Morgan Street Bridge

PRELIMINARY TYPE SIZE & LOCATION (TSL) Drawings

Tied Arch Main Span

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

BENCH MARK:

#25 Chiseled "X" on existing sidewalk Sta. 42+59.20, 21.11' Rt., Elevation = 709.61
#28 Iron Pin (5/8") on west side of RR track Sta. 51+52.10, 43.04' Lt., Elevation = 710.40

EXISTING STRUCTURE:

S.N. 101-6132 , originally built in 1916 and rehabilitated in 1959, 1983 and 1993. The existing structure is an eight span open spandrel reinforced concrete arch bridge. West approach is a single span with prestressed precast concrete box beams. East approach is a two span structure with prestressed precast concrete box beams. Substructure consists of concrete abutments and piers supported on timber piles. Back to back of approach-abutment measures 797'-7 5/8" and out to out width of deck is 50'-0". Structure is to be removed and replaced. Traffic is to be detoured.

PROPOSED IMPROVEMENTS:

Existing structure to be removed and replaced with a three span bridge with composite welded plate girder end spans and a steel tied arch middle span supported on concrete abutments and piers. The proposed structure is 504'-0 7/8" back to back of abutments and 73'-2" out to out of deck.

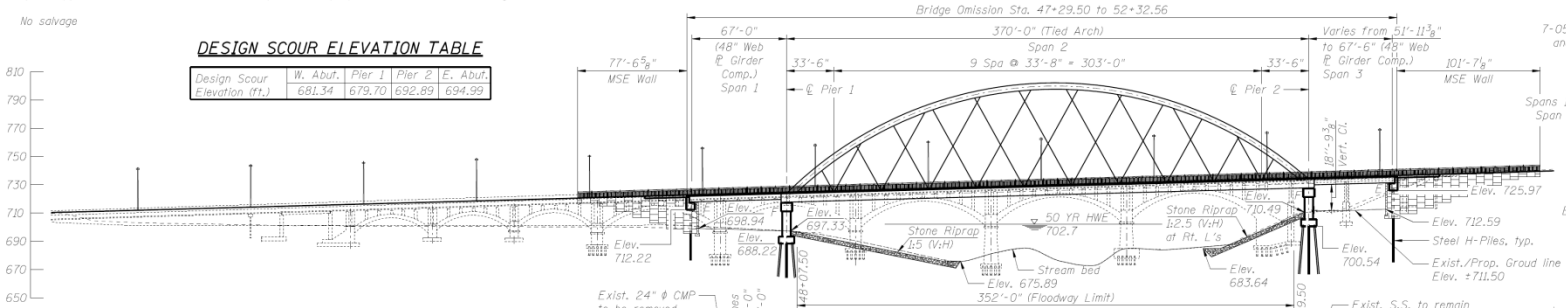
No salvage

WATERWAY INFORMATION

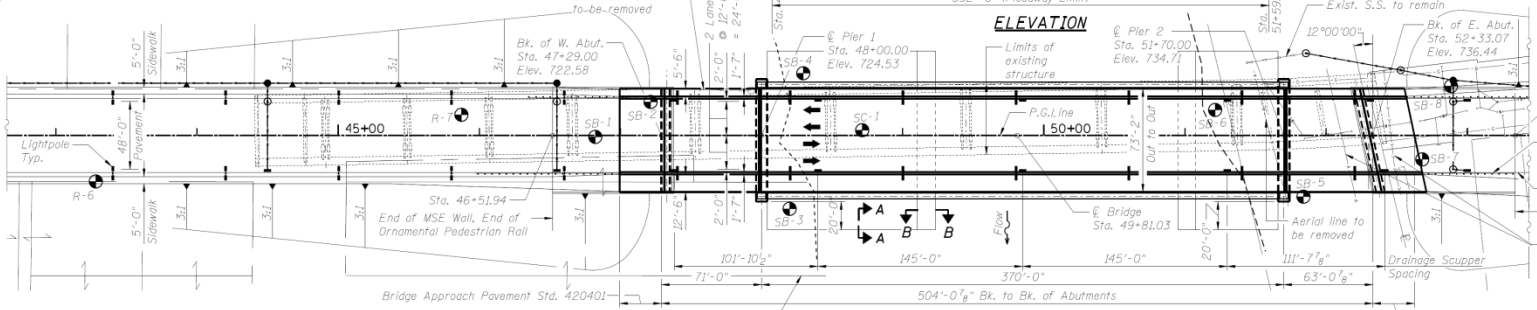
Drainage Area = 6535 sq. mi.					Low Grade Elev. 721.3 @ Sta. - 47+30			
Flood	Freq. Yr.	Q C.F.S.	Opening Sq. Ft. Exist.	Opening Sq. Ft. Prop.	Nat. H.W.E.	Head - Ft. Exist.	Head - Ft. Prop.	Headwater El. Exist.	Headwater El. Prop.
Design	50	39500	4610	6384	702.7	0	0	702.7	702.7
Base	100	44500	5090	6672	703.6	0	0	703.6	703.6
Overtopping	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Max. Calc.	500	56500	7200	7824	707.2	0	0	707.2	707.2

