DEFINITE PROJECT REPORT

Proposed
Interstate Mississippi River Bridge
Near LeClaire, Iowa
Iowa-Illinois Project No. I-80-8(4)310
Scott County, Iowa
and
Rock Island County, Illinois

PROPOSED INTERSTATE HIGHWAY BRIDGE

OVER THE

MISSISSIPPI RIVER

CONNECTING

LE CLAIRE, IOWA AND RAPIDS CITY, ILLINOIS

ON

INTERSTATE ROUTE I-80

PROJECT I-80-8(4)310

MODJESKI AND MASTERS

CONSULTING ENGINEERS

FRED WHITE
MIDWEST ASSOCIATE

JANUARY, 1963

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Founded 1893
Harrisburg, Penna.

FORSTER AT SIXTH
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HARRISBURG, PA.

1821-27 BROAD-LOCUST BUILDING
PHILADELPHIA 2, PA.

1055 ST. CHARLES AVENUE
NEW ORLEANS 13, LA.

January 10, 1963

Mr. L. M. Clauson,
Chief Engineer
Iowa State Highway Commission
Ames, Iowa

RE: DEFINITE PROJECT REPORT
IOWA-ILLINOIS PROJECT I-80-8(4)310

Dear Sir:

Pursuant to the terms of our agreement with the Iowa State Highway Commission and the Department of Public Works and Buildings, Division of Highways of the State of Illinois, dated August 27, 1958, enclosed is our Definite Project Report relative to the Mississippi River Bridge on Interstate Route I-80 between LeClaire, Iowa and Rapids City, Illinois.

This report supplements our Preliminary Report of April 13, 1959, and our Supplement to the Preliminary Report of July 17, 1959, and completes all work required under Phase I of our agreement.

Appreciation of the assistance and cooperation of personnel of the Highway Commission of the State of Iowa, the Department of Public Works and Buildings of the State of Illinois and the Bureau of Public Roads is respectfully expressed.

Very truly yours,

MODJESKI AND MASTERS
Engineers

By F. M. Masters

FDS:jc
Encl.

LIST OF EXHIBITS

I	Location Plan
II-1	General Plan and Elevation
II-2	Typical Details
II-3	Typical Roadway and Framing Plans
II-4	Typical Piers
III	Construction Cost Estimate
IV-1	Letter of Approval, Department of the Army Permit
IV-2	Instrument, Department of the Army Permit
IV-3	Location Diagram, Department of the Army Permit
IV-4	Clearance Diagram, Department of the Army Permit
V	Summary of Studies and Estimated Costs
VI - 1 thru 3	Field Survey
VII - 1 thru 6	Borings
VII - 7 & 8	Soundings and Rock Probings
VIII	Hydrograph of Mississippi River

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DEFINITE PROJECT REPORT
ON
PROPOSED INTERSTATE MISSISSIPPI RIVER BRIDGE
NEAR LE CLAIRE, IOWA

Iowa-Illinois Project No. I-80-8(4)310
Scott County, Iowa - Rock Island County, Illinois

AUTHORITY

This Definite Project Report is submitted in conformance with the terms of an agreement dated August 27, 1958, between Modjeski and Masters, the Highway Commission of the State of Iowa, and the Department of Public Works and Buildings of the State of Illinois

SCOPE

This Definite Project Report presents the results of studies and a final recommendation on the type and design features of a proposed four-lane highway bridge which will carry Interstate Route 80 over the Mississippi River in the vicinity of LeClaire, Iowa, and Rapids City, Illinois. The features of design are in accordance with instructions and approvals of the Iowa State Highway Commission, the Division of Highways of the Department of Public Works and Buildings of the State of Illinois and the Bureau of Public Roads, and represent features which are satisfactory as of the date of this Report.

Contained also in this Report are summaries of studies appearing in a Preliminary Report submitted to the Iowa State Highway Commission on April 13, 1959, and a Supplement to the Preliminary Report submitted to the Commission on July 17, 1959; each of which were accepted by the Iowa State Highway Commission and the Division of Highways of the Department of Public Works and Buildings of the State of Illinois on August 25, 1959.

LOCATION

The proposed bridge crossing is located approximately 1.7 miles downstream from LeClaire, Iowa, on a straight section of the Mississippi River which is approximately 495.4 miles upstream from the mouth of the Ohio River. A map showing this general location is presented as Exhibit I.

This crossing will be constructed across the lower portion of Pool No. 14 at a point approximately 2.1 miles upstream from Lock and Dam No. 14, which is located above Moline, Illinois and Bettendorf, Iowa. Ramp connections on the approaches will be provided with U. S. Route 67 on the Iowa shore and with State Route 80 on the Illinois shore.

DESCRIPTION OF PROJECT

The general plan and elevation of the proposed structure is shown on Exhibit II-1. This crossing will provide for two traffic lanes in

each direction, separated by a 4-foot wide median, requiring a total width between outside gutters of 58 feet. Approach grades of 2.4% are connected by an 800-foot vertical curve symmetrically located over the navigation channel, providing for 60-foot vertical clearance above flat pool elevation 572.0, 58.4-foot vertical clearance above the 2% line, and 56.8-foot clearance above high water of record. A hydrograph of the river at the LeClaire gage is appended for the period 1939 through 1961 as Exhibit VIII.

The navigation channel span and immediate joining spans are deck girders of continuous span design, providing for 350-foot horizontal clearance over the channel of the river. Approach spans are continuous deck girders, terminating with continuous, composite, rolled beam, stringer spans on vertical and horizontal alignments developed by the respective State Highway Departments.

ALTERNATE STUDIES

The Preliminary Report of April 13, 1959, presented the results of studies of fifteen different structures.

Study 1 proposed continuous deck girder spans providing for 3 spans which would have 145-foot horizontal clearance and a 45-foot vertical clearance for the navigation channel.

Study 2 proposed a simple deck truss span over the navigation channel which would provide a 450-foot horizontal clearance and 35-foot vertical clearance.

Study 3 proposed continuous deck truss spans which would provide a 450-foot horizontal clearance and 35-foot vertical clearance over the navigation channel.

Studies 4A, 4B, and 4C proposed a simple through truss span over the navigation channel providing respective horizontal clearances of 450-feet, 500-feet, and 600-feet with a vertical clearance of 45-feet.

Studies 4D, 4E, and 4F were identical with Studies 4A, 4B, and 4C except to provide for a 55-foot vertical clearance.

Studies 5A, 5B, and 5C proposed a tied arch through span over the navigation channel providing respective horizontal clearances of 450-feet, 500-feet, and 600-feet with a vertical clearance of 45-feet.

Studies 6A, 6B, and 6C proposed a cantilever through truss span arrangement which would provide horizontal clearances over the navigation channel of 450-feet, 500-feet, and 600-feet, respectively, with a vertical clearance of 45-feet.

These studies led to the recommendation that application to the Department of the Army for a permit to construct the crossings be made for either Study 4A or 5A.

A Supplement to the Preliminary Report, dated July 17, 1959, presented the results of studies of seven additional structures.

Study 1A proposed continuous deck girder spans providing for 3 spans which would have a 145-foot horizontal clearance and 35-foot vertical clearance over the navigation channel.

Study 7A proposed continuous deck girder spans providing for 2 spans which would have 250-foot horizontal clearance and a 35-foot vertical clearance over the navigation channel.

Study 7B is identical with 7A except to provide a 45-foot vertical clearance over the navigation channel.

Study 7C proposed continuous deck girder spans providing for a 350-foot horizontal clearance and 35-foot vertical clearance over the navigation channel, and Study 7D is identical except to provide for a 45-foot vertical clearance.

Study 8A proposed a simple through truss span over the navigation channel providing a 350-foot horizontal clearance and 35-foot vertical clearance, and Study 8B is identical except to provide for a 45-foot vertical clearance.

These supplementary studies led to the recommendation that a permit to construct the bridge should be applied for on the basis of Study 7C or 7D.

Each of the studies contained in the Preliminary Report of April 13, 1959, and in the Supplement to the Preliminary Report dated July 17, 1959, were developed from detailed topographic and triangulation surveys which were developed in plan and submitted to the State Highway Commissions on December 18, 1958. Approval of this survey information was received on February 2, 1959, and plans are appended as Exhibits VI-1, 2 and 3.

The preliminary estimates of construction cost for the studies contained in the Preliminary Report and the Supplement to the Preliminary Report were made on the basis of incomplete information relating to subsurface conditions, since actual borings were not to be taken until the permit for the bridge construction was obtained from the Corps of Engineers. A summary of these preliminary estimates of construction costs is shown on Exhibit V.

DEPARTMENT OF THE ARMY PERMIT

An application for a Department of the Army Permit based upon Study 1A was prepared by Modjeski and Masters and submitted to the State Highway Commissions on June 15, 1959, in accordance with instructions from the Bureau of Public Roads.

Subsequent to this submission, an application for a Department of the Army Permit was prepared on the basis of Study 7D and forwarded to the State Highway Commissions on August 31, 1959, pursuant to decisions reached between the Departments and the Bureau of Public Roads on August 14, 1959.

This application was forwarded to the U. S. Army, Corps of Engineers on September 3, 1959, and reviewed on October 26, 1959, during a joint conference held by the Corps of Engineers in St. Paul, Minneapolis, to discuss clearances relating to both the LeClaire and LaCrosse Bridges over the Mississippi River.

The application was returned to the State Highway Commissions by the Corps of Engineers in a letter dated November 9, 1959, indicating that low steel in the channel span could not be placed below Elevation 635.0 MSL, 4th General Adjustment.

The State Highway Commissions were reluctant to change the basis of their submission of September 3, 1959, and the application was processed for review by interested agencies. Sufficient objections were received to warrant a public hearing which was held on May 11, 1960.

Following a review of the testimony received at this hearing, the Corps of Engineers approved the issuance of a permit based upon a vertical clearance of 50-feet above flat pool elevation of 572.0, as compared with the application which was submitted providing 45-foot vertical clearance above maximum high water elevation of 576.0. This approval was not issued due to impending Federal legislating proposing to amend the General Bridge Act of 1946. Following the establishment of new standards for vertical bridge clearances by the Corps of Engineers on May 31, 1962, the State Highway Commissions prepared and submitted a revised application on June 15, 1962, which provided 60-foot vertical clearance over flat pool elevation 572.0. This application was approved by the Department of the Army in revised form on November 23, 1962, copies of which are shown on Exhibits IV - 1, 2, 3 and 4.

DESIGN

Design specifications for the project are to be in general conformance with the "Geometric Design Standards for the National System of Interstate and Defense Highways" as adopted by the American Association of State Highway Officials, including the 1961 Standard Specifications for Highway Bridges of the American Association of State Highway Officials and subsequent modifications. The highway loading is H20-S16. Construction details, materials and workmanship are in accordance with the standard specifications, series of 1960, of the Iowa State Highway Commission.

The substructure design is to be based upon subsurface information obtained from borings and soundings made by American Testing and Engineering Corporation during August and September, 1960, under contract with Modjeski and Masters. Borings, soundings and rock probings were made at proposed pier locations, the results of which are appended as Exhibits VII - 1 through 8.

This information indicated limestone rock, suitable for bridge pier foundation, near the ground surface in Iowa and Illinois, and approximately 15 to 20 feet below pool elevation in the river.

All piers, where required, are to be keyed against possible displacement approximately one foot in firm rock or by means of steel dowels. River Piers 9 through 23 consist of twin shafts of reinforced concrete above Elevation 579.0. Between Elevation 579.0 and Elevation 570.0 the

piers are stone faced to provide additional protection against erosion due to freezing and thawing.

Approach piers for stringer spans are of reinforced concrete designed as three-column bents.

The superstructure between Pier 8 and Pier 24 consists of deck girders spaced 34 feet center to center and are designed as continuous units between Piers 8 and 19 and between Piers 19 and 24. The units between the hangers adjacent to Piers 12 and 15 consist of twin girders spaced 3-feet, 8-inches on centers. These girders are haunched over the channel piers and have a suspended span over the navigation channel. The hangers adjacent to Piers 12 and 15 provide for the transition from twin girders to single girders.

The 27-foot wide roadways are separated by a 10-inch raised median, 4-feet wide. A combination barrier curb and parapet, containing a 2-pipe railing is located along the outer edges of the roadways.

The approach spans, between the Iowa abutment and Pier 8 and between the Illinois abutment and Pier 24, consist of rolled I-beam stringers on 9-foot centers of composite continuous design.

The roadways are to be lighted with a pole and bracket mounted Mercury Vapor System which will provide a lighting intensity varying between 0.75 and 0.85 foot candles with a uniformity ratio greater than 4:1. This intensity is dependent upon the type lamp selected, presumes a maintenance and depreciation factor of 70 percent and requires a staggered spacing of approximately 150 feet.

