

State Level Historic Documentation Report

State Project No. S345-20-9.07
Federal Project No. BR-0020(164)E

Lilly Bridge Summers County



Prepared by:

Randy Epperly III, Historian

Department of Transportation
Division of Highways
Engineering Division
Environmental Section

December 7, 2011

STATE LEVEL HISTORIC DOCUMENTATION
LILLY TRUSS BRIDGE

Location: WV Route 20, over Bluestone Lake
Summers County
West Virginia

USGS Pipestem Quadrangle

Date of Construction: 1950

Builder: Virginia Bridge Company

Present Owner: West Virginia Department of Transportation
Division of Highways
1900 Kanawha Boulevard, Building 5, Room A-110
Charleston, WV 25305

Present Use: Vehicular Bridge

Significance: The Lilly Truss Bridge is significant due to its association with a well known bridge builder and as an example of the use of a Cantilevered Thru Truss. It also significant due to its association with local history and the flood control acts.

Project Information: The project has been undertaken due to the poor condition of the bridge. Any future deterioration of the bridge would result in its closure. The existing bridge warrants replacement. The documentation was undertaken in September 2011 in accordance with a Memorandum of Agreement among the Federal Highway Administration, West Virginia Department of Transportation, West Virginia State Historic Preservation Office, West Virginia Division of Natural Resources, and Summers County Board of Education. These measures are required prior to replacement of this National Register eligible structure.

Randy Epperly III, Historian
West Virginia Division of Highways
Charleston, WV 25305
December 7, 2011

The Lilly Truss Bridge is located on WV State Route 20 in Summers County, West Virginia. The existing bridge crosses over Bluestone Lake.

Lilly Bridge was built in 1950, one year after the Bluestone Dam was completed and ready for operation. The Bluestone Dam was built to control flooding in the New River Gorge and possible hydroelectric production. The dam created Bluestone Lake by flooding most of the town of Lilly (Princeton Times). Lilly Bridge was named in honor of the town, which was one of the oldest in Summers County and was located about 3 miles from the current location of the bridge. A proclamation was issued in 1949 naming the bridge after Lilly but needed legislative action to make it official. The resolution was forgotten and it was not until the 1990s that it was passed and the bridge was named Lilly Bridge (Clarksburg Telegram).

This bridge was the first bridge established to cross Bluestone Lake. It provided a direct route from Hinton to Pipestem State Park and Bluestone Dam. The Giles, Fayette, and Kanawha Turnpike, chartered in 1837, was located in this area. But due to the construction of the Bluestone Dam and Lake, the area has changed and the original route can no longer be seen (WVDOH Turnpike Files). Lilly Bridge is eligible for the National Register of Historic Places under Criterion A.

The bridge is also eligible under Criterion C for engineering and as a good example of its type. It was built in 1950 by the Virginia Bridge Company. The Virginia Bridge Company was known primarily for their highway and railroad bridges. The company was founded in 1889 as the American Bridge Company. The name was changed in 1895 to the Virginia Bridge and Iron Company. It became the largest steel fabricating company in the south. In 1952 the company merged into the American Bridge Company, a subsidiary of U.S. Steel (Clarkton Bridge).

The Lilly Bridge is a 5-span cantilevered thru truss bridge built in 1950 by the Virginia Bridge Company. It is supported by concrete abutments and 4 concrete piers. The bridge is 1163'10" long and has a roadway width of 24'. The bridge has a concrete deck and sidewalks. It contains steel channel and angle bridge rails. (WVDOH Bridge Files).

Cantilevered bridges are built by extending cantilevers horizontally, supported only on one end (ACROW). The steel trusses are the cantilevers on Lilly Bridge. KCI's Historic Context states that cantilevered bridges are used for spanning great lengths and are defined by their supports and not their configuration. Only 7 cantilevered truss bridges remain in West Virginia. KCI also stated that other cantilever truss bridges may exist and be categorized under through trusses (KCI, 2006).

Pictured below are some of the supports and connections for the Lilly Truss Bridge.

BIBLIOGRAPHY

Carver, Martha. Tennessee's Survey Report for Historic Highway Bridges. "Virginia Bridge and Iron Co." 2008.

Clarksburg Telegram. "It's Finally Official, Bridge Has a Name." 17 May 1994.

Princeton Times. "Village of Lilly." 30 March 1989.

Staunton River Tour, Halifax County, Virginia. Clarkton Bridge.

West Virginia Division of Highways, Bridge Files, Maintenance Division, Building 5, Capitol Complex, Charleston, West Virginia, March 2007.

West Virginia Division of Highways, Turnpike Files, Environmental Section, Engineering Division, Building 5, Capitol Complex, Charleston, West Virginia.

STATE LEVEL HISTORIC DOCUMENTATION
INDEX TO PHOTOGRAPHS

Lilly Truss Bridge
WV Route 20
Bluestone Lake
Summers County, West Virginia

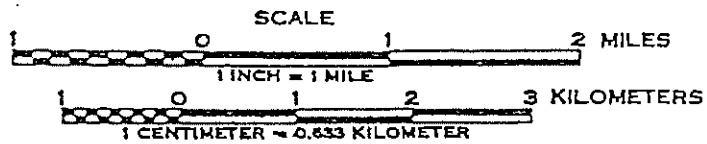
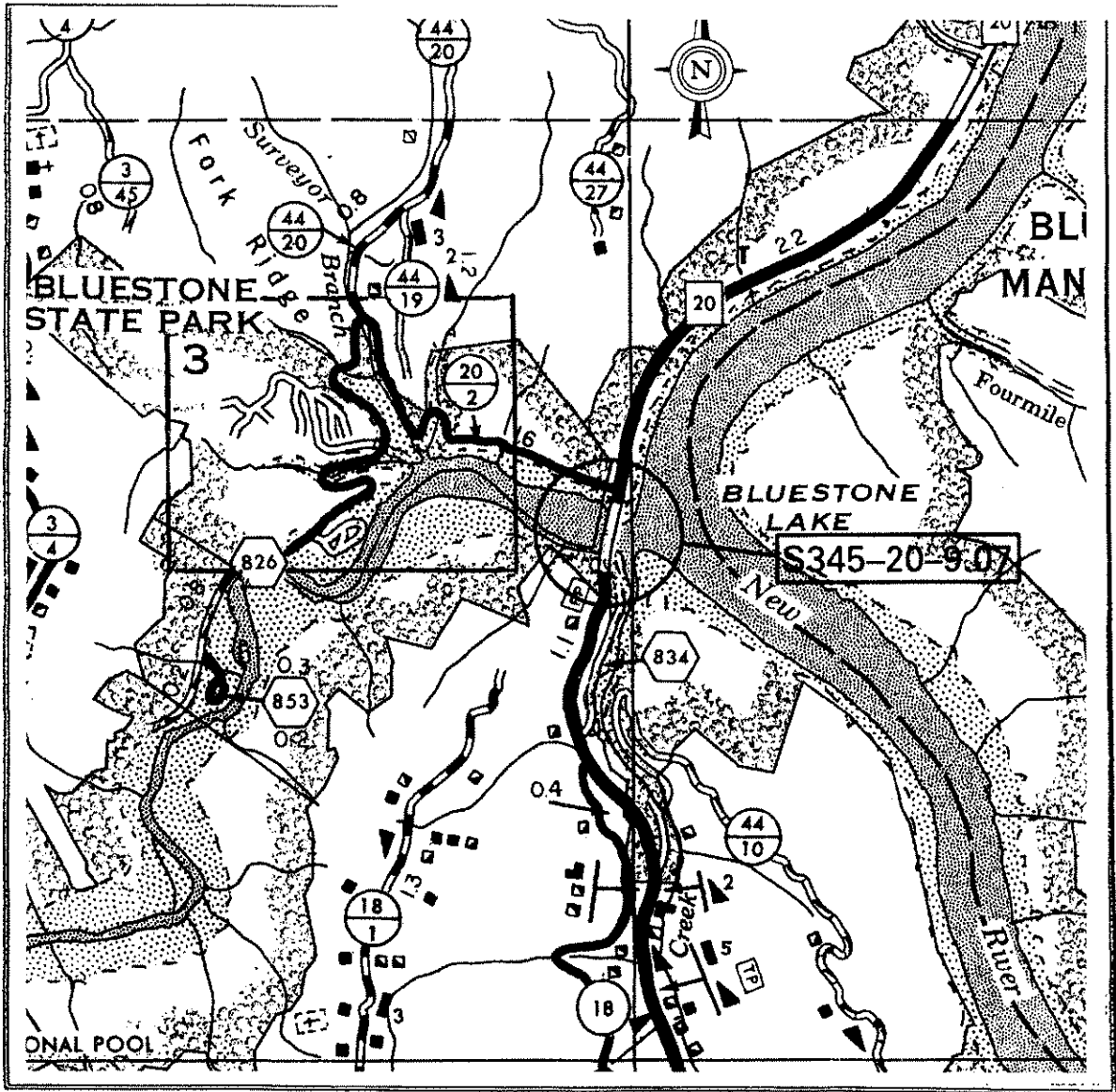
Photographer: Randy Epperly and Traci Cummings

Summer 2009 and July 2011

LILLY TRUSS BRIDGE-1	View of bridge looking west from Bluestone Lake.
LILLY TRUSS BRIDGE-2	View of bridge looking east from Bluestone Lake.
LILLY TRUSS BRIDGE-3	View from Northern approach on WV 20.
LILLY TRUSS BRIDGE-4	View from southern approach on WV 20.
LILLY TRUSS BRIDGE-5	View of bridge builder plate.
LILLY TRUSS BRIDGE-6	View of trusses along the top of the bridge.
LILLY TRUSS BRIDGE-7	View of abutments and bridge looking east from Bluestone Lake.
LILLY TRUSS BRIDGE-8	View of underside of bridge looking south from lake access site.
LILLY TRUSS BRIDGE-9	View of connection.
LILLY TRUSS BRIDGE-10	View of connection.
LILLY TRUSS BRIDGE-11	View of eastern side of bridge looking south across Bluestone Lake.

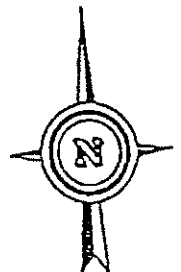
Original plans are attached.

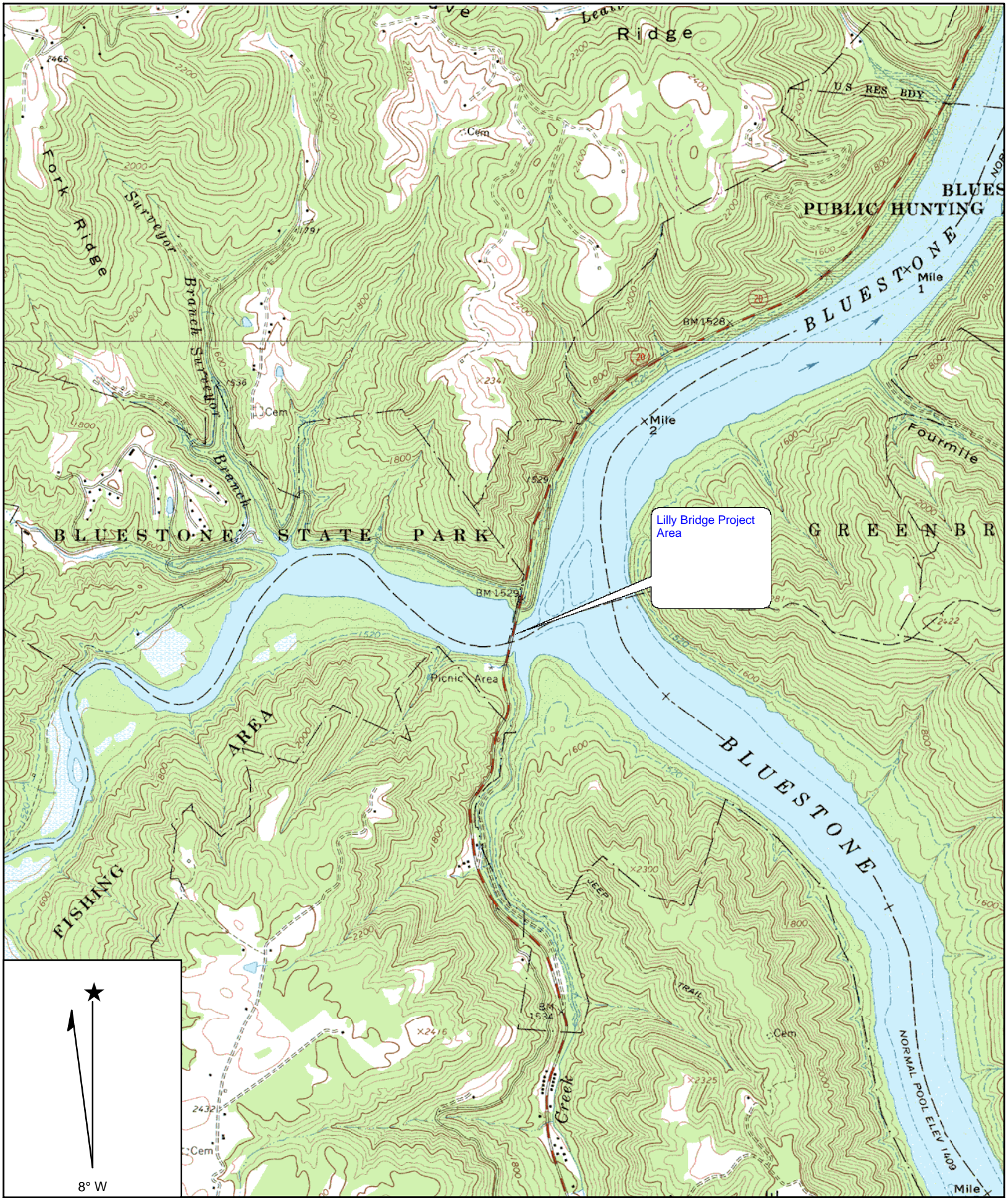
HIGHWAY MAP



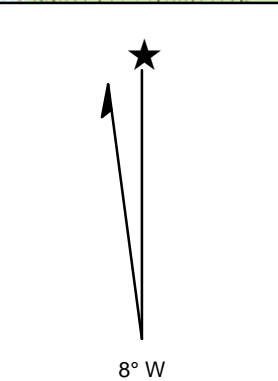
Lilly Bridge Summers County

State Project No. S345-20-9.07 Federal No. BR-0020(164)E





Lilly Bridge Project Area



Name: PIPESTEM
 Date: 6/9/2010
 Scale: 1 inch equals 2000 feet

Location: 17 0507227 E 4162889 N
 Caption: Lilly Bridge
 Summers County



Bluestone Dam

WV Route 20

County Route 20/2

Bluestone River

Bluestone State Park

Lilly Bridge

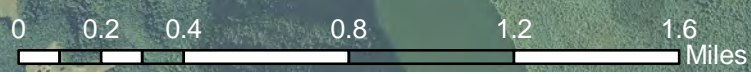
New River

Legend

— Roads


□ Lilly APE

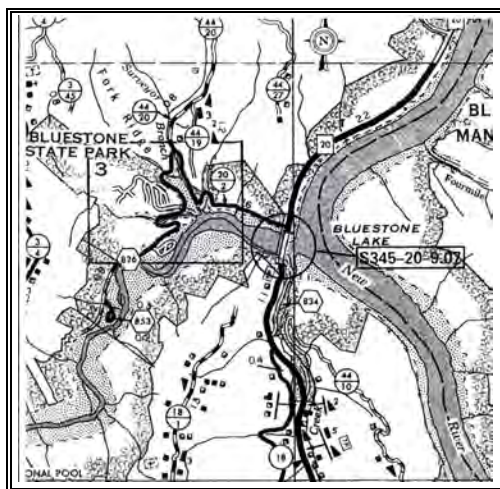
West Virginia Division of Highways
Engineering Division
Environmental Section
Randy Epperly
January 21, 2010





WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM

Street Address Located on WV Route 20, approximately 0.25 miles south of County Route 20/2, spanning Bluestone Lake.	Common/Historic Name/Both <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/> Lilly Bridge	Field Survey # HPI #1	Site # (SHPO Only)
Town or Community Near Hinton	County Summers	Negative No.	NR Listed Date
Architect/Builder Virginia Bridge Company	Date of Construction 1950	Style (SHPO Only)	
Exterior Siding / Materials Five-Span Cantilevered Thru Truss	Roofing Material Deck Material: Concrete	Foundation Abutments: Concrete Piers: Concrete	
Property Use or Function Transportation	UTM Zone17 NAD 1981 Easting 0507258E Northing 4162681N		
Survey Organization & Date WVDOH May 20, 2009	Quadrangle Name Pipestem		
Part of What Survey / FR# State County Route S345-20-9.07 Federal Route BR-0020(164)E			



Name: Lilly Bridge

Survey #: HPI #1

Survey / FR#: State County Route: S345-20-9.07

Present Owners WVDOH	Owners Mailing Address Building 5, Capitol Complex Charleston, WV 25305
Describe Setting <div style="text-align: right;">Unknown--<1 Acres <input type="checkbox"/> Archaeological Artifacts Present</div> <p>Lilly Bridge is located in a rural area in Summers County. It carries WV Route 20 across Bluestone Lake.</p>	
Description of Buildings or Site (Original and Present) <div style="text-align: right;">Stories Front Bays</div> <p>The structure is a 5-span cantilevered thru-truss bridge built in 1950 by the Virginia Bridge Company. It is supported by concrete abutments and 4 concrete piers. The bridge is 1163'10" and has a roadway width of 24'. The bridge has a concrete deck and sidewalks. The bridge has steel channel and angle bridge rails. There are flexbeam guardrails on the approaches. The bridge is posted for vertical clearance and weight limits. The ADT in 2006 was 1950 vehicles per day.</p>	
Alterations <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If yes, describe <p>1990- Abutment #2 approaches and bridge seats were raised. 1991-Stringers were repaired. 1996-Portal and sway strut members damaged by impact were removed and replaced. 1997- Bridge was painted. 2002-Various steel truss members were replaced. 2003-Cracked welds were repaired.</p>	
Additions <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If yes, describe	
Describe All Outbuildings N/A	
Statement of Significance: See Continuation Sheet	
Bibliographical References Carver, Martha. <u>Tennessee's Survey Report for Historic Highway Bridges</u> . "Virginia Bridge and Iron Co." 2008. <u>Clarksburg Telegram</u> . "It's Finally Official, Bridge Has a Name." 17 May 1994. KCI Technologies. <u>Draft Historic Context. West Virginia Statewide Historic Bridge Survey</u> . October 2006. Modjeski and Masters. <u>Final Feasibility Study, Lilly Bridge</u> . March 20, 2006. <u>Princeton Times</u> . "Village of Lilly." 30 March 1989. Staunton River Tour, Halifax County, Virginia. <u>Clarkton Bridge</u> . WVDOH Maintenance Division. <u>Bridge Inspection Report</u> . 2007.	
Form Prepared By: <div style="float: right;">Date: May 4, 2009</div> <p>Name/Organization: Randy Epperly Address: WV Division of Highways Capitol Complex Building 5, Rm. 463 Charleston, WV 25305</p> <p>Phone #: 304-558-9385</p>	

WEST VIRGINIA HISTORIC PROPERTY FORM CONTINUATION SHEET

Name: Lilly Bridge
Survey Number: HPI #1
Project / FR#: State County Route: S345-20-9.07

Lilly Bridge was built in 1950, one year after the Bluestone Dam was completed and ready for operation. The Bluestone Dam was built to control flooding in the New River Gorge and possible hydroelectric production. The dam created Bluestone Lake by flooding most of the town of Lilly (Princeton Times). Lilly Bridge was named in honor of the town, which was one of the oldest in Summers County and was located about 3 miles from the current location of the bridge. A proclamation was issued in 1949 naming the bridge after Lilly but needed legislative action to make it official. The resolution was forgotten and it was not until the 1990s that it was passed and the bridge was named Lilly Bridge (Clarksburg Telegram).

This bridge was the first bridge established to cross Bluestone Lake. It provided a direct route from Hinton to Pipestem State Park and Bluestone Dam. The Giles, Fayette, and Kanawha Turnpike, chartered in 1837, was located in this area. But due to the construction of the Bluestone Dam and Lake, the area has changed and the original route can no longer be seen.

Lilly Bridge is eligible for the National Register of Historic Places under Criterion A based on its significance with the local history.

Lilly Bridge is not associated with the significance of an individual or an individual's historic contribution. The bridge is not eligible under Criterion B.

Lilly Bridge is a 5-span cantilevered thru truss built in 1950 by the Virginia Bridge and Iron Company. The company was founded in 1889 as the American Bridge Company. Its name was changed to the Virginia Bridge and Iron Company in 1895 by its founders P.K. Wentworth, I.E. Hunter, and C.L. Michael. The company became the largest steel fabricating company in the south. Plants and offices were built in cities throughout the country (Clarkton Bridge). Highway bridges and railroad bridges were the specialties for the Virginia Bridge and Iron Company. They also produced steel and iron for other industries (Carver, 216). In 1952, the Virginia Bridge and Iron Company merged into the American Bridge Company. The American Bridge Company was a subsidiary of U.S. Steel, the largest bridge company in the United States (Clarkton Bridge).

It is a basic cantilever truss design, of which there are only 7 remaining in West Virginia. KCI's Historic Context states that other cantilever bridges may exist and be categorized under through trusses (KCI). KCI also states that cantilever bridges were used as a cheaper alternative to suspension bridges (KCI). Although the bridge has been repaired for various reasons, it has retained its integrity as an example of a cantilever truss. Lilly Bridge is eligible for the National Register of Historic Places under Criterion C for bridge design.

The bridge is not likely to possess any important information that will contribute to our understanding of early human history or prehistory. The potential for information is minimal. This structure is not eligible under Criterion D.



**MEMORANDUM OF AGREEMENT
BY AND AMONG
THE FEDERAL HIGHWAY ADMINISTRATION
THE WEST VIRGINIA STATE HISTORIC PRESERVATION OFFICE
AND THE WEST VIRGINIA DIVISION OF HIGHWAYS
REGARDING IMPLEMENTATION OF THE LILLY BRIDGE
REPLACEMENT PROJECT
S345-20-9.07
BR-0020(164)E
SUMMERS COUNTY, WEST VIRGINIA
JUNE 2011**

WHEREAS, the Federal Highway Administration (FHWA), in cooperation with the West Virginia Division of Highways (WVDOH), proposes to replace the Lilly Bridge, which spans the Bluestone Lake in Summers County, hereinafter referred to as the Project. The improvements involve the construction of a new bridge and the removal of the existing bridge; and

WHEREAS, the FHWA has determined that the Project will have an adverse effect upon the Lilly Bridge, a property eligible for the National Register of Historic Places (NRHP); and

WHEREAS, the FHWA has consulted with the West Virginia State Historic Preservation Officer (WVSHPO) pursuant to 36 CFR Part 800 Implementing Section 106 of the National Historic Preservation Act; (16 U.S.C., 470f); and

WHEREAS, the FHWA has determined that the Project will not effect archaeological properties; and

WHEREAS, the WVDOH contacted the Summers County Historic Landmarks Commission regarding the Project. The Summers County Historic Landmarks Commission chose not to respond. The Summers County Historical Society, Hinton Landmarks Commission, Three Rivers Council, Coal Heritage Authority, and National Park Service were contacted as well and chose not to respond. The project was also placed on the WVDOH's website for public comment; however, no comments have been received.

WHEREAS, in accordance with 36 CFR 800.6 (a) (1), the FHWA has notified the Advisory Council on Historic Preservation (ACHP) of its adverse effect determination providing the specified documentation, and the ACHP has chosen not to participate in the consultation pursuant to 36 CFR 800.6 (a) (1) (iii);

NOW, THEREFORE, the FHWA, the WVSHPO, and the WVDOH, agree that the undertaking will be implemented in accordance with the following stipulations in order to take into account the effects of the undertaking on historic properties.