DESIGN SCOUR ELEVATION TABLE

Design Scour Elevation (ft.)	W. Abut.	Pier 1	Pier 2	E. Abut.
	681.34	679.70	692.89	694.99



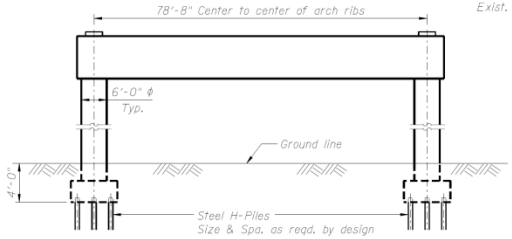
ELEVATION



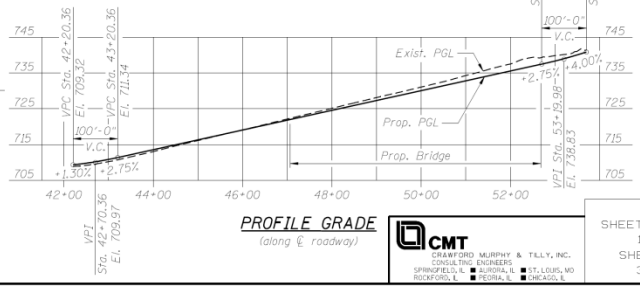
PLAN

BORING DATA

Boring No.	Station	Offset
R-6	43+28.32	32.55' RT.
R-7	45+87.33	14.61' LT.
SB-1	46+82.22	1.02' RT.
SB-2	47+21.39	23.72' LT.
SB-3	48+19.89	51.94' RT.
SB-4	48+29.52	44.00' LT.
SC-1	48+71.26	3.72' LT.
SB-5	51+83.95	43.36' RT.
SB-6	51+21.36	18.06' LT.
SB-7	52+68.13	16.92' RT.
SB-8	52+88.48	34.95' LT.



PIER SKETCH



PROFILE GRADE

(along ℄ roadway)

HIGHWAY CLASSIFICATION

F.A.U. Route 5077 (MORGAN STREET)
Functional Class: Urban Minor Arterial
ADT: 9,060 (2002); 16,000 (2031)
ADTT: Posted No Trucks (2002); 1,600 (2031)
DHV: 906 (2002); 1,600 (2031)
Design Speed: 30 m.p.h.
Posted Speed: 30 m.p.h.

DESIGN SPECIFICATIONS

2002 AASHTO "Standard Specifications for Highway Bridges" and Interims through 2005

7-05 SEI/ASCE "Minimum Design Loads for Buildings and Other Structures", wind load on arch rib only

LOADING HS20-44

Spans 1 & 3: Allow 50#/sq. ft. for fut. wearing surface.
Span 2: Allow 25#/sq. ft. for fut. wearing surface.