In accordance with instructions from the Highway Departments and the Bureau of Public Roads, all fabrication is to be shop welded with field bolted connections.

The roadway gradient for the bridge has been established under controls which provide for 60-feet vertical clearance above flat pool elevation 632.0 in the navigation channel, 15-feet vertical clearance for highway grade separations and 23-feet vertical clearance for railroad grade separations. Additionally, the approach span arrangements provide adequate horizontal clearances for the Davenport, Rock Island and Northwestern Railroads on the Iowa Approach, for the Chicago, Milwaukee, St. Paul and Pacific Railroads on the Illinois Approach and for the related improvements on U. S. Rt. 67 and State Rt. 80 which will be undertaken by the Highway Departments of Iowa and Illinois.

Details of these design features are shown on drawings appended as Exhibits II - 1, 2, 3 and 4.

CONSTRUCTION COST

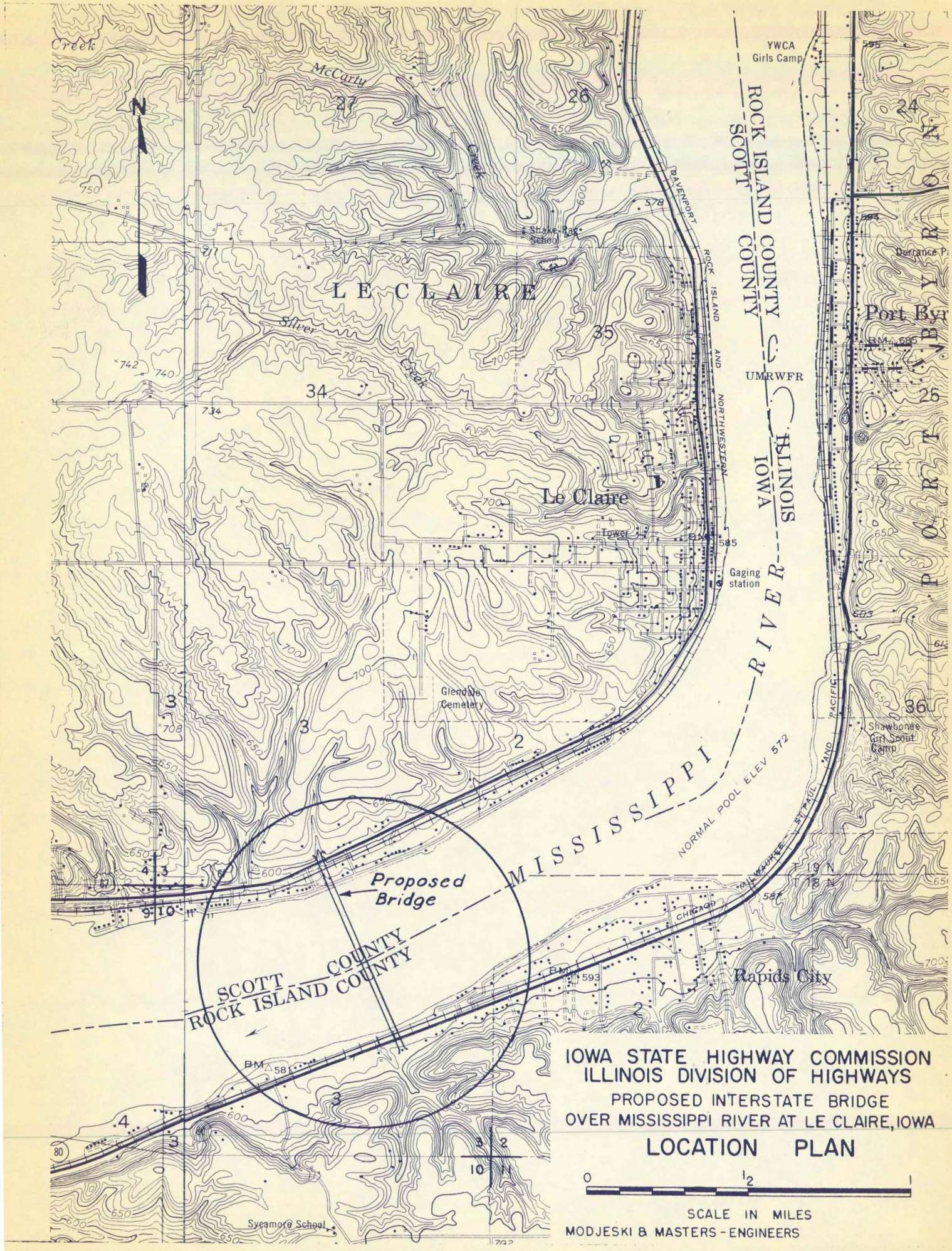
A final itemized estimate of construction cost is appended as Exhibit III and amounts to $5,384,824.80. This estimate is based upon the design herein contemplated and the approximate quantities of materials represent those which have been developed from the preliminary design completed to date. Unit prices applied to these quantities are current

values developed from actual bids on work of similar character; however, unit price variations resulting from actual bidding and changes in quantities which may develop during design and construction on the work, will likely result in modifications to the present estimate. This estimate does not include costs of right-of-way, engineering, financing, maintenance or other items related to the overall cost of the bridge project.

CONSTRUCTION

It is estimated that the new bridge can be completed and opened to traffic within two (2) years after award of the substructure contract, provided award is made so as to permit a full working season during the first year. In order to expedite the placement of work under contract, it is recommended that separate contracts be let for the substructure and superstructure.

The design of the project will permit simultaneous erection from both shores from the deck of the superstructure, using cantilever methods, which will minimize the amount of falsework. It will also be possible to float and lift the suspended span into position with a minimum of interference with river navigation if this method of erection is selected by the Contractor.



IOWA STATE HIGHWAY COMMISSION
ILLINOIS DIVISION OF HIGHWAYS

PROPOSED INTERSTATE BRIDGE
OVER MISSISSIPPI RIVER AT LE CLAIRE, IOWA

LOCATION PLAN

0 1/2 1

SCALE IN MILES

MODJESKI & MASTERS - ENGINEERS

EXHIBIT T

NOTES:
Elevations are to Mean Sea Level, 4th General Adjustment of 1912. For 5th General Adjustment elevations, subtract 0.73 ft from 4th General Adjustment elevations.

SUBMITTED BY:
F. M. Masters
MODJESKI & MASTERS
CONSULTING ENGINEERS
HARRISBURG, PENNA.
REG. PROF. ENG. { IA. 1676 / ILL. 81-1756

REPORT TO
IOWA STATE HIGHWAY COMMISSION
AND ILLINOIS DIVISION OF HIGHWAYS
ON PROPOSED INTERSTATE BRIDGE
OVER MISSISSIPPI RIVER AT LECLAIRE, IOWA

GENERAL PLAN AND ELEVATION

100' 50' 0 100' 200'
SCALE IN FEET
MODJESKI & MASTERS, ENGINEERS
JANUARY 1963 SHEET NO. 1 OF 4

EXHIBIT II-1

DESIGN CRITERIA AND GENERAL NOTES

DESIGN SPECIFICATIONS

The 1961 Standard Specifications for Highway Bridges of the American Association of State Highway Officials shall apply except as modified in the following summary. Construction details, materials and workmanship shall also be in accordance with the Standard Specifications, Series of 1960, Iowa State Highway Commission.

LOADINGS

Dead Load shall include the weight of the complete structure with standard weight concrete for roadways in all spans. No allowance shall be made for utilities. An allowance of 20. pounds per square foot of deck shall be made for future paving.

Live Load shall consist of four lanes of H20-S16 truck or lane loading with reduction permitted in Paragraph 1.2.9 of the A.A.S.H.O. Specifications, or of the alternate loading of 2-24,000 pound axles spaced 4 feet apart.

Thermal Forces shall be consistent with Paragraph 1.2.15 of the A.A.S.H.O. Specifications, assuming a moderate climate, except normal temperature shall be 55°F.

Ice pressure on piers shall be assumed to be 20,000 pounds per foot.

MATERIALS AND BASIC DESIGN UNIT STRESSES

CONCRETE

Basic allowable compressive unit stress shall be 1400 p.s.i..

REINFORCING STEEL

Intermediate grade, new billet steel, deformed bars conforming to A.S.T.M. A-15 or A.S.T.M. A-408. Basic tensile allowable stress shall be 20,000 p.s.i.. Reinforcing bars shall be 2" clear of face of concrete except as follows:

- Footings — 3"
- Top Roadway Slab — 2"
- Bottom Roadway Slab - 1"

ROCK

Basic allowable rock pressure shall be limited to 6 Tons per square foot.

STRUCTURAL STEEL

A.S.T.M. Designation	Basic Allowable Stress
A-36	20,000 p.s.i.
A-440 & A441 (for welding)	27,000 p.s.i. (¾" max. t)

The detailed allowable stresses for A.S.T.M. A-36 shall be in accordance with B.P.R. Circular Memorandum, dated August 17, 1962, titled "Unit Stresses for A.S.T.M. A-36 Carbon Steel and for Rivets and Bolts."

DEFLECTION

Steel beams and girders shall be designed so that the deflection due to live load plus impact shall not exceed 1/1400 of the distance center to center of bearings, and shall not exceed 1/530 of cantilever arms.

SHOP FABRICATION

The structural metalwork shall be fabricated by welding. All welding shall be in accordance with the latest revision of A.W.S. Specifications. Butt welds shall be 100% radiograph inspected. Fillet welds shall be 100% magnaflux inspected.

FIELD CONNECTIONS

All field connections and field splices shall use A.S.T.M. A-325 or A.S.T.M. A-354 high strength bolts.

LIGHTING

Lighting shall be designed for the use of 400 watt mercury vapor lamps. Design intensity is to be approximately 0.80 average horizontal foot candles in service, using a preferred maintenance and depreciation factor of 70%. The uniformity ratio shall be 4 to 1 or better.

SUBMITTED BY:
F. M. Masters
MODJESKI & MASTERS
CONSULTING ENGINEERS
HARRISBURG, PENNA
REG. PROF. ENG. {IA. 1676, ILL. 81-1756}

REPORT TO
IOWA STATE HIGHWAY COMMISSION
AND ILLINOIS DIVISION OF HIGHWAYS
ON PROPOSED INTERSTATE BRIDGE
OVER MISSISSIPPI RIVER AT LECLAIRE, IOWA

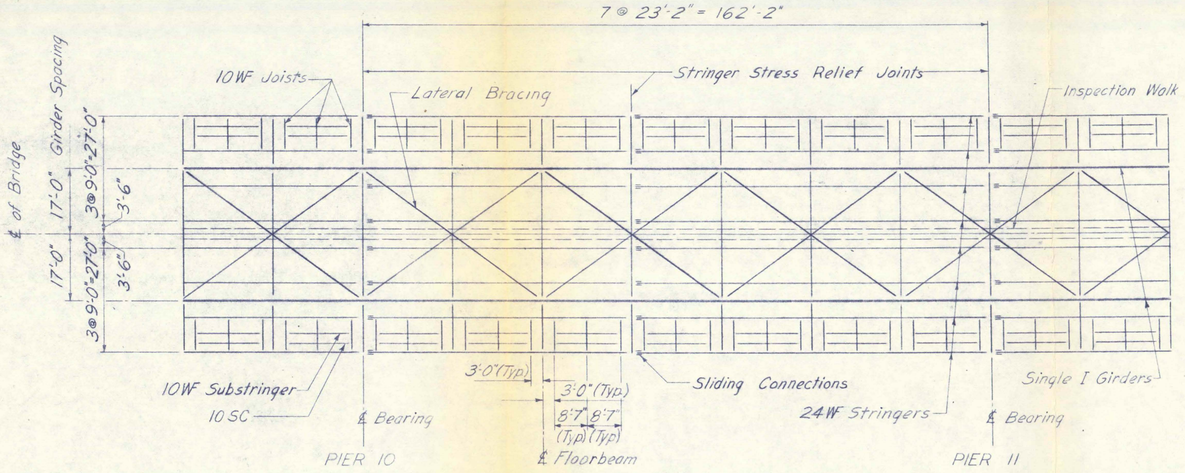
TYPICAL DETAILS

SCALE IN FEET (0 – 4' – 8')

