

C-D SEISMIC & 2 GIRDER REDUNDANCY

143

ROUTE NO.	SECTION	SHEET	TOTAL SHEETS	SHEET NO.
F.A.I. 70	82-3HVB-2R-1-1	91	1	91

THIS CONTRACT
CONSISTS OF
4 SETS

- SET 1 OF 4**
 STRUCTURE NO. 082-0141 (ROADWAY A)
 STRUCTURE NO. 082-0253 (RAMP R)
 STRUCTURE NO. 082-0201 (RAMP O)
 STRUCTURE NO. 082-0254 (ROADWAY G)
- SET 2 OF 4**
 STRUCTURE NO. 082-0144 (ROADWAY D)
 STRUCTURE NO. 082-0255 (RAMP O)
 STRUCTURE NO. 082-0203 (RAMP P)
 STRUCTURE NO. 082-0256 (ROADWAY H)
- SET 3 OF 4**
 STRUCTURE NO. 082-0206 (RAMP G OVER 4TH ST.)
- SET 4 OF 4**
 STRUCTURE NO. 082-0140 (RAMP H OVER TRENDLEY AVE.)

STATE OF ILLINOIS
 DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
**PLANS FOR PROPOSED
 SEISMIC AND REDUNDANCY
 RETROFIT REPAIRS**
 FAI ROUTE 70

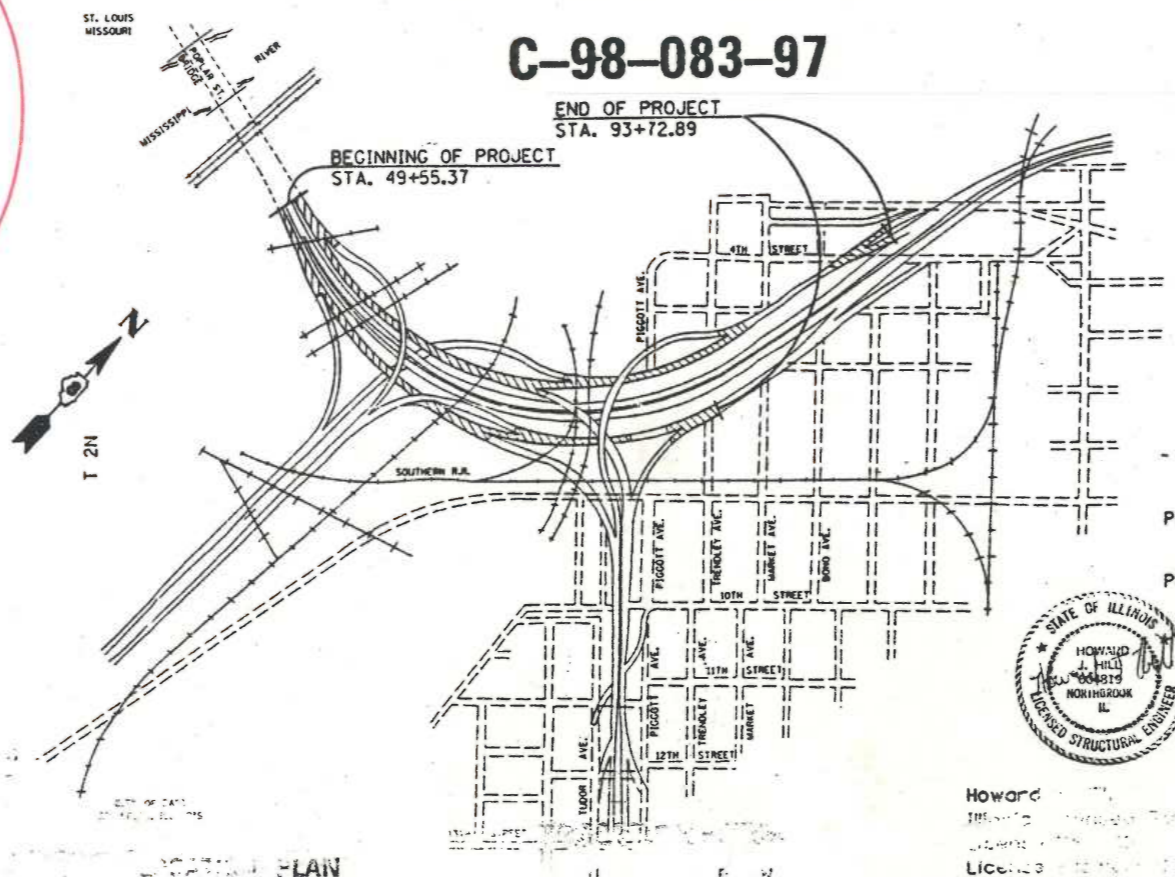
SECTION 82-3HVB-2R-1-1
POPLAR STREET BRIDGE APPROACHES
 PROJECT ACIM-70-1(171)1
 ST. CLAIR COUNTY



PROJECT LEADER: BILL ULIVI (618)346-
 SOUJAD LEADER: STEVE JINES (618)346-

STANDARDS
 701406
 702001

Contract
 96680



APPROVED
 FOR STRUCTURAL ADEQUACY ONLY
Richard E. Anderson
 ENGINEER OF BRIDGES AND STRUCTURES

PROJECT NET LENGTH :
 0.79 MI. = 4178.58 FT.
 PROJECT GROSS LENGTH :
 0.84 MI. = 4417.52 FT.

STATE OF ILLINOIS
 DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS

SUBMITTED Feb 5 1998
James Eastley (Incl.)
 DISTRICT ENGINEER

ENGINEER OF PROJECT DEVELOPMENT AND IMPLEMENTATION
June 26th 98
Bill Hunkley
 ENGINEER OF DESIGN AND ENVIRONMENT

June 26th 98
James P. St. John
 DIRECTOR, DIVISION OF HIGHWAYS

WJE Wiss, Janney, Elstner Associates, Inc.
 Engineers and Scientists
 100 North Dearborn Street
 Chicago, Illinois 60610
 (312) 271-2700
 (312) 291-4813

URBAN

90% FED.
10% STATE
SFTY-2A

ROUTE NO.	DISTRICT	COUNTY	TOTAL SHEETS	SHEET NO.	SHEET NO.
F.A.I. TO	#	ST. CLAIR	91	2	
FED. ROAD DIST. NO. 7 ILLINOIS FED. AID PROJECT					

82-34VB-2R-1-1

SUMMARY OF QUANTITIES			
CODE NO.	ITEM	UNIT	QUANTITY
50102400	Concrete removal	CUYD	81.0
50200200	STRUCTURE EXCAVATION (SPECIAL)	CUYD	70
50500405	Furnish & erect structural steel	LBS.	230760
50301245	Formed concrete repair (depth equal to less than 5")	SQ.FT.	270
X0322549	Column wrap	SQ.FT.	12223
X0322550	Wire rope	FT.	206.3
X0322551	Epoxy grouted dowels	EACH	1099
X0322552	Embankment protection	SQ.FT.	150
X0322553	Foundation wall dowel modification	EACH	544
X0322554	Foundation wall modification	SQ.FT.	191.5
X0322555	Cross frame removal	EACH	23
X0322556	Stiffener intersection modification	EACH	1920
X0322557	Long span floor beam retrofit	EACH	64
X0322558	Bottom flange splice - bolt replacement	EACH	22
X0322559	Bolt replacement	EACH	18
X0322560	Crack extension modifications	EACH	6
X0322561	Cross beam retrofit	EACH	10
X0322562	Steel girder web reinforcement plate	LBS.	807900
X0322563	Vertical web stiffener removal	EACH	2797
X0322564	Column wrap protection	EACH	4
70101800	Traffic Control and Protection, Special	L. Sum	1
70048665	Railroad Protective Liability Insurance	L. Sum	1
X7015000	CHANGEABLE MESSAGE SIGN	CALMO	12
67000400	ENGINEER'S FIELD OFFICE, TYPE A	CALMO	12

* Sheet 2A & 2B
Traffic Control and
Protection, Special

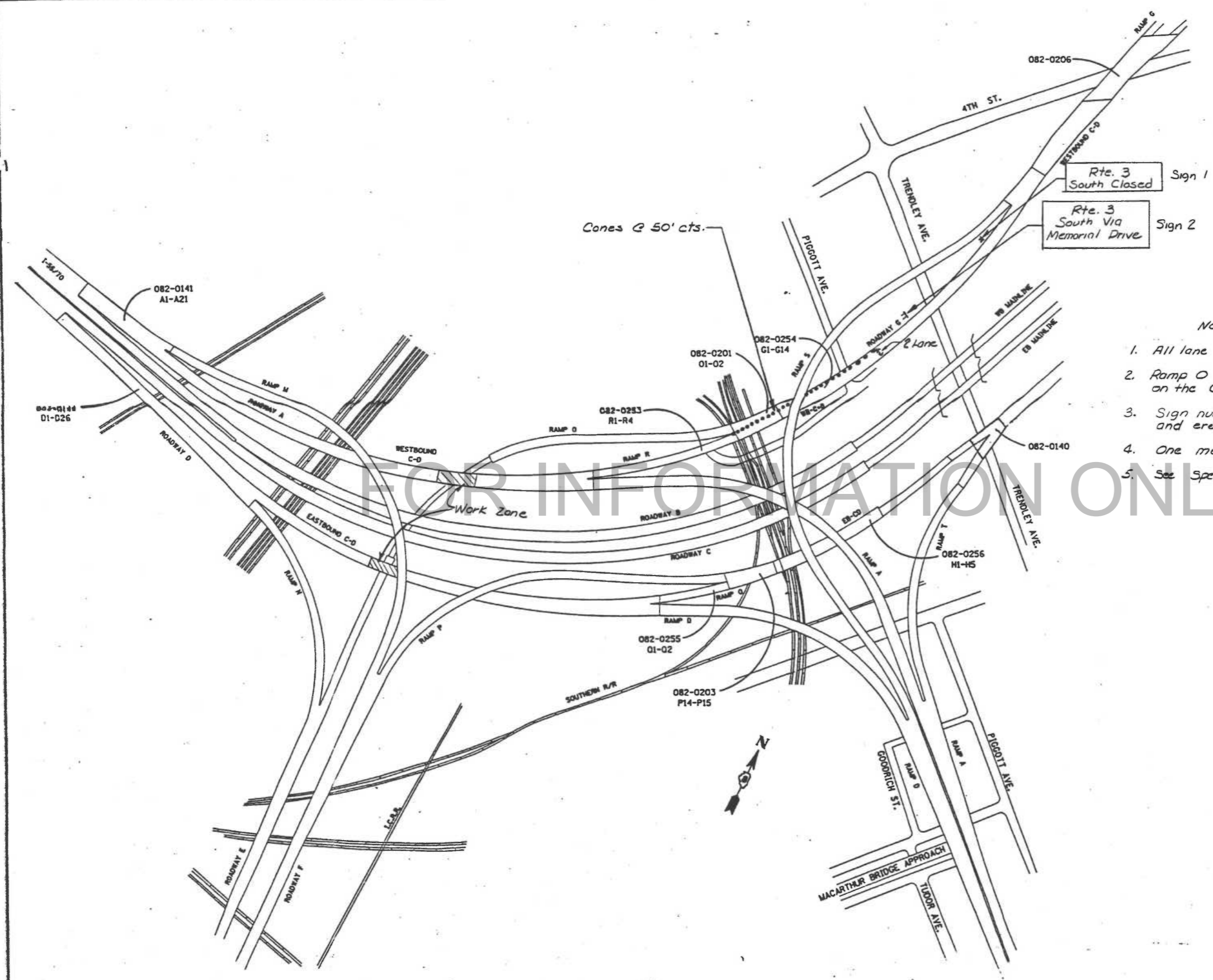
INDEX OF SHEETS	
SHEET NO.	DESCRIPTION
1	TITLE SHEET
2 *	QUANTITIES AND INDEX OF SHEETS
3	SET 1 - TITLE SHEET
4	GENERAL NOTES
5	SCOPE OF WORK
6	PROJECT PLAN
7	KEY PLAN ROADWAYS A, G, R & O
8	ELEVATION ROADWAYS A, G, R & O
9	TYPICAL SUBSTRUCTURE DETAILS
10	SEISMIC RETROFIT DETAILS
11	SEISMIC RETROFIT DETAILS
12	SEISMIC RETROFIT DETAILS
13	SEISMIC RETROFIT DETAILS
14	SEISMIC RETROFIT DETAILS
15	SEISMIC RETROFIT DETAILS
16	SEISMIC RETROFIT DETAILS
17	SEISMIC RETROFIT DETAILS
18	STIFFENER INTERSECTION MODIFICATION DETAIL
19	LONG SPAN FLOOR BEAM RETROFIT & BOLT REPLACEMENT
20	CRACK EXTENSION RETROFITS
21	REDUNDANCY RETROFIT DETAILS
22	REDUNDANCY RETROFIT DETAILS
23	REDUNDANCY RETROFIT DETAILS
24	CONCRETE REPAIR DETAILS
25	SEISMIC RETROFIT DETAILS
26	TEMPORARY EMBANKMENT PROTECTION
27	PIER A2 RETROFIT
28	PIER A5 RETROFIT
29	PIERS A7 & A8 RETROFIT
30	PIERS A9 & A11 RETROFIT
31	PIERS A12 & A15 RETROFIT
32	PIERS A16 & A18 RETROFIT
33	PIER A19 RETROFIT
34	PIER A21 RETROFIT
35	PIERS R1-1 & R2-1 RETROFIT
36	PIER R3-1 RETROFIT
37	PIERS R4-1 & 01-R RETROFIT
38	PIER G1 RETROFIT
39	PIERS G2 & G5 RETROFIT
40	PIERS G9 & G11 RETROFIT
41	PIER G12 RETROFIT
42	PIER G13 RETROFIT
43	SET 2 - TITLE SHEET
44	GENERAL NOTES
45	SCOPE OF WORK
46	PROJECT PLAN
47	KEY PLAN ROADWAYS D, H, Q & P
48	ELEVATION ROADWAYS D, H, Q & P
49	TYPICAL SUBSTRUCTURE DETAILS
50	SEISMIC RETROFIT DETAILS
51	SEISMIC RETROFIT DETAILS

INDEX OF SHEETS	
SHEET NO.	DESCRIPTION
52	SEISMIC RETROFIT DETAILS
53	SEISMIC RETROFIT DETAILS
54	SEISMIC RETROFIT DETAILS
55	SEISMIC RETROFIT DETAILS
56	SEISMIC RETROFIT DETAILS
57	SEISMIC RETROFIT DETAILS
58	STIFFENER INTERSECTION MODIFICATION DETAIL
59	LONG SPAN FLOOR BEAM RETROFIT & BOLT REPLACEMENT
60	CRACK EXTENSION & CROSS BEAM RETROFITS
61	REDUNDANCY RETROFIT DETAILS
62	REDUNDANCY RETROFIT DETAILS
63	REDUNDANCY RETROFIT DETAILS
64	CONCRETE REPAIR DETAILS
65	SEISMIC RETROFIT DETAILS
66	PIERS D2 & D5 RETROFIT
67	PIERS D8 & D9 RETROFIT
68	PIER D11 RETROFIT
69	PIERS D12 & D13 RETROFIT
70	PIERS D15 & D17 RETROFIT
71	PIERS D18 & D21 RETROFIT
72	PIERS D22 & D23 RETROFIT
73	PIER D24 RETROFIT
74	PIER D26 RETROFIT
75	PIERS Q1-1 & Q2-1 RETROFIT
76	PIER P14 RETROFIT
77	PIERS P15 & H1 RETROFIT
78	PIERS H2 & H3 RETROFIT
79	PIER H4 RETROFIT
80	SET 3 - TITLE SHEET
81	GENERAL NOTES
82	PROJECT PLAN/SCOPE OF WORK
83	KEY PLAN AND ELEVATION FOR RAMP G OVER 4TH STREET
84	SEISMIC RETROFIT DETAILS
85	PIER NO. 1 & NO. 2 RETROFIT
86	SET 4 - TITLE SHEET
87	GENERAL NOTES
88	PROJECT PLAN/SCOPE OF WORK
89	KEY PLAN AND ELEVATION FOR RAMP H OVER TRENDLEY AVE.
90	SEISMIC RETROFIT DETAILS
91	PIER NO. 1 & NO. 2 RETROFIT

QUANTITIES AND INDEX OF SHEETS
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
FAI ROUTE 70
POPLAR STREET BRIDGE APPROACHES
ST. CLAIR COUNTY

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.	SHEET NO.
F.A.I. 70	*	ST. CLAIR	91	2A	SHEETS
FED. ROAD DIST. NO. 7 ALLIANCE FED. AID PROJECT					

* 82-3MVB-2R-1-1



- Notes:
1. All lane closures limited to the hours of 9:00 a.m. to 3:00 p.m.
 2. Ramp O to be closed when work is being performed on the C-D roadways above Ramp O.
 3. Sign number 1 and number 2 will be supplied by IDOT and erected by the contractor.
 4. One message board required.
 5. See Special Provisions.

TRAFFIC CONTROL AND PROTECTION, SPL
WESTBOUND CLOSURE

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
FAI ROUTE 70
POPLAR STREET BRIDGE APPROACHES
ST. CLAIR COUNTY

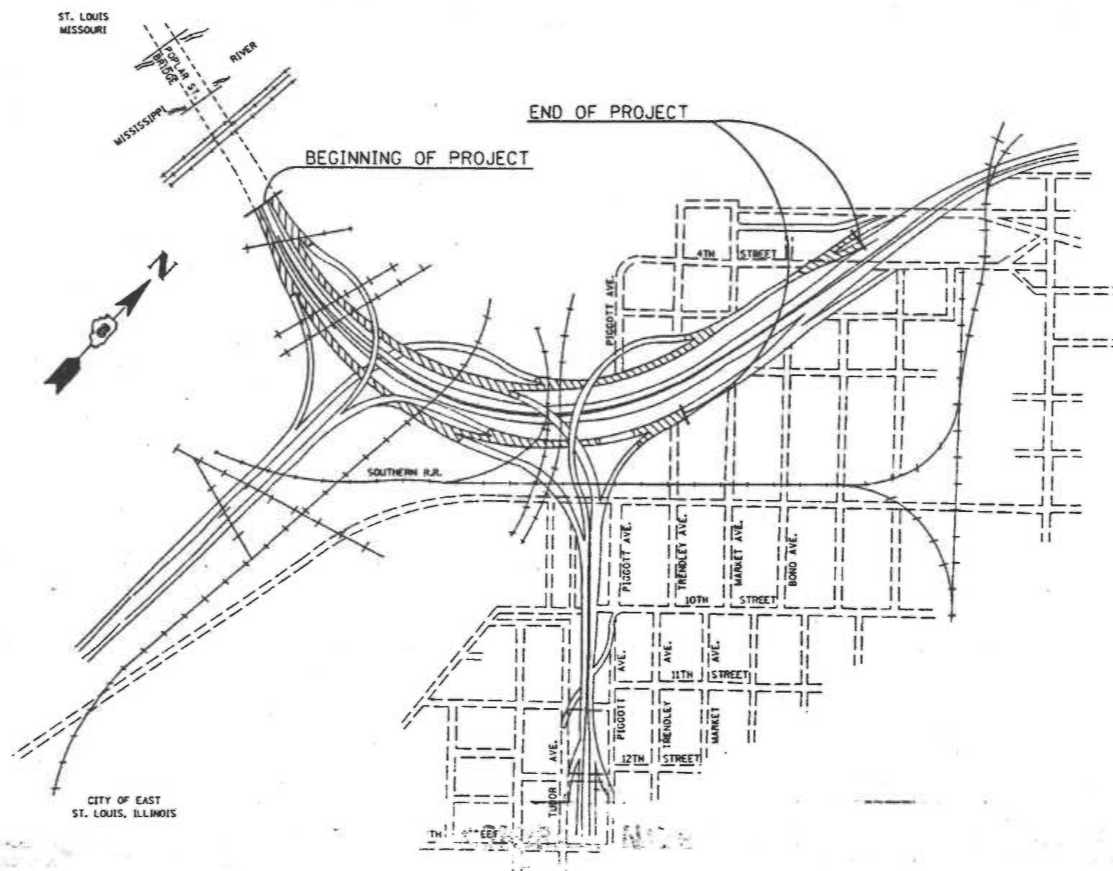
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- * ENCOMPASSING THE FOLLOWING ROADWAYS
- ROADWAY A, STRUCTURE NO. 082-0141
 - RAMP R, STRUCTURE NO. 082-0253
 - RAMP O, STRUCTURE NO. 082-0201
 - ROADWAY G, STRUCTURE NO. 082-0254

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
**PLANS FOR PROPOSED
SEISMIC AND REDUNDANCY
RETROFIT REPAIRS ***

SET 1 OF
4 SETS

INDEX OF SHEETS	
SHEET NO.	DESCRIPTION
S-1	SET 1 - TITLE SHEET
S-2	GENERAL NOTES
S-3	SCOPE OF WORK
S-4	PROJECT PLAN
S-5	KEY PLAN ROADWAYS A, G, R & O
S-6	ELEVATION ROADWAYS A, G, R & O
S-7	TYPICAL SUBSTRUCTURE DETAILS
S-8	SEISMIC RETROFIT DETAILS
S-9	SEISMIC RETROFIT DETAILS
S-10	SEISMIC RETROFIT DETAILS
S-11	SEISMIC RETROFIT DETAILS
S-12	SEISMIC RETROFIT DETAILS
S-13	SEISMIC RETROFIT DETAILS
S-14	SEISMIC RETROFIT DETAILS
S-15	SEISMIC RETROFIT DETAILS
S-16	STIFFENER INTERSECTION MODIFICATION DETAIL
S-17	LONG SPAN FLOOR BEAM RETROFIT & BOLT REPLACEMENT
S-18	CRACK EXTENSION RETROFITS
S-19	REDUNDANCY RETROFIT DETAILS
S-20	REDUNDANCY RETROFIT DETAILS
S-21	REDUNDANCY RETROFIT DETAILS
S-22	NOT USED
S-23	NOT USED
S-24	NOT USED
S-25	NOT USED
S-26	CONCRETE REPAIR DETAILS
S-27	SEISMIC RETROFIT DETAILS
S-28	TEMPORARY EMBANKMENT PROTECTION
S-29	PIER A2 RETROFIT
S-30	PIER A5 RETROFIT
S-31	PIERS A7 & A8 RETROFIT
S-32	PIERS A9 & A11 RETROFIT
S-33	PIERS A12 & A15 RETROFIT
S-34	PIERS A16 & A18 RETROFIT
S-35	PIER A19 RETROFIT
S-36	PIER A21 RETROFIT
S-37	PIERS R1-1 & R2-1 RETROFIT
S-38	PIER R3-1 RETROFIT
S-39	PIERS R4-1 & O1-R RETROFIT
S-40	PIER G1 RETROFIT
S-41	PIERS G2 & G5 RETROFIT
S-42	PIERS G9 & G11 RETROFIT
S-43	PIER G12 RETROFIT
S-44	PIER G13 RETROFIT



ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.	SHEET NO. S-1
F.A.I. 70	*	ST. CLAIR	91	3	SHEETS
FED. ROAD DIST. NO. 7 ILL. PROJ. NO. 82-3HVB-2R-1-1					
D-88-012-95					



STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

SUBMITTED _____ 19____
 _____ 19____
 DISTRICT ENGINEER
 _____ 19____
 ENGINEER OF PROJECT DEVELOPMENT AND IMPLEMENTATION
 _____ 19____
 ENGINEER OF DESIGN AND ENVIRONMENT
 _____ 19____
 DIRECTOR, DIVISION OF HIGHWAYS

GENERAL NOTES:

- 1. Plan dimensions and details relative to existing structure have been taken from existing plans and are subject to nominal construction variations. It shall be the Contractor's responsibility to verify such dimensions and details in the field and make necessary approved adjustments prior to construction or ordering materials. Such variations shall not be cause for additional compensation for a change in the scope of work, however, the Contractor will be paid for the quantity actually furnished at the unit price bid for the work.
- 2. This project addresses selected seismic, redundancy and fatigue issues related only to those structures that are listed on the drawings. Related hazards associated with nearby structures or roadways that pass over the subject structures were not considered.
- 3. Unless noted otherwise, all materials and workmanship shall conform to :
 - a. The Illinois Department of Transportation, "Standard Specifications for Road and Bridge Construction", January 1, 1997.
 - b. Bridge Welding Code, American Welding Society, AWS D1.5-95.
 - c. Surface Texture, American Society of Mechanical Engineers, ANSI B46.1- Latest Edition.

STEEL NOTES:

- 1. Actual dimensions may vary slightly from the design drawings. The Contractor shall field verify existing dimensions prior to starting work. Dimensions of new members shall be adjusted as required to fit as-built conditions.
- 2. All new steel assemblies and pieces shall be shop painted with Inorganic zinc rich primer/ Acrylic/ Acrylic paint system. The color of the final finish coat shall be Interstate Green, Munsell No. 7.5 G 4/8. Locations to receive field welding shall be masked off prior to shop painting and field painted after welding.
- 3. Unless noted otherwise, all bolts shall be high strength bolts (AASHTO M164). All threaded rods and dowels shall conform to the mechanical properties and thread configuration of AASHTO M164 bolts. All bolts, threaded rods, wire rope and hardware shall be galvanized according to IDOT galvanized bolt provisions. In bolted applications, threads shall not be permitted in shear planes, unless noted otherwise. ~~AASHTO M253 Bolts shall not be galvanized.~~
- 4. Unless noted otherwise, all new steel shall be AASHTO M270 Grade 36 and have a minimum CVN impact toughness of 25 Ft.-Lb. at 20° F. All rods with upset ends shall have a maximum yield strength of 45 ksi.
- 5. Welding electrodes shall be low hydrogen E70XX, unless noted otherwise. Weld metal shall have a minimum CVN of 25 Ft.-Lb. at 20° F.
- 6. All turnbuckles, clevises and pins shall be galvanized and capable of developing the ultimate strengths of the corresponding assemblies.
- 7. All wire ropes shall be galvanized and shall have a minimum effective modulus of elasticity of 10,000 ksi. All wire rope fittings shall be capable of developing the ultimate strength of the corresponding rope.
- 8. Threads on all bolts, rods, and dowels, not installed per AISC specifications shall be peened.
- 9. Turnbuckles located in cross frame retrofits shall be tightened to achieve a torque of 1000 Ft.-Lbs. in the turnbuckle.
- 10. The existing structural steel coating contains lead. The Contractor should take appropriate precautions to deal with the presence of lead on this project. Lead based paint will not be removed from the structure except as necessary to remove transverse stiffeners and perform fatigue retrofits.

11. At locations of transverse stiffener removal, existing girder webs shall be primed with an inorganic zinc rich primer and painted with a paint system compatible with the existing paint.

12. No welding, flame cutting or carbon-arc cutting is permitted unless specified in a repair detail or approved by the Engineer.

- 13. Alternative procedures for the structural modifications will be considered by the Engineer if submitted in writing for approval. The work shall be performed in the sequence listed in the Procedures unless otherwise approved by the Engineer. Where a procedure calls for approval of an Engineer before acceptance, it is anticipated that visual examinations or non-destructive tests will be conducted, and that additional grinding or other work may be required.
- 14. Where magnetic particle (MT) inspection is called for on the drawings, the minimum qualifications of the Inspector shall meet ASNT Level II requirements. The Engineer will observe the final test acceptance.
- 15. To avoid bolt clearance installation difficulties, the bumper assemblies shall be installed prior to the installation of the web reinforcement plate(s).

CONCRETE NOTES:

- 1. The Engineers' intent is to repair only large areas of unsound concrete or unsound areas receiving column wraps. The contract quantities do not include all of the unsound concrete on the piers. Areas of unsound concrete to be repaired shall be approved by the Engineer.
- 2. The extent of deteriorated concrete in columns and walls shall be determined by hammer tapping. The concrete removal shall extend a minimum of 4 in. beyond the edge of the unsound area, be as nearly rectangular as possible, and conform to the concrete repair details included in the drawings.
- 3. Concrete removal equipment consisting of pneumatic chipping hammers shall not exceed a maximum nominal weight of 30 lb. and shall be equipped with a cutting edge not less than 3/4 in. or greater than 2 1/2 in. in width. During concrete removal, exercise reasonable care to avoid cracking of underlying sound concrete.

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.	SHEET NO. S-2
F.A.I. 70	#	ST. CLAIR	91	4	
FED. ROAD DIST. NO. 7 BALDWIN FED. AID PROJECT					
# B2-34VR-2R-1-1					

FOR INFORMATION ONLY

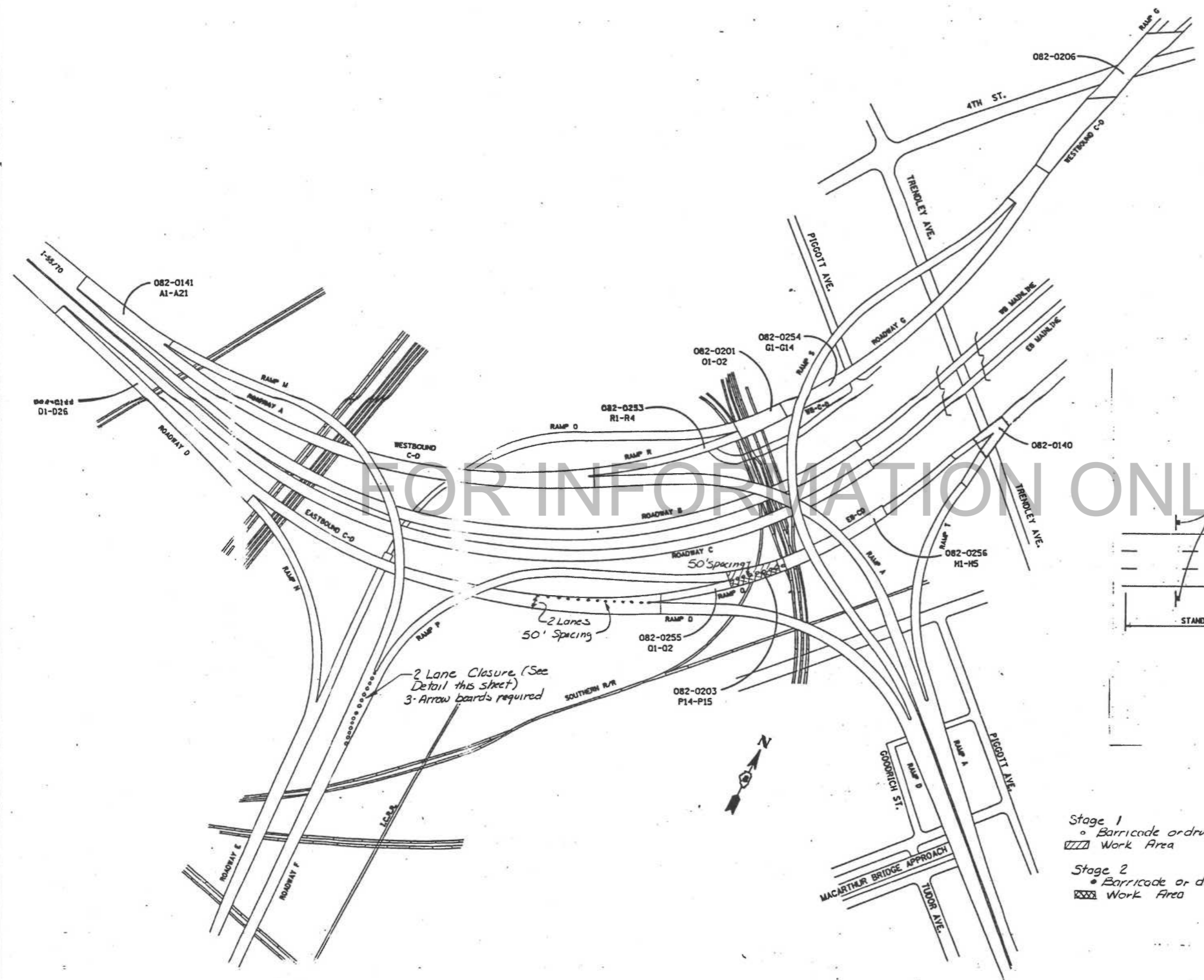
GENERAL NOTES

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
FAI ROUTE 70
ST. CLAIR STREET BRIDGE APPROACHES

SCALE: NONE
DATE: 1-23-98
DRAWN BY: JN
CHECKED BY: HH

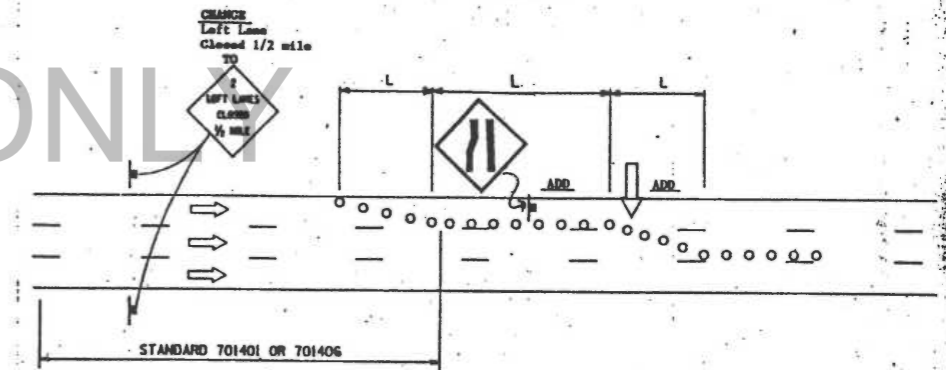
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F.A.I. 70	ST. CLAIR	91	26		
FED. ROAD DIST. NO. 7 ILLINOIS FED. AID PROJECT -					

82-34VB-2R-1-1



FOR INFORMATION ONLY

DISTRICT 8 TRAFFIC CONTROL STANDARD
2 LANE CLOSURE - MULTILANE
 By: Michael A. Kuhn, TCS



- LEGEND**
- ← - ARROW BOARD
 - ⊥ - SIGN
 - - CONE OR LIGHTED BARRICADE

NOTE:
 STANDARDS 701401 OR 701406 SHALL BE USED WITH ADDITIONS AND CHANGES LISTED ON THIS PAGE.

- Stage 1**
 ○ Barricade or drum
 ▨ Work Area
- Stage 2**
 ○ Barricade or drum
 ▩ Work Area

TRAFFIC CONTROL AND PROTECTION, SPL.
EASTBOUND CLOSURE

STATE OF ILLINOIS
 DEPARTMENT OF TRANSPORTATION
 SEISMIC AND REDUNDANCY RETROFIT REPAIRS
 FAI ROUTE 70
 POPLAR STREET BRIDGE APPROACHES
 ST. CLAIR COUNTY

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 70		ST. CLAIR	91	5
FED. ROAD DIST. NO. 7 ILLINOIS FED. AID PROJECT				

SHEET NO. S-3

SHEETS

082-34VB-2R-1-1

SCOPE OF WORK

SEISMIC RETROFIT

1. Install column wraps on the following piers.

• Structure No. 082-0141 (Roadway A, 18 locations)

A2 A7 A12 A16 A20
A4 A8 A13 A17 A21
A5 A9 A14 A18
A6 A10 A15 A19

• Structure No. 082-0253 (Ramp R, 4 locations)

R1-1 R2-1 R3-1 R4-1

• Structure No. 082-0201 (Ramp O, 1 location)

O1-R

• Structure No. 082-0254 (Roadway G, 11 locations)

G1 G4 G9 G12
G2 G5 G10 G13
G3 G8 G11

2. Install tie beam wraps on the following piers (excluding piers with cross frames)

• Structure No. 082-0141 (Roadway A, 6 locations)

A4 A10 A14
A6 A13 A17

• Structure No. 082-0254 (Roadway G, 2 locations)

G8 G10

3. Install cross frame assembly including: tie beam wraps, column bands, and slab/floor beam connections on the following piers.

• Structure No. 082-0141 (Roadway A, 5 locations)

A2 A7 A9 A16 A19

• Structure No. 082-0254 (Roadway G, 3 locations)

G2 G11 G12

4. Install floor beam/column connection assembly on the following piers.

• Structure No. 082-0254 (Roadway G, 1 location)

G13

5. Install slab/floor beam connections on the following piers (excluding piers with cross frames)

• Structure No. 082-0141 (Roadway A, 9 locations)

A3 A10 A14
A4 A11 (West) A17
A6 A13 A20

• Structure No. 082-0254 (Roadway G, 7 locations)

G3 G6 G8 G13
G4 G7 G10

6. Remove existing cross frames and install new cross frames on the following piers.

• Structure No. 082-0253 (Ramp R, 3 locations)

R1-1 R2-1 R4-1

• Structure No. 082-0201 (Ramp O, 1 location)

O1-R

7. Install bumper tie assembly on the following piers.

• Structure No. 082-0141 (Roadway A, 5 locations)

A5 A8 A12 A15 A18

• Structure No. 082-0253 (Ramp R, 1 location)

R3-1

• Structure No. 082-0254 (Roadway G, 3 locations)

G5 G9 G12

8. Install bumper assembly on the following piers.

• Structure No. 082-0254 (Roadway G, 2 locations)

G11 G12

9. Install girder tie assembly on the following piers.

• Structure No. 082-0141 (Roadway A, 2 locations)

A11 A21

• Structure No. 082-0254 (Roadway G, 1 location)

G1

10. Install roadway tie assembly on the following piers.

• Structure No. 082-0141 (Roadway A, 2 locations)

A5 A21

• Structure No. 082-0254 (Roadway G, 2 locations)

G1 G12

11. Install bumper column bands on the following piers.

• Structure No. 082-0141 (Roadway A, 4 locations)

A5 A8 A15 A18

• Structure No. 082-0254 (Roadway G, 3 locations)

G5 G9 G11

12. Install foundation wall sawcut on the following pier.

• Structure No. 082-0141 (Roadway A, 1 location)

A12

13. Install shear transfer assembly on the following pier.

• Structure No. 082-0141 (Roadway A, 1 location)

A11

14. Install foundation dowel modifications on the following piers.

• Structure No. 082-0141 (Roadway A, 10 locations)

A4 A8 A13 A17 A20
A6 A10 A15 A18 A21

• Structure No. 082-0253 (Ramp R, 4 locations)

R1-1 R2-1 R3-1 R4-1

• Structure No. 082-0201 (Ramp O, 1 location)

O1-R

• Structure No. 082-0254 (Roadway G, 6 locations)

G2 G8 G10
G5 G9 G11

FATIGUE & REDUNDANCY RETROFIT

1. Perform stiffener intersection modifications on the following structures.

• Structure No. 082-0141 (Roadway A, 20 spans)

A1 thru A20

• Structure No. 082-0254 (Roadway G, 13 spans)

G1 thru G13

2. Perform long span floor beam retrofits on the following structures.

• Structure No. 082-0141 (Roadway A, 7 spans)

A1 A3 A14 A20
A2 A4 A19

• Structure No. 082-0254 (Roadway G, 3 spans)

G1 G12 G13

3. Perform bottom flange splice - bolt replacement on the following structures.

• Structure No. 082-0141 (Roadway A, 13 spans)

A1 A4 A8 A13 A18
A2 A6 A9 A15
A3 A7 A10 A17

4. Perform crack extension retrofits on the following structures.

• Structure No. 082-0141 (Roadway A, 3 spans)

A2 A12 A16

5. Install redundancy web plates on the following structures.

• Structure No. 082-0141 (Roadway A, 19 spans)

A1 thru A10 and A12 thru A20

• Structure No. 082-0254 (Roadway G, 13 spans)

G1 thru G13

FOR INFORMATION ONLY

SCOPE OF WORK

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIR
ROUTE 70

STRUCTURE
SCALE: NONE
DATE 1-23-98

STRUCTURE
DRAWN BY JN
CHECKED BY HH

SEISMIC DATA

Bedrock acceleration coefficient (A) = 0.12g
 Site coefficient (S) = 1.0
 Seismic performance requirements:
 • Use of roadways without long delay or major repair.

DESIGN SPECIFICATIONS

1996 AASHTO Standard Specifications for Highway Bridges
 1995 FHWA Seismic Retrofit Manual

DESIGN LOADING

HS20-44

DESIGN STRESSES

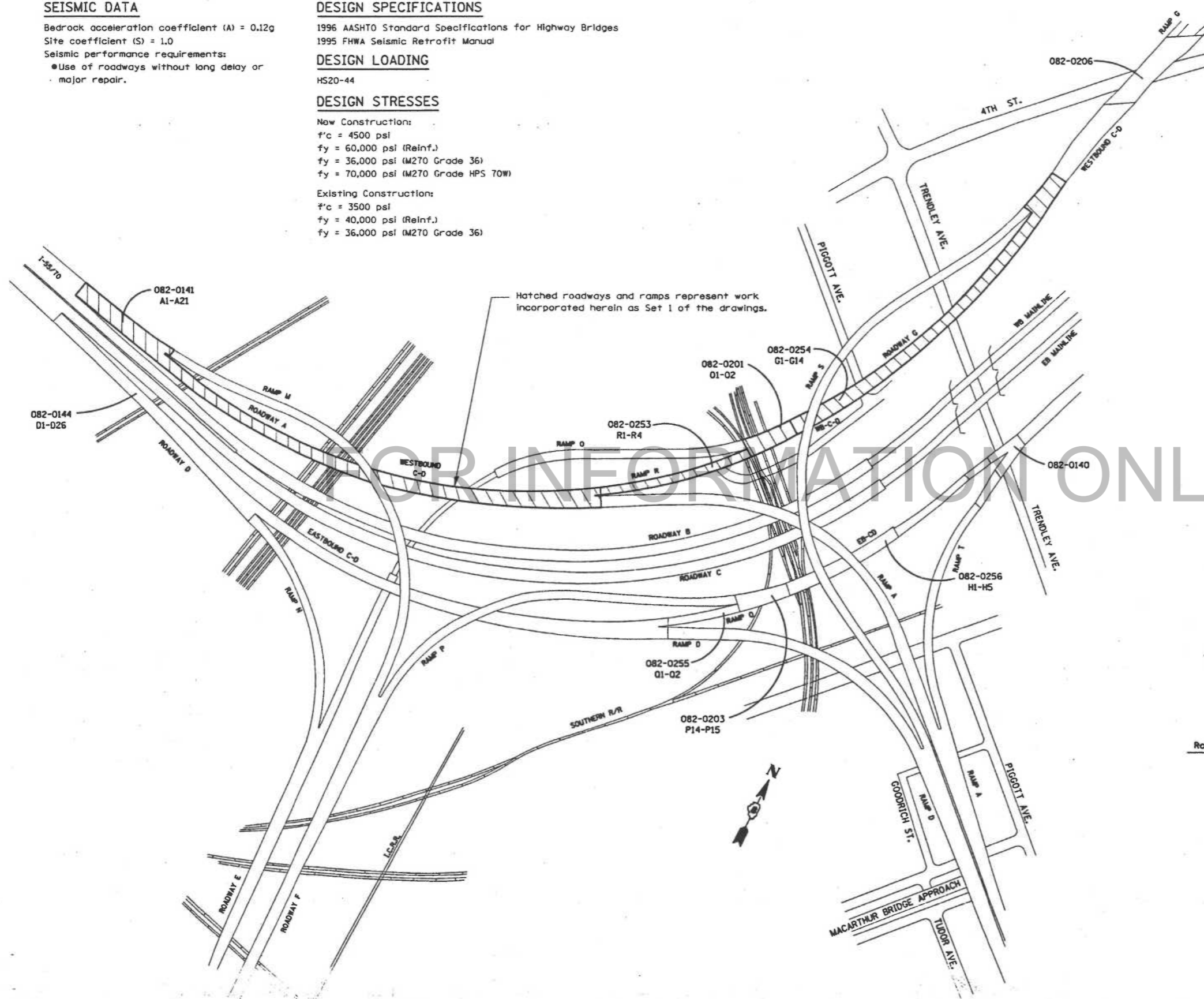
New Construction:
 f'c = 4500 psi
 fy = 60,000 psi (Reinf.)
 fy = 36,000 psi (M270 Grade 36)
 fy = 70,000 psi (M270 Grade HPS 70W)

Existing Construction:
 f'c = 3500 psi
 fy = 40,000 psi (Reinf.)
 fy = 36,000 psi (M270 Grade 36)

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.	SHEET NO. S-4
F.A.I. 70	8	ST. CLAIR	91	6	SHEETS
FED. ROAD DIST. NO. 7 ILLINOIS FED. AID PROJECT - 02-34VB-2R-1-1					



LOCATION SKETCH



Hatched roadways and ramps represent work incorporated herein as Set 1 of the drawings.

FOR INFORMATION ONLY

OVERALL PROJECT PLAN

Roadway / Ramp	Segment / Pier Nos.	Structure No.	Year / Structure Type
A	A1-A21	082-0141	1967 Two Girder System
G	G1-G14	082-0254	1967 Two Girder System
R	R1-R4	082-0253	1988 Multi Girder System
O	O1-O2 *	082-0201	---

* East side of span

PROJECT PLAN

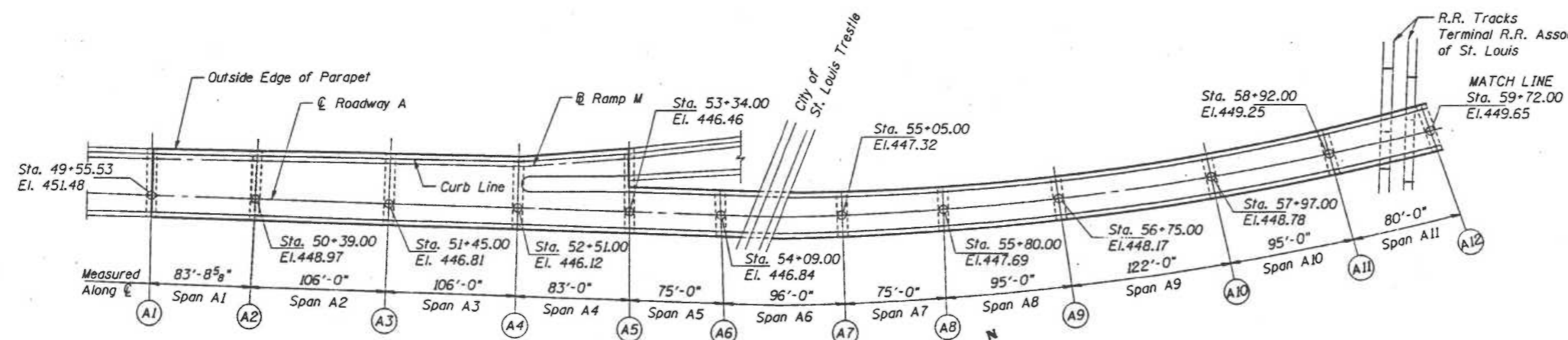
STATE OF ILLINOIS
 DEPARTMENT OF TRANSPORTATION
 SEISMIC AND REDUNDANCY RETROFIT REPAIRS
 70

STRUCTURE NO. 082-0201 RAMP O1
 SCALE: NONE
 DATE: 1-23-98
 DRAWN BY: JN
 CHECKED BY: HH

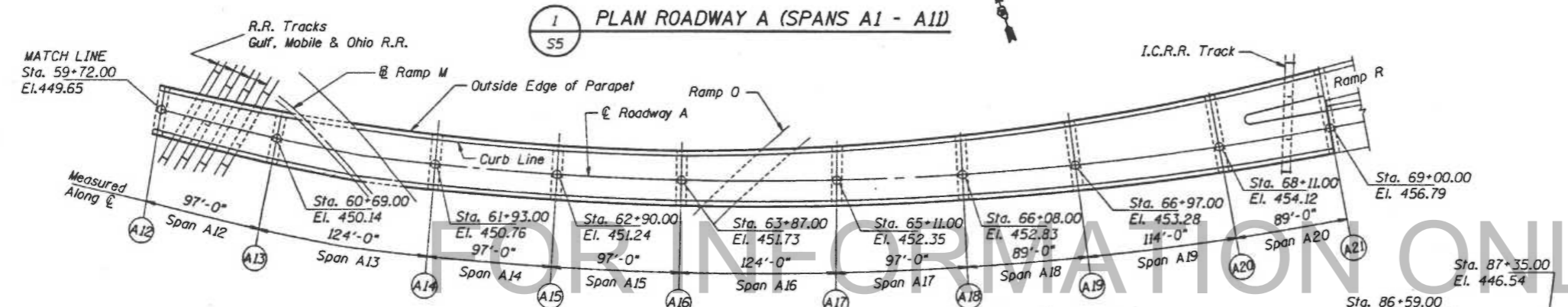
STRUCTURE: 97422\8811\81PPL64.DGN

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.	SHEET NO. S-5
F.A.I. 78	8	ST. CLAIR	91	7	
FED. ROAD DIST. NO. 7		ILLINOIS	FED. AID PROJECT		SHEETS

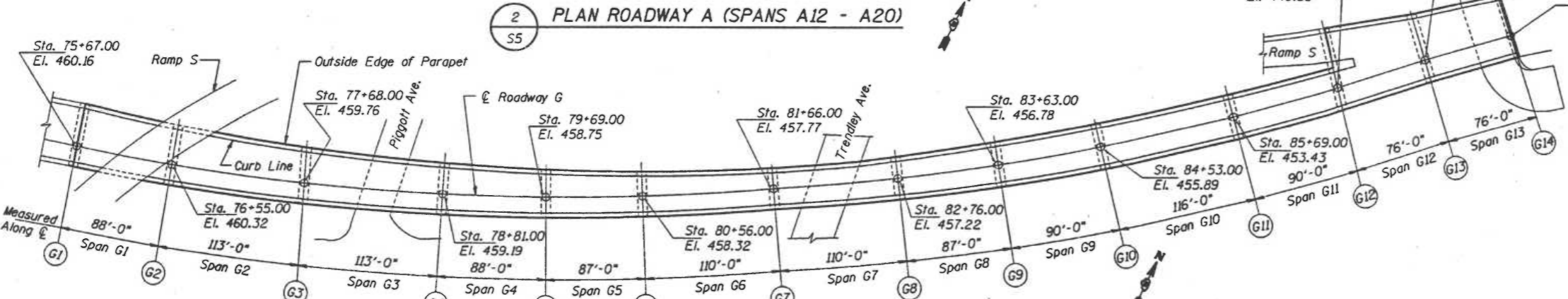
82-3HVB-2R-1-1



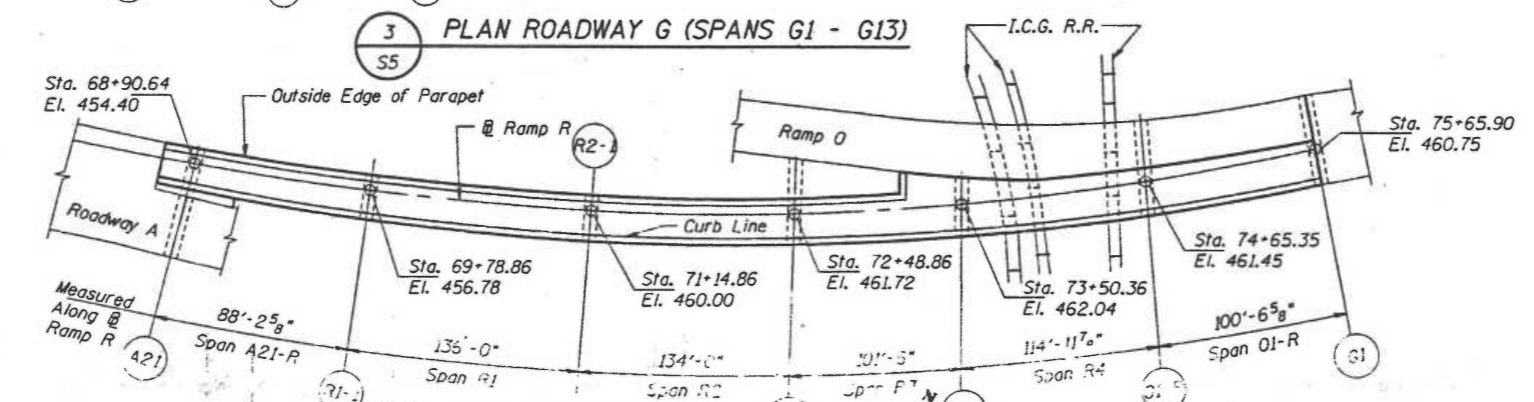
1 PLAN ROADWAY A (SPANS A1 - A11)



2 PLAN ROADWAY A (SPANS A12 - A20)



3 PLAN ROADWAY G (SPANS G1 - G13)



4 PLAN RAMP R & O

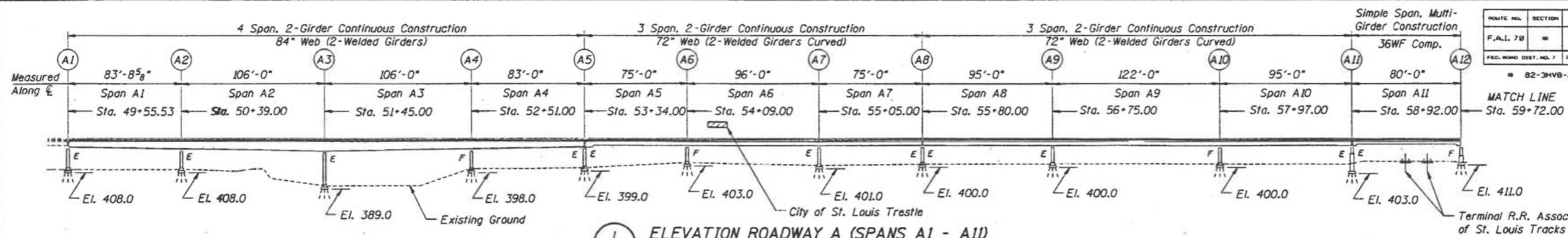
KEY PLAN FOR ROADWAYS A & G AND RAMPS R & O

STATE OF ILLINOIS
 DEPARTMENT OF TRANSPORTATION
 SEISMIC AND REDUNDANCY RETROFIT REPAIRS
 ROUTE TO
 POPLAR STREET BRIDGE APPROACH
 ST. CLAIR COUNTY

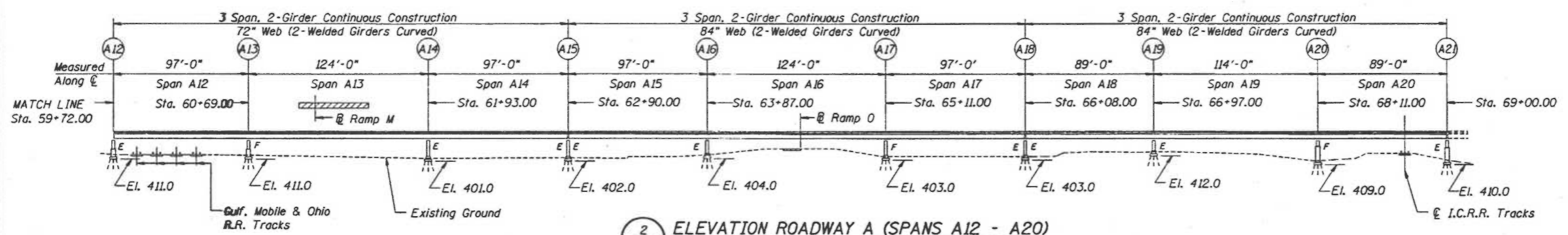
STRUCTURE NO. 082-0141 (ROADWAY A) STRUCTURE NO. 082-0253 (RAMP R)
 STRUCTURE NO. 082-0254 (ROADWAY G) STRUCTURE NO. 082-0201 (RAMP O)
 SCALE: NONE DRAWN BY JN
 DATE 1-23-98 CHECKED BY HH

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 70		ST. CLAIR	91	8
FED. ROAD DIST. NO. 7 ILLINOIS FED. AID PROJECT				
# 82-3HVB-2R-1-1				

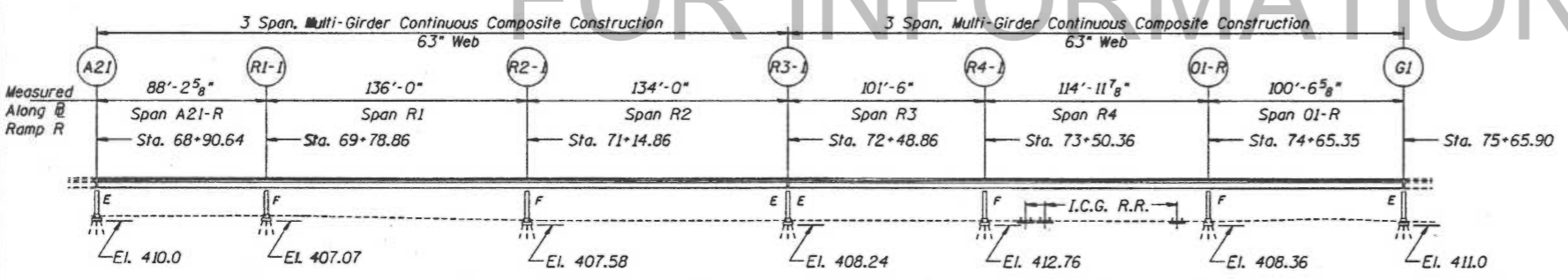
SHEET NO. 5-6
SHEETS



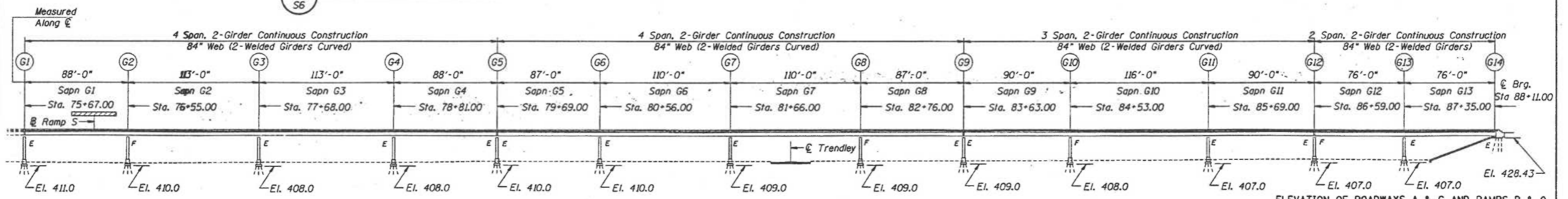
1 ELEVATION ROADWAY A (SPANS A1 - A11)
S6



2 ELEVATION ROADWAY A (SPANS A12 - A20)
S6



3 ELEVATION RAMP R & O
S6



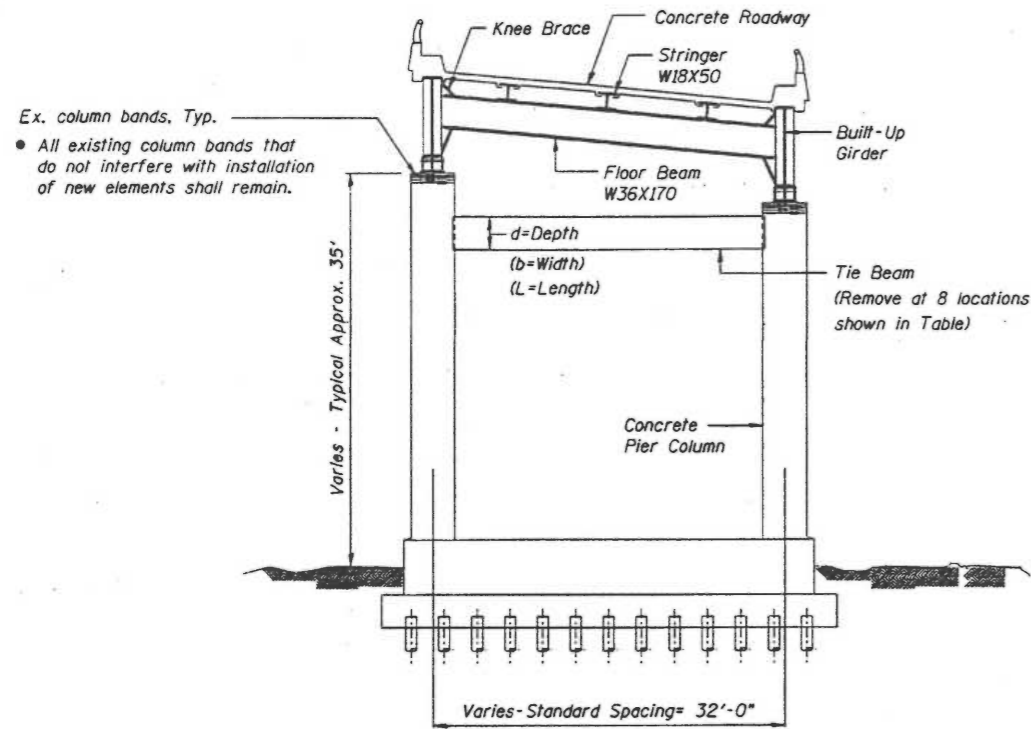
5 ELEVATION ROADWAY G (SPANS G1 - G13)
S6

ELEVATION OF ROADWAYS A & G AND RAMPS R & O

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
FAI ROUTE 70
POPLAR STREET BRIDGE APPROACHES
ST. CLAIR COUNTY

STRUCTURE NO. 022-0241 (ROADWAY A) STRUCTURE NO. 100-0253 (RAMP O)
STRUCTURE NO. 022-0254 (ROADWAY G) STRUCTURE NO. 082-0201 (RAMP R)
SCALE: NONE DRAWN BY JN
DATE 1-23-98 CHECKED BY HH

FOR INFORMATION ONLY



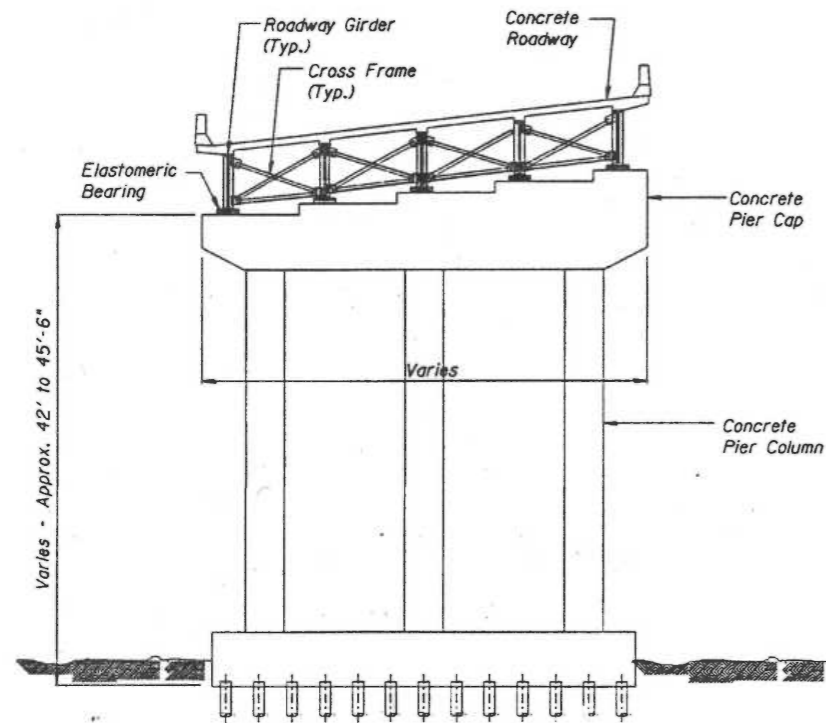
TIE BEAM REMOVAL PARAMETERS

Pier	d (in.)	b (in.)	L (Ft.-in.)	Comments
A5	36	15	48'-1"	See Note 3
A8	36	15	28'-0"	
A15	36	18	33'-1"	
A18	36	24	43'-7"	
A21	36	15	48'-1"	See Note 3
G1	36	15	40'-0"	See Note 3
G5	36	18	32'-7"	
G9	36	15	28'-0"	

Notes:

1. Cut tie beam ends flush with inside faces of columns, such that horizontal ledge is eliminated.
2. Coat exposed ends of reinforcement bars with IDOT approved epoxy. Epoxy shall overlap a minimum of 1" onto surrounding concrete.
3. Length (L) includes 2 tie beams to be removed.

1
S7 TYPICAL SECTION THROUGH TWO GIRDER ROADWAY
(Section through Ramp Similar)



S7 TYPICAL SECTION THROUGH MULTI-GIRDER ROADWAY

TYPICAL SUBSTRUCTURE DETAILS

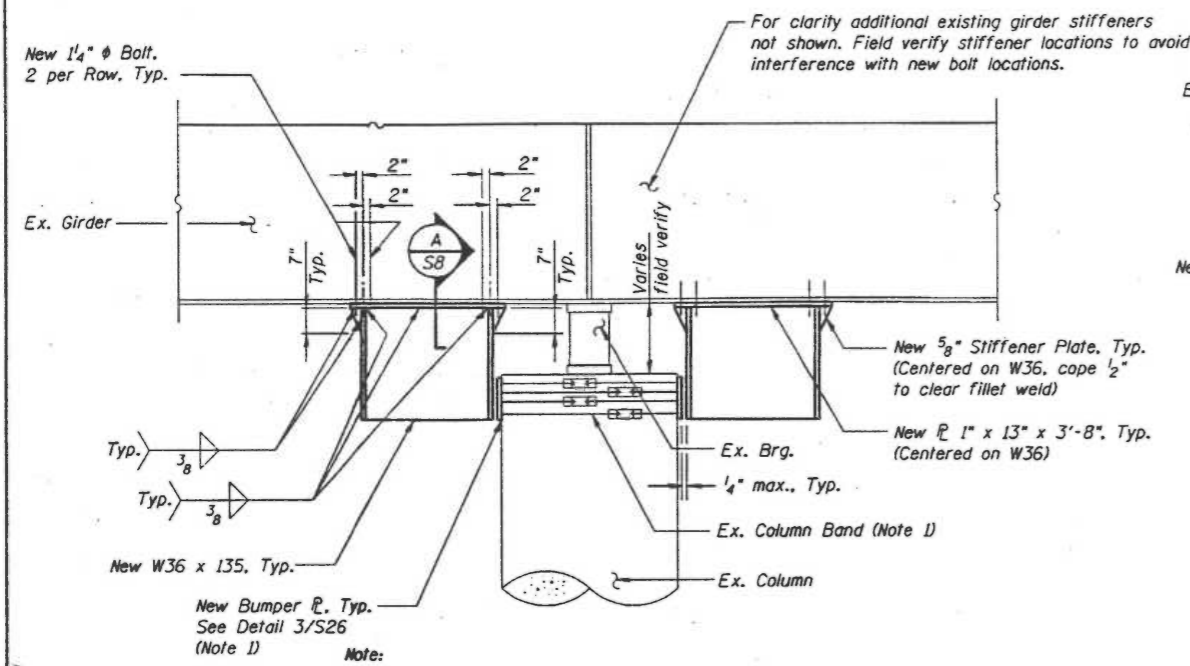
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
FAI ROUTE 70
POPULAR STREET BRIDGE
ST. CLAIR COUNTY

STR. NO. 102-1054 ROADWAY G STRUCTURE NO. 102-1054-1

SCALE: NONE DRAWN BY: JAV
DATE: 1-23-98 CHECKED BY: HH

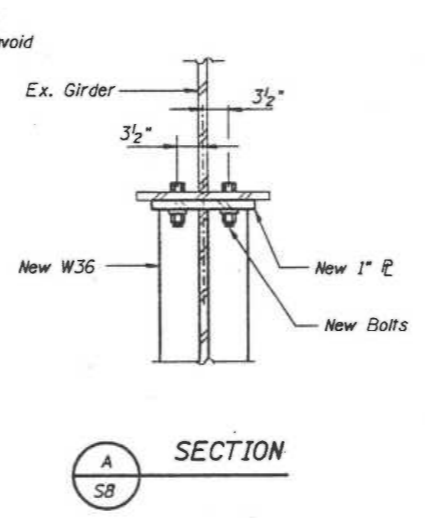
ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 70		ST. CLAIR	91	10
FED. ROAD DIST. NO. 7		ILLINOIS	FED. AID PROJECT	
# B2-34VB-2R-1-1				

SHEET NO. S-8
SHEETS

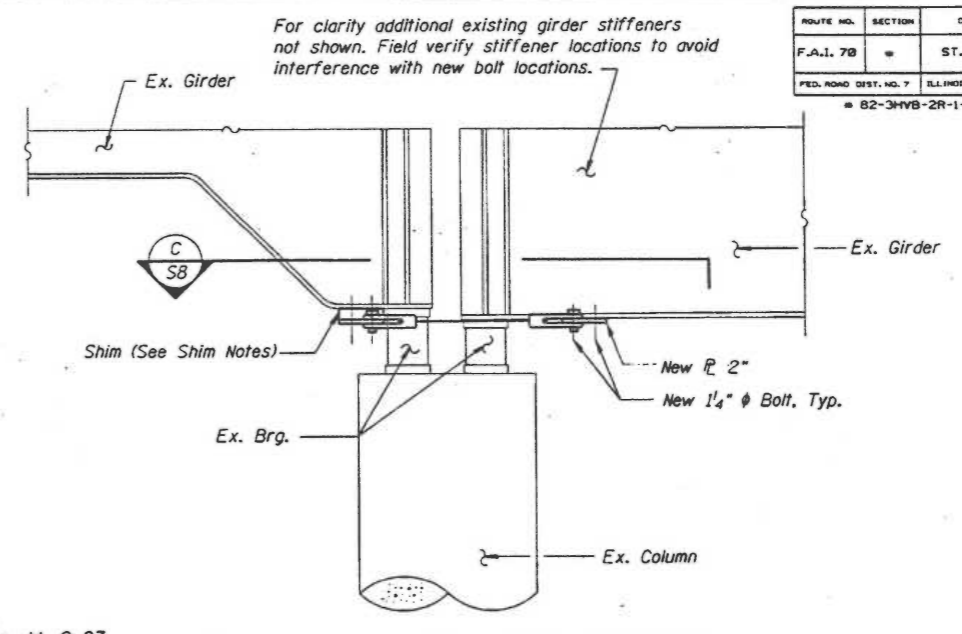


Note:
1. Some locations will require new band and bumper flange assembly. Appropriate details are called out on elevations of affected piers.

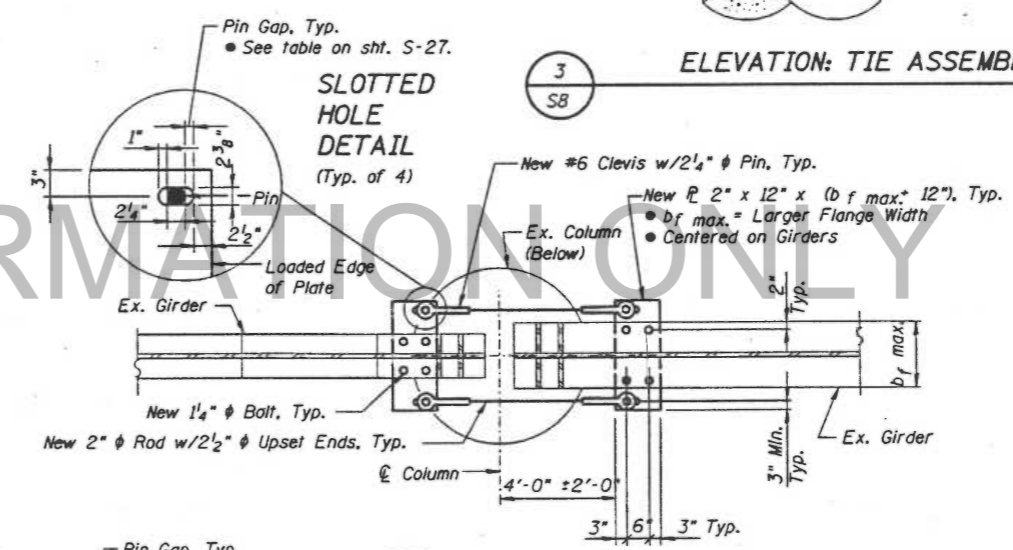
1 ELEVATION: BUMPERS AT CONTINUOUS GIRDER
SB



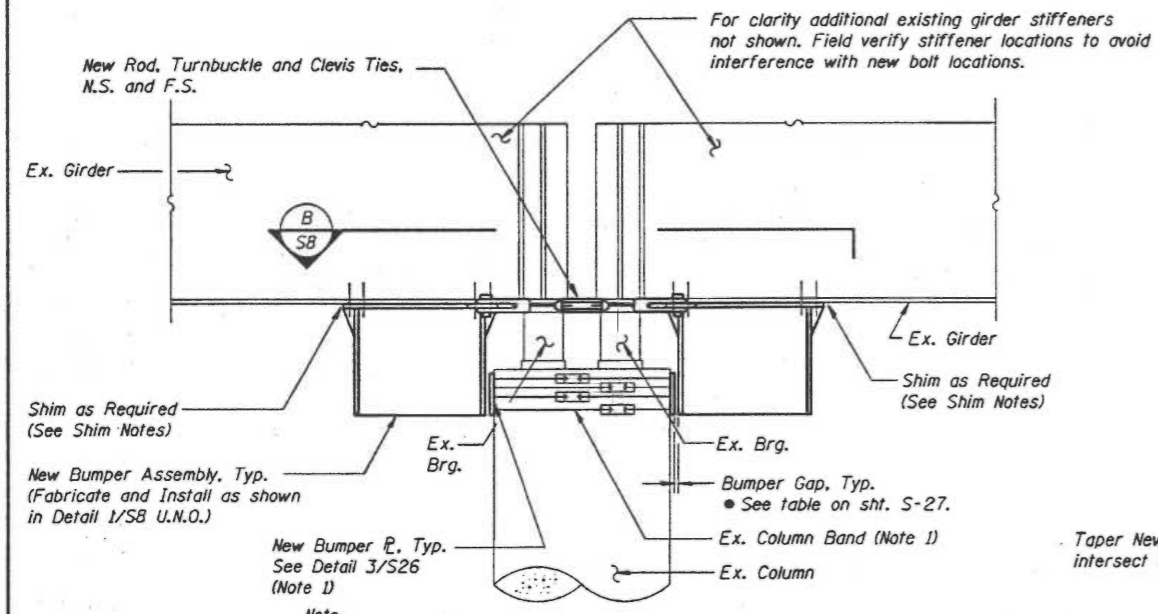
A SECTION
SB



3 ELEVATION: TIE ASSEMBLY
SB

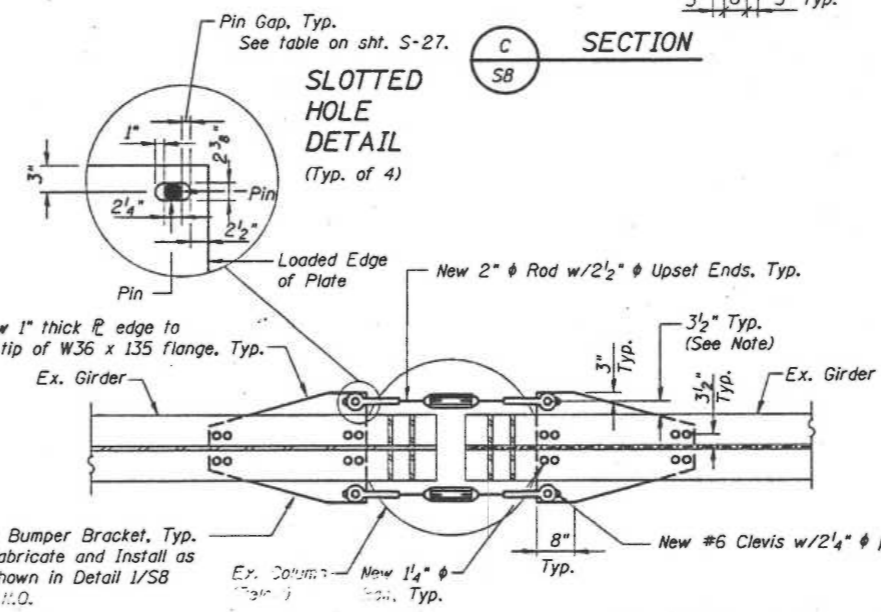


C SECTION
SB



Note:
1. Some locations will require new band and bumper flange assembly. Appropriate details are called out on elevations of affected piers.

2 ELEVATION: BUMPER/TIE ASSEMBLY
SB



3 SECTION
SB

SHIM NOTES:

1. Shim higher flange so that elevation difference between ends of rod is no more than 1/2".
2. Shim Plate length shall match the smaller length of the plates being shimmed, and shim plate width shall match the smaller width of the plates being shimmed.
3. Field verify shim requirements.

BUMPER/TIE ROD NOTES:

1. All bolt holes shall be standard round holes (φ + 1/16") Unless Noted Otherwise.
2. All bumpers and tie rod connection plates shall be centered on the existing girder.
3. Tie Rods may be multiple bar sections with turnbuckles or single rods without turnbuckles.
4. The total length of the unthreaded portion of each tie rod assembly shall not be less than 1'-8".
5. Tie rods may extend 0" min. to 3/4" max. into clevis and turnbuckle openings U.N.O.

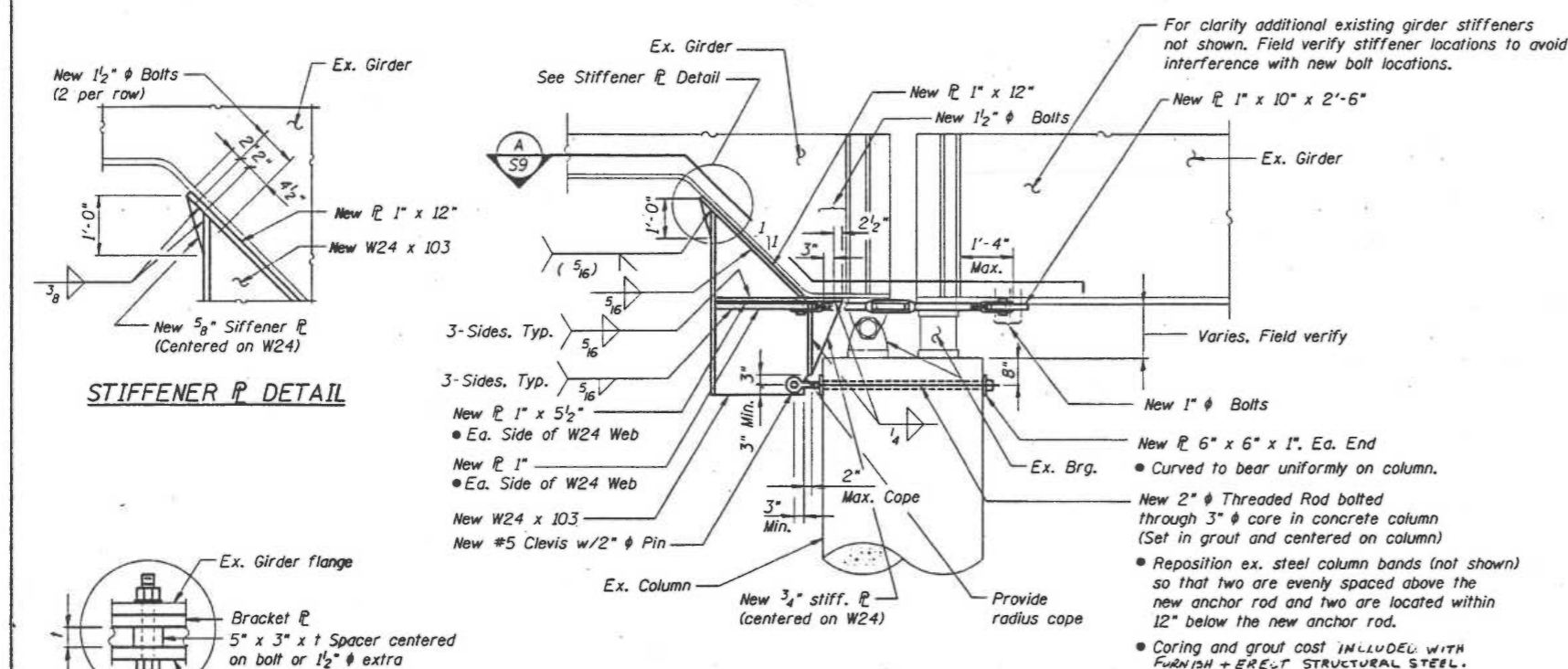
SEISMIC RETROFIT DETAILS

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
FAI ROUTE TO
POPULAR STREET BRIDGE APPROACHES
ST. CLAIR COUNTY

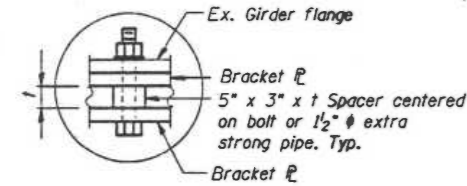
STRUCTURE NO. 082-0111 ROADWAY CI STRUCTURE NO. 082-0111 RAMP CI
SCALE: NONE DRAWN BY JN
DATE 1-23-98 CHECKED BY HM

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.	SHEET NO.
F.A.I. 7B		ST. CLAIR	91	11	
FED. ROAD DIST. NO. 7 ILLINOIS FED. AID PROJECT- 82-3HVB-2R-1-1					

SHEET NO. S-9

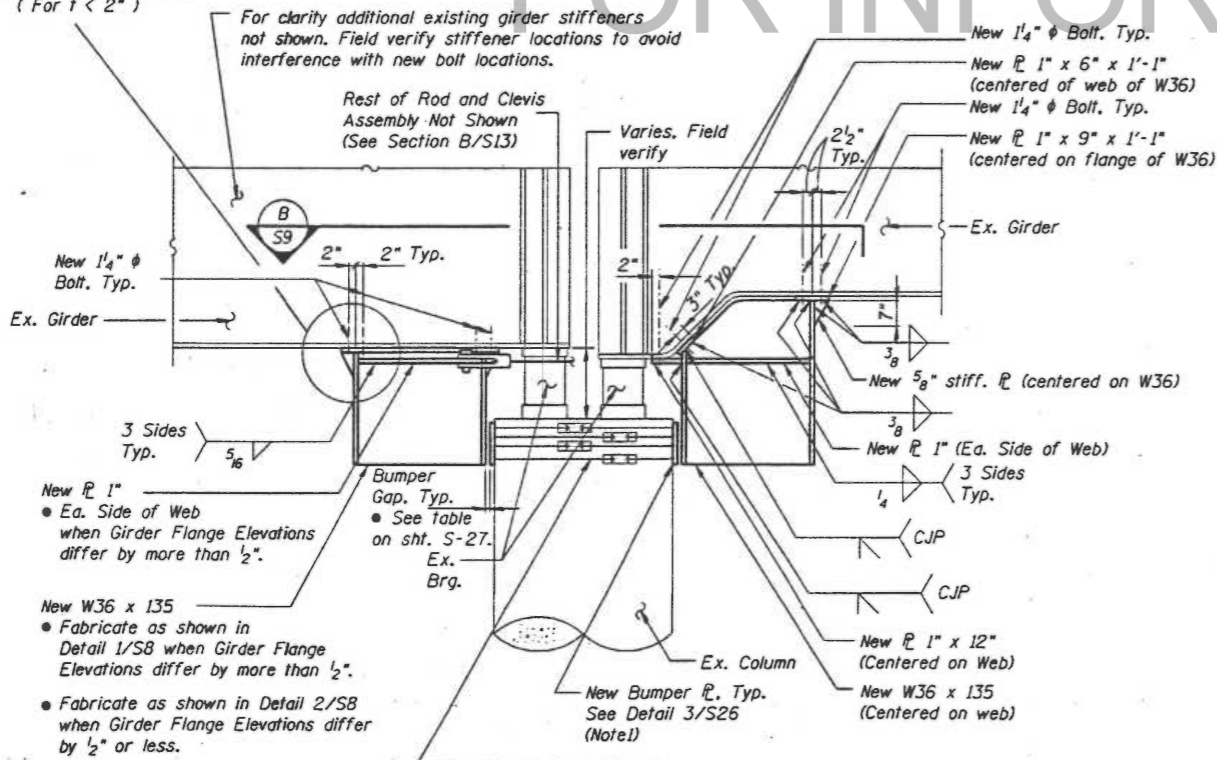


STIFFENER P DETAIL



SPACER DETAIL
(For 1 < 2")

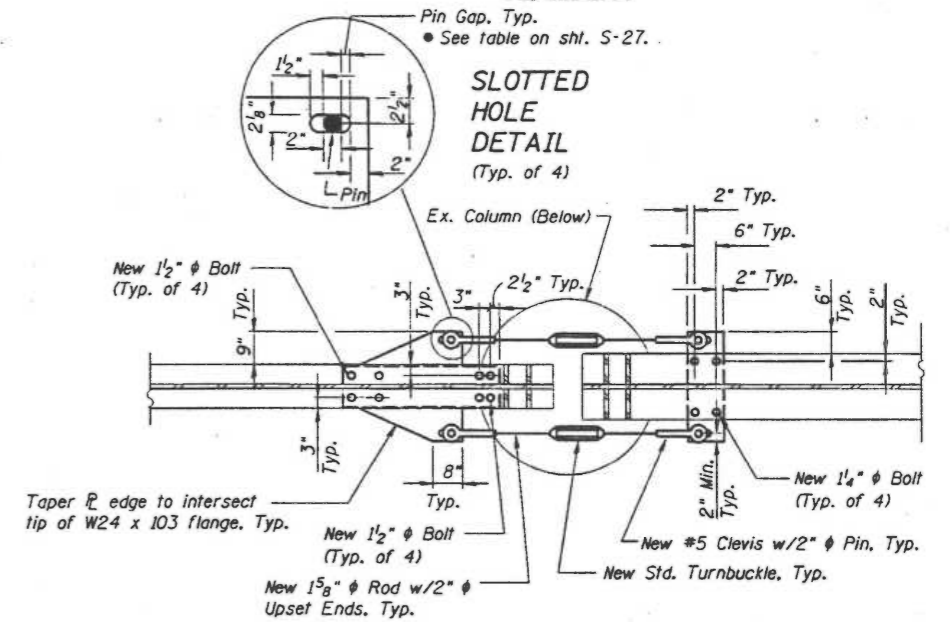
ELEVATION: BUMPER/TIE AT HAUNCHED GIRDER WITH FIXED BEARING



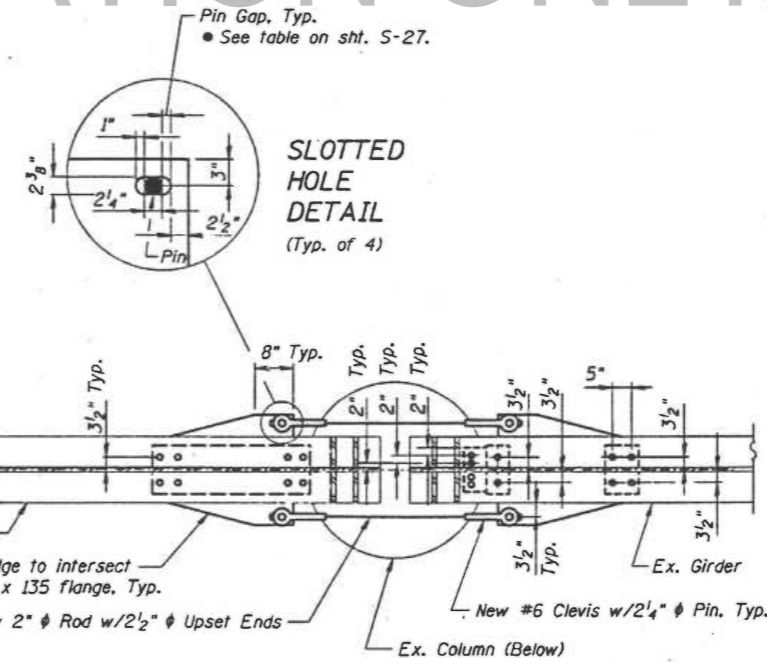
Note:

- Some locations will require new band and bumper P assembly. Appropriate details are called out on elevations of affected piers.