Vessel Collision: none

SEISMIC DATA

Seismic Performance Zone (SPC) = A
Bedrock Acceleration Coefficient (A) = 0.033g
Site Coefficient (S) = 1.2

DESIGN STRESSES

FIELD UNITS

f'c = 3,500 psi
fy = 60,000 psi (Reinforcement)
fy = 50,000 psi (M270 Grade 50W)

LOCATION SKETCH

GENERAL PLAN & ELEVATION
MORGAN STREET OVER ROCK RIVER
F.A.U. ROUTE 5077 - SEC. 99-00493-00-BR
WINNEBAGO COUNTY
STATION 49+81.03
STRUCTURE NO. 101-6108 (NEW)

DESIGNED	PA
CHECKED	RJK
DRAWN	PA
CHECKED	RJK

EXAMINED
ENGINEER OF BRIDGE DESIGN
PASSED
ENGINEER OF BRIDGES AND STRUCTURES

CMT
CRAWFORD MURPHY & TILLY, INC.
CONSULTING ENGINEERS
SPRINGFIELD, IL ■ AURORA, IL ■ ST. LOUIS, MO
ROCKFORD, IL ■ PEORIA, IL ■ CHICAGO, IL

SHEET NO.	F.A. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
1	5077	99-00493-00-BR	WINNEBAGO	3	1
SHEETS 3			CONTRACT NO.		
	FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		

STATE OF ILLINOIS
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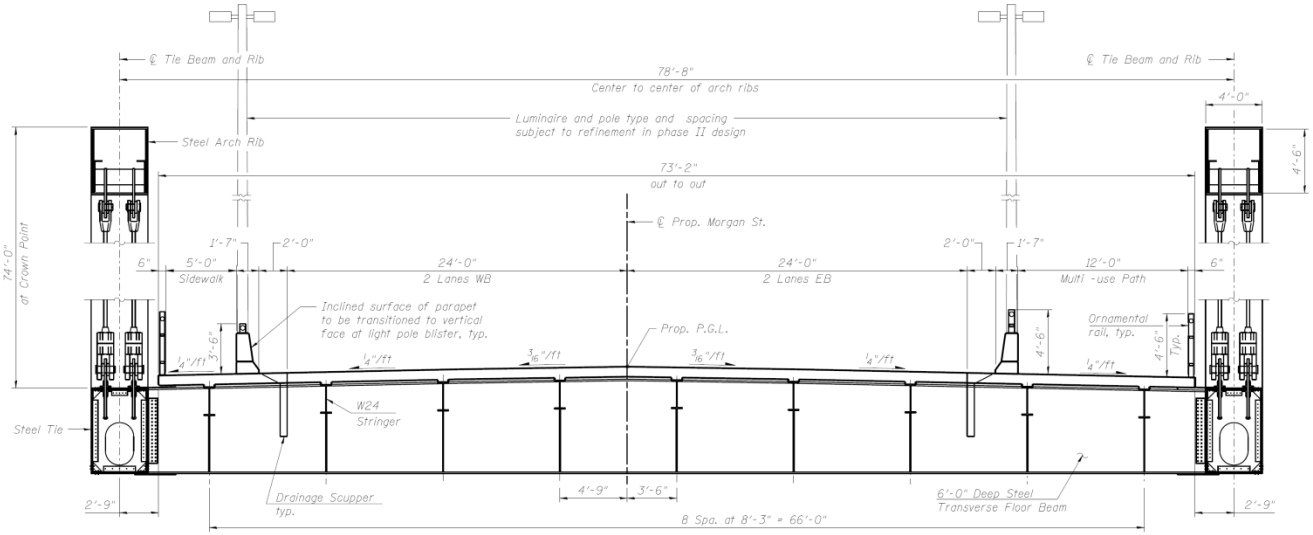
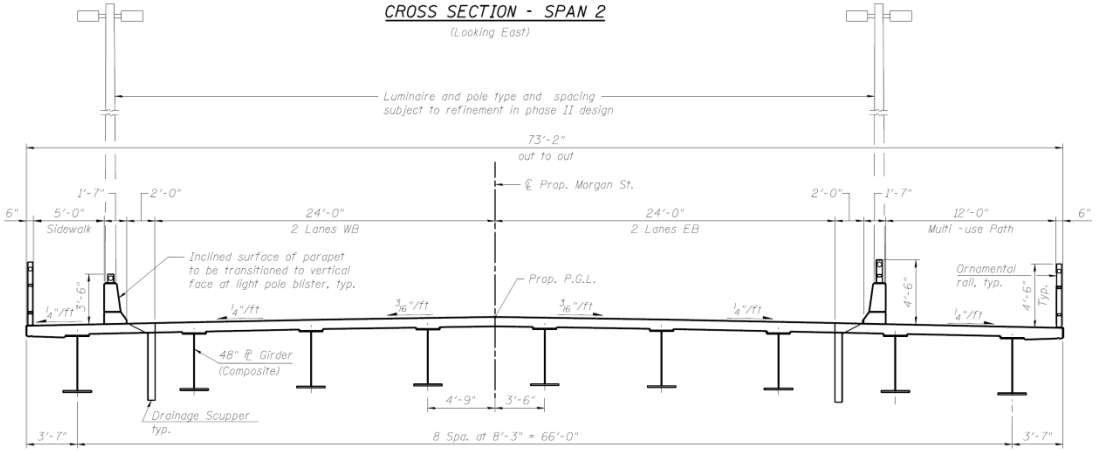