STIPULATIONS

The FHWA shall ensure that the following stipulations are carried out:

Lilly Bridge

- I. The Lilly Bridge will be documented in its present historic setting. The documentation package will include 5"x7" black and white digital prints in accordance with the National Register of Historic Places and National Historic Landmarks Survey Photo Policy Expansion of January 2009.
- II. A brief history of the structure will be included along with fully completed West Virginia Historic Property Inventory forms and copies of any available plan sheets and drawings of the bridge from WVDOH bridge files
- III. West Virginia Division of Highways staff will provide Summers County Public Library a copy of the Lilly Bridge State Level Historic Documentation for references and educational purposes.
- IV. The WVDOH will consult with West Virginia Division of Natural Resources and United States Army Corps of Engineers on final plans and specifications regarding the project and Bluestone State Park.
- V. The WVDOH will provide an amount of \$2,500 to the Summers County Board of Education to sponsor a contest regarding the historic preservation of the Lilly Bridge. The contest should use representations of the bridge such as photographs, replicas, etc. This contest will be contingent upon approval by the Summers County Board of Education.
- VI. The WVDOH in cooperation with the U.S. Army Corps of Engineers will provide a plaque or kiosk near the current bridge site describing the significance of the Lilly Bridge.
- VII. Duration

This MOA will expire if its stipulations are not carried out within five (5) years from the date of its execution. At such time, and prior to work continuing on the undertaking, the FHWA shall either (a) execute an MOA pursuant to 36 CFR 800.6, or (b) request, take into account, and respond to the comments of the ACHP under 36 CFR 800.7. Prior to

such time, FHWA may consult with other signatories to reconsider the terms of the MOA and amend it in accordance with Stipulation XI below. FHWA shall notify the signatories as to the course of action it will pursue.

VIII. Post-Review Discoveries

If any unanticipated discoveries of historic properties or archaeological sites, including human burial sites and/or skeletal remains, are encountered during the implementation of this undertaking, work shall be suspended in the area of the discovery until the WVDOH has developed and implemented an appropriate treatment plan in consultation with the WVSHPO pursuant to 800.13 (b).

IX. Monitoring and Reporting

Each year following the execution of this MOA until it expires or is terminated, FHWA shall provide all parties to this MOA a summary report detailing work carried out pursuant to its terms. Such report shall include any scheduling changes proposed, any problems encountered, and any disputes and objections received in FHWA's efforts to carry out the terms of this MOA.

X. Dispute Resolution

Should any signatory or concurring party to this MOA object at any time to any actions proposed or the manner in which the terms of this MOA are implemented, FHWA shall consult with such party to resolve the objection. If FHWA determines that such objection cannot be resolved, FHWA will:

- A. Forward all documentation relevant to the dispute, including the FHWA's proposed resolution, to the ACHP. The ACHP shall provide FHWA with its advice on the resolution of the objection within thirty (30) days of receiving adequate documentation. Prior to reaching a final decision on the dispute, FHWA shall prepare a written response that takes into account any timely advice or comments regarding the dispute from the ACHP, signatories and concurring parties, and provide them with a copy of this written response. FHWA will then proceed according to its final decision.
- B. If the ACHP does not provide its advice regarding the dispute within the thirty (30) day time period, FHWA may make a final decision on the dispute and proceed accordingly. Prior to reaching such a final decision, FHWA shall prepare a written response that takes into account any timely comments regarding the dispute from the signatories and concurring parties to the MOA, and provide them and the ACHP with a copy of such written response.

- C. FHWA's responsibility to carry out all other actions subject to the terms of this MOA that are not the subject of the dispute remain unchanged.

XI. Amendments

This MOA may be amended when such an amendment is agreed to in writing by all signatories. The amendment will be effective on the date a copy signed by all of the signatories is filed with the ACHP.

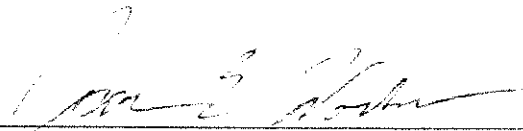
XII. Termination

If any signatory to this MOA determines that its terms will not or cannot be carried out, that party shall immediately consult with the other parties to attempt to develop an amendment per Stipulation VIII, above. If within thirty (30) days (or another time period agreed to by all signatories) an amendment cannot be reached, any signatory may terminate the MOA upon written notification to the other signatories.

Once the MOA is terminated, and prior to work continuing on the undertaking, FHWA must either (a) execute a MOA pursuant to 36 CFR 800.6, or (b) request, take into account, and respond to the comments of the ACHP under 36 CFR 800.7. FHWA shall notify the signatories as to the course of action it will pursue.

EXECUTION of the Memorandum of Agreement by the FHWA, WVSHPO, the WVDOH and the Council, and implementation of its terms evidence that the FHWA has afforded the Council an opportunity to comment on the Lilly Bridge Replacement project and its effects on historic properties, and that the FHWA has taken into account the effects of the undertaking on the historic property.

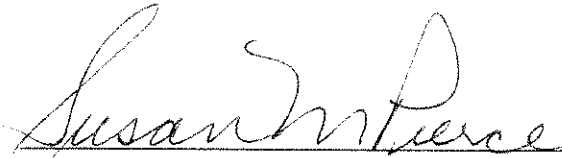
Signatories Page



Federal Highway Administration

9/12/11

Date



West Virginia Deputy State Historic Preservation Officer

6/13/11

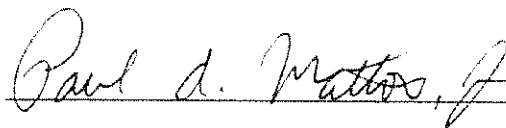
Date

APPROVED:

Advisory Council on Historic Preservation

Date

CONCUR:



West Virginia Division of Highways

6/22/11

Date

Lilly Bridge Replacement
Memorandum of Agreement
Page 6

Signature Page 2

Consulting Parties:

United States Army Corps of Engineers

Date

Signature Page 3

Consulting Parties:

A handwritten signature in cursive script, appearing to read "Frank G. ...", is written above a solid horizontal line.

West Virginia Division of Natural Resources

A handwritten date "4-17-11" is written above a solid horizontal line.

Date

Signature Page 4

Consulting Parties:

Debi L. Harmon, Superintendent 4/12/11
Summers County Board of Education Date





DALLASTON
OVER HILL

NO
LEFT
TURN

NO
LEFT
TURN

NO
LEFT
TURN



13-11

NO
PEDESTRIAN
CROSSING







BUILT BY
VIRGINIA BRIDGE COMPANY
ROANOKE VIRGINIA

19



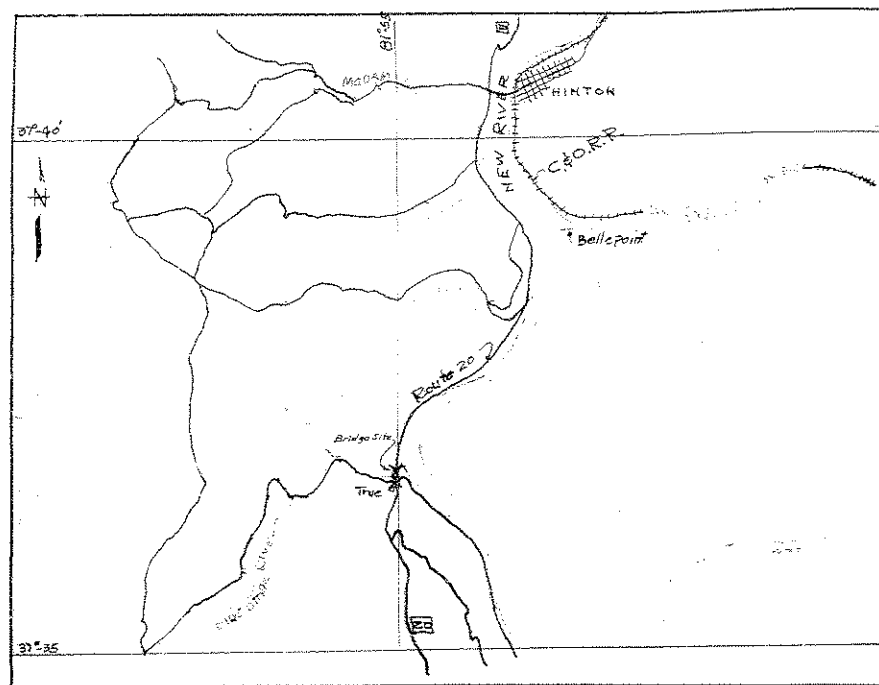
50











SCALE 2250' - TRACED FROM U.S.G.S.

QUADRANGLE

THE STATE ROAD COMMISSION
OF WEST VIRGINIA

PLAN AND PROFILE FOR CONSTRUCTION

OF

STATE ROAD

ROUTE NO. W.VA. 20

JUMPING BRANCH & PIPESTEM DISTRICTS SUMMERS COUNTY

PROJECT NO. 3494

TRUE BRIDGE

Sta. 228+19.667 To Sta. 239+93.000

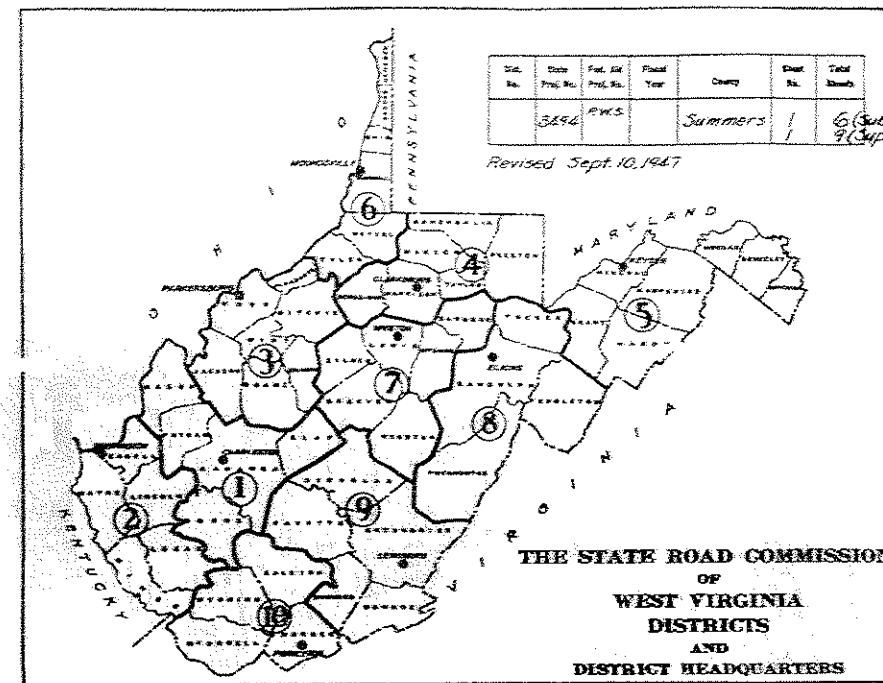
Length = 0.219 MI.

Plan 1 IN. =

SCALES

PROFILE HOR. 1 IN. =

VERT. 1 IN. =



TYPE OF CONSTRUCTION
BRIDGE

SPECIFICATIONS: Standard Specifications for Highway Bridges dated January 1943, by the State Road Commission of West Virginia.

Special Provisions for Projects Financed with State Funds dated Feb-18-1947 will govern.

For Pool Data see Bluestone Dam Pool Data dated March-18-1947 attached to Proposal for substructure and Bluestone Dam Pool Data dated Oct. 10, 1947, attached to Proposal for superstructure.

ROUTE NO. W. VA. 20

PROJECT NO. 3494

PREPARED & RECOMMENDED

REVIEWED

RECOMMENDED FOR APPROVAL

APPROVED

STATE ROAD COMMISSION

STATE ROAD COMMISSION

STATE ROAD COMMISSION

STATE ROAD COMMISSION

STATE ROAD COMMISSION

LAYOUT
SCALE 1 IN. = FT.

CONVENTIONAL SIGNS

Scale Line	Wall
County Line	Marsh
Corporation Line	Hedge
District Line	Deep Inlet
Right of Way Line	Bridge
Property Line	Present Culvert
Fence Line	Proposed
Guard Rail	Telegraph Pole
Proposed Road	Trolley Pole
Traveled Road	Power Pole
Railroad	Tree
Electric Railway	Brick Dwelling
Frame Dwelling	

INDEX TO SHEETS (Substructure Contract)

No.	Description
1	Title Sheet
2	Profile & Foundation Plan
3	Abutments
4	Piers
5	Bar List
6	Situation Plan

INDEX TO SHEETS (Superstructure Contract)

No.	Description
1	Title Sheet
2 to 8	Superstructure Details
9	Situation Plan

NOTE: Sheets 3 and 5 of the substructure plans are to be included with the superstructure plans.

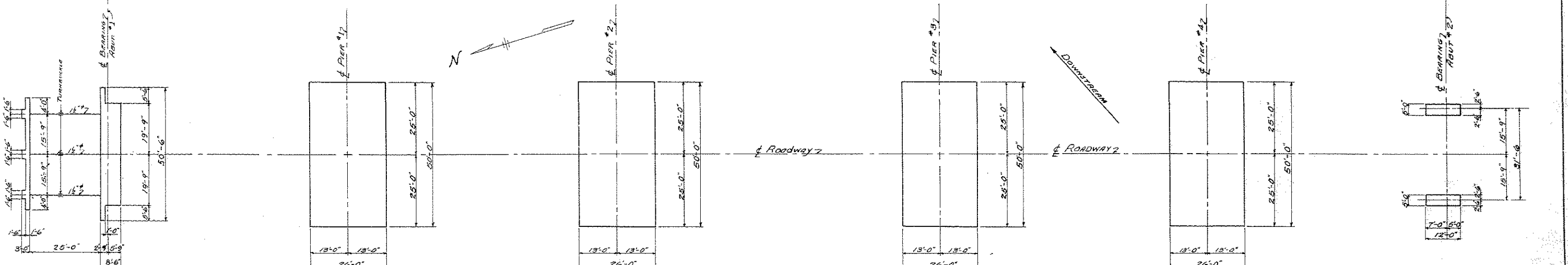
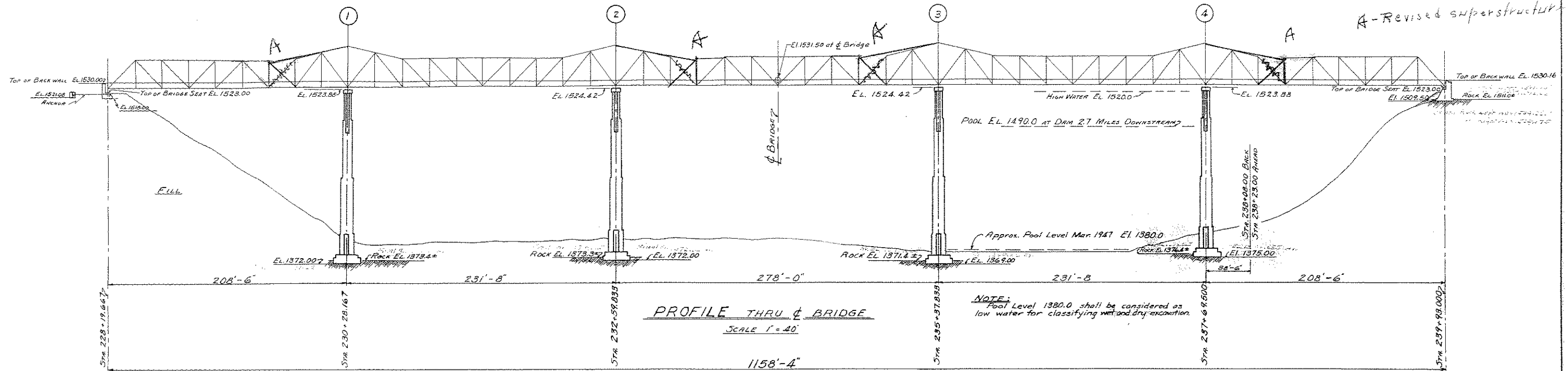
SUBSTRUCTURE PLANS COMPLETED March-20-1947
SUPERSTRUCTURE PLANS COMPLETED Sept.-21-1947



1764

325

Dist. No.	State Proj. No.	Federal Aid Proj. No.	Fiscal Year	County	Sheet No.	Total Sheets
3494				Summers	2	6



NOTES:
Standard Specifications for Bridges, Jan. 1943 by State Road Commission of W. Va. shall govern.
The Bridge is designed for H-15-S12 Loading and an additional wearing surface of 15" per sq. ft. of Roadway. The superstructure is not included in this Contract.
The approach fills are not included in this Contract.
All concrete in the Substructure shall be Class A.
The Contractor shall furnish certified Copies, secured from the Manufacturer of the results of Tests for autoclave expansion and Chemical analysis of all Portland Cement used in this project. These Tests shall conform to the A.S.T.M. designations T-1-42 (para. 6), T-107-42, T-105-42 and M85-42. Six copies of these certified results shall be submitted to the Dept. of Tests, Mechanical Hall, Morgantown, W. Va.
Superstructure, Abutment No. 1, and Curtain Wall above construction joint in Abutment No. 2 NOT included in Substructure Contract.
Anchor and bottom 2'-0" of abutment No. 1 shall be excavated to rock lines and concrete poured directly against earth without forms. If loose rocks are encountered on the heel line of this excavation these shall be removed and the openings formed. Back fill of such places shall be tamped in accordance with Specifications.
Rail Steel Reinforcing bars may be used in lieu of new billet steel bars.

	THIS CONTRACT					FUTURE CONTRACT	
	PIER 1	PIER 2	PIER 3	PIER 4	ABT. 2	ABT. 1	ABT. 2
Dry Exc. cy	477.8	638.5	0	508.0	231.0	325	0
Wet Exc. cy	376.0	381.0	246.0	205.0	0	0	0
Rock Exc. cy	72.5	53	116.5	72.3	8.9	0	0
CL. A. Conc. cu yd	1409.3	1419.3	1435.4	1387.1	48.7	91.5	22.6
St. Reinf. #	112,760	113,144	114,226	110,982	4788	9018	2582
					4788	9086	2577

SIZE	REINFORCING BARS		TOTAL WEIGHT
	Present Contract	Future Contract	
3/8"	0	48	48
1/2"	31,820	345	32,165
5/8"	867	3115	3,982
3/4"	20,069	255	20,324
1"	202,624	3765	206,389
1 1/2"	201,220	3320	204,540
1 3/4"	0	754	754
Total	456,600	11,600	468,200

SUMMARY OF ESTIMATE	This Contract	Future Contract	TOTAL	Substructure Contract	Superstr. Contract
7. DRY EXCAVATION	1855	325	2180 C.Y.	1712.85	200.40
8. WET EXCAVATION	1205	0	1205 C.Y.	1175.08	
9. ROCK EXCAVATION	322	0	322 C.Y.	487.68	
12. CLASS A CONCRETE	5694	114	5808 C.Y.	5712.11	127.34
7B STEEL REINFORCING	456,600	11,600	468,200 LBS.	472,230	
Total	477,310	11,939	489,249	477,310	327.74

THE STATE ROAD COMMISSION
OF WEST VIRGINIA

TRUE BRIDGE OVER BLUESTONE RIVER
PROJECT #3494 SUMMERS COUNTY, W. VA.

PROFILE AND FOUNDATION PLAN
SUBSTRUCTURE CONTRACT # 1764

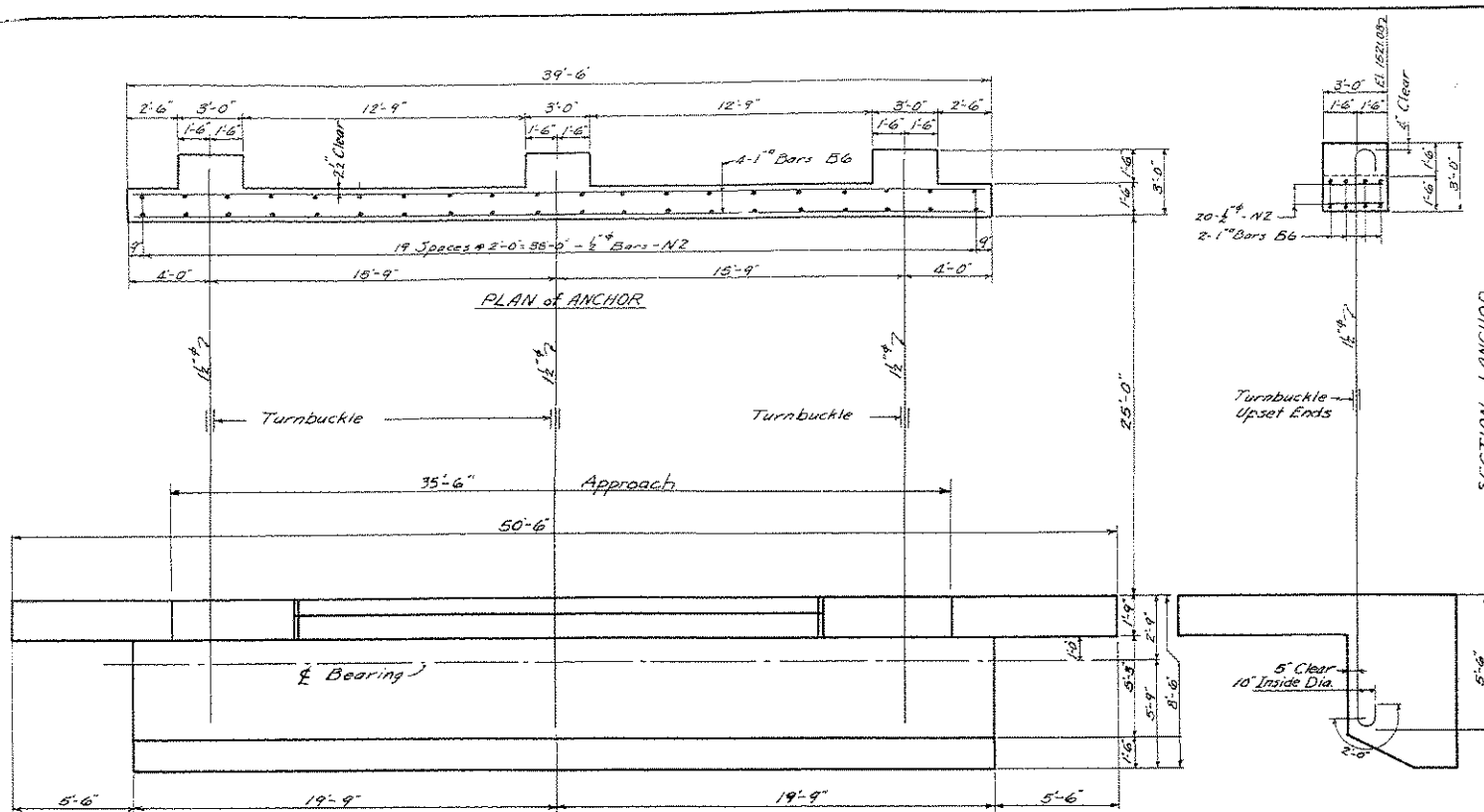
DESIGN BY FRANK D. MEENTER
CONSULTING ENGINEER
CLARKSBURG, W. VA.

SCALE: AS SHOWN Date: MAR 7, 1944

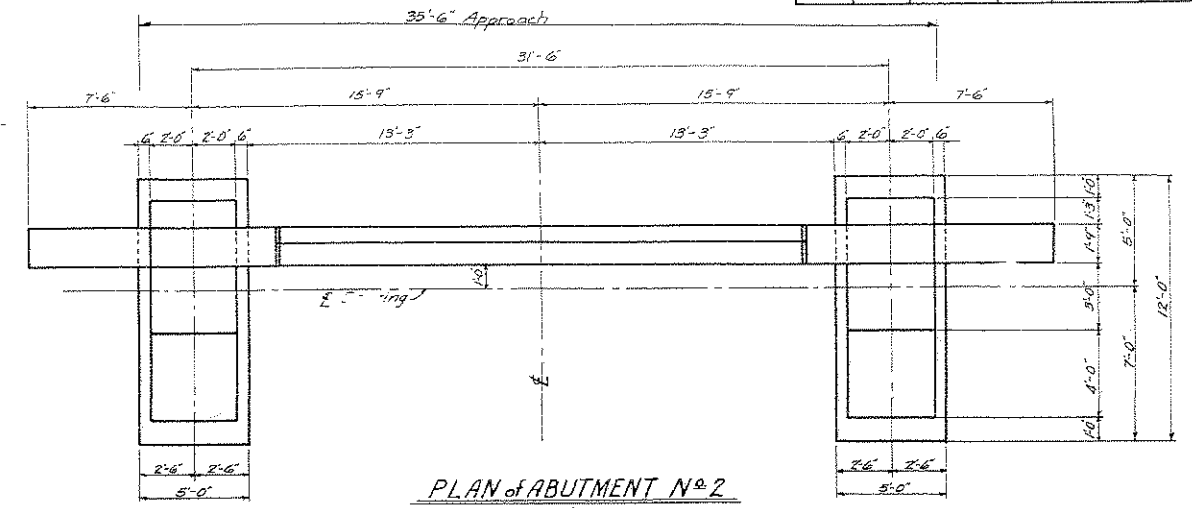
DESIGNED BY K.M.J.	CHECKED BY M.R.
DRAWN BY M.R.	CHECKED BY K.M.J.
TRACED BY F.D.H.	CHECKED BY K.M.J.

