C-D SEISMIC & 2GIRDER REDUNDANCY

143

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 70	*	ST. CLAIR	91	1

SHEET NO. S-1

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

**ACIM-70-1(171)1

D-08-012-85

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

THIS CONTRACT CONSISTS OF 4 SETS

PLANS FOR PROPOSED SEISMIC AND REDUNDANCY RETROFIT REPAIRS

FAI ROUTE 70

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

POPLAR STREET BRIDGE APPROACHES

PROJECT ACIM-70-1(171)1

ST. CLAIR COUNTY

C-98-083-97

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 Q)
- STRUCTURE NO. 082-0203 (RAMP P)
- STRUCTURE NO. 082-0256 (ROADWAY H)

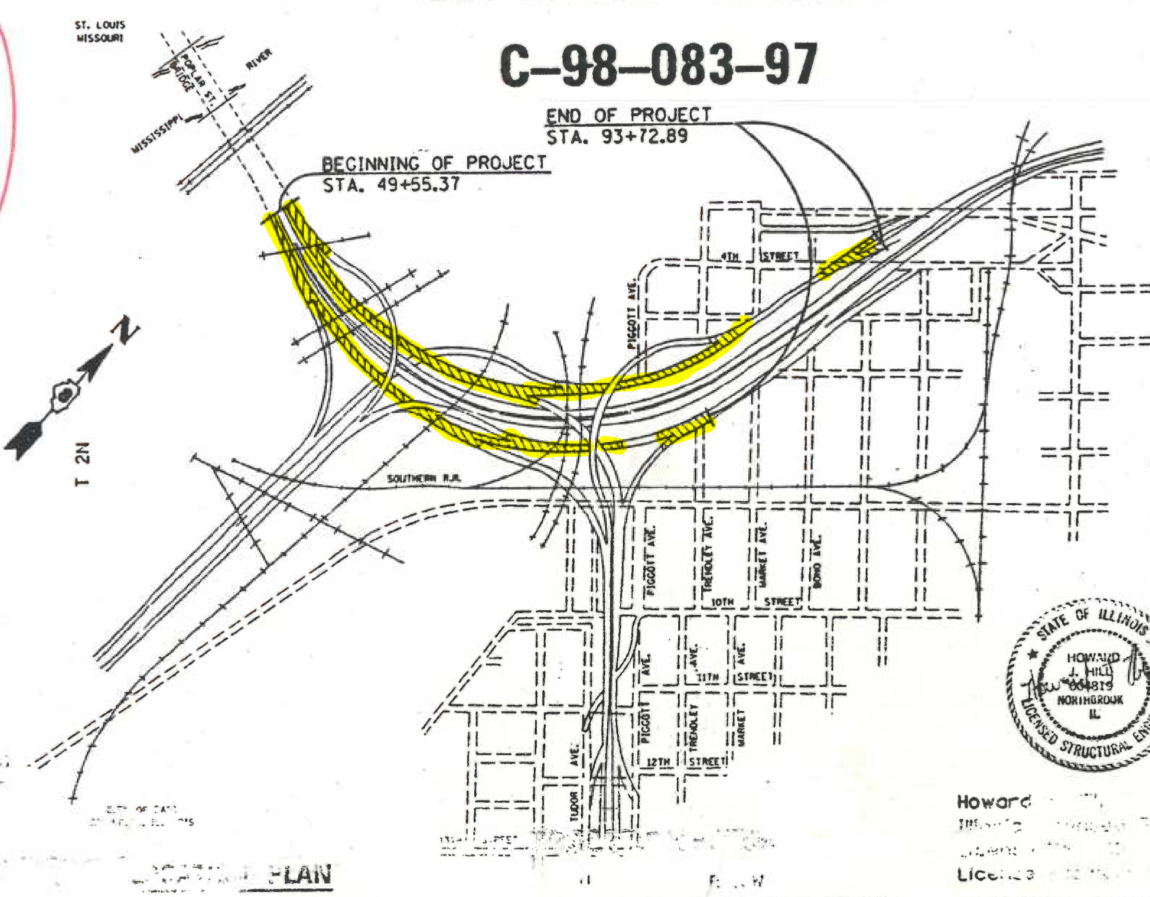
SET 3 OF 4
- STRUCTURE NO. 082-0206 (RAMP G OVER 4TH ST.)

SET 4 OF 4
- STRUCTURE NO. 082-0140 (RAMP H OVER TRENDLEY AVE.)

STANDARDS
701406
702001

Contract 96680

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



LOCATION PLAN

APPROVED
FOR STRUCTURAL ADEQUACY ONLY
Ralph 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 19 98
James Easterly (mc)
DISTRICT ENGINEER

19

ENGINEER OF PROJECT DEVELOPMENT AND IMPLEMENTATION

June 26 19 98
Bill Franke
ENGINEER OF DESIGN AND ENVIRONMENT

June 26 19 98
James C. Slifer
DIRECTOR, DIVISION OF HIGHWAYS

STATE OF ILLINOIS — HOWARD J. HILL — 081-004819 — NORTHBROOK IL — LICENSED STRUCTURAL ENGINEER

Howard
License

WJE Wiss, Janney, Elstner Associates, Inc.
Engineers ... Scientists
(847) 272 ... 291-4813

DEC 02 1997

URBAN

90% FED.
10% STATE
SFTY-2A

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

SHEET NO. . SHEETS

* 82-3HVB-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
Z0048665	Railroad Protective Liability Insurance	L Sum	1
X7015000	CHANGEABLE MESSAGE SIGN	CALMO	12
67000400	ENGINEER'S FIELD OFFICE, TYPE A	CAL MO	12

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

INDEX OF SHEETS

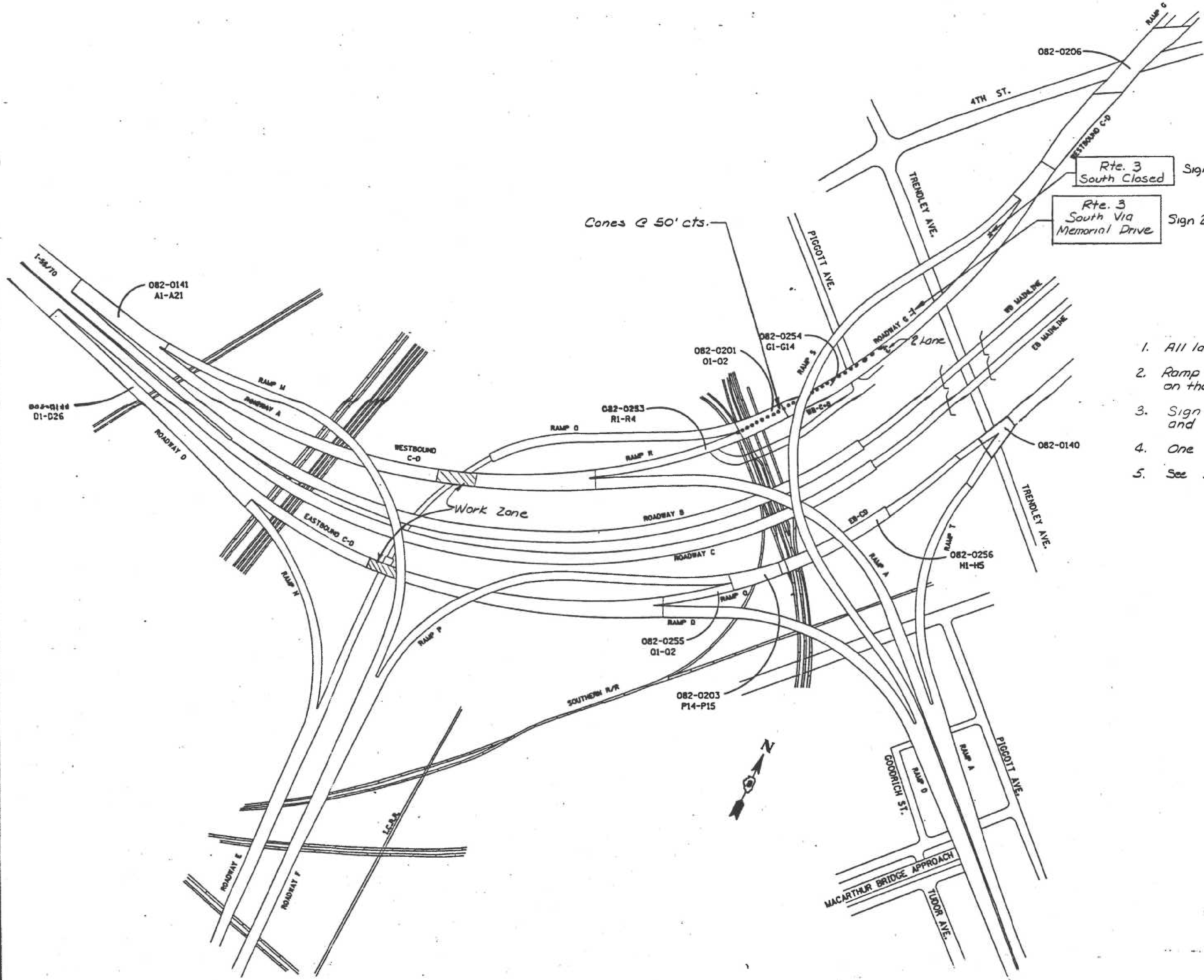
QUANTITIES AND INDEX OF SHEETS

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.
F.A.I. 70	*	ST. CLAIR	91	2A
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

SHEET NO.
SHEETS

* 82-3HVB-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 preformed 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 COUN

SCALE: NE

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 70	*	ST. CLAIR	91	3
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

SHEET NO. S-1

SHEETS

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

D-98-012-95

* ENCOMPASSING THE FOLLOWING ROADWAYS

- ROADWAY A, STRUCTURE NO. 082-0141
- RAMP R, STRUCTURE NO. 082-0253
- RAMP O, STRUCTURE NO. 082-0201
- ROADWAY C, STRUCTURE NO. 082-0254

STATE OF ILLINOIS

DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

SET 1 OF
4 SETS

PLANS FOR PROPOSED SEISMIC AND REDUNDANCY RETROFIT REPAIRS *

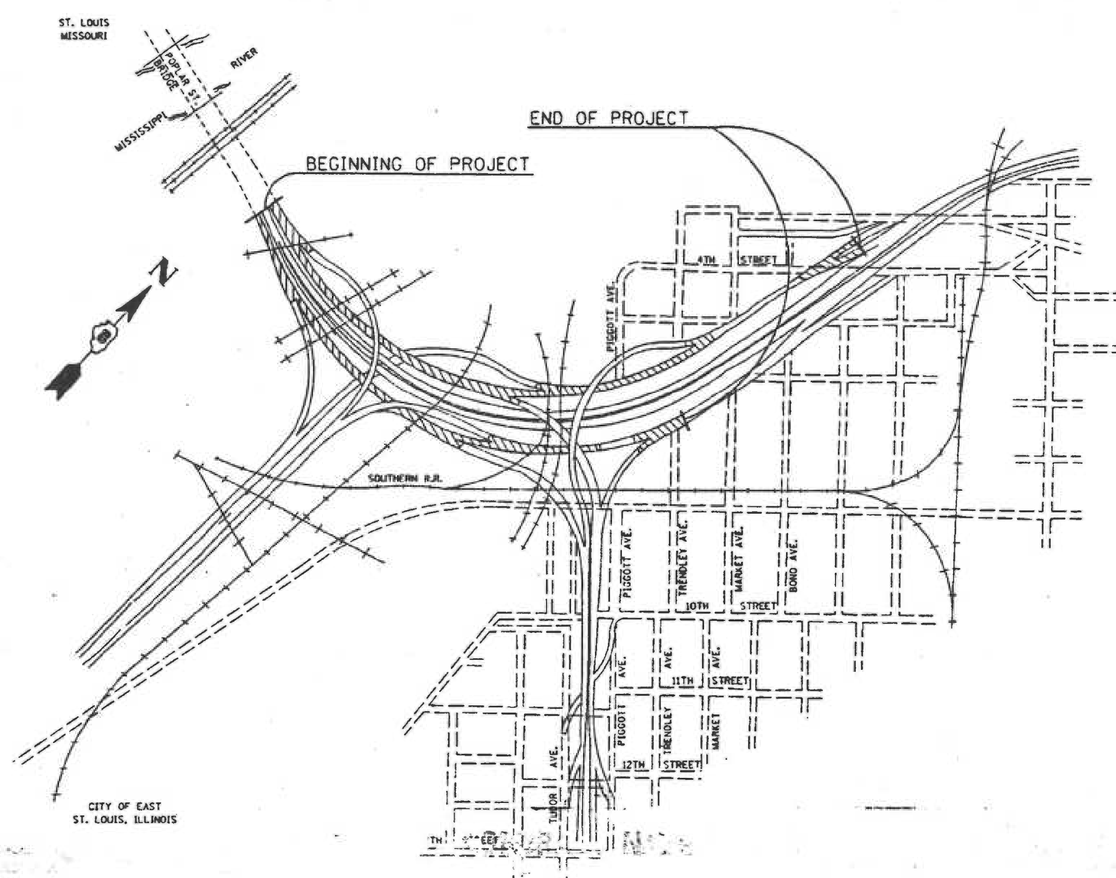
FAI ROUTE 70

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

POPLAR STREET BRIDGE APPROACHES

ST. CLAIR COUNTY

INDEX OF SHEETS



LOCATION OF SECTION INDICATED THUS:-

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

SUBMITTED ____________ 19 ____

____
DISTRICT ENGINEER

____________ 19 ____

____
ENGINEER OF PROJECT DEVELOPMENT AND IMPLEMENTATION

____________ 19 ____

____
ENGINEER OF DESIGN AND ENVIRONMENT

____________ 19 ____

____
DIRECTOR, DIVISION OF HIGHWAYS

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 70	*	ST. CLAIR	91	4
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT·		

SHEET NO. S-2

SHEETS

* 82-3HVR-2R-1-1

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.

GENERAL NOTES

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
FAI ROUTE 70
[illegible] STREET BRIDGE APPROACHES
[illegible] CLAIR [illegible]

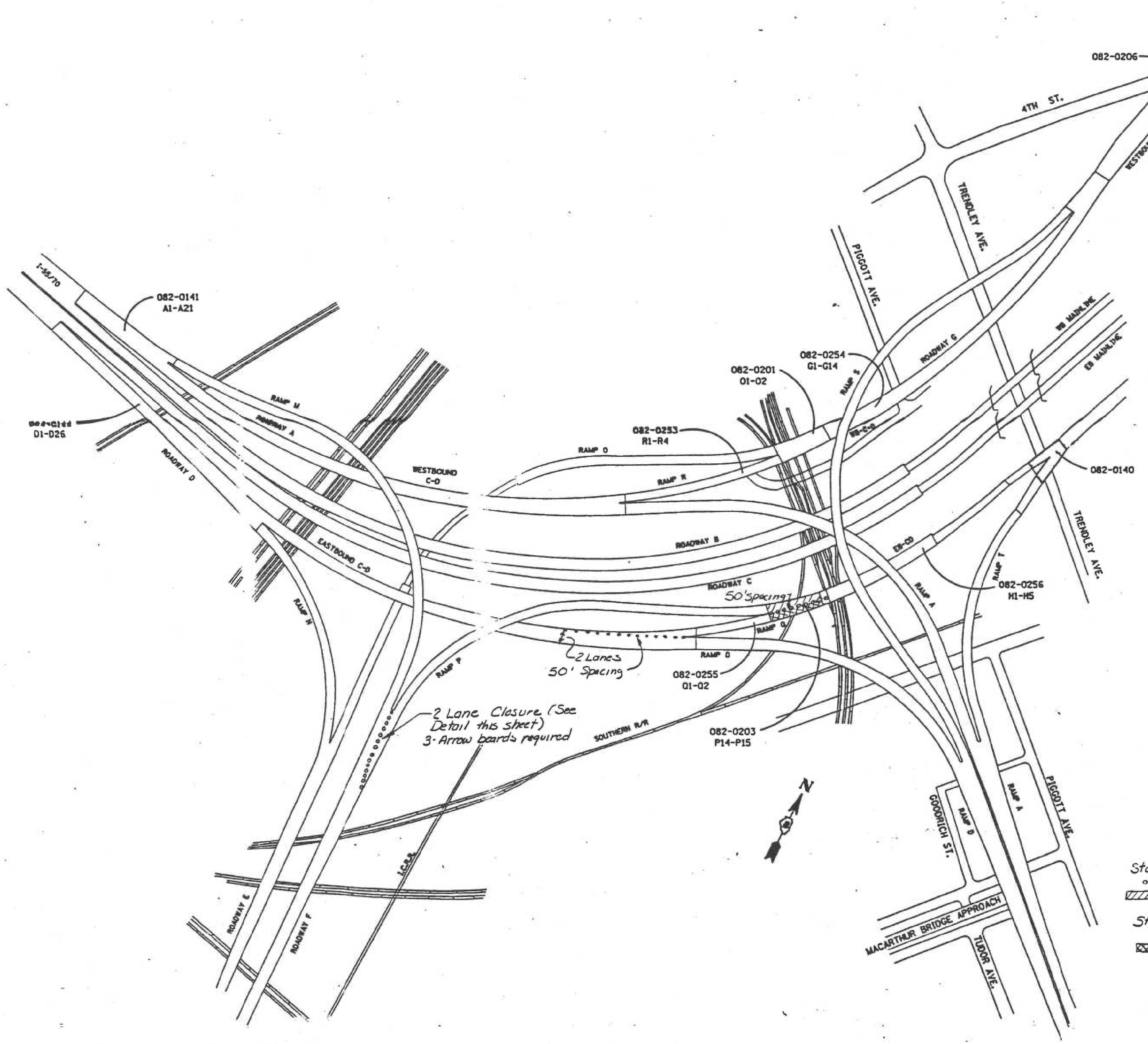
SCALE: NONE
DRAWN BY: JN
DATE 1-23-98
CHECKED BY HH

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 70	*	ST. CLAIR	91	28
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

SHEET NO.

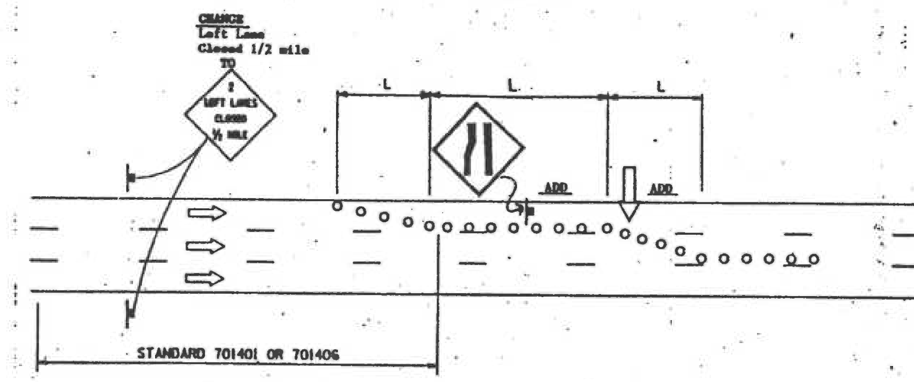
SHEETS

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



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. [illegible] COUNTY

SCALE: NONE
DATE: 1-23-9
CHECKED [illegible]

STRUCTUR\97422\E1\814PLS3.dgn

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-	

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

SHEET NO. S-3
SHEETS

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 locations)
     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 assem[illegible] on the following pier.
    - Structure No. 08[illegible], 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

SCOPE OF WORK

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAI[illegible]
[illegible]I ROUTE 70
[illegible]

STRUCTURE [illegible] STRUCTURE [illegible]
SCALE: NONE DRAWN BY JN
DATE 1-23-98 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

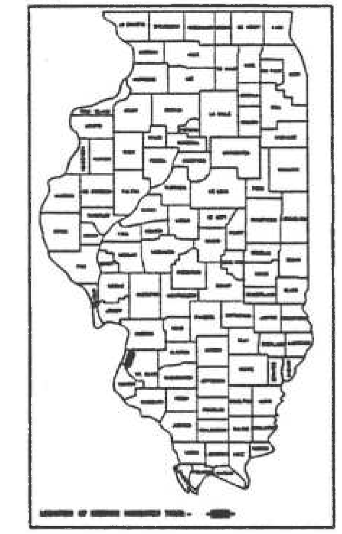
New Construction:
f'c = 4500 psi
fy = 60,000 psi (Reinf.)
fy = 36,000 psi (M270 Grade 36)
fy = 70,000 psi (M270 Grade HPS 70W)

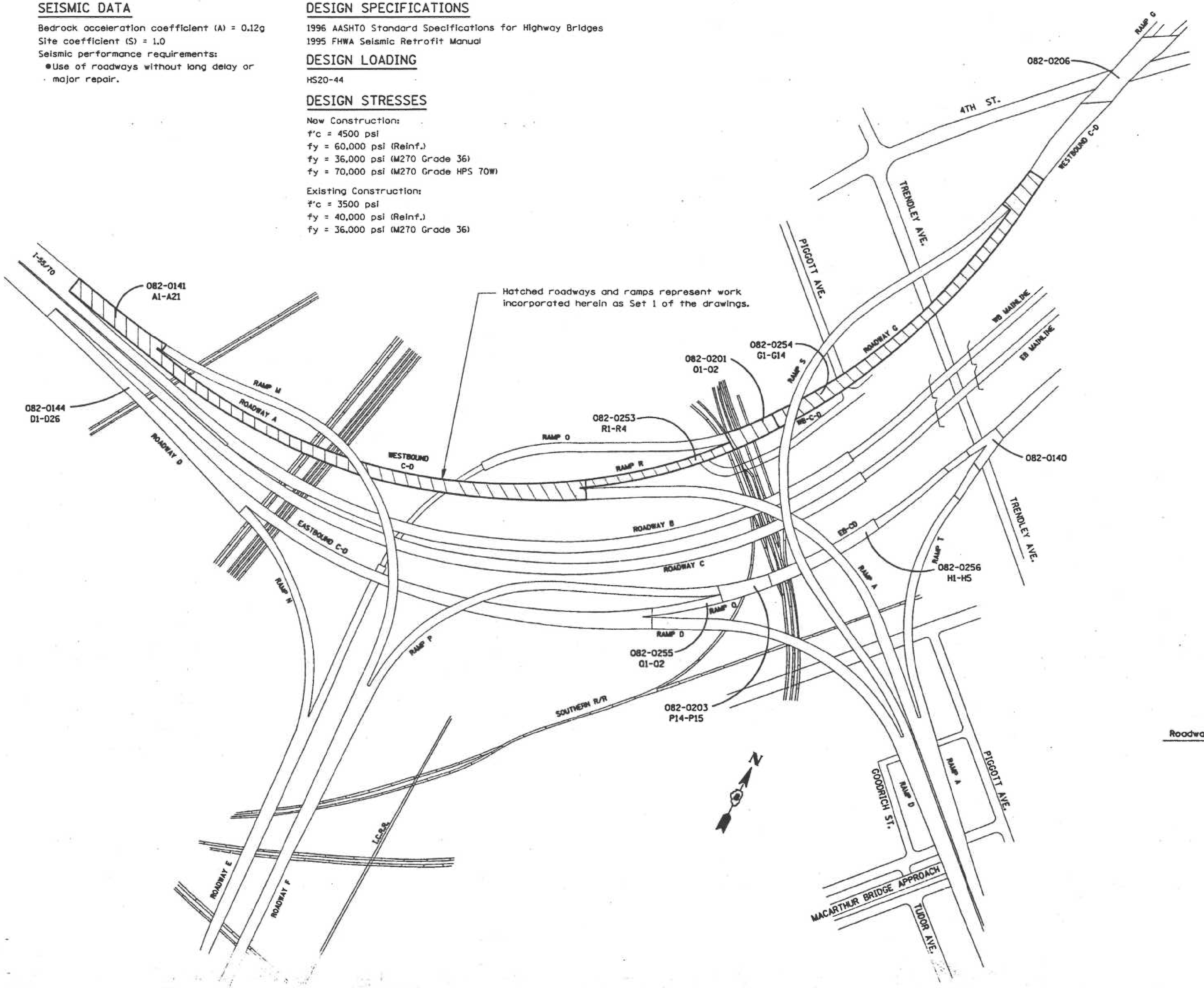
Existing Construction:
f'c = 3500 psi
fy = 40,000 psi (Reinf.)
fy = 36,000 psi (M270 Grade 36)

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

SHEET NO. S-4
SHEETS

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





LOCATION SKETCH

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 R...NDANCY RETROFIT REPAIRS
... 70

STRUC... ...URE NO.
STRUCTURE N... ...RUCTURE NO. 082-0201 ...AMP O)
SCALE: NONE
DRAWN BY JN
DATE 1-23-98
CHECKED BY HH

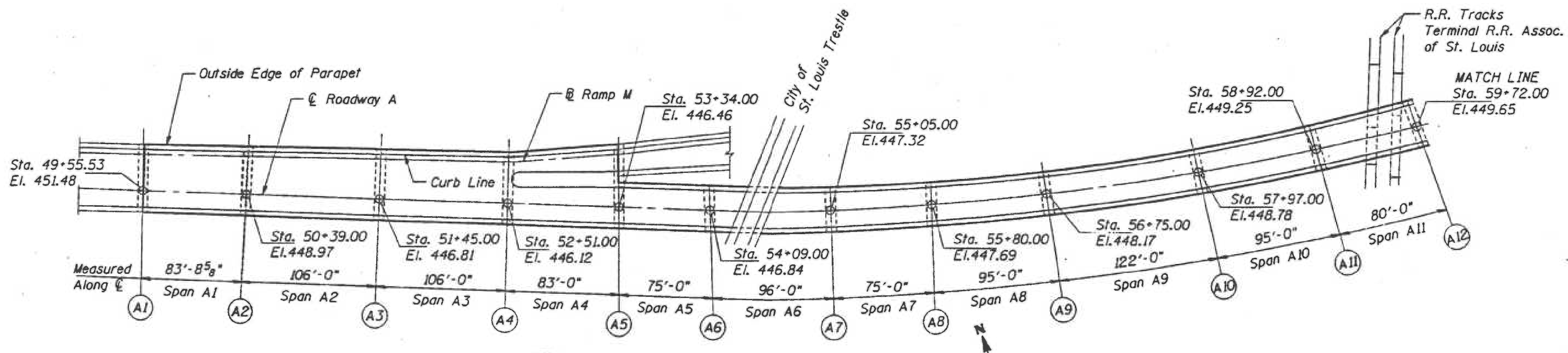
\STRUCTUR\97422\SET1\STIPPL84.DGN

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

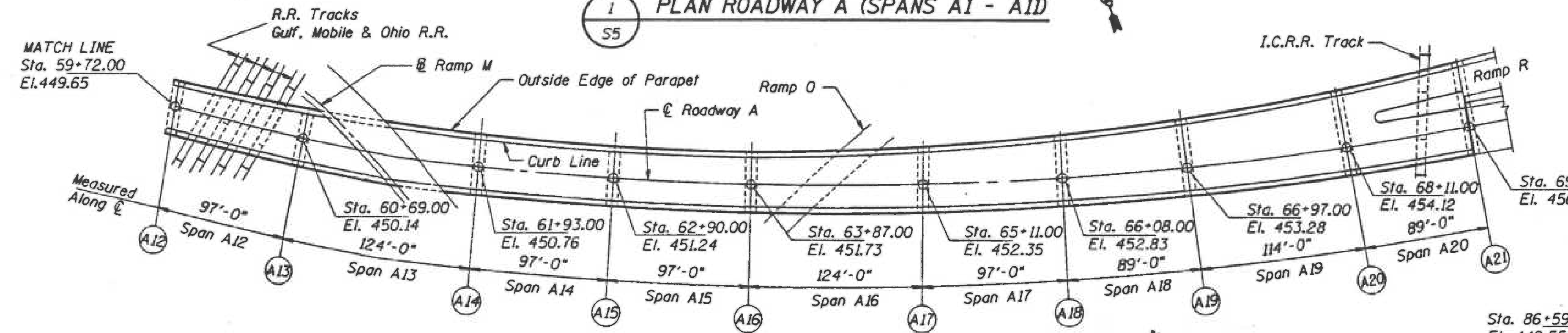
* 82-3HVB-2R-1-I

SHEET NO. S-5

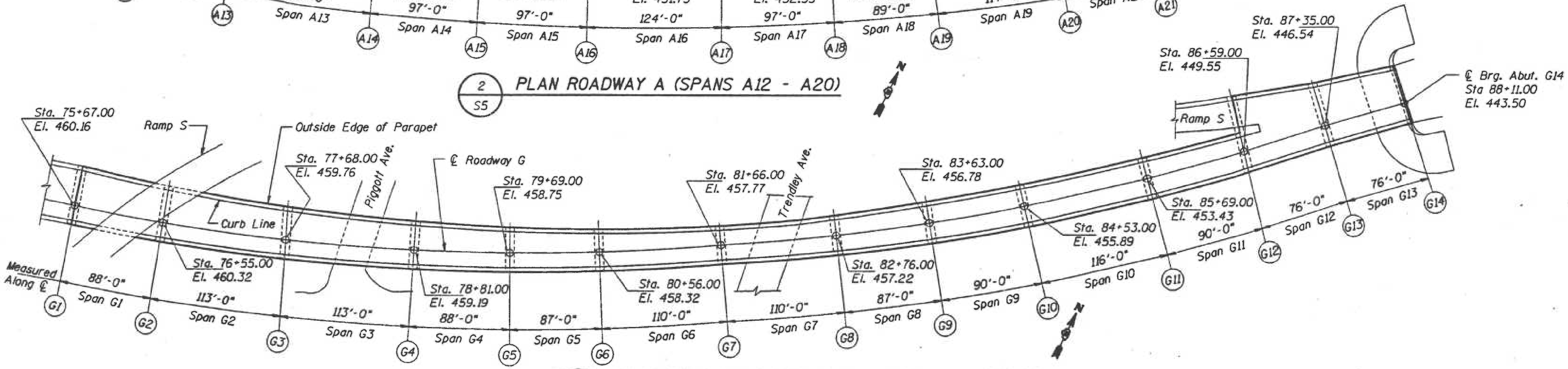
SHEETS



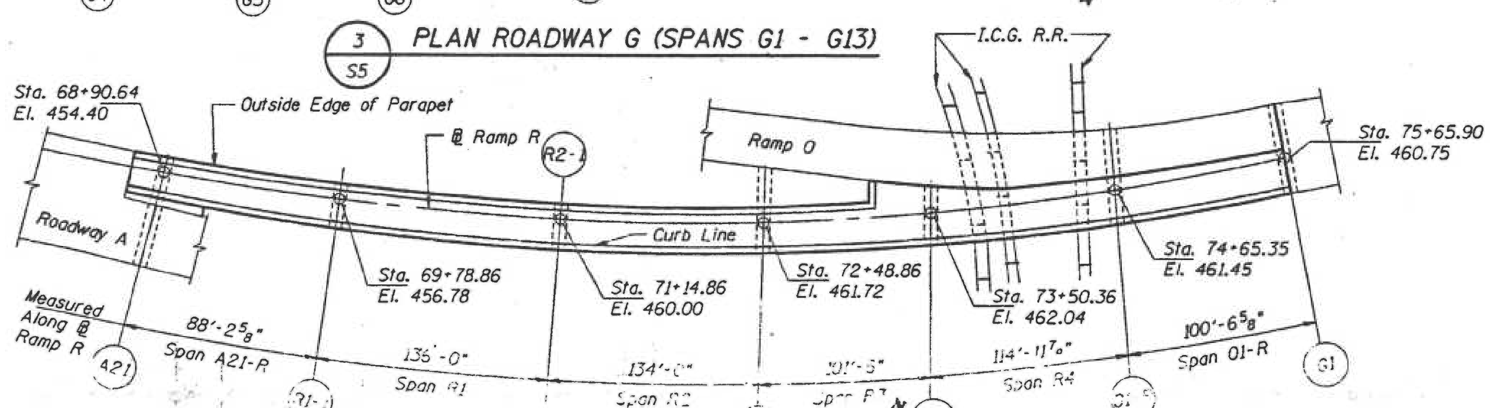
1/S5 PLAN ROADWAY A (SPANS A1 - A11)



