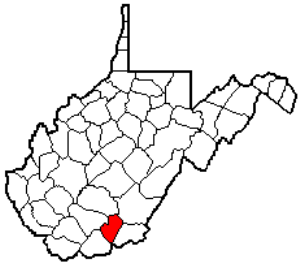
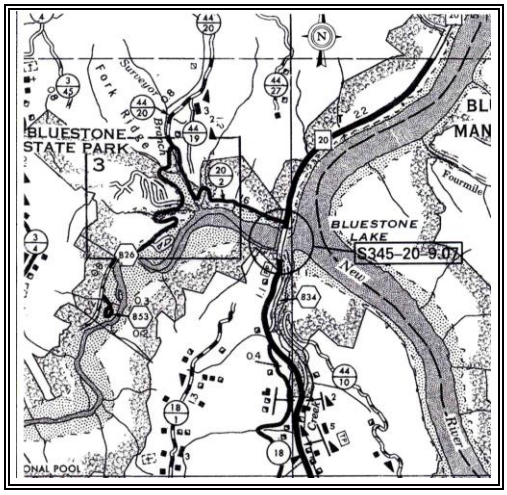
Internal Rating: _____



WEST VIRGINIA HISTORIC PROPERTY INVENTORY FORM

Street Address	**Common/Historic Name/Both** ☐ ☐ ☑	**Field Survey #**	**Site # (SHPO Only)**
Located on WV Route 20, approximately 0.25 miles south of County Route 20/2, spanning Bluestone Lake.	Lilly Bridge	HPI #1	
Town or Community	**County**	**Negative No.**	**NR Listed Date**
Near Hinton	Summers		
Architect/Builder	**Date of Construction**	**Style** ***(SHPO Only)***	
Virginia Bridge Company	1950		
Exterior Siding / Materials	**Roofing Material**	**Foundation**	
Five-Span Cantilevered Thru Truss	Deck Material: Concrete	Abutments: Concrete Piers: Concrete	
Property Use or Function	**UTM** Zone17 NAD 1981		
Transportation	Easting 0507258E Northing 4162681N		
	Quadrangle Name		
	Pipestem		
Survey Organization & Date	**Part of What Survey / FR#**		
WVDOH May 20, 2009	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	**Owners Mailing Address**
WVDOH	Building 5, Capitol Complex Charleston, WV 25305

Describe Setting

Unknown--<1 Acres
☐ Archaeological Artifacts Present

Lilly Bridge is located in a rural area in Summers County. It carries WV Route 20 across Bluestone Lake.

Description of Buildings or Site (Original and Present) Stories Front Bays

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.

Alterations ☑ Yes ☐ No If yes, describe

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.

Additions ☐ Yes ☑ No If yes, describe

Describe All Outbuildings
N/A

Statement of Significance:
See Continuation Sheet

Bibliographical References
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.
KCI Technologies. Draft Historic Context. West Virginia Statewide Historic Bridge Survey. October 2006.
Modjeski and Masters. Final Feasibility Study, Lilly Bridge. March 20, 2006.
Princeton Times. "Village of Lilly." 30 March 1989.
Staunton River Tour, Halifax County, Virginia. Clarkton Bridge.
WVDOH Maintenance Division. Bridge Inspection Report. 2007.

Form Prepared By: **Date:** May 4, 2009

Name/Organization: Randy Epperly
Address: WV Division of Highways
Capitol Complex
Building 5, Rm. 463
Charleston, WV 25305

Phone #: 304-558-9385

WEST VIRGINIA HISTORIC PROPERTY FORM
CONTINUATION SHEET

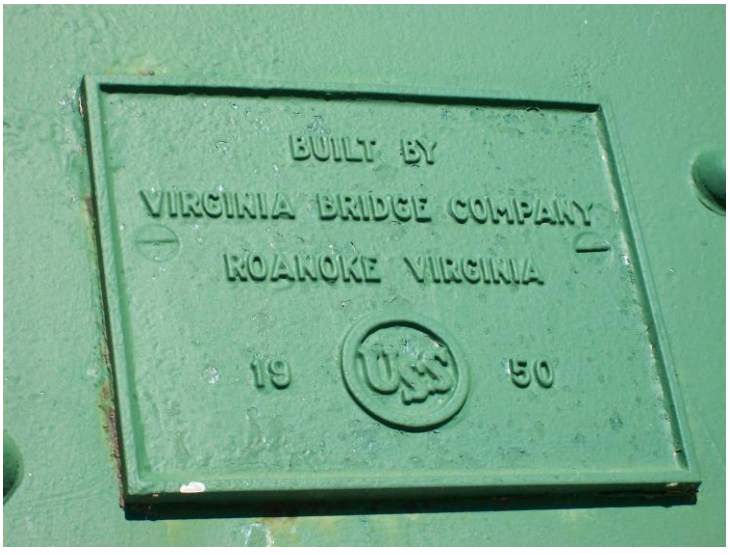
Name: Lilly Bridge
Survey Number: HPI #1
Project / FR#: State County Route: S345-20-9.07

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.



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

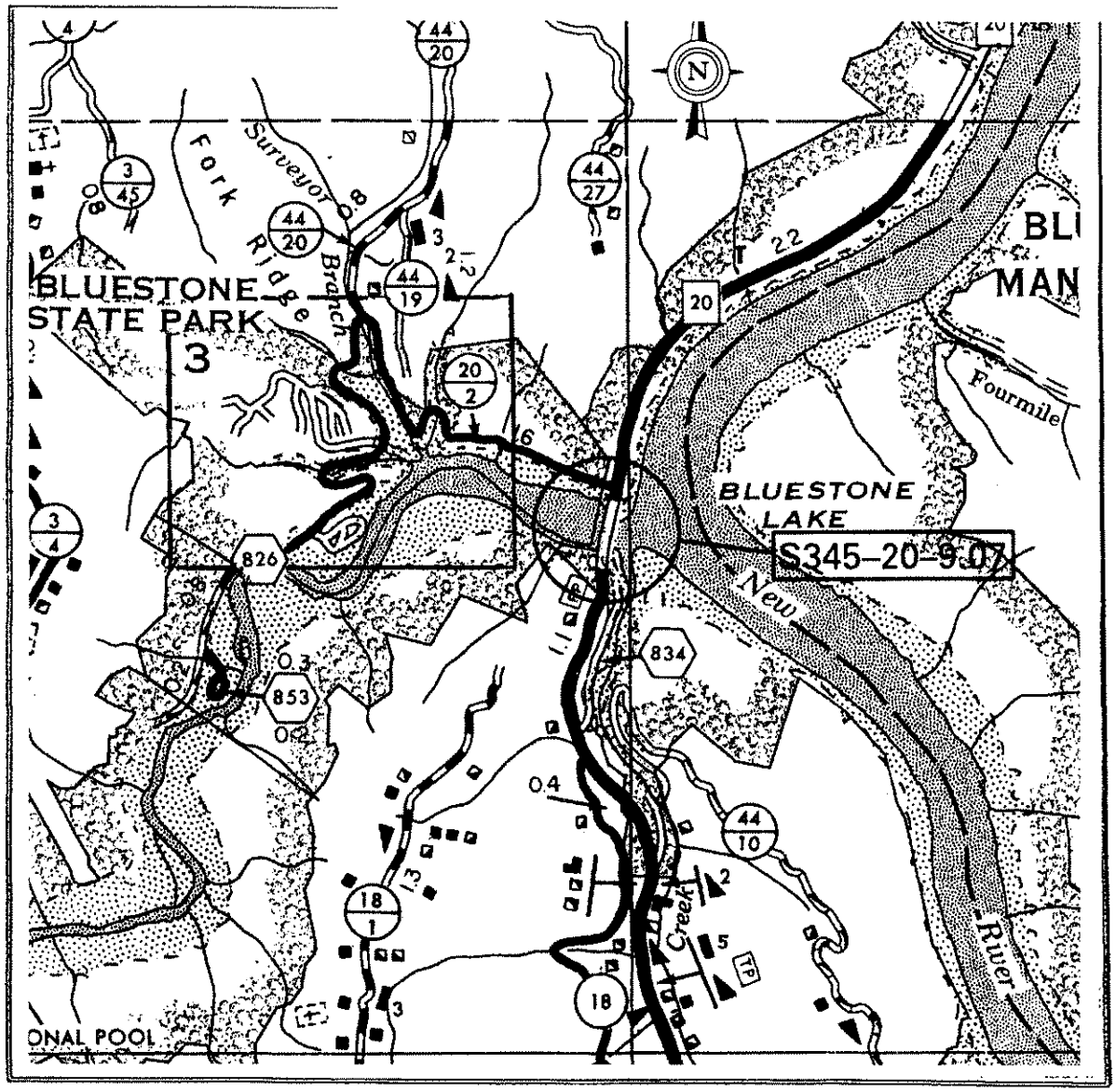
Lilly Truss Bridge
WV Route 20
Bluestone Lake
Summers County, West Virginia

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



SCALE

1 0 1 2 MILES

1 INCH = 1 MILE

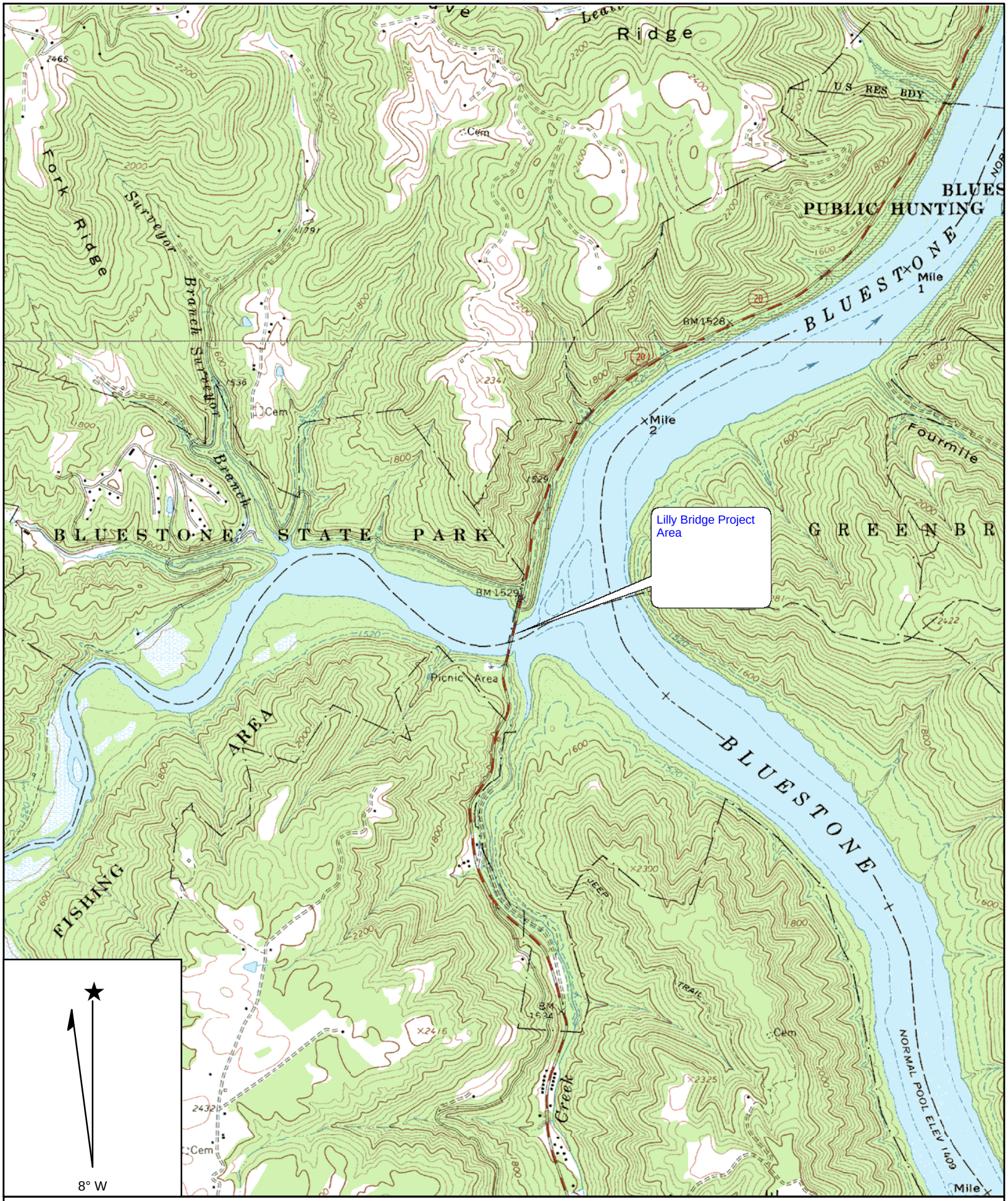
1 0 1 2 3 KILOMETERS

1 CENTIMETER ≈ 0.633 KILOMETER

Lilly Bridge

Summers County

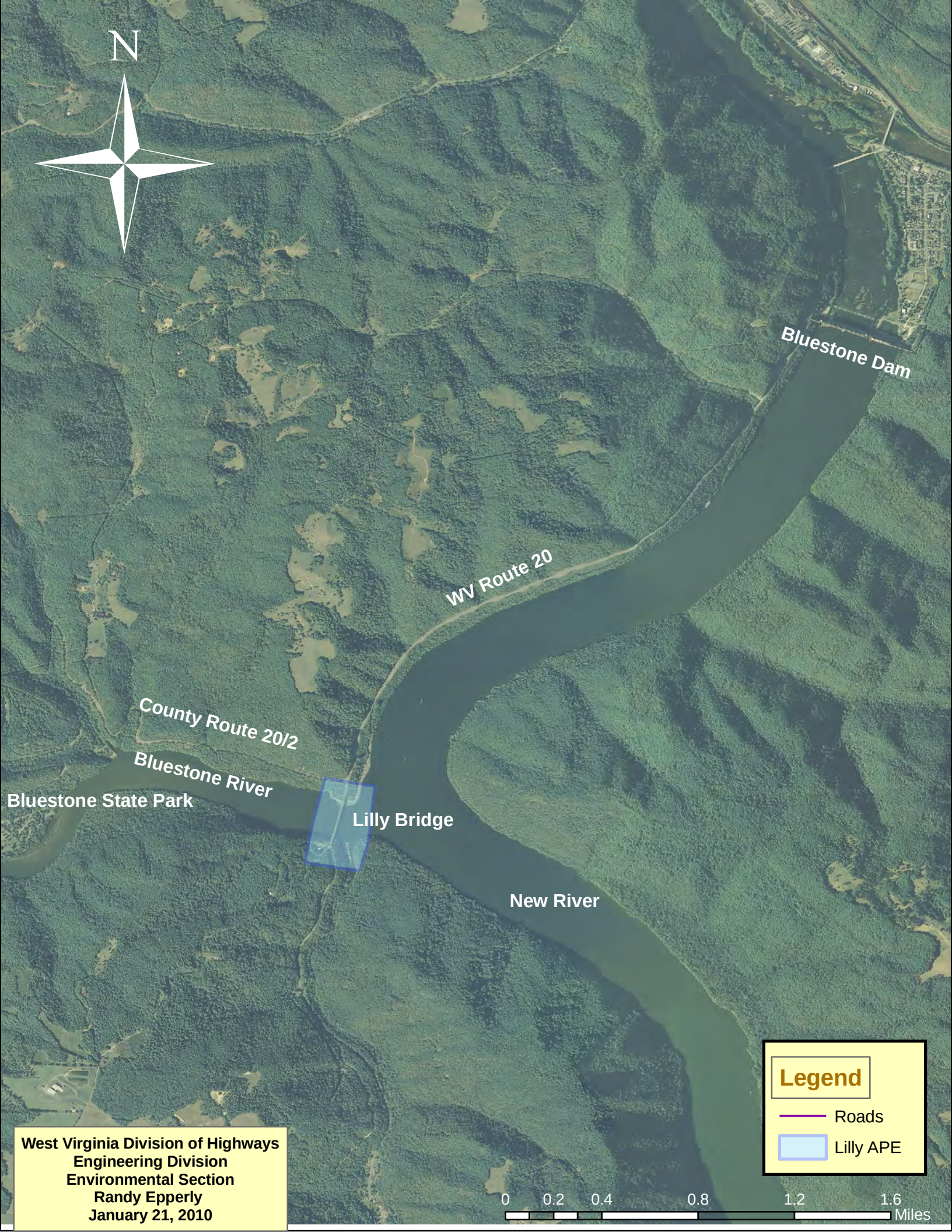
State Project No. S345-20-9.07 Federal No. BR-0020(164)E



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

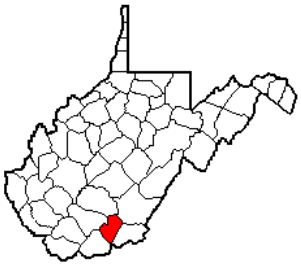
Location: 17 0507227 E 4162889 N
Caption: Lilly Bridge
Summers County

Copyright (C) 1998, Maptech, Inc.



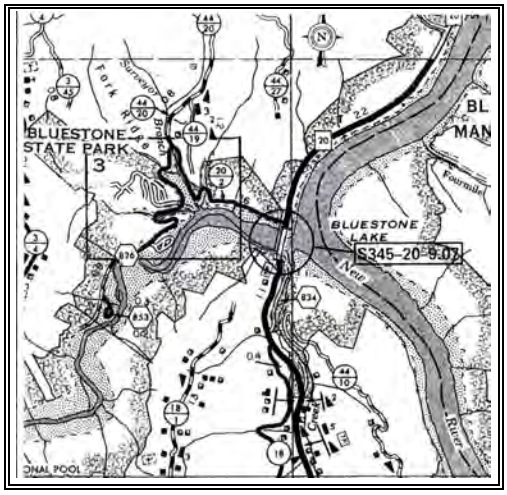
West Virginia Division of Highways
Engineering Division
Environmental Section
Randy Epperly
January 21, 2010

Internal Rating: _____



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** ☐ ☐ ☑ 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		
	Quadrangle Name Pipestem		
Survey Organization & Date WVDOH May 20, 2009	**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	**Owners Mailing Address**
WVDOH	Building 5, Capitol Complex Charleston, WV 25305

Describe Setting

Unknown--<1 Acres
☐ Archaeological Artifacts Present

Lilly Bridge is located in a rural area in Summers County. It carries WV Route 20 across Bluestone Lake.

Description of Buildings or Site (Original and Present) Stories Front Bays

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.

Alterations ☑ Yes ☐ No If yes, describe

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.

Additions ☐ Yes ☑ No If yes, describe

Describe All Outbuildings
N/A

Statement of Significance:
See Continuation Sheet

Bibliographical References
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.
KCI Technologies. Draft Historic Context. West Virginia Statewide Historic Bridge Survey. October 2006.
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Princeton Times. "Village of Lilly." 30 March 1989.
Staunton River Tour, Halifax County, Virginia. Clarkton Bridge.
WVDOH Maintenance Division. Bridge Inspection Report. 2007.

Form Prepared By: **Date:** May 4, 2009

Name/Organization: Randy Epperly
Address: WV Division of Highways
Capitol Complex
Building 5, Rm. 463
Charleston, WV 25305

Phone #: 304-558-9385

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	Date
West Virginia Deputy State Historic Preservation Officer	Date

APPROVED:

Advisory Council on Historic Preservation	Date

CONCUR:

West Virginia Division of Highways	Date

Signature Page 2

Consulting Parties:

_____ _____

United States Army Corps of Engineers Date

Signature Page 3

Consulting Parties:

West Virginia Division of Natural Resources

Date

Signature Page 4

Consulting Parties:

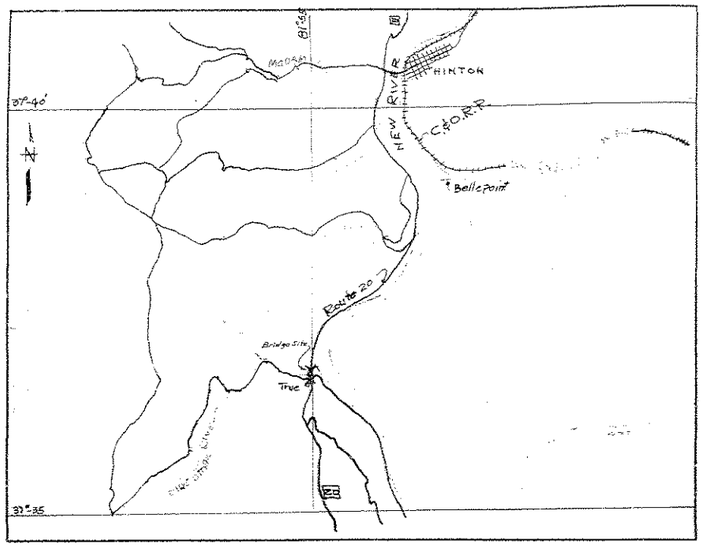
Summers County Board of Education

Date


BLUESTONE
STATE PARK


13'-11"
NO
PEDESTRIAN
CROSSING


BUILT BY
VIRGINIA BRIDGE COMPANY
ROANOKE VIRGINIA
19
50



THE STATE ROAD COMMISSION
OF WEST VIRGINIA

PLAN AND PROFILE FOR CONSTRUCTION
OF

STATE ROAD

ROUTE NO. W.VA. 20

PROJECT NO. 3494

JUMPING BRANCH & PIPESTEM DISTRICTS SUMMERS COUNTY

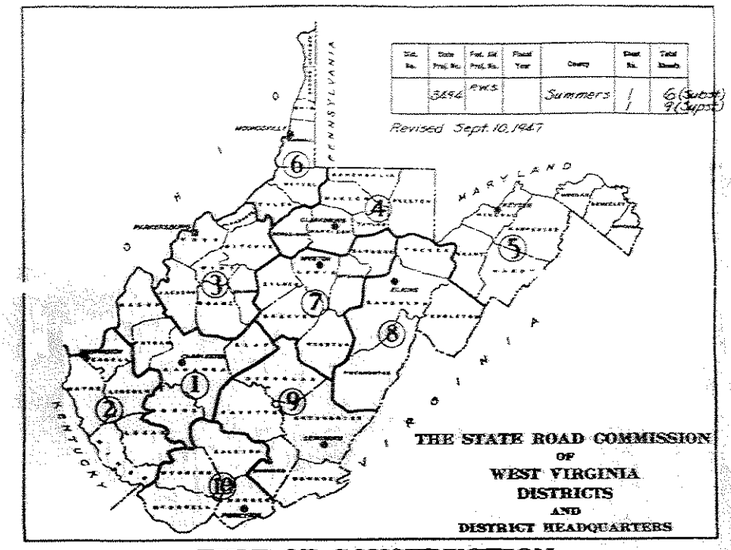
TRUE BRIDGE

Sta. 228+19.66 To Sta. 239+93.000

Length = 0.219 Mi.

SCALES Plan 1 IN.=

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
BRIDGE ENGINEER - STATE ROAD COMMISSION

REVIEWED
STATE CONSTRUCTION ENGINEER - STATE ROAD COMMISSION

RECOMMENDED FOR APPROVAL
CHIEF ENGINEER - STATE ROAD COMMISSION

APPROVED
STATE ROAD COMMISSIONER

I HEREBY CERTIFY THAT THIS IS A CORRECT COPY OF THE PLANS OF PROJECT 3494
March 7, 1947
SECRETARY

APPROVED BY OFFICIAL ORDER OF THE STATE ROAD COMMISSION OF WEST VIRGINIA, ENTERED 7th DAY OF March, 1947
SECRETARY

LAYOUT
SCALE 1 IN. = FT.

CONVENTIONAL SIGNS

State Line	Wall
County Line	Marsh
Corporation Line	Hedge
District Line	Drop 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)

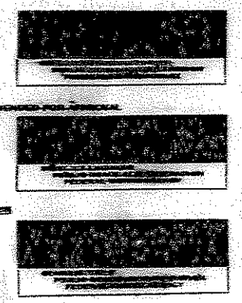
No.	Description
1	Title Sheet
2	Profile & Foundation Plan
3	Abutments
4	Piers
5	Bar List
6	Situation Plan

SUBSTRUCTURE PLANS COMPLETED March-20-1947

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.

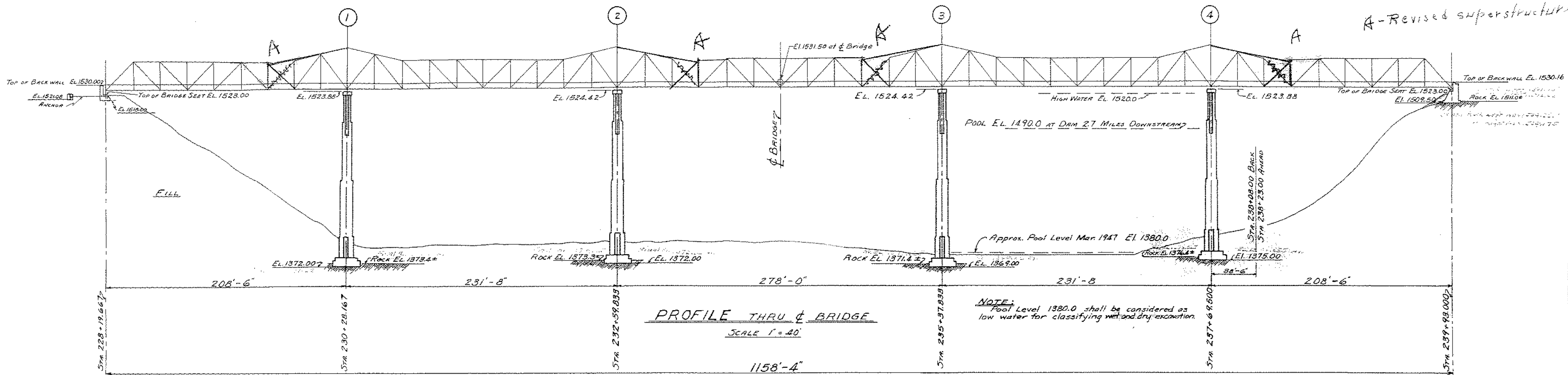
SUPERSTRUCTURE PLANS COMPLETED Sept-27-1947



#1764

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

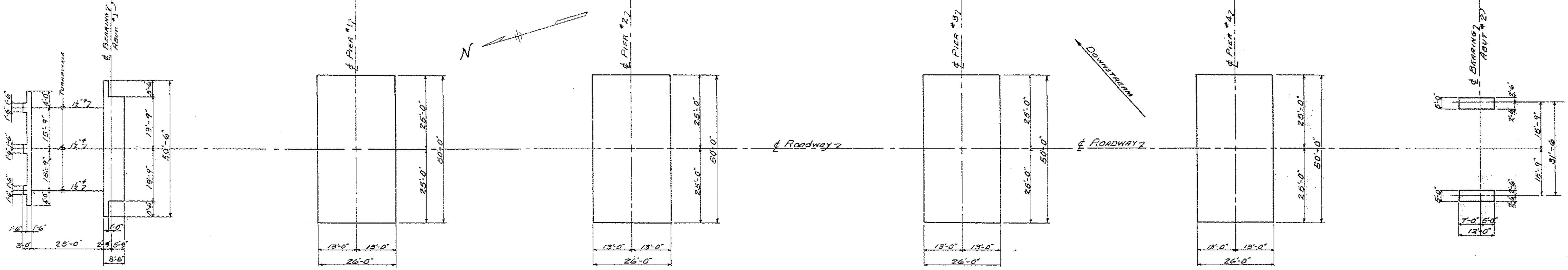
A - Revised superstructure



PROFILE THRU ℄ BRIDGE

SCALE 1" = 40'

NOTE: Pool Level 1380.0 shall be considered as low water for classifying wet and dry excavation.



PLAN

SCALE 1/16" = 1'-0"

NOTES:

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

The Bridge is designed for H15-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.A.S.H.O. designations T-1-42 (para. 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.

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 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. 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.

DETAILED ESTIMATED QUANTITIES

	This Contract					Future Contract	
	Pier 1	Pier 2	Pier 3	Pier 4	Abt. 2	Anchor & Abt. 1	Abt. 2
Dry Exc. c.y.	477.5	638.5	0	508.0	231.0	325	0
Wet Exc. c.y.	376.0	381.0	246.0	205.0	0	0	0
Rock Exc. c.y.	725	.53	116.5	72.3	8.9	0	0
Cl. A Conc. c.y.	1409.3	1413.2	1435.4	1387.1	48.7	91.5	22.6
St. Reinf. #	112,760	113,144	114,126	110,982	4788	9018	2582
					4786	9050	2577

REINFORCING BARS

Size	Present Contract	Future Contract	Total Weight
3/8"φ	0	48	48
1/2"φ	31,820	345	32,165
5/8"φ	867	3115	3,982
3/4"φ	20,069	255	20,324
1"φ	202,624	3763	206,387
1¼"φ	201,220	3320	204,540
1½"φ	0	754	754
Total	456,600	11,600	468,200
	472,230*		

* See Sheets 4 & 5

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.	1179.08	
9. Rock Excavation	322	0	322 C.Y.	487.68	
72. Class "A" Concrete	5694	114	5808 C.Y.	5712.11	127.36
78 Steel Reinforcing	456,600	11,600	468,200 Lbs.	472,230	

AS BUILT ! SHOWN IN RED

THE STATE ROAD COMMISSION OF WEST VIRGINIA

TRUE BRIDGE over BLUESTONE RIVER

PROJECT #3494 SUMMERS COUNTY, W. VA.

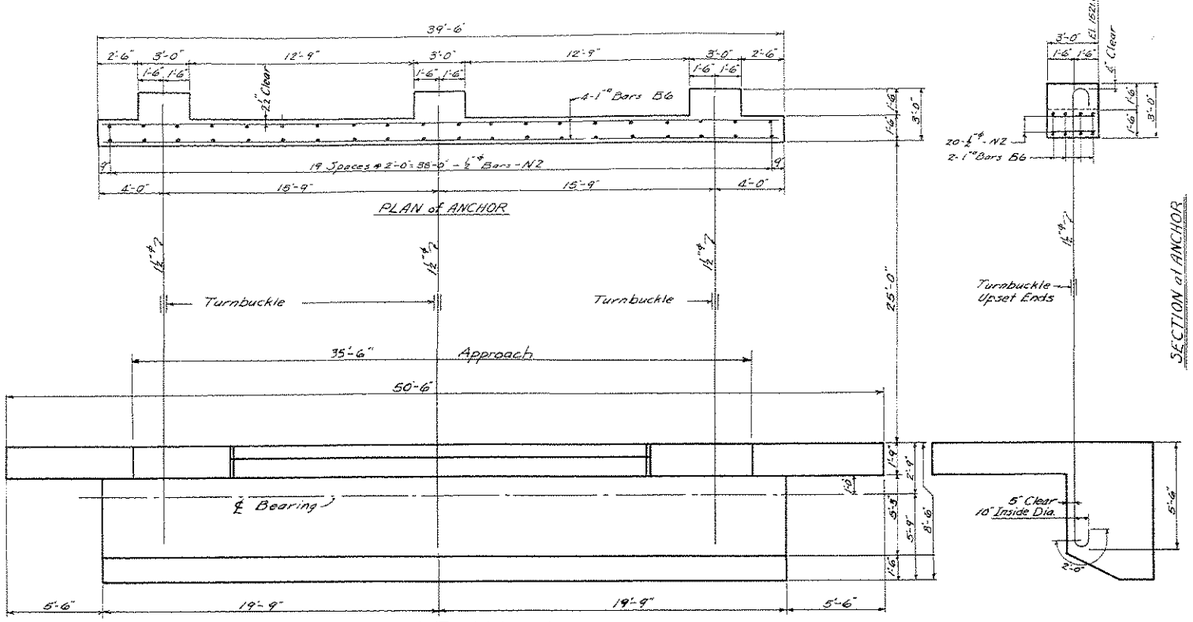
PROFILE AND FOUNDATION PLAN

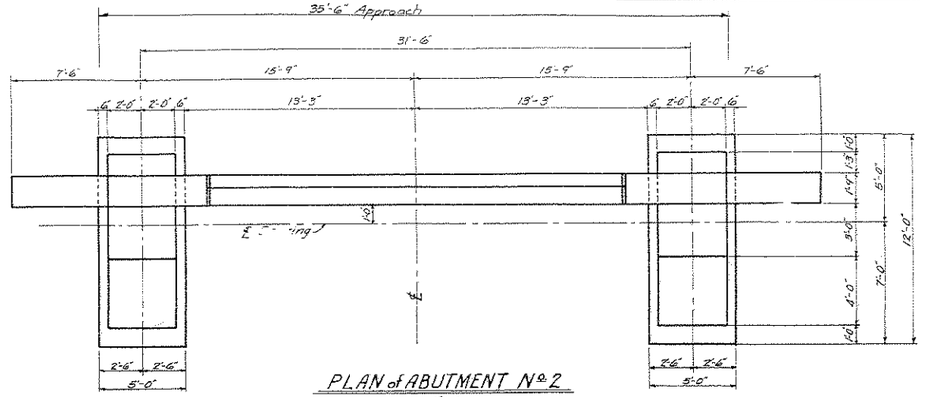
SUBSTRUCTURE CONTRACT #1764

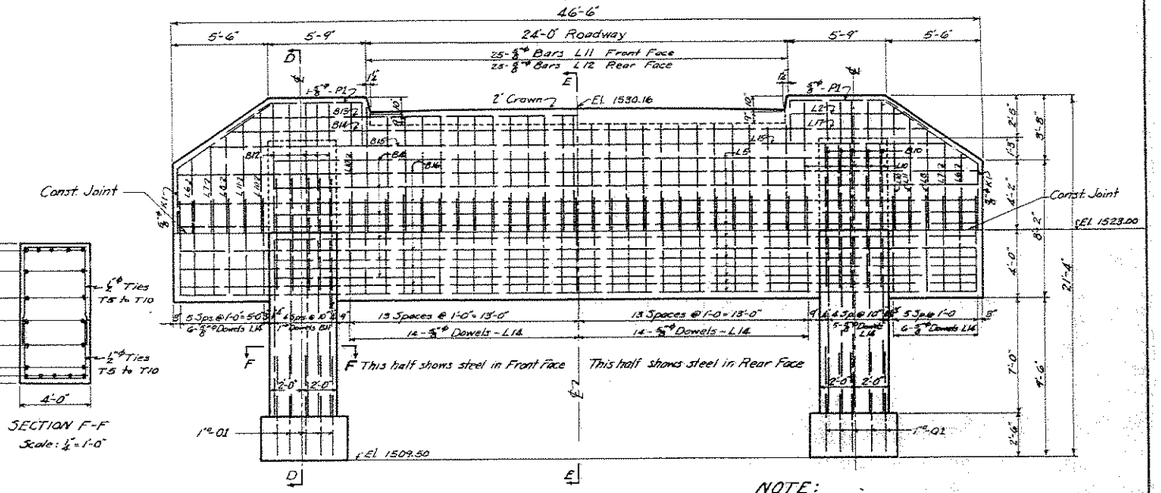
DESIGN BY FRANK D. McENTEER
CONSULTING ENGINEER
CLARKSBURG, W. VA.

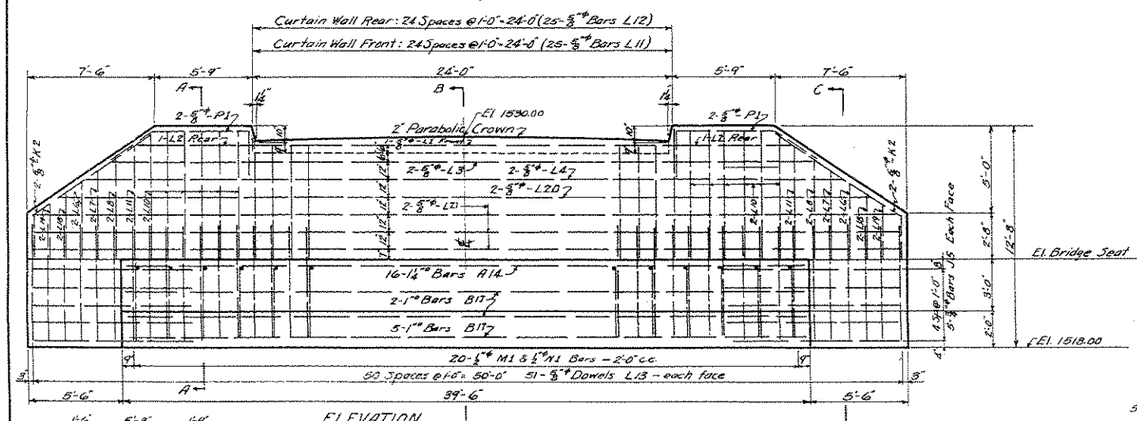
Scale: As Shown		Date: Mar. 7, 1947	
Designed by	K.H.J.	Checked by	M.R.
Drawn by	M.R.	Checked by	K.H.J.
Traced by	R.D.H.	Checked by	K.H.J.

