SECTION SHOWING BUILD-DOWN REINF.  
SCALE: 3/4"=1'-0"



QUANTITIES BOTH SIDES		One End Span		One Int. Span	
Class "A" Concrete	C.Y.	30.0		29.2	
Reinforcing Steel	Lbs.	6757		6604	

\*Includes .14 C.Y. of concrete and 74.1 lbs. reinforcing steel for Guard Rail Lugs.

Notes:  
For Standard Notes see Sh. No. 5.  
For Standard Details see Sh. No. 6.

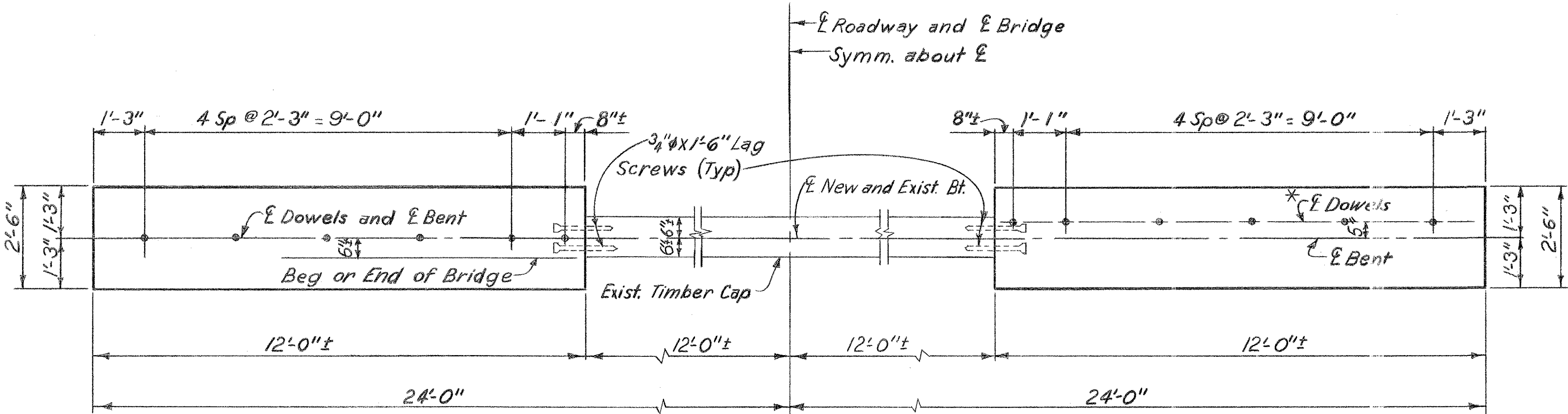
Scale as shown

REV.		S.C. STATE HIGHWAY DEPARTMENT
REV.		BRIDGE DIVISION
REV.		COLUMBIA S.C.
REV.		SUPERSTRUCTURE DETAILS
REV.		FOR WIDENING BRIDGE OVER
REV.		GILLS CREEK

QUAN.	M.C.M. A.M. 4-70	FILE NO.	COUNTY	ROUTE NO.	DATE
TR.		40.720	RICHLAND	48	4-70
DR.	M.C.M. RW 4-70	APPROVED BY			DESIGN
DES.	From 45.402				
BY	CHK'D DATE	BRIDGE DESIGN & PLANS ENGINEER			BRIDGE ENGINEER

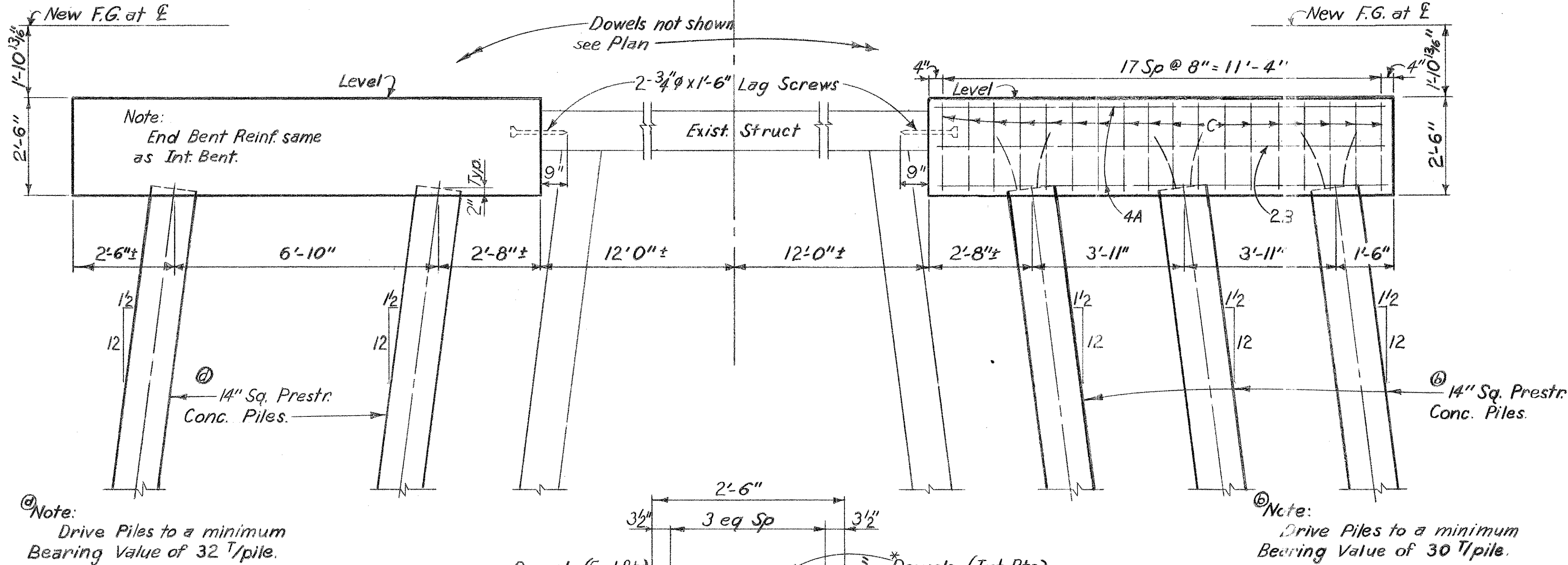


FED. RD. DIV. NO.	STATE	COUNTY	FILE NO.	ROUTE NO.	SHEET NO.	TOTAL SHEETS
3	S. C.	RICHLAND	40.720	48	16	44



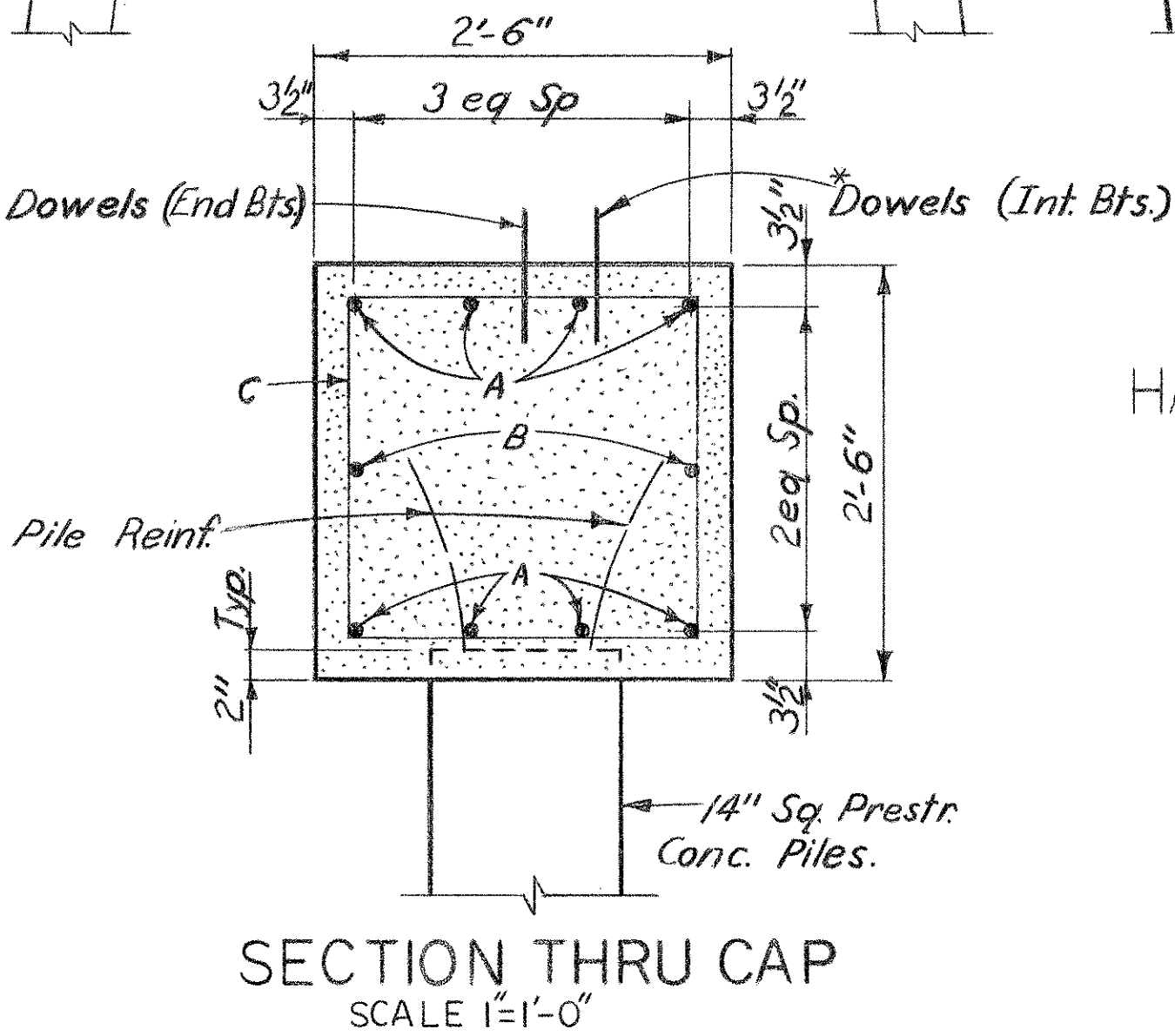
HALF PLAN-END BENT

HALF PLAN -INT. BENT



HALF ELEV-END BENT

HALF ELEV-INT. BENT

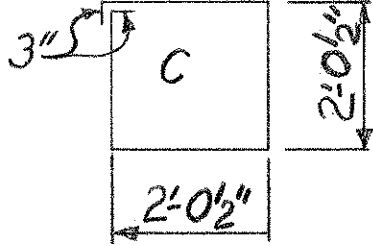


SECTION THRU CAP  
SCALE 1"=1'-0"

\*Note:  
Place Dowels at Fixed Ends of Spans only. Omit Dowels on Bent 2-Dry Branch, Bent 3-Bridge Creek, & Bent 4-Cedar Creek where both ends of spans are expansion ends.

REINFEEL STEEL SCHED.				
MARK	SIZE	D	END or INT. BENT	
			NO. REQ'D	LENGTH
A	9	S	16	11'-7"
B	4	S	4	11'-7"
C	4	B	36	8'-8"
*Dowels	6	S	12	1'-3"
Lag Screw	3/4" φ	—	4	1'-6"

BENDING DETAILS



QUANTITIES

Item	Unit	1-Bent
Concrete Class "A"	C.Y.	5.5
Reinforcing Steel	Lbs.	902.
14" Sq. Prest. Conc. Piling	L.F.	(See Summary)

① Includes 10 lbs. for Lag Screws and 23 lbs. for \*Dowels.

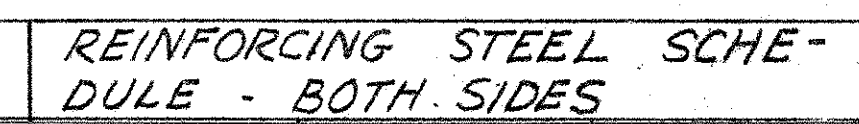
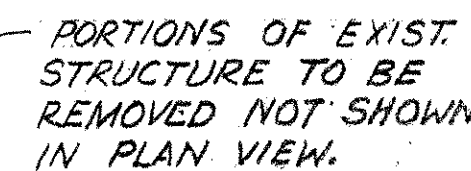
Note:  
Reinf. Steel Schedule and Quantities are for Both sides of Rdwy.

Note:  
For Standard Notes see Sh. 5.  
For Standard Details see Sh. 6.  
For Dowel Details see Sh. 6.  
For Details of 14" Sq. Prest. Conc. Piles see Sh. 11

Approx. Scale: 1/2" = 1'-0" or as noted.

REV.		S.C. STATE HIGHWAY DEPARTMENT BRIDGE DIVISION COLUMBIA S.C.
REV.		
REV.		
REV.		
REVIEWED	IN CHARGE	
QUAN.	AM.	FILE NO.
TR.	4-70	40.720
DR.	W.K.H.	COUNTY
DES.	R.W.H.	RICHLAND
BY	CHK'D	ROUTE NO.
		48
		DATE
		4-70
		APPROVED BY
		DESIGN
		BRIDGE DESIGN & PLANS ENGINEER
		ASS'T
		BRIDGE ENGINEER

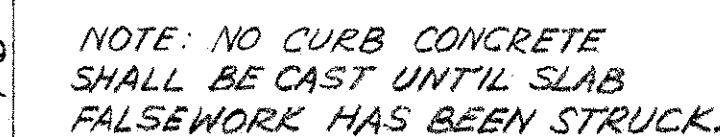




SUMMARY OF ESTIMATED QUANTITIES  
(BOTH SIDES)

① Includes .14 C.Y. of Concrete and 74 Lbs. of Reinf. Steel for Guard Rail Lugs.

NOTES:  
FOR STANDARD NOTES SEE SH. NO. 5.  
FOR STANDARD DETAILS, INCLUDING JOINT  
DETAILS, SLAB BUILD-DOWN DETAILS, BOLSTER  
DETAILS & HOOK DETAILS, SEE SH. NO. 6.



REV.		S.C. STATE HIGHWAY DEPARTMENT BRIDGE DIVISION COLUMBIA S.C.  25'-6" <sup>±</sup> END SPAN & 25'-0" <sup>±</sup> INT. SPAN SUPERSTRUCTURE FOR WIDENING BRIDGES OVER CEDAR CREEK & BRIDGE CREEK
REV.		
REV.	A.M. M.C.M. 4-70 <i>Quantities</i>	
REV.	A.M. M.C.M. 3-70 From: 2946.356	
REVIEWED	<i>10/1/82</i> IN CHARGE	
QUAN.	J.C. 226 7-68	FILE NO. COUNTY ROUTE NO. DATE 40.720 RICHLAND 48 3-70
TR.		APPROVED BY
DR.	JRC JWB 7-68	ASS'T. <i>W.C. Crum</i>
DES.	FROM 45.402 BY CHK'D DATE	APPROVED BY DESIGN BRIDGE DESIGN & PLANS ENGINEER BRIDGE ENGINEER













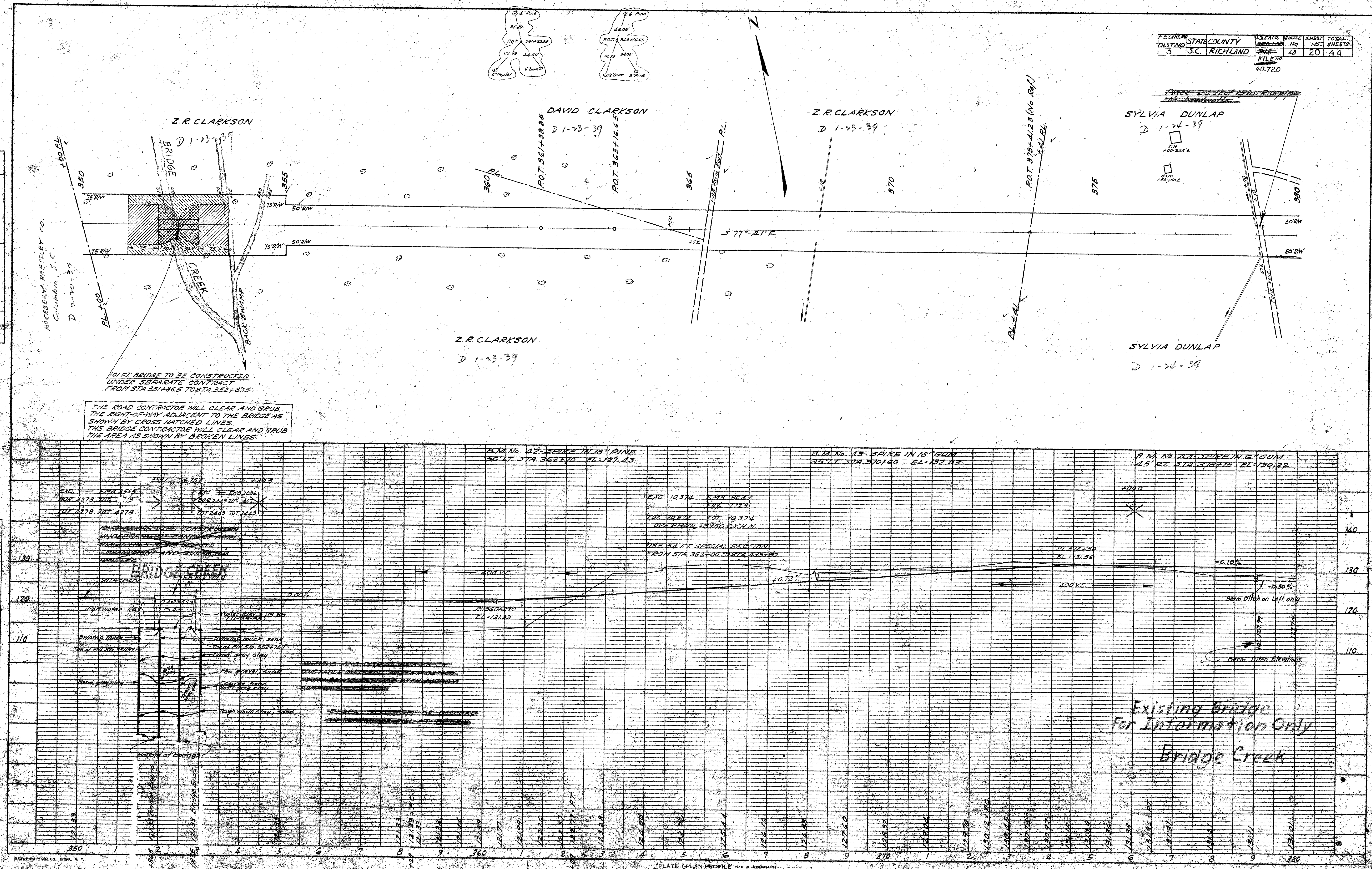


FED. ROAD DIST. NO.	STATE	COUNTY	STATES ROAD NO.	SHEET NO.	TOTAL SHEETS
3	S.C.	RICHLAND	48	20	44

FILE NO. 40.720

PLAN	DATE
SURVISED	
NOTED	
ALIGNED	
CHECKED	
BY	
NO.	

PROFILE	DATE
SURVISED	
NOTED	
ALIGNED	
CHECKED	
BY	
NO.	





PLAN	DATE	BY
SURVEYED		
NOTE BOOK		
PLOTTED		
CHECKED		
RT. OF WAY CHECKED		
NO.		

ANNIE J.  
MRS. CLARKSON  
D 2-8-39

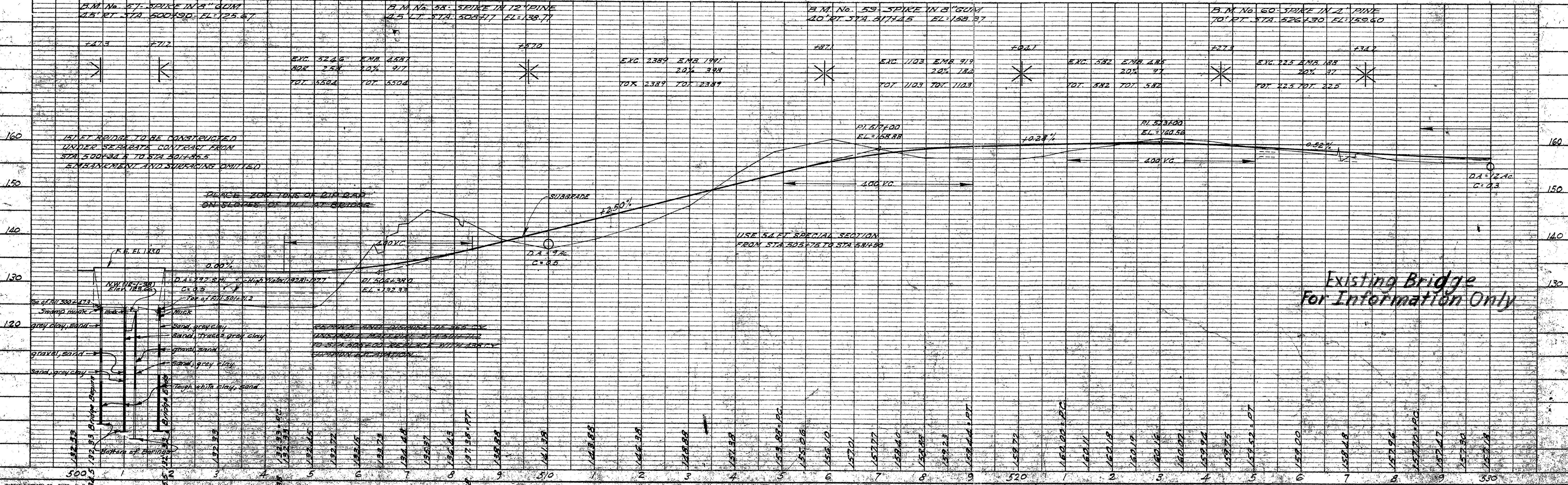
ANNIE J.  
MRS. CLARKSON  
D 2-8-39

W. K. DUFFIE  
150x Richland St.  
Columbia, S.C.  
D 1-26-39

W. K. DUFFIE  
D 1-26-39

Ten. House  
100-3504

THE ROAD CONTRACTOR WILL CLEAR AND GRUB THE RIGHT-OF-WAY ADJACENT TO THE BRIDGE AS SHOWN BY CROSS HATCHED LINES. THE BRIDGE CONTRACTOR WILL CLEAR AND GRUB THE AREA AS SHOWN BY BROKEN LINES.