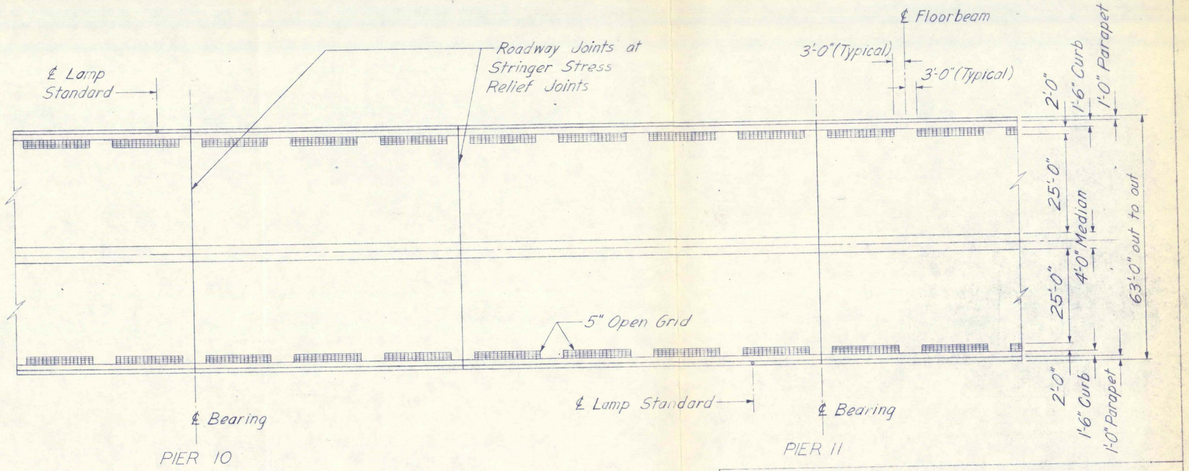
MODJESKI & MASTERS, ENGINEERS

JANUARY 1963 — SHEET NO. 2 OF 4

EXHIBIT II-2



TYPICAL FRAMING PLAN



TYPICAL ROADWAY PLAN

REPORT TO
IOWA STATE HIGHWAY COMMISSION
AND ILLINOIS DIVISION OF HIGHWAYS
ON PROPOSED INTERSTATE BRIDGE
OVER MISSISSIPPI RIVER AT LECLAIRE, IOWA

TYPICAL ROADWAY & FRAMING PLANS

SUBMITTED BY:
F. M. Masters
MODJESKI & MASTERS
CONSULTING ENGINEERS
HARRISBURG, PENNA.
REG. PROF. ENG. { IA. 1676 / ILL. 81-1756

20 10 0 20 40
SCALE IN FEET

MODJESKI & MASTERS, ENGINEERS
JANUARY 1963 SHEET NO. 3 OF 4

EXHIBIT II-3

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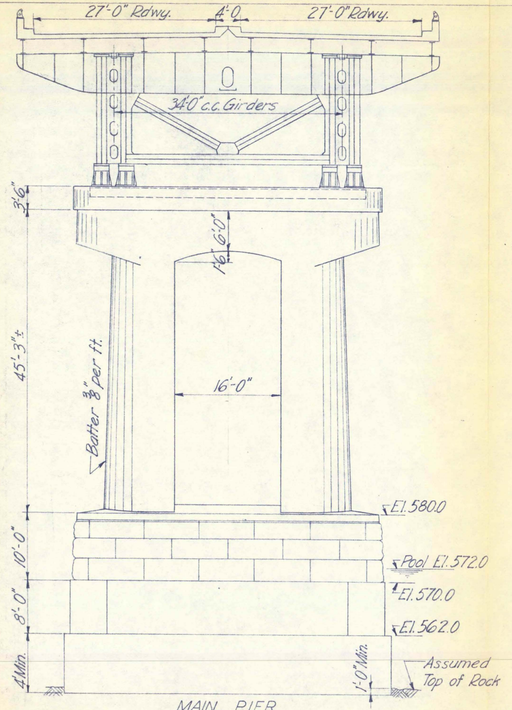
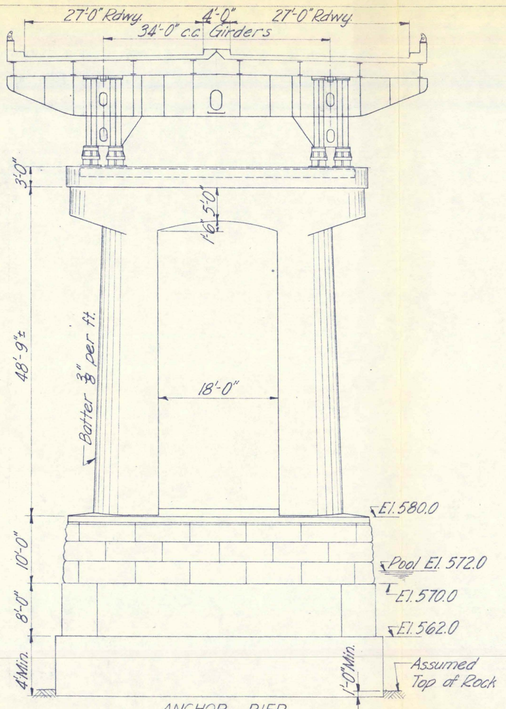
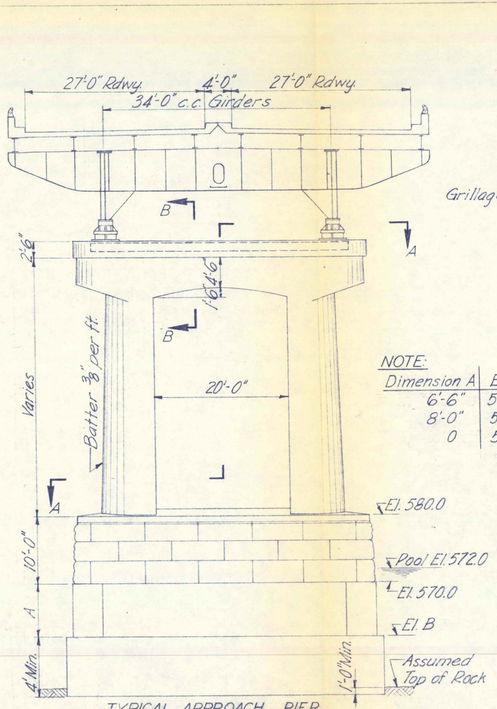


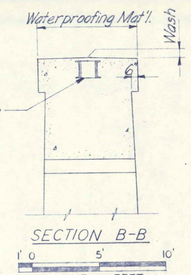
MAIN PIER



ANCHOR PIER

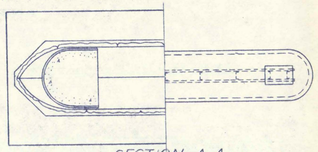


TYPICAL APPROACH PIER



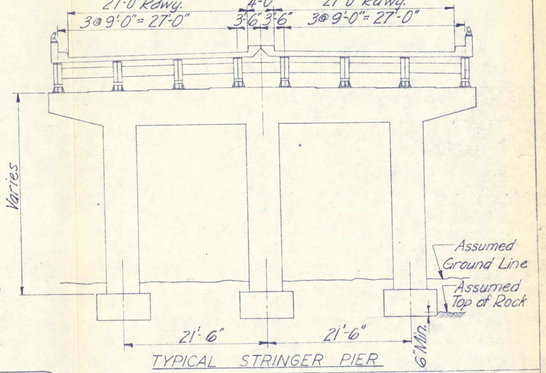
NOTE:

Dimension A	El. B
6'-6"	563.5 Piers 9, 10, 17, 19, 20, 21 & 23
8'-0"	562.0 Piers 11, 12, 13, 14, 15, 16, 18, & 22
0	570.0 Pier 24



SECTION A-A

NOTE:
Four exploratory probings shall be made at each river pier and one per column for each land pier prior to pouring footings.



TYPICAL STRINGER PIER

SUBMITTED BY:
F. M. Masters
MODJESKI & MASTERS
CONSULTING ENGINEERS
HARRISBURG, PENNA.
REG. PROF. ENG. IA. 1676 ILL. 81-1756

REPORT TO
IOWA STATE HIGHWAY COMMISSION
AND ILLINOIS DIVISION OF HIGHWAYS
ON PROPOSED INTERSTATE BRIDGE
OVER MISSISSIPPI RIVER AT LE CLAIRE, IOWA