ELEVATION: BUMPER/TIE AT HAUNCHED GIRDER



SECTION
A
S9



SECTION
B
S9

BUMPER/TIE ROD NOTES:

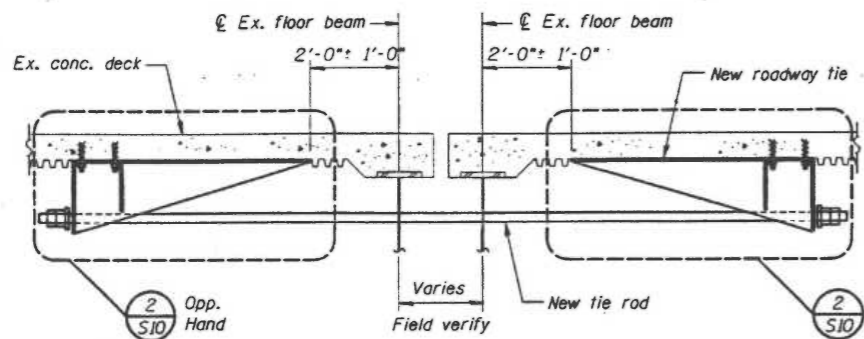
- All bolt holes shall be standard round holes ($\phi + \frac{1}{16}$) Unless Noted Otherwise.
- All bumpers and tie rod connection plates shall be centered on the existing girder.
- Tie Rods may be multiple bar sections with turnbuckles or single rods without turnbuckles.
- The total length of the unthreaded portion of each tie rod assembly shall not be less than 1'-8".
- Tie rods may extend 0" min. to 3/4" max. into clevis and turnbuckle openings U.N.O.

SEISMIC RETROFIT DETAILS

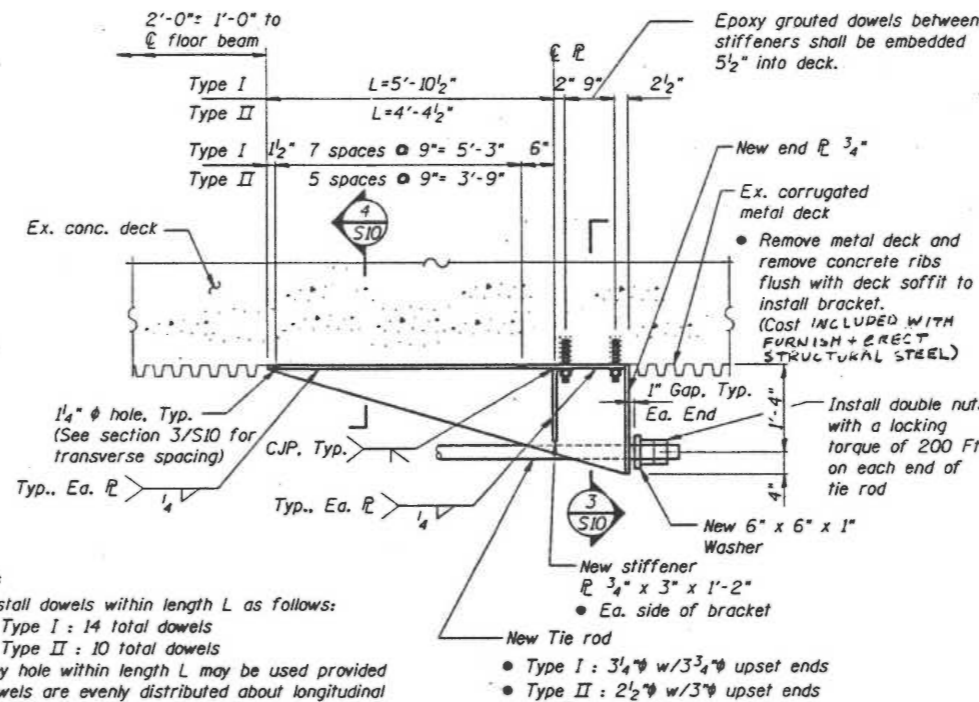
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
FAI ROUTE 70
ROSLAR STREET BRIDGE APPROX.

STRUCTURE NO. 0254 (ROADWAY) @ STRUCTURE NO. 082-020
SCALE: NONE DRAWN BY JM
DATE 1-23-98 CHECKED BY HM

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.	SHEET NO.
F.A.I. 7B		ST. CLAIR	91	12	SHEETS
FED. ROAD DIST. NO. 7 ILLINOIS FED. AID PROJECT - 82-34VB-2R-1-1					

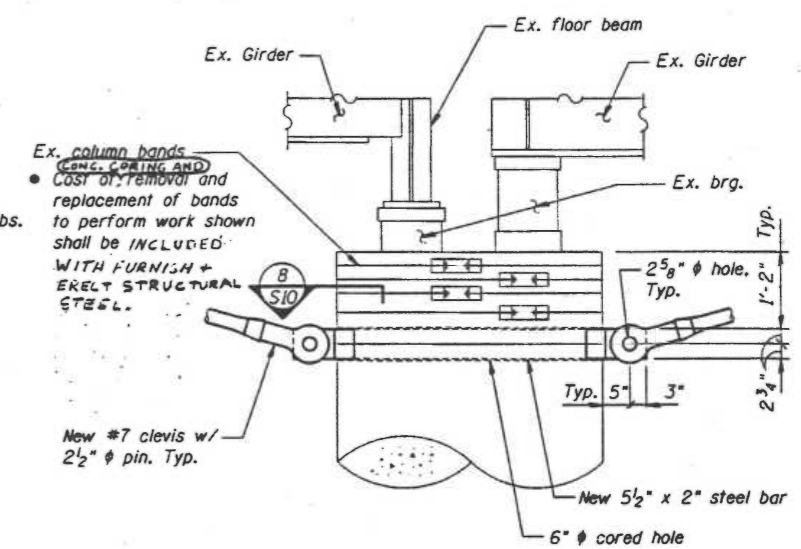


1 ELEVATION - ROADWAY TIE
S10

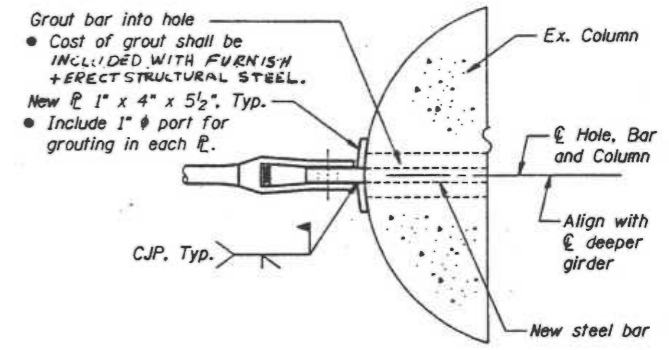


- Notes:
- Install dowels within length L as follows:
Type I : 14 total dowels
Type II : 10 total dowels
Any hole within length L may be used provided dowels are evenly distributed about longitudinal axis of bracket.
 - Unless noted otherwise, all dowels shall consist of 1" epoxy grouted dowels, embedded 4 1/2" into deck.
 - Core drill 4" holes in floor beam webs to permit passage of rod.
 - Gap at end of tie rod was developed for an installation temperature of 50° F. For other installation temperatures decrease the gap by 0.05" for every 5° F below 50° F and increase the gap by 0.05" for every 5° F above 50° F.
 - Epoxy grouted dowel embedment shall be measured from the embedded end of the dowel to the smooth surface on the bottom of the concrete deck created by removing the concrete ribs.

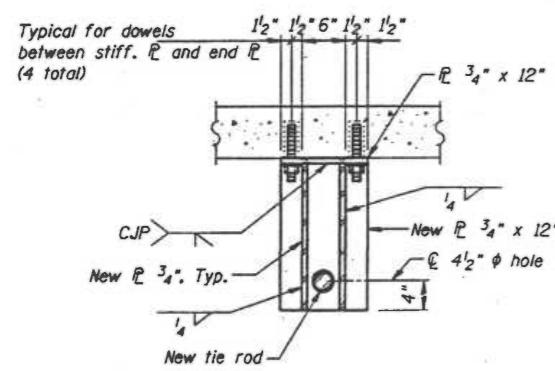
2 ELEVATION - ROADWAY TIE
S10



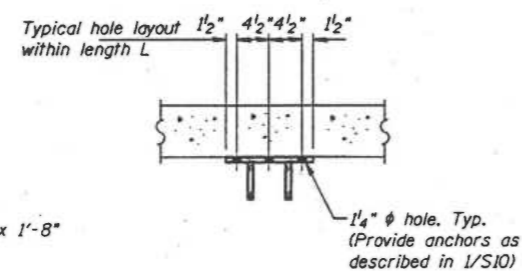
7 ELEVATION
S10



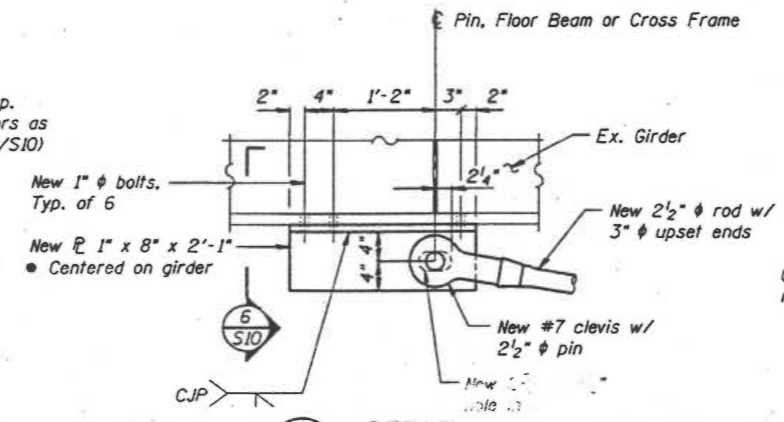
8 SECTION
S10



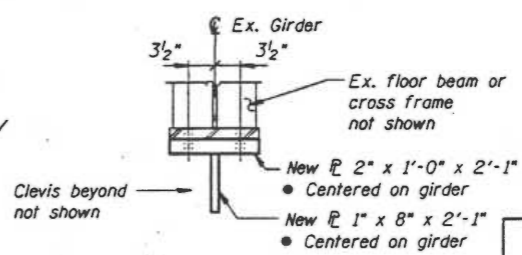
3 SECTION
S10



4 SECTION
S10



5 DETAIL
S10



6 SECTION
S10

FOR INFORMATION ONLY

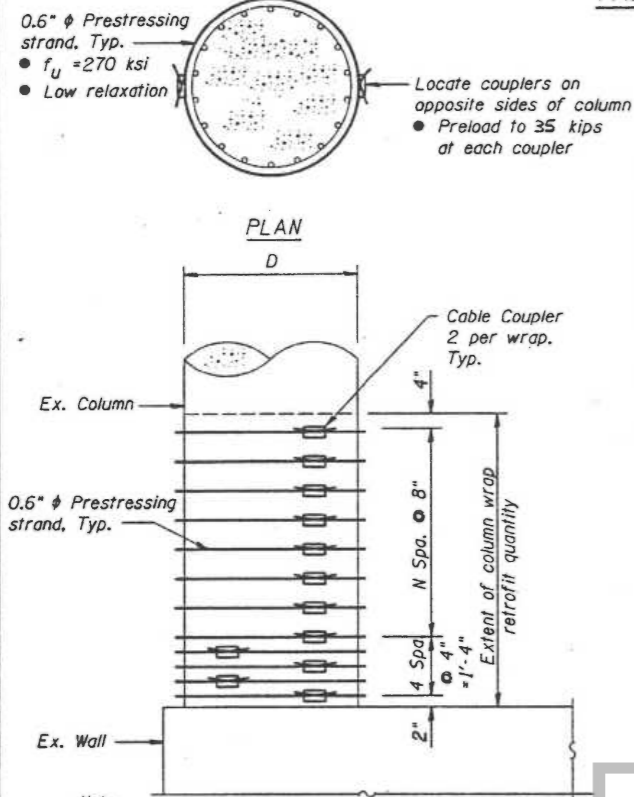
SEISMIC RETROFIT DETAILS

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
POPULAR STREET BRIDGE APPROACHES
ST. CLAIR COUNTY

STRUCTURE NO. 082-0254 (BRIDGE) STRUCTURE NO. 082-0254 (BRIDGE)
STRUCTURE NO. 082-0254 (BRIDGE) STRUCTURE NO. 082-0201 (BRIDGE)
SCALE: NONE DRAWN BY JN
DATE 1-23-98 CHECKED BY HH

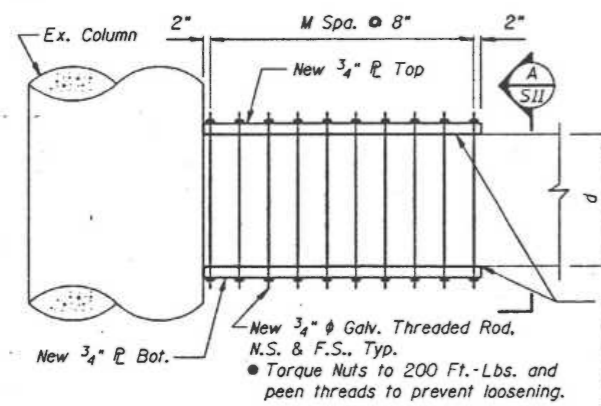
TABLE OF COLUMN WRAP AND TIE BEAM WRAP PARAMETERS

Pier	No. Cols.	D (in.)	N	M	b (in.)	d (in.)	Comments
A2	2	48	7	9	27	36	See Note 5
A4	2	54	8	9	27	36	
A5	1	48	7				Wrap South Col. only
A6	2	48	7	9	15	36	
A7	2	48	7	9	15	36	See Note 5
A8	2	48	7				
A9	2	48	7	9	15	36	See Note 5
A10	2	54	8	9	15	36	
A12	2	48					See Note 4
A13	2	48	7	9	15	36	See Note 7
A14	2	48	7	9	15	36	
A15	2	48	7				
A16	2	48	7	9	21	36	See Note 5 and 6
A17	2	54	8	9	24	36	See Note 6
A18	2	48	7				
A19	2	54	8	9	27	36	See Note 5
A20	2	54	8				
A21	1	48	7				Wrap North Col. only
R1-1	3	48	7				
R2-1	3	48	7				
R3-1	4	48	7				
R4-1	3	48	7				
O1-R	2	48	7				Wrap South 2 Cols. only
G1	1	48	7				Wrap South Col. only
G2	2	60	9	9	24	36	See Note 5
G3	2	48	7				See Note 8
G4	2	48	7				See Note 7
G5	2	48	7				
G8	2	54	8	9	15	36	
G9	2	48	7				
G10	2	54	8	9	15	36	
G11	2	48	7	9	15	36	See Note 5
G12	2	48	7	9	15	36	Wrap Out. Cols. See Note 5
G13	2	48	7				See Note 8



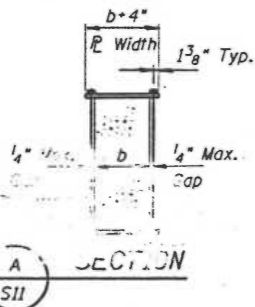
- Note:
- See table for dimensions not shown and additional notes.
 - Alternative column wraps may be used. See Special Provisions.

1 ELEVATION - TYPICAL COLUMN WRAP



- Notes:
- See table for dimensions not shown and additional notes.
 - Wrap each end as shown.

2 ELEVATION - TYPICAL TIE BEAM WRAP



- Notes:
- Complete all specified dowel bar modifications and concrete repairs at least 3 days before wrapping any member.
 - See detail 1/S11 for column wrap U.N.O.
 - See detail 2/S11 for tie beam wrap U.N.O.
 - See detail 6/S12 for column wrap.
 - See detail 2/S13 for modifications to the tie beam wrap.
 - Excavation required to install column wraps. See sheet S-28 for additional information. Provide column wrap protection at these locations as specified in the Special Provisions.
 - Existing dead conduit along face of column interferes with installation of column wrap. Remove conduit (approximate length of 30'). Removal cost shall be incidental to column wrap installation.
 - Existing live conduit along face of column interferes with installation of column wrap. Conduit shall be rerouted over the length of the wrap by a qualified electrician such that column wrap may be installed (approximate length of 6'-2"). Note that electrical service may only be interrupted between the hours of 8:00 AM and 4:00 PM. Relocation cost shall be incidental to column wrap installation.

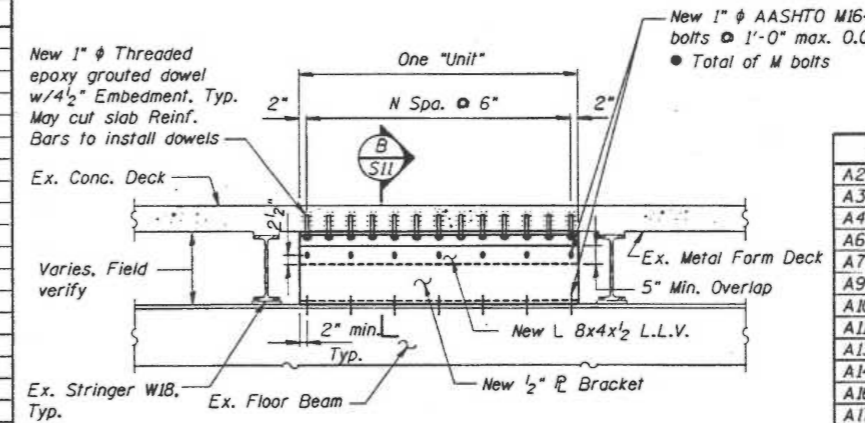
ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.	SHEET NO. S-11
F.A.I. 78		ST. CLAIR	91	13	

FED. ROAD DIST. NO. 7 ILLINOIS FED. AID PROJECT - 82-3HVB-2R-1-1

TABLE OF SLAB/FLOOR BEAM CONNECTION

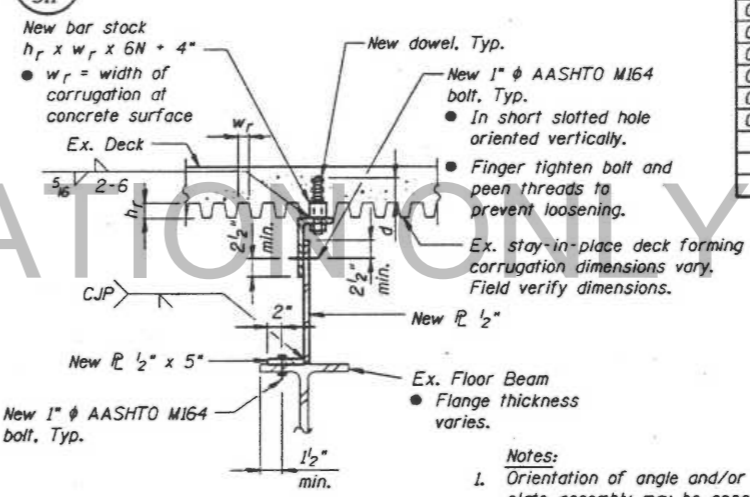
Pier	No. of Units	N Per Unit	M Per Unit	Ref. Detail	Comments
A2	2	11	6	3/S-11	
A3	1	7	4	3/S-11	
A4	2	9	5	3/S-11	
A6	1	11	6	3/S-11	
A7	1	12	7	3/S-11	
A9	1	11	6	3/S-11	
A10	2	7	4	3/S-11	
A11	1	7	4	4/S-11	See Note 1
A13	2	8	5	3/S-11	
A14	1	7	4	3/S-11	
A16	2	9	5	3/S-11	
A17	2	9	5	3/S-11	
A19	3	8	5	3/S-11	
A20	2	9	5	3/S-11	
G2	2	12	7	3/S-11	
G3	1	8	5	3/S-11	
G4	1	9	5	3/S-11	
G6	1	8	5	3/S-11	
G7	1	8	5	3/S-11	
G8	2	8	5	3/S-11	
G10	1	12	7	3/S-11	
G11	1	13	7	3/S-11	
G12	1	9	5	4/S-11	See Note 2
G13	2	7	4	3/S-11	

- Notes:
- West side expansion joint only.
 - East side expansion joint only, between southern 2 columns.

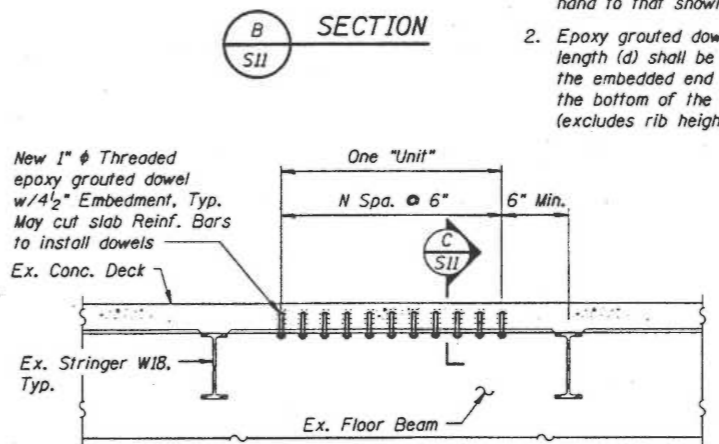


- Notes:
- See table for number of "units", per pier.
 - See table for N.

3 ELEVATION - SLAB FLOOR BEAM CONNECTION

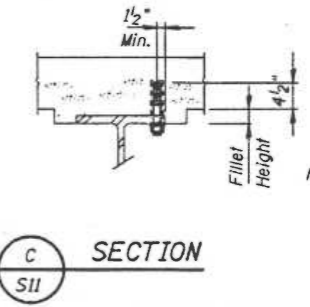


- Notes:
- Orientation of angle and/or plate assembly may be opposite hand to that shown.
 - Epoxy grouted dowel embedment length (d) shall be measured from the embedded end of the dowel to the bottom of the corrugation (excludes rib height).



- Notes:
- See table for number of "units", per pier.
 - See table for N.

4 ELEVATION - SLAB FLOOR BEAM CONNECTION



Note: Epoxy grouted dowel embedment length shall be measured from the bottom of the concrete slab to the end of the dowel excluding the fillet height.

SEISMIC RETROFIT DETAILS

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC REDUNDANCY RETROFIT REPAIRS
I-70
BRIDGE APPROACH
ST. CLAIR COUNTY

STRUCTURE NO. 082-0201 (ON-RAMP A) STRUCTURE NO. 082-0203 (RAMP B)
STRUCTURE NO. 082-0204 (RAMP C) STRUCTURE NO. 082-0201 (RAMP C)
SCALE: NONE DRAWN BY JN
DATE 1-23-98 CHECKED BY HH

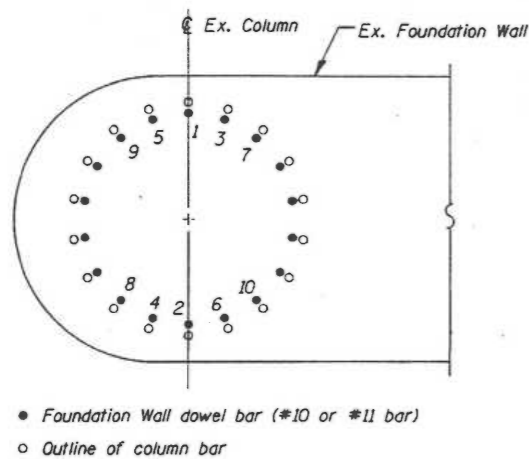
ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.	SHEET NO. S-12
F.A.I. 70		ST. CLAIR	91	14	
FED. ROAD DIST. NO. 7 ILLINOIS FED. AID PROJECT -					
# B2-34VB-2R-1-1					

FOUNDATION WALL DOWEL MODIFICATION TABLE

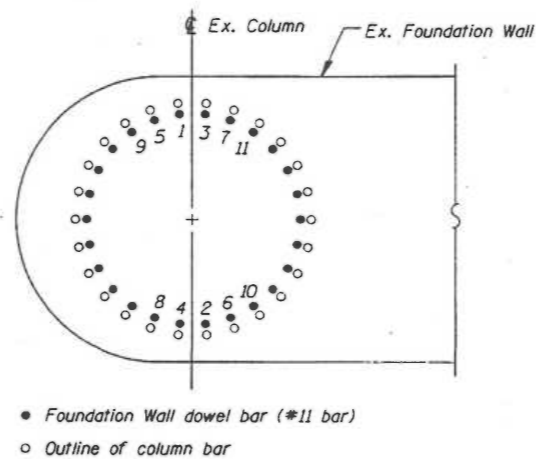
Pier	Modifications per pier	Ref. Detail	No. of bars cut per modification	Comments
A4	2	3/S12	4	
A6	2	1/S12	4	
A8	2	1/S12	6	
A10	2	3/S12	6	
A13	2	1/S12	8	
A15	2	1/S12	8	
A17	2	1/S12	6	See Note 6
A18	2	1/S12	6	
A20	2	2/S12	8	
A21	1	1/S12	6	See Note 7
R1-1	3	3/S12	10	
R2-1	3	4/S12	12	
R3-1	4	1/S12	10	
R4-1	3	2/S12	8	
O1-R	2	3/S12	2	See Note 8
G2	2	5/S12	14	
G5	2	1/S12	10	
G8	2	5/S12	10	
G9	2	1/S12	10	
G10	2	1/S12	4	
G11	2	1/S12	6	

Notes:

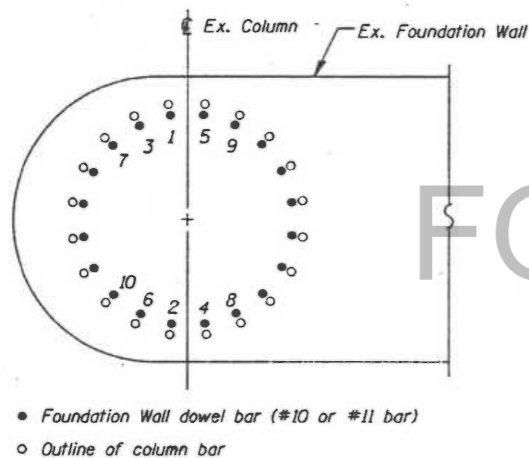
- Cut number of foundation dowel bars indicated. To determine which bars to cut, see reference detail and cut bars starting with number 1 and finishing with the number shown in the table.
Example: Pier A6 cut dowel bars 1, 2, 3 and 4 as labeled in detail 1/S12.
- The contractor shall positively discern between column longitudinal reinforcing bars and foundation wall dowel bars prior to cutting any bars.
- Dowel bars to be cut must be cut within 2" of top of foundation wall. Corresponding column bars may also be cut at the same location.
- Concrete removal areas shall be limited to 1'-6" in height and shall be no deeper than 1/2" clear inside the vertical bars.
- Concrete removal and repair costs shall be incidental to the foundation wall dowel modification. All unsound concrete caused by bar cutting shall be removed prior to concrete repair. See sheet S-26 for concrete removal and repair details.
- Excavation required to perform foundation wall dowel modifications. See sheet S-28 for additional information.
- Modify dowels for north column only.
- Modify dowels for south two columns only.



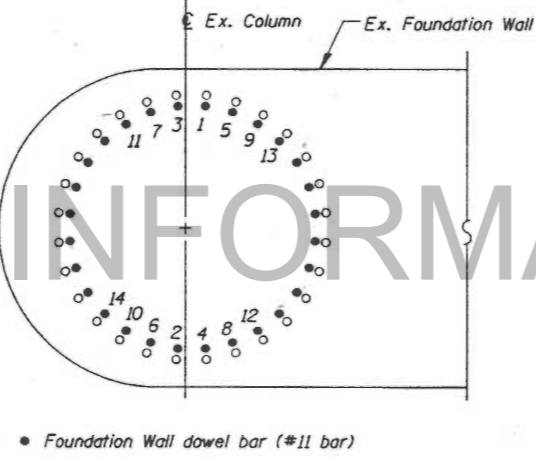
1 SECTION - FOUNDATION WALL DOWELS
S12 (18 Bar Layout)



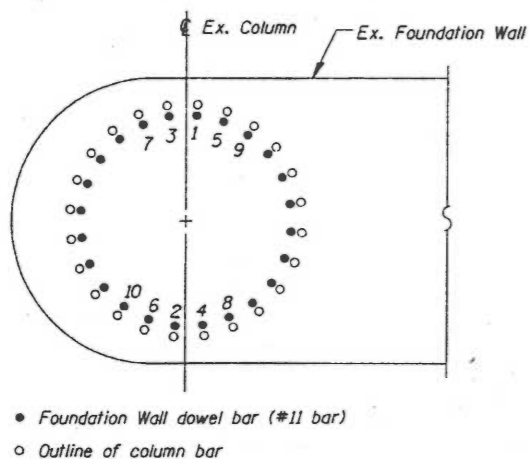
4 SECTION - FOUNDATION WALL DOWELS
S12 (26 Bar Layout)



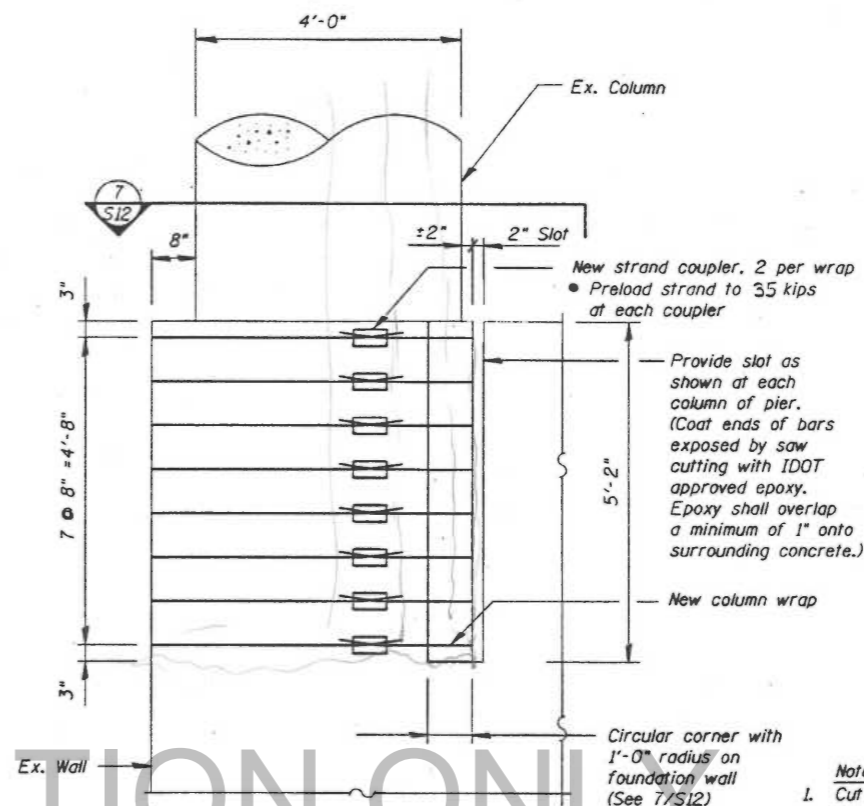
2 SECTION - FOUNDATION WALL DOWELS
S12 (20 Bar Layout)



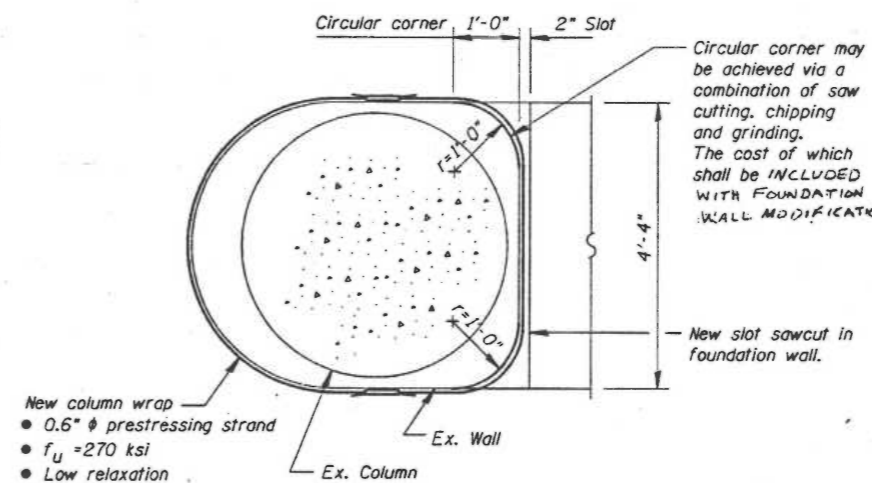
5 SECTION - FOUNDATION WALL DOWELS
S12 (28 Bar Layout)



3 SECTION - FOUNDATION WALL DOWELS
S12 (24 Bar Layout)



6 ELEVATION - PIER A12
S12

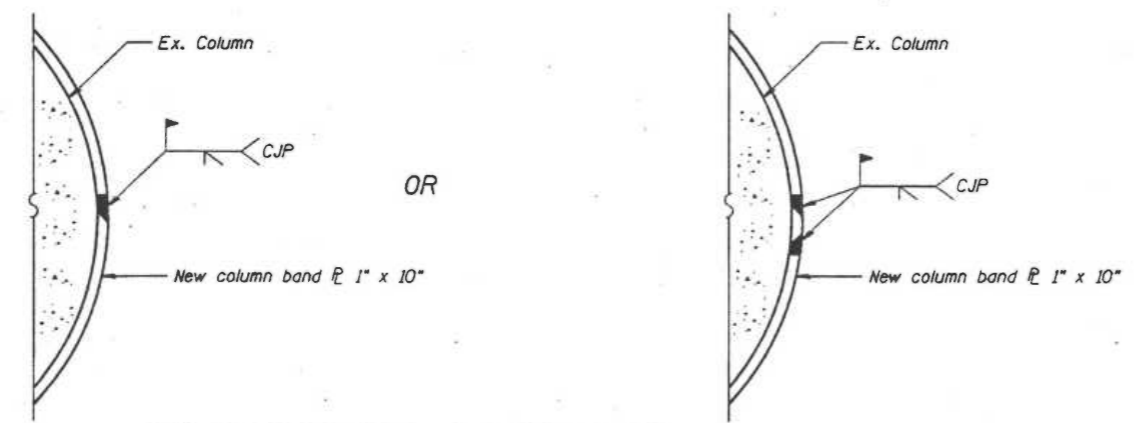


7 SECTION
S12

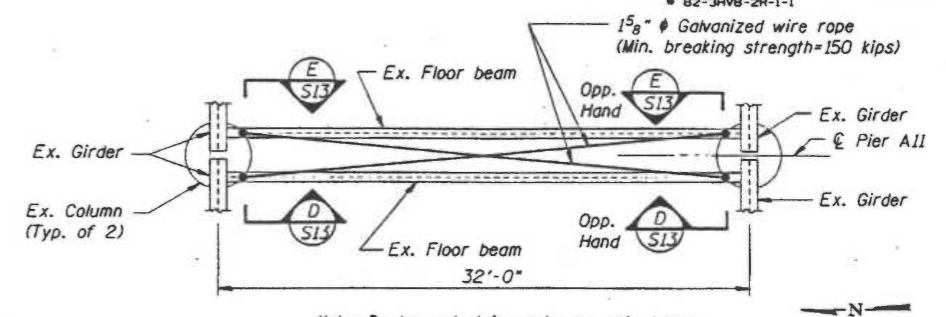
SEISMIC RETROFIT DETAILS

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
FAI ROUTE 70
RIVER STREET

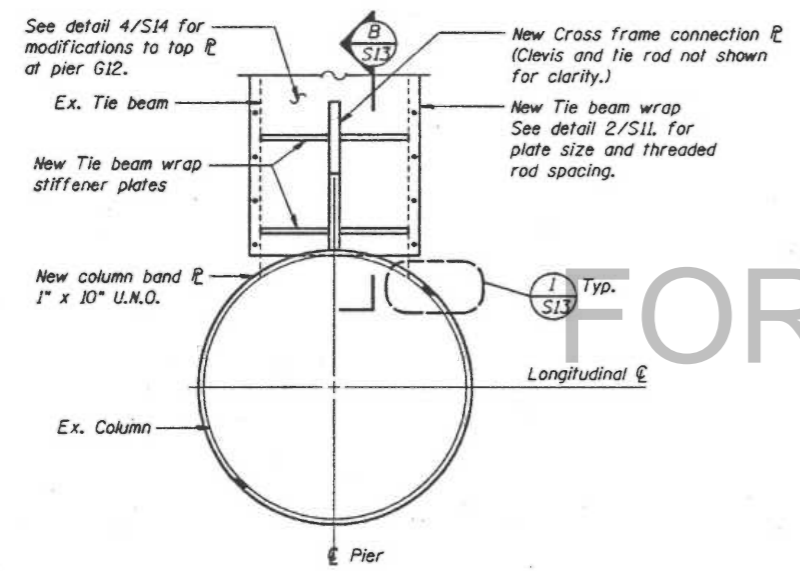
STRUCTURE NO. 02-0254 (ROADWAY G) STRUC. ...
SCALE: NONE DRAWN BY JN
DATE 1-23-98 CHECKED BY HH



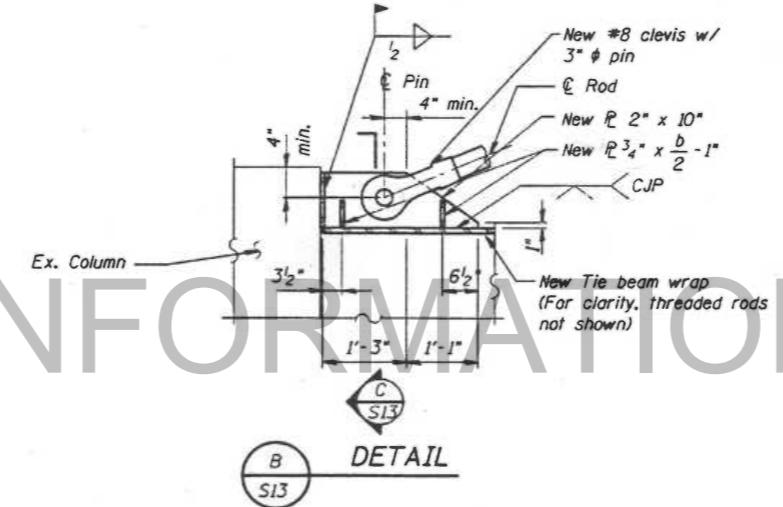
1 COLUMN BAND CONNECTION OPTIONS
S13



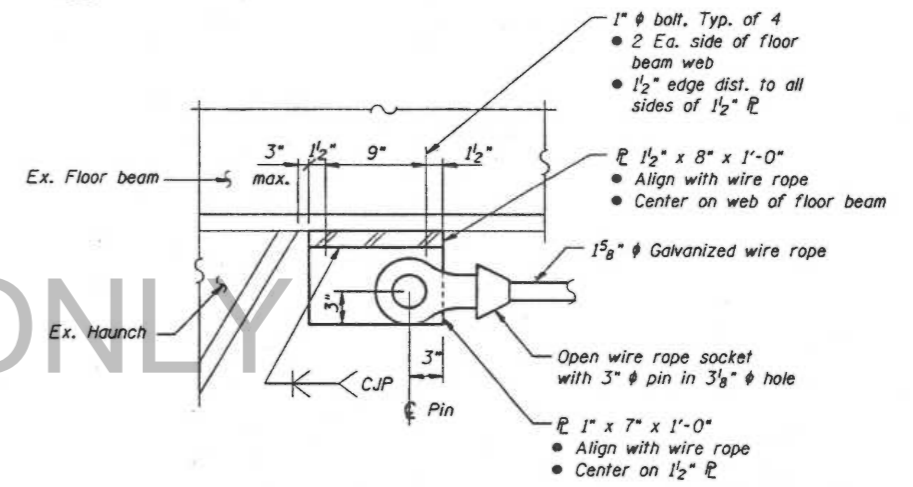
4 SHEAR TRANSFER ASSEMBLY AT PIER A11
S13



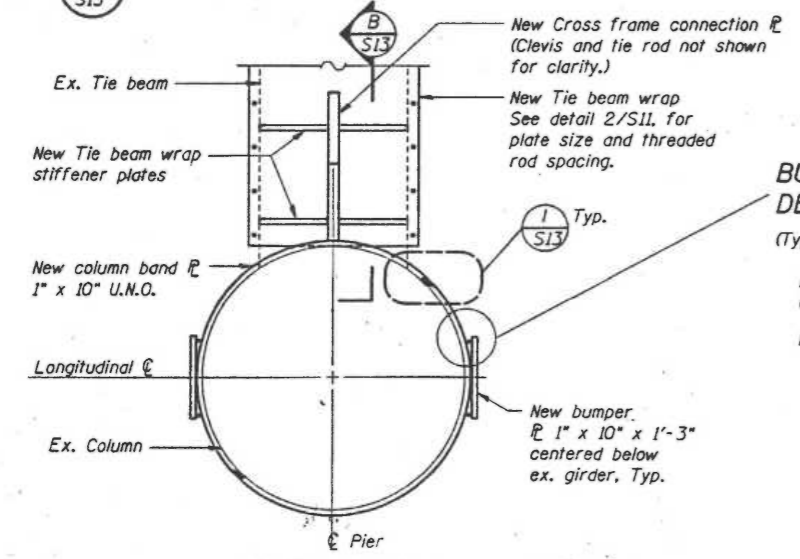
2 CROSS FRAME COLUMN BAND DETAIL
S13



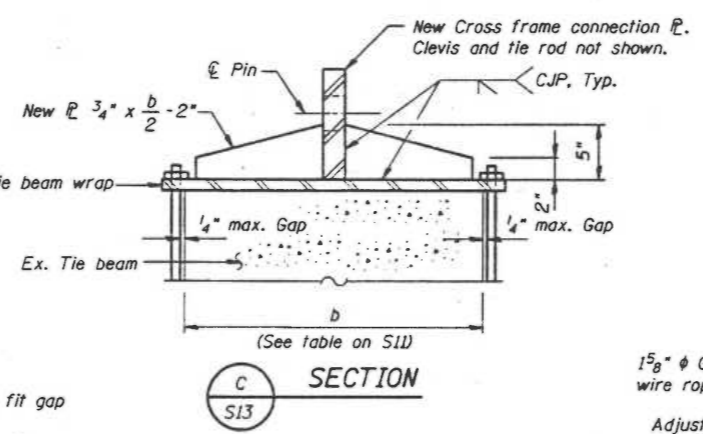
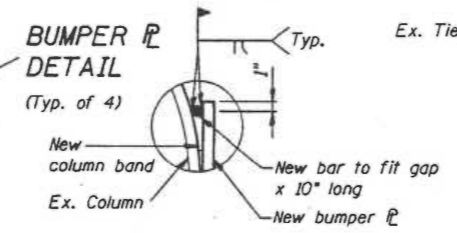
B DETAIL
S13



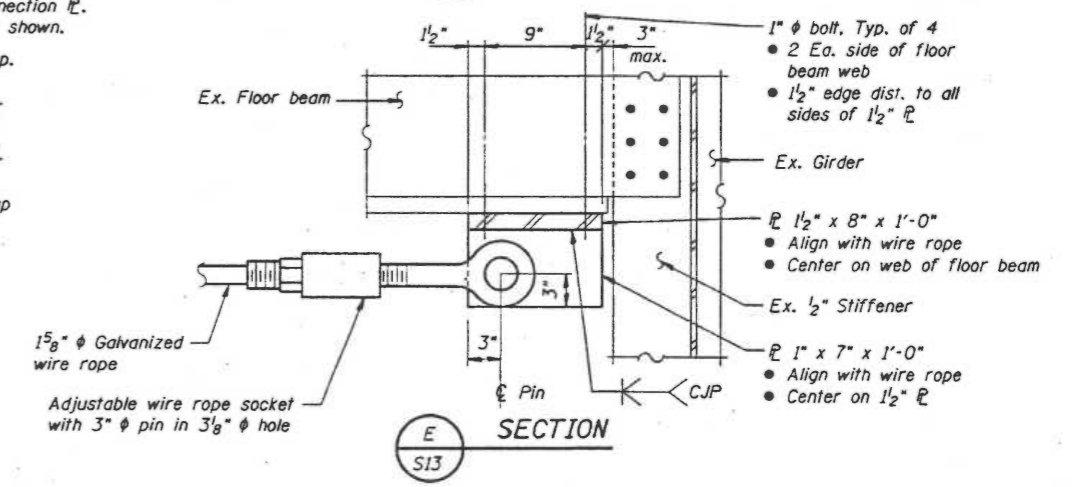
D SECTION
S13



2 CROSS FRAME COLUMN BAND DETAIL AT PIERS WITH BUMPERS & CROSS FRAMES
S13



C SECTION
S13



E SECTION
S13

- Notes:
1. Ex. Column wraps at the top of the columns shall be removed prior to the installation of the new column bands. REMOVAL OF EX. WRAPS SHALL BE INCLUDED WITH FURNISH + ERECT STRUCTURAL STEEL.
 2. Inject epoxy between the column band and concrete column surface to assure uniform bearing of the band. The cost shall be INCLUDED WITH FURNISH + ERECT STRUCTURAL STEEL.
 3. Prior to shop painting, mask off area of column band and cross frame connection plate in place. Field touch-up of paint shall be included WITH FURNISH + ERECT STRUCTURAL STEEL.

SEISMIC RETROFIT DETAILS

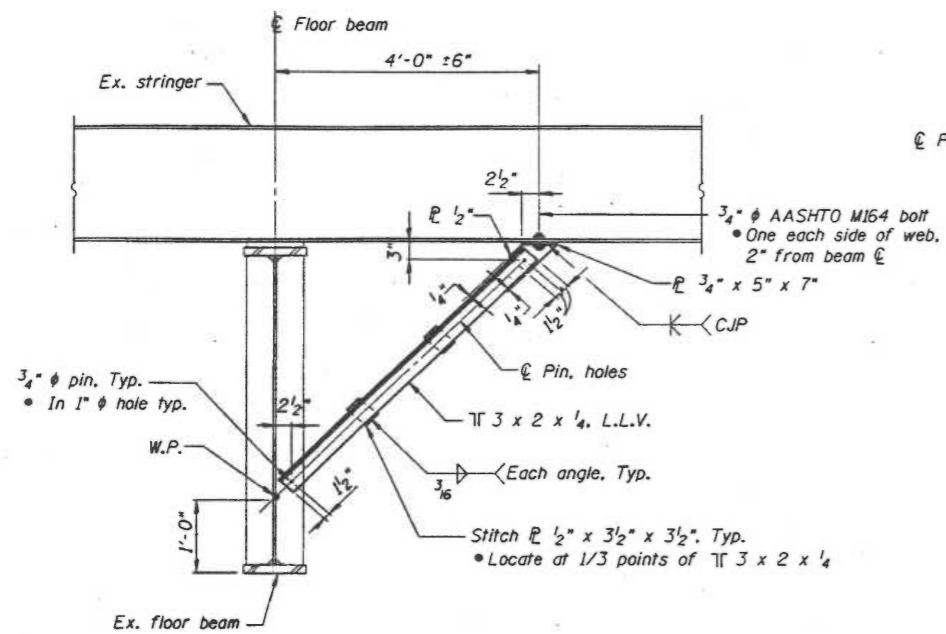
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
FAI ROUTE 70
BEST BRIDGE

DATE 1-23-98

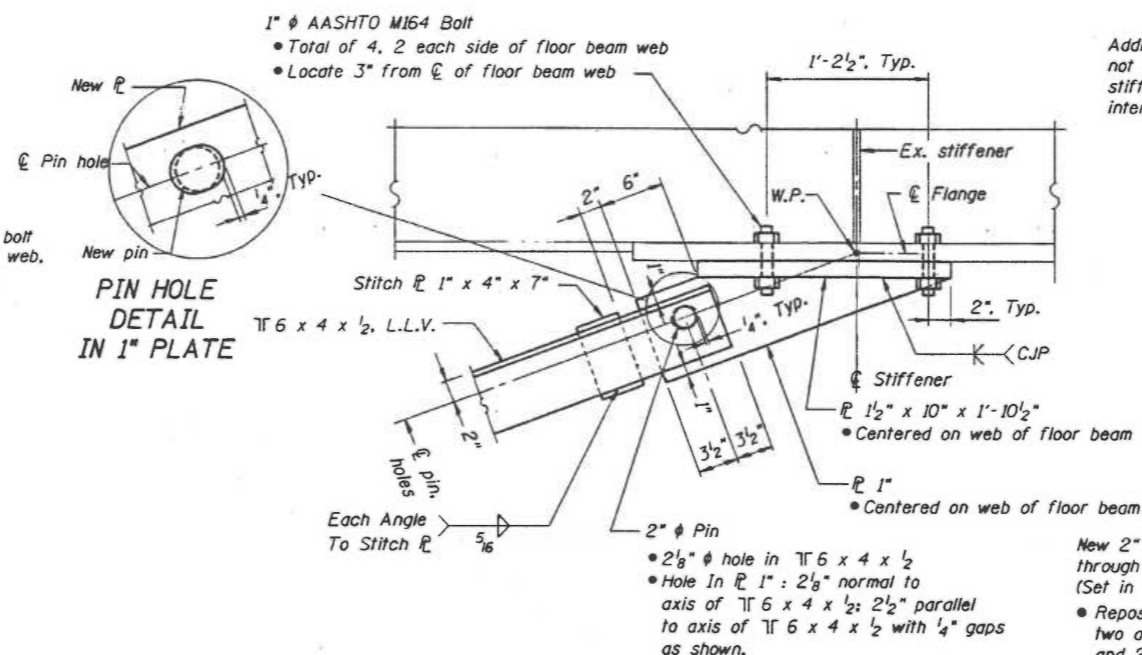
DRAWN BY
CHECKED BY

NS1001-14N 97422-SET11010101000

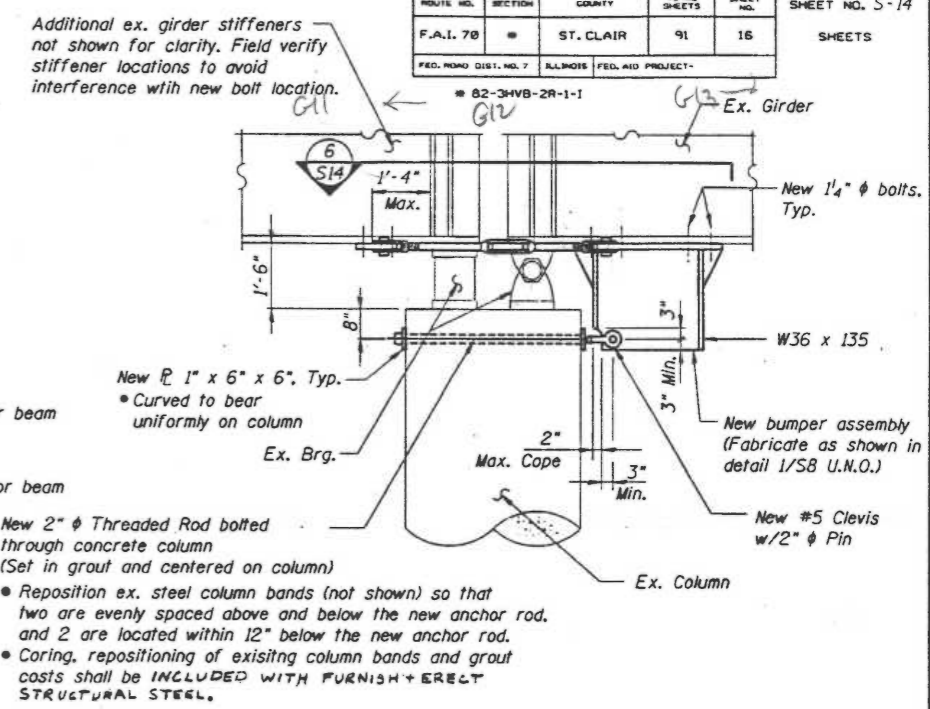
ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.	SHEET NO. S-14 SHEETS
F.A.I. 78		ST. CLAIR	91	16	
FED. ROAD DIST. NO. 7 BALTIMORE FED. AID PROJECT -					



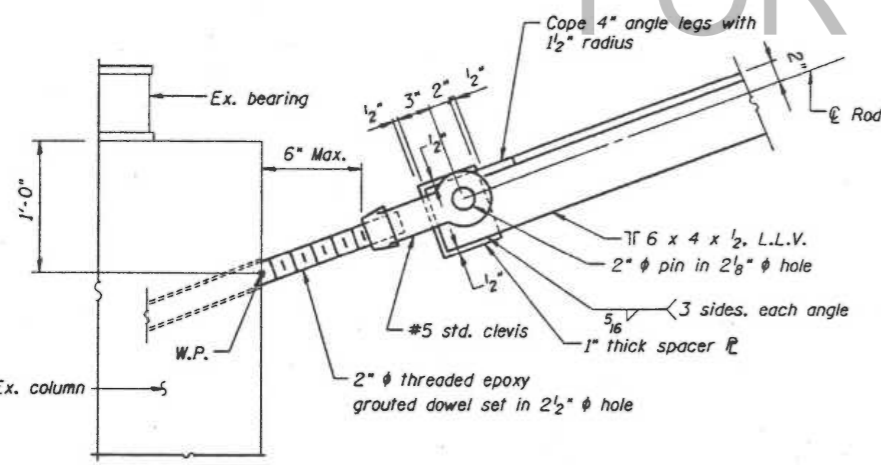
1 SECTION AT PIER G13
S14



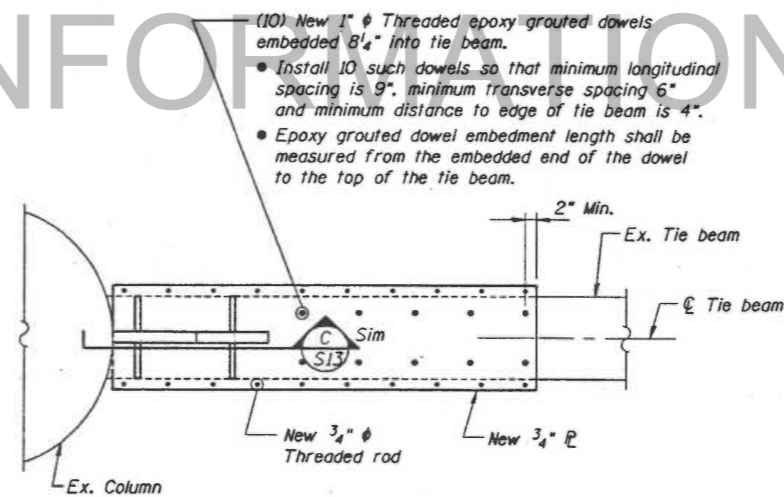
3 DETAIL AT PIER G13
S14



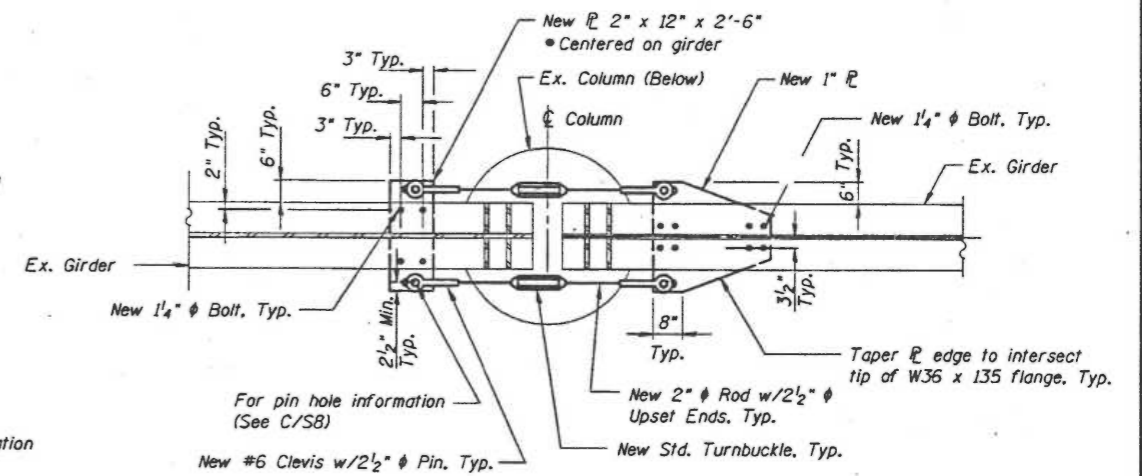
5 ELEVATION: BUMPER/TIE AT GIRDER WITH FIXED BEARING
S14



2 DETAIL PIER G13
S14



4 TIE BEAM TOP PLATE AT PIER G12
S14



6 SECTION
S14

1" AASHTO M164 Bolt
• Total of 4, 2 each side of floor beam web
• Locate 3" from CL of floor beam web

PIN HOLE
DETAIL
IN 1" PLATE

Additional ex. girder stiffeners not shown for clarity. Field verify stiffener locations to avoid interference with new bolt location.

New 2" Threaded Rod bolted through concrete column (Set in grout and centered on column)
• Reposition ex. steel column bands (not shown) so that two are evenly spaced above and below the new anchor rod, and 2 are located within 12" below the new anchor rod.
• Coring, repositioning of existing column bands and grout casts shall be INCLUDED WITH FURNISH + ERECT STRUCTURAL STEEL.

(10) New 1" Threaded epoxy grouted dowels embedded 8 1/4" into tie beam.
• Install 10 such dowels so that minimum longitudinal spacing is 9", minimum transverse spacing 6" and minimum distance to edge of tie beam is 4".
• Epoxy grouted dowel embedment length shall be measured from the embedded end of the dowel to the top of the tie beam.

Note:
For additional tie beam wrap information See details 2/S11 and 2/S13.

For pin hole information (See C/SB)

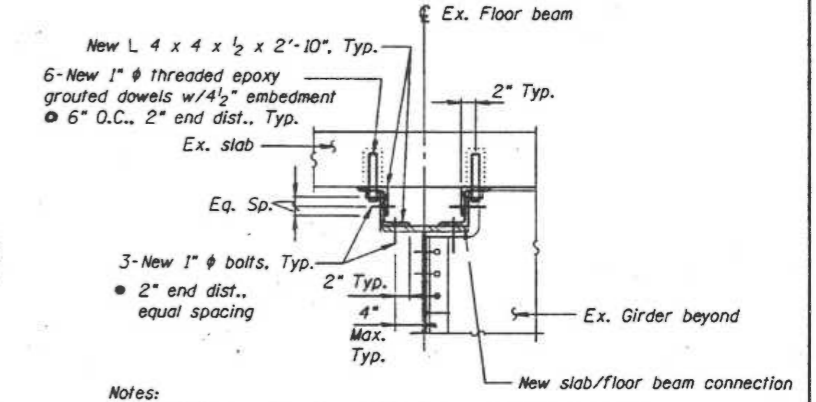
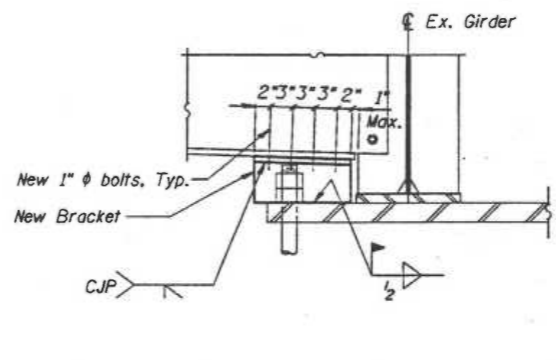
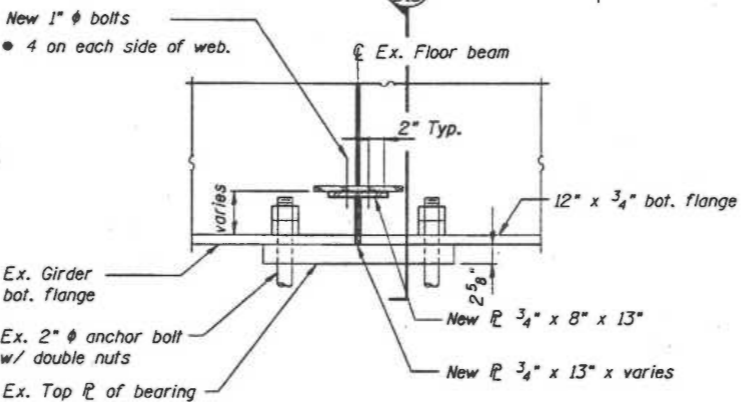
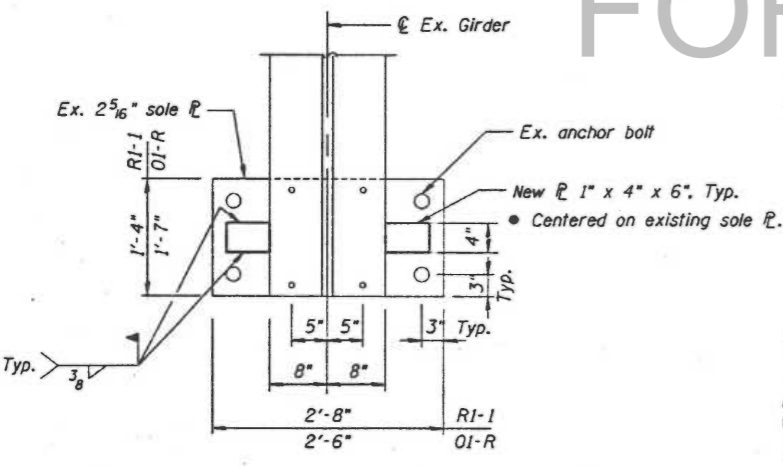
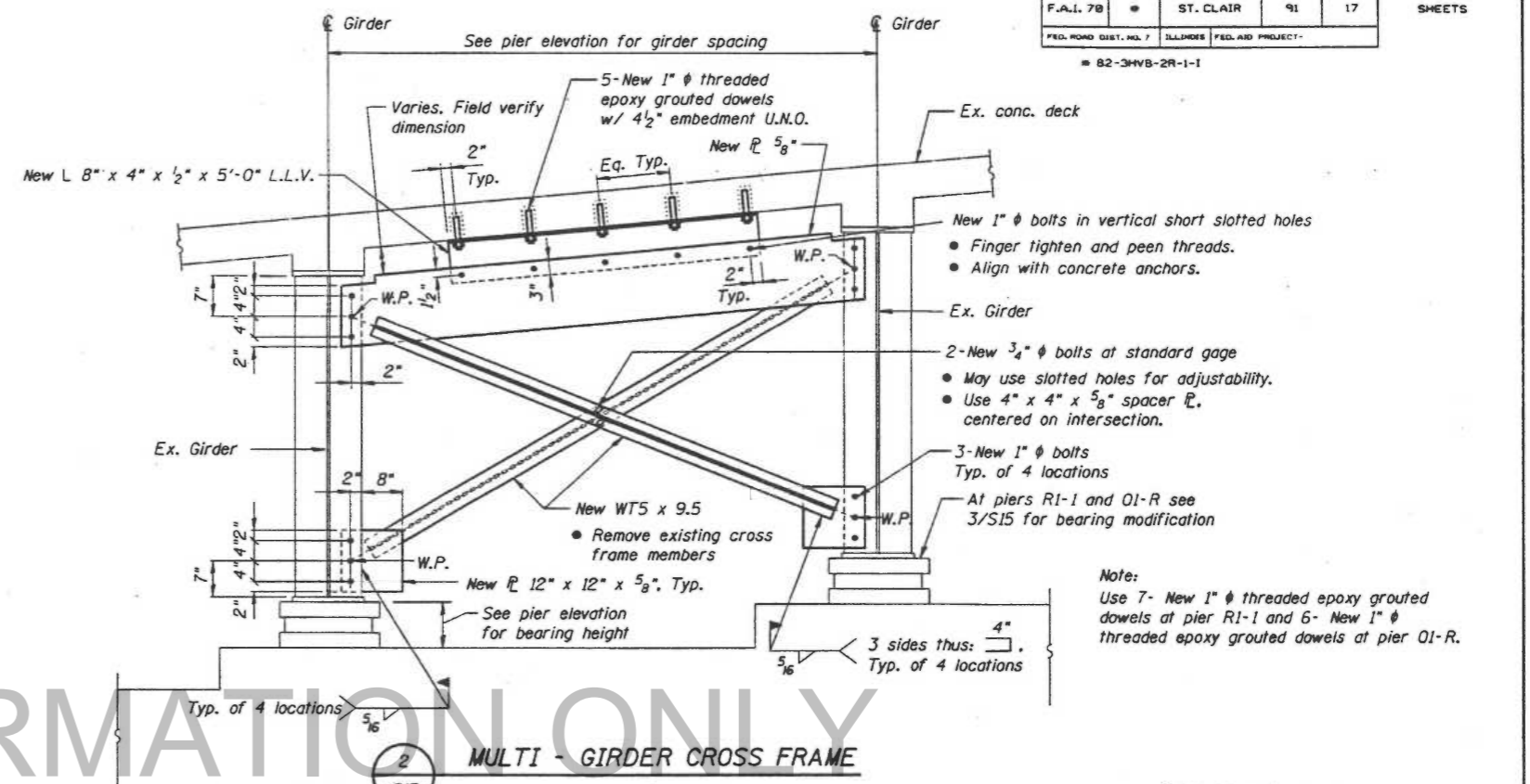
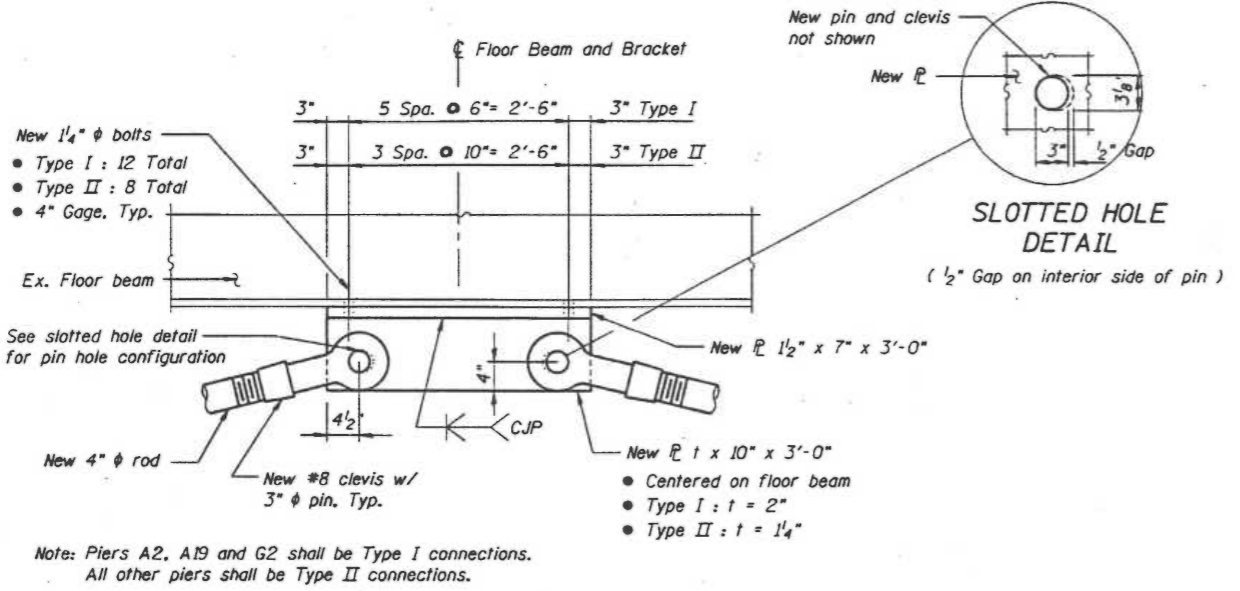
Notes:
1. See sheet S-8 for bumper/tie rod notes.
2. See sheet S-8 for shim notes.

SEISMIC RETROFIT DETAILS

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC REDUNDANCY RETROFIT REPAIRS
FURNISHMENT EDGE APP.
ST. CLAIR COUNTY

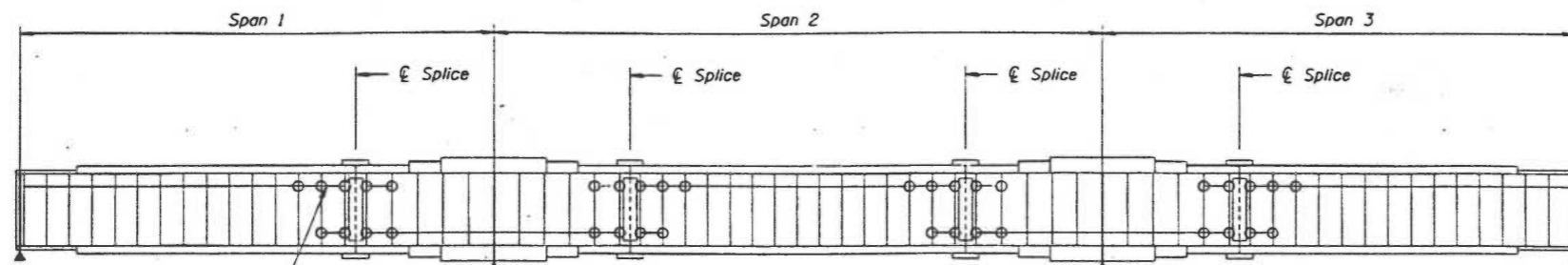
STRUCTURE NO. 062-0201 (RAMP C)
SCALE: NONE
DATE: 1-23-98

STRUCTURE NO. 062-0201 (RAMP C)
DRAWN BY: JN
CHECKED BY: HJ



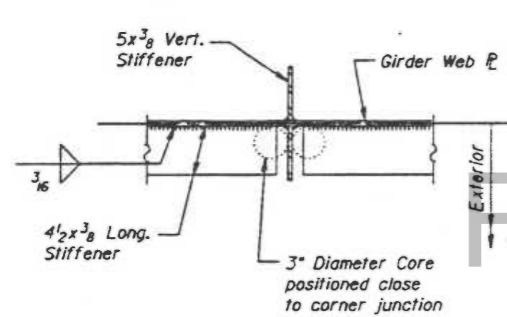
- Notes:
- Vertical legs of angles shall include vertical short slotted holes centered on overlapping portions.
 - Bolts connecting vertical legs of angles shall be finger tightened and threads peened.

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.	SHEET NO. 5-16 SHEETS
F.A.I. 7B	0	ST. CLAIR	91	18	
FED. ROAD DIST. NO. 7		ILLINOIS		FED. AID PROJECT-	
02-31VB-2R-1-1					

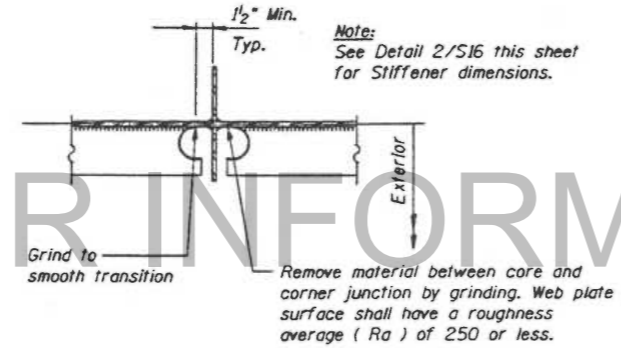


Modify stiffener intersection condition by increasing gap between stiffener welds
See Retrofit Details 2/S16 and 3/S16

1 GIRDER ELEVATION INDICATING TYPICAL FRACTURE CONTROL MODIFICATION LOCATIONS
S16



2 STIFFENER INTERSECTION MODIFICATION DETAIL
S16



3 STIFFENER INTERSECTION MODIFICATION DETAIL
S16

Procedure :

1. Core 3" diameter holes positioned close to corner junction through 3/8" thick longitudinal stiffener as shown in detail 2/S16.
2. Remove material between core and intersection junction by grinding with carbide tools and a dye grinder as shown in detail 3/S16. Web plate surface shall have a roughness average (Ra) of 250 or less.
3. Remove all burrs from cut edge and check for irregularities. Cored surface shall have an Ra equal to 500 or less.
4. After burr removal the modification shall be inspected using magnetic particle (MT) methods. Notify Engineer if a crack is detected. (cost incidental to stiffener intersection modification).
5. The exposed steel surfaces shall be cleaned and painted using an aluminum epoxy mastic primer.
6. Obtain approval of Engineer before proceeding.
7. Paint area with top coat.

BILL OF MATERIAL		
ITEM	UNIT	QUANTITY
Stiffener intersection modification	EACH	1056

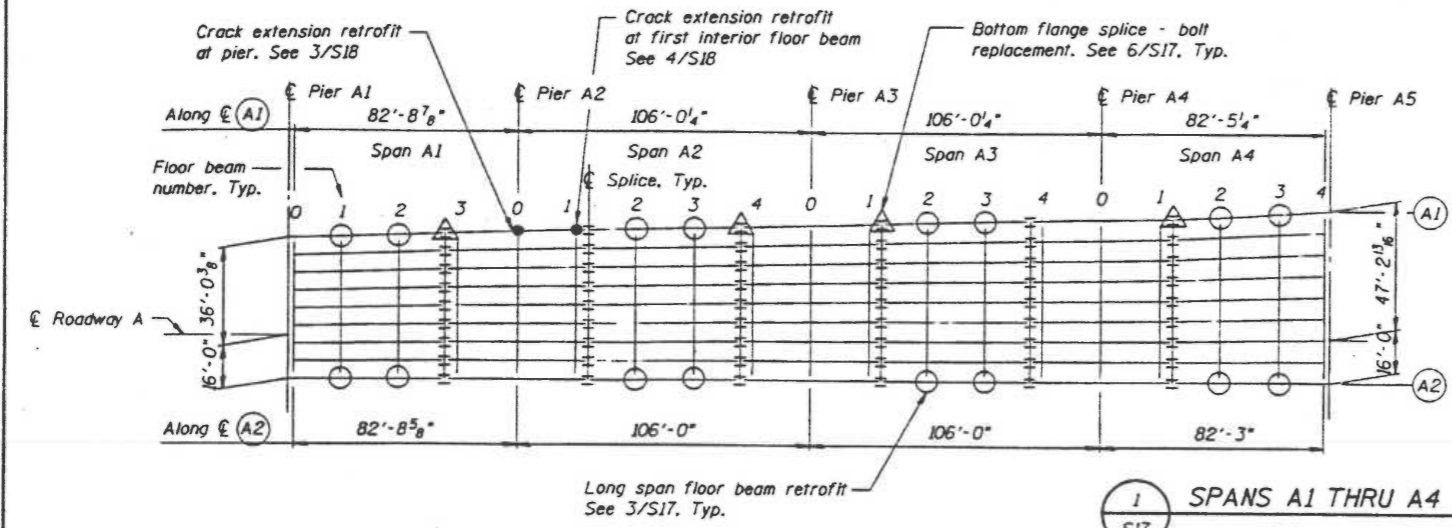
STIFFENER INTERSECTION MODIFICATION DETAIL

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS

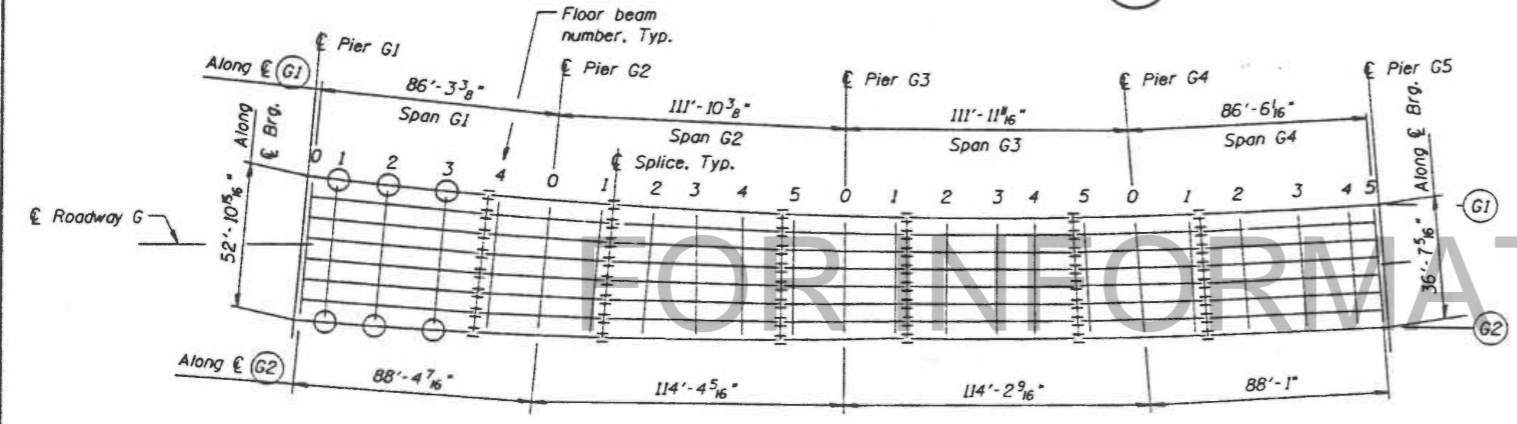
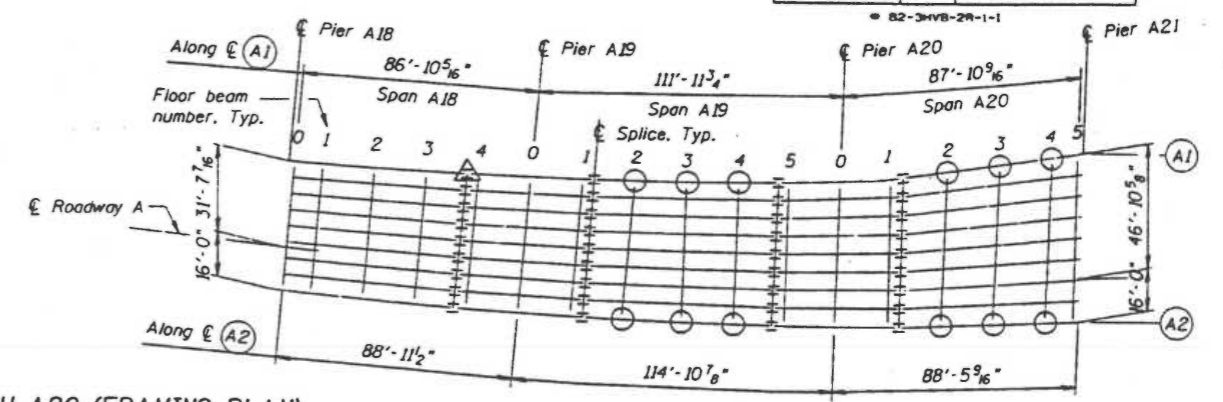
STRUCTURE NO. 082-0254 (ROADWAY) STRUCTURE NO. 082-0201 (RAMP 01)

SCALE: NONE DRAWN BY: JN DATE: 1-23-98 CHECKED BY: HH

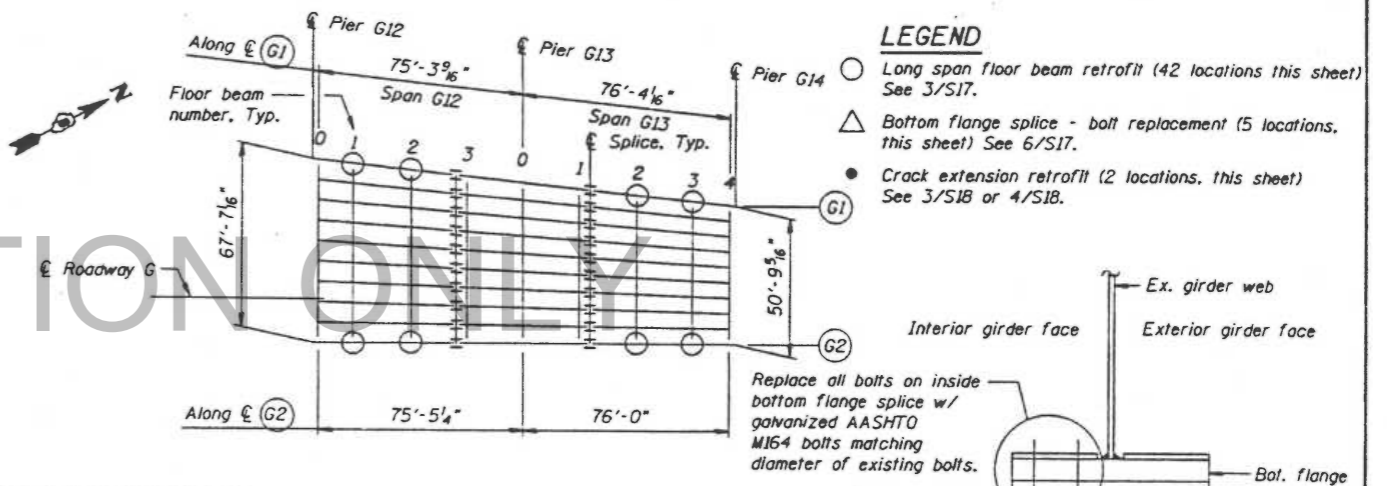
SERIAL 3010 7' 2 1/2" - INSTEAD OF 18.00"



1 SPANS A1 THRU A4 AND A18 THRU A20 (FRAMING PLAN)
S17

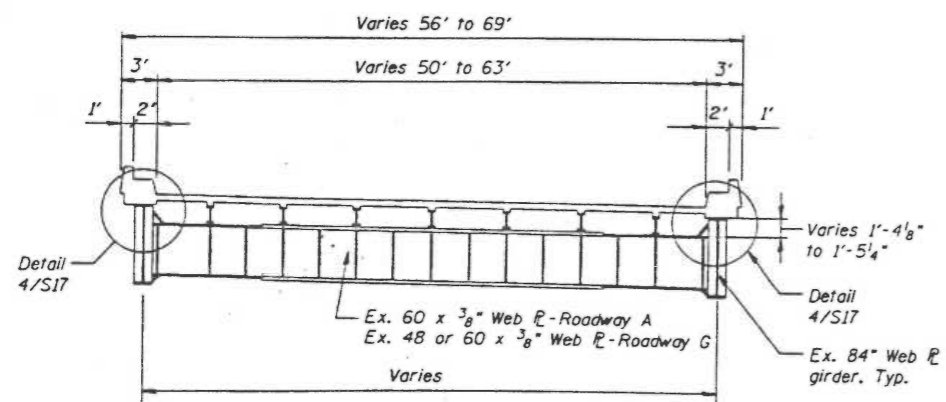


2 SPANS G1 THRU G4 AND G12 THRU G13 (FRAMING PLAN)
S17

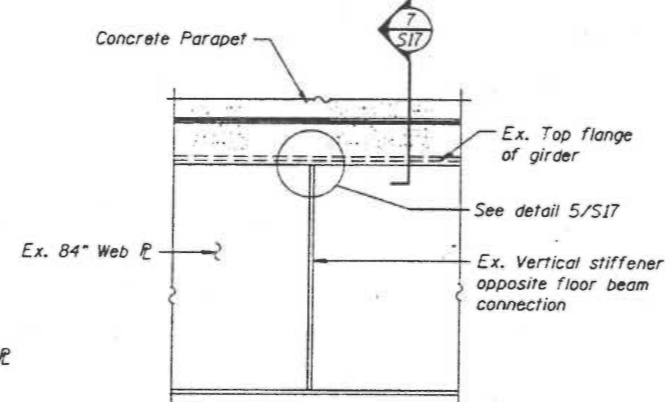


- LEGEND**
- Long span floor beam retrofit (42 locations this sheet) See 3/S17.
 - △ Bottom flange splice - bolt replacement (5 locations, this sheet) See 6/S17.
 - Crack extension retrofit (2 locations, this sheet) See 3/S18 or 4/S18.