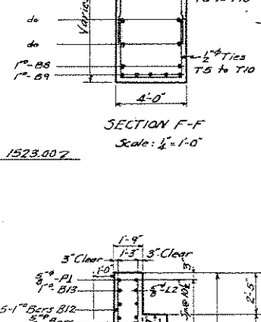
Dist No.	State Proj. No.	Federal Aid Proj. No.	Fiscal Year	County	Sheet No.	Total Sheets
	3494	P.W.S.		Summers	3	6

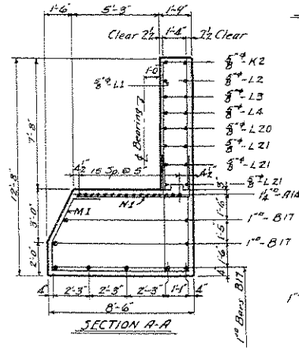


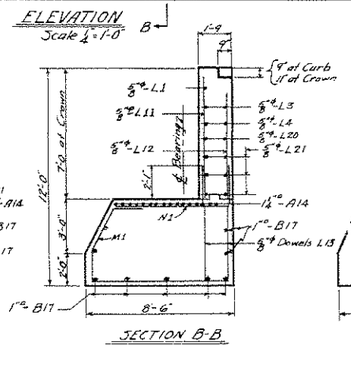


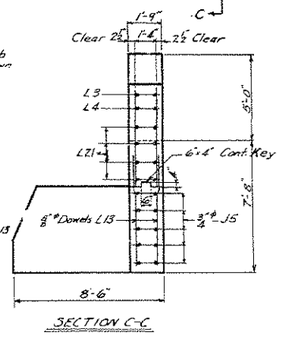


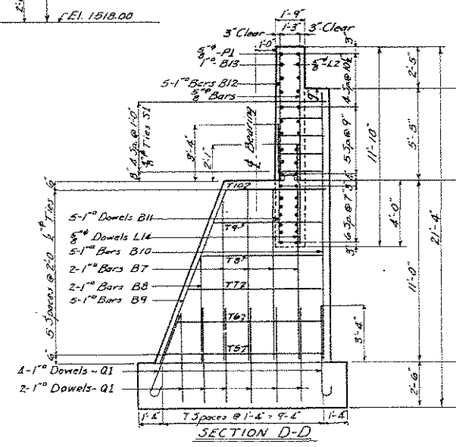


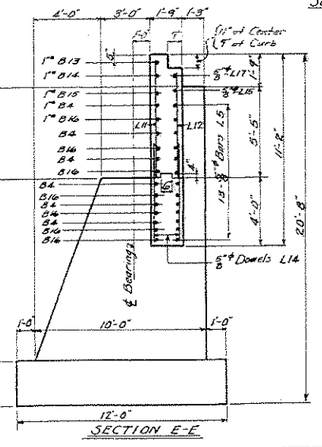












NOTE:

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 at one foot on each side of joint. This is to be included in Price Bid for Class "A" 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, 1967

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

Dist. No.	State Proj. No.	Federal Aid Proj. No.	Fiscal Year	County	Sheet No.	Total Sheets
	3494			Summers	5	6

BILL of REINFORCING STEEL

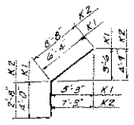
No.	Mk.	Size	Length		No.	Mk.	Size	Length		No.	Mk.	Size	Length		No.	Mk.	Size	Length		No.	Mk.	Size	Length	
ABUTMENT #1					ABUTMENT #2					PIER #1 *					PIER #2 *					PIER #3 *				
16	A18	1¼"□	39'-0"	Straight	6	B4	1"□	35'-0"	Straight	79	A1	1¼"□	11'-10"	Straight	79	A1	1¼"□	11'-10"	Straight	79	A1	1¼"□	11'-10"	Straight
9	B17	1"□	39'-0"	↕	16	B7	↕	10'-10"	↕	12	A2	↕	41'-0"	↕	12	A2	↕	41'-0"	↕	12	A2	↕	41'-0"	↕
20	J5	⅝"φ	8'-6"	Straight	4	B8		7'-6"		8	A3		19'-8"		8	A3		19'-8"		8	A3		19'-8"	
4	K2	⅝"φ	11'-4"	Bent	10	B9		11'-6"		70	A4		24'-2"		70	A4		24'-2"		70	A4		24'-2"	
1	L1	↕	38'-0"	Straight	10	B10		16'-3"		20	A5		45'-0"		20	A7		45'-7"		20	A9		48'-7"	
2	L2		7'-0"	↕	10	B11		7'-0"		50	A6		49'-6"	↓	50	A8		RN-1"	↓	50	A10		53'-1"	↓
2	L3		41'-6"		10	B12		7'-8"		16	A13		50'-8"	Straight	16	A13		50'-8"	Straight	16	A13		50'-8"	Straight
2	L4		44'-6"		1	B13		38'-0"		26	H1	↓	55'-2"	Bent	26	H1	↓	55'-2"	Bent	26	H1	↓	55'-2"	Bent
6	L21		50'-2"		1	B14		41'-0"		12	Z1	1¼"□	44'-4"	Bent	12	Z1	1¼"□	44'-4	Bent	12	Z1	1¼"□	44'-4	Bent
4	L6		4'-2"		1	B15		44'-0	↓	49	B1	1"□	11'-0"	Straight	49	B1	1"□	11'-0"	Straight	49	B1	1"□	11'-0"	Straight
4	L7		4'-10"		7	B16	↓	46'-0"	Straight	12	B2	↑	50'-8"	↕	12	B2	↑	50'-8"	↕	12	B2	↑	50'-8"	↕
4	L8		5'-6"		40	Q1	1"□	6'-3"	Bent	64	B3		27'-2"	Straight	64	B3		27'-2"	Straight	64	B3		27'-2"	Straight
24	L10		7'-4"		4	K1	⅝"φ	10'-4"	Bent	100	C1		27'-4"	Bent	100	C1		27'-4"	Bent	100	C1		27'-4"	Bent
29	L11		6'-8"		2	L2	↑	7'-0"	Straight	12	C2		42'-10"	↑	12	C2		42'-10"	↑	12	C2		42'-10	↑
25	L12		5'-11"	↓	13	L5		46'-0"	↑	48	G1		23'-4"		48	G1		23'-4"		48	G1		23'-4"	
108	L13	↓	6'-9"	Straight	4	L6		4'-2"		48	G2		48'-8"		48	G3		49'-3"		48	G4		52'-3"	
4	P1	⅝"φ	11'-0"	Bent	4	L7		4'-10"		66	G6	↓	54'-4"	↓	66	G6	↓	54'-4"	↓	66	G6	↓	54'-4"	↓
20	M1	½"φ	14'-3"	Bent	5	L8		5'-6"		14	R1	1"□	29'-8"	Bent	14	R1	1"□	29'-8"	↓	14	R1	1"□	29'-8"	↓
20	N1	½"φ	6'-6"	Straight	16	L10		7'-4		20	C3	1"□	51'-4	Bent	20	C3	1"□	51'-4	Bent	20	C3	1"□	51'-4	Bent
4	L18	⅝"φ	3'-6"		29	L11		6'-8"		40	F1	¾"φ	8'-0"	Bent	40	F1	¾"φ	8'-0"	Bent	40	F1	¾"φ	8'-0"	Bent
4	L19	⅝"φ	2'-10"		25	L12		5'-11"		22	J1	↑	27'-2"	Straight	22	J1	↑	27'-2"	Straight	22	J1	↑	27'-2"	Straight
2	L20	⅝"φ	47'-6"	Straight	88	L14		5'-9"		22	J2	↕	19'-8"	↕	22	J2	↕	19'-8"	↕	22	J2	↕	19'-8"	↕
DEADMAN					1	L15		44'-0"		23	J3	↓	10'-2"	Straight	23	J3	↓	10'-2"	Straight	23	J3	↓	10'-2"	Straight
8	B6	1"□	39'-0"	Straight	1	L17		41'-0"	Straight	11	U1	¾"φ	27'-1"	Bent	11	U1	¾"φ	27'-1"	Bent	11	U1	¾"φ	27'-1"	Bent
40	N2	½"φ	2'-6"	Straight	4	P1	⅝"φ	11'-0"	Bent	80	T1	½"φ	24'-6"	↑	80	T1	½"φ	24'-6"	↑	80	T1	½"φ	24'-6"	↑
3-1½"φ Anchor Bars, Upset ends & Turnbuckle					4	T5	½"φ	15'-6"	↑	180	T2	↕	22'-6"	↕	184	T2	↕	22'-6"	↕	196	T2	↕	22'-6"	↕
					4	T6	↑	14'-10"	↑	204	T3	↓	20'-6"	↓	204	T3	↓	20'-6"	↓	204	T3	↓	20'-6"	↓
					4	T7		14'-2"		96	T4	½"φ	16'-6"	Bent	96	T4	½"φ	16'-6"	Bent	96	T4	½"φ	16'-6"	Bent
					4	T8		13'-6"		54	J4	¾"φ	27'-0	Straight	54	J4	¾"φ	27'-0"	Straight	54	J4	¾"φ	27'-0"	Straight
					4	T9		12'-6"		1	N1	½"φ	5'-9"	Straight	1	N1	½"φ	5'-9"	Straight	1	N-1	½"φ	5'-9"	Straight
					4	T10	½"φ	11'-6"	↓																
					10	S1	⅝"φ	12'-8"	Bent																

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

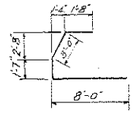
Note:
The following bars in the above list for Abut. #2 are in the curtain wall above the constr. Joint and are not included in the Substructure Contract:
3 B4, all of B12, B13, B14, B15, 3 B16, all of K1 and L2, 6 L5, all of L6, L7, L8, L10, L11, L12, L13, L17, P1 and S1.

As Built:

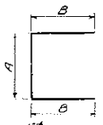
* Reinforcing steel revised to provide splices in Piers Nos. 1 to 4 inclusive at supplemental construction jts. permitted during Constr. as shown on sheet #4. See approved supplemental shop drawings, contractors nos. E 3969-1, E 3969-2, and E 3969-5 for revised lengths used.



⅝"K Bars

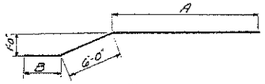


1"M1 Bar



½"T Bar

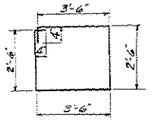
Type Bar	A	B
T1	9'-6	7'-6
T2	9'-6"	6'-6"
T3	7'-6"	6'-6"
T4	5'-6"	5'-6"
T5	3'-6"	6'-0"
T6	do	5'-8"
T7	do	5'-4"
T8	do	5'-0"
T9	do	4'-6"
T10	do	4'-0"



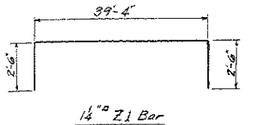
1"G Bars & 1¼"H Bars

Type Bar	A	B
G1	16'-0"	3'-4"
G2	39'-4"	do
G3	39'-11"	do
G4	42'-11"	do
G5	36'-4"	do
G6	45'-0"	do
H1	48'-0"	4'-8"

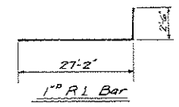
1"Q1 Bar



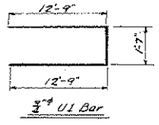
⅝"φ J1 Bar



1¼"□ Z1 Bar



1"□ R1 Bar



¾"φ U1 Bar

1"C Bars & ¾"φ F Bars

Type Bar	A	B	C
C1	26'-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

DESIGN BY FRANK D. McENTEER CONSULTING ENGINEER CLARKSBURG, W. Va.	Scale: None	DATE: Mar. 7, 1947
	Designed by K.H.J.	Checked by M.R.
	Drawn by M.P.	Checked by K.H.J.
	Traced by R.D.K.	Checked by K.H.J.

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

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

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

SECTION G-G THRU ℄ PIER
Scale: 1/4" = 1'-0"

℄ ELEVATION — SYMMETRICAL ABT ℄, EXCEPT AS NOTED
Scale: 1/4" = 1'-0"

PLAN AT TOP

NOTE:
All footings to be poured monolithically.

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"

THE STATE ROAD COMMISSION OF WEST VIRGINIA

TRUE BRIDGE OVER BLUESTONE RIVER

PROJECT #3494 SUMMERS COUNTY, W. VA.

PIERS

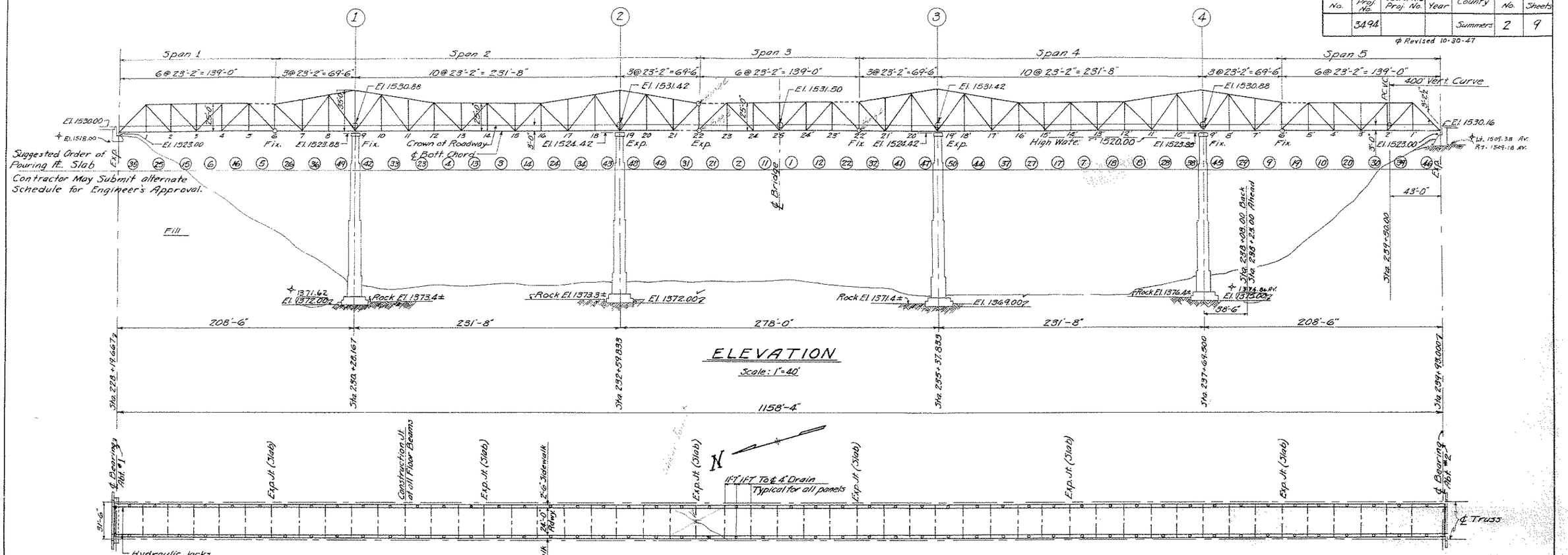
SUBSTRUCTURE CONTRACT #1764

DESIGN BY FRANK D. 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 R.D.H.		Checked by K.H.J.

Dist No.	State Proj. No.	Federal Aid Proj. No.	Fiscal Year	County	Sheet No.	Total Sheets
	3494			Summers	2	9

℄ Revised 10-30-47



NOTES:

Standard Specifications for Bridges, Jan. 1943 by the State Road Comission 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 #1 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.

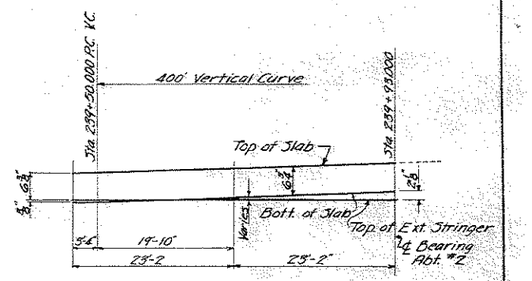
See sheets #3 and #5 of Substructure Plans for Abutment details and reinforcing bars for same.

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.



RISER DIAG. FOR VERT. CURVE
Not to Scale

REINFORCING BARS

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
3/4"℄	255		255
1"℄	3,763		3,763
1 1/4"℄	3,320		3,320
1 1/2"℄	754		754
	11,600	173,355	184,955

ESTIMATE

Item	Sub-Structure	Super-Structure	Total	Unit
7. Dry Excavation	325		325	c.y.
71. Class "A" Concrete Super-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: Struct. Steel		2,396,600	2,396,600 lbs.	Lump Sum
Cast Steel		12,000	12,000 lbs.	
Lead Plate		900	900 lbs.	
Bronze Plates		89	89 lbs.	
130 Jacking Arrangement		2	2	Lump Sum
86. Paint-Coat-Waterproofing	118.0		118.0	Sq. Yds.

℄ As Built

2-3-51 Structure Book: No 12854, 12855

℄ As Built

200.44
760.22
127.36
184.755
$354.000.00
$1300.00
92.00

THE STATE ROAD COMMISSION OF WEST VIRGINIA

TRUE BRIDGE over BLUESTONE RIVER

PROJECT #3494 SUMMERS CO., W.VA.

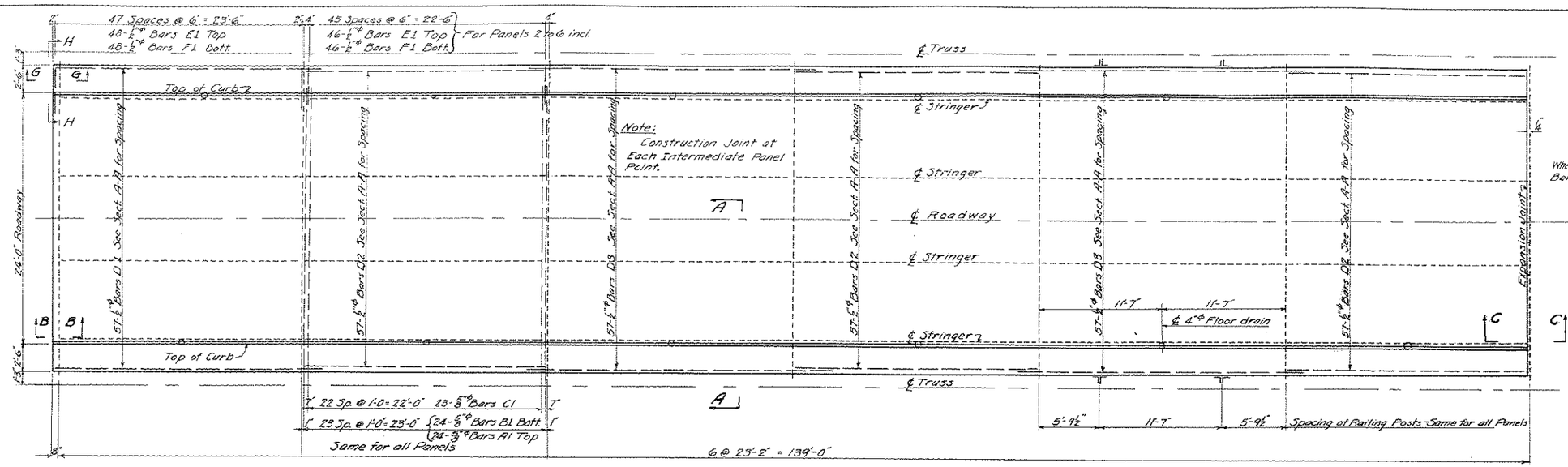
PLAN AND ELEVATION

SUPERSTRUCTURE CONTRACT #1764

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

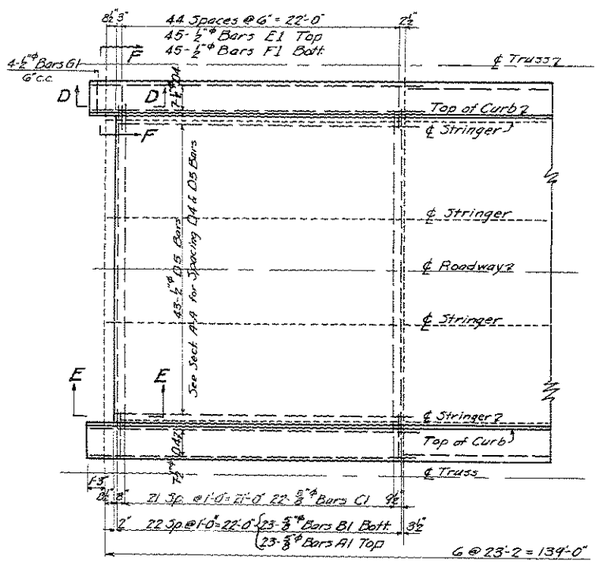
Scale: As Noted	Date: Aug. 25 1947		
Designed by	K.H.J.	Checked by	R.D.H.
Drawn by	M.E.B.	Checked by	K.H.J.
Traced by	M.E.B.	Checked by	N.D.W.

Dist. No.	State Proj. No.	Federal Aid Proj. No.	Fiscal Year	County	Sheet No.	Total Sheets
	3494			Summers	3	9



PLAN OF SLAB-SPAN #1 (#5 OPPOSITE HAND)

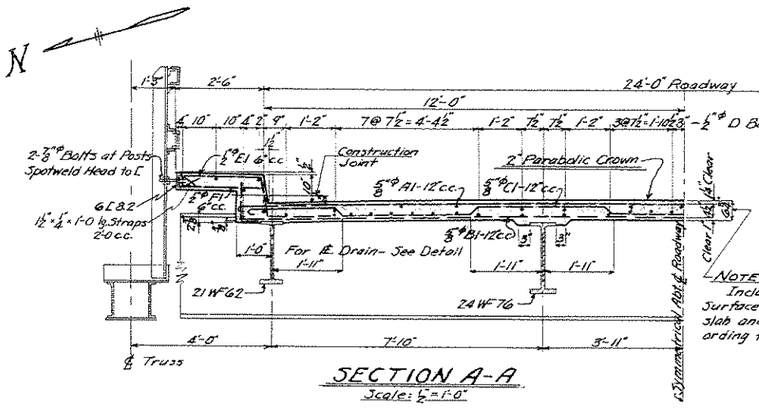
Scale: 3/16" = 1'-0"



PLAN OF SLAB-SPAN #3

Panels 2 to 6 Incl. Same as for Span #1

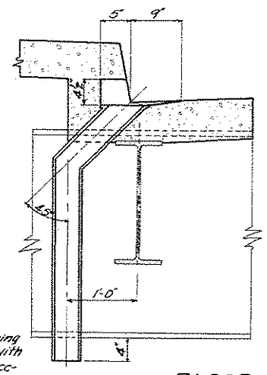
Scale: 3/16" = 1'-0"



NOTE:
Includes a ¼" wearing Surface Monolithic with slab and finished according to Specifications.

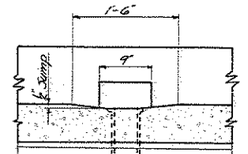
SECTION A-A

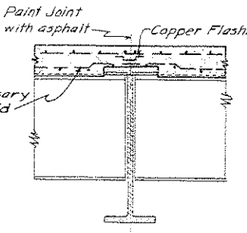
Scale: ½" = 1'-0"



FLOOR DRAIN

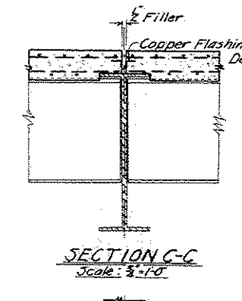
Scale: 1" = 1'-0"





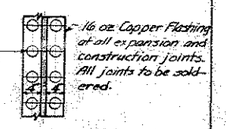
CONSTRUCTION JOINT

Scale: 3" = 1'-0"



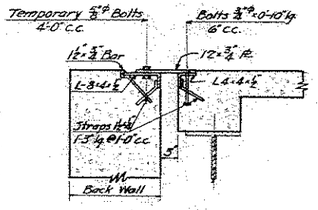
SECTION C-C

Scale: 3" = 1'-0"



DETAIL OF COPPER FLASHING

Scale: 3" = 1'-0"

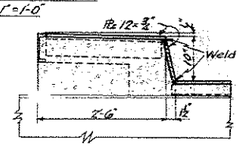


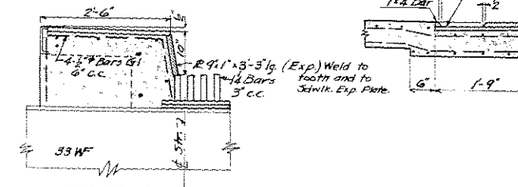
SECTION H-H

Scale: 3" = 1'-0"

SECTION G-G

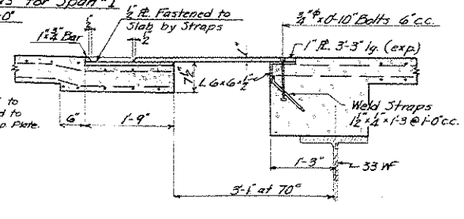
Scale: 3" = 1'-0"





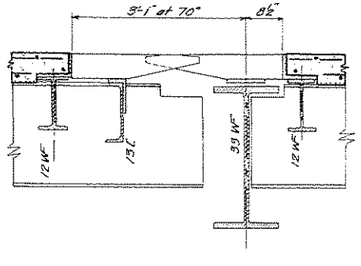
SECTION F-F

Scale: 3" = 1'-0"



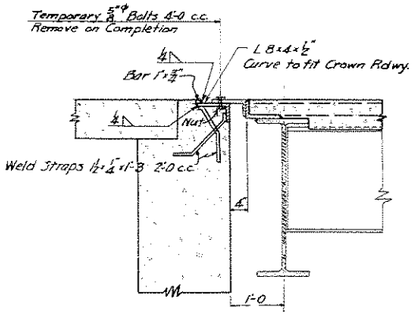
SECTION D-D

Scale: 3" = 1'-0"



SECTION E-E

Scale: 3" = 1'-0"



SECTION B-B

Scale: 3" = 1'-0"

For BAR SCHEDULE See Dwg. #4

THE STATE ROAD COMMISSION
OF WEST VIRGINIA

TRUE BRIDGE over BLUESTONE RIVER

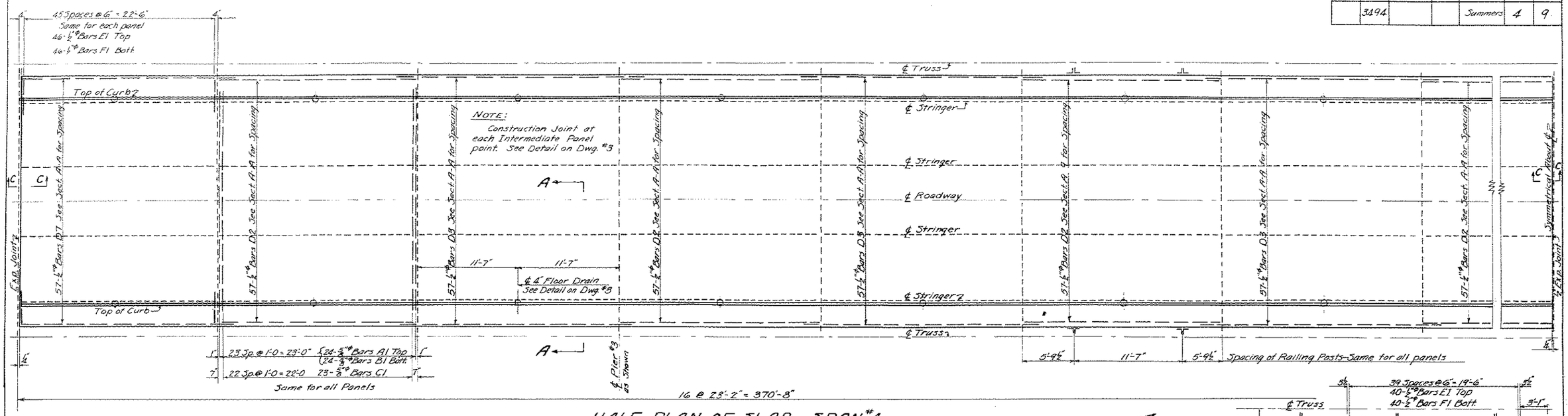
PROJECT #3494 SUMMERS COUNTY, W. VA.

CONCRETE DECK FOR 139'-0" SPAN SUPERSTRUCTURE CONTRACT #1764

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

Scale: As Noted		Date: Aug. 25, 1947	
Designed by	K.H.J.	Checked by	R.D.H.
Drawn by	R.D.H.	Checked by	K.H.J.
Traced by	M.E.B.	Checked by	N.D.W.

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

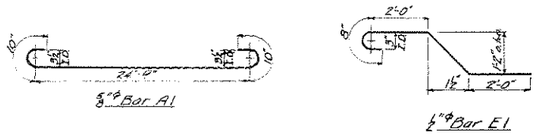


HALF PLAN OF SLAB - SPAN #4

Scale: 3/16" = 1'-0"

BILL OF REINFORCING STEEL

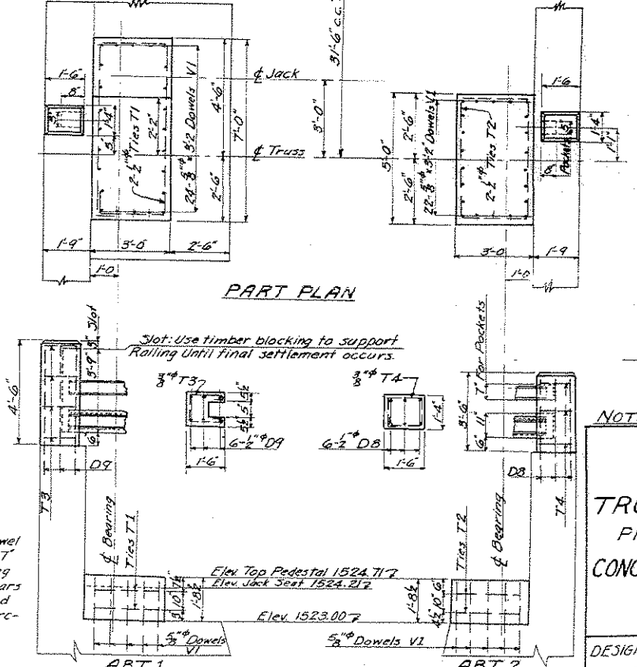
SPAN #1 & #5 - (One listed)					SPAN #2					SPAN #3					SPAN #4					POSTS & PEDESTALS				
No.	MK.	SIZE	LENGTH		No.	MK.	SIZE	LENGTH		No.	MK.	SIZE	LENGTH		No.	MK.	SIZE	LENGTH		No.	MK.	SIZE	LENGTH	
145	A1	⅜"ϕ	26'-5"	Bent	382	A1	⅜"ϕ	26'-5"	Bent	144	A1	⅜"ϕ	26'-5"	Bent	386	A1	⅜"ϕ	26'-5"	Bent	92	V1	⅜"ϕ	3'-2"	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	½"ϕ	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	½"ϕ	25'-4"	Str.	57	D7	½"ϕ	24'-10"	Str.	171	D2	½"ϕ	23'-0"	Str.	114	D7	½"ϕ	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	⅝"ϕ	4'-8"	Bent
114	D3	do	26'-6"	do	342	D3	do	26'-6"	do	14	D4	do	26'-0"	do	342	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	½"ϕ	5'-2"	Str.
556	F1	do	2'-9"	do	1462	E1	do	5'-10"	Bent	551	E1	do	5'-10"	Bent	1472	F1	do	2'-9"	do					
					1460	F1	do	2'-9"	do	550	F1	do	2'-9"	do										
										8	G1	do	4'-2"	do										



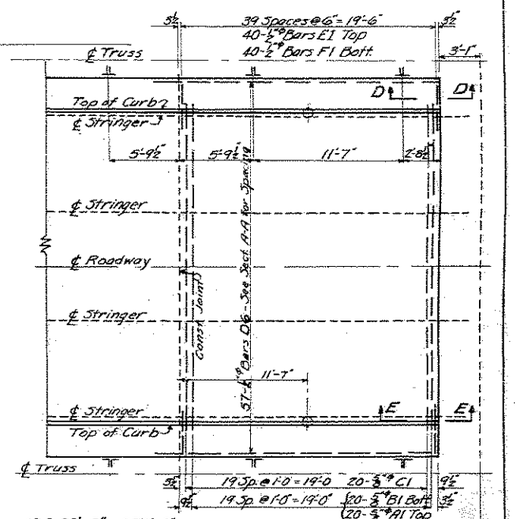
	A	B	C
T1	6'-9"	2'-9"	0'-4"
T2	4'-9"	2'-9"	0'-4"
T4	1'-4"	1'-2"	0'-4"

NOTE:
See Sheet #5 of Substructure plans for reinforcing bars in abutments which are included in Superstructure Contract

NOTE:
At Abut #2 the ⅝"ϕ Dowel Bars V1 are to be set 1'-7" into bridge seat. Drilling of holes and grouting bars in place is to be included in price bid for Reinforcing Bars, Item 78.



RAILING POSTS & PEDESTALS AT ABUTS. Scale: 3/8"=1'-0"
(Included in "Superstructure contract")



PLAN OF SLAB - SPAN #2

Scale: 3/16"=1'-0"

Panels 1 to 15 Incl. Same as Slab - Span 4

NOTE: For Sections A-A, C-C, D-D, & E-E: See Dwg. #3

THE STATE ROAD COMMISSION
OF WEST VIRGINIA

TRUE BRIDGE over BLUESTONE RIVER

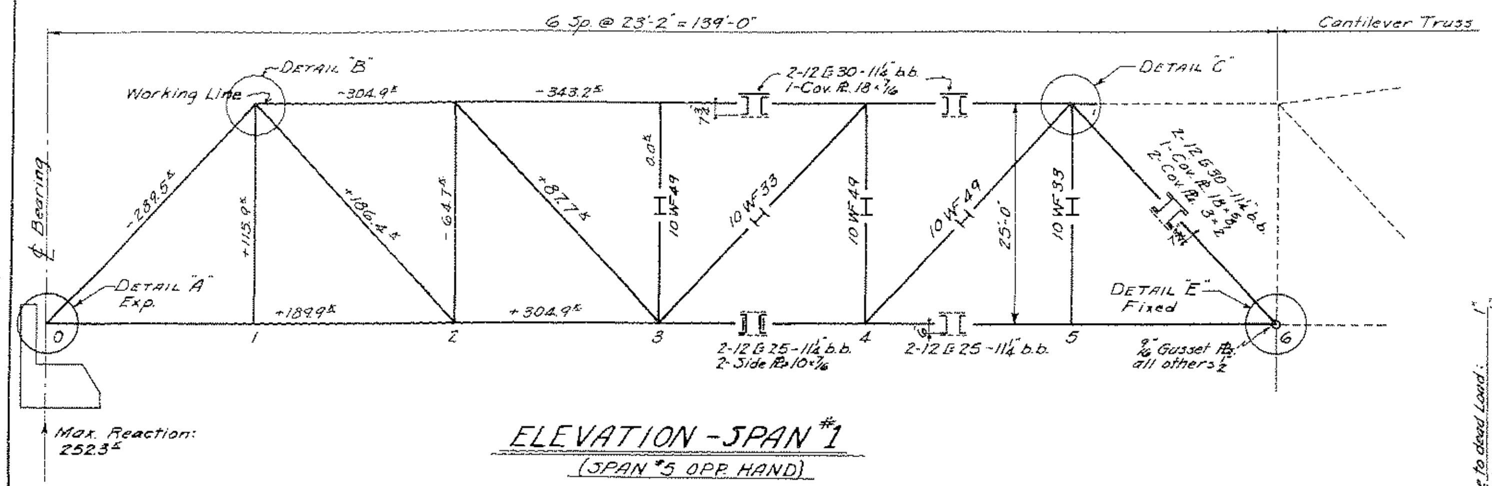
PROJECT #3494 SUMMERS CO., W. VA.

CONCRETE DECK DETAILS FOR CANTILEVER SPAN

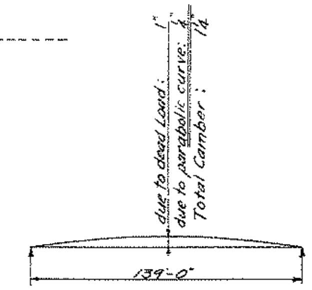
SUPERSTRUCTURE CONTRACT #1764

DESIGN BY FRANK D. McENTEER	Scale: As Noted	Date: Aug. 25, 1947
CONSULTING ENGINEER	Designed by K.H.J.	Checked by A.D.H.
Clarksburg, W. Va.	Drawn by M.E.B.	Checked by K.H.J.
	Traced by M.E.B.	Checked by N.D.W.