Existing Bridge  
For Information Only

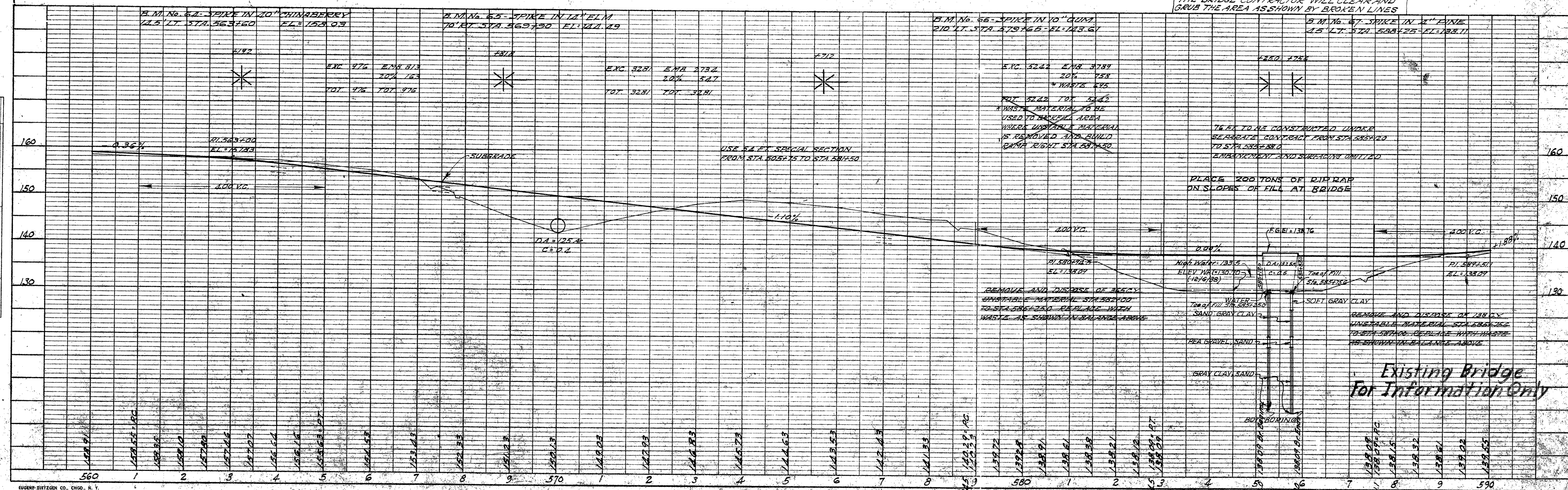
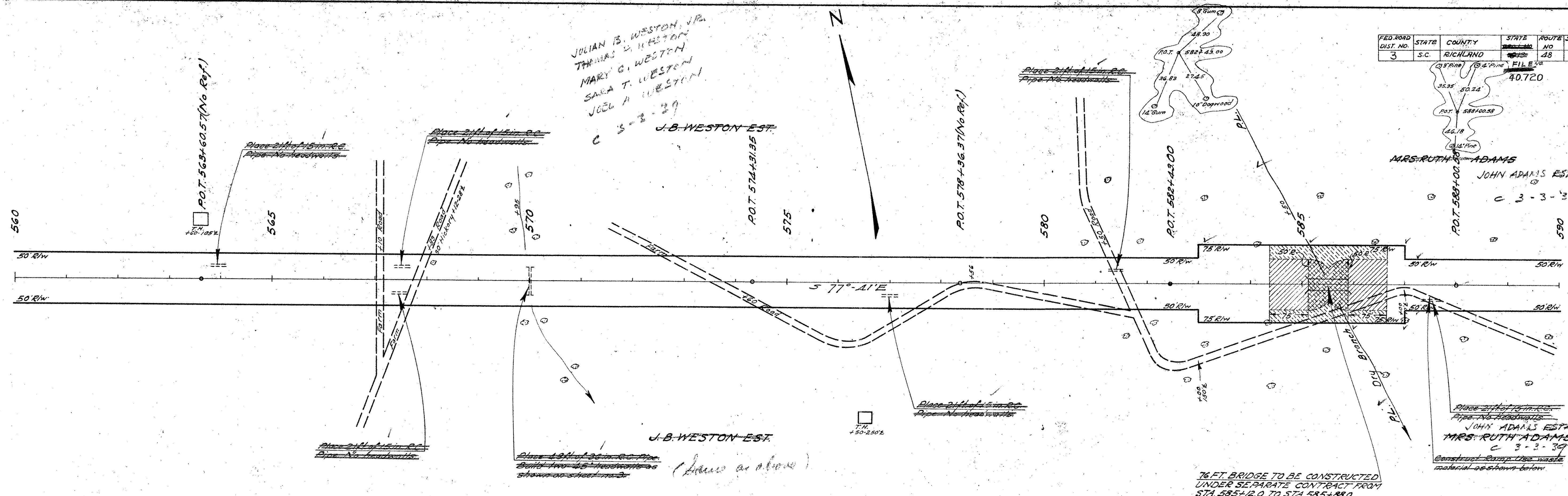
PROFILE	DATE	BY
SURVEYED		
NOTE BOOK		
GRADES CHECKED		
IS M.S. NOTED		
STRUCTURE NOTINGS OK		
NO.		



PLAN	DATE
SURVEYED	BY
NOTE BOOK	NO.
ALIGNMENT CHECKED	
RT. OF WAY CHECKED	

PROFILE	DATE
SURVEYED	BY
NOTE BOOK	NO.
GRADES CHECKED	
STRUCTURE NOTATIONS CHECKED	

FED. ROAD DIST. NO.	STATE	COUNTY	ROUTE NO.	SHEET NO.	TOTAL SHEETS
3	S.C.	RICHLAND	48	22	44



Existing Bridge  
For Information Only

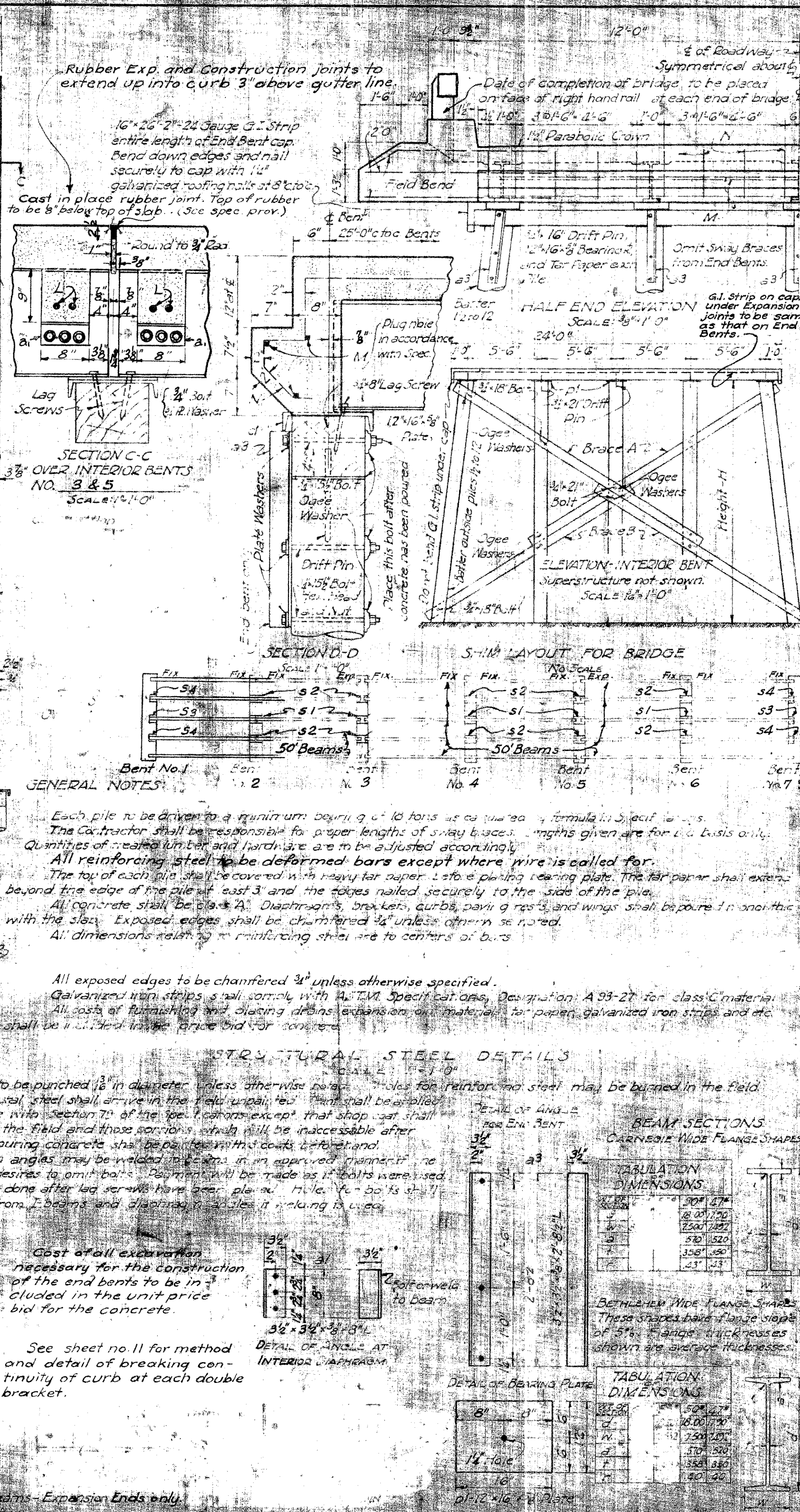
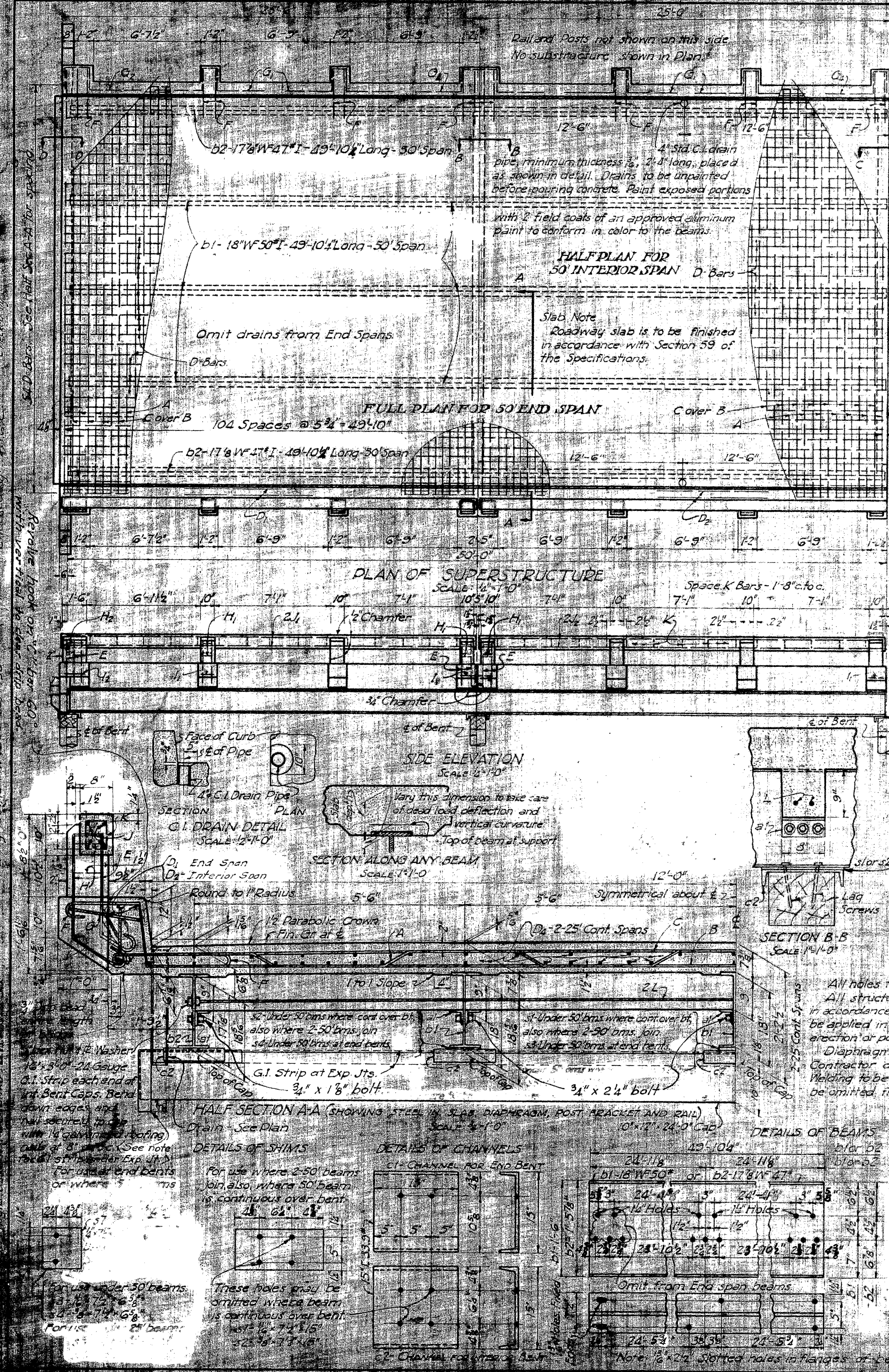


STAMP HIGHWAY ENGINE  
S 307









FEED DIST. NO.	STATE	COUNTY	FILE NO.	ROUTE NO.	SHEET NO.	TOTAL SHEETS
3	S.C.	RICHLAND	40.720	48	25	44

### BILL OF MATERIAL

#### SUBSTRUCTURE

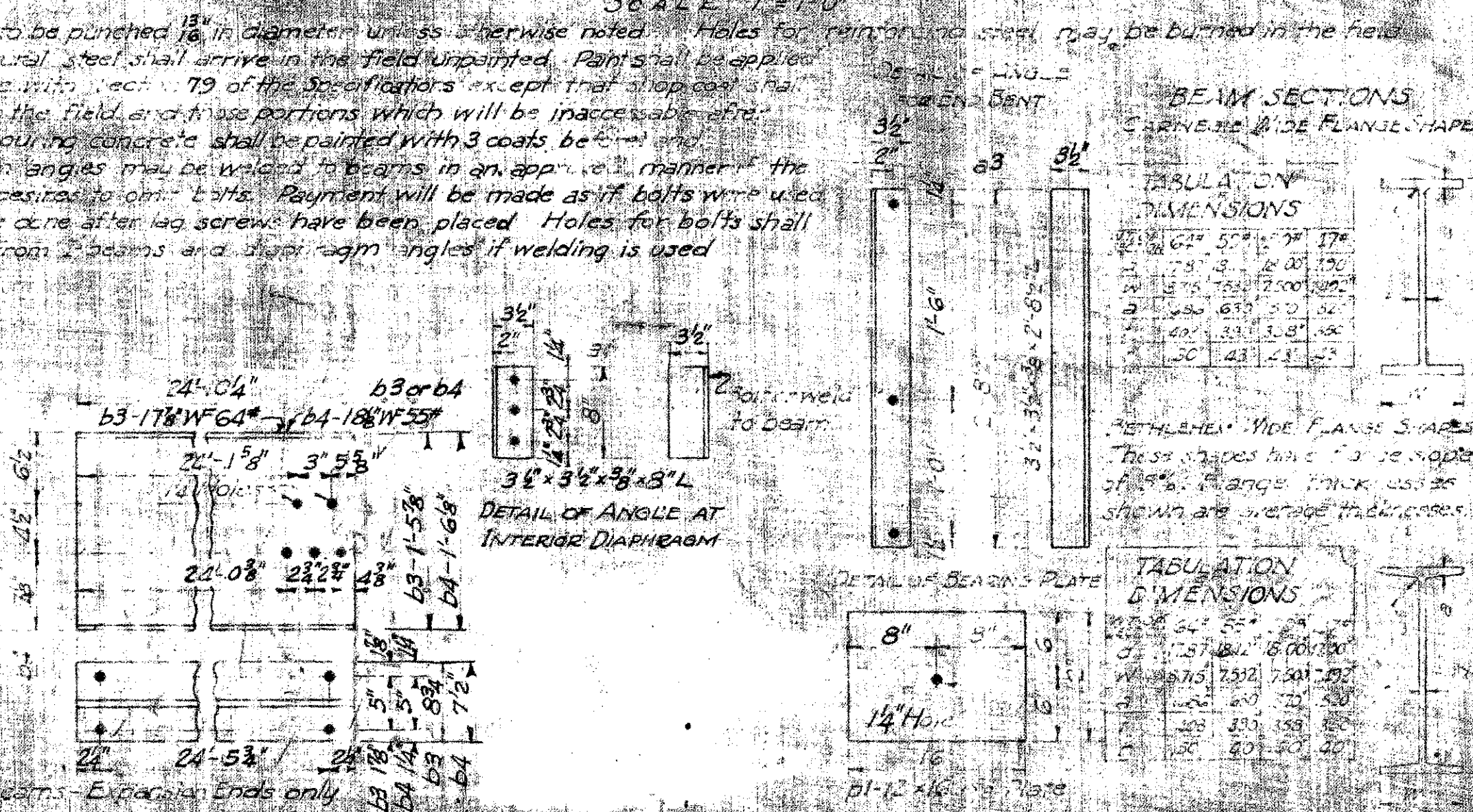
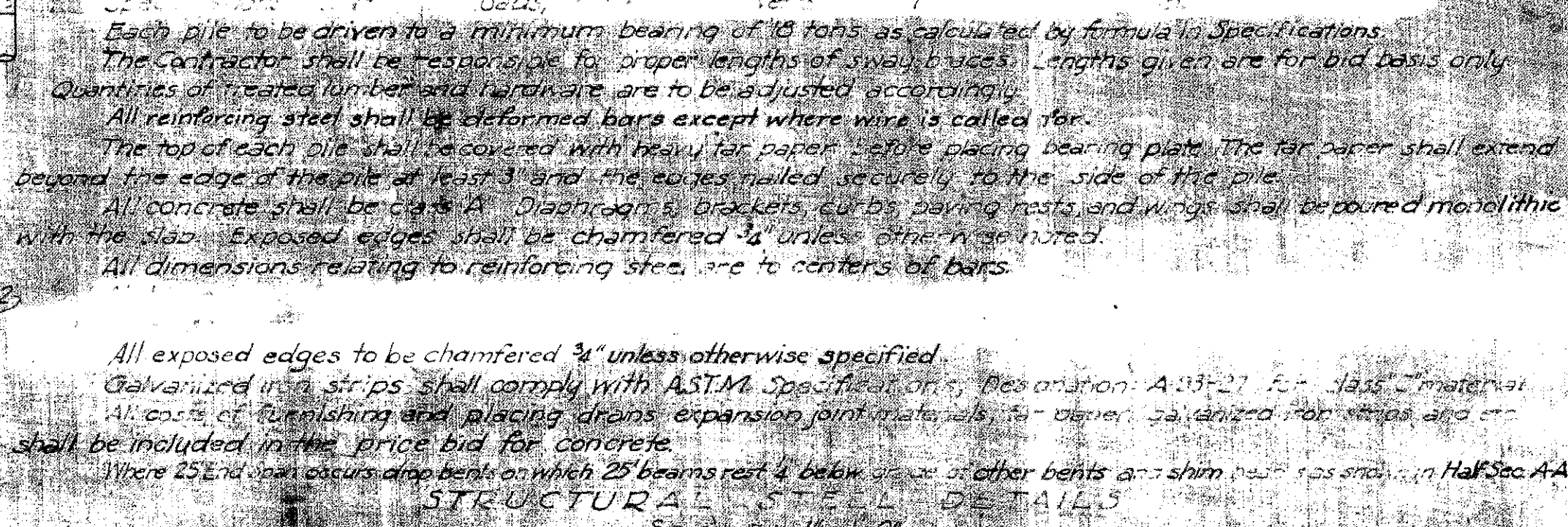
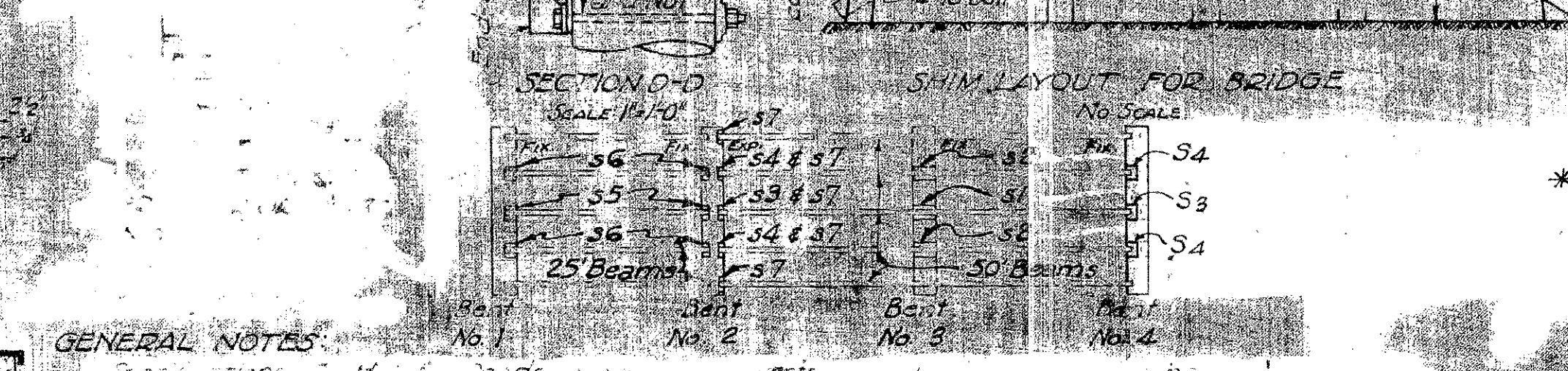
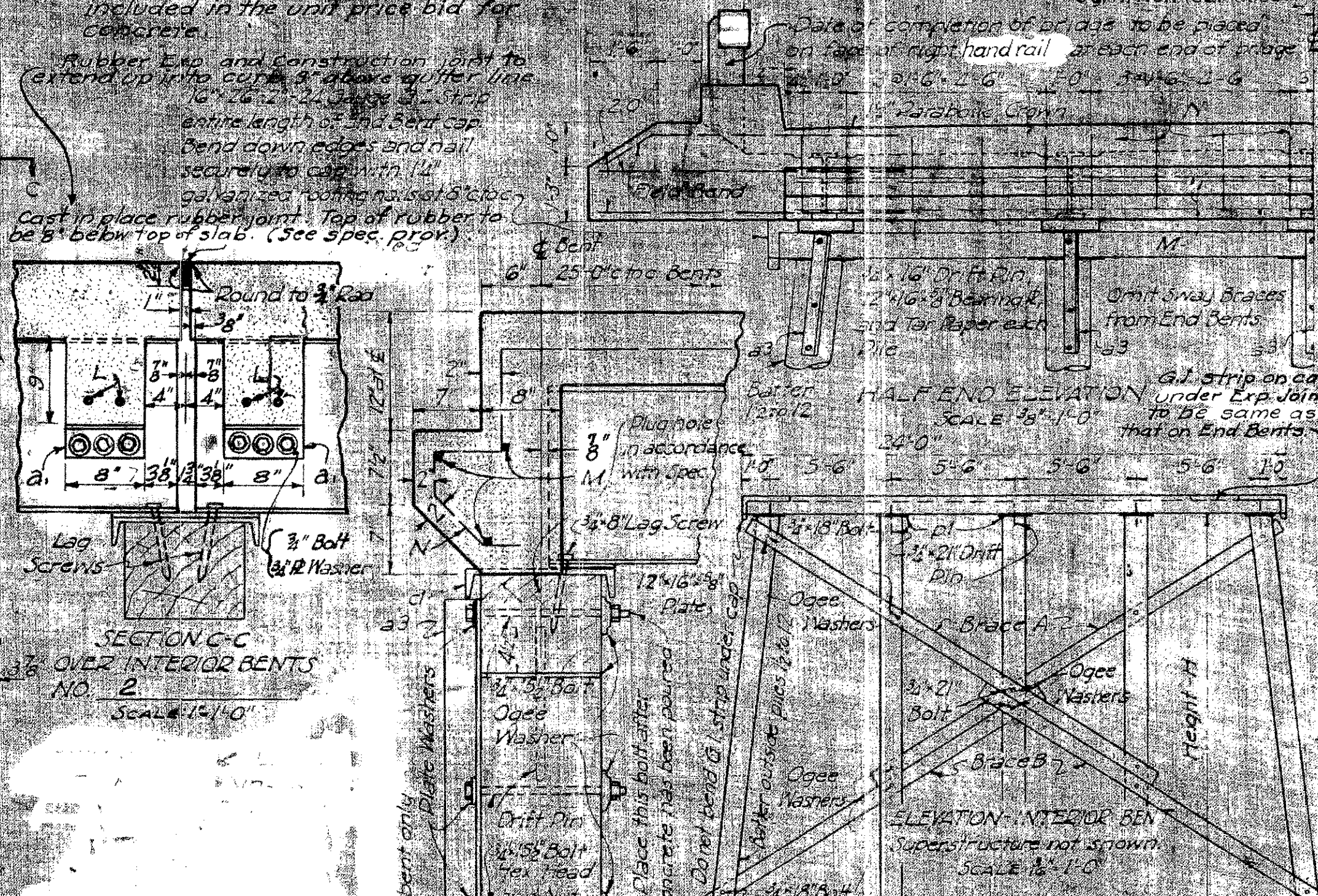
ONE INTERIOR BENT	
REINFORCING STEEL	MARK NO. DESCRIPTION
1. 16" x 16" x 24" 1240	
2. 16" x 16" x 24" 1240	
3. 16" x 16" x 24" 1240	
4. 16" x 16" x 24" 1240	
5. 16" x 16" x 24" 1240	
6. 16" x 16" x 24" 1240	
7. 16" x 16" x 24" 1240	
8. 16" x 16" x 24" 1240	
9. 16" x 16" x 24" 1240	
10. 16" x 16" x 24" 1240	
11. 16" x 16" x 24" 1240	
12. 16" x 16" x 24" 1240	
13. 16" x 16" x 24" 1240	
14. 16" x 16" x 24" 1240	
15. 16" x 16" x 24" 1240	
16. 16" x 16" x 24" 1240	
17. 16" x 16" x 24" 1240	
18. 16" x 16" x 24" 1240	
19. 16" x 16" x 24" 1240	
20. 16" x 16" x 24" 1240	
21. 16" x 16" x 24" 1240	
22. 16" x 16" x 24" 1240	
23. 16" x 16" x 24" 1240	
24. 16" x 16" x 24" 1240	
25. 16" x 16" x 24" 1240	
26. 16" x 16" x 24" 1240	
27. 16" x 16" x 24" 1240	
28. 16" x 16" x 24" 1240	
29. 16" x 16" x 24" 1240	
30. 16" x 16" x 24" 1240	
31. 16" x 16" x 24" 1240	
32. 16" x 16" x 24" 1240	
33. 16" x 16" x 24" 1240	
34. 16" x 16" x 24" 1240	
35. 16" x 16" x 24" 1240	
36. 16" x 16" x 24" 1240	
37. 16" x 16" x 24" 1240	
38. 16" x 16" x 24" 1240	
39. 16" x 16" x 24" 1240	
40. 16" x 16" x 24" 1240	
41. 16" x 16" x 24" 1240	
42. 16" x 16" x 24" 1240	
43. 16" x 16" x 24" 1240	
44. 16" x 16" x 24" 1240	
45. 16" x 16" x 24" 1240	
46. 16" x 16" x 24" 1240	
47. 16" x 16" x 24" 1240	
48. 16" x 16" x 24" 1240	
49. 16" x 16" x 24" 1240	
50. 16" x 16" x 24" 1240	
51. 16" x 16" x 24" 1240	
52. 16" x 16" x 24" 1240	
53. 16" x 16" x 24" 1240	
54. 16" x 16" x 24" 1240	
55. 16" x 16" x 24" 1240	
56. 16" x 16" x 24" 1240	
57. 16" x 16" x 24" 1240	
58. 16" x 16" x 24" 1240	
59. 16" x 16" x 24" 1240	
60. 16" x 16" x 24" 1240	
61. 16" x 16" x 24" 1240	
62. 16" x 16" x 24" 1240	
63. 16" x 16" x 24" 1240	
64. 16" x 16" x 24" 1240	
65. 16" x 16" x 24" 1240	
66. 16" x 16" x 24" 1240	
67. 16" x 16" x 24" 1240	
68. 16" x 16" x 24" 1240	
69. 16" x 16" x 24" 1240	
70. 16" x 16" x 24" 1240	
71. 16" x 16" x 24" 1240	
72. 16" x 16" x 24" 1240	
73. 16" x 16" x 24" 1240	
74. 16" x 16" x 24" 1240	
75. 16" x 16" x 24" 1240	
76. 16" x 16" x 24" 1240	
77. 16" x 16" x 24" 1240	
78. 16" x 16" x 24" 1240	
79. 16" x 16" x 24" 1240	
80. 16" x 16" x 24" 1240	
81. 16" x 16" x 24" 1240	
82. 16" x 16" x 24" 1240	
83. 16" x 16" x 24" 1240	
84. 16" x 16" x 24" 1240	
85. 16" x 16" x 24" 1240	
86. 16" x 16" x 24" 1240	
87. 16" x 16" x 24" 1240	
88. 16" x 16" x 24" 1240	
89. 16" x 16" x 24" 1240	
90. 16" x 16" x 24" 1240	
91. 16" x 16" x 24" 1240	
92. 16" x 16" x 24" 1240	
93. 16" x 16" x 24" 1240	
94. 16" x 16" x 24" 1240	
95. 16" x 16" x 24" 1240	
96. 16" x 16" x 24" 1240	
97. 16" x 16" x 24" 1240	
98. 16" x 16" x 24" 1240	
99. 16" x 16" x 24" 1240	
100. 16" x 16" x 24" 1240	