* See Sheets 1 & 2 AS BUILT - SHOWN IN RED

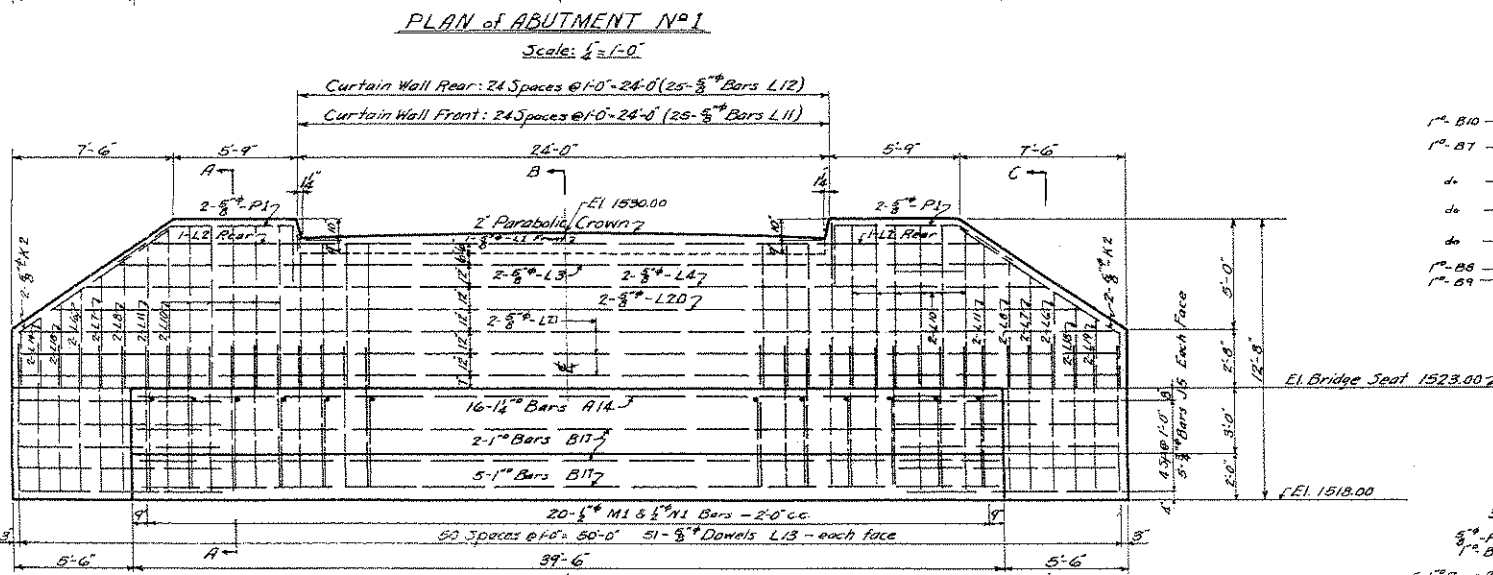
Dist No.	State Proj. No.	Federal Aid Proj. No.	Fiscal Year	County	Sheet No.	Total Sheets
	3494	P.W.S.		Summers	3	6



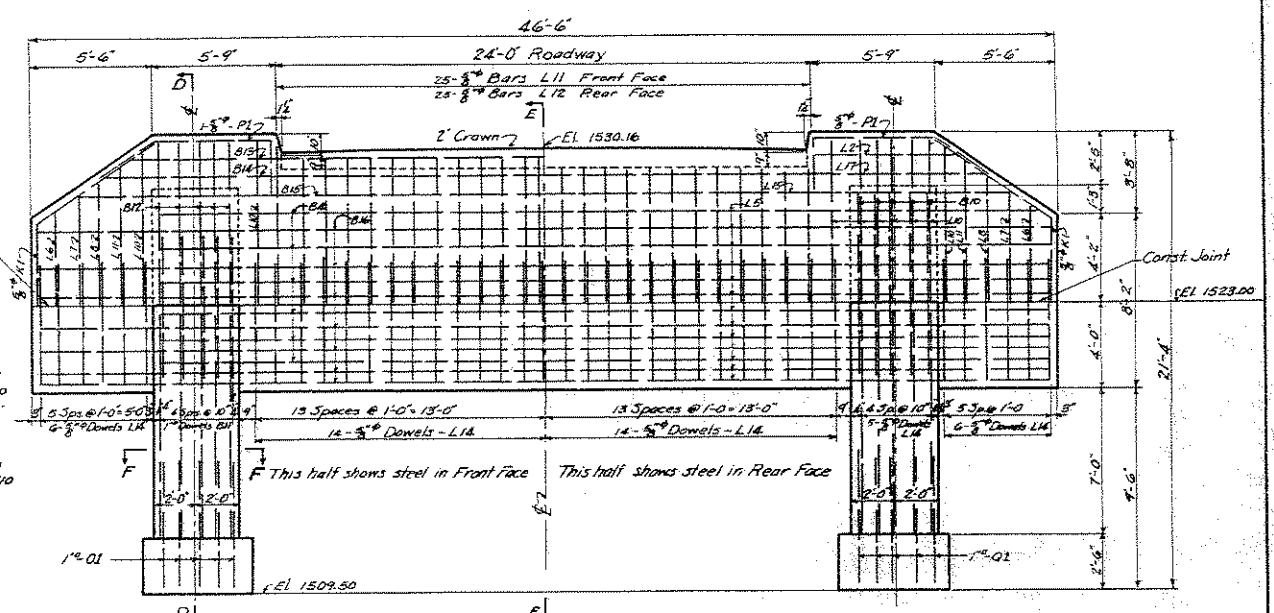
PLAN of ANCHOR
Scale: 1/2" = 1'-0"



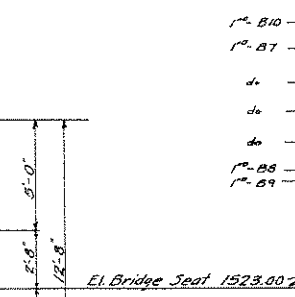
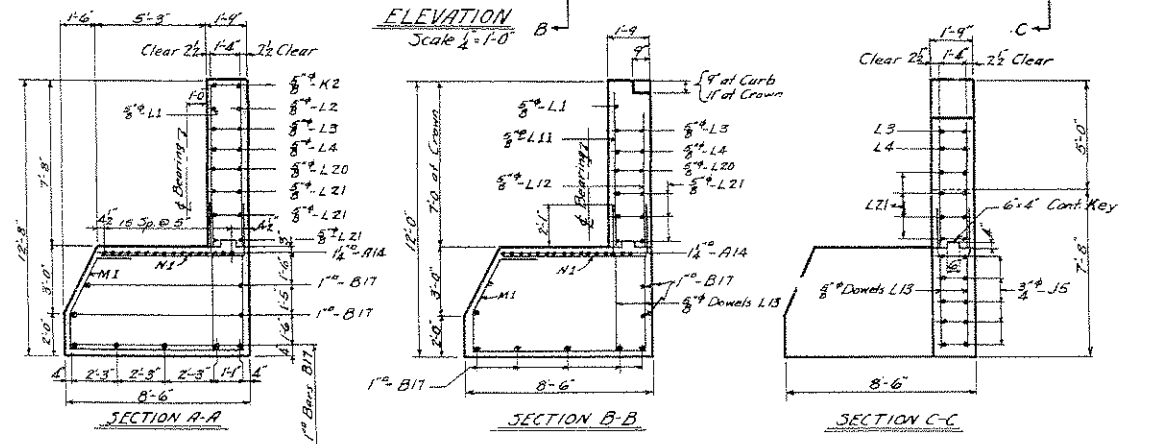
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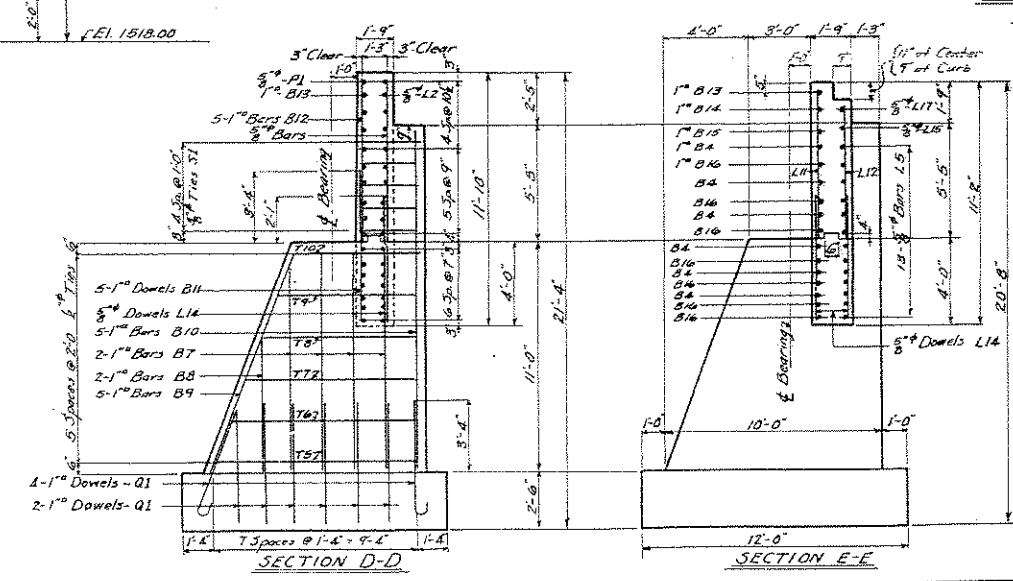
PLAN of ABUTMENT No 1
Scale: 1/2" = 1'-0"



ELEVATION
Scale: 1/4" = 1'-0"



SECTION F-F
Scale: 1/4" = 1'-0"



SECTION D-D
Scale: 1/4" = 1'-0"

SECTION E-E
Scale: 1/4" = 1'-0"

NOTE:
Concrete in Curtain Wall above Construction Joint is not to be poured until Steel Superstructure is in place.
Construction Joint thru Curtain Wall is to be treated with Membrane Waterproofing for a width of one foot on each side of joint. This is to be included in Price Bid for Class P Concrete.
No flashing is required.

**THE STATE ROAD COMMISSION
OF WEST VIRGINIA**

TRUE BRIDGE OVER BLUESTONE RIVER
PROJECT #3494 SUMMERS COUNTY, W. VA.

ABUTMENTS
SUBSTRUCTURE CONTRACT #1764

DESIGN BY FRANK D. McENTEER
CONSULTING ENGINEER
CLARKSBURG, W. VA.

SCALE: 1/4" = 1'-0" DATE: MAR. 7, 1947

Designed by K.H.J.	Checked by M.R.
Drawn by M.R.	Checked by K.H.J.
Traced by A.D.H.	Checked by K.H.J.

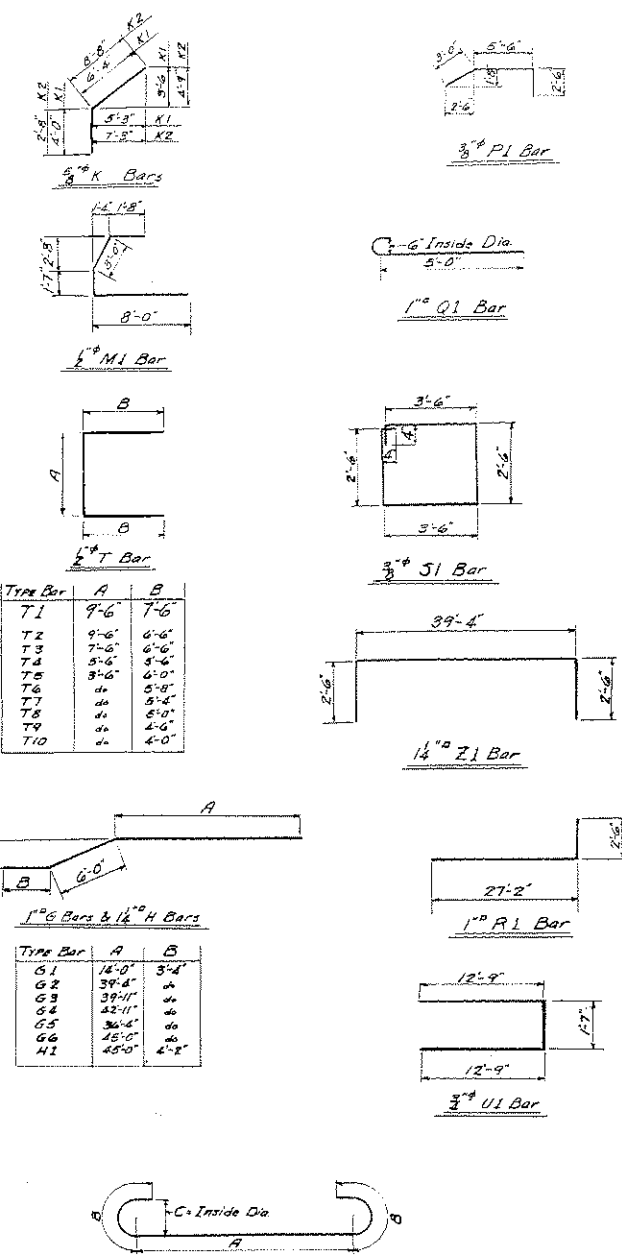
BILL of REINFORCING STEEL

ABUTMENT #1				ABUTMENT #2				PIER #1				PIER #2				PIER #3				PIER #4			
No.	MK.	SIZE	LENGTH	No.	MK.	SIZE	LENGTH	No.	MK.	SIZE	LENGTH	No.	MK.	SIZE	LENGTH	No.	MK.	SIZE	LENGTH	No.	MK.	SIZE	LENGTH
16	A12	1 1/2"	39'-0"	6	B4	1"	35'-0"	79	A1	1 1/2"	11'-10"	79	A1	1 1/2"	11'-10"	79	A1	1 1/2"	11'-10"	79	A1	1 1/2"	11'-10"
9	B17	1"	39'-0"	16	B7	1"	10'-10"	12	A2	1 1/2"	41'-0"	12	A2	1 1/2"	41'-0"	12	A2	1 1/2"	41'-0"	12	A2	1 1/2"	41'-0"
20	J5	3/4"	8'-6"	4	B8	1"	7'-6"	8	A3	1 1/2"	19'-8"	8	A3	1 1/2"	19'-8"	8	A3	1 1/2"	19'-8"	8	A3	1 1/2"	19'-8"
4	K2	3/4"	11'-4"	10	B9	1"	11'-6"	70	A4	1 1/2"	24'-2"	70	A4	1 1/2"	24'-2"	70	A4	1 1/2"	24'-2"	70	A4	1 1/2"	24'-2"
1	L1	1"	38'-0"	10	B10	1"	16'-3"	20	A5	1 1/2"	45'-0"	20	A5	1 1/2"	45'-0"	20	A5	1 1/2"	45'-0"	20	A5	1 1/2"	45'-0"
2	L2	1"	7'-0"	10	B11	1"	7'-0"	50	A6	1 1/2"	49'-6"	50	A6	1 1/2"	49'-6"	50	A6	1 1/2"	49'-6"	50	A6	1 1/2"	49'-6"
2	L3	1"	41'-6"	10	B12	1"	7'-8"	16	A13	1 1/2"	50'-8"	16	A13	1 1/2"	50'-8"	16	A13	1 1/2"	50'-8"	16	A13	1 1/2"	50'-8"
2	L4	1"	44'-6"	1	B13	1"	38'-0"	26	H1	1"	55'-2"	26	H1	1"	55'-2"	26	H1	1"	55'-2"	26	H1	1"	55'-2"
6	L21	1"	50'-2"	1	B14	1"	41'-0"	12	Z1	1 1/2"	44'-4"	12	Z1	1 1/2"	44'-4"	12	Z1	1 1/2"	44'-4"	12	Z1	1 1/2"	44'-4"
4	L6	1"	4'-2"	1	B15	1"	44'-0"	49	B1	1"	11'-0"	49	B1	1"	11'-0"	49	B1	1"	11'-0"	49	B1	1"	11'-0"
4	L7	1"	4'-10"	7	B16	1"	46'-0"	12	B2	1"	50'-8"	12	B2	1"	50'-8"	12	B2	1"	50'-8"	12	B2	1"	50'-8"
4	L8	1"	5'-6"	40	G1	1"	6'-3"	64	B3	1"	27'-2"	64	B3	1"	27'-2"	64	B3	1"	27'-2"	64	B3	1"	27'-2"
24	L10	1"	7'-4"	4	K1	5/8"	10'-4"	100	C1	1"	27'-4"	100	C1	1"	27'-4"	100	C1	1"	27'-4"	100	C1	1"	27'-4"
29	L11	1"	6'-8"	2	L2	1"	7'-0"	12	C2	1"	42'-10"	12	C2	1"	42'-10"	12	C2	1"	42'-10"	12	C2	1"	42'-10"
25	L12	1"	5'-11"	13	L5	1"	46'-0"	48	G1	1"	23'-4"	48	G1	1"	23'-4"	48	G1	1"	23'-4"	48	G1	1"	23'-4"
108	L13	1"	6'-9"	4	L6	1"	4'-2"	48	G2	1"	48'-8"	48	G2	1"	48'-8"	48	G2	1"	48'-8"	48	G2	1"	48'-8"
4	P1	5/8"	11'-0"	4	L7	1"	4'-10"	66	G6	1"	54'-4"	66	G6	1"	54'-4"	66	G6	1"	54'-4"	66	G6	1"	54'-4"
20	M1	1/2"	14'-3"	5	L8	1"	5'-6"	14	R1	1"	29'-8"	14	R1	1"	29'-8"	14	R1	1"	29'-8"	14	R1	1"	29'-8"
20	N1	1/2"	6'-6"	16	L10	1"	7'-4"	20	C3	1"	51'-4"	20	C3	1"	51'-4"	20	C3	1"	51'-4"	20	C3	1"	51'-4"
4	L18	3/4"	3'-6"	29	L11	1"	6'-8"	40	F1	3/4"	8'-0"	40	F1	3/4"	8'-0"	40	F1	3/4"	8'-0"	40	F1	3/4"	8'-0"
4	L19	5/8"	2'-10"	25	L12	1"	5'-11"	22	J1	1"	27'-2"	22	J1	1"	27'-2"	22	J1	1"	27'-2"	22	J1	1"	27'-2"
2	L20	5/8"	47'-6"	88	L14	1"	5'-9"	22	J2	1"	19'-8"	22	J2	1"	19'-8"	22	J2	1"	19'-8"	22	J2	1"	19'-8"
DEADMAN				1	L15	1"	44'-0"	23	J3	1"	10'-2"	23	J3	1"	10'-2"	23	J3	1"	10'-2"	23	J3	1"	10'-2"
8	B6	1"	39'-0"	1	L17	1"	41'-0"	11	U1	3/4"	27'-1"	11	U1	3/4"	27'-1"	11	U1	3/4"	27'-1"	11	U1	3/4"	27'-1"
40	N2	1/2"	2'-6"	4	P1	5/8"	11'-0"	80	T1	1/2"	24'-6"	80	T1	1/2"	24'-6"	80	T1	1/2"	24'-6"	80	T1	1/2"	24'-6"
3-1/2" Anchor Bars, Upset ends & Turnbuckle				4	T5	1/2"	15'-6"	180	T2	1/2"	22'-6"	180	T2	1/2"	22'-6"	180	T2	1/2"	22'-6"	180	T2	1/2"	22'-6"
				4	T6	1"	14'-10"	204	T3	1/2"	20'-6"	204	T3	1/2"	20'-6"	204	T3	1/2"	20'-6"	204	T3	1/2"	20'-6"
				4	T7	1"	14'-2"	96	T4	1/2"	16'-6"	96	T4	1/2"	16'-6"	96	T4	1/2"	16'-6"	96	T4	1/2"	16'-6"
				4	T8	1"	13'-6"	54	J4	3/4"	27'-0"	54	J4	3/4"	27'-0"	54	J4	3/4"	27'-0"	54	J4	3/4"	27'-0"
				4	T9	1"	12'-6"	1	N1	1/2"	5'-9"	1	N1	1/2"	5'-9"	1	N1	1/2"	5'-9"	1	N1	1/2"	5'-9"
				4	T10	1/2"	11'-6"																
				10	S1	3/8"	12'-8"																

Note:
Abut. #1 and Deadman reinforcing steel are not included in the Substr. contract.

Note:
The following bars in the above list for Abut. #2 are in the curtain wall above the concrete joint and are not included in the Substructure Contract:
3 B4, all of B12, B13, B14, B15, 3 B16, all of L1 and L2, 6 L5, all of L6, L7, L8, L9, L11, L12, L13, L14, and S1.

As Built:
* Reinforcing steel revised to provide splices in Plans Nos. 1 to 4 inclusive at supplemental construction (as permitted during Govt. as shown on sheet #4. See approved supplemental shop drawings, contractors nos. E 3969-1, E 3969-2, and E 3969-3 for revised lengths used.



Type Bar	A	B
T1	9'-6"	7'-6"
T2	9'-6"	6'-6"
T3	7'-6"	6'-6"
T4	8'-6"	8'-6"
T5	8'-6"	6'-0"
T6	do	5'-8"
T7	do	5'-4"
T8	do	5'-0"
T9	do	4'-6"
T10	do	4'-0"

Type Bar	A	B
G1	14'-0"	3'-4"
G2	39'-4"	do
G3	39'-4"	do
G4	42'-11"	do
G5	36'-6"	do
G6	45'-0"	do
H1	do	4'-2"

Type Bar	A	B	C
C1	24'-10"	1'-3"	6"
C2	40'-4"	1'-3"	6"
C3	48'-10"	1'-3"	6"
F1	6'-0"	1'-0"	5"

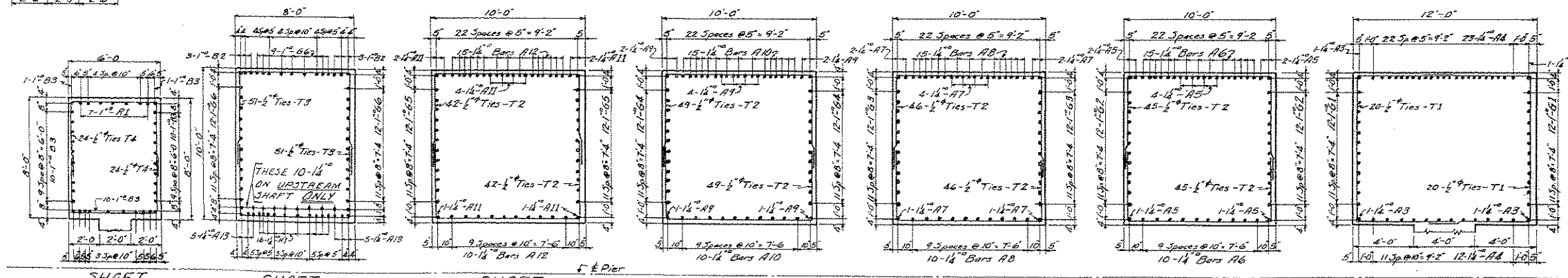
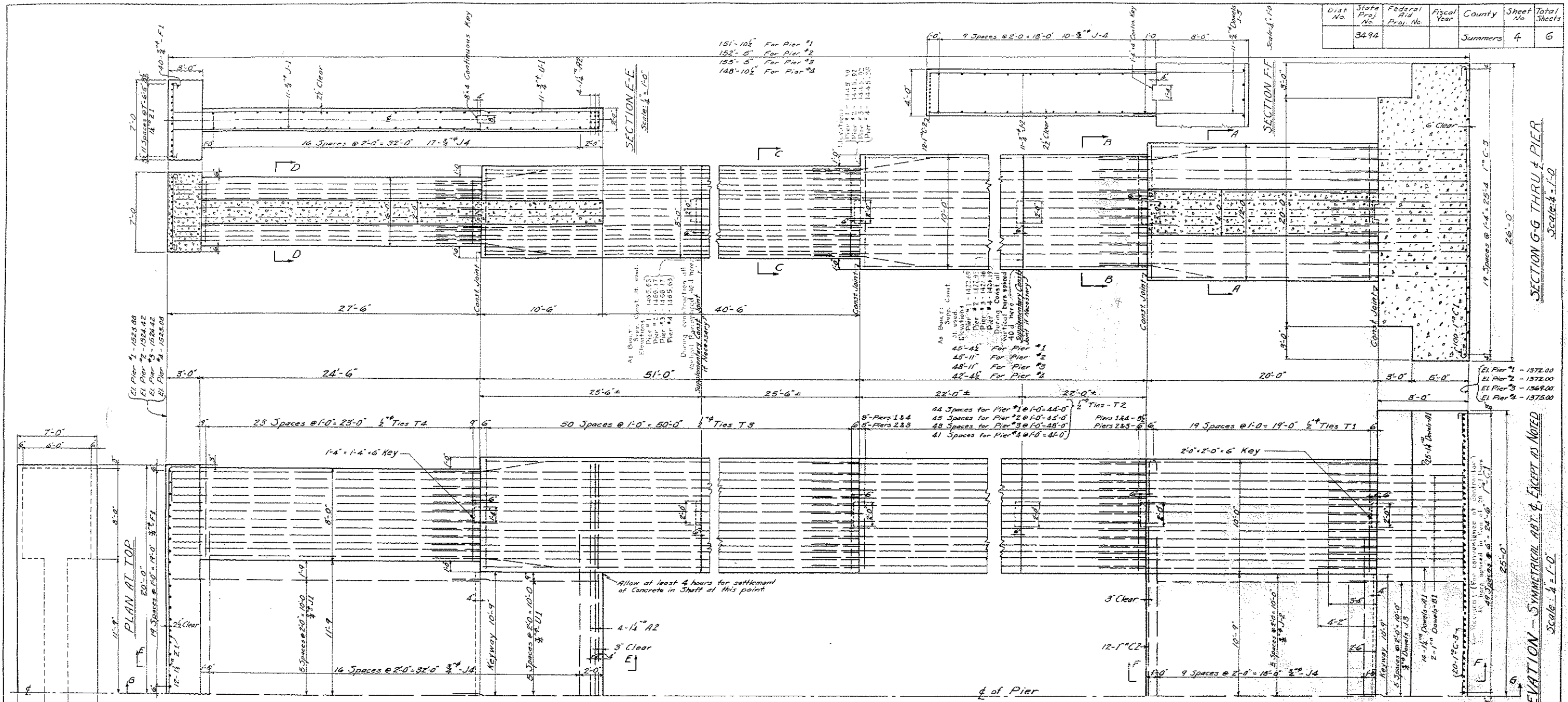
THE STATE ROAD COMMISSION
OF WEST VIRGINIA

TRUE BRIDGE OVER BLUESTONE RIVER
PROJECT #3494 SUMMERS COUNTY, W. VA.