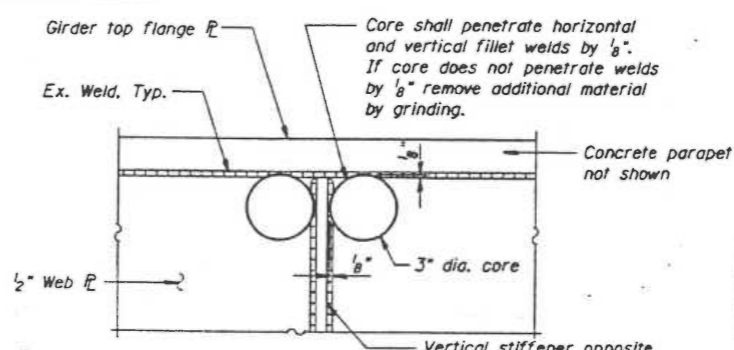
BILL OF MATERIAL		
ITEM	UNIT	QUANTITY
Long span floor beam retrofit	EACH	44
Bottom flange splice - bolt replacement	EACH	14



3 LONG SPAN FLOOR BEAMS (> 50')
S17

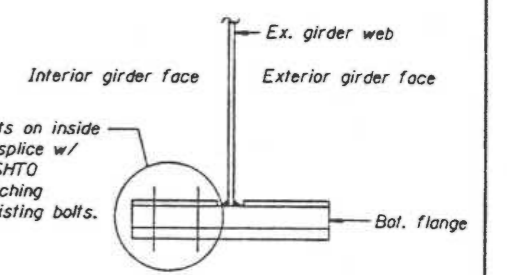


4 EXTERIOR ELEVATION OF GIRDER AT FLOOR BEAM CONNECTION
S17

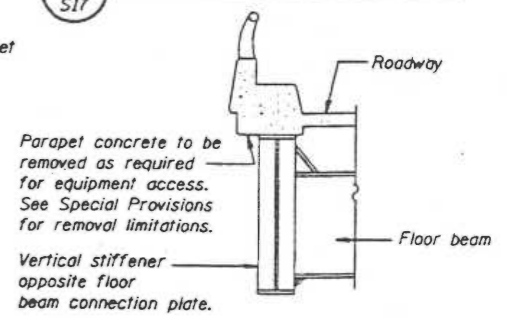


- Procedure:**
- Remove parapet concrete, as required, in accordance with detail 7/S17, for equipment access.
 - Core 3" diameter holes through web plate adjacent to the top flange as positioned in 5/S17. Core holes shall penetrate the horizontal and vertical fillet welds approximately 1/8". If core does not penetrate weld by 1/8", remove additional material by grinding. Remove all burrs from cored or ground surface. Surface shall have a roughness average (Ra) of 500 or less.
 - Grind surface to remove any cutting oils or rusting and paint. Coat steel surface with aluminum epoxy mastic primer.
 - Obtain approval of Engineer before proceeding.
 - Apply top coat.

5 LONG SPAN FLOOR BEAM RETROFIT
S17



6 BOTTOM FLANGE SPLICE - BOLT REPLACEMENT
S17



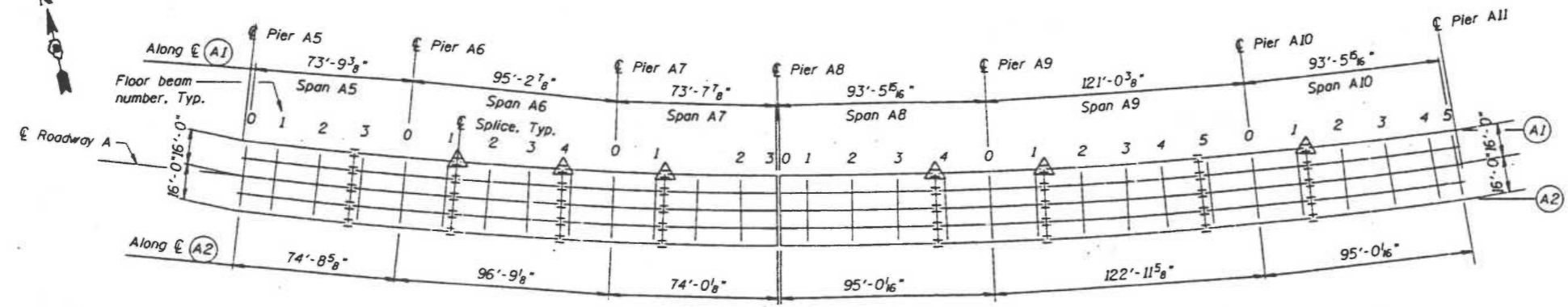
7 SECTION THRU GIRDER
S17

LONG SPAN FLOOR BEAM RETROFIT & BOLT REPLACEMENT

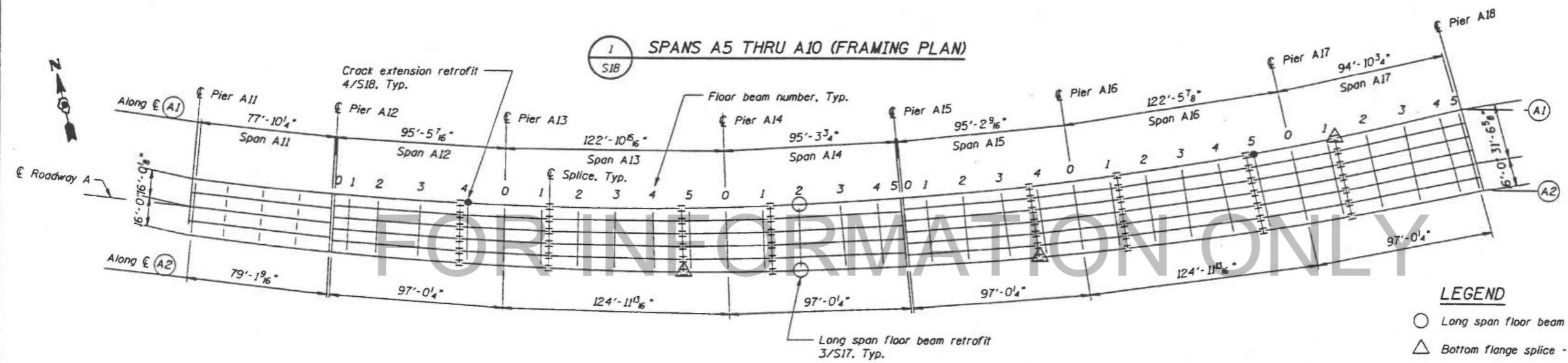
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY IMPROVEMENT PROGRAM
FAI PROJECT
POPLAR STREET BRIDGE
ST. CLAIR COUNTY

STRUCTURE NO. 082-0141 (ROADWAY A) STRUCTURE NO. 082-0201 (RAMP D)
STRUCTURE NO. 082-0254 (ROADWAY G) STRUCTURE NO. 082-0201 (RAMP D)
SCALE: NONE DRAWN BY JN
DATE 1-23-98 CHECKED BY HH

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.	SHEET NO. S-18 SHEETS
F.A.I. 7B		ST. CLAIR	91	28	
FED. ROAD DIST. NO. 7 ILLINOIS FED. AID PROJECT - 82-34V8-2R-1-1					



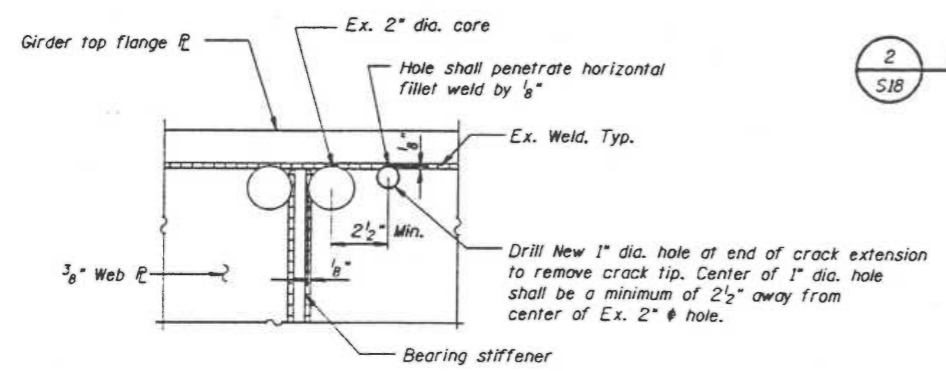
1 SPANS A5 THRU A10 (FRAMING PLAN)



2 SPANS A11 THRU A17 (FRAMING PLAN)

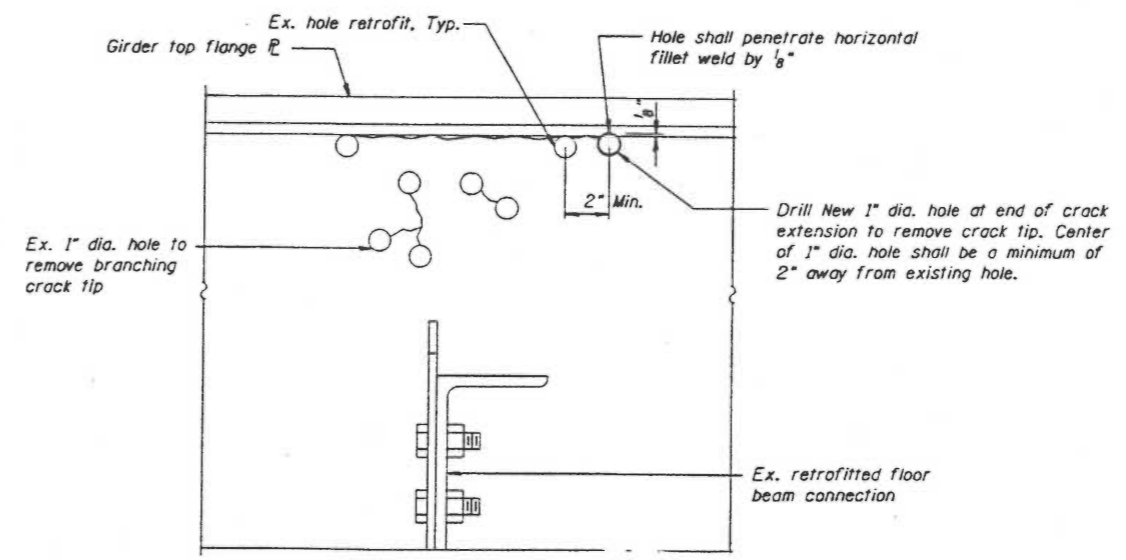
LEGEND

- Long span floor beam retrofit (2 locations this sheet) See 3/S17.
- △ Bottom flange splice - bolt replacement (9 locations, this sheet) See 6/S17.
- Crack extension retrofit (2 locations, this sheet) See 4/S18.



Procedure:

1. Inspect girder web plate in region of existing retrofits to determine location of crack extension and crack tip using magnetic particle inspection (MT) methods. (Cost incidental to crack extension of pier)
2. Drill 1" diameter hole at end of crack extension to remove crack tip. Center of 1" diameter hole shall be positioned in accordance with detail 3/S18 or 4/S18.
3. Cored surfaces shall have a Roughness Average (Ra) of 500 or less.
4. Re-inspect area using MT methods to verify crack does not extend past the newly drilled holes (Cost incidental to CRACK EXTENSION MODIFICATIONS).
5. Obtain approval of Engineer.
6. Clean exposed steel surface to remove contaminants and paint with aluminum epoxy mastic primer.



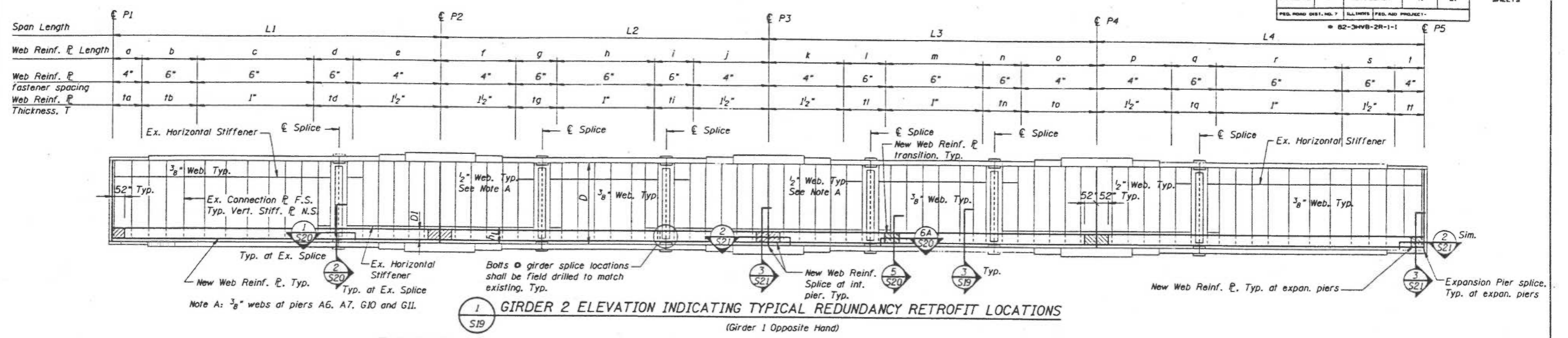
BILL OF MATERIAL		
ITEM	UNIT	QUANTITY
Crack extension MODIFICATIONS	EACH	4

CRACK EXTENSION RETROFITS

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT PER
FAI ROUTE 70
ST. CLAIR COUNTY
STREET BRIDGE

STRUCTURE NO. 082-024 (ROADWAY G) STRUCTURE NO. 082-024 (TRAMP C)
SCALE: NONE DRAWN BY JN
DATE 1-23-98 CHECKED BY MH

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 7B		ST. CLAIR	91	21
SHEETS				



GIRDER 2 ELEVATION INDICATING TYPICAL REDUNDANCY RETROFIT LOCATIONS (Girder 1 Opposite Hand)

TABLE OF WEB REINFORCEMENT PLATE PARAMETERS

Roadway	Girder	Span 1																				Span 2																				Span 3																				Span 4																			
		L1					L2					L3					L4					L1					L2					L3					L4					L1					L2					L3					L4																								
		PI	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	v	w	x	y	z	AA	AB	AC	AD	AE	AF	AG	AH	AI	AJ	AK	AL	AM	AN	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	B1	B2	B3	B4	B5	B6	B7	B8	B9	B0	B1	B2	B3	B4	B5	B6	B7	B8	B9								
A	1	A1	82.74	5.33	1/2	9.00	1/2	34.00	9.50	1/2	24.67	A2	106.02	25.33	10.00	1/2	35.50	9.50	1/2	25.67	A3	106.02	25.00	10.00	1/2	34.50	9.50	1/2	27.00	A4	182.44	26.00	9.50	1/2	32.00	8.00	6.67	1/2	A5																																										

MINIMUM BOLT LENGTH

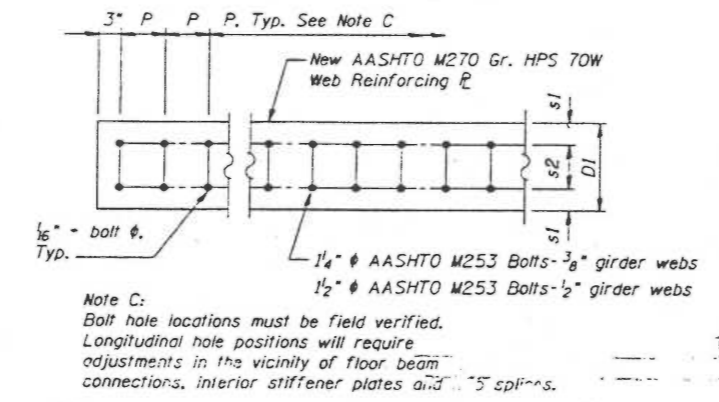
Bolt Diameter	Girder Web Plate	Total Reinforcement Plate Thickness							
		1	1/2	2	2 1/2	3	3 1/4	3 1/2	3 3/4
in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
1/2	2	3 3/4	4 1/4	4 3/4	5 1/4	5 3/4	6	6 1/2	6 3/4
1/4	3/8	3 1/2	4	4 1/2	5	5 1/2	na	na	na

Note B: Includes (1) 5/32" hardened washer each end.

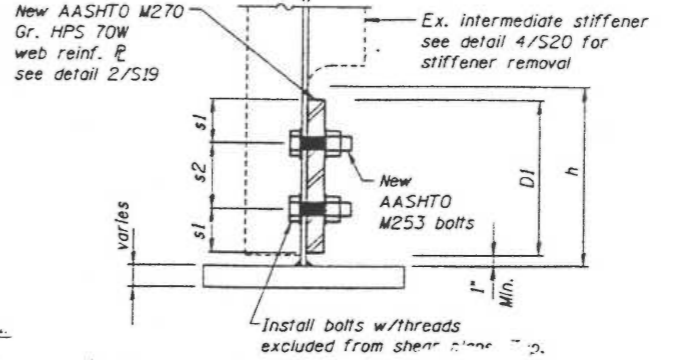
Note D: See S-20 and S-21 for additional web plate details.

Web Reinforcement Plate

Roadway Spans	D	DI	s1	s2	h	h1
	in.	in.	in.	in.	in.	in.
A1-A4	84	14	4	6	15	17
A5-A7	72	12	3	6	13	15
A8-A10	72	12	3	6	13	15
A12-A14	72	12	3	6	13	15
A15-A17	72	12	3	6	13	15
A18-A20	84	14	4	6	15	17
G1-G4	84	14	4	6	15	17
G5-G8	84	14	4	6	15	17
G9-G11	84	14	4	6	15	17
G12-G13	84	14	4	6	15	17



WEB REINFORCEMENT PLATE ELEVATION



TYPICAL WEB REINFORCEMENT PLATE

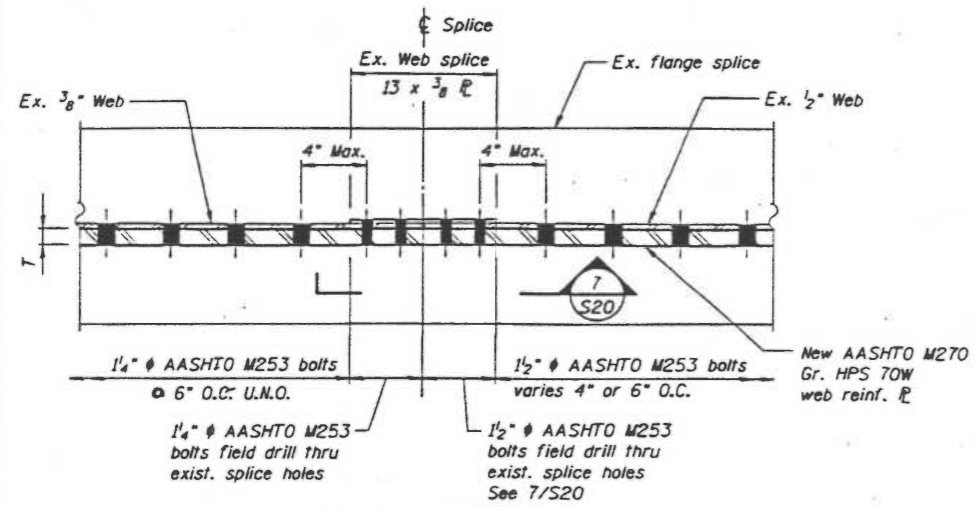
BILL OF MATERIAL

ITEM	UNIT	QUANTITY
Steel girder web reinforcement plate	Lbs.	436800
Vertical stiffener REMOVAL	EACH	1571

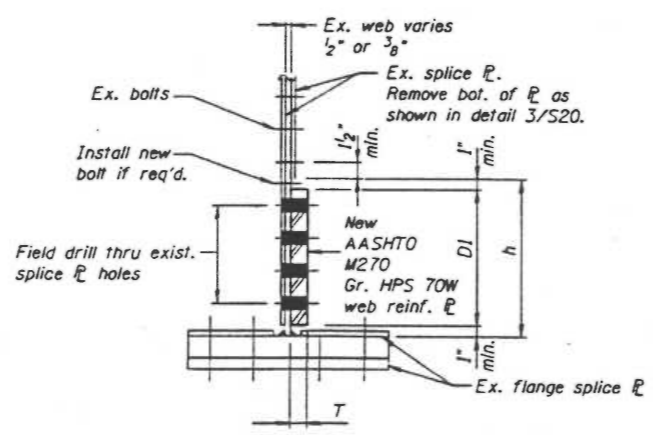
REDUANCY RETROFIT DETAILS

STATE OF ILLINOIS
 DEPARTMENT OF TRANSPORTATION
 SEISMIC AND REDUNDANCY RETROFIT REPAIRS
 FAI ROUTE TO
 PUBLIC STREET BRIDGE APPROACHES
 ST. CLAIR COUNTY

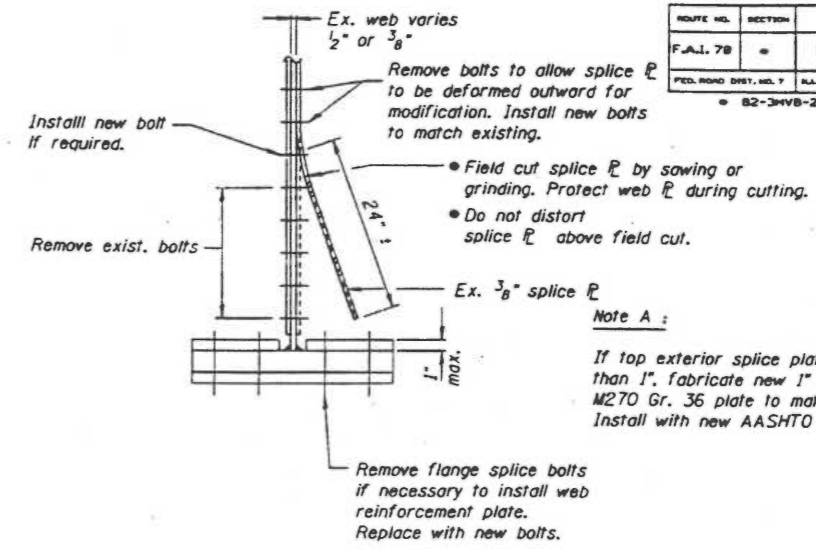
STRUCTURE NO. 06-G201 (RAMP) ON
 SCALE: NONE
 DATE 1-23-98
 DRAWN BY JUN
 CHECKED BY JWH



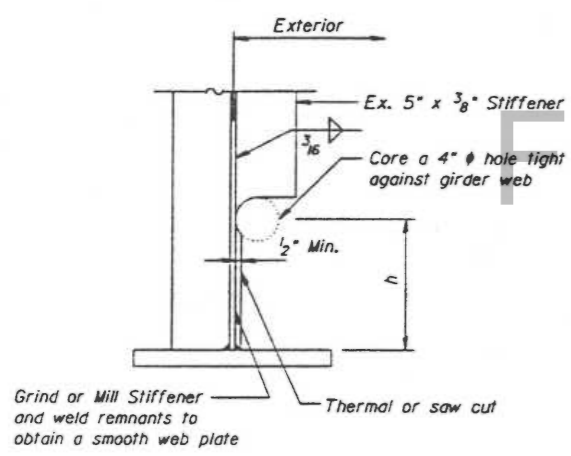
1
S20
WEB REINFORCEMENT PLATE AT GIRDER WEB SPLICE



2
S20
WEB REINFORCEMENT PLATE AT GIRDER WEB SPLICE

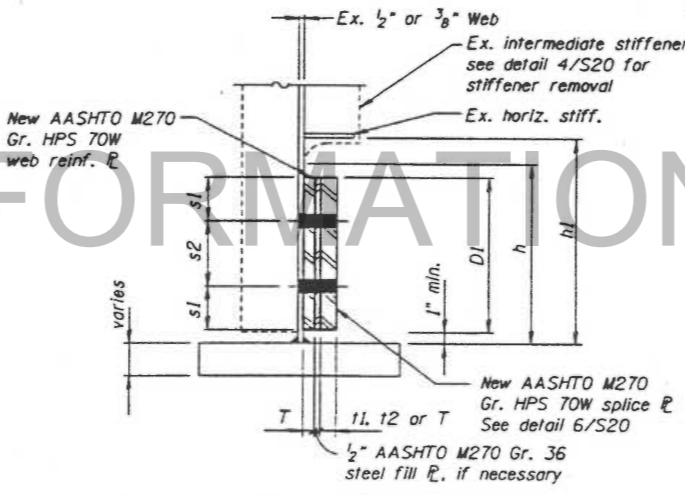


3
S20
GIRDER SPLICE PLATE MODIFICATION

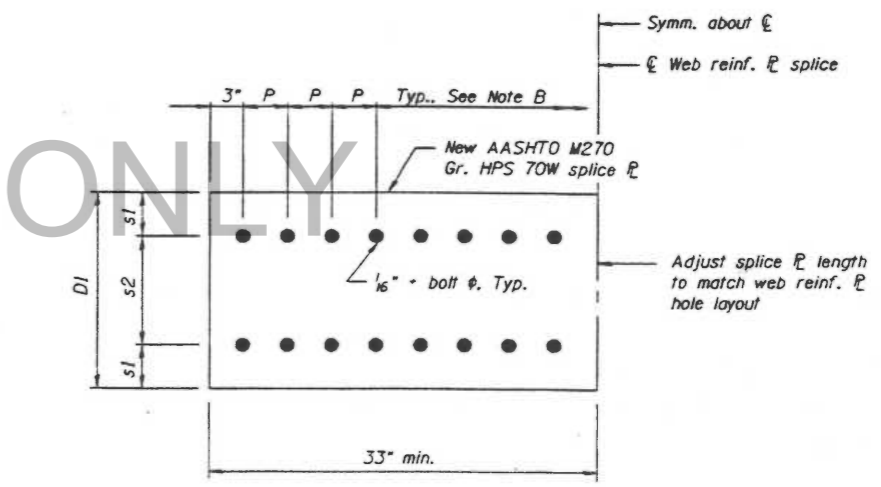


4
S20
VERTICAL STIFFENER MODIFICATION

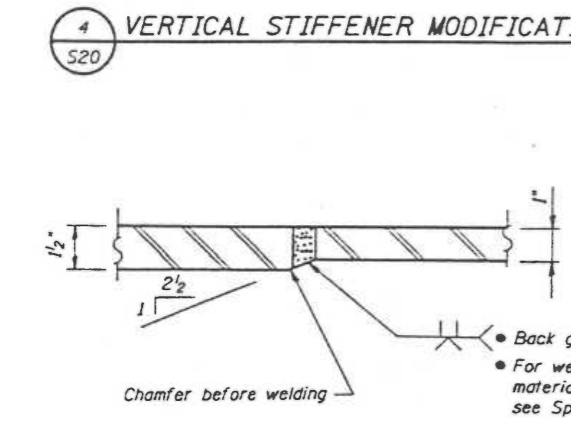
- Procedure :**
1. Core a 4" ϕ hole tight against girder web. Do not notch or gouge web plate.
 2. Thermal or saw cut, horizontal cut and vertical cut. Vertical cut shall be positioned at least 1/2" away from girder web. Do not notch or gouge web plate.
 3. Remove all stiffener remnants and connecting welds by grinding or milling. Web plate surface shall have a Roughness Average (R_a) of 250 or less.



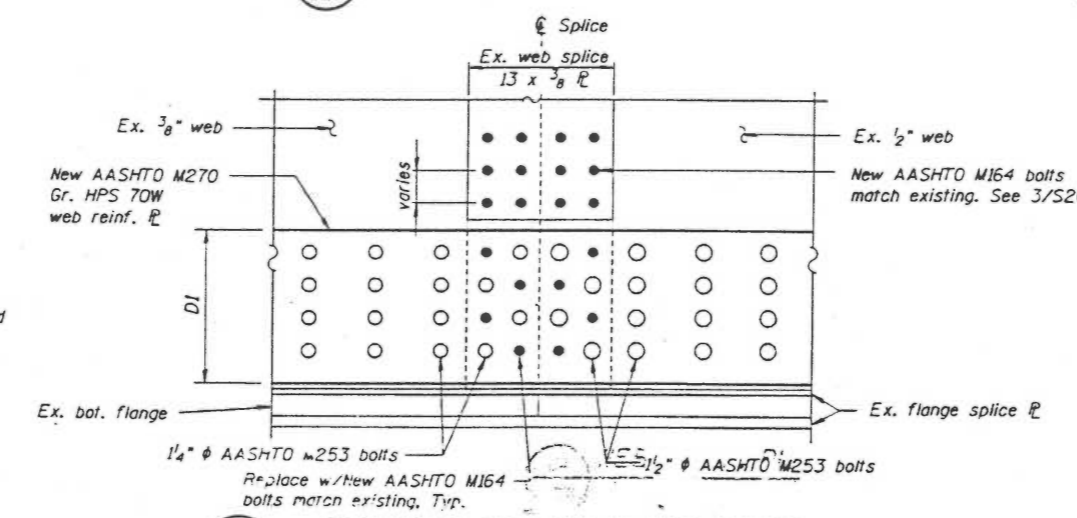
5
S20
TYPICAL WEB REINFORCEMENT PLATE SPLICE



6
S20
TYPICAL WEB REINFORCEMENT SPLICE PLATE



ALT. BUTT WELD SPLICE AT REINFORCEMENT PLATE TRANSITION



7
S20
ELEVATION AT GIRDER WEB SPLICE

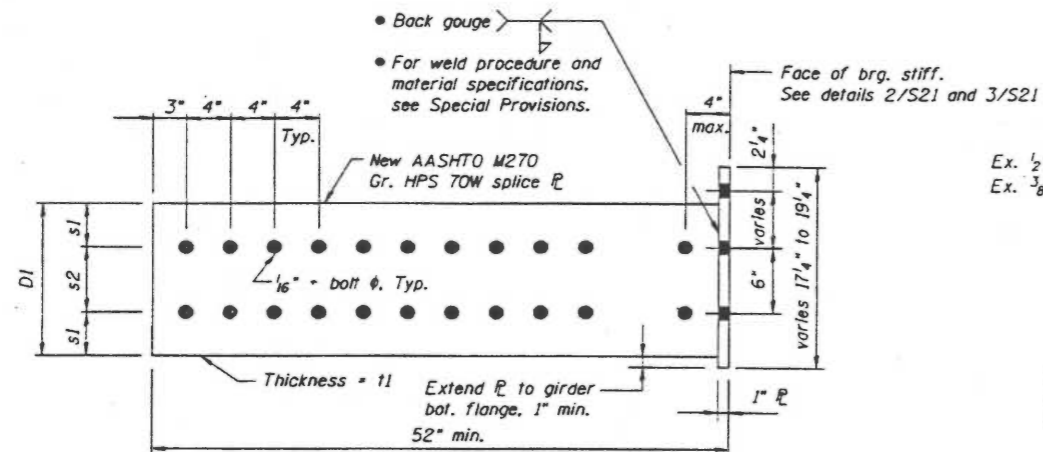
- Note B :** For splice locations other than at piers
- Hole size and spacing to match web reinf. ϕ .
 - Splice ϕ thickness to match greater web reinf. ϕ thickness.
 - Min. no. fasteners = 32
 - Alternate butt weld (See detail 6A/S20)

- Notes :**
1. See sheet S-19 for dimensions $D1, h, h1, s1$ & $s2$.
 2. See sheet S-21 for dimensions 11 & 12.
 3. T = thickness of top flange ϕ .

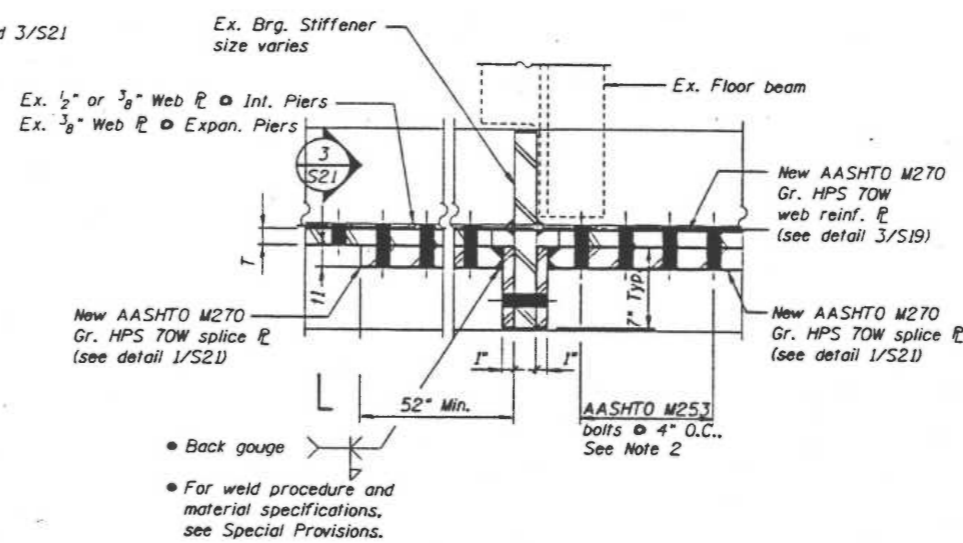
REUNDANCY RETROFIT DETAILS

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIR
FAI ROUTE 70
FOPLAR STREET BRIDGE APPROACH
ST. CLAIR COUNTY

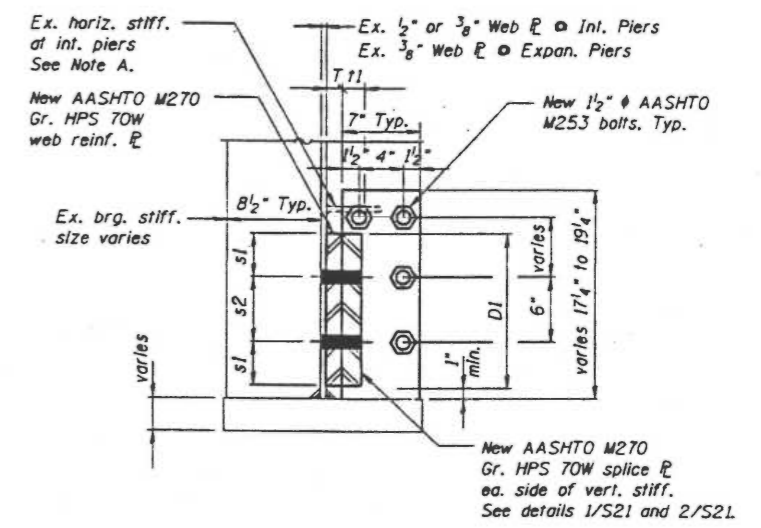
STRUCTURE NO. 082-0141 (ROADWAY A)	STRUCTURE NO.
STRUCTURE NO. 082-0254 (ROADWAY C)	STRUCTURE NO. 082-0201 (ROADWAY D)
SCALE: NONE	DRAWN BY: JN
DATE: 1-23-98	CHECKED BY: HH



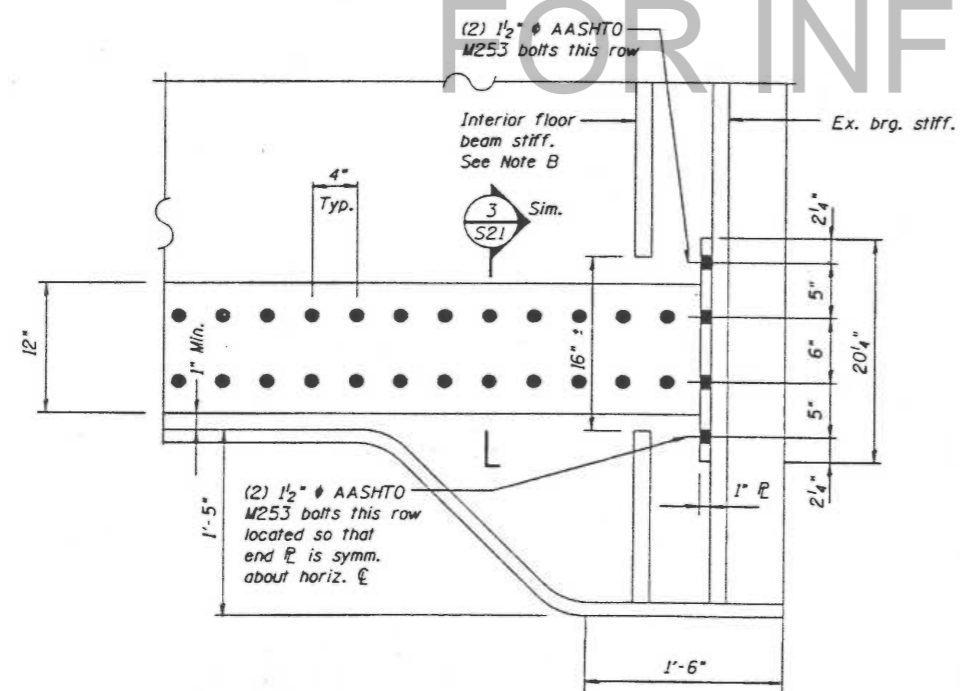
1 TYPICAL WEB REINFORCEMENT SPLICE PLATE AT PIERS
S21



2 WEB REINFORCEMENT PLATE SPLICE AT BEARING STIFFENER
S21



3 WEB REINFORCEMENT PLATE AT PIERS
S21



4 WEB REINFORCEMENT SPLICE PLATE AT HAUNCH
S21

Note B: Remove vertical stiffener to permit installation of web reinforcement splice plate. See detail 4/S20. Two core holes through stiffener will be required for stiffener removal.

- Notes:
1. Web reinforcement plate splice symmetric around interior bearing stiffener.
 2. 1/2" AASHTO M253 bolts in all 1/2" girder webs, threads excluded from shear plane. 1/4" AASHTO M253 bolts in all 3/8" girder webs, threads excluded from shear plane.
 3. Preload 1/2" AASHTO M253 bolts to proof load. Preload 1/4" AASHTO M253 bolts to proof load.

Note A: End of longitudinal stiffener to be removed if necessary to permit installation of splice plate.

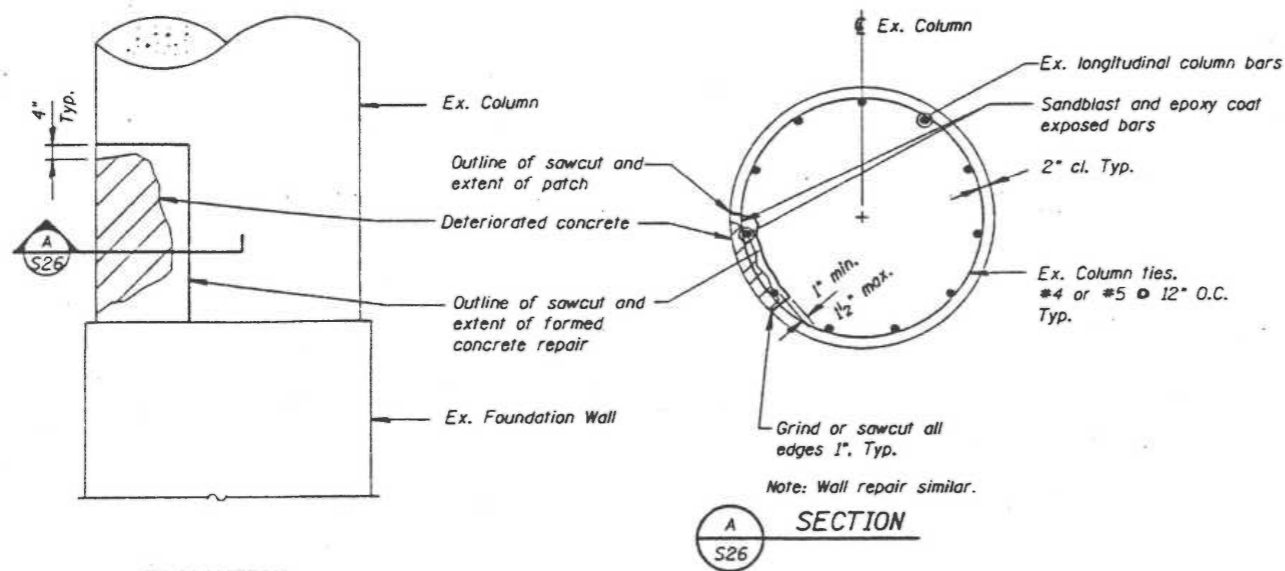
Roadway Spans	Splice Plate	
	Int. Pier	Expan. Pier
	11	12
	in.	in.
A1-A4	1 3/4	1 1/2
A5-A7	1 1/2	1
A8-A10	1 1/2	1 1/2
A12-A14	1 3/4	1 1/2
A15-A17	2	1 1/2
A18-A20	1 1/2	1 1/2
G1-G4	1 1/2	1 1/2
G5-G8	1 1/2	1 1/2
G9-G11	1 1/2	1 1/2
G12-G13	1 3/4	1 1/2

REDUNDANCY RETROFIT DETAILS

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT PROGRAMS
FAI ROUTE 70
ST. CLAIR COUNTY

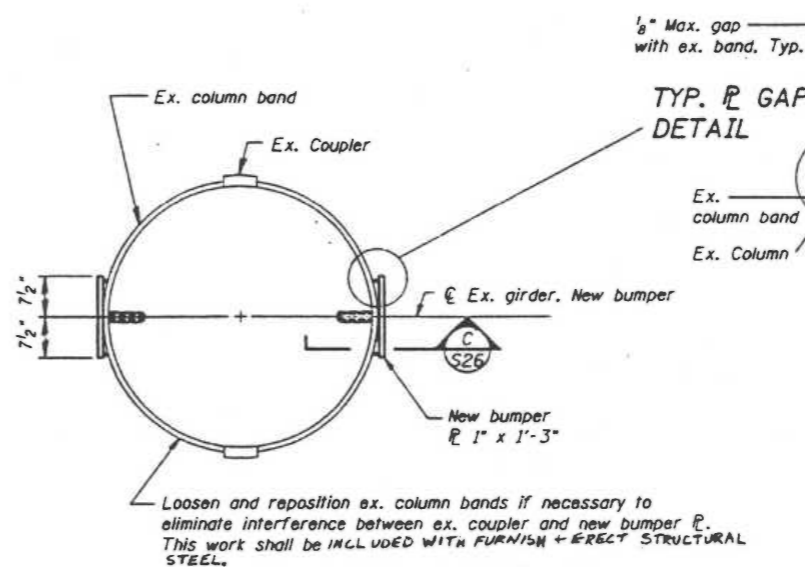
STRUCTURE NO. 082-0254 BROADWAY G1 STRUCTURE NO. 082-0254 BROADWAY G1
SCALE: NONE DRAWN BY JN
DATE 1-23-98 CHECKED BY

ROUTE NO.	SECTION	QUANTITY	TOTAL SHEETS	SHEET NO.	SHEET NO. S-26 SHEETS
F.A.I. 7B	III	ST. CLAIR	91	24	
FED. ROAD DIST. NO. 7 ALL MOIS. PROJ. AND PROJECTS = 82-34V8-2R-1-1					



ELEVATION

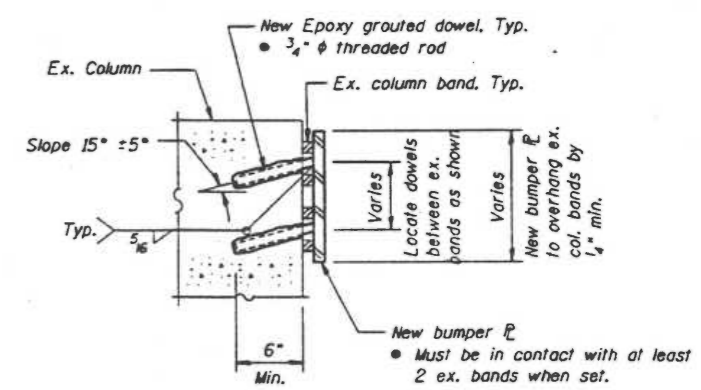
1 TYPICAL CONCRETE COLUMN REPAIR
S26



TYP. GAP DETAIL

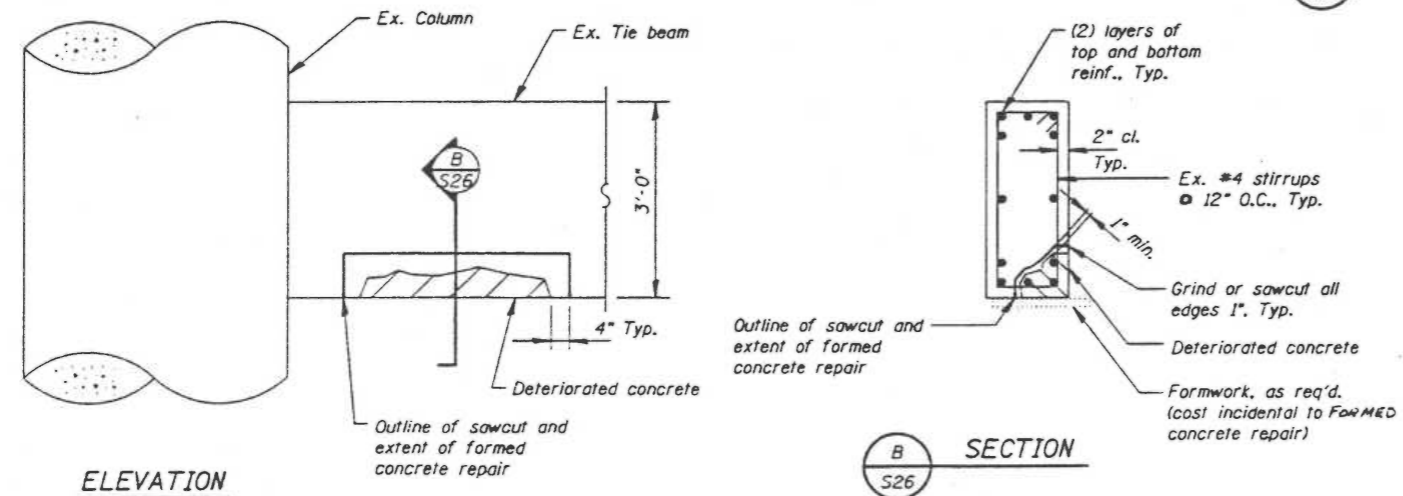
C SECTION
S26

- Loosened bands shall be reinstalled from bottom up. The repositioned bands shall be evenly spaced as possible and be located with a space of 10" vertically. The top of the top band shall not be closer than 3/4" nor farther than 4" from the top of the column.
- The bolts shall be tightened in 55 Ft.-Lb. increments in a clockwise direction, to a final torque of 220 Ft.-Lbs.
- All of the threads in each of the four nuts shall be fully engaged upon final tightening.
- Once a final torque of 220 Ft.-Lbs. is reached in each nut, the band threads shall be peened to the nut to prevent loosening.



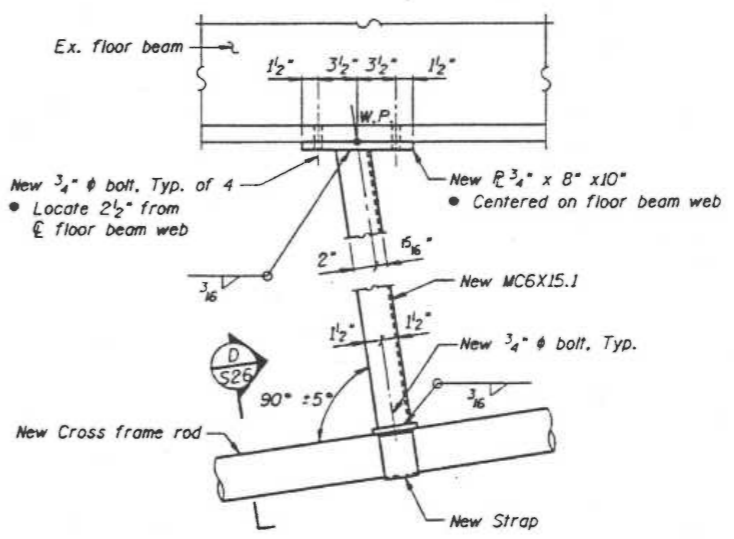
FOR INFORMATION ONLY

3 BUMPER PLATE DETAIL
S26

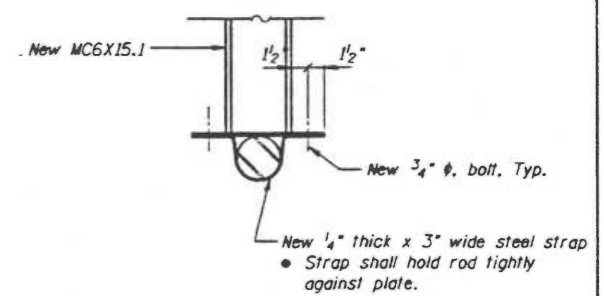


ELEVATION

2 TYPICAL CONCRETE TIE BEAM REPAIR
S26



4 TIE ROD SUPPORT DETAIL
S26



D SECTION
S26

CONCRETE REPAIR DETAILS

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND RESONANCE RETROFIT REPAIRS
DATE 7/0

STRUCTURE NO. 082-0254 (INDUSTRIAL) STRUCTURE NO. 082-0201 (RAILROAD)
SCALE: NONE DRAWN BY JN
DATE 1-23-98 CHECKED BY HH

EXPANSION JOINT, BUMPER, PIN AND TIE ROD GAPS

Pier	East Side	West Side
A5	0.60"	1.05"
A8	1.10"	0.85"
A11	0.40"	0.70"
A12	0.50"	N/A
A15	1.10"	1.10"
A18	1.00"	0.75"
A21	0.75"	0.65"
R3-1	0.75"	1.05"
G1	0.75"	0.85"
G5	1.55"	1.70"
G9	0.75"	0.85"
G12	N/A	1.00"

Notes:

1. Gaps defined as follows:

- Bumper Gap: Minimum clear distance between bumper and bumper plate.
- Pin Gap: Minimum clear distance between clevis pin and edge of plate in direction of rod.
- Tie Rod Gap: Clear distance between washer and end plate of bracket.

2. Gap dimensions shown were based upon roadway deck temperature of 50° F. If the roadway deck temperature (measured at mid-depth of concrete deck within 4 hours of installation) is greater than 50° F, decrease bumper gaps, and increase pin and tie rod gaps by the following amount:

$$\text{Gap change} = \left(\frac{\text{Actual Deck Temperature} - 50^\circ \text{ F}}{70} \right) \times \text{Gap shown}$$

If roadway deck temperature is less than 50° F, increase bumper gaps, and decrease pin and tie rod gaps by the following amount:

$$\text{Gap change} = \left(\frac{50^\circ \text{ F} - \text{Actual Deck Temperature}}{70} \right) \times \text{Gap shown}$$

FOR INFORMATION ONLY

SEISMIC RETROFIT DETAILS

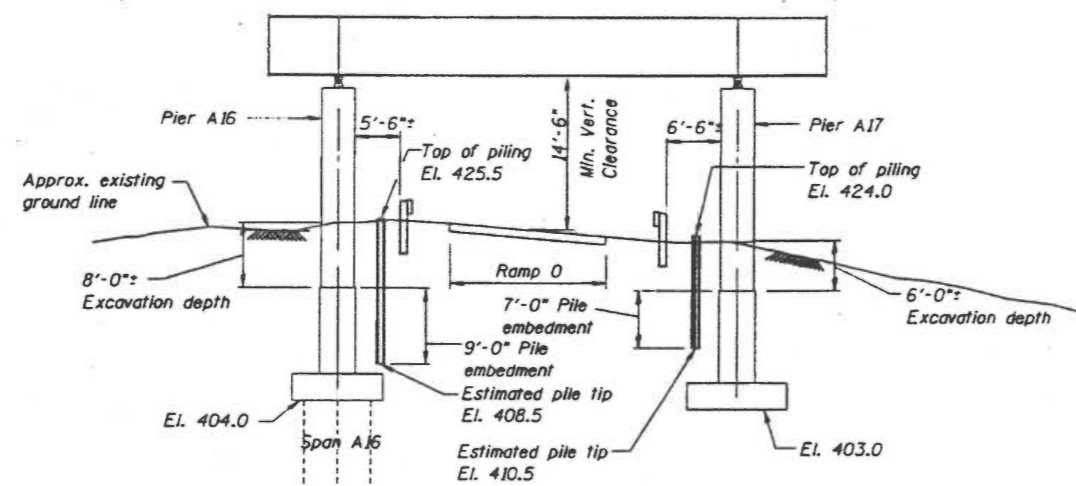
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
FAI ROUTE 70
CLAR STREET BRIDGE APPROACHES
T. CLAIR COUNTY

STRUCTURE NO. 010-0257
DATE: _____ CHECKED BY: NH

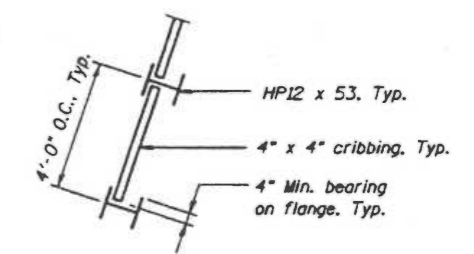
STRUCTURE 010-0257-001

ROUTE NO.	SECTION	EMBIT	TOTAL SHEETS	SHEET NO.	SHEET NO. 5-28
F.A.I. 70		ST. CLAIR	91	26	SHEETS
FED. ROAD DIST. NO. 7	SUBJECTS		FED. AID PROJECT		

© 82-34VB-2R-1-1



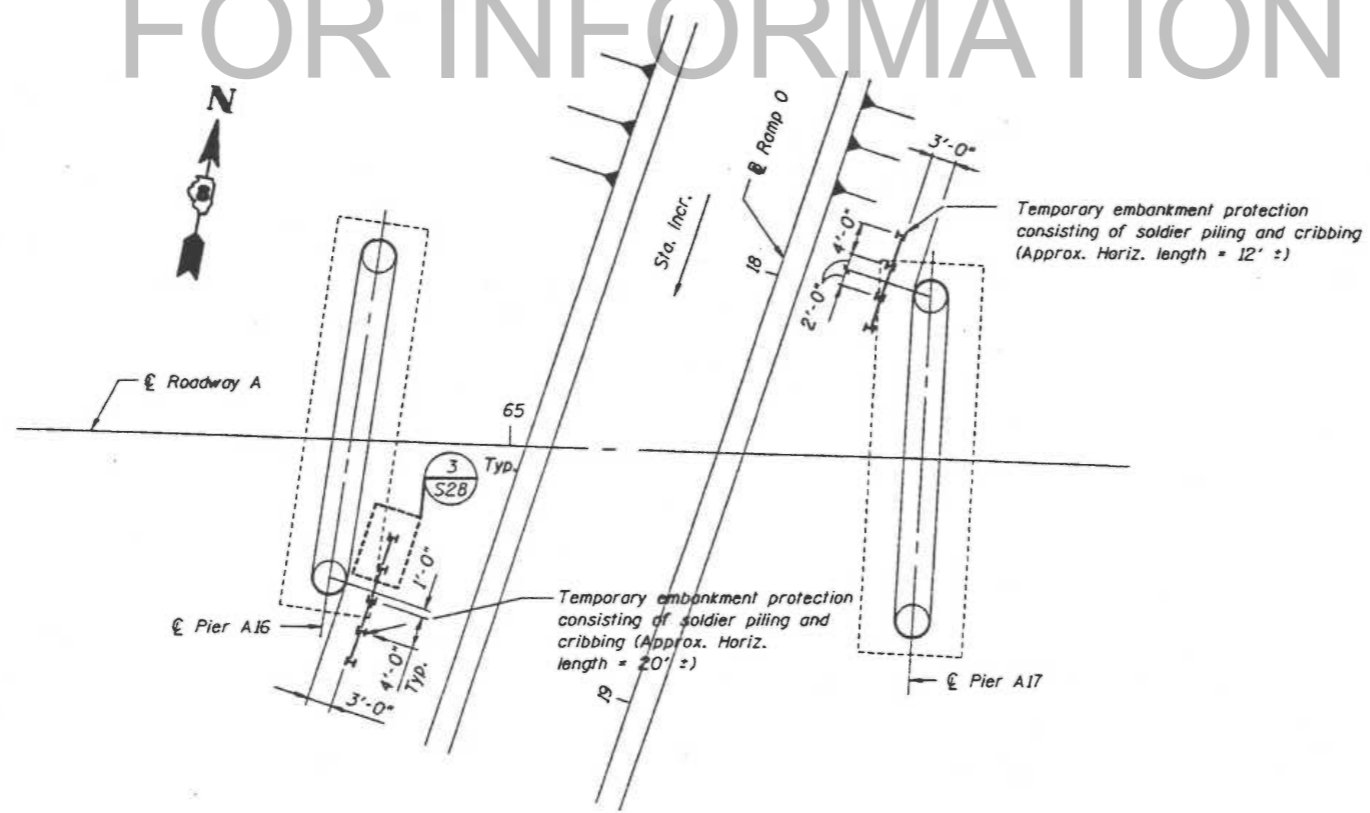
1 ELEVATION PIERS A16 & A17
S28



Note: The existing headroom may require auger drilling to install HP piles.

3 PILING DETAIL
S28

FOR INFORMATION ONLY



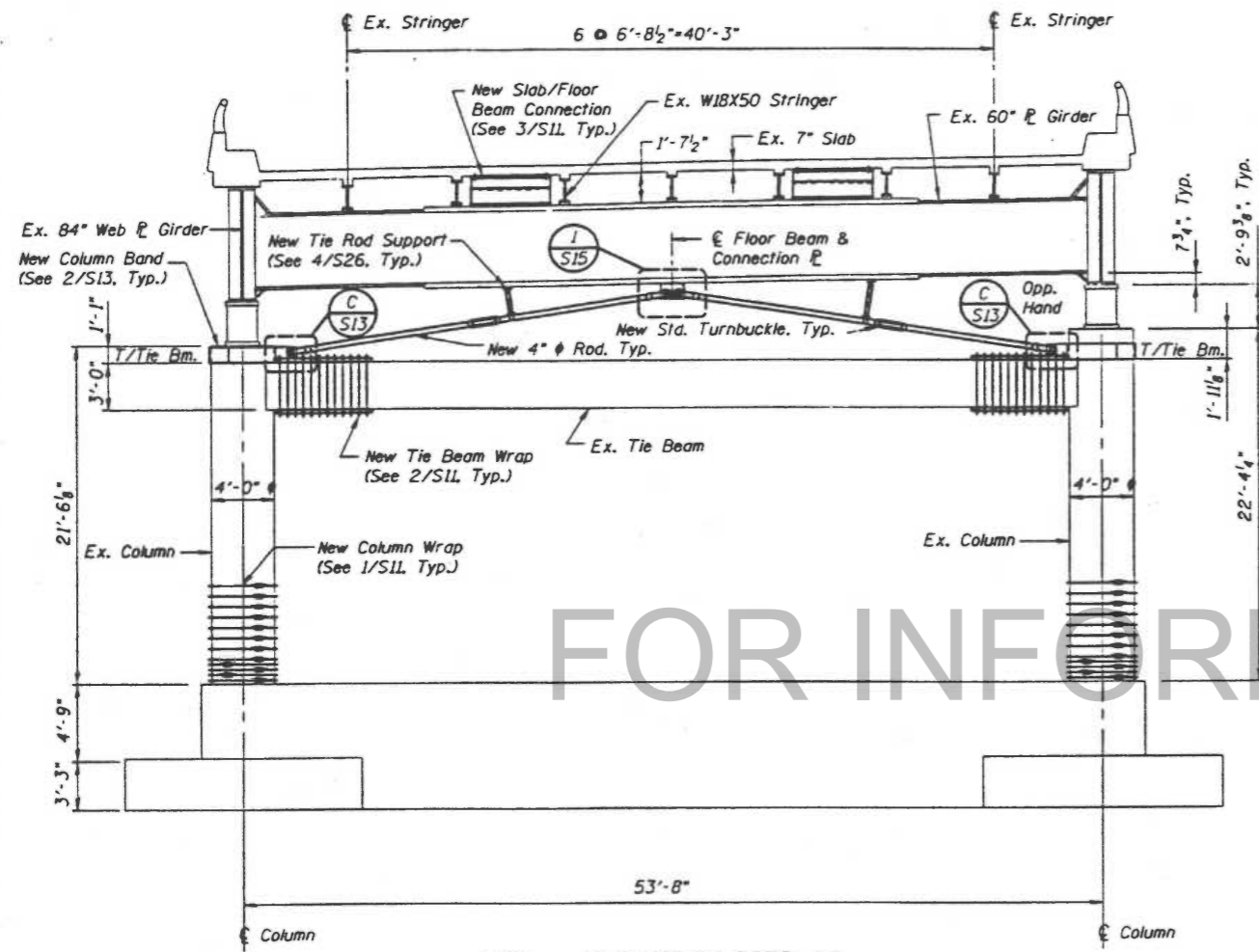
2 PLAN PIERS A16 & A17
S28

- Notes:
1. Locate all utilities prior to pile installation and excavation.
 2. The contractor shall use caution during pile installation and excavation not to damage existing Ramp O barriers.

TEMPORARY EMBANKMENT PROTECTION

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
FAI ROUTE 70
POPLAR STREET BRIDGE APPROACHES
ST. CLAIR COUNTY

STRUCTURE NO. ROADWAY A STRUCTURE NO. SHEET NO.
SCALE: NONE
DATE: 1-23-98 CHECK:



FOR INFORMATION ONLY

1
S29
ELEVATION PIER A2

BILL OF MATERIAL - PIER A2		
ITEM	UNIT	QUANTITY
Furnish and erect structural steel	LBS.	7150
Epoxy grouted dowels	EACH	24
Column wrap	SQ. FT.	163.4

BILL OF MATERIAL - PIER A3 *		
ITEM	UNIT	QUANTITY
Furnish and erect structural steel	LBS.	290
Epoxy grouted dowels	EACH	8

* Elevation not shown

BILL OF MATERIAL - PIER A4 *		
ITEM	UNIT	QUANTITY
Furnish and erect structural steel	LBS.	2965
Epoxy grouted dowels	EACH	20
Foundation wall dowel modification	EACH	8
Column wrap	SQ. FT.	202.7

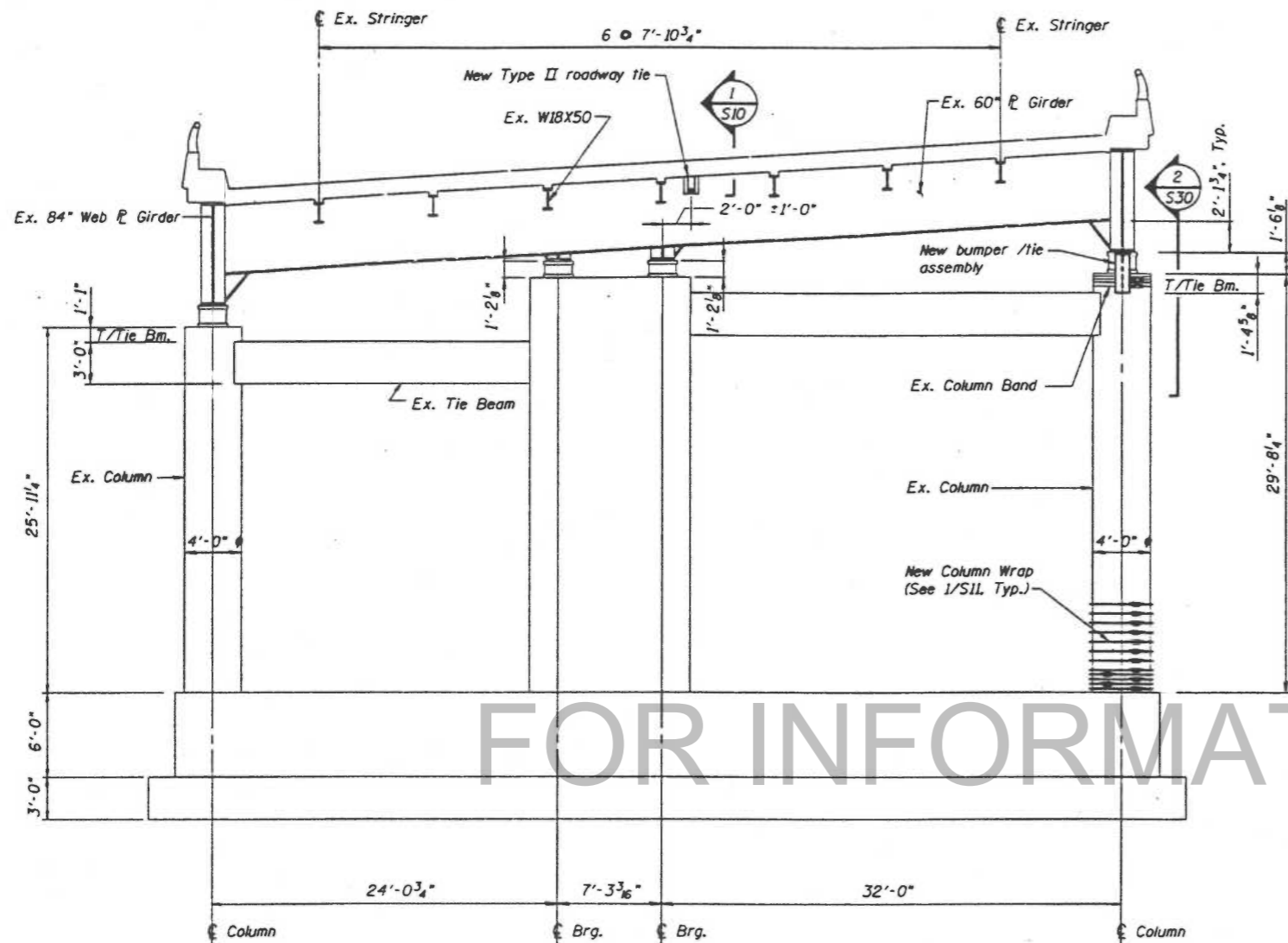
* Elevation not shown

PIER A2 RETROFIT

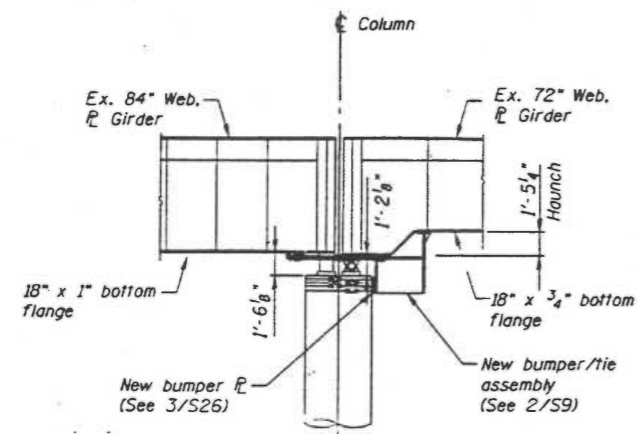
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
FAI ROUTE 70
POPLAR STREET APPROACHES

STRUCTURE NO. 000-011
DRAWING NO. 062-014
SCALE: NONE
DATE 1-23-98

DRAWN BY
CHECKED BY MH



1 ELEVATION PIER A5
S30



SECTION THROUGH EXISTING ROADWAY GIRDERS AT PIER A5

ITEM	UNIT	QUANTITY
Concrete removal	CY	6.7
Furnish and erect structural steel	LBS.	3685
Epoxy grouted dowels	EACH	24
Column wrap	SQ. FT.	81.7

ITEM	UNIT	QUANTITY
Furnish and erect structural steel	LBS.	1990
Epoxy grouted dowels	EACH	12
Foundation wall dowel modification	EACH	8
Column wrap	SQ. FT.	163.4

* Elevation not shown

PIER A5 RETROFIT
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
FAI ROUTE 70
POPLAR STREET BRIDGE ROACHES
ST

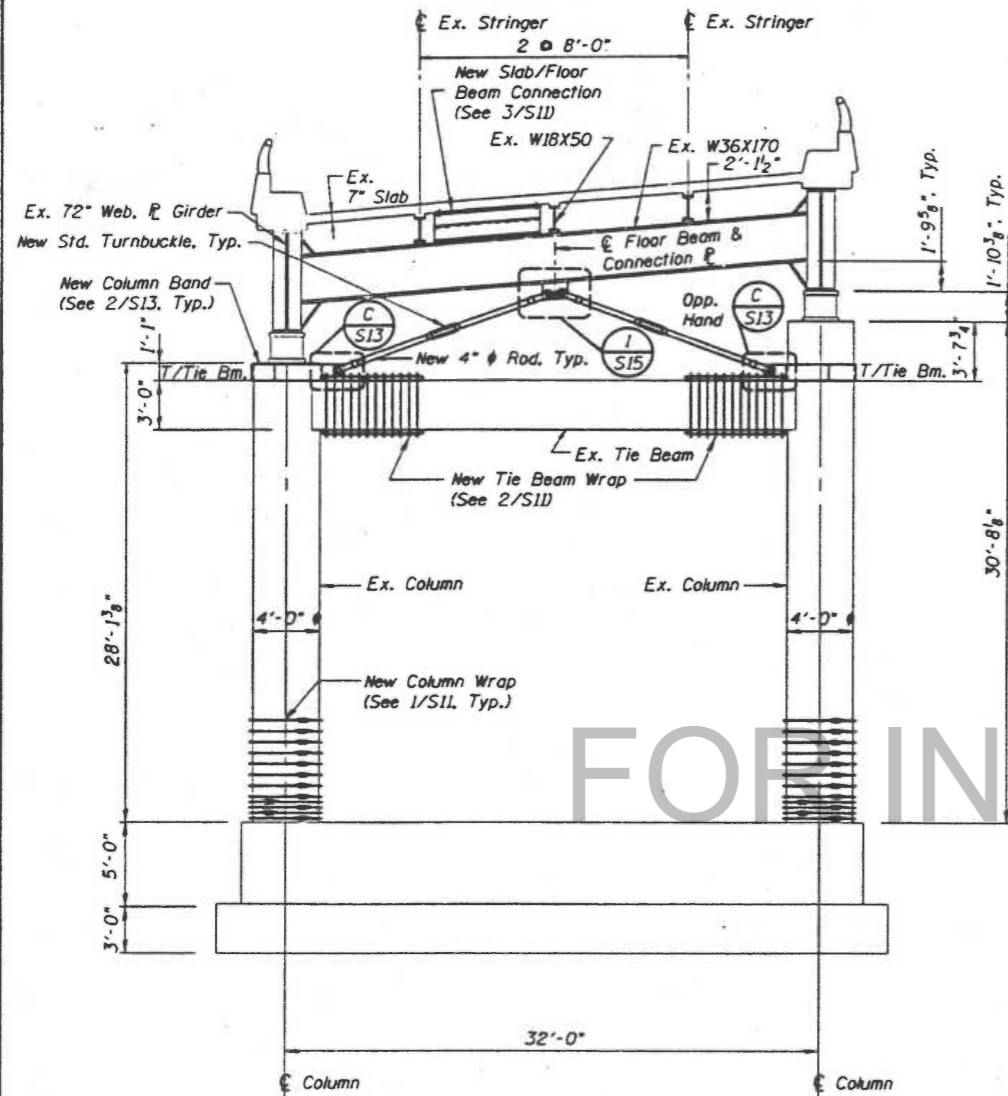
FOR INFORMATION ONLY

M:\PROJECTS\82-3118-2R-1-1\PIER A5.DWG

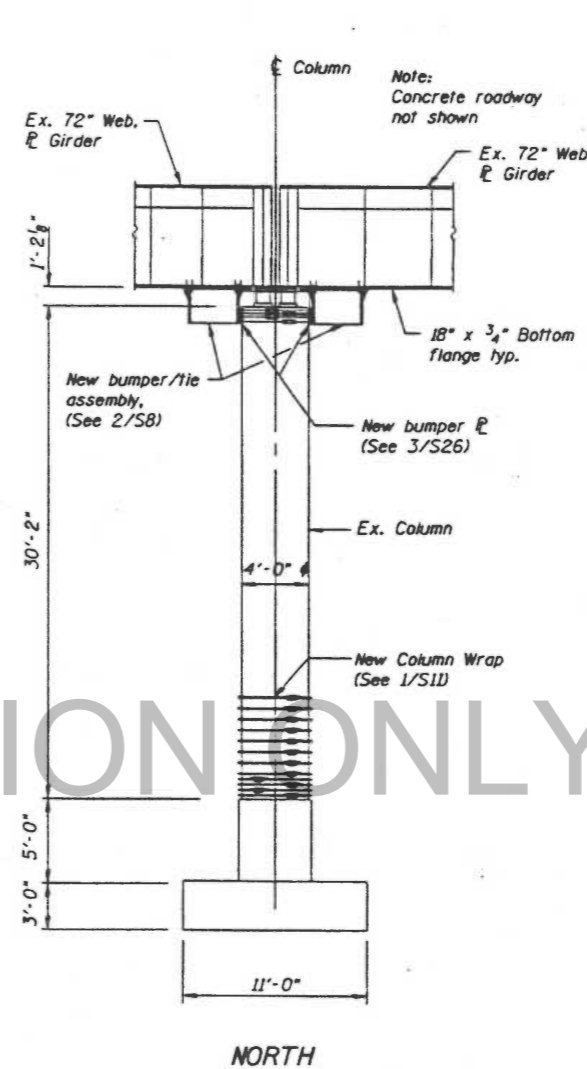
S30

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.	SHEET NO. S-31
F.A.I. 70		ST. CLAIR	91	29	SHEETS
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT			

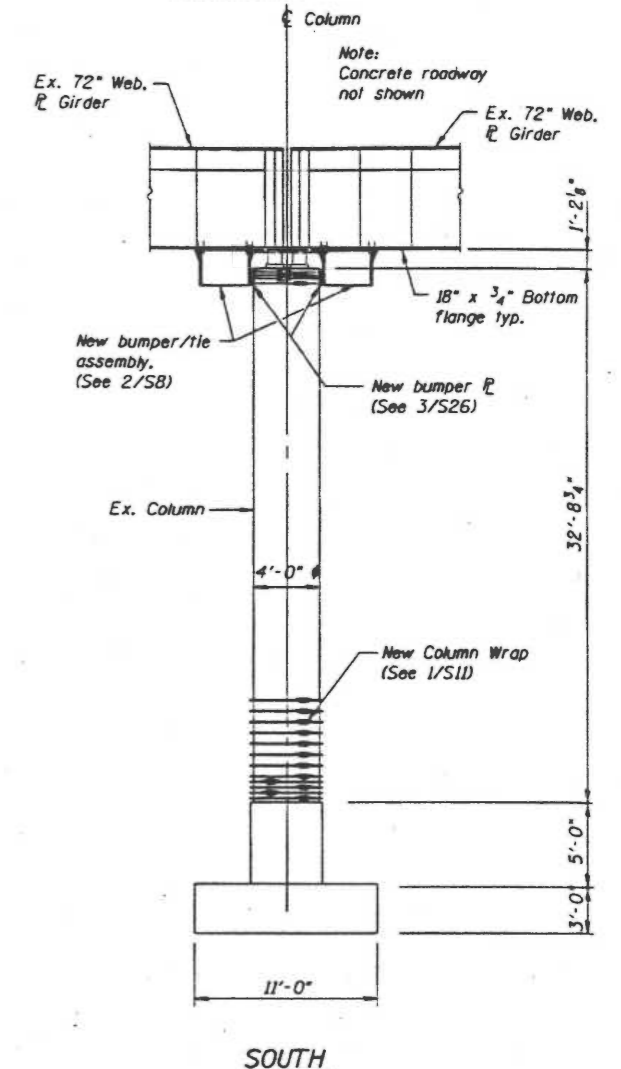
B2-DHB-2R-1-1



1 ELEVATION PIER A7
S31



NORTH



SOUTH

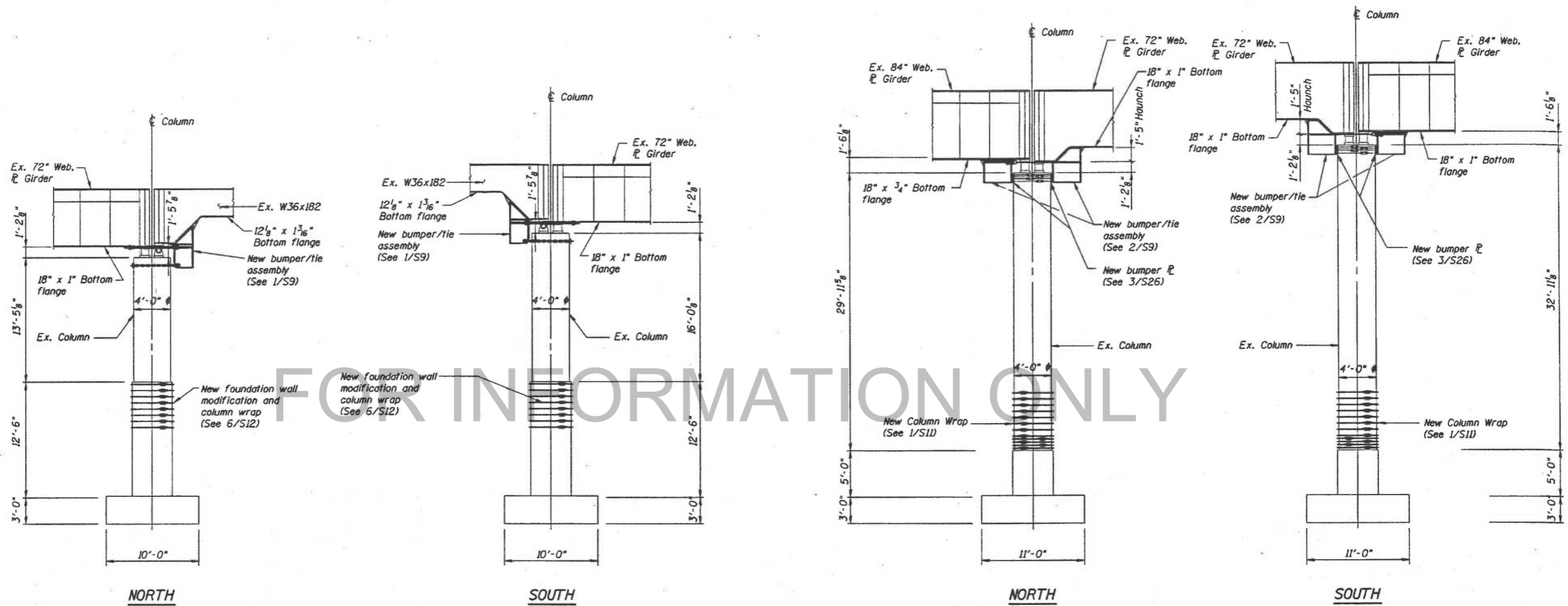
2 ELEVATIONS PIER A8
S31

BILL OF MATERIAL - PIER A7		
ITEM	UNIT	QUANTITY
Furnish and erect structural steel	LBS.	4973
Epoxy grouted dowels	EACH	13
Column wrap	SQ. FT.	163.4

BILL OF MATERIAL - PIER A8		
ITEM	UNIT	QUANTITY
Concrete removal	CY.	3.9
Furnish and erect structural steel	LBS.	3077
Epoxy grouted dowels	EACH	8
Foundation wall dowel modification	EACH	12
Column wrap	SQ. FT.	163.4

PIERS A7 AND A8 RETROFITS

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
FAI ROUTE 70
POPLAR STREET BRIDGE APPROACHES
ST. CLAIR COUNTY



BILL OF MATERIAL - PIER A12		
ITEM	UNIT	QUANTITY
Formed concrete repair	SQ. FT.	60
Furnish and erect structural steel	LBS.	2300
Foundation wall modification	SQ. FT.	45
Column wrap	SQ. FT.	148.8

BILL OF MATERIAL - PIER A13*		
ITEM	UNIT	QUANTITY
Furnish and erect structural steel	LBS.	2115
Epoxy grouted dowels	EACH	18
Foundation wall dowel modification	EACH	16
Column wrap	SQ. FT.	163.4

BILL OF MATERIAL - PIER A14*		
ITEM	UNIT	QUANTITY
Furnish and erect structural steel	LBS.	1748
Epoxy grouted dowels	EACH	8
Column wrap	SQ. FT.	163.4

BILL OF MATERIAL - PIER A15		
ITEM	UNIT	QUANTITY
Concrete removal	CY	5.5
Furnish and erect structural steel	LBS.	3702
Epoxy grouted dowels	EACH	8
Foundation wall dowel modification	EACH	16
Column wrap	SQ. FT.	163.4

* Elevation not shown

* Elevation not shown

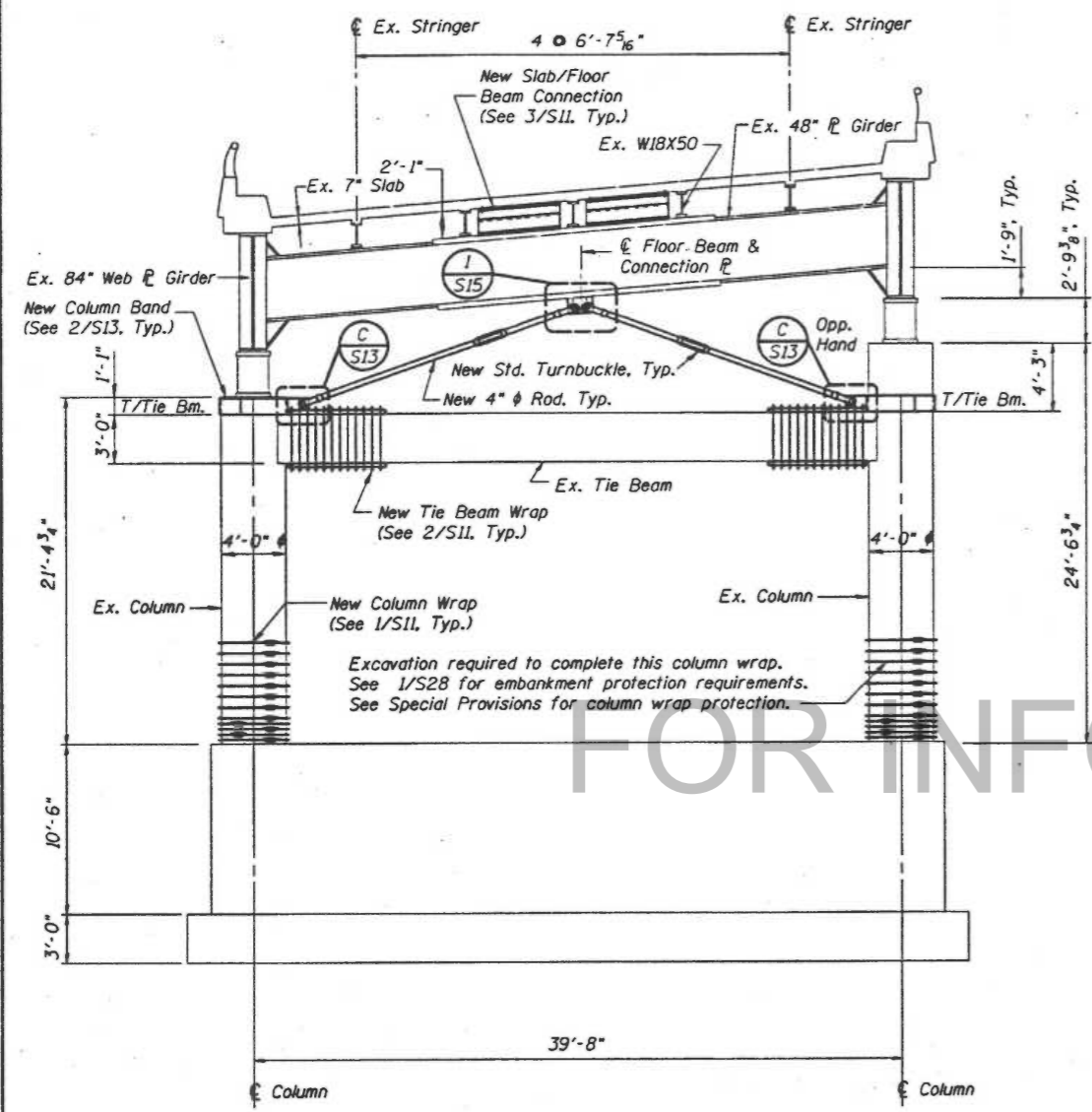
PIERS A12 AND A15 RETROFITS

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
FAI ROUTE TO
POPLAR STREET BRIDGE /
ST. CLAIR COUNTY

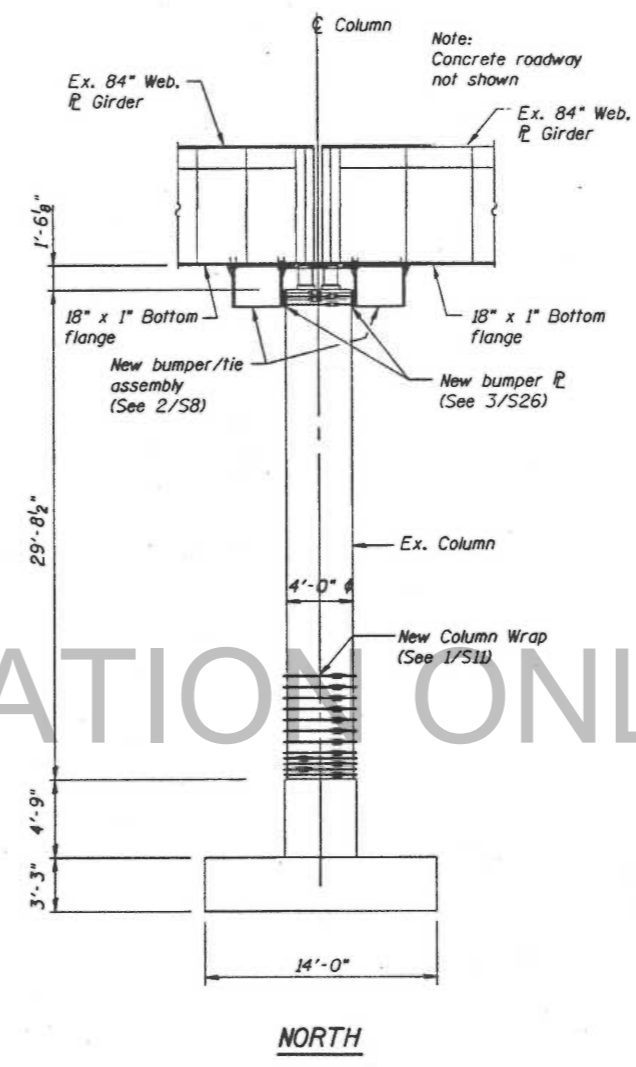
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DATE: 1-23-98