TYPICAL PIERS

1'0 5' 10' 15' 20'
SCALE IN FEET
MODJESKI & MASTERS, ENGINEERS

JANUARY 1963 SHEET 4 OF 4

022 | - | 0905 | 767

EXHIBIT II-4

MODJESKI AND MASTERS

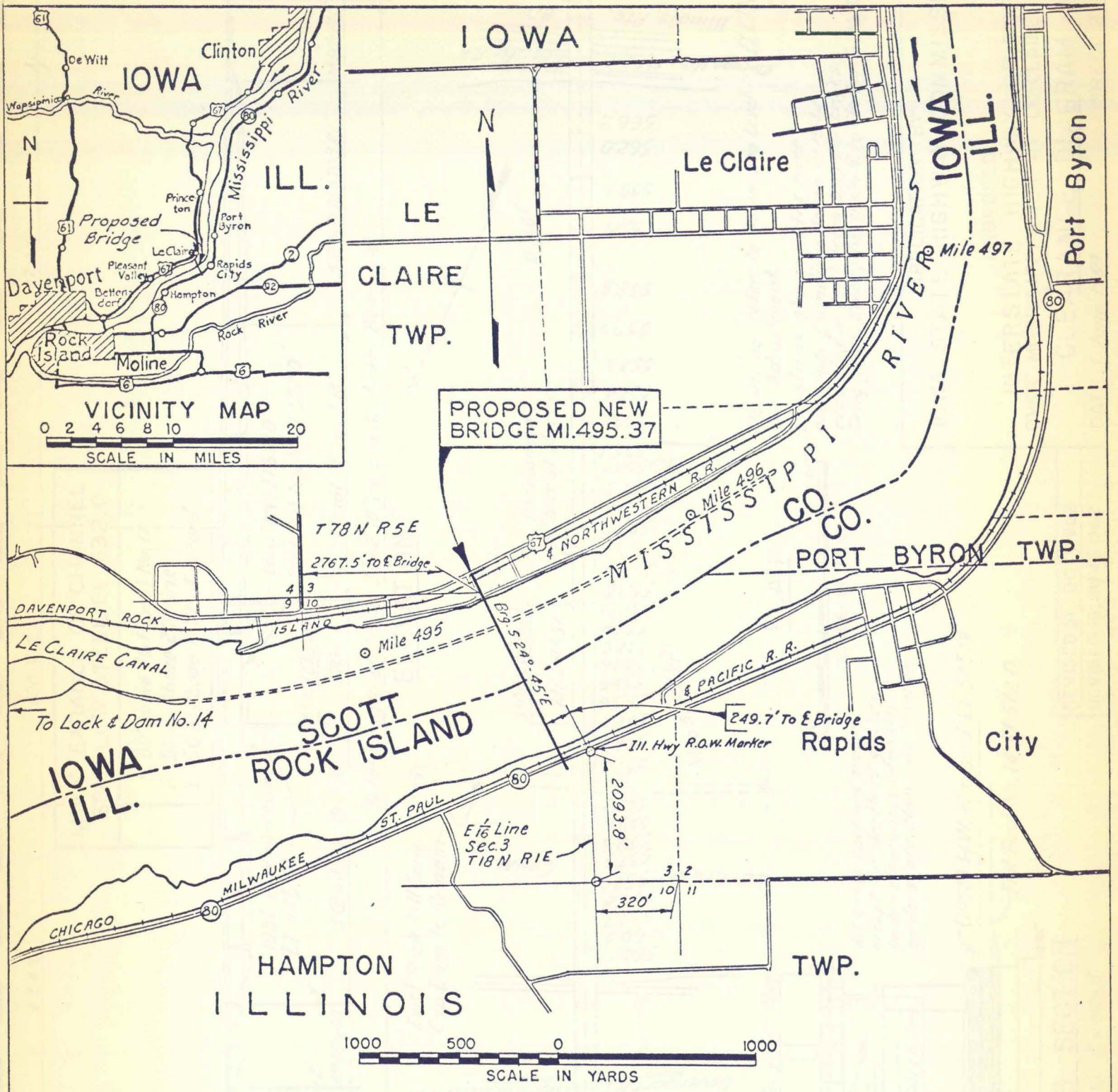
LE CLAIRE BRIDGE

CONSTRUCTION COST ESTIMATE

January 3, 1963

Item	Quantity	Unit Price	Amount
SUPERSTRUCTURE			
Metalwork in 748'± Curved Girder Spans	4,193,300 Lbs.	$ 0.30	$1,251,990.00
Metalwork in 1946'± Girder Spans	5,588,300 Lbs.	0.26	1,452,958.00
Metalwork in 789'± Beam Spans	1,657,200 Lbs.	0.18	298,296.00
Floor Concrete	5,691 C.Y.	85.00	483,735.00
Parapet Concrete	799 C.Y.	90.00	71,910.00
Railing on Parapet	6,974 L.F.	10.00	69,740.00
Reinforcing Steel	1,427,800 Lbs.	0.16	228,448.00
Open Steel Floor	9,972 S.F.	6.75	67,311.00
Navigation Lighting	L.S.	-	7,500.00
Bridge Lighting	L.S.	-	75,944.00
Total Superstructure			$4,007,832.00
SUBSTRUCTURE			
Clearing and Grubbing	L.S.	-	$ 340.00
Excavation, Class 20, above Elev. 572(Land)	2,208 C.Y.	7.00	15,456.00
Excavation, Class 21, below Elev. 572(River)	1,072 C.Y.	15.00	16,080.00
Excavation, Class 22, Rock (Land & River)	2,445 C.Y.	15.00	36,675.00
Structural Concrete			
River Footings	4,939 C.Y.	80.00	395,120.00
Land Footings	497 C.Y.	50.00	24,850.00
River Pier Bases	1,926 C.Y.	55.00	105,930.00
Shafts and Bents	5,376 C.Y.	65.00	349,440.00
Abutments	419 C.Y.	65.00	27,235.00
Stone Faced Concrete Pier Bases	2,082 C.Y.	85.00	176,970.00
Reinforcing Steel	699,730 Lbs.	0.16	111,956.80
Structural Steel in Grillages	156,000 Lbs.	0.45	70,200.00
Dampproofing	40 Sqs.	25.00	1,000.00
Pier Top Protection	8,400 S.F.	0.50	4,200.00
Exploratory Foundation Core Borings	1,060 L.F.	7.50	7,950.00
Provisions for Deck Drainage	Lump Sum	-	400.00
Embankment at Abutments	15,300 C.Y.	1.50	22,950.00
Abutment Berm Protection	400 S.Y.	8.00	3,200.00
6" Diameter Tile Drain	280 L.F.	3.00	840.00
Granular Backfill	1,240 Tons	5.00	6,200.00
Total - Substructure			$1,376,992.80
Total - Superstructure			4,007,832.00
Total - Bridge			$5,384,824.80

EXHIBIT III



Note: Traced from 1:25,000 Scale Army Map Service Maps, Silvis & Port Byron Quadrangles, Sheets 7967 III SW, Series V876 & Sheet 2967 III SE Series V863.

Distances are shown at one mile intervals measured along a mid-channel line established in 1931, with origin at the intersection of the thalwegs of the Mississippi and Ohio Rivers.

REVISED 15, JUNE 1962

APPLICATION BY
IOWA STATE HIGHWAY COMMISSION

PROPOSED
INTERSTATE HIGHWAY BRIDGE
OVER MISSISSIPPI RIVER AT LE CLAIRE, IOWA

LOCATION DIAGRAM

DATE: 1 June 1959

SHEET 1 OF 2

EXHIBIT IV-3

LECLAIRE BRIDGE

SUMMARY OF STUDIES AND ESTIMATED COSTS
(Preliminary Report April 30, 1959)
(Supplement to Preliminary Report, June 30, 1959)

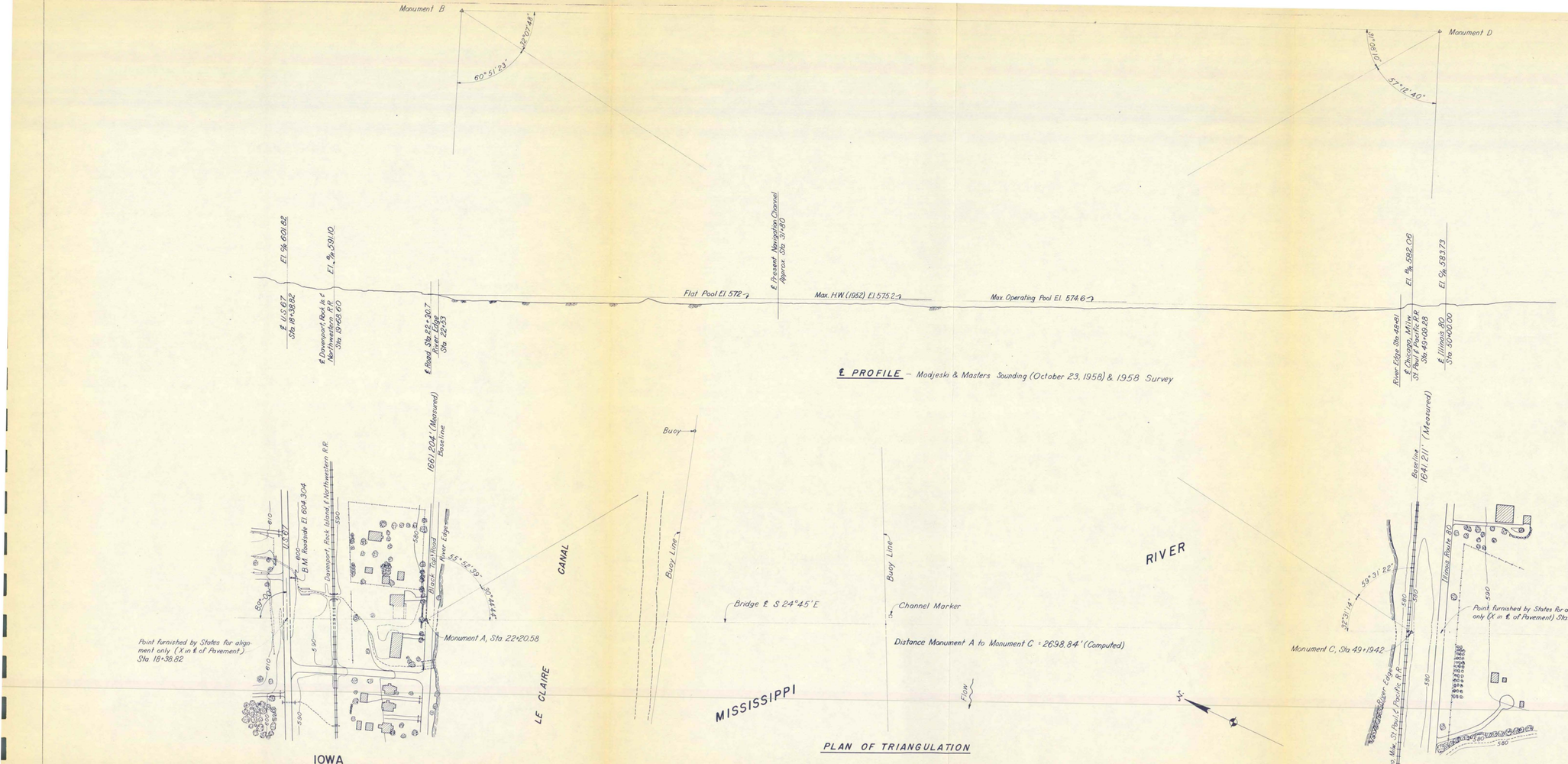
Estimate Number	Type of Main Spans	Horizontal Clearance (feet)	Vertical Clearance (feet)	Iowa Grade (%)	Illinois Grade (%)	Estimated Costs	Cost Ratio Over Estimate No. 1	Remarks
1-A	Continuous Deck Girder Spans	2-145	35	0.40	1.00	$5,883,000	99.0	
1.	" " " "	3-145	45	1.20	1.60	5,940,000	100.0	Limited to 163' span length
7-A	" " " "	2-250	35	0.60	1.20	5,931,000	99.8	
7-B	" " " "	2-250	45	1.50	1.90	6,000,000	101.0	
7-C	" " " "	350	35	0.50	1.20	6,343,000	106.8	
7-D	" " " "	350	45	1.50	1.90	6,415,000	108.0	
2	Simple Deck Truss Span	450	35	3.50	3.50	6,433,000	108.3	Limited to 35' vert. clear.
3	Continuous Deck Truss Spans	450	35	3.00	3.00	6,433,000	108.3	Limited to 35' vert. clear.
8-A	Simple Through Truss Span	350	35	0.22	0.53	6,165,000	103.8	
8-B	" " " "	350	45	0.50	1.20	6,227,000	104.8	
4-A	" " " "	450	45	0.70	1.23	6,466,000	108.9	
4-B	" " " "	500	45	0.72	1.25	6,659,000	112.1	
4-C	" " " "	600	45	0.78	1.30	7,108,000	119.7	
4-D	" " " "	450	55	1.55	1.90	6,549,000	110.3	Average of 1.1% more than corresponding 4A, 4B & 4C.
4-E	" " " "	500	55	1.60	1.93	6,737,000	113.4	
4-F	" " " "	600	55	1.72	2.00	7,176,000	120.8	
5-A	Tied Arch Span	450	45	0.60	1.20	6,572,000	110.6	Average of 1.6% more than corresponding 4A, 4B & 4C.
5-B	" " "	500	45	0.60	1.34	6,755,000	113.7	
5-C	" " "	600	45	0.64	1.40	7,223,000	121.6	
6-A	Cantilever Spans	450	45	0.70	1.20	6,785,000	114.2	Average of 4.8% more than corresponding 4A, 4B & 4C.
6-B	" "	500	45	0.72	1.25	6,972,000	117.4	
6-C	" "	600	45	0.80	1.37	7,448,000	125.4	

NOTE: Above estimated construction costs include stone facing of river piers at water line.

Vertical Clearance refers to maximum High Water Elevation 576.0
Preliminary and Supplementary Reports were approved by Highway Departments of the States of Iowa and Illinois, August 25, 1959.

Modjeski and Masters, Engineers

EXHIBIT V



℄ PROFILE – Modjeski & Masters Sounding (October 23, 1958) & 1958 Survey

PLAN OF TRIANGULATION

NOTES

States' P.O.T. on Illinois Route 80 given as Sta. 50+00.

Elevations are to Sea Level, 9th General Adjustment of 1912.

Indicates Rock.

Field Surveys made during period August through November 1958.

IOWA STATE HIGHWAY COMMISSION
AND
ILLINOIS DIVISION OF HIGHWAYS

INTERSTATE HIGHWAY BRIDGE
OVER
MISSISSIPPI RIVER AT LE CLAIRE, IOWA

FIELD SURVEY
TRIANGULATION & ℄ PROFILE

100' 50' 0 100' 200'
SCALE IN FEET

MODJESKI & MASTERS, ENGINEERS

MARCH, 1959

NAMES & ADDRESSES

NW Bell Telephone Co.
Mr. L.A. Beaumont D.P.E.
Box 390
Davenport, Iowa

Iowa-Illinois Gas and Electric Co.
Mr. Leo Miller
2811 5th Ave.
Rock Island, Illinois

Davenport Rock Island & Northwestern R.R.
Mr. J.J. Van Brokern Gen. Mgr.
102 South Harrison St
Davenport, Iowa

NOTES:

Contours are shown at 2' intervals.
Overhead utility clearances shown are at ℄ of Bridge.
B.M. Roadside set in a concrete post projecting about one foot out of the ground 15' south of centerline of U.S. Route 67 110' upstream of centerline of Bridge.
Field Surveys made during period - August through November 1958.

NOTES:

* Poles are in Rural Section 775
Elevations are to Sea Level, 4th General Adjustment of 1912.
℄ Staked at 100' Intervals.