BAR LIST
SUBSTRUCTURE CONTRACT #1764

DESIGNED BY FRANK D. McENTEER CONSULTING ENGINEER CLARKSBURG, W. VA.	Scale: None	DATE: Mar 21, 1947
	Designed by R.H.J.	Checked by M.R.
	Drawn by M.R.	Checked by R.H.J.
	Traced by R.D.N.	Checked by K.N.J.

Dist No	State Proj No	Federal Aid Proj No	Fiscal Year	County	Sheet No	Total Sheets
	3494			Summers	4	6



NOTE:
All footings to be poured monolithically.

THE STATE ROAD COMMISSION
OF WEST VIRGINIA

TRUE BRIDGE OVER BLUESTONE RIVER

PROJECT #3494 SUMMERS COUNTY, W. VA.

PIERS
SUBSTRUCTURE CONTRACT

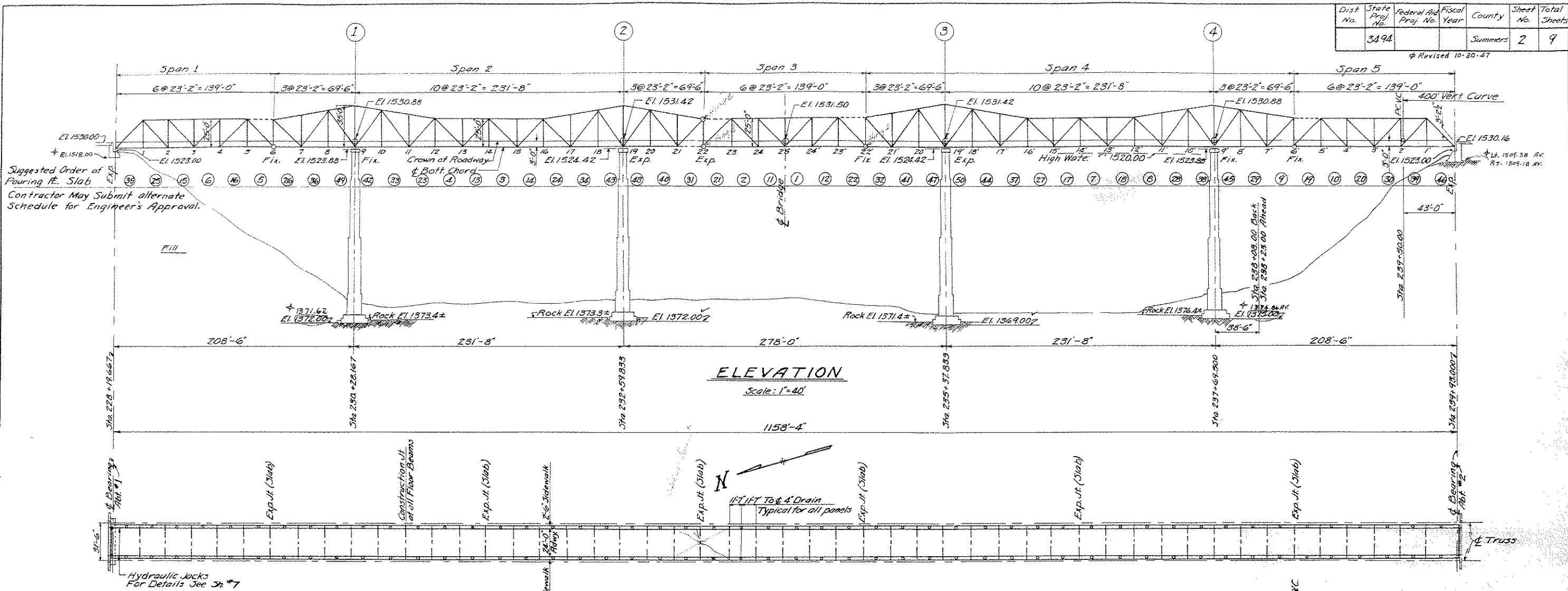
#1764

DESIGN BY FRANK D. M'ENTEEER CONSULTING ENGINEER CLARKSBURG, W. VA.	Scale: 1/4" = 1'-0" Designed by R.H.J. Drawn by M.R. Traced by R.D.H.	Date: MAR 1941 Checked by M.R. Checked by K.H.L. Checked by K.H.L.
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SHAFT SECTION D-D Scale: 1/4" = 1'-0"
SHAFT SECTION C-C Scale: 1/4" = 1'-0"
SHAFT SECTION B-B (PIER #4) Scale: 1/4" = 1'-0"
SHAFT SECTION B-B (PIER #3) Scale: 1/4" = 1'-0"
SHAFT SECTION B-B (PIER #2) Scale: 1/4" = 1'-0"
SHAFT SECTION B-B (PIER #1) Scale: 1/4" = 1'-0"
SHAFT SECTION A-A Scale: 1/4" = 1'-0"

Dist. No.	State Proj. No.	Federal Aid Proj. No.	Fiscal Year	County	Sheet No.	Total Sheets
	349A			Summers	2	9

Revised 10-30-47



ELEVATION
Scale: 1"=40'

NOTES:

Standard Specifications for Bridges, Jun 1943 by the State Road Commission of W. Va shall govern.

The Bridge is designed for H15-312 loading and an additional wearing surface of 15 lbs. per sq. ft. of roadway.

All concrete in this Contract shall be Class A.

All Joint Fillers to be sponge rubber Type III or Cork, Type I Art. 3.8.2 of the Specifications.

Approach fills are not included in this Contract.

This Contract includes superstructure, Abut. #1, curtain wall of Abut. #2 and bridge seat pedestals on Abutments. Anchor and bottom 2'-0" of Abutment #2 shall be excavated to neat lines and concrete poured directly against earth without forms. If loose rocks are encountered on the neat line of this excavation, these shall be removed and the openings formed. Backfill at such places shall be tamped in accordance with Specifications.

The Contractor shall submit a lump sum bid for steel superstructure, Item 90, a lump sum bid for jacking arrangement, Item 130, and a unit price bid for all other items shown in the estimate.

Copper flashing and floor drains shall be included in unit price bid for Class A Concrete, Item 71.

The Contractor shall furnish certified copies, secured from the Manufacturer of the results of Tests for autoclave expansion and chemical analysis of all Portland Cement used in this Project. These tests shall conform to the A. A. S. H. O. designations T-1-42 (par 5), T-107-42, T-105-42 and M85-42. Six copies of these certified results shall be submitted to the Dept. of Tests, Mechanical Hall, Morgantown, W. Va. See sheets #3 and #5 of Substructure Plans for Abutment details and reinforcing bars for same.

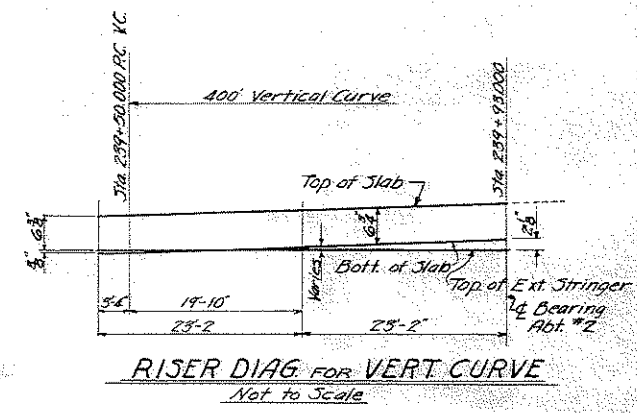
The Contractor shall submit to the Engineer his scheme for erection and his calculations of erection stresses. He will not be reimbursed for additional steel required due to erection stresses.

The Final coat of field paint shall be aluminum as specified under Art. 3.11.8 of the Specifications.

Back of Abutments from bottom to 1'-0" of top to be waterproofed with Paint-Coat-Waterproofing (membrane at construction joints).

⊕ All Structural Steel shall be copper bearing.

PLAN
Scale: 1"=40'



RISER DIAG FOR VERT CURVE
Not to Scale

SIZE	Sub-Structure	Super-Structure	Total (lbs)
3/8"	48	27	75
1/2"	345	73,157	73,502
5/8"	3,115	100,171	103,286
1"	255		255
1 1/4"	3,763		3,763
1 1/2"	3,320		3,320
1 3/4"	754		754
	11,600	173,355	184,955

Item	Sub-Structure	Super-Structure	Total	Unit
7. Dry Excavation	325		325	c.y.
71. Class A Concrete Structure		774	774	c.y.
72. Class A Concrete Sub-Structure	114		114	c.y.
78. Steel Reinforcing	11,600	173,355	184,955	Lbs.
90. Steel Super-Structure		2,396,600	2,396,600	Lump Sum
130. Jacking Arrangement		2	2	Lump Sum
86. Paint-Coat-Waterproofing	118.0		118.0	Sq. Yds.

As Built

THE STATE ROAD COMMISSION OF WEST VIRGINIA

TRUE BRIDGE OVER BLUESTONE RIVER

PROJECT #349A SUMMERS CO., W. VA.

PLAN AND ELEVATION

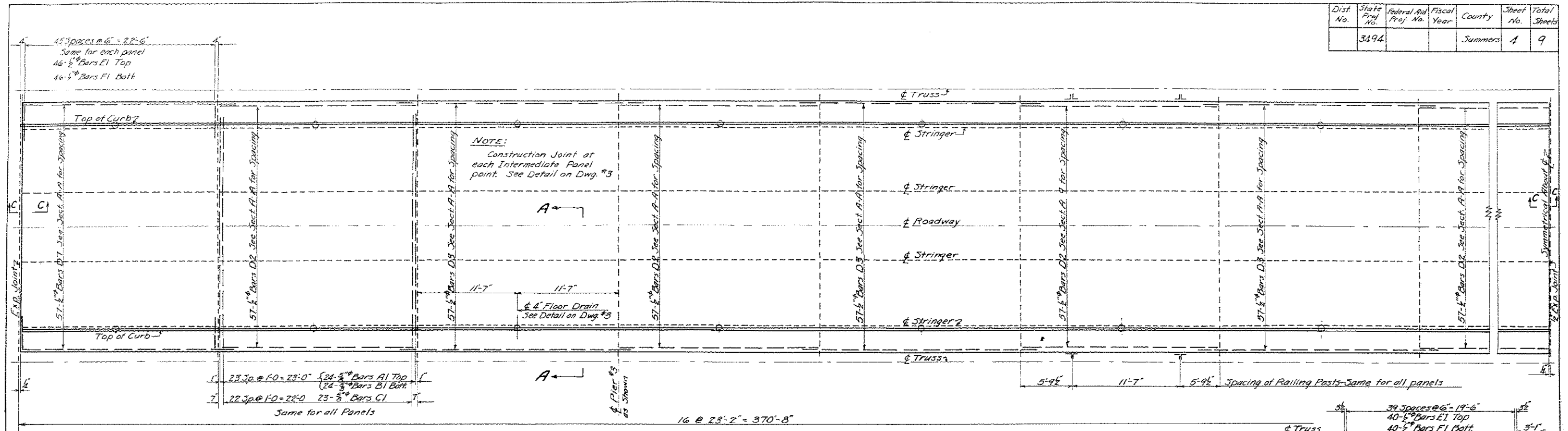
SUPERSTRUCTURE CONTRACT #1764

DESIGN BY FRANK D. MCENTEER
CONSULTING ENGINEER
Clarksburg, W. Va.

Scale: As Noted Date: Aug 25, 1947

Designed by KHJ Checked by RDH
Drawn by MEB Checked by KHJ
Traced by MEB Checked by NDW

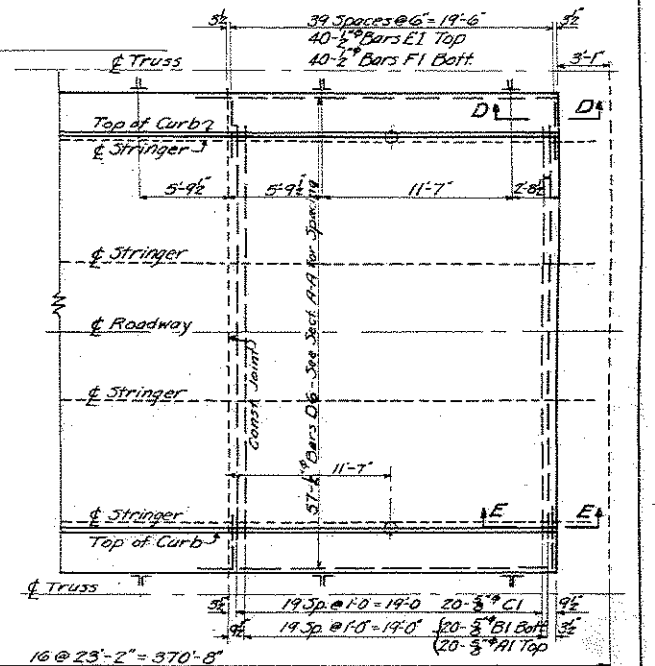
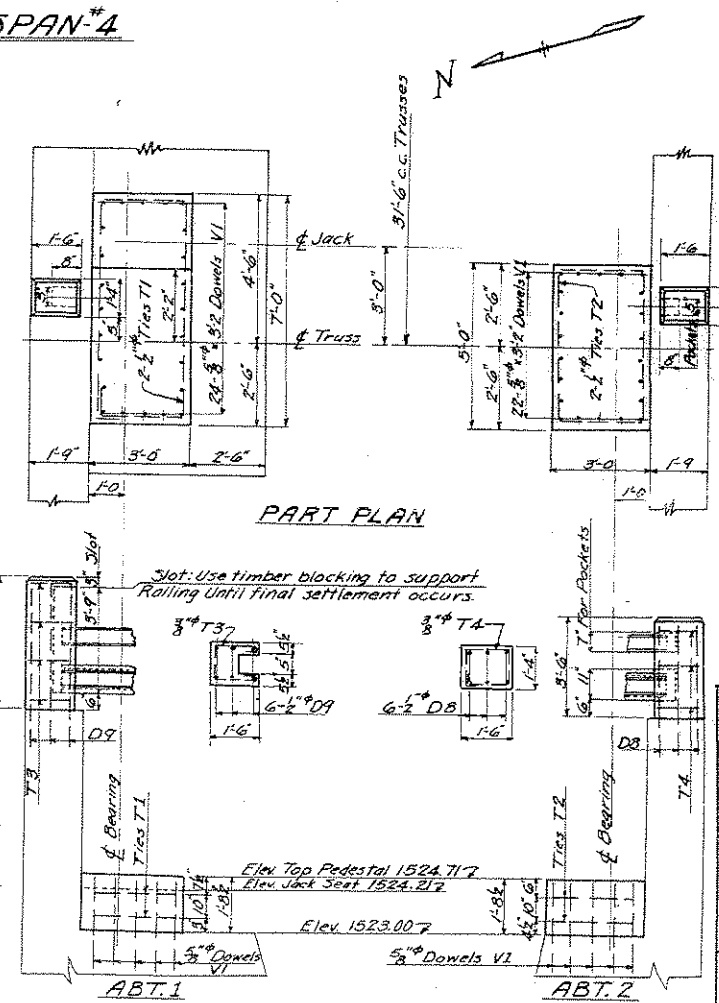
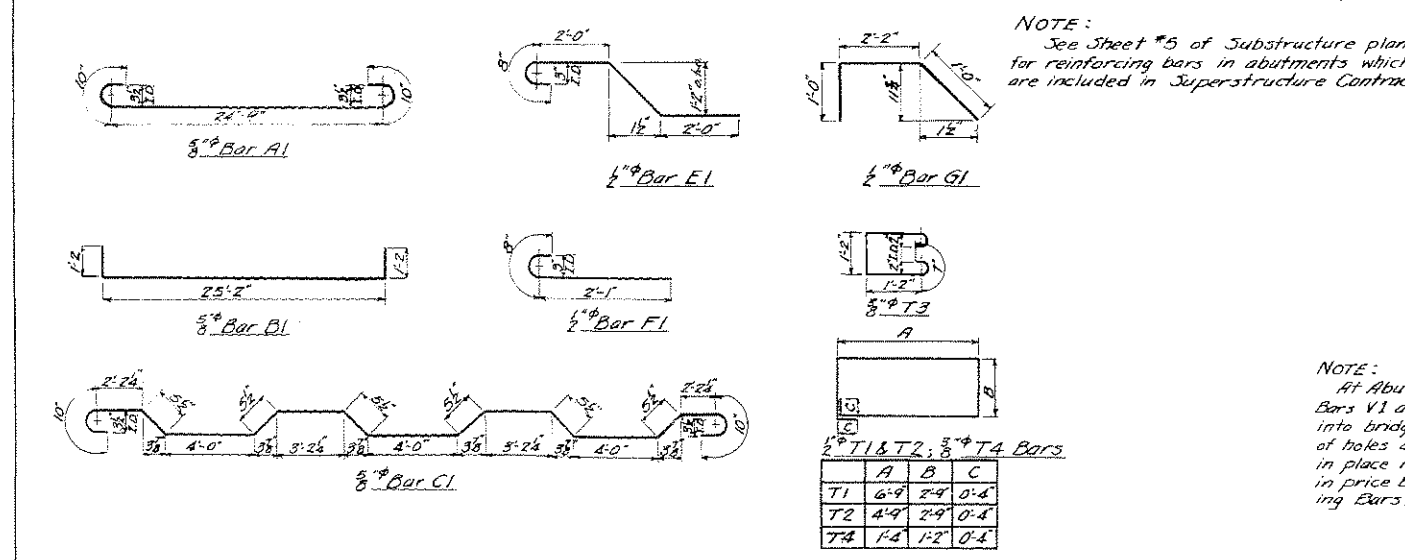
Dist. No.	State Proj. No.	Federal Aid Proj. No.	Fiscal Year	County	Sheet No.	Total Sheets
	3494			Summers	4	9



HALF PLAN OF SLAB - SPAN #4
Scale: 3/8" = 1'-0"

BILL OF REINFORCING STEEL

SPAN #1 & 5 - (One listed)				SPAN #2				SPAN #3				SPAN #4				POSTS & PEDESTALS			
No.	MK.	SIZE	LENGTH	No.	MK.	SIZE	LENGTH	No.	MK.	SIZE	LENGTH	No.	MK.	SIZE	LENGTH	No.	MK.	SIZE	LENGTH
145	A1	5/8"	26'-5" Bent	382	A1	5/8"	26'-5" Bent	144	A1	5/8"	26'-5" Bent	386	A1	5/8"	26'-5" Bent	92	V1	5/8"	3'-2" Str
144	B1	do	27'-6" do	380	B1	do	27'-6" do	143	B1	do	27'-6" do	384	B1	do	27'-6" do	4	T1	1/2"	19'-8" Bent
138	C1	do	27'-2" do	365	C1	do	27'-2" do	137	C1	do	27'-2" do	368	C1	do	27'-2" do	4	T2	do	15'-8" do
57	D1	1/2"	25'-4" Str	57	D7	1/2"	24'-10" Str	171	D2	1/2"	23'-0" Str	114	D7	1/2"	24'-10" Str	12	D9	do	6'-2" Str
171	D2	do	23'-0" do	456	D2	do	23'-0" do	114	D3	do	26'-6" do	456	D2	do	23'-0" do	8	T3	3/8"	4'-8" Bent
114	D3	do	26'-6" do	342	D3	do	26'-6" do	14	D4	do	26'-0" do	347	D3	do	26'-6" do	6	T4	do	5'-8" do
557	E1	do	5'-10" Bent	57	D6	do	21'-8" do	43	D5	do	24'-0" do	1474	E1	do	5'-10" Bent	12	D8	do	5'-2" Str
556	F1	do	2'-9" do	1462	F1	do	5'-10" Bent	551	F1	do	5'-10" Bent	1472	F1	do	2'-9" do				
				1460	F1	do	2'-9" do	8	G1	do	4'-2" do								



THE STATE ROAD COMMISSION
OF WEST VIRGINIA

TRUE BRIDGE OVER BLUESTONE RIVER
PROJECT #3494 SUMMERS CO., W. VA.