#### SUPERSTRUCTURE

ONE 30' END SPAN		ONE 30' INTERIOR SPAN	
REINFORCING STEEL	MARK NO. DESCRIPTION	REINFORCING STEEL	MARK NO. DESCRIPTION
1. 16" x 16" x 24" 1240		1. 16" x 16" x 24" 1240	
2. 16" x 16" x 24" 1240		2. 16" x 16" x 24" 1240	
3. 16" x 16" x 24" 1240		3. 16" x 16" x 24" 1240	
4. 16" x 16" x 24" 1240		4. 16" x 16" x 24" 1240	
5. 16" x 16" x 24" 1240		5. 16" x 16" x 24" 1240	
6. 16" x 16" x 24" 1240		6. 16" x 16" x 24" 1240	
7. 16" x 16" x 24" 1240		7. 16" x 16" x 24" 1240	
8. 16" x 16" x 24" 1240		8. 16" x 16" x 24" 1240	
9. 16" x 16" x 24" 1240		9. 16" x 16" x 24" 1240	
10. 16" x 16" x 24" 1240		10. 16" x 16" x 24" 1240	
11. 16" x 16" x 24" 1240		11. 16" x 16" x 24" 1240	
12. 16" x 16" x 24" 1240		12. 16" x 16" x 24" 1240	
13. 16" x 16" x 24" 1240		13. 16" x 16" x 24" 1240	
14. 16" x 16" x 24" 1240		14. 16" x 16" x 24" 1240	
15. 16" x 16" x 24" 1240		15. 16" x 16" x 24" 1240	
16. 16" x 16" x 24" 1240		16. 16" x 16" x 24" 1240	
17. 16" x 16" x 24" 1240		17. 16" x 16" x 24" 1240	
18. 16" x 16" x 24" 1240		18. 16" x 16" x 24" 1240	
19. 16" x 16" x 24" 1240		19. 16" x 16" x 24" 1240	
20. 16" x 16" x 24" 1240		20. 16" x 16" x 24" 1240	
21. 16" x 16" x 24" 1240		21. 16" x 16" x 24" 1240	
22. 16" x 16" x 24" 1240		22. 16" x 16" x 24" 1240	
23. 16" x 16" x 24" 1240		23. 16" x 16" x 24" 1240	
24. 16" x 16" x 24" 1240		24. 16" x 16" x 24" 1240	
25. 16" x 16" x 24" 1240		25. 16" x 16" x 24" 1240	
26. 16" x 16" x 24" 1240		26. 16" x 16" x 24" 1240	
27. 16" x 16" x 24" 1240		27. 16" x 16" x 24" 1240	
28. 16" x 16" x 24" 1240		28. 16" x 16" x 24" 1240	
29. 16" x 16" x 24" 1240		29. 16" x 16" x 24" 1240	
30. 16" x 16" x 24" 1240		30. 16" x 16" x 24" 1240	
31. 16" x 16" x 24" 1240		31. 16" x 16" x 24" 1240	
32. 16" x 16" x 24" 1240		32. 16" x 16" x 24" 1240	
33. 16" x 16" x 24" 1240		33. 16" x 16" x 24" 1240	
34. 16" x 16" x 24" 1240		34. 16" x 16" x 24" 1240	
35. 16" x 16" x 24" 1240		35. 16" x 16" x 24" 1240	
36. 16" x 16" x 24" 1240		36. 16" x 16" x 24" 1240	
37. 16" x 16" x 24" 1240		37. 16" x 16" x 24" 1240	
38. 16" x 16" x 24" 1240		38. 16" x 16" x 24" 1240	
39. 16" x 16" x 24" 1240		39. 16" x 16" x 24" 1240	
40. 16" x 16" x 24" 1240		40. 16" x 16" x 24" 1240	
41. 16" x 16" x 24" 1240		41. 16" x 16" x 24" 1240	
42. 16" x 16" x 24" 1240		42. 16" x 16" x 24" 1240	
43. 16" x 16" x 24" 1240		43. 16" x 16" x 24" 1240	
44. 16" x 16" x 24" 1240		44. 16" x 16" x 24" 1240	
45. 16" x 16" x 24" 1240		45. 16" x 16" x 24" 1240	
46. 16" x 16" x 24" 1240		46. 16" x 16" x 24" 1240	
47. 16" x 16" x 24" 1240		47. 16" x 16" x 24" 1240	
48. 16" x 16" x 24" 1240		48. 16" x 16" x 24" 1240	
49. 16" x 16" x 24" 1240		49. 16" x 16" x 24" 1240	
50. 16" x 16" x 24" 1240		50. 16" x 16" x 24" 1240	
51. 16" x 16" x 24" 1240		51. 16" x 16" x 24" 1240	
52. 16" x 16" x 24" 1240		52. 16" x 16" x 24" 1240	
53. 16" x 16" x 24" 1240		53. 16" x 16" x 24" 1240	
54. 16" x 16" x 24" 1240		54. 16" x 16" x 24" 1240	
55. 16" x 16" x 24" 1240		55. 16" x 16" x 24" 1240	
56. 16" x 16" x 24" 1240		56. 16" x 16" x 24" 1240	
57. 16" x 16" x 24" 1240		57. 16" x 16" x 24" 1240	
58. 16" x 16" x 24" 1240		58. 16" x 16" x 24" 1240	
59. 16" x 16" x 24" 1240		59. 16" x 16" x 24" 1240	
60. 16" x 16" x 24" 1240		60. 16" x 16" x 24" 1240	
61. 16" x 16" x 24" 1240		61. 16" x 16" x 24" 1240	
62. 16" x 16" x 24" 1240		62. 16" x 16" x 24" 1240	
63. 16" x 16" x 24" 1240		63. 16" x 16" x 24" 1240	
64. 16" x 16" x 24" 1240		64. 16" x 16" x 24" 1240	
65. 16" x 16" x 24" 1240		65. 16" x 16" x 24" 1240	
66. 16" x 16" x 24" 1240		66. 16" x 16" x 24" 1240	
67. 16" x 16" x 24" 1240		67. 16" x 16" x 24" 1240	
68. 16" x 16" x 24" 1240		68. 16" x 16" x 24" 1240	
69. 16" x 16" x 24" 1240		69. 16" x 16" x 24" 1240	
70. 16" x 16" x 24" 1240		70. 16" x 16" x 24" 1240	
71. 16" x 16" x 24" 1240		71. 16" x 16" x 24" 1240	
72. 16" x 16" x 24" 1240		72. 16" x 16" x 24" 1240	
73. 16" x 16" x 24" 1240		73. 16" x 16" x 24" 1240	
74. 16" x 16" x 24" 1240		74. 16" x 16" x 24" 1240	
75. 16" x 16" x 24" 1240		75. 16" x 16" x 24" 1240	
76. 16" x 16" x 24" 1240		76. 16" x 16" x 24" 1240	
77. 16" x 16" x 24" 1240		77. 16" x 16" x 24" 1240	
78. 16" x 16" x 24" 1240		78. 16" x 16" x 24" 1240	
79. 16" x 16" x 24" 1240		79. 16" x 16" x 24" 1240	
80. 16" x 16" x 24" 1240		80. 16" x 16" x 24" 1240	
81. 16" x 16" x 24" 1240		81. 16" x 16" x 24" 1240	
82. 16" x 16" x 24" 1240		82. 16" x 16" x 24" 1240	
83. 16" x 16" x 24" 1240		83. 16" x 16" x 24" 1240	
84. 16" x 16" x 24" 1240		84. 16" x 16" x 24" 1240	
85. 16" x 16" x 24" 1240		85. 16" x 16" x 24" 1240	
86. 16" x 16" x 24" 1240		86. 16" x 16" x 24" 1240	
87. 16" x 16" x 24" 1240		87. 16" x 16" x 24" 1240	
88. 16" x 16" x 24" 1240		88. 16" x 16" x 24" 1240	
89. 16" x 16" x 24" 1240		89. 16" x 16" x 24" 1240	
90. 16" x 16" x 24" 1240		90. 16" x 16" x 24" 1240	
91. 16" x 16" x 24" 1240		91. 16" x 16" x 24" 1240	
92. 16" x 16" x 24" 1240		92. 16" x 16" x 24" 1240	
93. 16" x 16" x 24" 1240		93. 16" x 16" x 24" 1240	
94. 16" x 16" x 24" 1240		94. 16" x 16" x 24" 1240	
95. 16" x 16" x 24" 1240		95. 16" x 16" x 24" 1240	
96. 16" x 16" x 24" 1240		96. 16" x 16" x 24" 1240	
97. 16" x 16" x 24" 1240		97. 16" x 16" x 24" 1240	
98. 16" x 16" x 24" 1240		98. 16" x 16" x 24" 1240	
99. 16" x 16" x 24" 1240		99. 16" x 16" x 24" 1240	
100. 16" x 16" x 24" 1240		100. 16" x 16" x 24" 1240	

### SUMMARY OF QUANTITIES





* See plan-profile sheet.									
FOR DETERMINING LENGTH OF SWAY BRACES									
HEIGHT	6	8	10	12	14	16	18	20	22
LENGTH OF BRACE	4'-6"	4'-9"	5'-0"	5'-6"	5'-9"	6'-0"	6'-3"	6'-6"	6'-9"
LENGTH OF BRACE	3'-6"	3'-9"	4'-3"	4'-6"	4'-9"	5'-0"	5'-3"	5'-6"	5'-9"

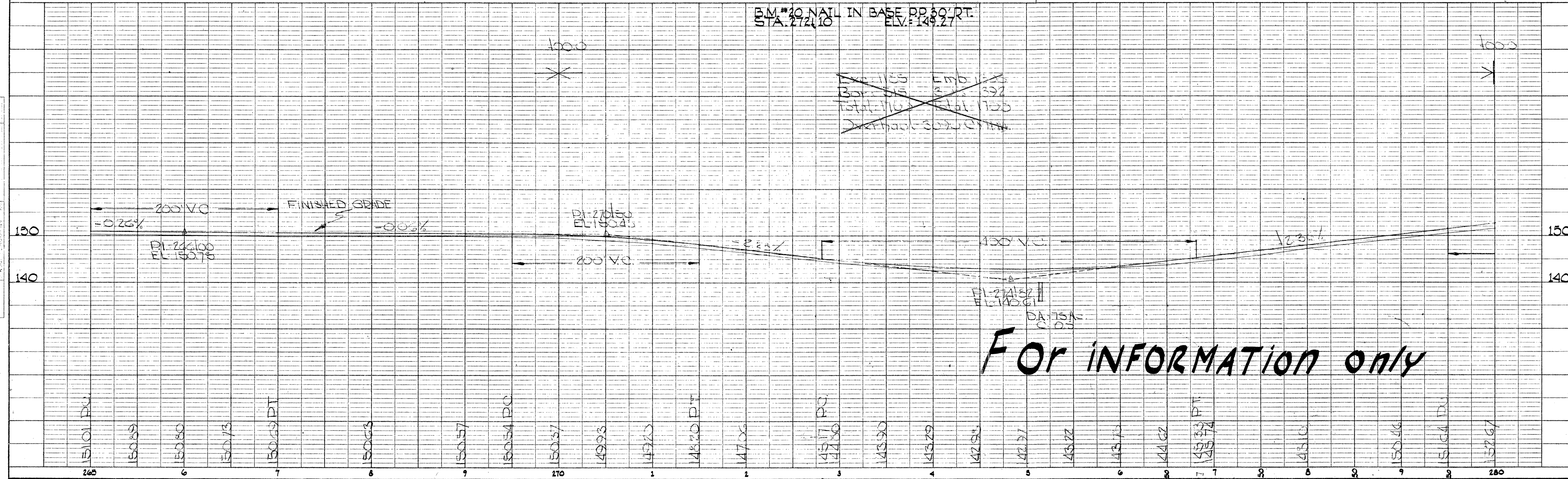
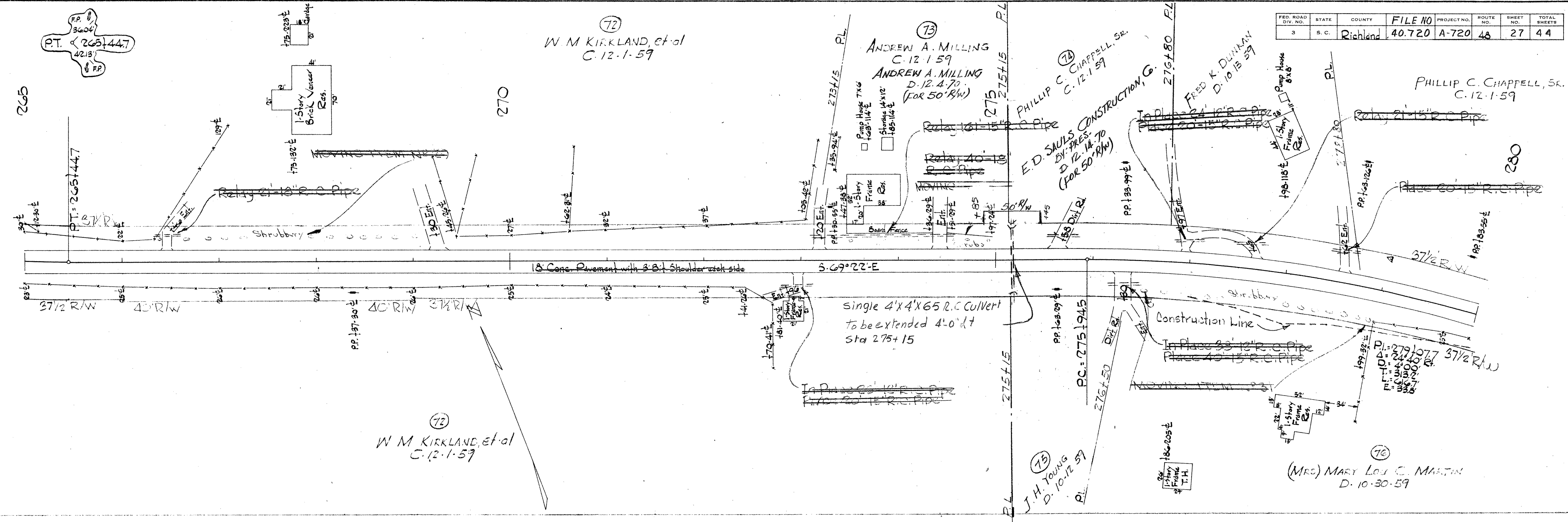
See sheet no. 11  
for method and  
detail of breaking  
the continuity of  
curb at each double  
bracket.



PLAN	DATE	BY
NO.		
NOTE BOOK		
NO.		

PROFILE	DATE	BY
NO.		
NOTE BOOK		
NO.		

FED. ROAD DIV. NO.	STATE	COUNTY	FILE NO.	PROJECT NO.	ROUTE NO.	SHEET NO.	TOTAL SHEETS
3	S. C.	Richland	40.720	A-720	48	27	44

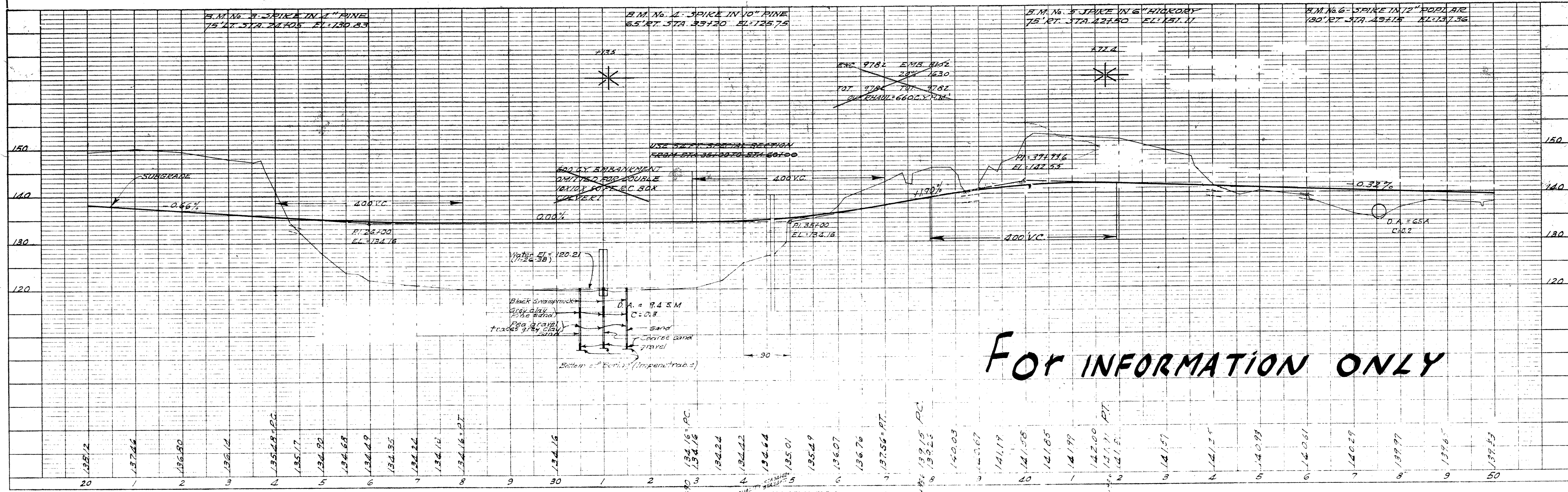
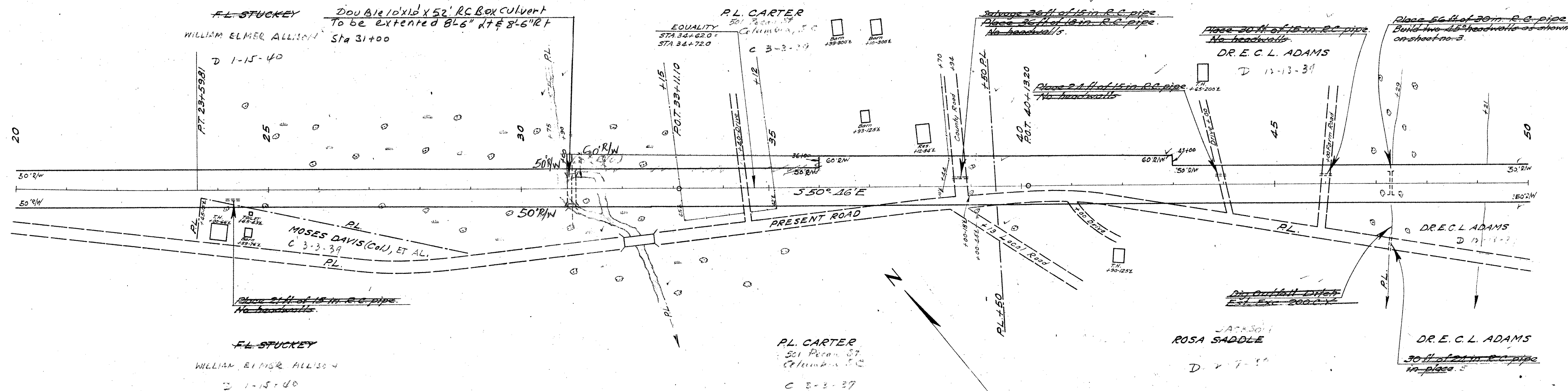




FED. ROAD DIST. NO.	STATE	COUNTY	FILE NO.	ROUTE NO.	SHEET NO.	TOTAL SHEETS
3	S.C.	RICHLAND	40.720	48	28	44

PLAN	DATE
SURVEYED	
NOTED	
ALIGNED	
CHECKED	
RT. OF WAY	
CHECKED	
NO.	