2/S5 PLAN ROADWAY A (SPANS A12 - A20)



3/S5 PLAN ROADWAY G (SPANS G1 - G13)



4/S5 PLAN RAMPS R & O

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

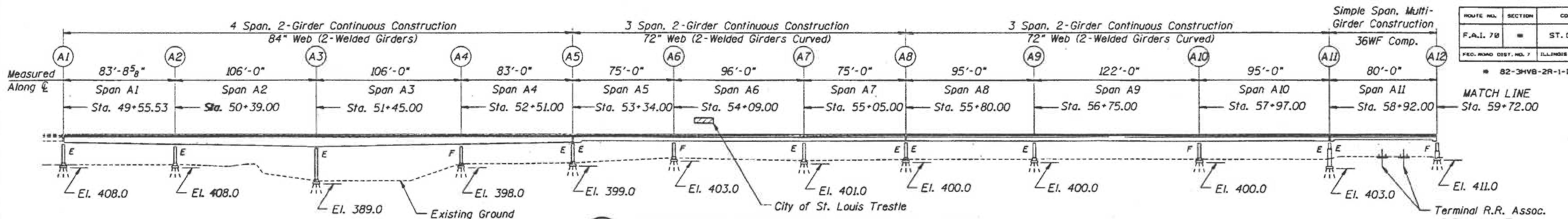
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
FAI ROUTE 70
POPLAR STREET BRIDGE APPROACHES
ST. CLAIR COUNTY

STRUCTURE NO. 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

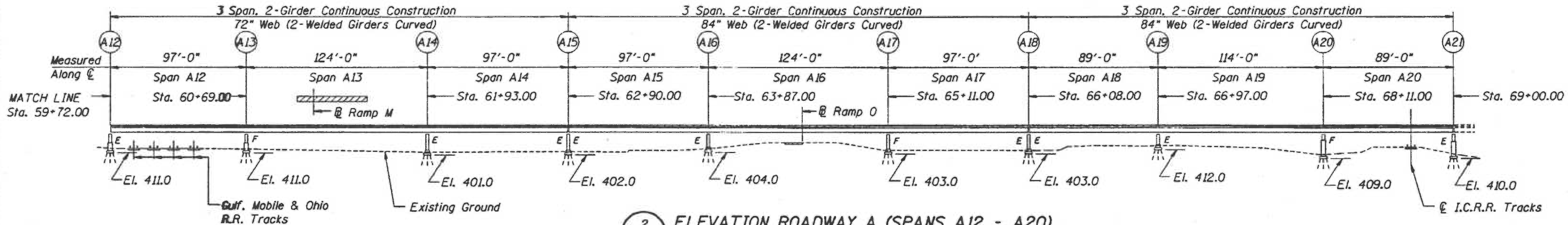
ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 70	*	ST. CLAIR	91	8
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

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

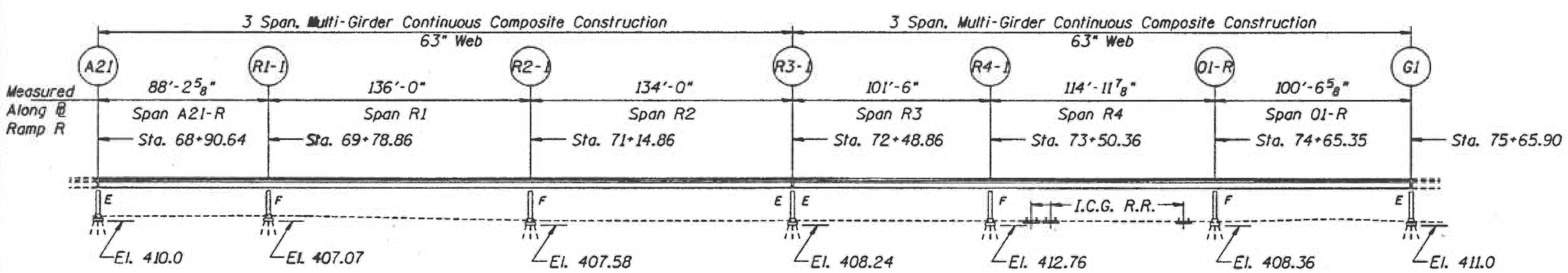
SHEET NO. S-6
SHEETS



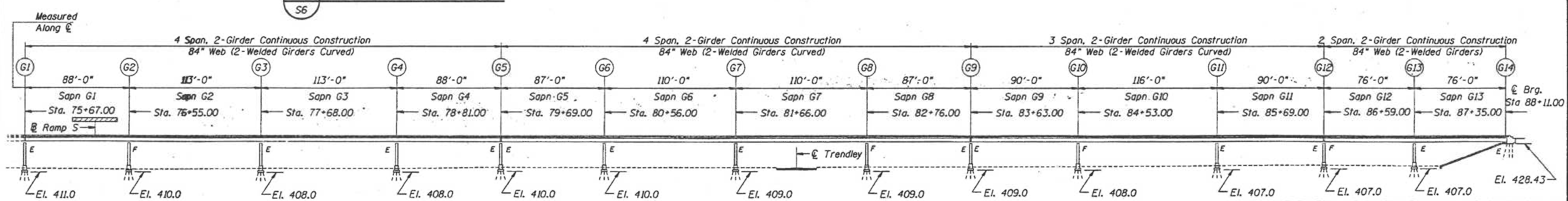
1/S6 ELEVATION ROADWAY A (SPANS A1 - A11)



2/S6 ELEVATION ROADWAY A (SPANS A12 - A20)



3/S6 ELEVATION RAMP R & O



5/S6 ELEVATION ROADWAY G (SPANS G1 - G13)

ELEVATION OF ROADWAYS A & G AND RAMPS R & O

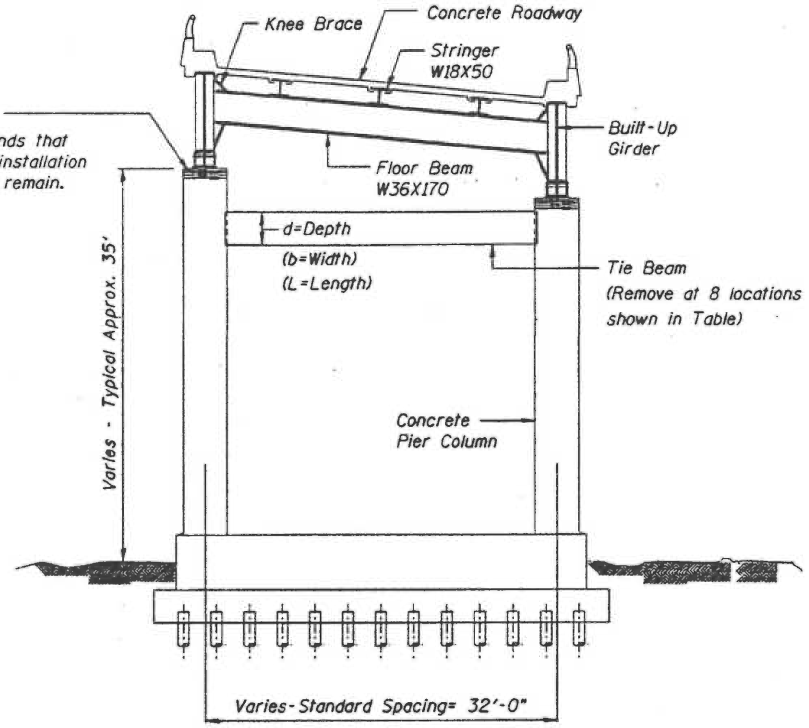
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
FAI ROUTE 70
POPLAR STREET BRIDGE APPROACHES
ST. CLAIR COUNTY

STRUCTURE NO. 082-0141 (ROADWAY A) STRUCTURE NO. [illegible]-0253 [illegible]
STRUCTURE NO. 082-0254 (ROADWAY G) STRUCTURE NO. 082-0201 (RAMP G)
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	9
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

SHEET NO. S-7
SHEETS

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



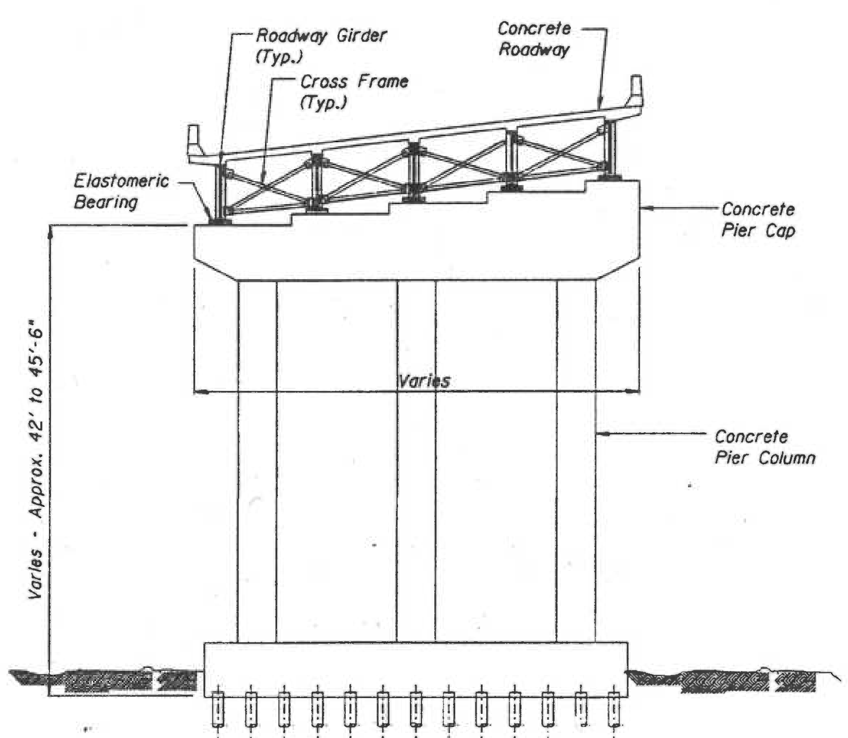
1/S7 TYPICAL SECTION THROUGH TWO GIRDER ROADWAY
(Section through Ramp Similar)

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.



S7 ...THROUGH ... GIRDER ROADWAY

TYPICAL SUBSTRUCTURE DETAILS

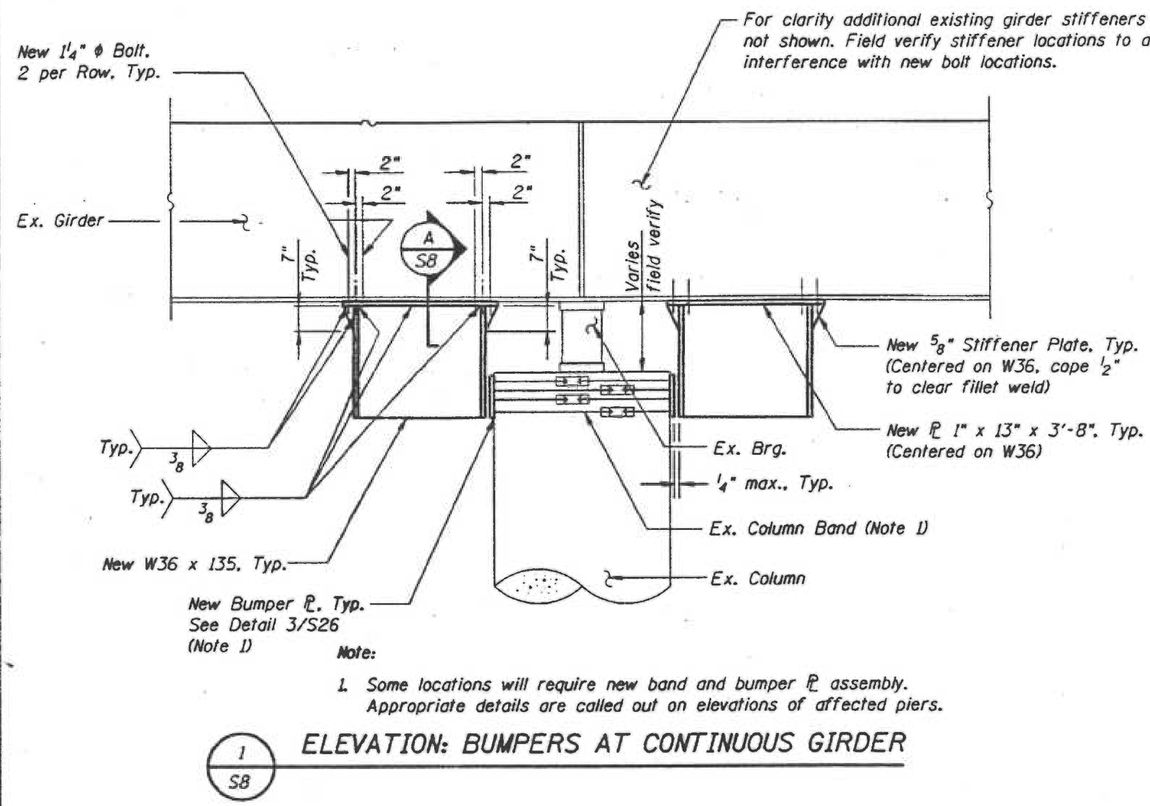
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT [illegible]AIRS
FAI ROUTE 7[illegible]
[illegible] STREET BRIDGE
ST. CLAIR COU[illegible]
ST[illegible] ROADWAY [illegible] STRUCTURE
STR[illegible] NO. [illegible]254 ROADWAY G[illegible] STRUCTURE [illegible]
SCALE: NONE | DRAWN BY [illegible]
DATE 1-23-98 | CHECKED BY HH

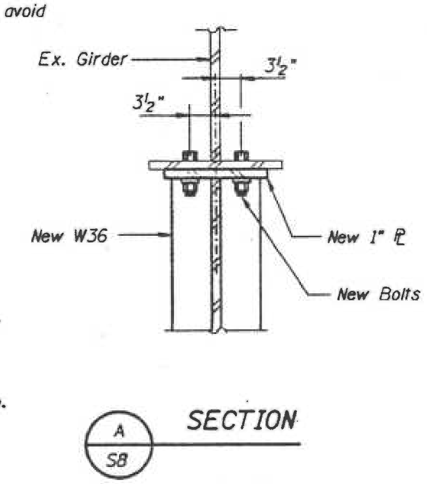
ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 70	*	ST. CLAIR	91	10
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

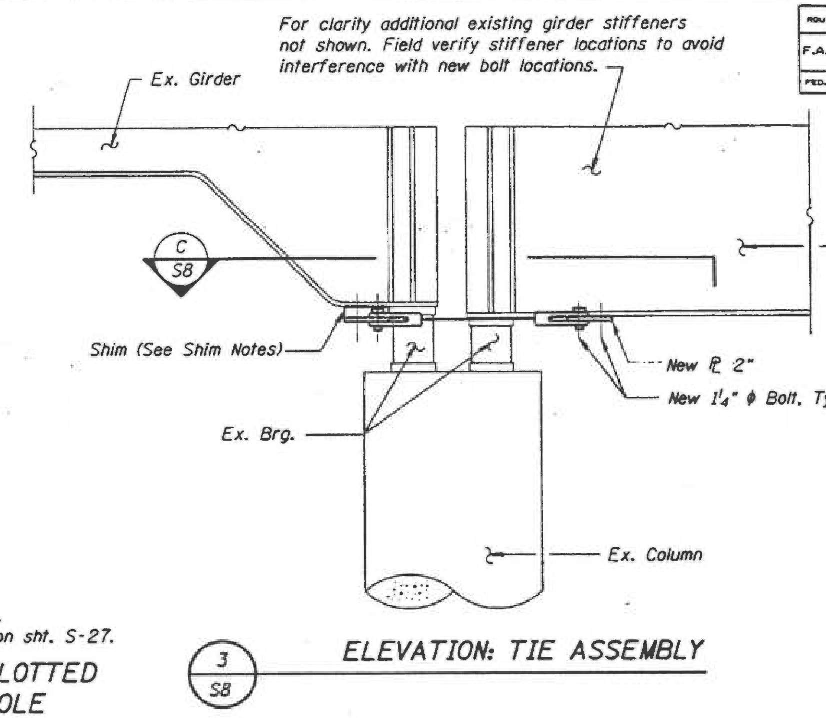
* 82-3HVB-2R-1-1

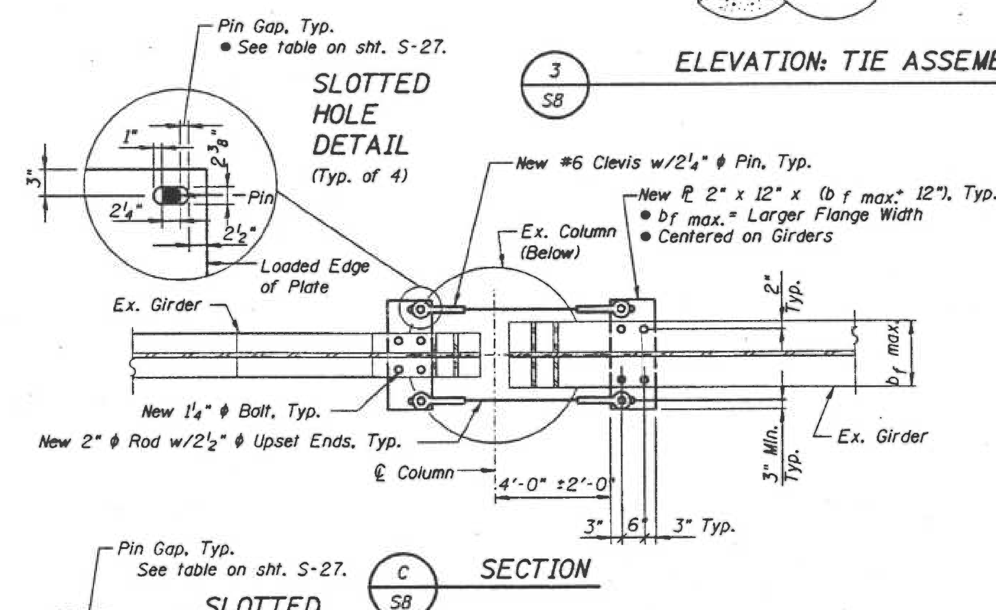
SHEET NO. S-8

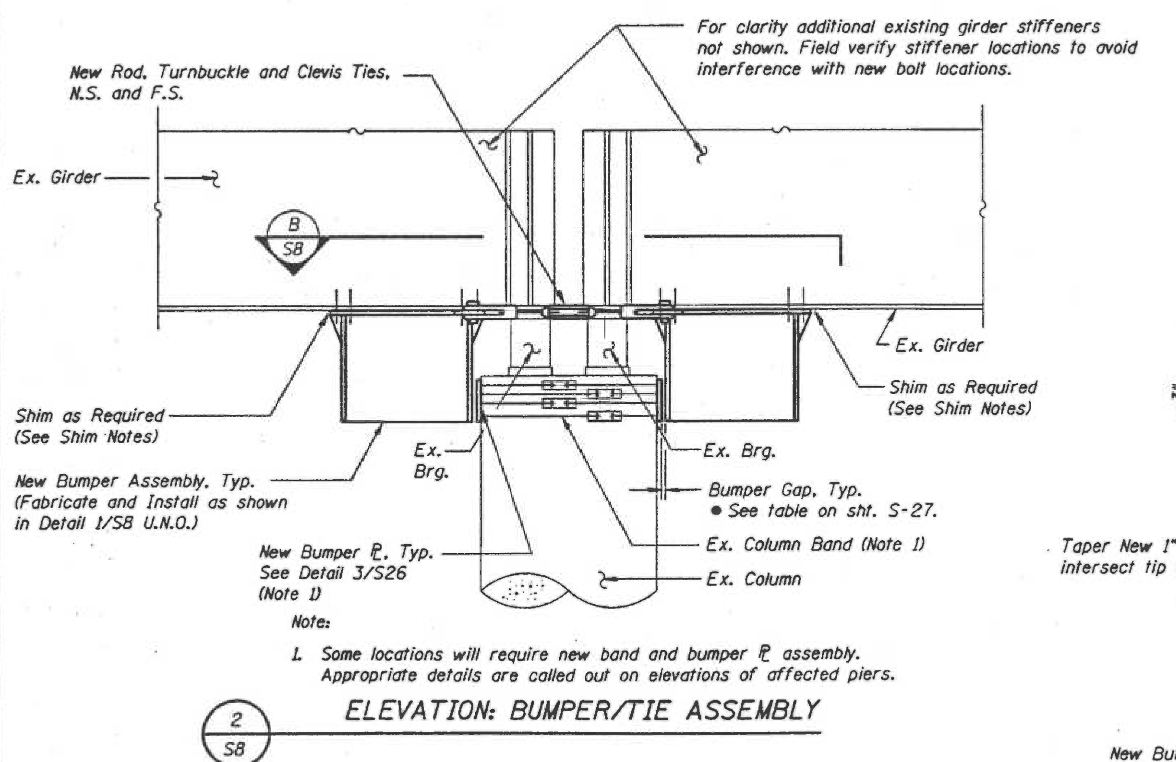
SHEETS

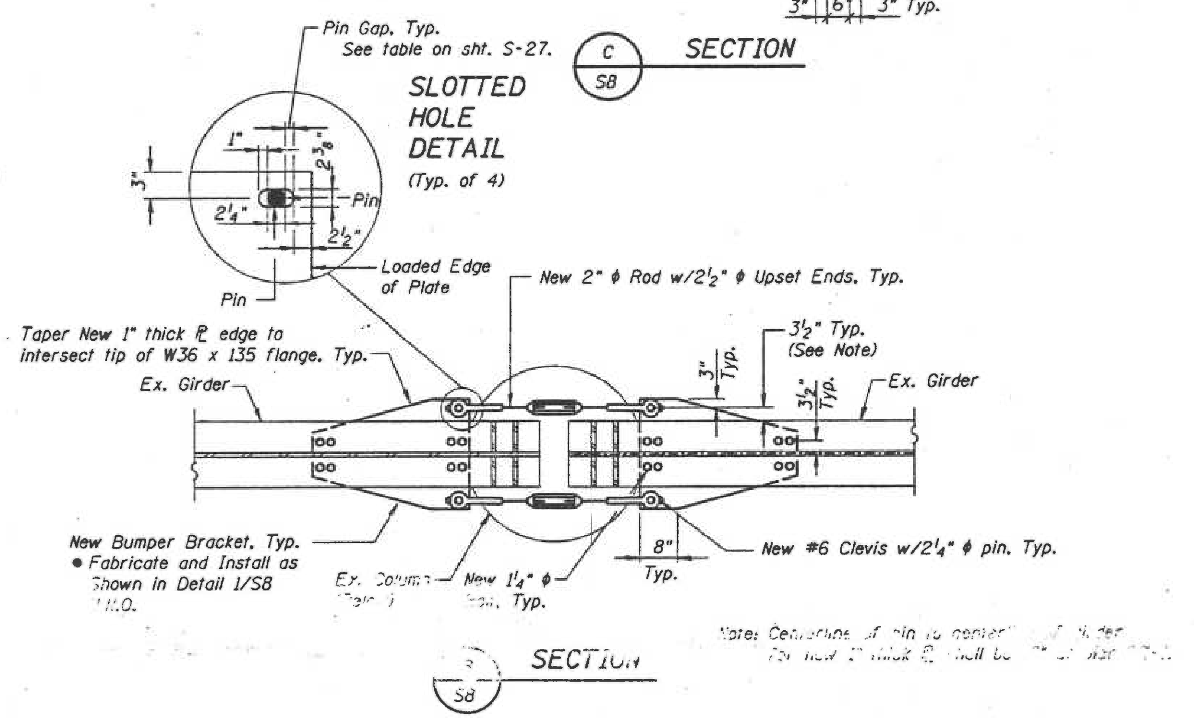












SHIM NOTES:

1. Shim higher flange so that elevation difference between ends of rod is no more than ½".
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+$\frac{1}{16}$") 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 ¾" 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 STREET BRIDGE APPROACHES
ST. CLAIR COUNTY

STRUCTURE NO. 082-0254 (ROADWAY G) STRUCTURE NO. 082-0 (RAMP O)

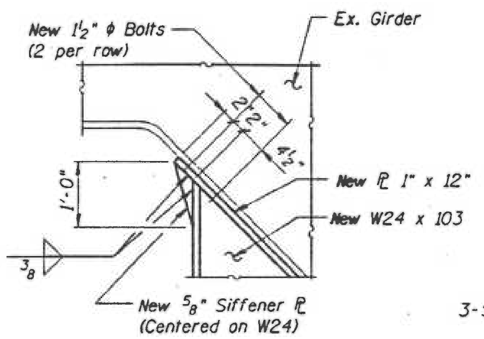
SCALE: NONE DRAWN BY JN

DATE 1-23-98 CHECKED BY HH

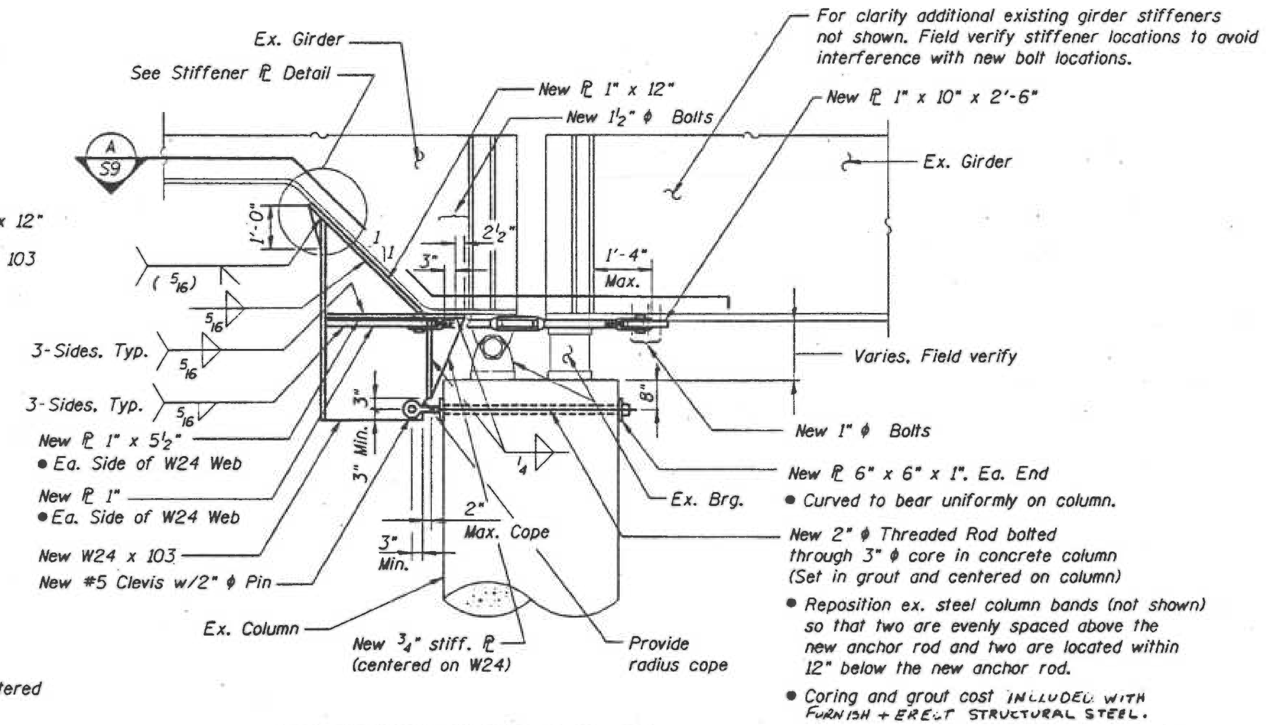
ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 70	*	ST. CLAIR	91	11
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