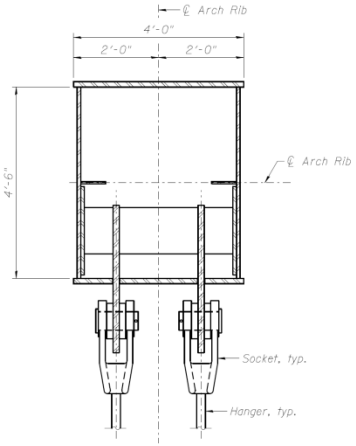
CROSS SECTION - SPAN 2

(Looking East)

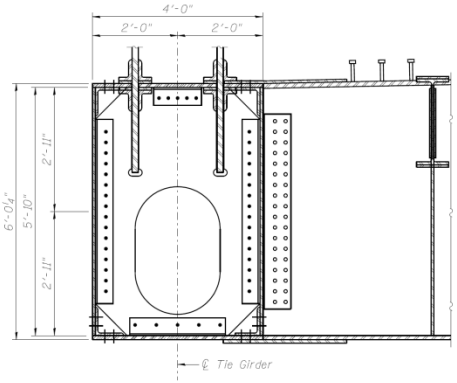


CROSS SECTION - SPANS 1 & 3

(Looking East)



SECTION - ARCH RIB



SECTION - ARCH TIE

DETAILS - I
MORGAN STREET OVER ROCK RIVER
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WINNEBAGO COUNTY
STATION 49+81.03
STRUCTURE NO. 101-6108 (NEW)