CHECKED BY: H81

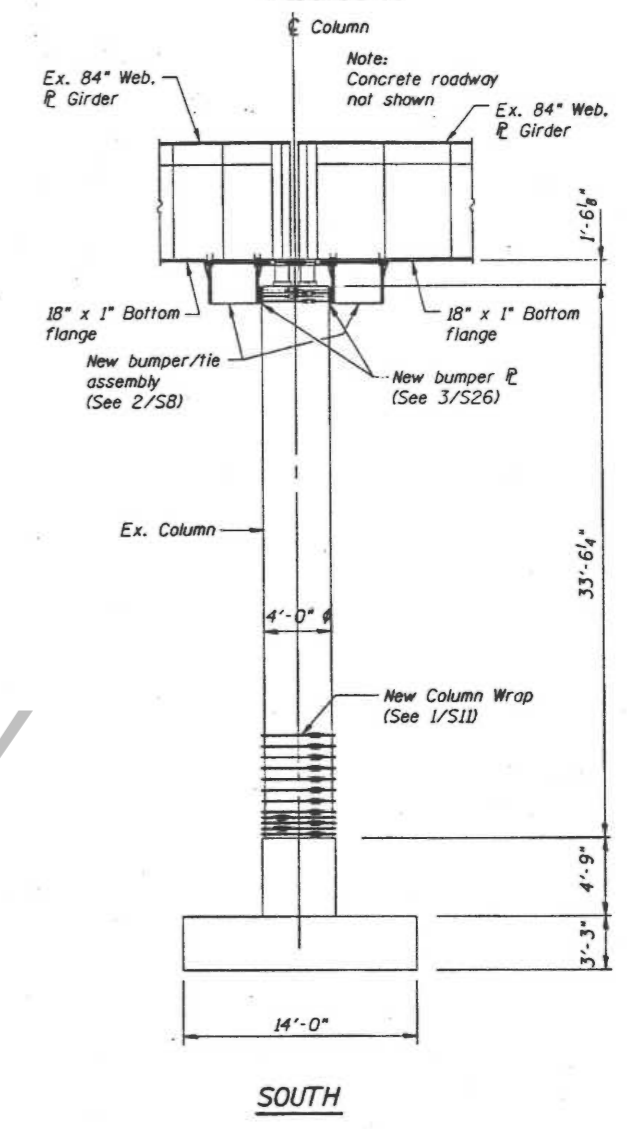
82-3HVB-2R-1-1



1 ELEVATION PIER A16
S34



2 ELEVATIONS PIER A18
S34



BILL OF MATERIAL - PIER A16		
ITEM	UNIT	QUANTITY
Excavation	CY	40
Embankment protection	SQ. FT.	96
Furnish and erect structural steel	LBS.	5973
Epoxy grouted dowels	EACH	20
Column wrap	SQ. FT.	163.4
Column wrap protection	EACH	1

BILL OF MATERIAL - PIER A17*		
ITEM	UNIT	QUANTITY
Excavation	CY	30
Embankment protection	SQ. FT.	54
Furnish and erect structural steel	LBS.	2770
Epoxy grouted dowels	EACH	20
Foundation wall dowel modification	EACH	12
Column wrap	SQ. FT.	202.7
Column wrap protection	EACH	1

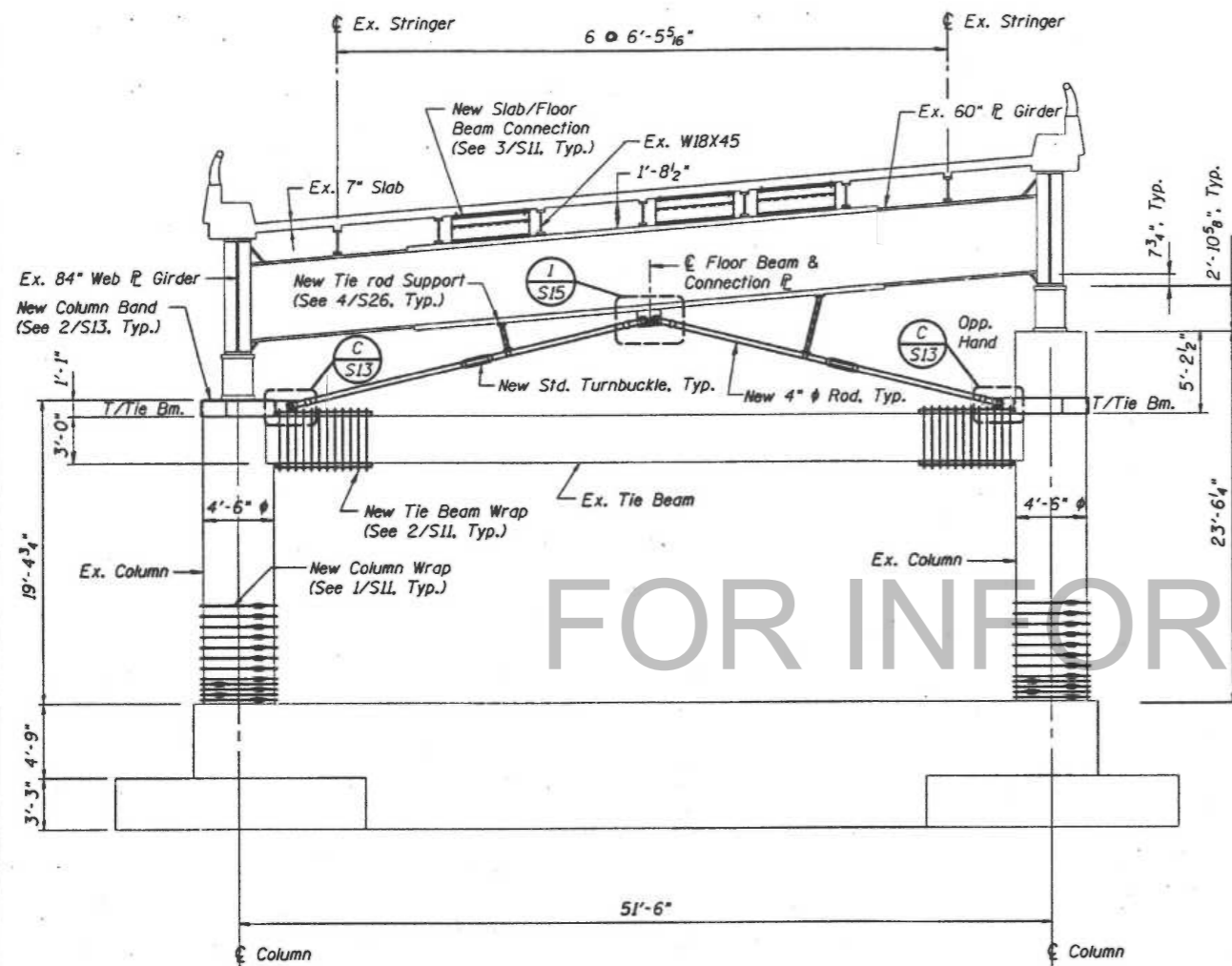
BILL OF MATERIAL - PIER A18		
ITEM	UNIT	QUANTITY
Concrete removal	CY	9
Furnish and erect structural steel	LBS.	3257
Epoxy grouted dowels	EACH	8
Foundation wall dowel modification	EACH	12
Column wrap	SQ. FT.	163.4

* Elevation not shown

PIERS A16 & A18 RETROFITS

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
FAI ROUTE 70
POPLAR STREET BRIDGE APPROACHES

DATE 1-23-98



FOR INFORMATION ONLY

1
S35
ELEVATION PIER A19

BILL OF MATERIAL - PIER A19		
ITEM	UNIT	QUANTITY
Furnish and erect structural steel	LBS.	7296
Epoxy grouted dowels	EACH	27
Column wrap	SQ. FT.	202.7

BILL OF MATERIAL - PIER A20*		
ITEM	UNIT	QUANTITY
Furnish and erect structural steel	LBS.	730
Epoxy grouted dowels	EACH	20
Foundation wall dowel modification	EACH	16
Column wrap	SQ. FT.	202.7

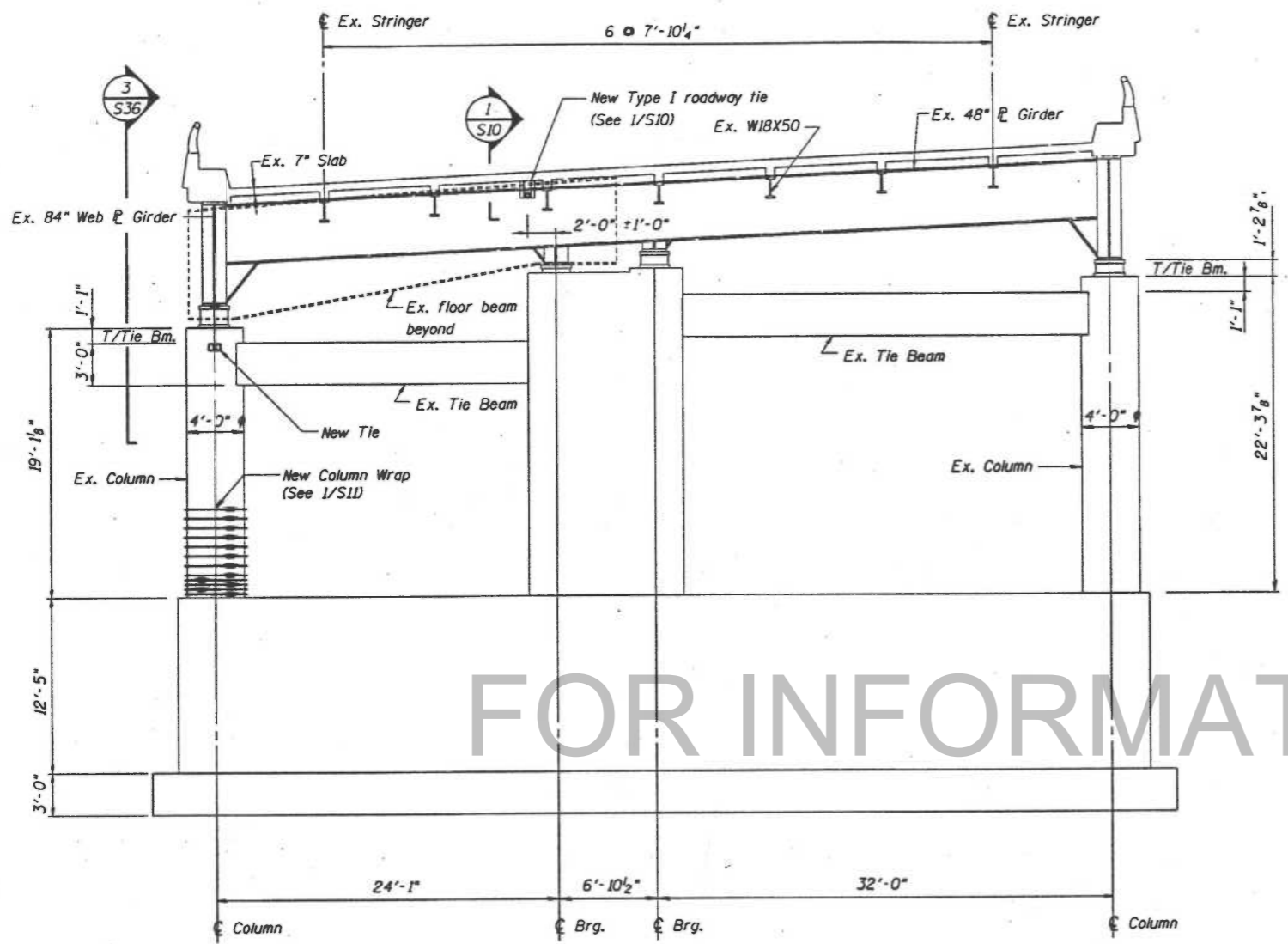
* Elevation not shown

PIER A19 RETROFIT

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
FAI ROUTE 70
POPLAR BLVD BRIDGE APPROACH
ST. CLAIR COUNTY

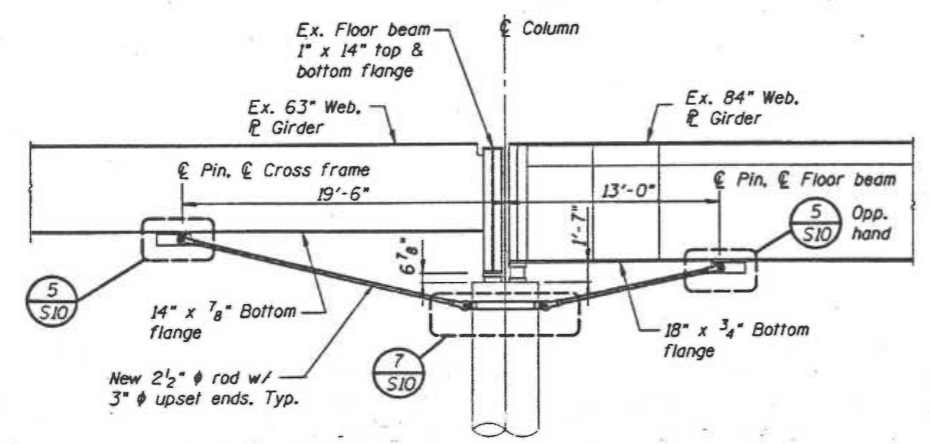
STRUCTURE NO. 010-0254
DATE 1-23-98
DRAWN
CHECKED BY HH

NSTRUC 10-1-97 17422 ABET/INT/PR030.dwg



FOR INFORMATION ONLY

1 ELEVATION PIER A21
S36



5 ELEVATION EXISTING ROADWAY GIRDERS AT PIER A21
S35

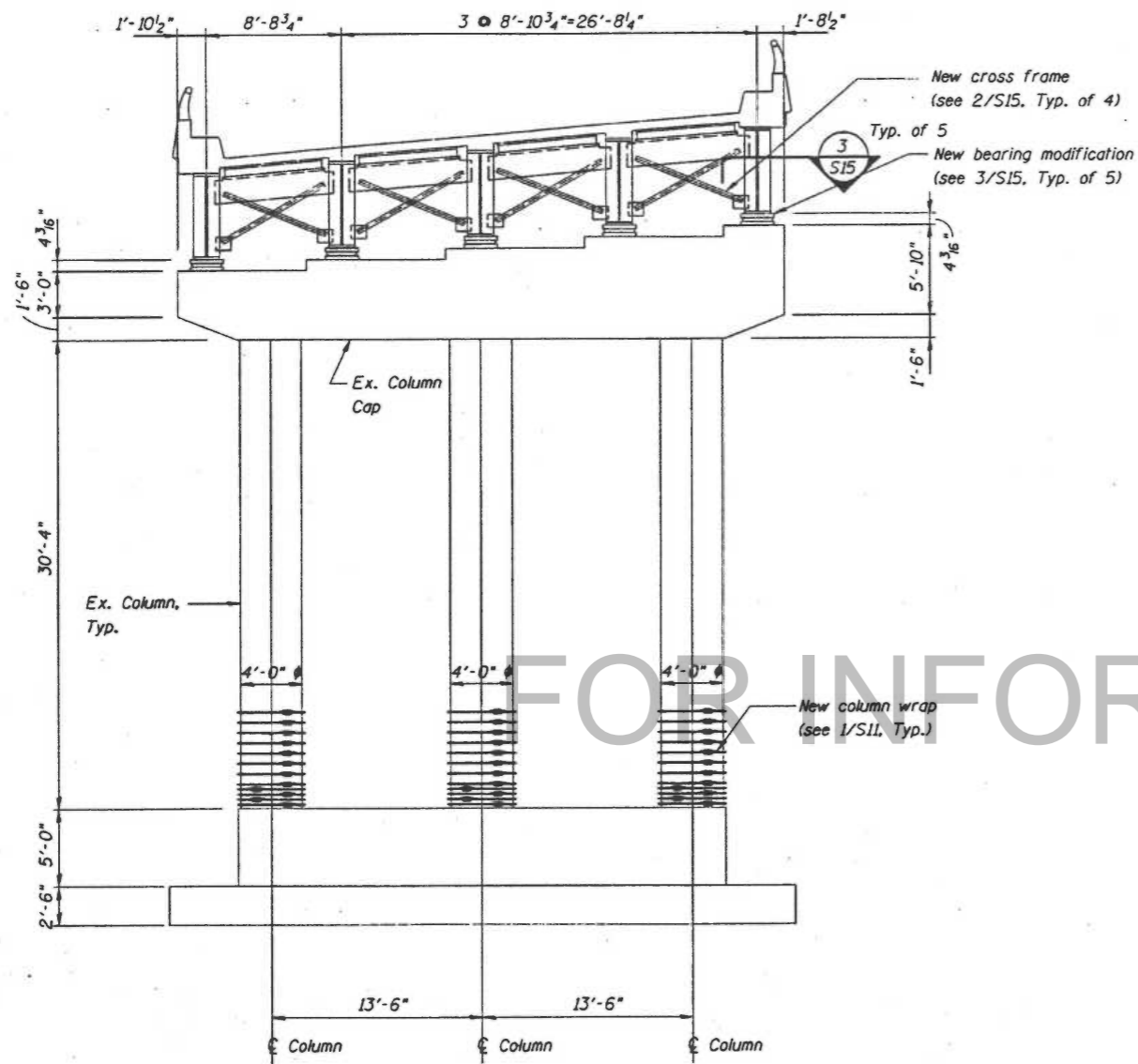
BILL OF MATERIAL - PIER A21		
ITEM	UNIT	QUANTITY
Concrete removal	CY	6.7
Furnish and erect structural steel	LBS.	3160
Epoxy grouted dowels	EACH	28
Foundation wall dowel modification	EACH	6
Column wrap	SQ. FT.	81.7

PIER A21 RETROFIT
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
FAI ROUTE 70
2001 9 STREET BRIDGE APPROACH
ST. CLAIR CO.

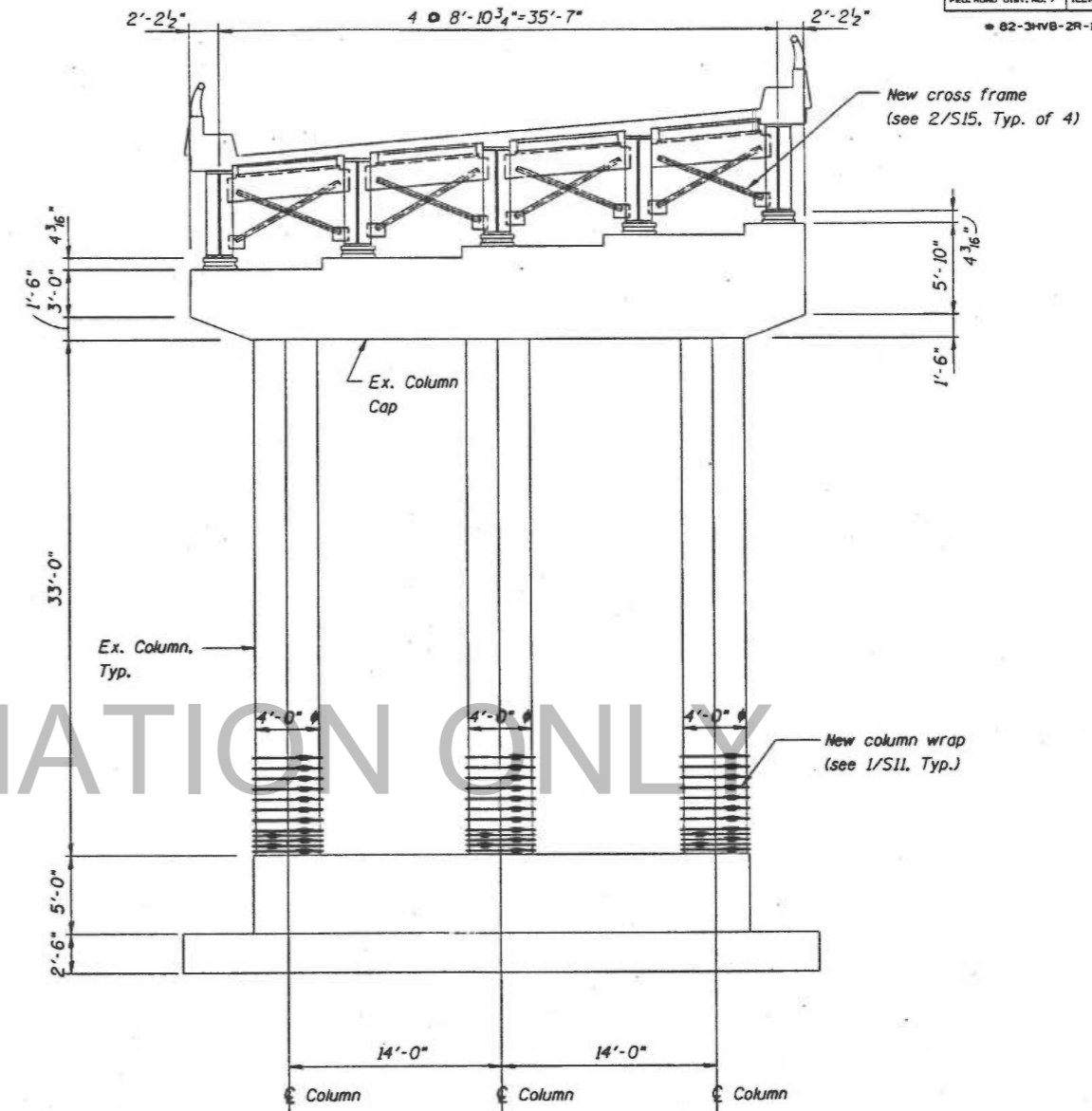
NSI - L:\17422\SET\151\PIR35.dwg

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.	SHEET NO. S-37
F.A.I. 78	#	ST. CLAIR	91	35	SHEETS
FED. ROAD DIST. NO. 7 ILLINOIS FED. AID PROJECT -					

82-3HVB-2R-1-1



1 ELEVATION PIER R1-1
S37

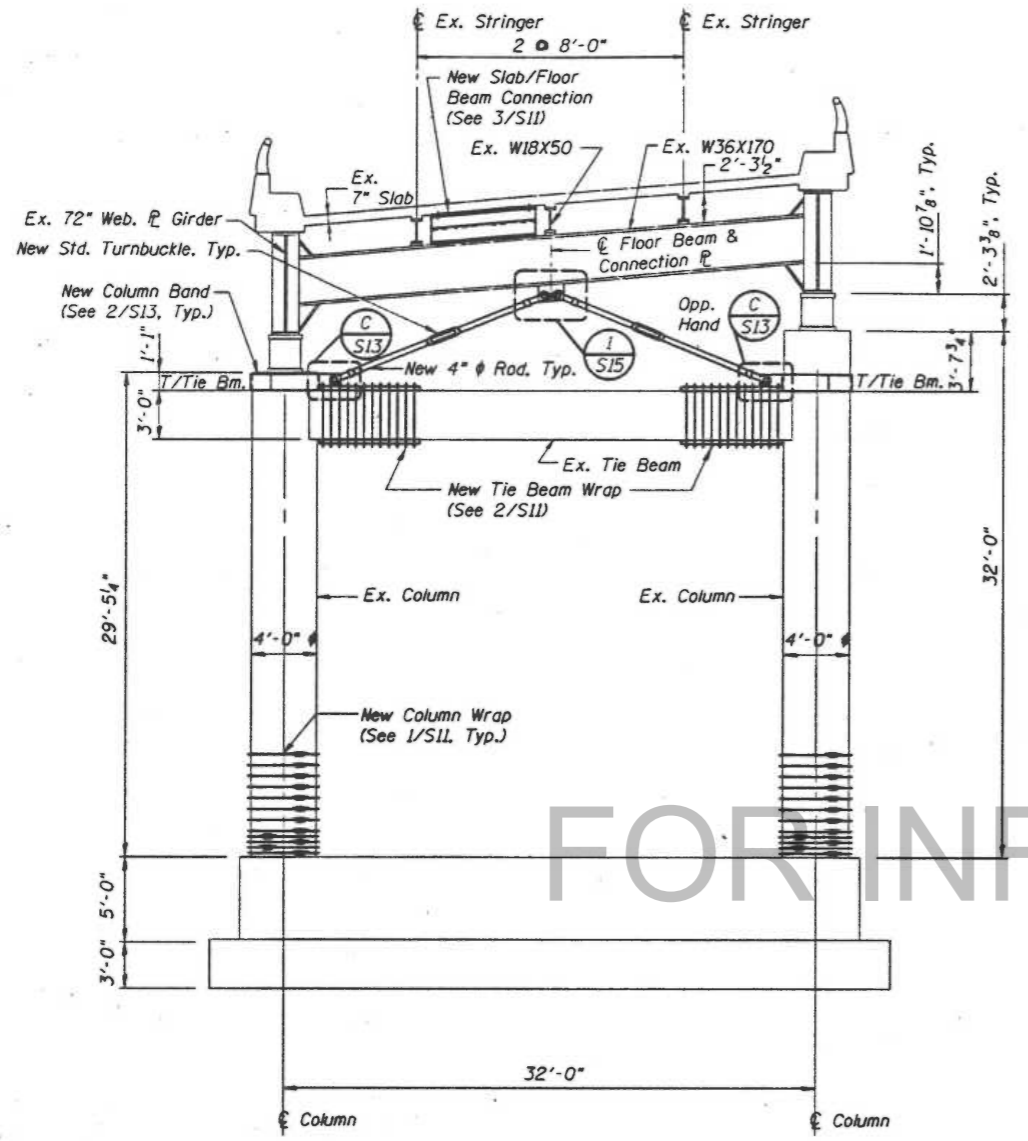


2 ELEVATION PIER R2-1
S37

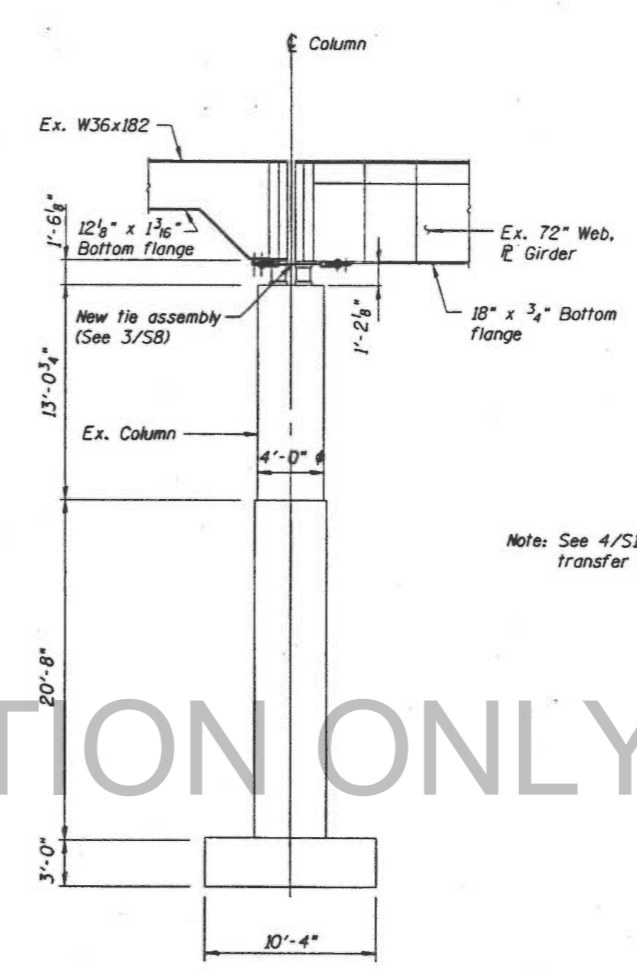
BILL OF MATERIAL - PIER R1-1		
ITEM	UNIT	QUANTITY
Furnish and erect structural steel	LBS.	2200
Steel cross frame removal	EACH	4
Epoxy grouted dowels	EACH	28
Foundation wall dowel modification	EACH	30
Column wrap	SQ. FT.	245.1

BILL OF MATERIAL - PIER R2-1		
ITEM	UNIT	QUANTITY
Furnish and erect structural steel	LBS.	2175
Steel cross frame removal	EACH	4
Epoxy grouted dowels	EACH	20
Foundation wall dowel modification	EACH	36
Column wrap	SQ. FT.	245.1

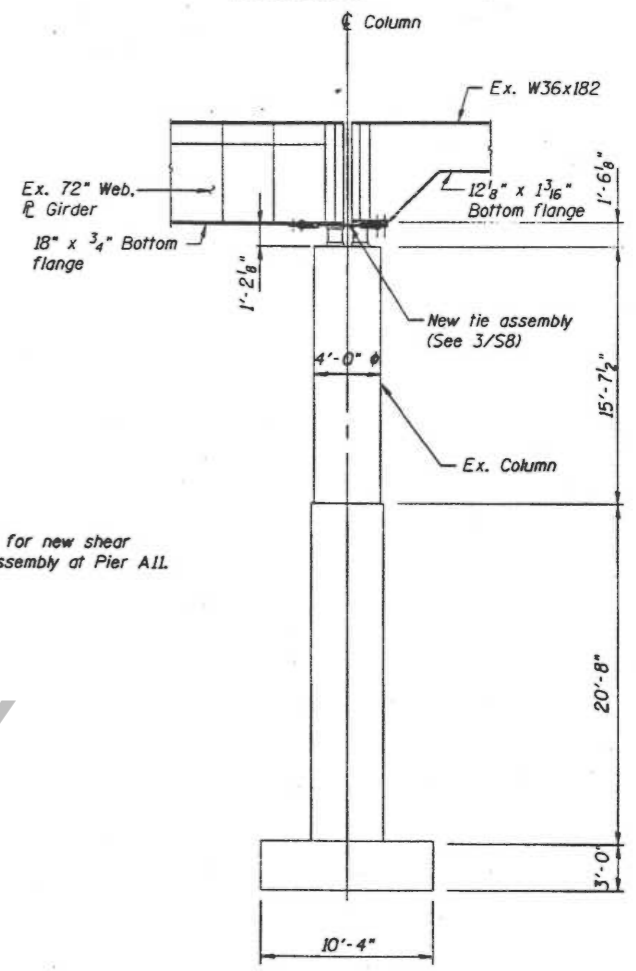
PIERS R1-1 & R2-1 RETROFITS
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
FAI ROUTE 70
POPLAR STREET BRIDGE
ST. CLAIR COUNTY



1 ELEVATION PIER A9
S32



NORTH



SOUTH

Note: See 4/S13 for new shear transfer assembly at Pier A11.

2 ELEVATIONS PIER A11
S32

BILL OF MATERIAL - PIER A9		
ITEM	UNIT	QUANTITY
Furnish and erect structural steel	LBS.	5747
Epoxy grouted dowels	EACH	12
Column wrap	SQ. FT.	163.4

BILL OF MATERIAL - PIER A10*		
ITEM	UNIT	QUANTITY
Furnish and erect structural steel	LBS.	2040
Epoxy grouted dowels	EACH	16
Foundation wall dowel modification	EACH	12
Column wrap	SQ. FT.	202.7

* Elevation not shown

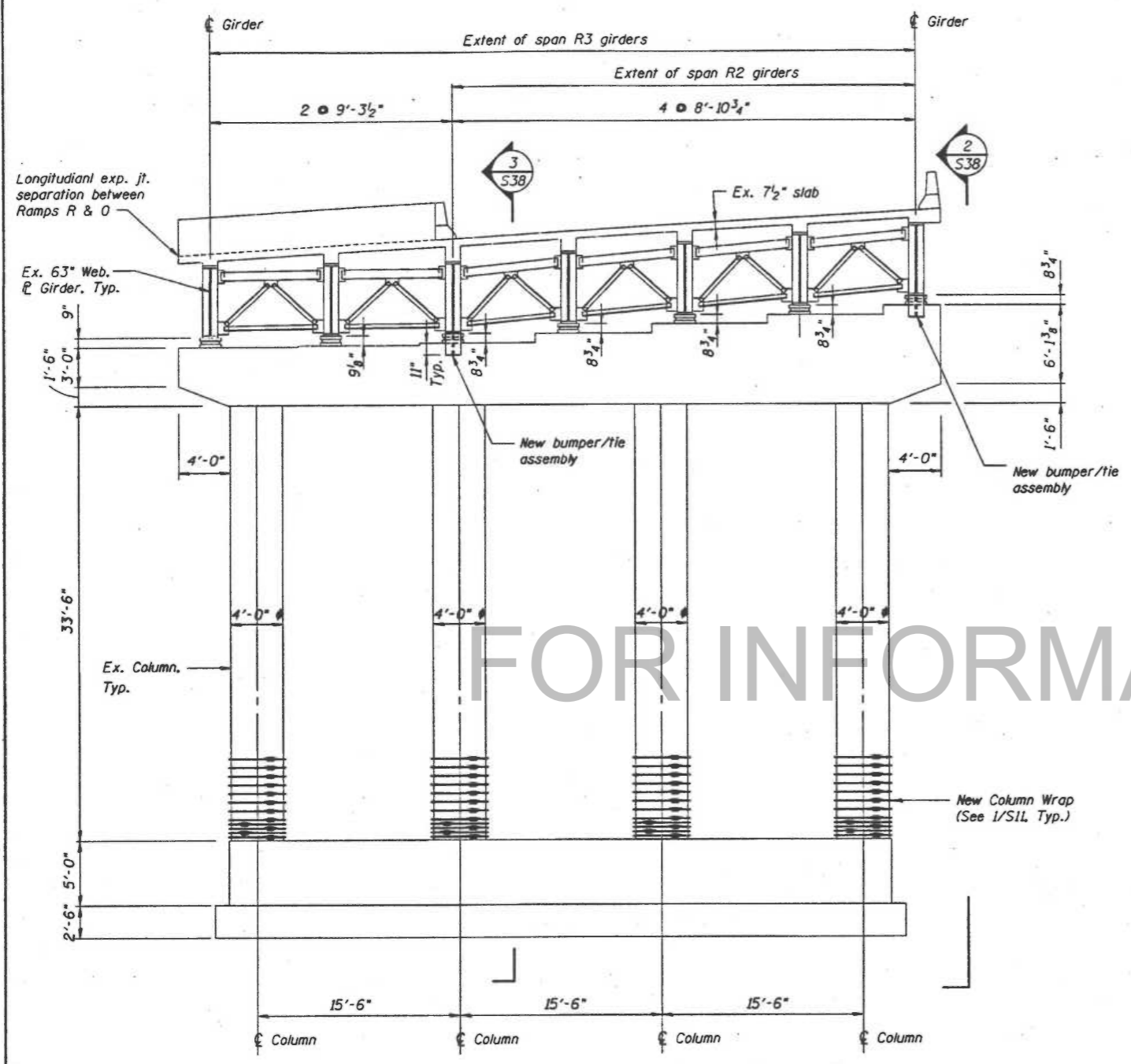
BILL OF MATERIAL - PIER A11		
ITEM	UNIT	QUANTITY
Furnish and erect structural steel	LBS.	1867
Epoxy grouted dowels	EACH	8
Wire rope	FT.	52.1

PIERS A9 AND A11 RETROFITS

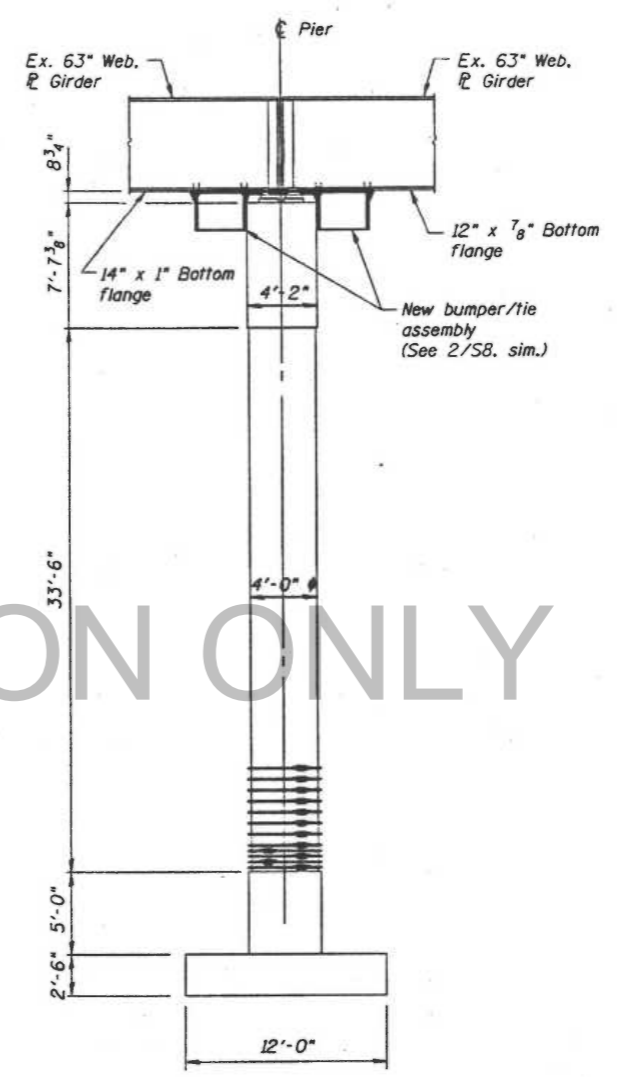
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
FAI ROUTE 70
POPLAR STREET BRIDGE APPROX. 0.15 MILES
ST. CLAIR COUNTY
HIGHWAY 11
ROADWAY STRUCTURE

DATE 1-23-98 CHECKED BY HM

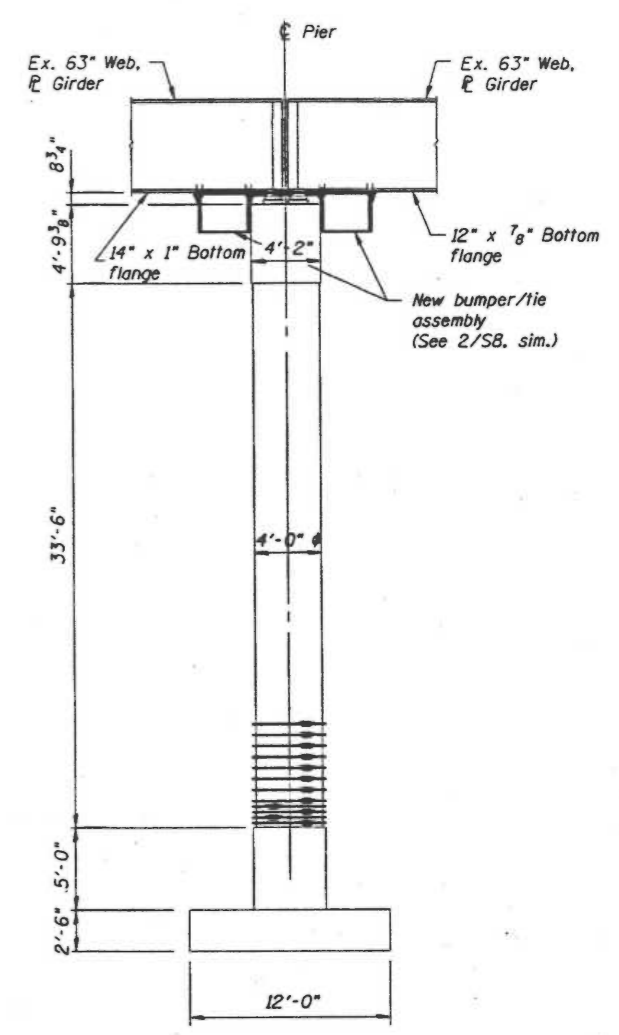
FOR INFORMATION ONLY



1 ELEVATION PIER R3-1
S38



2 ELEVATION PIER R3-1
S38



3 ELEVATION PIER R3-1
S38

BILL OF MATERIAL - PIER R3-1		
ITEM	UNIT	QUANTITY
Furnish and erect structural steel	LBS.	2835
Foundation wall dowel modification	EACH	40
Column wrap	SQ. FT.	326.8

PIER R3-1 RETROFIT

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
FAI ROUTE 70
POPLAR STREET APPROACHES

STRUCTURE NO. 001-1-1-1
STRUCTURE NO. 002-1-1-1
SCALE: NONE
DATE: 1-23-98

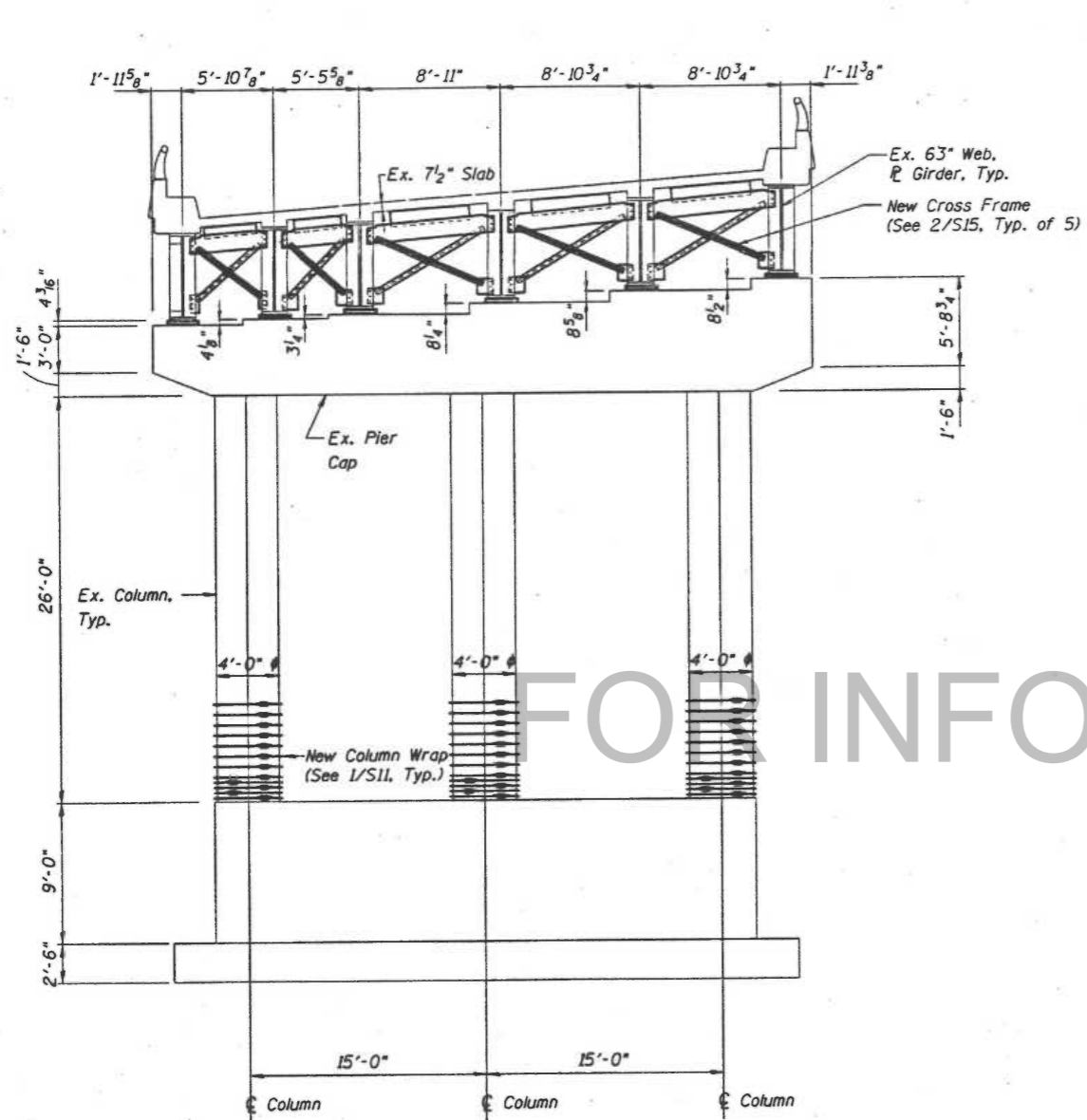
DRAWN BY: JN
CHECKED BY: HH

FOR INFORMATION ONLY

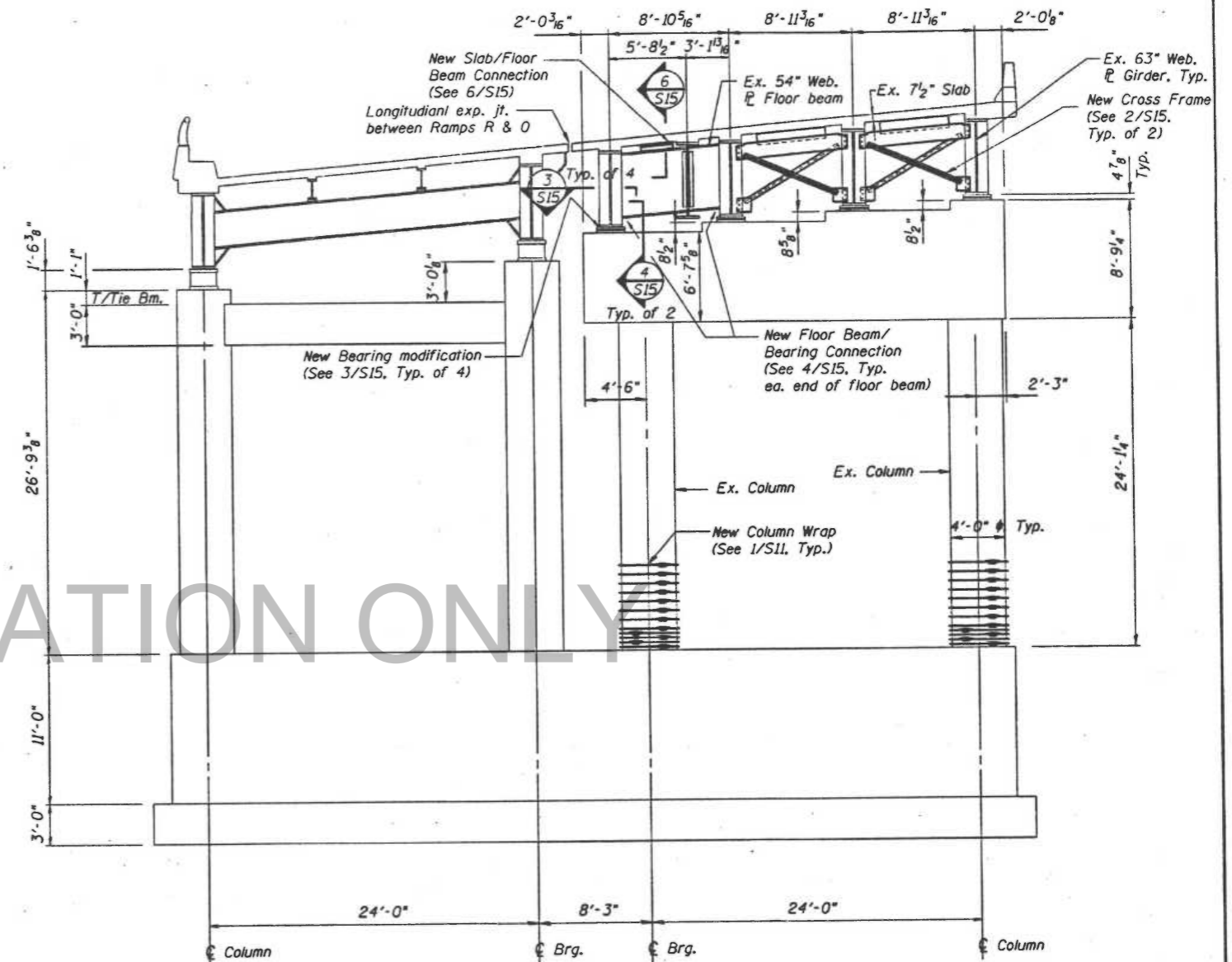
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ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.	SHEET NO. S-39 SHEETS
F.A.I. 70	0	ST. CLAIR	91	37	
FED. ROAD DIST. NO. 7 ILLINOIS FED. AID PROJECT					

82-3HVB-2R-1-1



1 ELEVATION PIER R4-1
S39



2 ELEVATION PIER O1-R
S39

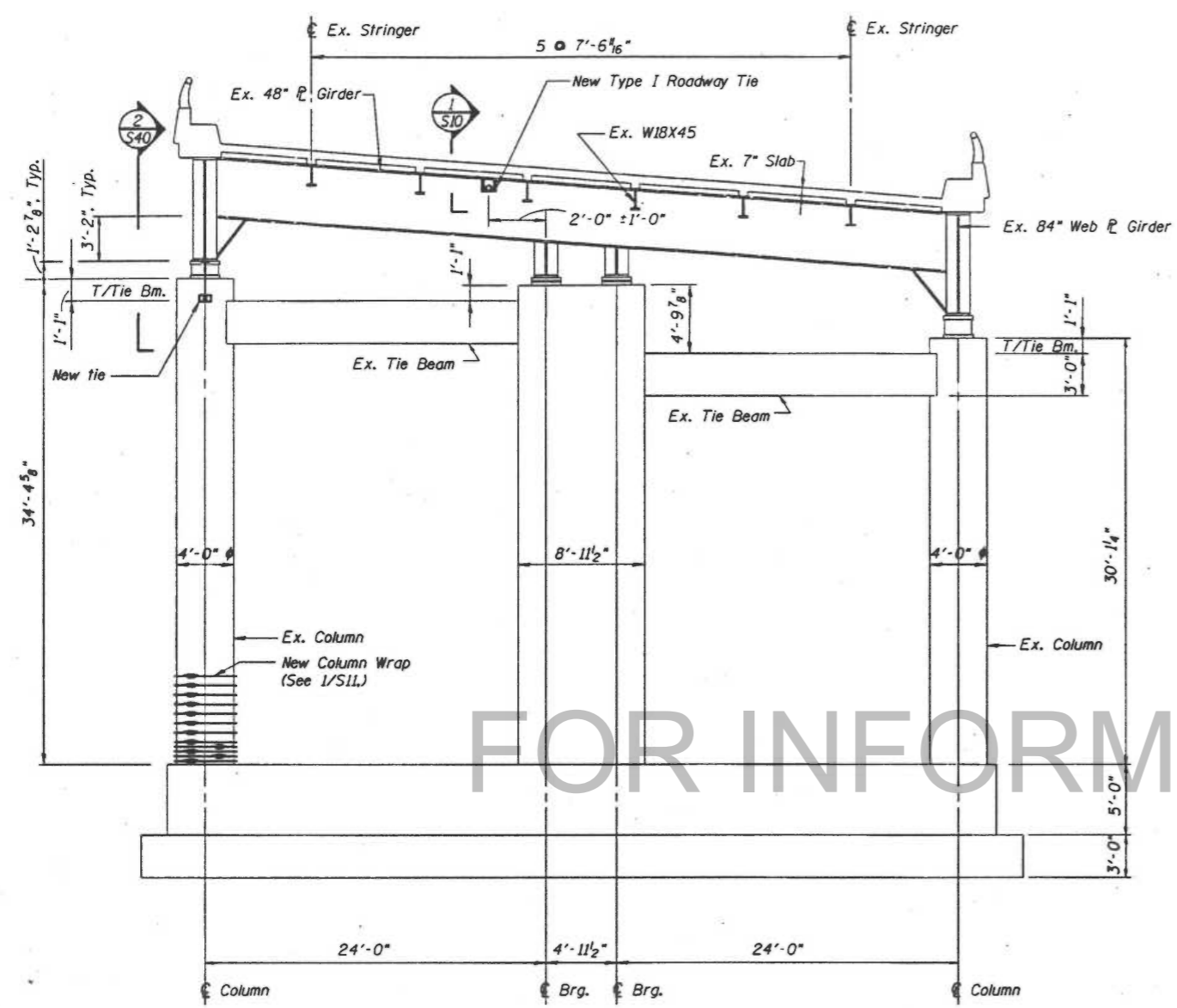
BILL OF MATERIAL - PIER R4-1		
ITEM	UNIT	QUANTITY
Furnish and erect structural steel	LBS.	2465
Steel cross frame removal	EACH	5
Epoxy grouted dowels	EACH	25
Foundation wall dowel modification	EACH	24
Column wrap	FT.	245.1

BILL OF MATERIAL - PIER O1-R		
ITEM	UNIT	QUANTITY
Furnish and erect structural steel	LBS.	1240
Epoxy grouted dowels	EACH	24
Foundation wall dowel modification	EACH	4
Column wrap	SQ. FT.	163.4
Steel cross frame removal	EACH	2

PIERS R4-1 & O1-R RETROFITS
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
FAI ROUTE 70
POPLAR BLVD BRIDGE APPROACHES
COUNTY

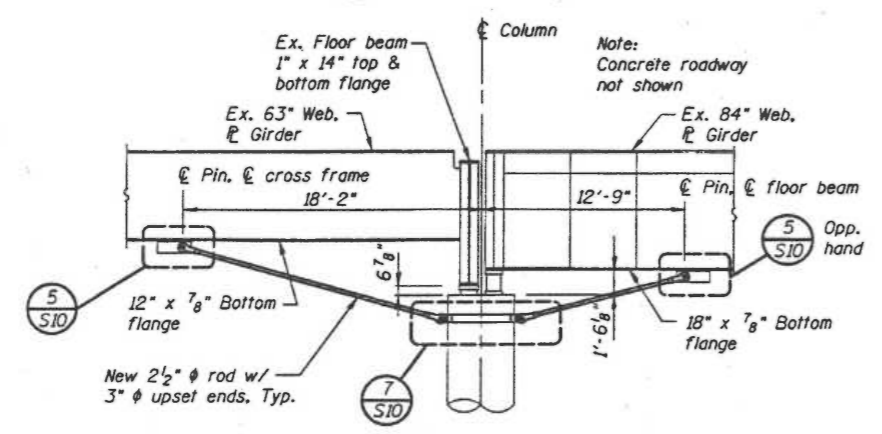
DATE 1-23-98 CHECKED BY HH

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FOR INFORMATION ONLY

1 ELEVATION PIER G1
S40



ELEVATION EXISTING ROADWAY GIRDERS AT PIER G1

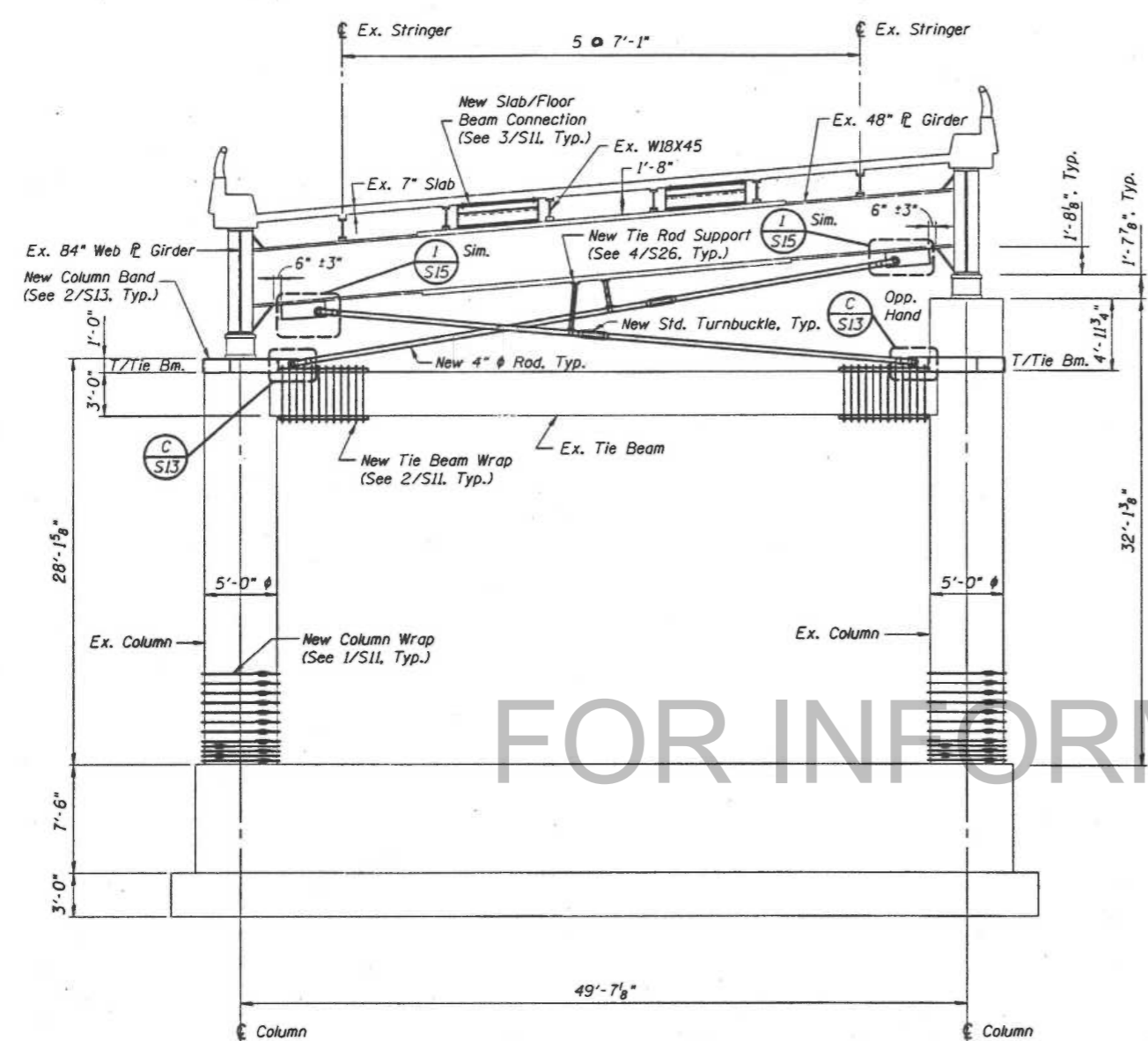
ITEM	UNIT	QUANTITY
Concrete removal	CY	5.6
Furnish and erect structural steel	LBS.	3135
Epoxy grouted dowels	EACH	28
Column wrap	SO. FT.	81.7

PIER G1 RETROFIT

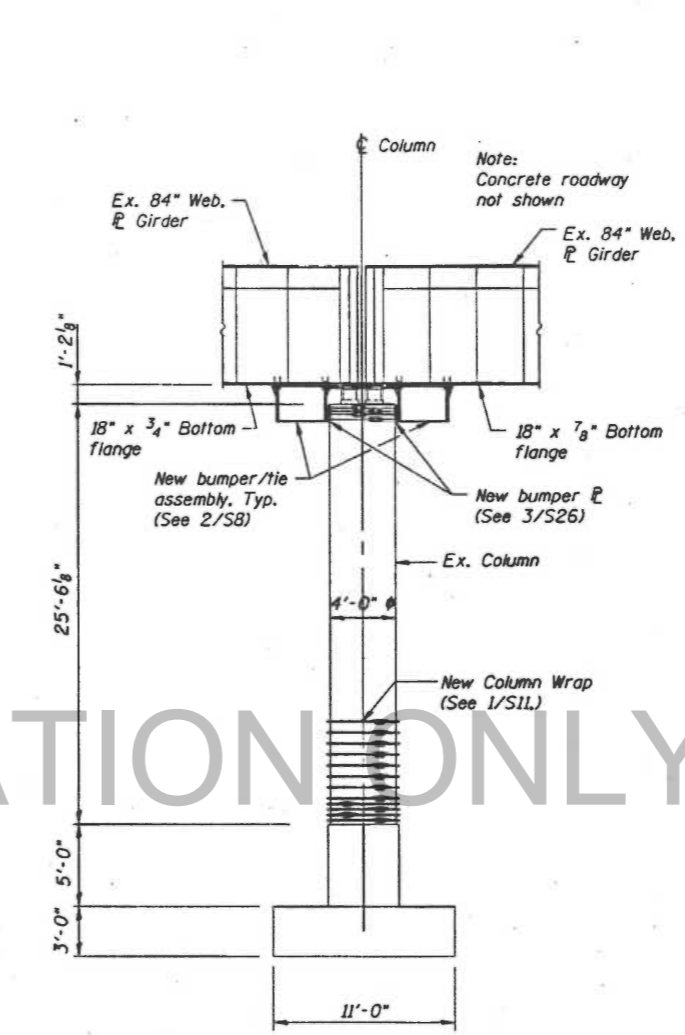
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
FAI ROUTE 70
POPLAR STREET BRIDGE APPROACHES
ST. CLAIR COUNTY

CHECKED BY: HH

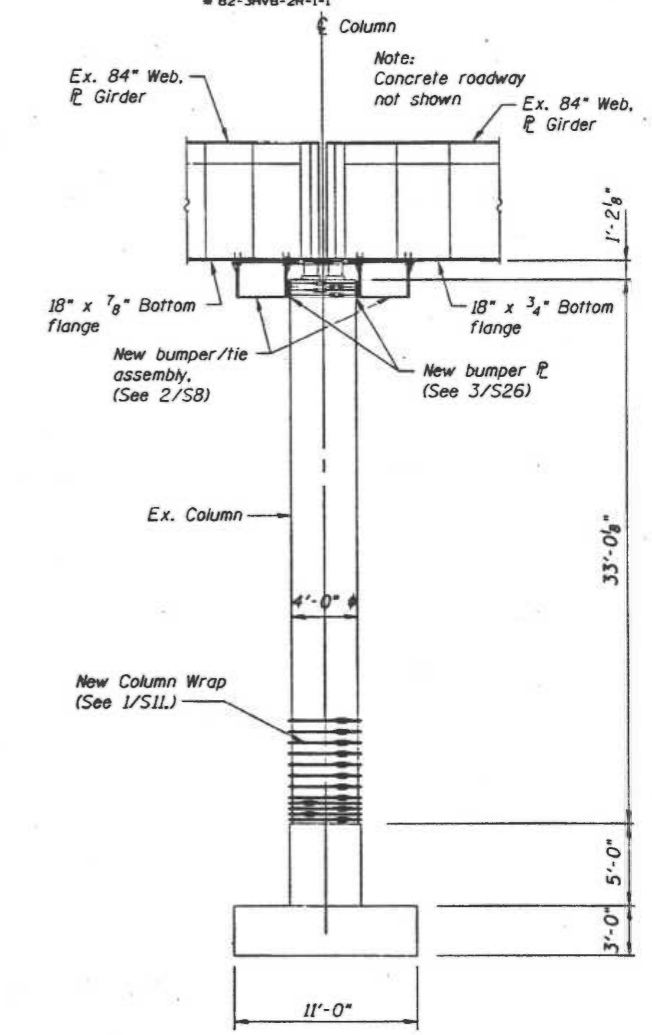
ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.	SHEET NO. S-41 SHEETS
F.A.I. 70		ST. CLAIR	91	39	
FED. ROAD DIST. NO. 7					
ALIGN. FED. AID PROJECT					
* 82-3HV8-2R-1-1					



1
S41
ELEVATION PIER G2



NORTH



SOUTH

2
S41
ELEVATIONS PIER G5

ITEM	UNIT	QUANTITY
Concrete removal	CY	5.4
Furnish and erect structural steel	LBS.	3077
Epoxy grouted dowels	EACH	8
Foundation wall dowel modification	EACH	20
Column wrap	SQ. FT.	163.4

ITEM	UNIT	QUANTITY
Furnish and erect structural steel	LBS.	9776
Epoxy grouted dowels	EACH	26
Foundation wall dowel modification	EACH	28
Column wrap	SQ. FT.	163.4

ITEM	UNIT	QUANTITY
Furnish and erect structural steel	LBS.	330
Epoxy grouted dowels	EACH	9
Column wrap	SQ. FT.	163.4

ITEM	UNIT	QUANTITY
Furnish and erect structural steel	LBS.	365
Epoxy grouted dowels	EACH	10
Column wrap	SQ. FT.	163.4

ITEM	UNIT	QUANTITY
Furnish and erect structural steel	LBS.	330
Epoxy grouted dowels	EACH	9

* Elevation not shown

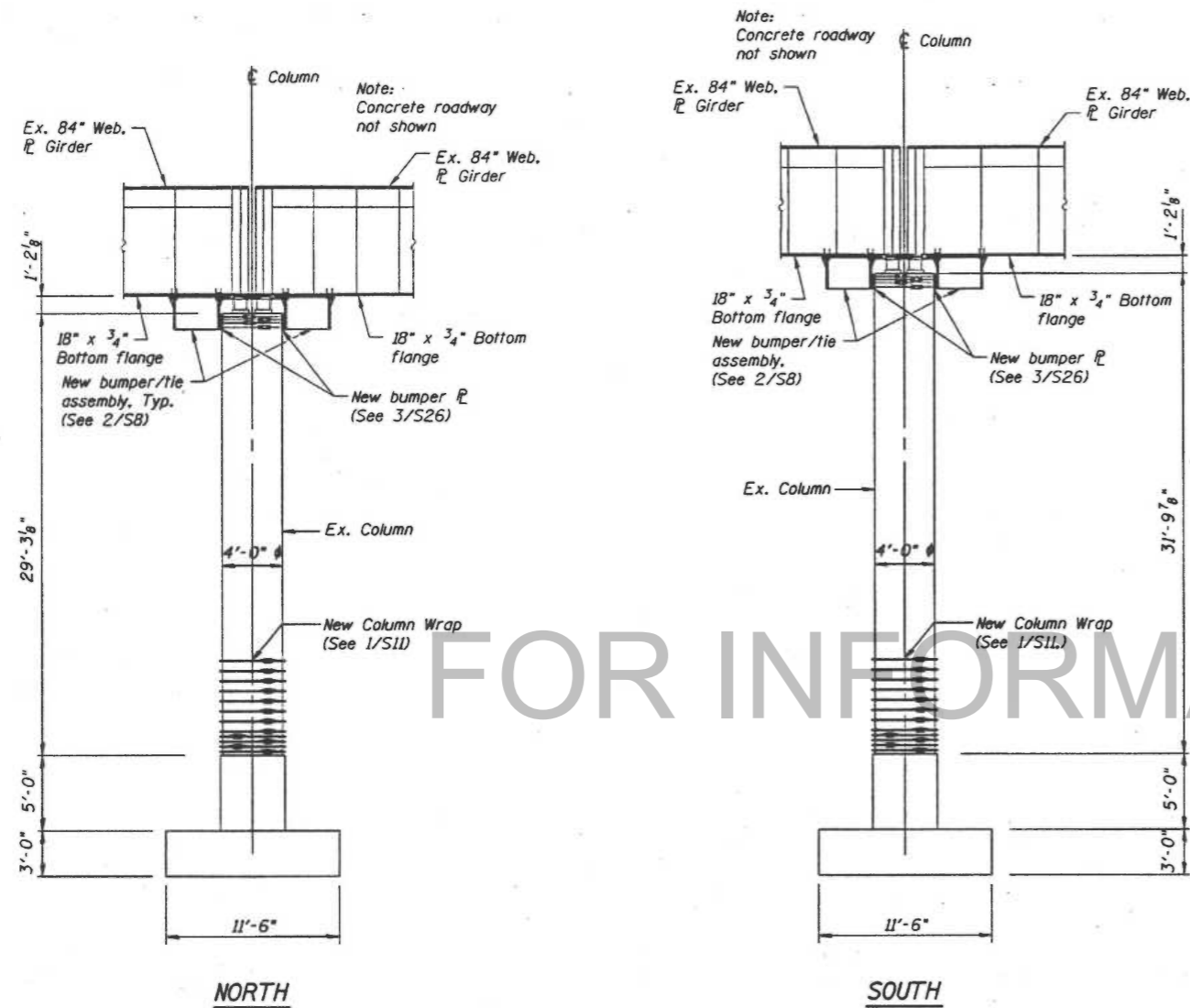
* Elevation not shown

* Elevation not shown

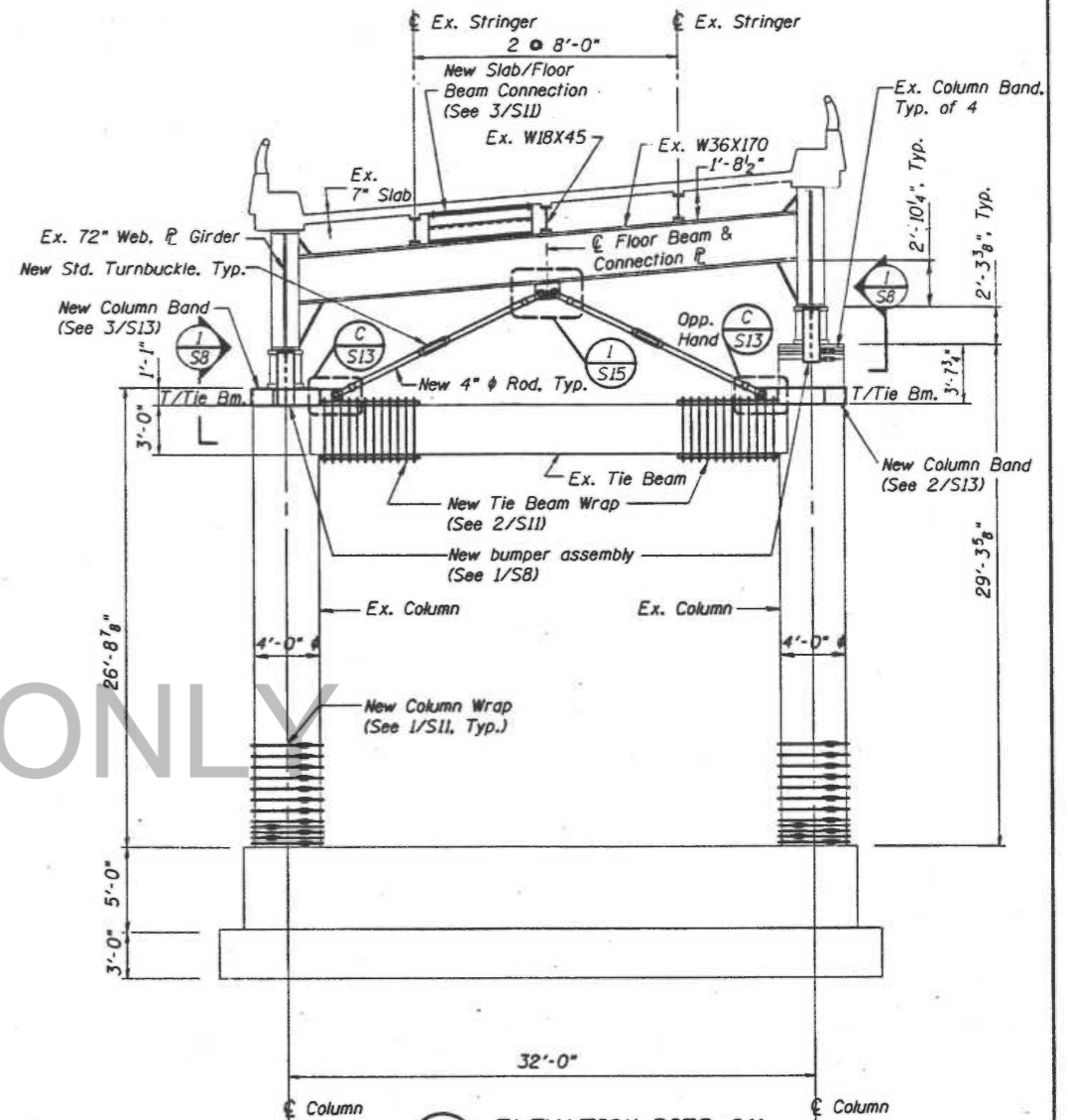
PIERS G2 & G5 RETROFITS

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
FAI ROUTE 70
STREET BRIDGE /
CLAIR COUNTY

SCALE: 1/4" = 1'-0"
DATE: 1-23-98
CHECKED BY: HH



1 ELEVATIONS PIER G9
S42



2 ELEVATION PIER G11
S42

ITEM	UNIT	QUANTITY
Furnish and erect structural steel	LBS.	330
Epoxy grouted dowels	EACH	9

* Elevation not shown

ITEM	UNIT	QUANTITY
Furnish and erect structural steel	LBS.	2115
Epoxy grouted dowels	EACH	18
Foundation wall dowel modification	EACH	20
Column wrap	SQ. FT.	202.7

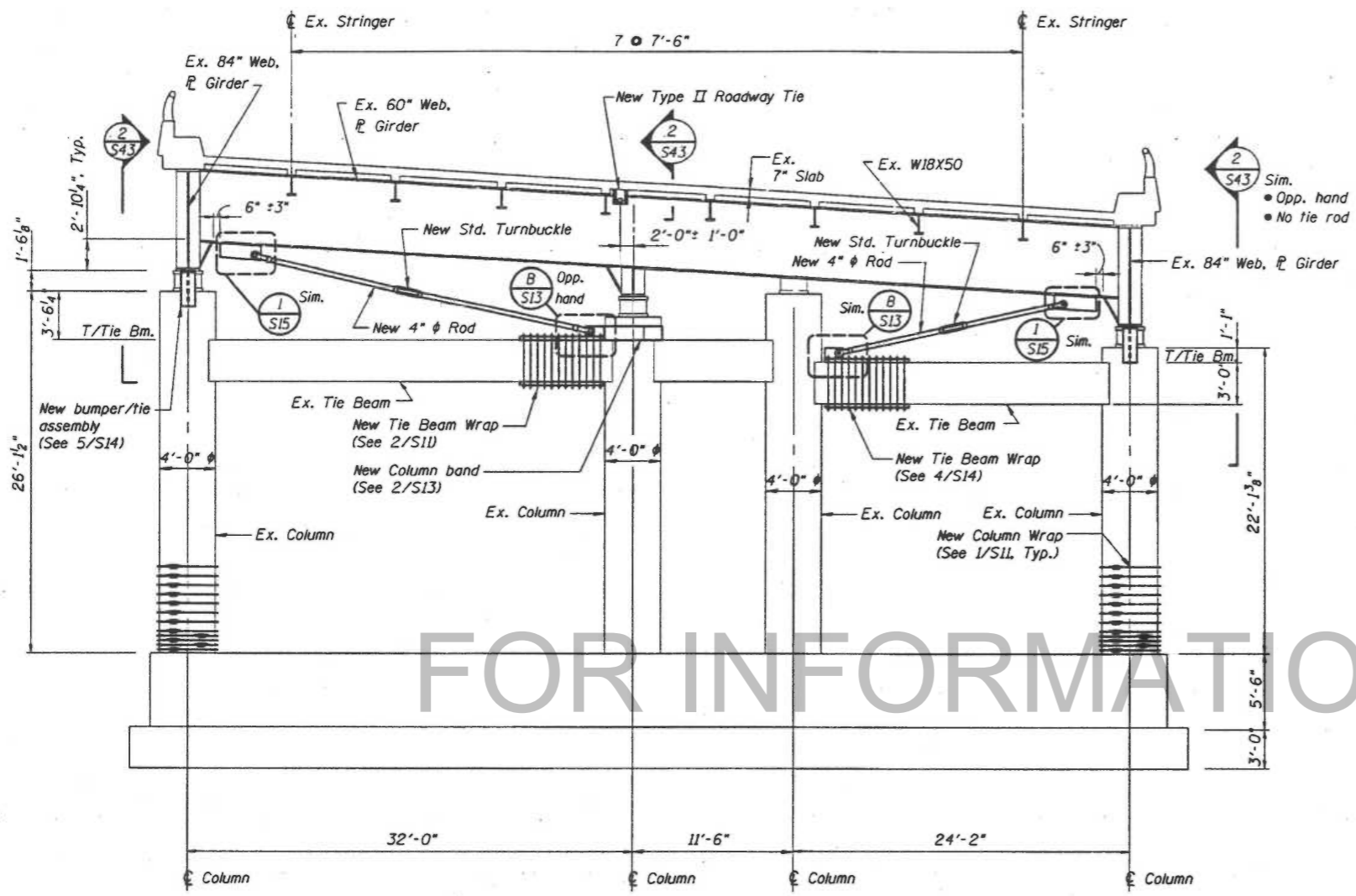
ITEM	UNIT	QUANTITY
Concrete removal	CY	3.9
Furnish and erect structural steel	EACH	3077
Epoxy grouted dowels	EACH	8
Foundation wall dowel modification	EACH	20
Column wrap	SQ. FT.	163.4
Formed concrete repair	SQ. FT.	1

ITEM	UNIT	QUANTITY
Furnish and erect structural steel	LBS.	1940
Epoxy grouted dowels	EACH	13
Foundation wall dowel modification	EACH	8
Column wrap	SQ. FT.	202.7

* Elevation not shown

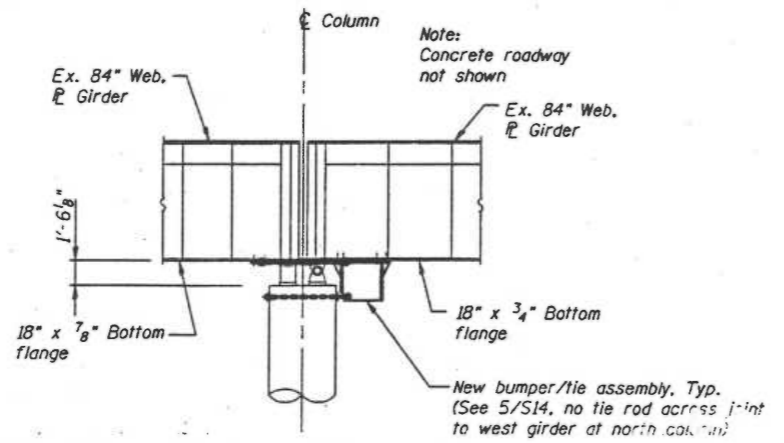
ITEM	UNIT	QUANTITY
Furnish and erect structural steel	LBS.	7767
Epoxy grouted dowels	EACH	18
Foundation wall dowel modification	EACH	20
Column wrap	SQ. FT.	163.4

PIERS G9 & G11 RETROFITS
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
FAI ROUTE 7C
POPLAR STREET



FOR INFORMATION ONLY

1 ELEVATION PIER G12
S43



2 ELEVATION EXISTING ROADWAY GIRDERS AT PIER G12
S43

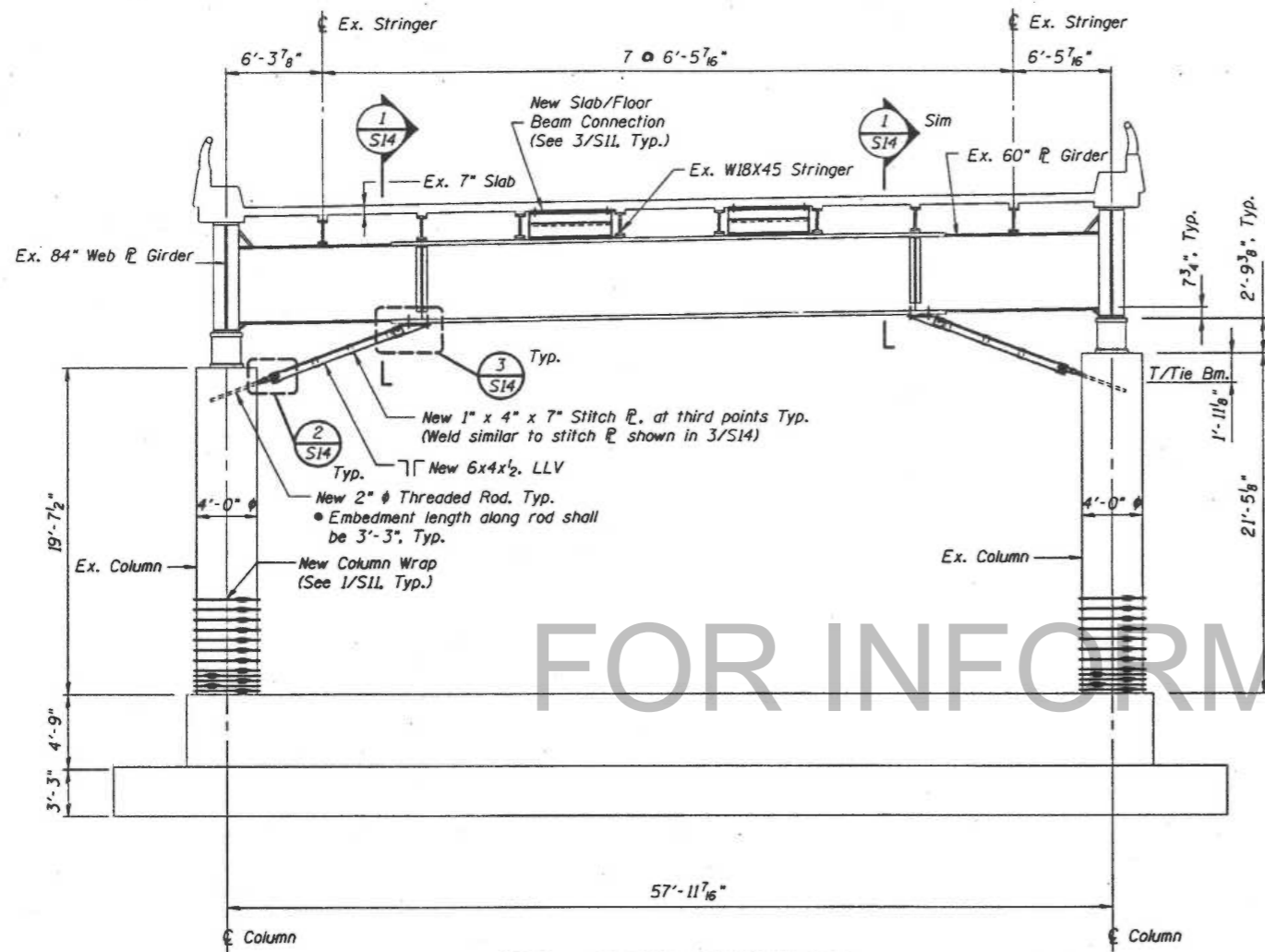
ITEM	UNIT	QUANTITY
Furnish and erect structural steel	LBS.	7859
Epoxy grouted dowels	EACH	20
Column wrap	SQ. FT.	163.4

PIER G12 RETROFITS

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
FAVORITE 70
POPLARVILLE APPROACHES

DATE 1-23-98

STILLING/428/SET/187/PRG3.DGN



FOR INFORMATION ONLY

1 ELEVATION PIER G13
S44

BILL OF MATERIAL - PIER G13		
ITEM	UNIT	QUANTITY
Furnish and erect structural steel	LBS.	1920
Epoxy grouted dowels	EACH	16
Column wrap	SQ. FT.	163.4

PIER G13 RETROFITS

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
FAI ROUTE 70
BRIDGE APPROACHES
ST. CLAIR COUNTY

DATE 1-23-98
DRAWN BY
CHECKED BY HM

* ENCOMPASSING THE FOLLOWING ROADWAYS

- ROADWAY D, STRUCTURE NO. 082-0144
- RAMP O, STRUCTURE NO. 082-0255
- RAMP P, STRUCTURE NO. 082-0203
- ROADWAY H, STRUCTURE NO. 082-0256

INDEX OF SHEETS	
SHEET NO.	DESCRIPTION
S-1	SET 2 - TITLE SHEET
S-2	GENERAL NOTES
S-3	SCOPE OF WORK
S-4	PROJECT PLAN
S-5	KEY PLAN ROADWAYS D, H, Q & P
S-6	ELEVATION ROADWAYS D, H, Q & P
S-7	TYPICAL SUBSTRUCTURE DETAILS
S-8	SEISMIC RETROFIT DETAILS
S-9	SEISMIC RETROFIT DETAILS
S-10	SEISMIC RETROFIT DETAILS
S-11	SEISMIC RETROFIT DETAILS
S-12	SEISMIC RETROFIT DETAILS
S-13	SEISMIC RETROFIT DETAILS
S-14	SEISMIC RETROFIT DETAILS
S-15	SEISMIC RETROFIT DETAILS
S-16	STIFFENER INTERSECTION MODIFICATION DETAIL
S-17	LONG SPAN FLOOR BEAM RETROFIT & BOLT REPLACEMENT
S-18	CRACK EXTENSION & CROSS BEAM RETROFITS
S-19	REDUNDANCY RETROFIT DETAILS
S-20	REDUNDANCY RETROFIT DETAILS
S-21	REDUNDANCY RETROFIT DETAILS
S-22	NOT USED
S-23	NOT USED
S-24	NOT USED
S-25	NOT USED
S-26	CONCRETE REPAIR DETAILS
S-27	SEISMIC RETROFIT DETAILS
S-28	NOT USED
S-29	PIERS D2 & D5 RETROFIT
S-30	PIERS D8 & D9 RETROFIT
S-31	PIER D11 RETROFIT
S-32	PIERS D12 & D13 RETROFIT
S-33	PIERS D15 & D17 RETROFIT
S-34	PIERS D18 & D21 RETROFIT
S-35	PIERS D22 & D23 RETROFIT
S-36	PIER D24 RETROFIT
S-37	PIER D26 RETROFIT
S-38	PIERS Q1-1 & Q2-1 RETROFIT
S-39	PIER P14 RETROFIT
S-40	PIERS P15 & H1 RETROFIT
S-41	PIERS H2 & H3 RETROFIT
S-42	PIER H4 RETROFIT

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

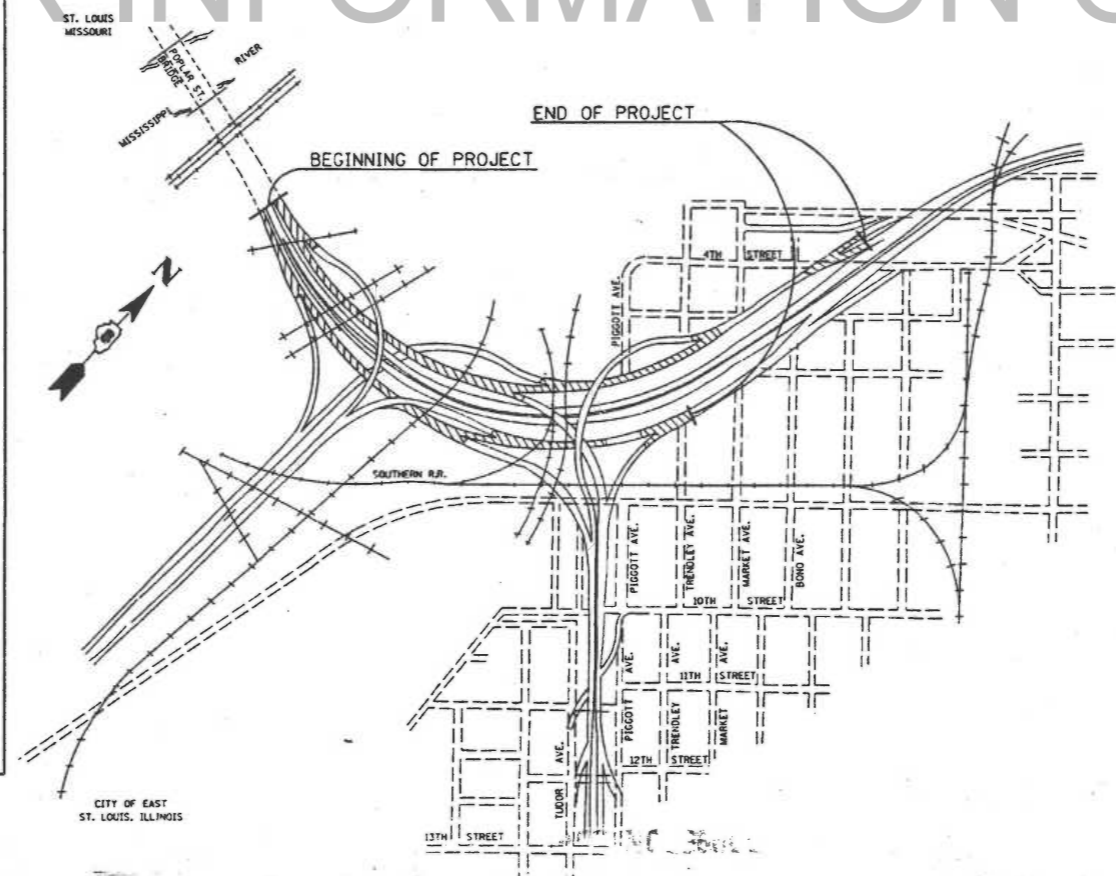
PLANS FOR PROPOSED SEISMIC AND REDUNDANCY RETROFIT REPAIRS *

FAI ROUTE 70
SECTION 82-3HVB-2R-1-I
POPLAR STREET BRIDGE APPROACHES
ST. CLAIR COUNTY

SET 2 OF
4 SETS

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.	SHEET NO. S-1
F.A.I. 70	N	ST. CLAIR	91	43	SHEETS
FED. ROAD DIST. NO. 7 ALL OTHER FED. AID PROJECTS					

82-3HVB-2R-1-I



STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

~~SUBMITTED _____ 19____
 _____ 19____
 DISTRICT ENGINEER
 _____ 19____
 ENGINEER OF PROJECT DEVELOPMENT AND IMPLEMENTATION
 _____ 19____
 ENGINEER OF DESIGN AND ENVIRONMENT
 _____ 19____
 DIRECTOR, DIVISION OF HIGHWAYS~~

CONTRACT NO. 82-3HVB-2R-1-I

GENERAL NOTES:

- 1. Plan dimensions and details relative to existing structure have been taken from existing plans and are subject to nominal construction variations. It shall be the Contractor's responsibility to verify such dimensions and details in the field and make necessary approved adjustments prior to construction or ordering materials. Such variations shall not be cause for additional compensation for a change in the scope of work, however, the Contractor will be paid for the quantity actually furnished at the unit price bid for the work.
- 2. This project addresses selected seismic, redundancy and fatigue issues related only to those structures that are listed on the drawings. Related hazards associated with nearby structures or roadways that pass over the subject structures were not considered.
- 3. Unless noted otherwise, all materials and workmanship shall conform to :
 - a. The Illinois Department of Transportation, "Standard Specifications for Road and Bridge Construction", January 1, 1997.
 - b. Bridge Welding Code, American Welding Society, AWS D1.5-95.
 - c. Surface Texture, American Society of Mechanical Engineers, ANSI B46.1- Latest Edition.