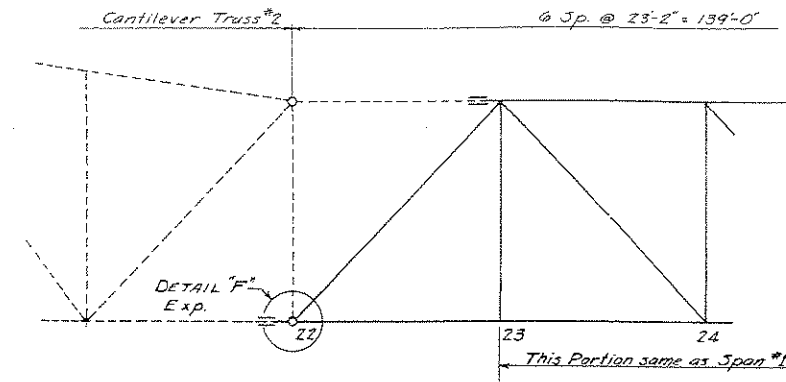
Dist. No.	State Proj. No.	Federal Aid Proj. No.	Fiscal Year	County	Sheet No.	Total Sheets
	3494			Summers	5	9



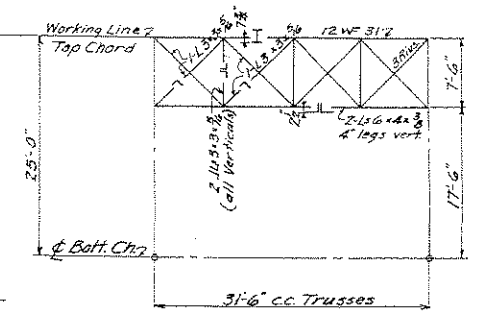
ELEVATION - SPAN #1
(SPAN #5 OPP. HAND)



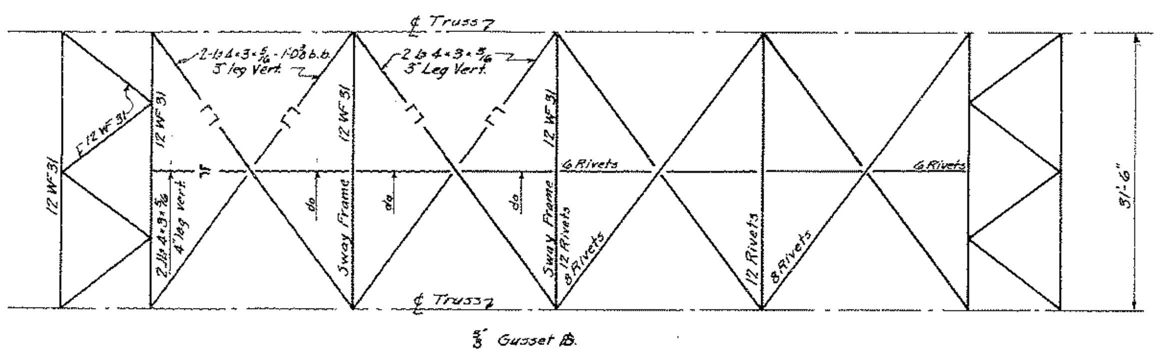
CAMBER DIAGRAM



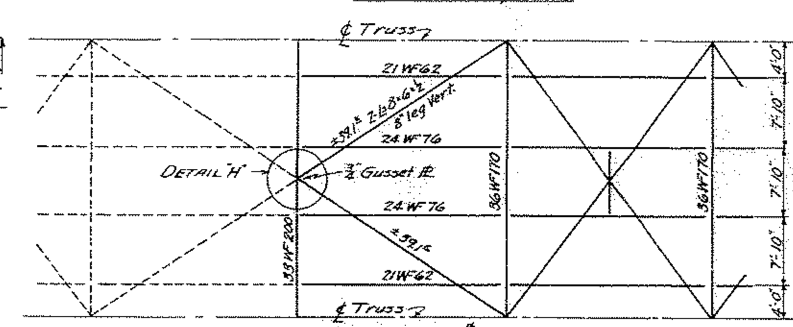
ELEVATION - SPAN #3
Stresses and Main Material Same as for Span #1.



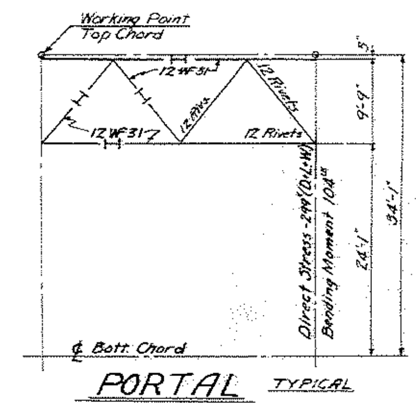
INTERMEDIATE SWAY FRAME
TYPICAL



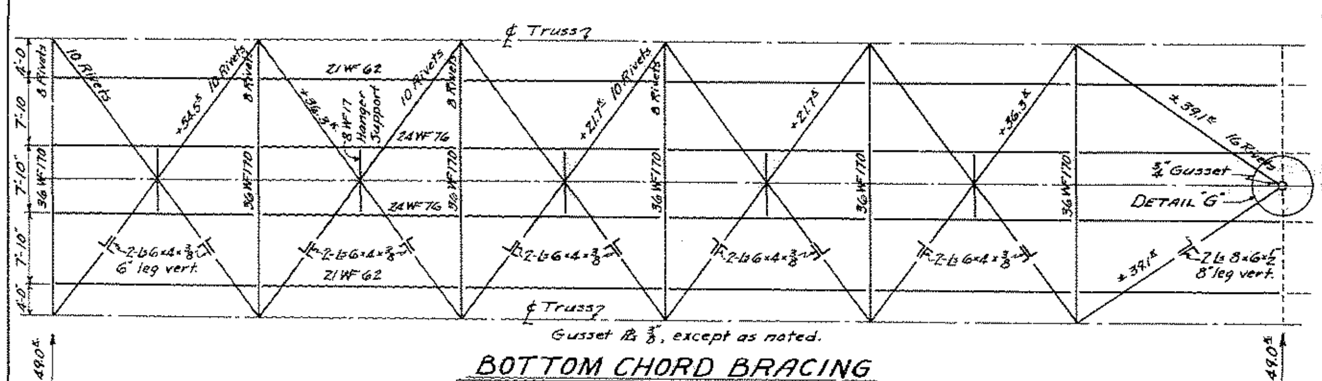
TOP CHORD BRACING
SPAN #1, 3, & 5



SPAN #3
BOTTOM CHORD BRACING



PORTAL TYPICAL



BOTTOM CHORD BRACING
SPAN #1 (SPAN #5 OPP. HAND)

STRESS SCHEDULE — Cantilever Span

Member	Dead Load	Sdwk. L.L.	Rdwy. L.L.	Imp.	Wind	Max. Tens. D+L+I	Max. Tens. D+L+I+W	Max. Comp. D+L+I	Max. Comp. D+L+I+W	Section	Area Gross	Area Net	Min. Rad. of Gyr. r	l/r	Tension Obt'd.	Tension Allow.	Compression Obt'd.	Compression Allow.
L_6L_7	—	—	—	—	—	0	0	0	0	2-13 [35	20.48	—	4.95	56.2	0	—	0	—
L_7L_9	+327.0	-14.6	-112.5	-18.2	±152.5	—	—	472.5	630.8	2-13 [35, 2-Sd. Pl. 10×5/8	35.48	—	4.2	66.0	—	—	17.75	17.42
L_9L_{11}	-355.4	-24.7 / +8.2	-177.0 / +59.2	-24.7 / +8.3	±158.5	—	—	581.4	739.9	2-13 [35, 2-Sd. Pl. 10×3/4	42.98	—	4.0	69.5	—	—	17.25	17.25
$L_{11}L_{13}$	-110.0	-31.3 / +28.4	-209.0 / +174.1	-29.3 / +28.4	±158.5	*•218.4	456.2 / •376.9	452.6	*690.4	2-Sd. Pl. 10×3/8	42.98	32.44	4.0	69.5	14.1	22.5	16.10	17.25
$L_{13}L_{15}$	-2.0	-31.3 / +29.0	-194.5 / +207.3	-27.2 / +29.0	±158.5	*•391.4	629.1 / •549.7	*382.5	*620.2	2-13 [35, 2-Sd. Pl. 10×3/8	35.48	28.30	4.2	66.0	22.3	22.5	17.41	17.42
U_5U_8	+159.0	+7.3	+58.5	+10.2	±6.4	235.0	241.4	—	—	2-13 [31.8, 1-C.Pl. 22×½	29.60	24.24	5.08	54.8	9.69	18.0	—	—
U_8U_9	+509	+22.6	+167.5	+25.2	±14.3	724.3	738.6	—	—	2-13 [40, 1-C.Pl. 22×½, 1-C.Pl. 22×7/16, 2-C.Pl. 4×3/8	49.04	40.68	—	—	17.79	18.0	—	—
U_9U_{10}	do	do	do	do	do	do	do	—	—		do	do	—	—	do	do	—	—
U_6U_{12}	+225.0	+27.9 / -16.7	+193.5 / -118.5	+27.1 / -16.7	±33.3	473.5	506.8	—	—	2-13 [40, 1-C.Pl. 22×½	34.42	27.95	—	—	16.90	18.0	—	—
$U_{12}U_{14}$	+26.8	+31.3 / -27.8	+201.8 / -199.0	+28.3 / -27.9	±39.7	*406.8	*465.7	×•353.9	×•413.7	2-13 [31.8, 1-C.Pl. 22×½	29.60	24.24	5.08	54.8	16.82	18.0	12.00	14.24
U_6L_7	-231.8	-12.4	-93.4	-16.3	—	—	—	353.9	—	2-13 [50	29.28	—	4.62	88.5	—	—	[illegible]	[illegible]
L_7U_8	+286.0	+14.2	+105.3	+17.0	—	422.5	—	—	—	2-13 [50	29.28	24.60	—	—	17.2	18.0	—	—
U_8L_9	-299.7	-14.1	-103.1	-15.5	—	—	—	432.4	—	2-13 [40, 4-C.Pl. 4×5/8	33.42	—	5.5	85.8	—	—	12.95	13.15
L_9U_{10}	-251.3	+4.4 / -14.8	+33.6 / -108.4	+8.7 / -15.2	—	—	—	389.7	—	2-13 [40, 4-C.Pl. 4×7/16	30.42	—	5.3	88.7	—	—	12.80	13.02
$U_{10}L_{11}$	+224.4	-14.7 / -5.4	+111.0 / -41.4	+15.6 / -10.7	—	365.7	—	—	—	2-13 [40	23.42	21.18	—	—	17.38	18.0	—	—
$L_{11}U_{12}$	-166.0	+5.6 / -12.6	+45.6 / -100.3	+11.8 / -14.1	—	—	—	293.0	—	2-13 [40	23.42	—	4.82	84.8	—	—	12.50	13.20
$U_{12}L_{13}$	+125.5	+11.9 / -6.6	+84.8 / -45.5	+11.9 / -6.6	—	234.1	—	—	—	2-12 [30	17.58	14.58	—	—	16.10	18.0	—	—
$L_{13}U_{14}$	-42.3	+8.0 / -9.8	+56.8 / -70.0	+8.0 / -9.8	—	×•43.2	—	×131.9	—	2-12 [25	14.64	12.39	4.43	92.3	3.50	18.0	9.00	12.87
U_6L_6	+192.5	+9.2	+77.6	+14.2	—	293.5	—	—	—	2-13 [35	20.48	17.80	—	—	16.50	18.0	—	—
U_7L_7 $U_{11}L_{11}$	—	—	—	—	—	0	—	0	—	12 WF 53	15.59	—	2.9	117.0	0	—	0	—
U_8L_8 $U_{10}L_{10}$	+61.0	+3.5	+47.3	+13.5	—	124.3	—	—	—	12 WF 40	11.77	9.73	—	—	12.80	18.0	—	—
U_9L_9	-145.4	-6.5	-47.9	-7.2	-40.3	—	—	207.0	247.3	2-13 [50, 2-Sd. Pl. 10×3/8	44.32	—	4.12	102.0	—	—	*5.60	15.50
$U_{12}L_{12}$ $U_{14}L_{14}$	+61.0	+3.5	+46.3	+13.5	—	124.3	—	—	—	12 WF 36	10.59	8.43	—	—	14.75	18.0	—	—
$U_{15}L_{15}$	—	—	—	—	—	0	—	0	—	12 WF 53	15.59	—	2.9	103.5	—	—	0	—

STRESS SCHEDULE — Simple Span

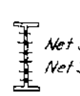
Member	Dead Load	Sdwk. L.L.	Rdwy. L.L.	Imp.	Wind	Max. Tens. D-L-I	Max. Tens. D-L-I+W	Max. Comp. D-L-I	Max. Comp. D-L-I+W	Section	Area Gross	Area Net	Min. Rad. of Gyr. r	l/r	Tension Obt'd.	Tension Allow.	Compression Obt'd.	Compression Allow.
L_0U_1	-182.0	-10.8	-81.2	-15.5	±9.5	—	—	289.5	299.0	2-12 [30, 1-C.Pl. 18×5/8, 2-C.Pl. 3×½	31.83	—	5.0	84.8	—	—	*9.48	16.67
U_1U_2	-198.0	-11.7	-80.0	-15.2	±3.9	—	—	304.9	308.8	2-12 [30, 1-C.Pl. 18×7/16	25.46	—	4.55	61.1	—	—	12.00	14.07
U_2U_3	-223.0	-13.2	-89.9	-17.1	±5.2	—	—	343.2	348.4	do	25.46	—	4.55	61.1	—	—	13.51	14.07
L_0L_2	+123.2	+7.3	+49.9	+9.5	±4.8	189.9	194.7	—	—	2-12 [25	14.66	11.46	—	—	16.60	18.0	—	—
L_2L_3	+198.0	+11.7	+80.0	+15.2	±5.4	304.9	310.3	—	—	2-12 [25, 2-Sd. Pl. 10×7/16	23.41	17.59	—	—	17.32	18.0	—	—
U_1L_2	+109.0	-0.4 / +6.9	-9.4 / +58.2	-2.8 / +12.3	—	°260.8 / 186.6	—	—	—	10 WF 49	14.40	12.16	—	—	°21.40	24.0	—	—
U_2L_3	+36.4	-1.7 / +3.9	-22.2 / +58.2	-6.2 / +9.2	—	°136.6 / 82.7	—	—	—	10 WF 33	9.71	7.98	2.25	184	°17.20	24.0	—	—
U_4L_3	+53.2	+3.1	+46.4	+13.2	—	°175.2 / 115.9	—	—	—	do	9.71	7.98	—	—	°22.00	24.0	—	—
U_2L_2	-26.9	+1.3 / -2.8	+16.2 / -28.2	+4.5 / -6.8	—	—	—	64.7	—	10 WF 49	14.40	—	2.54	118.0	—	—	4.50	11.50
U_3L_3	0	—	—	—	—	—	—	—	—	do	14.40	—	2.54	118.0	—	—	—	—

• 70% of Dead Load only.
× 50% of Smaller Stress added — See Specs. 4.7.6
* Exclusive of Bending
° Including Overload — See Specs. 4.2.4

NOTE: Stresses on truss members given thus, 472k are for D.L.+L.L.+Imp. Stresses in parenthesis thus, (631k) also include 30#/□' Wind.

DESIGN DATA: - Live Load H15-S12

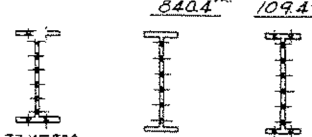
	Roadway Stringers Moments	Roadway Stringers Shears	Sidewalk Stringers Moments	Sidewalk Stringers Shears	Floor Beams Moments	Floor Beams Shears
Dead Load	57.9'k	10.2k	60.6'k	10.0k	336.1'k	43.0k
Sidewalk L.L.	0.0	0.0	17.0	2.9	19.8	5.7
Roadway L.L.	134.3	28.5	71.2	14.3	372.5	46.7
Impact	40.3	8.6	21.4	4.3	112.0	14.0
	232.5'k	47.3k	170.2'k	31.5k	840.4'k	109.4k



24 WF 76
Net S.M. Req'd.: 155 in³
Net S.M. Provided: 168 in³

21 WF 62
Net S.M. Req'd.: 113.3 in³
Net S.M. Provided: 121.6 in³

All Rivets ⅞"φ



33 WF 200 Bent 22
36 WF 170 All Bents Except 6, 22, 22', 6'
36 WF 194 - Bents 6, 22, 6'

Net S.M. Req'd.: 560 in³
Net S.M. Provided:
33 WF 200 584 in³
36 WF 170 564 in³
36 WF 194 560 in³

THE STATE ROAD COMMISSION
OF WEST VIRGINIA

TRUE BRIDGE OVER BLUESTONE RIVER

PROJECT #3494 SUMMERS CO., W. VA.

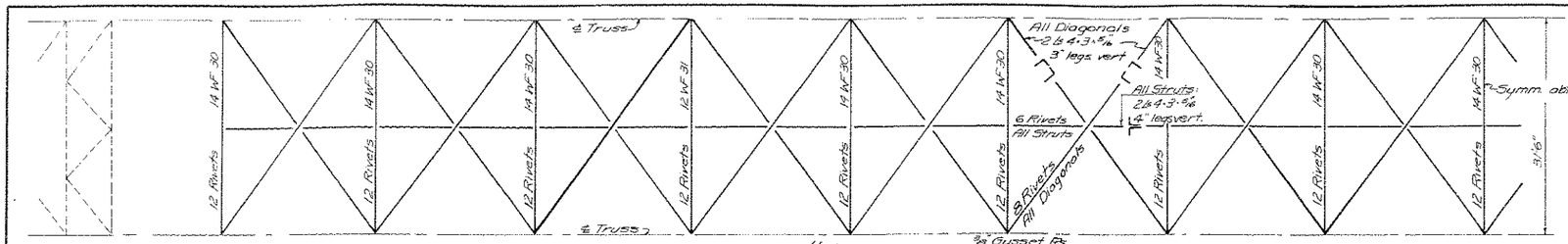
STRESS SHEET FOR 139'-0" SPANS

SUPERSTRUCTURE CONTRACT #1764

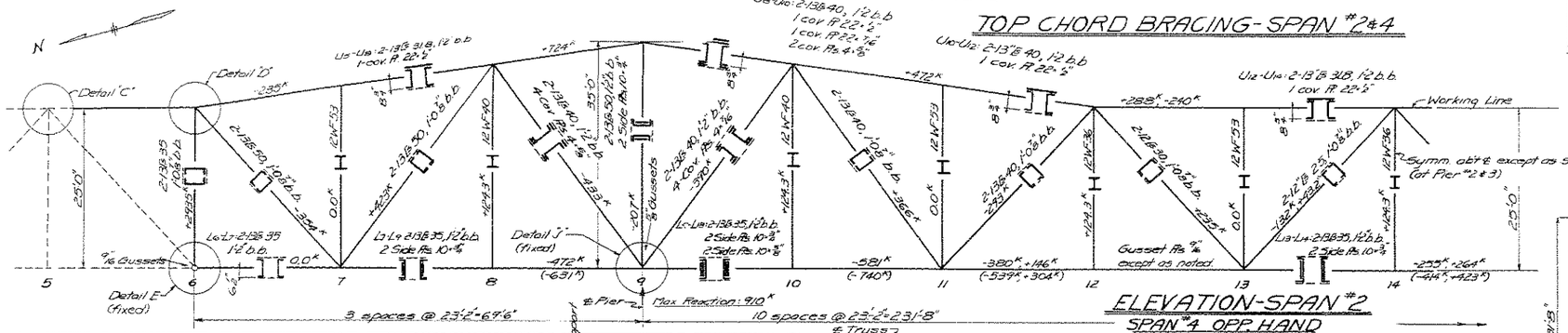
DESIGN BY FRANK D. McENTEER
CONSULTING ENGINEER
Clarksburg, W. Va.

Scale: 1"=10'		Date: Aug. 25, 1947	
Designed by	KHJ.	Checked by	RDH.
Drawn by	KHJ.	Checked by	RDH.
Traced by	RDH	Checked by	MEB.

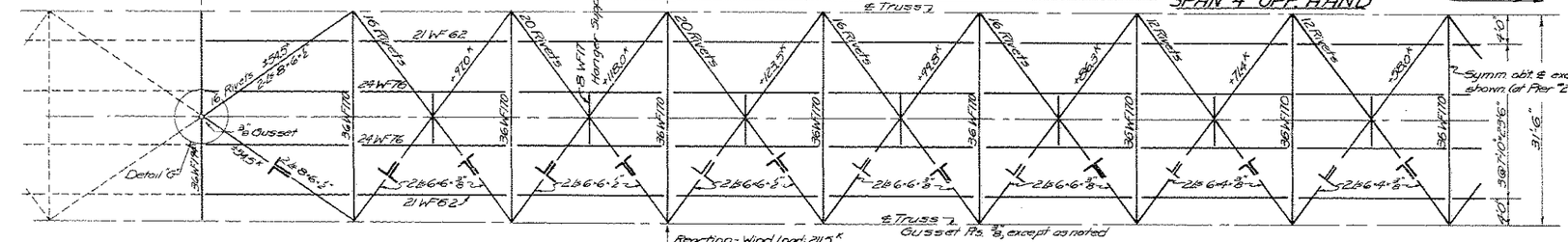
Dist. No	State Proj. No.	Federal Aid Proj. No.	Fiscal Year	County	Sheet No.	Total No. Sheets
	3494			Summers	6	9



TOP CHORD BRACING - SPAN #2 & 4



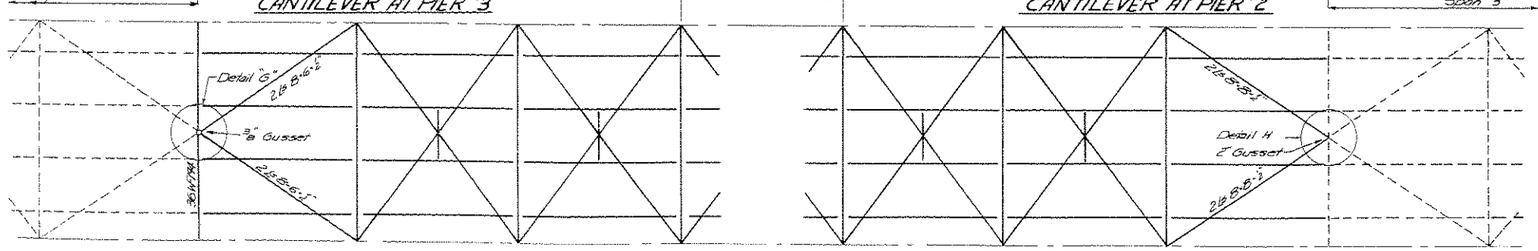
ELEVATION - SPAN #2
SPAN #4 OPP. HAND



BOTTOM CHORD BRACING - SPAN #2
SPAN #4 OPP. HAND

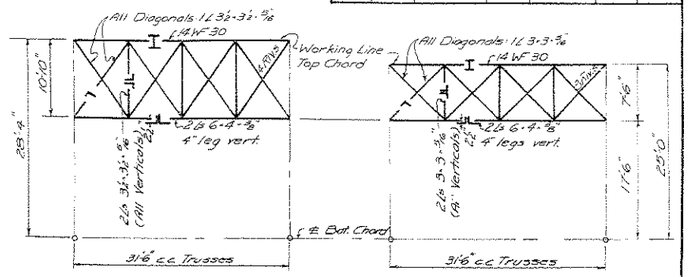
ELEVATION - SPAN #4
CANTILEVER AT PIER #3

ELEVATION - SPAN #2
CANTILEVER AT PIER #2



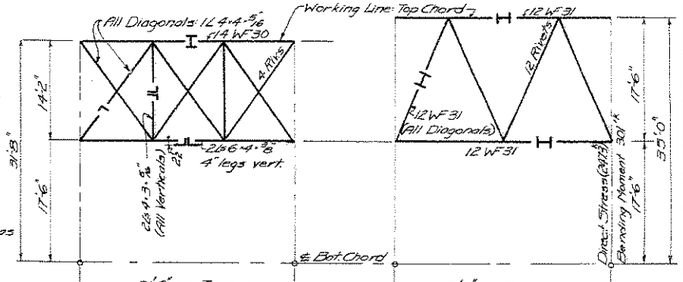
BOTTOM CHORD BRACING

BOTTOM CHORD BRACING



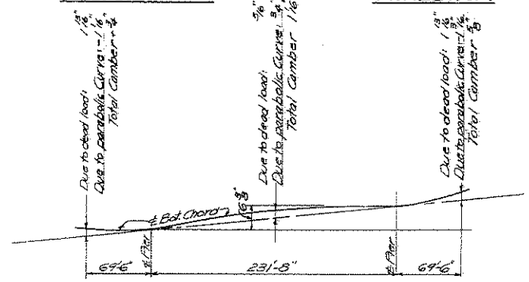
SWAY FRAME
PANEL NO. 7 & 11

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 412K are for D.L.+L.L.& Imp. Stresses in parenthesis, thus (631K) also include 30 lb/sq ft Wind. For Stresses in Stringers, Floor Beams & Trusses see Dwg. #5.

7/8" ø Rivets

THE STATE ROAD COMMISSION OF WEST VIRGINIA

TRUE BRIDGE OVER BLUESTONE RIVER

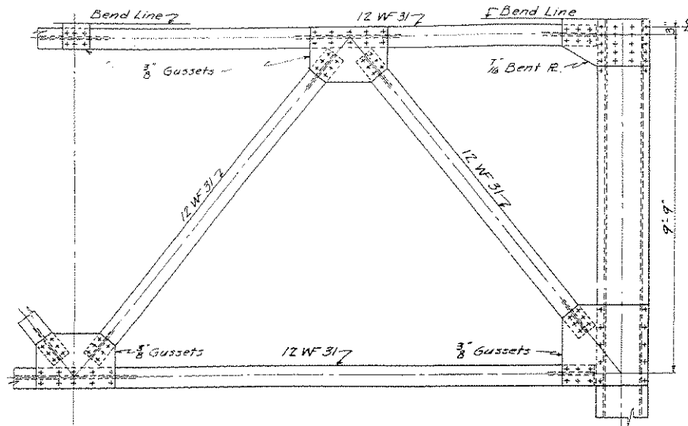
PROJECT #3494 SUMMERS CO., W.VA.

STRESS SHEET FOR CANTILEVER SPANS

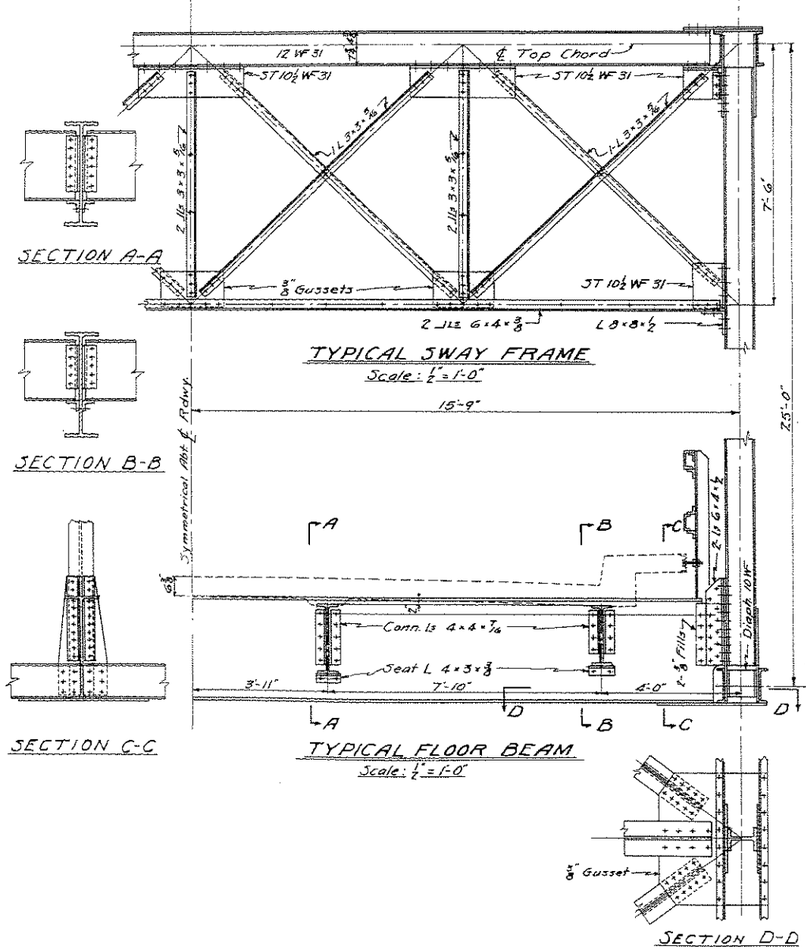
SUPERSTRUCTURE CONTRACT #1764

DESIGN BY FRANK D. McENTEER CONSULTING ENGINEER Clarksburg, W. Va.	Scale: 1"=10'-0"		Date: Aug. 25, 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" = 1'-0"



SECTION A-A

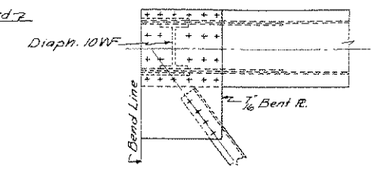
SECTION B-B

SECTION C-C

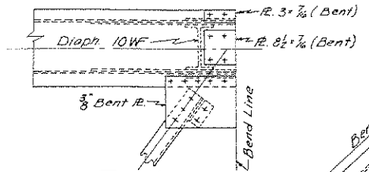
TYPICAL SWAY FRAME
Scale: ½" = 1'-0"

TYPICAL FLOOR BEAM
Scale: ½" = 1'-0"

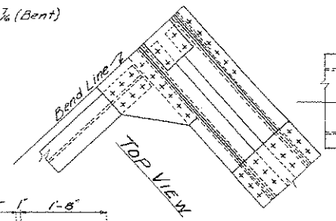
SECTION D-D

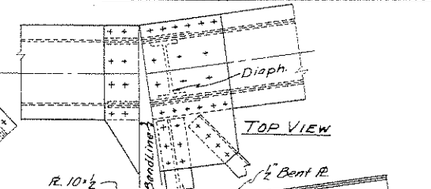


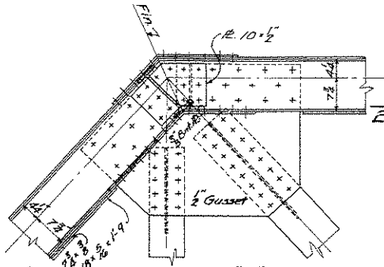
TOP VIEW



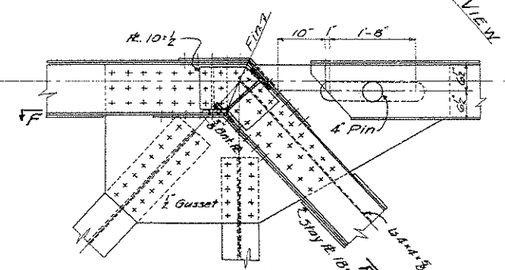
TOP VIEW



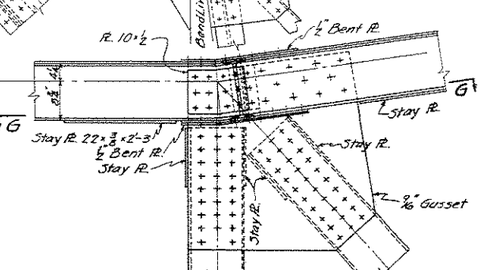




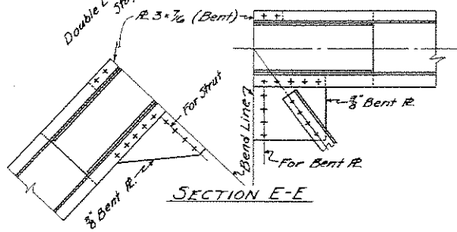
DETAIL "B"



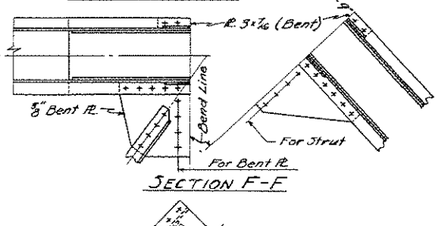
DETAIL "C"



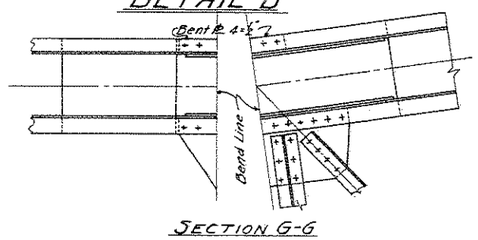
DETAIL "D"



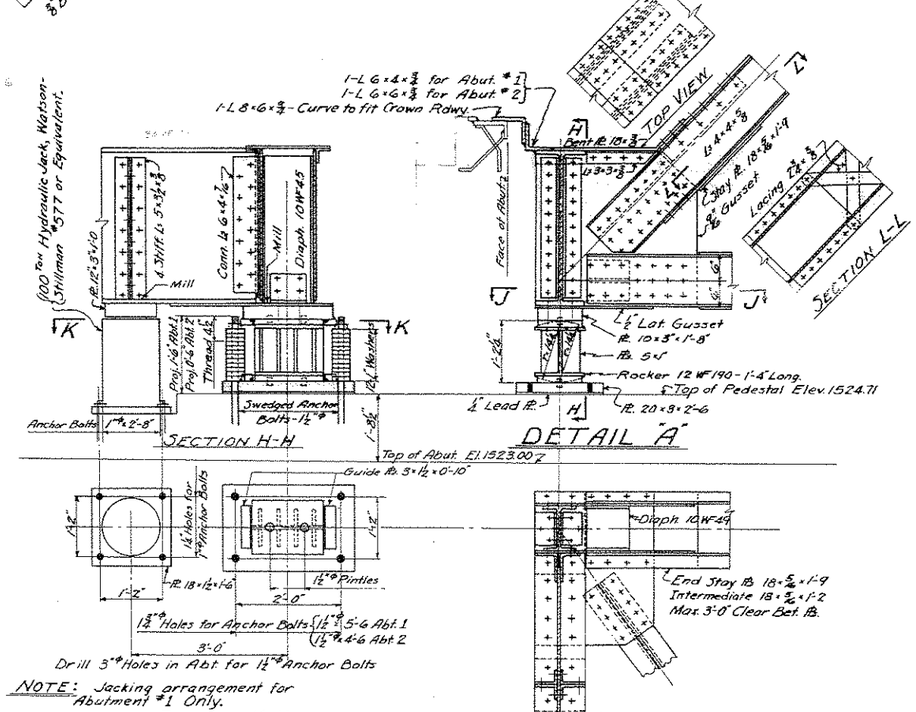
SECTION E-E



SECTION F-F



SECTION G-G



THE STATE ROAD COMMISSION
OF WEST VIRGINIA

TRUE BRIDGE over BLUESTONE RIVER

PROJECT #3494 SUMMERS CO., W. VA.

TYPICAL STEEL DETAILS 1 or 2

SUPERSTRUCTURE CONTRACT #1764

DESIGN BY FRANK D. McENTEER, CONSULTING ENGINEER, Clarksburg, W. Va.	Scale: ¾" = 1'-0" Unless Noted	Date: Aug. 25, 1947
	Designed by K.H.J.	Checked by R.D.H.
	Drawn by R.D.H.	Checked by K.H.J.
	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 Sheets
	3494			Summers	8	9

DETAIL "I"

SECTION A-A

DETAIL "F"

SECTION B-B

DETAIL "K"

DETAIL "J"

SECTION G-G

DETAIL "E"

SECTION H-H

SECTION J-J

SECTION D-D

SECTION C-C

PLAN OF 14" FIN PL. IN STR. POCKET

DETAIL "G"

SECTION K-K

DETAIL "H"

PART PLAN EXP. DEVICE

SECTION Z-Z

TYPICAL RAILING DETAILS

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

NOTE: Drill 3½" Holes in Pier for 2" Anchor Bolts.

THE STATE ROAD COMMISSION OF WEST VIRGINIA

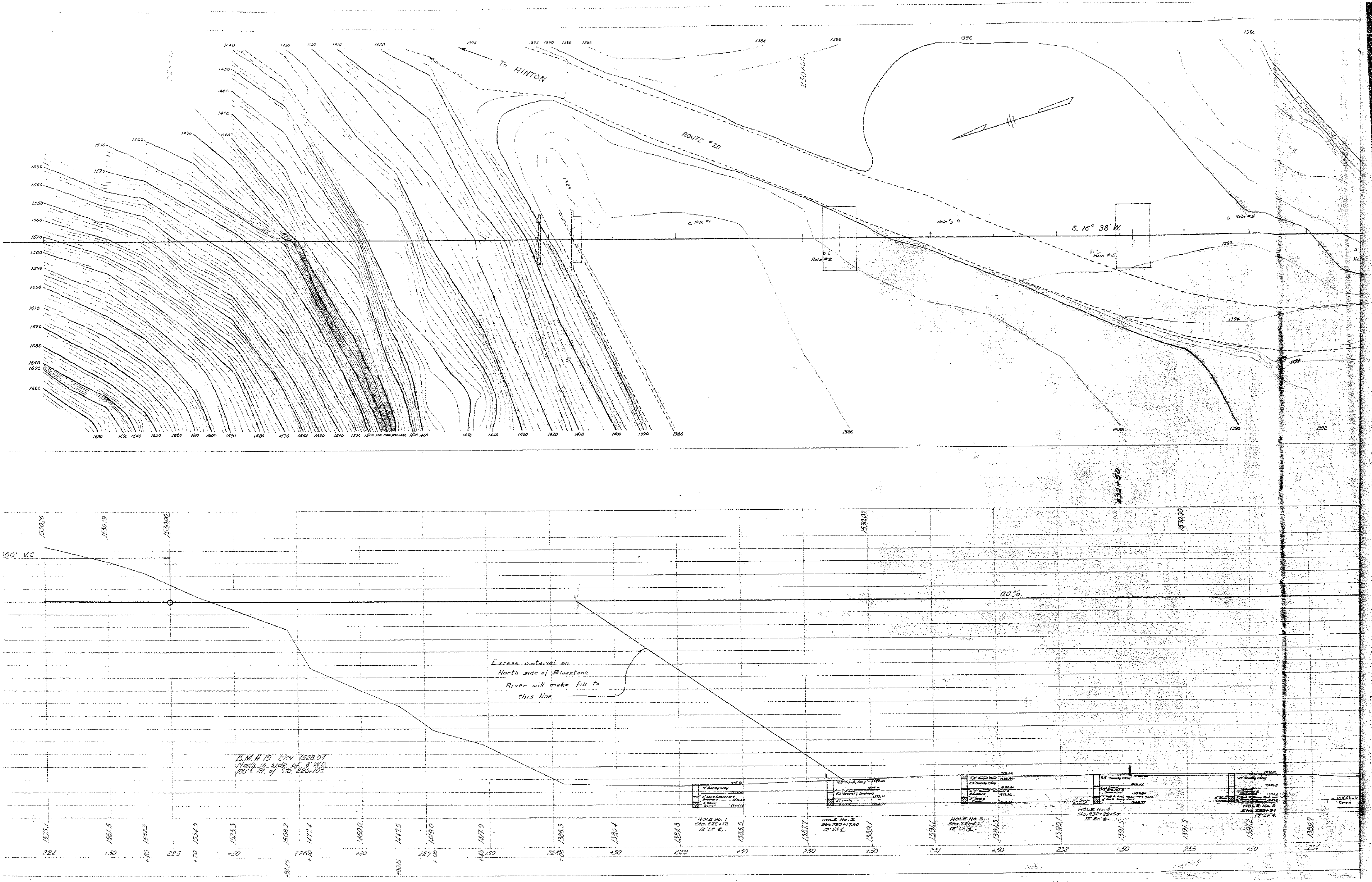
TRUE BRIDGE over BLUESTONE RIVER

PROJECT #3494 SUMMERS CO., W.VA.