PROFILE	DATE
SURVEYED	
NOTED	
BLACK	
RED	
WHITE	
STRUCTURE	
NOTATION	
CHECKED	
NO.	

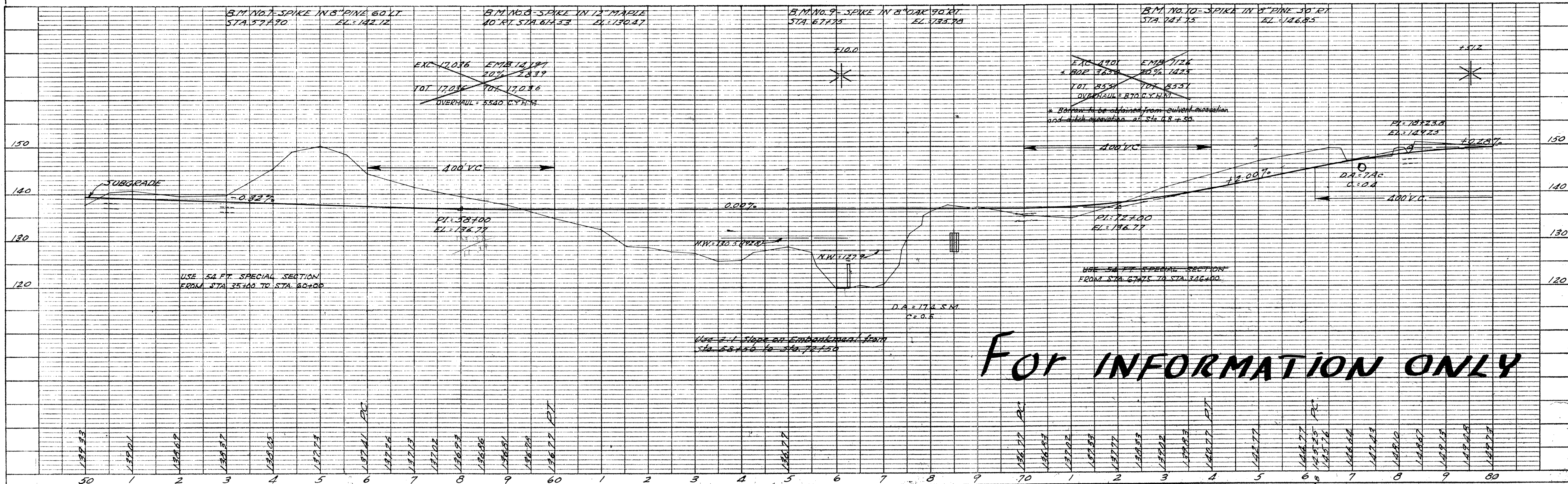
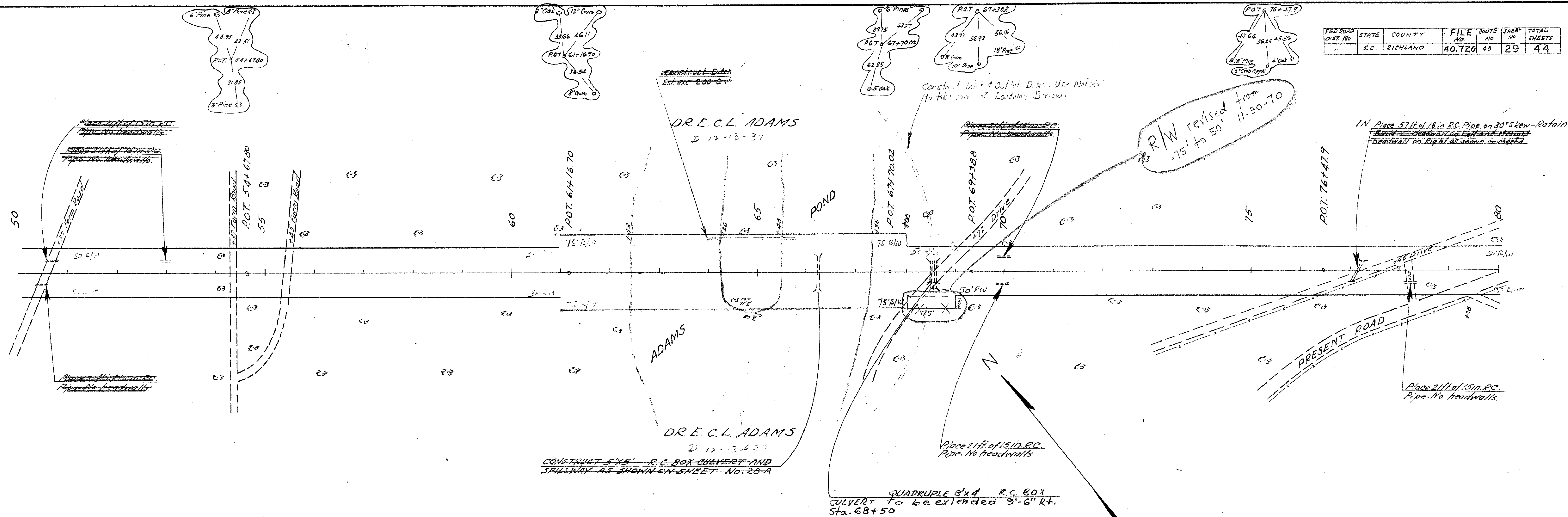




PLAN	DATE
SURVEYED	BY
NOTE BOOK	
PLACEMENT CHECKED	
RT. OF WAY CHECKED	
NO.	

PROFILE	DATE
SURVEYED	BY
NOTE BOOK	
GRADES CHECKED	
8 M. S. NOTED	
STRUCTURE NOTATION	
NO.	

FED. ROAD DIST. NO.	STATE	COUNTY	FILE NO.	ROUTE NO.	SHEET NO.	TOTAL SHEETS
	S.C.	RICHLAND	40.720	48	29	44



FOR INFORMATION ONLY





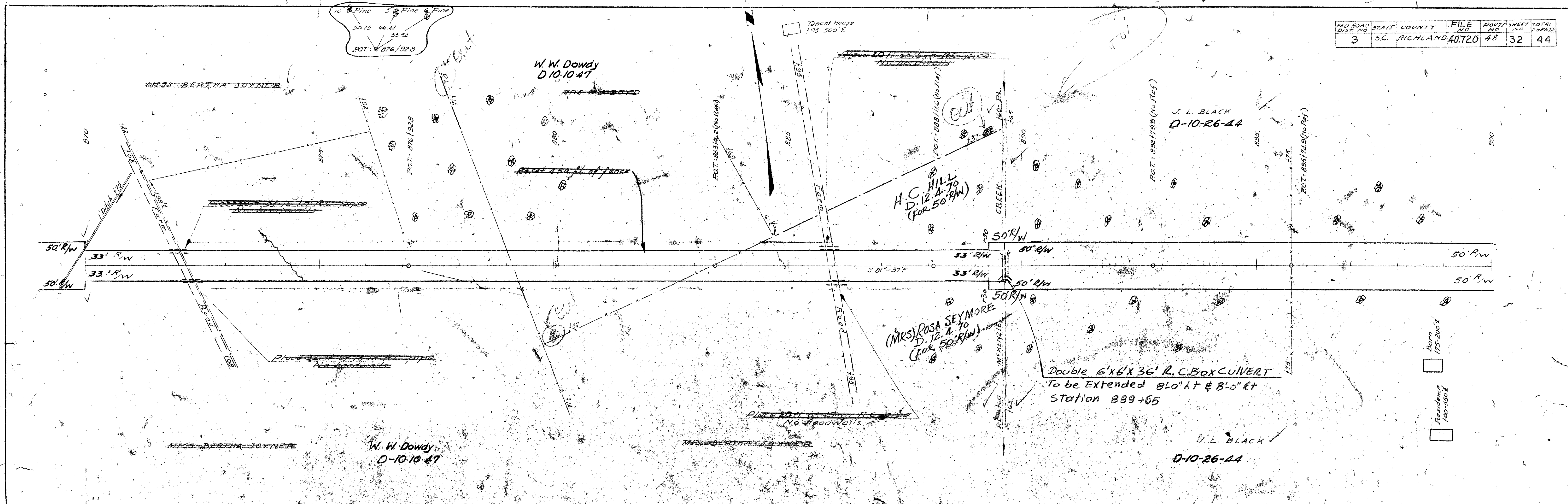




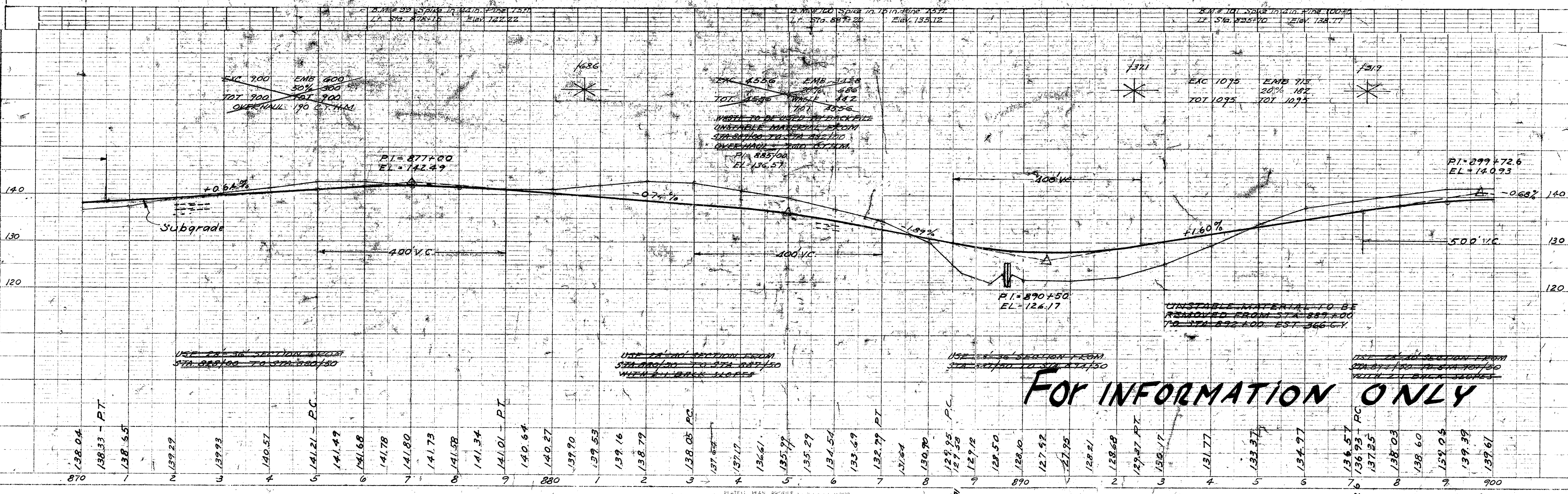


FED. ROAD DIST. NO.	STATE	COUNTY	FILE NO.	ROUTE NO.	SHEET NO.	TOTAL SHEETS
3	SC	RICHLAND	40.720	48	32	44

PLAN  
NO. 1  
NOTE: ALL  
ALIGNMENT CHECKED  
BY OF WAY CHECKED



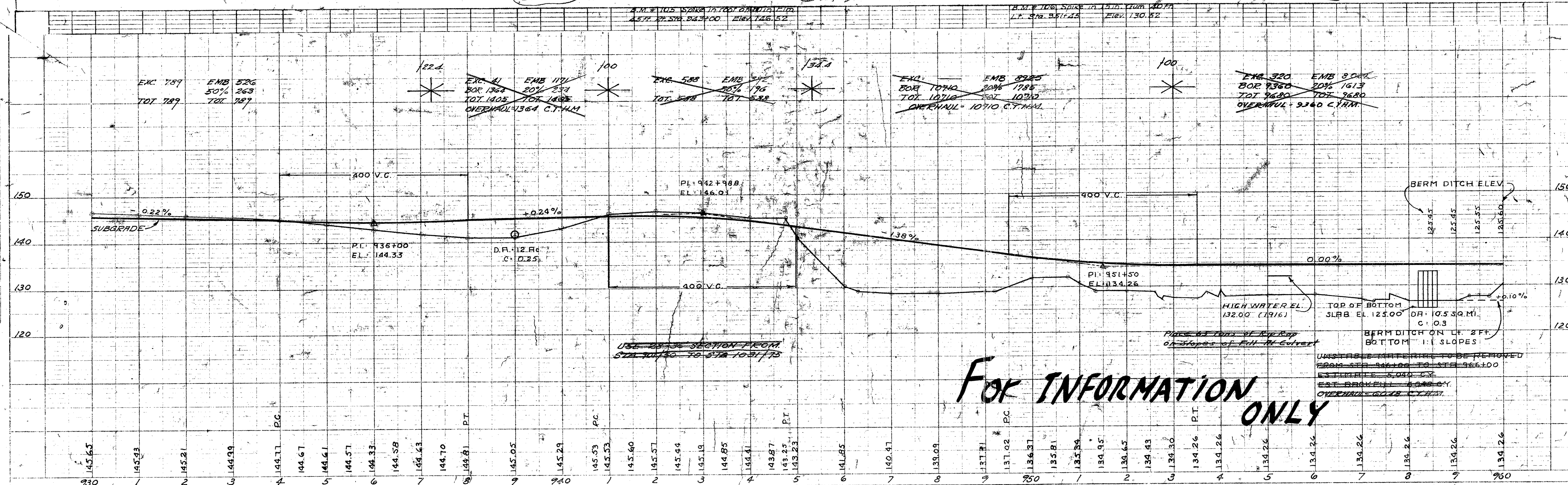
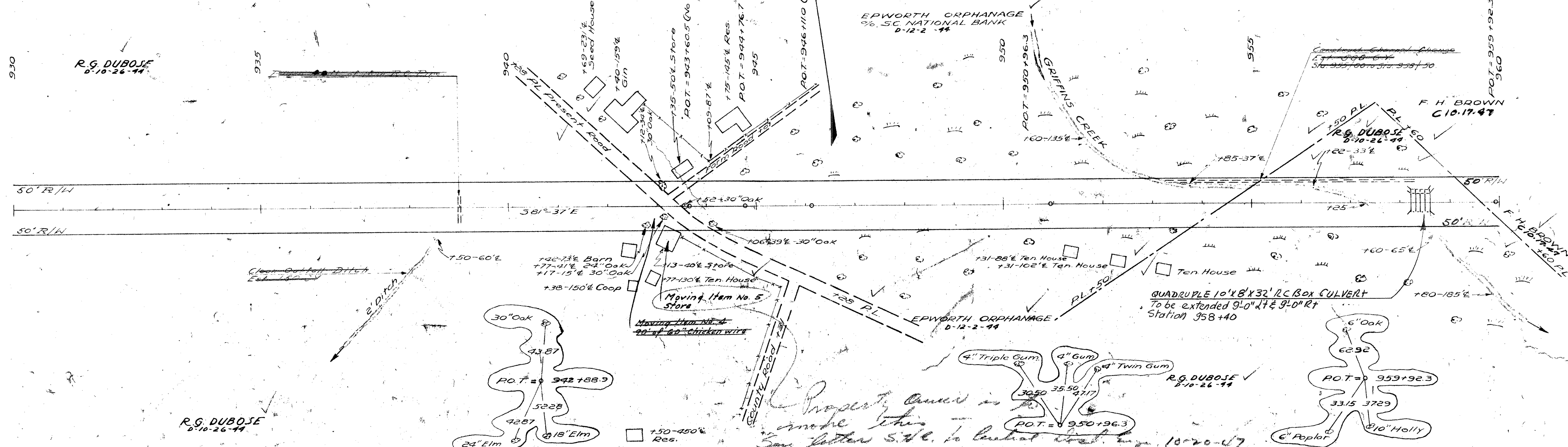
PROFILE  
NO. 1  
NOTE: ALL  
GRADES CHECKED  
BY OF WAY CHECKED



FOR INFORMATION ONLY



FED. ROAD DIST. NO.	STATE	COUNTY	FILE NO.	ROUTE NO.	SHEET NO.	TOTAL SHEETS
3	SC	RICHLAND	40.720	48	33	44

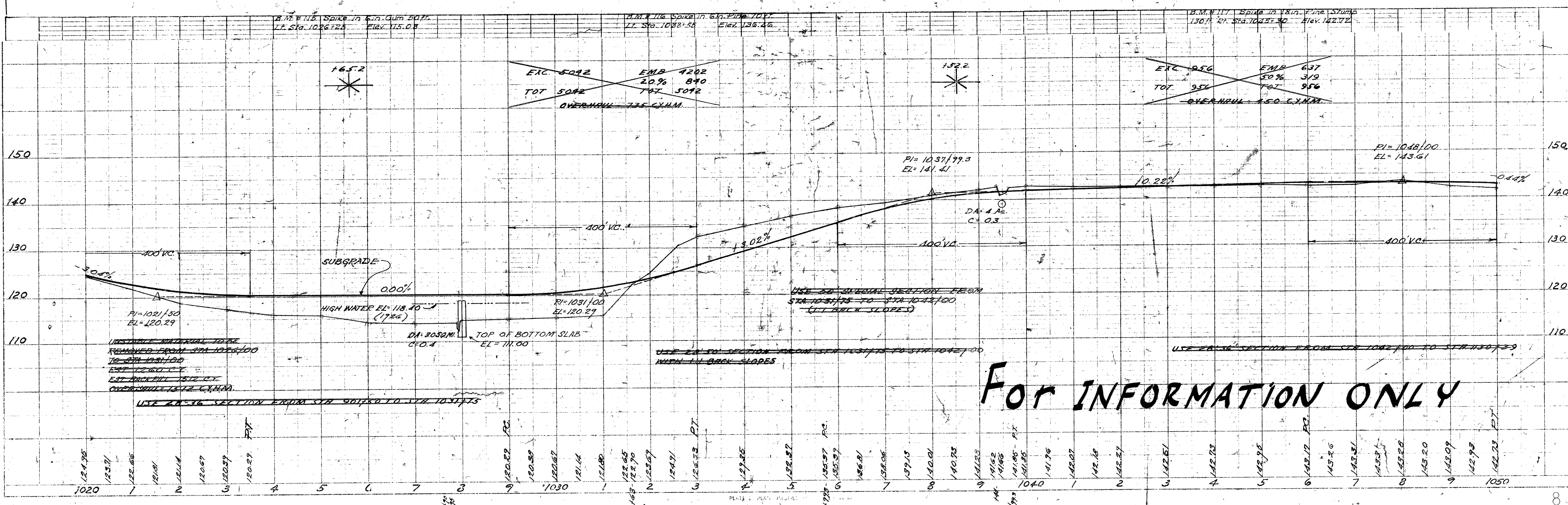
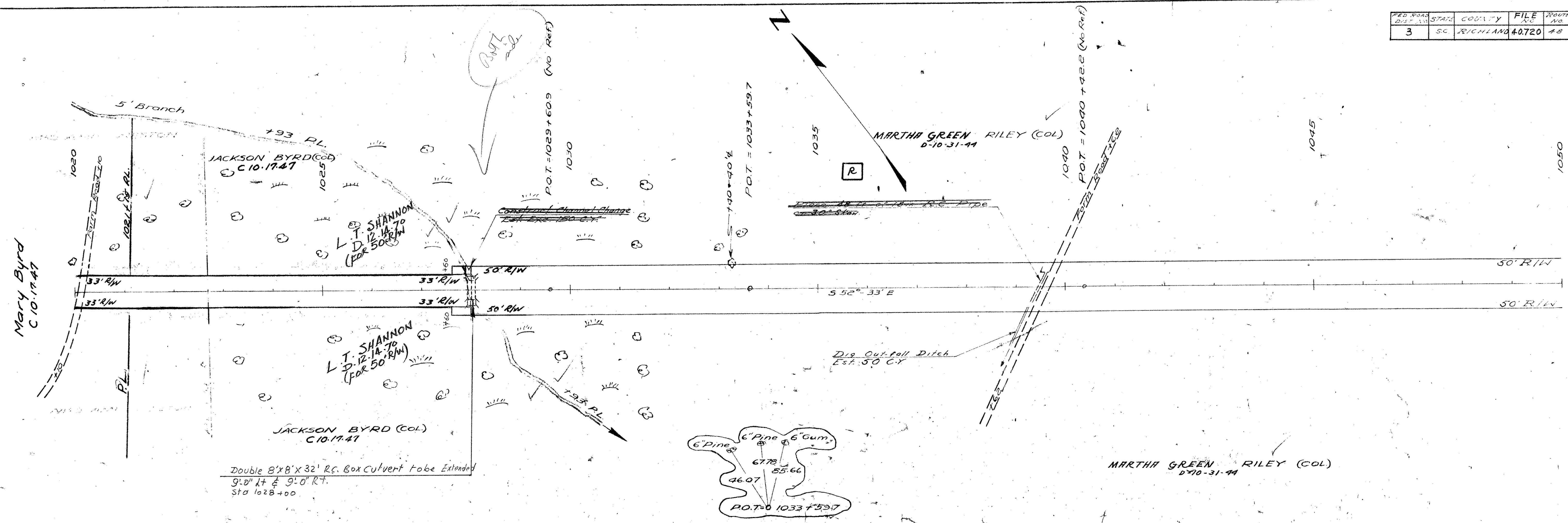


**FOR INFORMATION ONLY**



FED. ROAD DIST. NO.	STATE	COUNTY	FILE NO.	ROUTE NO.	SHEET NO.	TOTAL SHEETS
3	SC	RICHLAND	40720	48	34	44

PLAN  
NOTE BOOK  
ALCUMENT CHECKED  
BY OF WAY CHECKED  
NO.