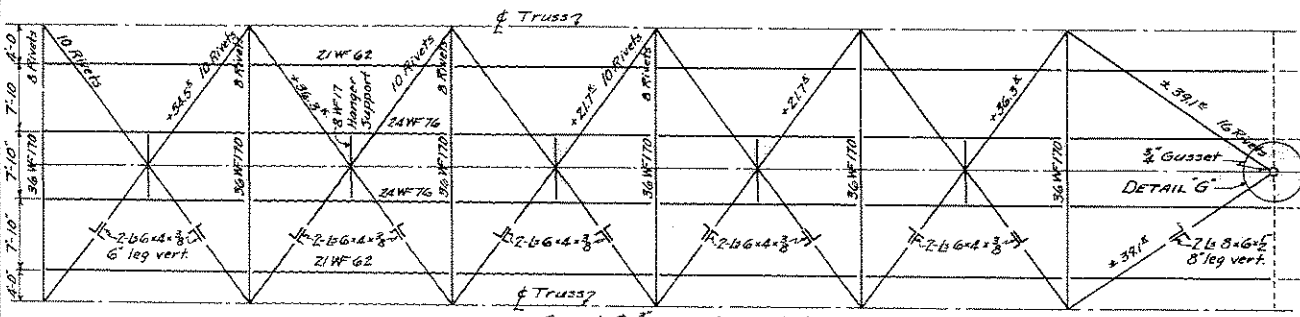
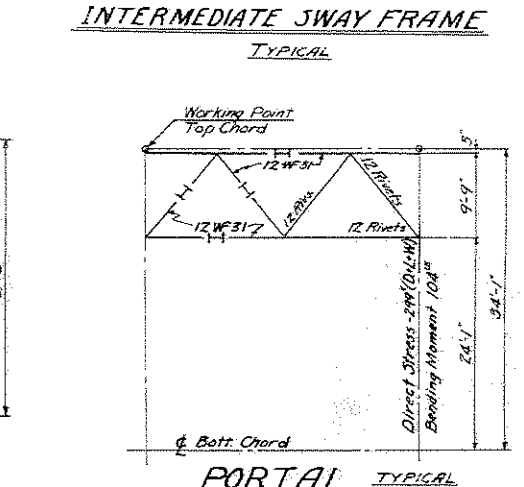
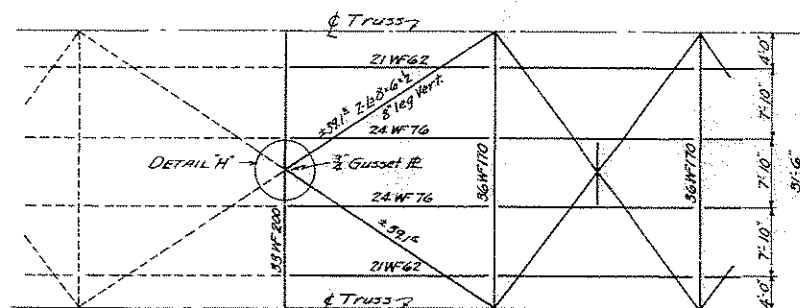
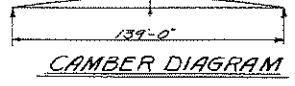
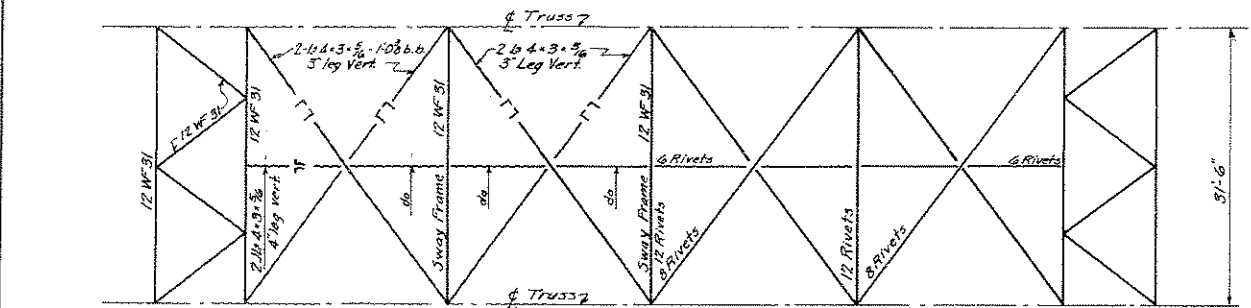
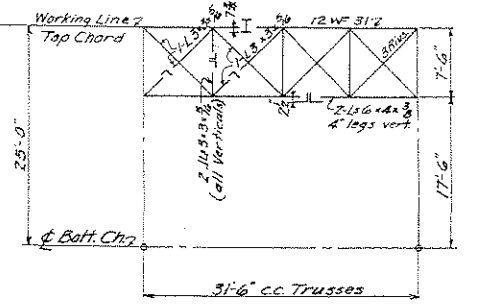
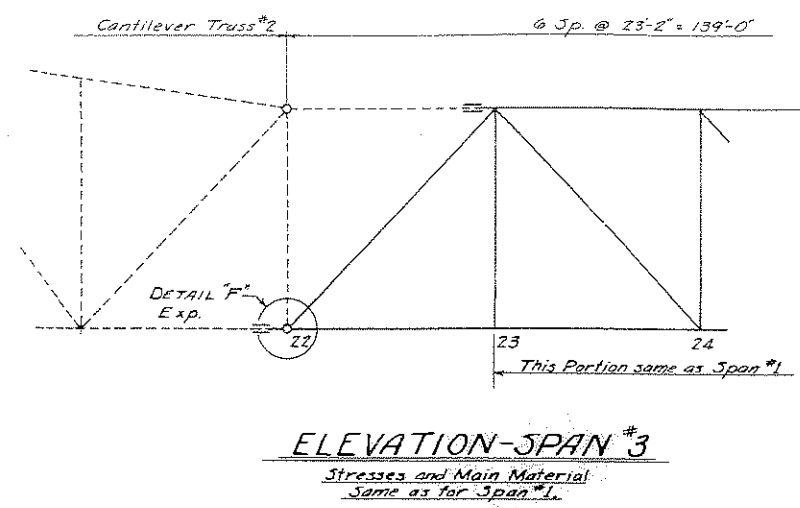
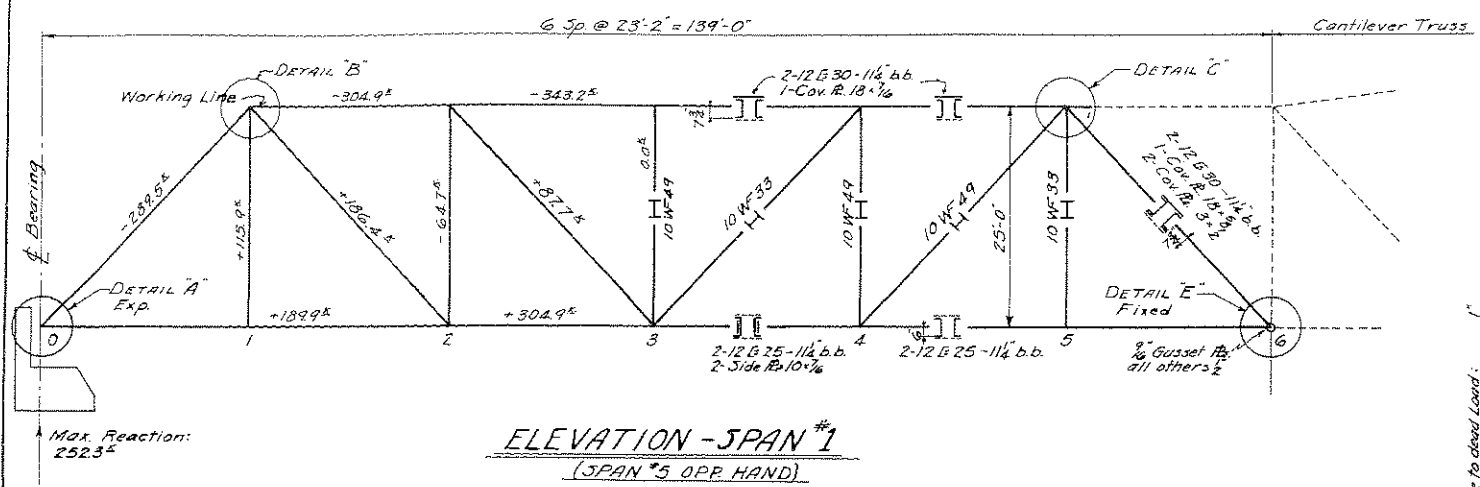
CONCRETE DECK DETAILS FOR CANTILEVER SPAN

SUPERSTRUCTURE CONTRACT #1764

DESIGN BY FRANK D. MEENTER
CONSULTING ENGINEER
Clarksburg, W. Va.

Scale: As Noted Date: Aug. 23, 1947

Designed by K.H.J. Checked by R.D.H.
Drawn by M.E.B. Checked by K.H.J.
Traced by M.E.B. Checked by N.D.W.



STRESS SCHEDULE Cantilever Span										STRESS SCHEDULE Simple Span																					
Member	Stresses (Kips)					Section	Area	Min. Rad. of Gy	f	Unit Design Stresses	Member	Stresses (Kips)					Section	Area	Min. Rad. of Gy	f	Unit Design Stresses										
	Dead	Surv.	Floxy.	Imp.	Wind							Dead	Surv.	Floxy.	Imp.	Wind						Dead	Surv.	Floxy.	Imp.	Wind					
	D-L	S-L	F-L	I-L	W-L							D-L	S-L	F-L	I-L	W-L						D-L	S-L	F-L	I-L	W-L					
U ₁ L ₁	-	-	-	-	0	2-13 B 35	26.48	4.95	562	0	0	0	0	0	0	U ₁ L ₁	1820	100	81	155	95	2885	2998	2-12 B 30	3183	5.0	81.8	7.0	16.67		
L ₁ L ₁	+3270	-146	-1125	-222	+1825	2-13 B 35	26.48	4.95	562	1775	17.42	4.4	780	-117	-800	-152	+3.9	-	-	-	-	-	-	-	2-12 B 30	2546	4.55	61.1	12.0	14.07	
L ₁ L ₂	-353.4	-247	-1770	-247	+2585	2-13 B 35	42.98	4.0	695	-	-	-	7225	17.25	4.4	720	-132	-899	-171	+5.2	-	-	-	-	do	2546	4.55	61.1	13.5	14.07	
L ₁ L ₃	-1100	-313	-2290	-293	+1585	2-34 B 10 1/2	42.98	3.04	695	14.1	22.5	10.0	17.25	4.4	720	-123	-73	+49.9	+9.5	+4.8	109.9	194.7	-	-	2-12 B 25	1866	11.46	-	16.60	18.0	
L ₁ L ₄	-2.0	-313	-194.5	-272	+1585	2-13 B 35	35.48	28.30	4.2	660	22.5	22.5	17.41	17.42	4.4	780	-117	-800	+152	+5.4	304.9	503.3	-	-	2-12 B 25	2341	17.59	-	17.32	18.0	
L ₁ L ₅	+1590	+73	+585	+102	+64	2-13 B 35	29.60	24.24	5.08	540	96.9	18.0	-	-	-	U ₁ L ₂	+1090	-0.4	-9.4	-2.8	-	260.8	-	-	10 W F 49	14.40	12.16	-	21.80	24.0	
L ₁ L ₆	+509	+22.6	+167.5	+25.2	+14.3	1-C.B. 22 1/2	49.04	40.68	-	-	17.79	18.0	-	-	-	U ₁ L ₃	+36.4	-1.7	-22.2	-6.2	-	136.6	-	-	10 W F 35	9.71	7.98	2.25	18.4	17.20	24.0
L ₁ L ₇	0	0	0	0	0	2-C.B. 14 3/8	0	0	0	0	0	0	-	-	-	U ₁ L ₄	+33.2	+3.1	+46.8	+13.2	-	153.1	-	-	do	9.71	7.98	-	22.00	24.0	
L ₁ L ₈	+2250	+27.9	+193.5	+271	+333	1-C.B. 22 1/2	34.42	27.95	-	-	14.90	18.0	-	-	-	U ₁ L ₅	-26.9	+1.3	+4.8	+4.3	-	64.7	-	-	10 W F 49	14.40	12.16	-	25.4	11.80	
L ₁ L ₉	+26.8	+31.3	+201.8	+283	+397	1-C.B. 22 1/2	29.60	24.24	5.08	54.0	16.82	18.0	12.00	14.24	U ₁ L ₆	0	0	0	0	-	-	-	-	do	14.40	12.16	-	25.4	11.80		
L ₁ L ₁₀	-314.8	-12.4	-98.4	-16.3	-	2-13 B 50	29.28	4.62	385	-	-	17.2	19.04	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
L ₁ L ₁₁	+2060	+14.2	+105.3	+170	+223.5	2-13 B 50	29.28	24.60	-	-	17.2	18.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
L ₁ L ₁₂	2927	-16.1	-108.1	-155	-	2-13 B 40	39.42	5.5	850	-	-	12.95	13.15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
L ₁ L ₁₃	251.5	+4.4	+33.6	+57	-	2-13 B 40	30.42	5.3	887	-	-	12.80	13.02	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
L ₁ L ₁₄	224.4	-14.7	-111.0	-156	-	2-13 B 40	23.42	21.18	-	-	17.38	18.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
L ₁ L ₁₅	-1668	+5.6	+45.6	+11.8	-	2-13 B 40	23.42	4.82	840	-	-	12.50	13.20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
L ₁ L ₁₆	1255	+11.9	+84.0	+11.9	-	2-12 B 30	17.58	14.58	-	-	16.10	10.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
L ₁ L ₁₇	425	-8.0	-56.8	-8.0	-	2-12 B 25	14.64	12.99	4.43	92.3	3.50	18.0	9.00	12.67	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
L ₁ L ₁₈	-1925	+2.2	+77.6	+14.2	-	2-13 B 35	26.48	17.80	-	-	14.50	18.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
L ₁ L ₁₉	-610	+3.5	+47.3	+13.5	-	12 W F 53	15.59	2.9	1170	0	0	0	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
L ₁ L ₂₀	-454	-6.5	-47.9	-7.2	-	2-13 B 50	44.32	4.12	1020	-	-	5.60	15.50	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
L ₁ L ₂₁	610	+3.5	+47.3	+13.5	-	12 W F 36	10.59	6.43	-	-	14.75	18.0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
L ₁ L ₂₂	-	-	-	-	-	12 W F 53	15.59	2.9	1035	-	-	0	0	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		

DESIGN DATA: -Live Load H15-312

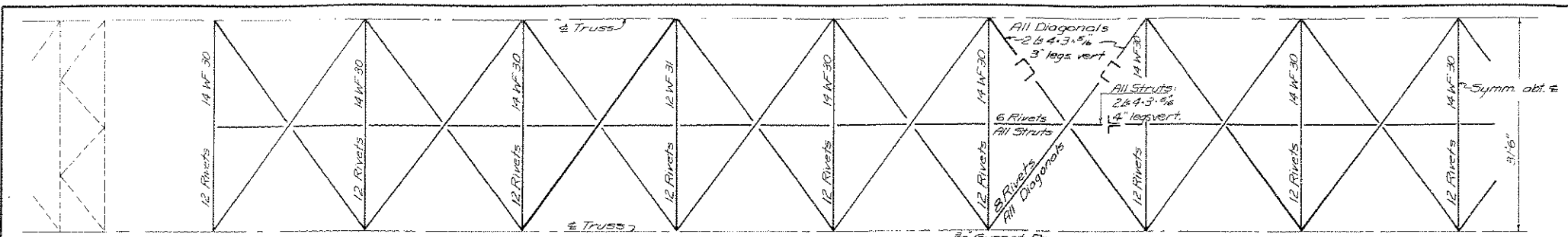
Roadway Stringers		Sidewalk Stringers		Floor Beams	
Moments	Shears	Moments	Shears	Moments	Shears
Dead Load	579 ^k 102 ^k	60.6 ^k 10.0 ^k	336.1 ^k 43.0 ^k	19.8	5.7
Sidewalk L.L.	0.0	17.0	2.9	372.5	46.7
Roadway L.L.	134.3	28.5	21.4	112.0	14.0
Impact	40.3	6.6	2.4	640.4 ^k	109.4 ^k
	232.5 ^k 473 ^k	170.2 ^k 31.5 ^k			

* 70% of Dead Load only.
 * 50% of Smaller Stress added.
 * Exclusive of Bending.
 * Including Overload.
 See Specs. 4.1.6
 See Specs. 4.2.4

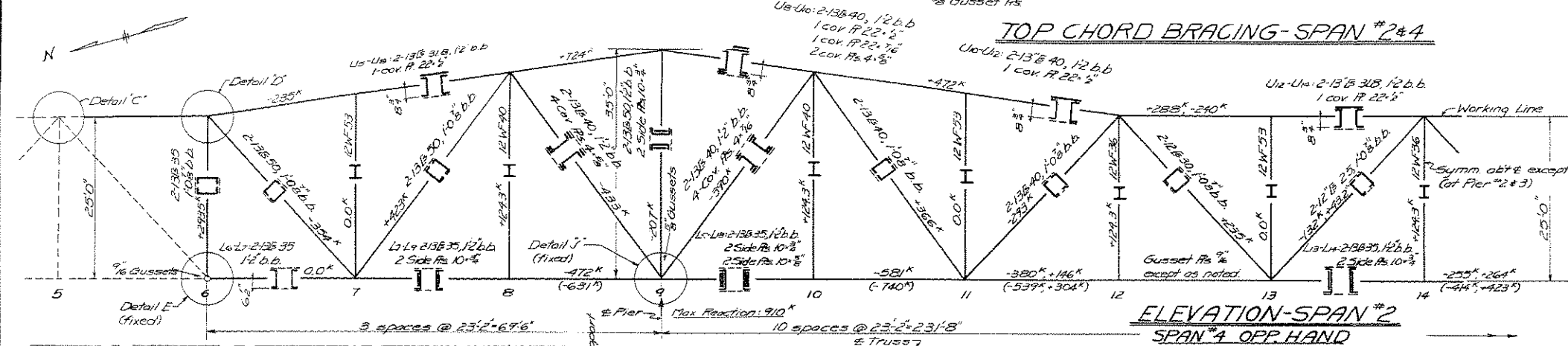
NOTE: Stresses on truss members given thus, 472^k are for DL+LL+Imp. Stresses in parenthesis thus, (631^k) also include 30% Wind.

THE STATE ROAD COMMISSION
 OF WEST VIRGINIA
 TRUE BRIDGE OVER BLUESTONE RIVER
 PROJECT #3494 SUMMERS CO., W. VA.
 STRESS SHEET FOR 139'-0" SPANS
 SUPERSTRUCTURE CONTRACT # 1764
 DESIGN BY FRANK D. M. ENTEER
 CONSULTING ENGINEER
 CLARKSBURG, W. VA.
 Scale: 1"=10'
 Date: AUG 25, 1947
 Designed by K.H.J. Checked by R.D.H.
 Drawn by K.H.J. Checked by R.D.H.
 Traced by R.D.H. Checked by M.E.B.

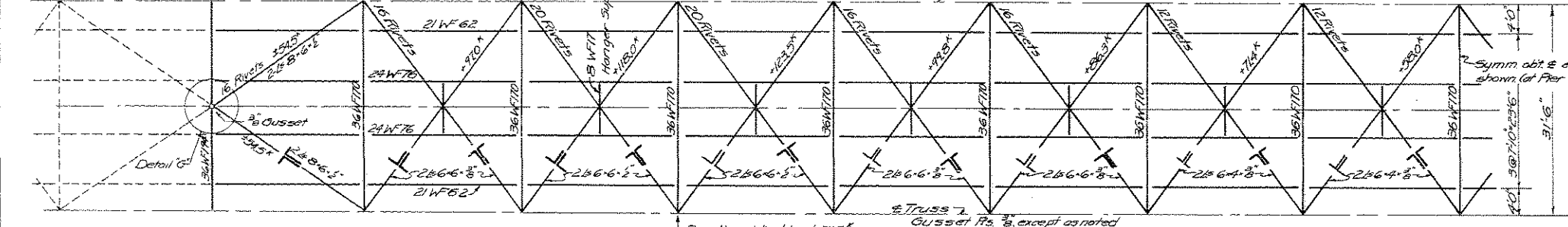
Dist. No.	State Proj. No.	Federal Aid Proj. No.	Fiscal Year	County	Sheet No.	Total No. Sheets
	3494			Summers	6	9



TOP CHORD BRACING-SPAN #2 & 4

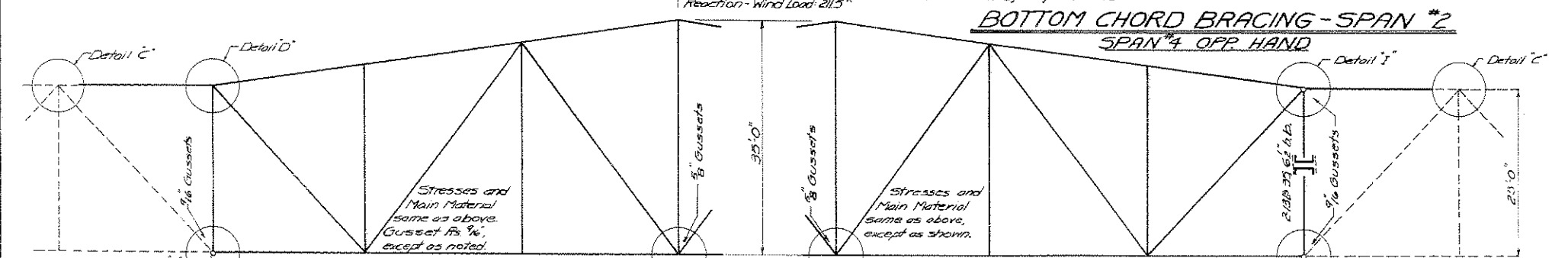


ELEVATION-SPAN #2



SPAN #4 OPP. HAND

BOTTOM CHORD BRACING-SPAN #2



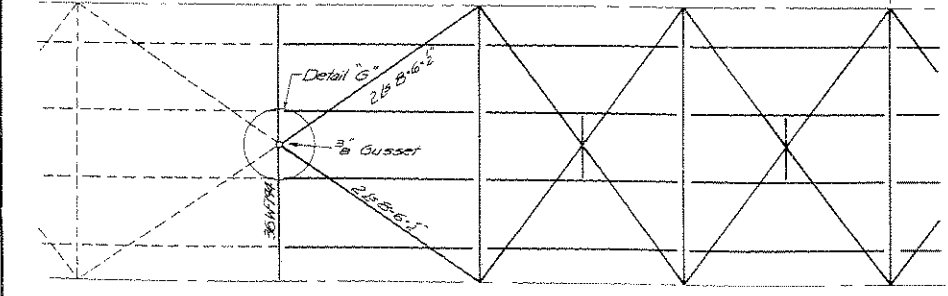
SPAN #4 OPP. HAND



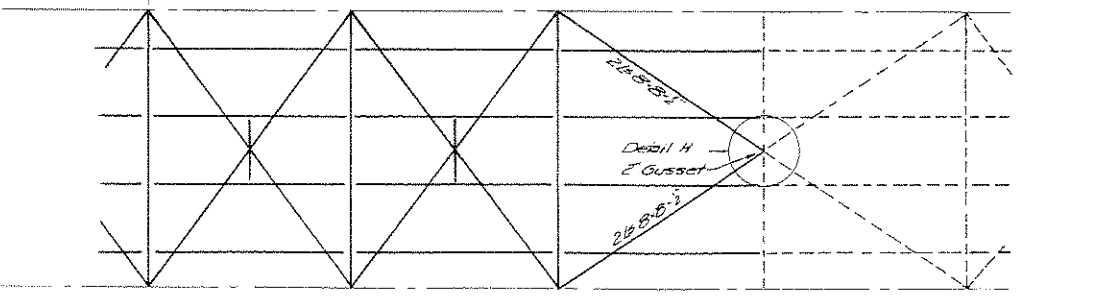
ELEVATION-SPAN #4 CANTILEVER AT PIER #3



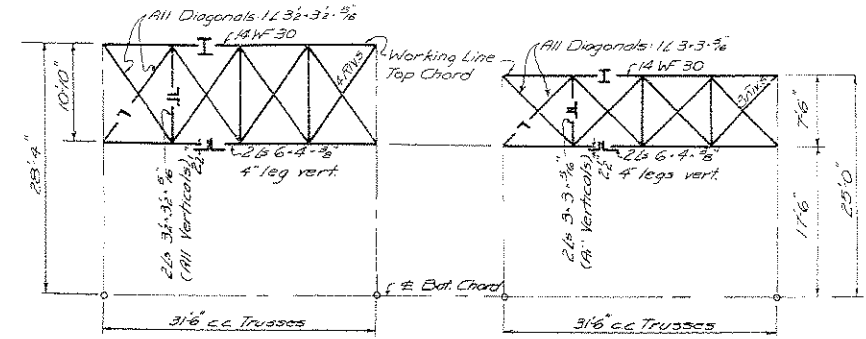
ELEVATION-SPAN #2 CANTILEVER AT PIER #2



BOTTOM CHORD BRACING

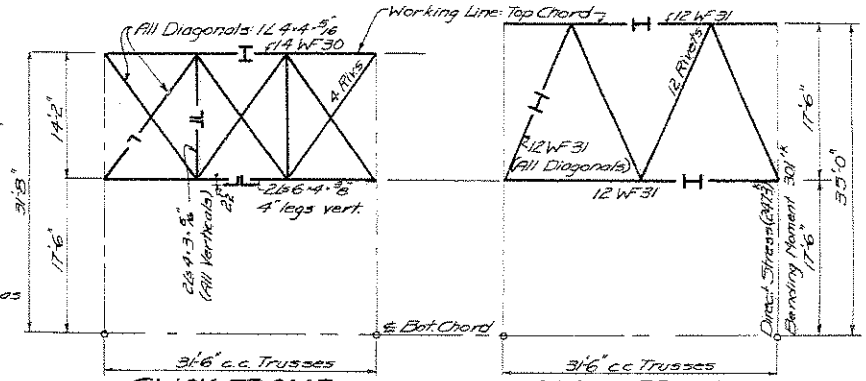


BOTTOM CHORD BRACING



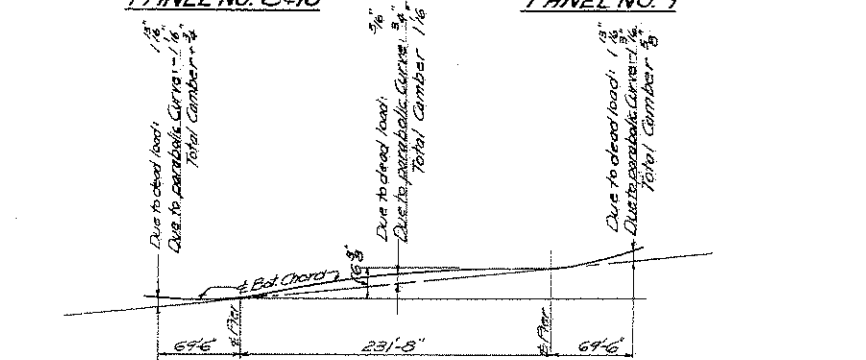
SWAY FRAME PANEL NO. 7 & 11

SWAY FRAME PANEL NO. 6, 12, 13 & 14



SWAY FRAME PANEL NO. 8 & 10

SWAY FRAME PANEL NO. 9



CAMBER DIAGRAM

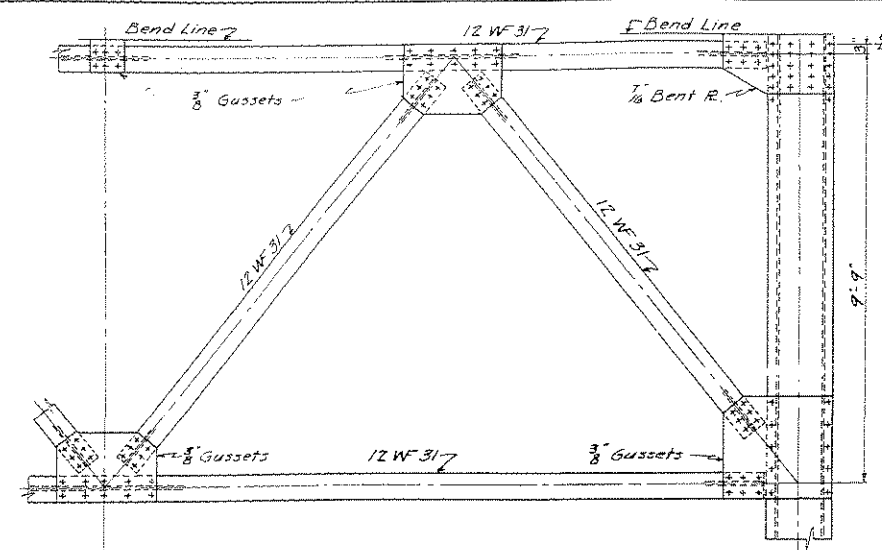
Note: Stresses for truss members, given thus 472 are for DL+LL+Imp. Stresses in parenthesis, thus (631) also include 30% Wind. For Stresses in Stringers, Floor Beams & Trusses see Dwg. #3.