TYPICAL STEEL DETAILS 2 of 2

SUPERSTRUCTURE CONTRACT #1764

DESIGN BY FRANK D. McENTEER CONSULTING ENGINEER Clarksburg, W.Va.	Scale: ¾" = 1'-0"		Date: Aug. 25, 1947	
	Designed by	K.H.J.	Checked by	R.D.H.
	Drawn by	R.D.H.	Checked by	K.H.J.
	Traced by	N.D.W.	Checked by	R.D.H.


To HINTON
ROUTE #20
230+00
Hole #1
Hole #2
Hole #3
Hole #4
Hole #5
S. 16° 38' W.
500' V.C.
0.0%
1530.26
1530.19
1530.00
1530.00
1530.00
232+50
Excess material on
North side of Bluestone
River will make fill to
this line
B.M. # 19 Elev. 1528.07
Nails in side of 8" W.O.
100'± Rt. of Sta. 226+10±
HOLE No. 1
Sta. 229+12
12' Lt. ℄.
HOLE No. 2
Sta. 230+17.50
12' Rt. ℄.
HOLE No. 3
Sta. 231+23
12' Lt. ℄.
HOLE No. 4
Sta. 232+29+50
12' Rt. ℄.
HOLE No. 5
Sta. 233+34
12' Lt. ℄.
1573.1
1561.5
1552.3
1534.3
1523.3
1508.2
1477.4
1460.0
1447.5
1429.0
1417.9
1386.3
1385.4
1384.8
1385.5
1387.7
1389.1
1391.1
1391.3
1390.1
1391.5
1391.5
1391.2
1389.7
224
+50
+80
225
+20
+50
+91.25
226
+10
+50
+80.15
227
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+50
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+50
229
+50
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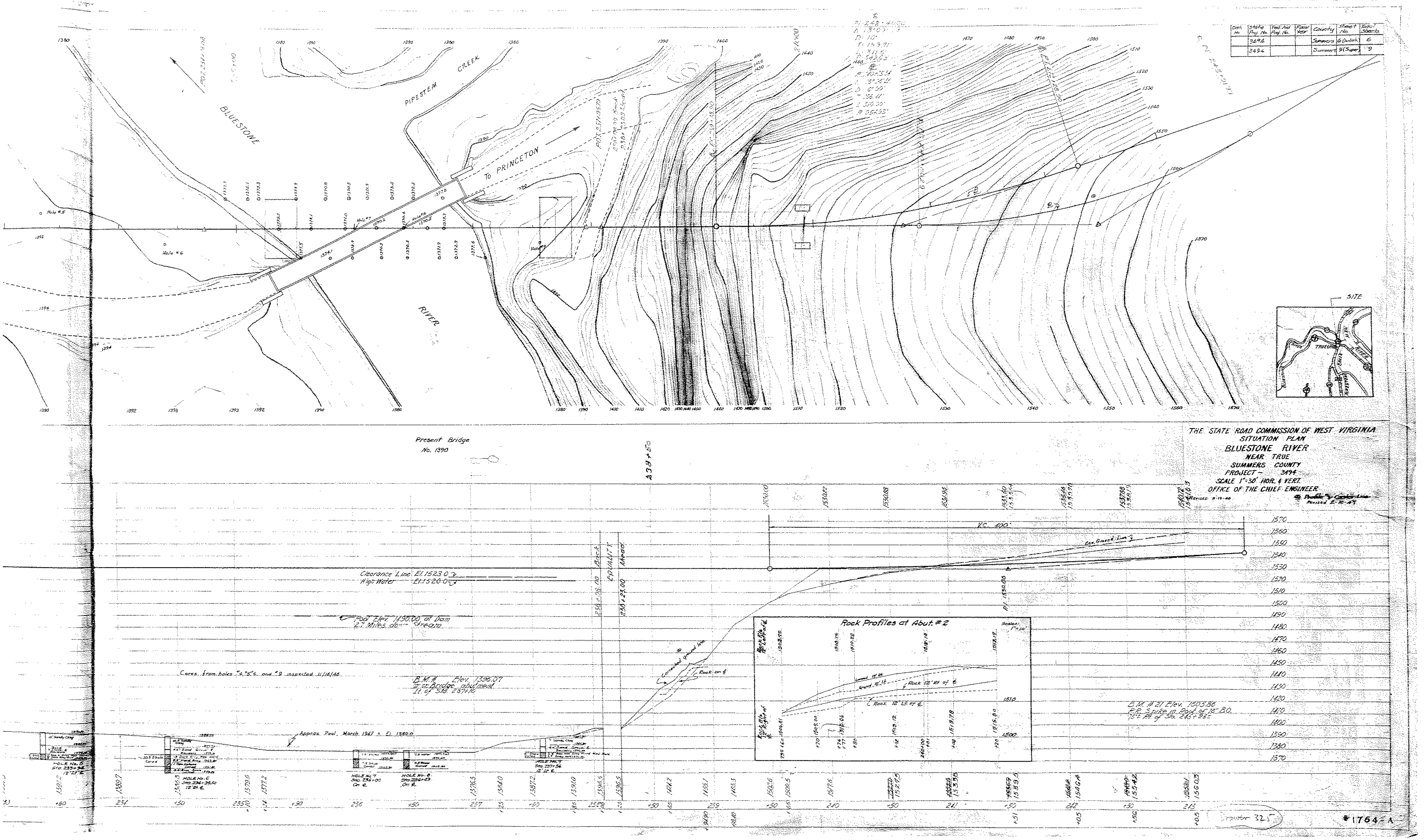
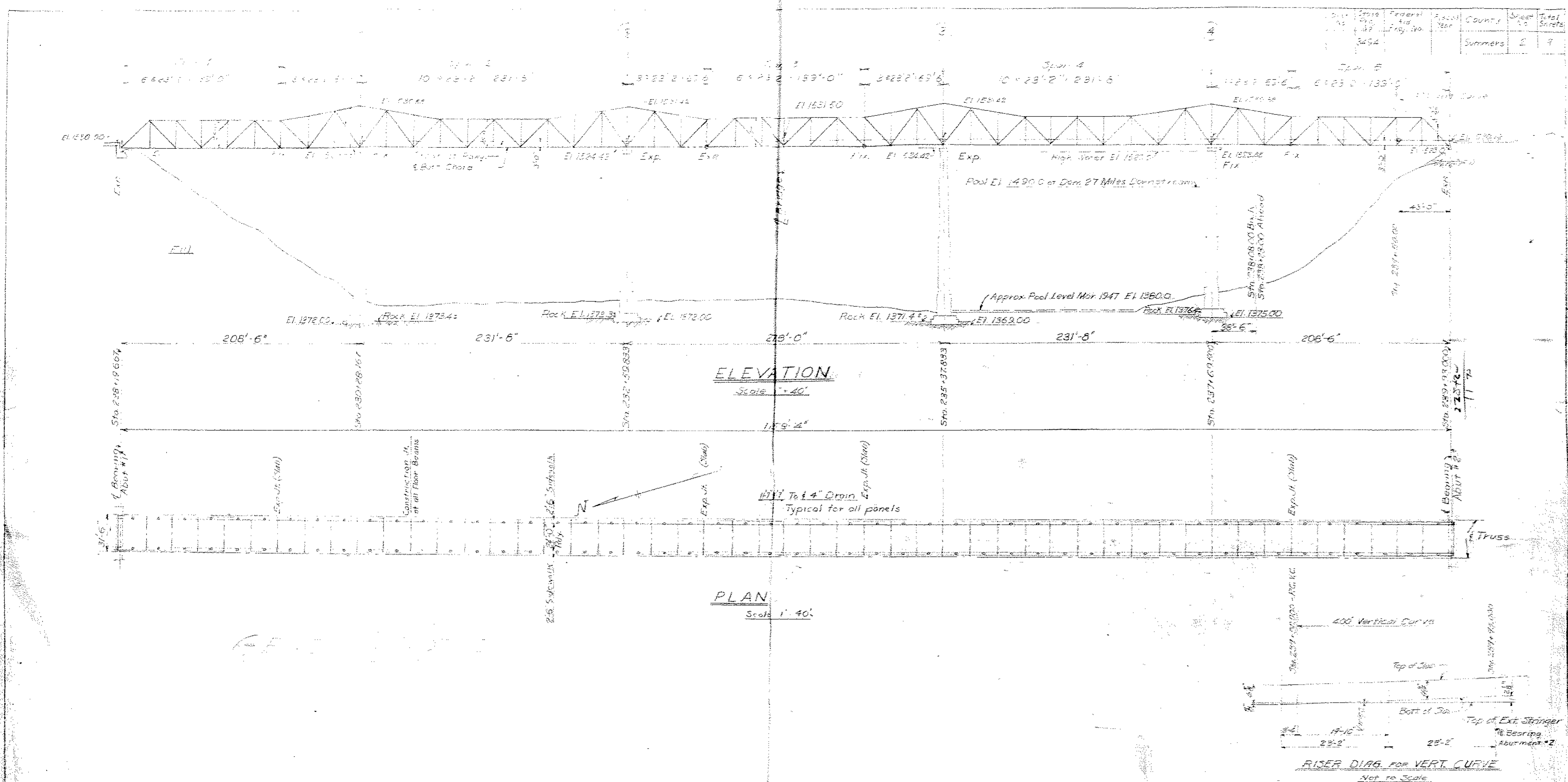
+50
232
+50
233
+50
234


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
Revised 2-10-47
Dist. No.
State Proj. No.
Fed. Aid Proj. No.
Fiscal Year
County
Sheet No.
Total Sheets
3494
Summers
6 (Substr.)
6
3494
Summers
9 (Super.)
9
BLUESTONE
RIVER
PIPESTEM CREEK
To PRINCETON
SITE
TRUE (P.O.)
NEW RIVER
Hole #5
Hole #6
Hole #7
Hole #8
Present Bridge
No. 1390
Clearance Line El. 1523.0
High Water El. 1520.0
Pool Elev. 1490.00 at Dam
2.7 Miles down Stream
Cores from holes #4, #5, and #9 inspected 11/16/46
B.M. # Elev. 1396.07
at Bridge abutment
Lt. of Sta. 237+10
Approx. Pool, March 1947 = El. 1380.0
EQUALITY
238+98.00 Back
238+23.00 Ahead
Corrected ground line
Rock on ℄
V.C. 400'
P.I. 1530.00
Rock Profiles at Abut. #2
Scales: 1"=10'
Rock 12' Rt of ℄
Rock 12' Lt of ℄
B.M. # 21 Elev. 1503.86
R.R. Spike in Root of 18" B.O.
75' Rt of Sta. 245+25
HOLE No. 5
Sta. 233+94
12' Lt ℄
HOLE No. 6
Sta. 234+39.50
12' Rt ℄
HOLE No. 7
Sta. 236+00
On ℄
HOLE No. 8
Sta. 236+43
On ℄
HOLE No. 9
Sta. 237+56
12' Lt ℄
Drawer 325
#1764-A



THE STATE ROAD COMMISSION
OF WEST VIRGINIA

TRUE BRIDGE OVER BLUESTONE RIVER

PROJECT #3494 SUMMERS COUNTY

PLAN AND ELEVATION

SUPERSTRUCTURE CONTRACT #1764

DESIGN BY FRANK D. McENTEER
Consulting Engineer
Clarksburg, W. Va.

Scale: As Shown	Date:
Designed by	Checked by
Drawn by	Checked by
Traced by	Checked by

DWK. 343

Dist. No.	State Proj. No.	Federal Aid Proj. No.	Fiscal Year	County	Sheet No.	Total Sheets
	3194			Summers	7	9

47 Spaces @ 6" = 23'-6"
48-$\frac{1}{2}$"ϕ Bars E1 Top
48-$\frac{1}{2}$"ϕ Bars F1 Bott.

45 Spaces @ 6" = 22'-6"
46-$\frac{1}{2}$"ϕ Bars E1 Top } For Panels 2 to 6 incl.
46-$\frac{1}{2}$"ϕ Bars F1 Bott.

℄ Truss

Top of Curb

Note: Construction Joint at Each Intermediate Panel Point.

℄ Stringer

℄ Roadway

℄ Stringer

Top of Curb

℄ Truss

24'-0" Roadway

See Sect. A-A for Spacing

57-$\frac{5}{8}$"ϕ Bars D1

57-$\frac{5}{8}$"ϕ Bars D2 See Sect. A-A for Spacing

57-$\frac{5}{8}$"ϕ Bars D3 See Sect. A-A for Spacing

17-$\frac{5}{8}$"ϕ Bars D4 See Sect. A-A for Spacing

57-$\frac{5}{8}$"ϕ Bars D3 See Sect. A-A for Spacing

57-$\frac{5}{8}$"ϕ Bars D2 See Sect. A-A for Spacing

Pouring Sequence

11'-7" 11'-7"

2-4" ϕ Floor drain

B B C C

℄ Filler
Copper Flashing

CONSTRUCTION JOINT
Scale: $\frac{3}{4}$"=1'-0"

SECTION C-C
Scale: $\frac{3}{4}$"=1'-0"

22 Sp. @ 1'-0" = 22'-0" } 23-$\frac{5}{8}$"ϕ Bars C1
28 Sp. @ 1'-0" = 28'-0" } 24-$\frac{5}{8}$"ϕ Bars B1 Bott.
24-$\frac{5}{8}$"ϕ Bars A1 Top

Same for all Panels

6 @ 23'-2" = 139'-0"

2-10½" 3 @ 5'-4½" = 17'-5½" 2-10½" Spacing Joint Posts - Same for All Panels.

PLAN OF SLAB-SPAN #1 (#5 OPPOSITE HAND)
Scale: $\frac{3}{16}$"=1'-0"

Revised 8/4/47

44 Spaces @ 6" = 22'-0"
45-$\frac{1}{2}$"ϕ Bars E1 Top
45-$\frac{1}{2}$"ϕ Bars F1 Bott.

4-$\frac{5}{8}$"ϕ Bars G1 6" c.c.

Top of Curb

℄ Stringer

43-$\frac{5}{8}$"ϕ Bars A-A for Spacing See Sect. A-A

℄ Roadways

℄ Stringer

Top of Curb

℄ Truss

21 Sp. @ 1'-0" = 21'-0" 22-$\frac{5}{8}$"ϕ Bars C1
22 Sp. @ 1'-0" = 22'-0" 23-$\frac{5}{8}$"ϕ Bars B1 Bott.
23-$\frac{5}{8}$"ϕ Bars A1 Top

6 @ 23'-2" = 139'-0"

PLAN OF SLAB-SPAN #3
Panels 2 to 6 Incl. Same as for Span #1.
Scale: $\frac{3}{16}$"=1'-0"

N

24'-0 Roadway

1'-5½" 2'-6" 12'-0"

5 10 10 5½ 6 1-2 7 @ 7½ = 4'-4½ 1-2 7½ 7½ 1-2 3 @ 7½ = 4'-4½

1-$\frac{1}{2}$"ϕ D Bars

2% Parabolic Crown

$\frac{5}{8}$"ϕ A1-12" c.c. $\frac{5}{8}$"ϕ C1-12" c.c.

$\frac{5}{8}$"ϕ B1-12" c.c.

6" E B2 12"-L Straps 5'-0" c.c. Provide 2-$\frac{3}{4}$"ϕ 10" Bolts at Posts.

1'-0" For E Limit - See Cons. 1 12" c.c.

1'-11" 1'-11" 1'-11"

21 WF 62

24 WF 76

3'-0" 7'-10" 5'-1"

℄ Truss

Sprung Arch Roadway ℄ Roadway

Clear

NOTE: Includes a ½" wearing Surface Monolithic with slab and finished according to Specifications.

SECTION A-A
Scale: $\frac{1}{2}$"=1'-0"

5' 9"

1'-6" 9"

Slope

1'-0"

4" W.I. Pipe Paint Surface in Contact with concrete with heavy coat of Asphalt

END SPAN
Scale: 1"=1'-0"

Temporary ¾"ϕ Bars 2'-0" c.c. Remove on Completion of Pour

1-L 6"×4"×½" 1-L 8"×4"×¾" Curve to fit Crown of Rdwy.

Bar 1-2"×½"

1-L 8"×6"×½" (weld to F.B.)

Weld Straps 1"×½" @ 2'-0" c.c.

℄ Girder

1'-0"

SECTION B-B
Scale: $\frac{3}{4}$"=1'-0"

For Bar Schedule see Dwg. #4.

½"ϕ Bolts with 6" c.c.

½"×8" Plate fastened to Slab by Straps

Weld Straps 1½"×½"×8'-8" c.c.

2'-6" 1'-8"

4-$\frac{5}{8}$"ϕ Bars G1 6" c.c.

33 WF 200

SECTION E-E
Scale: $\frac{3}{4}$"=1'-0"

3'-1" at 70° 6½"

SECTION F-F
Scale: $\frac{3}{4}$"=1'-0"

SECTION D-D
Scale: $\frac{3}{4}$"=1'-0"

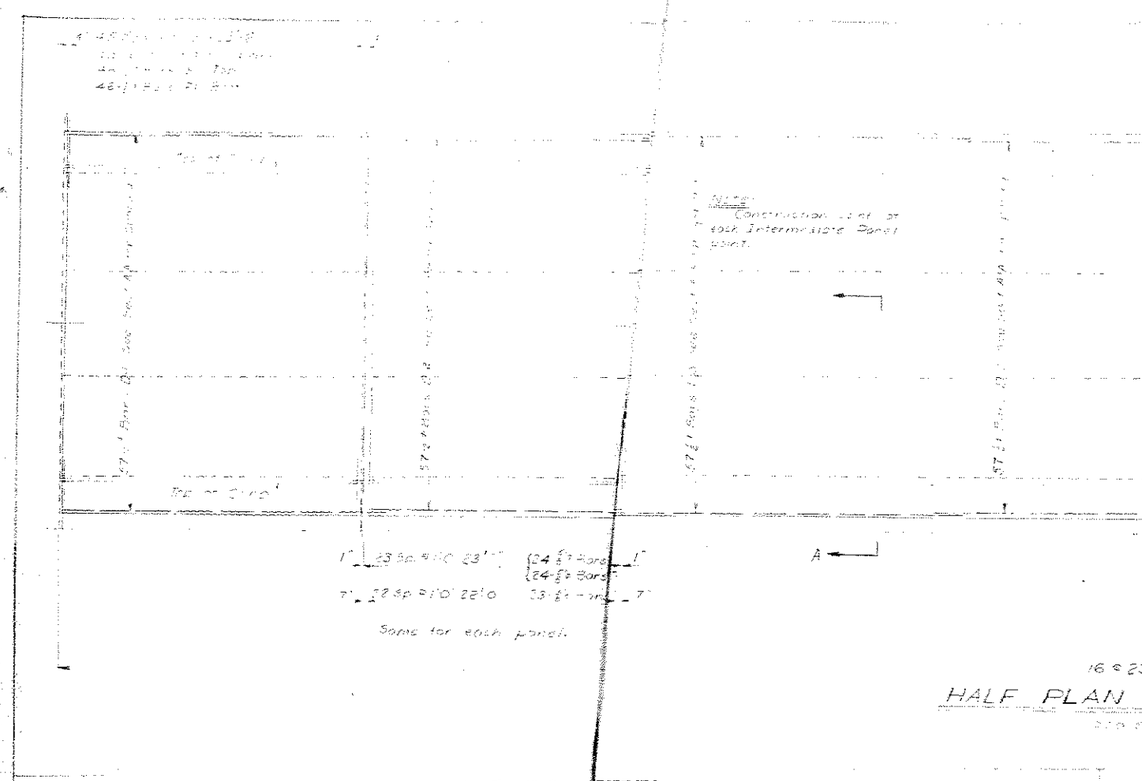
THE STATE ROAD COMMISSION
OF WEST VIRGINIA

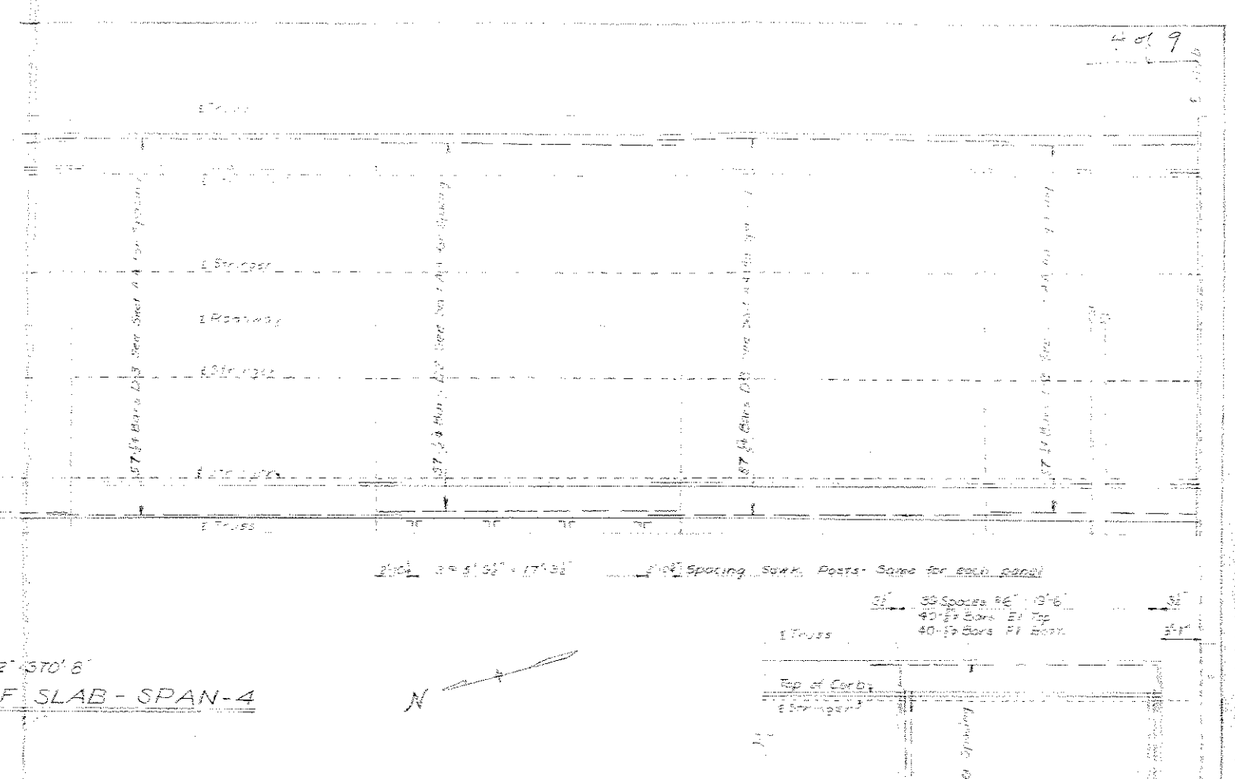
TRUE BRIDGE over BLUESTONE RIVER

PROJECT #3194 SUMMERS COUNTY

CONCRETE DECK FOR 139'-0" SPAN
SUPERSTRUCTURE CONTRACT #1764

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

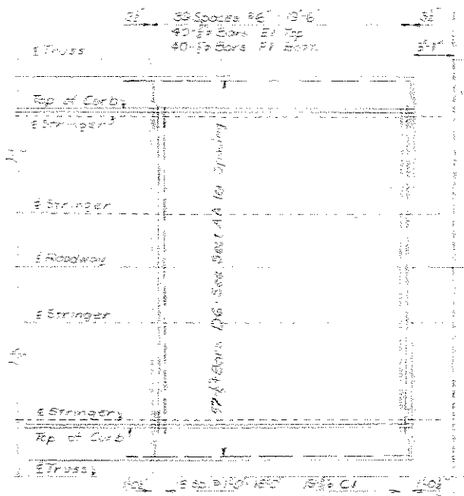




16 @ 23'-2" = 370'-8"

HALF PLAN OF SLAB - SPAN-4

N



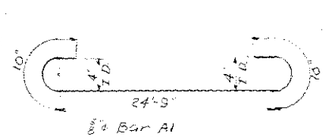
PLAN OF SLAB - SPAN-2

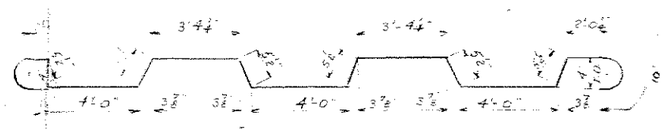
Panels 1 to 15 Incl. Same as Slab - Span 4

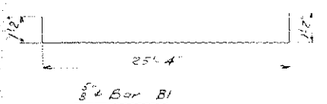
Scale 1/4" = 1'-0"

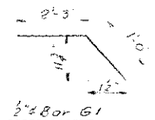
BILL OF REINFORCING STEEL

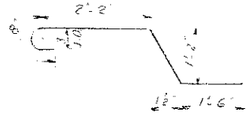
SPANS #1 & #5 - (One Unit)					SPAN #2					SPAN #3					SPAN #4				
No.	Mk	Size	Length		No	Mk	Size	Length		Mk	Size	Length		No	Mk	Size	Length		
144	A1	5/8" ø	26'-5"	Bent	380	A1	5/8" ø	25'-5"	Bent	A1	5/8" ø	26'-5"	Bent	384	A1	5/8" ø	26'-5"	Bent	
144	B1	do	27'-8"	do	380	B1	do	27'-8"	do	B1	do	27'-8"	do	384	B1	do	27'-8"	do	
136	C1	do	27'-2"	do	364	C1	do	27'-2"	do	C1	do	27'-2"	do	368	C1	do	27'-2"	do	
57	D1	1/2" ø	26'-8"	Str.	57	D1	1/2" ø	24'-2"	Str.	D2	1/2" ø	23'-1"	Str.	57	D1	1/2" ø	24'-2"	Str.	
171	D2	do	22'-10"	do	389	D2	do	22'-3"	do	D2	do	21'-6"	do	456	D2	do	21'-1"	do	
114	D3	do	27'-2"	do	399	D3	do	27'-2"	do	D4	do	26'-5"	do	304	D3	do	27'-2"	do	
556	E1	do	5'-7"	Bent	57	D2	do	22'-10"	do	D5	do	24'-5"	do	1472	S1	do	5'-7"	Bent	
556	F1	do	2'-9"	do	1460	S1	do	5'-7"	Bent	E1	do	5'-7"	Bent	1472	F1	do	2'-9"	do	
					1460	F1	do	2'-9"	do	F1	do	2'-9"	do						
										G1	do	3'-3"	do						

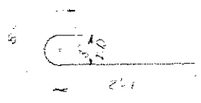












PRELIMINARY

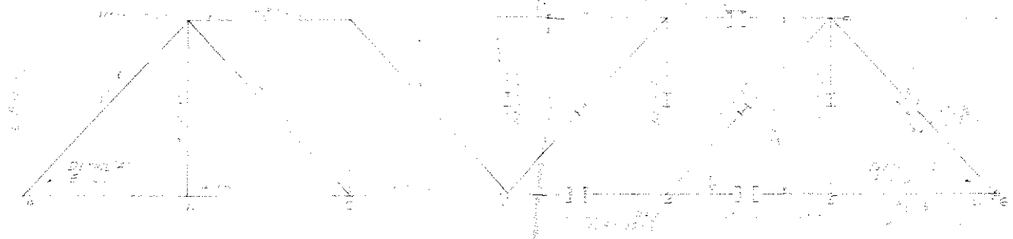
THE STATE ROAD COMMISSION
OF WEST VIRGINIA

TRUE BRIDGE over BLUESTONE RIVER

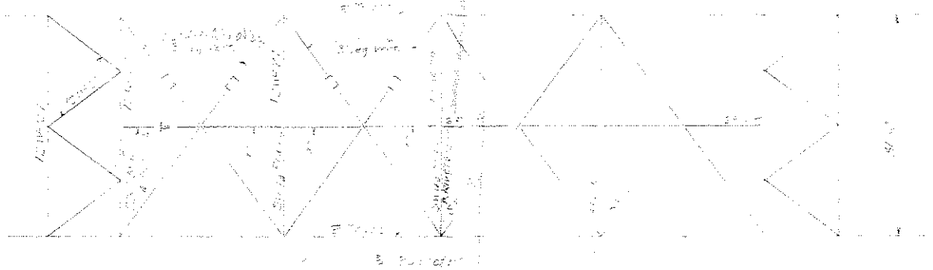
PROJECT #3494 SUMMERS COUNTY

CONCRETE DECK DETAILS for CANTILEVER SPAN SUPERSTRUCTURE CONTRACT #1764

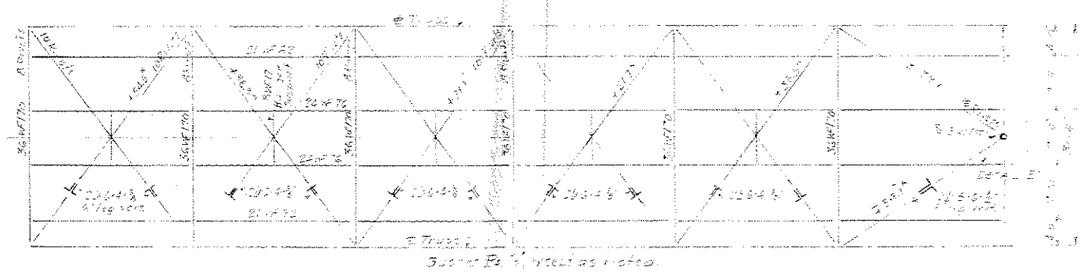
DESIGN BY FRANK D. MENTEER Consulting Engineer Charleston, W. Va.	Scale: As noted	Date
	Designed by F.D.M.	Checked by A.D.H.
	Drawn by M.L.B.	Checked by
	Traced by	Checked by



ELEVATION - SPAN # 1



TOP CHORD BRACING
SPAN # 1



BOTTOM CHORD BRACING
SPAN # 1

DESIGN DATA: - Live Load: H-15-44 -

Roadway Stringers:

	Moments	Shears
Dead Load	57.8 K	10.2 K
Live Load	134.3	36.5
Impact	84.1	23.0
Total:	276.2 K	69.7 K

Wt. S.M. reqd = 155 in³
Net S.M. provided = 128 in³

24 WF 76
7/8" ø Rivets

Sidewalk Stringers:

	Moments	Shears
Dead Load	4.6 K	1.0 K
Sidewalk L.L.	11.0	2.8
Railing L.L.	2.1	1.5
Impact	2.4	1.2
Total	20.1 K	6.5 K

Net S.M. reqd = 11.3 in³
Net S.M. provided = 12.3 in³

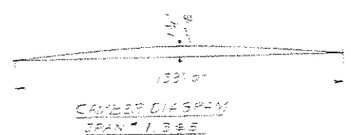
21 WF 50
7/8" ø Rivets

Floor Beams:

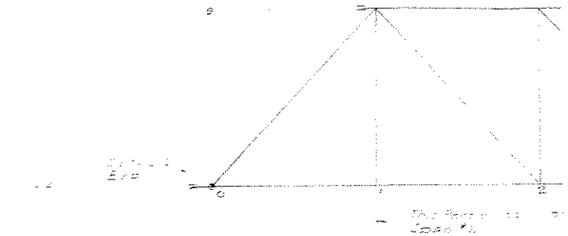
	Moments	Shears
Dead Loads	32.5 K	13.5 K
Stringers	8.5	4.5
Railings	5.1	4.5
Floor	11.2	4.2
Total	57.3 K	26.7 K

Net S.M. reqd = 330 in³
Net S.M. provided = 346 in³

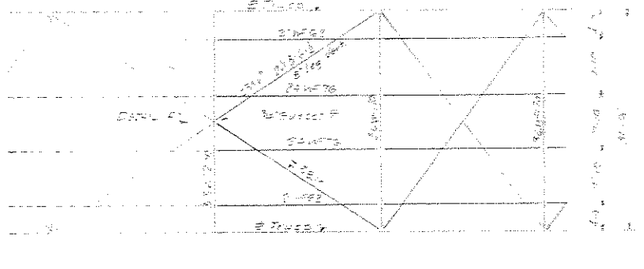
36 WF 170
7/8" ø Rivets



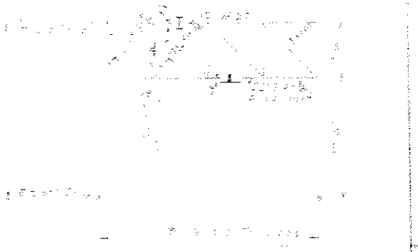
CAMBER DIAGRAM
SPAN # 1 & 5



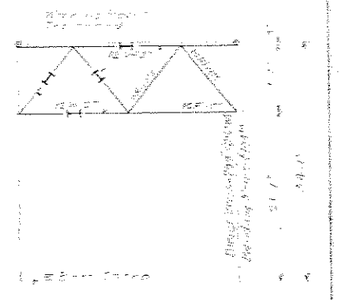
ELEVATION - SPAN # 3



BOTTOM CHORD BRACING
SPAN # 3



ALTERNATE SWAY FRAME
TYPE A2



PORTAL
TYPICAL

THE STATE ROAD COMMISSION
OF WEST VIRGINIA

TRUE BRIDGE over BLUESTONE RIVER

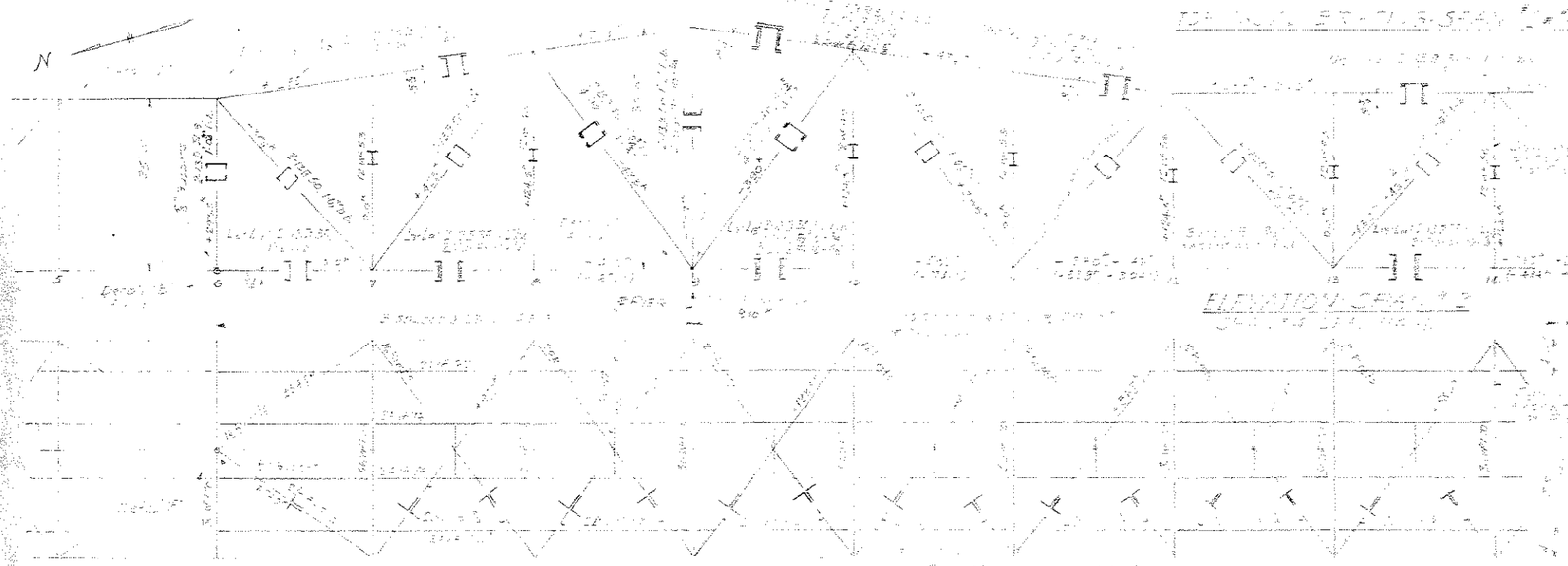
PROJECT # 3494 SUMMERS COUNTY, W. VA.