IOWA STATE HIGHWAY COMMISSION
AND
ILLINOIS DIVISION OF HIGHWAYS
INTERSTATE HIGHWAY BRIDGE
OVER
MISSISSIPPI RIVER AT LE CLAIRE, IOWA
FIELD SURVEY
IOWA APPROACH AREA

30' 20' 10' 0 30' 60'
SCALE IN FEET

MODJESKI & MASTERS, ENGINEERS

MARCH, 1959

SHEET NO. 2 OF 3

Names and Addresses

Iowa - Illinois Gas and Electric Co.
Mr. Leo Miller
2811 5th Ave.
Rock Island, Illinois

Illinois Bell Telephone Co.
Mr. D.H. Green D.P.E.
411 19th Street
Rock Island, Illinois

Port Byron Telephone Co.
Mr. W. Houtcooper Mgr.
Port Byron, Illinois

Chicago, Milwaukee, St. Paul and Pacific Railroad Co.
Mr. K.L. Clark Div. Engr.
South Fourth Street
Savannah, Illinois

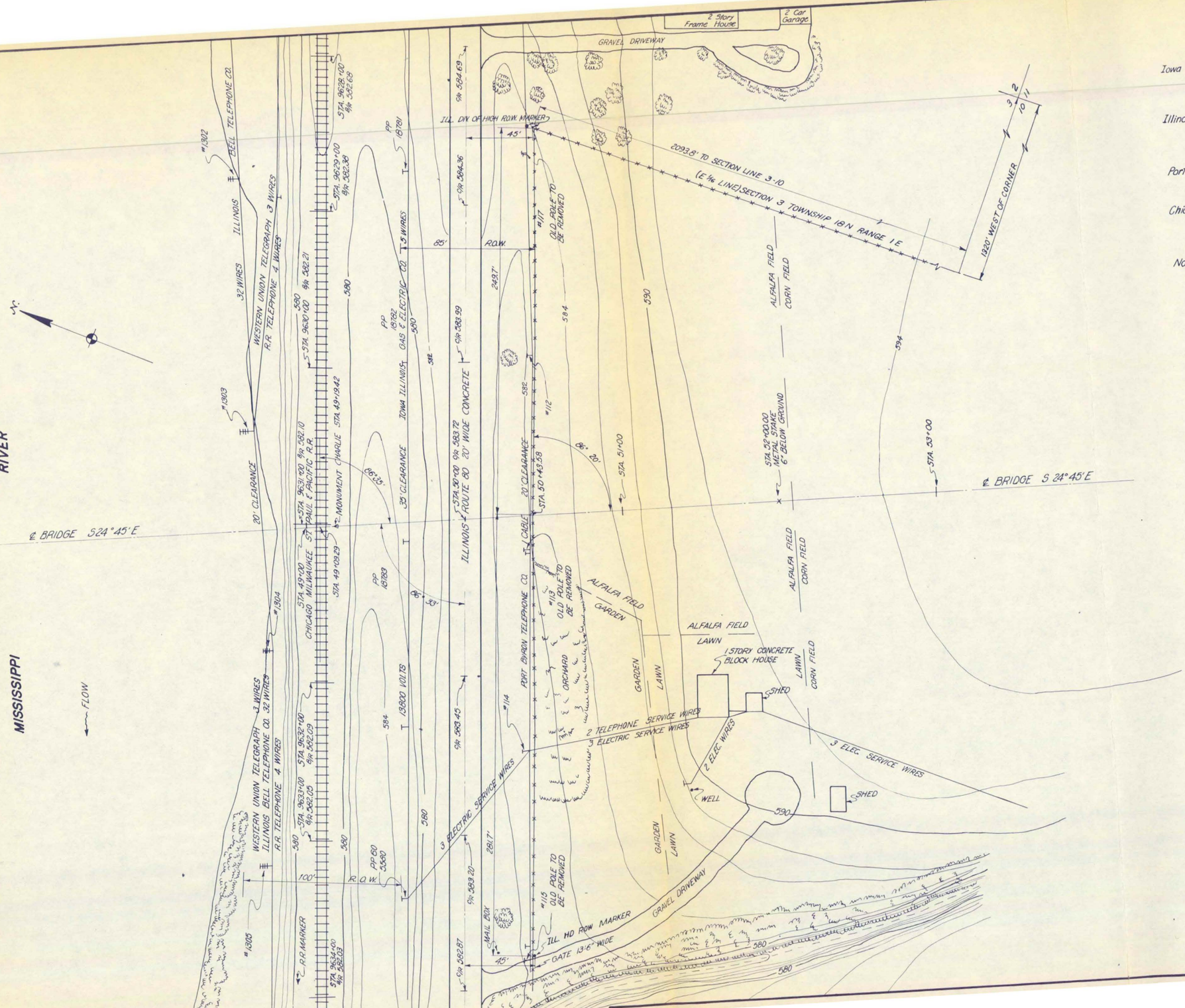
Note: Western Union Telegraph Lines Maintained by C.M. St.P. and P. Railroad

Bench Mark Description

1. T.B.M 14-L-1 Elevation 582.62-4"a Cut in Top of Northeast Corner of Concrete Wingwall of Highway Bridge 37.5'± West of ℄ Bridge Established by reciprocal levels run from B.M Roadside (Sheet #2). Inscribed elevation on B.M 14-L-1 is 582.44
2. T.B.M -M&M2 Elevation 581.06-4"a Cut in Southeast Corner of Concrete Wingwall of Railroad Bridge E486' of C.M. St. P and P Railroad 390' West of ℄ Bridge.

NOTES:

Elevations are to Sea Level, 4th General Adjustment 1912.
℄ Staked at 100' Intervals.
Contours are shown at 2' intervals
Overhead Utility Clearances shown are at ℄ Bridge.
Field Surveys made during period - August through November 1958.



IOWA STATE HIGHWAY COMMISSION AND ILLINOIS DIVISION OF HIGHWAYS

INTERSTATE HIGHWAY BRIDGE OVER MISSISSIPPI RIVER AT LE CLAIRE, IOWA

FIELD SURVEY

ILLINOIS APPROACH AREA

30' 20' 10' 0 30' 60'

SCALE IN FEET

MODJESKI & MASTERS, ENGINEERS

SHEET NO. 3 OF 3

MARCH, 1959

BORING NO. 1 — Sta. 16+67.82 — Centerline

DATE: September 18, 1960.

Sample No.	Blows/6 inches (Soil) % Core Recovered (Rock)	Samples taken at Elev.	Stratum Elev.	CLASSIFICATION	REMARKS
			+620		
1	2 2 3	+618.8	+618.8	Black organic silty sand.	
			+615.8		
2	5 5 6	+613.8		Gr.& Br. Loose silty clay.	
3	4 5 4	+608.8			
			+605.7	Br. hard silty clay.	
4	30 100	+603.8			
			+602.9		
	40%	+600.9		Hard buff limestone.	Core believed to be lost in hole.
	40%	+599.2			
	80%	+598.4			
	12%				
	0%	+593.0			
		+591.9			

BORING NO. 2 — Sta. 17+21.82 — 25' Lt.

DATE: September 19, 1960.

Sample No.	Blows/6 inches (Soil) % Core Recovered (Rock)	Samples taken at Elev.	Stratum Elev.	CLASSIFICATION	REMARKS
1	4 5 6	+617.4	+617.4	Black organic silt.	
			+614.4		
2	5 6 5	+612.4		Brown silty clay.	
			+608.1		
3	1 2 2	+607.4			
4	4 5 14	+602.4		Brown, silty sand.	
			+597.4		
	25%			Hard buff colored limestone.	All cores fragmented.
	40%	+593.8			
	100%	+591.5			
		+590.7			
	60%				
		+587.3			

BORING NO. 3 — Sta. 18+01.82 — 25' Rt.

DATE: September 14, 1960.

Sample No.	Blows/6 inches (Soil) % Core Recovered (Rock)	Samples taken at Elev.	Stratum Elev.	CLASSIFICATION	REMARKS
			+620		
			+610.0		
1	6 8 9	+609.0		Brown organic silt.	
			+605.5		
	50%	+603.5			
	65%	+601.5		Hard buff limestone.	All cores broken.
	25%				
	100%	+597.5			
		+596.5			
	100%	+595.5			

BORING NO. 4 — Sta. 18+71.82 — 25' Lt.

DATE: September 14, 1960.

Sample No.	Blows/6 inches (Soil) % Core Recovered (Rock)	Samples taken at Elev.	Stratum Elev.	CLASSIFICATION	REMARKS
	5 25 50	+593.9	+593.9	Brown silt.	
			+592.4	Hard buff limestone.	Fragmented
	25%				
		+587.8		Med-hard br. weathered limestone.	
	65%				
		+582.4	+582.9	Gray limestone.	

BORING NO. 5 — Sta. 19+42.82 — 25' Rt.

DATE: September 13, 1960.

Sample No.	Blows/6 inches (Soil) % Core Recovered (Rock)	Samples taken at Elev.	Stratum Elev.	CLASSIFICATION	REMARKS
			+586.5		
1	3 3 3	+585.5		Dark brown silt w/sand.	
2	3 4 20	+581.5			
			+580.5		
			+578.5	Gray silt w/ weathered limestone.	
	20%				
		+574.1			
	15%			Hard, gray to brown, limestone.	All cores fragmented.
		+569.0			
	25%	+566.3			
	50%	+565.1			
	10%	+563.3			
	20%				
		+558.2			

BORING NO. 6 — Sta. 20+03.82 — 25' Lt.

DATE: September 5, 1960.

Sample No.	Blows/6 inches (Soil) % Core Recovered (Rock)	Samples taken at Elev.	Stratum Elev.	CLASSIFICATION	REMARKS
			+588		
1	1 2 2	+585.8	+585.8		
2	2 3 5	+580.8		Dark br. silt to gray silty clay.	
			+576.3		
	40%	+574.8		Weathered brown to gray limestone.	Fragmented.
	10%			Hard gray limestone.	Broken.
		+571.3			
	35%				Broken.
		+566.3			

BORING NO. 7 — Sta. 20+63.82 — 25' Rt.

DATE: September 5, 1960.

Sample No.	Blows/6 inches (Soil) % Core Recovered (Rock)	Samples taken at Elev.	Stratum Elev.	CLASSIFICATION	REMARKS
1	1 8 38	+581.2	+581.2	Brown silt & weathered limestone.	
	100%	+579.5	+579.7		
	65%	+578.0		Hard gray limestone.	Fragmented.
	20%				
	60%	+575.2			El. 574.2 to 570.7 Cavities filled with cemeted br. limestone chips.
		+574.2			
		+570.7			Fragmented.
	100%	+569.4			

BORING NO. 8 — Sta. 21+23.82 — 25' Lt.

DATE: September 7, 1960.

Sample No.	Blows/6 inches (Soil) % Core Recovered (Rock)	Samples taken at Elev.	Stratum Elev.	CLASSIFICATION	REMARKS
			+585		
1	1 1 2	+583.2	+583.2	Black organic topsoil.	
			+581.9	Brown silty clay.	
2	4 11 20	+578.2			
			+576.2		
	30%			Hard gray limestone.	All cores fragmented.
	60%	+572.7			
	100%	+572.4			
	85%	+572.2			
	65%	+570.9		Brown limestone.	Clay seams @ +569.2 to +566.4.
	65%	+570.0			
	30%	+568.9			
	75%	+567.2			
		+566.2			

BORING NO. 9 — Sta. 21+84.82 — 25' Rt.

DATE: September 8, 1960.

Sample No.	Blows/6 inches (Soil) % Core Recovered (Rock)	Samples taken at Elev.	Stratum Elev.	CLASSIFICATION	REMARKS
			+579.7		
1	2 2 3	+578.7		Dark brown sandy silt.	
2	23 30 70	+574.7	+574.7	Brown weathered limestone chips.	
			+572.2		
	50%	+570.7		Hard gray limestone.	Fragmented.
	100%	+570.0			Fragmented.
	100%				
		+567.4			
	90%				
		+564.9			
	100%				
		+562.2			

NOTES:

Borings were made by American Testing and Engineering Corp. Indianapolis, Indiana, in August and September of 1960.

Elevations are to Mean Sea Level, 4th General Adjustment of 1912.

Size of Casing = 3½".

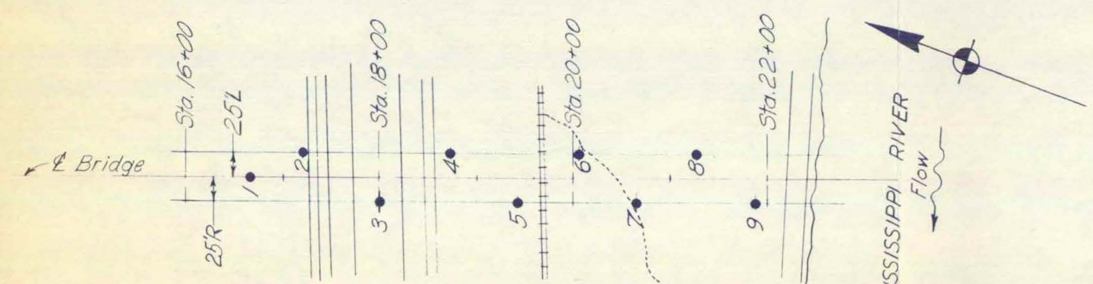
Size of Split Spoon = 2".

Size of Rock Core = 2⅛".

Hammer weight = 140#. Average drop of 30".

Classification of material made in field by visual inspection.

Broken cores indicate cores were recovered in several pieces but could be arranged in proper order. Fragmented cores were recovered in many pieces and could not be arranged in proper order.



PLAN OF BORINGS

IOWA STATE HIGHWAY COMMISSION
AND ILLINOIS DIVISION OF HIGHWAYS
PROPOSED INTERSTATE BRIDGE
OVER MISSISSIPPI RIVER AT LE CLAIRE, IOWA.

BORINGS 1 TO 9

SCALE IN FEET: 0, 8', 16'

MODJESKI & MASTERS, ENGINEERS

OCTOBER 1960 — SUPPLEMENTARY DWG. NO. 1

AWH

BORING NO. 12 Sta. 25+09.49 30' Lt.