THE STATE ROAD COMMISSION
OF WEST VIRGINIA
TRUE BRIDGE OVER BLUESTONE RIVER
PROJECT #3494 SUMMERS CO., W.VA.
STRESS SHEET FOR CANTILEVER SPANS
SUPERSTRUCTURE CONTRACT # 1764

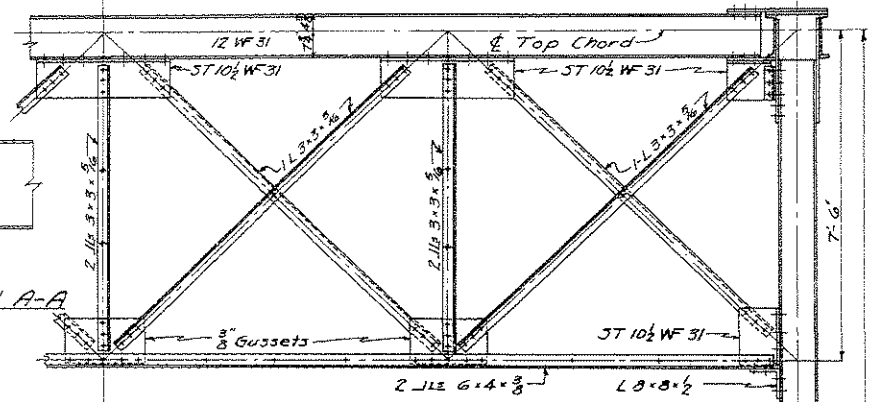
DESIGN BY FRANK D. McENTEER
 CONSULTING ENGINEER
 Clarksburg, W. Va.

Scale: 1"=10'-0"
 Date: Aug. 23, 1947
 Designed by K.H.J. Checked by R.D.H.
 Drawn by K.H.J. Checked by R.D.H.
 Traced by N.D.W. Checked by R.D.H.

Dist. No.	State Proj. No.	Federal Aid Proj. No.	Fiscal Year	County	Sheet No.	Total Sheets
	3494			Summers	7	9



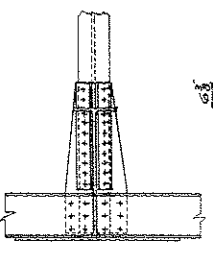
PORTAL FRAMING
Scale: 1/2" = 1'-0"



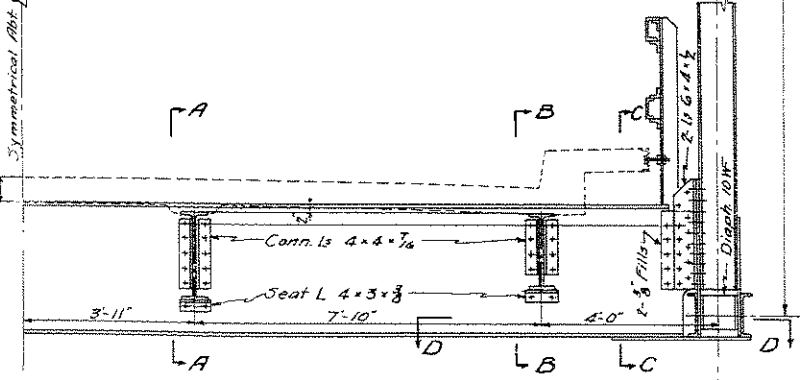
TYPICAL SWAY FRAME
Scale: 1/2" = 1'-0"

SECTION A-A

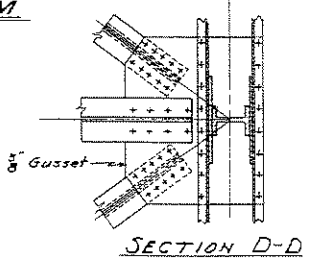
SECTION B-B



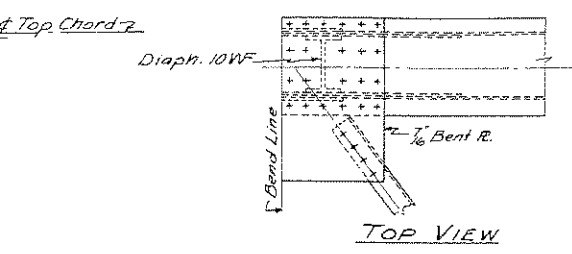
SECTION C-C



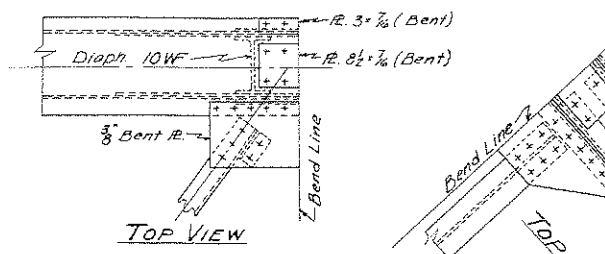
TYPICAL FLOOR BEAM
Scale: 1/2" = 1'-0"



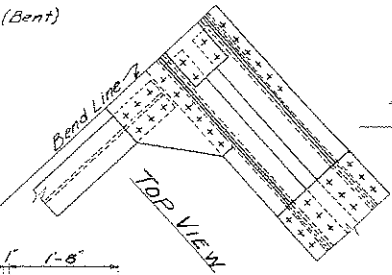
SECTION D-D



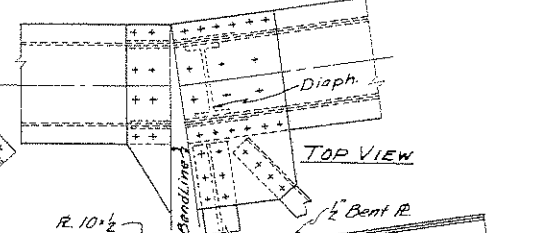
TOP VIEW



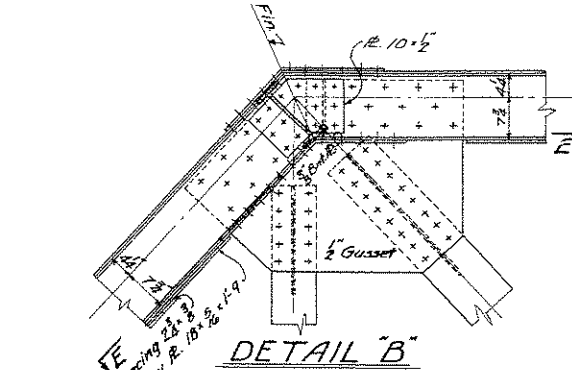
TOP VIEW



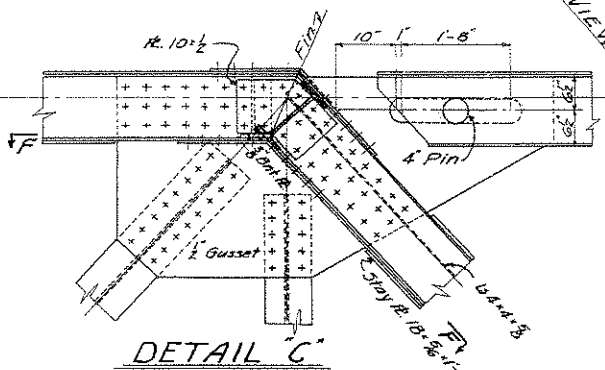
TOP VIEW



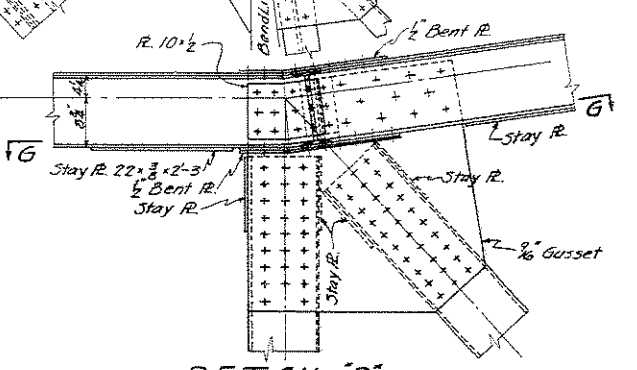
TOP VIEW



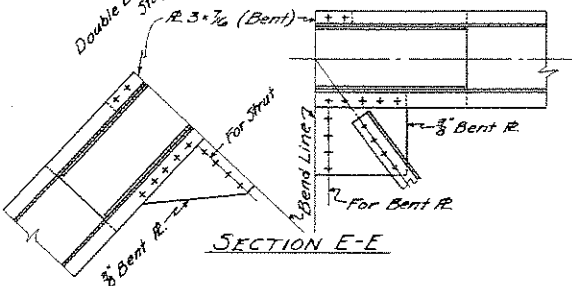
DETAIL B



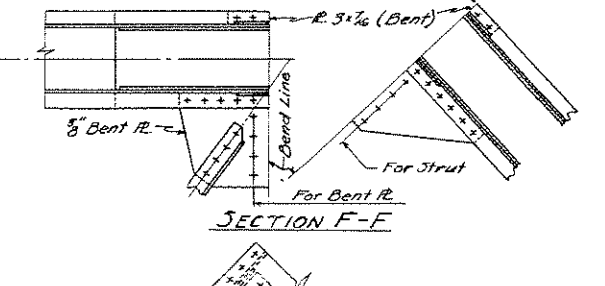
DETAIL C



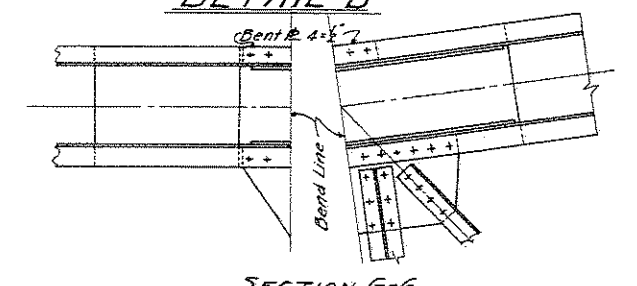
DETAIL D



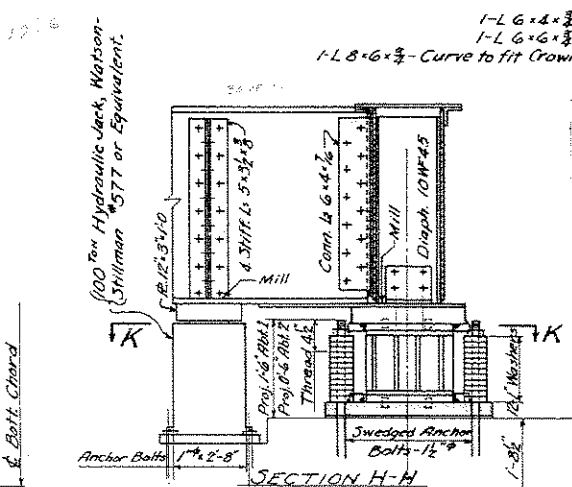
SECTION E-E



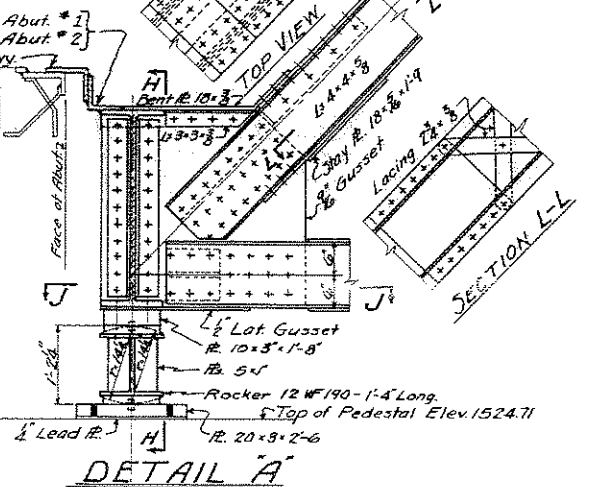
SECTION F-F



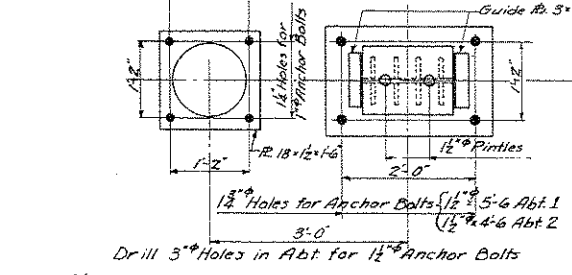
SECTION G-G



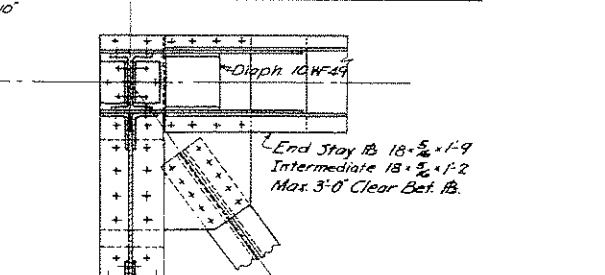
SECTION H-H



DETAIL A



SECTION K-K



SECTION J-J

100 Ton Hydraulic Jacks, Watson-Stillman #577 or Equivalent.

1-L 6x4x3/8 for Abut. #1
1-L 6x6x3/8 for Abut. #2
1-L 8x6x3/8 - Curve to fit Crown Rdwy.

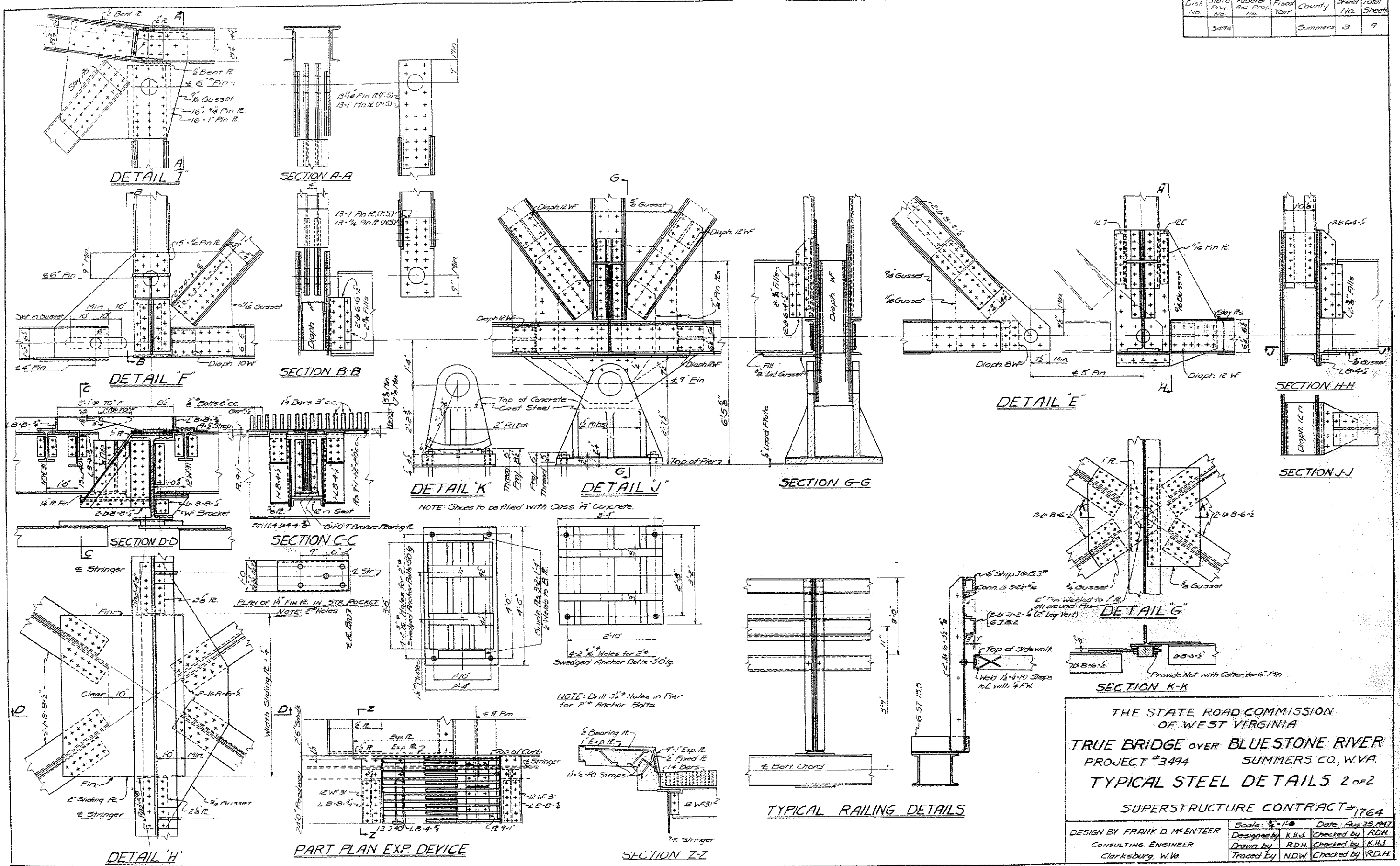
Drill 5" Holes in Abt. for 1/2" Anchor Bolts

NOTE: Jacking arrangement for Abutment #1 Only.

THE STATE ROAD COMMISSION
OF WEST VIRGINIA
TRUE BRIDGE OVER BLUESTONE RIVER
PROJECT #3494 SUMMERS CO., W.VA.
TYPICAL STEEL DETAILS 1 of 2
SUPERSTRUCTURE CONTRACT #1764

DESIGN BY FRANK D. M'ENTEER CONSULTING ENGINEER Clarksburg, W. Va.	Scale: 3/8" = 1'-0" unless noted Designed by R.D.H. Drawn by R.D.H. Traced by R.D.H.	Date: AUG 25, 1947 Checked by R.D.H. Checked by K.H.J. Checked by M.E.B.
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Dist. No.	State Proj. No.	Federal Aid Proj. No.	Fiscal Year	County	Sheet No.	Total Sheets
	3494			Summers	8	9



NOTE: Shoes to be filled with Class 'A' Concrete.

NOTE: Drill 3/4" Holes in Pier for 2" Anchor Bolts.

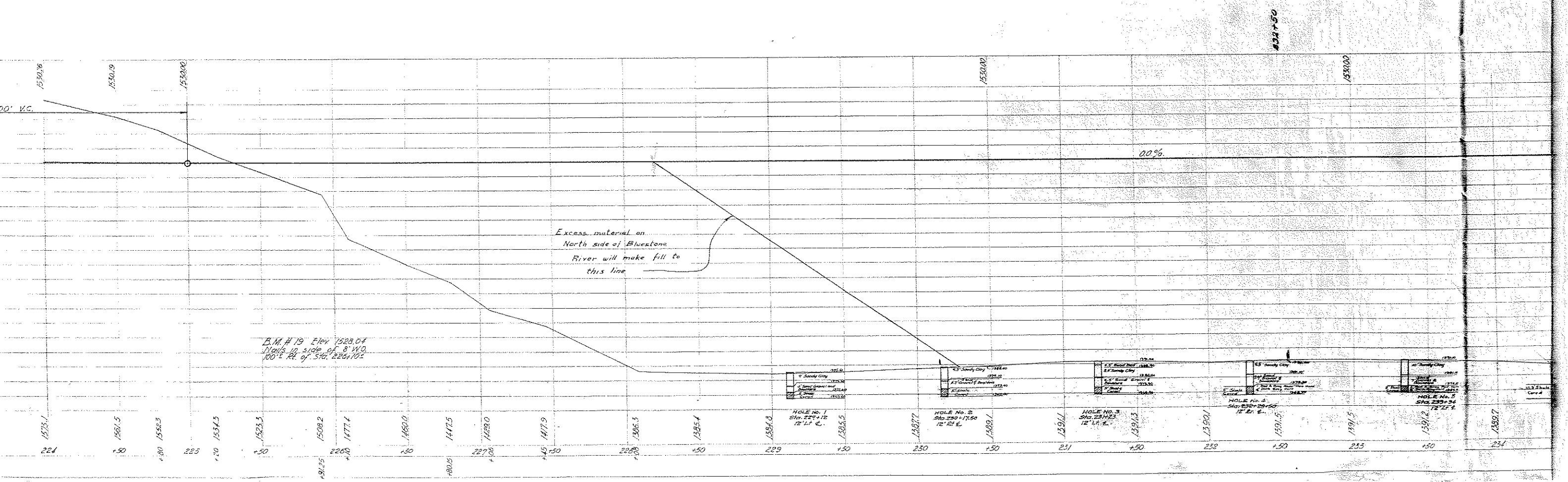
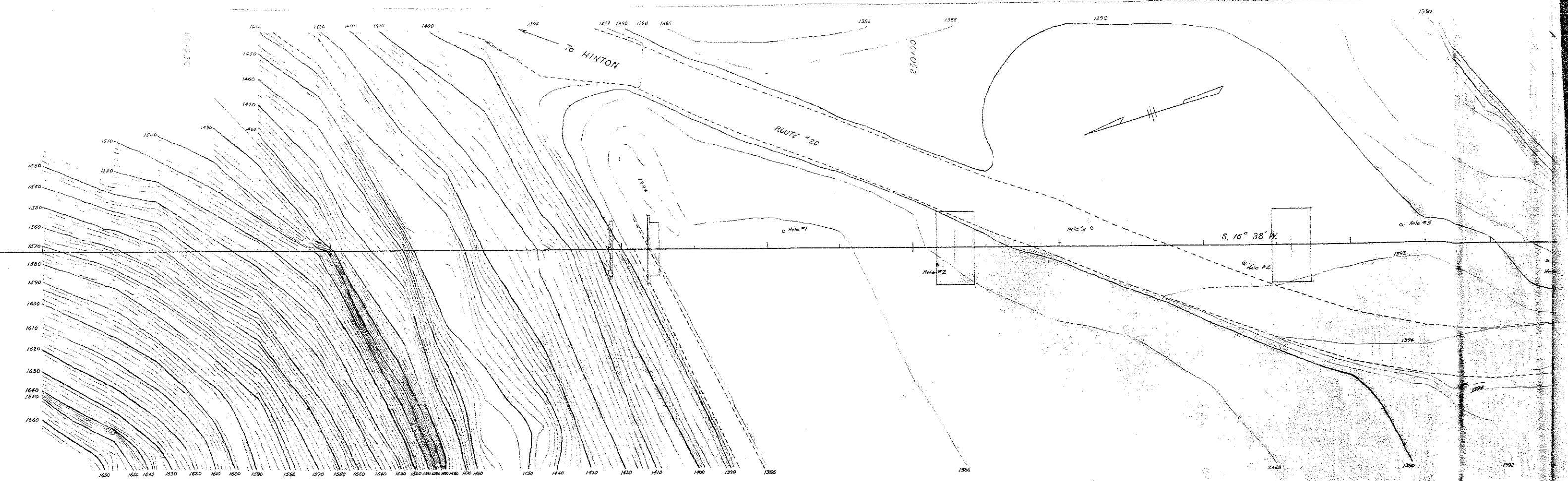
THE STATE ROAD COMMISSION
OF WEST VIRGINIA

TRUE BRIDGE OVER BLUESTONE RIVER
PROJECT #3494 SUMMERS CO., W.VA.