STRESS SHEET FOR 139'-0" SPANS
SUPERSTRUCTURE CONTRACT

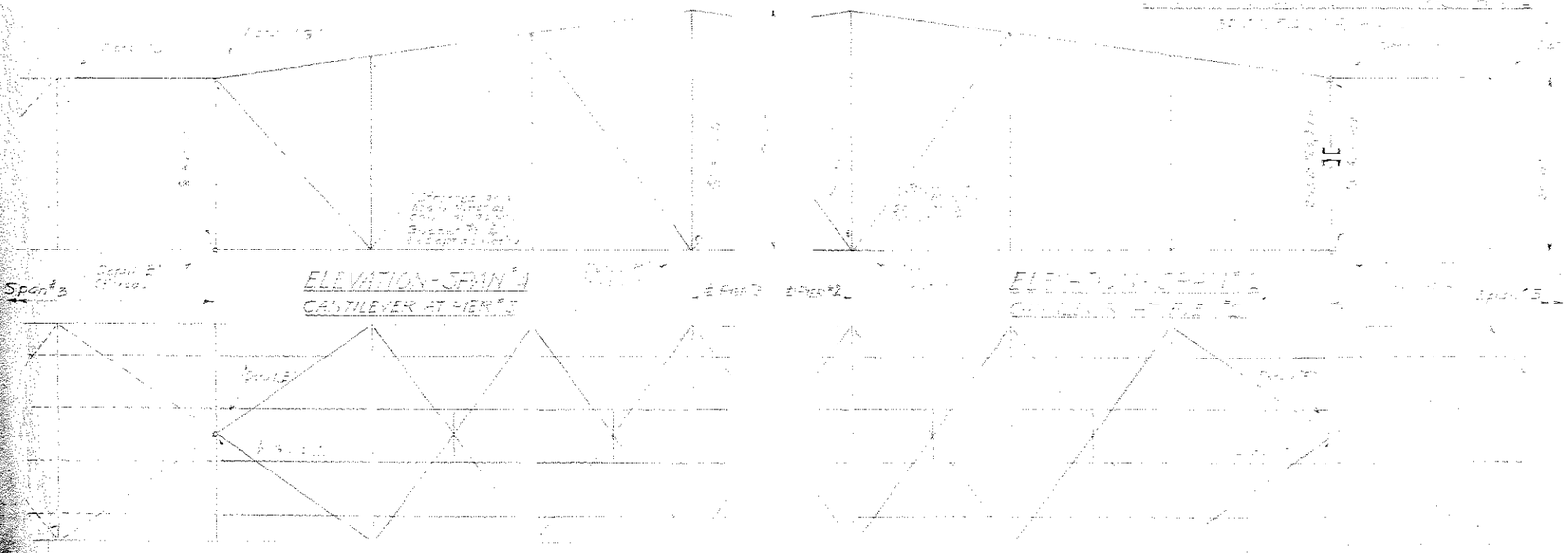
1734

DESIGN BY FRANK S. McESTEP
Consulting Engineer
Clarksburg, W. Va.

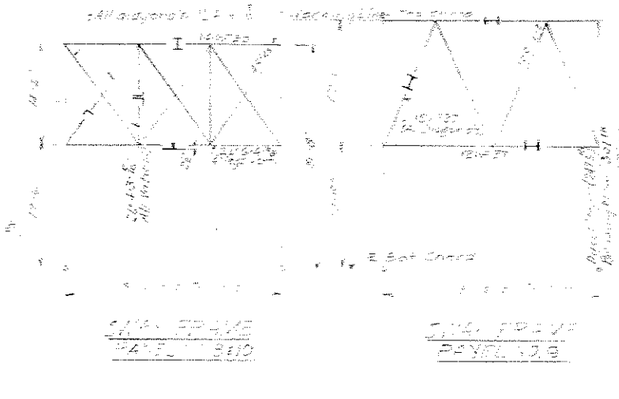
Scale 1" = 10'-0"	Date:
Designed by R.D.H.	Checked by R.D.H.
Drawn by R.D.H.	Checked by
Traced by	Checked by



ELEVATION - SPAN 1
CANTILEVER AT PIER 2



ELEVATION - SPAN 2



Note: Stresses for truss members given thus, 475 are for $S_y = 33$ ksi.
Stresses in parentheses, thus (621), also include 30% impact.
For stresses in stringers and floor beams see Dwg #5.

THE STATE ROAD COMMISSION
OF WEST VIRGINIA

NEW RIVER BRIDGE over BLUESTONE RIVER

PROJECT 340 JUNIOR, FAYETTE CO., W.VA.

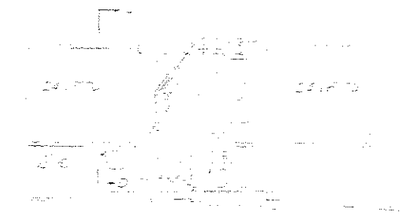
STEEL SHEET for CANTILEVER TRUSS

SUPERSTRUCTURE CONTRACT

STATE ENGINEER		SHEET NO.	25
DESIGNED BY		TOTAL SHEETS	
DRAWN BY		CHECKED BY	
TRACED		CHECKED BY	

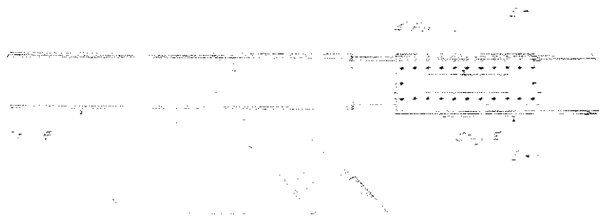
CHIEF ENGINEER
CHARLESTON, W.VA.

DETAIL 'A'

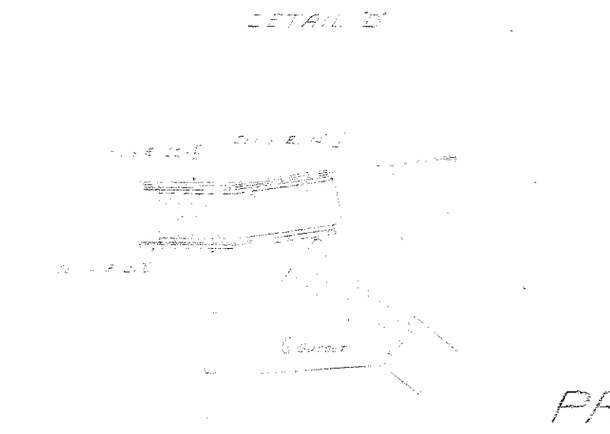


Sect C-C

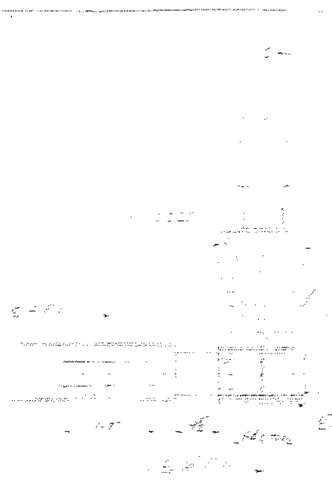
DETAIL 'E'



Sect D-D

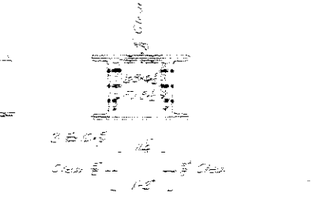


DETAIL 'D'



Sect E-E

NOTE: 4 - 7/8" ø Holes Drilled Full Thru Plate & Top Flg. Angle Both Ends of Member



DETAIL 'C'

Sect F-F

* Provide Nut with Letter by C.P.M.

DETAIL 'E' - BOTT. CHORD BRACING AT L_0 & L_{20} (L_{40} OPP. HAND)

PRELIMINARY

THE STATE ROAD COMMISSION
OF WEST VIRGINIA

TRUE BRIDGE over BLUESTONE RIVER

PROJECT #314 SUMMERS COUNTY

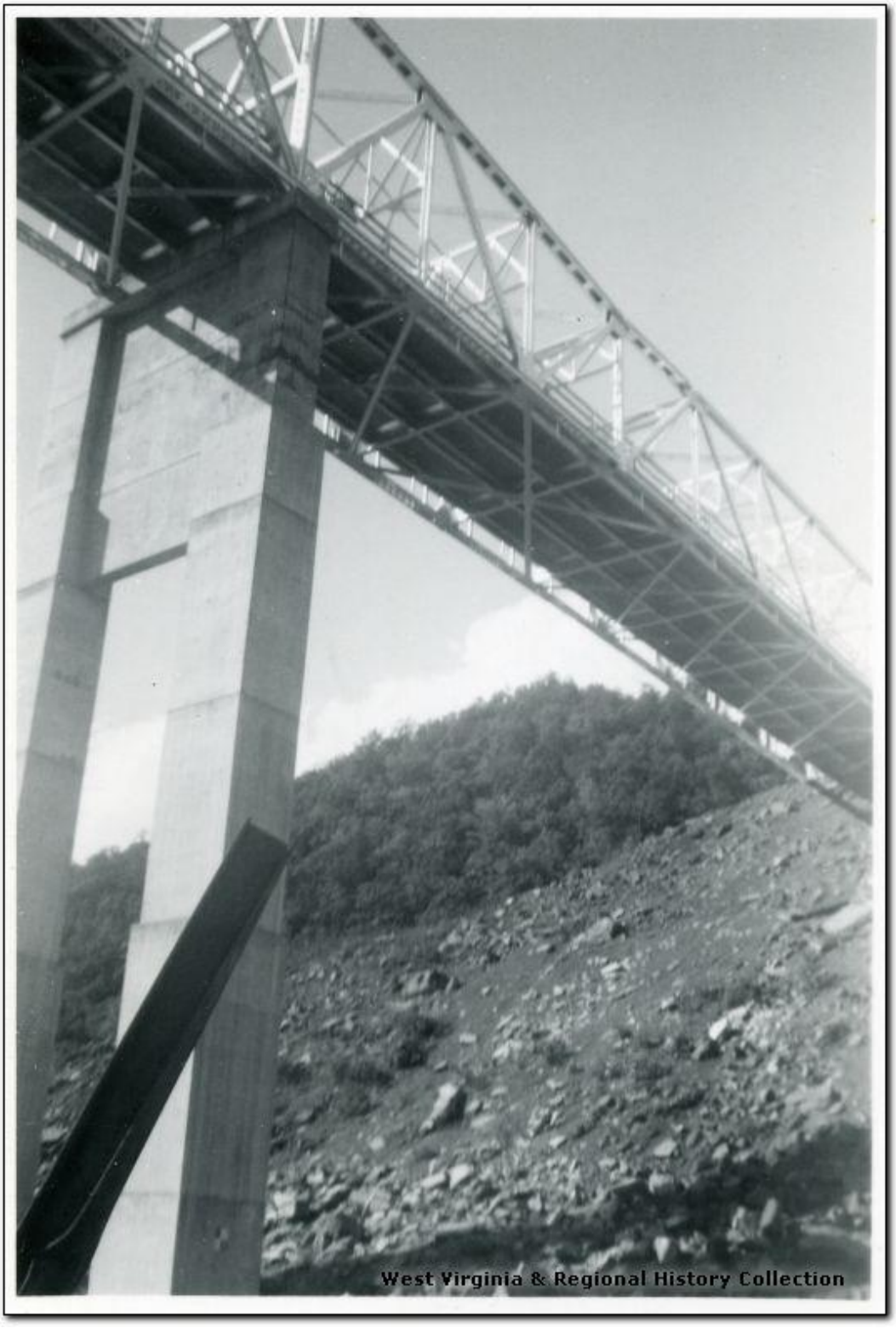
STRUCTURAL STEEL DETAILS

SUPERSTRUCTURE CONTRACT #1764

DESIGN BY FRANK C. MENTEER
CONSULTING ENGINEER
CLARKSBURG, W. VA.

Scale: 3/4"=1'-0" DATE:

DESIGNED BY	HMJ	CHECKED BY	RDM
DRAWN BY	RDM	CHECKED BY	
TRACED BY		CHECKED BY	



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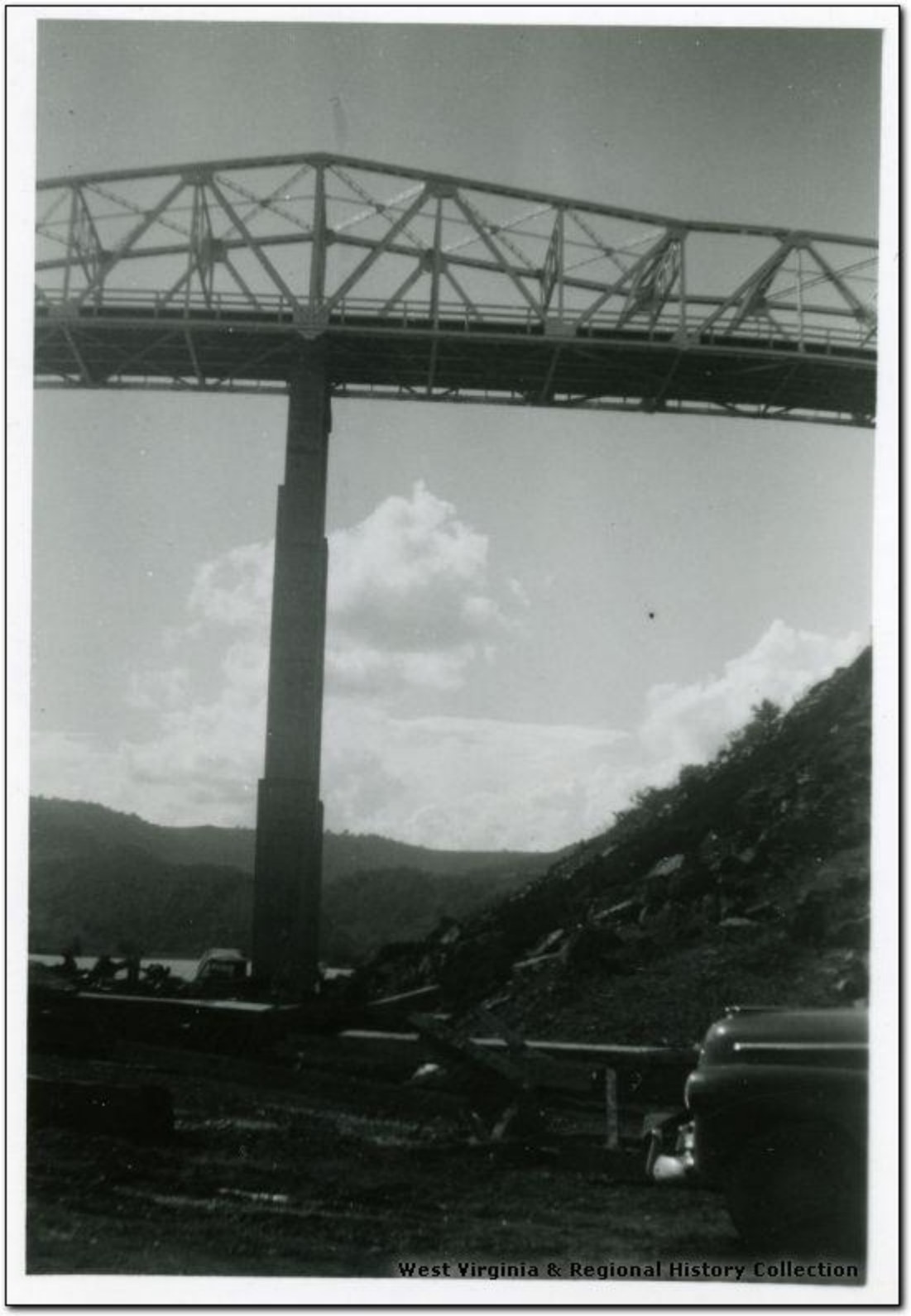

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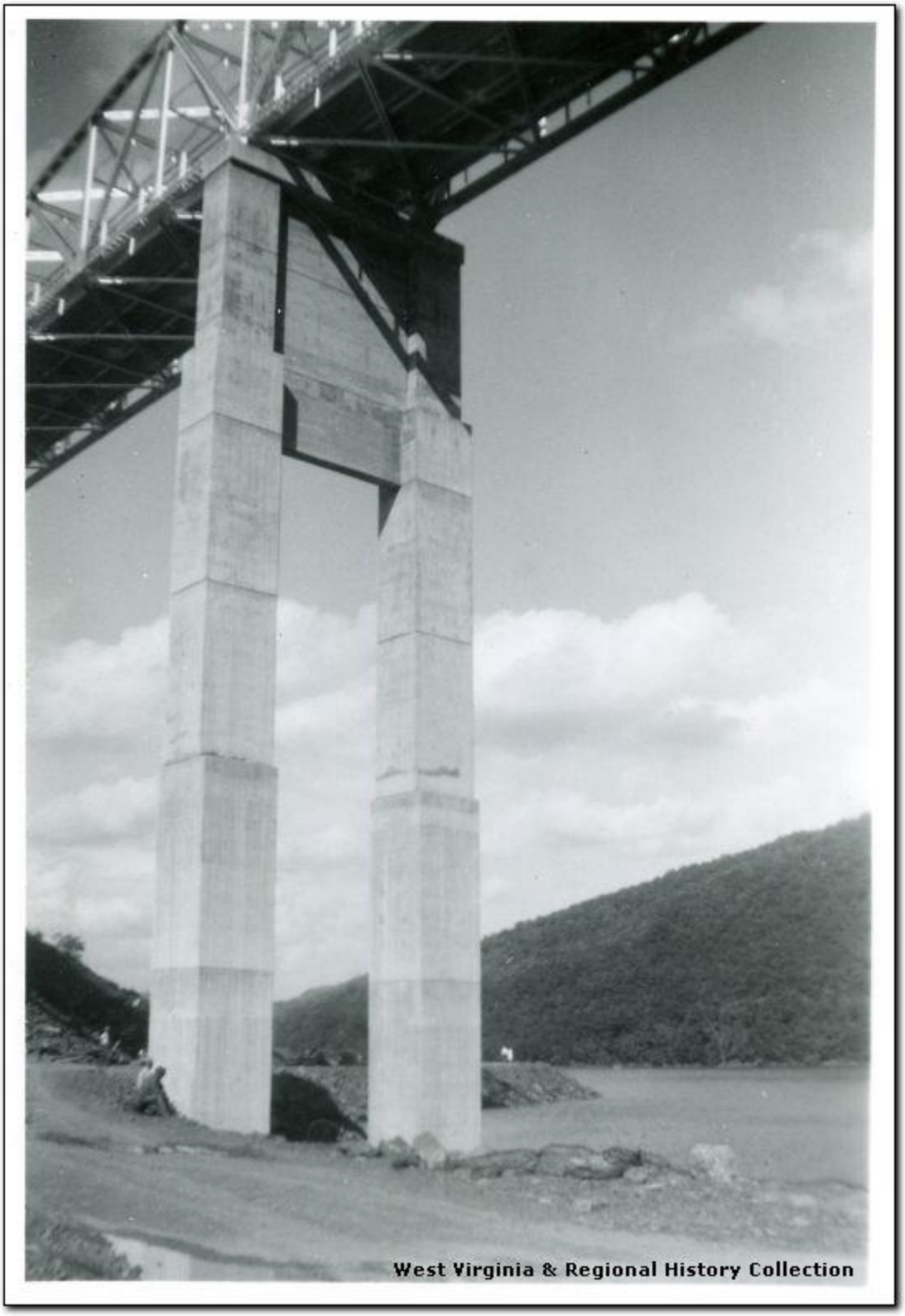

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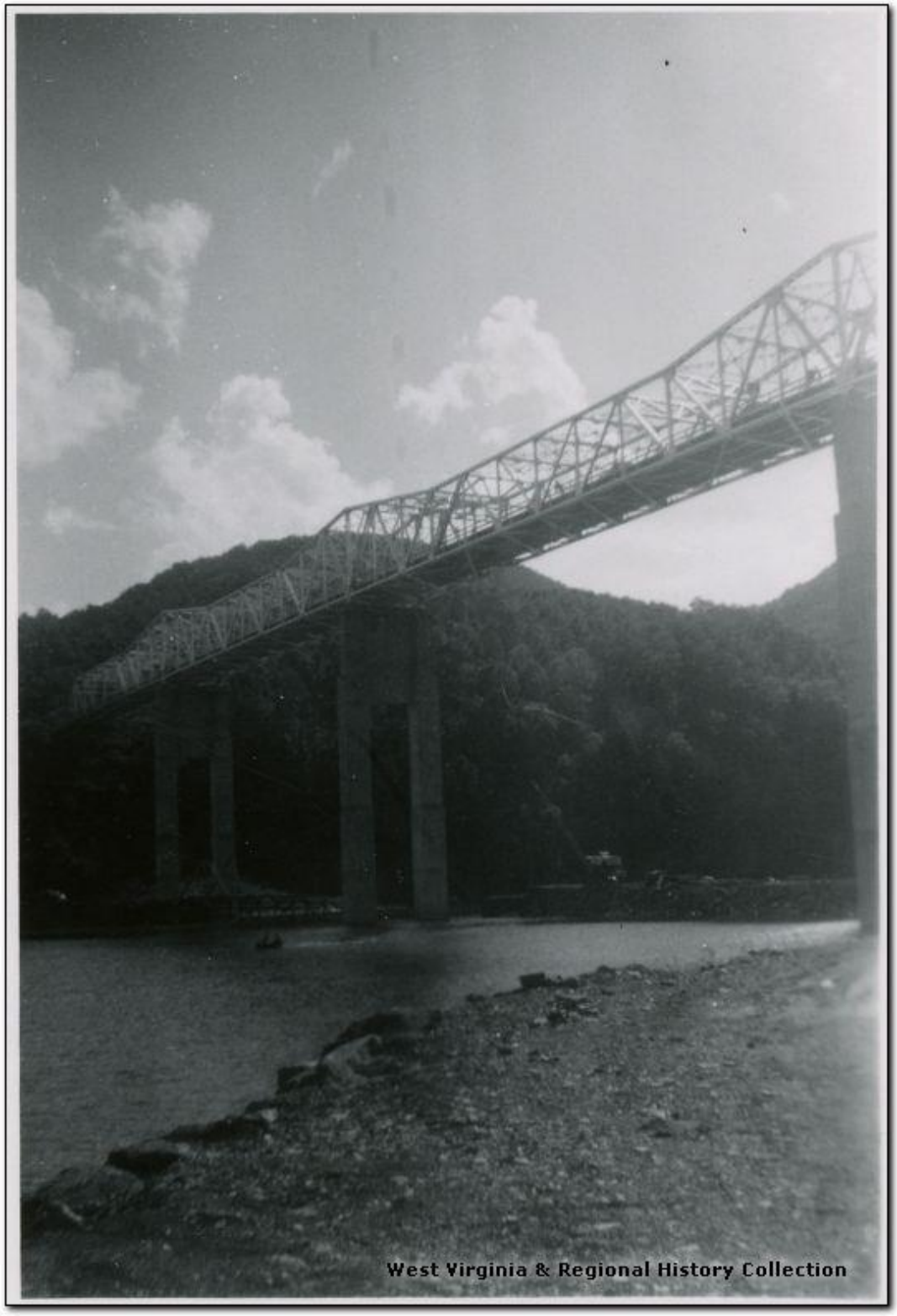

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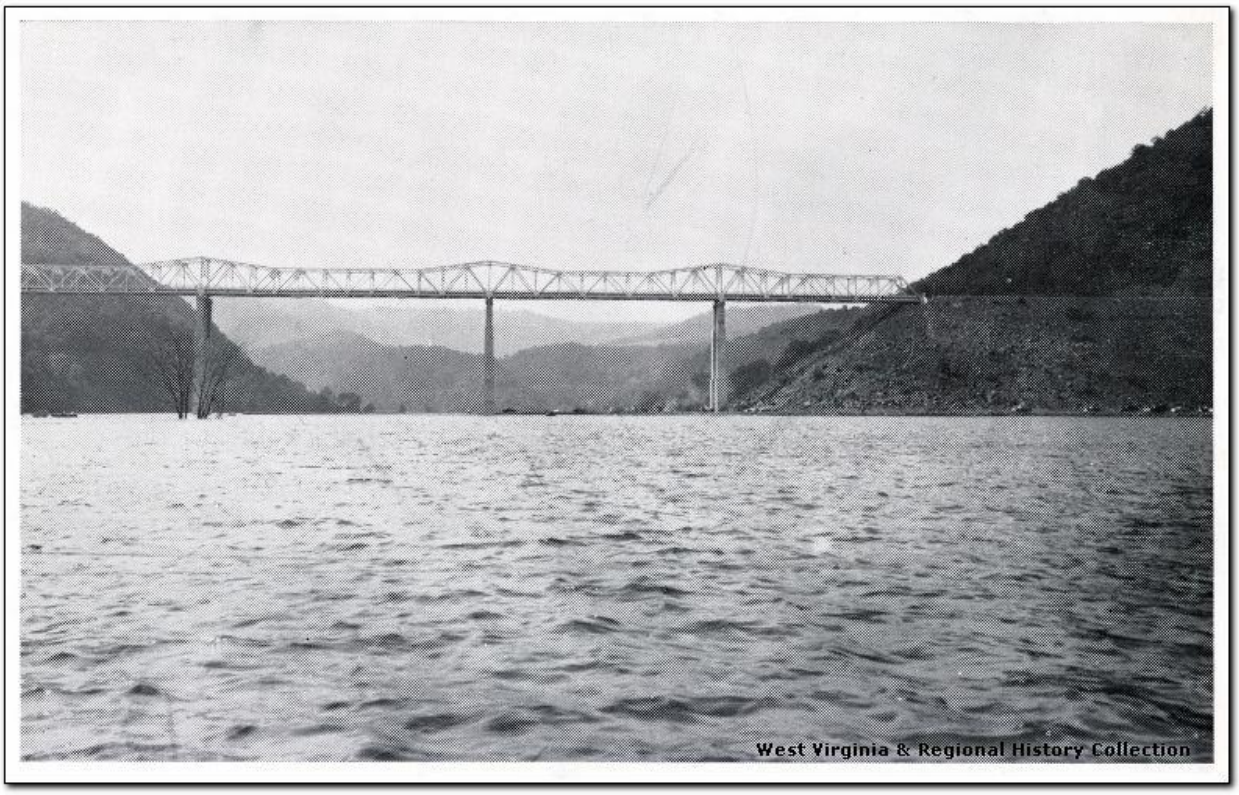

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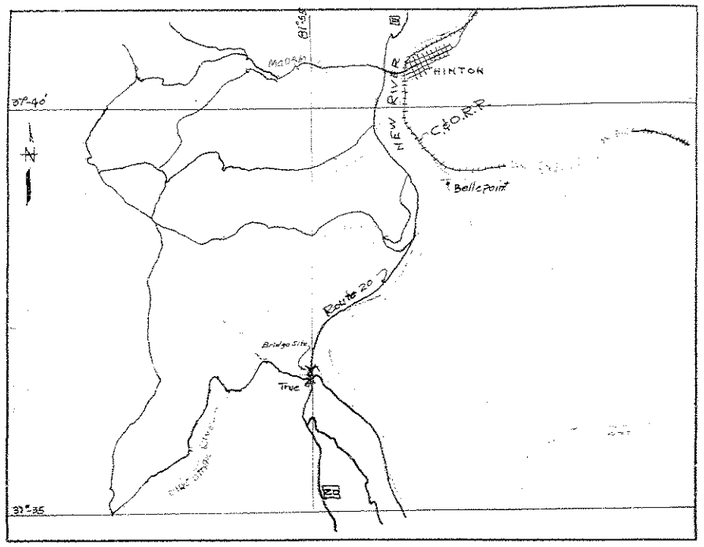


THE STATE ROAD COMMISSION
OF WEST VIRGINIA

PLAN AND PROFILE FOR CONSTRUCTION
OF

STATE ROAD

ROUTE NO. W.VA. 20

PROJECT NO. 3494

JUMPING BRANCH & PIPESTEM DISTRICTS SUMMERS COUNTY

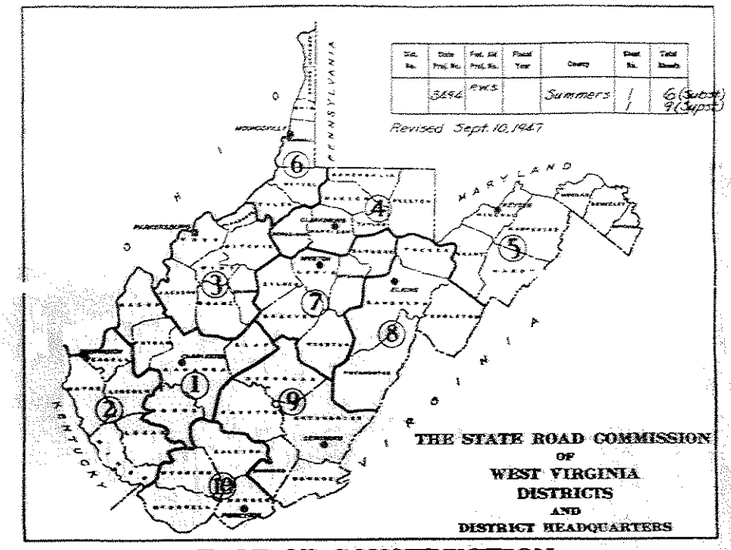
TRUE BRIDGE

Sta. 228+19.66 To Sta. 239+93.000

Length = 0.219 Mi.

SCALES Plan 1 IN.=

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
BRIDGE ENGINEER - STATE ROAD COMMISSION

REVIEWED
STATE CONSTRUCTION ENGINEER - STATE ROAD COMMISSION

RECOMMENDED FOR APPROVAL
CHIEF ENGINEER - STATE ROAD COMMISSION

APPROVED
STATE ROAD COMMISSIONER

I HEREBY CERTIFY THAT THIS IS A CORRECT COPY OF THE PLANS OF PROJECT 3494
March 7, 1947
SECRETARY

APPROVED BY OFFICIAL ORDER OF THE STATE ROAD COMMISSION OF WEST VIRGINIA, ENTERED 7th DAY OF March, 1947
SECRETARY

LAYOUT
SCALE 1 IN. = FT.

CONVENTIONAL SIGNS

State Line	Wall
County Line	Marsh
Corporation Line	Hedge
District Line	Drop 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)

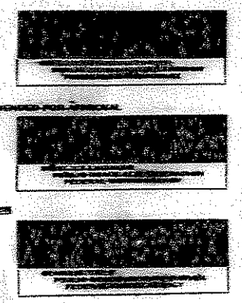
No.	Description
1	Title Sheet
2	Profile & Foundation Plan
3	Abutments
4	Piers
5	Bar List
6	Situation Plan

SUBSTRUCTURE PLANS COMPLETED March-20-1947

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.

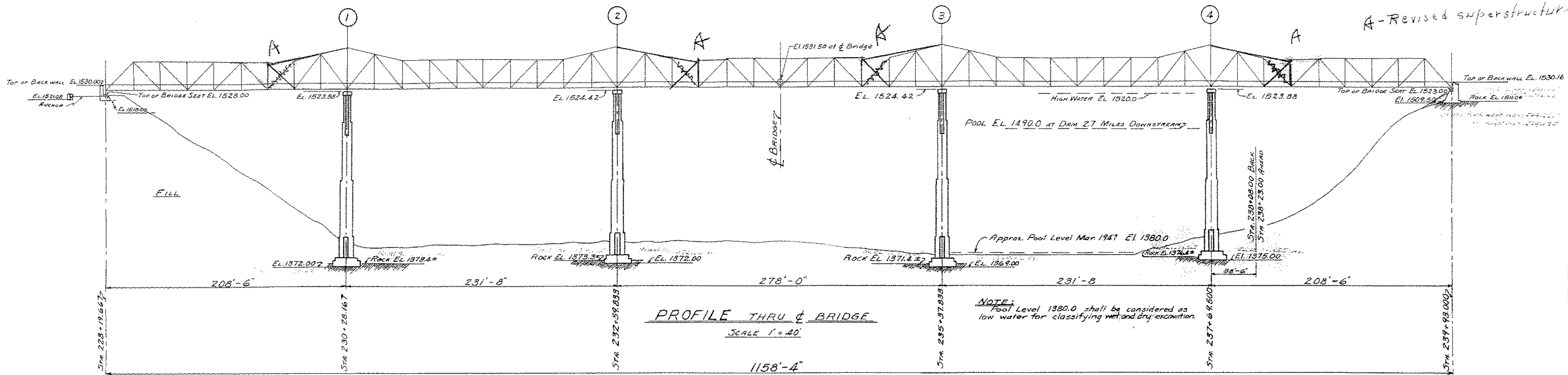
SUPERSTRUCTURE PLANS COMPLETED Sept-27-1947



#1764

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

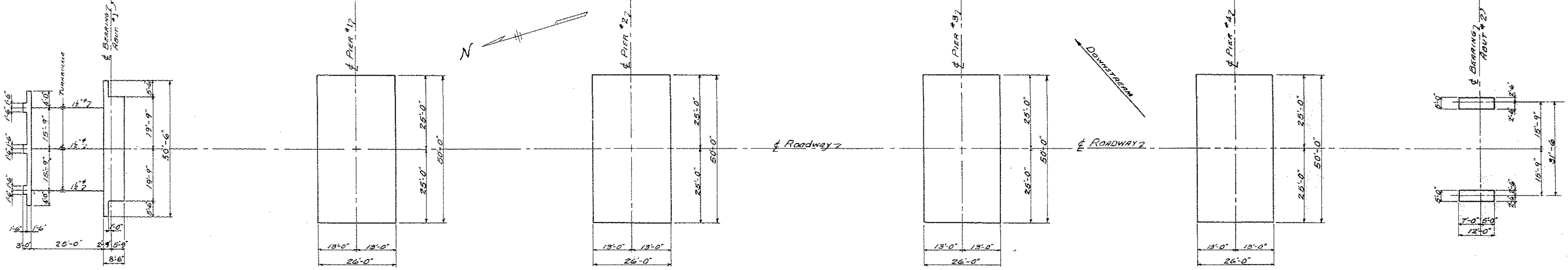
A-Revised superstructure



PROFILE THRU ℄ BRIDGE

SCALE 1" = 40'

NOTE: Pool Level 1380.0 shall be considered as low water for classifying wet and dry excavation.



PLAN

SCALE 1/16" = 1'-0"

NOTES:

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

The Bridge is designed for H15-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.A.S.H.O. designations T-1-42 (para. 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.

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 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. 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.

DETAILED ESTIMATED QUANTITIES

	This Contract					Future Contract	
	Pier 1	Pier 2	Pier 3	Pier 4	Abt. 2	Anchor & Abt. 1	Abt. 2
Dry Exc. c.y.	477.5	638.5	0	508.0	231.0	325	0
Wet Exc. c.y.	376.0	381.0	246.0	205.0	0	0	0
Rock Exc. c.y.	72.5	.53	116.5	72.3	8.9	0	0
Cl. A Conc. c.y.	1409.3	1413.2	1435.4	1387.1	48.7	91.5	22.6
St. Reinf. #	112,760	113,144	114,126	110,982	4788	9018	2582
					4786	9050	2577

REINFORCING BARS

Size	Present Contract	Future Contract	Total Weight
3/8"φ	0	48	48
1/2"φ	31,820	345	32,165
5/8"φ	867	3115	3,982
3/4"φ	20,069	255	20,324
1"φ	202,624	3763	206,387
1 1/4"φ	201,220	3320	204,540
1 1/2"φ	0	754	754
Total	456,600	11,600	468,200
	472,230*		

* See Sheets 4 & 5

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.	1179.08	
9. Rock Excavation	322	0	322 c.y.	487.68	
72. Class "A" Concrete	5694	114	5808 c.y.	5712.11	127.36
78 Steel Reinforcing	456,600	11,600	468,200 Lbs.	472,230	

AS BUILT ! Shown in Red

THE STATE ROAD COMMISSION OF WEST VIRGINIA

TRUE BRIDGE over BLUESTONE RIVER

PROJECT #3494 — SUMMERS COUNTY, W. VA.

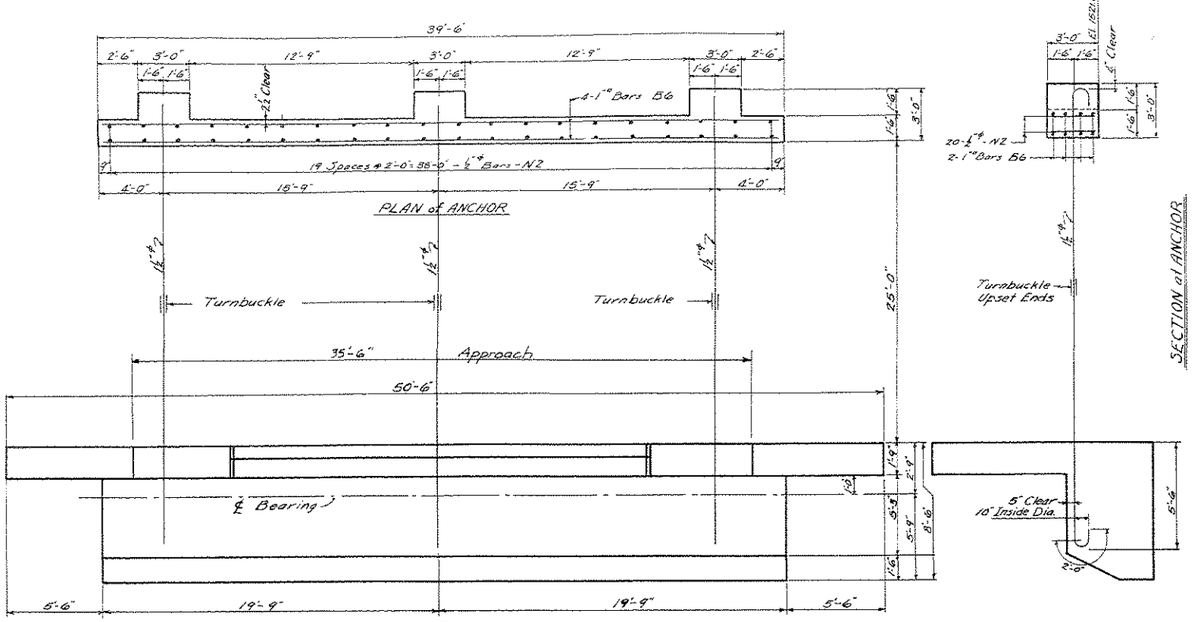
PROFILE AND FOUNDATION PLAN

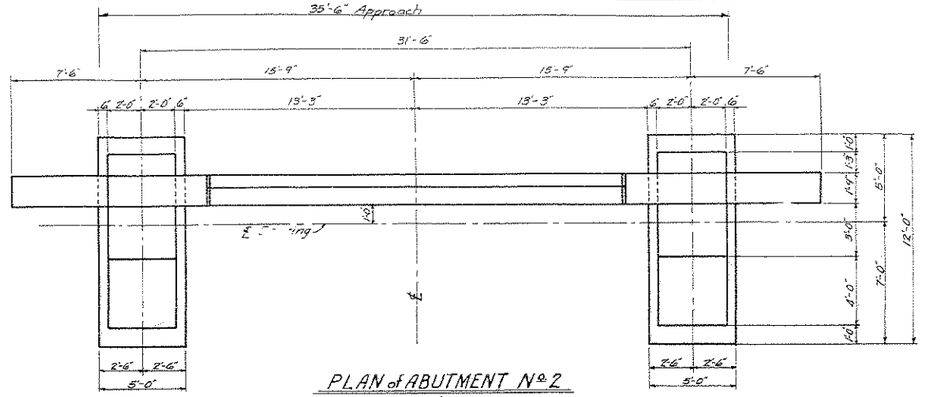
SUBSTRUCTURE CONTRACT #1764

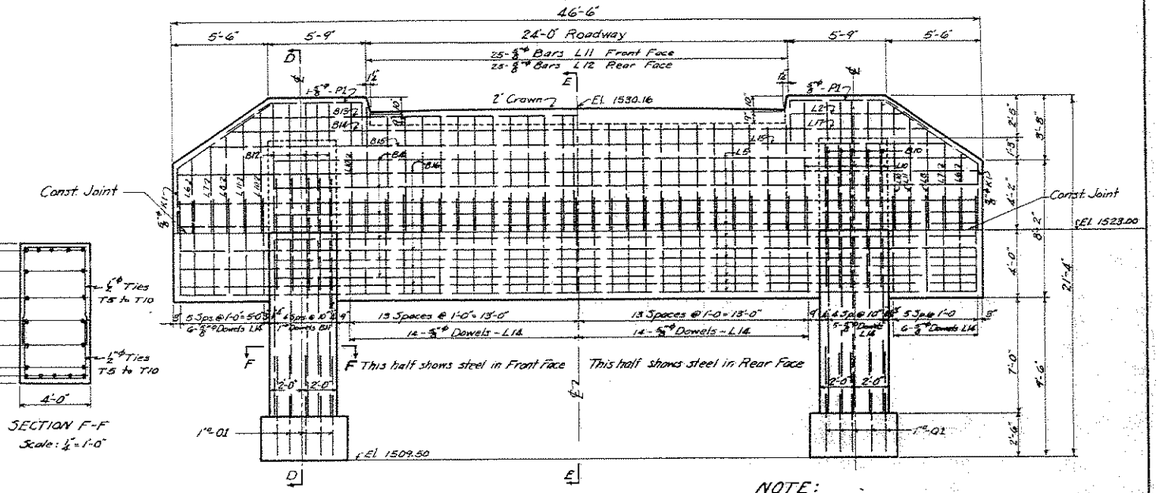
DESIGN BY FRANK D. McENTEER
CONSULTING ENGINEER
CLARKSBURG, W. VA.