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

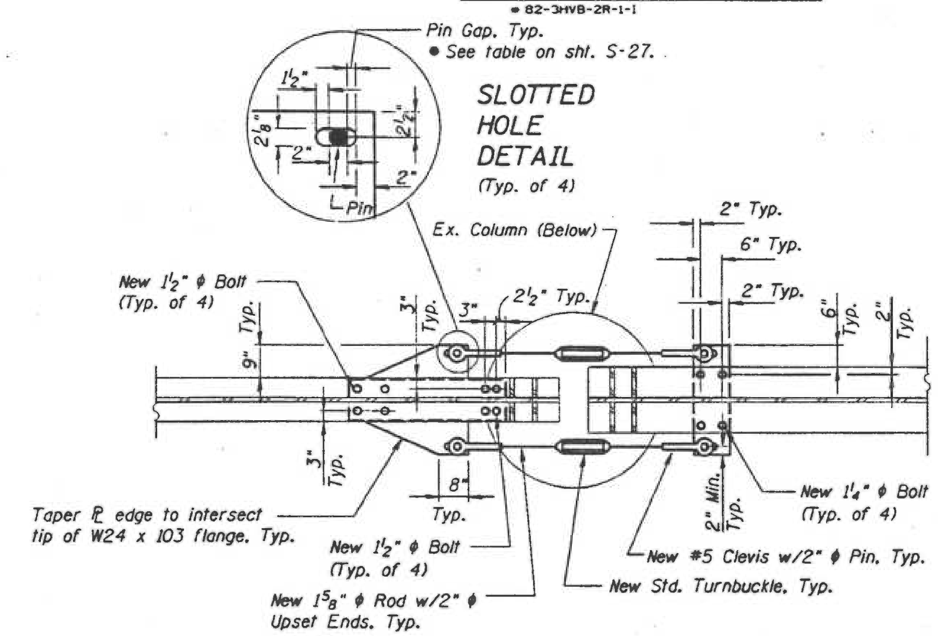
SHEET NO. S-9 SHEETS



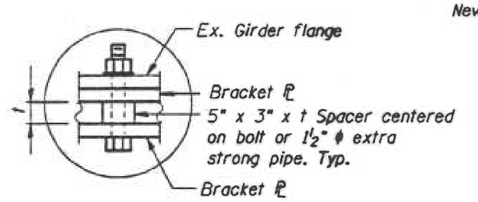
STIFFENER ℙ DETAIL



ELEVATION: BUMPER/TIE AT HAUNCHED GIRDER WITH FIXED BEARING (1/S9)

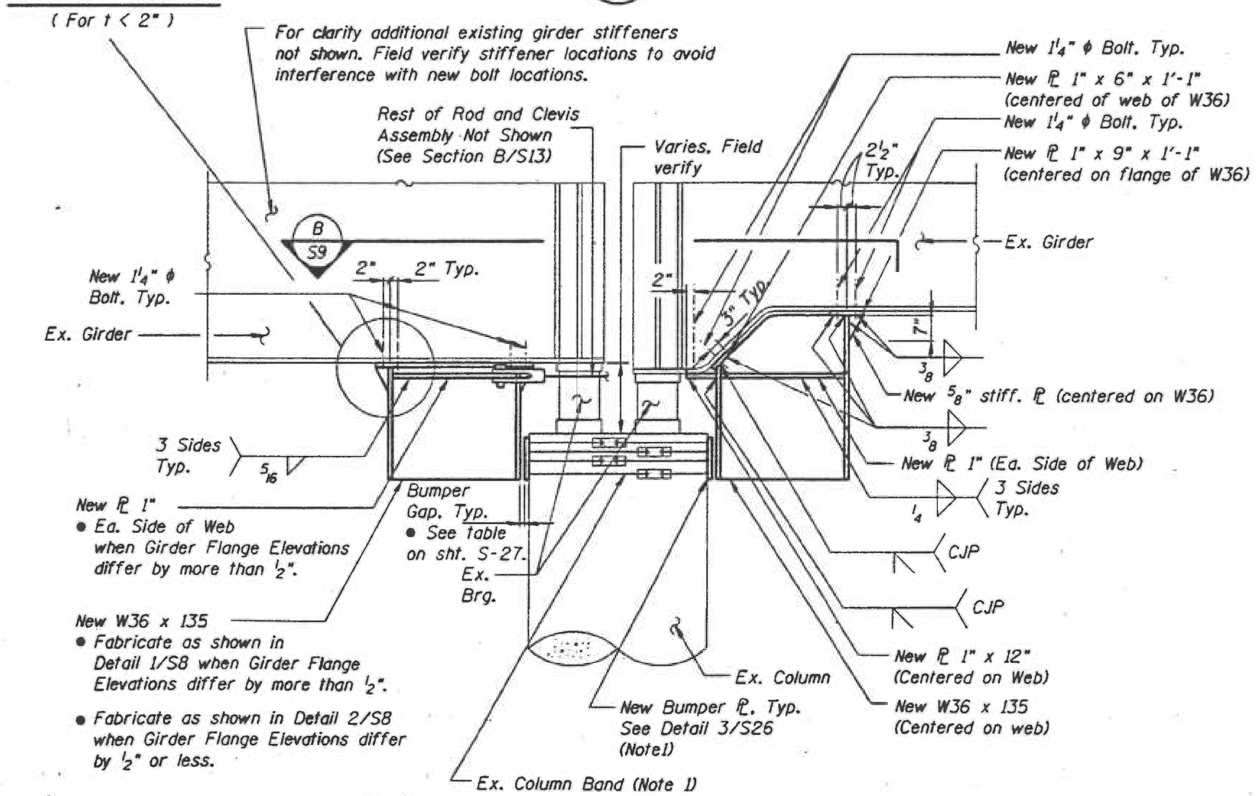


SECTION (A/S9)



SPACER DETAIL

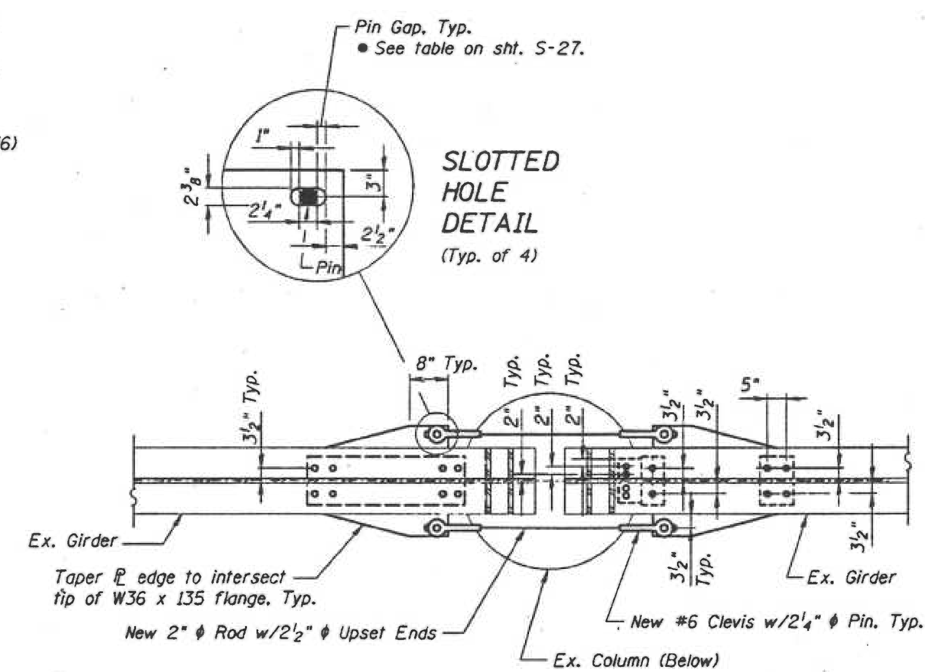
(For t < 2")



Note:

1. 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 (S9)



SECTION (B/S9)

BUMPER/TIE ROD NOTES:

1. All bolt holes shall be standard round holes (ϕ+$\frac{1}{16}$") 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 $\frac{3}{4}$" 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 STREET BRIDGE APPROACHES

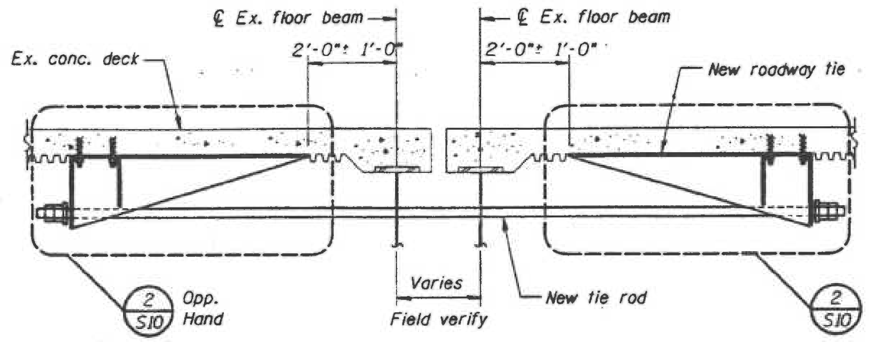
STRUCTURE NO. ...
STRUCTURE NO. ...0254 (ROADWAY G) STRUCTURE NO. 082-020...
SCALE: NONE DRAWN BY JN
DATE 1-23-98 CHECKED BY HH

\STRUC\UR\97422\SET1\S1TDTS9.DGN

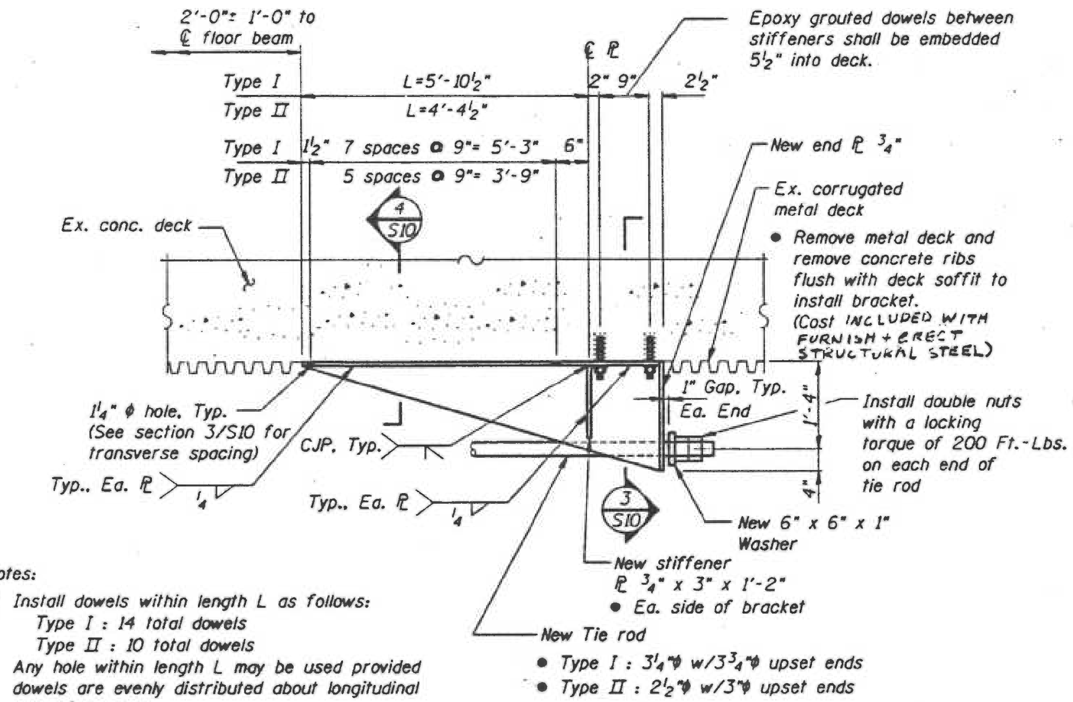
ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 70	*	ST. CLAIR	91	12
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

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

SHEET NO. S-10 SHEETS



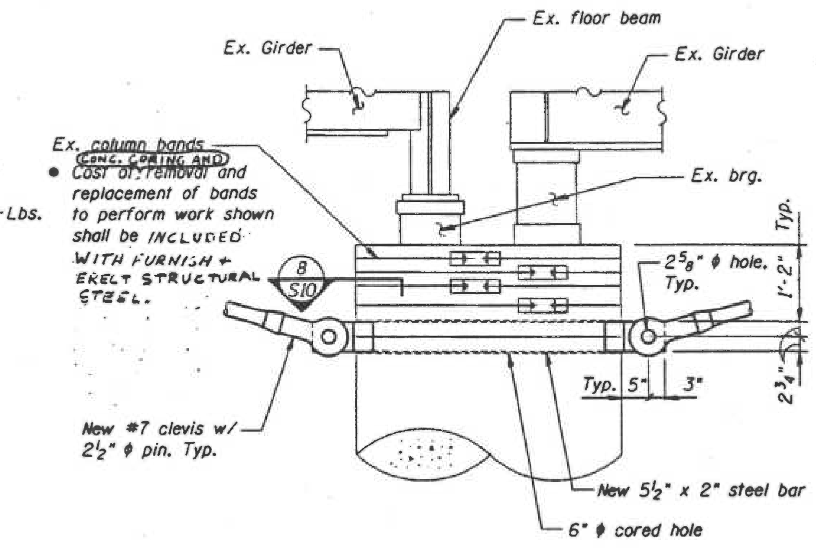
1 S10 ELEVATION - ROADWAY TIE



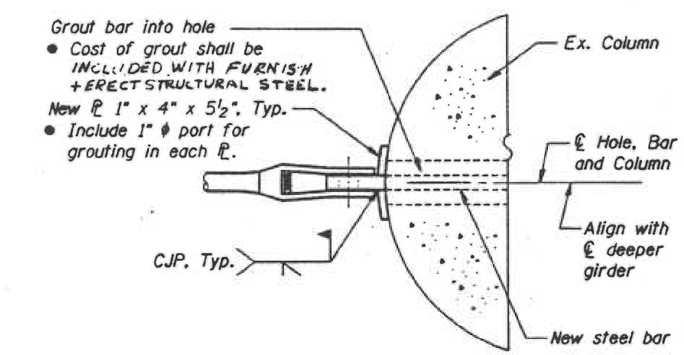
Notes:

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 4½" 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.

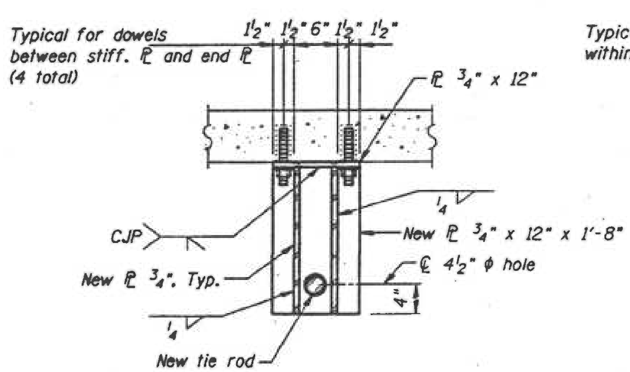
2 S10 ELEVATION - ROADWAY TIE



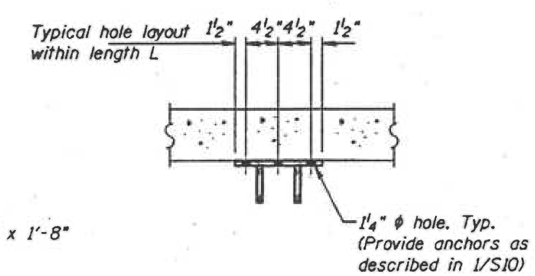
7 S10 ELEVATION



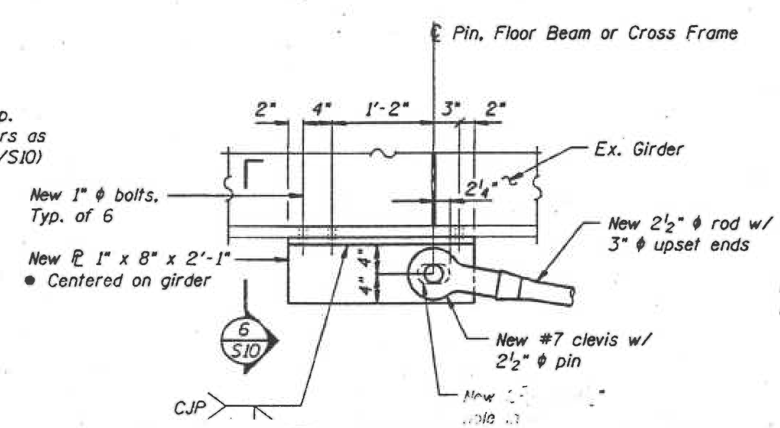
8 S10 SECTION



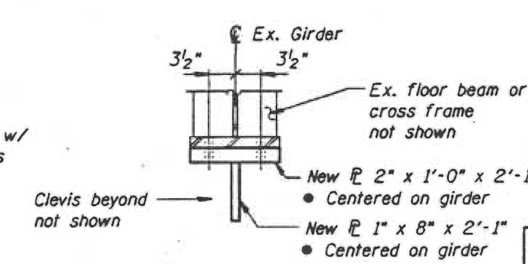
3 S10 SECTION



4 S10 SECTION



5 S10 DETAIL



6 S10 SECTION

SEISMIC RETROFIT DETAILS

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
F.A.I. ... TO ...
POPLAR ST... APPROACHES
...

STRUCTURE NO. 082-0241 ... STRUCTURE NO. 082-025...
STRUCTURE NO. 082-0254 (ROADWAY G... STRUCTURE NO. 082-0201 (RAMP ...

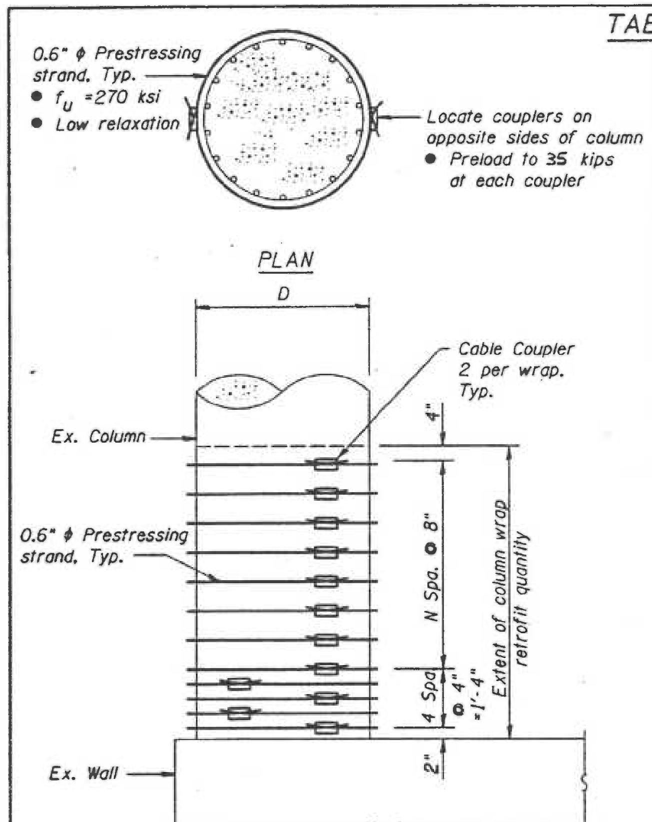
SCALE: NONE DRAWN BY JN
DATE 1-23-98 CHECKED BY HH

\STRUCTURE\...\S10.DGN

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 70	*	ST. CLAIR	91	13
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

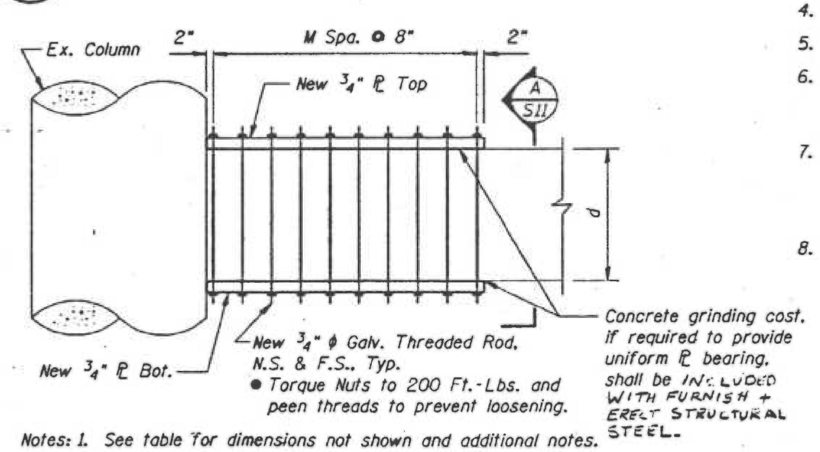
* 82-3HVB-2R-1-1

SHEET NO. S-11 SHEETS



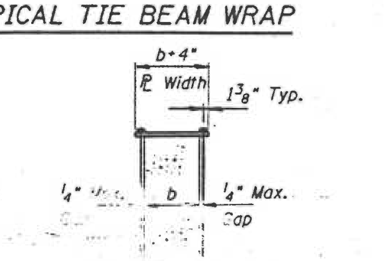
Note:
1. See table for dimensions not shown and additional notes.
2. Alternative column wraps may be used. See Special Provisions.

1/S11 ELEVATION - TYPICAL COLUMN WRAP



Notes: 1. See table for dimensions not shown and additional notes.
2. Wrap each end as shown.

2/S11 ELEVATION - TYPICAL TIE BEAM WRAP

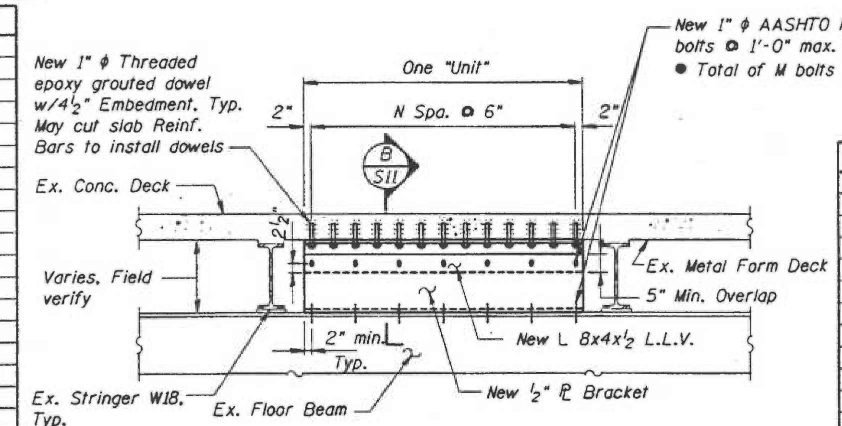


A/S11 SECTION

TABLE OF COLUMN WRAP AND TIE BEAM WRAP PARAMETERS

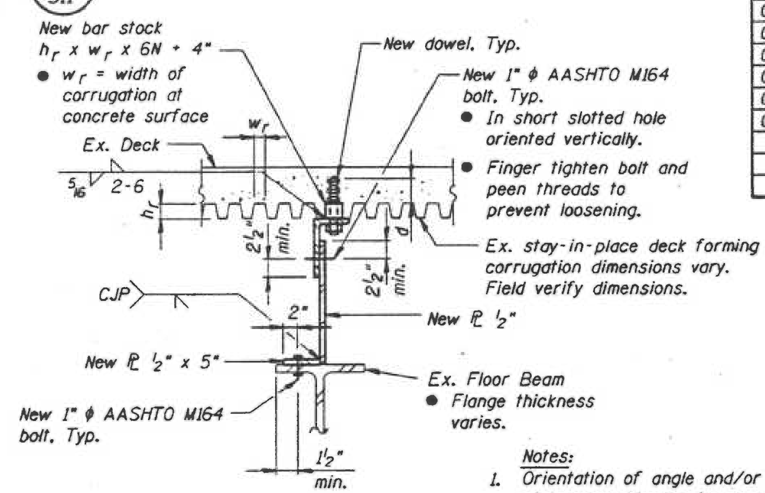
Pier	No. Cols.	D (in.)	N	M	b (in.)	d (in.)	Comments
A2	2	48	7	9	27	36	See Note 5
A4	2	54	8	9	27	36	
A5	1	48	7	—	—	—	Wrap South Col. only
A6	2	48	7	9	15	36	
A7	2	48	7	9	15	36	See Note 5
A8	2	48	7	—	—	—	
A9	2	48	7	9	15	36	See Note 5
A10	2	54	8	9	15	36	
A12	2	48	—	—	—	—	See Note 4
A13	2	48	7	9	15	36	See 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	—	—	—	
01-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

Notes:
1. Complete all specified dowel bar modifications and concrete repairs at least 3 days before wrapping any member.
2. See detail 1/S11 for column wrap U.N.O.
3. See detail 2/S11 for tie beam wrap U.N.O.
4. See detail 6/S12 for column wrap.
5. See detail 2/S13 for modifications to the tie beam wrap.
6. 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.
7. 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.
8. 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.



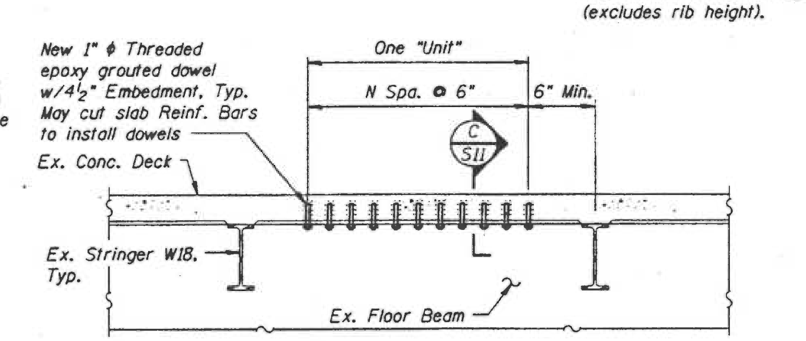
Notes: 1. See table for number of "units", per pier.
2. See table for N.

3/S11 ELEVATION - SLAB FLOOR BEAM CONNECTION



Notes:
1. Orientation of angle and/or plate assembly may be opposite hand to that shown.
2. 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).

B/S11 SECTION



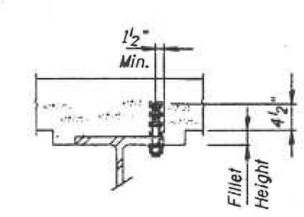
Notes: 1. See table for number of "units" per pier.
2. See table for N.

4/S11 ELEVATION - SLAB FLOOR BEAM CONNECTION

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



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.