For INFORMATION ONLY



FED. ROAD DIV. NO.	STATE	COUNTY	FILE NO.	ROUTE NO.	SHEET NO.	TOTAL SHEETS
3	S.C.	Richland	40.720	48	35	44

STEEL SCHEDULE					
MARK	SIZE	LENGTH	SPACING	LOCATION	
A	1/2"	8'-6"	12"	Top Slab	
B	1/2"	4'-10"	"	" "	
C	1/2"	3'-9"	"	Corners	
D	1/2"	1'-6"	"	Top Slab	
E	1/2"	4'-10"	"	Bot. Slab	
F	1/2"	10'-4"	12"	Apron	
F <sub>2</sub>	1/2"	10'-10"	"	" "	
F <sub>3</sub>	1/2"	9'-8"	"	" "	
F <sub>4</sub>	1/2"	8'-6"	"	" "	
F <sub>5</sub>	1/2"	7'-4"	"	" "	
F <sub>6</sub>	1/2"	6'-2"	"	" "	
G	1/2"	4'-10"	9"	Shoulder	
H	2"	L+1'-6"	12"	S.W. Nings	
H <sub>2</sub>	2"	L+3'-2"	12"	" "	
H <sub>3</sub>	2"	L+5'-0"	12"	" "	
H <sub>4</sub>	2"	L+5'-8"	12"	" "	
I	2"	2'-9"	As Shown	Wings & Apron	
I <sub>2</sub>	2"	3'-8"	"	" "	
I <sub>3</sub>	2"	4'-6"	"	" "	
I <sub>4</sub>	2"	5'-4"	"	" "	
I <sub>5</sub>	2"	6'-0"	"	" "	
J	1/2"	9'-0"	"	Wings	
L	2"	5'-0"	"	Top of Apron	
L <sub>2</sub>	2"	3'-0"	"	" "	
M	16	1'-6"	"	Dowels	

\* Disregard Fractions.  
Concrete RFL. Bbl. 0.4562 C.Y.  
Concrete RFL. Cut-Off Wall (1 end) 0.2934 C.Y.  
Excavation RFL. RFL. Bbl. 0.3766 C.Y.  
Reinforcing Steel RFL. Bbl. 79.8 Lbs

QUANTITIES			
STATION	LENGTH "L"	REINFORCING STEEL	CLASS "A" CONCRETE
275+15	Ext 4'-0" Lt	517 LBS	3.9 CY
		LBS	CY
		LBS	CY
		LBS	CY
		LBS	CY
		LBS	CY
TOTAL		517 LBS	3.9 CY

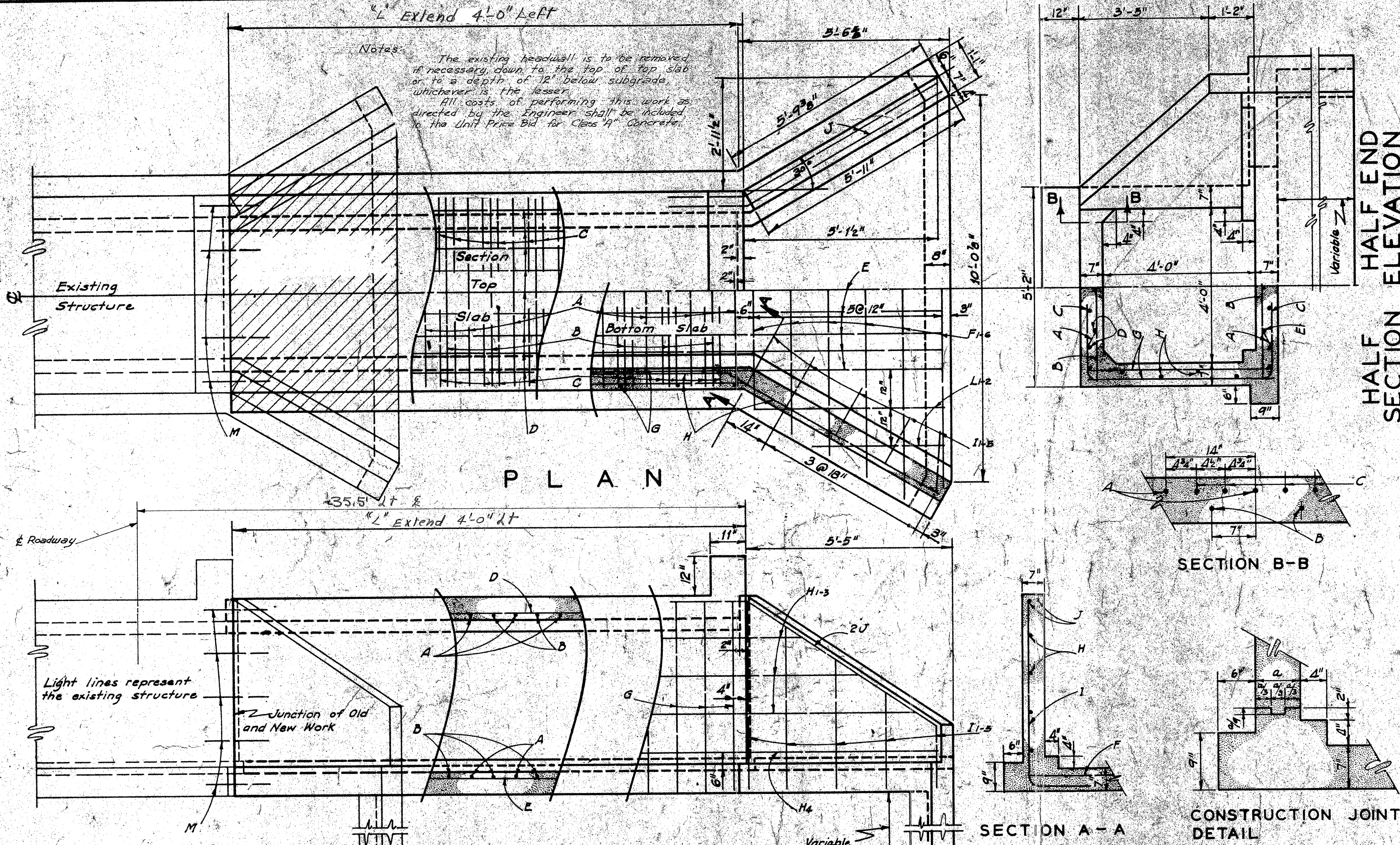
NOTE:  
Method used in figuring Quantities  
Reinf. Steel = 198.3 + 79.8 L  
Class "A" Concrete = 2.119 + 0.4362 L

Unclassified Excavation = 5 CY

S.C. STATE HIGHWAY DEPARTMENT  
COLUMBIA

CONCRETE CULVERT  
REINFORCED BOX TYPE  
SINGLE 4' x 4' EXTENSION  
S.C. FILE NO. 40.720 Richland COUNTY  
ROUTE NO. 48 DATE 4/70

B.144 EXT.



# NOTES:

Specifications: Standard Specifications for Highway Bridges, A.A.H.S.O., 1965 Ed., 20,000' / in.<sup>2</sup>, 1200' / in.<sup>2</sup>, n=10, v=90' / in.<sup>2</sup>, u=300' / in.<sup>2</sup>, H-20 Loading, 10' Earth Fill (Max) with revisions through 1966 and also meets requirements of Alternate Interstate Tandem Axle Live Load.

Work to be done consists of removing that portion of the existing structure interfering with construction of new structure and extending in accordance with these plans.

The holes for dowels to be drilled 9" into old concrete and the dowels firmly set in a 1:3 mortar.

All costs of removing and disposing of portions of old structure, drilling and chipping, whether shown or not, necessary to construct new structure shall be included in the Unit Price Bid for Class "A" Concrete.

The Contractor shall replace or repair at his own expense, and to the satisfaction of the Engineer, any portion of the existing structure damaged due to his carelessness or negligence.

All Concrete shall be Class "A" Concrete.

Spacing of bars is center to center and at right angles.

Center of main reinforcing steel shall be 2" from the surface of concrete.

Chamfer all exposed edges 3/4".

Depth of Cut-off Walls shall be determined by the Engineer and Quantities added to those shown.

Rev	CRP	WBB	1-67
QUANT	GRD	WBB	7-65
Tr	WRT	WBB	8-66
Dr	GRD	WBB	7-65
Des	GRD	WBB	7-65
1	ES	CHKO	10-67



FED. ROAD DIV. NO.	STATE	COUNTY	FILE NO.	ROUTE NO.	SHEET NO.	TOTAL SHEETS
3	S.C.	Richland	40.720	48	36	44

STEEL SCHEDULE (I END)					
MARK	NO.	SIZE	LENGTH	SPACING	LOCATION
A	(L/8)2	5	29'-4"	8" c to c	T & B Slabs
B	(L/8)2	5	22'-2"	"	"
C	(L/8)2	6	9'-4"	"	"
D	5B	4	L-(0'-4")	As Shown	T & B Slabs
F <sub>1</sub> to F <sub>3</sub>	2 ea.	4	2'-6" to 3'-4" vary by 5"	"	Wing Footings
F <sub>4</sub> to F <sub>18</sub>	2 ea.	4	3'-8" to 6'-0" vary by 2"	"	"
G <sub>1</sub>	(L/12)4	4	11'-4"	12" ea Face	Side Wall
G <sub>2</sub>	(L/8)	4	11'-8"	8" Stgd.	Midwall
H <sub>1</sub> to H <sub>6</sub>	2 ea.	4	L-(0'-9") to L-(10'-9") vary by 1'-9"	12" c to c	Side wall & Wings
H <sub>7</sub>	B	4	L-(11'-2")	"	"
H <sub>8</sub>	10	4	L-(0'-4")	12" Stgd.	Midwall
I <sub>1</sub> to I <sub>10</sub>	2 ea.	4	6'-1" to 12'-10" vary by 9"	As Shown	Wings & Footings
I <sub>11</sub>	10	4	5'-9"	"	"
J	4	5	16'-0"	"	Top of Wings
K	2	7	11'-0"	"	Headwall
L	8	4	15'-0"	"	Footings
M	2	4	16'-0"	"	"
N	48	6	1'-6"	"	Dowels
H <sub>9</sub>	20	4	L-(2'-0")	12" c to c	5 Walls & Wings

\*Disregard Fractions  
Concrete P.F.L. Barrel 2.5123 CY  
Concrete P.F.D. Cut-Off Wall (I End) 1.3310 CY  
Excavation P.F.L. P.F.D. Barrel 1.0185 CY  
Reinforcing Steel P.F.L. Barrel 356.7 LBS

QUANTITIES			
STATION	LENGTH "L"	REINFORCING STEEL	CLASS "A" CONCRETE
31+00	Ext 8'-6" L	3749 LBS	31.0 CY
31+00	Ext 8'-6" L	3749 LBS	31.0 CY
		LBS	CY
		LBS	CY
		LBS	CY
		LBS	CY
TOTAL		7498 LBS	62.0 CY

NOTE:  
Method used in figuring Quantities  
Reinforcing Steel = 717.1 + 356.7 L  
Class "A" Concrete = 9.609 + 2.5123 L  
Unclassified Excavation 80 C.Y.

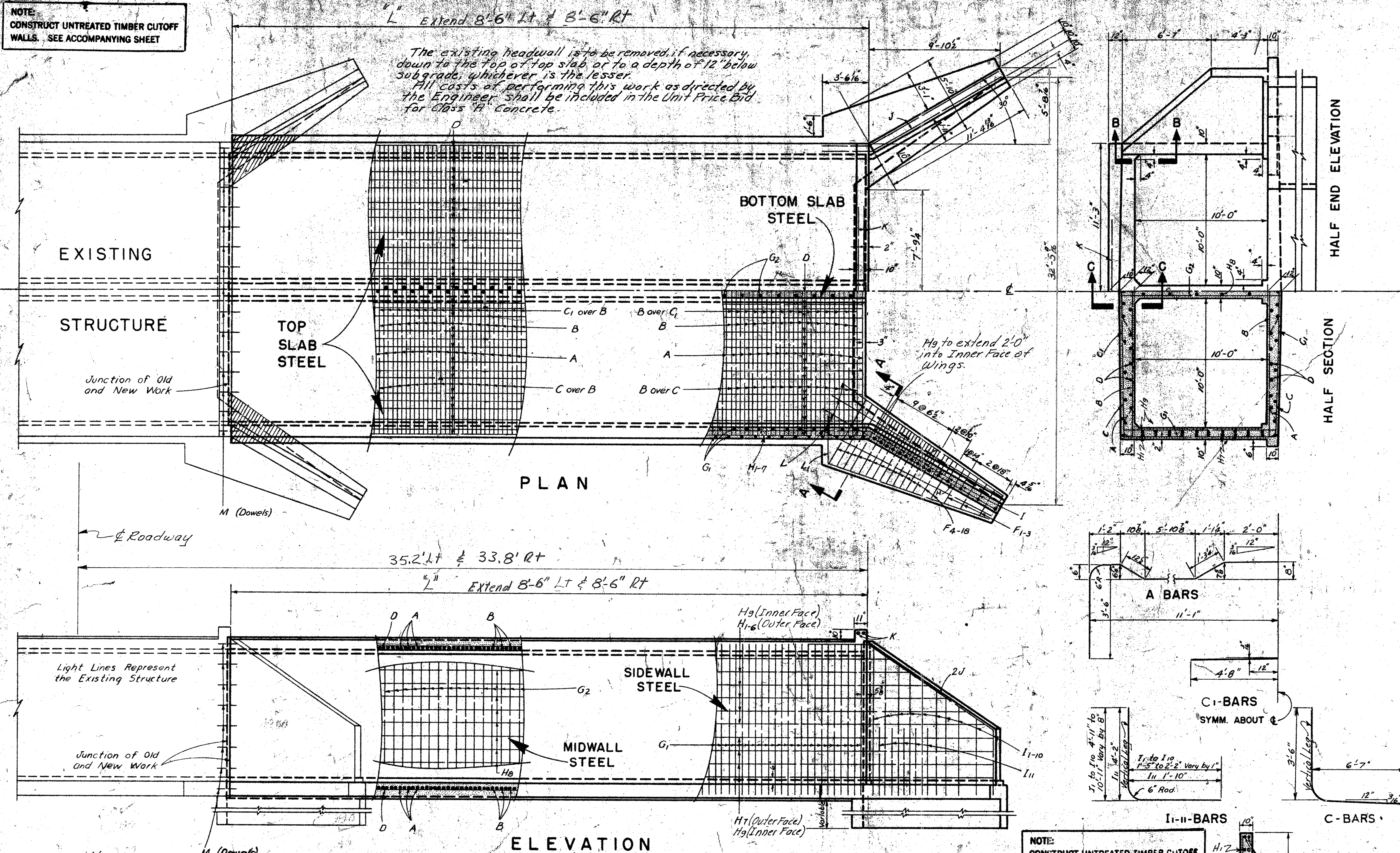
CONSTRUCT WEEP HOLES AND FRENCH DRAINS. SEE PARA. 712.0 OF STANDARD SPECIFICATIONS.

S.C. STATE HIGHWAY DEPARTMENT  
COLUMBIA

CONCRETE CULVERT  
REINFORCED BOX TYPE  
DOUBLE 10'x10' EXT.

S.C. FILE NO. 40.720 COUNTY RICHLAND  
ROUTE NO. 48 DATE 4-70  
B 21010 EXT

NOTE:  
CONSTRUCT UNTREATED TIMBER CUTOFF WALLS. SEE ACCOMPANYING SHEET



NOTES:  
Specifications: "Standard Specifications for Highway Bridges," A.A.S.H.O. 1965  
 $f'_c = 20,000 \text{ psi}$ ;  $f'_s = 120,000 \text{ psi}$ ;  $n = 10$ ;  $v = 90 \text{ psi}$ ;  $u = 300 \text{ psi}$ ;  $H = 20 \text{ Loading}$ ;  $10' \text{ Earth Fill (Max.)}$   
with revisions through 1966 and also meets requirements of Alternate Interstate Tandem Axle Live Load.  
Work to be done consists of removing that portion of the existing structure interfering with construction of new structure and extending in accordance with these plans.  
The holes for dowels to be drilled 9" into old concrete and the dowels firmly set in a 1:3 mortar.  
All costs of removing and disposing of portions of old structure, drilling and chipping whether shown or not, necessary to construct new structure shall be included in the Unit Price Bid for Class "A" concrete.  
The Contractor shall replace or repair at his own expense, and to the satisfaction of the Engineer, any portion of the existing structure damaged due to his carelessness or negligence.  
All concrete shall be Class "A" concrete.  
Spacing of bars is center to center and at right angles.  
Center of main reinforcing steel shall be 2" from the surface of concrete.  
Chamfer all exposed edges.  
Depth of cut-off wall shall be determined by the Engineer and quantities added to those shown.

Rev.	MANRRS 4-70
FOR FILE	
Rev.	G.K.P. W.B.B. 2-77
QUANT.	W.B.B. R.U.P. 4-76
T.R.	A.G.W. R.U.P. 6-77
D.R.	A.G.W. R.U.P. 6-77
DES.	D.F.D. W.B.B. 10-79
BY	CHKD DATE







FED. ROAD DIST. NO.	STATE	COUNTY	FILE NO.	ROUTE NO.	SHEET NO.	TOTAL SHEETS
3	S.C.	RICHLAND	40-720	48	38	44

STEEL SCHEDULE I END					
MARK	* NO.	SIZE	LENGTH	SPACING	LOCATION
A	6/1022	5/8"	11'-7"	10" C.T.C.	TOP SLABS
B	6/1022	2"	6'-10"	"	"
C	6/1022	2"	4'-9"	As Shown	CORNERS
D	11	2"	5'-0"	"	TOP SLAB
E	11	2"	4'-7"	"	BOT. SLAB
F	1	2"	15'-2"	12" C.T.C.	APRON
F2	1ea	1"	15'-4" to 8'-4"	vary by 1:2	"
F3	2	2"	7'-0"	6 1/2" Stagger	SIDE WALLS
H	2ea	2"	11'-0" to 6'-0"	vary by 1:2	S.N. & WINGS
H3	4	2"	11'-0"	"	"
I	2ea	2"	3'-5" to 6'-0"	As Shown	WING APRON
I5	2	2"	7'-5"	"	"
I6	2	2"	8'-0"	"	"
J	4	5/8"	12'-0"	"	WINGS
L	2	2"	7'-2"	"	TOP OF APRON
L2	2	2"	5'-6"	"	"
M	20	3/4"	11'-6"	"	DOWELS

\* Disregard Fractions  
Concrete P.F.L. Barrel 0.6533 C.Y.  
Concrete P.F.D. Cut-Off Wall (1 end) 0.4104 C.Y.  
Excavation P.F.L., P.F.D. Barrel 0.4506 C.Y.  
Reinforcing Steel P.F.L. Barrel 107.0 LBS.

QUANTITIES			
STATION	LENGTH "L"	REINFORC'G STEEL	CLASS "A" CONCRETE
437+40	EXT 5'-0" LT	864 LBS	7.7 CY
437+40	EXT 5'-0" RT	864 LBS	7.7 CY
		LBS	CY
		LBS	CY
		LBS	CY
		LBS	CY
TOTAL		1728 LBS	15.4 CY

NOTE:-  
Method used in figuring Quantities  
Reinforcing Steel 329.0 + 107.0 L  
Class "A" Concrete 4.398 + 0.6533 L

Unclassified Excavation = 20 C.Y.

S.C. STATE HIGHWAY DEPARTMENT  
COLUMBIA

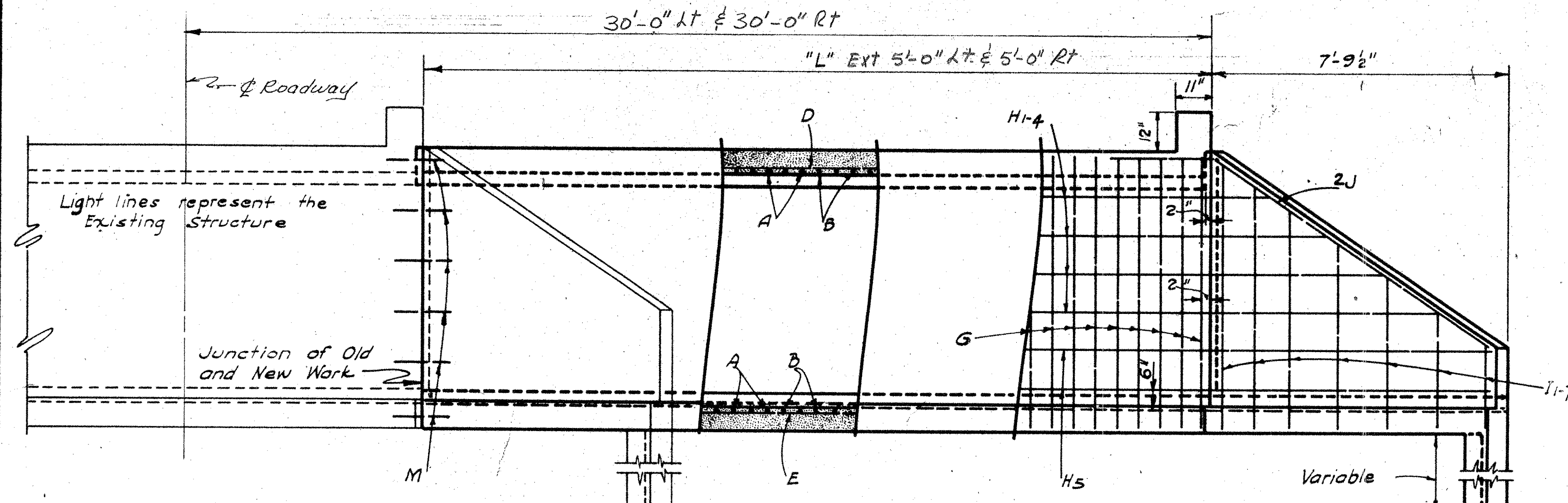
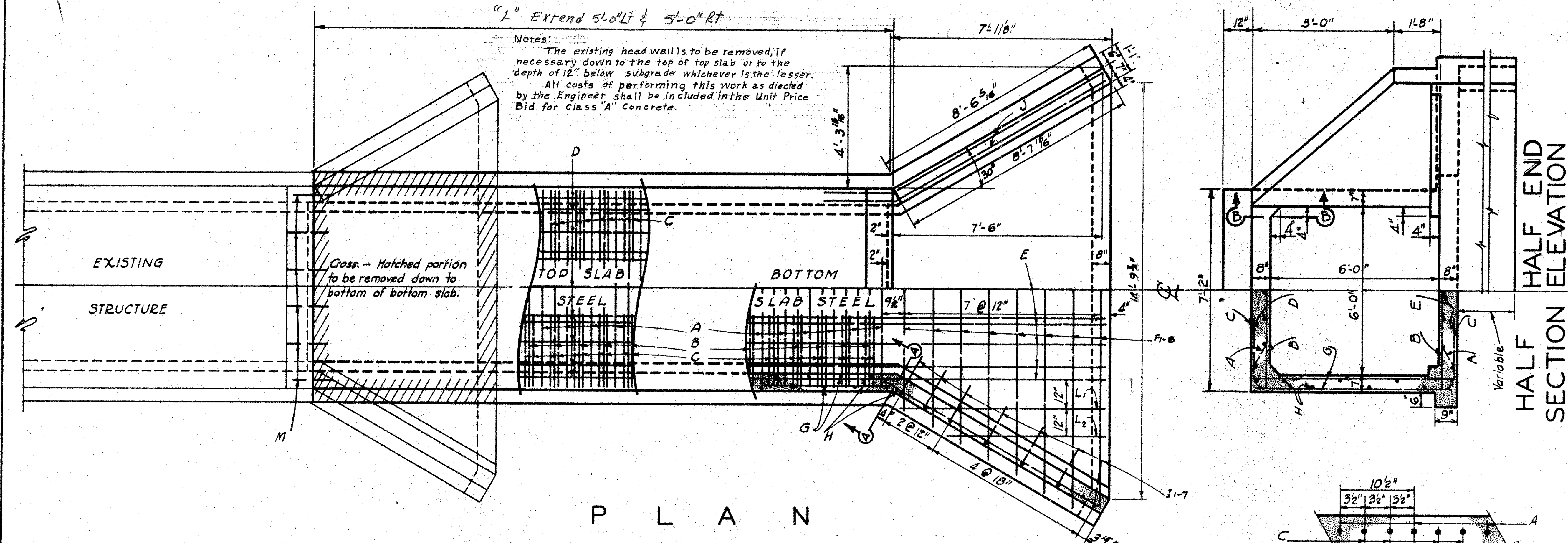
CONCRETE CULVERT  
REINFORCED BOX TYPE