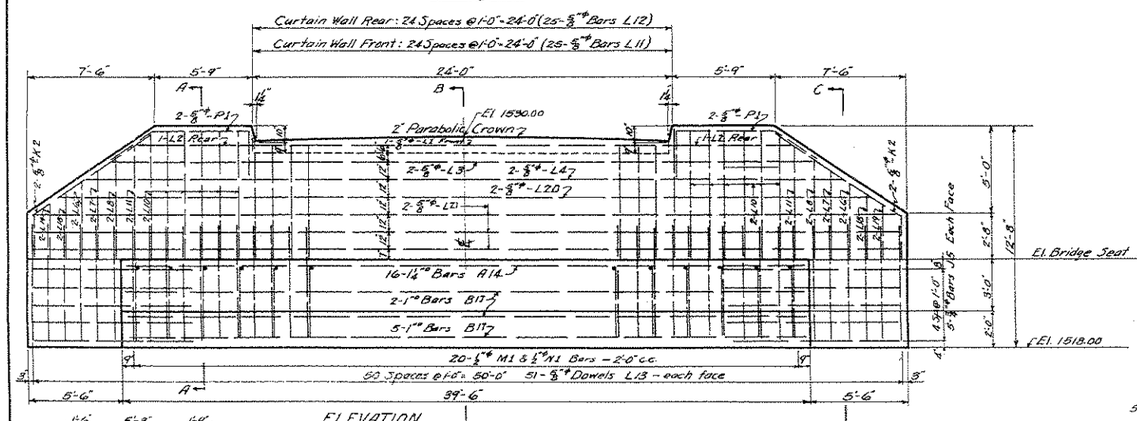
Scale: As Shown		Date: Mar. 7, 1947	
Designed by	K.H.J.	Checked by	M.R.
Drawn by	M.R.	Checked by	K.H.J.
Traced by	R.D.H.	Checked by	K.H.J.

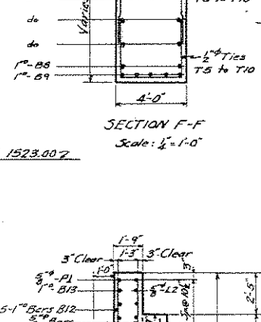
Dist No.	State Proj. No.	Federal Aid Proj. No.	Fiscal Year	County	Sheet No.	Total Sheets
	3494	P.W.S.		Summers	3	6

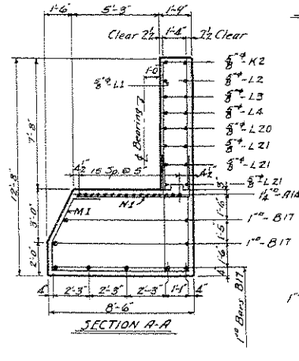


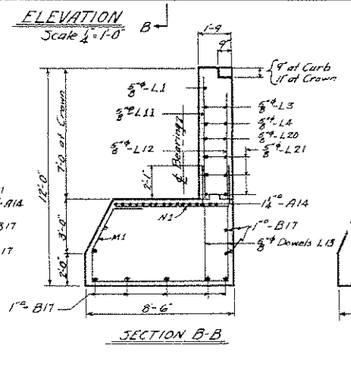


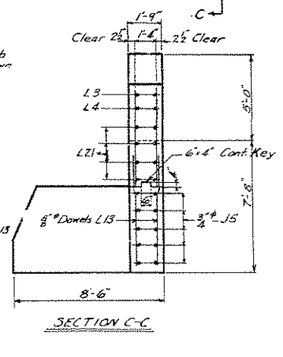


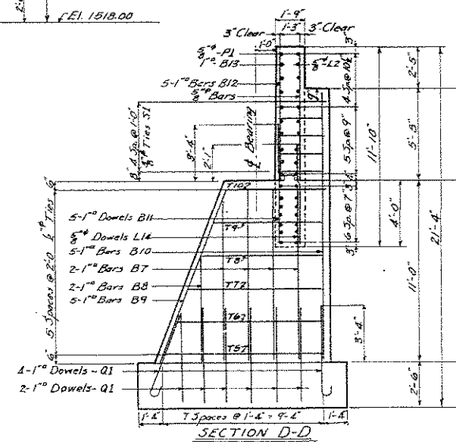


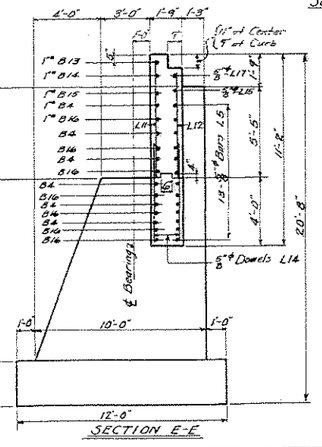












NOTE:

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 at one foot on each side of joint. This is to be included in Price Bid for Class "A" 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, 1967

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

Dist. No.	State Proj. No.	Federal Aid Proj. No.	Fiscal Year	County	Sheet No.	Total Sheets
	3494			Summers	5	6

BILL of REINFORCING STEEL

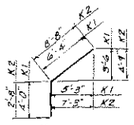
No.	Mk.	Size	Length		No.	Mk.	Size	Length		No.	Mk.	Size	Length		No.	Mk.	Size	Length		No.	Mk.	Size	Length	
ABUTMENT #1					ABUTMENT #2					PIER #1 *					PIER #2 *					PIER #3 *				
16	A18	1¼"□	39'-0"	Straight	6	B4	1"□	35'-0"	Straight	79	A1	1¼"□	11'-10"	Straight	79	A1	1¼"□	11'-10"	Straight	79	A1	1¼"□	11'-10"	Straight
9	B17	1"□	39'-0"	↕	16	B7	↕	10'-10"	↕	12	A2	↕	41'-0"	↕	12	A2	↕	41'-0"	↕	12	A2	↕	41'-0"	↕
20	J5	⅝"φ	8'-6"	Straight	4	B8		7'-6"		8	A3		19'-8"		8	A3		19'-8"		8	A3		19'-8"	
4	K2	⅝"φ	11'-4"	Bent	10	B9		11'-6"		70	A4		24'-2"		70	A4		24'-2"		70	A4		24'-2"	
1	L1	↕	38'-0"	Straight	10	B10		16'-3"		20	A5		45'-0"		20	A7		45'-7"		20	A9		48'-7"	
2	L2		7'-0"	↕	10	B11		7'-0"		50	A6		49'-6"	↓	50	A8		RN-1"	↓	50	A10		53'-1"	↓
2	L3		41'-6"		10	B12		7'-8"		16	A13		50'-8"	Straight	16	A13		50'-8"	Straight	16	A13		50'-8"	Straight
2	L4		44'-6"		1	B13		38'-0"		26	H1	↓	55'-2"	Bent	26	H1	↓	55'-2"	Bent	26	H1	↓	55'-2"	Bent
6	L21		50'-2"		1	B14		41'-0"		12	Z1	1¼"□	44'-4"	Bent	12	Z1	1¼"□	44'-4	Bent	12	Z1	1¼"□	44'-4	Bent
4	L6		4'-2"		1	B15		44'-0	↓	49	B1	1"□	11'-0"	Straight	49	B1	1"□	11'-0"	Straight	49	B1	1"□	11'-0"	Straight
4	L7		4'-10"		7	B16	↓	46'-0"	Straight	12	B2	↑	50'-8"	↕	12	B2	↑	50'-8"	↕	12	B2	↑	50'-8"	↕
4	L8		5'-6"		40	Q1	1"□	6'-3"	Bent	64	B3		27'-2"	Straight	64	B3		27'-2"	Straight	64	B3		27'-2"	Straight
24	L10		7'-4"		4	K1	⅝"φ	10'-4"	Bent	100	C1		27'-4"	Bent	100	C1		27'-4"	Bent	100	C1		27'-4"	Bent
29	L11		6'-8"		2	L2	↑	7'-0"	Straight	12	C2		42'-10"	↑	12	C2		42'-10"	↑	12	C2		42'-10	↑
25	L12		5'-11"	↓	13	L5		46'-0"	↑	48	G1		23'-4"		48	G1		23'-4"		48	G1		23'-4"	
108	L13	↓	6'-9"	Straight	4	L6		4'-2"		48	G2		48'-8"		48	G3		49'-3"		48	G4		52'-3"	
4	P1	⅝"φ	11'-0"	Bent	4	L7		4'-10"		66	G6	↓	54'-4"	↓	66	G6	↓	54'-4"	↓	66	G6	↓	54'-4"	↓
20	M1	½"φ	14'-3"	Bent	5	L8		5'-6"		14	R1	1"□	29'-8"	Bent	14	R1	1"□	29'-8"	↓	14	R1	1"□	29'-8"	↓
20	N1	½"φ	6'-6"	Straight	16	L10		7'-4		20	C3	1"□	51'-4	Bent	20	C3	1"□	51'-4	Bent	20	C3	1"□	51'-4	Bent
4	L18	⅝"φ	3'-6"		29	L11		6'-8"		40	F1	¾"φ	8'-0"	Bent	40	F1	¾"φ	8'-0"	Bent	40	F1	¾"φ	8'-0"	Bent
4	L19	⅝"φ	2'-10"		25	L12		5'-11"		22	J1	↑	27'-2"	Straight	22	J1	↑	27'-2"	Straight	22	J1	↑	27'-2"	Straight
2	L20	⅝"φ	47'-6"	Straight	88	L14		5'-9"		22	J2	↕	19'-8"	↕	22	J2	↕	19'-8"	↕	22	J2	↕	19'-8"	↕
DEADMAN					1	L15		44'-0"		23	J3	↓	10'-2"	Straight	23	J3	↓	10'-2"	Straight	23	J3	↓	10'-2"	Straight
8	B6	1"□	39'-0"	Straight	1	L17		41'-0"	Straight	11	U1	¾"φ	27'-1"	Bent	11	U1	¾"φ	27'-1"	Bent	11	U1	¾"φ	27'-1"	Bent
40	N2	½"φ	2'-6"	Straight	4	P1	⅝"φ	11'-0"	Bent	80	T1	½"φ	24'-6"	↑	80	T1	½"φ	24'-6"	↑	80	T1	½"φ	24'-6"	↑
3-1½"φ Anchor Bars, Upset ends & Turnbuckle					4	T5	½"φ	15'-6"	↑	180	T2	↕	22'-6"	↕	184	T2	↕	22'-6"	↕	196	T2	↕	22'-6"	↕
					4	T6	↑	14'-10"	↑	204	T3	↓	20'-6"	↓	204	T3	↓	20'-6"	↓	204	T3	↓	20'-6"	↓
					4	T7		14'-2"		96	T4	½"φ	16'-6"	Bent	96	T4	½"φ	16'-6"	Bent	96	T4	½"φ	16'-6"	Bent
					4	T8		13'-6"		54	J4	¾"φ	27'-0	Straight	54	J4	¾"φ	27'-0"	Straight	54	J4	¾"φ	27'-0"	Straight
					4	T9		12'-6"		1	N1	½"φ	5'-9"	Straight	1	N1	½"φ	5'-9"	Straight	1	N-1	½"φ	5'-9"	Straight
					4	T10	½"φ	11'-6"	↓																
					10	S1	⅝"φ	12'-8"	Bent																

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

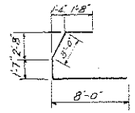
Note:
The following bars in the above list for Abut. #2 are in the curtain wall above the constr. Joint and are not included in the Substructure Contract:
3 B4, all of B12, B13, B14, B15, 3 B16, all of K1 and L2, 6 L5, all of L6, L7, L8, L10, L11, L12, L13, L17, P1 and S1.

As Built:

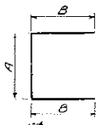
* Reinforcing steel revised to provide splices in Piers Nos. 1 to 4 inclusive at supplemental construction jts. permitted during Constr. as shown on sheet #4. See approved supplemental shop drawings, contractors nos. E 3969-1, E 3969-2, and E 3969-5 for revised lengths used.



⅝"K Bars

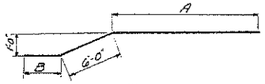


1"M1 Bar



½"T Bar

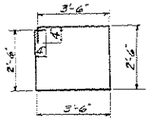
Type Bar	A	B
T1	9'-6	7'-6
T2	9'-6"	6'-6"
T3	7'-6"	6'-6"
T4	5'-6"	5'-6"
T5	3'-6"	6'-0"
T6	do	5'-8"
T7	do	5'-4"
T8	do	5'-0"
T9	do	4'-6"
T10	do	4'-0"



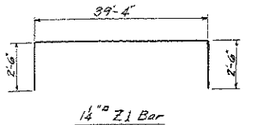
1"G Bars & 1¼"H Bars

Type Bar	A	B
G1	16'-0"	3'-4"
G2	39'-4"	do
G3	39'-11"	do
G4	42'-11"	do
G5	36'-4"	do
G6	45'-0"	do
H1	48'-0"	4'-8"

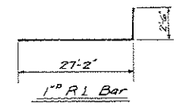
1"Q1 Bar



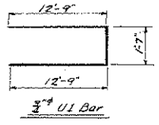
⅝"φ J1 Bar



1¼"□ Z1 Bar



1"□ R1 Bar



¾"φ U1 Bar

1"C Bars & ¾"φ F Bars

Type Bar	A	B	C
C1	26'-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

DESIGN BY FRANK D. McENTEER CONSULTING ENGINEER CLARKSBURG, W. Va.	Scale: None	DATE: Mar. 7, 1947
	Designed by K.H.J.	Checked by M.R.
	Drawn by M.P.	Checked by K.H.J.
	Traced by R.D.K.	Checked by K.H.J.

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

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

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

SECTION G-G THRU ℄ PIER
Scale: 1/4" = 1'-0"

℄ ELEVATION — SYMMETRICAL ABT ℄, EXCEPT AS NOTED
Scale: 1/4" = 1'-0"

PLAN AT TOP

NOTE:
All footings to be poured monolithically.

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"

THE STATE ROAD COMMISSION OF WEST VIRGINIA

TRUE BRIDGE OVER BLUESTONE RIVER

PROJECT #3494 SUMMERS COUNTY, W. VA.

PIERS

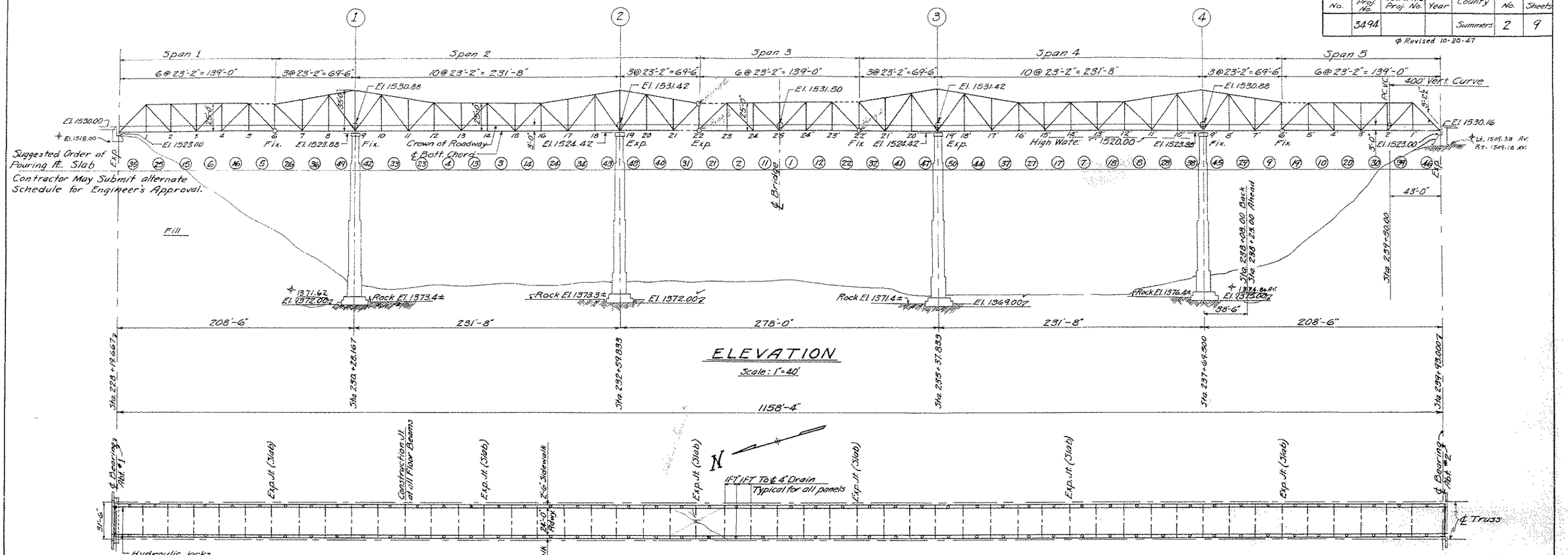
SUBSTRUCTURE CONTRACT #1764

DESIGN BY FRANK D. 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 R.D.H.		Checked by K.H.J.

Dist No.	State Proj. No.	Federal Aid Proj. No.	Fiscal Year	County	Sheet No.	Total Sheets
	3494			Summers	2	9

℄ Revised 10-30-47



NOTES:

Standard Specifications for Bridges, Jan. 1943 by the State Road Comission 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 #1 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.

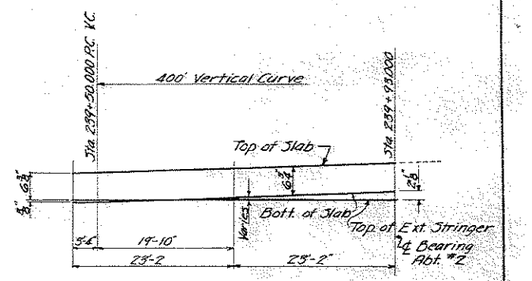
See sheets #3 and #5 of Substructure Plans for Abutment details and reinforcing bars for same.

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.



RISER DIAG. FOR VERT. CURVE
Not to Scale

REINFORCING BARS

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
3/4"℄	255		255
1"℄	3,763		3,763
1 1/4"℄	3,320		3,320
1 1/2"℄	754		754
	11,600	173,355	184,955

ESTIMATE

Item	Sub-Structure	Super-Structure	Total	Unit
7. Dry Excavation	325		325	c.y.
71. Class "A" Concrete Super-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: Struct. Steel		2,396,600	2,396,600 lbs.	Lump Sum
Cast Steel		12,000	12,000 lbs.	
Lead Plate		900	900 lbs.	
Bronze Plates		89	89 lbs.	
130 Jacking Arrangement		2	2	Lump Sum
86. Paint-Coat-Waterproofing	118.0		118.0	Sq. Yds.

℄ As Built

2-3-51 Structure Book: No 12854, 12855

℄ As Built

200.44
760.22
127.36
184.755
$354.000.00
$1300.00
92.00

THE STATE ROAD COMMISSION OF WEST VIRGINIA

TRUE BRIDGE over BLUESTONE RIVER

PROJECT #3494 SUMMERS CO., W.VA.

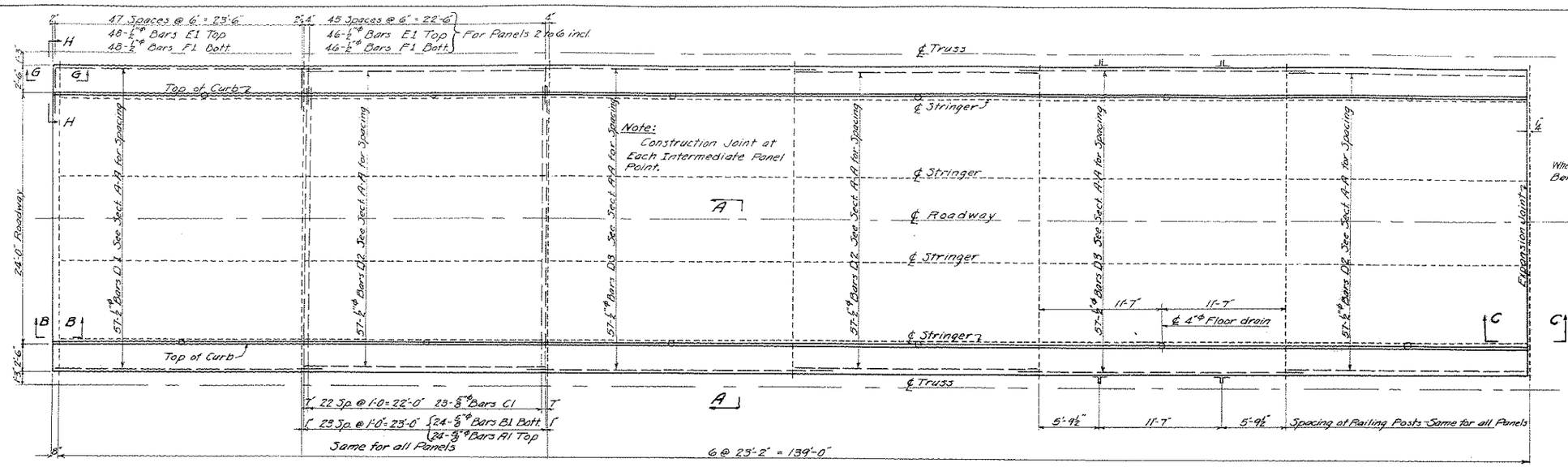
PLAN AND ELEVATION

SUPERSTRUCTURE CONTRACT #1764

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

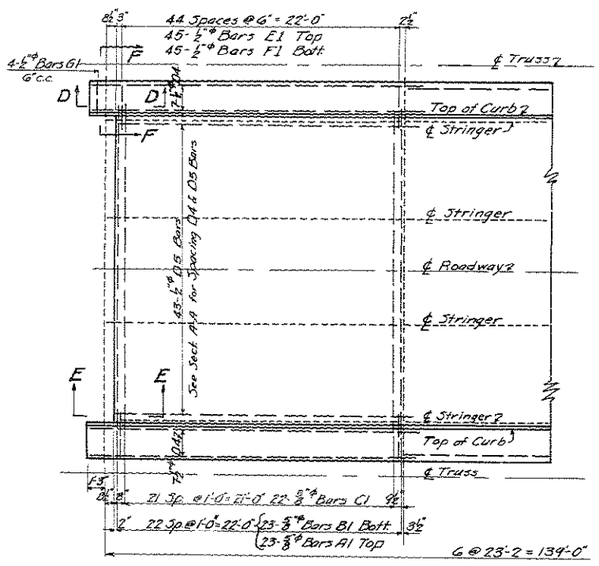
Scale: As Noted	Date: Aug. 25 1947		
Designed by	K.H.J.	Checked by	R.D.H.
Drawn by	M.E.B.	Checked by	K.H.J.
Traced by	M.E.B.	Checked by	N.D.W.

Dist. No.	State Proj. No.	Federal Aid Proj. No.	Fiscal Year	County	Sheet No.	Total Sheets
	3494			Summers	3	9



PLAN OF SLAB-SPAN #1 (#5 OPPOSITE HAND)

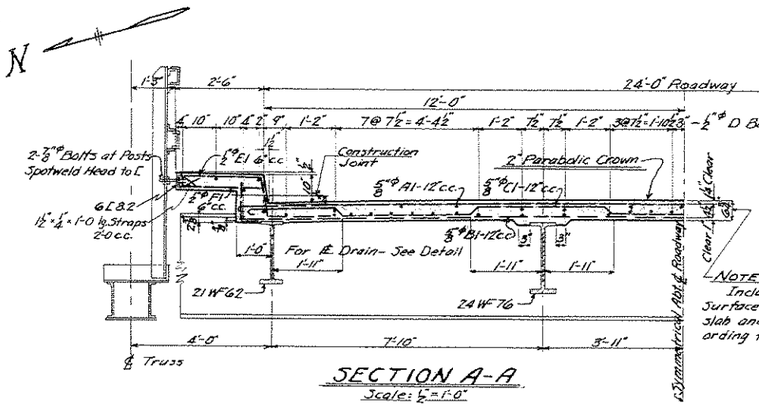
Scale: 3/16" = 1'-0"



PLAN OF SLAB-SPAN #3

Panels 2 to 6 Incl. Same as for Span #1

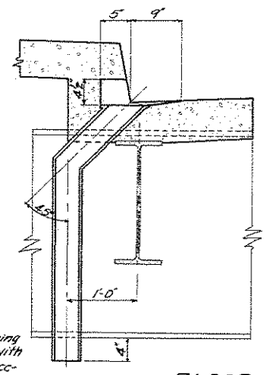
Scale: 3/16" = 1'-0"



NOTE:
Includes a ¼" wearing Surface Monolithic with slab and finished according to Specifications.

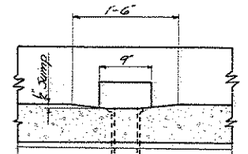
SECTION A-A

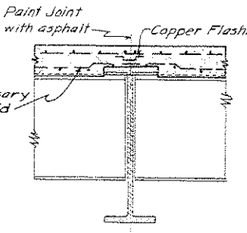
Scale: ½" = 1'-0"



FLOOR DRAIN

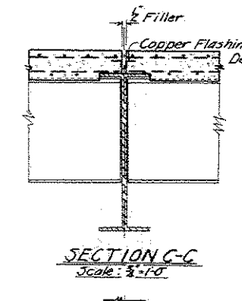
Scale: 1" = 1'-0"





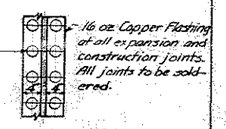
CONSTRUCTION JOINT

Scale: 3" = 1'-0"



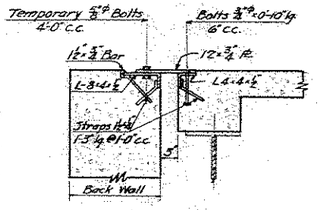
SECTION C-C

Scale: 3" = 1'-0"



DETAIL OF COPPER FLASHING

Scale: 3" = 1'-0"

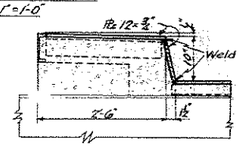


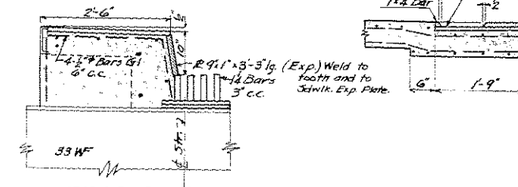
SECTION H-H

Scale: 3" = 1'-0"

SECTION G-G

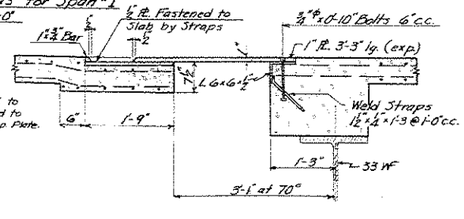
Scale: 3" = 1'-0"





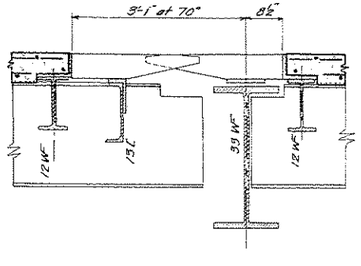
SECTION F-F

Scale: 3" = 1'-0"



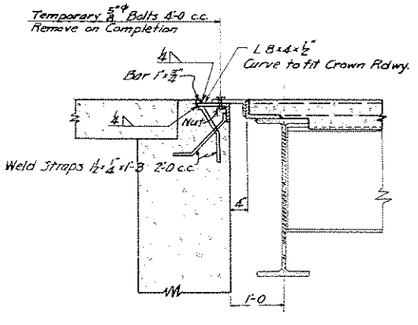
SECTION D-D

Scale: 3" = 1'-0"



SECTION E-E

Scale: 3" = 1'-0"



SECTION B-B

Scale: 3" = 1'-0"

For BAR SCHEDULE See Dwg. #4

THE STATE ROAD COMMISSION
OF WEST VIRGINIA

TRUE BRIDGE over BLUESTONE RIVER

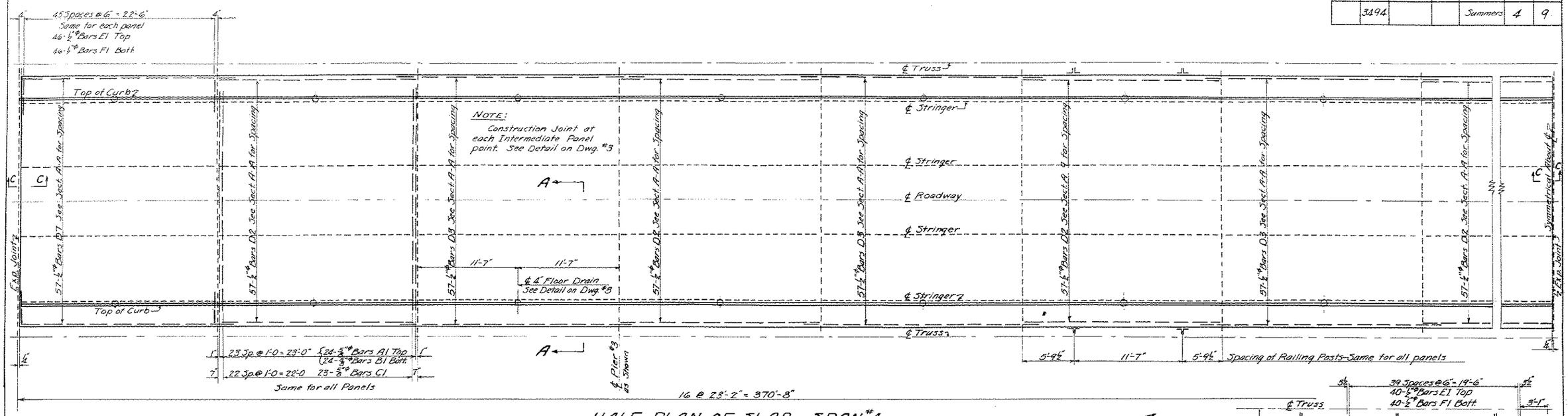
PROJECT #3494 SUMMERS COUNTY, W. VA.

CONCRETE DECK FOR 139'-0" SPAN SUPERSTRUCTURE CONTRACT #1764

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

Scale: As Noted		Date: Aug. 25, 1947	
Designed by	K.H.J.	Checked by	R.D.H.
Drawn by	R.D.H.	Checked by	K.H.J.
Traced by	M.E.B.	Checked by	N.D.W.

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

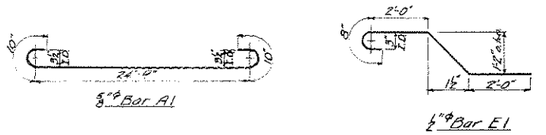


HALF PLAN OF SLAB - SPAN #4

Scale: 3/16" = 1'-0"

BILL OF REINFORCING STEEL

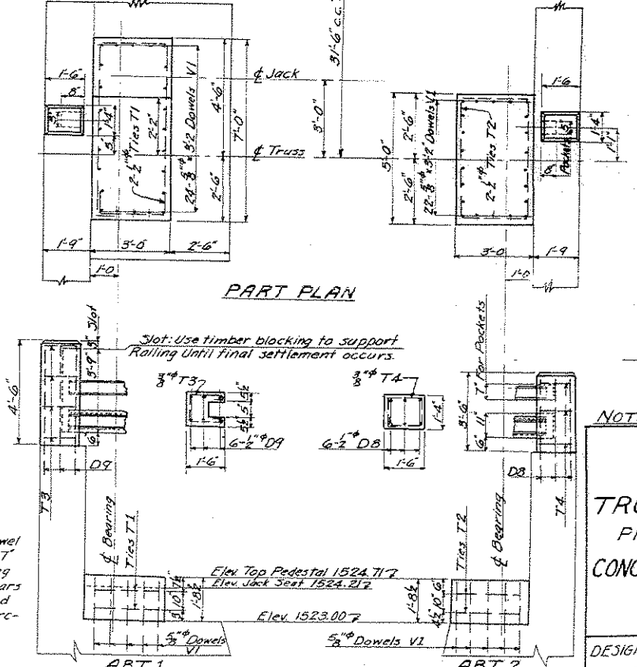
SPAN #1 & #5 - (One listed)					SPAN #2					SPAN #3					SPAN #4					POSTS & PEDESTALS				
No.	MK.	SIZE	LENGTH		No.	MK.	SIZE	LENGTH		No.	MK.	SIZE	LENGTH		No.	MK.	SIZE	LENGTH		No.	MK.	SIZE	LENGTH	
145	A1	⅜"ϕ	26'-5"	Bent	382	A1	⅜"ϕ	26'-5"	Bent	144	A1	⅜"ϕ	26'-5"	Bent	386	A1	⅜"ϕ	26'-5"	Bent	92	V1	⅜"ϕ	3'-2"	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	½"ϕ	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	½"ϕ	25'-4"	Str.	57	D7	½"ϕ	24'-10"	Str.	171	D2	½"ϕ	23'-0"	Str.	114	D7	½"ϕ	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	⅝"ϕ	4'-8"	Bent
114	D3	do	26'-6"	do	342	D3	do	26'-6"	do	14	D4	do	26'-0"	do	342	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	½"ϕ	5'-2"	Str.
556	F1	do	2'-9"	do	1462	E1	do	5'-10"	Bent	551	E1	do	5'-10"	Bent	1472	F1	do	2'-9"	do					
					1460	F1	do	2'-9"	do	550	F1	do	2'-9"	do										
										8	G1	do	4'-2"	do										



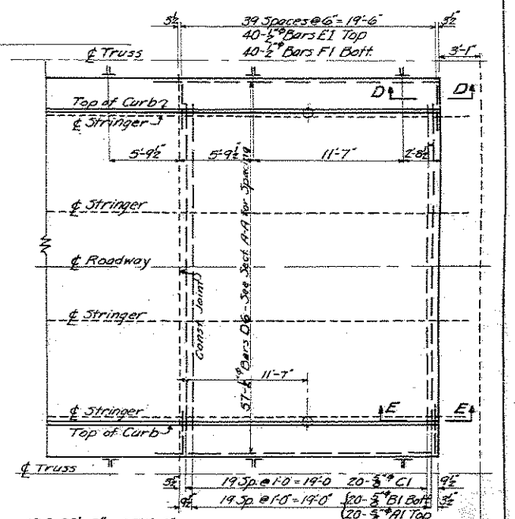
	A	B	C
T1	6'-9"	2'-9"	0'-4"
T2	4'-9"	2'-9"	0'-4"
T4	1'-4"	1'-2"	0'-4"

NOTE:
See Sheet #5 of Substructure plans for reinforcing bars in abutments which are included in Superstructure Contract

NOTE:
At Abut #2 the ⅝"ϕ Dowel Bars V1 are to be set 1'-7" into bridge seat. Drilling of holes and grouting bars in place is to be included in price bid for Reinforcing Bars, Item 78.