DESIGNED	PA
CHECKED	RJK
DRAWN	PA
CHECKED	RJK

- 200
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2 SHEETS 3	5077	99-00493-00-BR	WINNEBAGO	3	2
			CONTRACT NO.		
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STATE OF ILLINOIS
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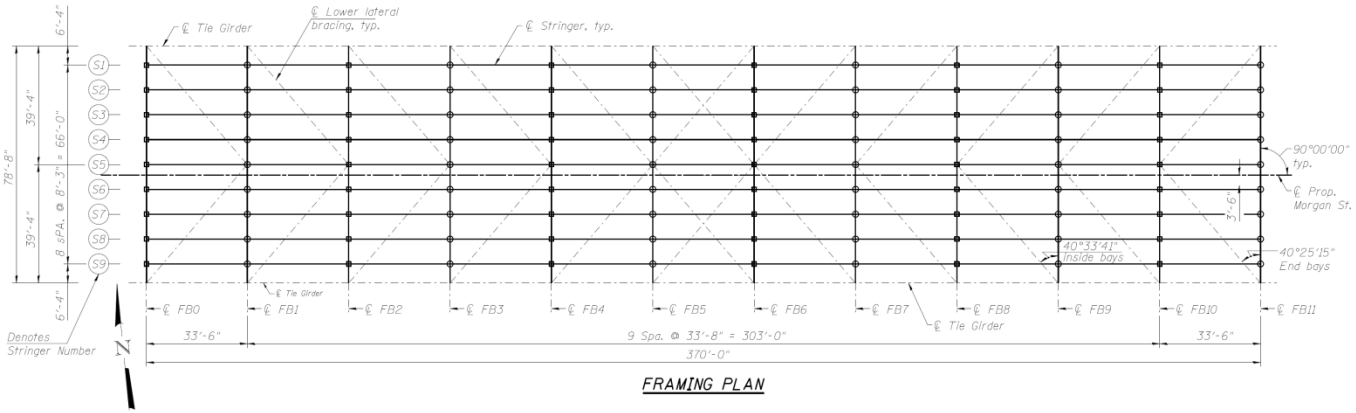
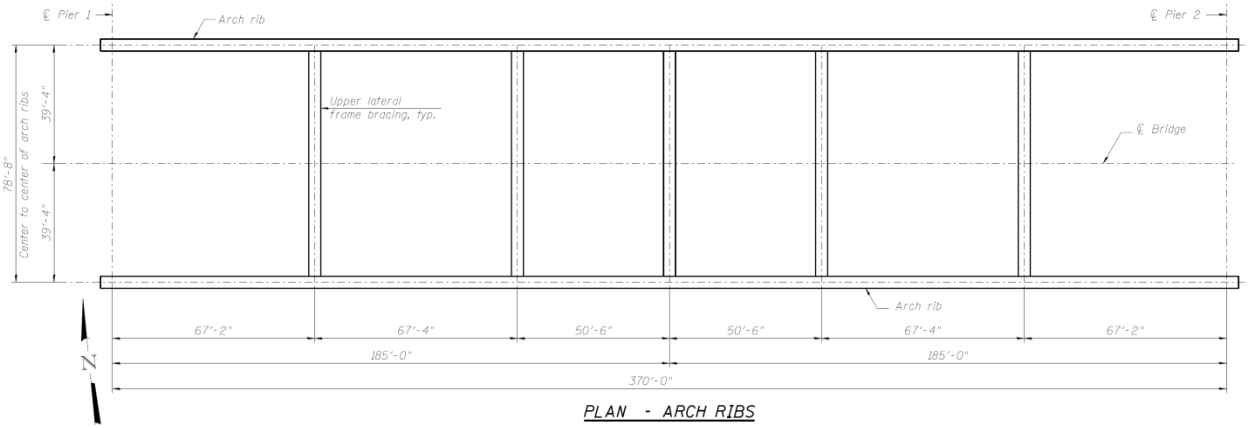
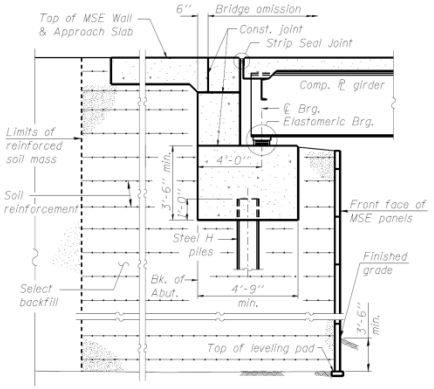


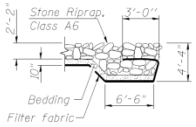
FRAMING PLAN



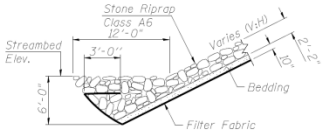
PLAN - ARCH RIBS



SECTION THRU ABUTMENT
(Horiz. dim. @ Rt. L's)



SECTION A-A



SECTION B-B

DETAILS - II
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WINNEBAGO COUNTY
STATION 49+81.03
STRUCTURE NO. 101-6108 (NEW)

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3 SHEETS 3	5077	99-00493-00-BR	WINNEBAGO	3	3
			CONTRACT NO.		
	FED. ROAD DIST. NO.	ILLINOIS	FED. AID PROJECT		