SINGLE 6' x 6' EXTENSION

S.C. FILE NO. 40-720 Richland County

ROUTE NO. 48 DATE 4-70

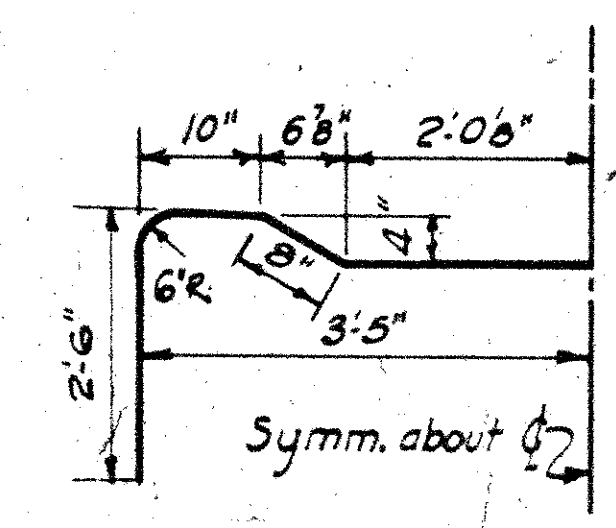
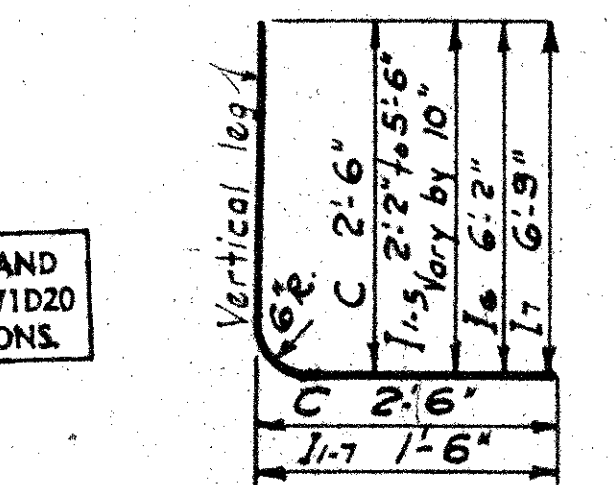
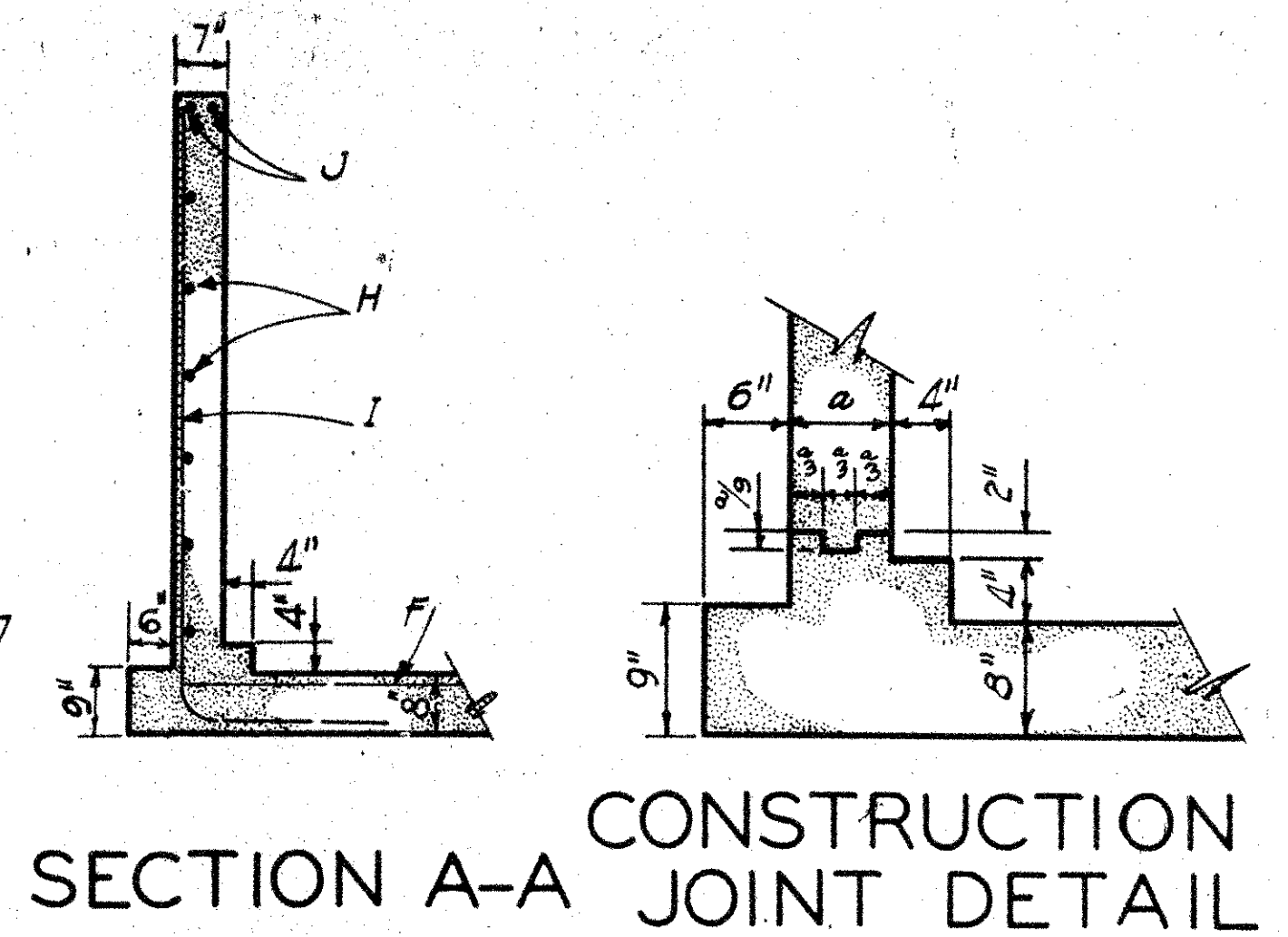
B1.66 EXT.



Notes:

Specifications: "Standard Specifications for Highway Bridges," A.A.S.H.O. 1965, fs-20,000  $\frac{1}{2}$  in<sup>2</sup>, n=10, V=90  $\frac{1}{2}$  in<sup>2</sup>, U=300  $\frac{1}{2}$  in<sup>2</sup>, H=20 Loading  
10' Earth Fill (max.) with revisions through 1965 and also meets requirements of Alternate Tandem Axle Live Load.  
Work to be done consists of removing that portion of the existing structure interfering with construction of new structure and extending in accordance with these plans.  
The holes for dowels to be drilled 9" into old concrete and the dowels firmly set in a 1:3 mortar.  
All costs of removing and disposing of portions of old structure, drilling, and chipping, whether shown or not, necessary to Construct New Structure shall be included in the Unit Price Bid for Class "A" Concrete.  
The Contractor shall replace or repair at his own expense, and to the satisfaction of the engineer, any portion of the existing structure damaged due to his carelessness or negligence.  
All concrete shall be Class "A" Concrete.  
Spacing of bars is center to center and at right angles.  
Center of main reinforcing steel shall be 2" from the surface of concrete.  
Chamfer all exposed edges 3/4".  
Depth of Cut-off walls shall be determined by the Engineer and Quantities added to those shown.

CONSTRUCT WEEP HOLES AND FRENCH DRAINS. SEE PARA. 71D20 OF STANDARD SPECIFICATIONS.



C & I-7 BARS

A-BARS

REV.	DATE	BY	CHKD	DATE
1	12-66	W.B.G.	W.B.G.	12-66
2	12-66	W.B.G.	W.B.G.	12-66
3	12-66	W.B.G.	W.B.G.	12-66
4	12-66	W.B.G.	W.B.G.	12-66
5	12-66	W.B.G.	W.B.G.	12-66



FED. ROAD DIV. NO.	STATE	COUNTY	FILE NO.	ROUTE NO.	SHEET NO.	TOTAL SHEETS
3	S.C.	Richland	40.720	48	39	44

# STEEL SCHEDULE BOTH ENDS

Mark	SIZE	NO. REQS.	Length	Spacing	Location
A	#5	80	29'-0"	12" c.c.	T. & B. Slabs
B <sub>1</sub>	#7	72	15'-7"	"	"
B <sub>2</sub>	#4	36	24'-10"	"	"
C <sub>1</sub>	#5	80	7'-9"	"	Corners
C <sub>2</sub>	#5	36	44'-6"	"	T. & B. Slabs
C <sub>3</sub>	#6	72	10'-4"	"	"
C <sub>4</sub>	#4	36	9'-0"	"	"
D	#4	224	8'-6"	As Shown	"
F <sub>1</sub> to F <sub>6</sub>	#4	4 ea.	3'-0" to 4'-3"	"	Wing Footings
F <sub>7</sub> to F <sub>24</sub>	#5	4 ea.	4'-4" to 7'-2"	"	"
G <sub>1</sub>	#5	72	11'-3"	12" c.c.	S.W. & Corners
G <sub>2</sub>	#4	28	12'-8"	18" c.c.	Side Walls
G <sub>3</sub>	#4	84	12'-8"	18" c.c.	Interior Walls
H <sub>1</sub> to H <sub>7</sub>	#4	4 ea.	11'-0" to 21'-6"	12" c.c.	S. Walls & Wings (Outer face)
H <sub>8</sub>	#4	16	22'-4"	"	"
H <sub>9</sub>	#4	72	8'-6"	11" Spaced	Interior Walls (Inner face)
H <sub>10</sub>	#4	44	10'-10"	12" c.c.	Side Walls & Wings (Inner face)
I <sub>1</sub>	#4	4	6'-2"	As Shown	Wings & Footings
I <sub>2</sub>	#4	4	7'-2"	"	"
I <sub>3</sub> to I <sub>14</sub>	#5	4 ea.	7'-8" to 15'-0"	"	"
J	#5	28	7'-1"	"	"
K	#8	4	18'-0"	"	Wings
L <sub>1</sub>	#4	16	17'-6"	"	Headwalls
L <sub>2</sub>	#4	4	20'-0"	"	Wing Footings
M	#6	228	1'-6"	"	Dowels

CONSTRUCT WEEP HOLES AND FRENCH DRAINS. SEE PARA. 712.20 OF STANDARD SPECIFICATIONS.

## TOTAL QUANTITIES BOTH ENDS

CLASS "A" CONCRETE	135.0 C. Yds.
REINFORCING STEEL	15911 LBS.
Unclassified Excavation	245 C. Yds.
Concrete P.F.L. Barrel	5.8618 C. Yds.
Concrete P.F.D. Cut-off Wall (1 end)	2.3805 C. Yds.
Excava. P.F.D., P.F.L. Barrel	2.1235 C. Yds.

NOTE: CONSTRUCT UNTREATED TIMBER CUTOFF WALLS. SEE ACCOMPANYING SHEET

NOTES:—  
Specifications = "Standard Specifications for Highway Bridges," A.A.S.H.O. 1965,  $f_s = 20,000 \text{ psi}$ ,  $f_c = 1,200 \text{ psi}$ ,  $m = 10$ ,  $v = 90 \text{ psi}$ ,  $u = 300 \text{ psi}$ , H-20 Loading, 10' Earth Fill (Max.) with revisions through 1966 and also meets requirements of Alternate Interstate Tandem Axle Live Load.  
Work to be done consists of removing that portion of the existing structure interfering with construction of new structure and extending in accordance with these plans.  
The holes for dowels to be drilled 9" into old concrete and the dowels firmly set in a 1:3 mortar.  
All costs of removing and disposing of portions of old structure, drilling, and chipping, whether shown or not, necessary to construct New Structure shall be included in the Unit Price Bid for Class "A" Concrete.  
The Contractor shall replace or repair at his own expense, and to the satisfaction of the Engineer, any portion of the existing structure damaged due to his carelessness or negligence.  
All Concrete shall be Class "A" Concrete.  
Spacing of bars is center to center and at right angles.  
Center of main reinforcing steel shall be 2" from the surface of concrete.  
Chamfer all exposed edges  $\frac{3}{4}$ ".  
Depth of Cut-off Walls shall be determined by the Engineer and Quantities added to those shown.

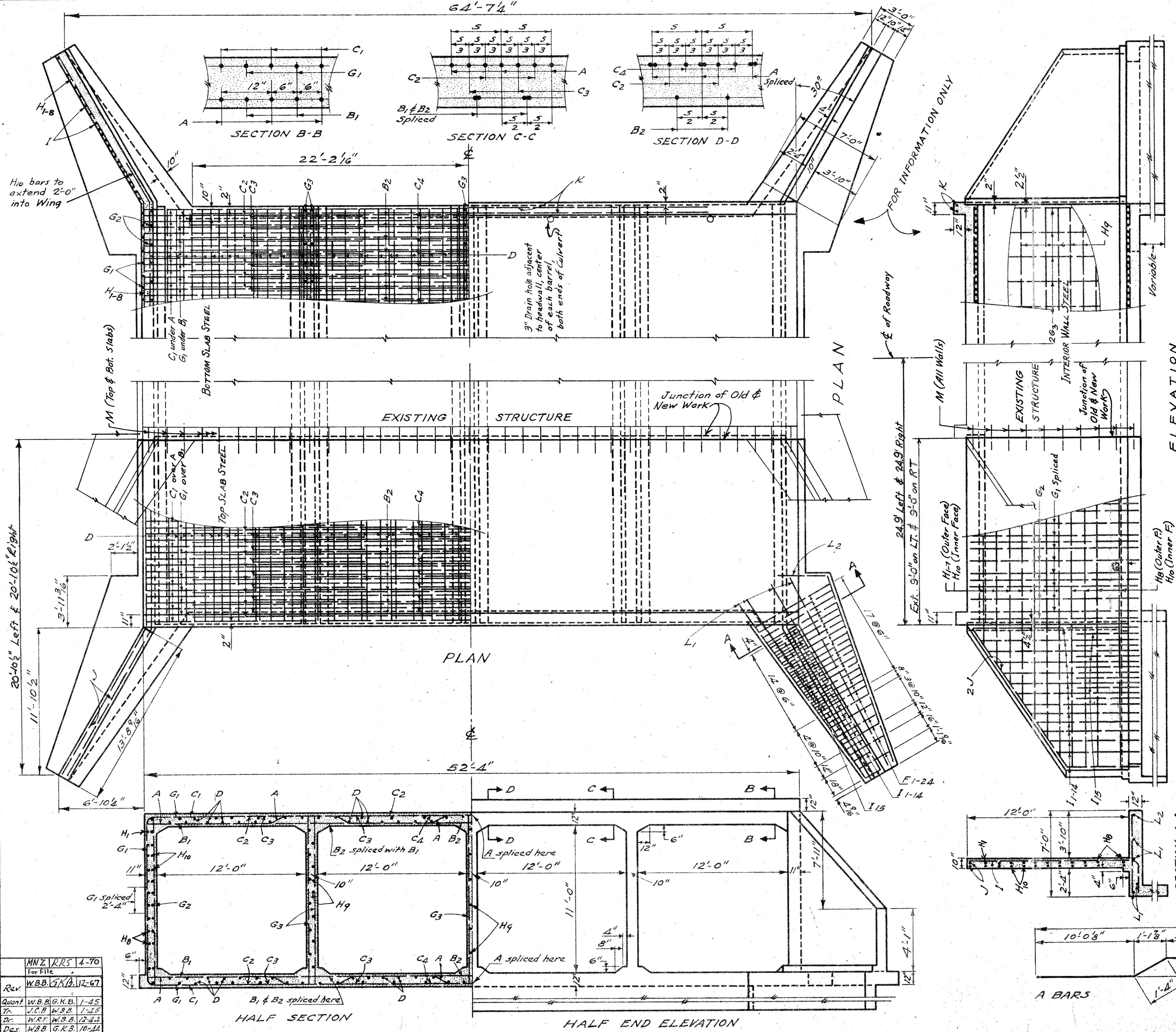
S. C. STATE HIGHWAY DEPARTMENT  
COLUMBIA

## CONCRETE CULVERT

REINFORCED BOX TYPE  
QUAD. 12 x 11' EXTENDED  
9'-0" ON LT. & 9'-0" ON RT.  
STA. NO. 810+75

S.C. FILE NO. 40.720 Richland COUNTY  
ROUTE NO. 48 DATE 4-70

B 4.121.1 EXT



Rev.	W.B.B. G.K.B. 1-45
Tr.	J.C.B. W.B.B. 1-45
Dr.	W.R.T. W.B.B. 12-4-4
Des.	W.B.B. G.K.B. 10-4-4
By	Checked Date



FED. ROAD DIV. NO.	STATE	COUNTY	FILE NO.	ROUTE NO.	SHEET NO.	TOTAL SHEETS
3	S.C.	Richland	40.720	48	40	44

STEEL SCHEDULE ONE END					
MARK	* No.	SIZE	LENGTH	SPACING	LOCATION
A	(L/14) 2	5	18'-4"	14" C to C	T&B Slabs
B	(L/14) 2	5	13'-5"	"	"
C	(L/14) 8	4	4'-9"	As Shown	Corners
C <sub>1</sub>	(L/14) 2	6	8'-9"	"	T&B Slabs
C <sub>2</sub>	(L/14) 2	6	5'-4"	"	"
D	21	4	L-(0'-4")	"	Top Slob
E	21	4	L-(6'-2")	"	Bot. Slob
F <sub>1</sub>	2	4	20'-1"	12" C to C	Apron
F <sub>2</sub>	2	4	20'-7"	"	"
F <sub>3</sub>	2	4	19'-5"	"	"
F <sub>4</sub>	2	4	18'-3"	"	"
F <sub>5</sub>	2	4	17'-1"	"	"
F <sub>6</sub>	2	4	15'-11"	"	"
F <sub>7</sub>	2	4	14'-9"	"	"
G	(L/7) 3	4	7'-0"	7" Std	Walls
H <sub>1</sub>	2-20	4	L+(1'-8") to L+(6'-8")	12" Std	S.W. & Wings
H <sub>2</sub>	4	4	L+(7'-0")	"	"
H <sub>6</sub>	6	4	L-(0'-4")	"	Mid Wall
I <sub>1</sub>	2	4	4'-5"	As Shown	Wings
I <sub>2</sub>	2	4	5'-4"	"	"
I <sub>3</sub>	2	4	6'-2"	"	"
I <sub>4</sub>	2	4	7'-0"	"	"
I <sub>5</sub>	2	4	7'-7"	"	"
I <sub>6</sub>	2	4	8'-2"	"	"
J	4	5	10'-6"	"	"
K	2	5	6'-6"	"	Headwall
L	4	4	5'-7"	"	Apron
M	27	6	1'-6"	"	Dowels

\* Disregard Fractions.  
Concrete P.F.L. Barrel.....1.1204 C.Y.  
Concrete P.F.D. Cut-Off Wall (1 End).....0.6689 C.Y.  
Excavation P.F.L. P.F.D. Barrel.....0.6944 C.Y.  
Reinforcing Steel P.F.L. Barrel.....179.0 Lbs.

QUANTITIES			
STATION	LENGTH "L"	REINFORCING STEEL	CLASS "A" CONCRETE
889+65	Ext. 8'-0" Lt.	1907 LBS.	14.0 C.Y.
889+65	Ext. 8'-0" Rt.	1907 LBS.	14.0 C.Y.
		LBS.	C.Y.
		LBS.	C.Y.
		LBS.	C.Y.
TOTAL		3814 LBS.	28.0 C.Y.

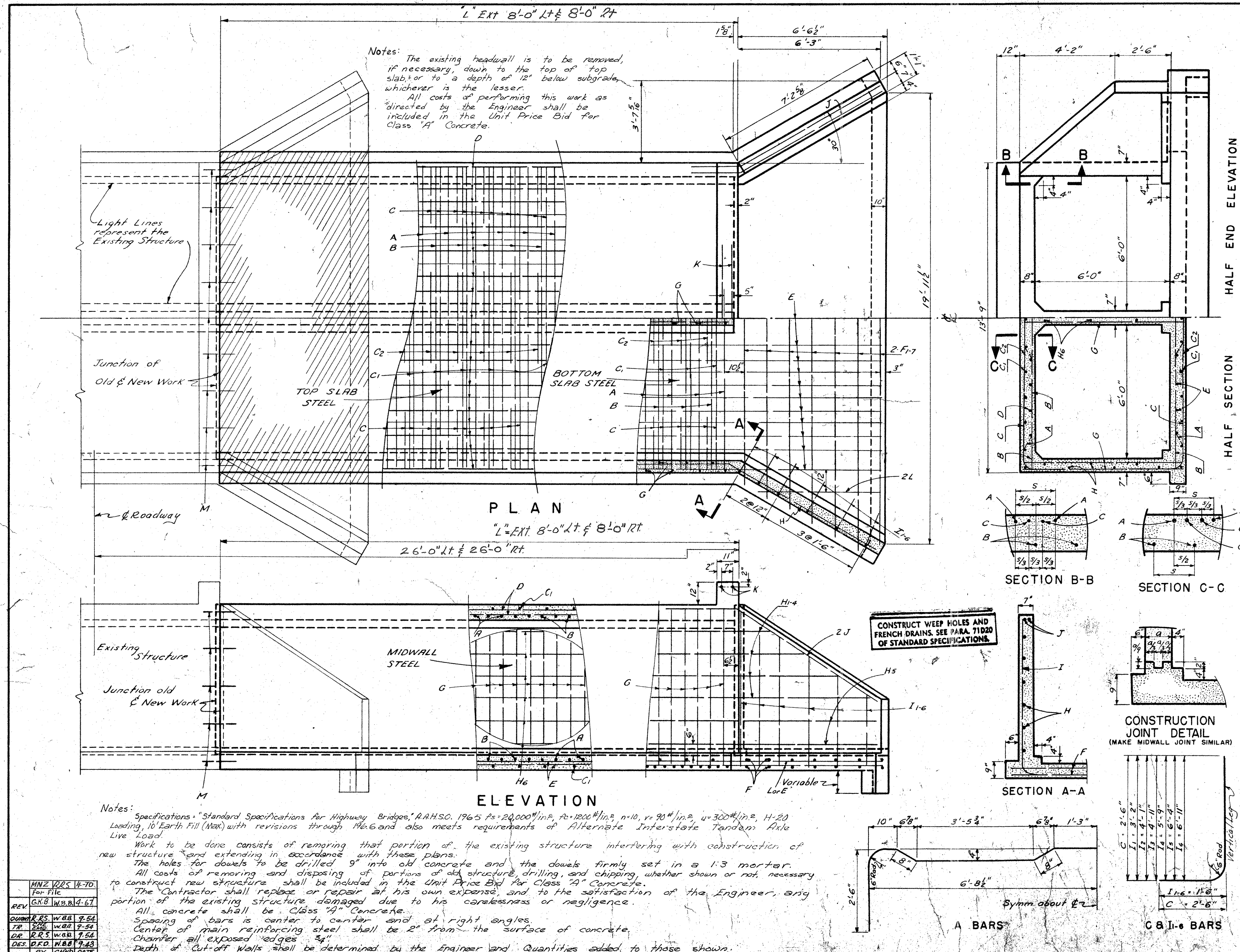
NOTE:  
Method used in figuring Quantities  
Reinforcing Steel = 474.7 + 179.0 L  
Class "A" Concrete = 5.027 + 1.1204 L  
UNCLASSIFIED EXCAVATION = 4.5 C.Y.