DATE: August 23, 1960.

% Core Recovery	Samples taken at Elev.	Log of Hole	Stratum Elev.	CLASSIFICATION	REMARKS
				← 572.1 Pool	
				Water.	
			+560.5		
100%	+555.5			Hard gray limestone.	
100%	+553.5				
100%	+550.5				

BORING NO. 13 Sta. 25+09.49 30' Rt.

DATE: August 23, 1960.

Sample No.	% Core Recovery	Samples taken at Elev.	Log of Hole	Stratum Elev.	CLASSIFICATION	REMARKS
					Water.	
				+558.1		
	73%	+553.8			Hard gray limestone.	All cores fragmented.
	42%					
	100%	+549.2				
		+547.8				

BORING NO. 16 Sta. 28+33.16 30' Lt.

DATE: September 13, 1960.

% Core Recovery	Samples taken at Elev.	Log of Hole	Stratum Elev.	CLASSIFICATION	REMARKS
				← 572.1 Pool	
			+569.3	Water.	
			+568.7	Concrete	
				Water.	
				Loose limestone boulders.	
100%	+555.5		+556.3		
100%	+554.8				
90%	+554.0			Hard gray limestone.	All cores broken.
100%	+552.9				
100%	+552.6				
50%	+551.7				
100%					
	+546.3				

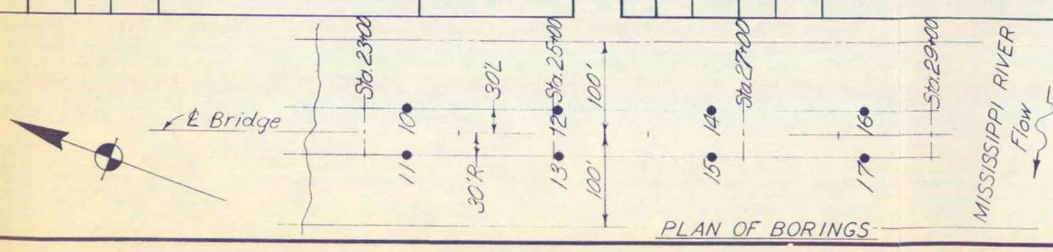
BORING NO 17 Sta. 28+33.16 30' Rt.

DATE: September 12, 1960.

Sample No.	Blows/6 inches (Soil) % Core Recovered (Rock)	Samples taken at Elev.	Log of Hole	Stratum Elev.	CLASSIFICATION	REMARKS
				+569.1	Water.	
				+568.8	Concrete.	
1	2 3 4	+562.1			Fine to course sand.	
2	2 3 5	+558.1			Silty clay and sand.	
				+553.4	Wood.	
				+552.8		
	15%					
		+546.0				
	38%	+543.6				
	30%	+540.3			Hard gray limestone.	All cores broken.
	40%	+538.7				
	100%	+538.1				
	60%	+535.6				
	25%					
		+531.1				
	40%	+528.1				

NOTES:

For boring notes, see Supplementary drawing No. 1.



PLAN OF BORINGS

IOWA STATE HIGHWAY COMMISSION
AND ILLINOIS DIVISION OF HIGHWAYS
PROPOSED INTERSTATE BRIDGE
OVER MISSISSIPPI RIVER AT LE CLAIRE, IOWA

BORINGS 10 TO 17

1'0 8' 16'
SCALE IN FEET

MODJESKI & MASTERS, ENGINEERS
OCTOBER 1960 SUPPLEMENTARY DWG. NO. 2

A.W.H.

BORING NO. 18 — Sta. 29+95.00 — 30' Lt.

DATE: August 26, 1960.

Columns: Sample No. | % Core Recovery | Samples taken at Elev. | Log of Hole | Stratum Elev. | CLASSIFICATION | REMARKS

572.1 Pool

% Core Recovery	Samples taken at Elev.	Stratum Elev.	Classification	Remarks
			Water.	
40%	+556.7	+557.4	Hard, gray limestone.	All cores fragmented, except as noted.
100%	+556.4			Good core.
60%	+555.7			
80%	+554.5			
100%	+552.5			
75%	+552.1			
100%	+549.3			Badly fragmented core.
25%	+547.4			No evidence of cavities or large seams.

BORING NO. 19 — Sta. 29+95.00 — 30' Rt.

DATE: August 29, 1960.

Columns: Sample No. | Blows/6 inches (Soil) % Core Recovered (Rock) | Samples taken at Elev. | Log of Hole | Stratum Elev. | CLASSIFICATION | REMARKS

Sample No.	Blows / % Core	Samples taken at Elev.	Stratum Elev.	Classification	Remarks
				Water	
			+555.4	Gravel and coarse gray sand.	All cores fragmented. No evidence of cavities or large seams except as noted.
	80%	+551.5	+553.1	Hard limestone.	
			+550.8	Cavity, +550.8 to +545.9 with some sand and gravel.	
1	13 26	+546.9			
	100%	+545.1	+545.9	Hard, gray limestone.	
	50%	+544.1			
	20%				Badly fragmented.
	50%	+539.1			
		+536.2			

BORING NO. 20 — Sta. 33+65.00 — 30' Lt.

DATE August 30, 1960.

572.1 Pool

% Core Recovery	Samples taken at Elev.	Stratum Elev.	Classification	Remarks
			Water.	
30%	+558.0	+558.9	Hard, gray limestone	All cores fragmented, except as noted.
95%				Good core.
60%	+554.8			
60%	+553.5			
60%	+552.3			
75%	+551.4			
70%	+550.3			No evidence of cavities or large seams.
	+548.9			

BORING NO. 21 — Sta. 33+65.00 — 30' Rt.

DATE: August 30, 1960.

% Core Recovery	Samples taken at Elev.	Stratum Elev.	Classification	Remarks
			Water.	
40%	+557.5	+558.5	Hard, gray limestone.	Fragmented core.
100%	+555.7			
60%	+554.2			Partly frag. with small clay seams.
85%				
100%	+551.3			Fragmented core.
35%	+550.1			
90%	+549.5			4" clay seam at El. +551.7.
	+548.4			

BORING NO. 22 — Sta. 35+26.84 — 30' Lt.

DATE: August 31, 1960.

572.1 Pool

% Core Recovery	Samples taken at Elev.	Stratum Elev.	Classification	Remarks
			Water.	
		+560.0	Sand and gravel.	
30%	+551.3	+553.4	Hard, gray limestone.	All cores fragmented.
30%				Small clay seams.
50%	+548.5			Small clay seams
30%	+547.3			No evidence of cavities or large seams.
30%	+545.5			
75%	+544.4			
	+543.3			

BORING NO. 23 — Sta. 35+26.84 — 30' Rt.

DATE: August 31, 1960.

% Core Recovery	Samples taken at Elev.	Stratum Elev.	Classification	Remarks
			Water.	
80%	+555.0	+557.6	Hard, gray limestone.	Broken.
100%	+554.1			Broken.
60%	+552.9			Partly fragmented.
30%				Fragmented.
60%	+549.8			Partly fragmented.
	+547.6			

BORING NO. 24 — Sta. 36+88.67 — 30' Lt.

DATE: September 1, 1960.

572.1 Pool

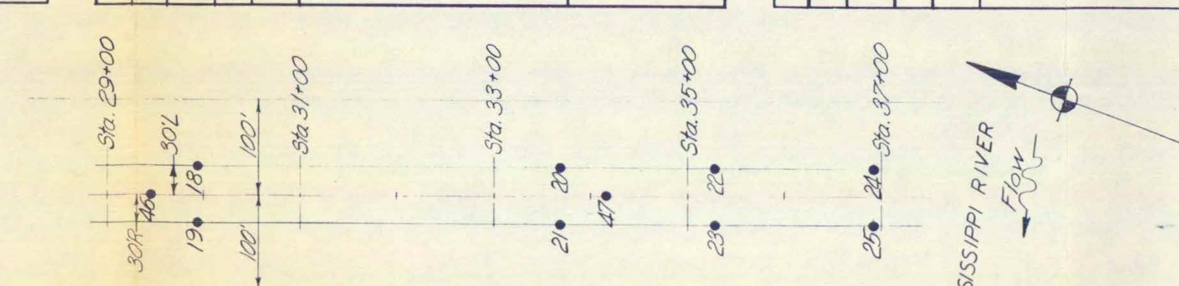
% Core Recovery	Samples taken at Elev.	Stratum Elev.	Classification	Remarks
			Water.	
80%	+554.7	+555.2	Hard, gray limestone.	Fragmented.
15%				Frag. and ground.
50%	+551.7			
90%	+551.3			
35%	+549.0			Fragmented.
100%	+548.4			Broken.
25%	+547.2			Broken.
25%	+546.1			Fragmented.
	+545.2			No evidence of cavities or large seams.

BORING NO. 25 — Sta. 36+88.67 — 30' Rt.

DATE: September 1, 1960.

% Core Recovery	Samples taken at Elev.	Stratum Elev.	Classification	Remarks
			Water.	
50%		+550.6	Hard, gray limestone with soft seams.	Broken.
40%	+547.9			Broken.
100%	+546.2			Broken
100%	+543.4			
	+540.3			2" clay seam at Elev. +541.

NOTES:
For boring notes, see Supplementary drawing No. 1.



PLAN OF BORINGS

IOWA STATE HIGHWAY COMMISSION
AND ILLINOIS DIVISION OF HIGHWAYS
PROPOSED INTERSTATE BRIDGE
OVER MISSISSIPPI RIVER AT LE CLAIRE, IOWA

BORINGS 18 TO 25

SCALE IN FEET: 0 – 8' – 16'

MODJESKI & MASTERS, ENGINEERS

OCTOBER 1960 SUPPLEMENTARY DWG NO. 3

BORING NO. 26 — Sta. 38+50.51 — 30' Lt.

DATE: September 6, 1960.

Sample No.	% Core Recovery	Samples taken at Elev.	Log of Hole	Stratum Elev.	CLASSIFICATION	REMARKS
				572.1 Pool		
					Water.	
				+555.0	Hard, gray sandy limestone.	
	100%					
	100%	+550.0				
	35%	+547.9				Fragmented.
	100%	+546.0				Broken.
		+545.0				

BORING NO. 27 — Sta. 38+50.51 — 30' Rt.

DATE: September 6, 1960.

Sample No.	% Core Recovery	Samples taken at Elev.	Log of Hole	Stratum Elev.	CLASSIFICATION	REMARKS
					Water.	
				+560.2	Hard, gray sandy limestone.	
	100%	+555.2				
	100%	+550.1				

BORING NO. 28 — Sta. 40+12.34 — 30' Lt.

DATE: September 7, 1960.

Sample No.	% Core Recovery	Samples taken at Elev.	Log of Hole	Stratum Elev.	CLASSIFICATION	REMARKS
				572.1 Pool		
					Water.	
				+556.1	Sand.	
				+555.8	Hard, gray sandy layered limestone.	Core loss by grinding +549.3 to +545.8.
	65%	+545.8				
	100%	+542.3				

BORING NO. 29 — Sta. 40+12.34 — 30' Rt.

DATE: September 7, 1960.

Sample No.	% Core Recovery	Samples taken at Elev.	Log of Hole	Stratum Elev.	CLASSIFICATION	REMARKS
					Water.	
				+552.5	Sand and gravel.	
				+548.0	Hard gray limestone.	
	30%	+544.8				Fragmented.
	45%	+542.8				Broken.
	50%	+540.6				Broken.
	65%	+538.0				8" core of partially cemented sandy limestone at Elev. +540.6.

BORING NO. 30 — Sta. 41+74.18 — 30' Lt.

DATE: September 8, 1960.

Sample No.	% Core Recovery	Samples taken at Elev.	Log of Hole	Stratum Elev.	CLASSIFICATION	REMARKS
				572.1 Pool		
					Water.	
	75%			+559.1	Hard, gray limestone.	
	100%	+557.0				Fragmented.
	95%	+555.7				
	75%	+552.1				Broken.
		+549.1				

BORING NO. 31 — Sta. 41+74.18 — 30' Rt.

DATE: September 8, 1960.

Sample No.	% Core Recovery	Samples taken at Elev.	Log of Hole	Stratum Elev.	CLASSIFICATION	REMARKS
					Water.	
				+558.5	Fine gray sand.	
				+558.2	Hard, gray limestone.	
	55%	+555.9				Broken.
	60%	+553.2				Broken.
	100%	+547.3				

BORING NO. 32 — Sta. 43+14.94 — 30' Lt.

DATE: September 8, 1960.