TYPICAL STEEL DETAILS 2 OF 2

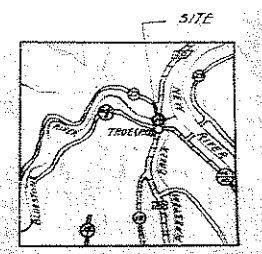
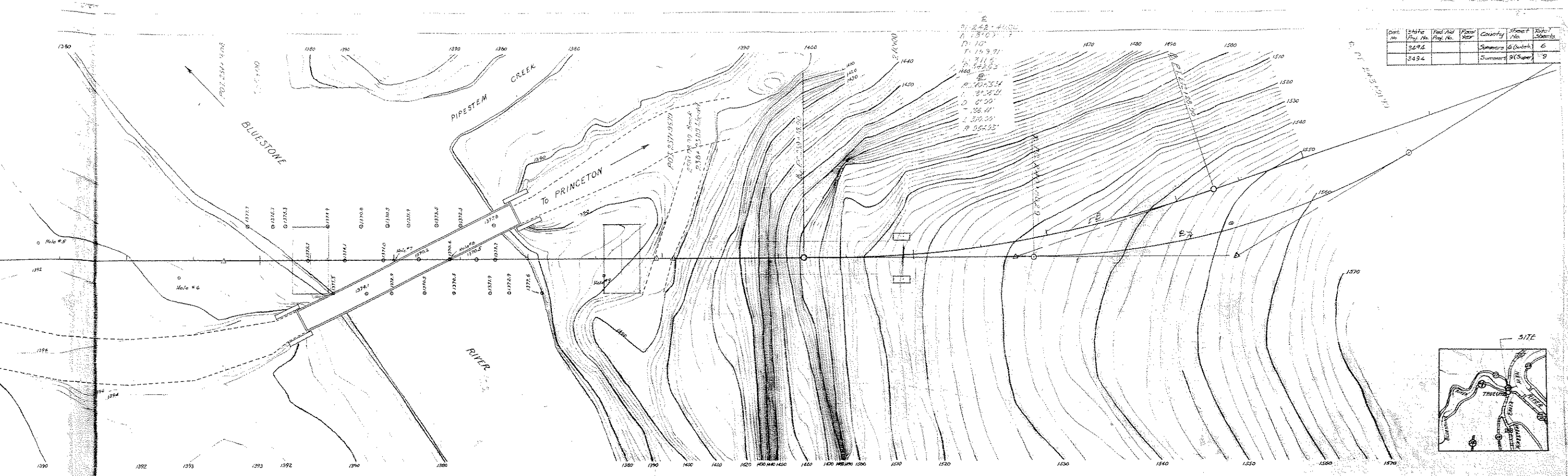
SUPERSTRUCTURE CONTRACT #1764

DESIGN BY FRANK D. McENTEEER CONSULTING ENGINEER Clarksburg, W.Va.	Scale: 3/4" = 1'-0" Designed by K.H.J. Drawn by R.D.H. Traced by NDW	Date: Aug 25, 1947 Checked by R.D.H. Checked by K.H.J. Checked by R.D.H.
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Date	State	Fed. Aid	County	Sheet	Scale
No.	Plan No.	Proj. No.	Year	No.	Feet
	2494		Summers	6 (Sheet)	6
	3494		Summers	9 (Super)	9

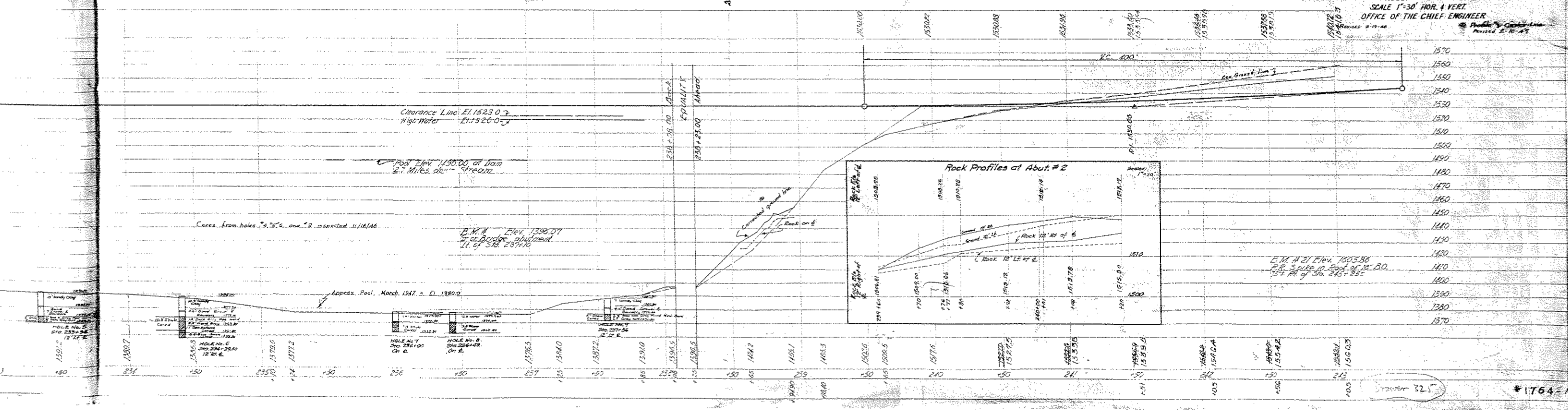
D. 242 - #100
 D. 13'0" - 1
 T. 159.71
 R. 211.5
 A. 57.55
 H. 60
 R. 102.534
 L. 27.54
 D. 0' 20"
 L. 370.00
 R. 552.53



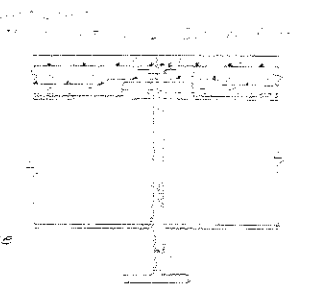
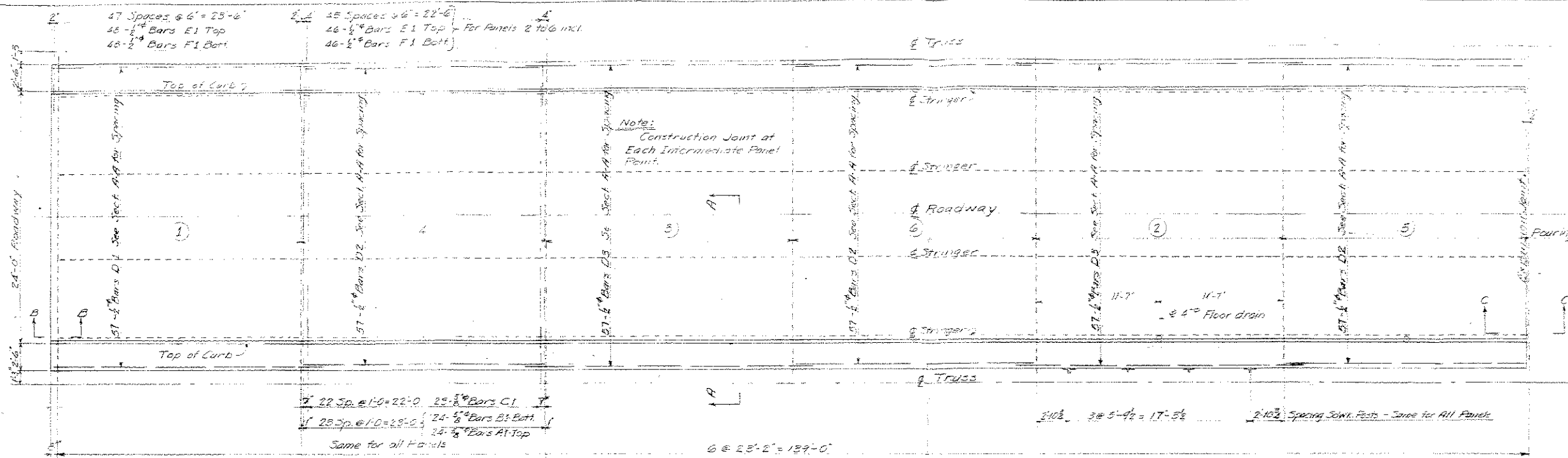
Present Bridge
No. 1390

438+50

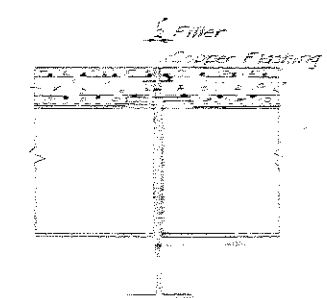
THE STATE ROAD COMMISSION OF WEST VIRGINIA
 SITUATION PLAN
 BLUESTONE RIVER
 NEAR TRUE
 SUMMERS COUNTY
 PROJECT - 3494
 SCALE 1"=30' HOR. & VERT.
 OFFICE OF THE CHIEF ENGINEER
 Revised 8-19-46
 Printed by Carolina Line
 Revised 2-10-47



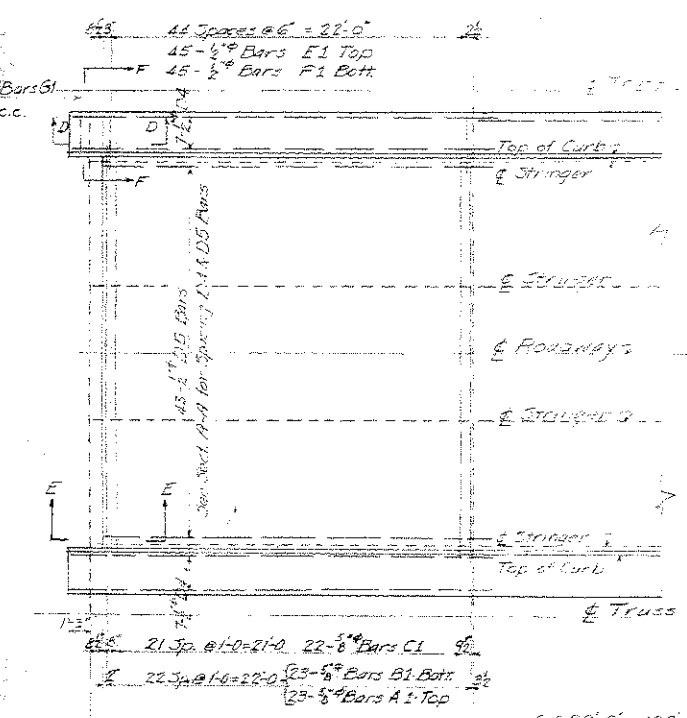
Dist. No.	State Proj. No.	Federal Proj. No.	Fiscal Year	County	Sheet No.	Total Sheets
13494				Summers	7	9



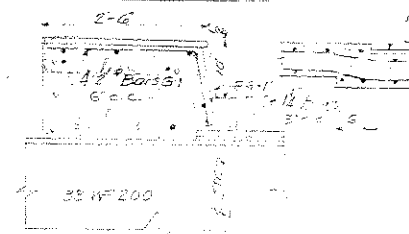
CONSTRUCTION JOINT
Scale: 3/8"=1'-0"



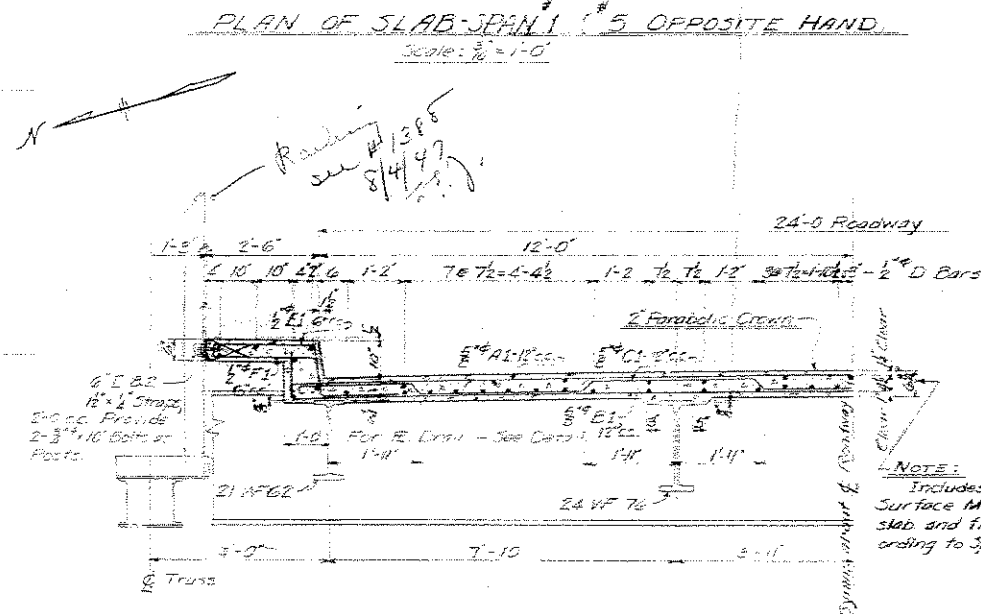
SECTION C-C
Scale: 3/8"=1'-0"



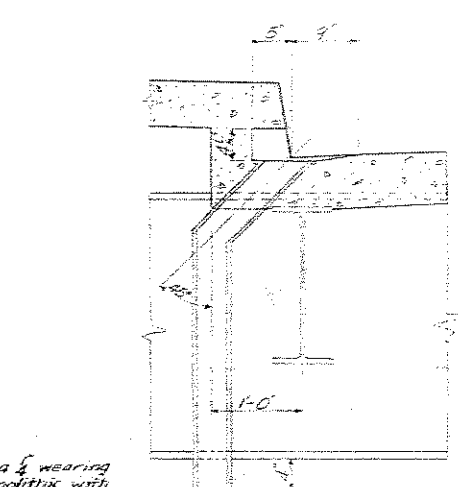
PLAN OF SLAB-SPAN #3
Panels 2 to 6 Incl. Same as For Span #1.
Scale: 3/8"=1'-0"



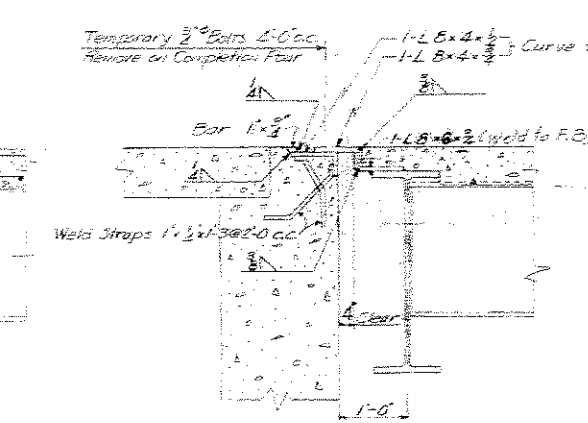
SECTION F-F
Scale: 3/8"=1'-0"



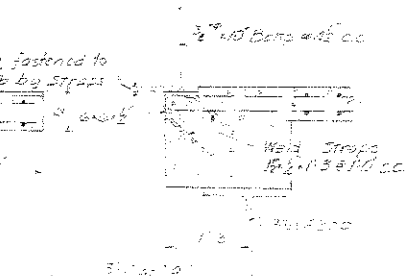
SECTION A-A
Scale: 3/8"=1'-0"



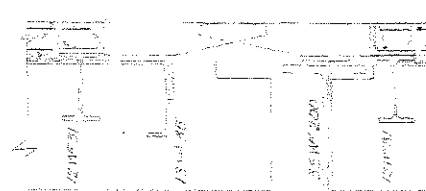
FLOOR DRAIN
Scale: 1"=1'-0"



SECTION B-B
Scale: 3/8"=1'-0"



SECTION L-L
Scale: 3/8"=1'-0"



SECTION E-E
Scale: 3/8"=1'-0"

NOTE:
Includes a 1/2" wearing surface Monolithic with slab and finished according to Specifications.

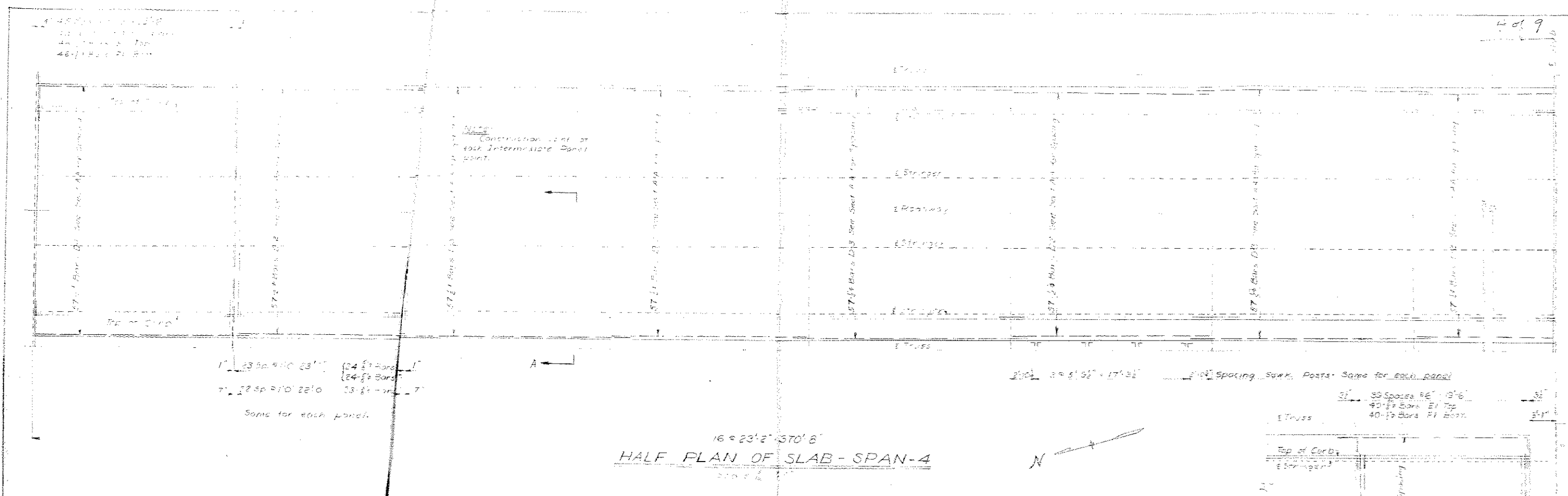
NOTE:
2" W.I. Pipe - Point Surface in Contact with concrete with heavy coat of Asphalt.

For Bar Schedule see Dwg. #4.

**THE STATE ROAD COMMISSION
OF WEST VIRGINIA**

TRUE BRIDGE OVER BLUESTONE RIVER
PROJECT #3494 SUMMERS COUNTY
CONCRETE DECK FOR 139'-0" SPAN
SUPERSTRUCTURE CONTRACT #1764

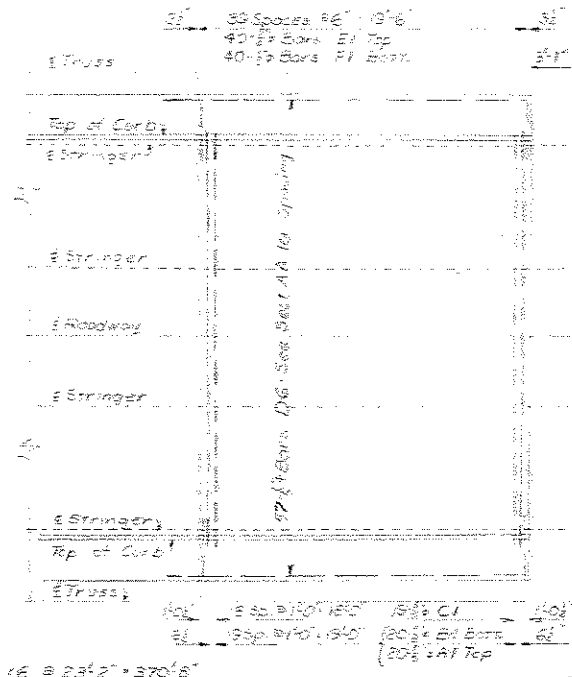
DESIGN BY FRANK D. MAENTZEEP Consulting Engineer Clarksburg, W. Va.	Scale: As Noted Date:
Designed by K.H.J.	Checked by R.D.H.
Drawn by R.D.H.	Checked by K.H.J.
Traced by	Checked by



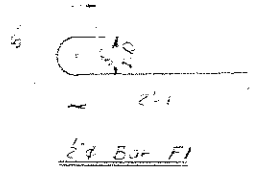
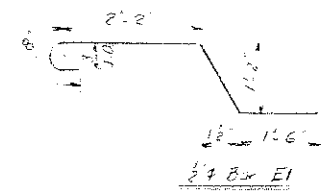
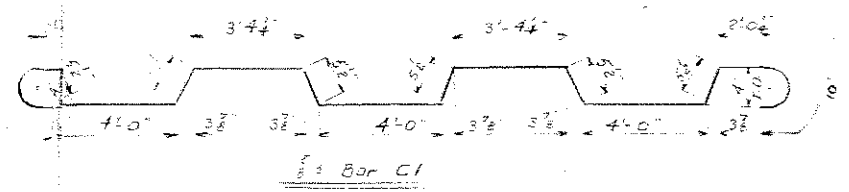
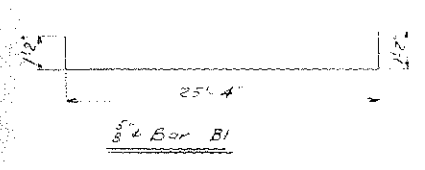
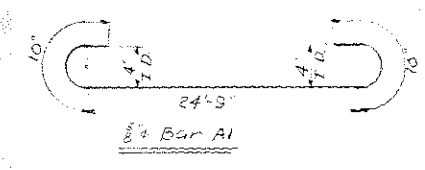
16 @ 23'-2" x 370' 8"
HALF PLAN OF SLAB - SPAN-4
 Scale 1/8" = 1'-0"

BILL OF REINFORCING STEEL

SPAN #1 (one listed)				SPAN #2				SPAN #3				SPAN #4			
No.	MK	SIZE	LENGTH	No.	MK	SIZE	LENGTH	No.	MK	SIZE	LENGTH	No.	MK	SIZE	LENGTH
144	A1	5/8"	26'-5"	380	A1	5/8"	25'-5"	384	A1	5/8"	26'-5"	384	A1	5/8"	26'-5"
144	B1	do	27'-8"	do	B1	do	27'-8"	do	B1	do	27'-8"	do	B1	do	27'-8"
136	C1	do	27'-2"	364	C1	do	27'-2"	368	C1	do	27'-2"	368	C1	do	27'-2"
57	D1	1/2"	24'-2"	57	D1	1/2"	24'-2"	57	D1	1/2"	24'-2"	57	D1	1/2"	24'-2"
171	D2	do	23'-0"	393	D2	do	23'-0"	456	D2	do	23'-0"	456	D2	do	23'-0"
114	D3	do	27'-2"	393	D3	do	27'-2"	393	D3	do	27'-2"	393	D3	do	27'-2"
556	E1	do	5'-7"	57	D3	do	22'-0"	1472	E1	do	5'-7"	1472	E1	do	5'-7"
556	F1	do	2'-9"	1460	E1	do	5'-7"	1472	F1	do	2'-9"	1472	F1	do	2'-9"
				1460	F1	do	2'-9"		G1	do	3'-5"				