S. C. STATE HIGHWAY DEPARTMENT  
COLUMBIA

CONCRETE CULVERT  
REINFORCED BOX TYPE  
DOUBLE 6'X6' EXT.

FILE NO. 40.720 Richland COUNTY  
ROUTE NO. 48 DATE 4-70

B 2.66 EXT.





FED. ROAD DIV. NO.	STATE	COUNTY	FILE NO.	ROUTE NO.	SHEET NO.	TOTAL SHEETS
3	S.C.	Richland	40.720	48	41	44

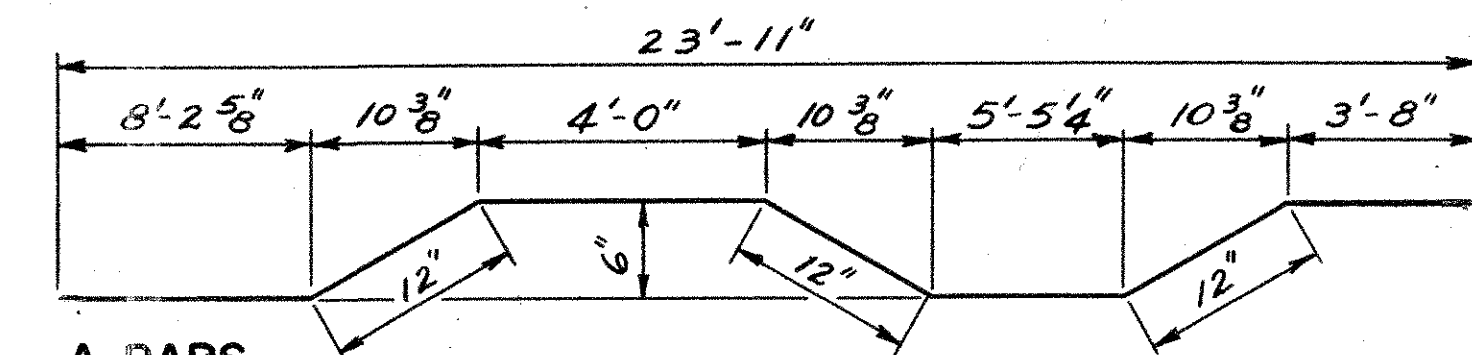
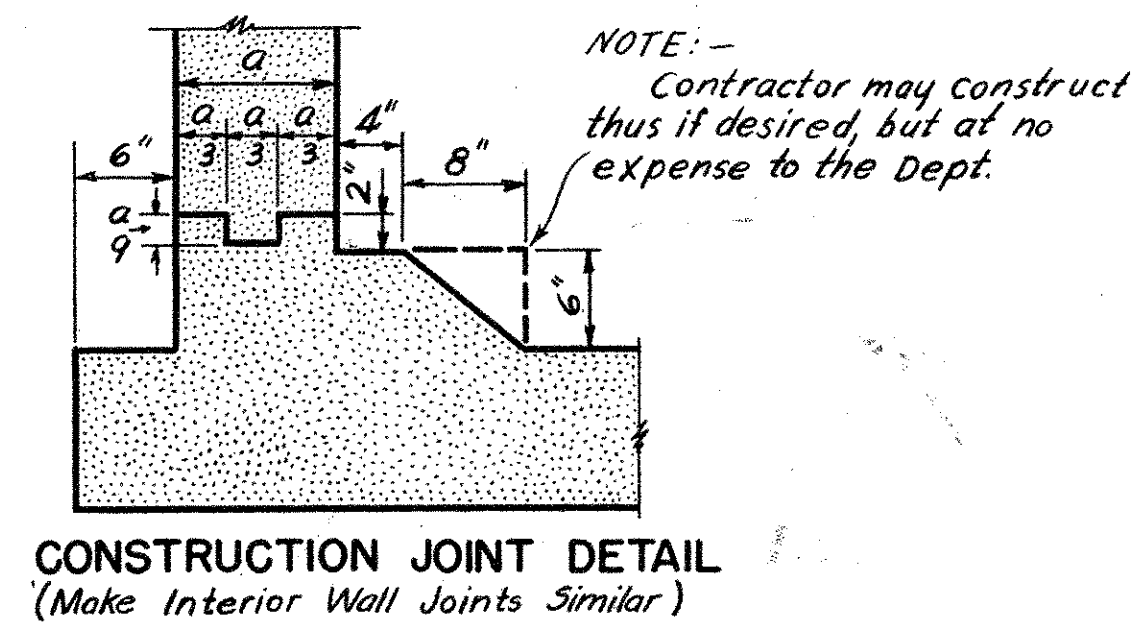
STEEL SCHEDULE - ONE END					
MARK	NO.	SIZE	LENGTH	SPACING	LOCATION
A	(4/12)4	5	24'-4"	12" C to C	T&B Slabs
B1	(4/12)2	4	13'-6"	"	"
B2	(4/12)2	4	20'-10"	"	"
C1	(4/12)4	4	6'-3"	"	Corners
C2	(4/12)2	4	37'-0"	"	T&B Slabs
C3	(4/12)4	7	10'-0"	"	"
C4	(4/12)2	5	8'-4"	"	"
D	106	4	L-(0'-4")	As Shown	"
F1 to F11	2 ea.	4	2'-1" to 4'-7"	"	Wing Footings
G1	(4/12)4	5	9'-1"	12" C to C	Corners & S.W.
G2	(4/12)2	4	9'-4"	18" C to C	Side Walls
G3	(4/12)6	4	9'-4"	18" C to C each face	Interior Walls
H1 to H5	2 ea.	4	L+(1'-9") to L+(8'-9")	12" C to C	S. Walls & Wings
H6	6	4	L+(9'-2")	"	"
H7	24	4	L-(0'-4")	"	Interior Walls
I1 to I3	2 ea.	4	4'-11" to 6'-9"	As Shown	Wings
I4 to I10	2 ea.	4	7'-3" to 10'-4"	"	"
J	4	5	13'-0"	"	"
K	2	7	32'-6"	"	Headwalls
L	8	4	13'-8"	"	Wing Footings
M	83	6	1'-6"	"	Dowels
H8	16	4	L+(2'-6")	12" C to C	S. Walls & Wings

* DISREGARD FRACTIONS	
CONCRETE P.F.L. BARREL	4.1646 C.Y.
CONCRETE P.F.D. CUT OFF WALL (1 END)	1.8855 C.Y.
EXCAVATION P.F.L. BARREL	1.8210 C.Y.
REINFORCING STEEL P.F.L. BARREL	555.11 LBS.

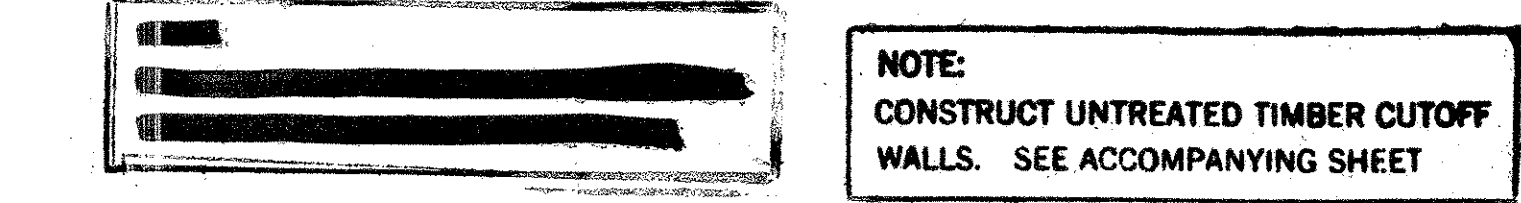
QUANTITIES			
STATION	LENGTH "L"	REINFORCING STEEL	CLASS "A" CONCRETE
958+40	9'-0" RT	5674 LBS.	44.3 C.Y.
958+40	9'-0" RT	5674 LBS.	44.3 C.Y.
		LBS.	C.Y.
		LBS.	C.Y.
		LBS.	C.Y.
		LBS.	C.Y.
TOTALS		11348 LBS.	88.6 C.Y.

UNCLASSIFIED EXCAVATION	175 C.Y.
NOTES:	
METHOD USED IN FIGURING QUANTITIES	
REINFORCING STEEL	677.7 + 555.11 L
CLASS "A" CONCRETE	6.80 + 4.1646 L

S.C. STATE HIGHWAY DEPARTMENT COLUMBIA	
CONCRETE CULVERT REINFORCED BOX TYPE QUADRUPLE 10'x 8' EXT.	
STATION 958+40	
FILE NO. 40.720 COUNTY Richland	
ROUTE NO. 48 DATE 4-70	
B 4.108 EXT.	



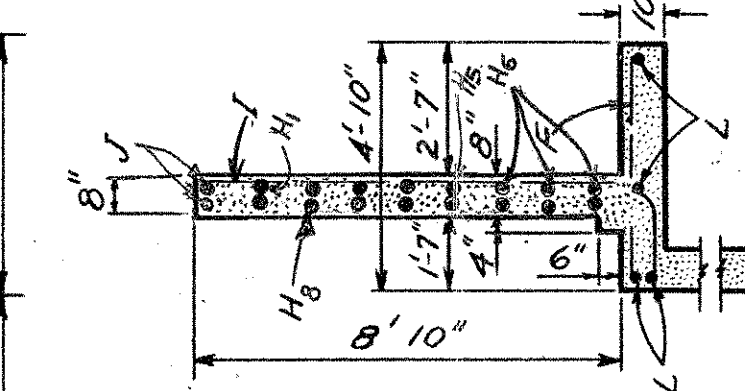
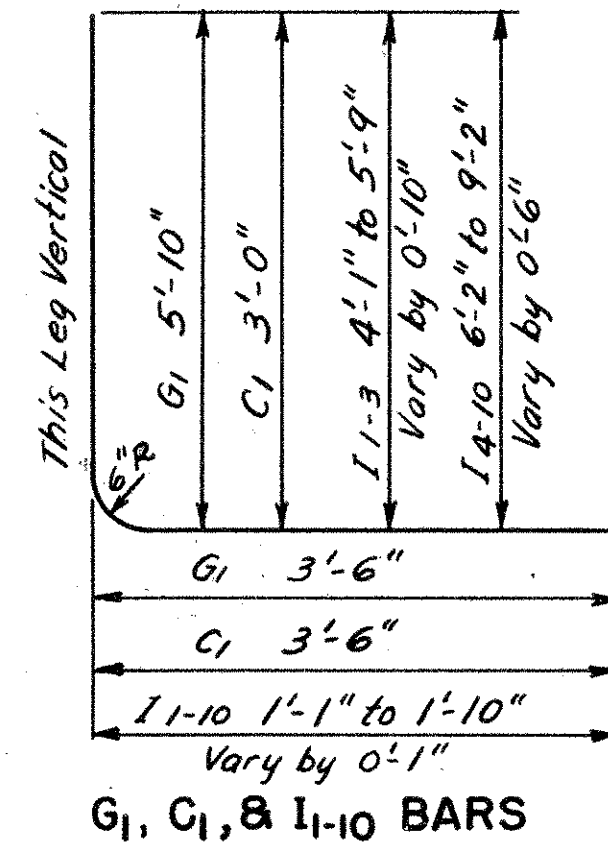
Notes:  
Specifications: "Standard Specifications for Highway Bridges," AASHTO 1965.  
f=20,000 psi, f=1,200 psi, n=10, v=90 psi, u=300 psi, H-20 loading.  
18" Edgth fill (Max). With revisions through 1966 and also meets requirements of alternate Interstate Tandem Axle Live Load.  
Work to be done consists of removing that portion of the existing structure interfering with construction of new structure and extending in accordance with these plans.  
The Contractor shall replace or repair at his own expense, and to the satisfaction of the Engineer, any portion of the existing structure damaged due to his carelessness or negligence.



CONSTRUCT WEEP HOLES AND FRENCH DRAINS. SEE PARA. 71D20 OF STANDARD SPECIFICATIONS.

NOTE:  
The Existing Headwalls are to be removed, if necessary, down to the top of Top Slab or to a depth of 12" below subgrade, whichever is the lesser.  
All costs of performing this work as directed by the Engineer, shall be included in the Unit Price Bid for Class "A" Concrete.

All Concrete shall be Class "A" Concrete.  
Spacing of bars is center to center and at right angles.  
Center of main reinforcing Steel shall be 2" from the surface of Concrete.  
Chamfer all exposed edges 3/4".  
Depth of Cut-off walls shall be determined by the Engineer and quantities added to those shown.





FED. ROAD DIV. NO.	STATE	COUNTY	FILE NO.	ROUTE NO.	SHEET NO.	TOTAL SHEETS
3	S.C.	Richland	40.720	48	42	44

STEEL SCHEDULE ONE END					
MARK	NO.	SIZE	LENGTH	SPACING	LOCATION
A	(L/4) 2	5	24'-0"	14" C to C	T & B Slabs
B	(L/4) 2	5	17'-11"		
C	(L/4) 8	4	5'-9"	As Shown	Corners
C1	(L/4) 2	6	12'-0"	As Shown	T & B Slabs
C2	(L/4) 2	6	6'-4"		
D	32	4	L-(0'-4")		Top Slab
E	32	4	L+(8'-0")		Bot Slab
F1	2	4	26'-5"	12" C to C	T & B Apron
F2	2	4	27'-2"		
F3	2	4	26'-0"		
F4	2	4	24'-11"		
F5	2	4	23'-9"		
F6	2	4	22'-7"		
F7	2	4	21'-5"		
F8	2	4	20'-3"		
F9	2	4	19'-1"		
G	(L/7) 3	4	9'-4"	7" Stag'd	Side & Mid Walls
H1	2	4	L+(1'-11")	12" C to C	Sidewalls & Wings
H2	2	4	L+(3'-9")		
H3	2	4	L+(5'-4")		
H4	2	4	L+(7'-3")		
H5	2	4	L+(8'-10")		
H6	6	4	L+(9'-0")		
H7	8	4	L-(0'-4")	12" Stag'd	Midwall
I1	2	4	6'-4"	As Shown	Wings
I2	2	4	7'-2"		
I3	2	4	7'-11"		
I4	2	4	8'-6"		
I5	6	4	9'-1"		
I6	6	4	10'-5"		
J	4	5	12'-6"		
K	2	6	8'-9"		Headwall
L1	4	4	3'-11"		T & B Apron
L2	4	4	6'-6"		
M	41	6	1'-6"		Dowels
H8	16	4	L+(2'-0")	12" C to C	Side Walls

* Disregard fractions	
Concrete P.F.L. Barrel	18488 C.Y.
Concrete P.F.D. Cut-off Wall (1 End)	08710 C.Y.
Excavation P.F.L. P.F.D. Barrel	08611 C.Y.
Reinforcing Steel P.F.L. Barrel	250.0 LBS

QUANTITIES			
STATION	LENGTH "L"	REINFORCING STEEL LBS.	CLASS "A" CONCRETE CY.
1028+0.0	9'-0" LT	310.5 LBS.	26.4 CY.
1028+0.0	9'-0" RT	310.5 LBS.	26.4 CY.
		LBS.	CY.
		LBS.	CY.
		LBS.	CY.
		LBS.	CY.
		LBS.	CY.
TOTAL		621.0 LBS.	52.8 CY.

NOTE:—  
Method used in figuring quantities:  
Reinforcing Steel = 855 + 250.0 L  
Class "A" Concrete = 9.795 + 1.8488 L

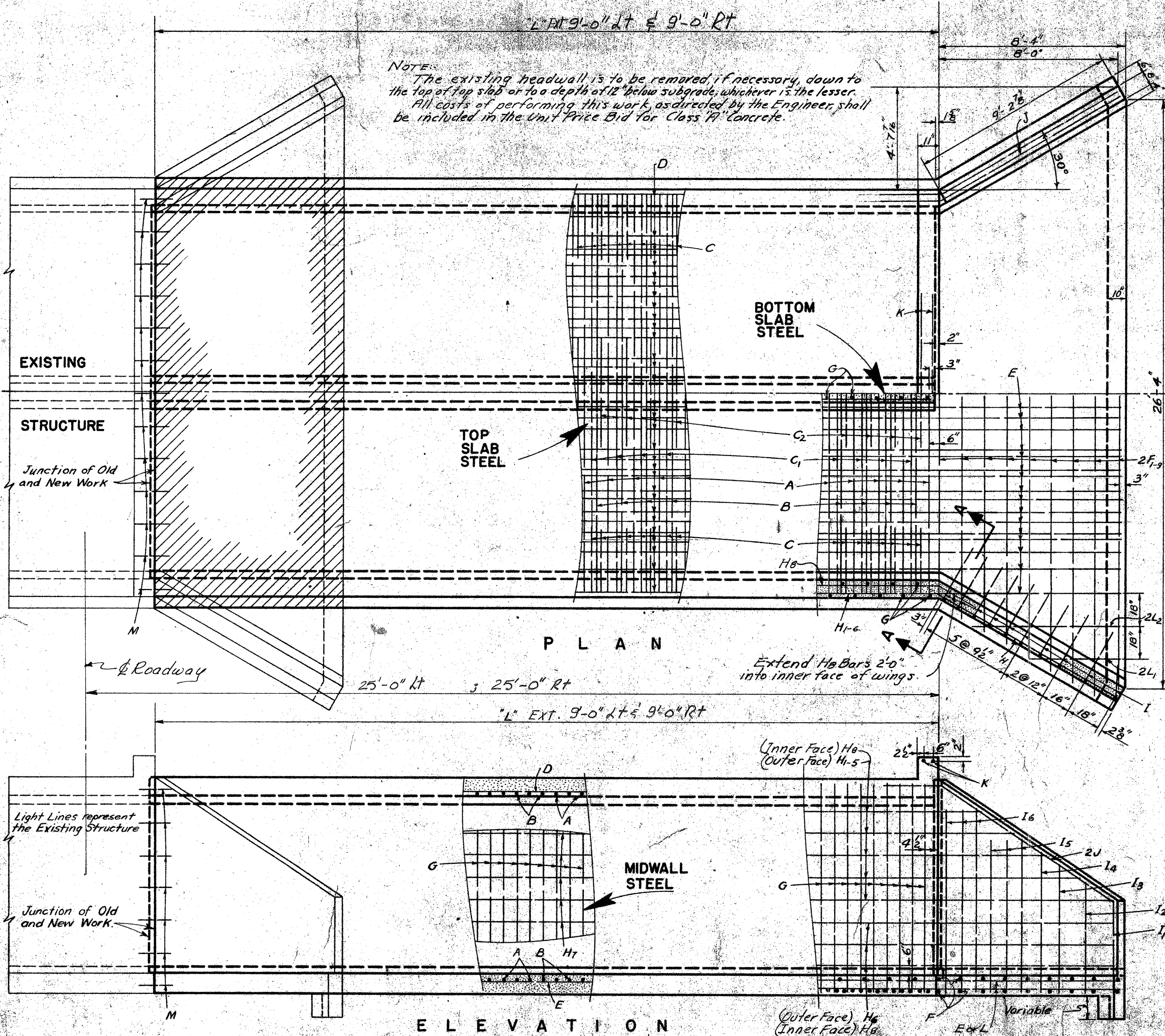
S.C. STATE HIGHWAY DEPARTMENT  
COLUMBIA

CONCRETE CULVERT  
REINFORCED BOX TYPE  
DOUBLE 8'X8' EXTENSION

S.C. FILE NO. 40.720 RICHLAND COUNTY  
ROUTE NO. 48 DATE 4-70

B 2.88 EXT

UNCLASSIFIED EXCAVATION = 65 C.Y.

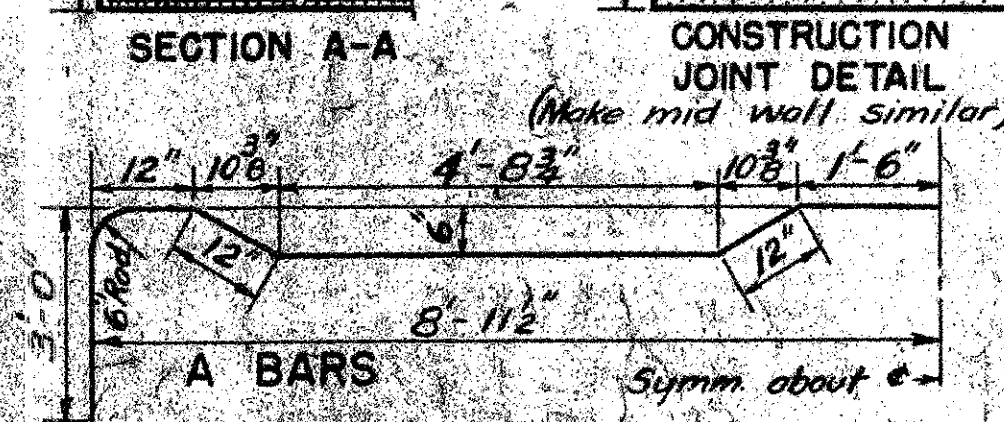


NOTE:  
The existing headwall is to be removed, if necessary, down to the top of top slab or to a depth of 12" below subgrade, whichever is the lesser.  
All costs of performing this work, as directed by the Engineer, shall be included in the Unit Price Bid for Class "A" Concrete.

Extend H8 Bars 2'-0" into inner face of wings.

NOTES:  
Specifications: "Standard Specifications for Highway Bridges," AASHTO, 1965, 15" 20,000 #/in<sup>2</sup>, f<sub>c</sub> = 1200 #/in<sup>2</sup>, n = 10, v = 90 #/in<sup>2</sup>, u = 300 #/in<sup>2</sup>, H20 Loading, 10' Earth Fill (Max.) with revisions through 1966 and also meets requirements of Alternate Interstate Tandem Axle-Live Load.  
Work to be done consists of removing that portion of the existing structure interfering with construction of new structure and extending in accordance with these plans.  
The holes for dowels to be drilled, 9" into old concrete and dowels firmly set in a 1:3 mortar.  
All costs of removing and disposing of portions of old structure, drilling and chipping, whether shown or not, necessary to construct New Structure shall be included in the Unit Price Bid for Class "A" Concrete.