STEEL NOTES:

- 1. Actual dimensions may vary slightly from the design drawings. The Contractor shall field verify existing dimensions prior to starting work. Dimensions of new members shall be adjusted as required to fit as-built conditions.
- 2. All new steel assemblies and pieces shall be shop painted with Inorganic zinc rich primer/ Acrylic/ Acrylic paint system. The color of the final finish coat shall be Interstate Green, Munsell No. 7.5 G 4/8. Locations to receive field welding shall be masked off prior to shop painting and field painted after welding.
- 3. Unless noted otherwise, all bolts shall be high strength bolts (AASHTO M164). All threaded rods and dowels shall conform to the mechanical properties and thread configuration of AASHTO M164 bolts. All bolts, threaded rods, wire rope and hardware shall be galvanized according to IDOT galvanized bolt provisions. In bolted applications, threads shall not be permitted in shear planes, unless noted otherwise. **AASHTO M253 Bolts SHALL NOT BE GALVANIZED.**
- 4. Unless noted otherwise, all new steel shall be AASHTO M270 Grade 36 and have a minimum CVN impact toughness of 25 Ft.-Lb. at 20° F. All rods with upset ends shall have a maximum yield strength of 45 ksi.
- 5. Welding electrodes shall be low hydrogen E70XX, unless noted otherwise. Weld metal shall have a minimum CVN of 25 Ft.-Lb. at 20° F.
- 6. All turnbuckles, clevises and pins shall be galvanized and capable of developing the ultimate strengths of the corresponding assemblies.
- 7. All wire ropes shall be galvanized and shall have a minimum effective modulus of elasticity of 10,000 ksi. All wire rope fittings shall be capable of developing the ultimate strength of the corresponding rope.
- 8. Threads on all bolts, rods, and dowels, not installed per AISC specifications shall be peened.
- 9. Turnbuckles located in cross frame retrofits shall be tightened to achieve a torque of 1000 Ft.-Lbs. in the turnbuckle.
- 10. The existing structural steel coating contains lead. The Contractor should take appropriate precautions to deal with the presence of lead on this project. Lead based paint will not be removed from the structure except as necessary to remove transverse stiffeners and perform fatigue retrofits.

11. At locations of transverse stiffener removal, existing girder webs shall be primed with an inorganic zinc rich primer and painted with a paint system compatible with the existing paint.

12. No welding, flame cutting or carbon-arc cutting is permitted unless specified in a repair detail or approved by the Engineer.

- 13. Alternative procedures for the structural modifications will be considered by the Engineer if submitted in writing for approval. The work shall be performed in the sequence listed in the Procedures unless otherwise approved by the Engineer. Where a procedure calls for approval of an Engineer before acceptance, it is anticipated that visual examinations or non-destructive tests will be conducted, and that additional grinding or other work may be required.
- 14. Where magnetic particle (MT) inspection is called for on the drawings, the minimum qualifications of the Inspector shall meet ASNT Level II requirements. The Engineer will observe the final test acceptance.
- 15. To avoid bolt clearance installation difficulties, the bumper assemblies shall be installed prior to the installation of the web reinforcement plate(s).

CONCRETE NOTES:

- 1. The Engineers' intent is to repair only large areas of unsound concrete or unsound areas receiving column wraps. The contract quantities do not include all of the unsound concrete on the piers. Areas of unsound concrete to be repaired shall be approved by the Engineer.
- 2. The extent of deteriorated concrete in columns and walls shall be determined by hammer tapping. The concrete removal shall extend a minimum of 4 in. beyond the edge of the unsound area, be as nearly rectangular as possible, and conform to the concrete repair details included in the drawings.
- 3. Concrete removal equipment consisting of pneumatic chipping hammers shall not exceed a maximum nominal weight of 30 lb. and shall be equipped with a cutting edge not less than 3/4 in. or greater than 2 1/2 in. in width. During concrete removal, exercise reasonable care to avoid cracking of underlying sound concrete.

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.	SHEET NO. S-2
F.A.I. 70	8	ST. CLAIR	91	44	SHEETS
FED. ROAD DIST. NO. / BALANCE / PROJ. AND PROJECT					

82-3HVB-2R-1-1

FOR INFORMATION ONLY

GENERAL NOTES

STATE OF ILLINOIS
 DEPARTMENT OF TRANSPORTATION
 SEISMIC AND REDUNDANCY RETROFIT REPAIRS
 FAI ROUTE 70
 POPLAR STREET BRIDGE APPROACHES
 ST. CLAIR COUNTY

STRUCTURE NO.	STRUCTURE NO.
STRUCTURE NO.	STRUCTURE NO.
SCALE: NONE	DATE
DATE 1-23-98	CHECKED BY

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.	SHEET NO. S-3
F.A.I. 78	#	ST. CLAIR	91	45	
FED. ROAD DIST. NO. 7		ILLINOIS		FED. AID PROJECT	

82-3HVB-2R-1-1

SCOPE OF WORK

SEISMIC RETROFIT

1. Install column wraps on the following piers.
 - Structure No. 082-0144 (Roadway D, 22 locations)
 - D2 08 D14 D19 D25
 - D4 09 D15 D20 D26
 - D5 10 D16 D21
 - D6 12 D17 D23
 - D7 13 D18 D24
 - Structure No. 082-0255 (Ramp O, 2 locations)
 - Q1-1 Q2-1
 - Structure No. 082-0203 (Ramp P, 2 locations)
 - P14 P15
 - Structure No. 082-0256 (Roadway H, 3 locations)
 - H1 H3 H4
2. Install tie beam wraps on the following piers (excluding piers with cross frames)
 - Structure No. 082-0144 (Roadway D, 6 locations)
 - D4 D7 D16
 - D6 D10 D19
3. Install cross frame assembly including: tie beam wraps, column bands and slab/floor beam connections on the following piers.
 - Structure No. 082-0144 (Roadway D, 6 locations)
 - D2 D13 D23
 - D9 D17 D24
 - Structure No. 082-0256 (Ramp H, 2 locations)
 - H3 H4
4. Install slab/floor beam connections on the following piers (excluding piers with cross frames).
 - Structure No. 082-0144 (Roadway D, 12 locations)
 - D3 D7 D14 D20
 - D4 D10 D16 D22 (East)
 - D6 D11 (West) D19 D25
5. Remove existing cross frames and install new cross frames at the following piers.
 - Structure No. 082-0255 (Ramp O, 2 locations)
 - Q1-1 Q2-1
6. Install bumper/tie assembly on the following piers.
 - Structure No. 082-0144 (Roadway D, 7 locations)
 - D5 D11 D15 D21
 - D8 D12 D18
 - Structure No. 082-0203 (Ramp P, 1 location)
 - P15
 - Structure No. 082-0256 (Roadway H, 1 location)
 - H1
7. Install foundation wall dowel modifications on the following piers.
 - Structure No. 082-0144 (Roadway D, 13 locations)
 - D4 D9 D18 D26
 - D5 D13 D19
 - D6 D15 D24
 - D8 D17 D25
 - Structure No. 082-0203 (Ramp P, 1 location)
 - P14
 - Structure No. 082-0256 (Roadway H, 2 locations)
 - H1 H4
8. Install shear transfer assembly at the following piers.
 - Structure No. 082-0144 (Roadway D, 2 locations)
 - D11 D22
9. Install bumper assembly on the following piers.
 - Structure No. 082-0144 (Roadway D, 2 locations)
 - D9 D24
 - Structure No. 082-0203 (Ramp P, 1 location)
 - P14
10. Install girder tie assembly on the following piers.
 - Structure No. 082-0144 (Roadway D, 2 locations)
 - D22 D26
 - Structure No. 082-0256 (Roadway H, 1 location)
 - H2
11. Install roadway tie assembly on the following piers.
 - Structure No. 082-0144 (Roadway D, 2 locations)
 - D11 D26
 - Structure No. 082-0203 (Ramp P, 1 location)
 - P14

12. Install bumper column bands on the following piers.
 - Structure No. 082-0144 (Roadway D, 6 locations)
 - D5 D9 D18
 - D8 D15 D24
13. Install foundation wall saw cut on the following piers.
 - Structure No. 082-0144 (Roadway D, 2 locations)
 - D12 D21
 - Structure No. 082-0203 (Ramp P, 1 location)
 - P15

FATIGUE & REDUNDANCY RETROFIT

1. Perform stiffener intersection modifications on the structures.
 - Structure No. 082-0144 (Roadway D, 23 spans)
 - D1 thru D10, D12 thru D20 & D22 thru D25
 - Structure No. 082-0256 (Roadway H, 3 spans)
 - H2 H3 H4
2. Perform long span floor beam retrofits on the following structures.
 - Structure No. 082-0144 (Roadway D, 4 spans)
 - D9 D10 D24 D25
3. Perform bottom flange splice - bolt replacement on the following structures.
 - Structure No. 082-0144 (Roadway D, 6 spans)
 - D1 D3 D9
 - D2 D4 D22
4. Perform bolt replacement retrofits on the following structures.
 - Structure No. 082-0144 (Roadway D, 3 spans)
 - D22 D23 D24
 - Structure No. 082-0256 (Roadway H, 1 span)
 - H3
5. Perform crack extension retrofits on the following structures.
 - Structure No. 082-0256 (Roadway H, 2 spans)
 - H3 H4
6. Perform cross beam retrofits on the following structures.
 - Structure No. 082-0144 (Roadway D, 1 span)
 - D21
 - Structure No. 082-0203 (Ramp P, 1 span)
 - P15
 - Structure No. 082-0256 (Roadway H, 1 span)
 - H1
7. Install redundancy web plates on the following structures.
 - Structure No. 082-0144 (Roadway D, 23 locations)
 - D1 thru D10, D12 thru D20 & D22 thru D25
 - Structure No. 082-0256 (Roadway H, 3 locations)
 - H2 H3 H4

FOR INFORMATION ONLY

SCOPE OF WORK

STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION SEISMIC AND REDUNDANCY RETROFIT REPAIRS FAI ROUTE 70 POB... STREET BRIDGE APPROACHES COUNTY	
SCALE: NONE	STRUCTURE
DATE: 1-23-98	CHECKED BY: HH

STRUCTURE 7422\SET1\A\ST28CP83.DGN

SEISMIC DATA

Bedrock acceleration coefficient (A) = 0.12g
 Site coefficient (S) = 1.0
 Seismic performance requirements:
 • Use of roadways without long delay or major repair.

DESIGN SPECIFICATIONS

1996 AASHTO Standard Specifications for Highway Bridges
 1995 FHWA Seismic Retrofit Manual

DESIGN LOADING

HS20-44

DESIGN STRESSES

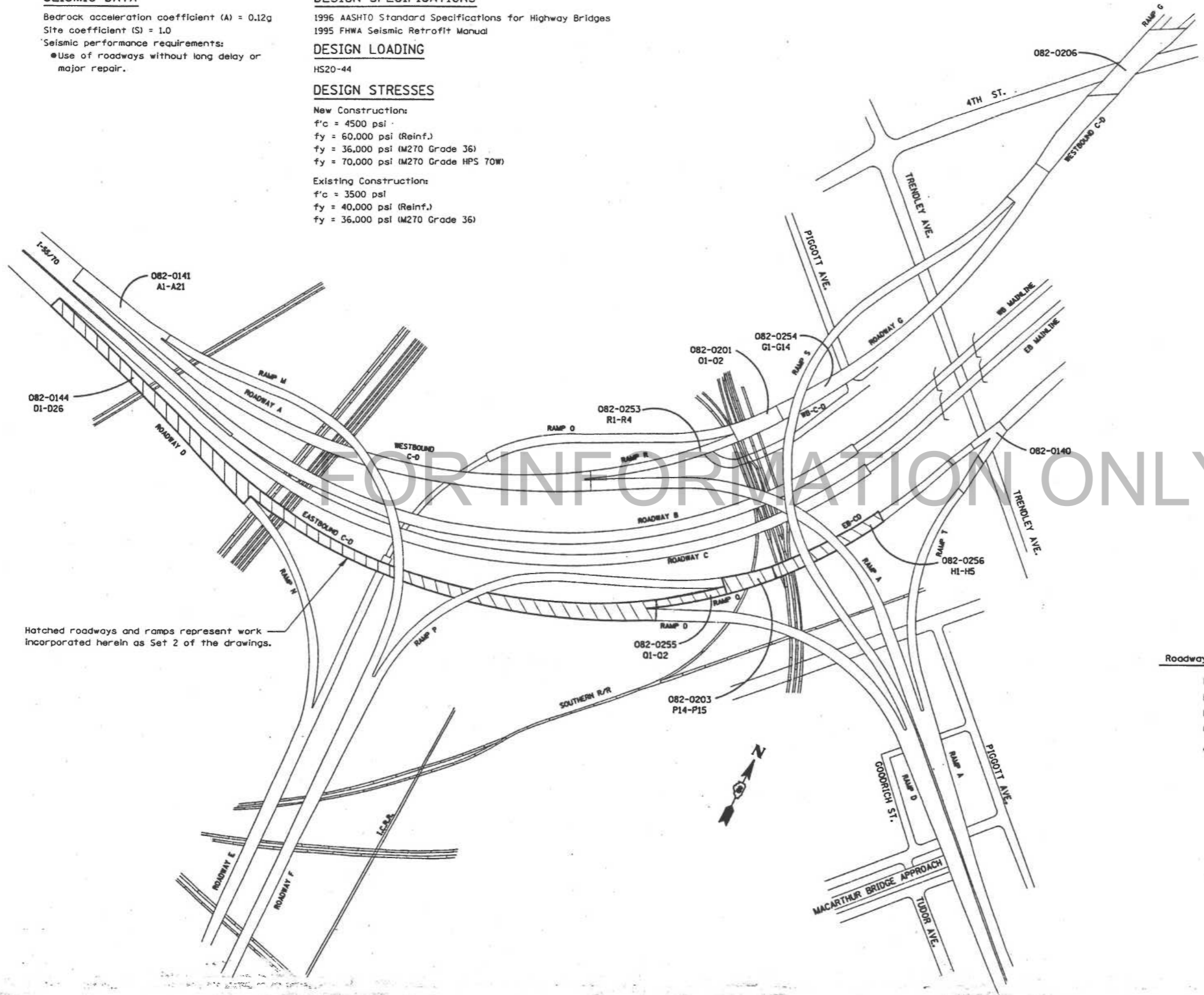
New Constructions:
 f'c = 4500 psi
 fy = 60,000 psi (Reinf.)
 fy = 36,000 psi (M270 Grade 36)
 fy = 70,000 psi (M270 Grade HPS 70W)

Existing Constructions:
 f'c = 3500 psi
 fy = 40,000 psi (Reinf.)
 fy = 36,000 psi (M270 Grade 36)

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.	SHEET NO. S-4
F.A.I. 78		ST. CLAIR	91	46	SHEETS
FED. ROAD DIST. NO. 7		ILLINOIS FED. AID PROJECT-		82-3HVB-2R-1-E	



LOCATION SKETCH



Hatched roadways and ramps represent work incorporated herein as Set 2 of the drawings.

OVERALL PROJECT PLAN

Roadway / Ramp	Segment / Pier Nos.	Structure No.	Year / Structure Type
D	D1-D26	082-0144	1967 Two Girder System
H	H1-H5	082-0256	1967 Two Girder System
P	P14-P15 *	082-0203	---
Q	Q1-Q2	082-0255	1988 Multi Girder System

* East side of span

PROJECT PLAN

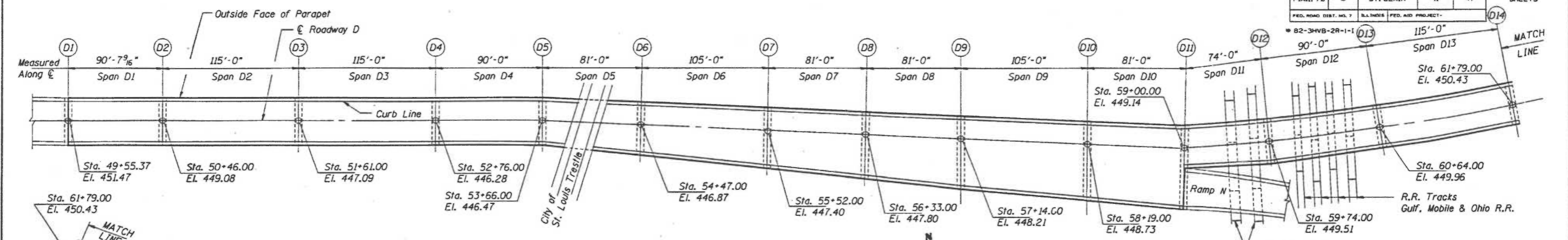
STATE OF ILLINOIS
 DEPARTMENT OF TRANSPORTATION
 SEISMIC AND REDUNDANCY RETROFIT REPAIRS
 FAI ROUTE TO
 POPLAR STREET BRIDGE APPROACHES
 ST. CLAIR COUNTY

NO. 082-0144
 SHEET NO. 082-0000
 DATE 1-23-98

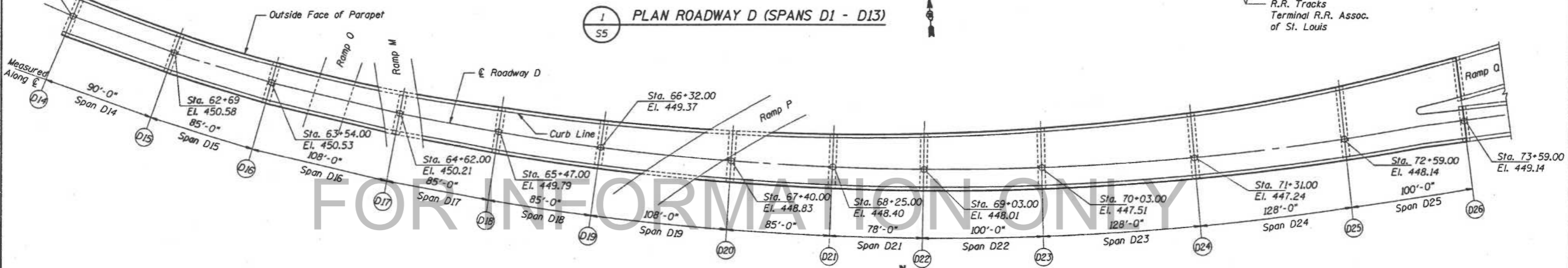
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1/23/98 1:42:22 PM SETA212PPLA.DWG

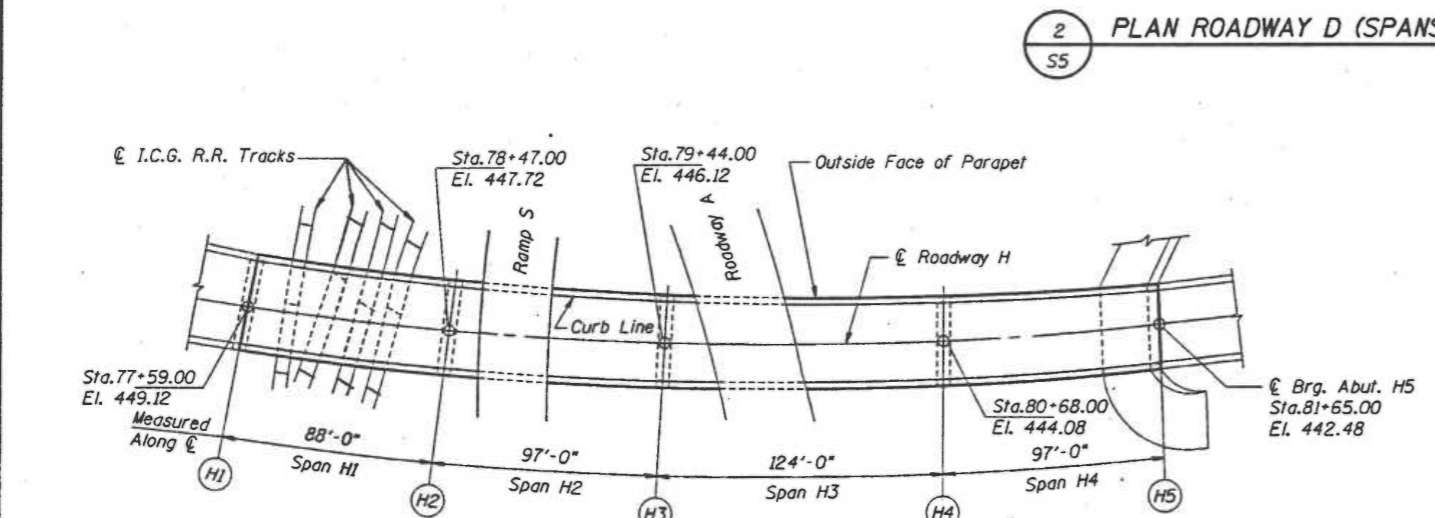
ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.	SHEET NO. S-5
F.A.I. 7B		ST. CLAIR	91	47	
SHEETS					
FED. ROAD DIST. NO. 7 ILLINOIS FED. AID PROJECT					



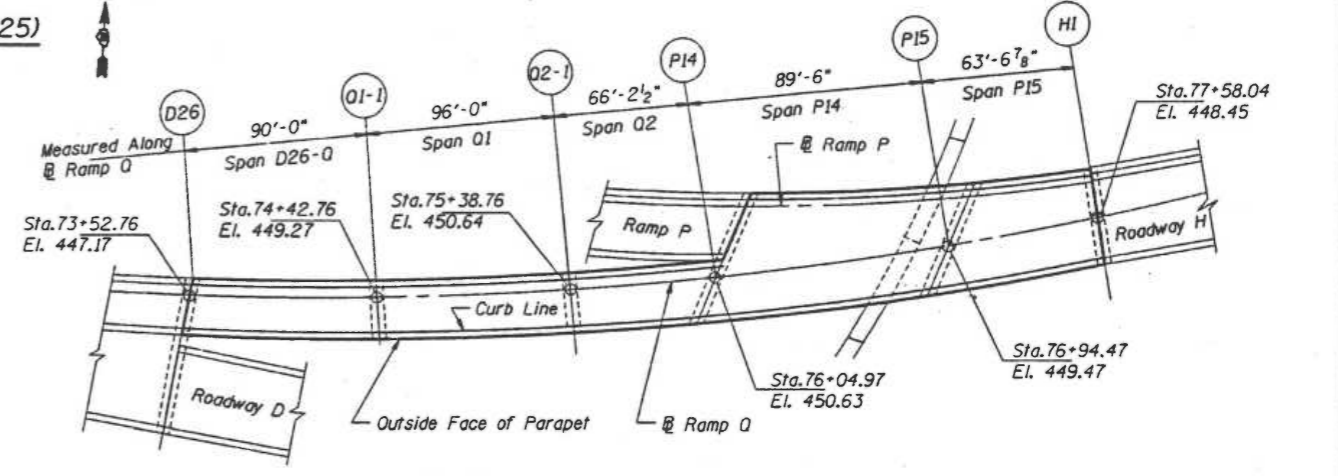
1 PLAN ROADWAY D (SPANS D1 - D13)



2 PLAN ROADWAY D (SPANS D14 - D25)



3 PLAN ROADWAY H



4 PLAN RAMPS Q & P

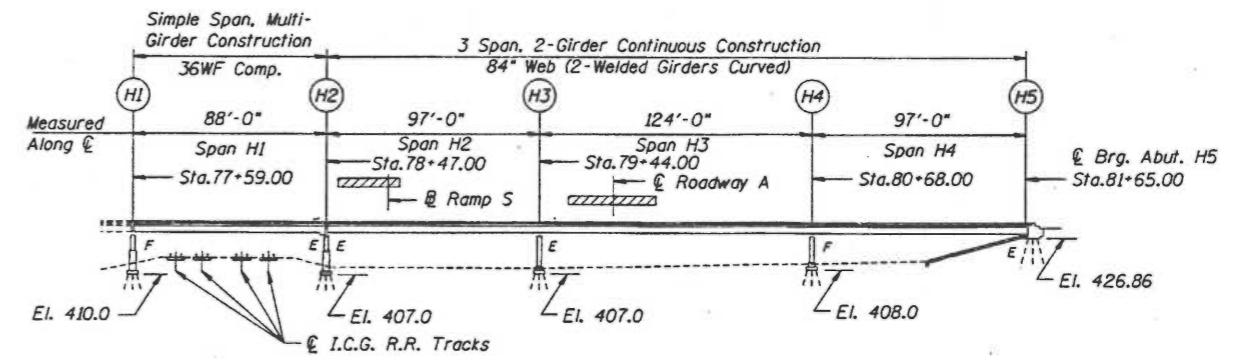
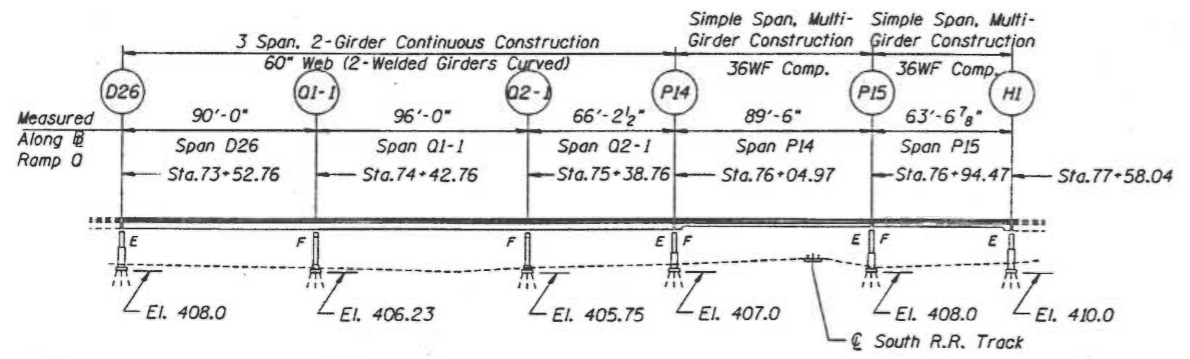
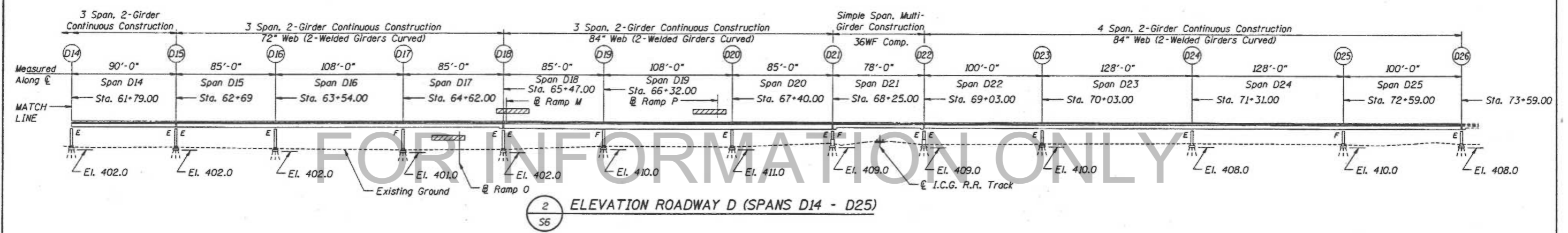
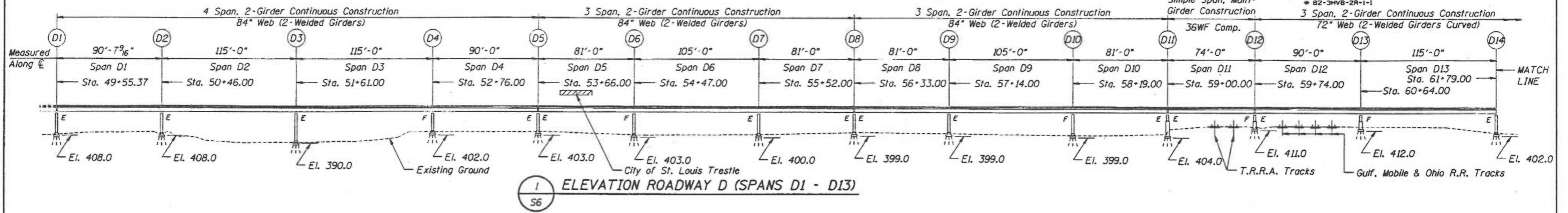
KEY PLAN FOR ROADWAYS D & H AND RAMPS Q & P

STATE OF ILLINOIS
 DEPARTMENT OF TRANSPORTATION
 SEISMIC AND REDUNDANCY RETROFIT REPAIRS
 FAI ROUTE 70
 POPLAR STREET BRIDGE APPROACHES
 ST. CLAIR COUNTY

STRUCTURE NO. 082-0144 ROADWAY NO. 2003
 DATE 1-23-98

S:\STRUCTURE\97422\SET\ST2D-05L.DGN

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.	SHEET NO. S-6
F.A.I. 70	ST. CLAIR	ST. CLAIR	91	48	SHEETS
FED. ROAD DIST. NO. 7 ILLINOIS FED. AID PROJECT					

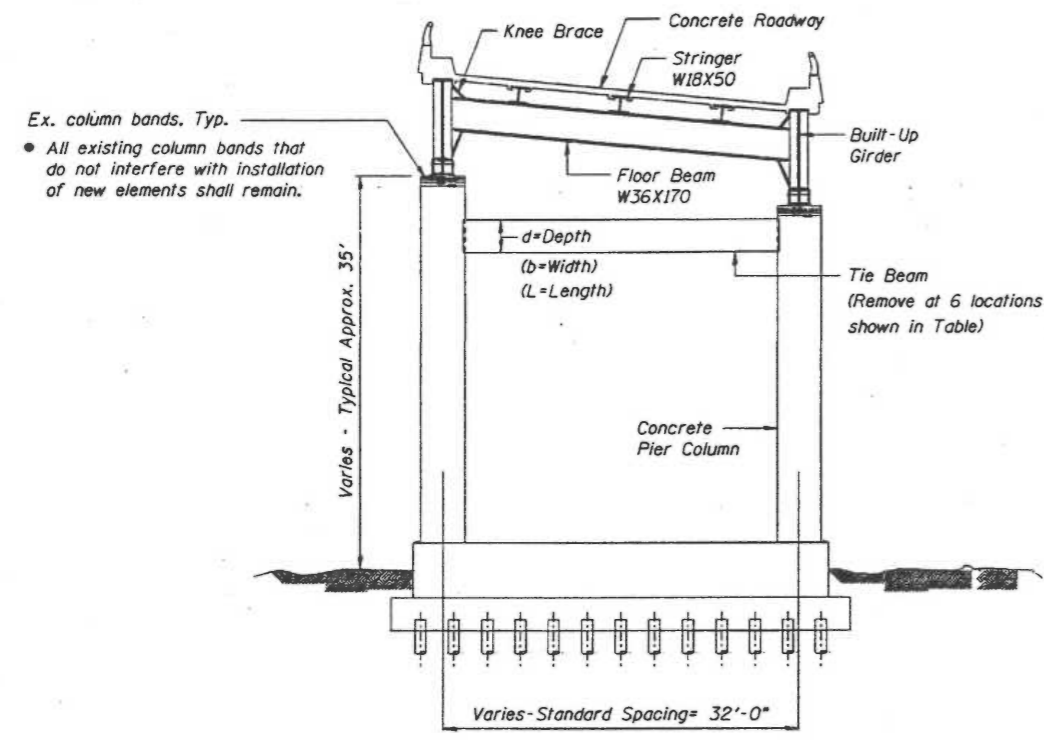


ELEVATION OF SPAN UNITS FOR ROADWAYS D & H AND RAMP Q & P

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
FAI ROUTE 70
200' W STREET BRIDGE APPROACH
ST. CLAIR COUNTY

DATE 1-23-98 CHECKED BY

A:\STC\1\JUN97\425\NET\2\1572EL\986.DGN



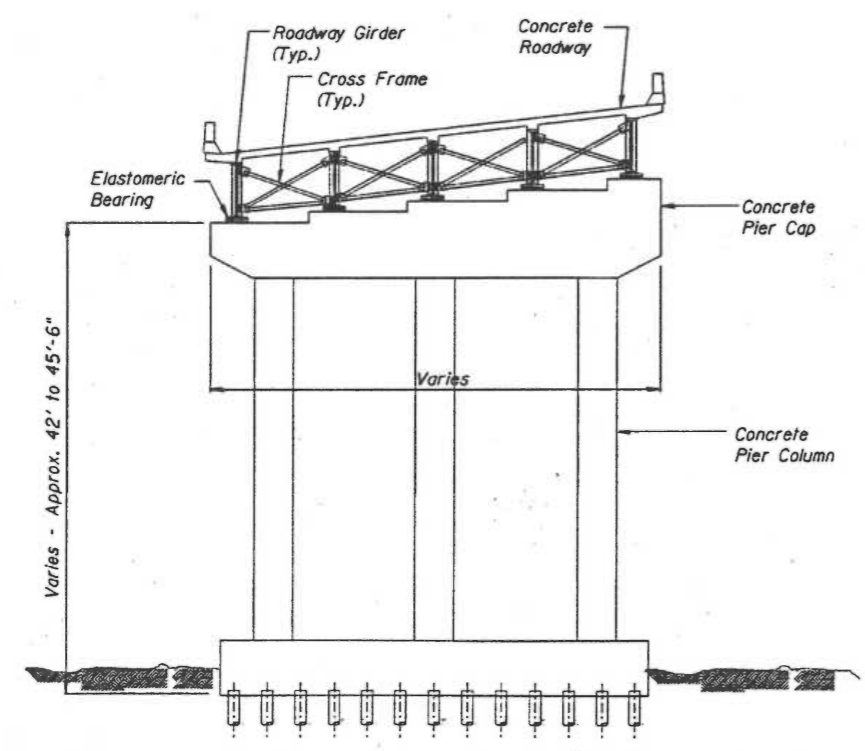
TIE BEAM REMOVAL PARAMETERS

Pier	d (in.)	b (in.)	L (ft.-in.)	Comments
D5	36	15	28'-0"	
D8	36	21	40'-2"	
D15	36	15	28'-0"	
D18	36	15	28'-1"	
D26	36	15 & 24	57'-0"	See Note 4
P14	36	15	42'-10"	See Note 3

- Notes:**
1. Cut tie beam ends flush with inside faces of columns, such that horizontal ledge is eliminated.
 2. Coat exposed ends of reinforcement bars with IDOT approved epoxy. Epoxy shall overlap a minimum of 1" onto surrounding concrete.
 3. Length (L) includes 2 tie beams to be removed.
 4. Includes 9'-0" of 24" x 36" tie beam and 48'-0" of 15" x 36" tie beam, in 3 sections.

1
S7
TYPICAL SECTION THROUGH TWO GIRDER ROADWAY
(Section through Ramp Similar)

FOR INFORMATION ONLY



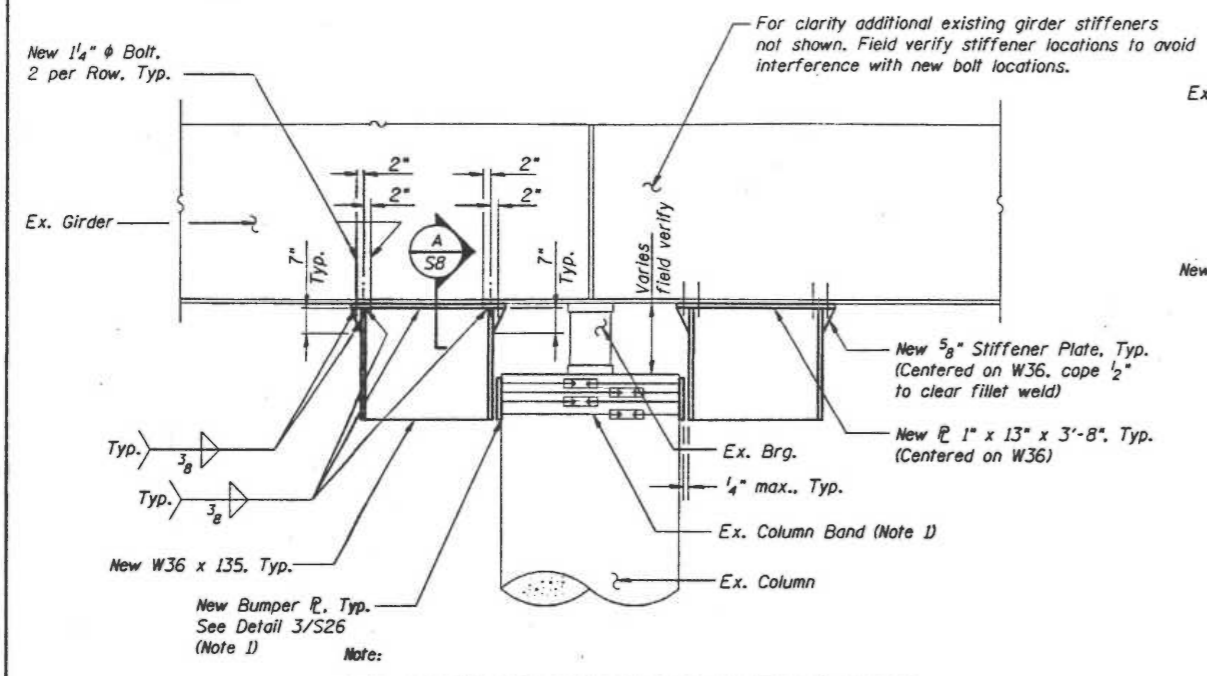
2
TYPICAL SECTION THROUGH MULTI-GIRDER ROADWAY

TYPICAL SUBSTRUCTURE DETAILS

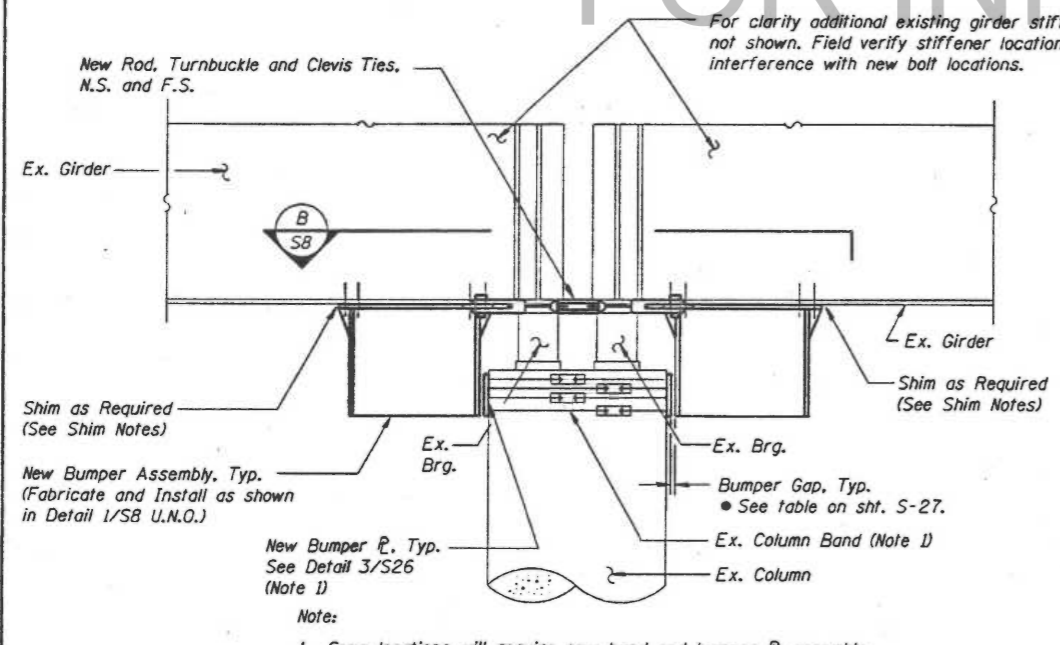
STATE OF ILLINOIS
 DEPARTMENT OF TRANSPORTATION
 SEISMIC AND REDUNDANCY RETROFIT REPAIRS
 FAI ROUTE TO
 PLAR STREET BRIDGE APPROACHES
 ST. CLAIR COUNTY

DATE _____ CHECKED BY _____

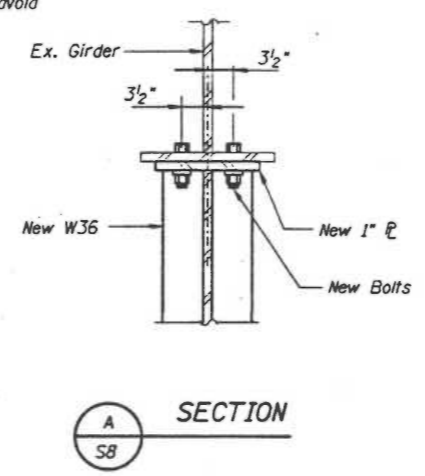
ROUTE NO.	SECTION	COUNTY	TOTAL LENGTH	SHEET NO.	SHEET NO. S-8
F.A.I. 7B		ST. CLAIR	91	58	SHEETS
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT	82-3HVB-2R-1-1		



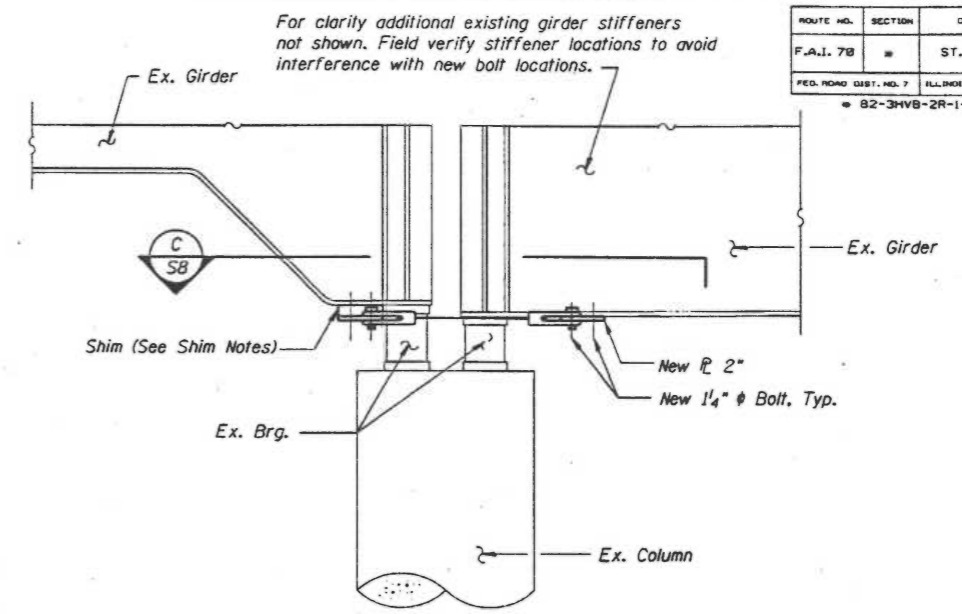
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S8
ELEVATION: BUMPERS AT CONTINUOUS GIRDER



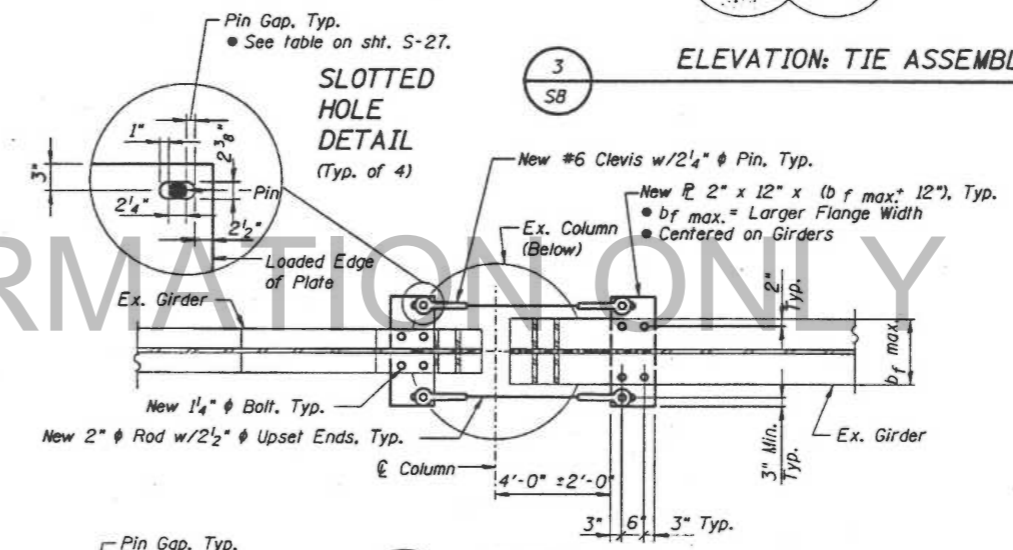
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S8
ELEVATION: BUMPER/TIE ASSEMBLY



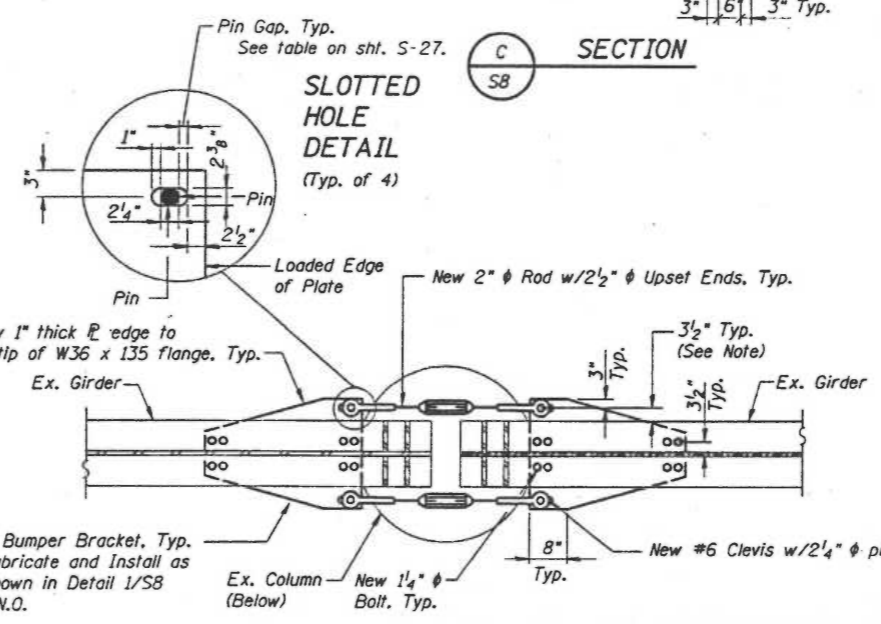
A
S8
SECTION



3
S8
ELEVATION: TIE ASSEMBLY



C
S8
SECTION



B
S8
SECTION

SHIM NOTES:

1. Shim higher flange so that elevation difference between ends of rod is no more than 1/2".
2. Shim Plate length shall match the smaller length of the plates being shimmed, and shim plate width shall match the smaller width of the plates being shimmed.
3. Field verify shim requirements.

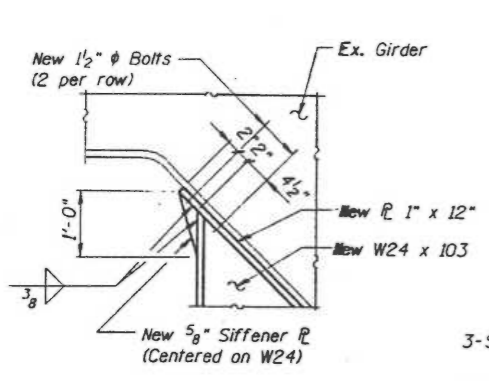
BUMPER/TIE ROD NOTES:

1. All bolt holes shall be standard round holes (φ 1/16") Unless Noted Otherwise.
2. All bumpers and tie rod connection plates shall be centered on the existing girder.
3. Tie Rods may be multiple bar sections with turnbuckles or single rods without turnbuckles.
4. The total length of the unthreaded portion of each tie rod assembly shall not be less than 1'-8".
5. Tie rods may extend 0" min. to 3/4" max. into clevis and turnbuckle openings U.N.O.

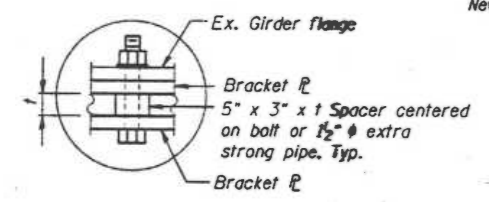
SEISMIC RETROFIT DETAILS
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
FAI ROUTE 70
POPLAR STP/FET BRIDGE APPROACHES
AIR COUNTY

DATE 23-98
DRAWN BY JUN
CHECKED BY HH

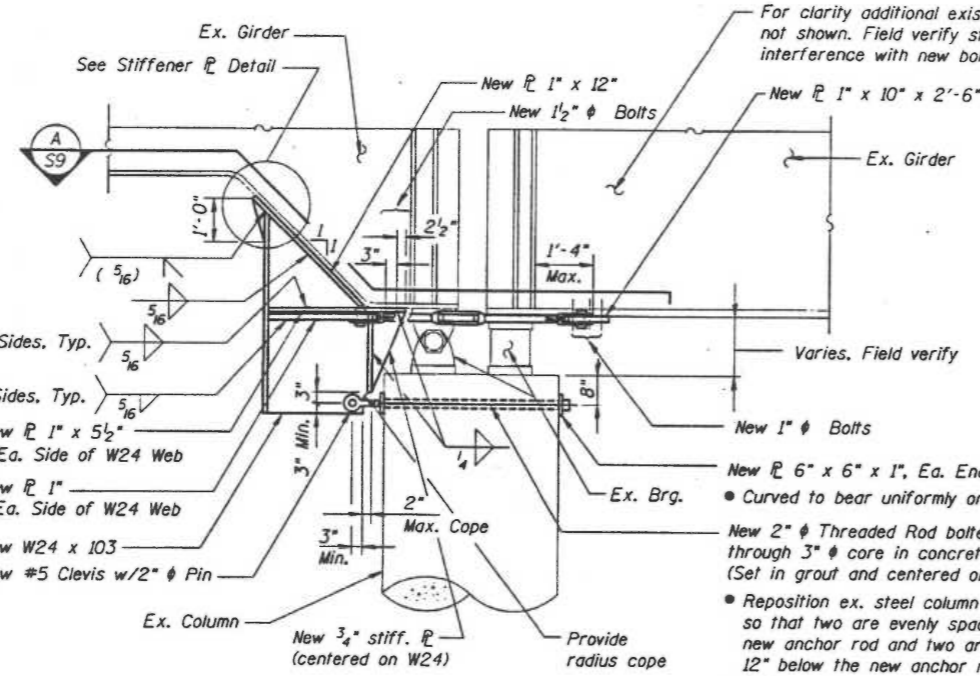
ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.	SHEET NO. S-9
F.A.I. 78		ST. CLAIR	91	51	SHEETS
FED. ROAD DIST. NO. 7 ILLINOIS FED. AID PROJECT					
82-3HVB-2R-1-1					



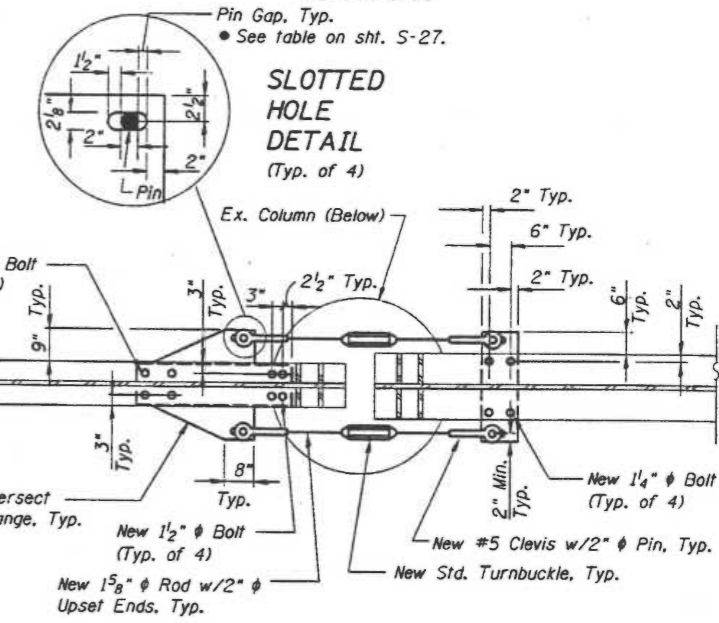
STIFFENER PLATE DETAIL



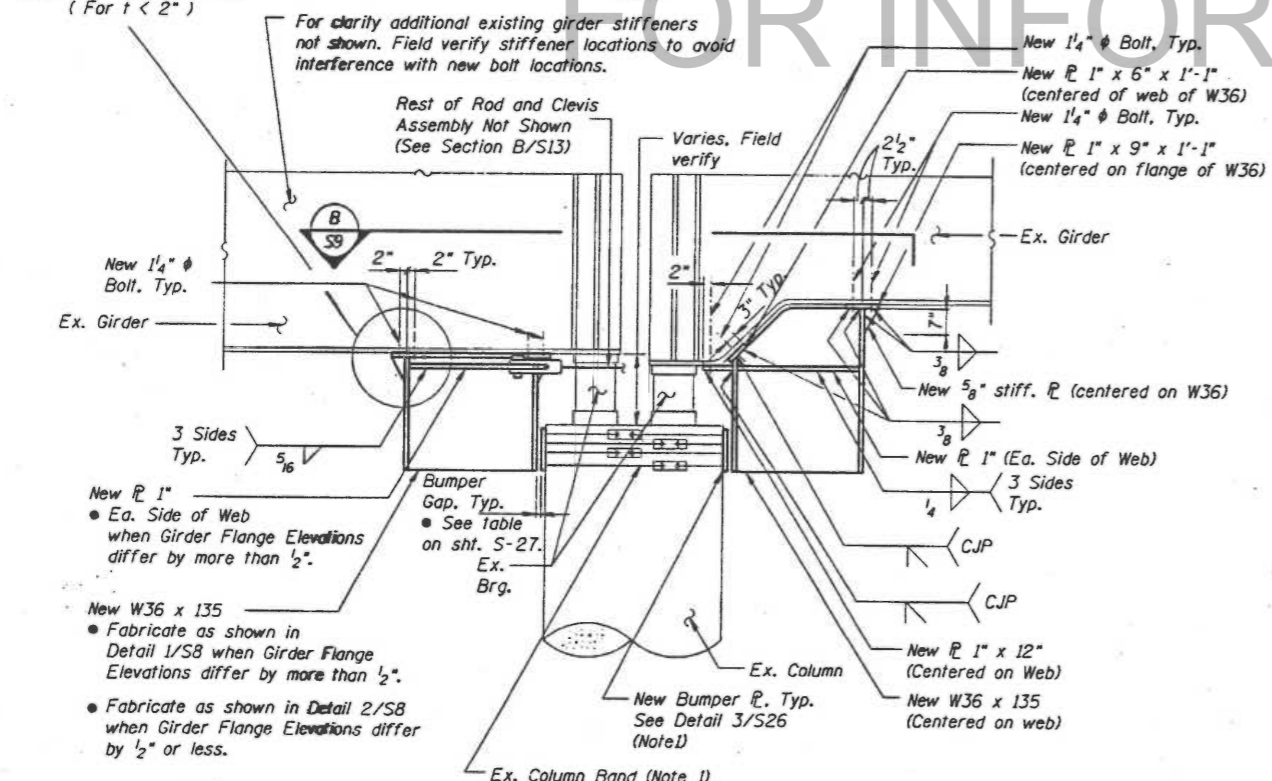
SPACER DETAIL
(For t < 2")



ELEVATION: BUMPER/TIE AT HAUNCHED GIRDER WITH FIXED BEARING

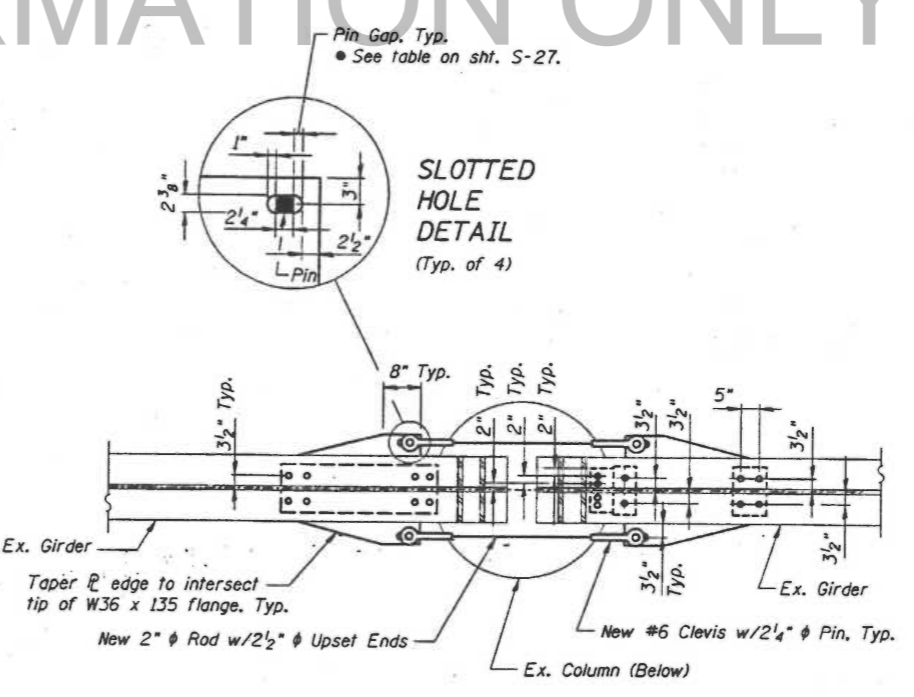


SECTION A-S9



- Note:
- Some locations will require new band and bumper PL assembly. Appropriate details are called out on elevations of affected piers.

ELEVATION: BUMPER/TIE AT HAUNCHED GIRDER



SECTION B-S9

BUMPER/TIE ROD NOTES:

- All bolt holes shall be standard round holes (φ = 1/16") Unless Noted Otherwise.
- All bumpers and tie rod connection plates shall be centered on the existing girder.
- Tie Rods may be multiple bar sections with turnbuckles or single rods without turnbuckles.
- The total length of the unthreaded portion of each tie rod assembly shall not be less than 1'-8".
- Tie rods may extend 0" min. to 3/4" max. into clevis and turnbuckle openings U.N.O.

SEISMIC RETROFIT DETAILS

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
FAI ROUTE 70
POLAR STREET BRIDGE APPROACHES
CLATSOP COUNTY

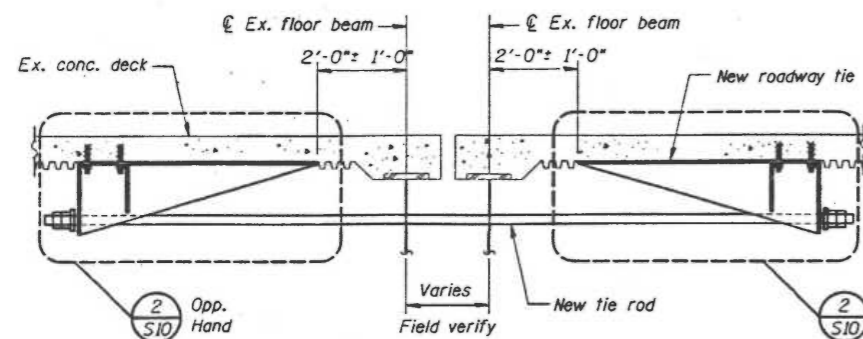
STRUCTURE NO. 02-2-11
SCALE: NONE
DATE: 1-23-98

STRUCTURE NO. 02-2-11
DRAWN BY:
CHECKED BY: HH

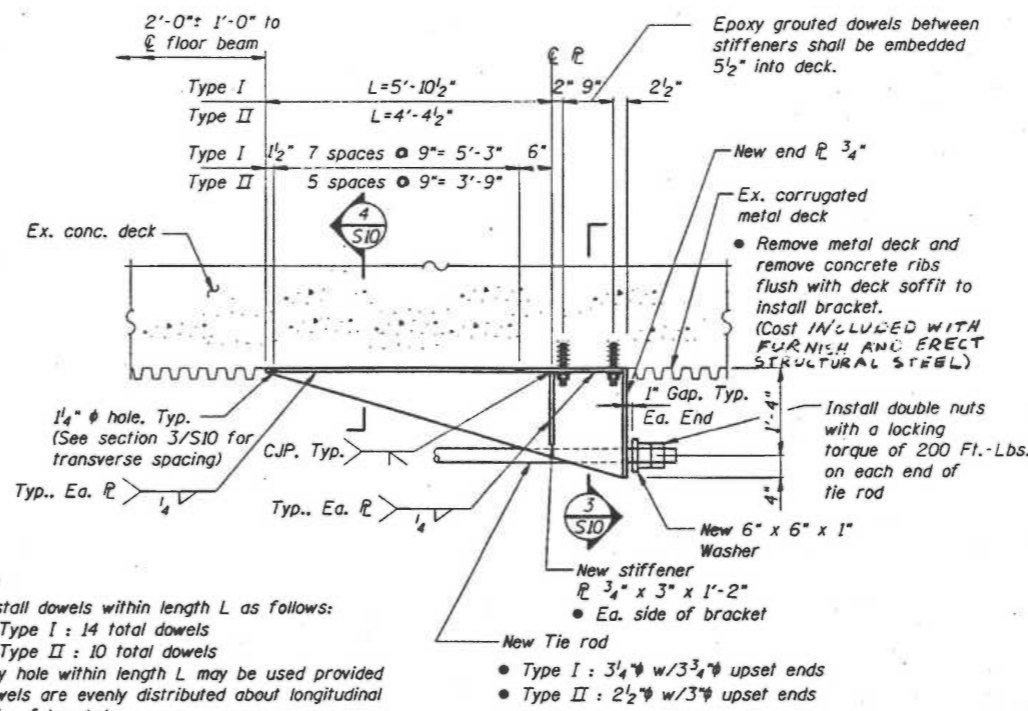
FOR INFORMATION ONLY

STRUCTURE NO. 02-2-11

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.	SHEET NO. S-10
F.A.L. 78		ST. CLAIR	91	52	SHEETS
FFD. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT			
# 82-3HVB-2R-1-1					

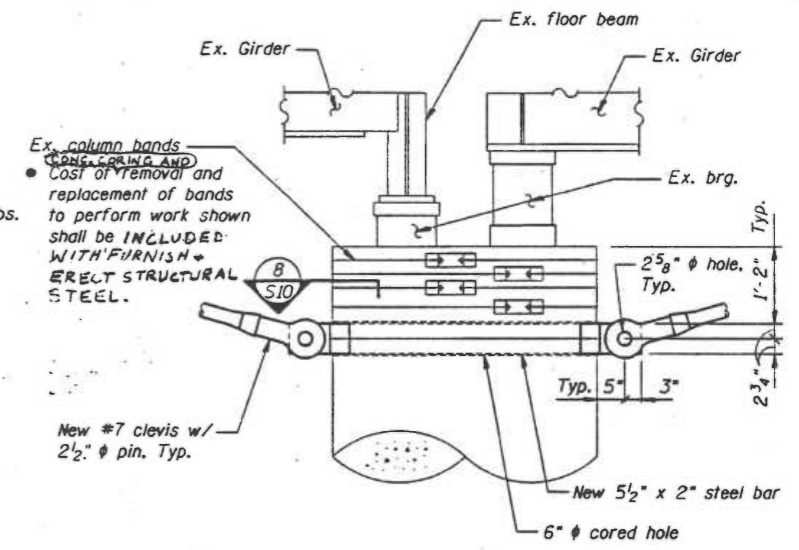


1 ELEVATION - ROADWAY TIE
S10

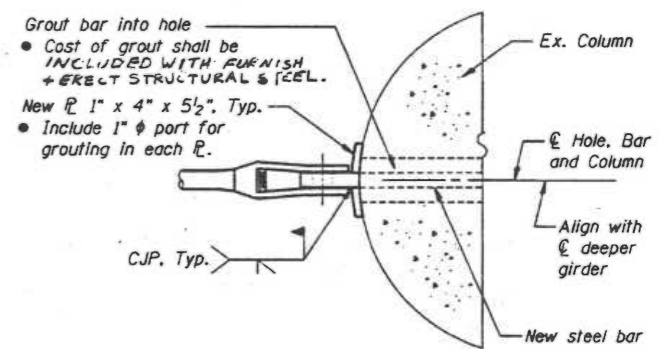


- Notes:
1. Install dowels within length L as follows:
Type I : 14 total dowels
Type II : 10 total dowels
Any hole within length L may be used provided dowels are evenly distributed about longitudinal axis of bracket.
 2. Unless noted otherwise, all dowels shall consist of 1" ϕ epoxy grouted dowels, embedded 4 1/2" into deck.
 3. Core drill 4" ϕ holes in floor beam webs to permit passage of rod.
 4. Gap at end of tie rod was developed for an installation temperature of 50° F. For other installation temperatures decrease the gap by 0.05" for every 5° F below 50° F and increase the gap by 0.05" for every 5° F above 50° F.
 5. Epoxy grouted dowel embedment shall be measured from the embedded end of the dowel to the smooth surface on the bottom of the concrete deck created by removing the concrete ribs.

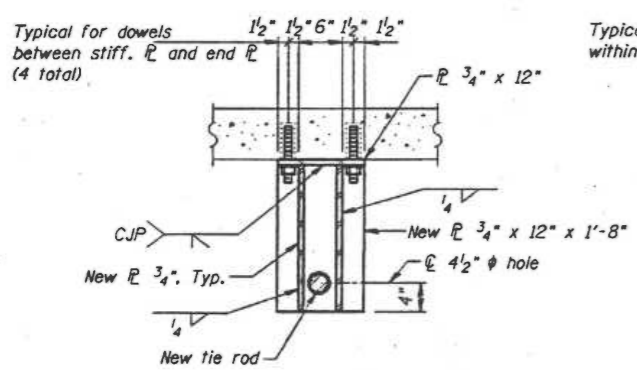
2 ELEVATION - ROADWAY TIE
S10



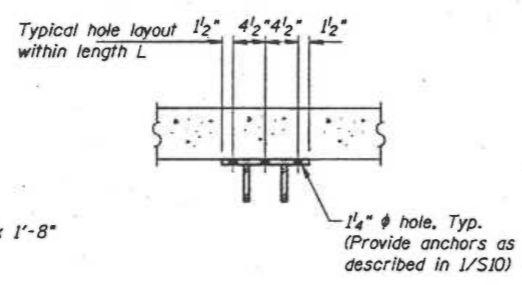
7 ELEVATION
S10



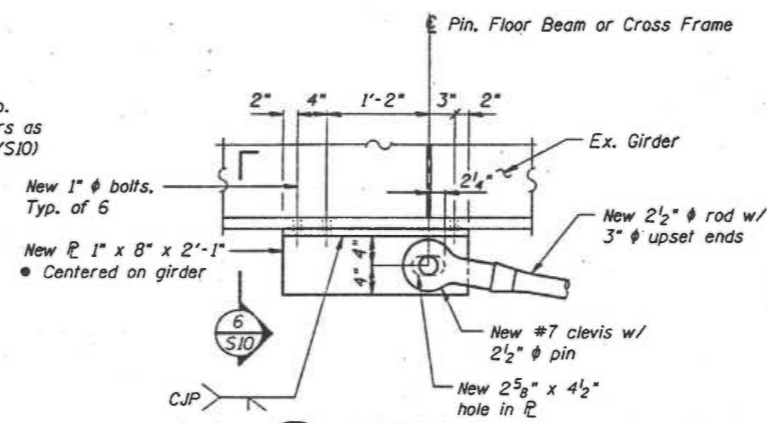
8 SECTION
S10



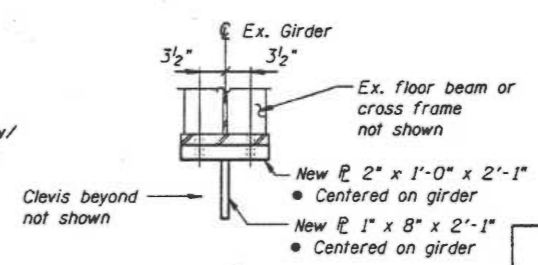
3 SECTION
S10



4 SECTION
S10



5 DETAIL
S10



6 SECTION
S10

FOR INFORMATION ONLY

SEISMIC RETROFIT DETAILS

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
FAI ROUTE 70
POPLAR STREET BRIDGE APPROACHES
ST. CLAIR COUNTY

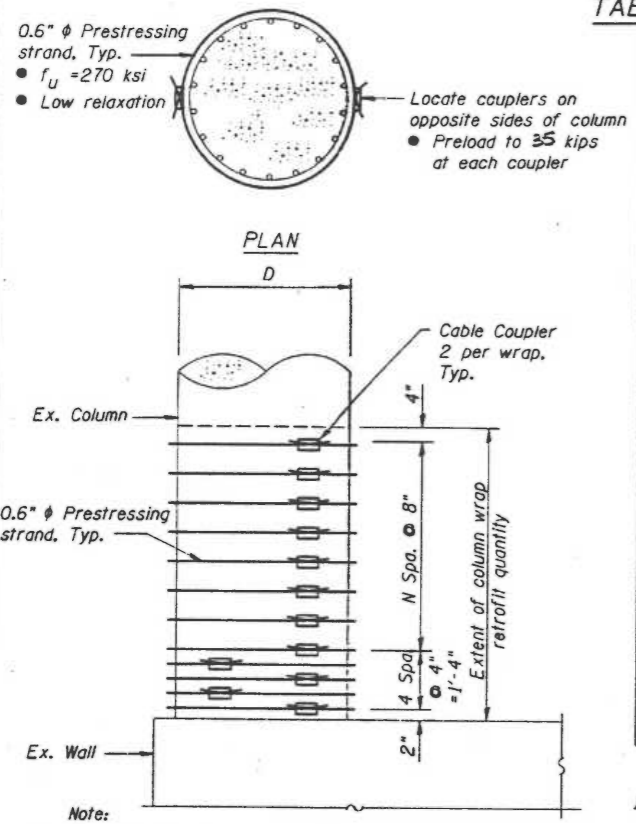
STRUCTURE NO. 032-0144 (ROADWAY) OR STRUCTURE NO. 032-0256 (ROADWAY) STRUCTURE NO. 032-0256 (ROADWAY)
SCALE: NONE
DATE: 1-23-98 CHECKED BY: [Signature]

TABLE OF COLUMN WRAP AND TIE BEAM WRAP PARAMETERS

Pier	No. Cols.	D (in.)	N	M	b (in.)	d (in.)	Comments
D2	2	48	7	9	15	36	See Note 5
D4	2	54	8	9	15	36	
D5	2	48	7				
D6	2	48	7	9	18	36	
D7	2	48	7	9	21	36	
D8	2	48	7				
D9	2	48	7	9	24	36	See Note 5
D10	2	54	8	9	27	36	See Note 7
D12	2	48					See Note 4
D13	2	48	7	9	15	36	See Note 5
D14	2	48	7				See Note 6
D15	2	48	7				
D16	2	48	7	9	15	36	
D17	2	54	8	9	15	36	See Note 5
D18	2	48	7				
D19	2	48	7	9	15	36	
D20	2	48	7				
D21	2	48					See Note 4
D23	2	54	8	9	21	36	See Note 5
D24	2	54	8	9	24	36	See Note 5, 6 and 7
D25	2	54	8				See Note 7
D26	1	48	7				Wrap North Col. only
O1-1	2	48	7				
O2-1	2	48	7				
P14	2	48	7				Wrap Outside Cols. only
P15	2	54					See Note 4
H1	2	48	7				
H3	2	48	7	9	21	36	See Note 5
H4	2	48	7	9	18	36	See Note 5

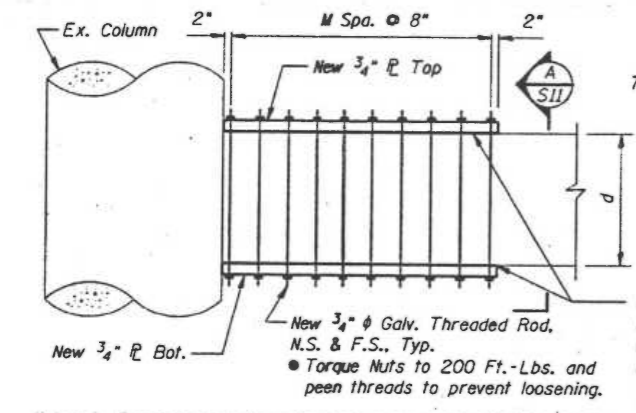
- Notes:**
- Complete all specified dowel bar modifications and concrete repairs at least 3 days before wrapping any member.
 - See detail 1/S11 for column wrap U.N.O.
 - See detail 2/S11 for tie beam wrap U.N.O.
 - See detail 6/S12 for column wrap.
 - See detail 2/S13 for modifications to the tie beam wrap.
 - Existing dead conduit along face of column interferes with installation of column wrap. Remove conduit (approximate length of 30'). Removal cost shall be incidental to column wrap installation.
 - Existing live conduit along face of column interferes with installation of column wrap. Conduit shall be rerouted over the length of the wrap by a qualified electrician such that column wrap may be installed (approximate length of 6'-2"). Note that electrical service may only be interrupted between the hours of 8:00 AM and 4:00 PM. Relocation cost shall be incidental to column wrap installation.

Concrete grinding cost, if required to provide uniform bearing, shall be INCLUDED WITH FURNISH, + ERECT STRUCTURAL STEEL.



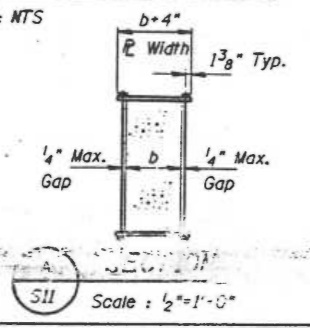
- Note:**
- See table for dimensions not shown and additional notes.
 - Alternative column wraps may be used. See Special Provisions.

1 ELEVATION - TYPICAL COLUMN WRAP
Scale: NTS



- Notes:**
- See table for dimensions not shown and additional notes.
 - Wrap each end as shown.

2 ELEVATION - TYPICAL TIE BEAM WRAP
Scale: NTS



3 SECTION
Scale: 1/2" = 1'-0"

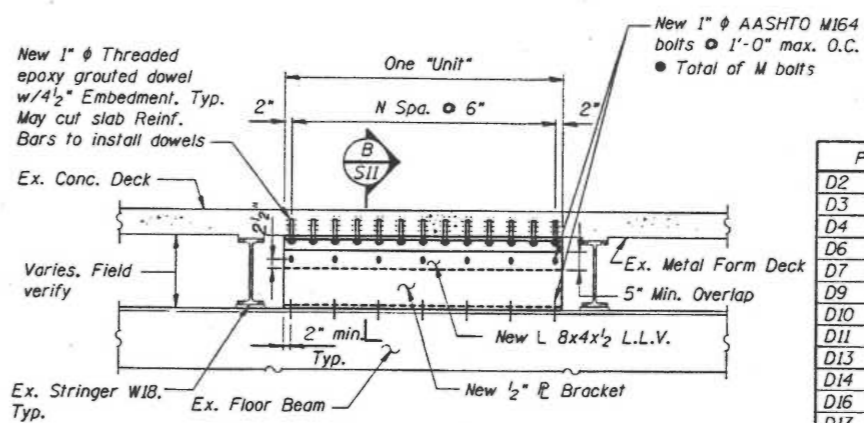
ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.	SHEET NO.
F.A.I. 70		ST. CLAIR	91	53	SHEETS

FED. ROAD DIST. NO. 7 ILLINOIS FED. AID PROJECT: # B2-3HVB-2R-1-1

TABLE OF SLAB/FLOOR BEAM CONNECTION

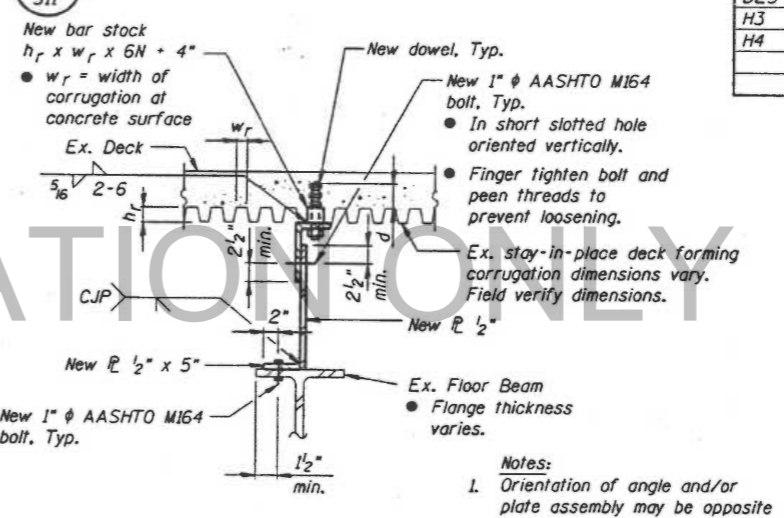
Pier	No. of Units	N Per Unit	M Per Unit	Ref. Detail	Comments
D2	2	9	5	3/S-II	
D3	1	5	3	3/S-II	
D4	2	8	5	3/S-II	
D6	2	8	5	3/S-II	
D7	2	5	3	3/S-II	
D9	2	7	4	3/S-II	
D10	2	7	4	3/S-II	
D11	1	7	4	4/S-II	See Note 1
D13	2	8	5	3/S-II	
D14	1	8	5	3/S-II	
D16	1	9	5	3/S-II	
D17	2	7	4	3/S-II	
D19	2	9	5	3/S-II	
D20	1	10	6	3/S-II	
D22	1	7	4	4/S-II	See Note 2
D23	4	7	4	3/S-II	
D24	4	7	4	3/S-II	
D25	2	8	5	3/S-II	
H3	2	8	5	3/S-II	
H4	2	10	6	3/S-II	

- Notes:**
- West side expansion joint only.
 - East side expansion joint only.