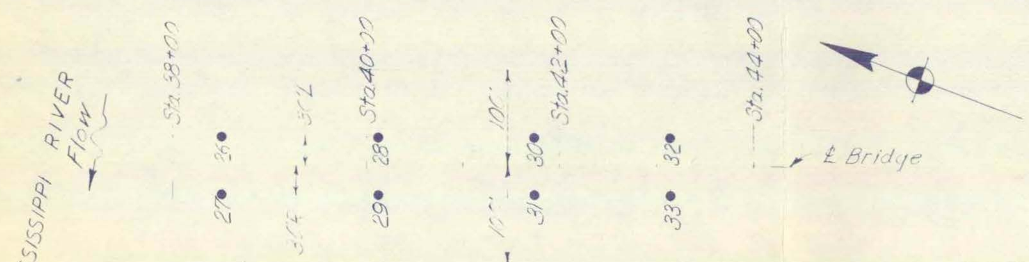
Sample No.	% Core Recovery	Samples taken at Elev.	Log of Hole	Stratum Elev.	CLASSIFICATION	REMARKS
				572.1 Pool		
					Water.	
				+558.8	Hard, gray limestone.	
	60%	+556.4				Partly broken.
	45%					Partly broken.
	75%	+550.7				Broken.
		+548.8				

BORING NO. 33 — Sta. 43+14.94 — 30' Rt.

DATE: September 9, 1960.

Sample No.	% Core Recovery	Samples taken at Elev.	Log of Hole	Stratum Elev.	CLASSIFICATION	REMARKS
					Water	
				+559.4	Hard gray limestone.	
	85%	+557.7				Broken
	45%	+555.0				Fragmented
	95%	+552.7				
	100%	+548.7				

NOTES:
For boring notes, see Supplementary drawing No. 1.



PLAN OF BORINGS

IOWA STATE HIGHWAY COMMISSION
AND ILLINOIS DIVISION OF HIGHWAYS
PROPOSED INTERSTATE BRIDGE
OVER MISSISSIPPI RIVER AT LE CLAIRE, IOWA

BORINGS 26 TO 33

0' 8' 16'
SCALE IN FEET

MODJESKI & MASTERS, ENGINEERS

OCTOBER 1960 SUPPLEMENTARY DWG. NO. 4

AWH

BORING NO. 34 — Sta. 44+55.71 — 30' Lt.

DATE: September 9, 1960.

Sample No.	% Core Recovery	Samples taken at Elev.	Log of Hole	Stratum Elev.	CLASSIFICATION	REMARKS
					572.1 Pool	
					Water	
50%		+556.1		+557.7	Sand.	
30%				+556.8	Sandy gray limestone.	Broken.
		+551.3			Hard gray limestone.	
90%		+550.1			Crystalline gray limestone.	Broken.
90%		+547.3				
100%		+546.8				Broken.

BORING NO. 35 — Sta. 44+55.71 — 30' Rt.

DATE: September 9, 1960.

Sample No.	% Core Recovery	Samples taken at Elev.	Log of Hole	Stratum Elev.	CLASSIFICATION	REMARKS
					Water.	
100%		+557.7		+559.3		
100%		+555.6			Alternate layers of sandy gray limestone and hard gray limestone without seams.	
90%						
		+551.4				
50%		+549.2				

BORING NO. 36 — Sta. 45+96.47 — 30' Lt.

DATE: September 10, 1960.

Sample No.	% Core Recovery	Samples taken at Elev.	Log of Hole	Stratum Elev.	CLASSIFICATION	REMARKS
					572.1 Pool	
					Water.	
95%				+558.2		
		+554.0			Hard gray limestone.	
90%		+552.0				
95%					Hard crystalline limestone.	
		+547.8				

BORING NO. 37 — Sta. 45+96.47 — 30' Rt.

DATE: September 10, 1960.

Sample No.	% Core Recovery	Samples taken at Elev.	Log of Hole	Stratum Elev.	CLASSIFICATION	REMARKS
					Water.	
85%				+556.7	Gray sand.	
		+550.2		+556.2	Sandy buff to gray limestone.	
30%						Broken. Part of core lost in hole.
		+546.2				

BORING NO. 38 — Sta. 47+37.24 — 30' Lt.

DATE: September 10, 1960.

Sample No.	% Core Recovery	Samples taken at Elev.	Log of Hole	Stratum Elev.	CLASSIFICATION	REMARKS
					572.1 Pool	
					Water.	
50%		+558.2		+560.5		
65%		+556.5			Hard gray limestone.	Broken.
90%		+553.9				Broken.
100%		+553.0				Partly broken.
100%		+549.4				Broken.

BORING NO. 39 — Sta. 47+37.24 — 30' Rt.

DATE: September 10, 1960.

Sample No.	% Core Recovery	Samples taken at Elev.	Log of Hole	Stratum Elev.	CLASSIFICATION	REMARKS
					Water.	
60%		+558.6		+560.4		
20%		+557.0			Weathered brown to gray limestone.	Fragmented.
90%					Hard gray limestone.	Fragmented.
		+554.0				
55%		+550.4				Broken.

BORING NO. 40 — Sta. 48+79.00 — 30' Lt.

DATE: September 14, 1960.

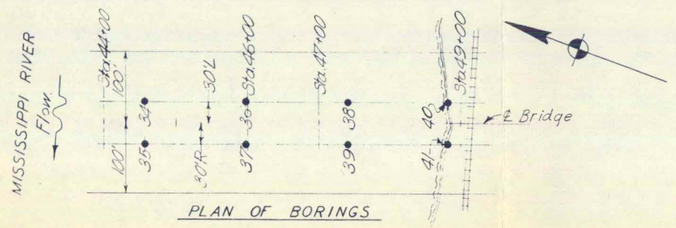
Sample No.	% Core Recovery	Samples taken at Elev.	Log of Hole	Stratum Elev.	CLASSIFICATION	REMARKS
					572.1 Pool	
				+571.0	Water	
100%		+567.0			Soft, brown sandy limestone.	Broken
100%		+562.2				
65%		+560.7				

BORING NO. 41 — Sta. 48+79.00 — 30' Rt.

DATE: September 14, 1960.

Sample No.	% Core Recovery	Samples taken at Elev.	Log of Hole	Stratum Elev.	CLASSIFICATION	REMARKS
				+571.3	Water	
100%		+571.0			Soft brown sandy limestone.	
100%		+566.0				
100%		+562.6			Hard gray limestone.	Gray clay seam at El. +558.1.
85%		+557.0				

NOTES:
For boring notes, see Supplementary drawing No. 1.



PLAN OF BORINGS

IOWA STATE HIGHWAY COMMISSION
AND ILLINOIS DIVISION OF HIGHWAYS
PROPOSED INTERSTATE BRIDGE
OVER MISSISSIPPI RIVER AT LE CLAIRE, IOWA.

BORINGS 34 TO 41

0 8' 16'
SCALE IN FEET

MODJESKI & MASTERS, ENGINEERS
OCTOBER 1960 — SUPPLEMENTARY DWG NO. 5

BORING NO. 42. Sta. 49+40.00 25' Lt.

DATE: August 13, 1960.

Ground: +585

Sample No.	Blows/6 inches (Soil) % Core Recovered (Rock)	Samples taken at Elev.	Log of Hole	Stratum Elev.	CLASSIFICATION	REMARKS
1	1 2 2	+578.9		+578.9	Black silty clay topsoil.	
				+575.9		
	95%	+574.5			Soft brown limestone.	All cores fragmented.
	95%	+573.7				
	40%	+571.9				
	50%	+569.6				
	90%	+568.7				
	60%	+567.2				
	75%	+565.8				

BORING NO. 43. Sta. 50+34.00 25' Rt.

DATE: August 19, 1960.

Sample No.	Blows/6 inches (Soil) % Core Recovered (Rock)	Samples taken at Elev.	Log of Hole	Stratum Elev.	CLASSIFICATION	REMARKS
1	2 4 6	+580.6		+580.6	Brown clayey silt topsoil.	
2	11 100	+575.6		+574.6		
	100%				Medium hard, brown sandy limestone.	At Elev. +571.4 .1' Blue clay. .7' Gray limestone. .2' Brown clay.
	75%	+571.5				
		+570.6				
	98%				Weathered, brown & gray limestone.	
	75%	+565.6			Hard, brown limestone.	
		+563.2				

BORING NO. 44. Sta. 50+60.00 25' Lt.

DATE: August 18, 1960.

Sample No.	Blows/6 inches (Soil) % Core Recovered (Rock)	Samples taken at Elev.	Log of Hole	Stratum Elev.	CLASSIFICATION	REMARKS
1	2 6 9	+583.1		+583.1	6" Black organic silt topsoil.	
2	5 5 9	+578.1			Brown sand- some gravel.	
				+575.6	Granite Boulder.	
				+574.6		
4					Sand, gravel, & small boulders.	
5		+572.1				
6		+571.1				
	45%			+568.6		
		+565.6				
	33%	+562.1			Soft to hard, blue & gray shale.	
	60%					
		+557.1				
	75%			+553.1	Gray limestone.	
				+552.1	Soft, gray clay seams.	
				+551.6		
	67%					
		+547.1				
	70%				Soft gray layered limestone w/ clay or shale seams.	
	85%	+543.1				
		+540.7				

BORING NO. 45. Sta. 51+20.00 Centerline.

DATE: August 15, 1960.

Ground: +590

Sample No.	Blows/6 inches (Soil) % Core Recovered (Rock)	Samples taken at Elev.	Log of Hole	Stratum Elev.	CLASSIFICATION	REMARKS
1	1 3 5	+588.1		+588.1	Black organic silt.	
				+587.2	Gray silty clay w/ gravel.	
2	16 18 26	+585.3				
3	14 40	+581.7		+581.7	Brown weathered limestone.	
				+580.8		
	95%	+579.8			Soft brown limestone.	All cores fragmented.
	50%	+577.7				
	85%	+577.1				
	70%	+575.1				
	80%					
		+570.8				

BORING NO. 46 Sta. 29+45.00 Centerline.

DATE: September 18, 1960.

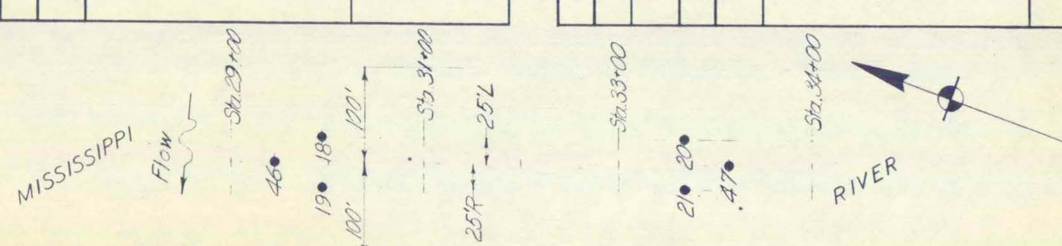
572.1 Pool

Sample No.	% Core Recovery.	Samples taken at Elev.	Log of Hole.	Stratum Elev.	CLASSIFICATION	REMARKS
					Water.	
				+556.7	Sand.	
				+556.6		
	50%					
	90%	+553.4			Hard gray limestone.	All cores broken.
	70%	+551.7				
	100%	+550.3				
	85%	+549.5				
	60%	+548.1				
	60%	+546.4				
		+544.0				
	10%					
		+540.5				
	50%					
		+537.0				
	50%					
		+532.0				

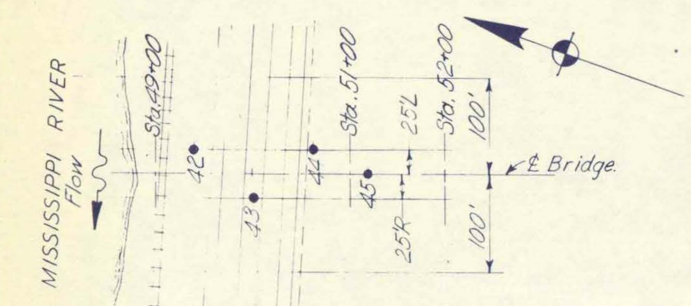
BORING NO. 47 Sta. 34+15.00 Centerline.

DATE: September 15, 1960.

Sample No.	% Core Recovery.	Samples taken at Elev.	Log of Hole.	Stratum Elev.	CLASSIFICATION	REMARKS
					Water.	
				+561.3		
	45%					Broken.
	100%	+558.3				
	100%	+557.8				
	60%	+556.9				
	55%	+555.1			Hard gray limestone.	Broken.
		+553.2				Broken.
	80%					
		+549.5				
	90%	+547.1				
	80%	+545.8				Broken.
	20%					
		+538.0				



PLAN OF BORINGS



PLAN OF BORINGS

NOTES:
For boring notes, see Supplementary Drawing No. 1.