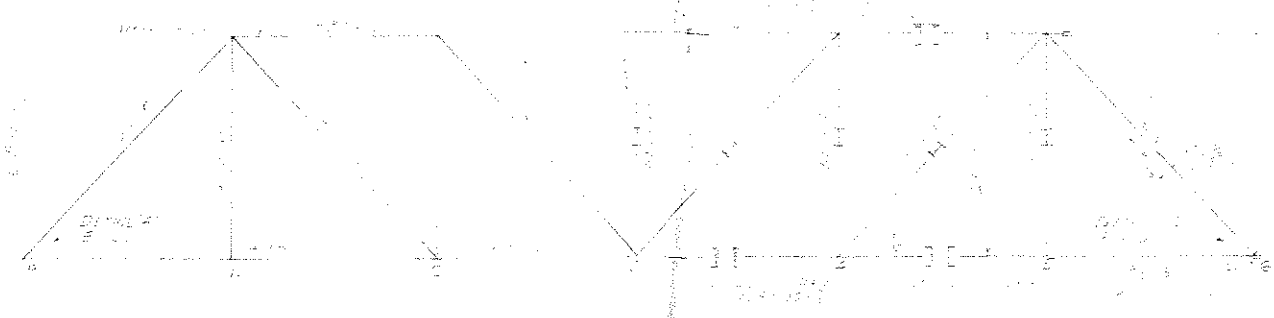
16 @ 23'-2" x 370' 8"
PLAN OF SLAB - SPAN-2
 Panels 1 to 6 Incl. Same as Slab - Span 4
 Scale 1/8" = 1'-0"



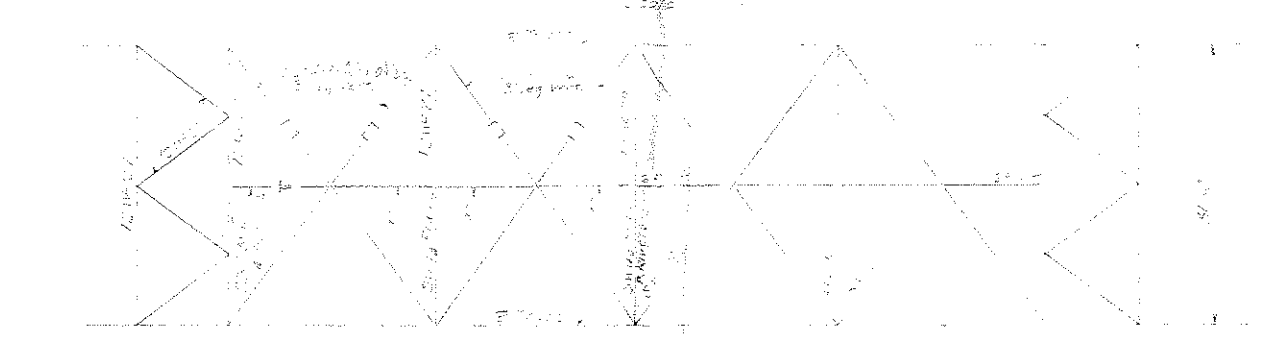
THE STATE ROAD COMMISSION
 OF WEST VIRGINIA
 TRUE BRIDGE OVER BLUESTONE RIVER
 PROJECT #3494 SHAMERS CDD TV
 CONCRETE DECK DETAILS FOR CANTILEVER SPAN
 SUPERSTRUCTURE CONTRACT #1764

PRELIMINARY

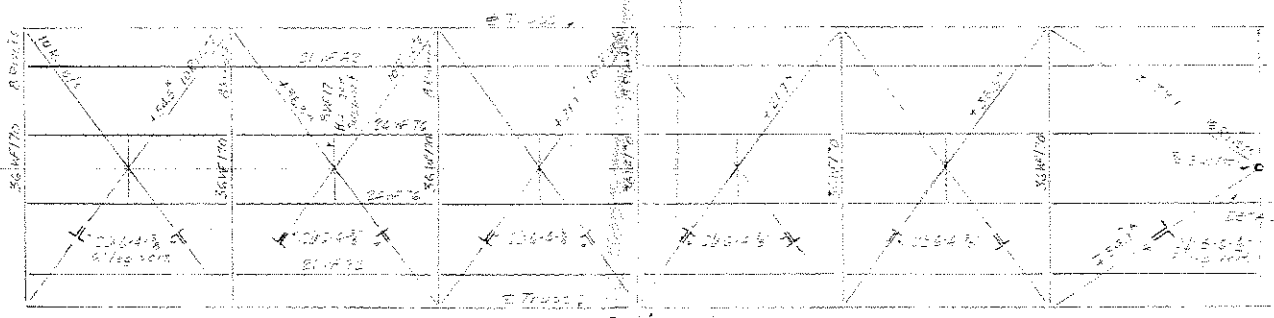
DESIGN BY FRANK D. MENTZER	SEVERAL APPROVED	DATE
Consulting Engineer	Checked by R.D.H.	
Charleston, W. Va.	Drawn by M.E.E.	
	Checked by	



ELEVATION-SPAN #1



TOP CHORD ELEVATION
SPAN #3

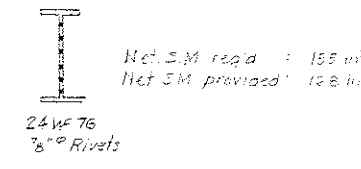


BOTTOM CHORD ELEVATION
SPAN #1

DESIGN DATA: -Live Load: H-15-S16-

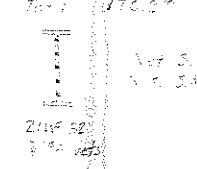
Roadway Structures:

	Moments	Shears
Dead Load	518'	16.2'
Live Load	1323	36.5
Impact	45.3	5.8
Total	1886	58.5



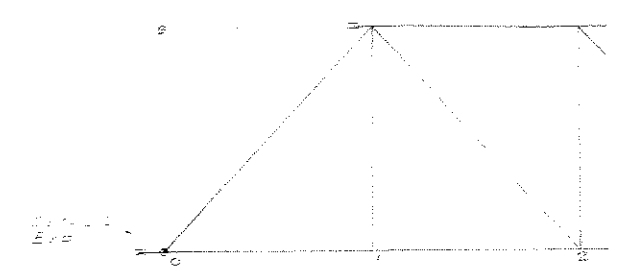
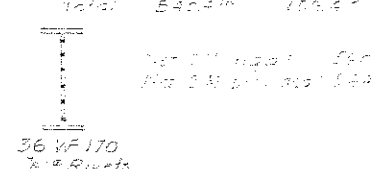
Sidewalk Structures:

	Moments	Shears
Dead Load	47.6'	1.06'
Live Load	11.0	2.9
Impact	2.1	0.5
Total	60.7	4.5

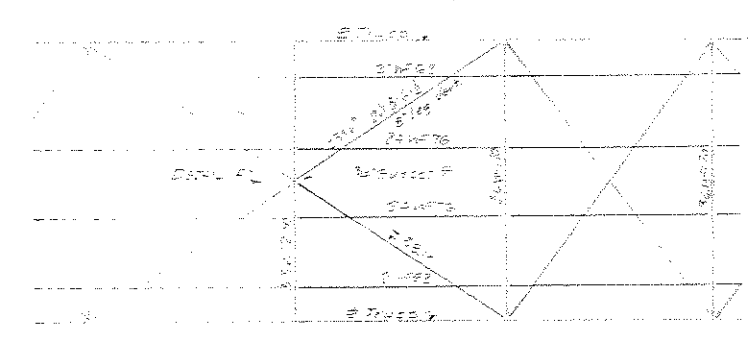


Floor Beams:

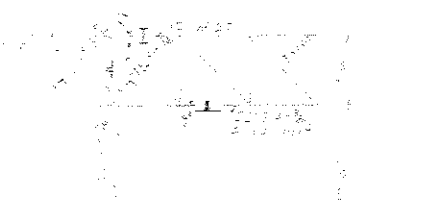
	Moments	Shears
Dead Load	3324'	43.5'
Live Load	11.5	3.0
Impact	27.5	4.8
Total	3463	51.3



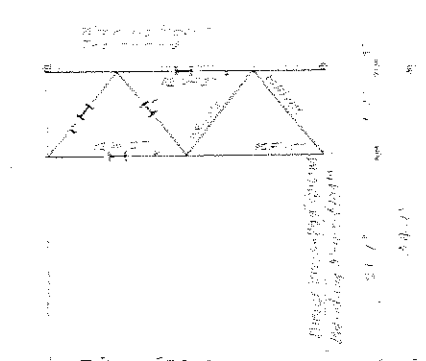
ELEVATION-SPAN #3



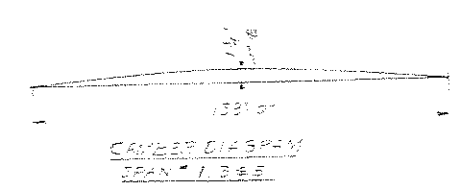
BOTTOM CHORD BRACING
SPAN #3



TRANSVERSE TRUSS



PORTAL
TYPICAL

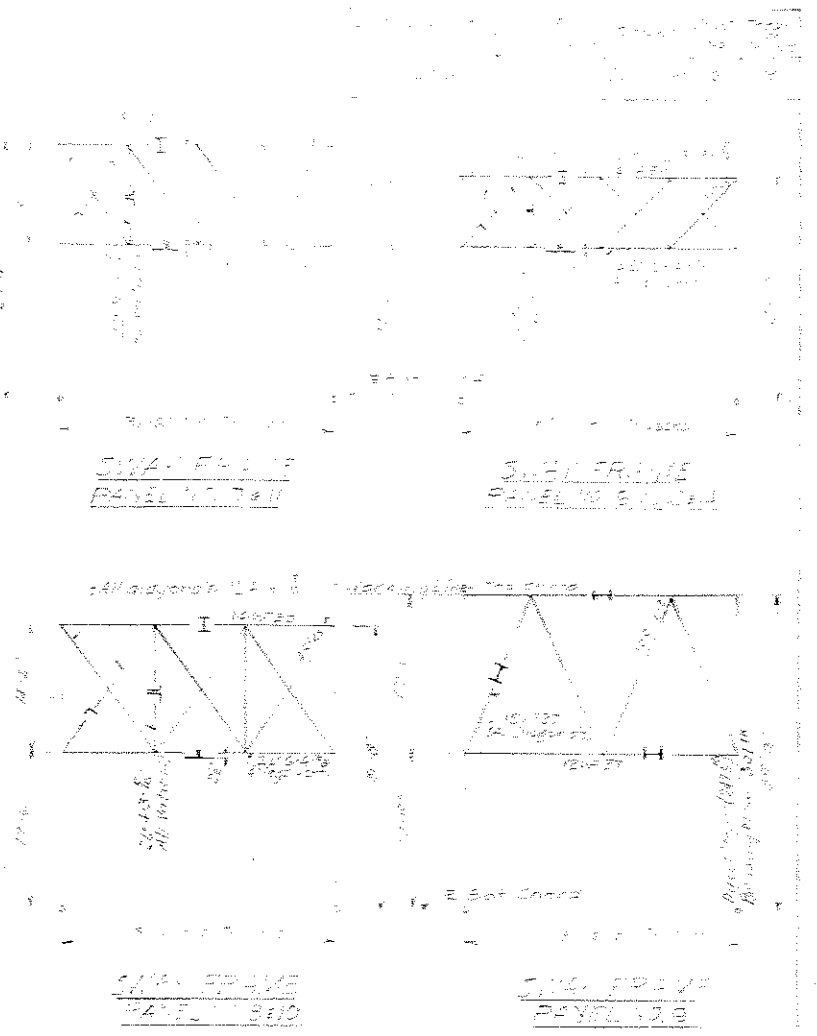
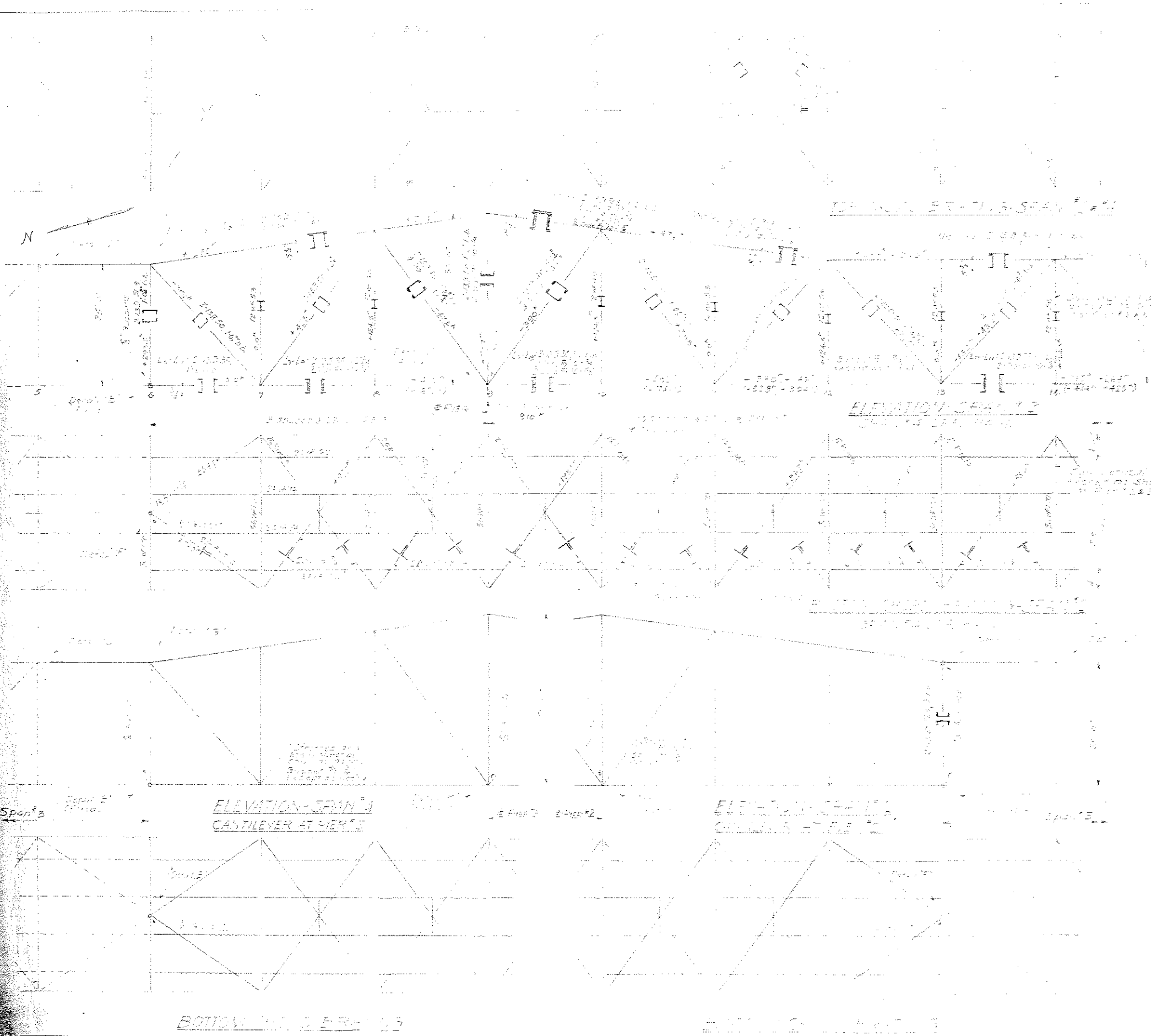


THE STATE ROAD COMMISSION
OF WEST VIRGINIA

TRUE BRIDGE OVER BLUESTONE RIVER
PROJECT #3494 SUMMERS COUNTY, W. VA.

STRESS SHEET FOR 139'-0" SPANS
SUPERSTRUCTURE CONTRACT #1764

DESIGN BY FRANK D. McENTEE Consulting Engineer Clarksburg, W. Va.	Scale: 1" = 10'-0" Drawn by R.H.A. Traced by	Date: Checked by R.D.K. Checked by R.D.K. Checked by
---	--	---



Note: Stresses for truss members given from 470' are for $D_1 = 1.0$ - Imp. Stresses in parenthesis, full (621') also include 30% wind. The stresses in stringers and floor beams are $D_1 = 1.0$.

THE STATE ROAD COMMISSION
OF WEST VIRGINIA

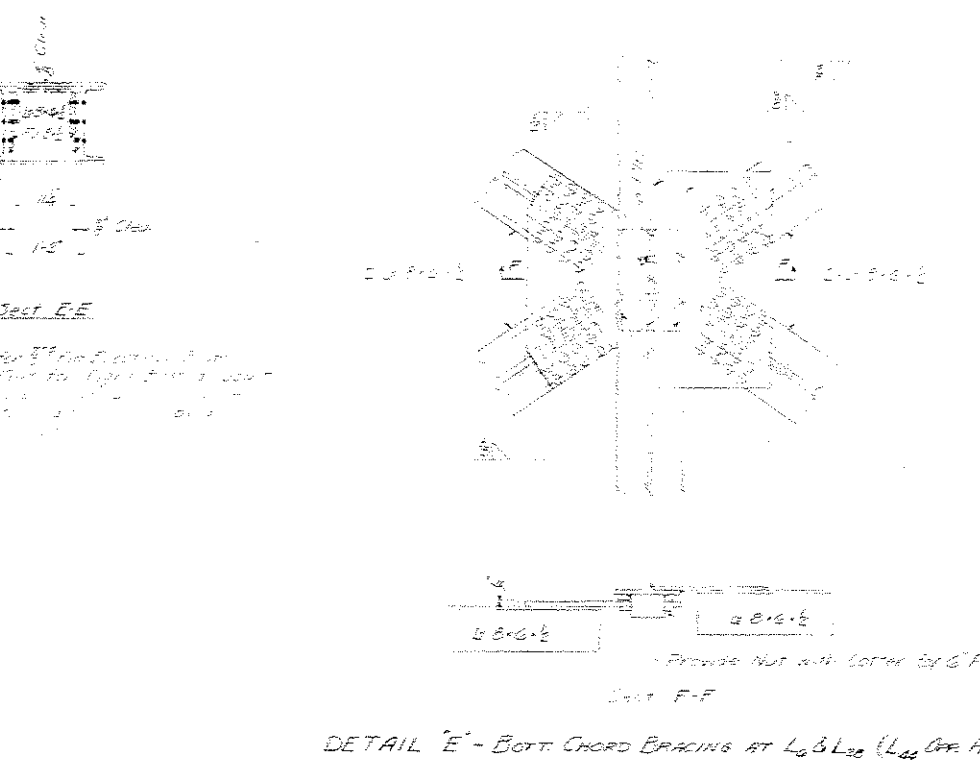
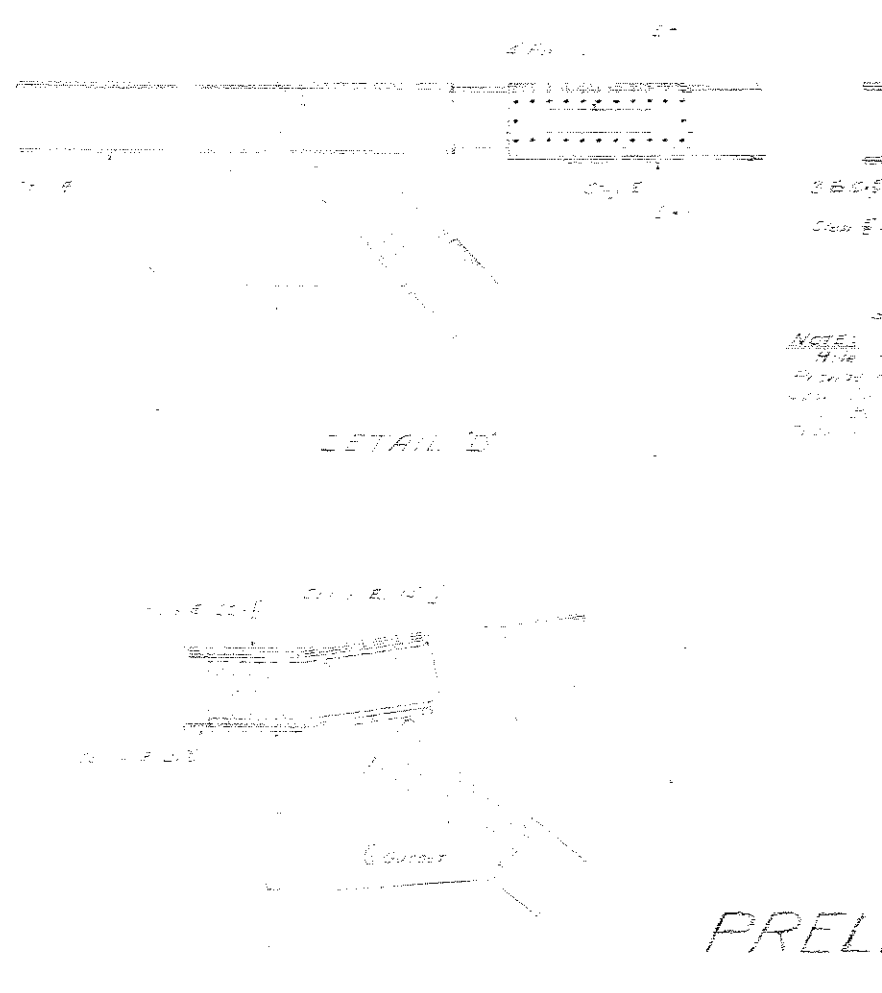
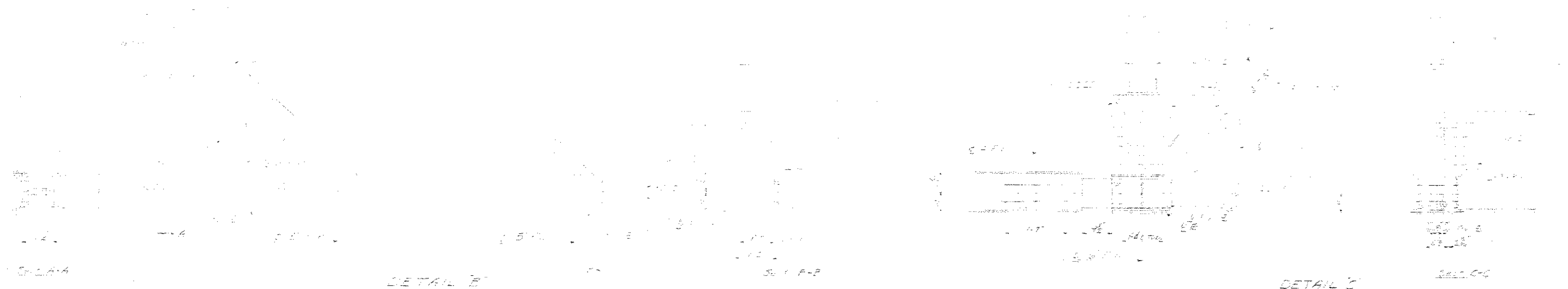
TRUSS BRIDGE over BLUESTONE RIVER
PROJECT 3486 SUMMERS COUNTY W.VA.

STRESS SHEET AND CASTILEVER DETAILS
SUPERSTRUCTURE CONTRACT

DESIGNED BY FRANK C. McINTYRE
Consulting Engineer
Martinsburg, W. VA.

APPROVED BY
[Signature]
[Title]

DATE: [Date]



NOTE:
 1. All steel to be painted with
 2. Provide flat for lightening of steel
 3. All steel to be galvanized
 4. All steel to be fireproofed

PRELIMINARY

THE STATE ROAD COMMISSION
 OF WEST VIRGINIA
 TRUE BRIDGE OVER BLUESTONE RIVER
 PROJECT #3474 SUMMERS COUNTY
 STRUCTURAL STEEL DETAILS
 SUPERSTRUCTURE CONTRACT #1764

DESIGNED BY FRANK D. WENTZ	Scale: 3/4" = 1'-0"	DATE:
CONSULTING ENGINEER	DESIGNED BY WALS CHECKED BY RDM	
CLAYTON, W. VA.	DRAWN BY RDM CHECKED BY	
	TYPED BY	CHECKED BY

DETAIL 'E' - BOT. CHORD BRACING AT L₃ & L₂₀ (L₂₀ Opp. Hand)