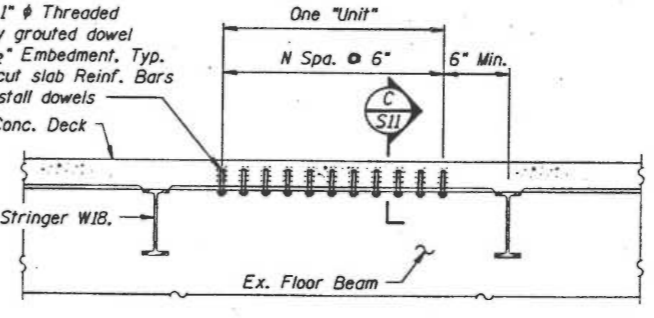


- Notes:**
- See table for number of "units", per pier.
 - See table for N.

3 ELEVATION - SLAB FLOOR BEAM CONNECTION

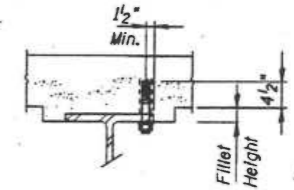


- Notes:**
- Orientation of angle and/or plate assembly may be opposite hand to that shown.
 - Epoxy grouted dowel embedment length (d) shall be measured from the embedded end of the dowel to the bottom of the corrugation (excludes rib height).



- Notes:**
- See table for number of "units" per pier.
 - See table for N.

4 ELEVATION - SLAB FLOOR BEAM CONNECTION



Note: Epoxy grouted dowel embedment length shall be measured from the bottom of the concrete slab to the end of the dowel excluding the fillet height.

5 SECTION

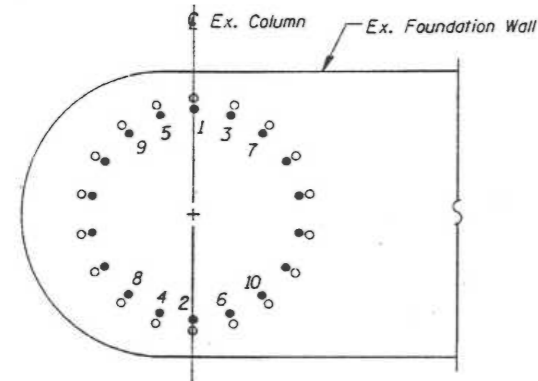
SEISMIC RETROFIT DETAILS

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
FAI ROUTE TO
POPLAR STRE... APPROACHES

**FOUNDATION WALL DOWEL
MODIFICATION TABLE**

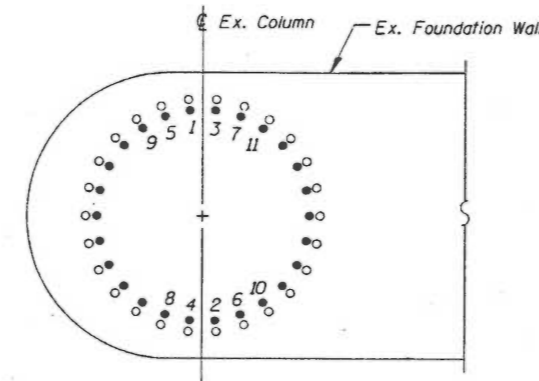
Pier	Modifications per pier	Ref. Detail	No. of bars cut per modification	Comments
D4	2	1/S12	2	
D5	2	1/S12	8	
D6	2	1/S12	4	
D8	2	1/S12	8	
D9	2	1/S12	6	
D13	2	1/S12	6	
D15	2	1/S12	8	
D17	2	3/S12	6	
D18	2	1/S12	8	
D19	2	1/S12	4	
D24	2	1/S12	6	
D25	2	2/S12	6	
D26	2	1/S12	4	See Note 7
P14	2	1/S12	2	See Note 8
H1	2	2/S12	10	
H4	2	1/S12	4	

- Notes:**
1. Cut number of foundation dowel bars indicated. To determine which bars to cut, see reference detail and cut bars starting with number 1 and finishing with the number shown in the table.
Example: Pier D6 cut dowel bars 1, 2, 3 and 4 as labeled in detail 1/S12.
 2. The contractor shall positively discern between column longitudinal reinforcing bars and foundation wall dowel bars prior to cutting any bars.
 3. Dowel bars to be cut must be cut within 2" of top of foundation wall. Corresponding column bars may also be cut at the same location.
 4. Concrete removal areas shall be limited to 1'-6" in height and shall be no deeper than 1/2" clear inside the vertical bars.
 5. Concrete removal and repair costs shall be incidental to the foundation wall dowel modification. All unsound concrete caused by bar cutting shall be removed prior to concrete repair. See sheet S-26 for concrete removal and repair details.
 6. Excavation required to perform foundation wall dowel modifications. See sheet S-28 for additional information.
 7. Modify dowels for north column only.
 8. Modify dowels for south two columns only.



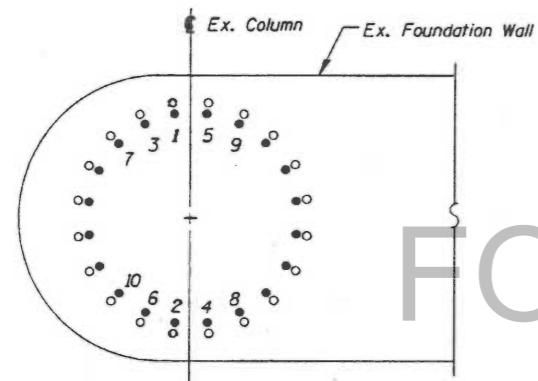
1 SECTION - FOUNDATION WALL DOWELS
S12 (18 Bar Layout)

- Foundation Wall dowel bar (#10 or #11 bar)
- Outline of column bar



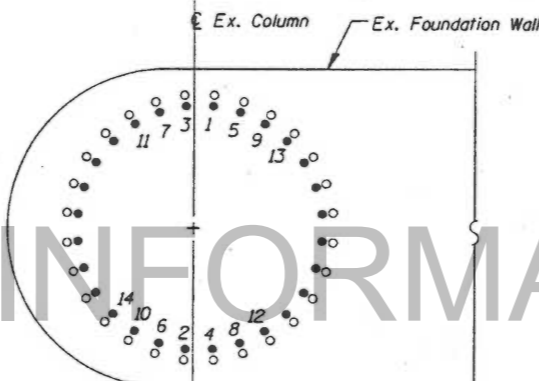
4 SECTION - FOUNDATION WALL DOWELS
S12 (26 Bar Layout)

- Foundation Wall dowel bar (#11 bar)
- Outline of column bar



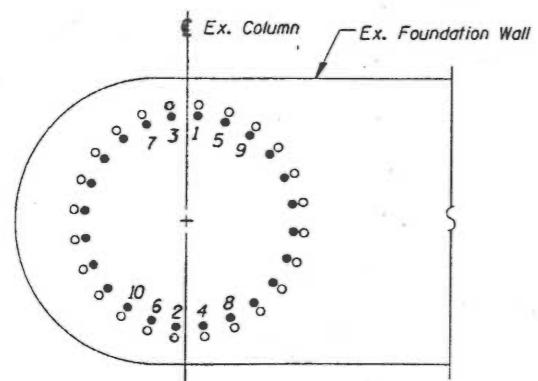
2 SECTION - FOUNDATION WALL DOWELS
S12 (20 Bar Layout)

- Foundation Wall dowel bar (#10 or #11 bar)
- Outline of column bar



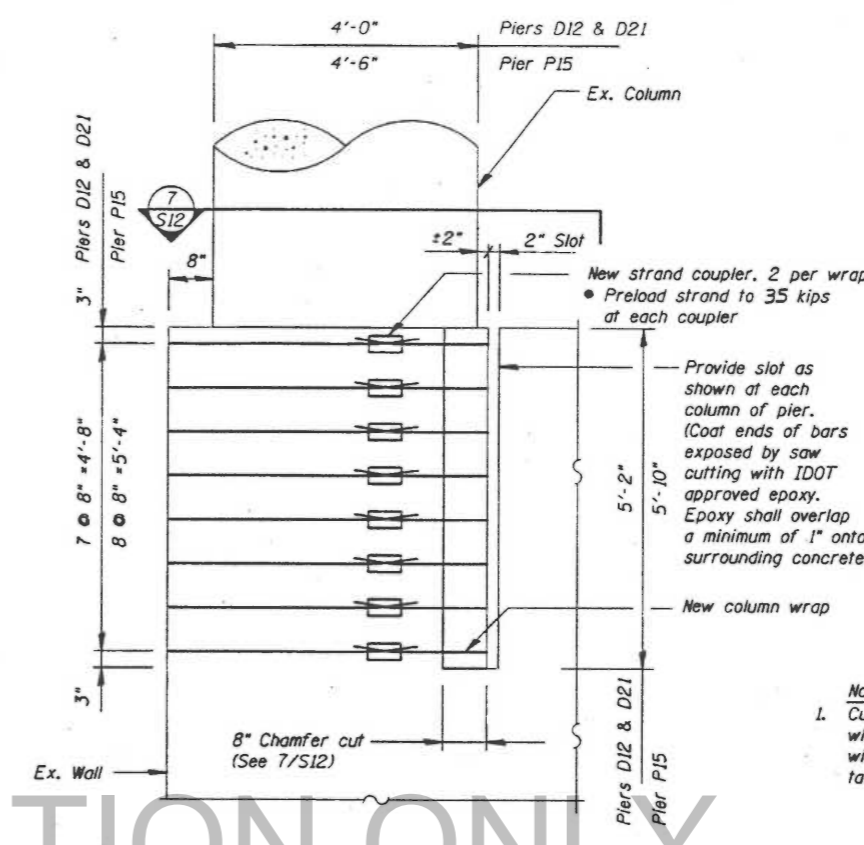
5 SECTION - FOUNDATION WALL DOWELS
S12 (28 Bar Layout)

- Foundation Wall dowel bar (#11 bar)
- Outline of column bar

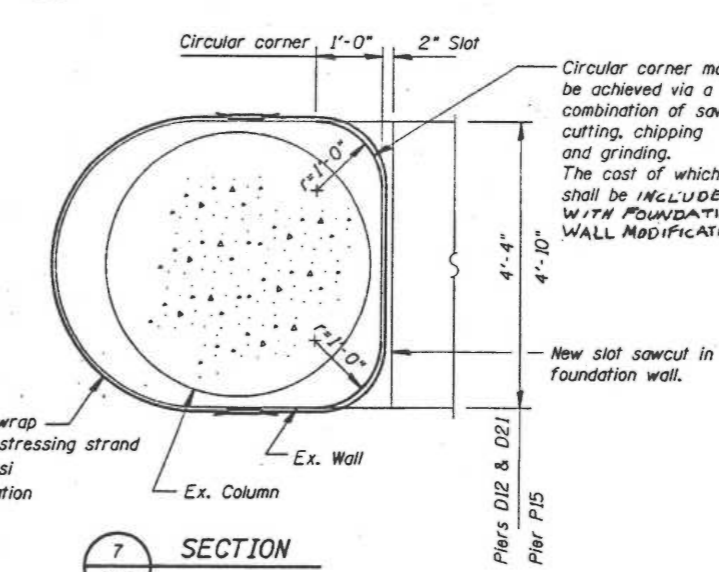


3 SECTION - FOUNDATION WALL DOWELS
S12 (24 Bar Layout)

- Foundation Wall dowel bar (#11 bar)
- Outline of column bar



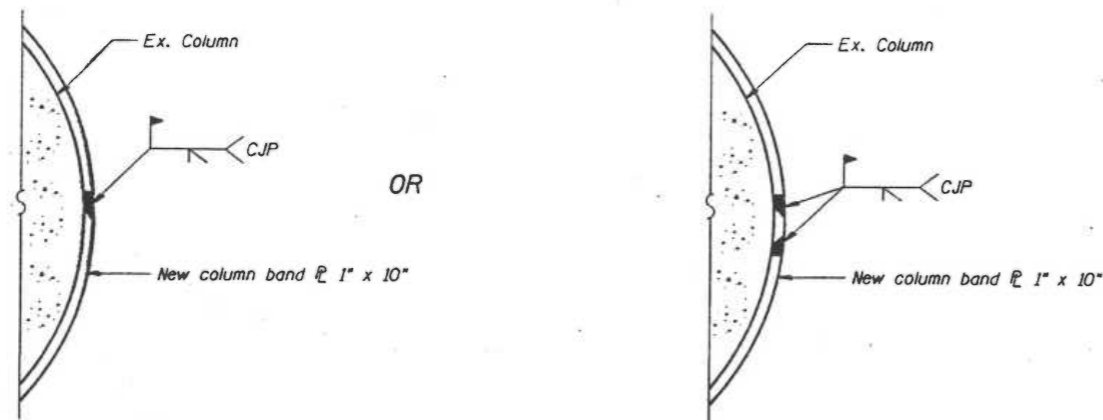
6 ELEVATION - PIERS D12, D21 & P15
S12



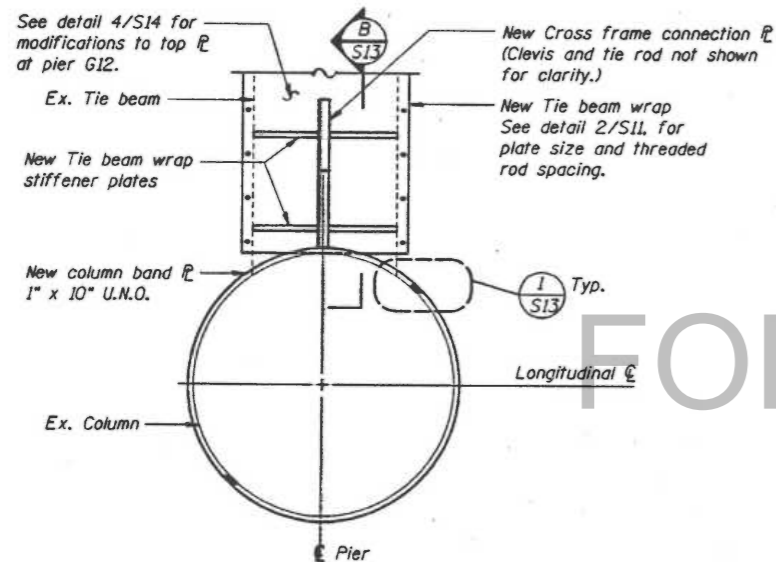
7 SECTION
S12

SEISMIC RETROFIT DETAILS
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
FAI ROUTE 70
PUBLIC STREET BRIDGE APPROACHES
CLAIR COUNTY

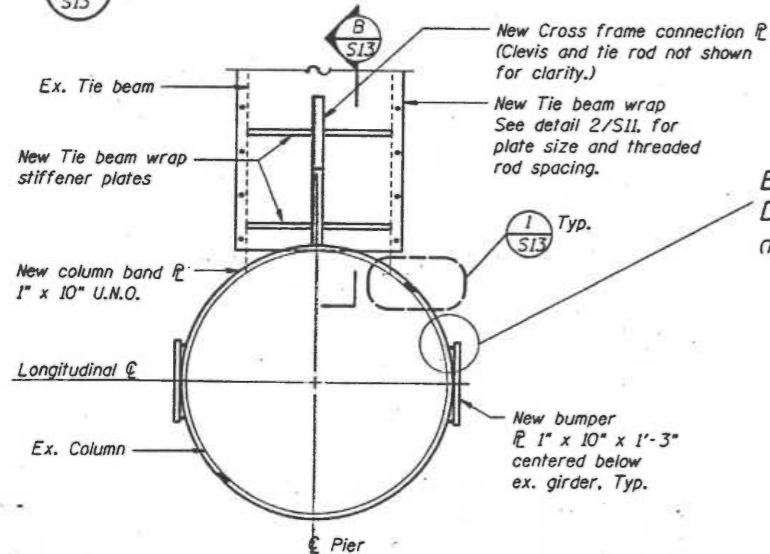
REFIT NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.	SHEET NO.
F.A.I. 7B	#	ST. CLAIR	91	55	5-13
FED. ROAD DIST. NO. 7		ILLINOIS		FED. AID PROJECT	
# 82-3HVB-2R-1-1					



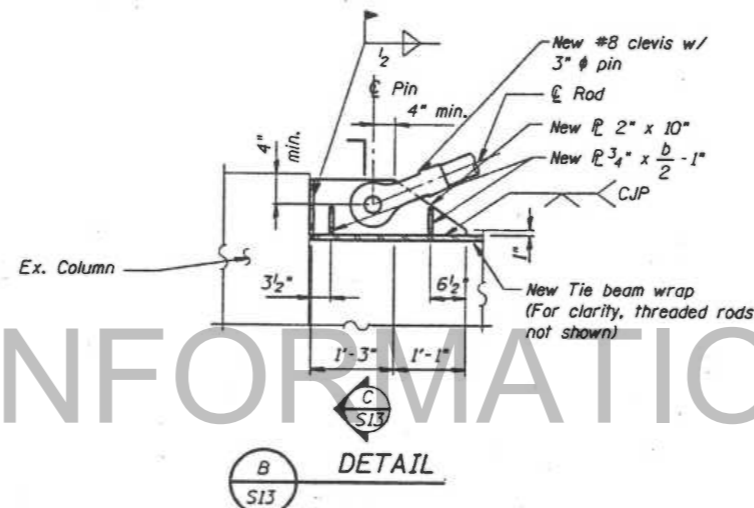
1 COLUMN BAND CONNECTION OPTIONS
S13



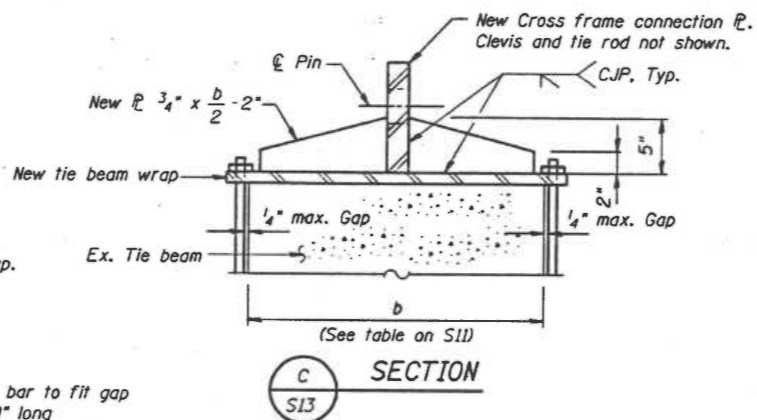
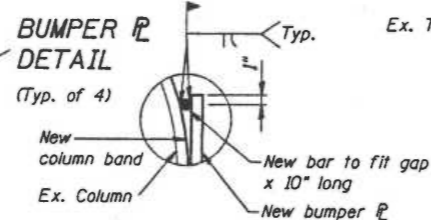
2 CROSS FRAME COLUMN BAND DETAIL
S13



COLUMN BAND DETAIL AT PIERS
WITH BUMPERS & CROSS FRAMES



DETAIL
S13



SECTION
S13

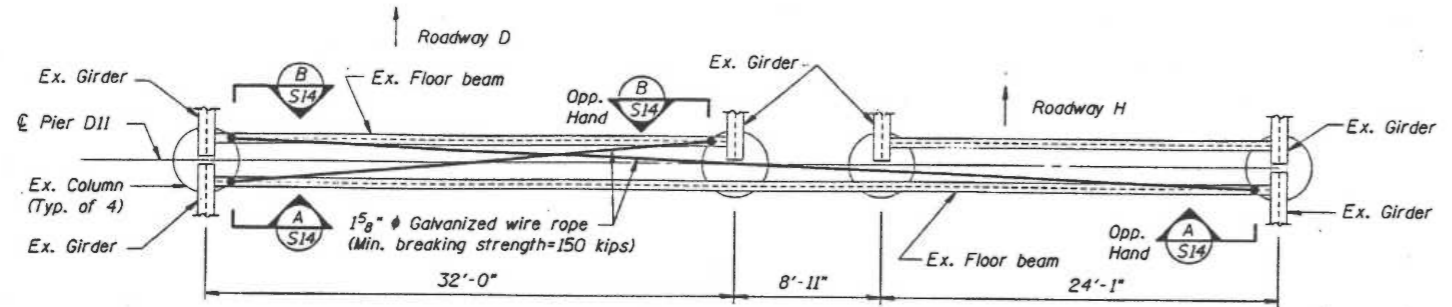
- Notes:
1. Ex. Column wraps at the top of the columns shall be removed prior to the installation of the new column bands. REMOVAL OF EX. WRAPS SHALL BE INCLUDED WITH #
 2. Inject epoxy between the column band and concrete column surface to assure uniform bearing of the band. The cost shall be INCLUDED WITH FURNISH + ERECT STRUCTURAL STEEL.
 3. Prior to shop painting, mask off area of column band and cross frame connection plate interface. Field touch-up of paint shall be INCLUDED WITH FURNISH + ERECT STRUCTURAL STEEL.

* FURNISH + ERECT STRUCTURAL STEEL.

SEISMIC RETROFIT DETAILS
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
FAI ROUTE 70
POPLAR STREET BRIDGE APPROACHES

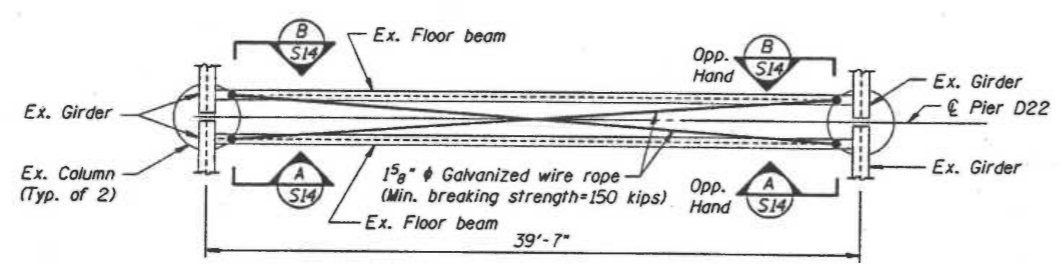
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DATE 1-23-98
SHEET NO. 082-020
CHECKED BY

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.	SHEET NO. S-14 SHEETS
F.A.I. 7B	#	ST. CLAIR	91	56	
FED. ROAD DIST. NO. 7		ILLINOIS		FED. AID PROJECT	
# 82-3HVB-2R-1-1					



Note: Decks and stringer beams not shown.

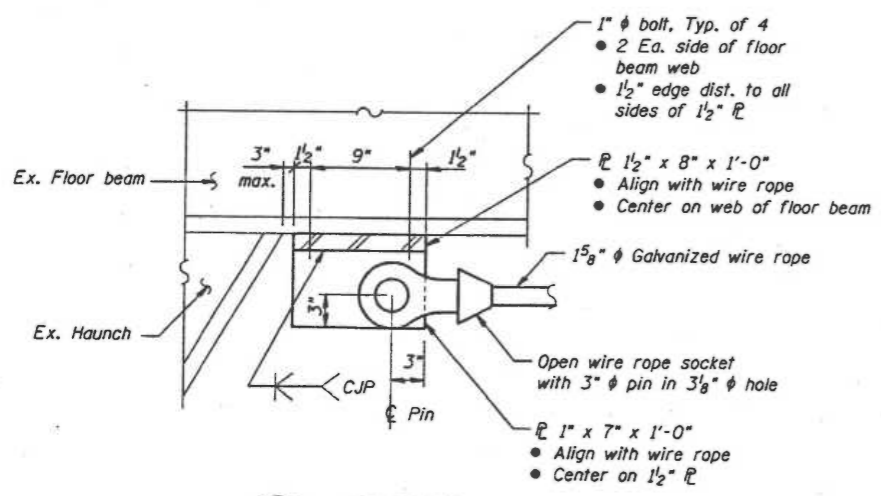
1 SHEAR TRANSFER ASSEMBLY AT PIER D11



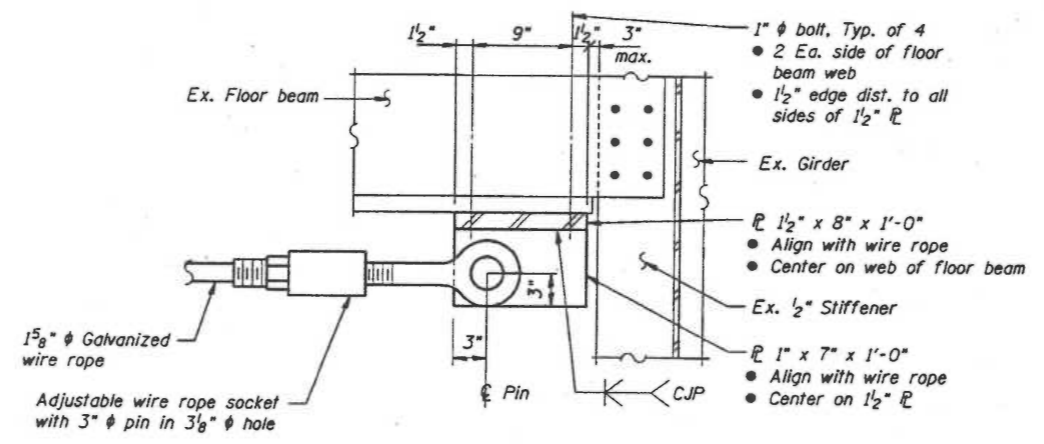
Note: Decks and stringer beams not shown.

2 SHEAR TRANSFER ASSEMBLY AT PIER D22

FOR INFORMATION ONLY



A SECTION
S14



B SECTION
S14

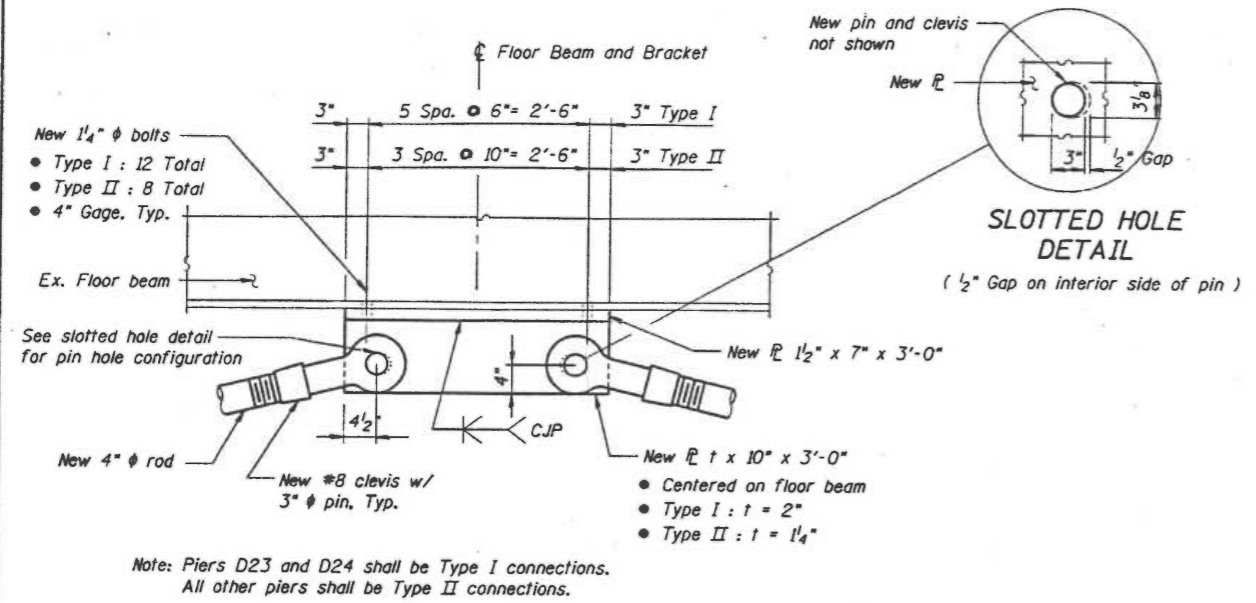
SEISMIC RETROFIT DETAILS

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
FAI ROUTE 70
POPLAR STREET BRIDGE APPROACHES
ST. CLAIR COUNTY

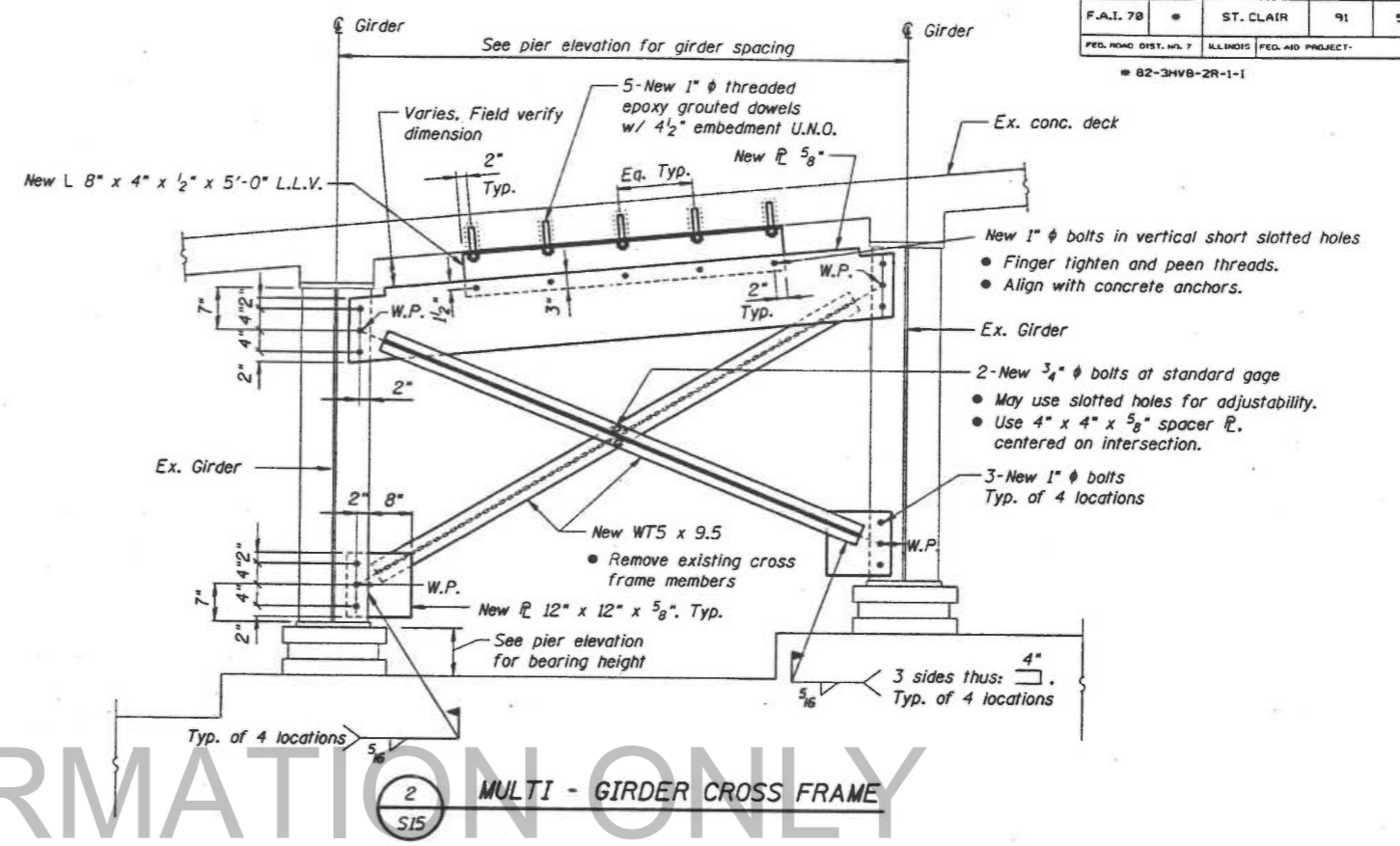
STRUCTURE NO. 00-2-0000 STRUCTURE NO. 00-2-0000
STRUCTURE NO. 00-2-0000 STRUCTURE NO. 00-2-0000
SCALE: 1-20-98 DRAWN BY
DATE AS NOTED CHECKED BY

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ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.	SHEET NO. S-15 SHEETS
F.A.I. 70	*	ST. CLAIR	91	57	
FED. ROAD DIST. NO. 7		ILLINOIS	FED. AID PROJECT-		
# 82-3MVB-2R-1-1					



1 TIE ROD CONNECTION PLATE DETAIL
S15



2 MULTI - GIRDER CROSS FRAME
S15

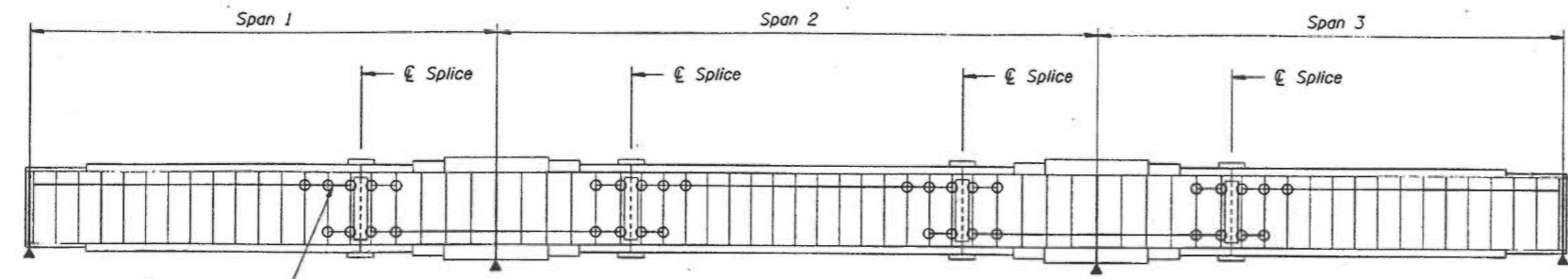
FOR INFORMATION ONLY

SEISMIC RETROFIT DETAILS

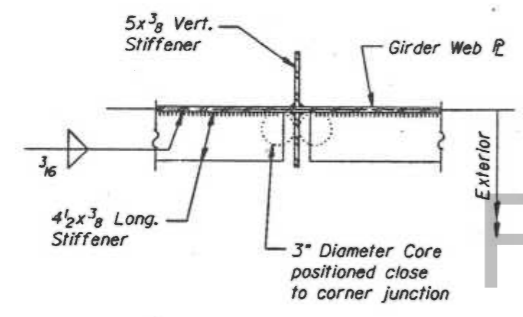
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
FAI ROUTE 70
AR STREET BRIDGE
ST. CLAIR
ROADWAY
ROADWAY
SCALE: AS SHOWN
DATE 1-23-98
CHECKED BY HH

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.	SHEET NO. S-16 SHEETS
F.A.I. 70	#	ST. CLAIR	91	58	
FED. ROAD DIST. NO. 7		ILLINOIS	FED. AID PROJECT		

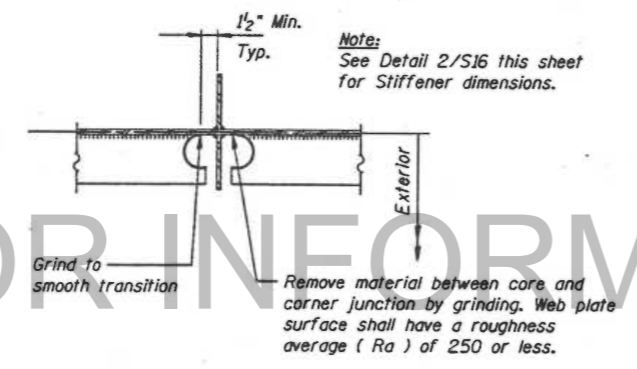
B2-3HVB-2R-1-1



1 GIRDER ELEVATION INDICATING TYPICAL FRACTURE CONTROL MODIFICATION LOCATIONS
S16



2 STIFFENER INTERSECTION MODIFICATION DETAIL
S16



3 STIFFENER INTERSECTION MODIFICATION DETAIL
S16

Procedure :

1. Core 3" diameter holes positioned close to corner junction through 3/8" thick longitudinal stiffener as shown in detail 2/S16.
2. Remove material between core and intersection junction by grinding with carbide tools and a dye grinder as shown in detail 3/S16. Web plate surface shall have a roughness average (Ra) of 250 or less.
3. Remove all burrs from cut edge and check for irregularities. Cored surface shall have an Ra equal to 500 or less.
4. After burr removal the modification shall be inspected using magnetic particle (MT) methods. Notify Engineer if a crack is detected. (cost incidental to stiffener intersection modification).
5. The exposed steel surfaces shall be cleaned and painted using an aluminum epoxy mastic primer.
6. Obtain approval of Engineer before proceeding.
7. Paint area with top coat.

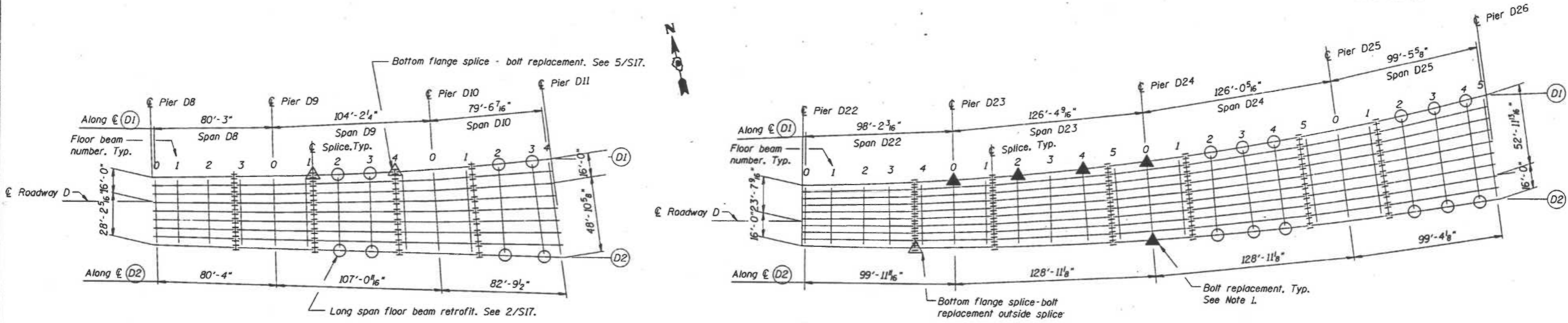
BILL OF MATERIAL		
ITEM	UNIT	QUANTITY
Stiffener intersection modification	EACH	864

STIFFENER INTERSECTION MODIFICATION DETAIL

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
FAI ROUTE 70
POPLAR STREET APPROACHES

DATE 1-23-98

CHECKED BY HH



LEGEND

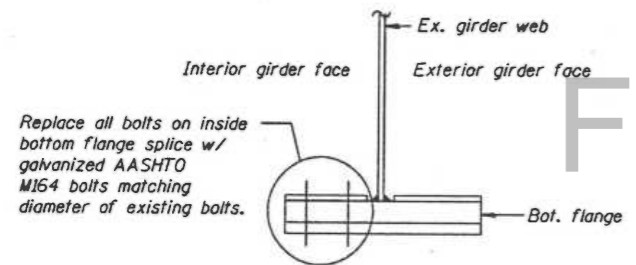
- Long span floor beam retrofit (14 locations, this sheet). See 2/S17.
- △ Bottom flange splice - bolt replacement (3 locations, this sheet). See 5/S17.
- ▲ Bolt replacement (17 bolts, this sheet) See Note 1.

Note 1:
Replace broken or missing bolts at locations noted in drawings. All replacement bolts to be galvanized AASHTO M164 bolts matching diameter of existing bolt.

FOR INFORMATION ONLY

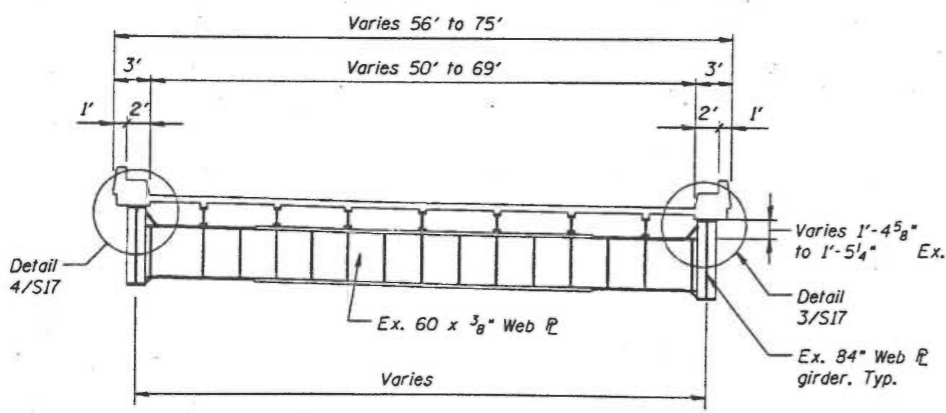
1 SPANS D8 THRU D10 AND D22 THRU D25 (FRAMING PLAN)

BILL OF MATERIAL		
ITEM	UNIT	QUANTITY
Long span floor beam retrofit	EACH	20
Bottom flange splice - bolt replacement	EACH	8
Bolt replacement	EACH	18

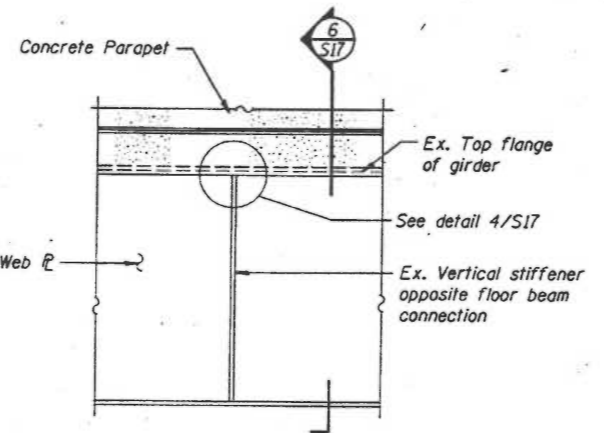


5 BOTTOM FLANGE SPLICE - BOLT REPLACEMENT

5
S17

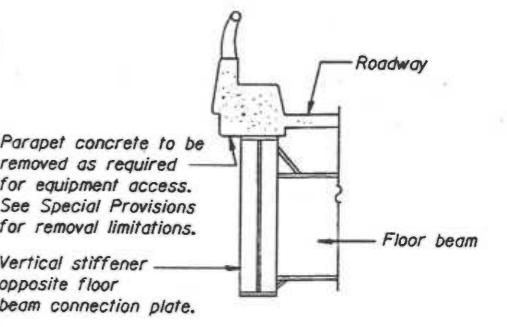
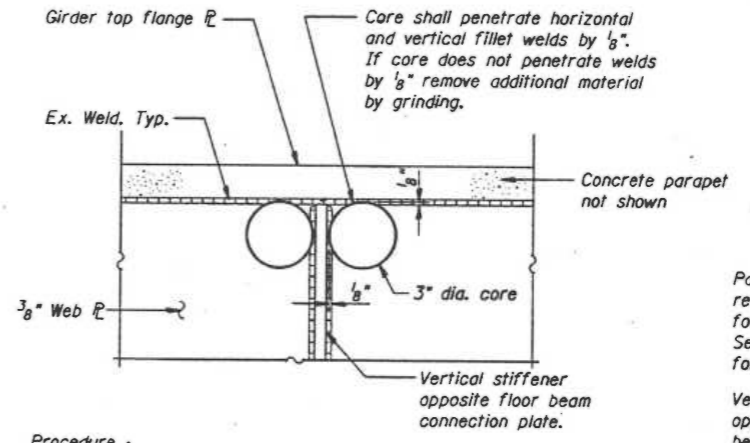


LONG SPAN FLOOR BEAMS (> 50')



EXTERIOR ELEVATION OF GIRDER AT FLOOR BEAM CONNECTION

3
S17



6 SECTION THRU GIRDER

6
S17

Procedure :

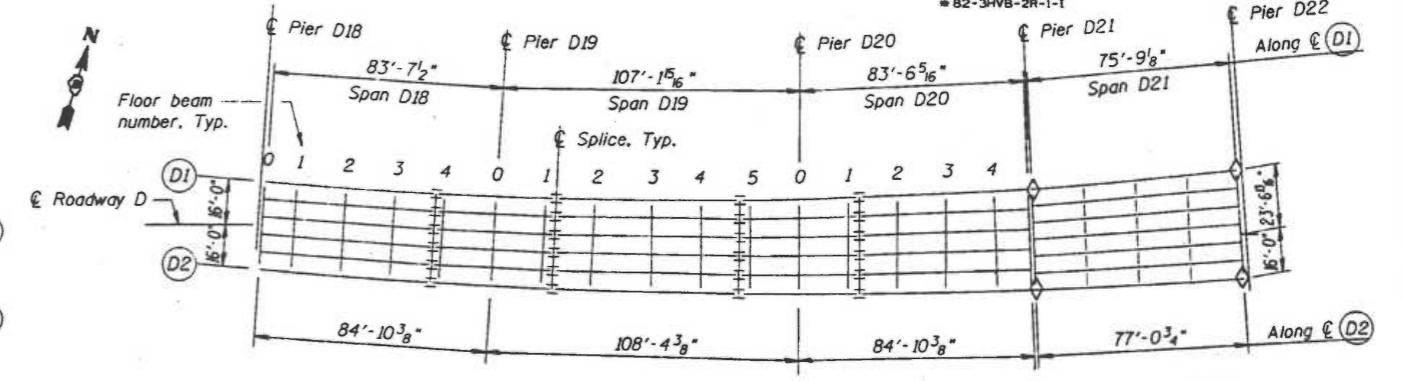
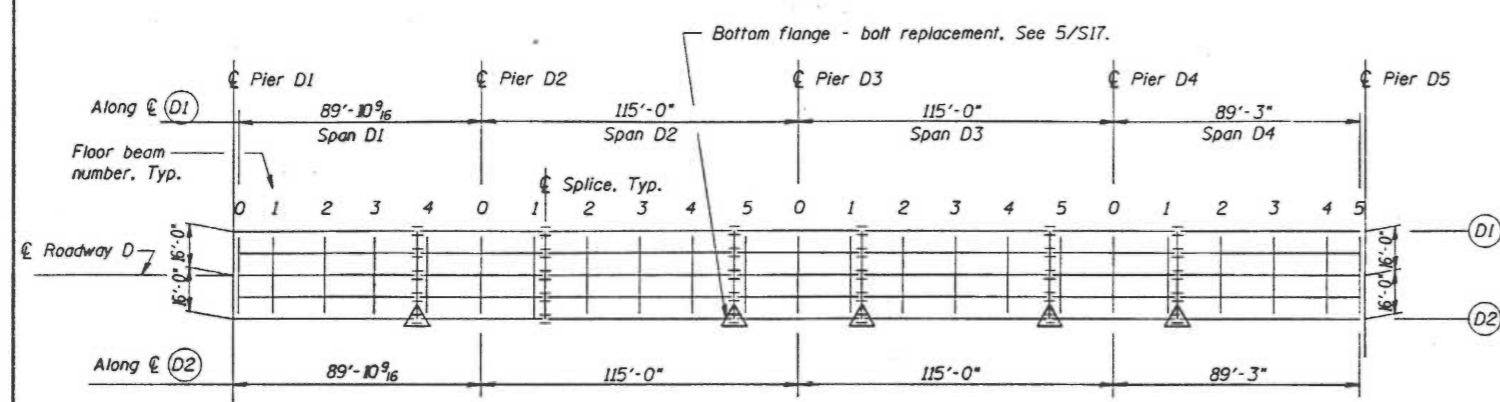
1. Remove parapet concrete, as required, in accordance with detail 6/S17, for equipment access.
2. Core 3" diameter holes through web plate adjacent to the top flange as positioned in 4/S17. Core holes shall penetrate the horizontal and vertical fillet welds approximately 1/8". If core does not penetrate weld by 1/8", remove additional material by grinding. Remove all burrs from cored or ground surface. Surface shall have a roughness average (Ra) of 500 or less.
3. Clean surface to remove any cutting oils or rusting and paint exposed steel surface with aluminum epoxy mastic primer.
4. Obtain approval of Engineer before proceeding.
5. Paint surfaces with top coat.

5
S17

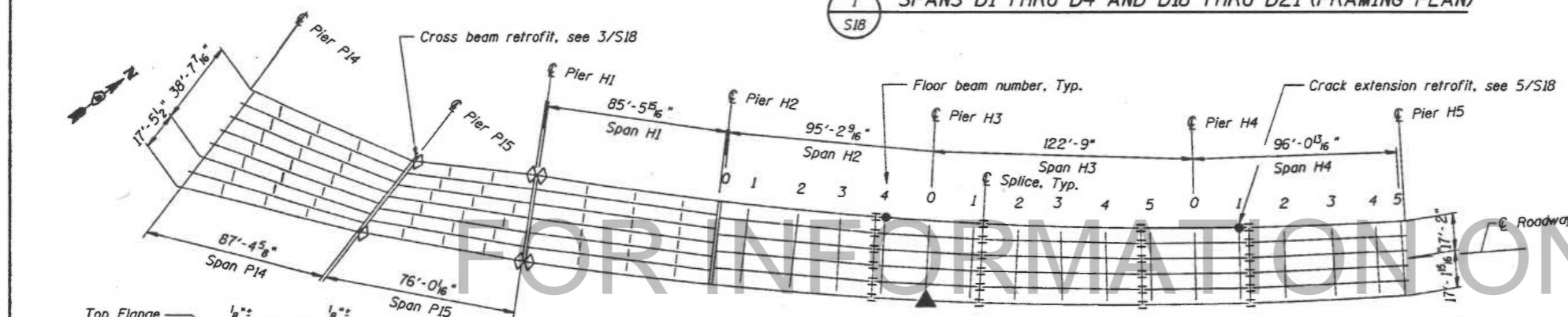
LONG SPAN FLOOR BEAM RETROFIT

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
FAI ROUTE 70
JUDGE APPROVES
COUNTY
STRUCTURE NO.
STRUCTURE NO.
SCALE: NONE
DATE 1-23-98

DRAWN BY JUN
CHECKED BY HH



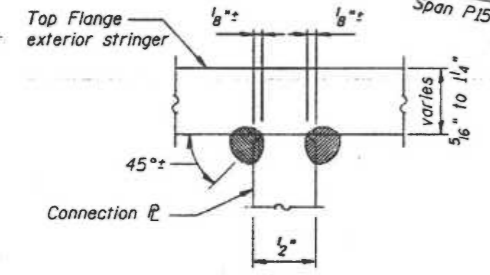
1 SPANS D1 THRU D4 AND D18 THRU D21 (FRAMING PLAN)
S18



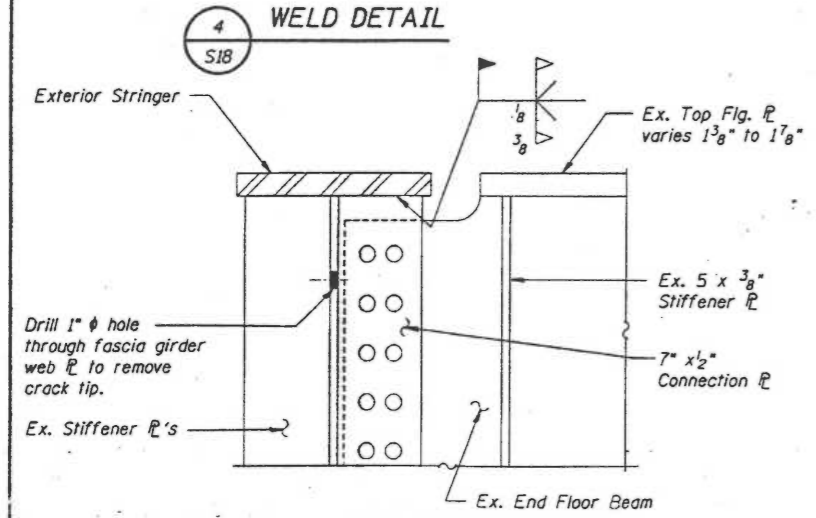
LEGEND

- ▲ Bottom flange splice - bolt replacement (5 locations, this sheet). See 5/S17.
- ◇ Cross beam retrofit (10 locations). See 3/S18
- Crack extension retrofit (2 locations, this sheet). See 5/S18
- ▲ Bolt replacement (1 bolt this sheet) See Note 1, sheet S17.

2 SPANS P14 THRU P15 AND H1 THRU H4 (FRAMING PLAN)
S18



4 WELD DETAIL
S18

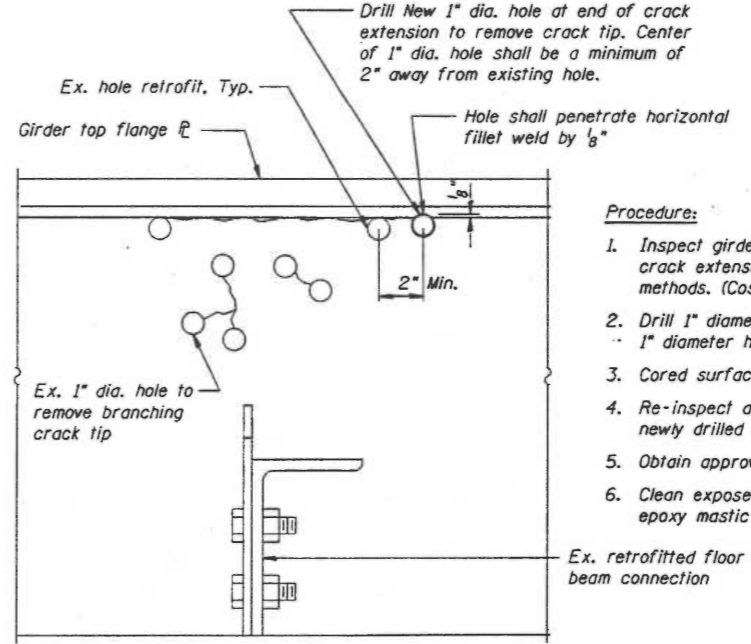


3 CROSS BEAM RETROFIT
S18

Procedure:

1. Inspect floor beam connection region in the vicinity of the top flange for cracking and determine crack tip locations using magnetic particle (MT) inspection methods.*
2. Drill 1" diameter hole at end of crack extension to remove crack tip. Re-inspect area using MT methods to verify crack tip removal.*
3. Vacuum blast (SSPC SP-10) an area approximately 8" on each side of the connection plate at top flange intersection. Note existing paint contains lead.
4. Grind ends of connection plate to obtain an approximate 1/8" bevel as shown in Detail 4/S18. Clean weld fit up area to remove contaminants.
5. Eliminate traffic from roadway lane adjacent to connection being welded. Install small groove and fillet welds at connection plate and top flange plate using SMAW low hydrogen E7018 electrodes as shown in Detail 4/S18. Minimum preheat and interpass temperature shall be followed in strict accordance with AWS D1.5-95. Preheat girder flange to a minimum of 150°F prior to any welding. Maintain 150°F as a minimum interpass temperature.
6. After welding is complete, open roadway to traffic.
7. Following cool-down period, the welds shall be visually and MT inspected.*
8. Obtain approval of Engineer before proceeding.
9. Clean exposed steel surfaces to remove any contaminants or rusting. Paint surfaces with an aluminum epoxy mastic primer/acrylic paint system.

* COST OF ALL MT TESTING SHALL BE INCIDENTAL TO CROSS BEAM RETROFIT.



5 CRACK EXTENSION RETROFIT AT FIRST INTERIOR FLOOR BEAMS
S18

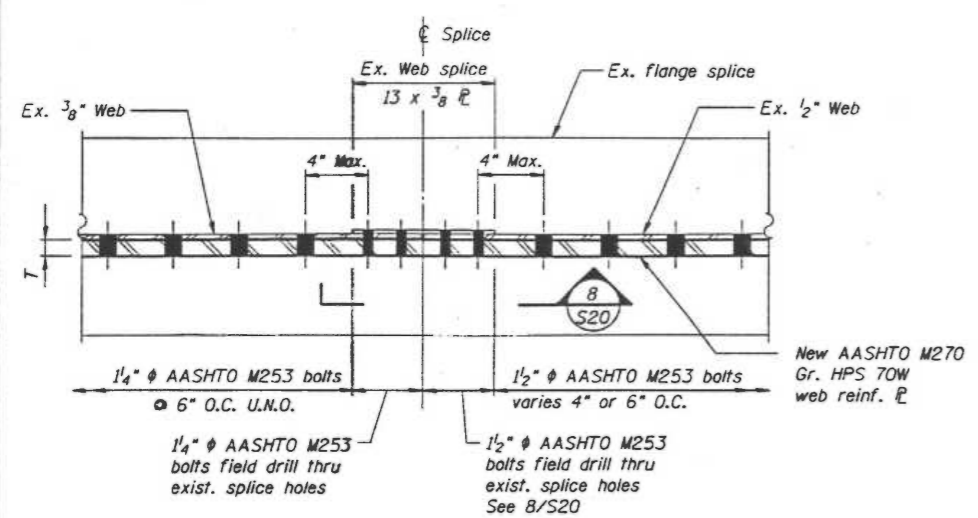
BILL OF MATERIAL		
ITEM	UNIT	QUANTITY
Crack extension MODIFICATIONS	EACH	2
Cross beam retrofit	EACH	10

Procedure:

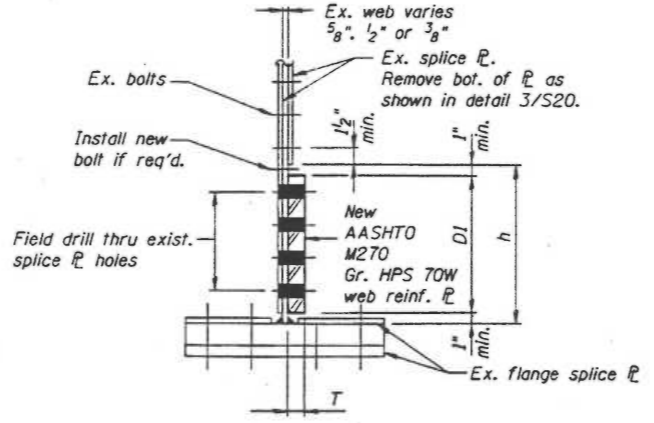
1. Inspect girder web plate in region of existing retrofits to determine location of crack extension and crack tip using magnetic particle inspection (MT) methods. (Cost incidental to crack extension MODIFICATIONS)
2. Drill 1" diameter hole at end of crack extension to remove crack tip. Center of 1" diameter hole shall be positioned in accordance with detail 5/S18.
3. Cored surfaces shall have a Roughness Average (Ra) of 500 or less.
4. Re-inspect area using MT methods to verify crack does not extend past the newly drilled holes (COST INCIDENTAL TO CRACK EXTENSION MODIFICATIONS).
5. Obtain approval of Engineer.
6. Clean exposed steel surface to remove contaminants and paint with an aluminum epoxy mastic primer.

CRACK EXTENSION AND CROSS BEAM RETROFITS

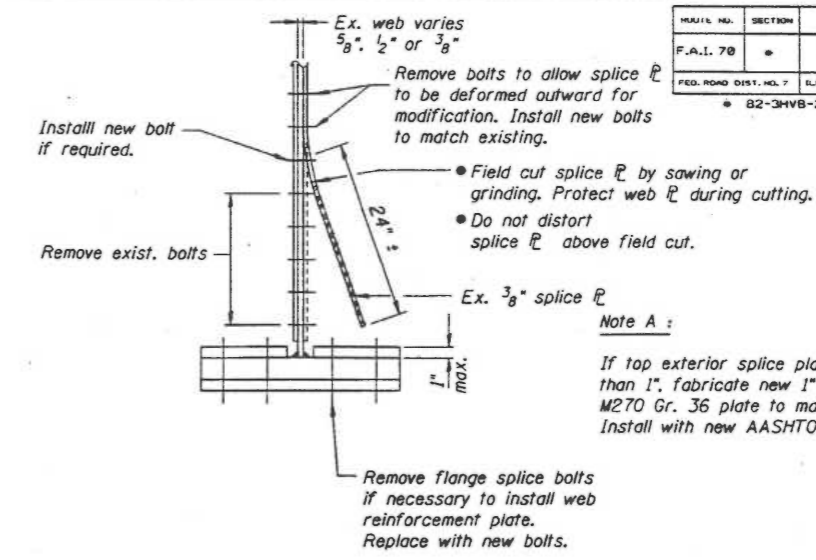
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
FAI ROUTE 70
POPULAR STREET BRIDGE APPROACHES
ST. CLAIR COUNTY



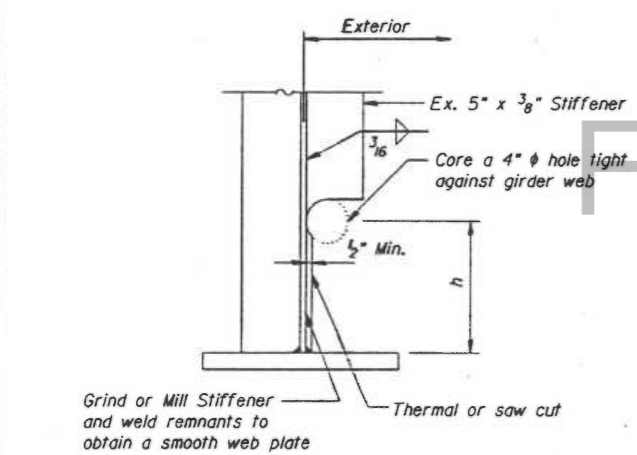
1
S20
WEB REINFORCEMENT PLATE AT GIRDER WEB SPLICE



2
S20
WEB REINFORCEMENT PLATE AT GIRDER WEB SPLICE



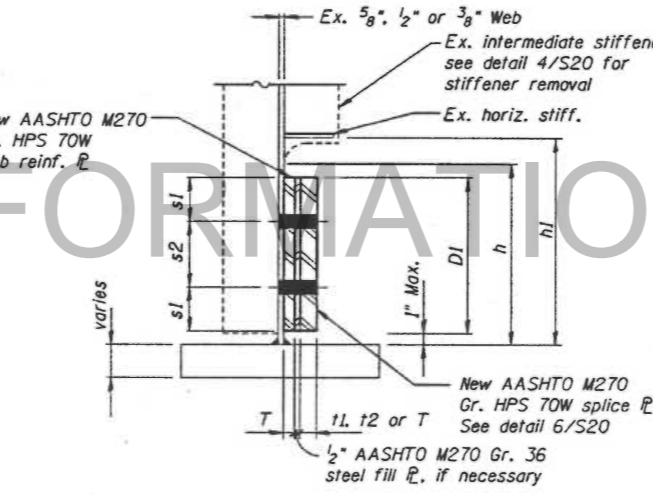
3
S20
GIRDER SPLICE PLATE MODIFICATION



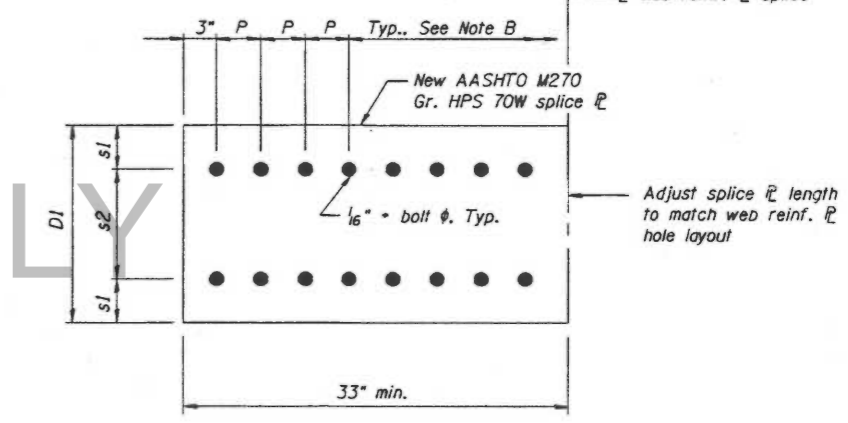
4
S20
VERTICAL STIFFENER MODIFICATION

Procedure :

1. Core a 4" ϕ hole tight against girder web. Do not notch or gouge web plate.
2. Thermal or saw cut, horizontal cut and vertical cut. Vertical cut shall be positioned at least 1/2" away from girder web. Do not notch or gouge web plate.
3. Remove all stiffener remnants and connecting welds by grinding or milling. Web plate surface shall have a Roughness Average (Ra) of 250 or less.

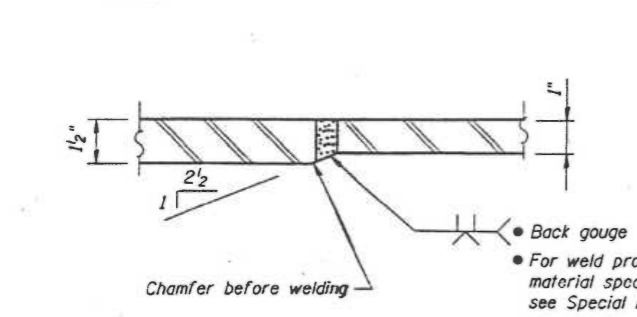


5
S20
TYPICAL WEB REINFORCEMENT PLATE SPLICE

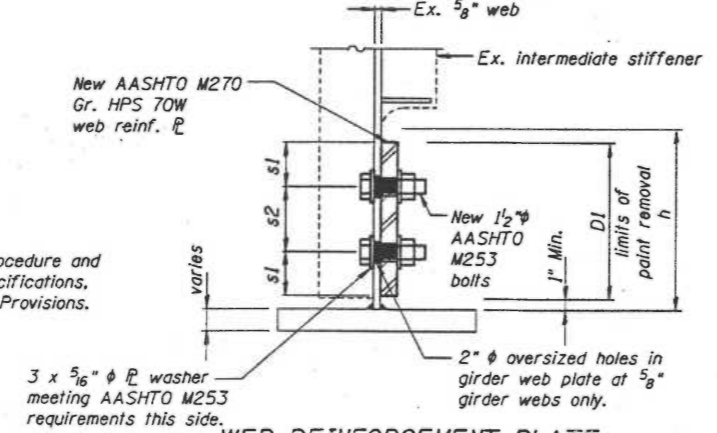


6
S20
TYPICAL WEB REINFORCEMENT SPLICE PLATE

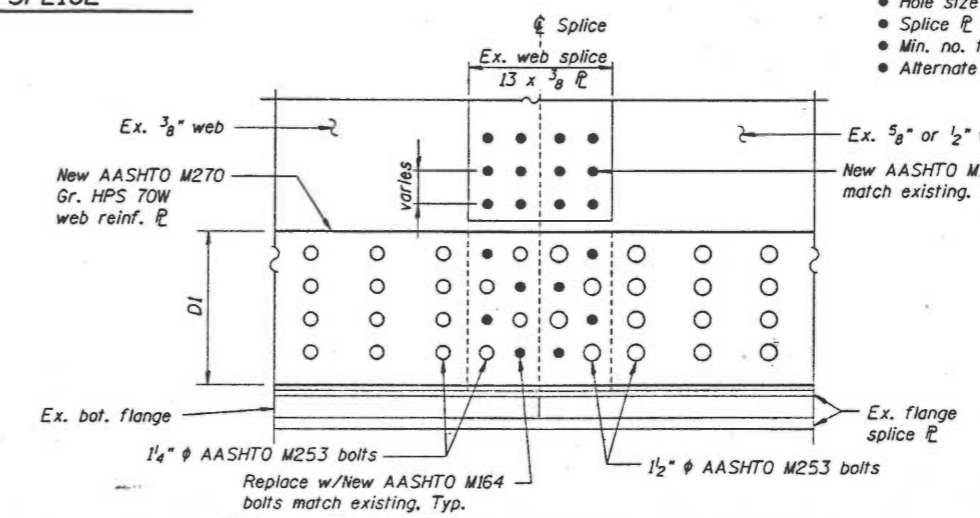
- Note B : For splice locations other than at piers
- Hole size and spacing to match web reinf. ϕ .
 - Splice ϕ thickness to match greater web reinf. ϕ thickness.
 - Min. no. fasteners = 32
 - Alternate butt weld (See detail 6A/S20)



6A
S20
ALT. BUTT WELD AT WEB REINF. PLATE TRANSITION



7
S20
WEB REINFORCEMENT PLATE INSTALLATION IN 5/8 IN. GIRDER WEBS



8
S20
ELEVATION AT GIRDER WEB SPLICE

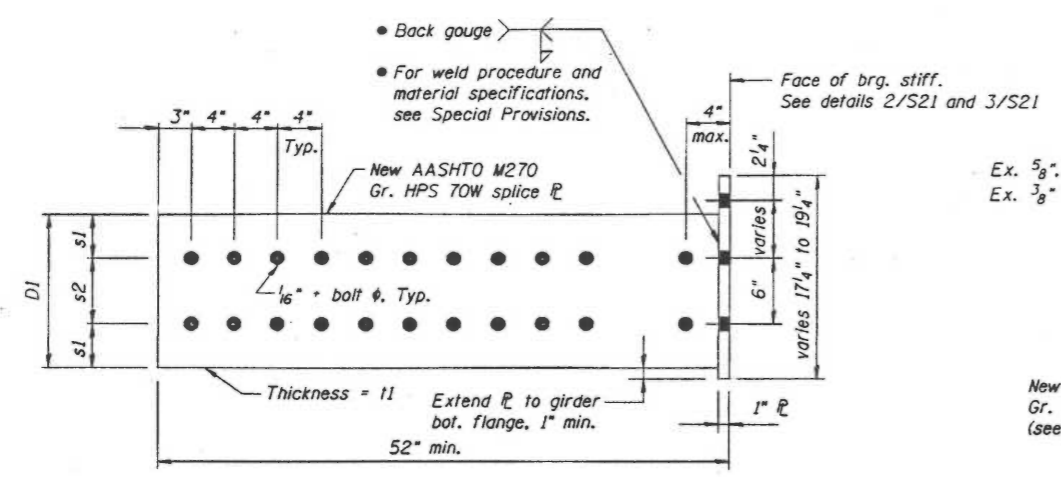
- Notes :**
1. See sheet S-19 for dimensions DI, h, h1, s1 & s2.
 2. See sheet S-21 for dimensions t1 & t2.
 3. T = thickness of web reinf. ϕ .

REDUNDANCY RETROFIT DETAILS

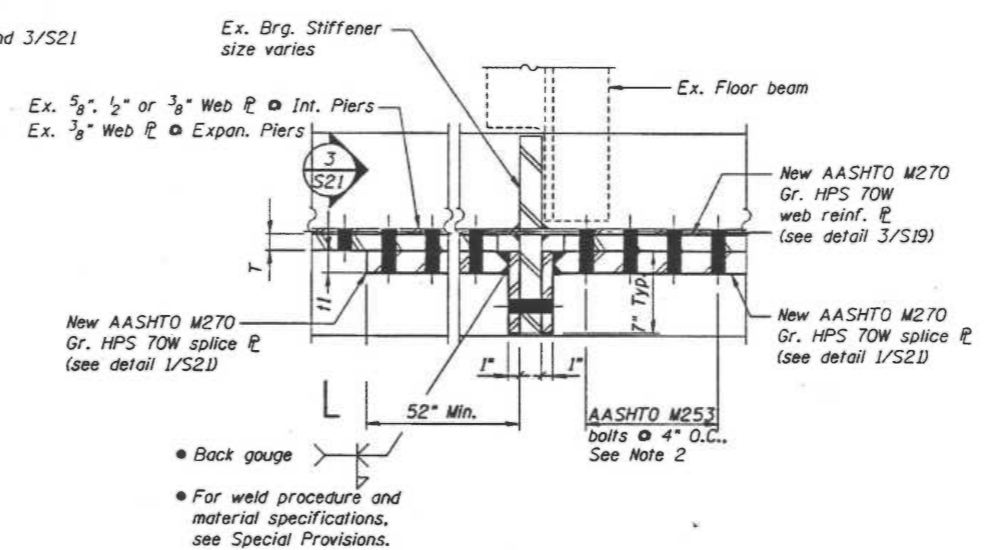
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
FAI ROUTE 70
POPLAR STREET BRIDGE APPROACHES
ST. CLAIR COUNTY

NO. 082-0154 STRUCTURE NO. 082-0203
NO. 082-0251 STRUCTURE NO. 082-0203
NO. 082-0252 STRUCTURE NO. 082-0203
NO. 082-0253 STRUCTURE NO. 082-0203
NO. 082-0254 STRUCTURE NO. 082-0203
NO. 082-0255 STRUCTURE NO. 082-0203
NO. 082-0256 STRUCTURE NO. 082-0203
NO. 082-0257 STRUCTURE NO. 082-0203
NO. 082-0258 STRUCTURE NO. 082-0203
NO. 082-0259 STRUCTURE NO. 082-0203
NO. 082-0260 STRUCTURE NO. 082-0203
NO. 082-0261 STRUCTURE NO. 082-0203
NO. 082-0262 STRUCTURE NO. 082-0203
NO. 082-0263 STRUCTURE NO. 082-0203
NO. 082-0264 STRUCTURE NO. 082-0203
NO. 082-0265 STRUCTURE NO. 082-0203
NO. 082-0266 STRUCTURE NO. 082-0203
NO. 082-0267 STRUCTURE NO. 082-0203
NO. 082-0268 STRUCTURE NO. 082-0203
NO. 082-0269 STRUCTURE NO. 082-0203
NO. 082-0270 STRUCTURE NO. 082-0203

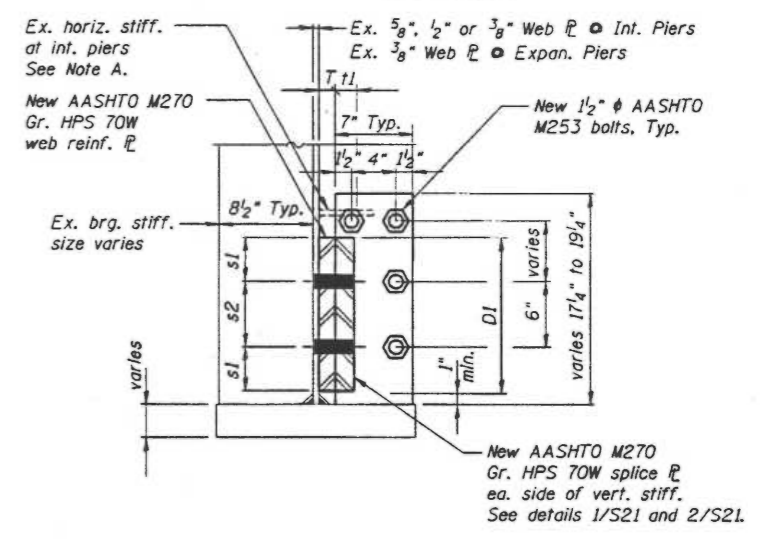
23-98 CHECKED BY HH



1 TYPICAL WEB REINFORCEMENT SPLICE PLATE AT PIERS
S21

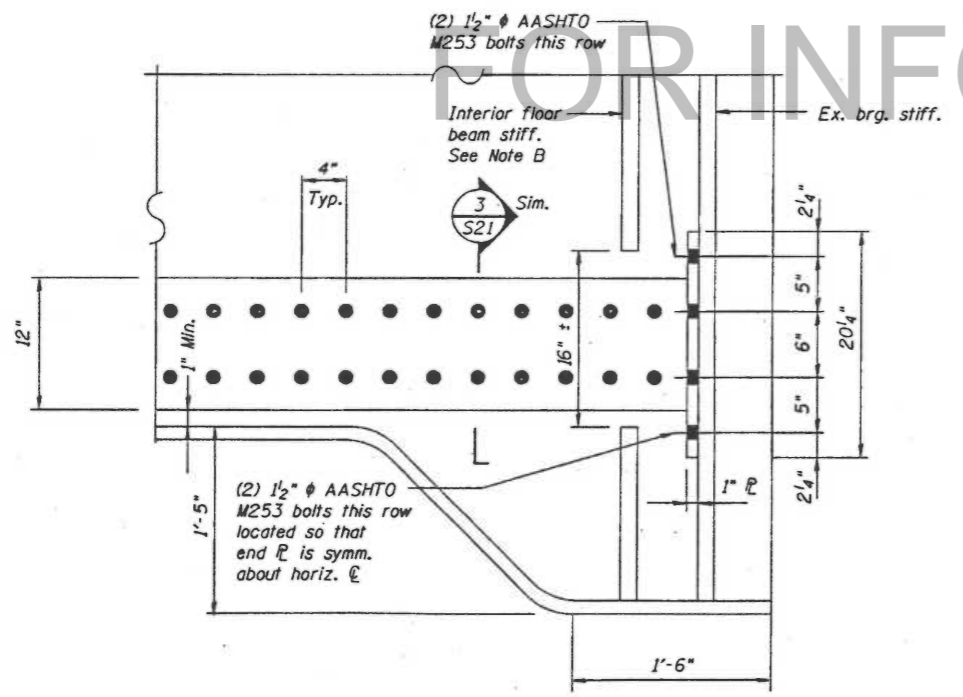


2 WEB REINFORCEMENT PLATE SPLICE AT BEARING STIFFENER
S21



3 WEB REINFORCEMENT PLATE AT PIERS
S21

Note A : End of longitudinal stiffener to be removed if necessary to permit installation of splice plate.



4 WEB REINFORCEMENT SPLICE PLATE AT HAUNCH
S21

Note B : Remove vertical stiffener to permit installation of web reinforcement splice plate. See detail 4/S20. Two core holes through stiffener will be required for stiffener removal.

- Notes:
1. Web reinforcement plate splice symmetric around interior bearing stiffener.
 2. 1/2" AASHTO M253 bolts in all 5/8" girder webs. (See detail 7/S20)
1/2" AASHTO M253 bolts in all 1/2" girder webs. threads excluded from shear plane.
1/4" AASHTO M253 bolts in all 3/8" girder webs. threads excluded from shear plane.
 3. Preload 1/2" AASHTO M253 bolts to proof load.
Preload 1/4" AASHTO M253 bolts to proof load.

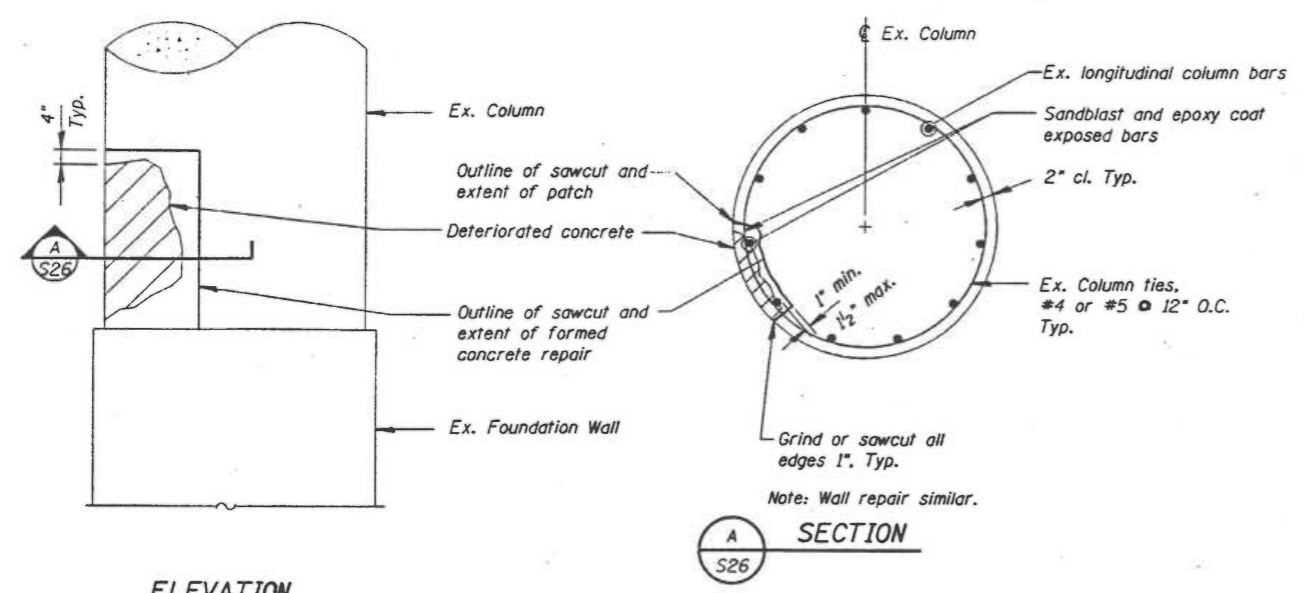
Roadway Spans	Splice Plate	
	Int. Pier	Expan. Pier
	t1	t2
	in.	in.
D1-D4	1 1/2	1 1/2
D5-D7	1 1/2	1 1/2
D8-D10	1 3/4	1 1/2
D12-D14	2	1 1/2
D15-D17	2	1 1/2
D18-D20	1 1/2	1 1/2
D22-D25	2 1/4	1 1/2
H2-H4	1 1/2	1 1/2

REDUNDANCY RETROFIT DETAILS

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
FAI ROUTE TO
POPLAR STREET BRIDGE APPROACHES
ST. CLAIR COUNTY

DATE 1-23-98

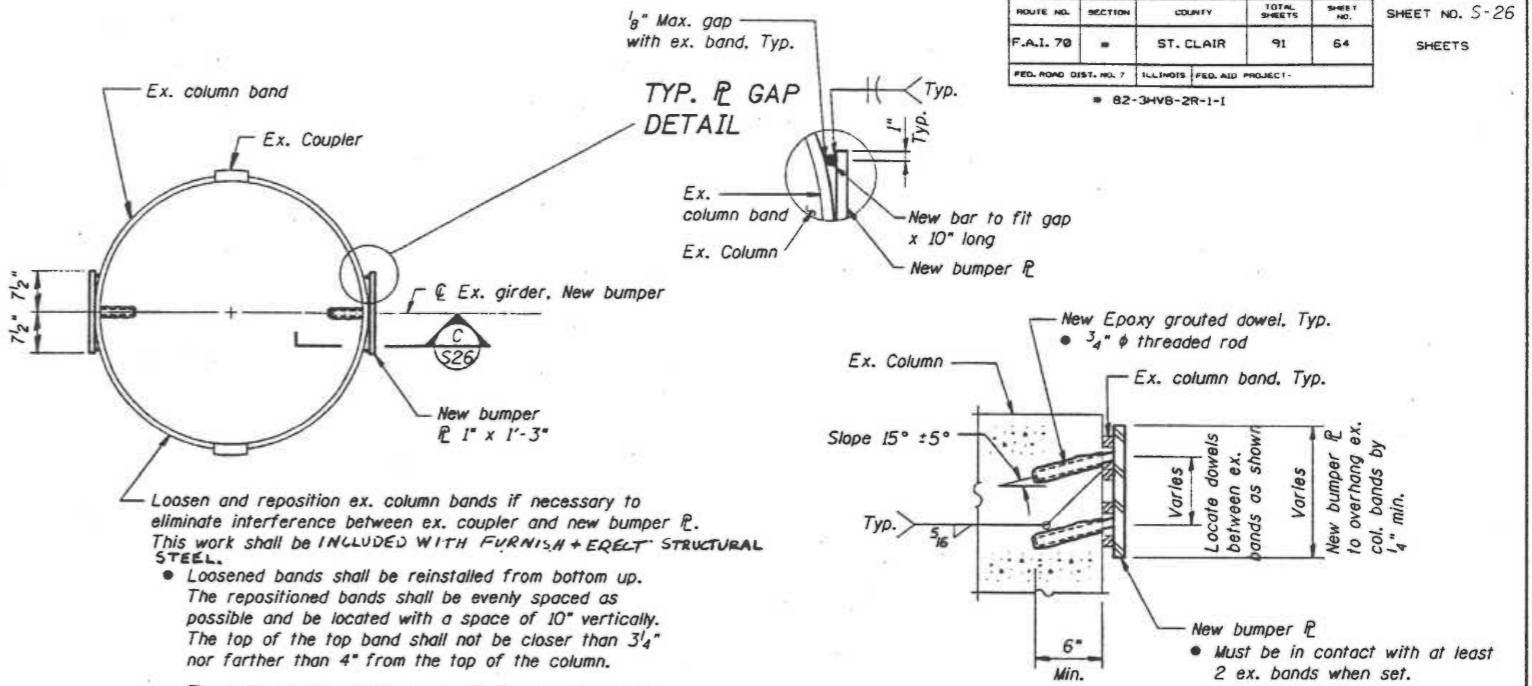
ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.	SHEET NO. S-26 SHEETS
F.A.I. 70		ST. CLAIR	91	64	
FED. ROAD DIST. NO. 7	ILLINOIS FED. AID PROJECT		82-3HVB-2R-1-1		



ELEVATION

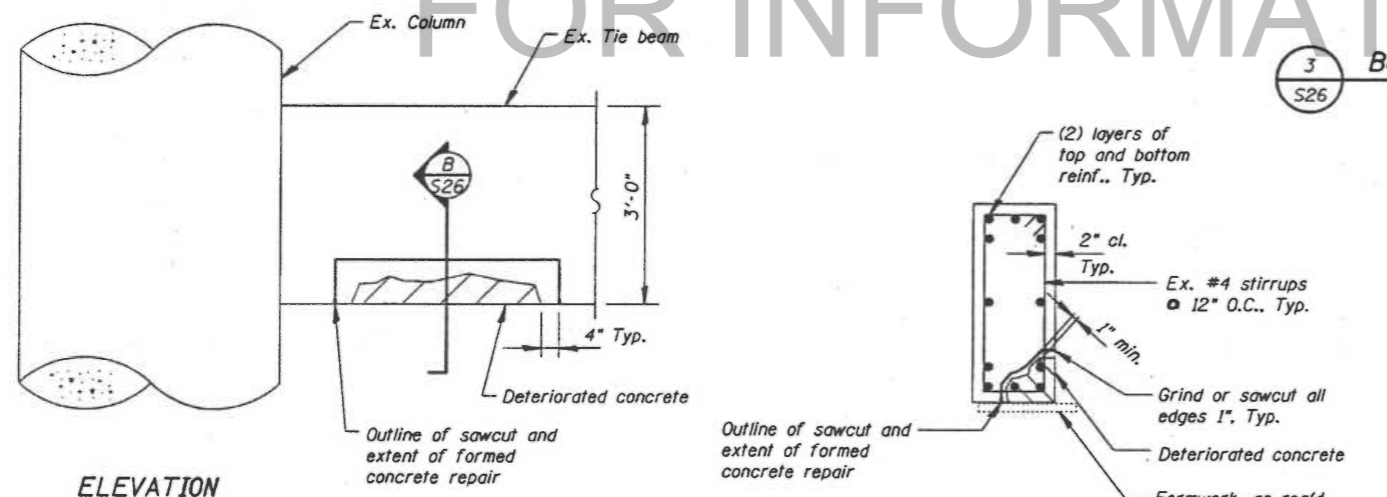
SECTION

1 TYPICAL CONCRETE COLUMN REPAIR



3 BUMPER PLATE DETAIL

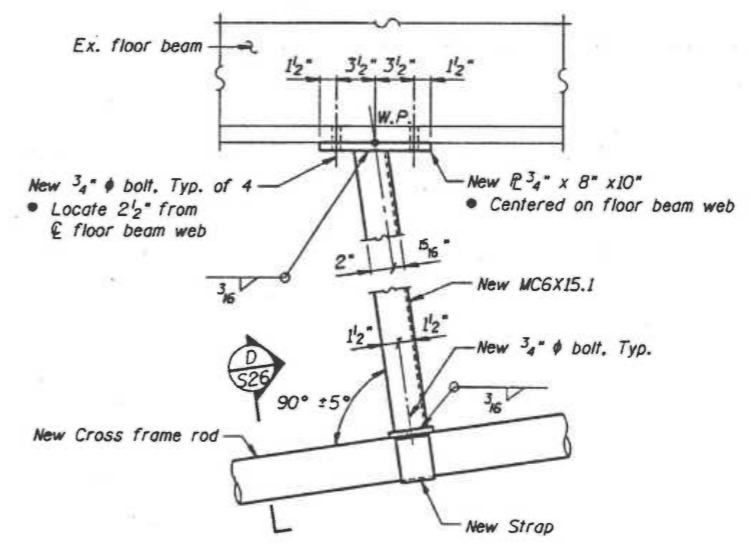
SECTION C



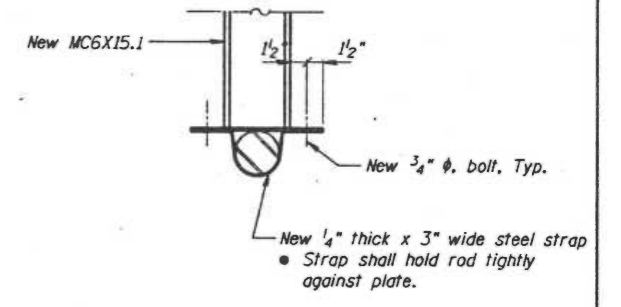
ELEVATION

SECTION B

2 TYPICAL CONCRETE TIE BEAM REPAIR



4 TIE ROD SUPPORT DETAIL



SECTION D

CONCRETE REPAIR DETAILS

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
FAI ROUTE 70
POPLAR STREET BRIDGE APPROACHES
ST. CLAIR

DATE 1-23-98

FOR INFORMATION ONLY

- Loosen and reposition ex. column bands if necessary to eliminate interference between ex. coupler and new bumper plate. This work shall be INCLUDED WITH FURNISH + ERECT STRUCTURAL STEEL.
- Loosened bands shall be reinstalled from bottom up. The repositioned bands shall be evenly spaced as possible and be located with a space of 10" vertically. The top of the top band shall not be closer than 3/4" nor farther than 4" from the top of the column.
- The bolts shall be tightened in 55 Ft.-Lb. increments in a clockwise direction, to a final torque of 220 Ft.-Lbs.
- All of the threads in each of the four nuts shall be fully engaged upon final tightening.
- Once a final torque of 220 Ft.-Lbs. is reached in each nut, the band threads shall be peened to the nut to prevent loosening.