RAILING POSTS & PEDESTALS AT ABUTS. Scale: 3/8"=1'-0"
(Included in "Superstructure contract")



PLAN OF SLAB - SPAN #2

Scale: 3/16"=1'-0"

Panels 1 to 15 Incl. Same as Slab - Span 4

NOTE: For Sections A-A, C-C, D-D, & E-E: See Dwg. #3

THE STATE ROAD COMMISSION
OF WEST VIRGINIA

TRUE BRIDGE over BLUESTONE RIVER

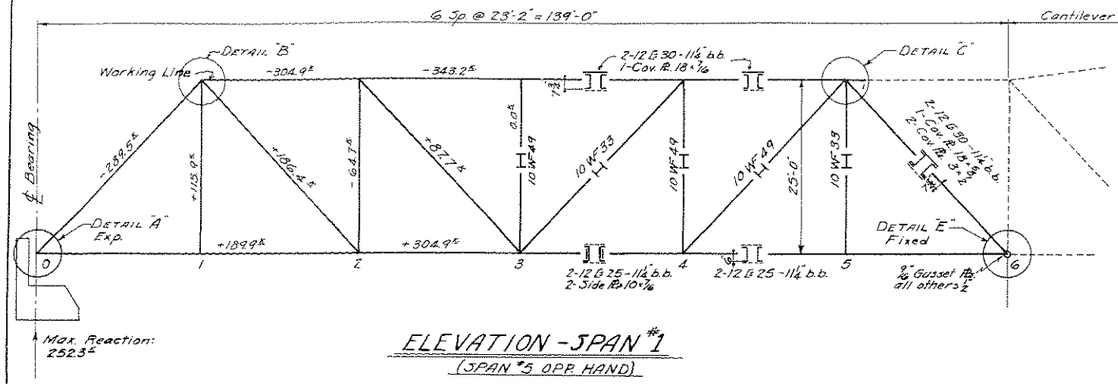
PROJECT #3494 SUMMERS CO., W. VA.

CONCRETE DECK DETAILS FOR CANTILEVER SPAN

SUPERSTRUCTURE CONTRACT #1764

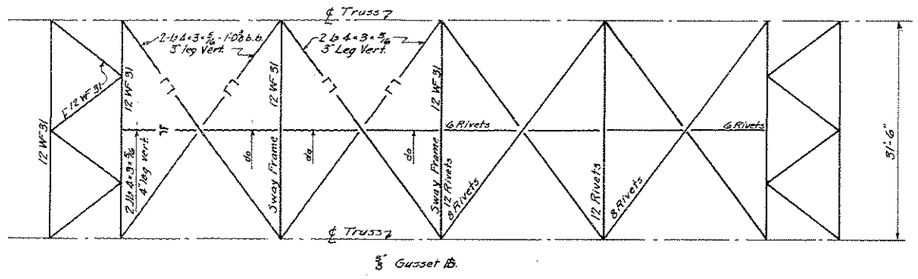
DESIGN BY FRANK D. McENTEER	Scale: As Noted	Date: Aug. 25, 1947
CONSULTING ENGINEER	Designed by K.H.J.	Checked by A.D.H.
Clarksburg, W. Va.	Drawn by M.E.B.	Checked by K.H.J.
	Traced by M.E.B.	Checked by N.D.W.

Dist No.	State Proj. No.	Federal Aid Proj. No.	Fiscal Year	County	Sheet No.	Total Sheets
	3494			Summers	5	9



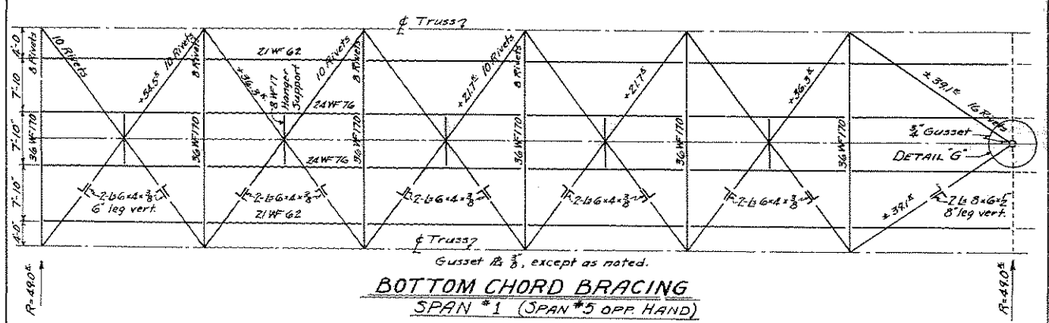
Max. Reaction: 252.3K

ELEVATION - SPAN #1
(SPAN #5 OPP. HAND)



⅜" Gusset Pls.

TOP CHORD BRACING
SPAN #1, 3, & 5



BOTTOM CHORD BRACING
SPAN #1 (SPAN #5 OPP. HAND)

DESIGN DATA: -Live Load H15-312

	Roadway Stringers Moments	Roadway Stringers Shears	Sidewalk Stringers Moments	Sidewalk Stringers Shears	Floor Beams Moments	Floor Beams Shears
Dead Load	57.9'K	10.2K	60.6'K	10.0K	336.1'K	43.0K
Sidewalk L.L.	0.0	0.0	17.0	2.9	19.8	5.7
Roadway L.L.	134.3	28.5	71.2	12.3	372.5	46.7
Impact	40.3	8.6	21.4	4.3	112.0	14.0
	232.5'K	47.9K	170.2'K	31.5K	840.4'K	109.4K

24 WF 76: Net S.M. Req'd.: 155 in³; Net S.M. Provided: 168 in³

21 WF 62: Net S.M. Req'd.: 113.3 in³; Net S.M. Provided: 121.6 in³

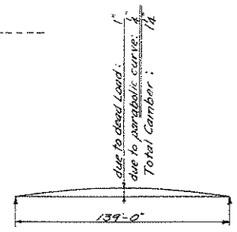
All Rivets ⅞" ϕ

33 WF 200 Bent 22

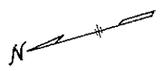
36 WF 170 All Beats Except 6, 22, 22', 6'

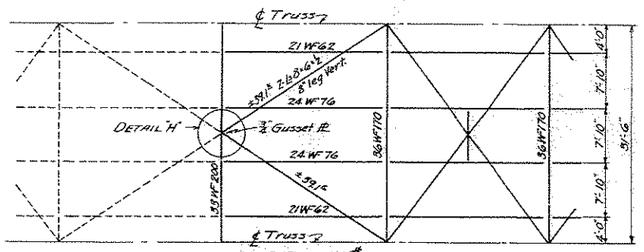
36 WF 194 - Bents 6, 22', 6'

Net S.M. Req'd.: 560 in³
Net S.M. Provided:
33 WF 200 584 in³
36 WF 170 564 in³
36 WF 194 560 in²

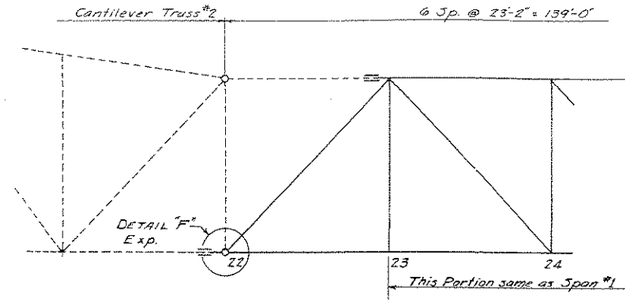


CAMBER DIAGRAM

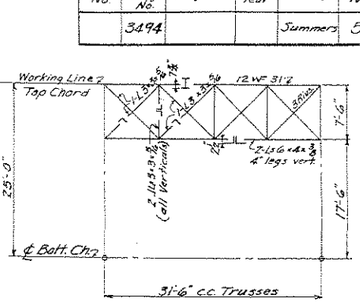




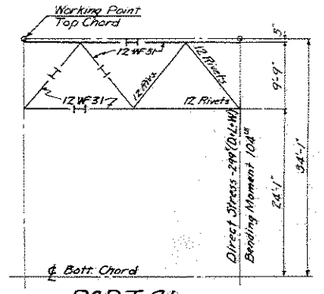
SPAN #3
BOTTOM CHORD BRACING



ELEVATION - SPAN #3
Stresses and Main Material Same as for Span #1.



INTERMEDIATE SWAY FRAME
TYPICAL



PORTAL
TYPICAL

STRESS SCHEDULE — Cantilever Span

Member	Dead Load	Stress. L.L.	Fldry. L.L.	Imp.	Wind	Max. Tens. D-L +I	Max. Tens. D+L I+W	Max. Comp. D-L +I	Max. Comp. D+L I+W	Section	Area Gross	Area Net	Min. Rad. of Gyr. r	l/r	Unit Design Stresses Tension Obt'd	Tension Allow	Compression Obt'd	Compression Allow
L_0L_1	—	—	—	—	—	0	0	0	0	2-13 B 35	20.48	—	4.95	56.2	0	—	0	—
L_1L_3	+327.0	- 14.6	-112.5	- 18.2	±15.5	—	—	472.5	643.8	2-13 B 35 2-36 lb. 10"×⅝	35.48	—	4.2	66.0	—	—	17.75	17.42
L_3L_5	-355.8	- 24.1 + 8.2	-177.0 + 98.2	- 24.7 + 8.3	±15.5	—	—	501.4	739.9	2-13 G 35 2-36 lb. 10"×⅝	42.98	—	4.0	69.5	—	—	17.25	17.25
L_5L_7	-110.0	- 31.3 + 28.8	-209.0 +174.1	- 29.8 + 34.4	±15.5	21.8	45.2 37.6	85.2	49.4	2-36 lb. 10"×⅝	42.98	32.44	4.0	69.5	14.1	22.5	16.10	17.25
L_1U_2	- 2.0	- 31.3 + 29.0	-195.5 +207.3	- 27.2 + 35.0	±15.5	39.8	60.2 54.9	98.5	62.5	2-13 G 35 2-36 lb. 10"×⅝	35.48	28.30	4.2	66.0	22.5	22.5	17.41	17.42
U_2U_3	+159.0	+ 7.3	+ 58.5	+ 10.2	± 6.4	23.5	0	21.8	—	2-15 D 31.8 1-C.P. 22"×½	29.60	24.24	5.08	54.8	9.69	18.0	—	—
U_3U_5	+50.9	+ 22.6	+167.5	+ 25.2	± 14.3	72.3	73.6	—	—	2-15 B 40 1-C.P. 22"×½ 1-C.P. 22"×¾ 2-C.P. 4"×⅜	49.04	40.68	—	—	17.79	18.0	—	—
U_4U_6	do	do	do	do	do	do	do	—	—		do	do	—	—	do	do	—	—
U_6U_7	+225.0	+ 27.9 - 14.7	+193.5 -118.5	+ 27.1 - 16.7	±33.3	47.3	50.6	—	—	2-15 B 40 1-C.P. 22"×½	34.42	27.85	—	—	16.90	18.0	—	—
U_5U_6	+26.8	+ 31.3 - 27.8	+210.8 -199.0	+ 28.3 - 27.9	±39.7	40.6	46.5	33.9	41.3	2-15 D 31.8 1-C.P. 22"×½	29.60	24.24	5.08	54.8	16.82	18.0	12.00	14.24
U_6L_7	-231.8	- 12.4	- 93.4	- 16.3	—	—	—	353.9	—	2-15 B 50	29.28	—	4.62	88.5	—	—	17.72	19.05
L_7U_8	+206.0	+ 14.2	+105.3	+ 17.0	—	122.5	—	—	—	2-13 G 50	29.28	24.60	—	—	17.2	18.0	—	—
U_6L_9	-298.7	- 14.1	-103.1	- 15.5	—	—	—	432.4	—	2-15 D 40 4-C.P. 4"×⅜	33.42	—	5.5	85.8	—	—	12.95	13.15
L_9U_{10}	-251.5	+ 4.4 - 14.8	+ 33.6 -108.4	+ 5.7 - 15.2	—	—	—	398.7	—	2-13 G 40 4-C.P. 4"×⅝	30.42	—	5.3	86.7	—	—	12.80	13.02
U_6L_{10}	+204.4	- 14.7 - 5.4	-111.0 - 41.4	+ 15.6 - 10.7	—	36.5	—	—	—	2-13 G 40	23.62	21.16	—	—	17.38	18.0	—	—
L_9U_{12}	-166.0	+ 5.6 - 12.6	+ 45.6 -102.3	+ 11.8 - 14.1	—	—	—	293.0	—	2-13 B 40	23.42	—	4.82	84.8	—	—	12.50	13.20
$U_{12}L_{13}$	+12.5	+ 11.9 - 6.6	+ 54.6 - 45.5	+ 11.9 - 6.4	—	29.1	—	—	—	2-12 G 30	17.58	14.58	—	—	16.10	18.0	—	—
$L_{13}U_{14}$	- 42.3	+ 8.0 - 9.8	+ 56.8 - 70.0	+ 8.0 - 9.8	—	43.2	—	131.9	—	2-12 B 25	14.64	12.39	4.43	92.3	3.50	18.0	9.00	12.67
$U_{14}L_{15}$	+92.5	+ 9.2	+ 77.6	+ 14.2	—	29.3	—	—	—	2-13 G 35	20.48	17.80	—	—	16.50	18.0	—	—
U_6L_7 L_7U_8	—	—	—	—	—	0	—	0	—	12 WF 53	15.59	—	2.9	117.0	0	—	0	—
U_6L_7 L_7U_8	+61.0	+ 3.5	+ 47.3	+ 13.5	—	124.3	—	—	—	12 WF 40	11.77	9.73	—	—	17.80	18.0	—	—
$U_{14}L_{15}$	-145.4	- 6.5	- 47.9	- 7.2	- 6.03	—	—	201.0	247.3	2-13 G 50 2-36 lb. 10"×⅝	44.32	—	4.12	102.0	—	—	5.60*	15.50
$U_{14}L_{15}$ $L_{15}U_{16}$	+ 61.0	+ 3.5	+ 46.3	+ 13.5	—	124.3	—	—	—	12 WF 36	10.59	8.43	—	—	14.75	18.0	—	—
U_6L_{17}	—	—	—	—	—	0	—	0	—	12 WF 53	15.59	—	2.9	103.5	—	—	0	—

STRESS SCHEDULE — Simple Span

Member	Dead Load	Stress. L.L.	Fldry. L.L.	Imp.	Wind	Max. Tens. D-L -I	Max. Tens. D+L I+W	Max. Comp. D-L -I	Max. Comp. D+L I+W	Section	Area Gross	Area Net	Min. Rad. of Gyr. r	l/r	Unit Design Stresses Tension Obt'd	Tension Allow	Compression Obt'd	Compression Allow
L_4L_4	-122.0	- 10.5	- 81.2	- 15.5	± 9.5	—	—	178.5	219.0	2-12 B 30 2-C.P. 10"×⅜	31.83	—	5.0	84.8	—	—	9.48*	16.67
U_4L_4	-118.0	- 11.7	- 86.0	- 15.2	± 3.9	—	—	174.9	212.5	2-12 B 30 1-C.P. 18"×⅜	25.46	—	4.55	61.1	—	—	12.00	14.07
U_4L_5	-223.0	- 13.2	- 89.9	- 17.1	± 5.2	—	—	343.7	385.4	do	25.46	—	4.55	61.1	—	—	13.51	14.07
L_4L_5	+123.2	+ 7.3	+ 49.9	+ 9.5	± 4.8	189.9	194.7	—	—	2-12 B 25	14.66	11.86	—	—	16.60	18.0	—	—
L_5L_6	+198.0	+ 11.7	+ 80.0	+ 15.2	± 5.4	304.9	310.3	—	—	2-12 D 25 2-36 lb. 10"×⅜	23.41	17.59	—	—	17.32	18.0	—	—
U_5L_6	+109.0	- 0.4 + 6.9	- 9.4 + 58.2	- 2.8 + 12.3	—	26.0 176.6	—	—	—	10 WF 49	14.40	12.16	—	—	21.60	24.0	—	—
U_4L_5	+36.4	- 1.7 + 3.9	- 22.2 + 58.2	- 6.2 + 9.2	—	136.2 82.7	—	—	—	10 WF 33	9.71	7.98	2.23	186.	17.20	24.0	—	—
L_4L_5	+53.2	+ 3.1	+ 46.8	- 13.2	—	175.2 115.9	—	—	—	do	9.71	7.98	—	—	22.00	24.0	—	—
U_4L_4	-269	+ 1.5 - 2.8	+ 16.2 - 38.2	+ 4.5 - 6.8	—	—	—	—	64.7	10 WF 69	14.40	—	2.54	118.0	—	—	4.50	11.50
L_4L_5	0	—	—	—	—	—	—	—	—	do	14.40	—	2.54	118.0	—	—	—	—

* 70% of Dead Load only.
× 50% of Smaller Stress added. — See Specs. 4.7.6
✱ Exclusive of Bending
○ Including Overload — See Specs. 4.2.4

NOTE: Stresses on truss members given thus, 472.5 are for D.L + LL + Imp. Stresses in parenthesis thus, (6.3[18]) also include 30% for Wind.

THE STATE ROAD COMMISSION
OF WEST VIRGINIA

TRUE BRIDGE over BLUESTONE RIVER

PROJECT #3494 SUMMERS CO., W.VA.

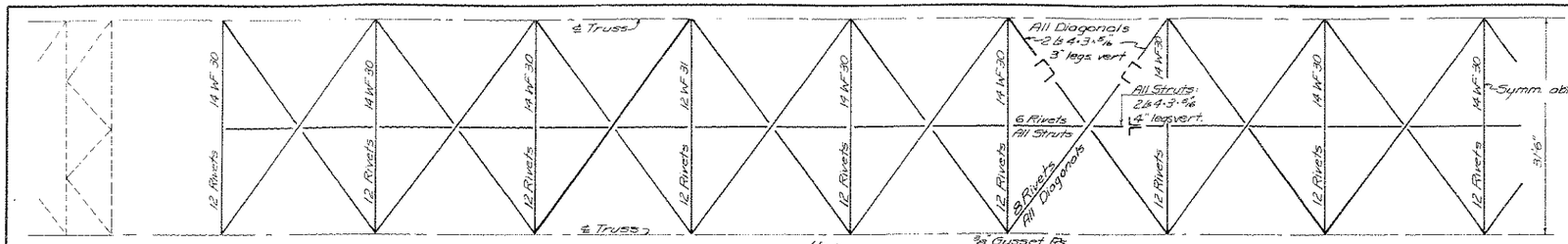
STRESS SHEET FOR 139'-0" SPANS

SUPERSTRUCTURE CONTRACT #1764

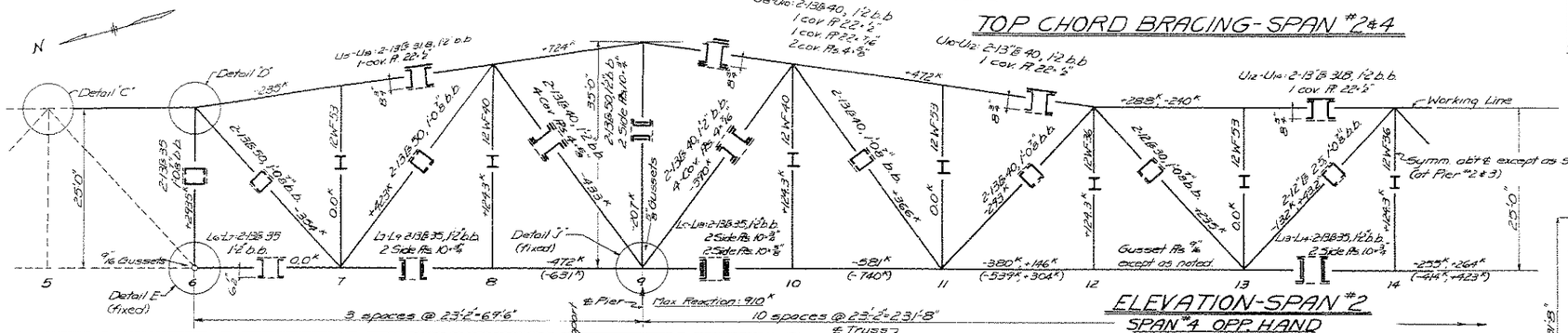
DESIGN BY FRANK D. McENTEER
CONSULTING ENGINEER
Clarksburg, W. Va.

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.

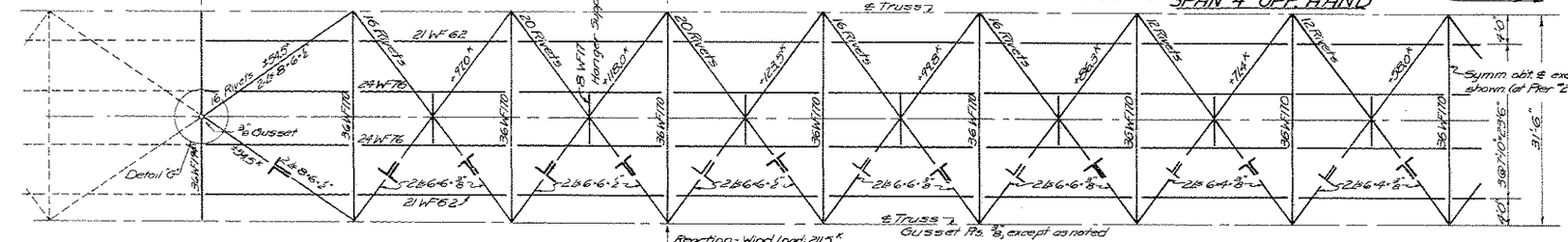
Dist. No	State Proj. No.	Federal Aid Proj. No.	Fiscal Year	County	Sheet No.	Total No. Sheets
	3494			Summers	6	9



TOP CHORD BRACING - SPAN #2 & 4



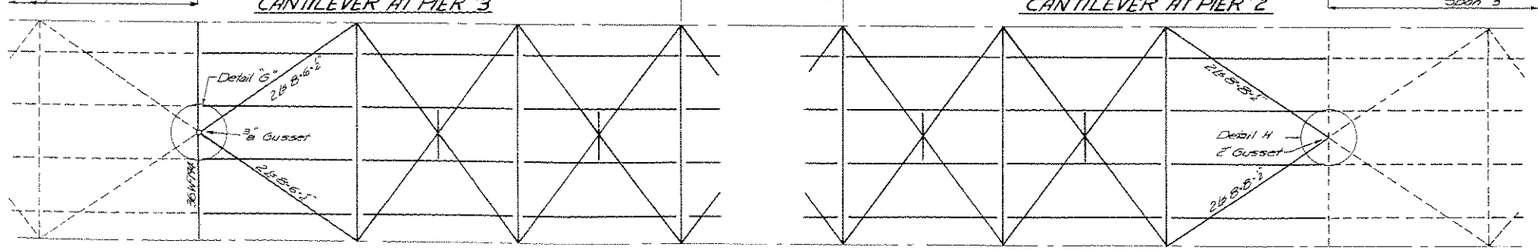
ELEVATION - SPAN #2
SPAN #4 OPP. HAND



BOTTOM CHORD BRACING - SPAN #2
SPAN #4 OPP. HAND

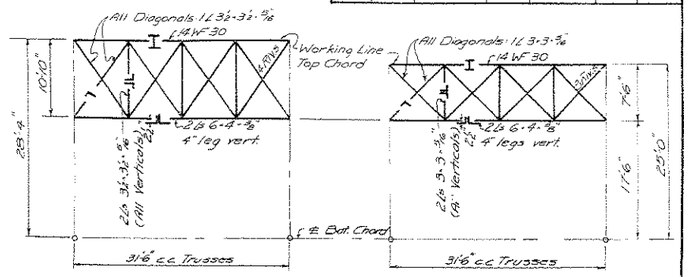
ELEVATION - SPAN #4
CANTILEVER AT PIER #3

ELEVATION - SPAN #2
CANTILEVER AT PIER #2



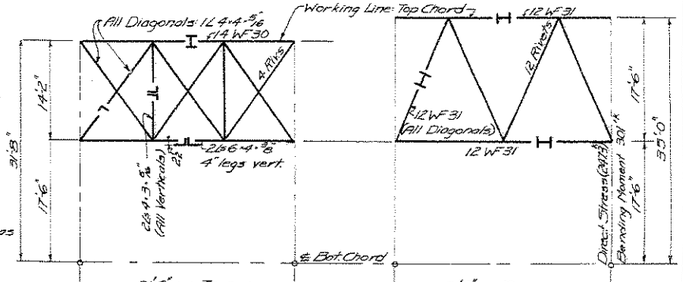
BOTTOM CHORD BRACING

BOTTOM CHORD BRACING



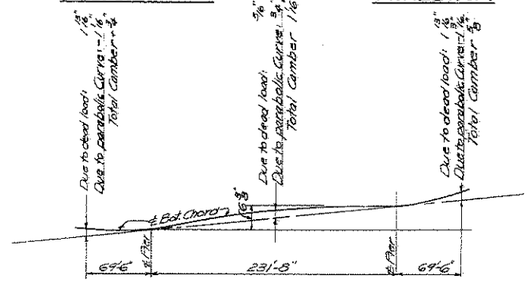
SWAY FRAME
PANEL NO. 7 & 11

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 412K are for D.L.+L.L.& Imp. Stresses in parenthesis, thus (631K) also include 30 lb/sq ft Wind. For Stresses in Stringers, Floor Beams & Trusses see Dwg. #5.

7/8" ø Rivets

THE STATE ROAD COMMISSION OF WEST VIRGINIA

TRUE BRIDGE OVER BLUESTONE RIVER

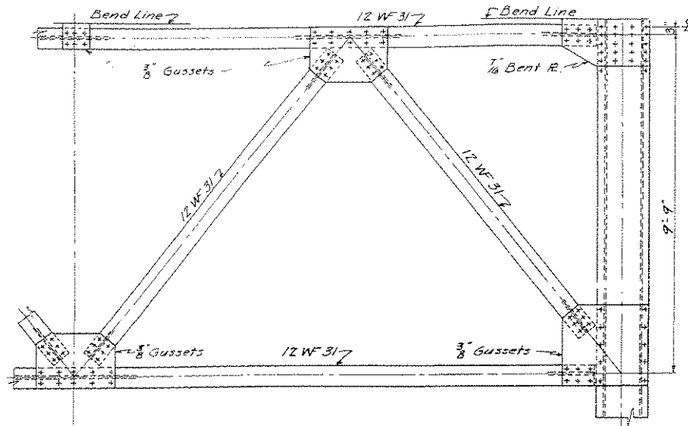
PROJECT #3494 SUMMERS CO., W.VA.

STRESS SHEET FOR CANTILEVER SPANS

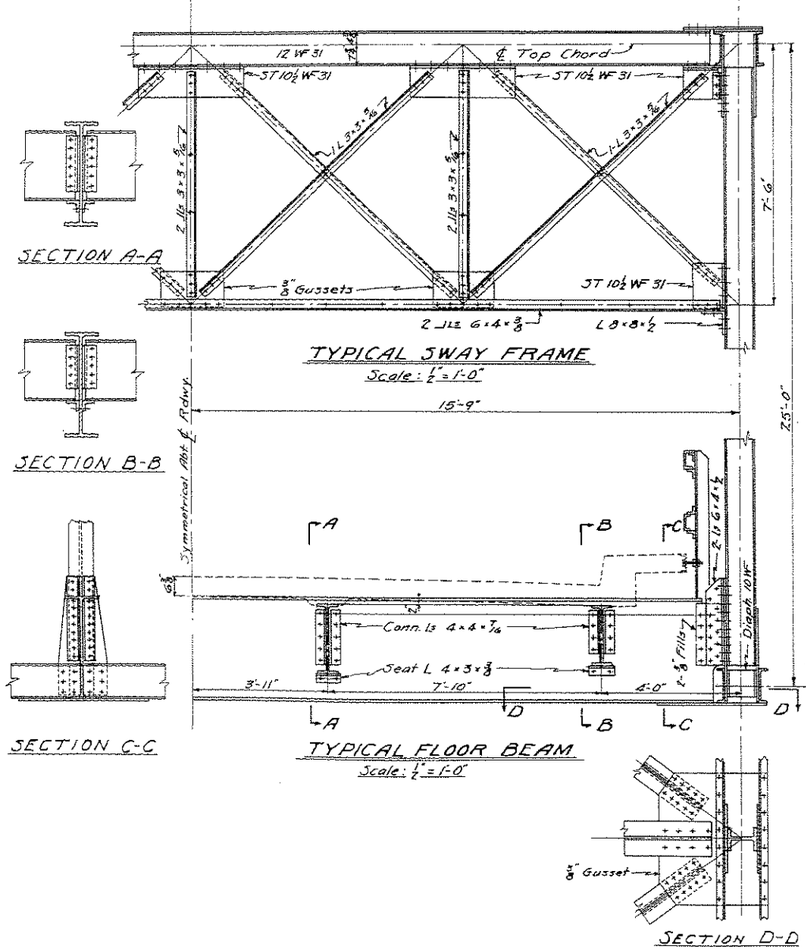
SUPERSTRUCTURE CONTRACT #1764

DESIGN BY FRANK D. McENTEER CONSULTING ENGINEER Clarksburg, W. Va.	Scale: 1"=10'-0"		Date: Aug. 25, 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" = 1'-0"



SECTION A-A

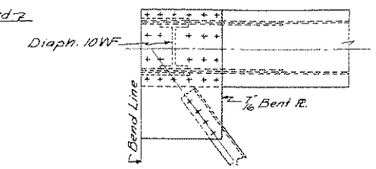
SECTION B-B

SECTION C-C

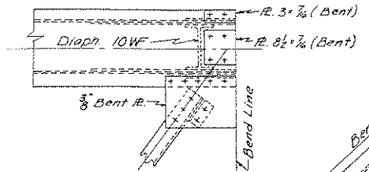
TYPICAL SWAY FRAME
Scale: ½" = 1'-0"

TYPICAL FLOOR BEAM
Scale: ½" = 1'-0"

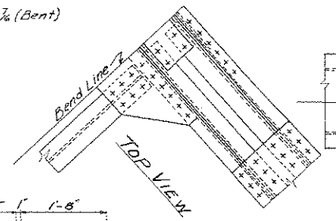
SECTION D-D

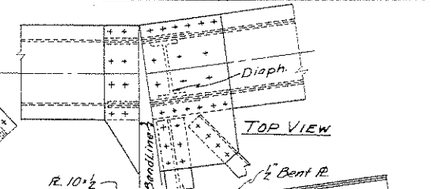


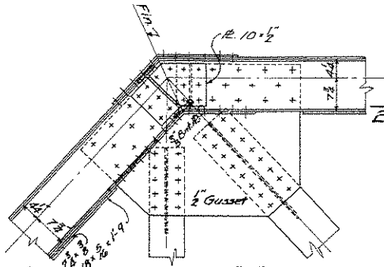
TOP VIEW



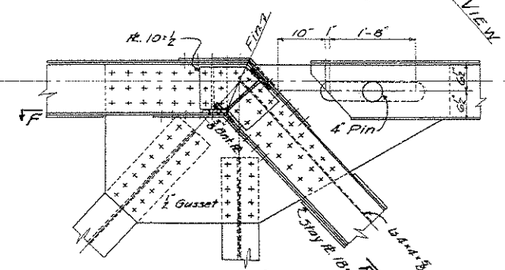
TOP VIEW



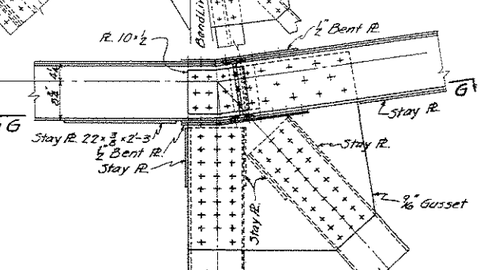




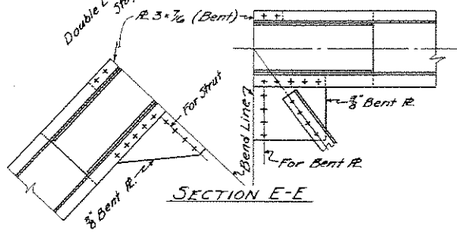
DETAIL "B"



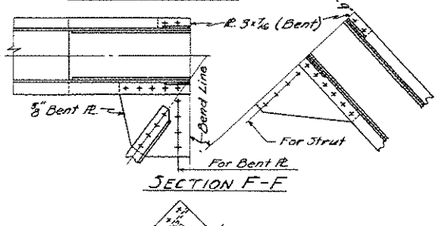
DETAIL "C"



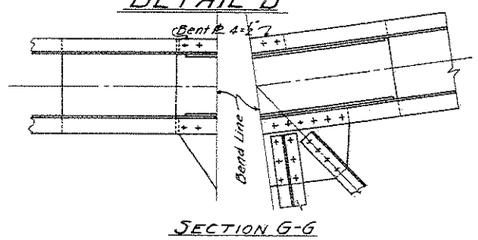
DETAIL "D"



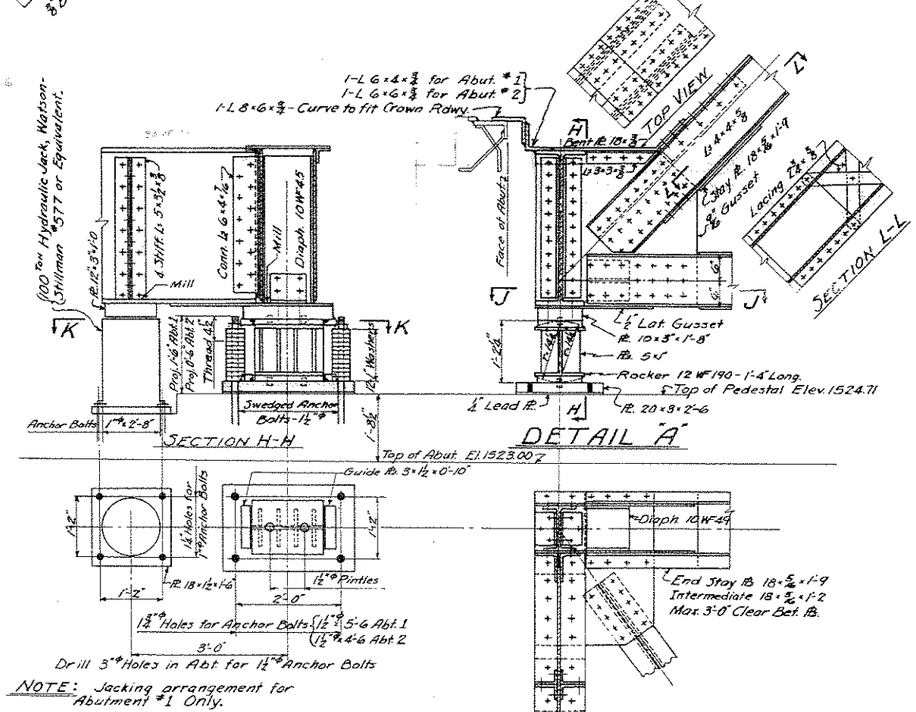
SECTION E-E



SECTION F-F



SECTION G-G



THE STATE ROAD COMMISSION
OF WEST VIRGINIA

TRUE BRIDGE over BLUESTONE RIVER

PROJECT #3494 SUMMERS CO., W. VA.

TYPICAL STEEL DETAILS 1 or 2

SUPERSTRUCTURE CONTRACT #1764

DESIGN BY FRANK D. McENTEER, CONSULTING ENGINEER, Clarksburg, W. Va.	Scale: ¾" = 1'-0" Unless Noted	Date: Aug. 25, 1947
	Designed by K.H.J.	Checked by R.D.H.
	Drawn by R.D.H.	Checked by K.H.J.
	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 Sheets
	3494			Summers	8	9

DETAIL "I"

SECTION A-A

DETAIL "F"

SECTION B-B

DETAIL "K"

DETAIL "J"

SECTION G-G

DETAIL "E"

SECTION H-H

SECTION J-J

SECTION D-D

SECTION C-C

PLAN OF 14" FIN PL. IN STR. POCKET

DETAIL "G"

SECTION K-K

DETAIL "H"

PART PLAN EXP. DEVICE

SECTION Z-Z

TYPICAL RAILING DETAILS

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

NOTE: Drill 3½" 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. McENTEER CONSULTING ENGINEER Clarksburg, W.Va.	Scale: ¾" = 1'-0"		Date: Aug. 25, 1947	
	Designed by	K.H.J.	Checked by	R.D.H.
	Drawn by	R.D.H.	Checked by	K.H.J.
	Traced by	N.D.W.	Checked by	R.D.H.

TO HINTON

ROUTE #20

S. 16° 38' W.

Hole #1

Hole #2

Hole #3

Hole #4

Hole #5

Hole #6

2.50/100

1384

1386

1388

1390

1392

1394

1396

1398

1380

1640 1630 1620 1610 1600 1590 1580 1570 1560 1550 1540 1530 1520 1510 1500 1490 1480 1470 1460 1450 1440 1430 1420 1410 1400 1390 1386

1650 1660 1530 1540 1550 1560 1570 1580 1590 1600 1610 1620 1630 1640 1650 1660 1510 1500 1490 1460 1470 1460 1450 1440 1430 1420 1410 1400 1390 1386

1386 1388 1390 1392

1530.16 1530.19 1530.00 1530.00 1530.00

100' V.C.