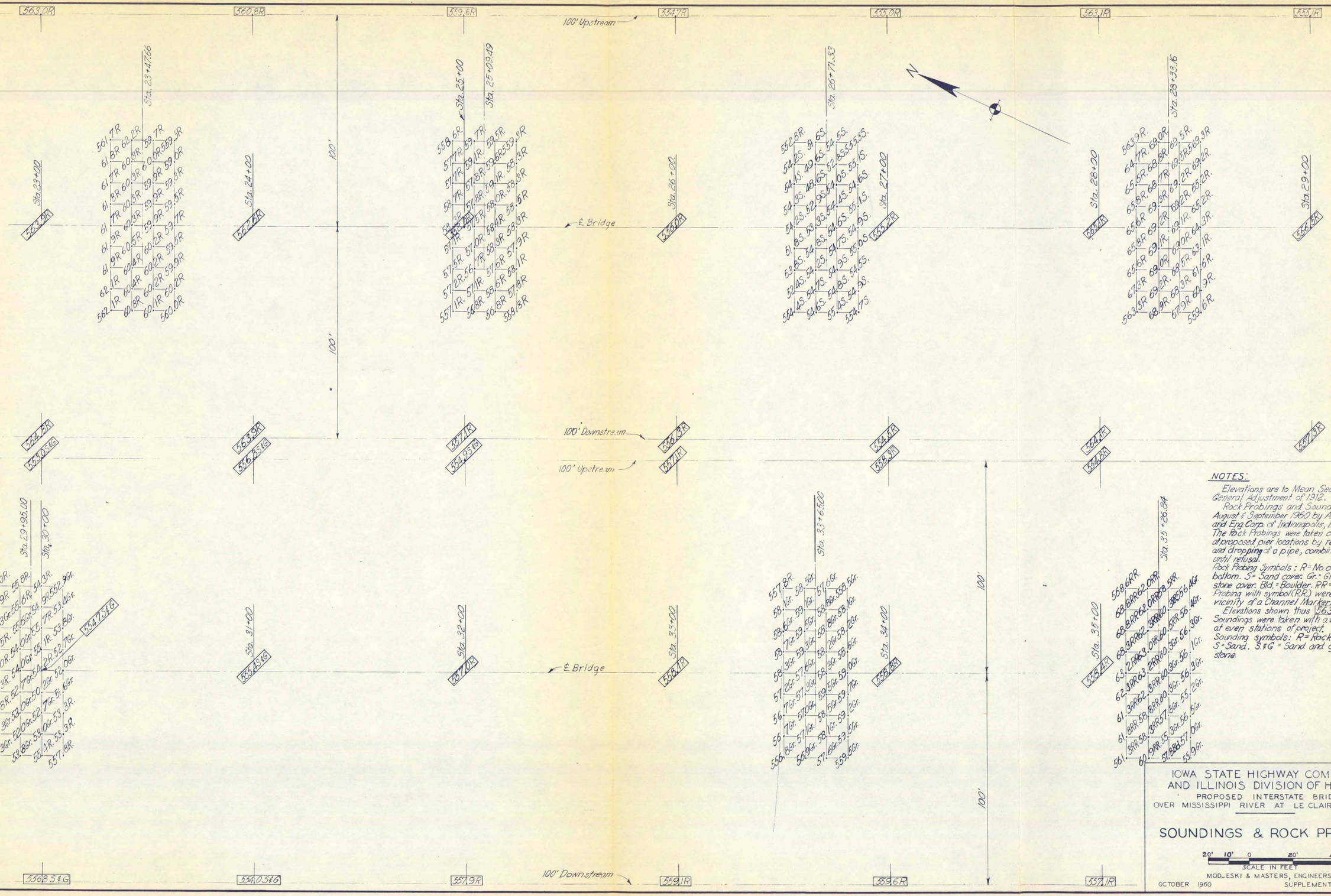
IOWA STATE HIGHWAY COMMISSION
AND ILLINOIS DIVISION OF HIGHWAYS
PROPOSED INTERSTATE BRIDGE
OVER MISSISSIPPI RIVER AT LECLAIRE, IOWA.

BORINGS 42 TO 47

1'0 8' 16'
SCALE IN FEET

MODJESKI & MASTERS, ENGINEERS

OCTOBER 1960 SUPPLEMENTARY DWG. NO. 6



NOTES:

Elevations are to Mean Sea Level, 4th General Adjustment of 1912.

Rock Probings and Sounding made in August & September 1960 by American Testing and Eng. Corp. of Indianapolis, Indiana. The Rock Probings were taken on a ten foot grid of proposed pier locations by repeated raising and dropping of a pipe, combined with jetting, until refusal.

Rock Probing Symbols: R = No cover over rock bottom. S = Sand cover. Gr. = Gravel or broken stone cover. Bld. = Boulder. RP = Rip-Rap. Probing with symbol (R.R.) were made in the vicinity of a Channel Marker.

Elevations shown thus 563.0R are soundings. Soundings were taken with a weighted cord at even stations of project.

Sounding symbols: R = Rock or large boulders. S = Sand. S.&G. = Sand and gravel or broken stone.

IOWA STATE HIGHWAY COMMISSION AND ILLINOIS DIVISION OF HIGHWAYS

PROPOSED INTERSTATE BRIDGE OVER MISSISSIPPI RIVER AT LE CLAIRE, IOWA.

SOUNDINGS & ROCK PROBINGS-I

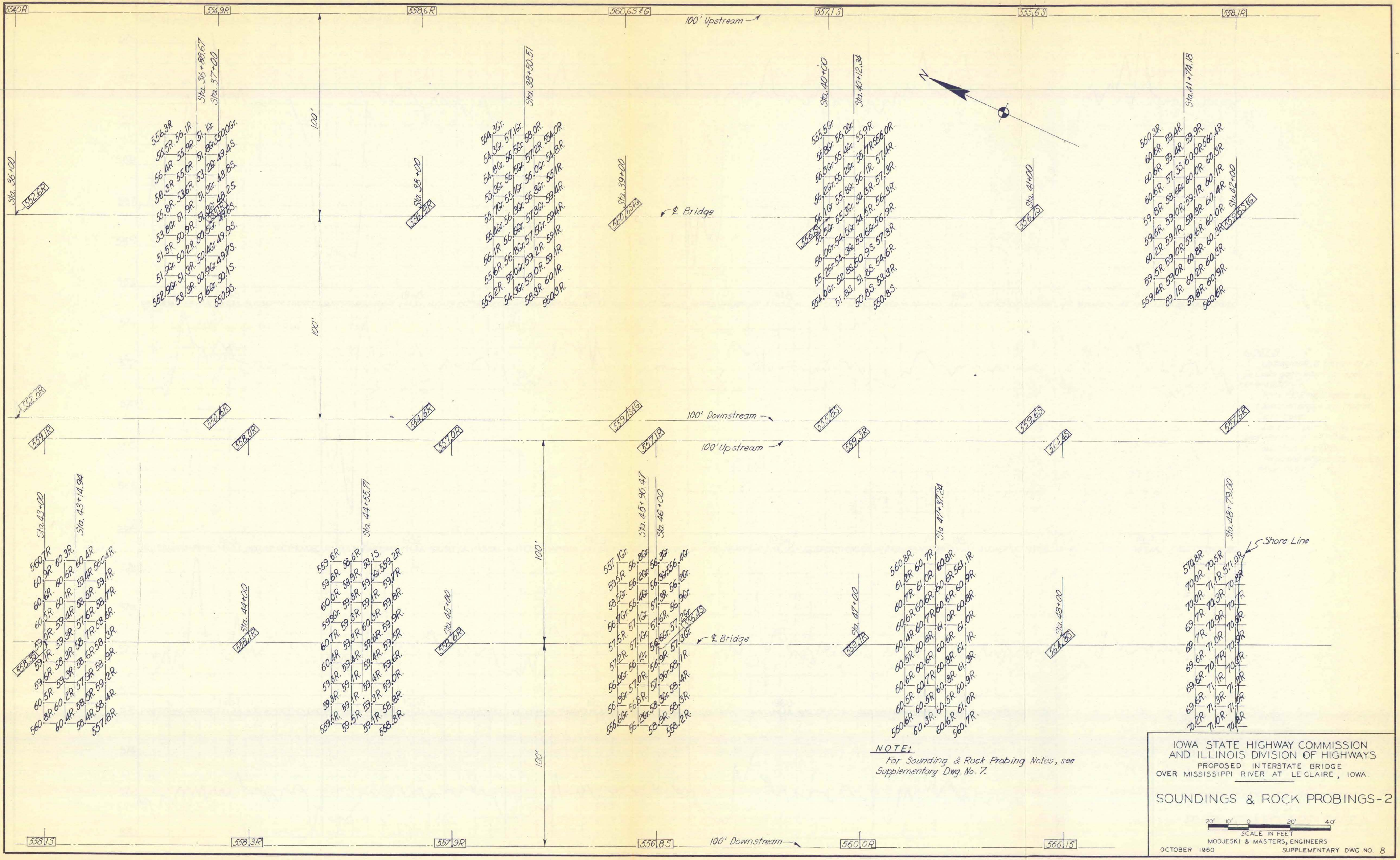
20' 10' 0 20' 40'

SCALE IN FEET

MODJESKI & MASTERS, ENGINEERS

OCTOBER 1960 SUPPLEMENTARY DWG. NO. 7

A.W.H.



NOTE:
For Sounding & Rock Probing Notes, see Supplementary Dwg. No. 7.

IOWA STATE HIGHWAY COMMISSION
AND ILLINOIS DIVISION OF HIGHWAYS
PROPOSED INTERSTATE BRIDGE
OVER MISSISSIPPI RIVER AT LE CLAIRE, IOWA.

SOUNDINGS & ROCK PROBINGS - 2

20' 10' 0 20' 40'
SCALE IN FEET

MODJESKI & MASTERS, ENGINEERS

OCTOBER 1960 SUPPLEMENTARY DWG NO. 8

A.W.H.

F. M. MASTERS
O. F. SORGENFREI
T. R. KEALEY
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G. K. GILLAN

H. G. VAN RIPER
HWY. ENGR.

MODJESKI AND MASTERS
CONSULTING ENGINEERS
Founded 1893
Harrisburg, Penna.

FORSTER AT SIXTH
P. O. BOX 2345
HARRISBURG, PA.

1021-27 BROAD-LOCUST BUILDING
PHILADELPHIA 2, PA.

1055 ST. CHARLES AVENUE
NEW ORLEANS 13, LA.

April 8, 1963

Mr. L. M. Clauson, Chief Engineer
Iowa State Highway Commission
Ames, Iowa

RE: LE CLAIRE BRIDGE - ESTIMATES
(Substructure and Superstructure)

Dear Mr. Clauson:

In accordance with your letter of March 29, 1963, we have broken down the construction cost estimate shown in the report as follows:

IOWA SHARE

Approach, Substructure	$ 145,505.00	
Approach, Superstructure	338,367.50	
Main Bridge, Substructure		
36.9625% x 1,136,317.60 =	420,011.39	
Main Bridge, Superstructure		
36.9625% x 3,482,788.55 =	1,287,325.72	
Total Iowa Share		$2,191,209.61

ILLINOIS SHARE

Approach, Substructure	95,170.20	
Approach, Superstructure	186,675.95	
Main Bridge, Substructure		
63.0375% x 1,136,317.60 =	716,306.21	
Main Bridge, Superstructure		
63.0375% x 3,482,788.55 =	2,195,462.83	
Total Illinois Share		$3,193,615.19

TOTAL COST	$5,384,824.80

MODJESKI AND MASTERS

Harrisburg, Penna.
April 8, 1963

Mr. Clauson
Re: Le Claire Bridge - Estimates

While this is perhaps not in the exact form you have indicated in your letter, there was some confusion in our minds as to whether you referred to a percentage breakdown of total cost of substructure and superstructure or whether this was intended to be a breakdown of the total cost of the river crossing portion.

It should be noted that the Iowa approach substructure and superstructure included everything from the Iowa abutment to the centerline of Pier 8 at Station 21+84.17. Similarly, the Illinois approach includes everything from the abutment to the centerline of Pier 24 at Station 48+78.33. The portion between the centerlines of Piers 8 and 24 has been shown as "Main Bridge, Substructure and Superstructure". In breaking the substructure estimate down, we have split the quantities for both Piers 8 and 24, applying half of Pier 8 to the Iowa approach, half of Pier 24 to the Illinois approach, and the remaining half of Piers 8 and 24 have been included in the main bridge substructure.

We trust that this division of costs is in accordance with your wishes. Please advise if we can be of further help.

Very truly yours,

MODJESKI AND MASTERS
Engineers

By T. R. Healy

TRK:jc

cc: Mr. Fred R. White