S:\PROJECTS\97422\SET2\51201826.DGN

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 70		ST. CLAIR	91	65
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT		

SHEET NO. S-27
SHEETS

82-34VB-2R-1-1

EXPANSION JOINT, BUMPER, PIN AND TIE ROD GAPS

Pier	East Side	West Side
D5	0.60"	1.05"
D8	0.95"	0.95"
D11	0.35"	0.65"
D12	0.55"	N/A
D15	0.95"	1.00"
D18	0.70"	0.60"
D21	N/A	0.95"
D22	1.75"	0.40"
D26	0.65"	1.20"
P14	N/A	0.60"
P15	N/A	0.45"
H1	N/A	0.35"
H2	1.10"	0.45"

Notes:

1. Gaps defined as follows:

- Bumper Gap: Minimum clear distance between bumper and bumper plate.
- Pin Gap: Minimum clear distance between clevis pin and edge of plate in direction of rod.
- Tie Rod Gap: Clear distance between washer and end plate of bracket.

2. Gap dimensions shown were based upon roadway deck temperature of 50° F. If the roadway deck temperature (measured at mid-depth of concrete deck within 4 hours of installation) is greater than 50° F, decrease bumper gaps, and increase pin and tie rod gaps by the following amount:

$$\text{Gap change} = \left(\frac{\text{Actual Deck Temperature} - 50^\circ \text{ F}}{70} \right) \times \text{Gap shown}$$

If roadway deck temperature is less than 50° F, increase bumper gaps, and decrease pin and tie rod gaps by the following amount:

$$\text{Gap change} = \left(\frac{50^\circ \text{ F} - \text{Actual Deck Temperature}}{70} \right) \times \text{Gap shown}$$

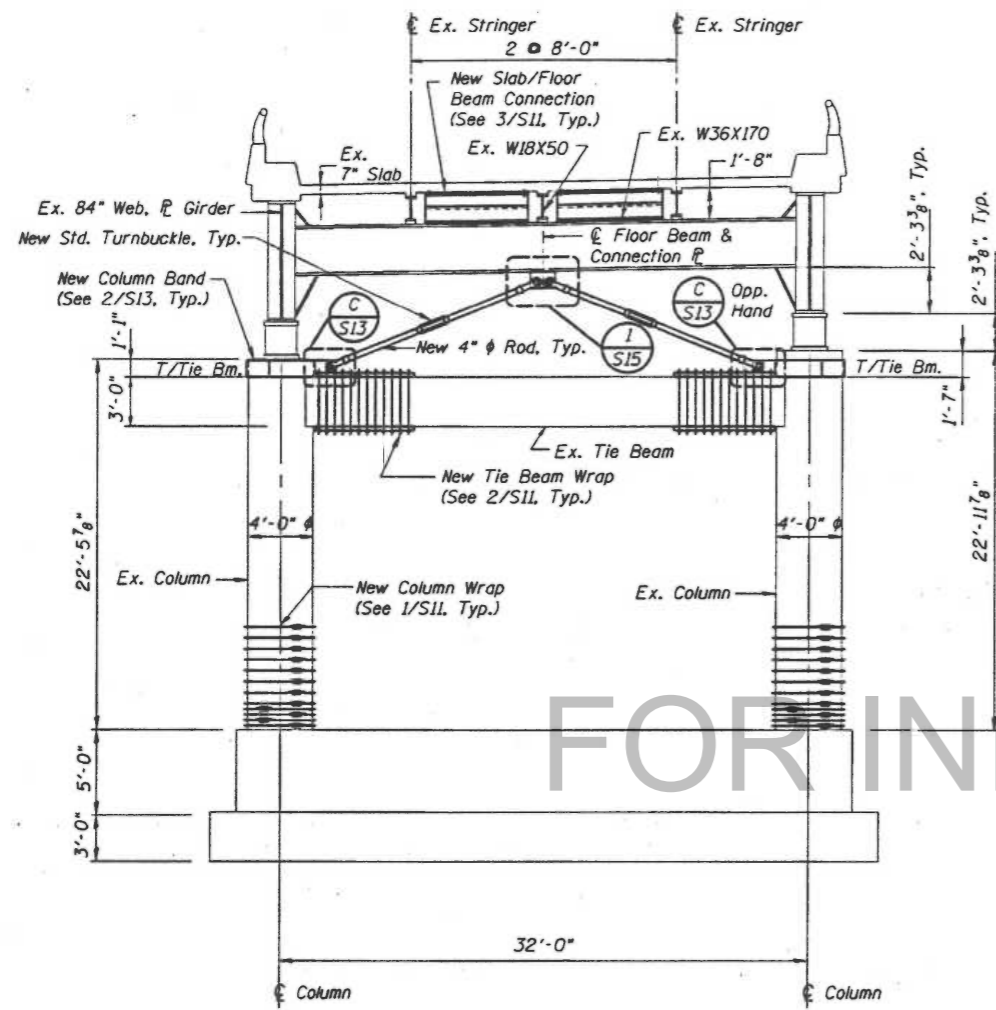
FOR INFORMATION ONLY

SEISMIC RETROFIT DETAILS

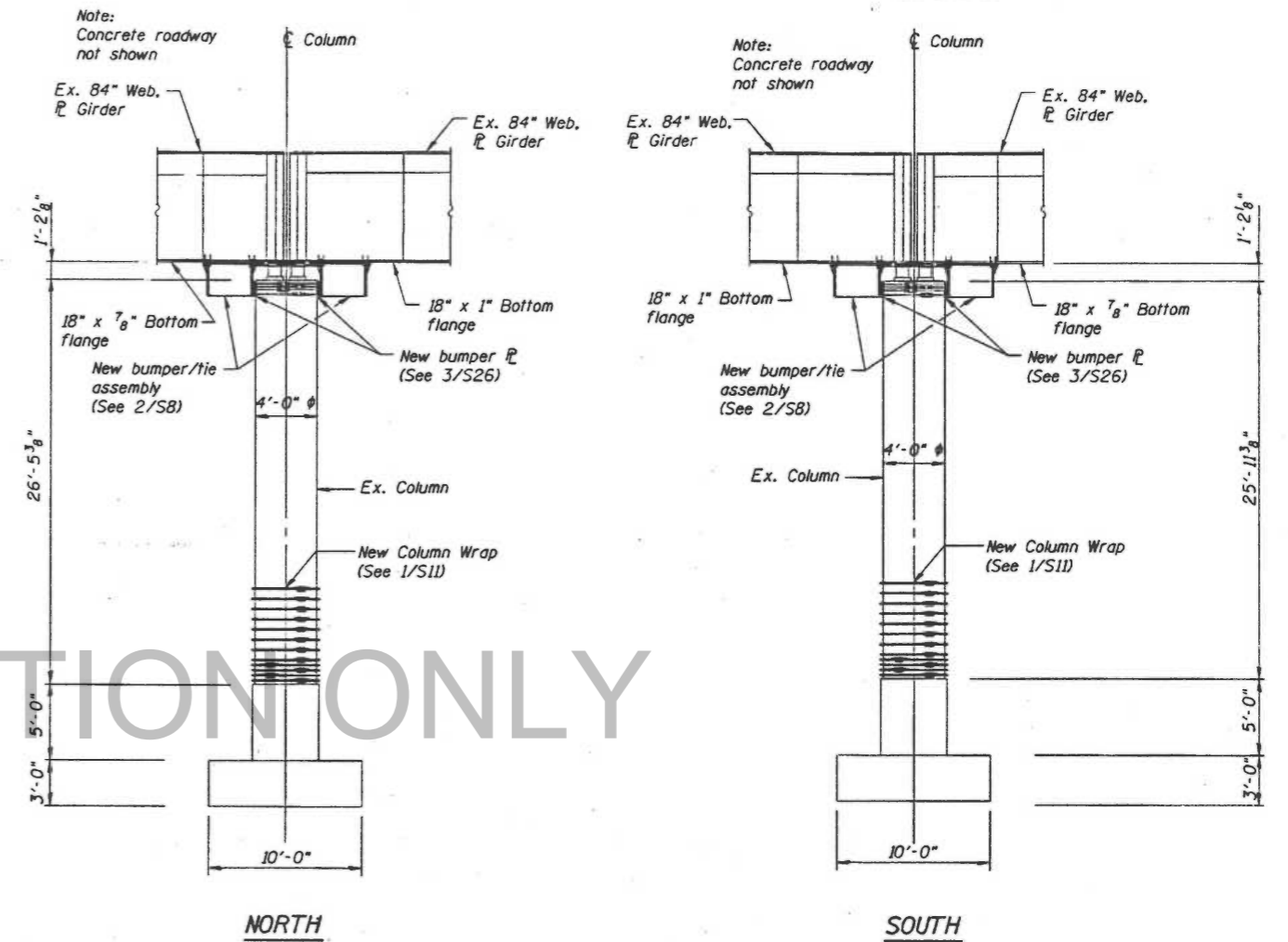
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
FAI ROUTE 70
POPLAR STREET BRIDGE APPROACHES
COUNTY

STRUCTURE NO. 112-011
DATE 1-23-98
DRAWN BY
CHECKED BY

11/17/98 10:17:48 AM 11/17/98 10:17:48 AM



1 ELEVATION PIER D2
S29



2 ELEVATIONS PIER D5
S29

BILL OF MATERIAL - PIER D2		
ITEM	UNIT	QUANTITY
Furnish and erect structural steel	LBS.	5218
Epoxy grouted dowels	EACH	20
Column wrap	SQ. FT.	163.4

BILL OF MATERIAL - PIER D3 *		
ITEM	UNIT	QUANTITY
Furnish and erect structural steel	LBS.	237
Epoxy grouted dowels	EACH	6

* Elevation not shown

BILL OF MATERIAL - PIER D4 *		
ITEM	UNIT	QUANTITY
Furnish and erect structural steel	LBS.	2115
Epoxy grouted dowels	EACH	18
Foundation wall dowel modification	EACH	4
Column wrap	SQ. FT.	202.7

* Elevation not shown

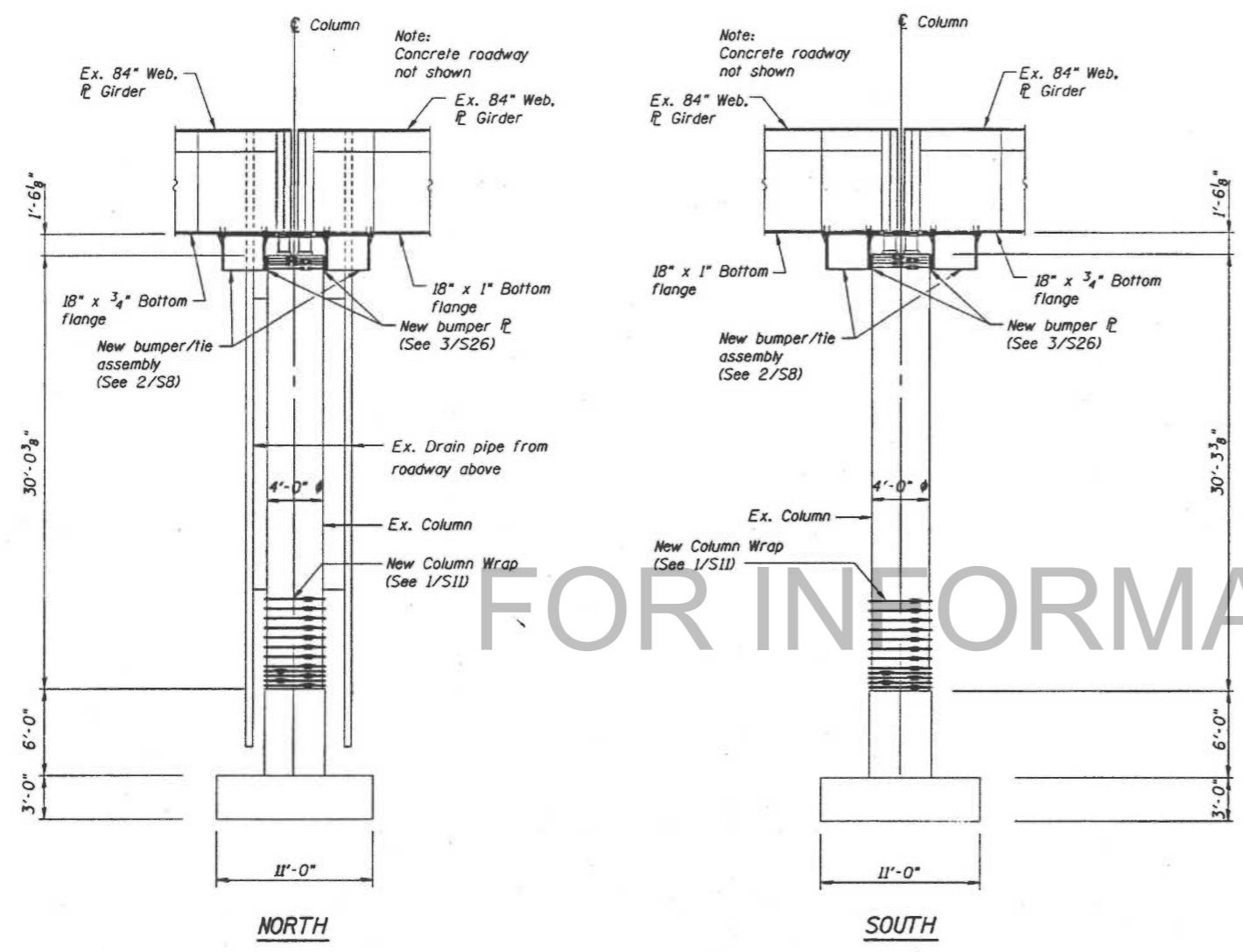
BILL OF MATERIAL - PIER D5		
ITEM	UNIT	QUANTITY
Concrete removal	CY	3.9
Formed concrete repair	SQ. FT.	10
Furnish and erect structural steel	LBS.	3077
Epoxy grouted dowels	EACH	8
Foundation wall dowel modification	EACH	16
Column wrap	SQ. FT.	163.4

PIER D2 & D5 RETROFITS

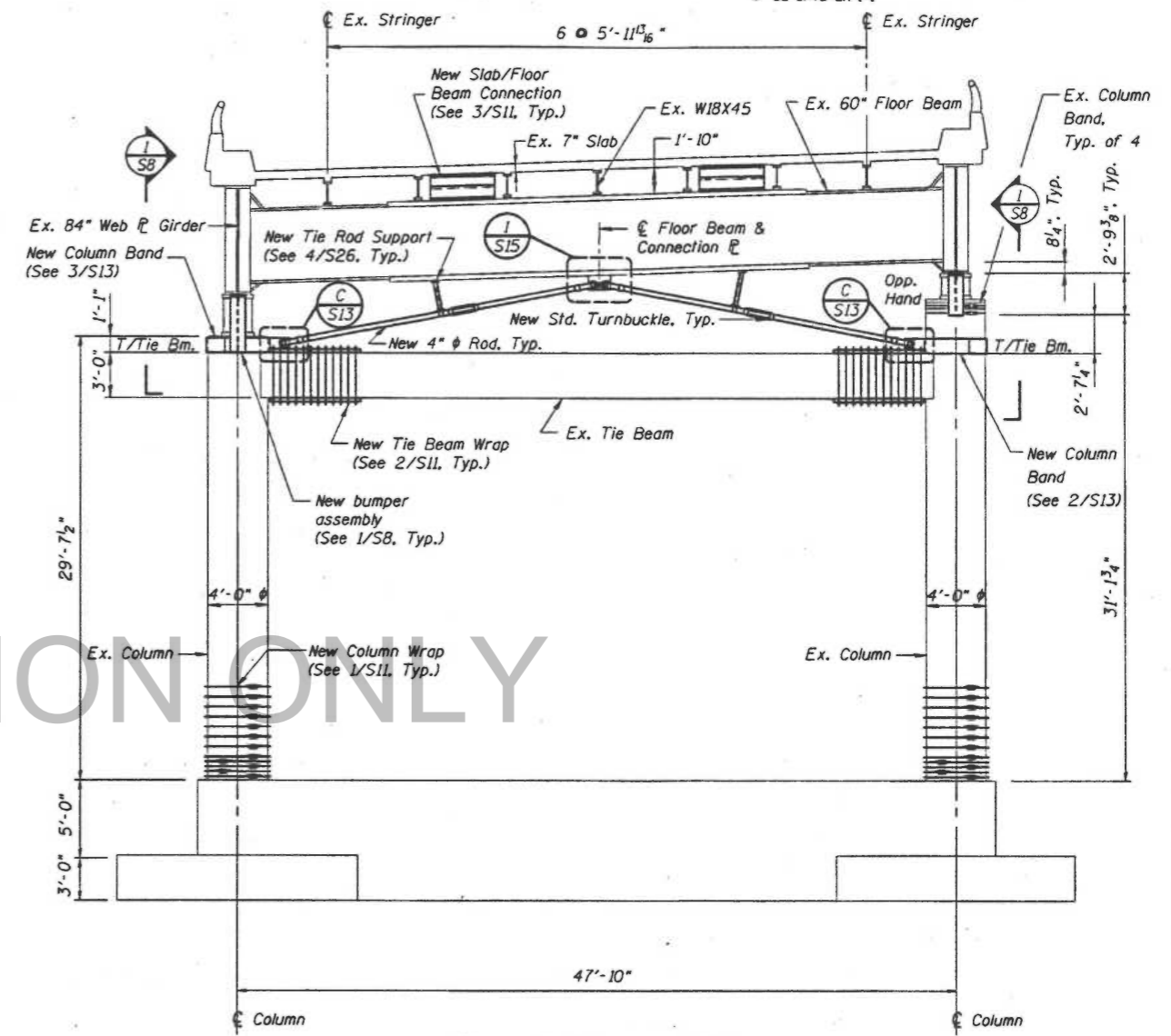
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
FAI ROUTE 70
BROAD STREET BRIDGE APPROACH
ST. CLAIR COUNTY

DATE: 1-23-00

82-34VB-2R-1-1



1
S30 ELEVATIONS PIER D8



2
S30 ELEVATION PIER D9

BILL OF MATERIAL - PIER D6 *		
ITEM	UNIT	QUANTITY
Furnish and erect structural steel	LBS.	2310
Epoxy grouted dowels	EACH	18
Foundation wall dowel modification	EACH	8
Column wrap	SQ. FT.	163.4

* Elevation not shown

BILL OF MATERIAL - PIER D7 *		
ITEM	UNIT	QUANTITY
Furnish and erect structural steel	LBS.	2320
Epoxy grouted dowels	EACH	12
Column wrap	SQ. FT.	163.4

* Elevation not shown

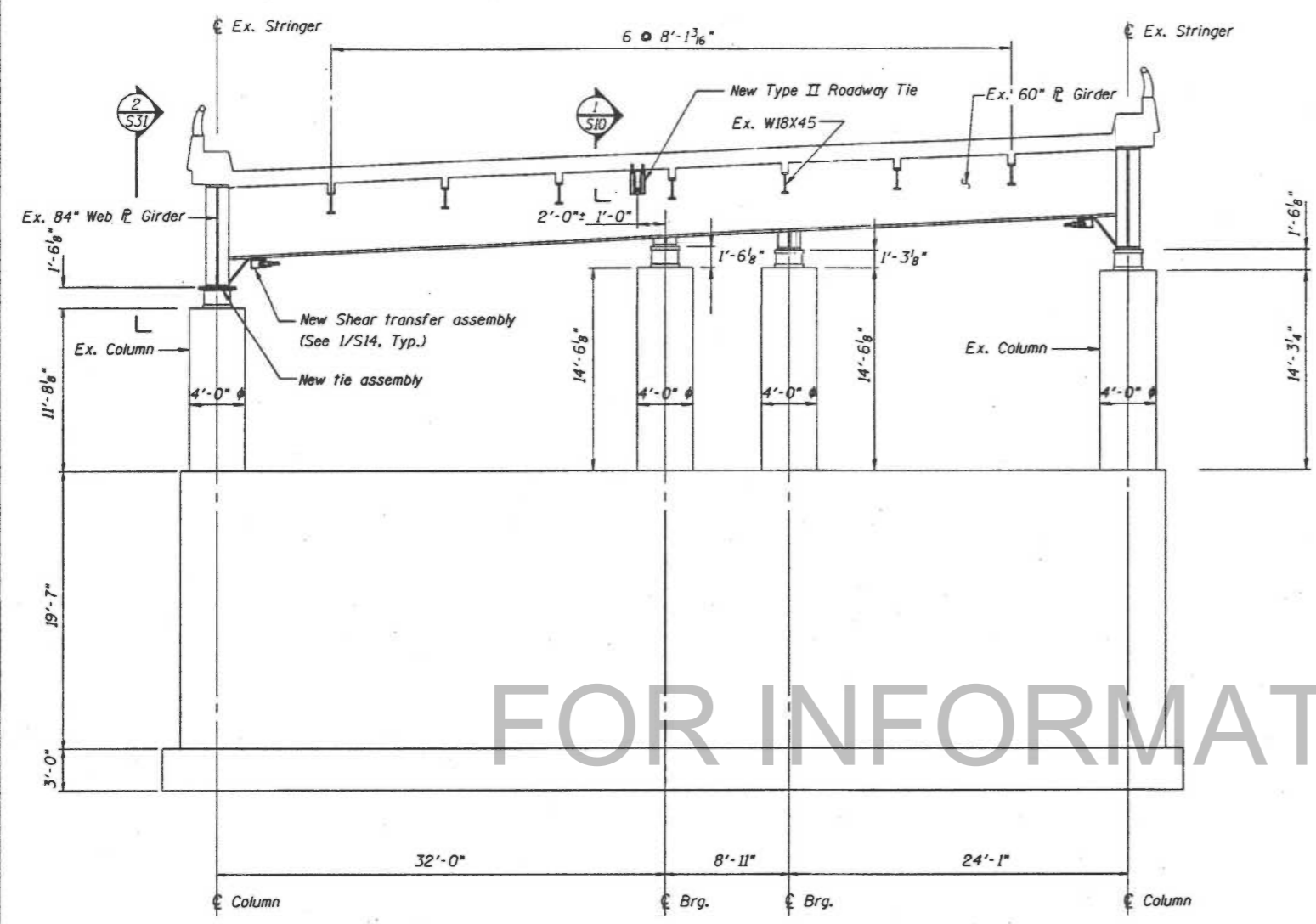
BILL OF MATERIAL - PIER D8		
ITEM	UNIT	QUANTITY
Concrete removal	CY	7.8
Furnish and erect structural steel	LBS.	3257
Epoxy grouted dowels	EACH	8
Foundation wall dowel modification	EACH	16
Column wrap	SQ. FT.	163.4

BILL OF MATERIAL - PIER D9		
ITEM	UNIT	QUANTITY
Furnish and erect structural steel	LBS.	10484
Epoxy grouted dowels	EACH	16
Foundation wall dowel modification	EACH	12
Column wrap	SQ. FT.	163.4

PIERS D8 & D9 RETROFITS

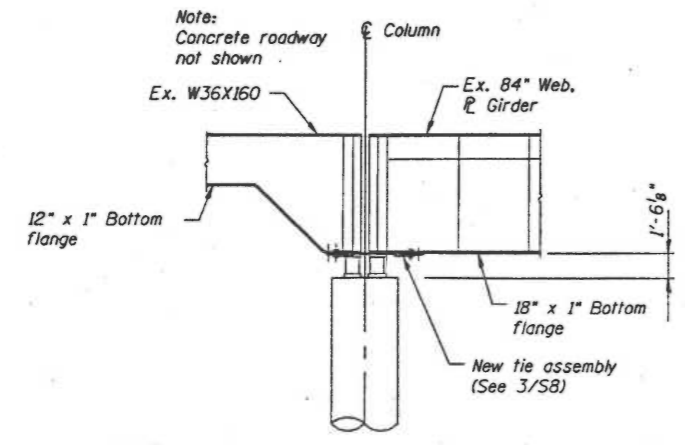
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
FAI ROUTE 70
POPLAR STREET BRIDGE

DATE 1-23-98 CHECKED BY



FOR INFORMATION ONLY

1
S31
ELEVATIONS PIER D11



ELEVATION EXISTING ROADWAY GIRDERS AT PIER D11

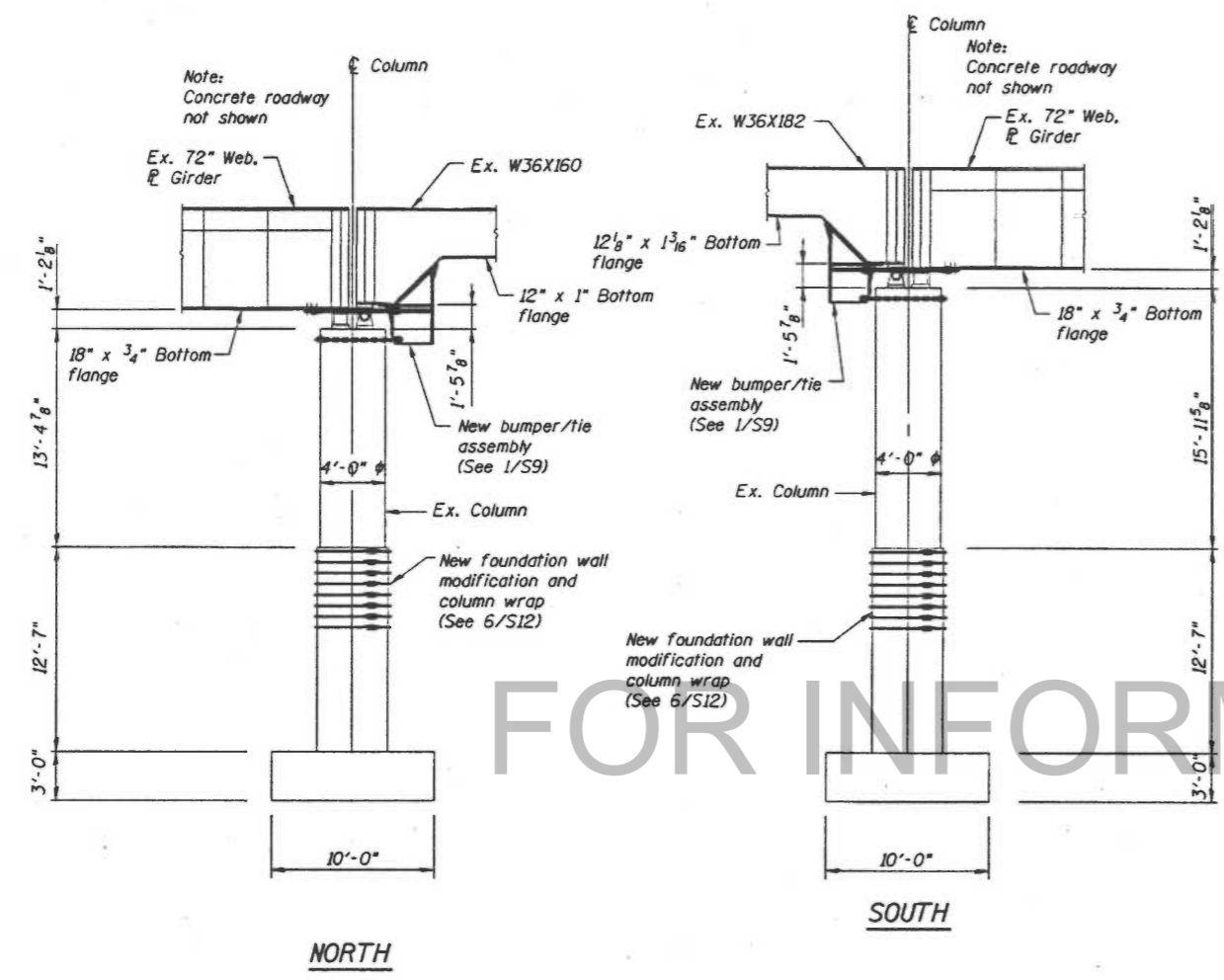
BILL OF MATERIAL - PIER D10 *		
ITEM	UNIT	QUANTITY
Furnish and erect structural steel	LBS.	2815
Epoxy grouted dowels	EACH	16
Column wrap	SQ. FT.	202.7

BILL OF MATERIAL - PIER D11		
ITEM	UNIT	QUANTITY
Furnish and erect structural steel	LBS.	2466
Epoxy grouted dowels	EACH	28
Wire rope	FT.	87.0

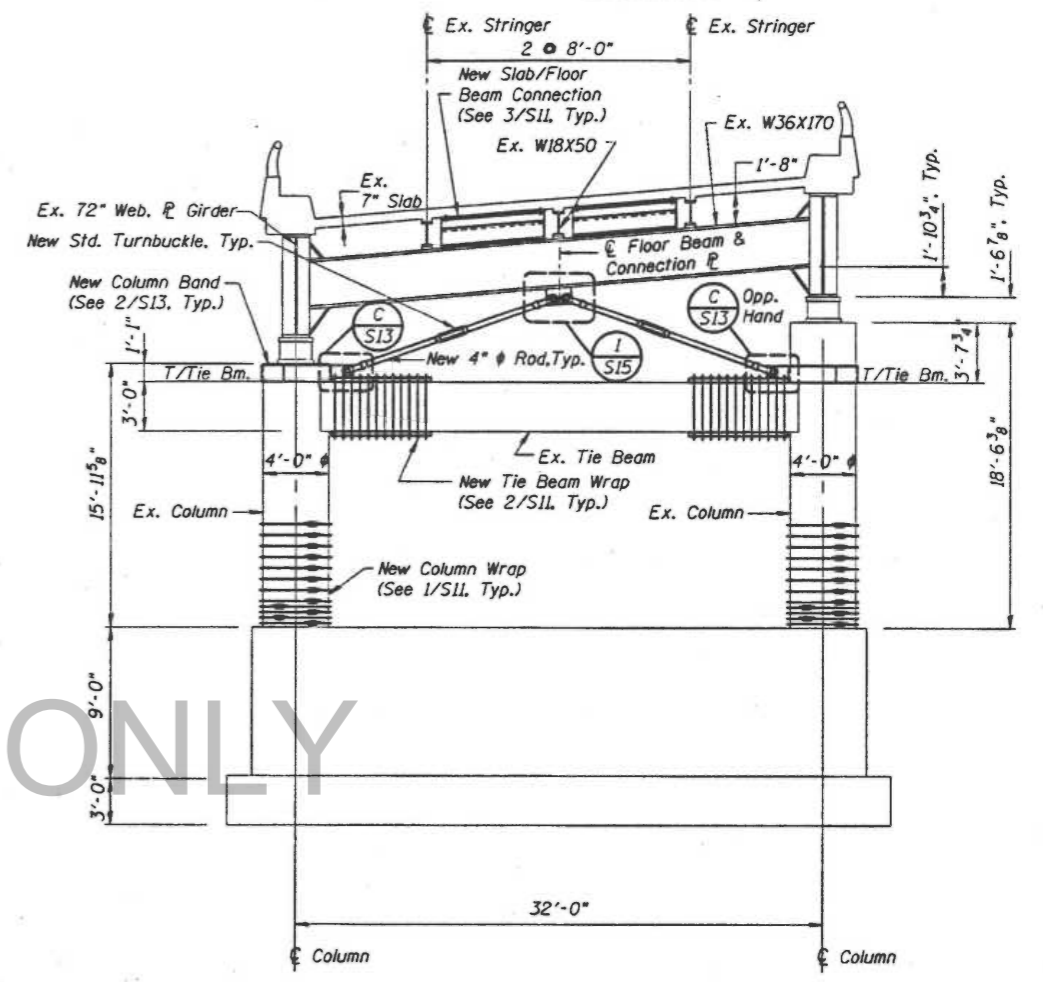
* Elevation not shown

PIER D11 RETROFITS
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
FAI ROUTE 70
POPLAR STREET BRIDGE APPROACHES

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.	SHEET NO. S-32
F.A.I. 78		ST. CLAIR	91	89	SHEETS
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT			



1
S32
ELEVATIONS PIER D12



2
S32
ELEVATION PIER D13

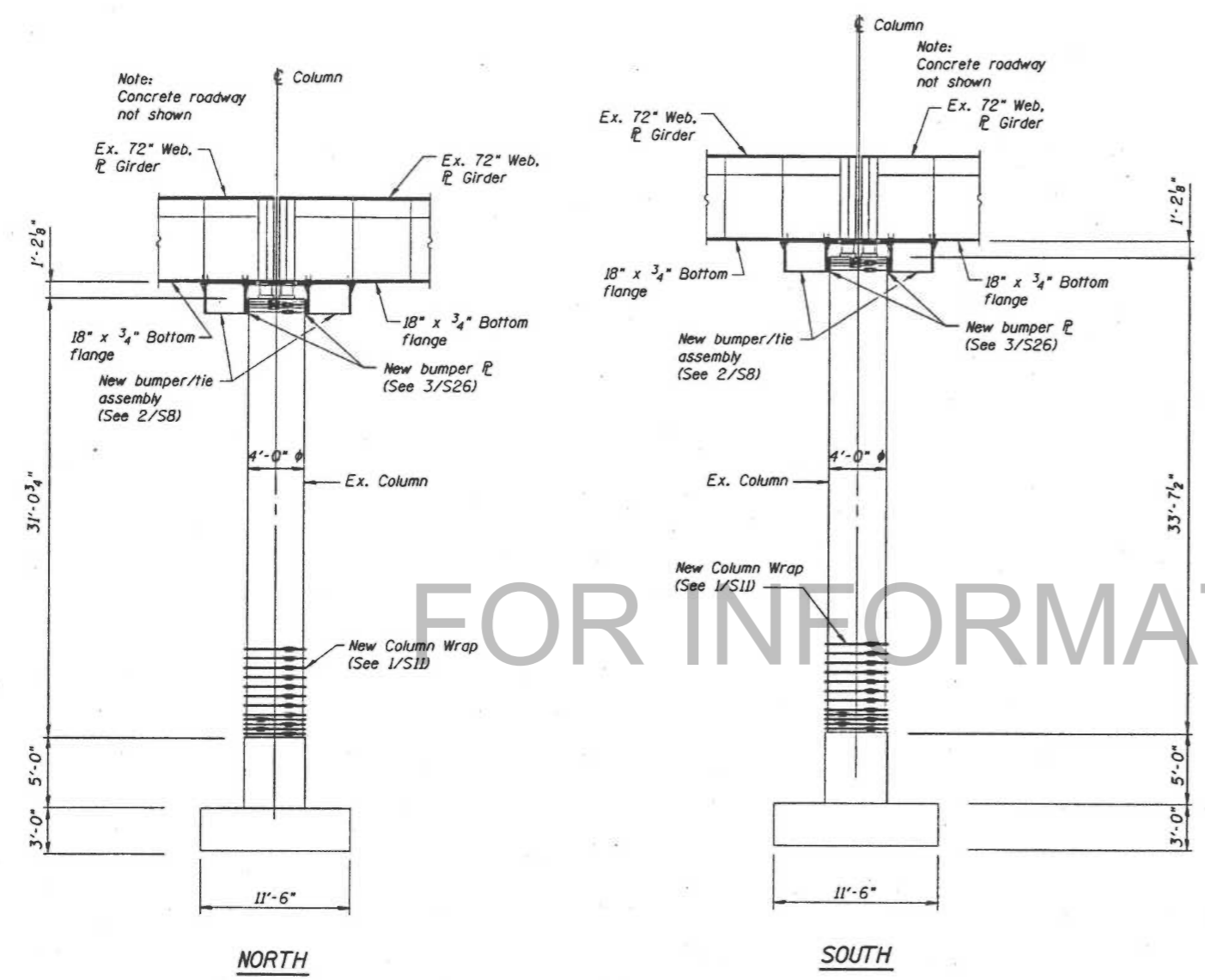
BILL OF MATERIAL - PIER D12		
ITEM	UNIT	QUANTITY
Formed concrete repair	SQ. FT.	150
Furnish and erect structural steel	LBS.	2298
Foundation wall modification	SQ. FT.	45
Column wrap	SQ. FT.	148.8

BILL OF MATERIAL - PIER D13		
ITEM	UNIT	QUANTITY
Furnish and erect structural steel	LBS.	4915
Epoxy grouted dowels	EACH	18
Foundation wall dowel modification	EACH	12
Column wrap	SQ. FT.	163.4

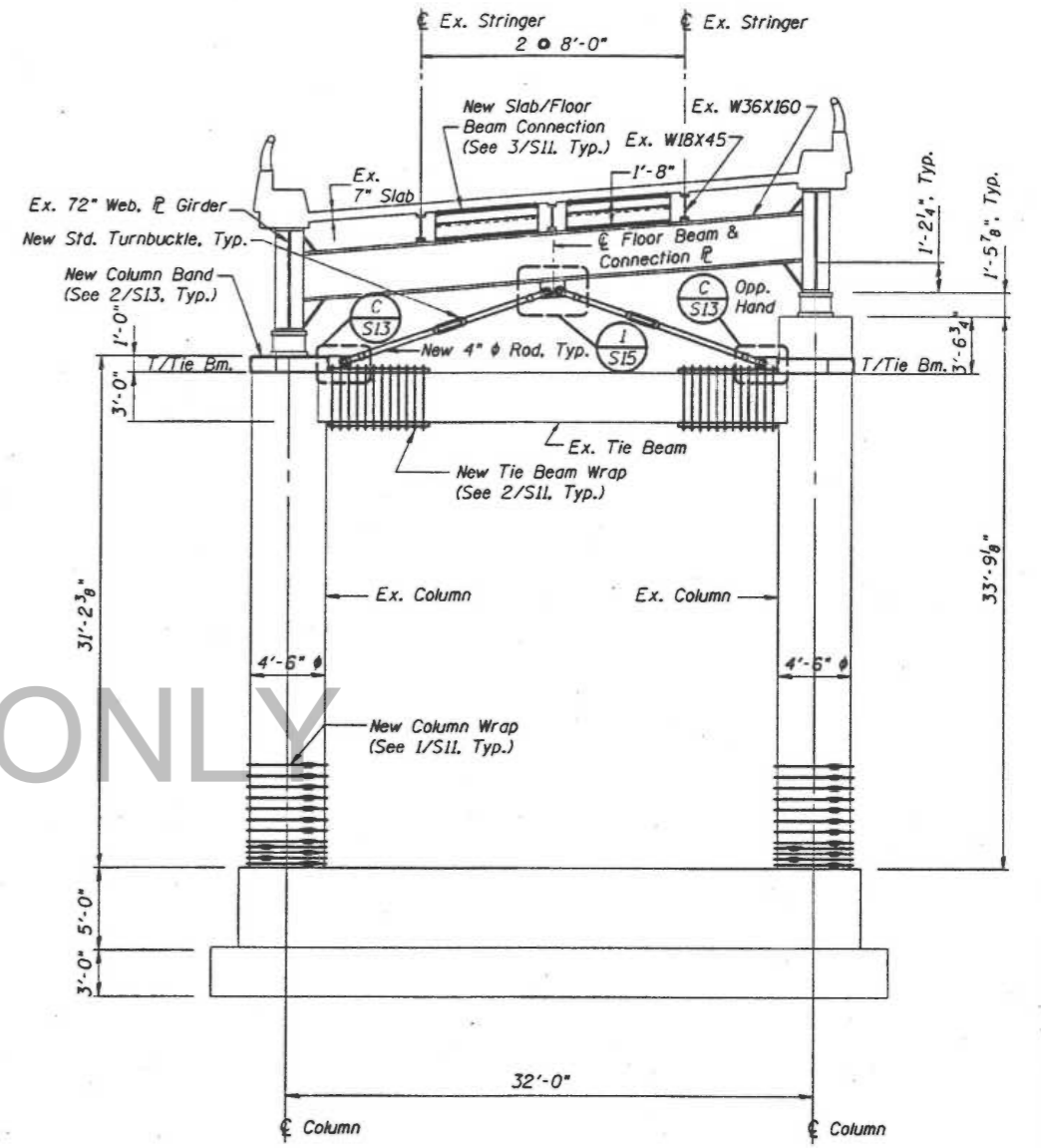
PIERS D12 & D13 RETROFITS

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
FAI ROUTE 70
STREET BRIDGE APPROACHES
AIR COL

DATE 1-23-06
DRAWN BY
CHECKED BY HH



1 ELEVATION PIER D15
S33



2 ELEVATIONS PIER D17
S33

BILL OF MATERIAL - PIER D14 *

ITEM	UNIT	QUANTITY
Furnish and erect structural steel	LBS.	329
Epoxy grouted dowels	EACH	9
Column wrap	SQ. FT.	163.4

* Elevation not shown

BILL OF MATERIAL - PIER D15

ITEM	UNIT	QUANTITY
Concrete removal	CY	3.9
Furnish and erect structural steel	LBS.	3077
Epoxy grouted dowels	EACH	8
Foundation wall dowel modification	EACH	16
Column wrap	SQ. FT.	163.4

BILL OF MATERIAL - PIER D16 *

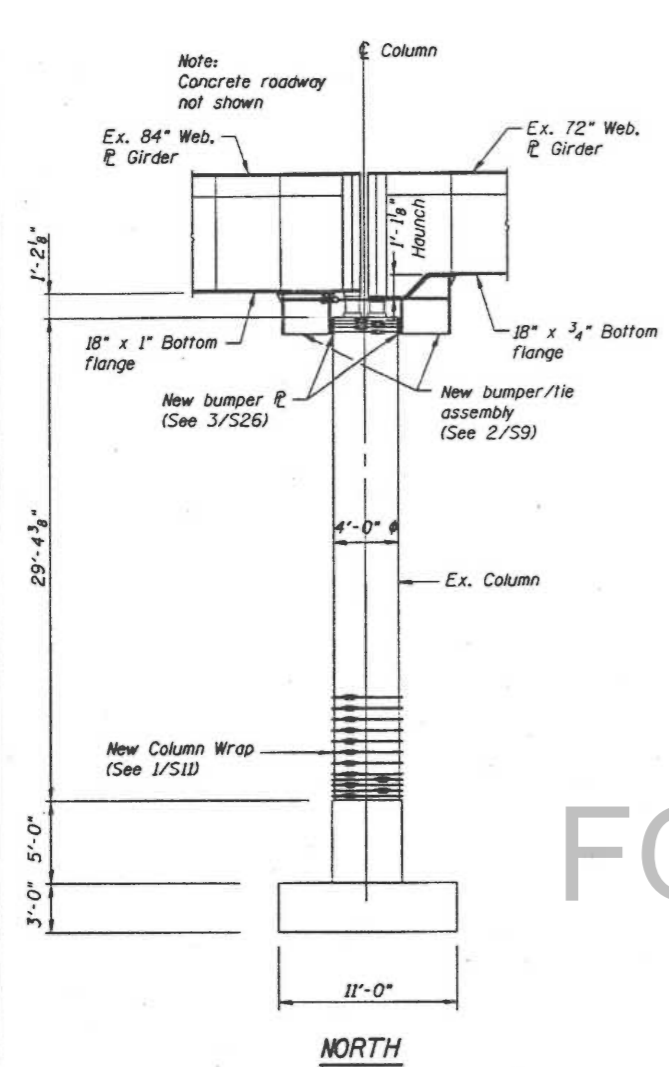
ITEM	UNIT	QUANTITY
Furnish and erect structural steel	LBS.	1825
Epoxy grouted dowels	EACH	10
Column wrap	SQ. FT.	163.4

* Elevation not shown

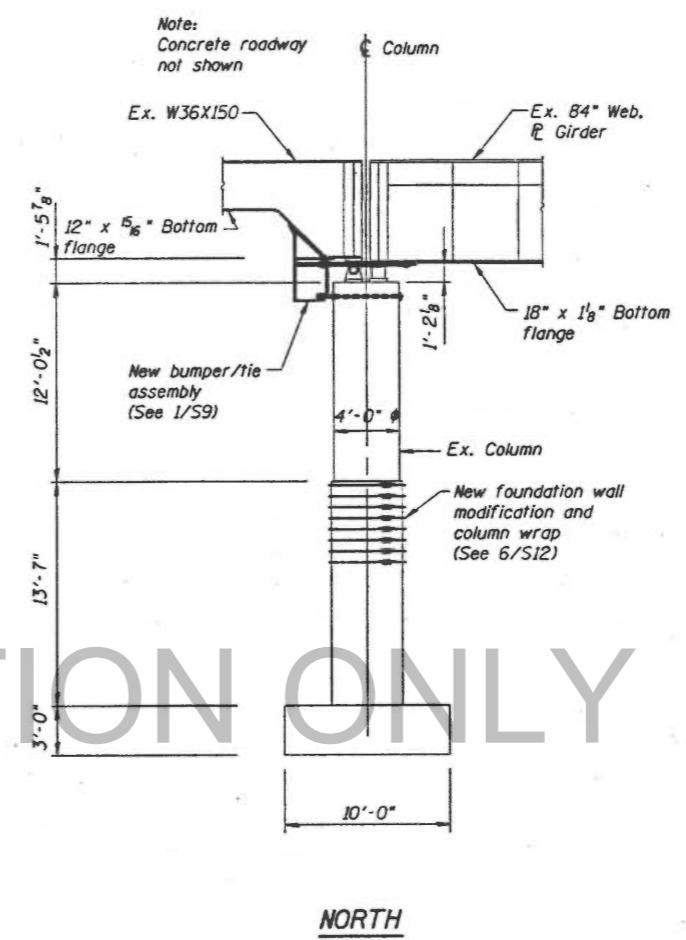
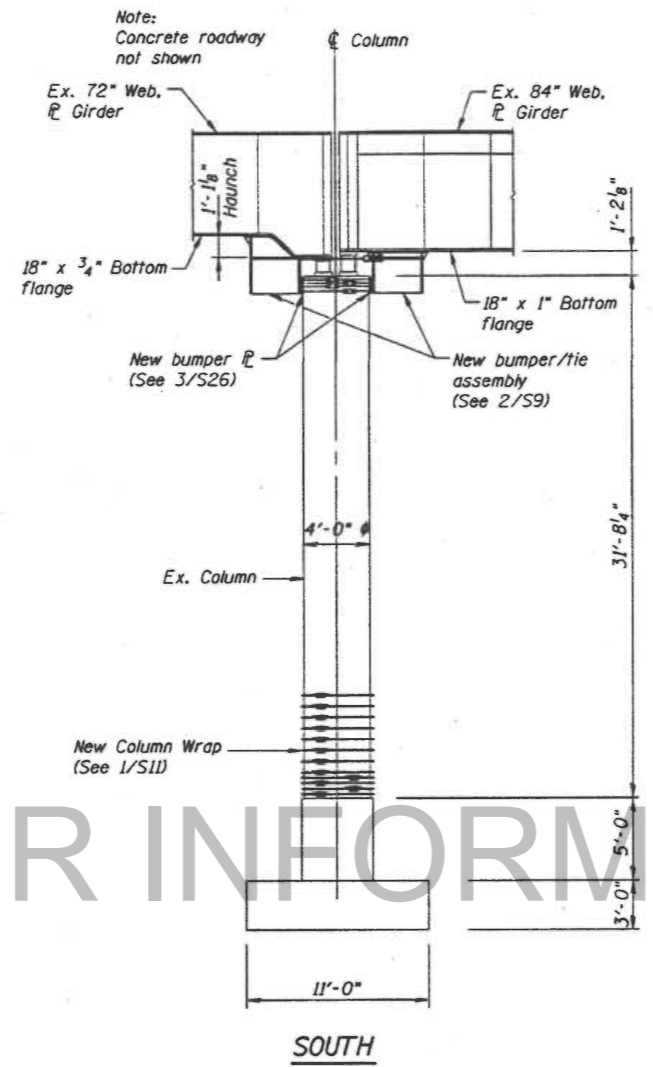
BILL OF MATERIAL - PIER D17

ITEM	UNIT	QUANTITY
Furnish and erect structural steel	LBS.	5124
Epoxy grouted dowels	EACH	16
Foundation wall dowel modification	EACH	12
Column wrap	SQ. FT.	202.7

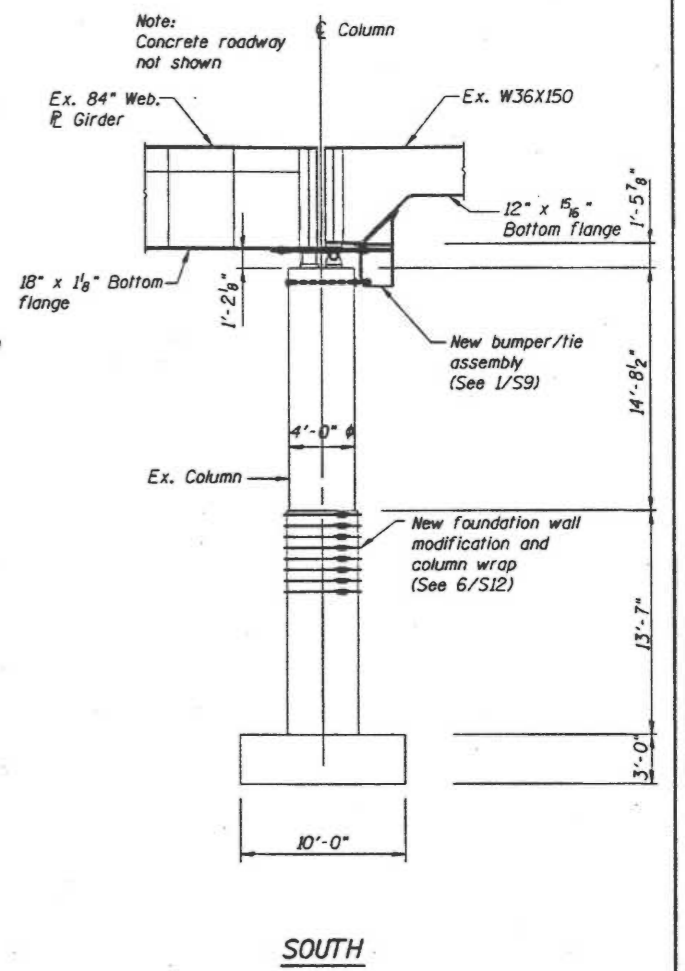
PIERS D15 & D17 RETROFITS
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
FAI ROUTE 70
POPULAR STREET BRIDGE APPROACHES
ST. CLAIR COUNTY



1
S34
ELEVATIONS PIER D18



2
S34
ELEVATIONS PIER D21



BILL OF MATERIAL - PIER D18

ITEM	UNIT	QUANTITY
Concrete removal	CY	3.9
Furnish and erect structural steel	LBS.	3699
Epoxy grouted dowels	EACH	8
Foundation wall dowel modification	EACH	16
Column wrap	SQ. FT.	163.4

BILL OF MATERIAL - PIER D19*

ITEM	UNIT	QUANTITY
Furnish and erect structural steel	LBS.	2190
Epoxy grouted dowels	EACH	20
Foundation wall dowel modification	EACH	8
Column wrap	SQ. FT.	163.4

BILL OF MATERIAL - PIER D20*

ITEM	UNIT	QUANTITY
Furnish and erect structural steel	LBS.	415
Epoxy grouted dowels	EACH	11
Column wrap	SQ. FT.	163.4

BILL OF MATERIAL - PIER D21

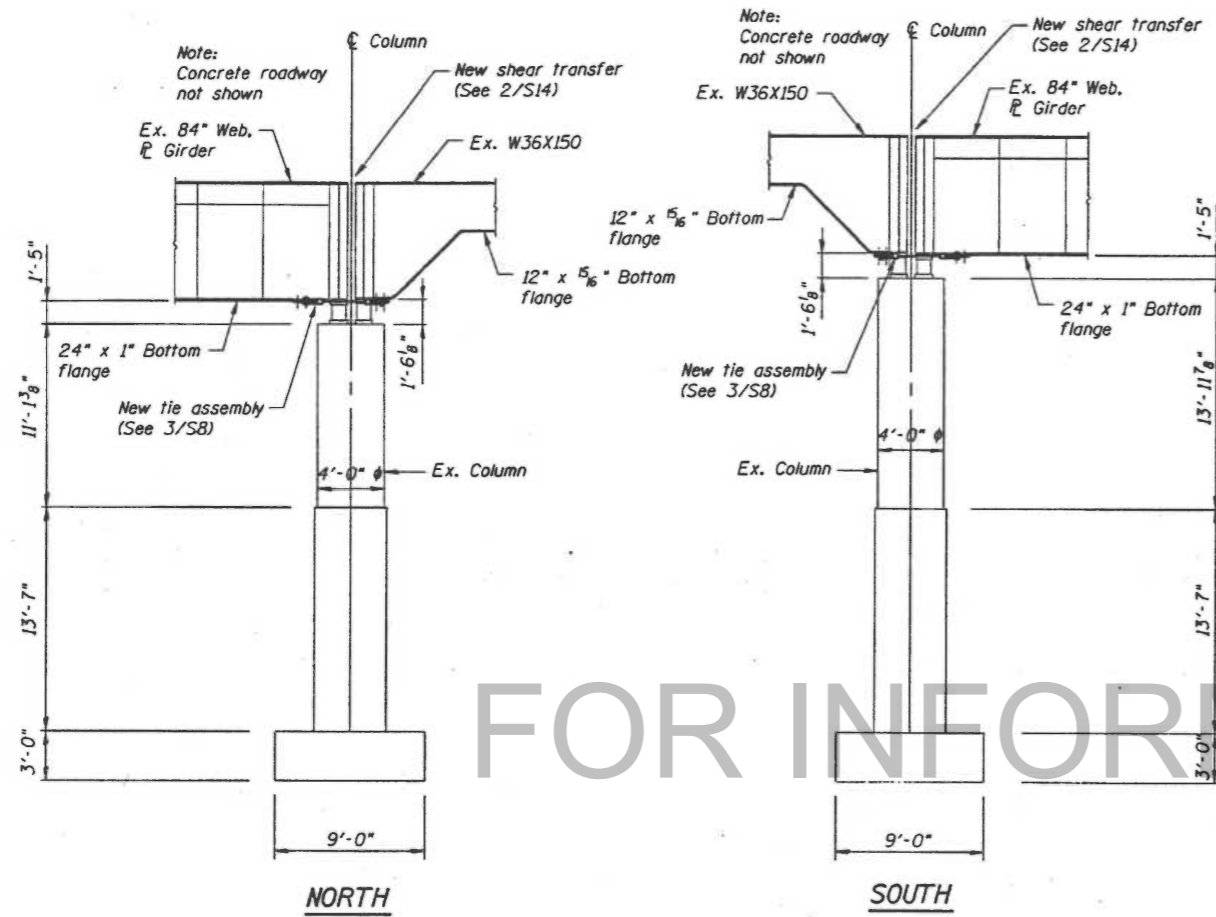
ITEM	UNIT	QUANTITY
Formed concrete repair	SQ. FT.	40
Furnish and erect structural steel	LBS.	2298
Foundation wall modification	SQ. FT.	45
Column wrap	SQ. FT.	74.4

* Elevation not shown

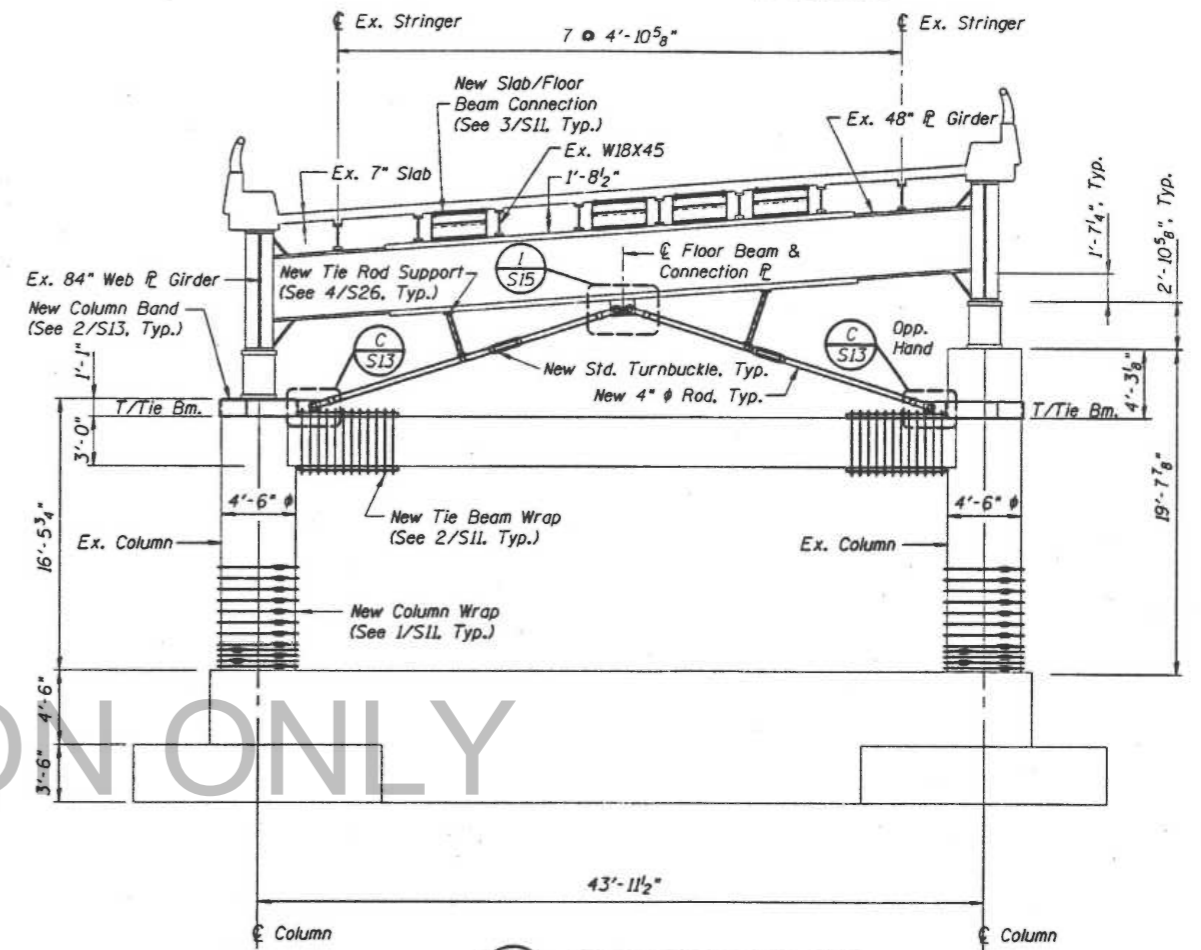
* Elevation not shown

PIERS D18 & D21 RETROFITS
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
FAI ROUTE 70
POPLAR STREET BRIDGE APPROACHES
ST. CLAIR COUNTY

STRUCTURE NO. 082-0144 (ROADWAY)
STRUCTURE NO. 082-0256 (ROADWAY)
LOCAL NO. NONE
DATE 1-23-98



1 ELEVATIONS PIER D22
S35



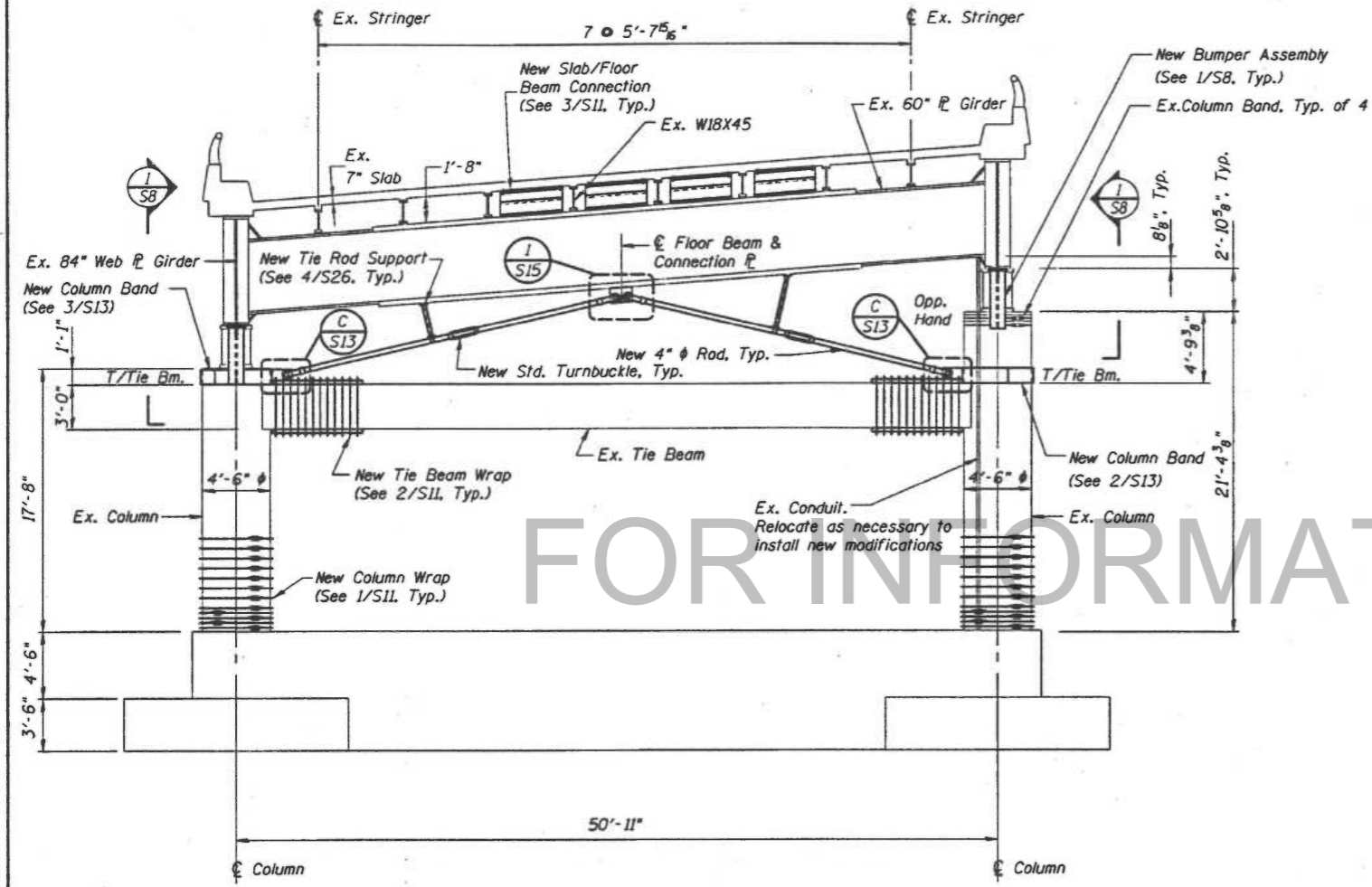
2 ELEVATION PIER D23
S35

BILL OF MATERIAL - PIER D22		
ITEM	UNIT	QUANTITY
Furnish and erect structural steel	LBS.	1061
Epoxy grouted dowels	EACH	8
Wire rope	FT.	67.2

BILL OF MATERIAL - PIER D23		
ITEM	UNIT	QUANTITY
Furnish and erect structural steel	LBS.	6773
Epoxy grouted dowels	EACH	32
Column wrap	SQ. FT.	202.7

PIER D22 & D23 RETROFITS
 STATE OF ILLINOIS
 DEPARTMENT OF TRANSPORTATION
 SEISMIC AND REDUNDANCY RETROFIT REPAIRS
 FAI ROUTE 70
 POPLAR STREET BRIDGE APPROACHES
 ST. CLAIR COUNTY
 DATE 1-23-98
 CHECKED BY HH

FOR INFORMATION ONLY



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1
S36
ELEVATION PIER D24

BILL OF MATERIAL - PIER D24		
ITEM	UNIT	QUANTITY
Furnish and erect structural steel	LBS.	10264
Epoxy grouted dowels	EACH	36
Foundation wall dowel modification	EACH	12
Column wrap	SQ. FT.	202.7

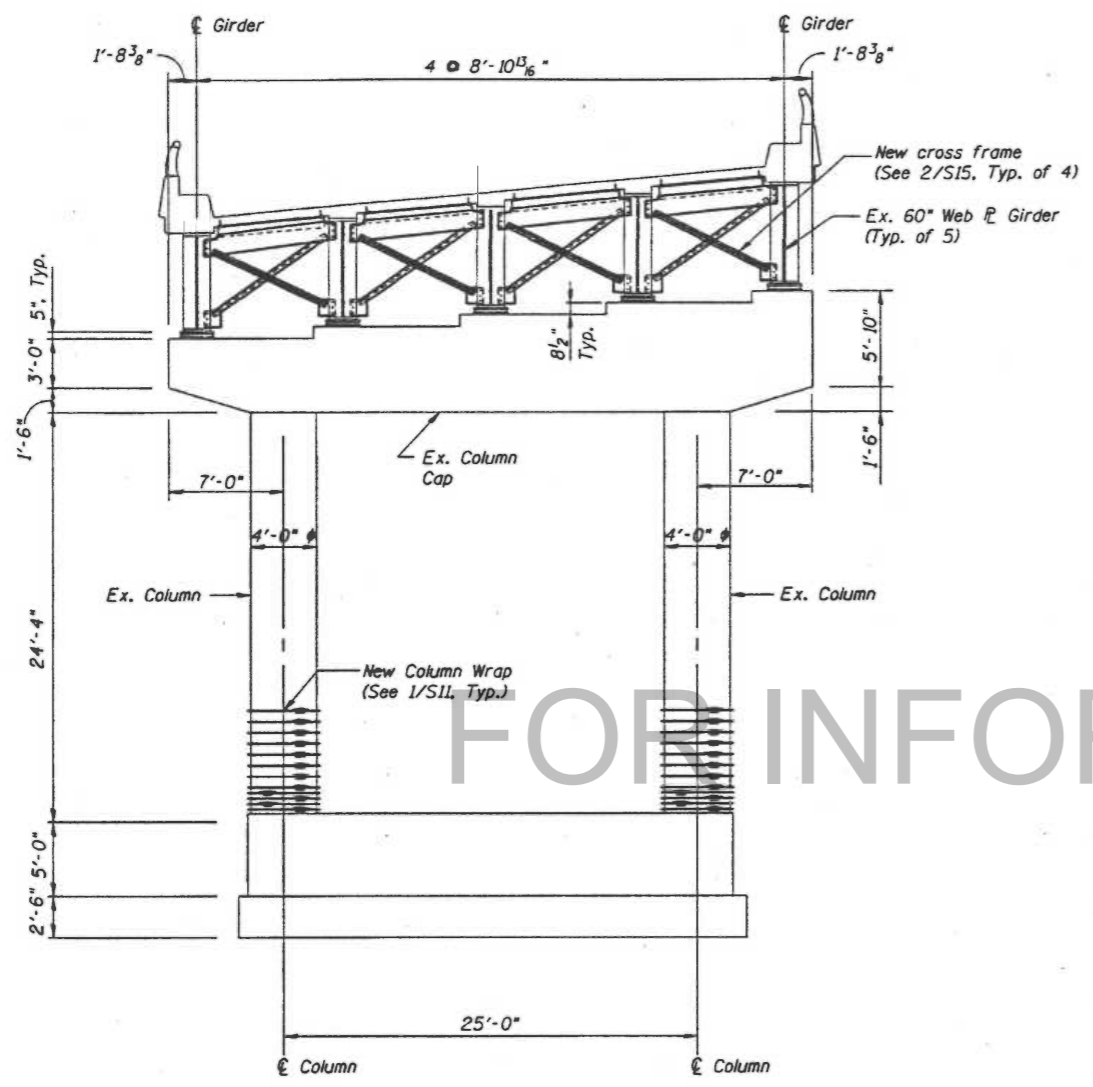
BILL OF MATERIAL - PIER D25*		
ITEM	UNIT	QUANTITY
Furnish and erect structural steel	LBS.	658
Epoxy grouted dowels	EACH	18
Foundation wall dowel modification	EACH	12
Column wrap	SQ. FT.	202.7

* Elevation not shown

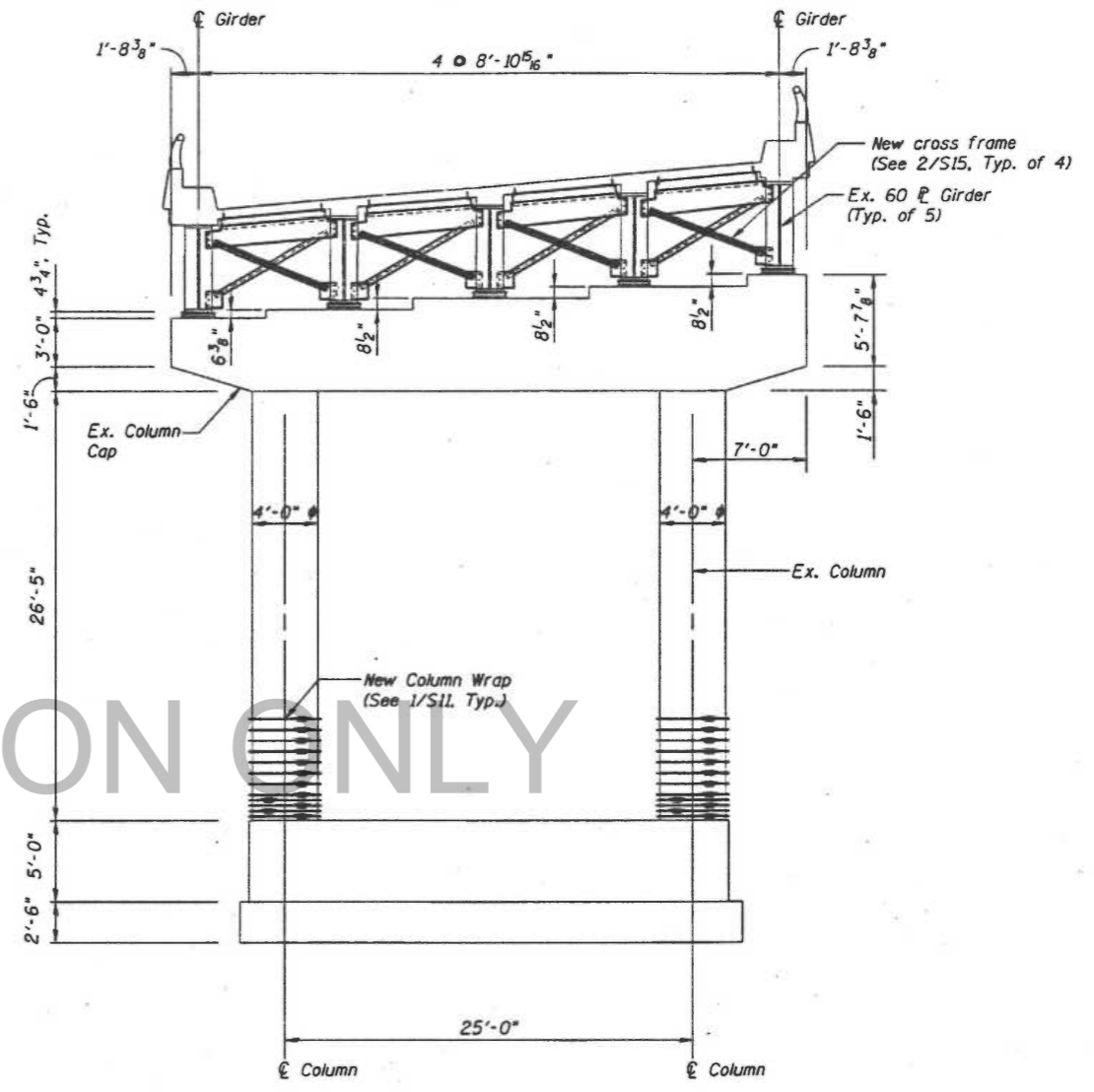
PIER D24 RETROFITS
 STATE OF ILLINOIS
 DEPARTMENT OF TRANSPORTATION
 SEISMIC AND REDUNDANCY RETROFIT REPAIRS
 FAI ROUTE 70
 POPLAR STREET BRIDGE APPROACHES
 COUNTY

STRUCTURE NO. _____ STRUCTURE NO. _____
 DATE 1-23-98 CHECKED BY Hh

82-3HWB-2R-1-1



1 ELEVATION PIER Q1-1
S38



2 ELEVATION PIER Q2-1
S38

BILL OF MATERIAL - PIER Q1-1

ITEM	UNIT	QUANTITY
Furnish and erect structural steel	LBS.	2175
Steel cross frame removal	EACH	4
Epoxy grouted dowels	EACH	20
Column wrap	SQ. FT.	163.4

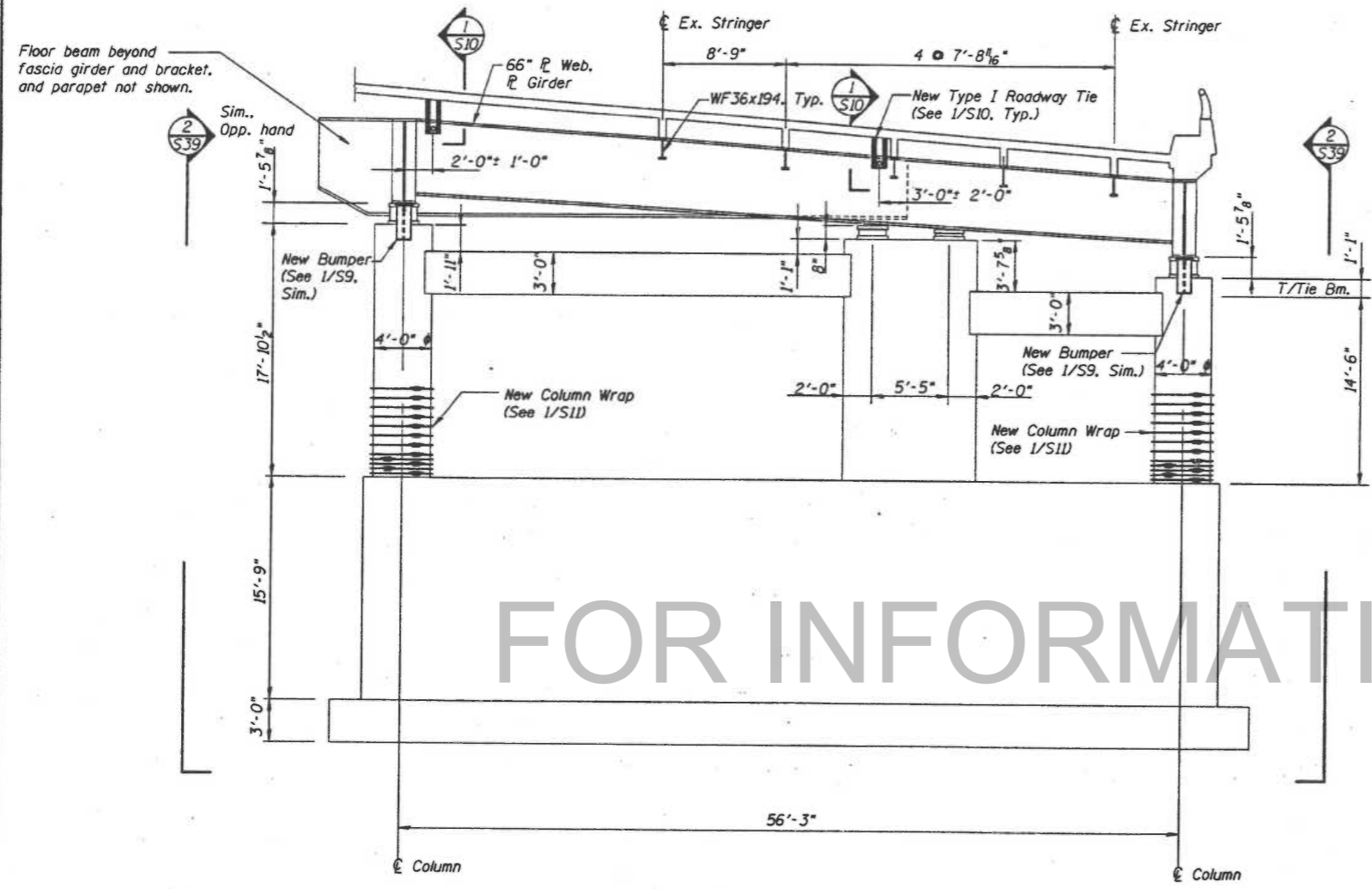
BILL OF MATERIAL - PIER Q2-1

ITEM	UNIT	QUANTITY
Furnish and erect structural steel	LBS.	2175
Steel cross frame removal	EACH	4
Epoxy grouted dowels	EACH	20
Column wrap	SQ. FT.	163.4

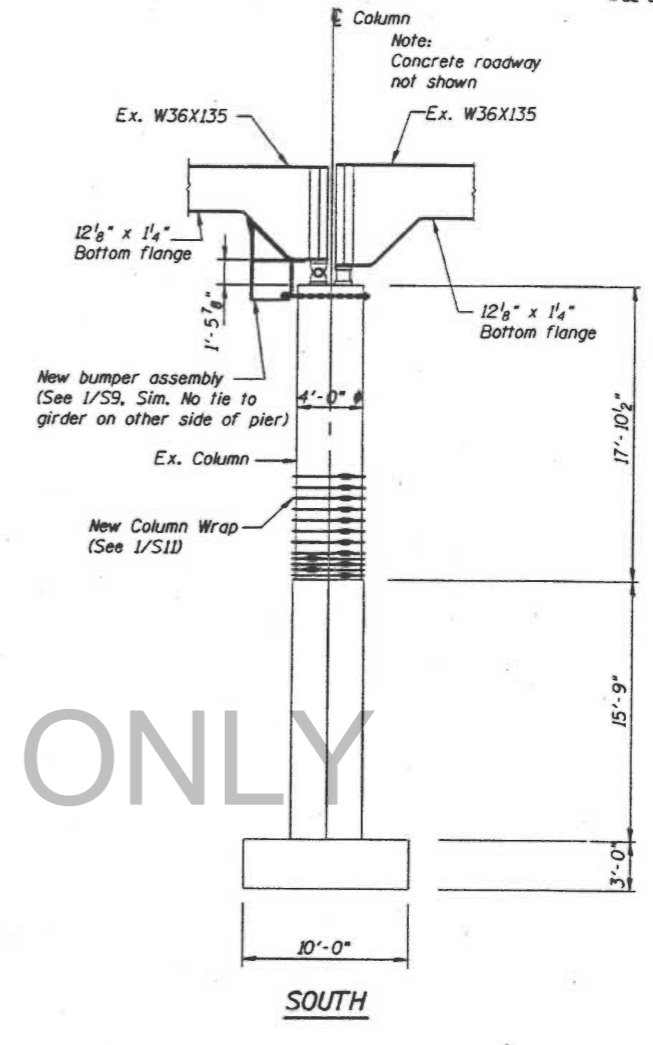
PIERS Q1-1 AND Q2-1 RETROFITS
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
FAI ROUTE 70
POPLAR STREET BRIDGE APPROACHES
ST. CLAIR

782-0144 (2/2/01)
0756 (8/1/01)

RAMP 01
HH



1 ELEVATION PIER P14
S39



2 ELEVATION PIER P14
S39

FOR INFORMATION ONLY

BILL OF MATERIAL - PIER P14

ITEM	UNIT	QUANTITY
Concrete removal	C.Y.	6
Furnish and erect structural steel	LBS.	6240
Epoxy grouted dowels	EACH	56
Foundation wall dowel modification	EACH	4
Column wrap	SQ. FT.	163.4

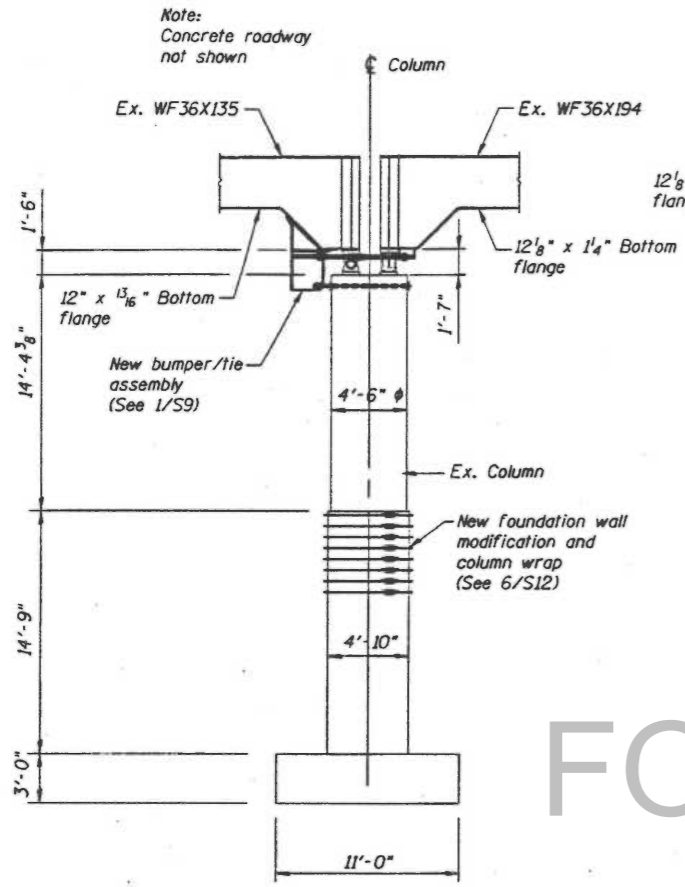
PIER P14 RETROFITS

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
FAI ROUTE 70
ST. CLAIR COUNTY

