

Existing Structure Number 048-0018:  
The existing structure is a three span consisting of a PPC deck beam superstructure on closed abutments and solid wall piers. The total structure length is 99.5' back-to-back abutments and the width is 33.0' out to out. The superstructure consists of 17" PPC deck beams with approximately 3" of bituminous overlay. The closed abutments are founded on spread footings that are supported by untreated timber piling. Abutment caps were added to the original closed abutments in 1977 to provide ample bearing surface for the new deck beams. The caps are longer than the existing abutment wall due to the wider deck. The closed abutments are approximately 16' tall with 2.25' thick footings. The solid wall piers are supported by HP8x36 piles and were added in 1977 when the truss bridge was removed. Road will be closed and traffic detoured during construction.

All components of temporary beam shoring shall be salvaged and delivered to IDOT Maintenance Yard. IDOT will provide means to unload.

Bench Mark BM4:  
Chiseled "C" on NE wing at IL78 bridge.  
Elev 610.54

Bench Mark BM6:  
RR spike in power pole 0.3 mi south of  
IL78 bridge of east side of road.  
Elev 647.24

**LOADING HL-93**  
Allow 50#/sq. ft. for future wearing surface.

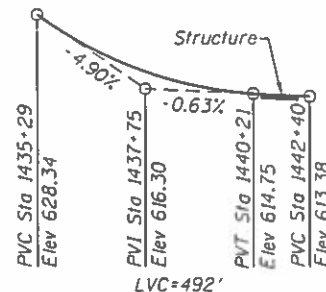
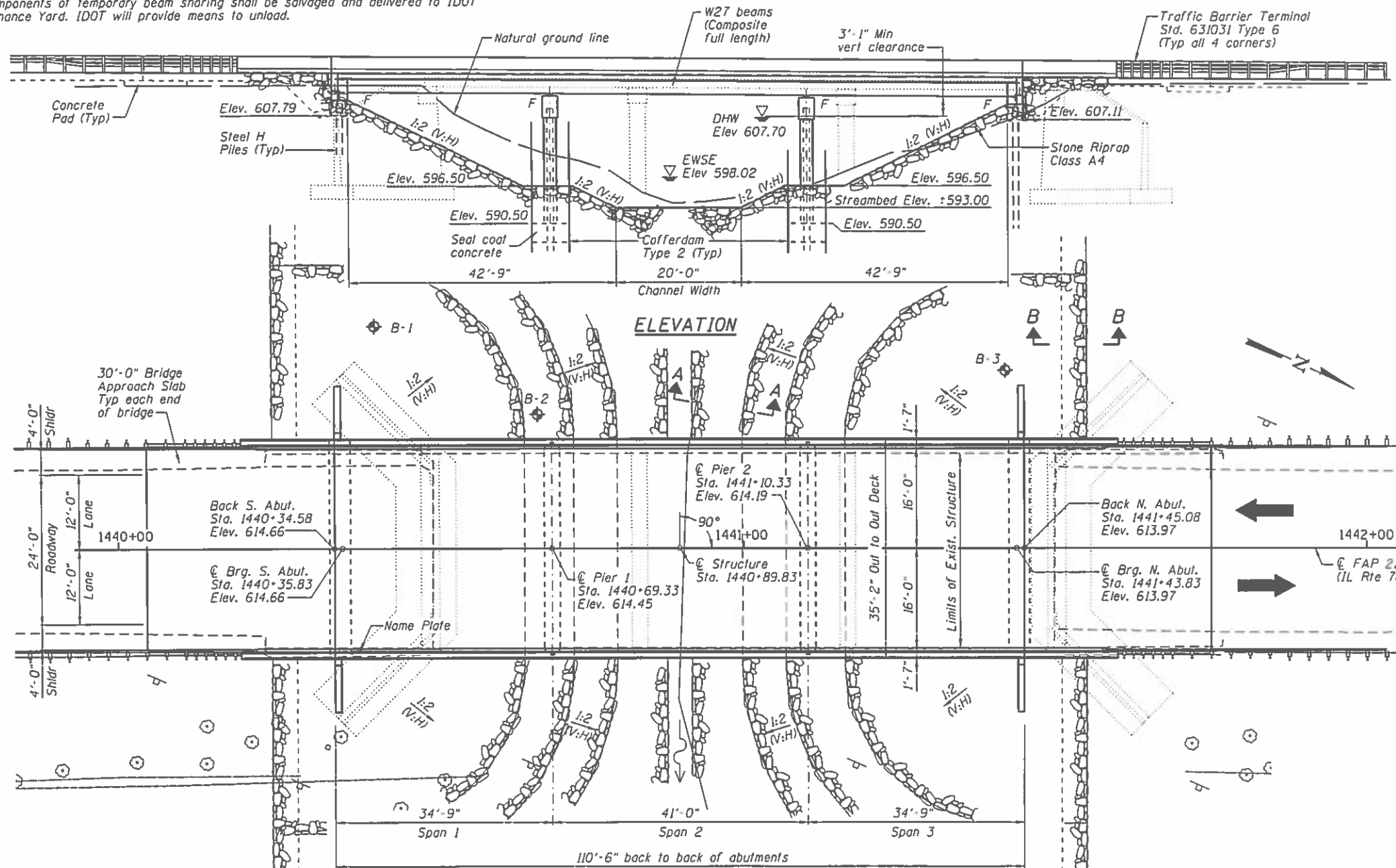
**DESIGN SPECIFICATIONS**  
2012 AASHTO LRFD Bridge Design  
Specifications, 6th Edition with 2013 Interims