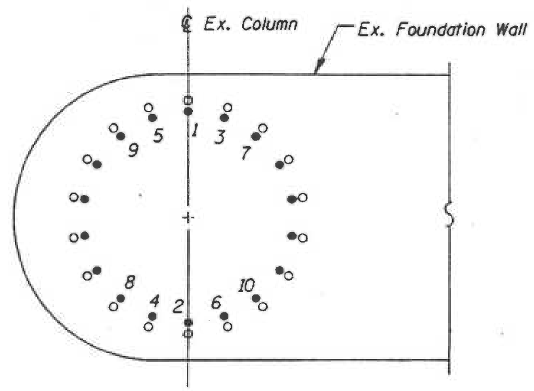
C/S11 SECTION

SEISMIC RETROFIT DETAILS

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEI[illegible] AND REDUNDANCY RETROFIT REPAIRS
[illegible]AI ROUTE [illegible]
[illegible] BRIDGE APPROACHES
ST. [illegible]AIR COUNTY

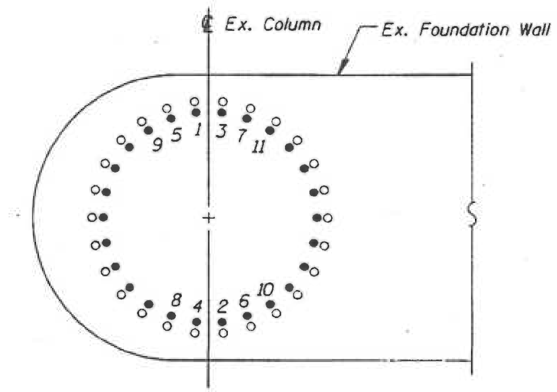
STRUCTURE NO. [illegible]82-0[illegible] (ROADWAY A) STRUCTURE NO. 082-02[illegible] (RAMP R)
STRUCTURE NO. [illegible]82-0254 (ROADWAY G) STRUCTURE NO. 082-0201 (RAMP O)
SCALE: NONE DRAWN BY JN
DATE 1-23-98 CHECKED BY HH

\STRUCTURES\7422\SET1\ST10TS11.DGN



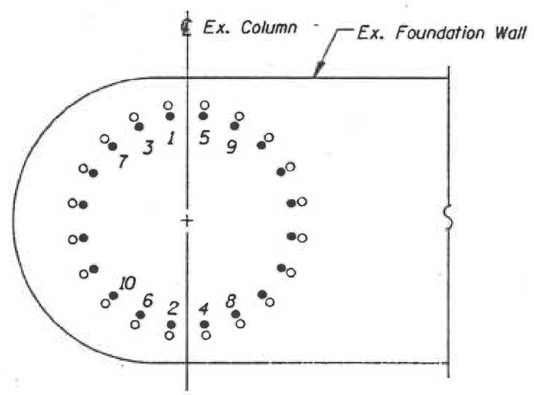
- ● Foundation Wall dowel bar (#10 or #11 bar)
- ○ Outline of column bar

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



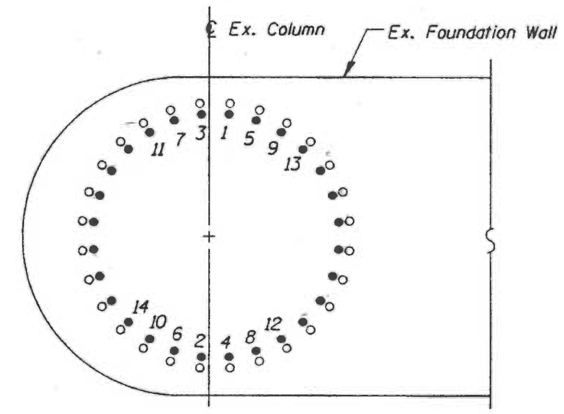
- ● Foundation Wall dowel bar (#11 bar)
- ○ Outline of column bar

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



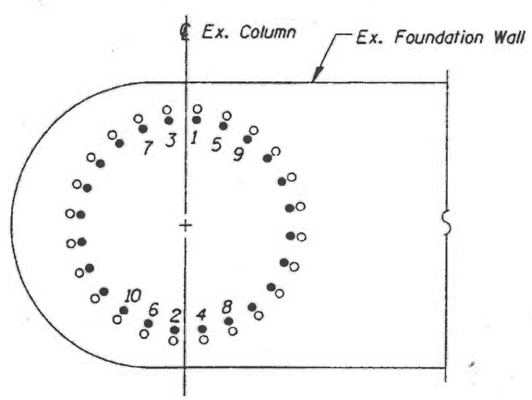
- ● Foundation Wall dowel bar (#10 or #11 bar)
- ○ Outline of column bar

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



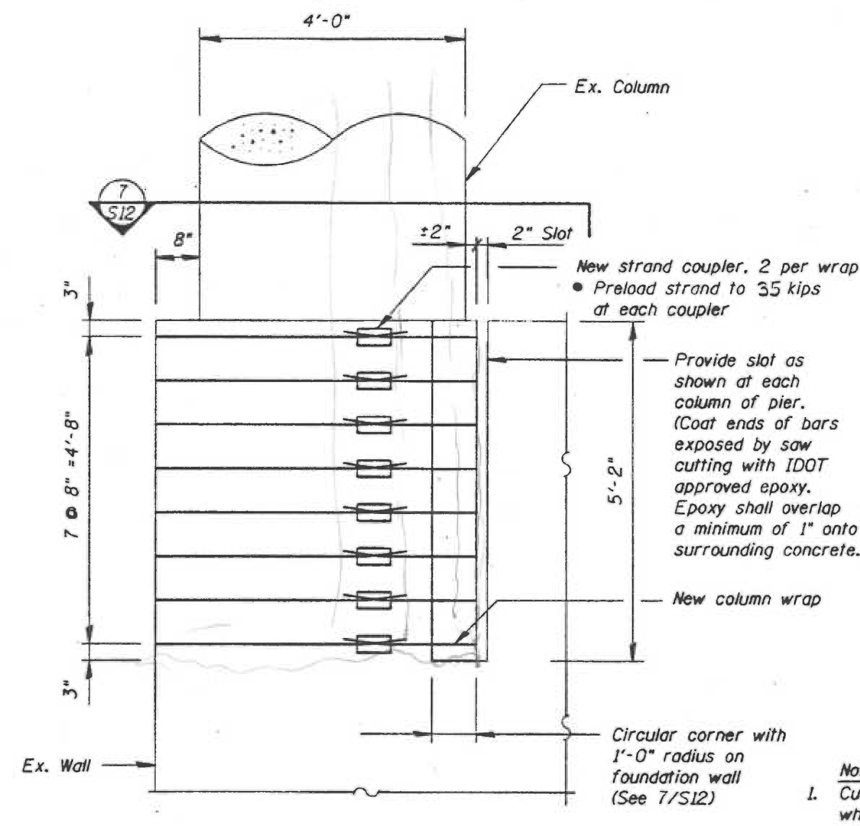
- ● Foundation Wall dowel bar (#11 bar)
- ○ Outline of column bar

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

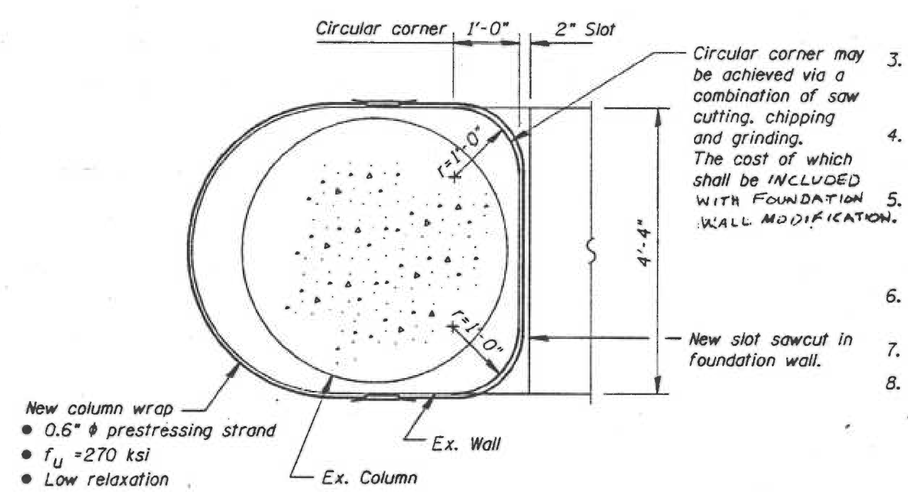


- ● Foundation Wall dowel bar (#11 bar)
- ○ Outline of column bar

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



6/S12 ELEVATION - PIER A12



7/S12 SECTION

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 70	*	ST. CLAIR	91	14
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

SHEET NO. S-12

SHEETS

* 82-3HVB-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	
01-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:

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 A6 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 $1\frac{1}{2}$" 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.

SEISMIC RETROFIT DETAILS

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
FAI ROUTE 7C
POPL... STREET

...UCTURE No. 082-0254 (ROADWAY G) STRUC... ...MP O)

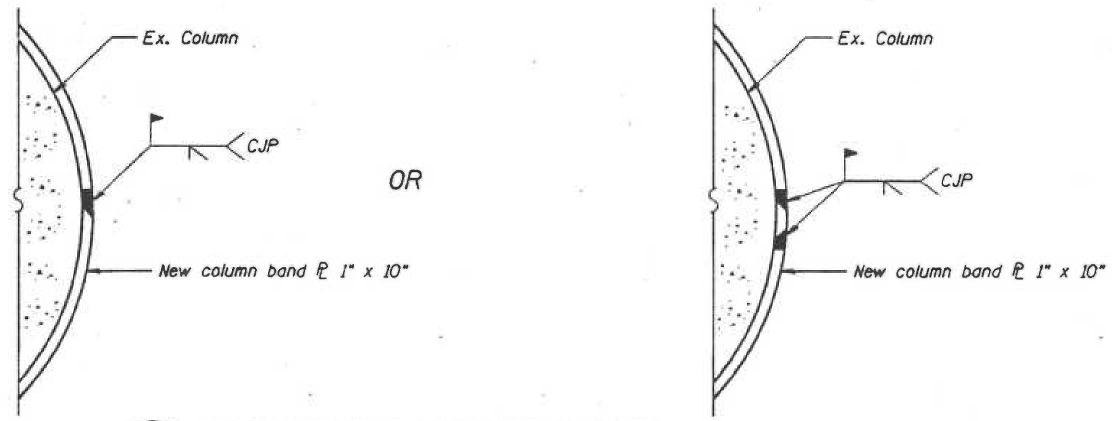
SCALE: NONE DRAWN BY JN

DATE 1-23-98 CHECKED BY HH

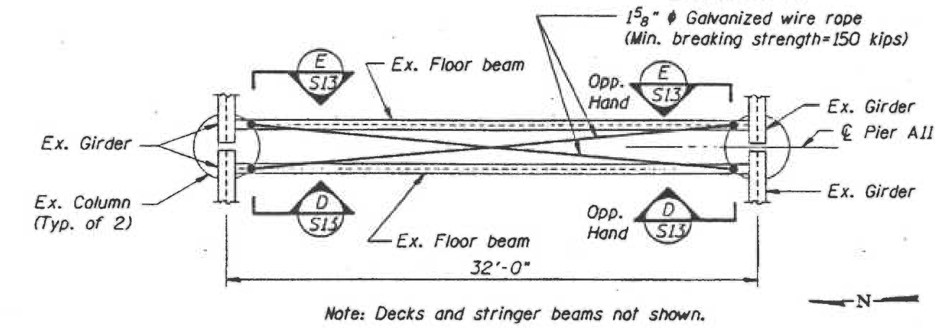
ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 70	*	ST. CLAIR	91	15
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

* 82-3HV8-2R-1-I

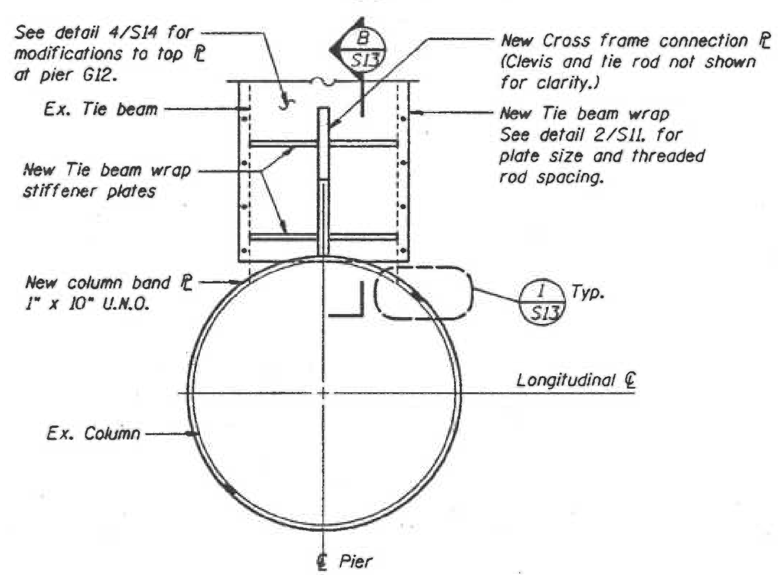
SHEET NO. S-13 SHEETS



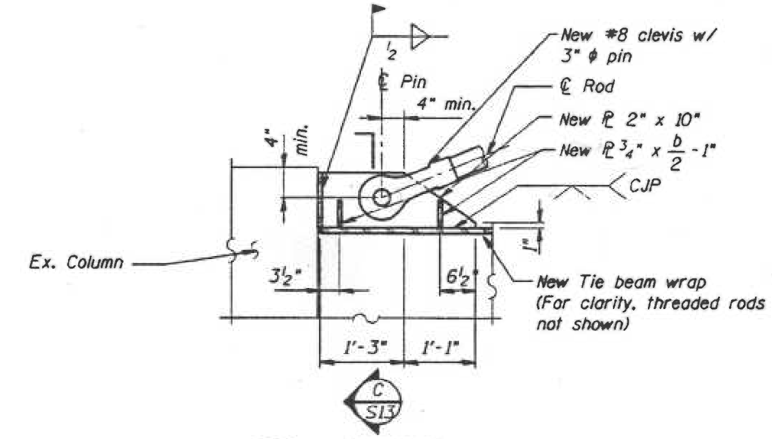
1/S13 COLUMN BAND CONNECTION OPTIONS



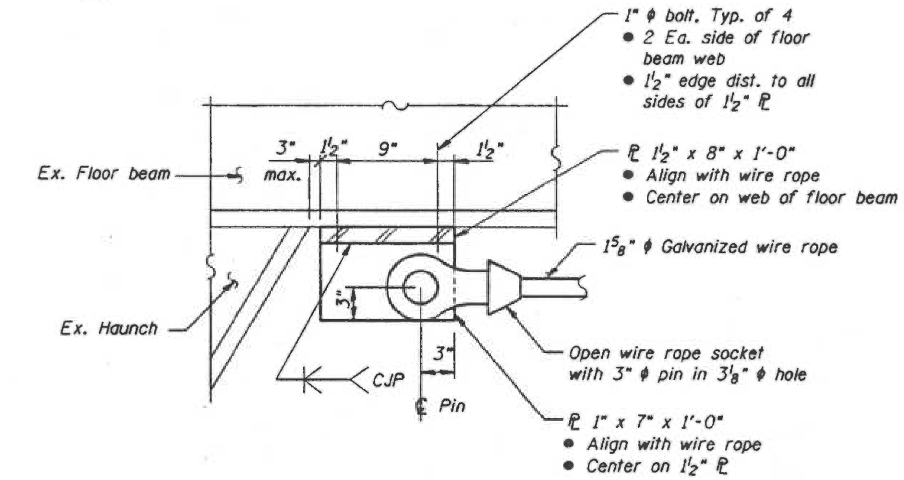
4/S13 SHEAR TRANSFER ASSEMBLY AT PIER A11



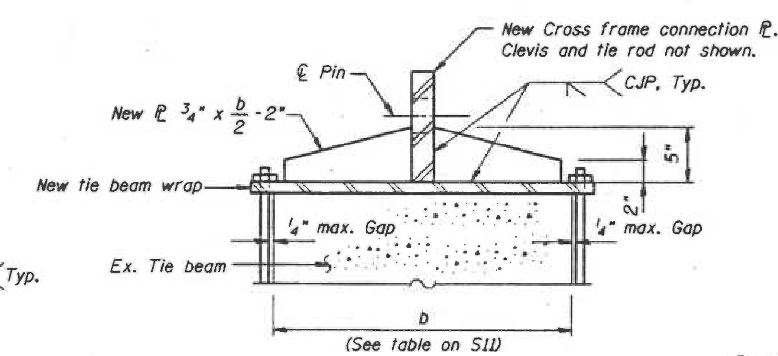
2/S13 CROSS FRAME COLUMN BAND DETAIL



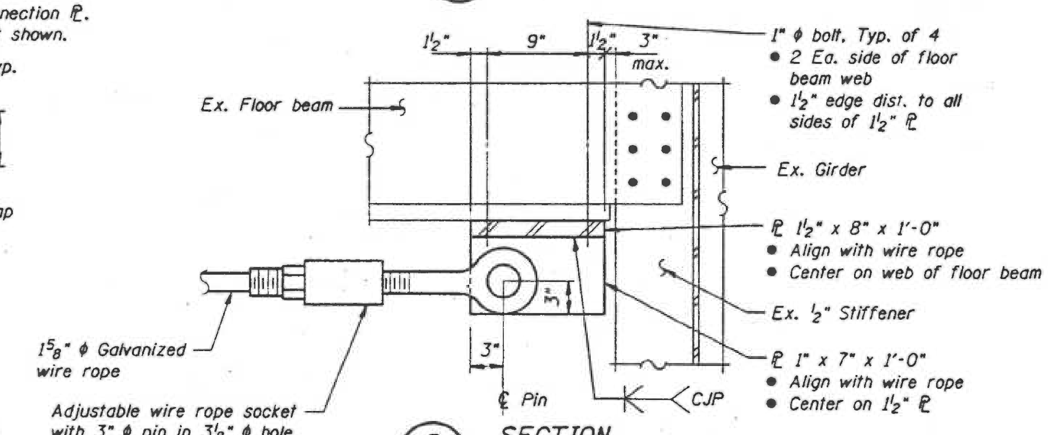
B/S13 DETAIL



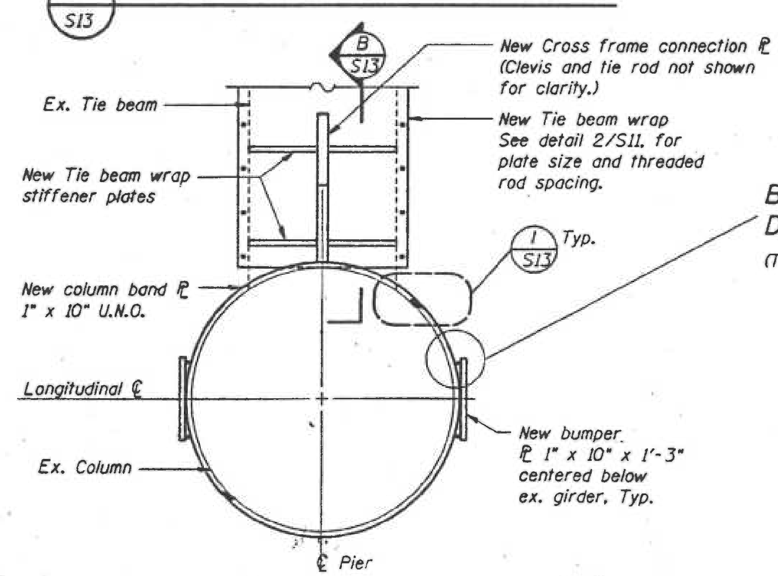
D/S13 SECTION

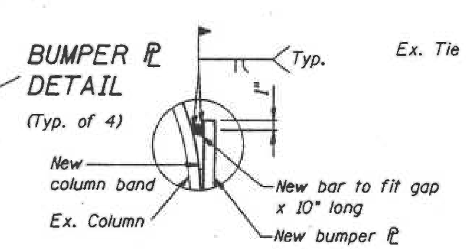


C/S13 SECTION



E/S13 SECTION





3/S13 COLUMN BAND DETAIL AT PIERS WITH BUMPERS & CROSS FRAMES

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 ... Field touch-up paint shall be INCLUDED WITH FURNISH + ERECT STRUCTURAL STEEL.

SEISMIC RETROFIT DETAILS

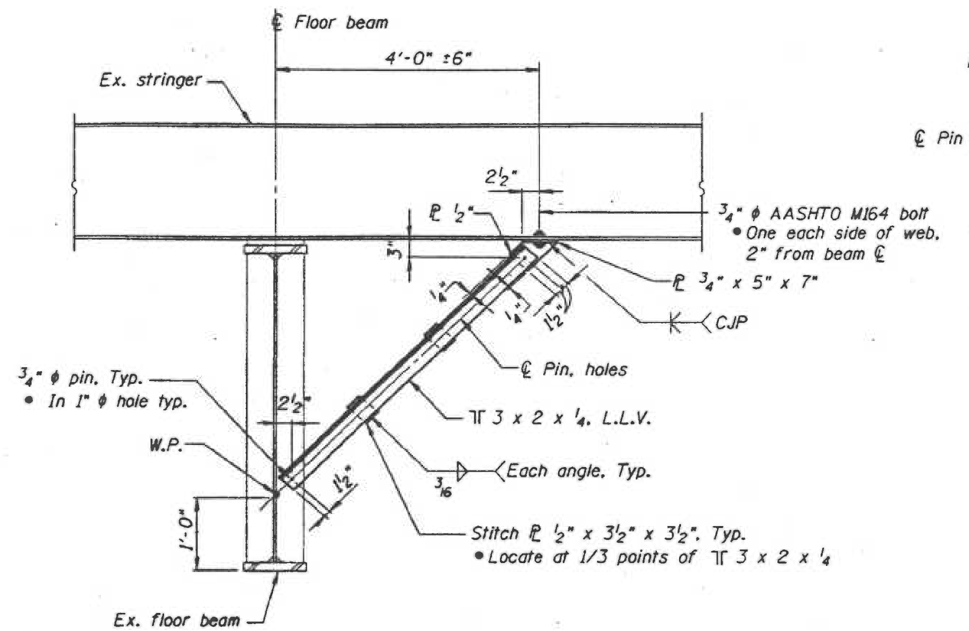
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
FAI ROUTE 70
... BRIDGE ...

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

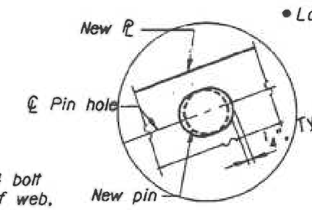
ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 70	*	ST. CLAIR	91	16
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

SHEET NO. S-14
SHEETS

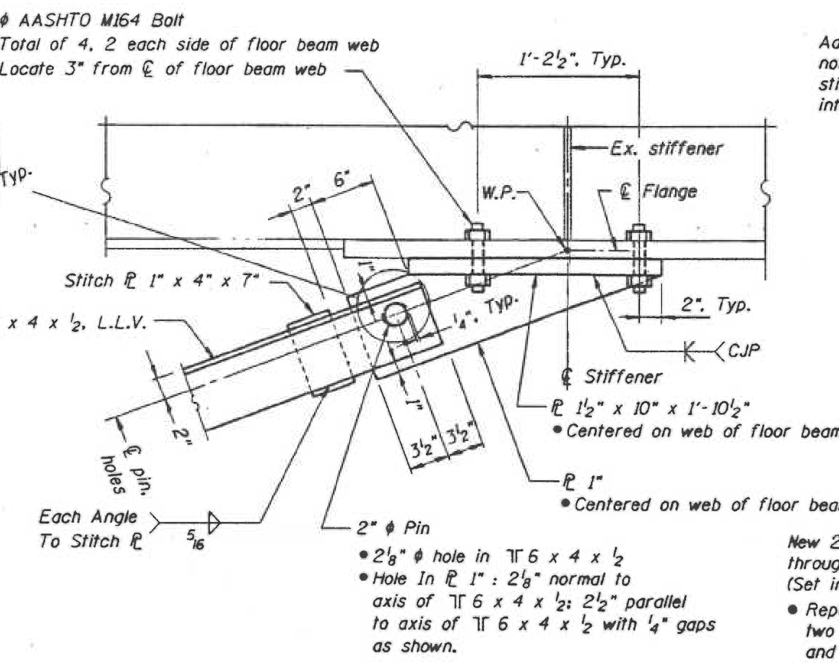
* 82-3HVB-2R-1-I



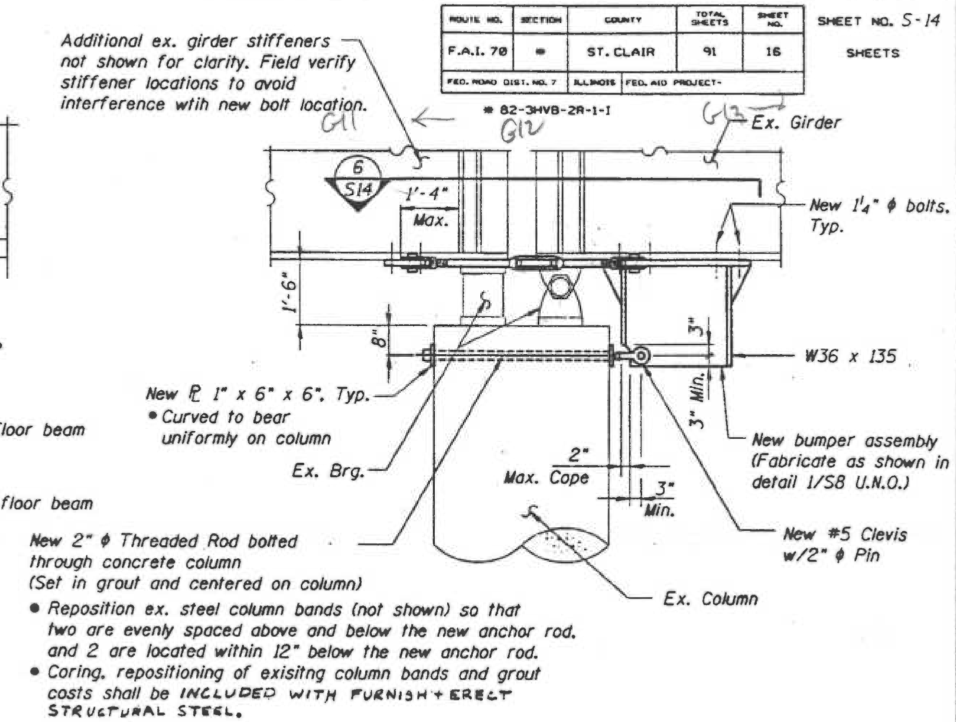
SECTION AT PIER G13 (1/S14)



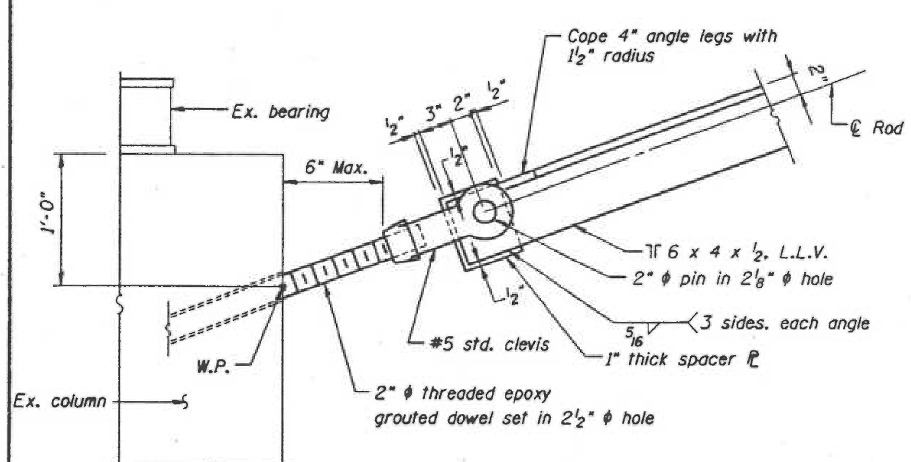
PIN HOLE DETAIL IN 1" PLATE



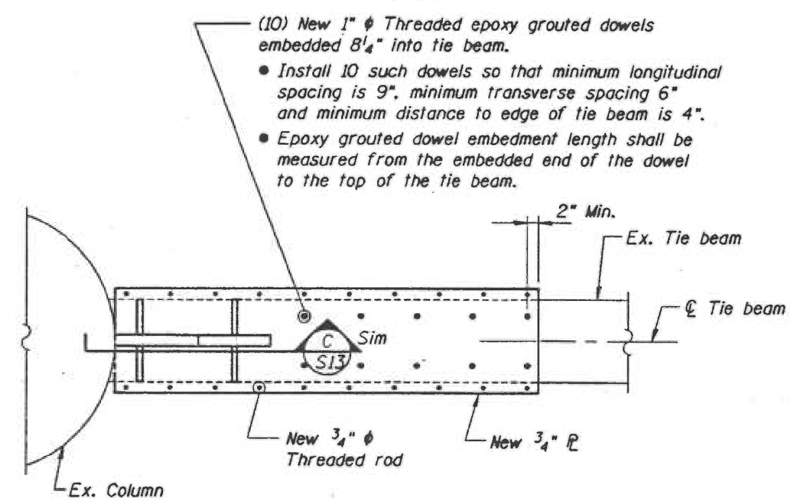
DETAIL AT PIER G13 (3/S14)



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



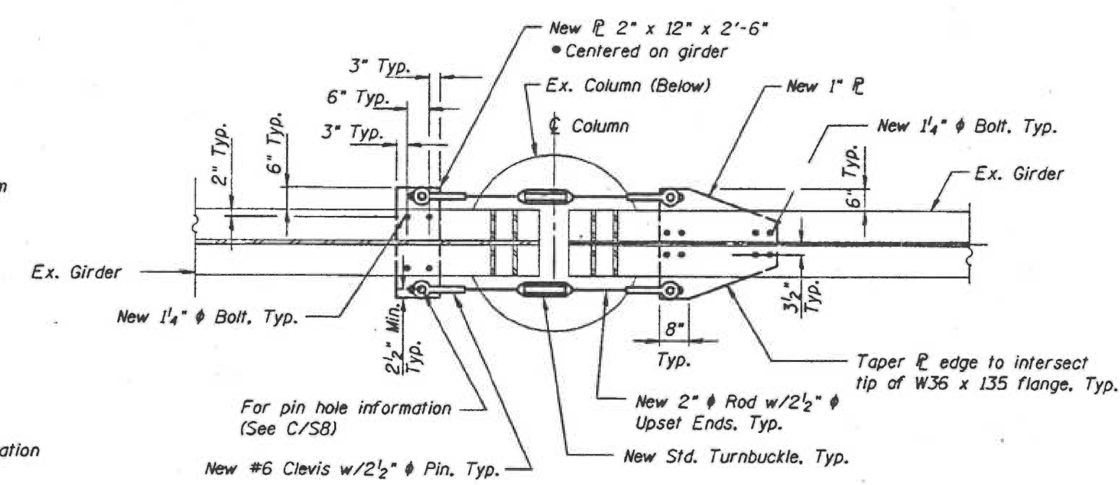
DETAIL PIER G13 (2/S14)



Note:

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

TIE BEAM TOP ℄ AT PIER G12 (4/S14)



SECTION (6/S14)

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 [illegible] EDUNDANCY RETROFIT REPAIRS
FAI [illegible]UTE 70
[illegible] IDGE APP[illegible]
[illegible] COUNTY

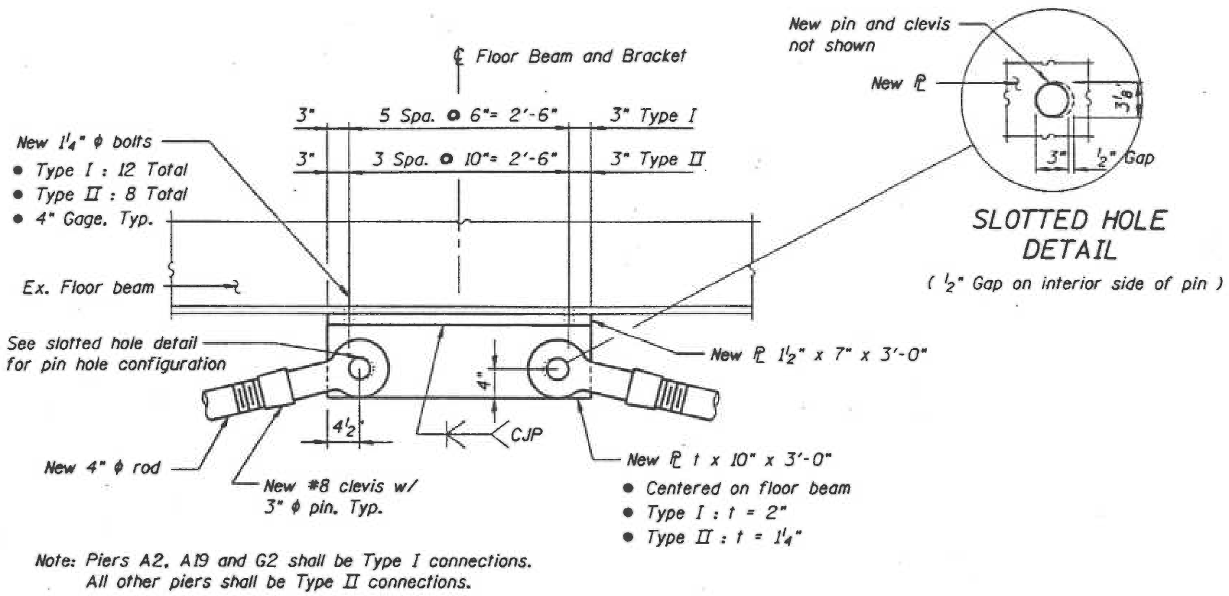
STRUCTURE NO. 082-0201 (RAMP C)
SCALE: NONE
DRAWN BY JN
DATE 1-23-98
CHECKED BY HH