STRUCTURE NO. _____
SCALE: _____
DATE 1-23-98

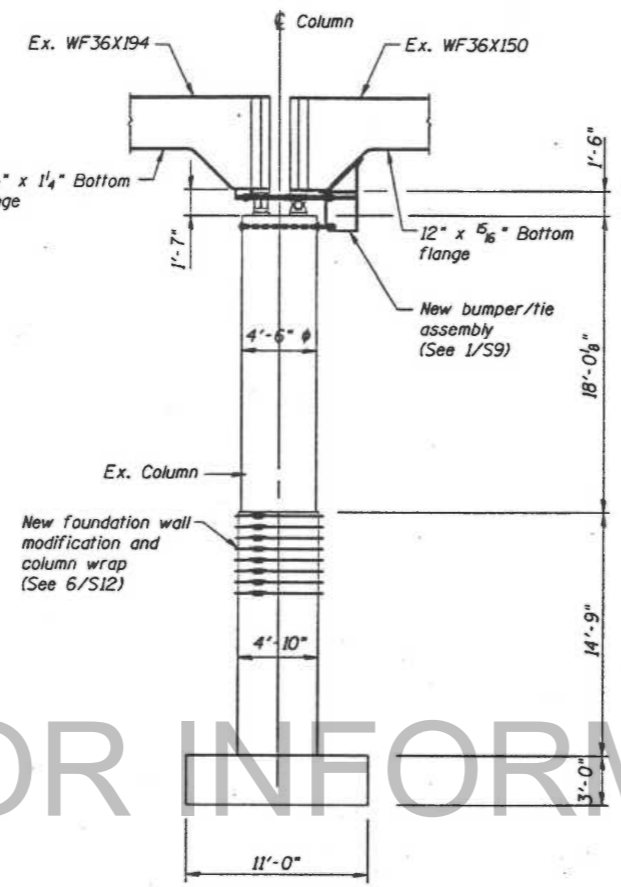
DRAWN BY: JUN
CHECKED BY: HHH

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.	SHEET NO. S-40
F.A.I. 78	8	ST. CLAIR	91	77	
FED. ROAD DIST. NO. 7		ILLINOIS	FED. AID PROJECT		SHEETS
82-3HVB-2R-1-1					

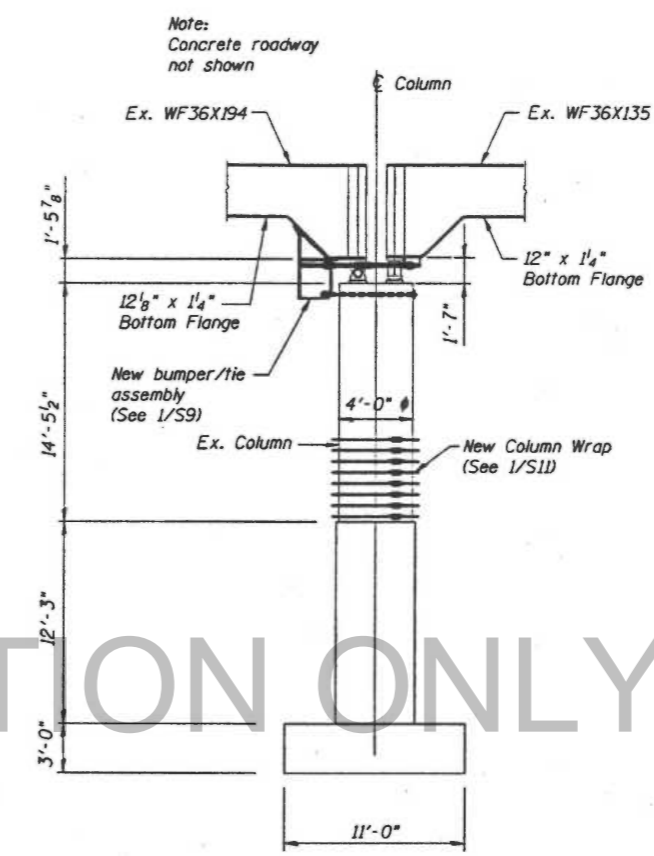


NORTH

1 ELEVATIONS PIER P15
S40

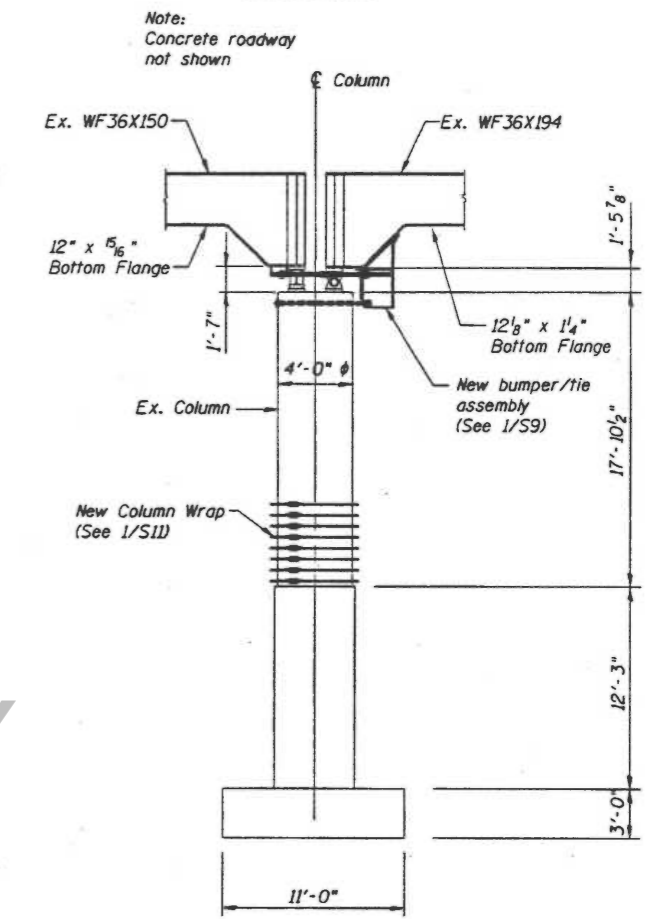


SOUTH



NORTH

2 ELEVATIONS PIER H1
S40



SOUTH

BILL OF MATERIAL - PIER P15		
ITEM	UNIT	QUANTITY
Furnish and erect structural steel	LBS.	2320
Foundation wall modification	SQ. FT.	56.5
Column wrap	SQ. FT.	221.4

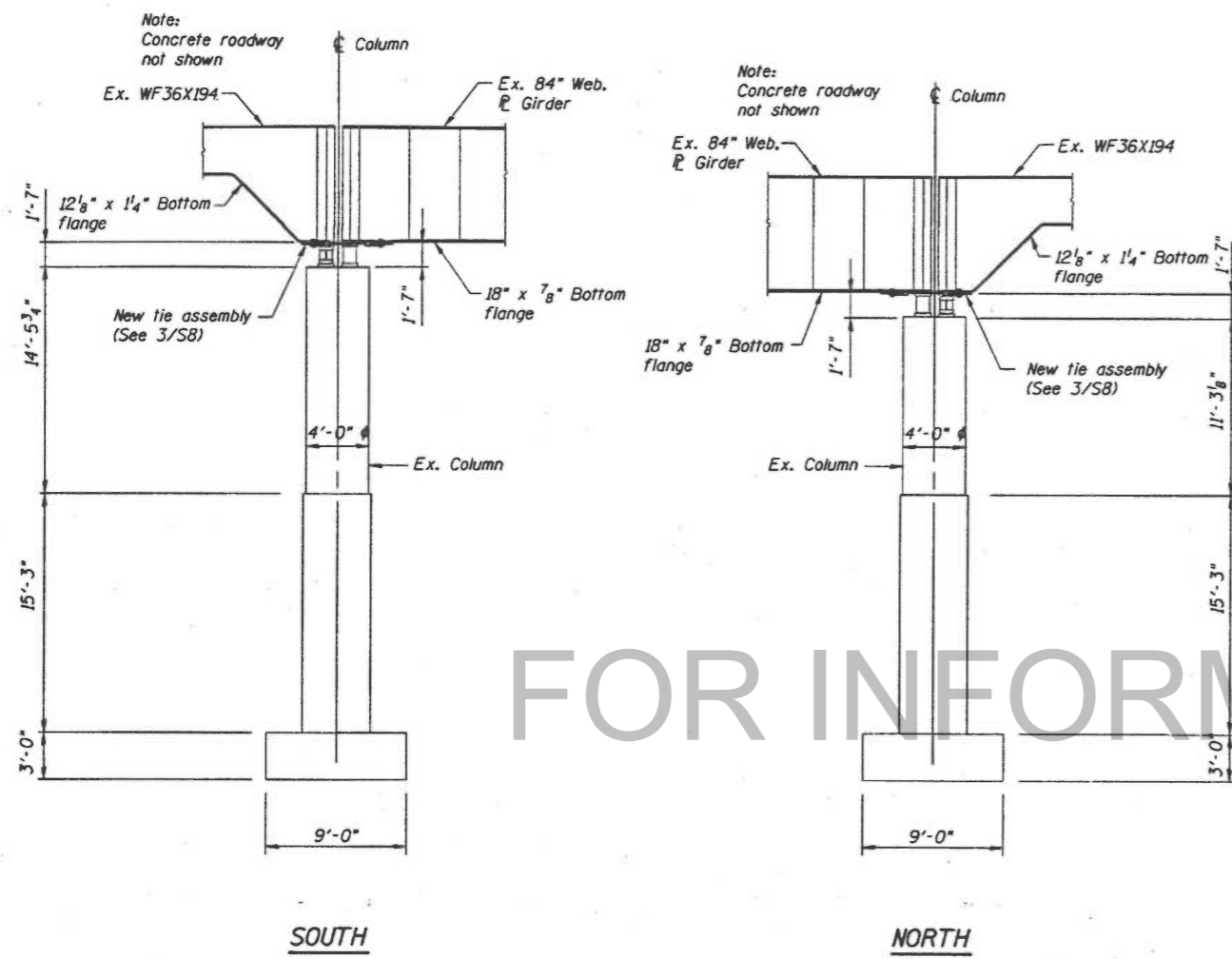
BILL OF MATERIAL - PIER H1		
ITEM	UNIT	QUANTITY
Furnish and erect structural steel	LBS.	2320
Foundation wall dowel modification	EACH	20
Column wrap	SQ. FT.	163.4

PIERS P15 AND H1 RETROFITS

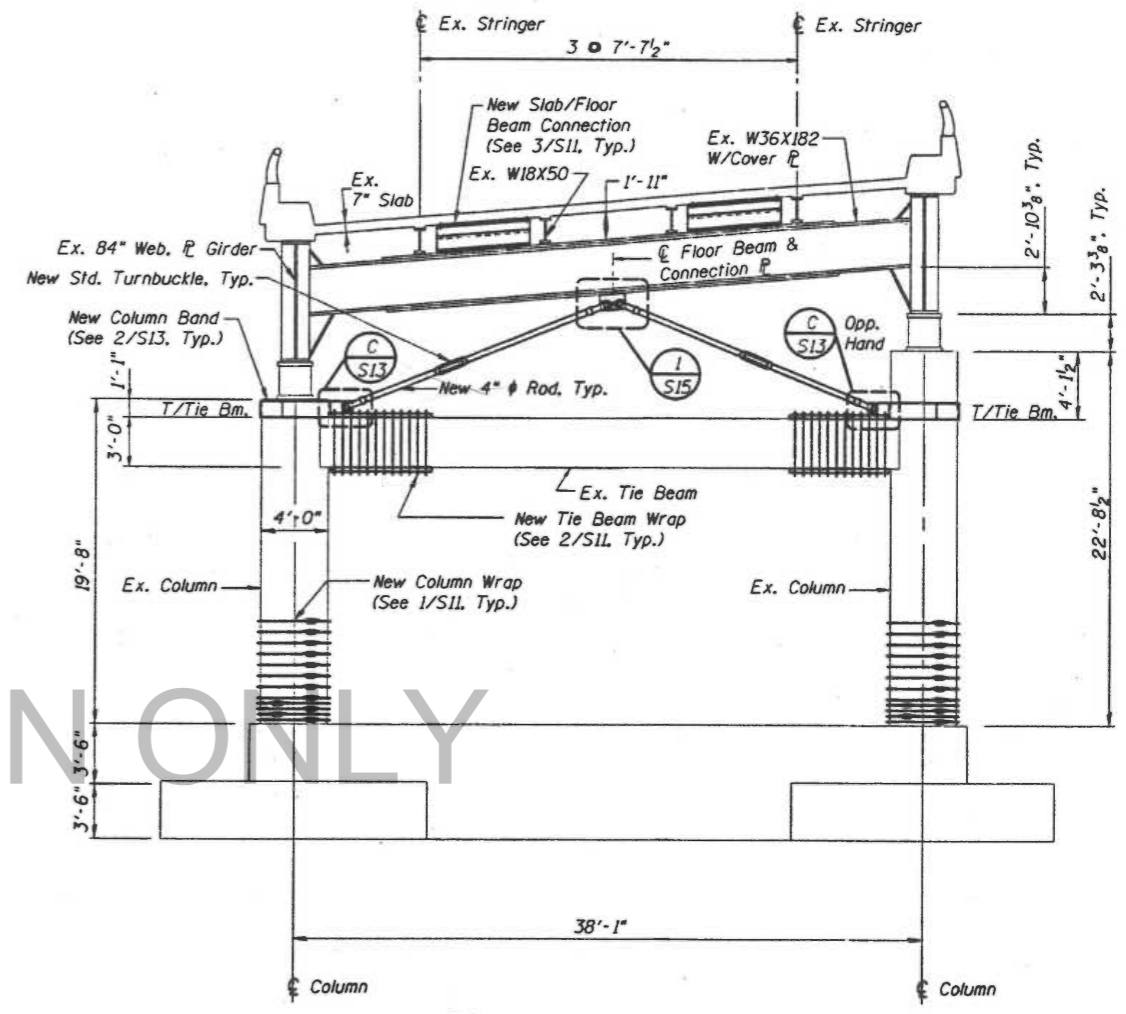
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
FAI ROUTE TO
POGAR STREET BRIDGE APPROACHES
ST. CLAIR COUNTY

DATE 1-23-99 DRAWN BY [signature] CHECKED BY [signature]

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.	SHEET NO. S-41
F.A.I. 78		ST. CLAIR	91	78	
ILLINOIS PROJECT					
* 82-3HVB-2R-1-1					



1 ELEVATIONS PIER H2
S41



2 ELEVATION PIER H3
S41

BILL OF MATERIAL - PIER H2		
ITEM	UNIT	QUANTITY
Furnish and erect structural steel	LBS.	1605

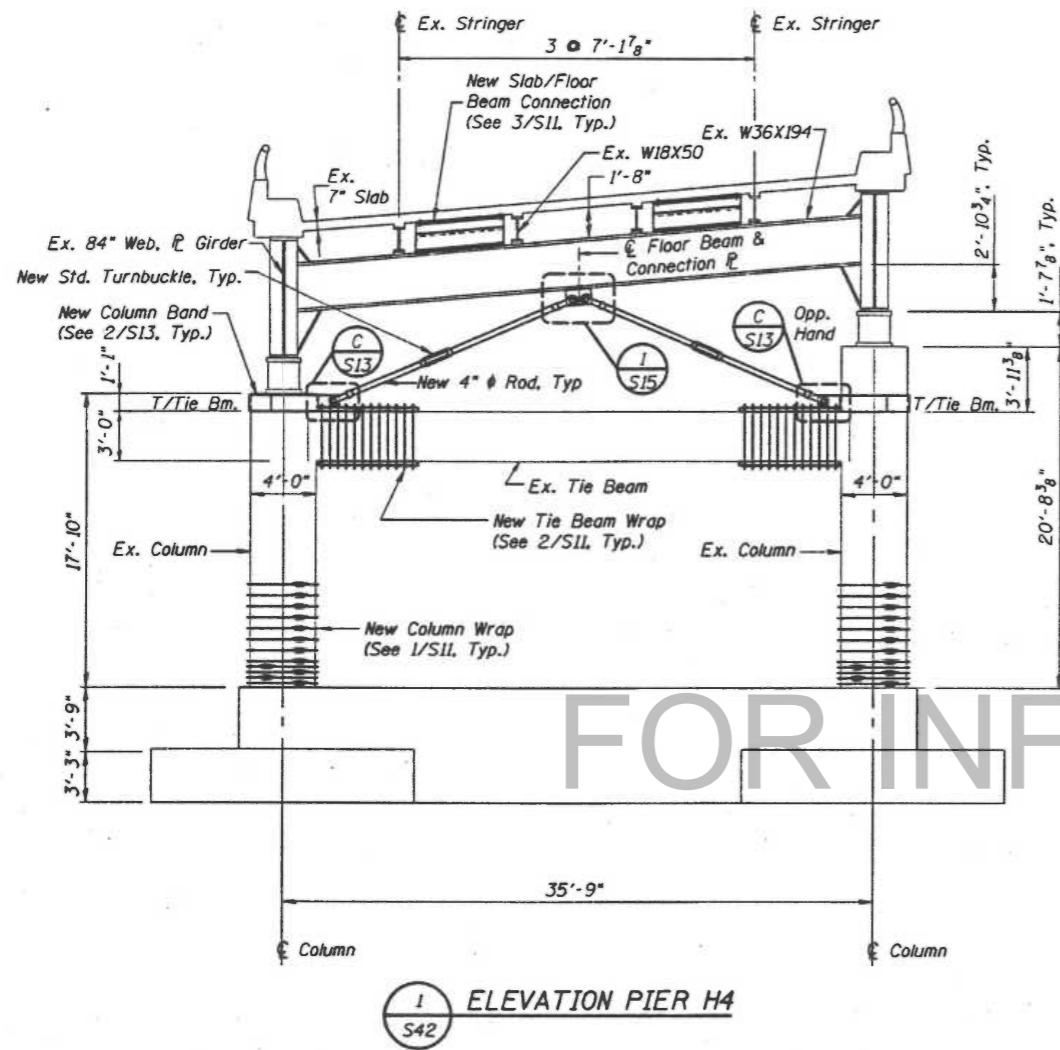
BILL OF MATERIAL - PIER H3		
ITEM	UNIT	QUANTITY
Furnish and erect structural steel	LBS.	5858
Epoxy grouted dowels	EACH	18
Column wrap	SQ. FT.	163.4

PIERS H2 AND H3 RETROFITS

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
FAI ROUTE TO
POPULAR STREET BRIDGE APPROACHES
ST. CLAIR COUNTY

DATE 1-23-98

FOR INFORMATION ONLY



FOR INFORMATION ONLY

BILL OF MATERIAL - PIER H4		
ITEM	UNIT	QUANTITY
Furnish and erect structural steel	LBS.	5688
Epoxy grouted dowels	EACH	22
Foundation wall dowel modification	EACH	8
Column wrap	SQ. FT.	163.4

PIER H4 RETROFITS

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
FAI ROUTE 70
POPLAR STREET BRIDGE APPROACHES
ST. CLAIR COUNTY

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.	SHEET NO. S-1
F.A.I. 70	8	ST. CLAIR	91	80	SHEETS
FED. ROAD DIST. NO. 7					
ILL. ROAD DIST. NO. 7					

82-3HVB-2R-1-1
D-88-012-85

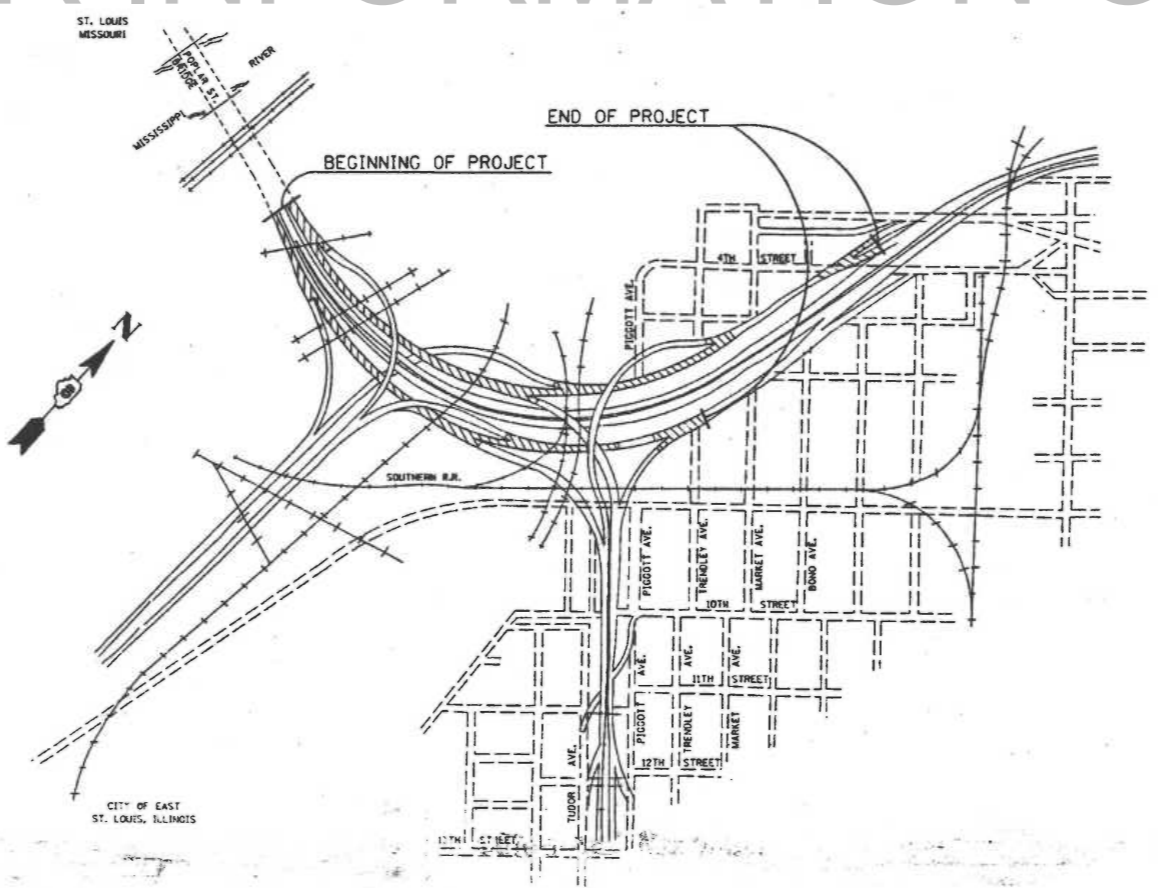
**SET 3 OF
4 SETS**

* ENCOMPASSING RAMP G OVER 4TH STREET, STRUCTURE NO. 082-0206

INDEX OF SHEETS	
SHEET NO.	DESCRIPTION
S-1	SET 3 - TITLE SHEET
S-2	GENERAL NOTES
S-3	PROJECT PLAN/SCOPE OF WORK
S-4	KEY PLAN AND ELEVATION FOR RAMP G OVER 4TH STREET
S-5	SEISMIC RETROFIT DETAILS
S-6	PIER NO. 1 & NO. 2 RETROFIT

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
PLANS FOR PROPOSED
SEISMIC
RETROFIT REPAIR *
FAI ROUTE 70
SECTION 82-3HVB-2R-1-1
POPLAR STREET BRIDGE APPROACHES
ST. CLAIR COUNTY

FOR INFORMATION ONLY



STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

SUBMITTED _____ TO _____
 _____ TO _____ DISTRICT ENGINEER
 _____ TO _____
 ENGINEER OF PROJECT DEVELOPMENT AND IMPLEMENTATION
 _____ TO _____
 _____ TO _____ ENGINEER OF DESIGN AND ENVIRONMENT
 _____ TO _____
 _____ TO _____ DIRECTOR, DIVISION OF HIGHWAYS

GENERAL NOTES:

1. Plan dimensions and details relative to existing structure have been taken from existing plans and are subject to nominal construction variations. It shall be the Contractor's responsibility to verify such dimensions and details in the field and make necessary approved adjustments prior to construction or ordering materials. Such variations shall not be cause for additional compensation for a change in the scope of work, however, the Contractor will be paid for the quantity actually furnished at the unit price bid for the work.
2. This project addresses selected seismic, redundancy and fatigue issues related only to those structures that are listed on the drawings. Related hazards associated with nearby structures or roadways that pass over the subject structures were not considered.
3. Unless noted otherwise, all materials and workmanship shall conform to :
 - a. The Illinois Department of Transportation, "Standard Specifications for Road and Bridge Construction", January 1, 1997.
 - b. Bridge Welding Code, American Welding Society, AWS D1.5-95.

STEEL NOTES:

1. Actual dimensions may vary slightly from the design drawings. The Contractor shall field verify existing dimensions prior to starting work. Dimensions of new members shall be adjusted as required to fit as-built conditions.
2. All new steel assemblies and pieces shall be shop painted with Inorganic zinc rich primer/ Acrylic/ Acrylic paint system. The color of the final finish coat shall be Interstate Green, Munsell No. 7.5 G 4/8. Locations to receive field welding shall be masked off prior to shop painting and field painted after welding.
3. Unless noted otherwise, all bolts shall be high strength bolts (AASHTO M164). All threaded rods and dowels shall conform to the mechanical properties and thread configuration of AASHTO M164 bolts. All bolts, threaded rods, wire rope and hardware shall be galvanized according to IDOT galvanized bolt provisions. In bolted applications, threads shall not be permitted in shear planes, unless noted otherwise. ~~AASHTO M253 BOLTS SHALL NOT BE GALVANIZED.~~
4. Unless noted otherwise, all new steel shall be AASHTO M270 Grade 36 and have a minimum CVN impact toughness of 25 Ft.-Lb. at 20° F. All rods with upset ends shall have a maximum yield strength of 45 ksi.
5. Welding electrodes shall be low hydrogen E70XX, unless noted otherwise. Weld metal shall have a minimum CVN of 25 Ft.-Lb. at 20° F.

CONCRETE NOTES:

1. The Engineers' intent is to repair only large areas of unsound concrete or unsound areas receiving column wraps. The contract quantities do not include all of the unsound concrete on the piers. Areas of unsound concrete to be repaired shall be approved by the Engineer.
2. The extent of deteriorated concrete in columns and walls shall be determined by hammer tapping. The concrete removal shall extend a minimum of 4 in. beyond the edge of the unsound area, be as nearly rectangular as possible, and conform to the concrete repair details included in the drawings.
3. Concrete removal equipment consisting of pneumatic chipping hammers shall not exceed a maximum nominal weight of 30 lb. and shall be equipped with a cutting edge not less than 3/4 in. or greater than 2 1/2 in. in width. During concrete removal, exercise reasonable care to avoid cracking of underlying sound concrete.

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.	SHEET NO. 5-2
F.A.I. 70	#	ST. CLAIR	91	81	SHEETS
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT			

82-3HV8-2R-1-1

FOR INFORMATION ONLY

GENERAL NOTES

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
FAI ROUTE 70
POPLAR STREET BRIDGE APPROACH
ST. CLAIR COUNTY

082-0206 (F&MP)

DATE

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.	SHEET NO. S-3 SHEETS
F.A.I. 7B		ST. CLAIR	91	82	
FED. ROAD DIST. NO. 7		ILLINOIS FED. AID PROJECT			

82-34VB-2R-1-1

Work area included in this set (Set 3).

SCOPE OF WORK

SEISMIC RETROFIT

1. Install column wraps on columns of piers 1 and 2 of Structure No. 082-0206.

SEISMIC DATA

Bedrock acceleration coefficient (A) = 0.12g
 Site coefficient (S) = 1.0
 Seismic performance requirements:
 • Use of roadways without long delay or major repair.

DESIGN SPECIFICATIONS

1996 AASHTO
 1995 FHWA Seismic Retrofit Manual

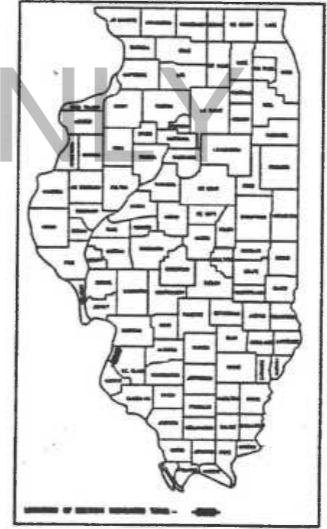
DESIGN LOADING

HS20-44

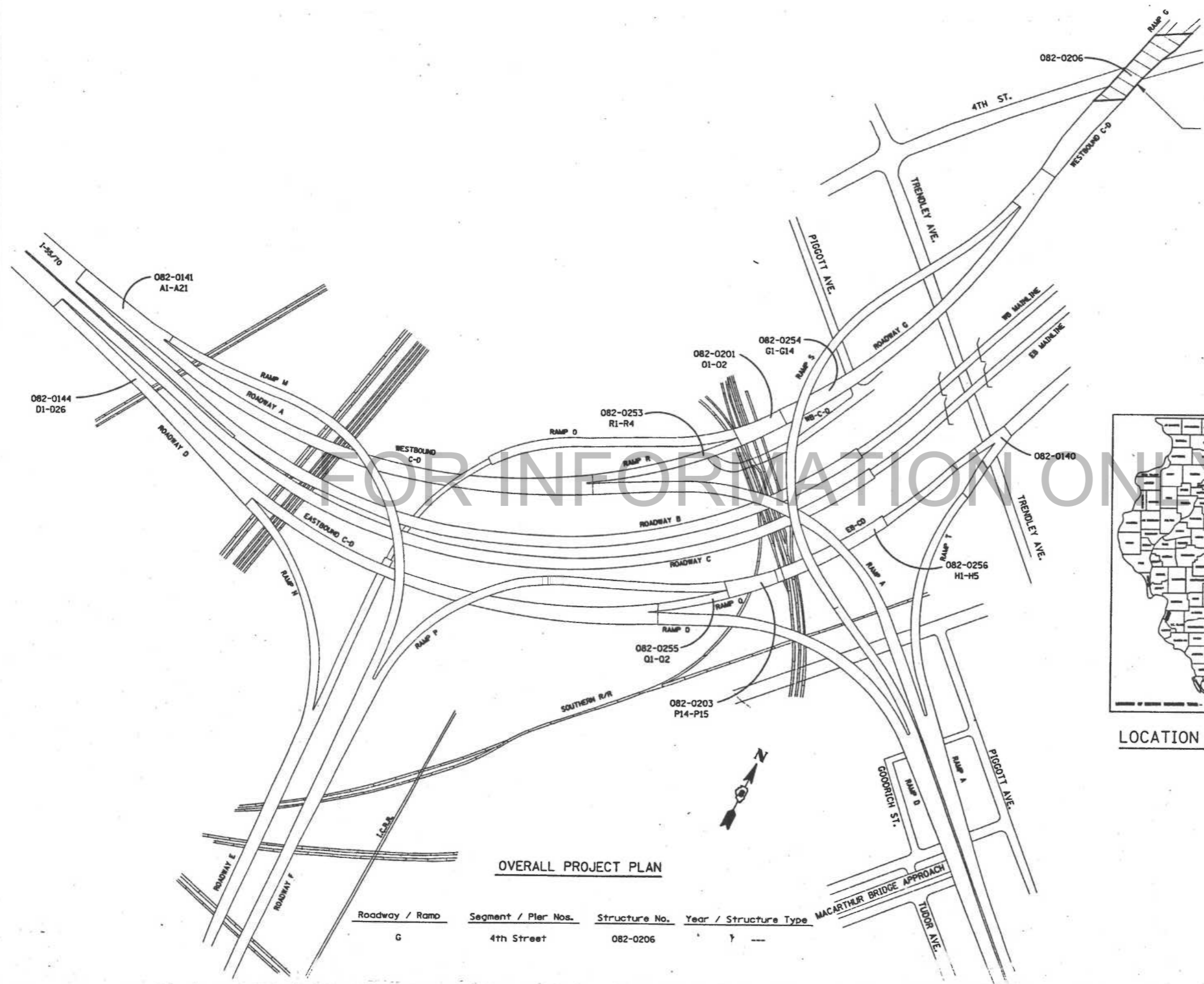
DESIGN STRESSES

New Construction:
 f'c = 4500 psi
 fy = 60,000 psi (Reinf.)
 fy = 36,000 psi (M270 Grade 36)

Existing Construction:
 f'c = 3500 psi
 fy = 40,000 psi (Reinf.)
 fy = 36,000 psi (M270 Grade 36)



LOCATION SKETCH



OVERALL PROJECT PLAN

Roadway / Ramp	Segment / Pier Nos.	Structure No.	Year / Structure Type
G	4th Street	082-0206	7 ---

PROJECT PLAN / SCOPE OF WORK

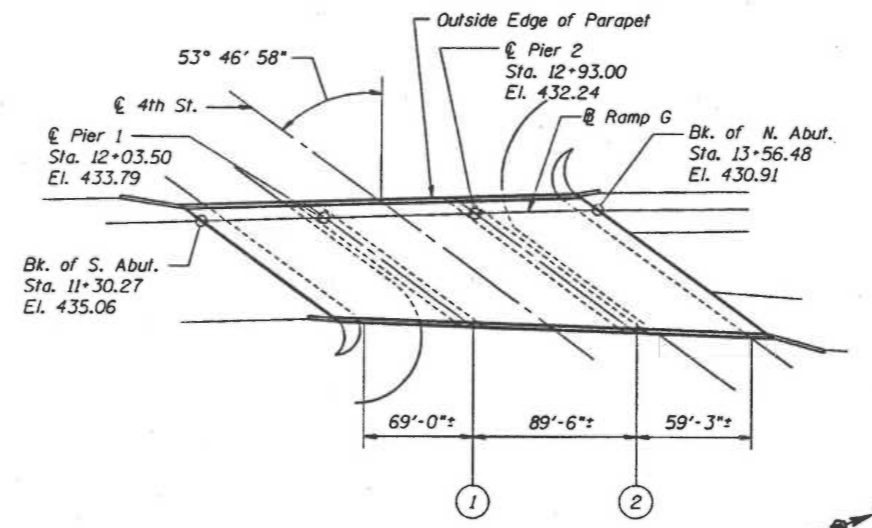
STATE OF ILLINOIS
 DEPARTMENT OF TRANSPORTATION
 SEISMIC AND REDUNDANCY RETROFIT REPAIRS
 FAI ROUTE 7B
 POPLAR STREET
 ST. CLAIR COUNTY

DATE 1-23-98

CHECKED BY HH

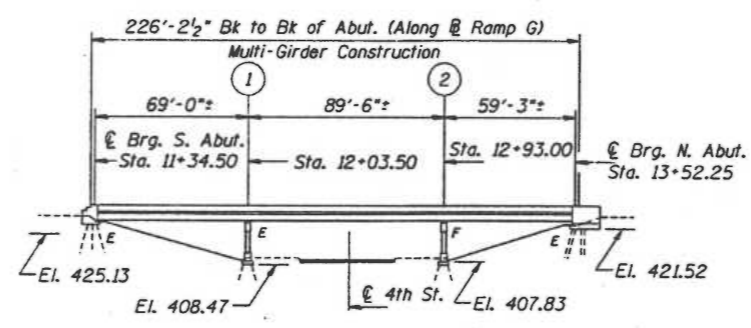
ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.	SHEET NO. S-4
F.A.I. 70	10	ST. CLAIR	91	83	SHEETS
FED. ROAD DIST. NO. 7		ILLINOIS	FED. AID PROJECT-		

82-34VB-2R-1-1



1 PLAN RAMP G OVER 4TH STREET
S4

FOR INFORMATION ONLY



2 ELEVATION RAMP G OVER 4TH ST.
S4

KEY PLAN AND ELEVATION FOR RAMP G OVER 4TH STREET

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
FOR ROUTE 70
POPULAR STREET BRIDGE APPROACHES
ST. CLAIR COUNTY

SCALE: NONE
DATE: 1-23-98
DRAWN BY:
CHECKED BY: HH

I:\stc\stc\197422\SET3\ST3KPLS4.dgn

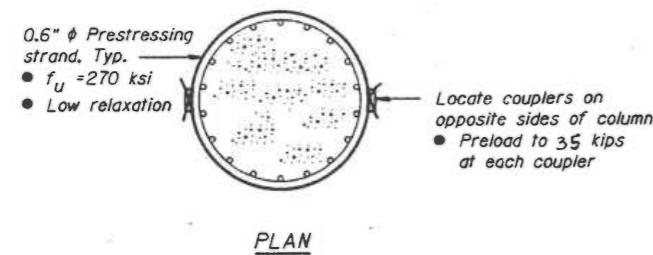
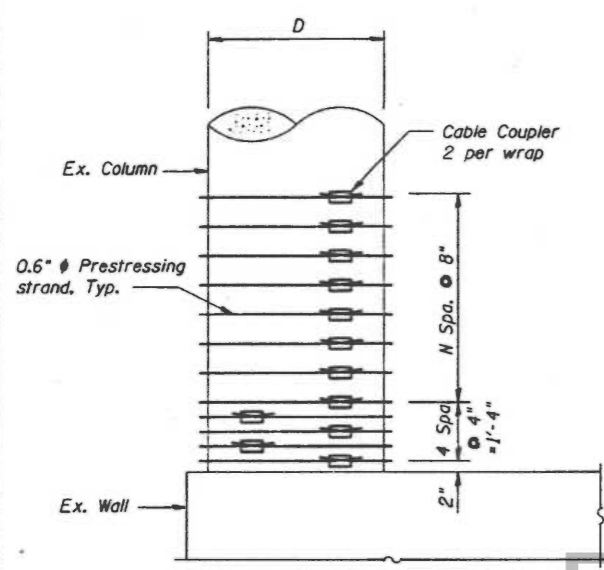


TABLE OF COLUMN WRAP PARAMETERS

Pier	No. Cols.	D (in.)	N	Comments
4th St. Overpass				
Pier 1	8	30	10	
Pier 2	9	30	Varies	See Note 2

- Notes:**
- See detail 1/S5 for column wrap U.N.O.
 - N=9 except for Eastern most col. where N=10.



- Notes:**
- See table for dimensions not shown and additional notes.
 - Alternative column wraps may be used. Extent of column wrap retrofit for quantity calculations shall be the height of the column times the column circumference. See Special Provisions.

1 ELEVATION - TYPICAL COLUMN WRAP
S5

FOR INFORMATION ONLY

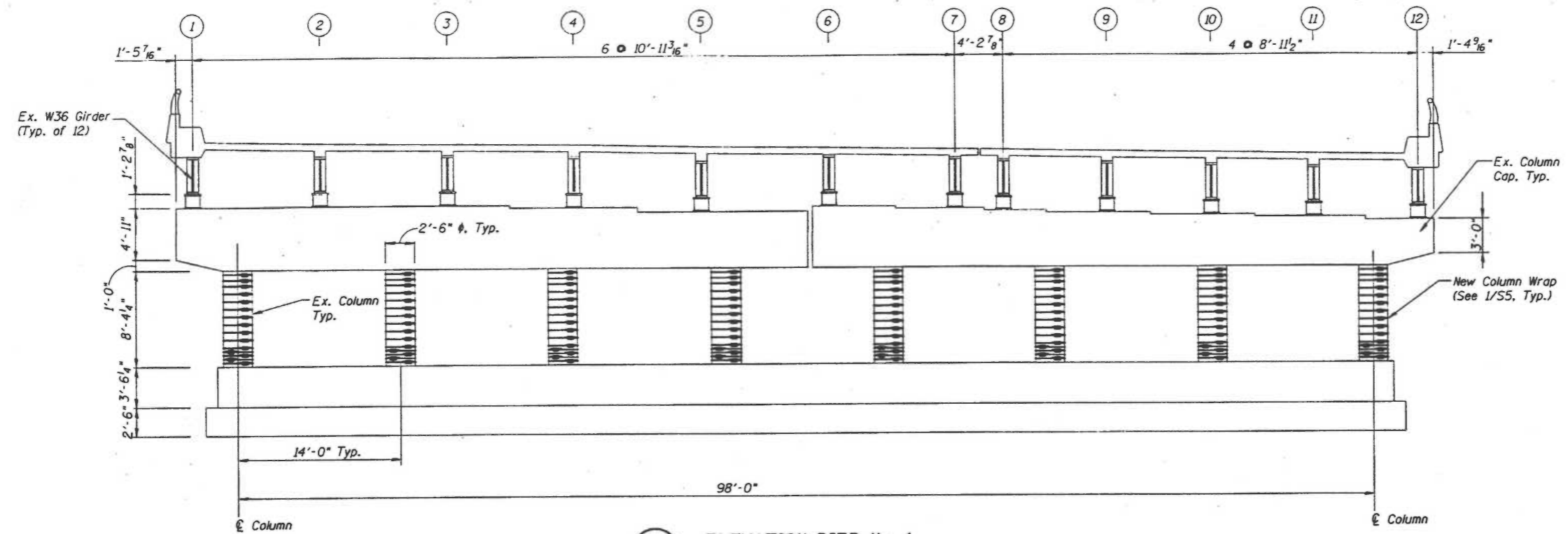
SEISMIC RETROFIT DETAILS
 STATE OF ILLINOIS
 DEPARTMENT OF TRANSPORTATION
 SEISMIC AND REDUNDANCY RETROFIT REPAIRS
 FAI ROUTE 70
 POND STREET BRIDGE APPROACHES
 ST. CLAIR COUNTY

DATE 1-... CHECKED BY...

STRUCTURE 97422 SET 13 8130756.DGN

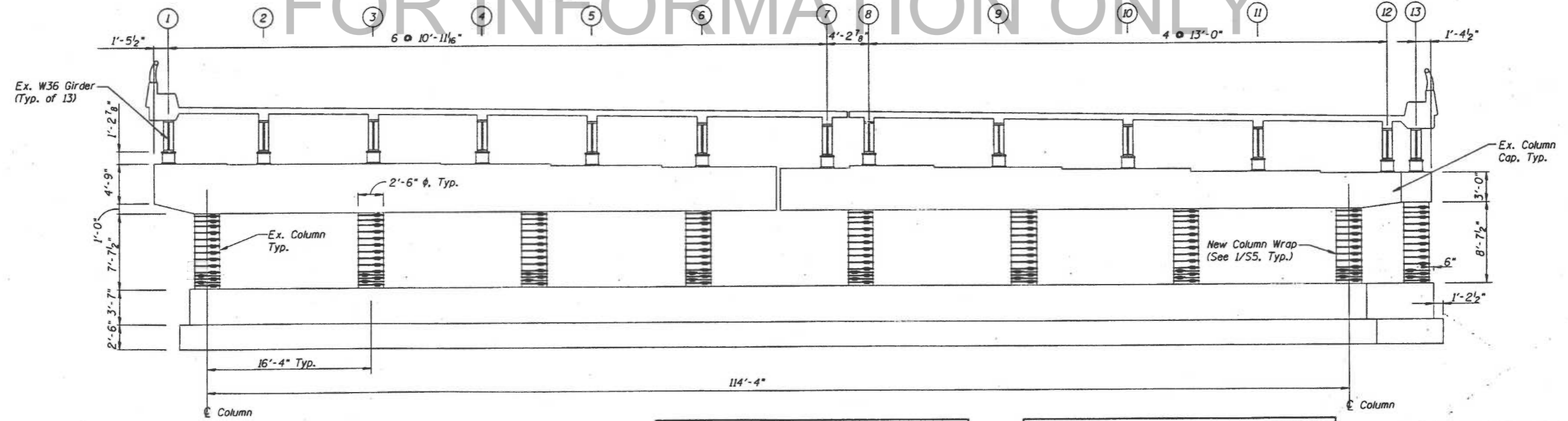
ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.	SHEET NO. 56 SHEETS
F.A.I. 70		ST. CLAIR	91	85	
FED. ROAD DIST. NO. 7		ILLINOIS	FED. AID PROJECT		

82-3HVB-2R-1-1



1
S6
ELEVATION PIER No. 1

FOR INFORMATION ONLY



2
S6
ELEVATION PIER No. 2

BILL OF MATERIAL - PIER NO. 1		
ITEM	UNIT	QUANTITY
Column wrap	SQ. FT.	328.1

BILL OF MATERIAL - PIER NO. 2		
ITEM	UNIT	QUANTITY
Column wrap	SQ. FT.	341.8

PIER NO. 1 & PIER NO. 2 RETROFITS
 STATE OF ILLINOIS
 DEPARTMENT OF TRANSPORTATION
 SEISMIC AND REDUNDANCY RETROFIT REPAIRS
 FAI ROUTE 70
 POPLAR STREET BRIDGE APPROACHES
 ST. CLAIR COUNTY

STATE OF ILLINOIS
 DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.	SHEET NO. 5-1
F.A.I. 70	*	ST. CLAIR	91	06	SHEETS
FED. ROAD DIST. NO. 7 ALL ILLINOIS FED. AID PROJECT					

* ENCOMPASSING RAMP H OVER TRENDLEY AVE., STRUCTURE NO. 082-0140

SET 4 OF
4 SETS

INDEX OF SHEETS	
SHEET NO.	DESCRIPTION
S-1	SET 4 - TITLE SHEET
S-2	GENERAL NOTES
S-3	PROJECT PLAN/SCOPE OF WORK
S-4	KEY PLAN AND ELEVATION FOR RAMP H OVER TRENDLEY AVE.
S-5	SEISMIC RETROFIT DETAILS
S-6	PIER NO. 1 & NO. 2 RETROFIT

**PLANS FOR PROPOSED
 SEISMIC
 RETROFIT REPAIR ***

FAI ROUTE 70

SECTION 82-3HVB-2R-1-I

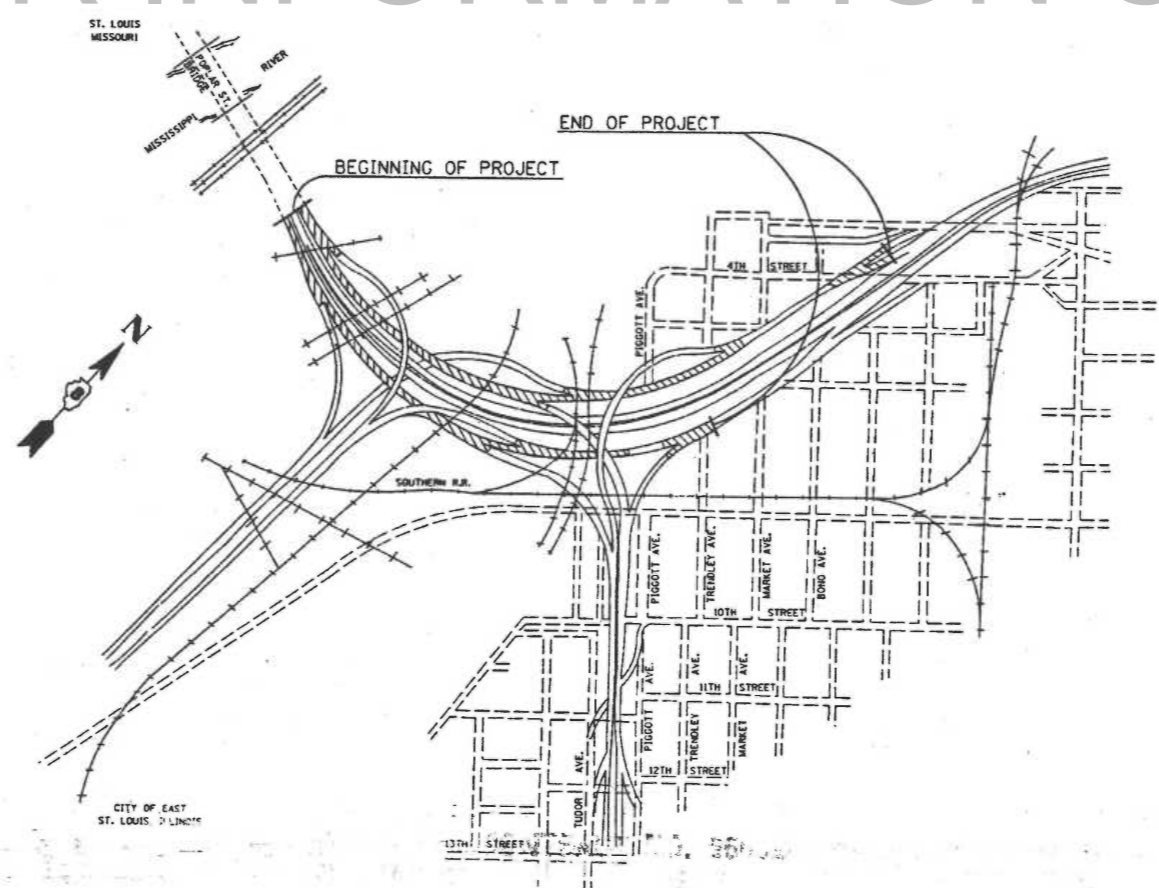
POPLAR STREET BRIDGE APPROACHES

ST. CLAIR COUNTY

FOR INFORMATION ONLY



LOCATION OF SECTION INDICATED THUS: - [shaded box] -



STATE OF ILLINOIS
 DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS

SUBMITTED _____ TO _____

_____ DISTRICT ENGINEER

_____ TO _____

ENGINEER OF PROJECT DEVELOPMENT AND IMPLEMENTATION

_____ TO _____

ENGINEER OF DESIGN AND ENVIRONMENT

_____ TO _____

DIRECTOR, DIVISION OF HIGHWAYS

GENERAL NOTES:

1. Plan dimensions and details relative to existing structure have been taken from existing plans and are subject to nominal construction variations. It shall be the Contractor's responsibility to verify such dimensions and details in the field and make necessary approved adjustments prior to construction or ordering materials. Such variations shall not be cause for additional compensation for a change in the scope of work, however, the Contractor will be paid for the quantity actually furnished at the unit price bid for the work.
2. This project addresses selected seismic, redundancy and fatigue issues related only to those structures that are listed on the drawings. Related hazards associated with nearby structures or roadways that pass over the subject structures were not considered.
3. Unless noted otherwise, all materials and workmanship shall conform to :
 - a. The Illinois Department of Transportation, "Standard Specifications for Road and Bridge Construction", January 1, 1997.
 - b. Bridge Welding Code, American Welding Society, AWS D1.5-95.

STEEL NOTES:

1. Actual dimensions may vary slightly from the design drawings. The Contractor shall field verify existing dimensions prior to starting work. Dimensions of new members shall be adjusted as required to fit as-built conditions.
2. All new steel assemblies and pieces shall be shop painted with Inorganic zinc rich primer/ Acrylic/ Acrylic paint system. The color of the final finish coat shall be Interstate Green, Munsell No. 7.5 G 4/8. Locations to receive field welding shall be masked off prior to shop painting and field painted _____ after welding.
3. Unless noted otherwise, all bolts shall be high strength bolts (AASHTO M164). All threaded rods and dowels shall conform to the mechanical properties and thread configuration of AASHTO M164 bolts. All bolts, threaded rods, wire rope and hardware shall be galvanized according to IDOT galvanized bolt provisions. In bolted applications, threads shall not be permitted in shear planes, unless noted otherwise. ~~AASHTO M253 BOLTS SHALL NOT BE GALVANIZED.~~
4. Unless noted otherwise, all new steel shall be AASHTO M270 Grade 36 and have a minimum CVN impact toughness of 25 Ft.-Lb. at 20° F. All rods with upset ends shall have a maximum yield strength of 45 ksi.
5. Welding electrodes shall be low hydrogen E70XX, unless noted otherwise. Weld metal shall have a minimum CVN of 25 Ft.-Lb. at 20° F.

CONCRETE NOTES:

1. The Engineers' intent is to repair only large areas of unsound concrete or unsound areas receiving column wraps. The contract quantities do not include all of the unsound concrete on the piers. Areas of unsound concrete to be repaired shall be approved by the Engineer.
2. The extent of deteriorated concrete in columns and walls shall be determined by hammer tapping. The concrete removal shall extend a minimum of 4 in. beyond the edge of the unsound area, be as nearly rectangular as possible, and conform to the concrete repair details included in the drawings.
3. Concrete removal equipment consisting of pneumatic chipping hammers shall not exceed a maximum nominal weight of 30 lb. and shall be equipped with a cutting edge not less than 3/4 in. or greater than 2 1/2 in. in width. During concrete removal, exercise reasonable care to avoid cracking of underlying sound concrete.

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.	SHEET NO. S-2
F.A.I. 70	*	ST. CLAIR	91	87	
FED. ROAD DIST. NO. 7 ILLINOIS FED. AID PROJECT					

*82-3HVB-2R-1-1

FOR INFORMATION ONLY

GENERAL NOTES

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
FAI ROUTE 70
POPLAR STREET BRIDGE APPROACHES
ST. CLAIR COUNTY

DATE 1-23-98
DRAWN BY
CHECKED BY

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.	SHEET NO. S-3
F.A.I. 78	#	ST. CLAIR	91	88	SHEETS
FED. ROAD DIST. NO. 7		ILLINOIS		FED. AID PROJECT	
# 82-3HVB-2R-1-1					

SCOPE OF WORK

SEISMIC RETROFIT

1. Install column wraps on columns of piers 1 and 2 of Structure No. 082-0140.

SEISMIC DATA

Bedrock acceleration coefficient (A) = 0.12g
 Site coefficient (S) = 1.0
 Seismic performance requirements:
 • Use of roadways without long delay or major repair.

DESIGN SPECIFICATIONS

1996 AASHTO
 1995 FHWA Seismic Retrofit Manual

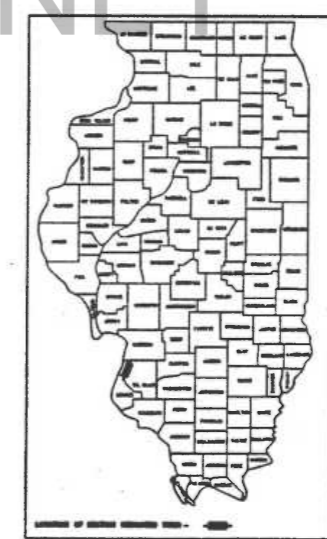
DESIGN LOADING

HS20-44

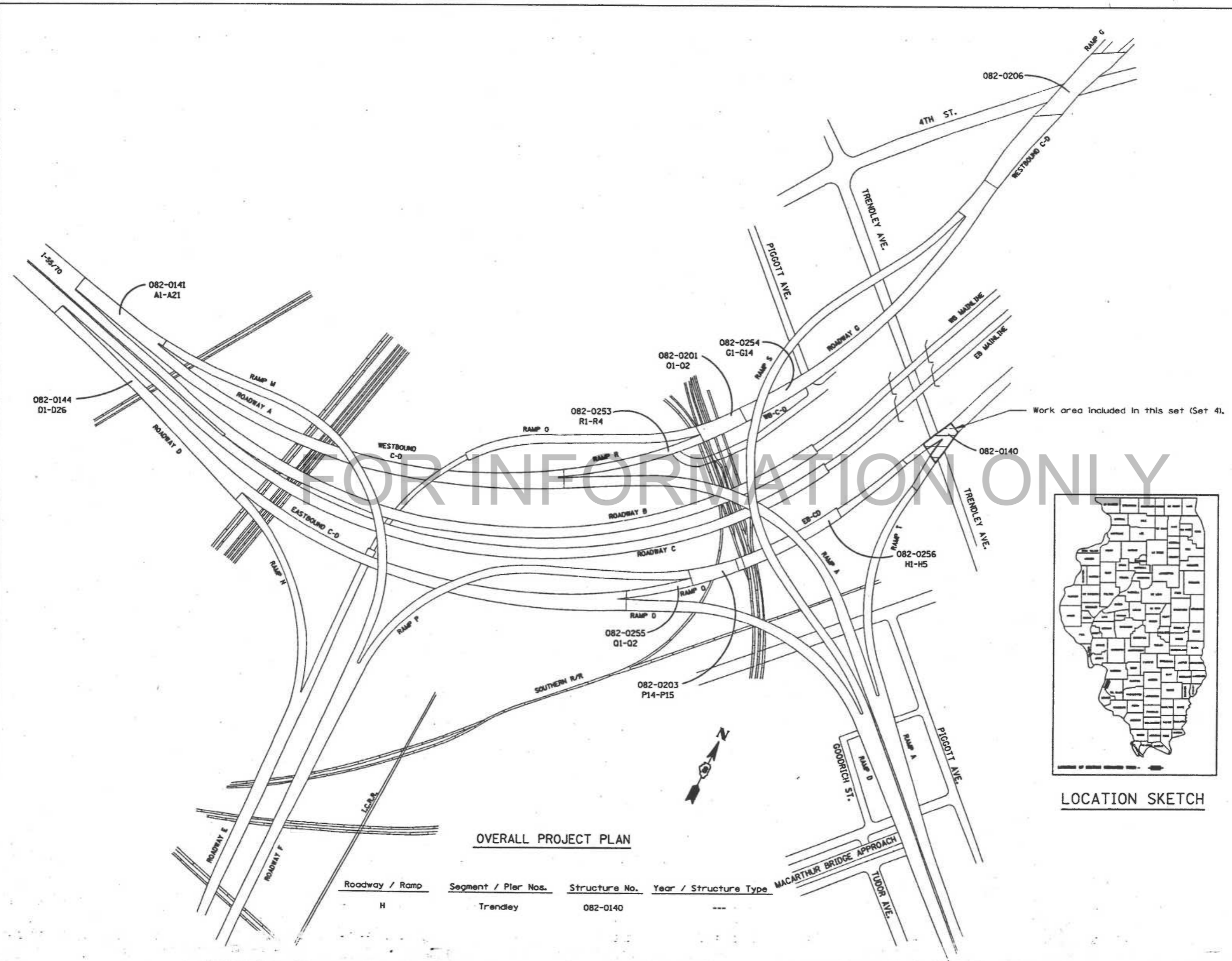
DESIGN STRESSES

New Construction:
 $f'_c = 4500$ psi
 $f_y = 60,000$ psi (Reinf.)
 $f_y = 36,000$ psi (M270 Grade 36)

Existing Construction:
 $f'_c = 3500$ psi
 $f_y = 40,000$ psi (Reinf.)
 $f_y = 36,000$ psi (M270 Grade 36)



LOCATION SKETCH



OVERALL PROJECT PLAN

Roadway / Ramp	Segment / Pier Nos.	Structure No.	Year / Structure Type
H	Trendley	082-0140	---

PROJECT PLAN / SCOPE OF WORK

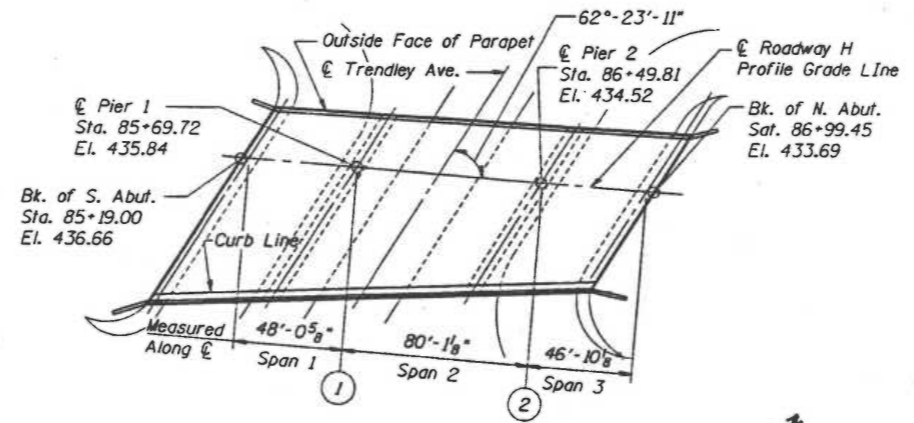
STATE OF ILLINOIS
 DEPARTMENT OF TRANSPORTATION
 SEISMIC AND REDUNDANCY RETROFIT REPAIRS
 FAI ROUTE TO
 POPLAR BRIDGE APPROACHES
 ST. CLAIR COUNTY

STRUCTURE NO. 082-0140 TRENDLEY

SCALE: NONE DRAWN BY: []
 DATE: 1-23-98 CHECKED BY: []

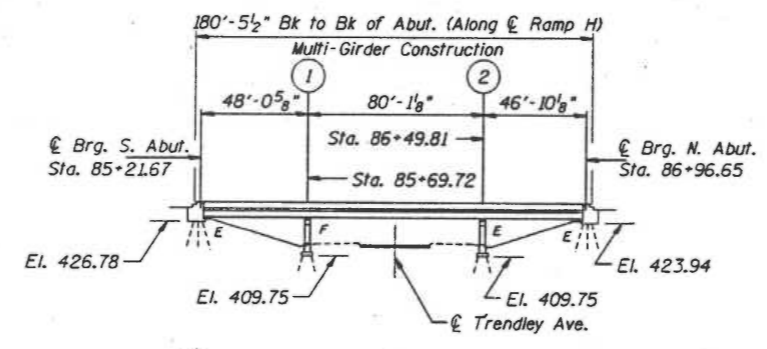
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ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.	SHEET NO. S-4
F.A.I. 78	8	ST. CLAIR	91	89	SHEETS
FED. ROAD DIST. NO. 7		ILLINOIS		FED. AID PROJECT	
82-3HV8-2R-1-1					



1 PLAN RAMP H OVER TRENDLEY AVE.
S4

FOR INFORMATION ONLY



2 ELEVATION RAMP H OVER TRENDLEY AVE.
S4

KEY PLAN AND ELEVATION FOR RAMP H OVER TRENDLEY AVE.

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
FAI ROUTE TO
FET BRIDGE APPF
AIR COUNTY

RAMP H OVER TRENDLEY AVE.

SCALE: NONE
DATE: 1-23-98
DRAWN: _____
CHECKED BY: HM

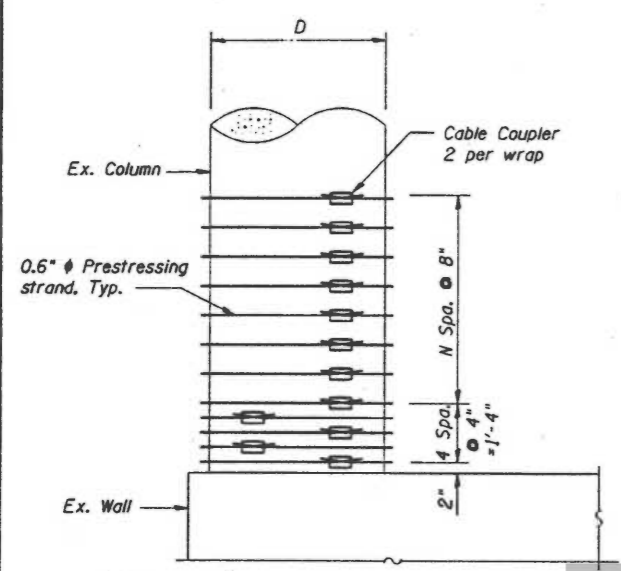
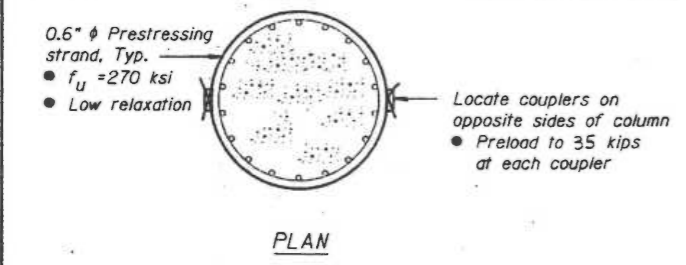
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ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.	SHEET NO. S-5 SHEETS
F.A.I. 70		ST. CLAIR	91	98	
FED. ROAD DIST. NO. 7		ILLINOIS	FED. AID PROJECT		
# 82-3HVB-2R-1-1					

TABLE OF COLUMN WRAP PARAMETERS

Pier	No. Cols.	D (in.)	N	Comments
<i>Trendley Overpass</i>				
Pier 1	6	30	Varies	See Note 2
Pier 2	6	30	Varies	See Note 3

- Notes:**
- See detail 1/S5 for column wrap U.N.O.
 - N=14, 14, 15, 16, 17, 18 respectively from North to South.
 - N=11, 12, 13, 13, 14, 15 respectively from North to South.



- Notes:**
- See table for dimensions not shown and additional notes.
 - Alternative column wraps may be used. Extent of column wrap retrofit for quantity calculations shall be the height of the column times the column circumference. See Special Provisions.

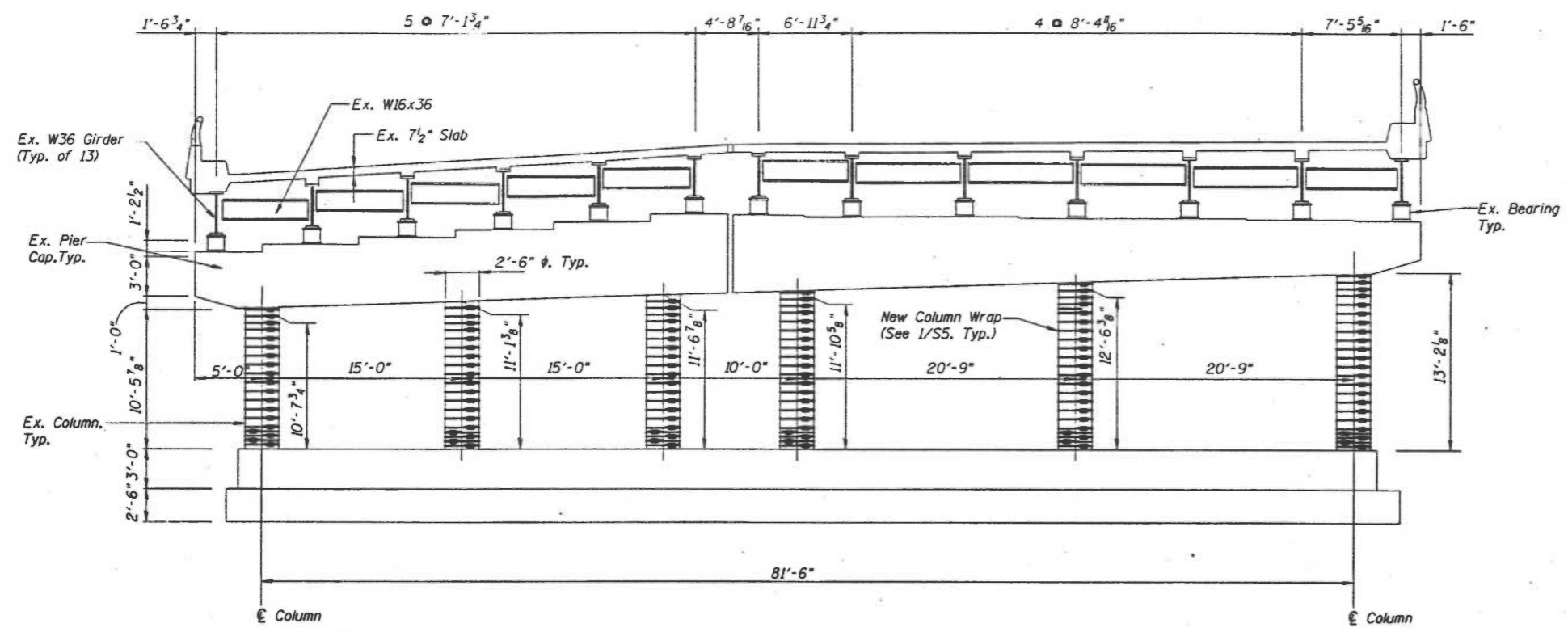
1
S5
ELEVATION - TYPICAL COLUMN WRAP

FOR INFORMATION ONLY

SEISMIC RETROFIT DETAILS
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
FAI ROUTE 70
POPLAR STREET BRIDGE
ST. CLAIR COUNTY, ILL.

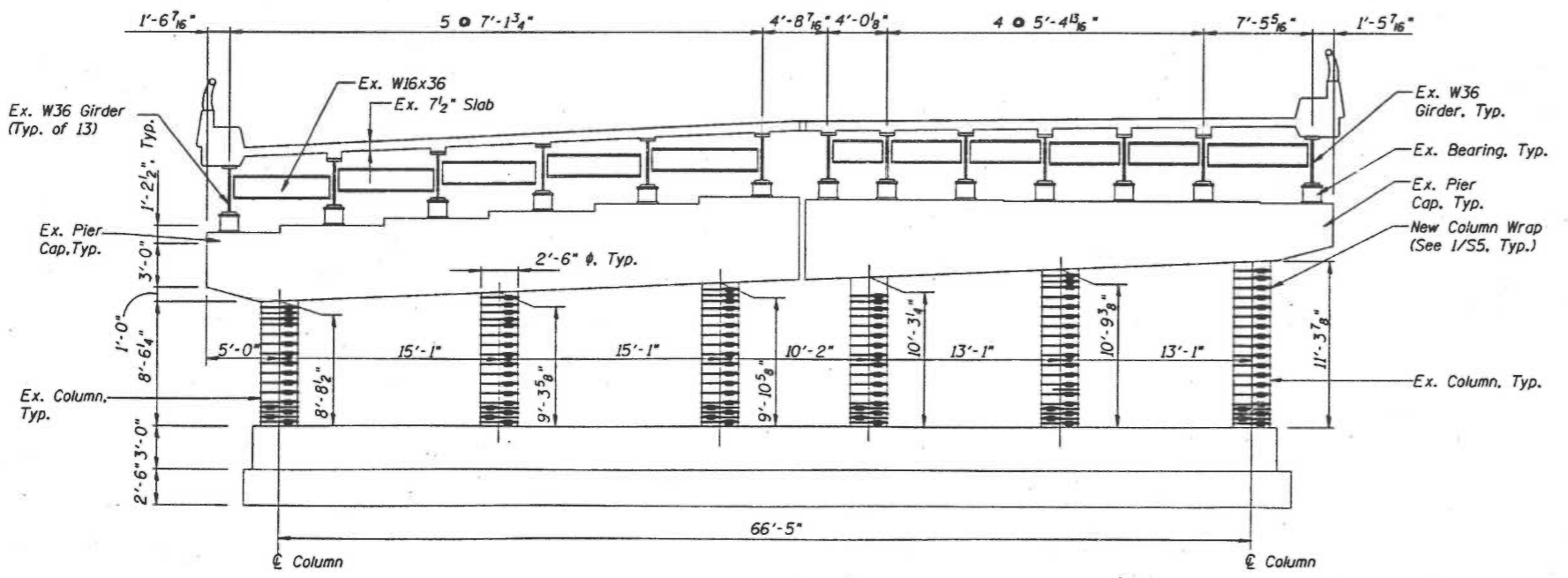
STRUCTUR-17422-SET4-1-0188.DGN

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.	SHEET NO. 5-6
F.A.I. 78	11	ST. CLAIR	91	91	SHEETS
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-			
82-3HVB-2R-1-1					



FOR INFORMATION ONLY

(1) ELEVATION PIER NO. 1



(2) ELEVATION PIER NO. 2

BILL OF MATERIAL - PIER NO. 1

ITEM	UNIT	QUANTITY
Column wrap	SQ. FT.	348.2

BILL OF MATERIAL - PIER NO. 2

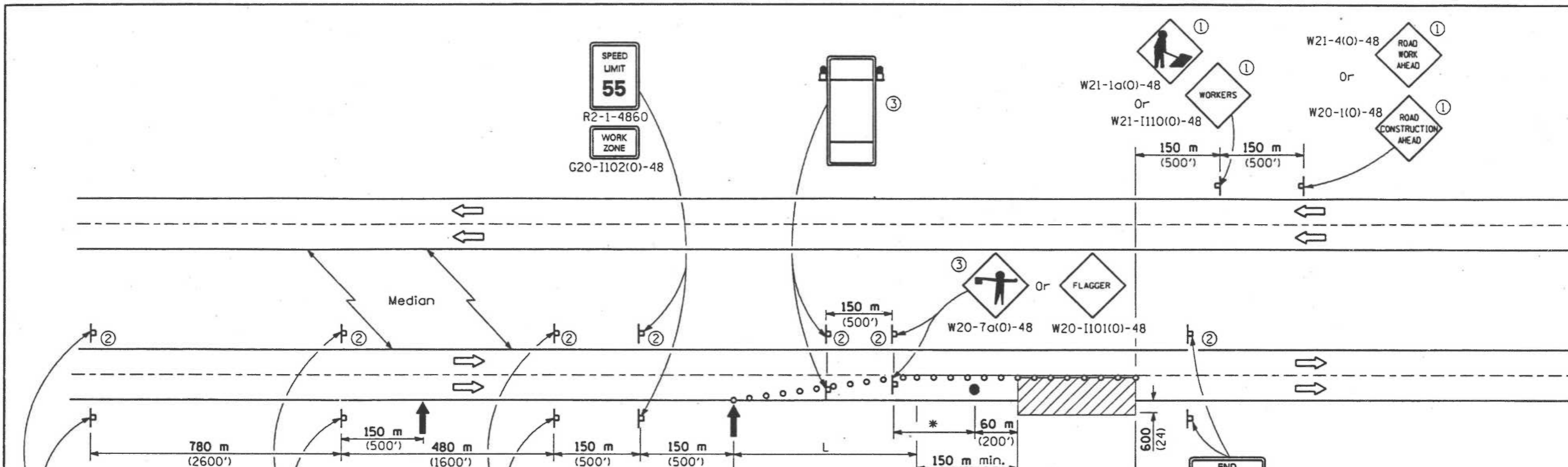
ITEM	UNIT	QUANTITY
Column wrap	SQ. FT.	295.9

PIER NO. 1 & PIER NO. 2 RETROFITS

STATE OF ILLINOIS
 DEPARTMENT OF TRANSPORTATION
 SEISMIC AND REDUNDANCY RETROFIT REPAIRS
 FAI ROUTE 70
 POPLAR STREET BRIDGE APPROACHES
 ST. CLAIR COUNTY

DATE: 1-23-98

DRAWN BY: JN
 CHECKED BY: HH



FOR INFORMATION ONLY

GENERAL NOTES

This Standard is used where at any time, any vehicle, equipment, workers or their activities will encroach on the lane adjacent to the shoulder, or on the shoulder within 600 mm (24") of the edge of pavement.

This Standard also applies when work is being performed in the left lane. Under these conditions, LFT LANE CLOSED signs shall be substituted for RIGHT LANE CLOSED signs. On undivided highways, signs shall be added in the opposite direction as shown. On left lane closures with narrow medians, the arrow board at the beginning of the lane closure shall be relocated behind the taper as necessary so that a clearance of at least 1.2 m (4') can be maintained from the opposing traffic.

- ① Undivided roadway only with left lane closure in opposite direction.
- ② Omitted when median is less 3 m (10').
- ③ Construction speed limit signs and FLAGGER signs shall be moved as necessary to maintain a spacing of 150 m (500') to 750 m (2500') between the FLAGGER sign and each separate work activity.

All dimensions are in millimeters (Inches) unless otherwise shown.

For contract construction projects

W20-1(0)-48

RIGHT LANE CLOSED 1/2 MILE

W20-5(0)-48

LANE CLOSED AHEAD

W4-2R(0)-48

For maintenance and utility projects

W21-4(0)-48

TYPICAL APPLICATIONS

- Pavement patch
- Utility operations
- Bituminous resurfacing

SYMBOLS

- ↑ Arrow board
- ▨ Work area
- ⊥ Sign
- Cone, drum or barricade
- ⊙ Flagger with traffic control sign
- 🚚 Construction speed limit sign

* 150 m to 750 m (500' to 2500')

L = lane width X taper ratio		
Normal Posted Speed		Taper Ratio
km/h	mph	
110	65	65/1
100	60	60/1
90	55	55/1
80	45	45/1

APPR. 1997

 ENGINEER OF OPERATIONS

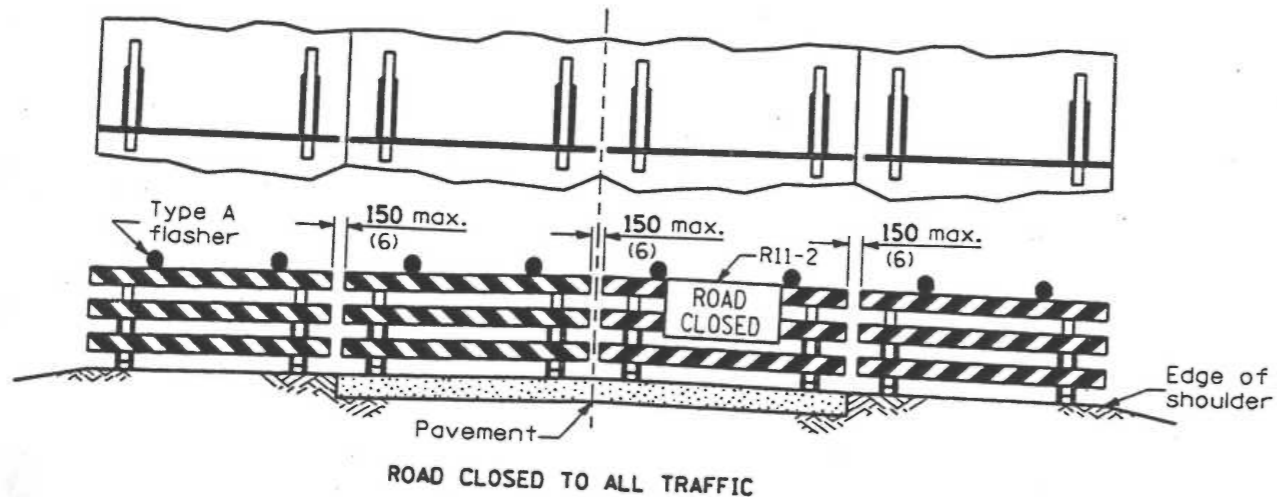
 APPROVED January 1, 1997

 ENGINEER OF DESIGN AND ENVIRONMENT

 ISSUED 1-1-97

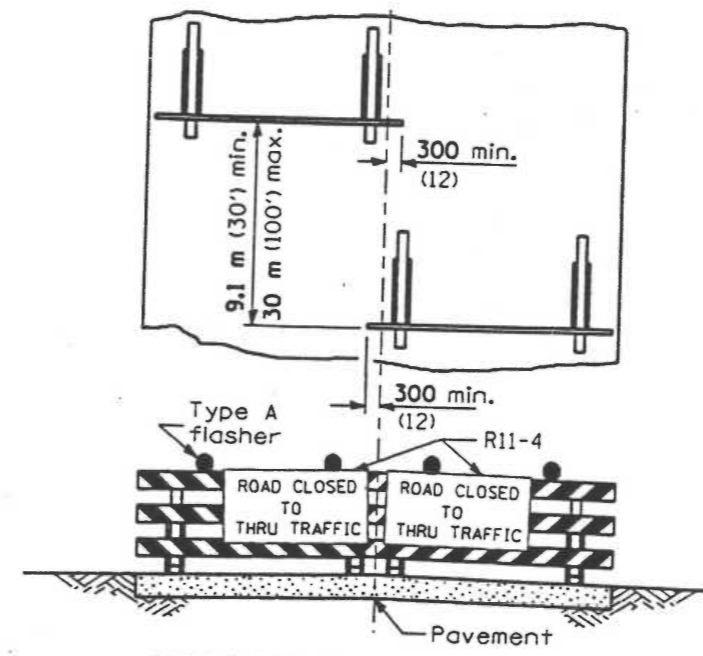
DATE	REVISIONS
10-1-95	Rev. arrowboard, flagger symbols and W4 signs to be filled in. Rem. DN sym.

LANE CLOSURE MULTILANE
OPERATIONS
STANDARD 701406



ROAD CLOSED TO ALL TRAFFIC

Reflectorized striping may be omitted on the back side of the barricades. The barricades shall be to the edge of the shoulders except when otherwise directed by the Engineer or shown on the detailed construction plans.



ROAD CLOSED TO ALL THRU TRAFFIC

Reflectorized striping shall appear on both sides of the barricades. The barricades shall be to the edge of the pavement except when otherwise directed by the Engineer or shown on the detailed construction plans.

ROAD
CONSTRUCTION
NEXT X MILES

END
CONSTRUCTION

G20-1(0)-6036

G20-2(0)-6024

This signing is required for all projects over 3200 m (2 miles) or more in length.

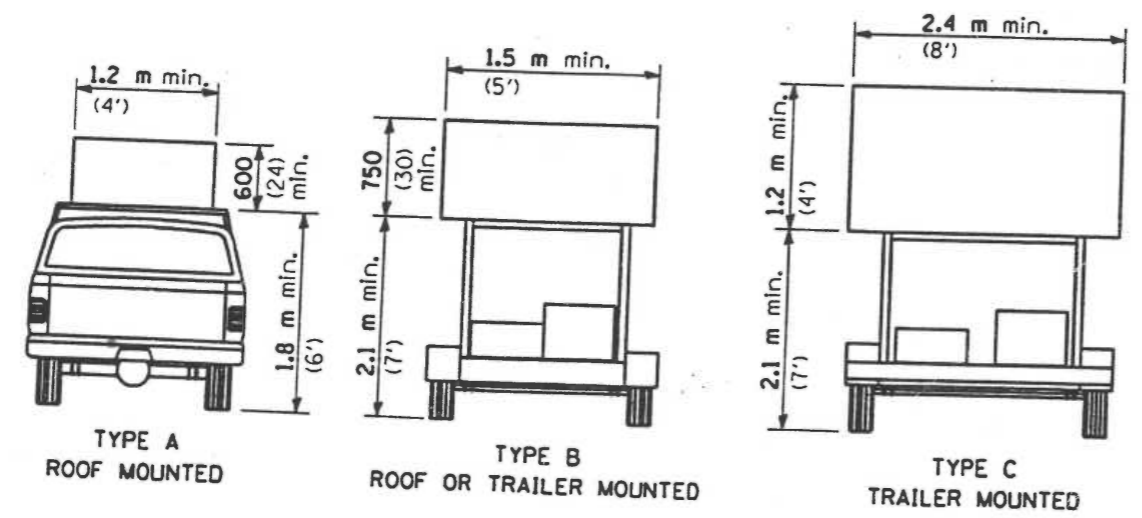
ROAD CONSTRUCTION NEXT X MILES sign shall be placed 150 m (500') in advance of project.

END CONSTRUCTION sign shall be erected at the of the job unless another job is within 3200 m (2 miles).

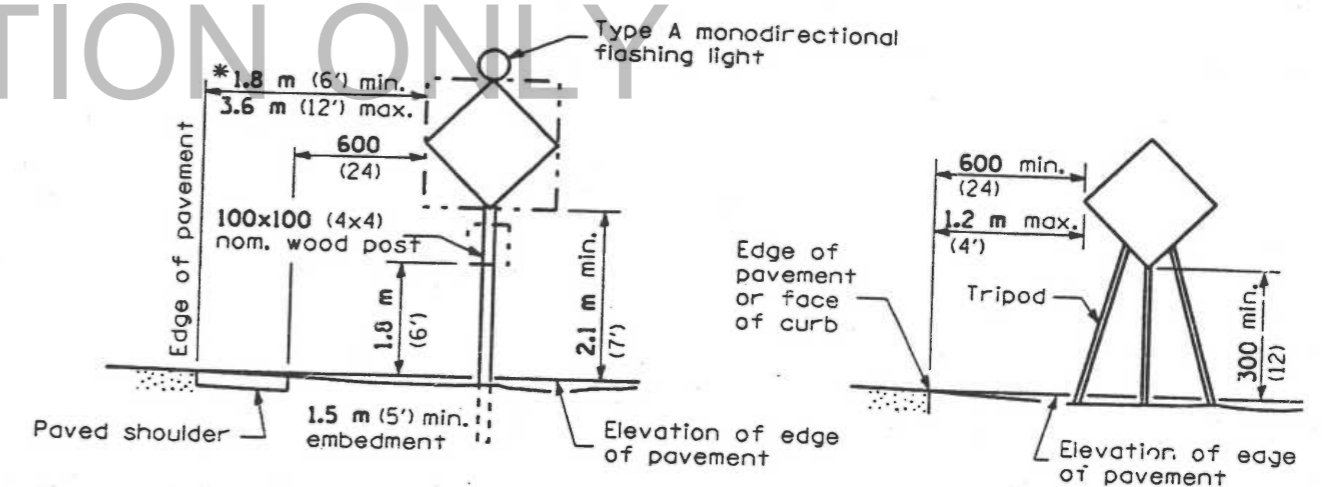
WORK LIMIT SIGNING

FOR INFORMATION ONLY

TYPICAL APPLICATIONS OF TYPE III BARRICADES CLOSING A ROAD



ARROW BOARDS



TYPICAL SIGN INSTALLATIONS

GENERAL NOTES

* When curb or paved shoulder are present this dimension shall be 600 mm (24") to the face of curb or 1.8 m (6') to the outside edge of the paved shoulder.

All heights shown shall be measured above the pavement surface.

All dimensions are in millimeters (inches) unless otherwise shown.

Department of Transportation
APPROVED January 1, 1997
ENGINEER OF DESIGN AND ENVIRONMENT

DATE	REVISIONS
1-1-97	1 220
10-1-95	Rev. height above pav't for TYPE B arrow board.

TRAFFIC CONTROL DEVICES
STANDARD 50000
(Sheet 1 of 3)