**DESIGN STRESSES**

**FIELD UNITS**  
f'c = 3,500 psi  
fy = 60,000 psi (Reinforcement)  
fs = 50,000 psi (M270 Grade 50)

**SEISMIC DATA**

Seismic Performance Zone (SPZ) = 1  
Design Spectral Acceleration at 1.0 Sec. (Sa1) = 0.077 g  
Design Spectral Acceleration at 0.2 Sec. (Sas) = 0.124 g  
Soil Site Class = C



**PROFILE GRADE**  
(Along C Rdwy)

**DESIGN SCOUR ELEVATION TABLE**

Event / Limit	Design Scour Elevations (ft.)				
	S. Abut.	Pier 1	Pier 2	N. Abut.	Item 113
0100	607.79	583.34	583.34	607.11	5
0200	607.79	579.39	579.39	607.11	
Design	607.79	579.34	579.34	607.11	
Check	607.79	579.39	579.39	607.11	

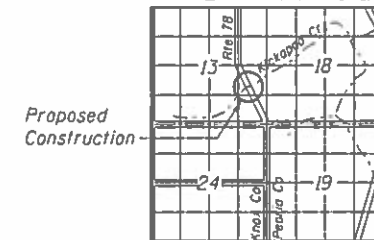
**WATERWAY INFORMATION**

Drainage Area = 17.4 sq mi Low Grade Elev. 613.00 @ Sta. 1443+00

Flood	Freq. Yr.	Q	Opening Sq. Ft.		Head - Ft.		Headwater El.		
			Exist.	Prop.	H.W.E. Exist.	Prop.	Exist.	Prop.	
Design	50	4,420	506	827	607.70	2.40	1.20	610.10	608.90
Base	100	5,180	549	924	608.20	3.50	1.40	611.70	609.60
Max. Calc.	500	7,020	639	1020	609.20	3.50	1.90	612.70	611.10

10 year velocity through existing bridge = 6.9 fps  
10 year velocity through proposed bridge = 3.7 fps

R 4 E 4th P.M. R 5 E



**LOCATION SKETCH**

**APPROVED**  
FOR STRUCTURAL ADEQUACY ONLY  
*Jeremy Buening*  
ENGINEER OF BRIDGES AND STRUCTURES



*Jeremy Buening* 4/23/19  
Jeremy Buening, P.E., S.E. Date  
License Expires 11/30/20

**GENERAL PLAN AND ELEVATION**  
IL ROUTE 78 OVER  
KICKAPOO CREEK  
F.A.P. ROUTE 22  
SECTION 48(B-1)BR:CRJ  
KNOX COUNTY  
STATION 1440+89.93  
STRUCTURE NUMBER 048-0095

**CHASTAIN & ASSOCIATES LLC**  
CONSULTING ENGINEERS  
184-101397

USER NAME = jacobsm	DESIGNED - ACB	REVISED -
PLOT TIME = 8:22:43 AM	CHECKED - JMB	REVISED -
PLOT SCALE = 28.8000 / in.	DRAWN - RLK	REVISED -
PLOT DATE = 5/18/2019	CHECKED - JMB	REVISED -

STATE OF ILLINOIS  
DEPARTMENT OF TRANSPORTATION

GENERAL PLAN AND ELEVATION  
STRUCTURE NO. 048-0095  
SHEET NO. 1 OF 24 SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
22	48(B-1)BR:CRJ	KNOX	94	29
CONTRACT NO. 68758				
ILLINOIS FED. AID PROJECT				