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 70	*	ST. CLAIR	91	17
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

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

SHEET NO. S-15

SHEETS

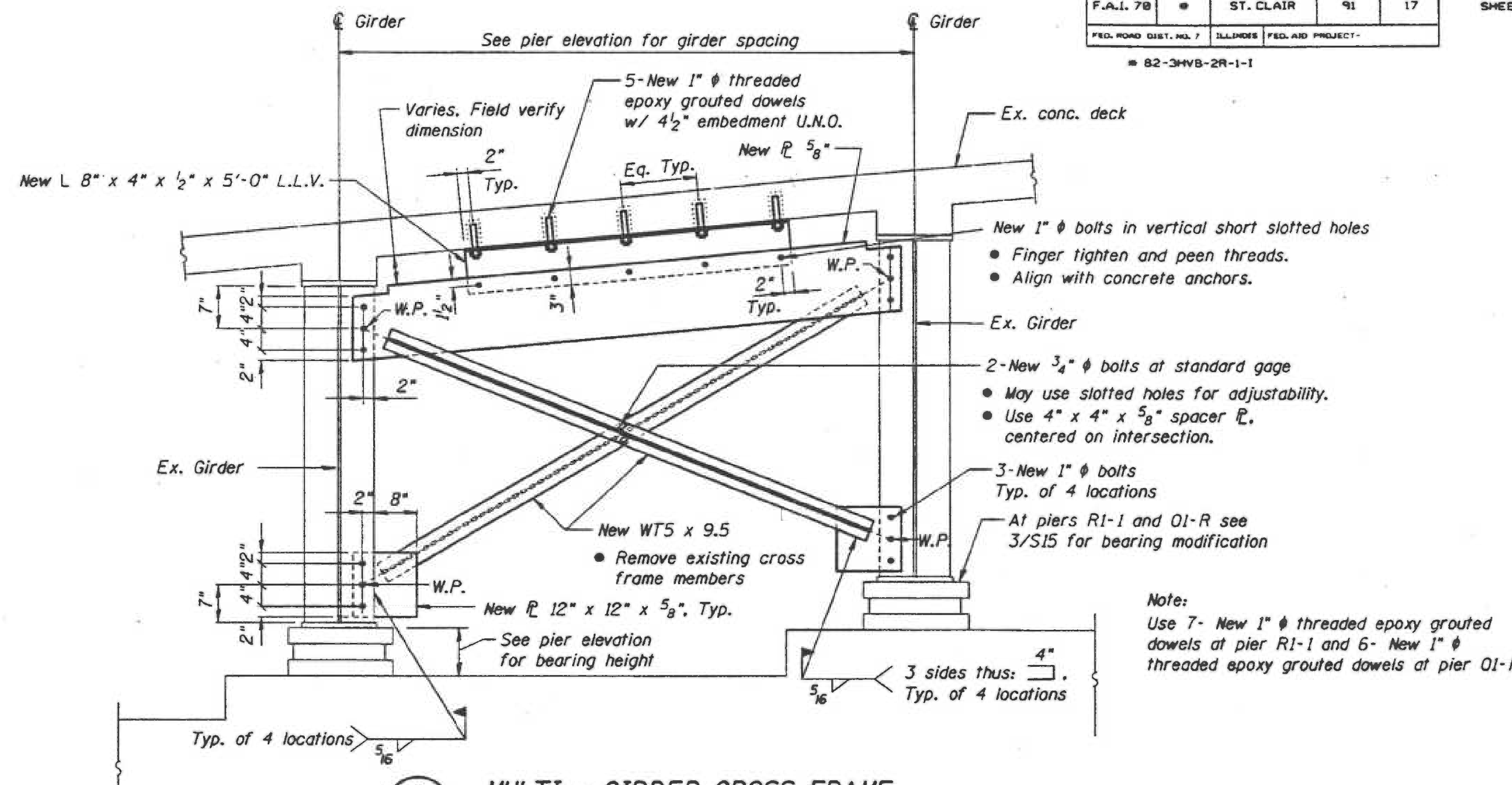


SLOTTED HOLE DETAIL

(½" Gap on interior side of pin)

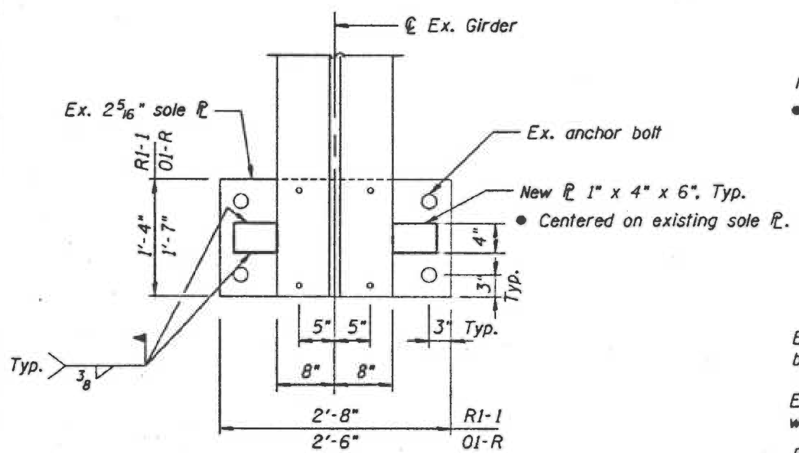
Note: Piers A2, A19 and G2 shall be Type I connections. All other piers shall be Type II connections.

1 / S15 TIE ROD CONNECTION PLATE DETAIL

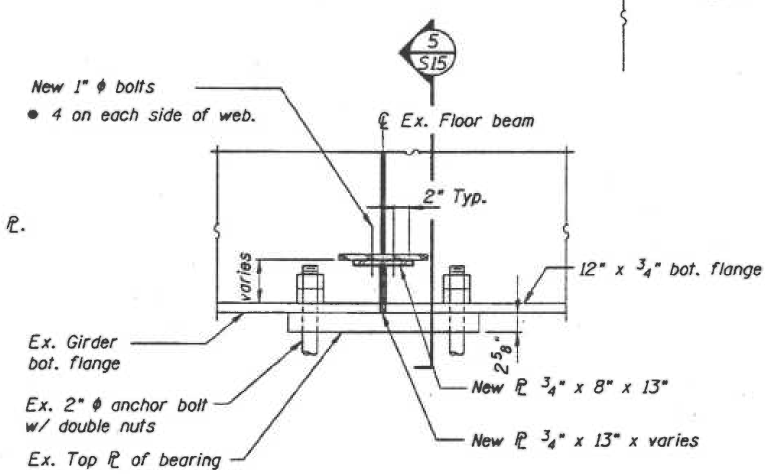


Note:
Use 7- New 1" ϕ threaded epoxy grouted dowels at pier R1-1 and 6- New 1" ϕ threaded epoxy grouted dowels at pier O1-R.

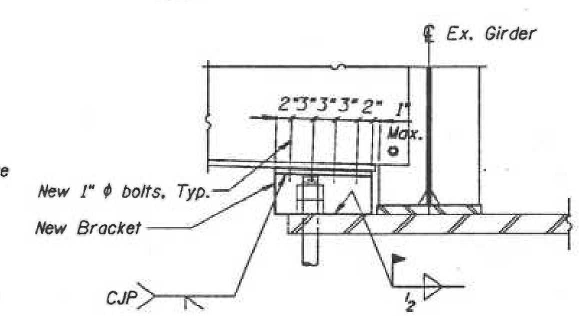
2 / S15 MULTI - GIRDER CROSS FRAME



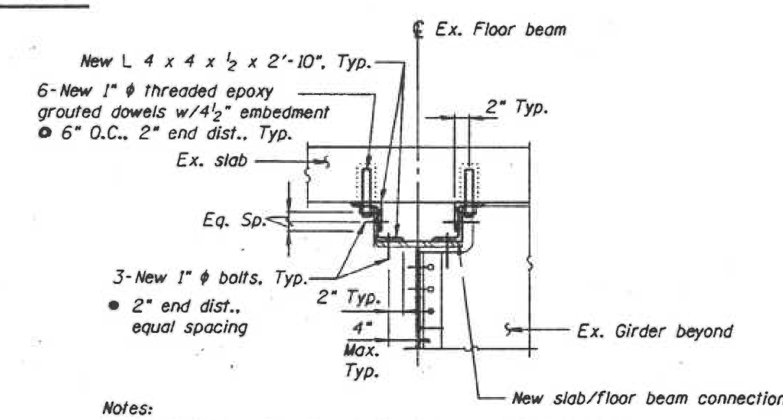
3 / S15 BEARING MODIFICATION AT R1-1 AND O1-R



4 / S15 FLOOR BEAM/BEARING CONNECTION AT PIER O1-R



5 / S15 FLOOR BEAM/BEARING CONNECTION AT PIER O1-R



Notes:

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

6 / S15 SLAB/FLOOR BEAM CONNECTION AT PIER O1-R

SEISMIC RETROFIT DETAILS

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

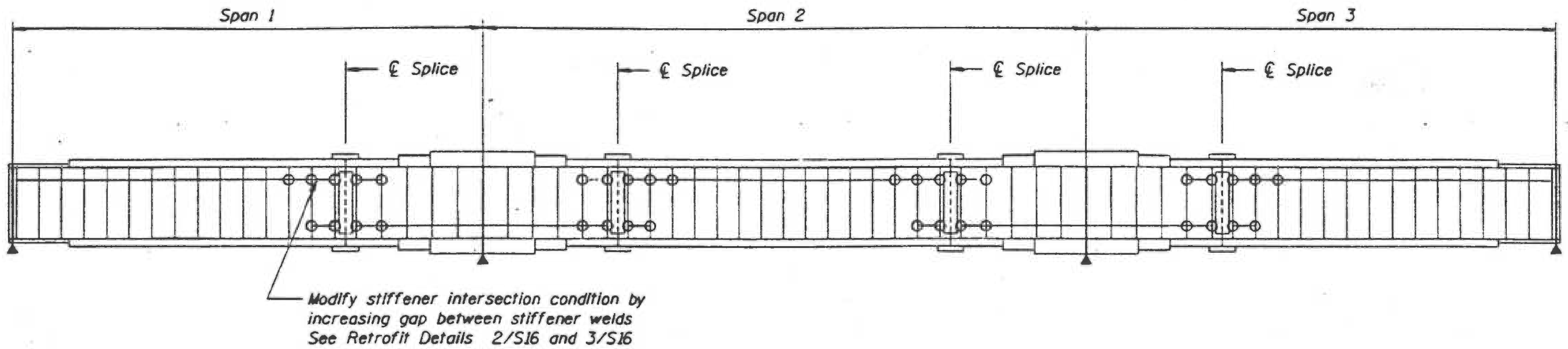
STRUCTURE NO. 082-0241 (ROADWAY A) STRUCTURE NO. 082-0253 (...)
STRUCTURE NO. 082-0254 (ROADWAY G) STRUCTURE NO. 082-0201 (RAMP ...)
SCALE: NONE DRAWN BY JN
DATE 1-23-98 CHECKED BY HH

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 70	*	ST. CLAIR	91	18
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

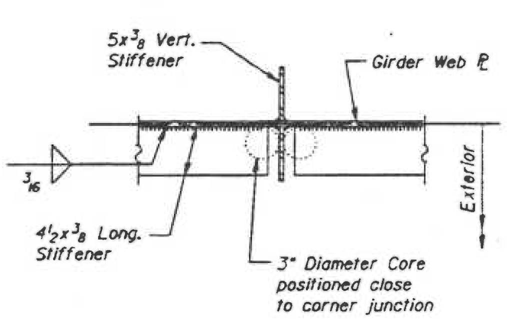
* 82-3HVB-2R-1-1

SHEET NO. S-16

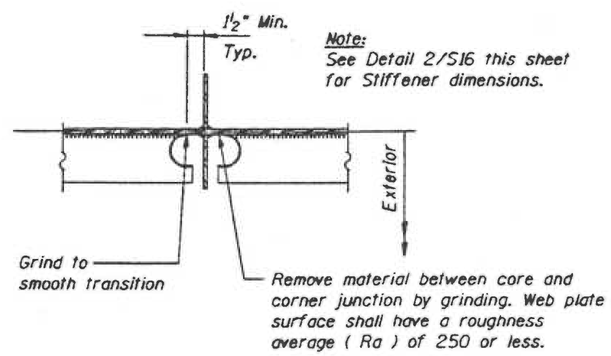
SHEETS



1/S16 GIRDER ELEVATION INDICATING TYPICAL FRACTURE CONTROL MODIFICATION LOCATIONS



2/S16 STIFFENER INTERSECTION MODIFICATION DETAIL



3/S16 STIFFENER INTERSECTION MODIFICATION DETAIL

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 (R_a)of 250 or less.
3. Remove all burrs from cut edge and check for irregularities. Cored surface shall have an R_a 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

F[illegible]

[illegible]

STRUCTURE NO. 082-0254 (ROADWA[illegible] STRUCTURE NO. 082-0201 (RAMP O)

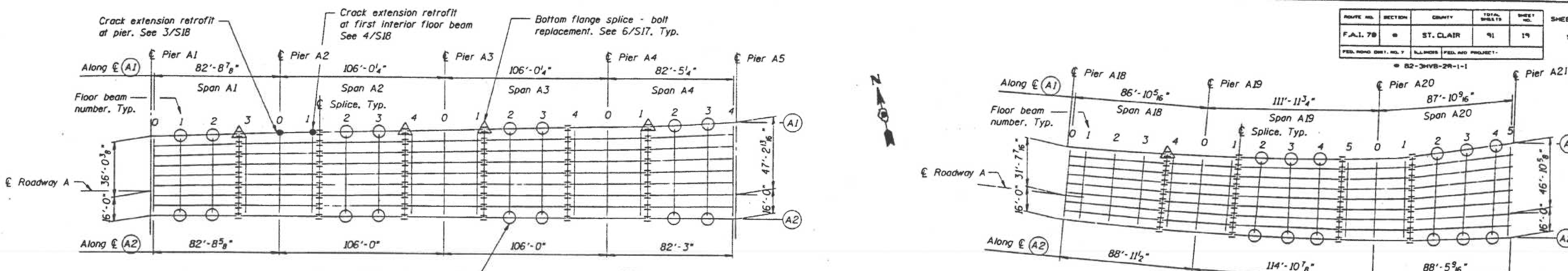
SCALE: NONE — DRAWN BY JN

DATE 1-23-98 — CHECKED BY HH

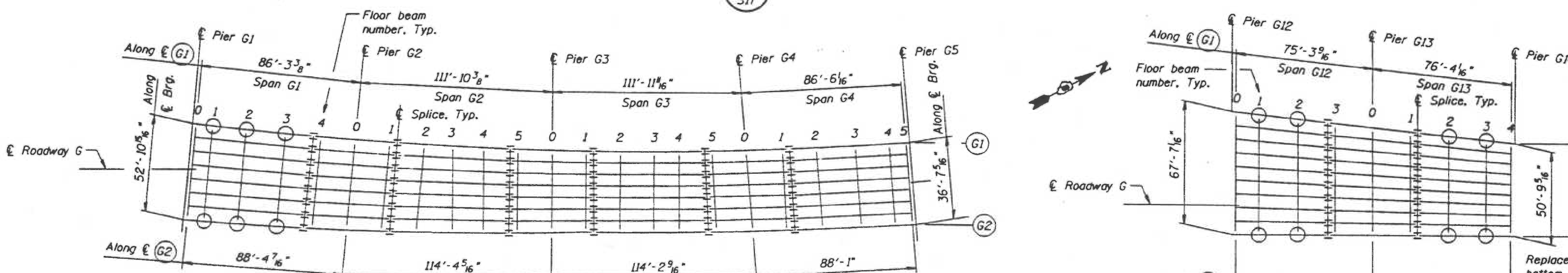
ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 70	*	ST. CLAIR	91	19

SHEET NO. S-17 SHEETS

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



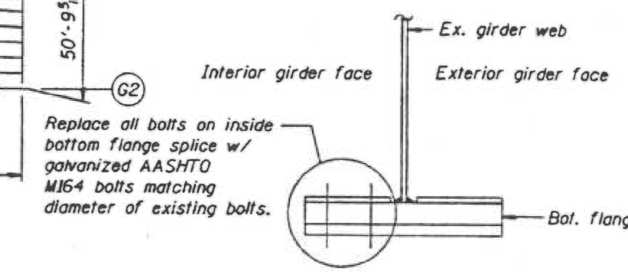
SPANS A1 THRU A4 AND A18 THRU A20 (FRAMING PLAN) (1/S17)



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

LEGEND

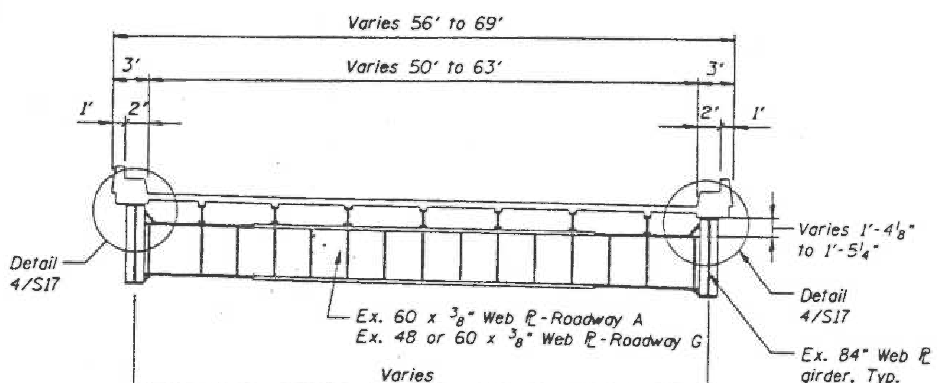
- ○ Long span floor beam retrofit (42 locations this sheet) See 3/S17.
- △ Bottom flange splice - bolt replacement (5 locations, this sheet) See 6/S17.
- ● Crack extension retrofit (2 locations, this sheet) See 3/S18 or 4/S18.



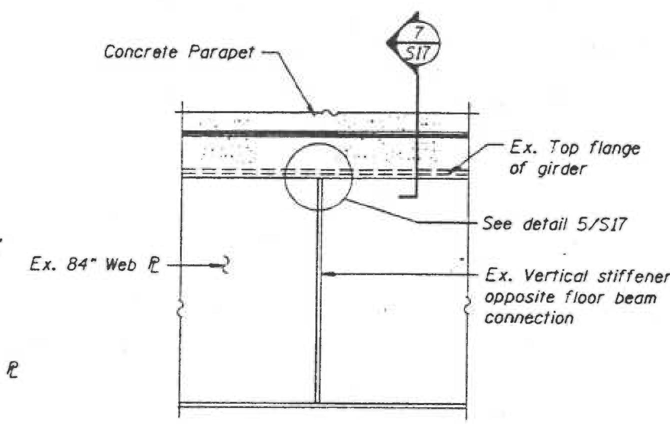
BOTTOM FLANGE SPLICE - BOLT REPLACEMENT (6/S17)

BILL OF MATERIAL

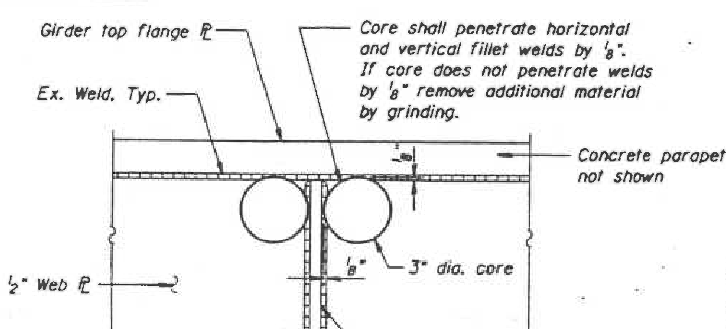
ITEM	UNIT	QUANTITY
Long span floor beam retrofit	EACH	44
Bottom flange splice - bolt replacement	EACH	14



LONG SPAN FLOOR BEAMS (> 50') (3/S17)



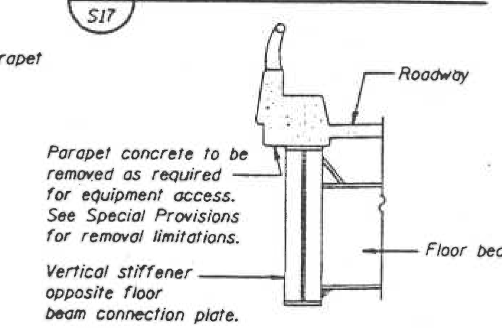
EXTERIOR ELEVATION OF GIRDER AT FLOOR BEAM CONNECTION (4/S17)



Procedure :

1. Remove parapet concrete, as required, in accordance with detail 7/S17, for equipment access.
2. 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 (R_a) of 500 or less.
3. C[illegible] surface to remove any cutting oils or rusting and paint [illegible]osed steel surface with aluminum epoxy mastic primer.
4. Obtain approval of Engineer before proceeding.
[illegible] surfaces with top coat.

LONG SPAN FLOOR BEAM RETROFIT (5/S17)

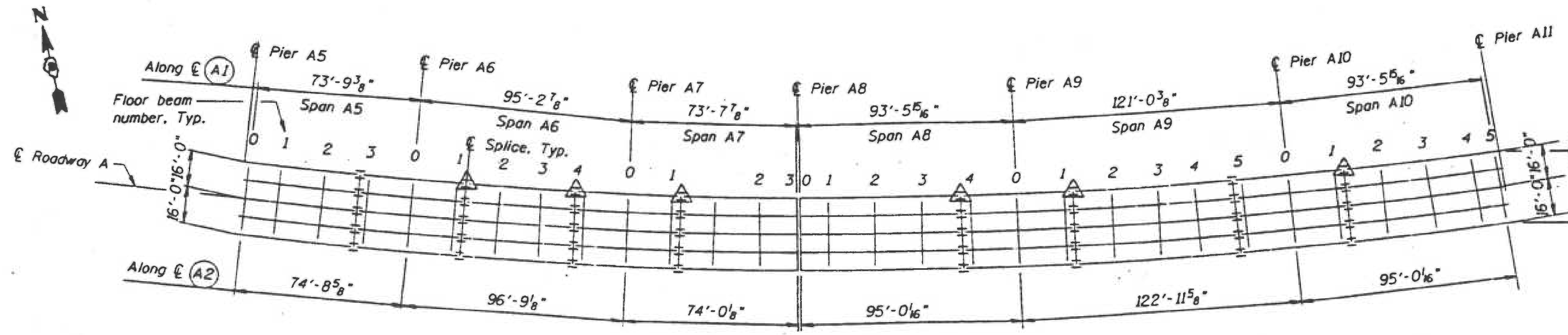


SECTION THRU GIRDER (7/S17)

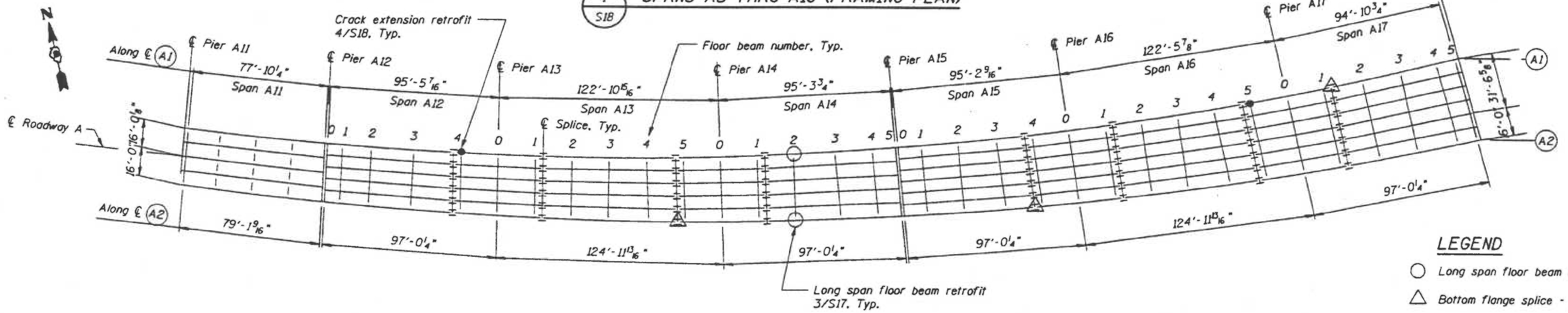
LONG SPAN FLOOR BEAM RETROFIT & BOLT REPLACEMENT

STATE OF ILLINOIS
DEPARTMENT OF TRANSPO[illegible]ATION
[illegible]SMIC AND REDUNDANC[illegible] R[illegible]FIT REP[illegible]RS
FAI [illegible]
POPLAR STREET [illegible]
ST. CL[illegible]

STRUCTURE NO. 082-0141 (ROADWAY A) STR[illegible] (RAMP R)
STRUCTURE NO. 082-0254 (ROADWAY G) STRUCTURE NO. 082-[illegible]201 (RAMP O)
SCALE: NONE DRAWN BY JN
DATE 1-23-98 CHECKED BY HH



1/S18 SPANS A5 THRU A10 (FRAMING PLAN)



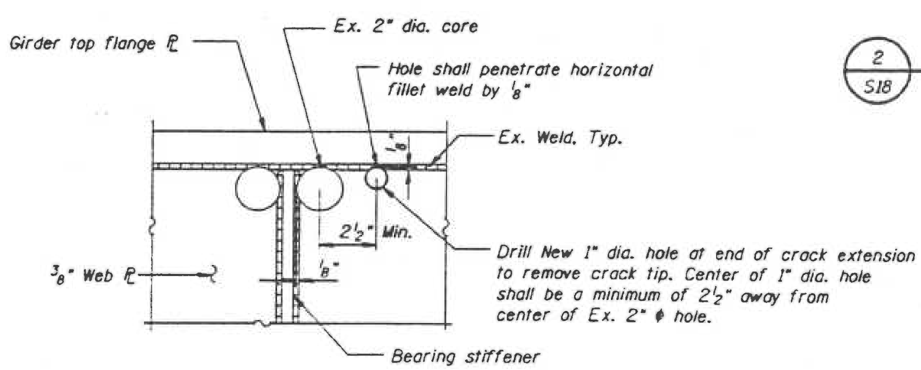
2/S18 SPANS A11 THRU A17 (FRAMING PLAN)

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.

BILL OF MATERIAL

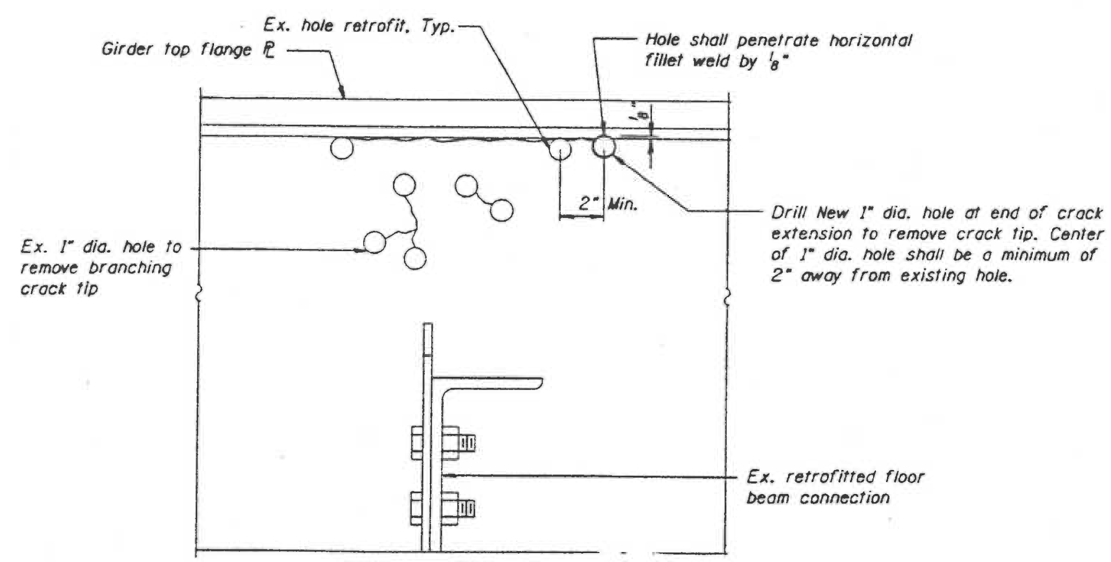
ITEM	UNIT	QUANTITY
Crack extension MODIFICATIONS	EACH	4



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 at 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 (R_a) 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.