0.0%

Excess material on North side of Bluestone River will make fill to this line

B.M. # 19 Elev 1528.04 Nail & slug in side of 8" W.O. 100' Rt. of Sta. 226+10±

HOLE No. 1 Sta. 229+12 12' Lt. ℄

HOLE No. 2 Sta. 230+17.50 12' Rt. ℄

HOLE No. 3 Sta. 231+23 12' Lt. ℄

HOLE No. 4 Sta. 232+29.50 12' Rt. ℄

HOLE No. 5 Sta. 233+36 12' Lt. ℄

1528.1 1527.5 1526.3 1524.5 1523.3 1508.2 1477.4 1460.0 1447.5 1429.0 1417.9 1386.3 1385.4 1384.8 1384.5 1387.7 1389.7 1391.7 1390.1 1391.5 1391.5 1391.2 1388.7

224 +50 +80 225 +20 +50 226 +50 227 +00 +50 228 +50 229 +50 230 +50 231 +50 232 +50 233 +50 234

+91.25 +80.15

Dist. No.	State Proj. No.	Fed. Aid Proj. No.	Fiscal Year	County	Sheet No.	Total Sheets
	3494			Summers	1(Culvert)	6
	3494			Summers	3(Superst.)	9

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
Profile & Grade Line Revised 2-10-47

BLUESTONE
PIPESTEM CREEK
RIVER
To PRINCETON
Present Bridge No. 1390
Hole #5
Hole #6
Hole #7
Hole #8
Hole #9
Hole No. 5 Sta. 233+94 12' Lt. ℄
Hole No. 6 Sta. 234+39.50 12' Rt. ℄
Hole No. 7 Sta. 236+00 On ℄
Hole No. 8 Sta. 236+29 On ℄
Hole No. 9 Sta. 237+56 12' Lt. ℄
Pool Elev. 1490.00 at Dam 2.7 Miles do--- stream
Clearance Line El. 1523.0
High Water El. 1520.0
Approx. Pool, March, 1947 = El. 1380.0
Cores from holes "5" "6" and "9" inspected 11/18/46
B.M. # Elev. 1396.07 at Bridge abutment Lt. of Sta. 237+10
Rock Profiles at Abut. # 2
Scales: 1"=10'
Rock on ℄
Ground 12' Rt.
Rock 12' Rt. of ℄
Rock 12' Lt. of ℄
Ground 12' Lt.
Ground Line
Rock on ℄
E.M. # 21 Elev. 1505.86 P.K. Spike in Spad at 12" B.O. 10' Rt. of Sta. 245+85
V.C. 400'
Ext. Grade Line 2
Approx. Pool, March, 1947 = El. 1380.0
SITE
TRENTON
PRINCETON
BLUEFIELD
WELCH
WILLIAMSON
CHARLESTON
Tracing 325
#1764-A

Sheet No.	Total Sheets
2	9

Span 1 — 6 @ 23'-0" = 138'-0"

Span 2 — 10 @ 23'-2" = 231'-8"

Span 3 — 6 @ 23'-0" = 138'-0"

Span 4 — 10 @ 23'-2" = 231'-8"

Span 5 — 6 @ 23'-0" = 138'-0"

El. 1290.00 — El. 1280.44 — El. 1270.44 — El. 1263.50 — El. 1252.42 — El. 1250.44 — El. 1250.00

Fix — Exp. — Fix — Exp. — Fix — Exp. — Fix

6 Bar "I" Chords

El. 1324.43 — El. 1324.43 — High Water El. 1361.27

Pool El. 1490.0 at Dam 27 Miles Downstream

Sta. 238+08.00 Bk. of Sta. 238+30.00 Ahead

Approx. Pool Level Mar. 1947 El. 1360.0

El. 1276.00 — Rock El. 1273.43 — Rock El. 1273.31 — El. 1270.00 — Rock El. 1271.4 ± — El. 1369.00 — Rock El. 1376.5 — El. 1375.00

43'-0"

38'-6"

208'-6" | 231'-6" | 278'-0" | 231'-8" | 208'-6"

Sta. 228+19.67 — Sta. 230+29.67 — Sta. 232+59.33 — Sta. 235+37.83 — Sta. 237+69.50 — Sta. 239+98.50

1175'-4"

ELEVATION

Scale 1" = 40'

℄ Bearing Abut #1

Exp. Jt. (Std.)

Construction Jt. at all Floor Beams

Exp. Jt. (Std.)

2'-6" Sidewalk

Exp. Jt. (Std.)

Exp. Jt. (Std.)

Exp. Jt. (Std.)

2'-6" Sidewalk

℄ Bearing Abut #2

31'-6"

Weep Holes To ℄ 4" Drain Typical for all panels

℄ Truss

PLAN

Scale 1" = 40'

400' Vertical Curve

Sta. 237+00.00 ± Approx. P.C.

Top of Slab

Sta. 239+00.00 P.T.

Bott. of Slab

Top of Ext. Stringer

℄ Bearing Abutment #2

14'-10"

23'-2"

23'-2"

RISER DIAG. for VERT. CURVE

Not to Scale

THE STATE ROAD COMMISSION OF WEST VIRGINIA

TRUE BRIDGE OVER BLUESTONE RIVER

PROJECT #3494 SUMMERS COUNTY

PLAN AND ELEVATION

SUPERSTRUCTURE CONTRACT #1764

DESIGN BY FRANK D. McENTEER
Consulting Engineer
Clarksburg, W. Va.

Scale: As Shown Date:

Designed by F.D.M.

Drawn by H.E.C.

Traced by

Checked by F.D.M.

Checked by

Checked by

DWG. 303

Dist. No.	State Proj. No.	Federal Aid Proj. No.	Fiscal Year	County	Sheet No.	Total Sheets
	3194			Summers	7	9

47 Spaces @ 6" = 23'-6"
48-$\frac{1}{2}$"ϕ Bars E1 Top
48-$\frac{1}{2}$"ϕ Bars F1 Bott.

45 Spaces @ 6" = 22'-6"
46-$\frac{1}{2}$"ϕ Bars E1 Top } For Panels 2 to 6 incl.
46-$\frac{1}{2}$"ϕ Bars F1 Bott.

℄ Truss

Top of Curb

Note: Construction Joint at Each Intermediate Panel Point.

℄ Stringer

℄ Roadway

℄ Stringer

Top of Curb

℄ Truss

24'-0" Roadway

See Sect. A-A for Spacing

57-$\frac{5}{8}$"ϕ Bars D1

57-$\frac{5}{8}$"ϕ Bars D2 See Sect. A-A for Spacing

57-$\frac{5}{8}$"ϕ Bars D3 See Sect. A-A for Spacing

17-$\frac{5}{8}$"ϕ Bars D4 See Sect. A-A for Spacing

57-$\frac{5}{8}$"ϕ Bars D3 See Sect. A-A for Spacing

57-$\frac{5}{8}$"ϕ Bars D2 See Sect. A-A for Spacing

Pouring Sequence

11'-7" 11'-7"

2-4" ϕ Floor drain

B B C C

℄ Filler
Copper Flashing

CONSTRUCTION JOINT
Scale: $\frac{3}{4}$"=1'-0"

SECTION C-C
Scale: $\frac{3}{4}$"=1'-0"

22 Sp. @ 1'-0" = 22'-0" } 23-$\frac{5}{8}$"ϕ Bars C1
28 Sp. @ 1'-0" = 28'-0" } 24-$\frac{5}{8}$"ϕ Bars B1 Bott.
24-$\frac{5}{8}$"ϕ Bars A1 Top

Same for all Panels

6 @ 23'-2" = 139'-0"

2-10½" 3 @ 5'-4½" = 17'-5½" 2-10½" Spacing Joint Posts - Same for All Panels.

PLAN OF SLAB-SPAN #1 (#5 OPPOSITE HAND)
Scale: $\frac{3}{16}$"=1'-0"

Revised 8/4/47

44 Spaces @ 6" = 22'-0"
45-$\frac{1}{2}$"ϕ Bars E1 Top
45-$\frac{1}{2}$"ϕ Bars F1 Bott.

4-$\frac{5}{8}$"ϕ Bars G1 6" c.c.

Top of Curb

℄ Stringer

43-$\frac{5}{8}$"ϕ Bars A-A for Spacing See Sect. A-A

℄ Roadways

℄ Stringer

Top of Curb

℄ Truss

21 Sp. @ 1'-0" = 21'-0" 22-$\frac{5}{8}$"ϕ Bars C1
22 Sp. @ 1'-0" = 22'-0" 23-$\frac{5}{8}$"ϕ Bars B1 Bott.
23-$\frac{5}{8}$"ϕ Bars A1 Top

6 @ 23'-2" = 139'-0"

PLAN OF SLAB-SPAN #3
Panels 2 to 6 Incl. Same as for Span #1.
Scale: $\frac{3}{16}$"=1'-0"

N

24'-0 Roadway

1'-5½" 2'-6" 12'-0"

5 10 10 5½ 6 1-2 7 @ 7½ = 4'-4½ 1-2 7½ 7½ 1-2 3 @ 7½ = 4'-4½

1-$\frac{1}{2}$"ϕ D Bars

2% Parabolic Crown

$\frac{5}{8}$"ϕ A1-12" c.c. $\frac{5}{8}$"ϕ C1-12" c.c.

$\frac{5}{8}$"ϕ B1-12" c.c.

6" E B2 12"-L Straps 5'-0" c.c. Provide 2-$\frac{3}{4}$"ϕ 10" Bolts at Posts.

1'-0" For E Limit - See Cons. 1 12" c.c.

1'-11" 1'-11" 1'-11"

21 WF 62

24 WF 76

3'-0" 7'-10" 5'-1"

℄ Truss

Sprung Arch Roadway ℄ Roadway

Clear

NOTE: Includes a ½" wearing Surface Monolithic with slab and finished according to Specifications.

SECTION A-A
Scale: $\frac{1}{2}$"=1'-0"

5' 9"

1'-6" 9"

Slope

1'-0"

4" W.I. Pipe Paint Surface in Contact with concrete with heavy coat of Asphalt

END SPAN
Scale: 1"=1'-0"

Temporary ¾"ϕ Bars 2'-0" c.c. Remove on Completion of Pour

1-L 6"×4"×½" 1-L 8"×4"×¾" Curve to fit Crown of Rdwy.

Bar 1-2"×½"

1-L 8"×6"×½" (weld to F.B.)

Weld Straps 1"×½" @ 2'-0" c.c.

℄ Girder

1'-0"

SECTION B-B
Scale: $\frac{3}{4}$"=1'-0"

For Bar Schedule see Dwg. #4.

½"ϕ Bolts with 6" c.c.

½"×8" Plate fastened to Slab by Straps

Weld Straps 1½"×½"×8'-8" c.c.

2'-6" 1'-8"

4-$\frac{5}{8}$"ϕ Bars G1 6" c.c.

33 WF 200

SECTION E-E
Scale: $\frac{3}{4}$"=1'-0"

3'-1" at 70° 6½"

SECTION F-F
Scale: $\frac{3}{4}$"=1'-0"

SECTION D-D
Scale: $\frac{3}{4}$"=1'-0"

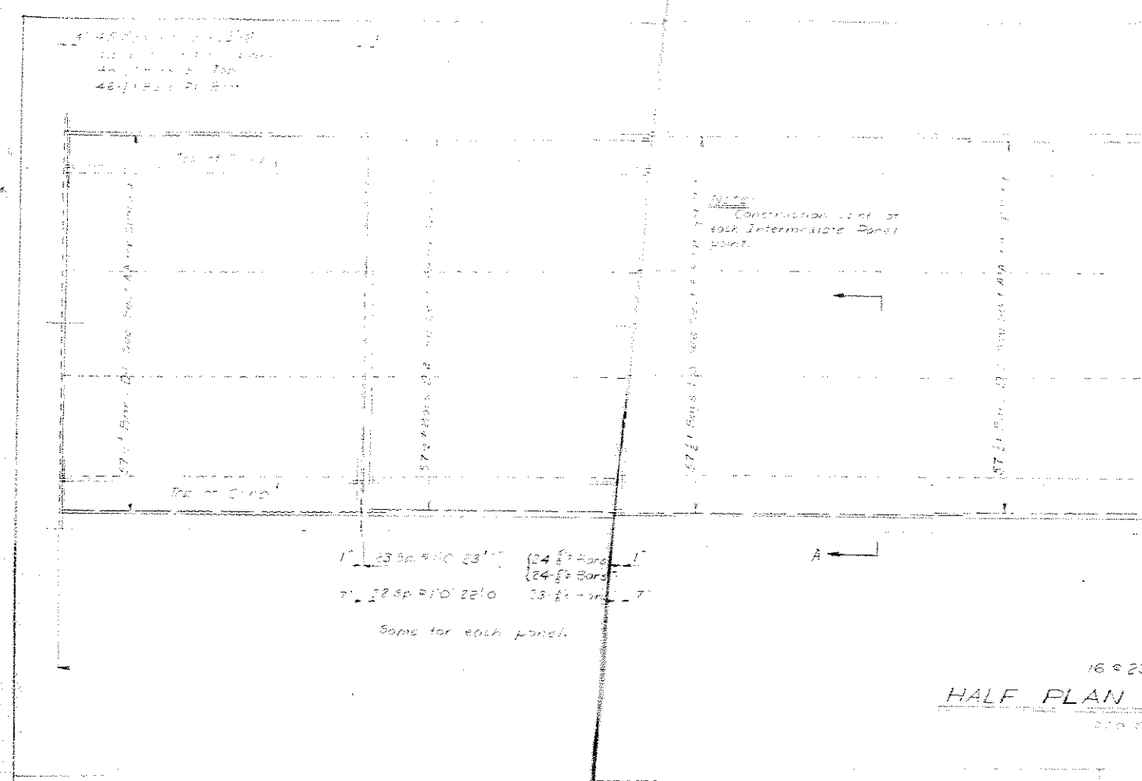
THE STATE ROAD COMMISSION
OF WEST VIRGINIA

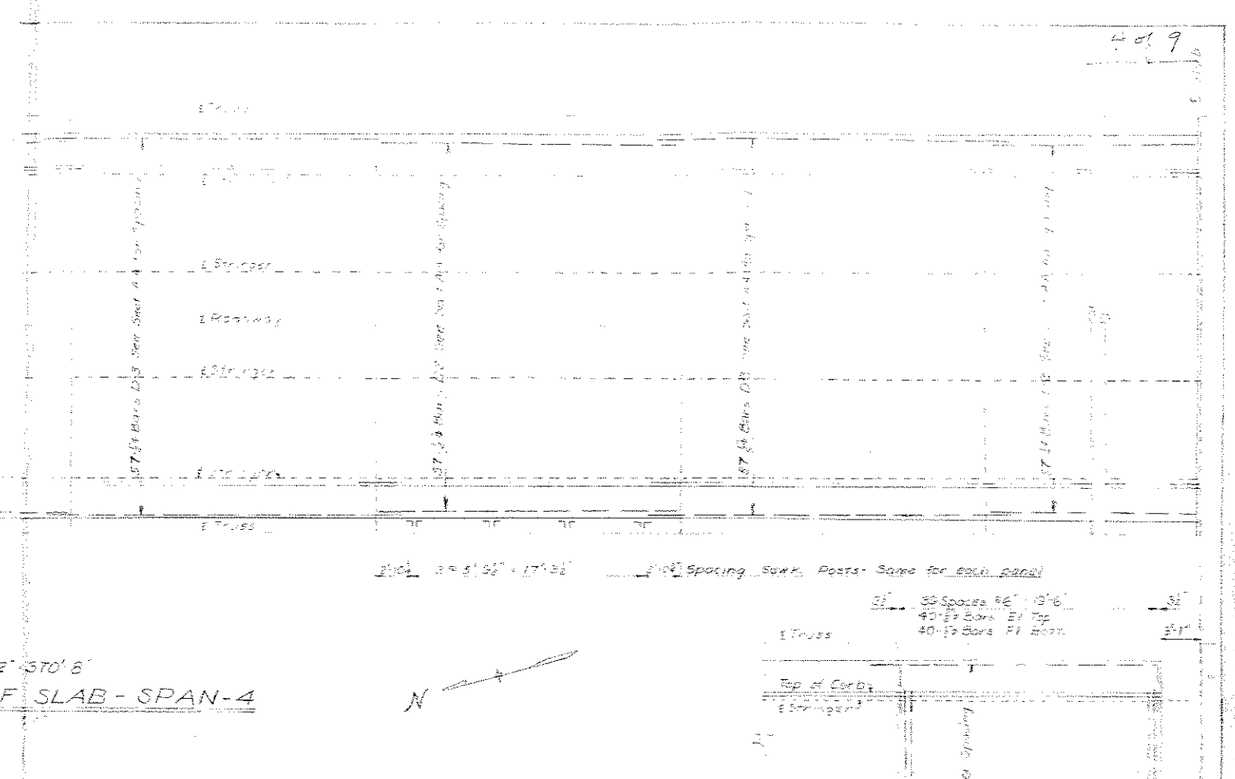
TRUE BRIDGE over BLUESTONE RIVER

PROJECT #3194 SUMMERS COUNTY

CONCRETE DECK FOR 139'-0" SPAN
SUPERSTRUCTURE CONTRACT #1764

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

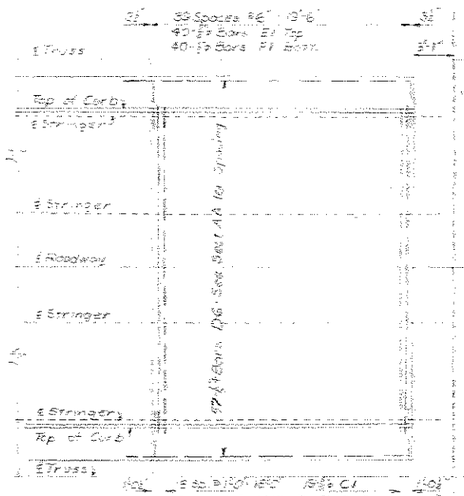




16 @ 23'-2" = 370'-8"

HALF PLAN OF SLAB - SPAN-4

N



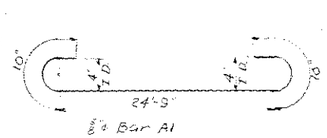
PLAN OF SLAB - SPAN-2

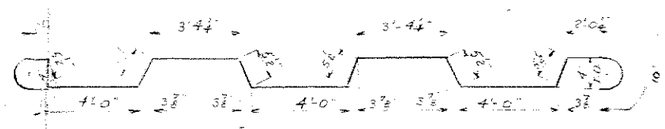
Panels 1 to 15 Incl. Same as Slab - Span 4

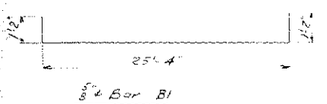
Scale 1/4" = 1'-0"

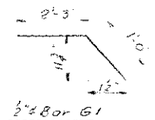
BILL OF REINFORCING STEEL

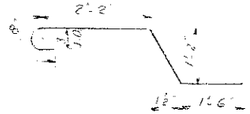
SPANS #1 & #5 - (One Unit)					SPAN #2					SPAN #3					SPAN #4				
No.	Mk	Size	Length		No	Mk	Size	Length		Mk	Size	Length		No	Mk	Size	Length		
144	A1	5/8" ø	26'-5"	Bent	380	A1	5/8" ø	25'-5"	Bent	A1	5/8" ø	26'-5"	Bent	384	A1	5/8" ø	26'-5"	Bent	
144	B1	do	27'-8"	do	380	B1	do	27'-8"	do	B1	do	27'-8"	do	384	B1	do	27'-8"	do	
136	C1	do	27'-2"	do	364	C1	do	27'-2"	do	C1	do	27'-2"	do	368	C1	do	27'-2"	do	
57	D1	1/2" ø	26'-8"	Str.	57	D1	1/2" ø	24'-2"	Str.	D2	1/2" ø	23'-1"	Str.	57	D1	1/2" ø	24'-2"	Str.	
171	D2	do	22'-10"	do	389	D2	do	22'-3"	do	D2	do	21'-6"	do	456	D2	do	21'-1"	do	
114	D3	do	27'-2"	do	399	D3	do	27'-2"	do	D4	do	26'-5"	do	304	D3	do	27'-2"	do	
556	E1	do	5'-7"	Bent	57	D2	do	22'-10"	do	D5	do	24'-5"	do	1472	S1	do	5'-7"	Bent	
556	F1	do	2'-9"	do	1460	S1	do	5'-7"	Bent	E1	do	5'-7"	Bent	1472	F1	do	2'-9"	do	
					1460	F1	do	2'-9"	do	F1	do	2'-9"	do						
										G1	do	3'-3"	do						

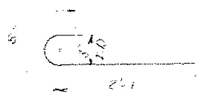












PRELIMINARY

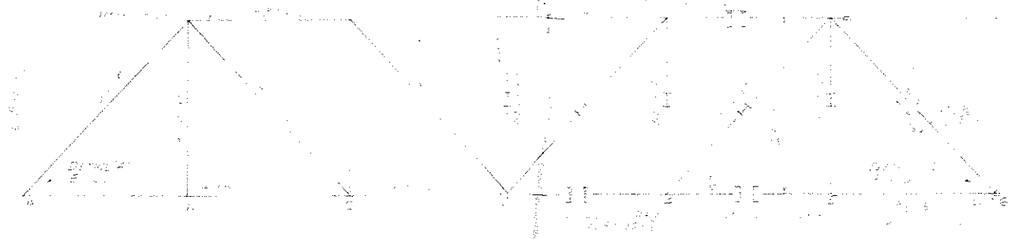
THE STATE ROAD COMMISSION
OF WEST VIRGINIA

TRUE BRIDGE over BLUESTONE RIVER

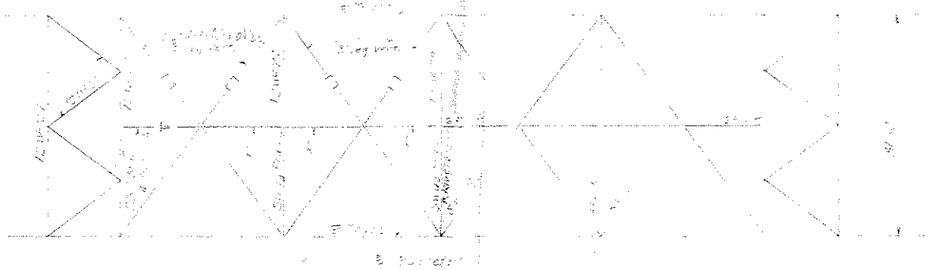
PROJECT #3494 SUMMERS COUNTY

CONCRETE DECK DETAILS for CANTILEVER SPAN SUPERSTRUCTURE CONTRACT #1764

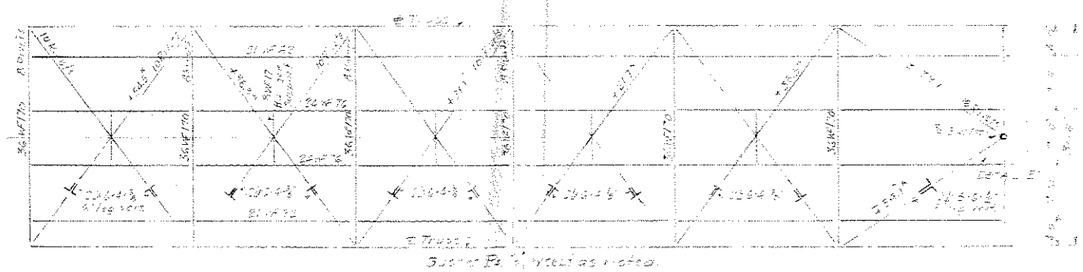
DESIGN BY FRANK D. MENTEER Consulting Engineer Charleston, W. Va.	Scale: As noted	Date
	Designed by F.D.M.	Checked by A.D.H.
	Drawn by M.L.B.	Checked by
	Traced by	Checked by



ELEVATION - SPAN # 1



TOP CHORD BRACING
SPAN # 1



BOTTOM CHORD BRACING
SPAN # 1

DESIGN DATA: - Live Load: H-15-44 -

Roadway Stringers:

	Moments	Shears
Dead Load	57.8 K	10.2 K
Live Load	134.3	36.5
Impact	84.1	23.0
Total:	276.2 K	69.7 K

Wt. S.M. reqd = 155 in³
Net S.M. provided = 128 in³

24 WF 76
7/8" ø Rivets

Sidewalk Stringers:

	Moments	Shears
Dead Load	4.6 K	1.0 K
Sidewalk L.L.	11.0	2.8
Railing L.L.	2.1	1.5
Impact	2.4	1.2
Total	20.1 K	6.5 K

Net S.M. reqd = 11.3 in³
Net S.M. provided = 12.3 in³

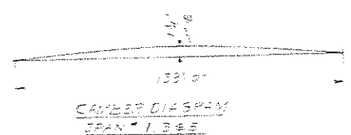
21 WF 50
7/8" ø Rivets

Floor Beams:

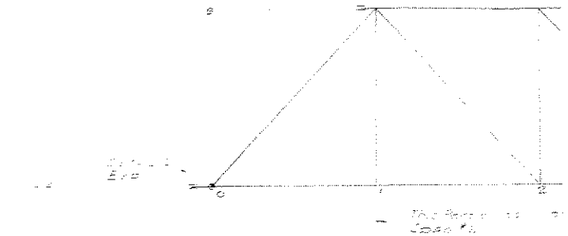
	Moments	Shears
Dead Loads	32.5 K	13.5 K
Stringers	8.5	4.5
Railings	5.1	4.5
Floor	11.2	4.2
Total	57.3 K	26.7 K

Net S.M. reqd = 330 in³
Net S.M. provided = 346 in³

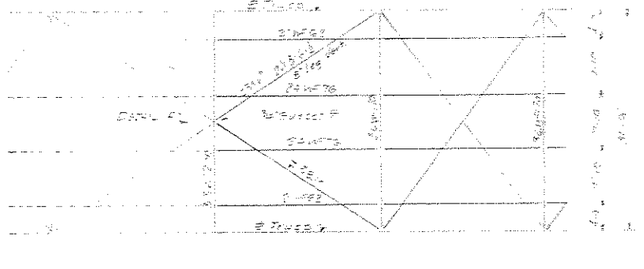
36 WF 170
7/8" ø Rivets



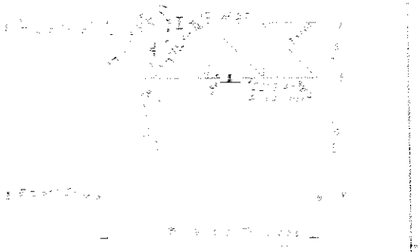
CAMBER DIAGRAM
SPAN # 1 & 5



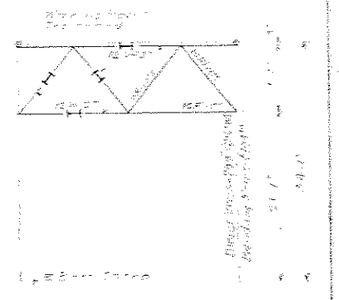
ELEVATION - SPAN # 3



BOTTOM CHORD BRACING
SPAN # 3



ALTERNATE SWAY FRAME
TYPE A2



PORTAL
TYPICAL

THE STATE ROAD COMMISSION
OF WEST VIRGINIA

TRUE BRIDGE over BLUESTONE RIVER

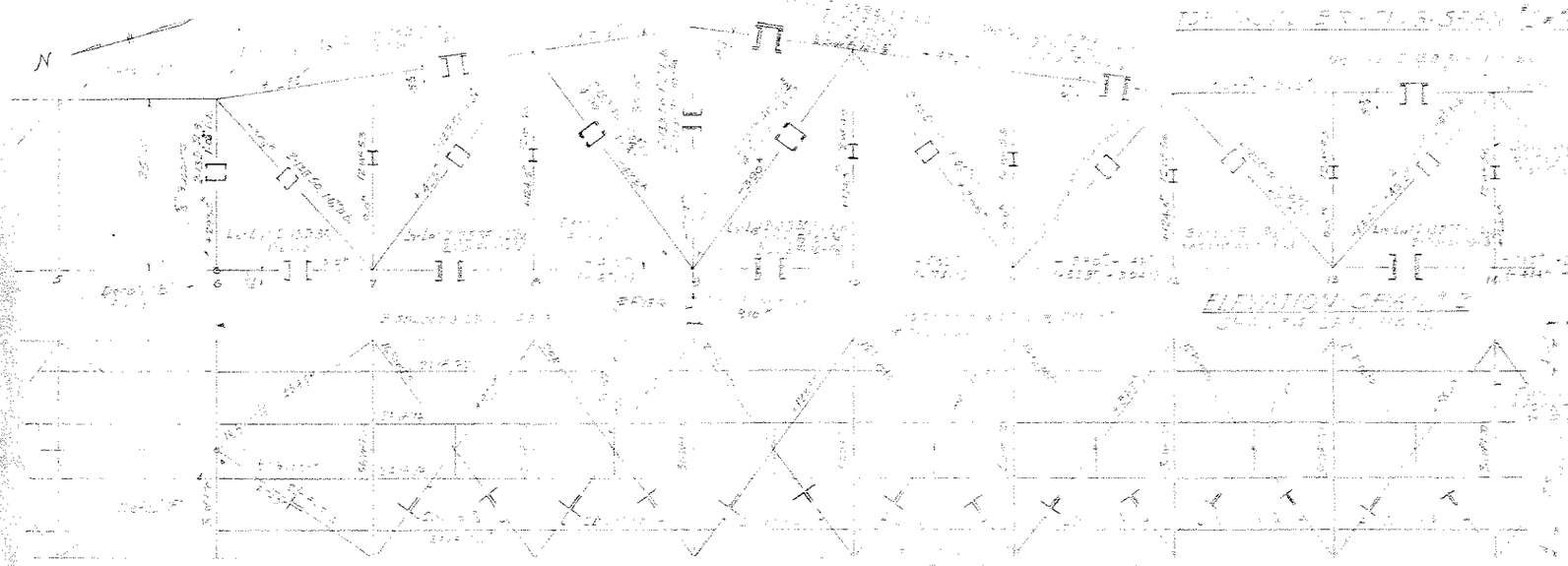
PROJECT # 3494 SUMMERS COUNTY, W. VA.

STRESS SHEET FOR 139'-0" SPANS
SUPERSTRUCTURE CONTRACT

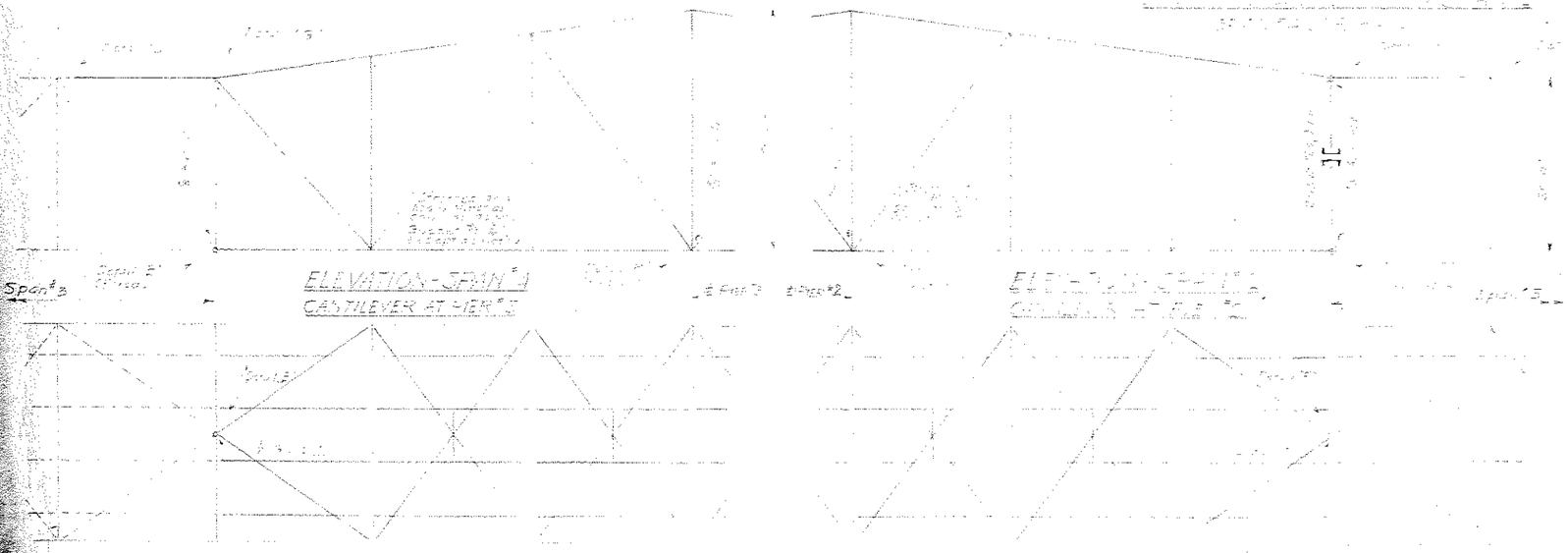
1734

DESIGN BY FRANK S. McESTEP
Consulting Engineer
Clarksburg, W. Va.

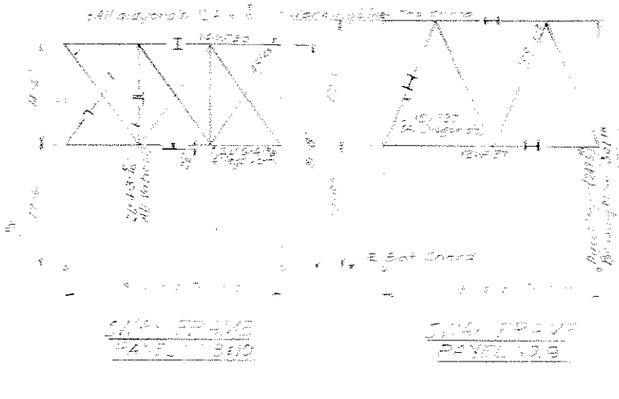
Scale 1" = 10'-0"	Date:
Designed by R.D.H.	Checked by R.D.H.
Drawn by R.D.H.	Checked by
Traced by	Checked by



ELEVATION - SPAN 1
CANTILEVER AT PIER 2



ELEVATION - SPAN 2



Note: Stresses for truss members given thus, 475 are for $S_y = 33$ ksi.
Stresses in parentheses, thus (621), also include 30% impact.
For stresses in stringers and floor beams see Dwg #5.

THE STATE ROAD COMMISSION
OF WEST VIRGINIA

NEW RIVER BRIDGE over BLUESTONE RIVER

PROJECT 340 JUNIOR, FAYETTE CO., W.VA.

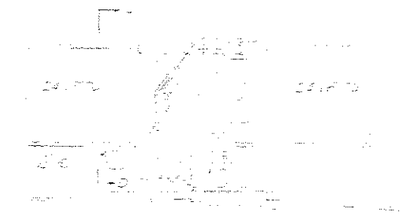
STEEL SHEET for CANTILEVER TRUSS

SUPERSTRUCTURE CONTRACT

STATE ENGINEER		SHEET NO.	25
DESIGNED BY		TOTAL SHEETS	
DRAWN BY		CHECKED BY	
TRACED		CHECKED BY	

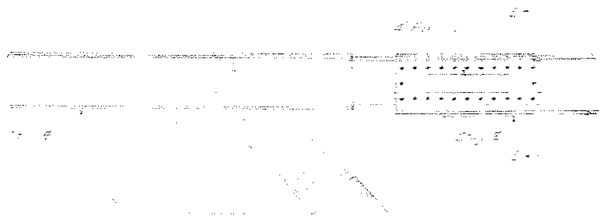
CHIEF ENGINEER
CHARLESTON, W.VA.

DETAIL 'A'

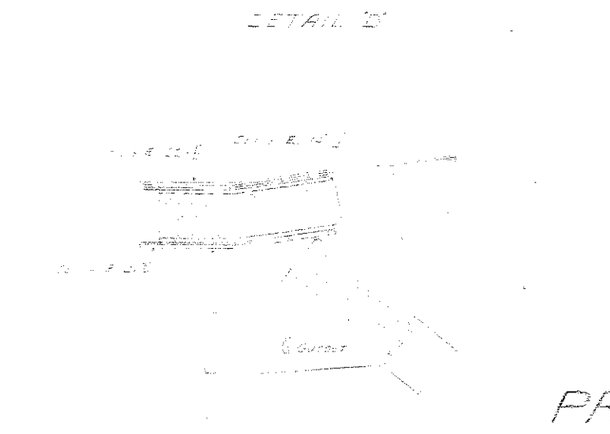


Sect C-C

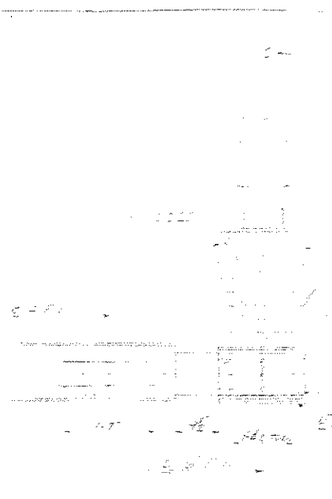
DETAIL 'E'



Sect D-D

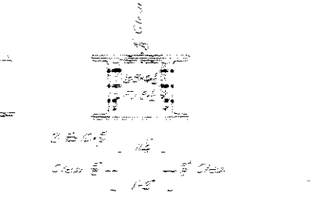


DETAIL 'D'



Sect E-E

NOTE: 4 - 7/8" ø Holes Drilled Full Thru Plate & Top Flg. Angle Both Ends of Member



DETAIL 'C'

Sect F-F

* Provide Nut with Letter by C.P.M.

DETAIL 'E' - BOTT. CHORD BRACING AT L_0 & L_{20} (L_{40} OPP. HAND)

PRELIMINARY

THE STATE ROAD COMMISSION
OF WEST VIRGINIA

TRUE BRIDGE over BLUESTONE RIVER

PROJECT #314 SUMMERS COUNTY

STRUCTURAL STEEL DETAILS

SUPERSTRUCTURE CONTRACT #1764

DESIGN BY FRANK C. MENTEER
CONSULTING ENGINEER
CLARKSBURG, W. VA.

Scale: 3/4"=1'-0" DATE:

DESIGNED BY	HMJ	CHECKED BY	RDM
DRAWN BY	RDM	CHECKED BY	
TRACED BY		CHECKED BY	