The Contractor shall replace or repair at his own expense, and to the satisfaction of the Engineer, any portion of the existing structure damaged due to his carelessness or negligence.  
All Concrete shall be Class "A" Concrete.  
Spacing of bars is center to center, and at right angles.  
Center of main reinforcing steel shall be 2" from the surface of concrete.  
Chamfer all exposed edges 3".  
Depth of cut-off walls shall be determined by the Engineer and quantities added to those shown.



CONSTRUCT WEIR HOLES AND FRENCH DRAINS SEE PARA. 710.00 OF STANDARD SPECIFICATIONS.

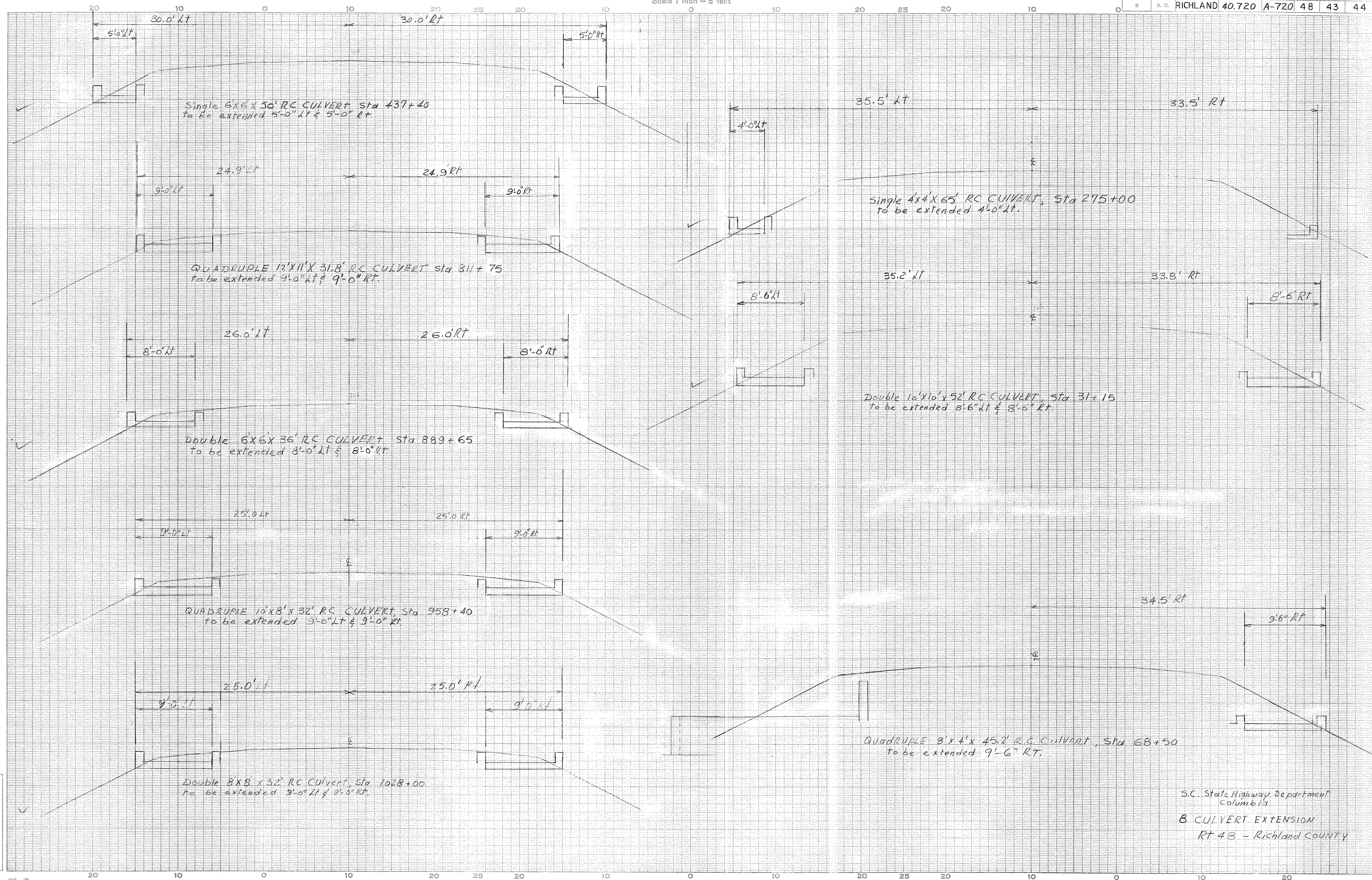
Rev.	DATE	BY	CHKD	DATE
1	4-70	W.B.B.	W.B.B.	4-70
2	4-70	W.B.B.	W.B.B.	4-70
3	4-70	W.B.B.	W.B.B.	4-70
4	4-70	W.B.B.	W.B.B.	4-70
5	4-70	W.B.B.	W.B.B.	4-70
6	4-70	W.B.B.	W.B.B.	4-70
7	4-70	W.B.B.	W.B.B.	4-70
8	4-70	W.B.B.	W.B.B.	4-70
9	4-70	W.B.B.	W.B.B.	4-70
10	4-70	W.B.B.	W.B.B.	4-70



## CROSS SECTIONS

Scale 1 inch = 5 feet

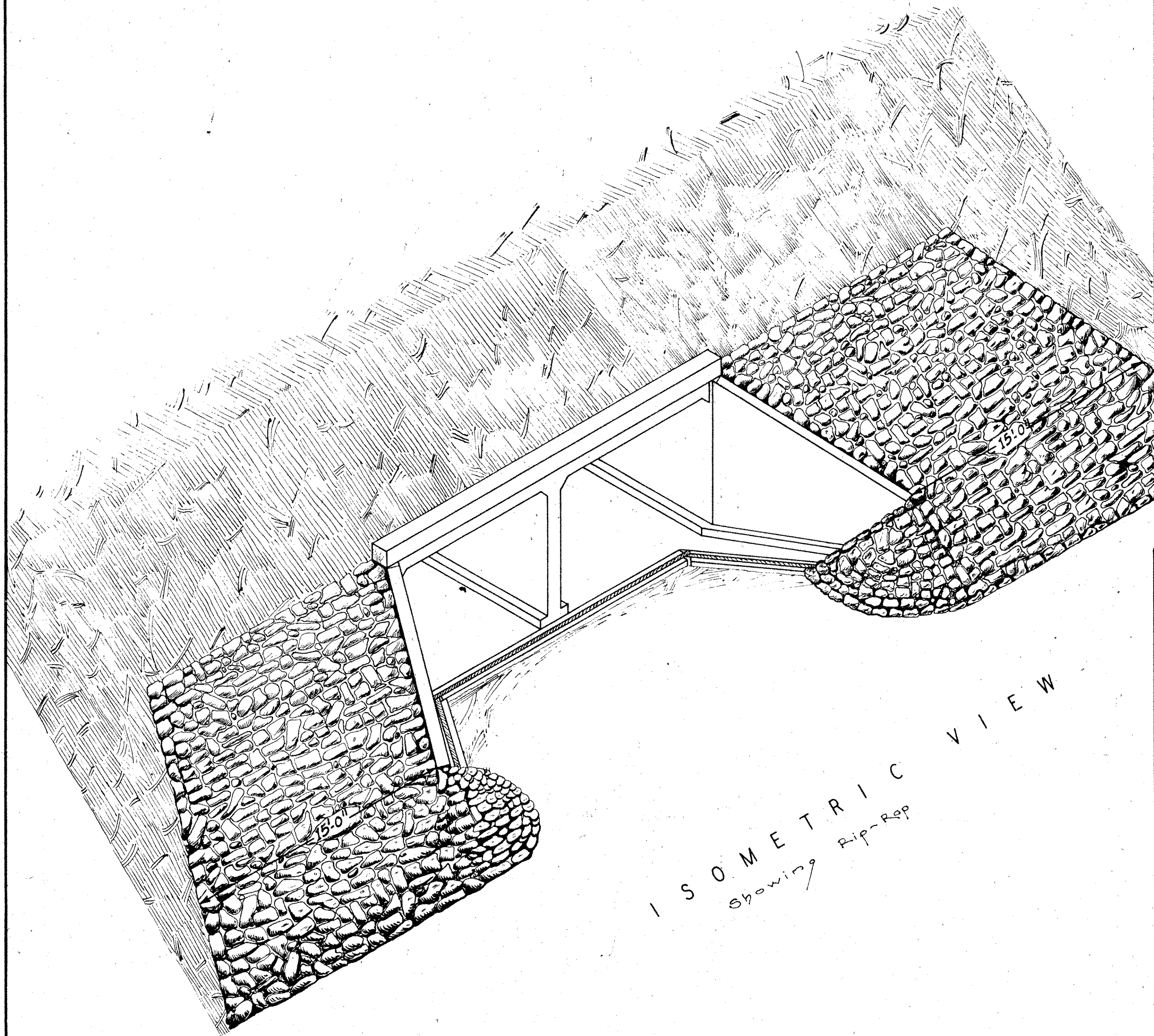
FED. ROAD DIV. NO.	STATE	COUNTY	DOCKET NO.	PROJECT NO.	ROUTE NO.	SHEET NO.	TOTAL SHEETS
3	S. C.	RICHLAND	40.720	A-720	48	43	44



Ground Surface Plotted by \_\_\_\_\_  
 " Checked by \_\_\_\_\_  
 Template Sections Plotted by \_\_\_\_\_  
 " Checked by \_\_\_\_\_  
 Areas by \_\_\_\_\_  
 " Checked by \_\_\_\_\_  
 Template Sections Revised by \_\_\_\_\_  
 " Checked by \_\_\_\_\_  
 Final Areas by \_\_\_\_\_  
 " Checked by \_\_\_\_\_  
 Quantities Transferred and Inked by \_\_\_\_\_

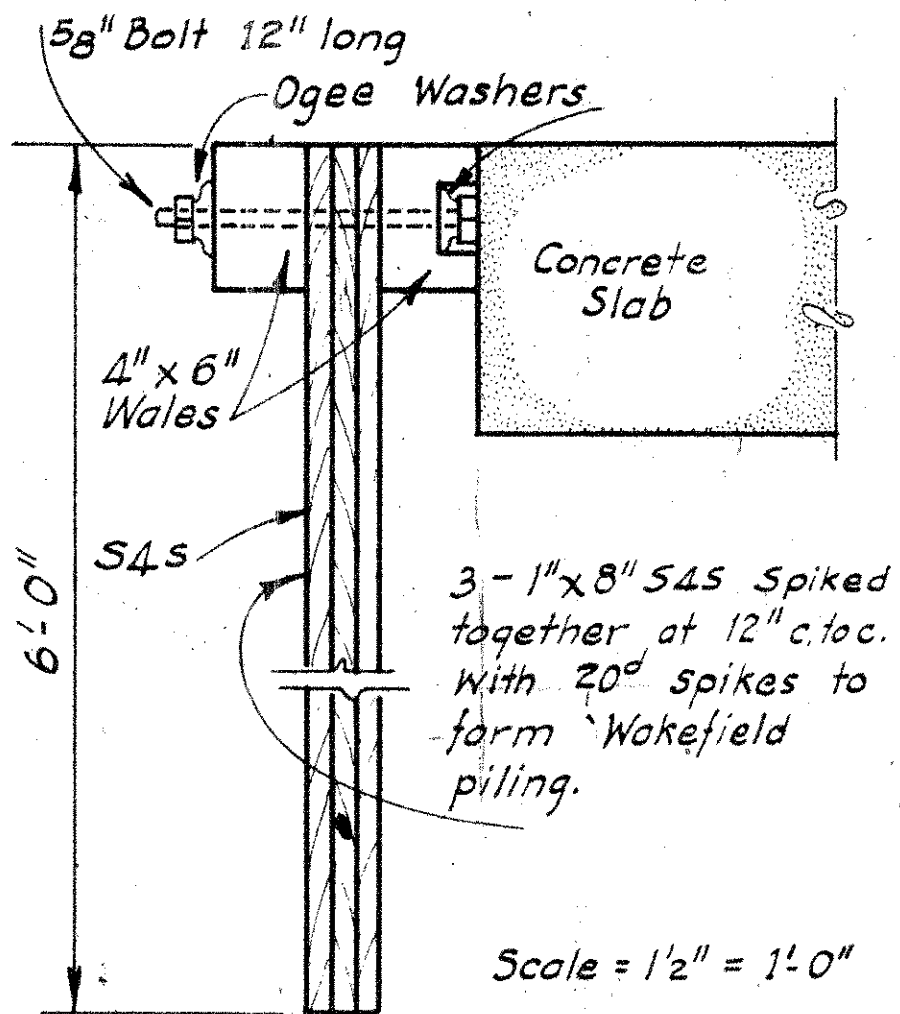


FED. ROAD DIST. NO.	STATE	COUNTY	S.C. FILE	ROUTE No.	SHEET NO.	TOTAL SHEETS
3	S.C.	Richland	40.720	48	44	44

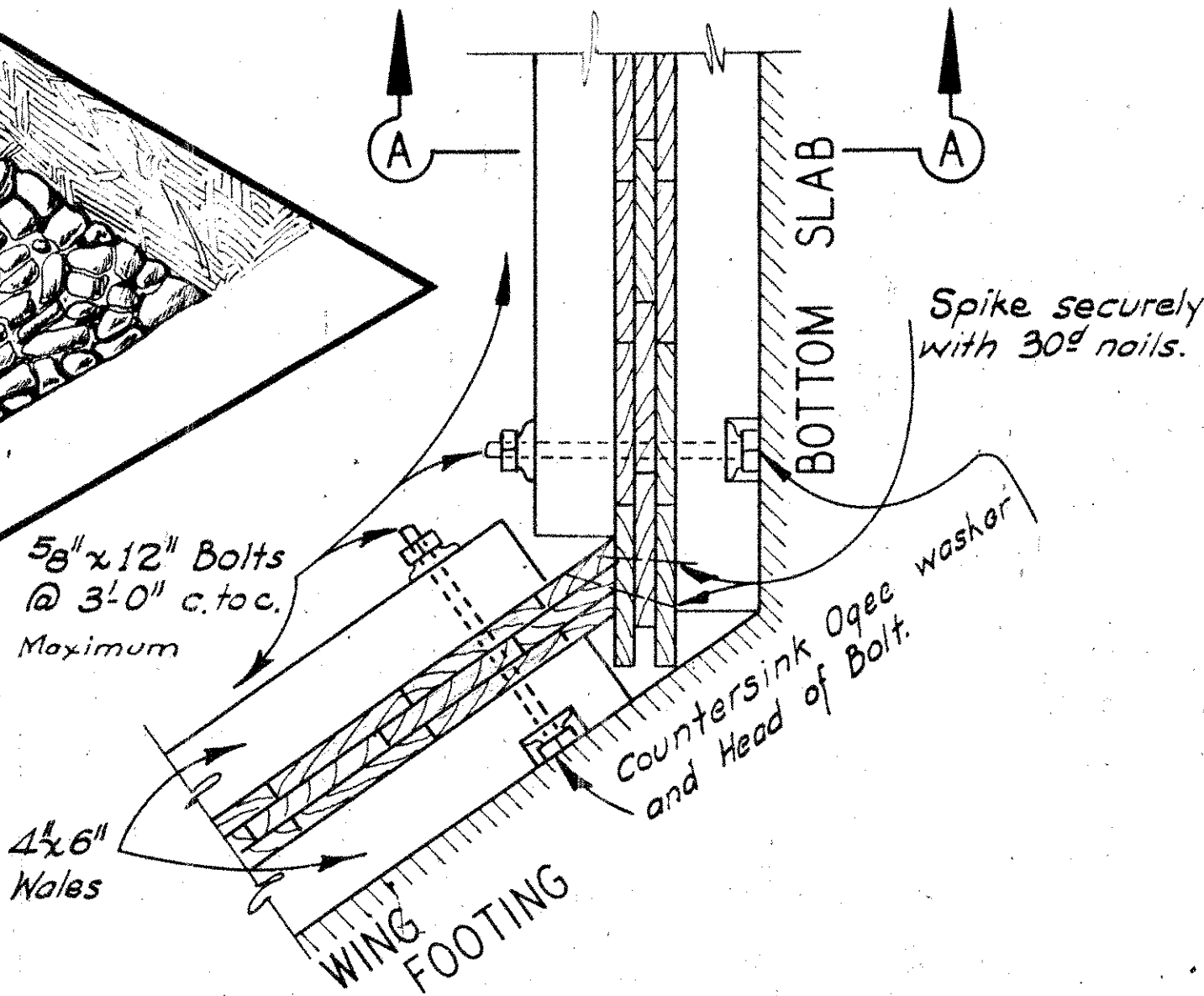


NOTES:  
All Culverts having a normal distance between sidewalls of 20' or greater are to be rip-rapped at each end approximately as shown above.

Rev.	MNZ	4-70
Drawn	W.R.T. G.K.B. 11-49	
Des.	W.B.B. G.K.B. 11-49	
Chd.	By	Date

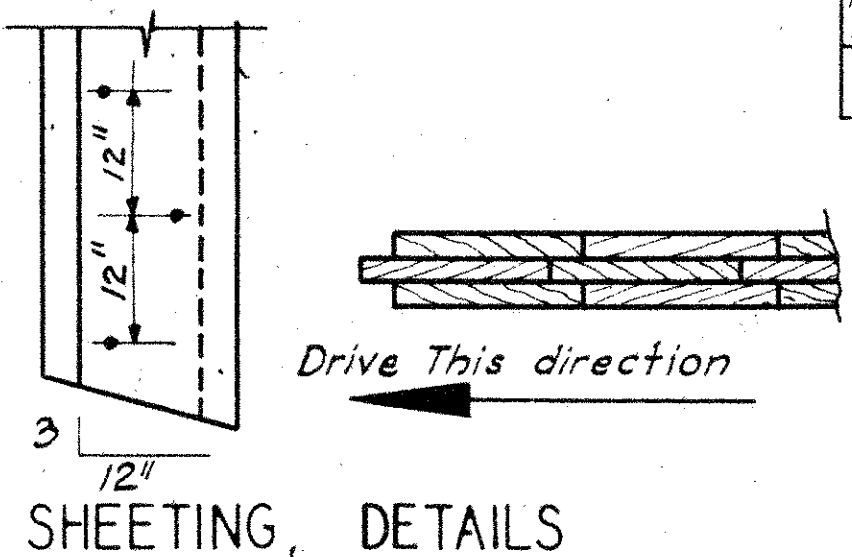


SECTION A - A

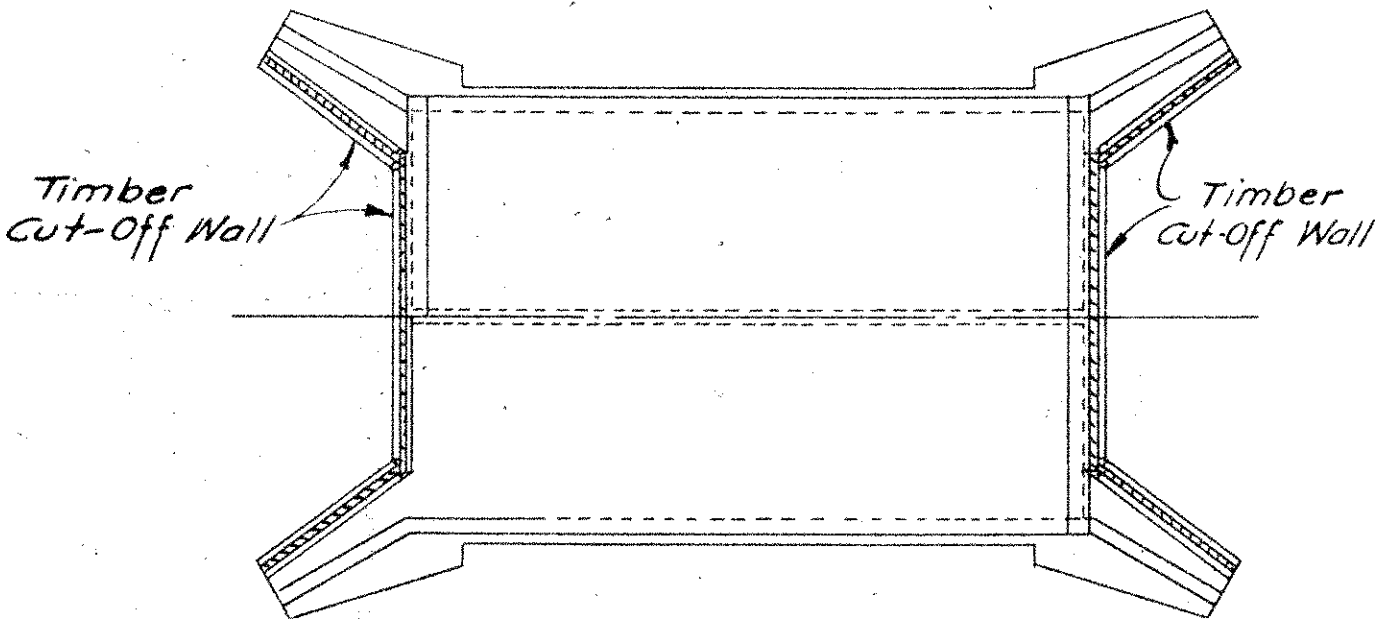


DETAIL: SHOWING METHOD OF CONSTRUCTING ANGULAR BEND IN SHEET PILE WALL.  
Scale = 1/2" = 1'-0"

NOTES:  
Instead of constructing the concrete Cut-Off walls shown on culvert plan sheet, untreated timber cut-off walls are to be constructed, if practicable, at each end of all culverts having a normal distance between sidewalls of 20 feet or greater.  
If in the opinion of the Engineer, the foundation conditions are such that a penetration for the sheeting of 3 feet below top of bottom slab cannot be secured, then concrete cut-off walls shall be constructed to a depth sufficient to rest on the hard material and paid for as called, for on culvert plan sheet.



NOTES:  
Sheeting shall be driven before slab concrete is cast.  
The contractor will be required to use a jet and force pump, if necessary, in order to secure the 6' penetration of the sheet piles below top of bottom slab.  
Sheeting and Wales to be of untreated timber. The timber used in cut-off walls will not be subject to the standard Specifications. Any species of wood may be used which will withstand nailing and driving. All timber shall be sound, have square corners, and be manufactured to the size called for.  
All costs of furnishing and placing sheeting, Wales, nails, bolts, etc., to be included in the unit price bid per linear foot of untreated timber cut-off wall.  
The linear feet of "Untreated Timber Cut-Off wall" to be paid for, will be measured along the centerline of the wall from end of wing to end of wing, each end of Culvert.



TYPICAL PLAN SHOWING LOCATION OF TIMBER CUT-OFF WALL

ESTIMATED QUANTITIES			
STATION	SIZE	RIP RAP	UNTREATED TIMBER CUT-OFF WALL
31+15	B21010		83.0 Lin.Ft.
68+50	B4.84		46.0 Lin.Ft.
810+75	B4.1211		150.0 Lin.Ft.
958+40	B4.108		118.0 Lin.Ft.
			Lin.Ft.
			Lin.Ft.
TOTAL			Lin.Ft.

S. C. STATE HIGHWAY DEPARTMENT  
COLUMBIA  
DETAILS OF UNTREATED TIMBER CUT-OFF WALLS AND VIEW SHOWING RIP-RAP FOR LARGE BOX CULVERTS  
FILE NO. 40.720 DATE 4-70  
COUNTY Richland ROUTE No. 48

THIS SHEET TO ACCOMPANY CULVERTS DOUBLE 10'x 10' AND LARGER