3/S18 CRACK EXTENSION RETROFIT AT PIER



4/S18 CRACK EXTENSION RETROFIT AT FIRST INTERIOR FLOOR BEAMS

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 70	●	ST. CLAIR	91	20
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

● 82-3HVB-2R-1-1

SHEET NO. S-18

SHEETS

CRACK EXTENSION RETROFITS

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REP
FAI ROUTE 70
[illegible] BRIDGE
ST. CLAIR COUNTY

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

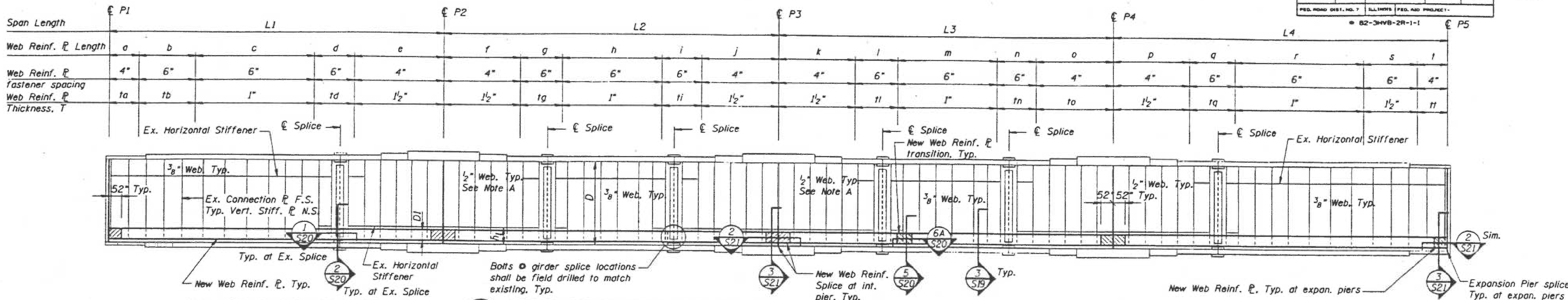
\STRUC\...\97422\SE11\S11OTS18.DGN

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 70	*	ST. CLAIR	91	21
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

SHEET NO. S-19

SHEETS

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



Note A: 3/8" webs at piers A6, A7, G10 and G11.

1 S19 GIRDER 2 ELEVATION INDICATING TYPICAL REDUNDANCY RETROFIT LOCATIONS

(Girder 1 Opposite Hand)

TABLE OF WEB REINFORCEMENT PLATE PARAMETERS

Roadway	Girder	Span 1										Span 2								
		P1	L1	a	ta	b	tb	c	d	td	e	P2	L2	f	g	tg	h	i	ti	j
			ft.	ft.	in.	ft.	in.	ft.	ft.	in.	ft.		ft.	ft.	ft.	in.	ft.	ft.	in.	ft.
A	1	A1	82.74	5.33	1½	9.00	1½	34.00	9.50	1½	24.67	A2	106.02	25.33	10.00	1½	35.50	9.50	1½	25.67
A	2	A1	82.72	5.33	1½	9.00	1½	34.00	9.50	1½	24.67	A2	106.00	25.00	10.00	1½	35.50	9.50	1½	25.67
A	1	A5	73.78	4.67	1	0.00	1	49.50	14.50	1	5.00	A6	95.24	4.00	12.50	1	63.00	11.50	1	4.00
A	2	A5	74.72	4.67	1	0.00	1	50.50	14.50	1	5.00	A6	96.76	4.33	12.50	1	64.00	11.50	1	4.33
A	1	A8	93.45	4.00	1	0.00	1	63.00	12.00	1	14.33	A9	121.03	14.33	13.00	1	67.00	12.50	1	14.00
A	2	A8	95.00	4.00	1	0.00	1	64.00	12.50	1	14.33	A9	122.97	14.33	13.50	1	68.00	13.00	1	14.00
A	1	A12	95.45	6.00	1	0.00	1	61.00	12.00	1	16.33	A13	122.91	16.67	12.50	1	63.50	13.00	1	17.33
A	2	A12	97.02	6.00	1	0.00	1	62.00	12.00	1	17.00	A13	124.98	17.00	13.00	1	64.50	13.00	1	17.33
A	1	A15	95.21	12.00	1	0.00	1	47.50	10.00	1	25.67	A16	122.49	25.67	11.00	1	48.50	10.00	1	27.00
A	2	A15	97.02	12.33	1	0.00	1	48.50	10.00	1	26.00	A16	124.98	26.00	11.00	1	49.50	10.00	1	28.33
A	1	A18	86.86	5.33	1½	9.50	1½	35.50	9.50	1½	27.00	A19	111.98	28.00	10.50	1½	36.00	10.00	1½	27.33
A	2	A18	88.96	5.33	1½	10.00	1½	36.50	10.00	1½	27.00	A19	114.91	29.00	11.00	1½	37.00	10.50	1½	27.33
G	1	G1	86.28	5.67	1½	9.50	1½	35.50	11.00	1½	24.33	G2	111.87	25.33	11.50	1½	40.00	11.00	1½	24.00
G	2	G1	88.37	5.67	1½	10.00	1½	36.50	11.00	1½	25.00	G2	114.36	25.67	11.50	1½	41.00	11.50	1½	24.67
G	1	G5	85.55	4.67	1	0.00	1	56.00	14.00	1½	10.67	G6	109.16	9.67	15.00	1½	61.50	14.50	1½	8.33
G	2	G5	86.99	5.00	1	0.00	1	57.00	14.00	1½	10.67	G6	110.87	9.67	15.00	1½	62.50	15.00	1½	8.67
G	1	G9	88.58	3.67	1	0.00	1	61.00	15.00	1½	8.67	G10	115.14	8.67	16.00	1½	66.50	15.50	1½	8.33
G	2	G9	89.92	3.67	1	0.00	1	62.00	15.50	1½	8.67	G10	116.87	8.67	16.00	1½	67.50	16.00	1½	8.67
G	1	G12	75.30	8.33	1½	8.50	1½	30.00	9.00	1½	19.33	G13	76.34	19.67	9.50	1½	32.50	8.50	1½	6.00
G	2	G12	75.44	8.33	1½	8.50	1½	30.00	9.00	1½	19.33	G13	76.00	19.67	9.50	1½	32.50	8.50	1½	5.67

Roadway	Girder	Span 3										Span 4									
		P3	L3	k	l	tl	m	n	tn	o	to	P4	L4	p	q	tq	r	s	t	tt	P5
			ft.	ft.	ft.	in.	ft.	ft.	in.	ft.	in.		ft.	ft.	ft.	in.	ft.	ft.	ft.	in.	
A	1	A3	106.02	25.00	10.00	1½	34.50	9.50	1½	27.00	1½	A4	82.44	26.00	9.50	1½	32.00	8.00	6.67	1½	A5
A	2	A3	106.00	25.00	10.00	1½	34.50	9.50	1½	27.00	1½	A4	82.25	26.00	9.50	1½	32.00	8.00	6.67	1½	A5
A	1	A7	73.66	4.33	12.00	1	54.00	0.00	1	3.33	1	A8	—								—
A	2	A7	74.84	4.33	12.00	1	55.00	0.00	1	3.33	1	A8	—								—
A	1	A10	93.50	14.00	12.50	1	63.00	0.00	1	3.67	1	A11	—								—
A	2	A10	95.00	14.33	13.00	1	64.00	0.00	1	3.67	1	A11	—								—
A	1	A14	95.31	17.67	12.00	1	58.50	0.00	1	7.33	1	A15	—								—
A	2	A14	97.02	18.00	12.50	1	59.50	0.00	1	7.33	1	A15	—								—
A	1	A17	94.90	27.33	9.50	1	44.00	8.50	1	5.33	1½	A18	—								—
A	2	A17	97.02	28.00	10.00	1	45.00	8.50	1	5.33	1½	A18	—								—
A	1	A20	87.88	27.33	9.50	1½	33.50	9.00	1½	8.33	1½	A21	—								—
A	2	A20	88.46	27.33	10.00	1½	34.00	9.00	1½	8.33	1½	A21	—								—
G	1	G3	111.97	24.00	12.00	1½	42.00	12.00	1½	22.00	1½	G4	86.51	21.33	12.00	1½	41.00	0.00	12.00	1½	G5
G	2	G3	114.21	24.67	12.00	1½	43.00	12.00	1½	22.33	1½	G4	88.08	21.67	12.00	1½	42.00	0.00	12.33	1½	G5
G	1	G7	109.18	8.67	15.50	1½	62.00	15.00	1½	8.00	1½	G8	85.60	8.33	15.00	1	58.50	0.00	3.67	1	G9
G	2	G7	110.83	8.67	15.50	1½	63.00	15.50	1½	8.00	1½	G8	86.90	8.67	15.00	1	59.50	0.00	3.67	1	G9
G	1	G11	88.58	8.33	15.50	1½	61.00	0.00	1	3.67	1	G12	—								—
G	2	G11	89.92	8.67	15.50	1½	62.00	0.00	1	3.67	1	G12	—								—
G	1	G14	—									—	—								—
G	2	G14	—									—	—								—

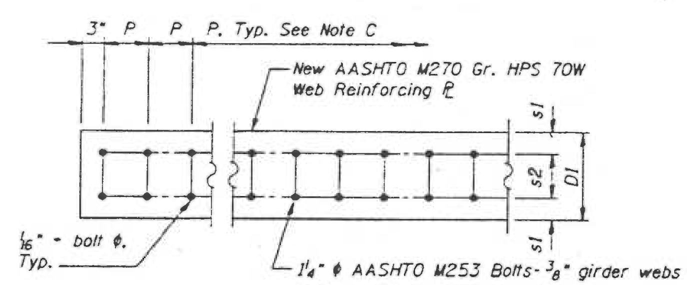
Note D: See S-20 and S-21 for additional web plate details.

MINIMUM BOLT LENGTH

Bolt Diameter	Girder Web Plate	Total Reinforcement Plate Thickness							
		1	1½	2	2½	3	3¼	3½	3¾"
in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
1½	½	3¾	4¼	4¾	5¼	5¾	6	6¼	6½
1¼	3/8	3½	4	4½	5	5½	na	na	na

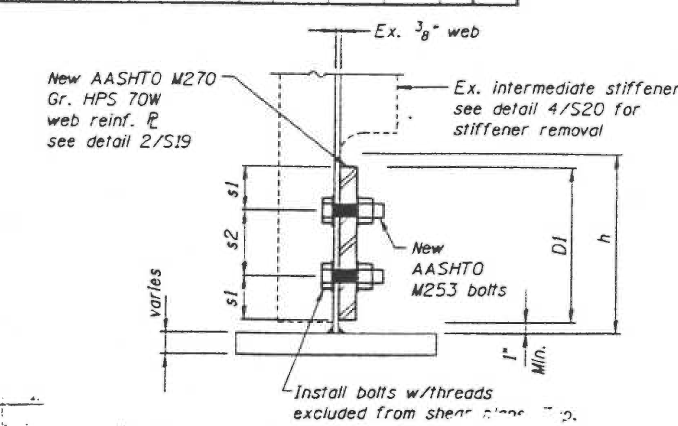
Note B : Includes (1) 5/32" hardened washer each end.

Roadway Spans	Web Reinforcement Plate					
	D	D1	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



Note C:
Bolt hole locations must be field verified.
Longitudinal hole positions will require adjustments in the vicinity of floor beam connections, interior stiffener plates and ... splices.

2 S19 WEB REINFORCEMENT PLATE ELEVATION

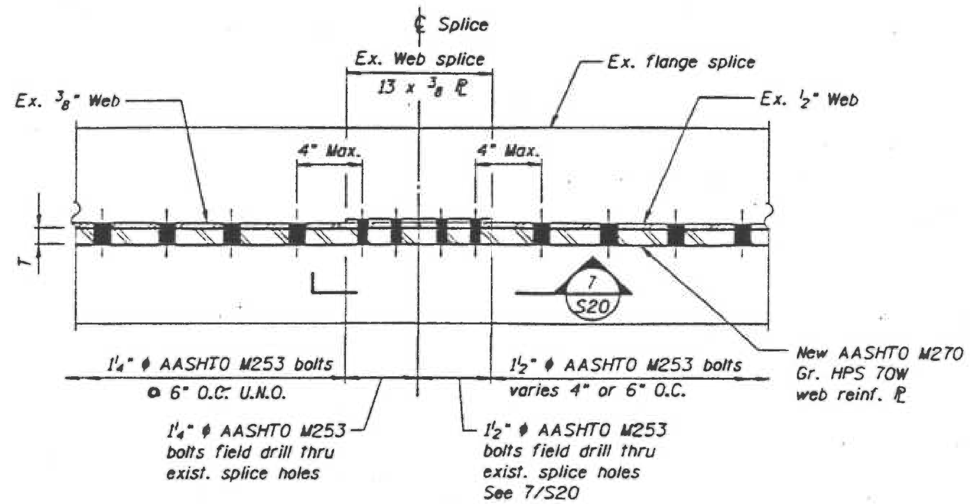


3 S19 TYPICAL WEB REINFORCEMENT PLATE

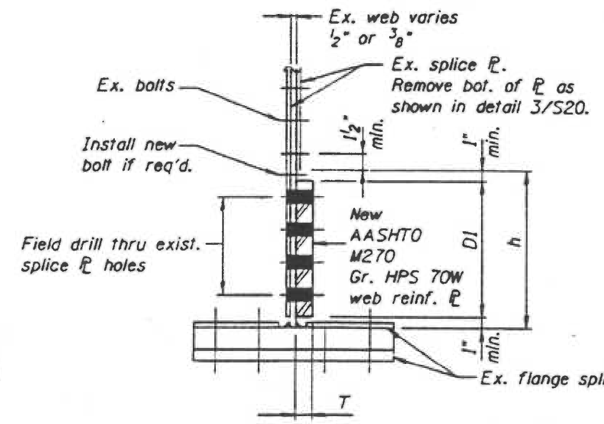
BILL OF MATERIAL		
ITEM	UNIT	QUANTITY
Steel girder web reinforcement plate	Lbs.	436800
Vertical WEB stiffener REMOVAL	EACH	1571

REDUNDANCY RETROFIT DETAILS

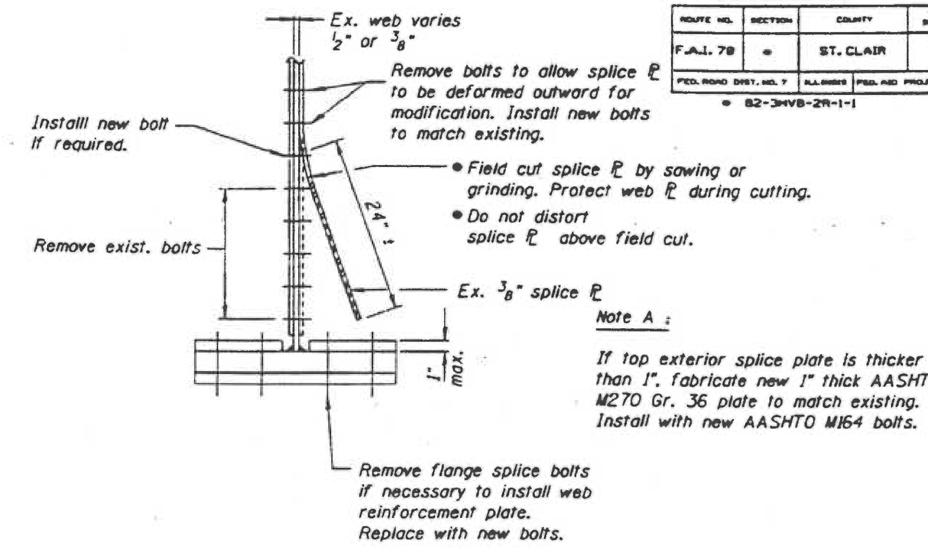
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
FAI ROUTE 70
POPLAR STREET BRIDGE APPROACHES
ST. CLAIR COUNTY
STRUCTURE NO. ... (ROADWAY A) STRUCTURE NO. ... (RAMP ...)
STRUCTURE NO. ... (ROADWAY G) STRUCTURE NO. ... 0201 (RAMP G)
SCALE: NONE DRAWN BY JN
DATE 1-23-98 CHECKED BY HH



WEB REINFORCEMENT PLATE AT GIRDER WEB SPLICE
1 / S20



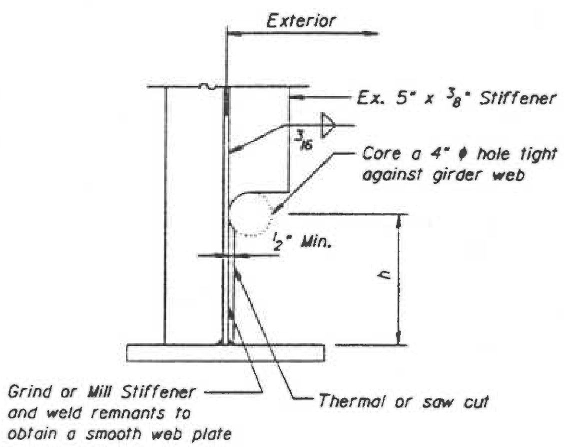
WEB REINFORCEMENT PLATE AT GIRDER WEB SPLICE
2 / S20



Note A :

If top exterior splice plate is thicker than 1", fabricate new 1" thick AASHTO M270 Gr. 36 plate to match existing. Install with new AASHTO M164 bolts.

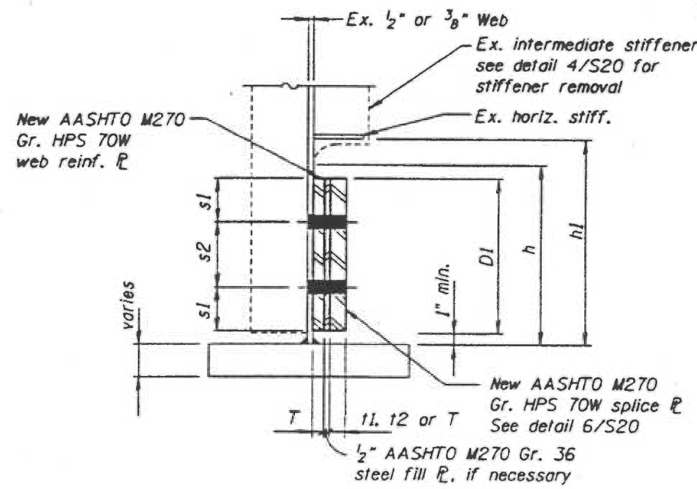
GIRDER SPLICE PLATE MODIFICATION
3 / S20



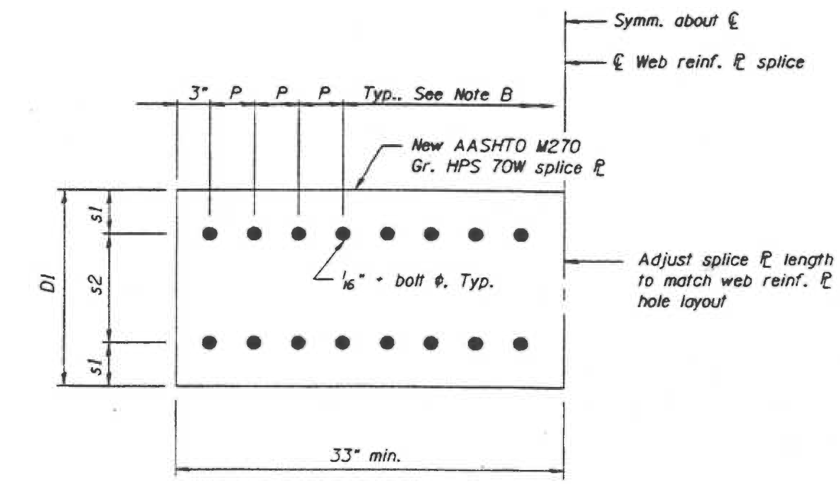
VERTICAL STIFFENER MODIFICATION
4 / S20

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.



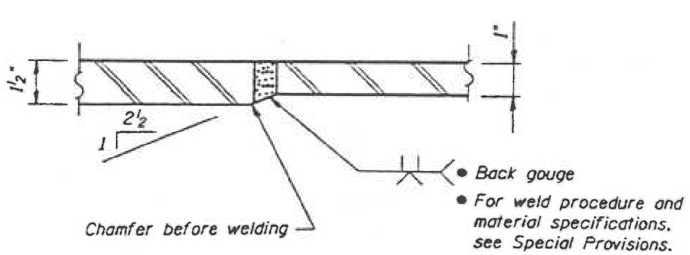
TYPICAL WEB REINFORCEMENT PLATE SPLICE
5 / S20



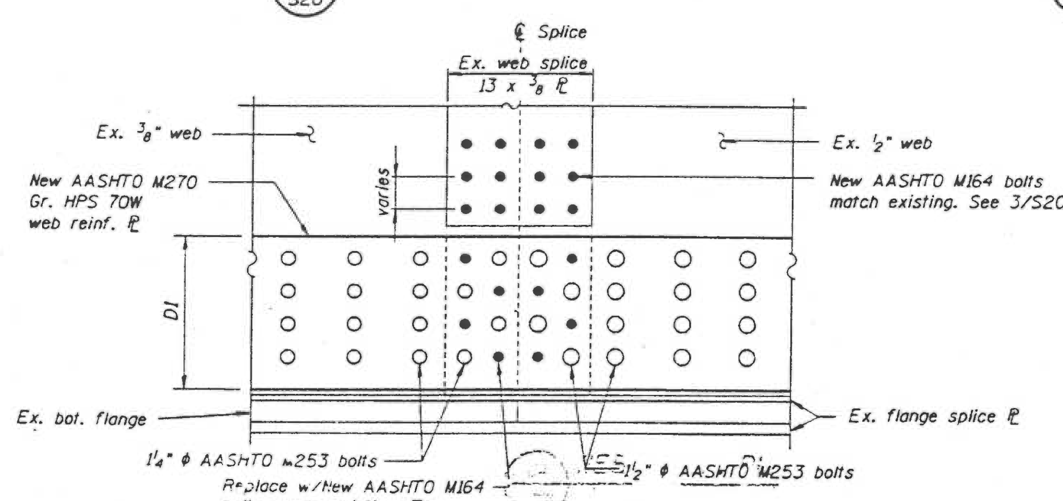
TYPICAL WEB REINFORCEMENT SPLICE PLATE
6 / S20

Note B : For splice locations other than at piers

- Hole size and spacing to match web reinf. ℄.
- Splice ℄ thickness to match greater web reinf. ℄ thickness.
- Min. no. fasteners = 32
- Alternate butt weld (See detail 6A/S20)



ALT. BUTT WELD SPLICE AT REINF. ATE TRANSITION



ELEVATION AT GIRDER WEB SPLICE
7 / S20

Notes :

1. See sheet S-19 for dimensions D1, h, h1, s1 & s2.
2. See sheet S-21 for ...nsions t1 & t2.
3. T = thickness of ... ℄.

REDUNDANCY RETROFIT DETAILS

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

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

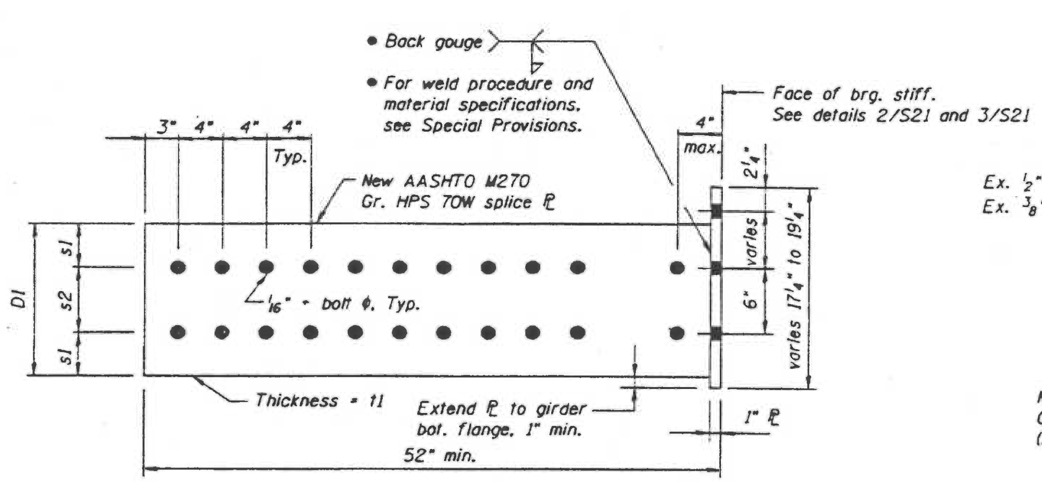
ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 70	*	ST. CLAIR	91	23

FED. ROAD DIST. NO. 7 | ILLINOIS | FED. AID PROJECT-

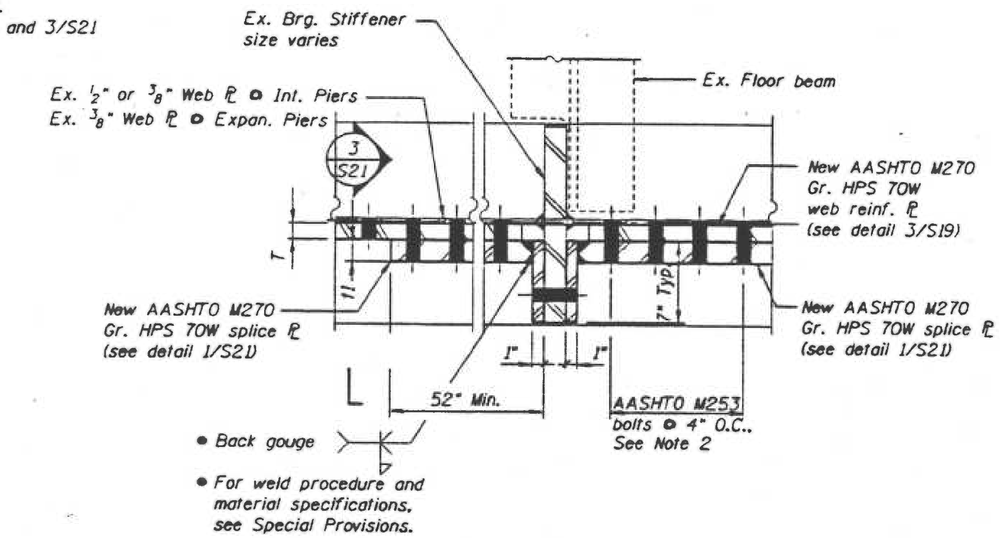
* 82-3HVB-2R-1-1

SHEET NO. S-21

SHEETS



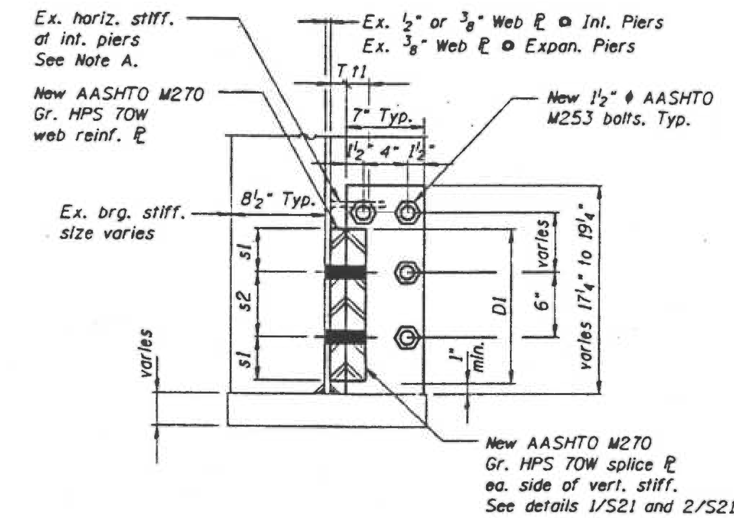
1/S21 TYPICAL WEB REINFORCEMENT SPLICE PLATE AT PIERS



2/S21 WEB REINFORCEMENT PLATE SPLICE AT BEARING STIFFENER

Notes:

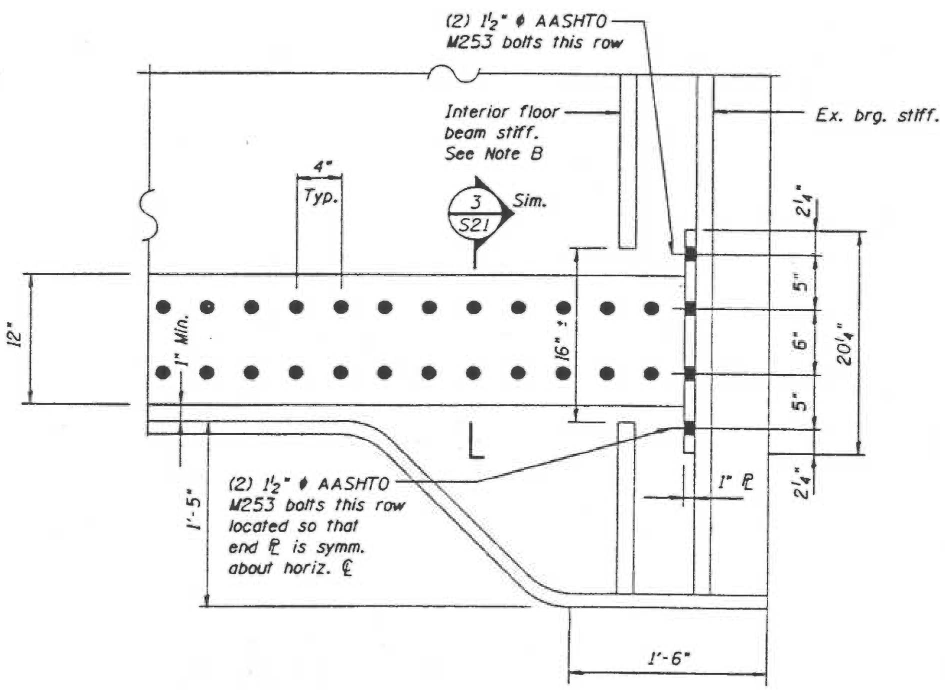
1. Web reinforcement plate splice symmetric around interior bearing stiffener.
2. 1½" ϕ AASHTO M253 bolts in all ½" girder webs, threads excluded from shear plane. 1¼" ϕ AASHTO M253 bolts in all ⅜" girder webs, threads excluded from shear plane.
3. Preload 1½" ϕ AASHTO M253 bolts to proof load. Preload 1¼" ϕ AASHTO M253 bolts to proof load.



3/S21 WEB REINFORCEMENT PLATE AT PIERS

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
	t1	t2
	in.	in.
A1-A4	1¾	1½
A5-A7	1½	1
A8-A10	1½	1½
A12-A14	1¾	1½
A15-A17	2	1½
A18-A20	1½	1½
G1-G4	1½	1½
G5-G8	1½	1½
G9-G11	1½	1½
G12-G13	1¾	1½



4/S21 WEB REINFORCEMENT SPLICE PLATE AT HAUNCH

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.

REDUNDANCY RETROFIT DETAILS

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
FAI ROUTE 70
[illegible] STREET BR[illegible]
ST. CLAIR [illegible]

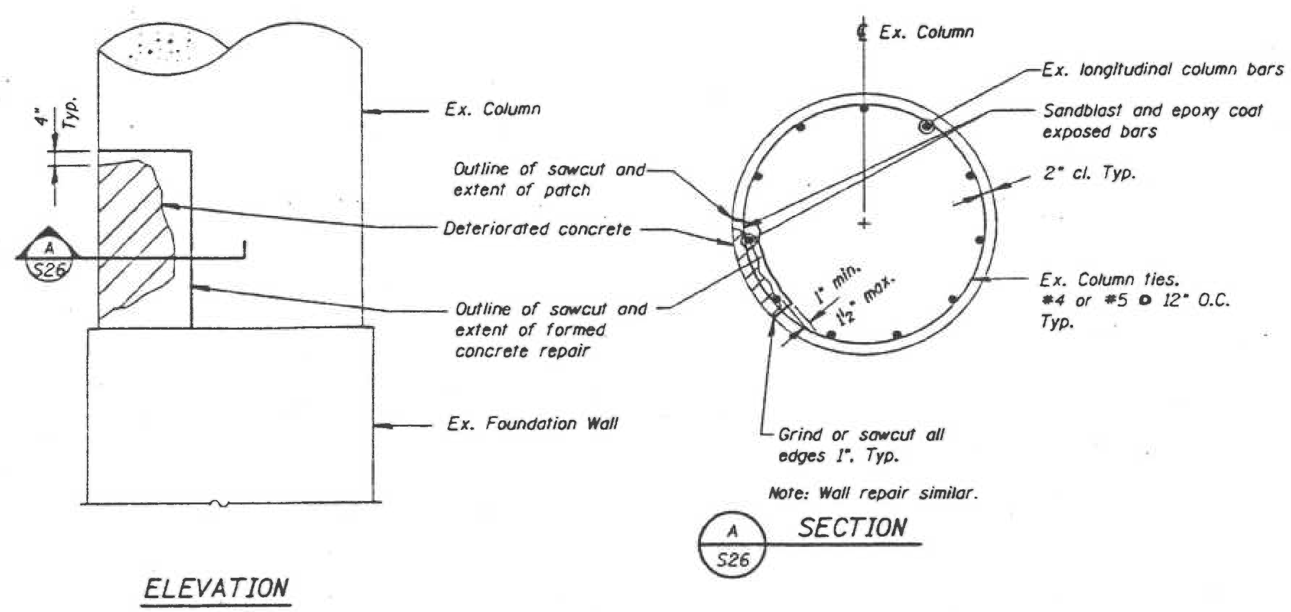
STRUCTURE NO. 082-0141 (ROADWAY A) STRUCTURE [illegible]
STRUCTURE NO. 082-0254 (ROADWAY G) STRUCTURE NO. 082-[illegible] D)
SCALE: NONE DRAWN BY JN
DATE 1-23-98 CHECKED BY HH

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 70	■	ST. CLAIR	91	24
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

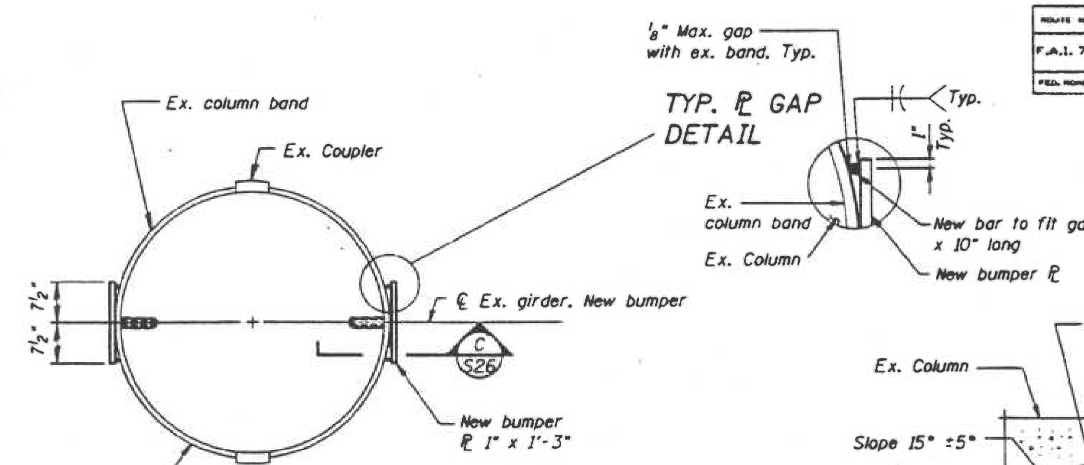
■ 82-3HVB-2R-1-1

SHEET NO. S-26

SHEETS

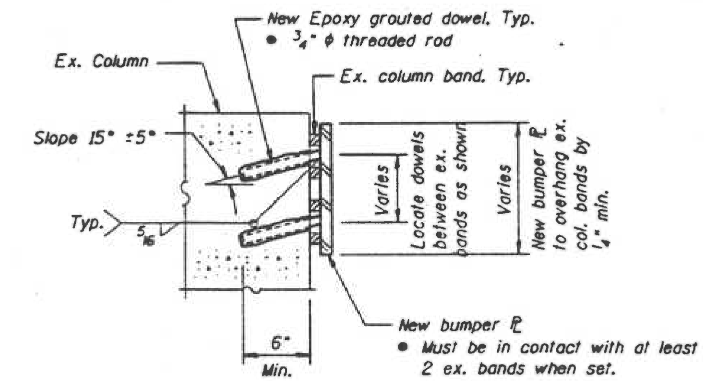


1 S26 TYPICAL CONCRETE COLUMN REPAIR

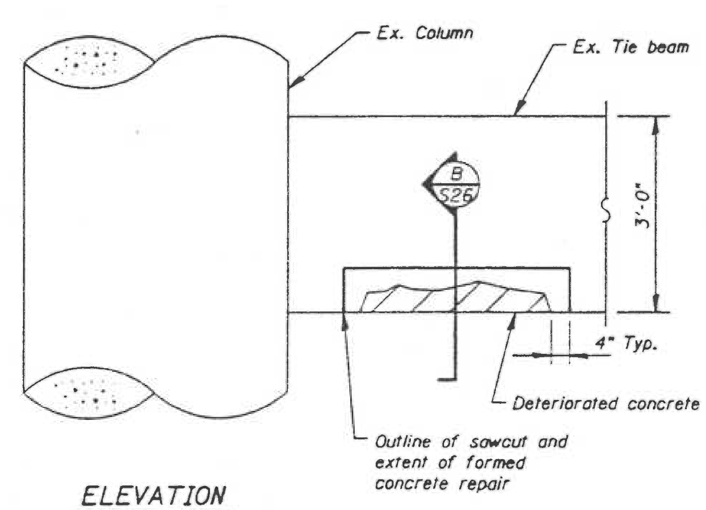


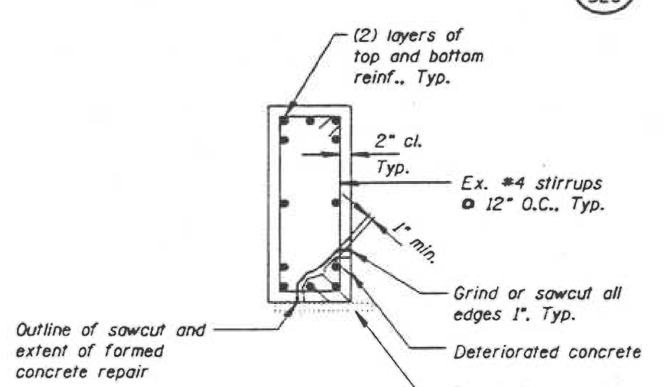
- Loosen and reposition ex. column bands if necessary to eliminate interference between ex. coupler and new bumper ℄. This work shall be INCLUDED WITH FURNISH + ERECT STRUCTURAL STEEL.
- Loosened bands shall be reinstalled from bottom up. The repositioned bands shall be evenly spaced as possible and be located with a space of 10" vertically. The top of the top band shall not be closer than 3¼" 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.

3 S26 BUMPER PLATE DETAIL



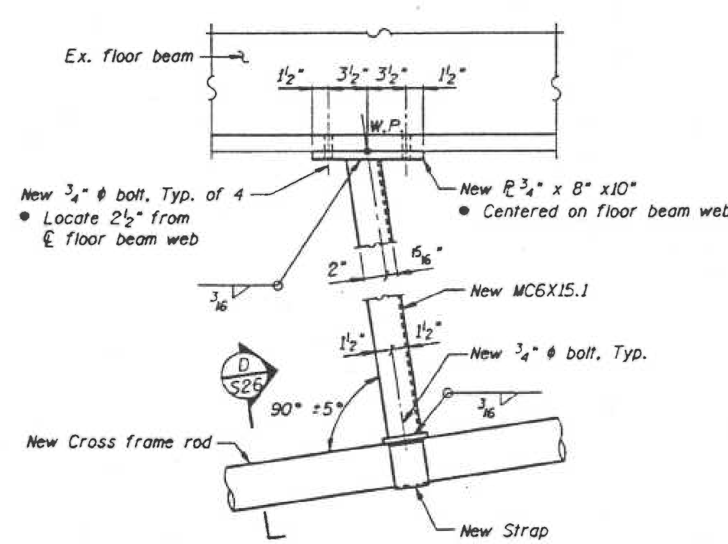
C S26 SECTION



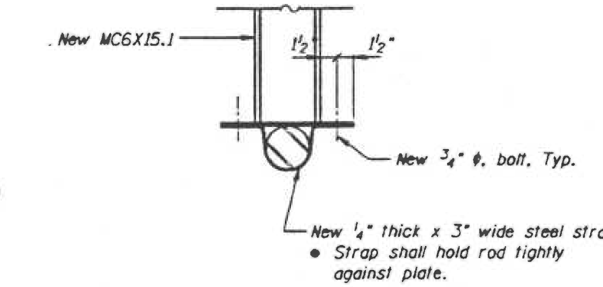


B S26 SECTION

2 S26 TYPICAL CONCRETE TIE BEAM REPAIR



4 S26 TIE ROD SUPPORT DETAIL



D S26 SECTION

CONCRETE REPAIR DETAILS

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND [illegible]ANCY RETROFIT REP[illegible]
[illegible] 70

STRUCTURE NO. [illegible] STRUCTURE NO. [illegible]
STRUCTURE NO. 082-0254 [illegible] STRUCTURE NO. 082-0201 [illegible]
SCALE: NONE DRAWN BY JN
DATE 1-23-98 CHECKED BY HH

\STRUC\ [illegible]\SET1\STIDTS26.DGN

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 70	*	ST. CLAIR	91	26
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

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

SHEET NO. S-27

SHEETS

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:

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

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

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

SEISMIC RETROFIT DETAILS

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

DATE 1-

CHECKED BY HH

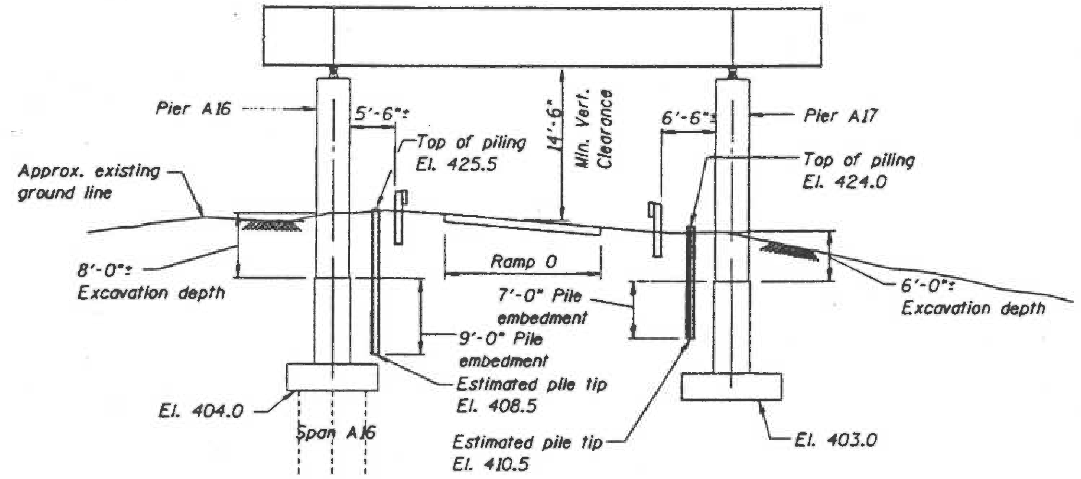
\STRUCTUR\97422\SET1\STDTS27.DGN

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 70	*	ST. CLAIR	91	26
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

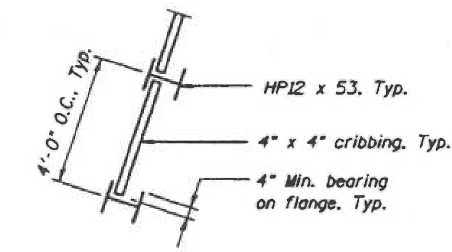
* 82-3HVB-2R-1-1

SHEET NO. S-28

SHEETS

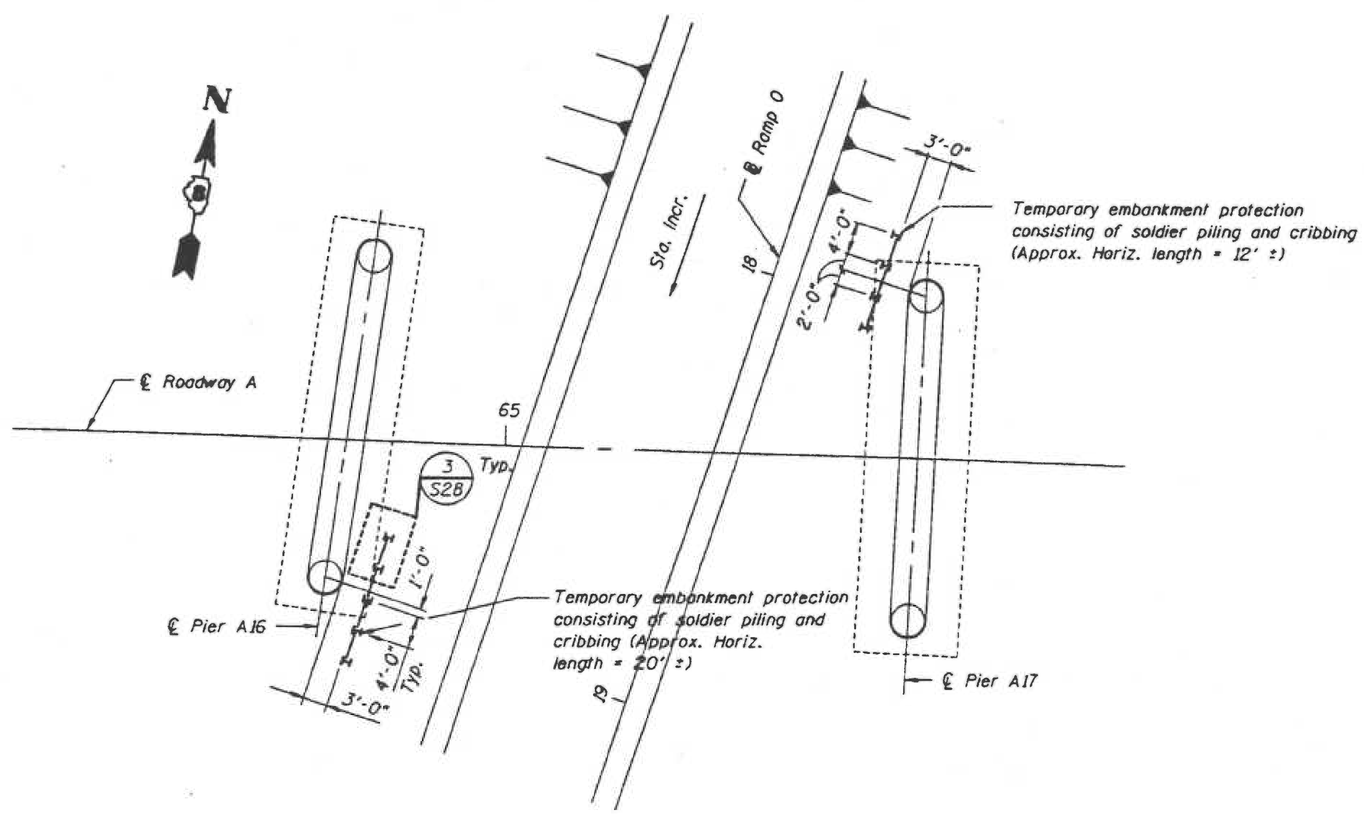


1/S28 ELEVATION PIERS A16 & A17



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

3/S28 PILING DETAIL



2/S28 PLAN PIERS A16 & A17

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

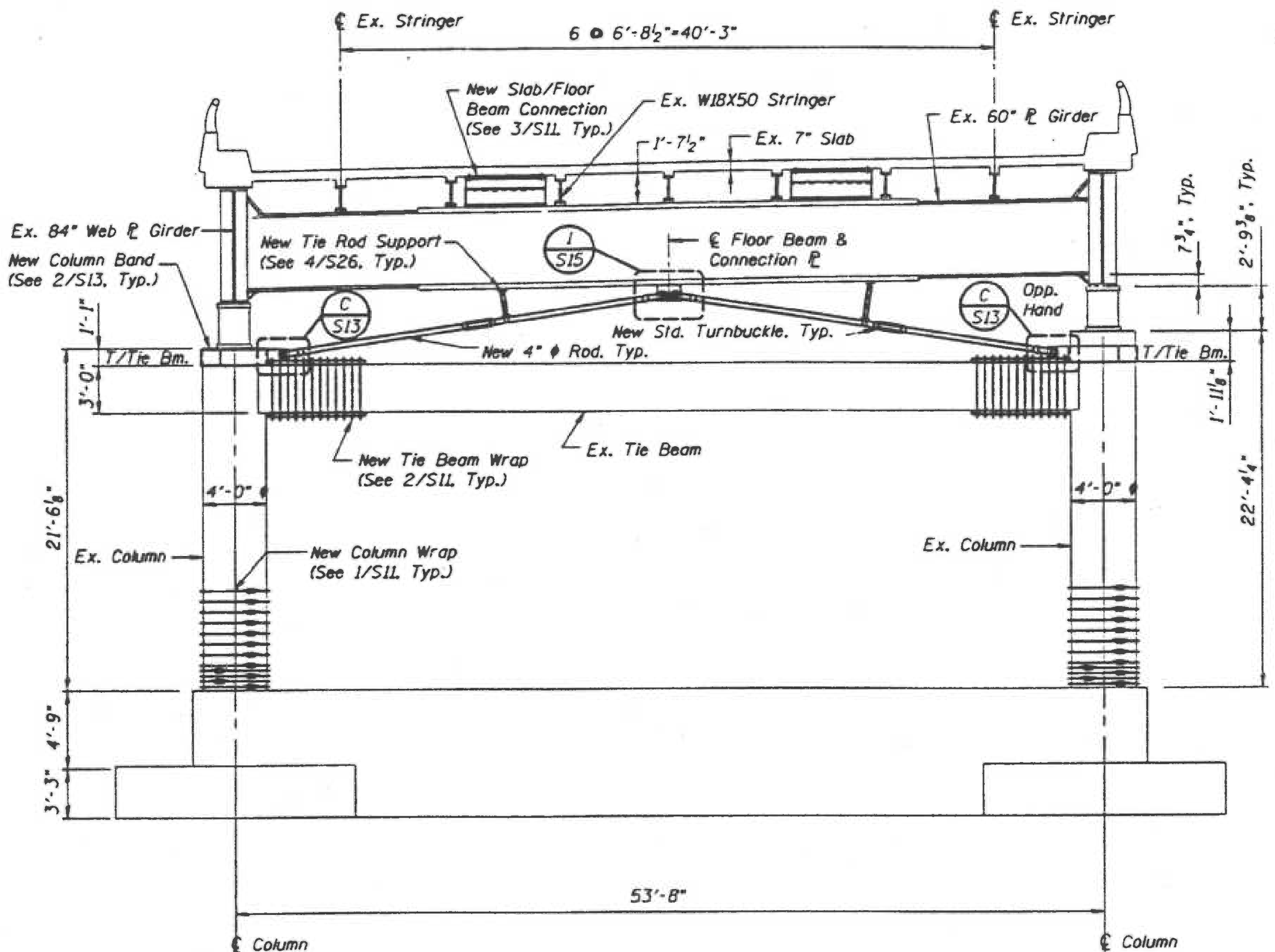
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
FAI ROUTE 70
POPLAR STREET BRIDGE APPROACHES
ST. CLAIR COUNTY

STRUCTURE NO. [illegible] (ROADWAY A) STRUCTURE NO. [illegible]
STRUCTURE [illegible]
SCALE NONE
DATE 1-23-98 CHECKED

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 70	*	ST. CLAIR	91	27
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

SHEET NO. S-29 SHEETS

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



ELEVATION PIER A2 (1/S29)

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 BRIDGE APPROACHES

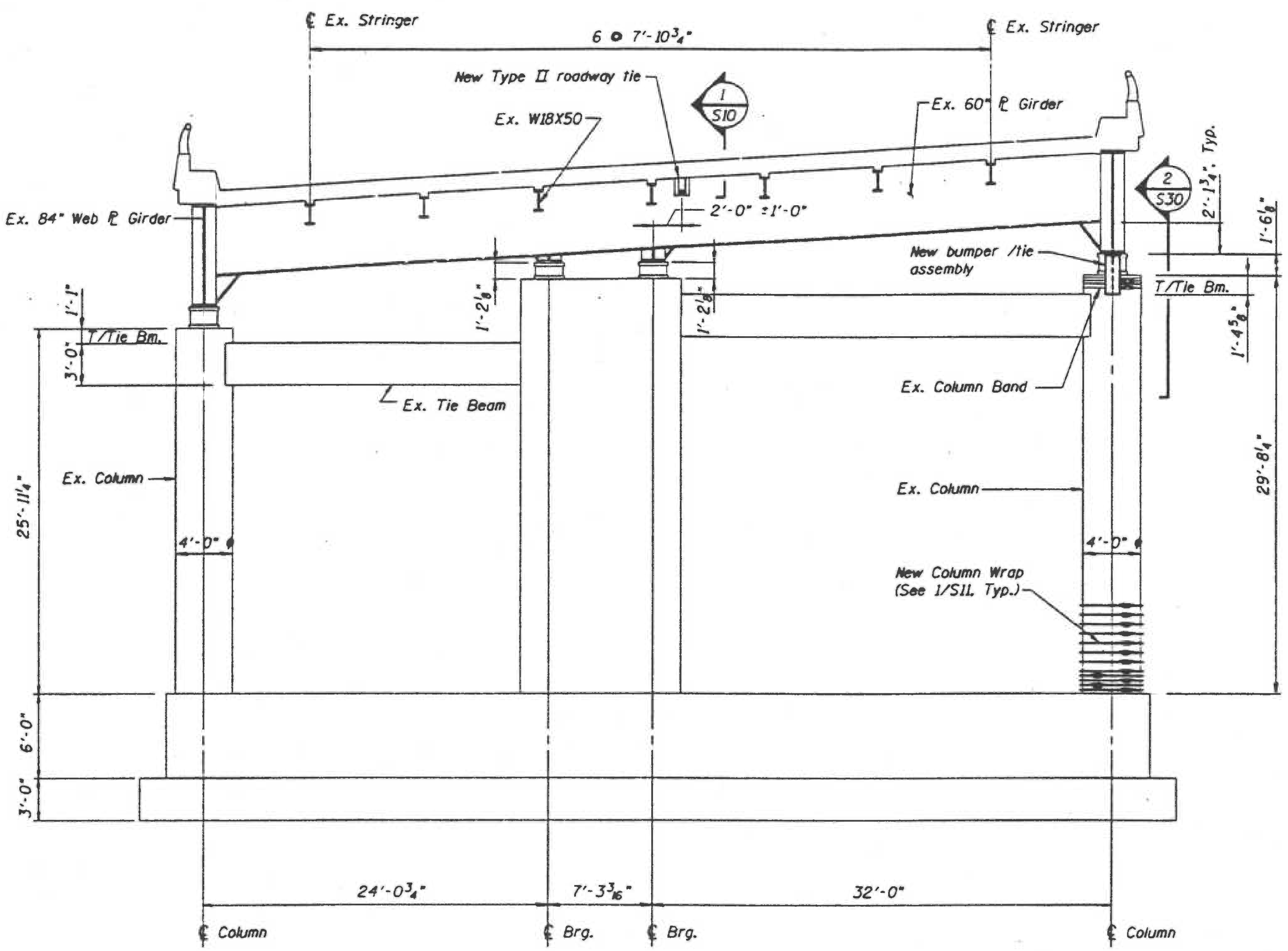
STRUCTURE NO. 082-...
STRUCTURE NO. 082-...
SCALE: NONE
DRAWN BY
DATE 1-23-98
CHECKED BY MH

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 70	*	ST. CLAIR	91	28
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

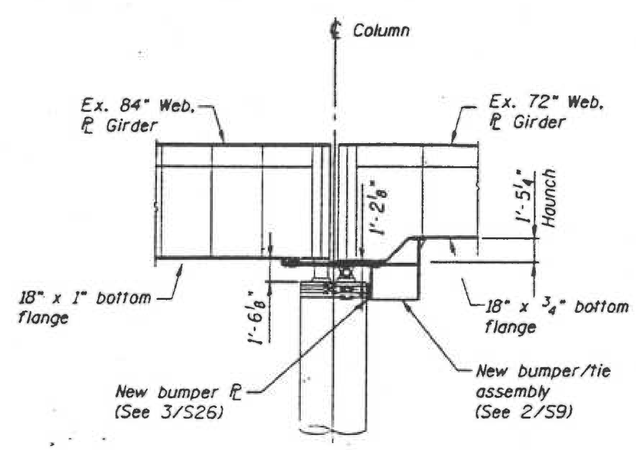
* 82-3HVB-2R-1-I

SHEET NO. S-30

SHEETS



1 S30 ELEVATION PIER A5



S30 ...VATION EXISTING ROADWAY GIRDERS AT PIER A5

BILL OF MATERIAL - 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

BILL OF MATERIAL - PIER A6 *		
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 BRID[illegible]ROACHES
ST[illegible]

JN

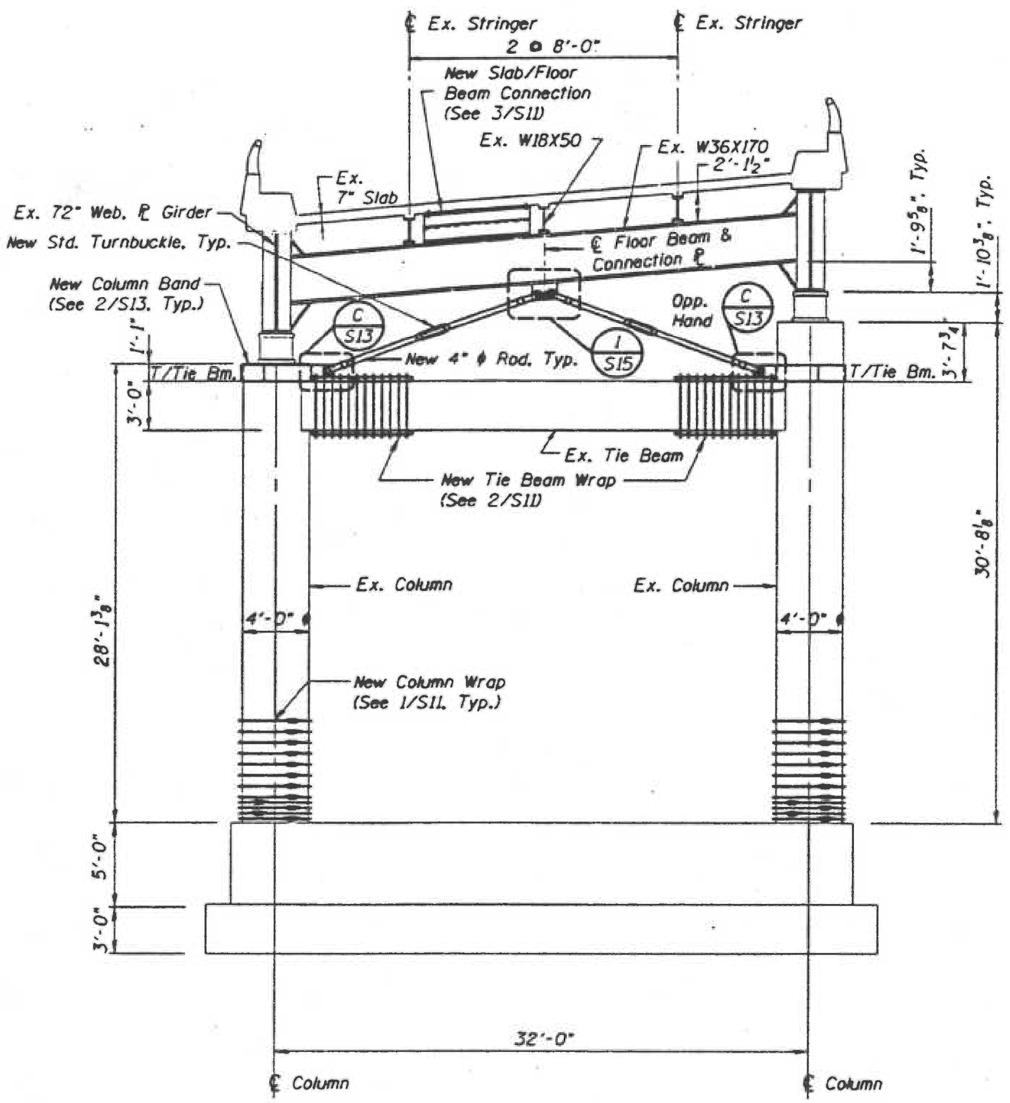
DATE [illegible]-23-98 CH[illegible] BY HH

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 70	*	ST. CLAIR	91	29

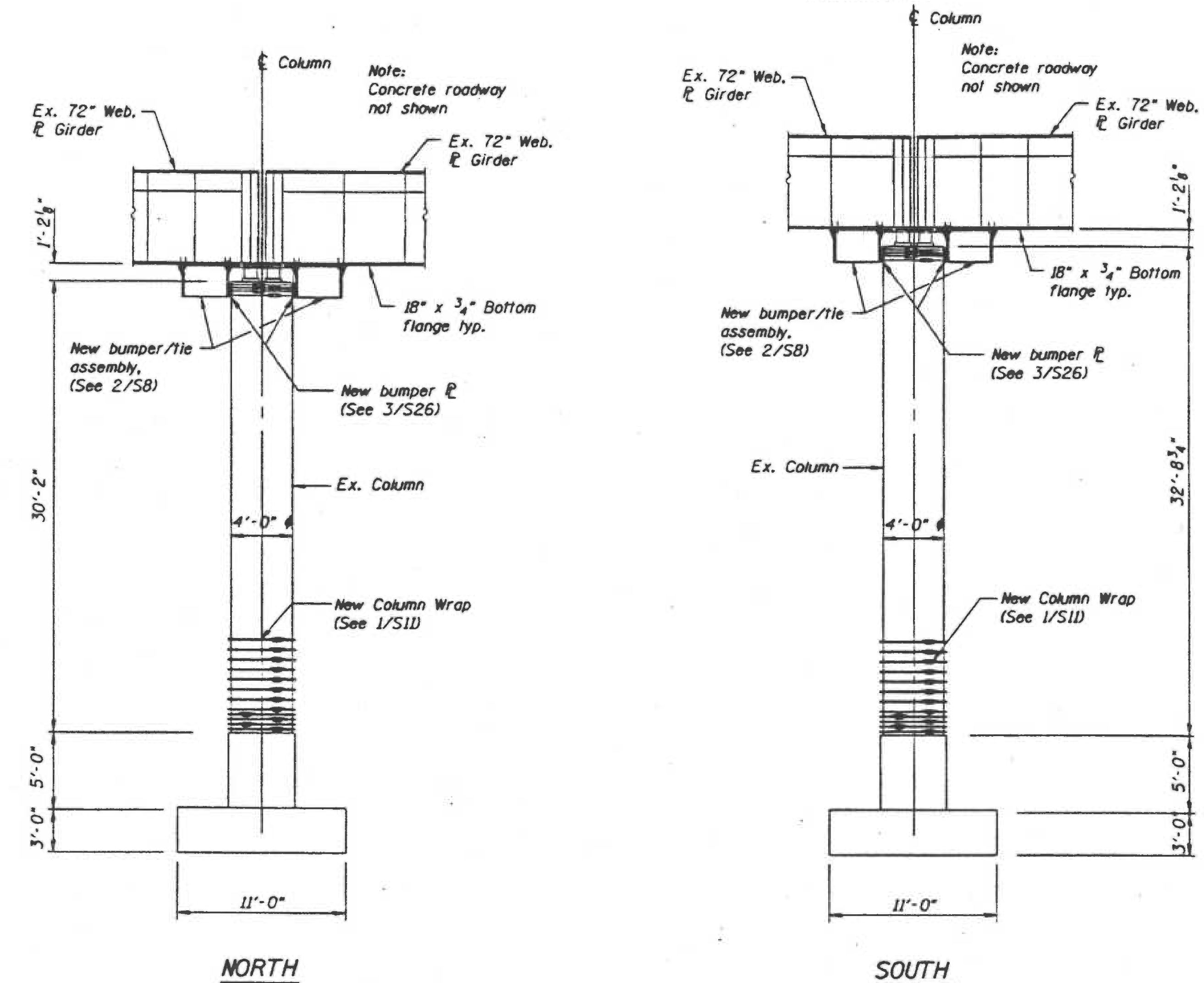
FED. ROAD DIST. NO. 7 | ILLINOIS | FED. AID PROJECT-

SHEET NO. S-31 SHEETS

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



1 S31 ELEVATION PIER A7



2 S31 ELEVATIONS PIER A8

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
[illegible]R STREET B[illegible]GE APPROACHES
ST. C[illegible]
[illegible]

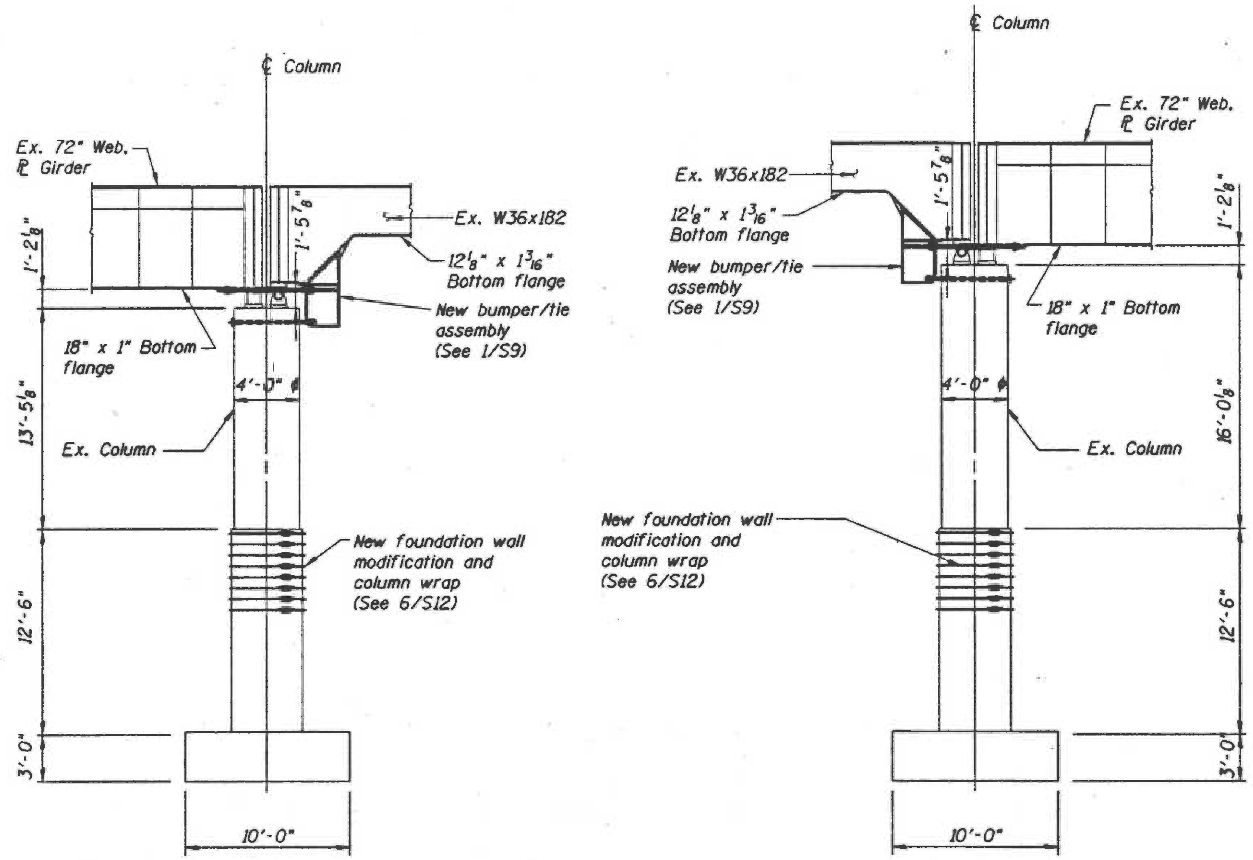
DATE 1-23-98
CHECKED BY HH

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

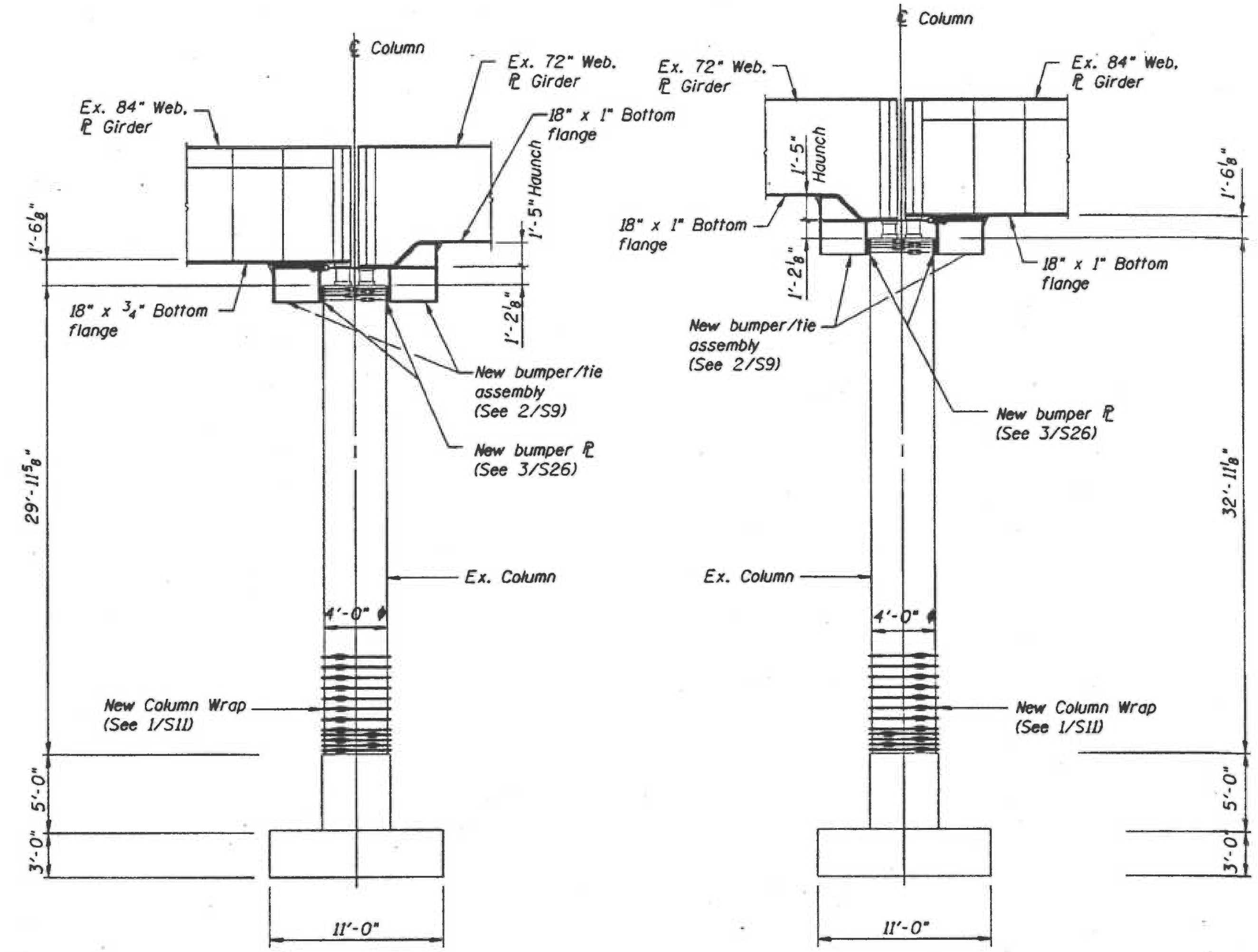
* 82-3HVB-2R-1-I

SHEET NO. S-33

SHEETS



(1/S33) ELEVATIONS PIER A12



(2/S33) ELEVATIONS PIER A15

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

* Elevation not shown

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

* Elevation not shown

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

PIERS A12 AND A15 RETROFITS

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

SCALE: NONE

DATE 1-23-98

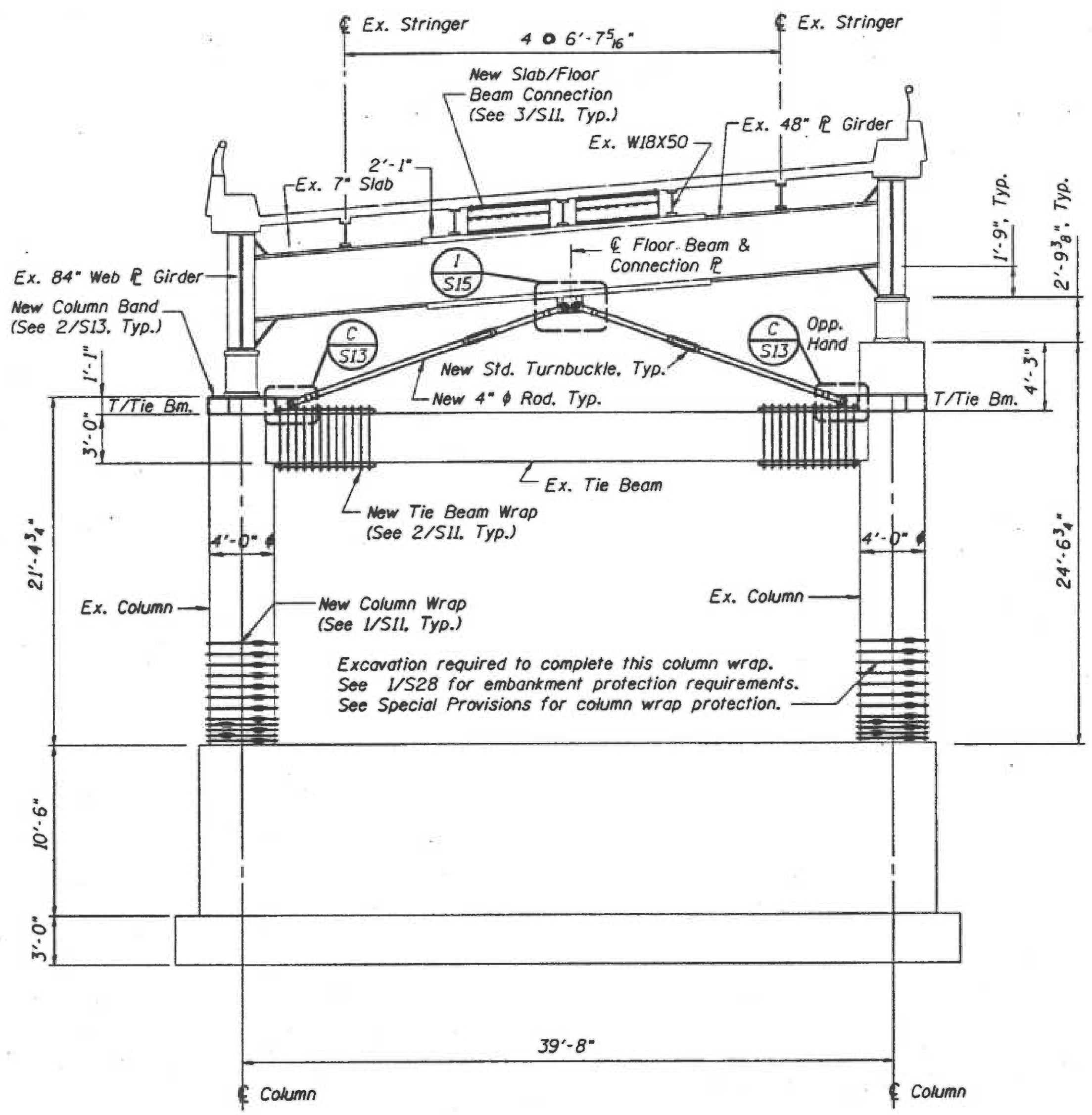
CHECKED BY HH

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 70	*	ST. CLAIR	91	32
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

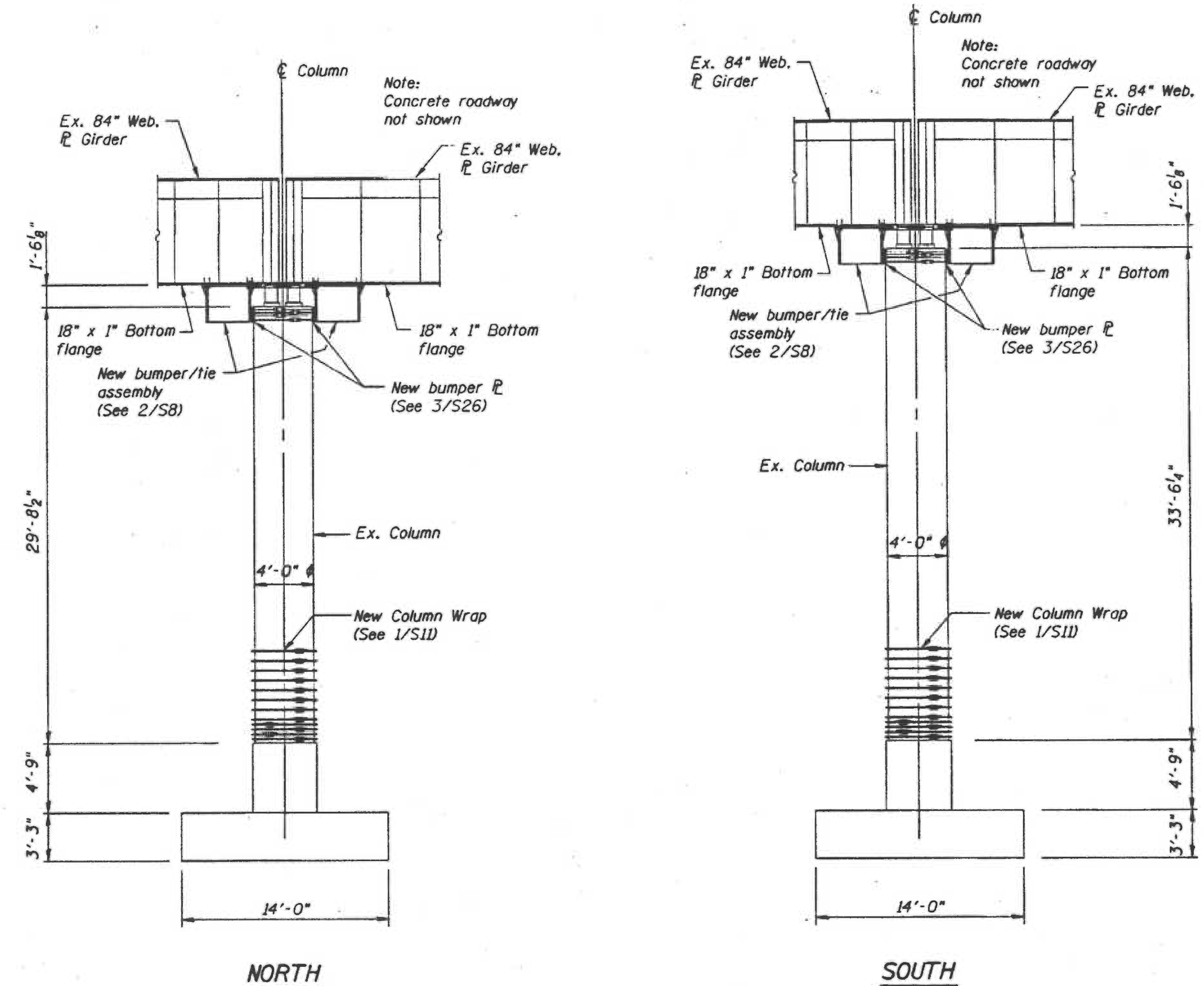
* 82-3HVB-2R-1-1

SHEET NO. S-34

SHEETS



1/S34 ELEVATION PIER A16



2/S34 ELEVATIONS PIER A18

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

* Elevation not shown

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

PIERS A16 & A18 RETROFITS

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

SCALE: NONE ... DRAWN BY [illegible]

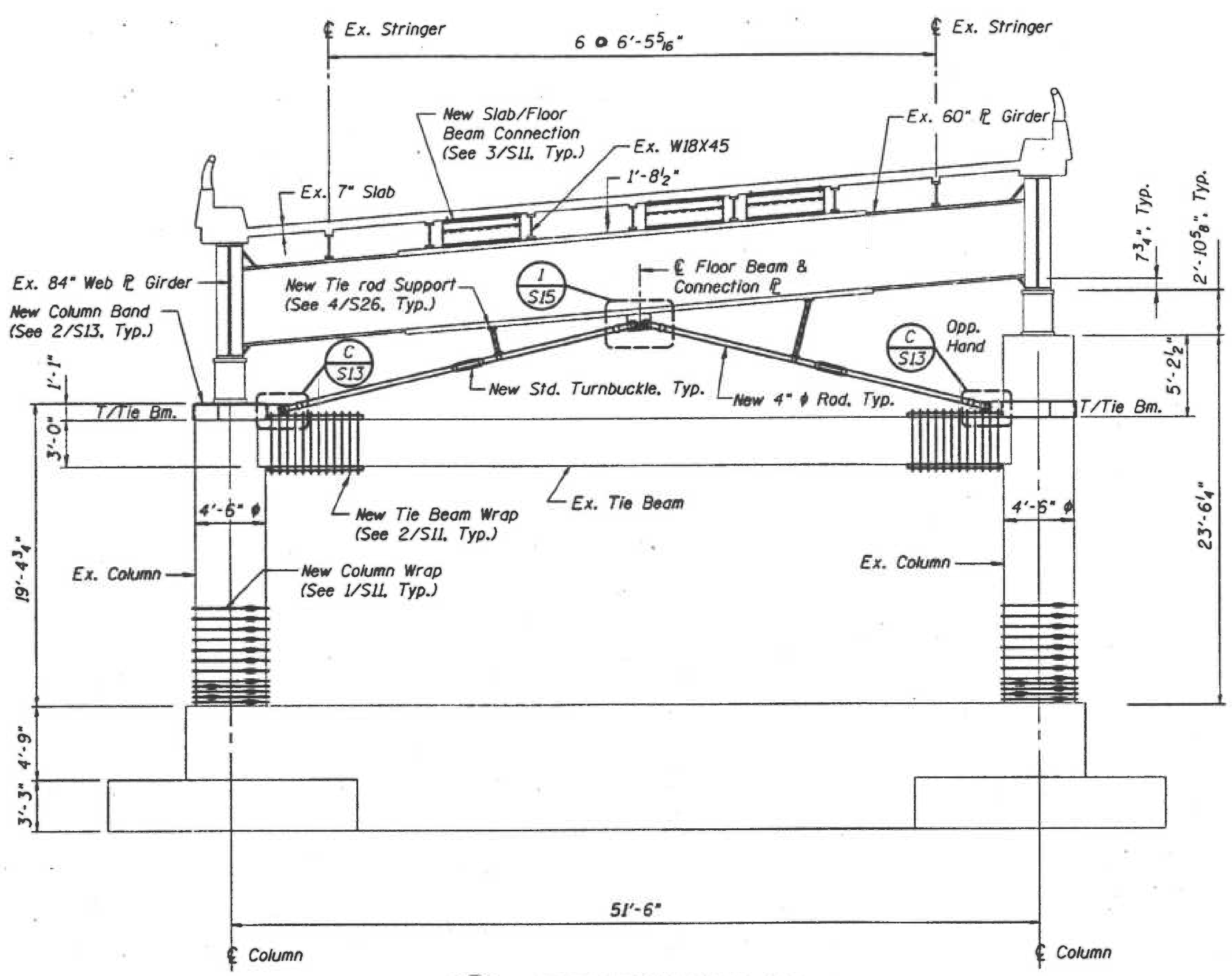
DATE 1-23-98 ... CHECKED BY HH

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 70	*	ST. CLAIR	91	33
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

SHEET NO. S-35

SHEETS

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



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 s[illegible]

PIER A19 RETROFIT

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

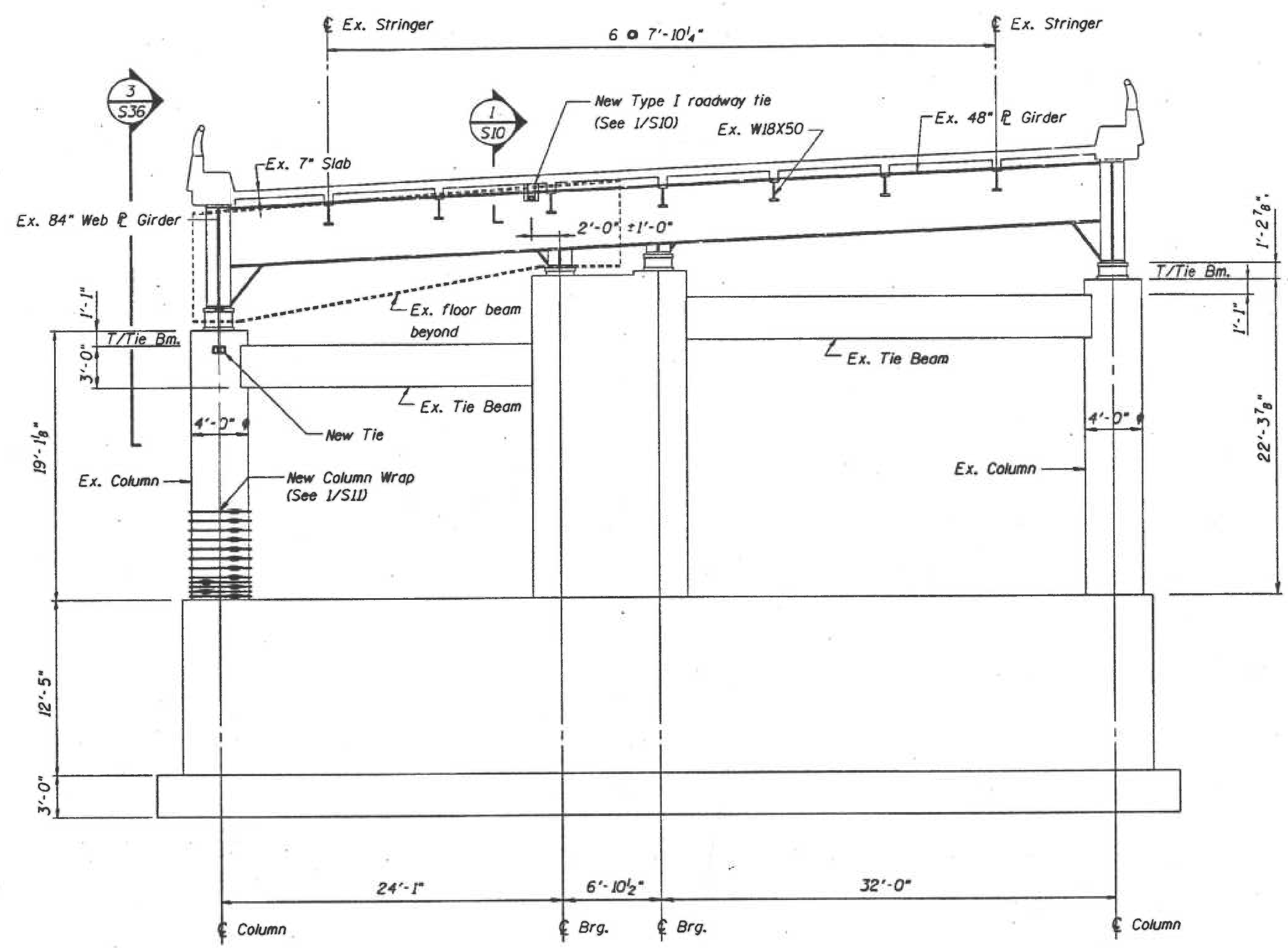
STRUCTURE NO. [illegible] STRUCTURE NO.
STRUCTURE NO. [illegible]-0254 [illegible] STRUCTURE NO.
SCALE: NONE DRAWN [illegible]
DATE 1-23-98 CHECKED BY HH

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 70	*	ST. CLAIR	91	34
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

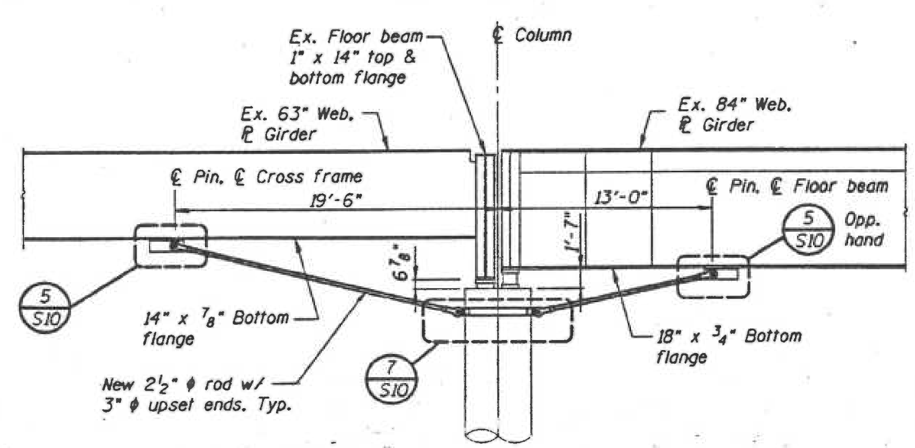
* 82-3HVB-2R-1-I

SHEET NO. S-36

SHEETS



1
S36
ELEVATION PIER A21



S36
ELEVATION EXISTING ROADWAY GIRDERS AT PIER A21

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
R STREET BRIDGE
ST. CLAIR CO

SCALE

DRA

DATE 1-23-98

CHECKED BY

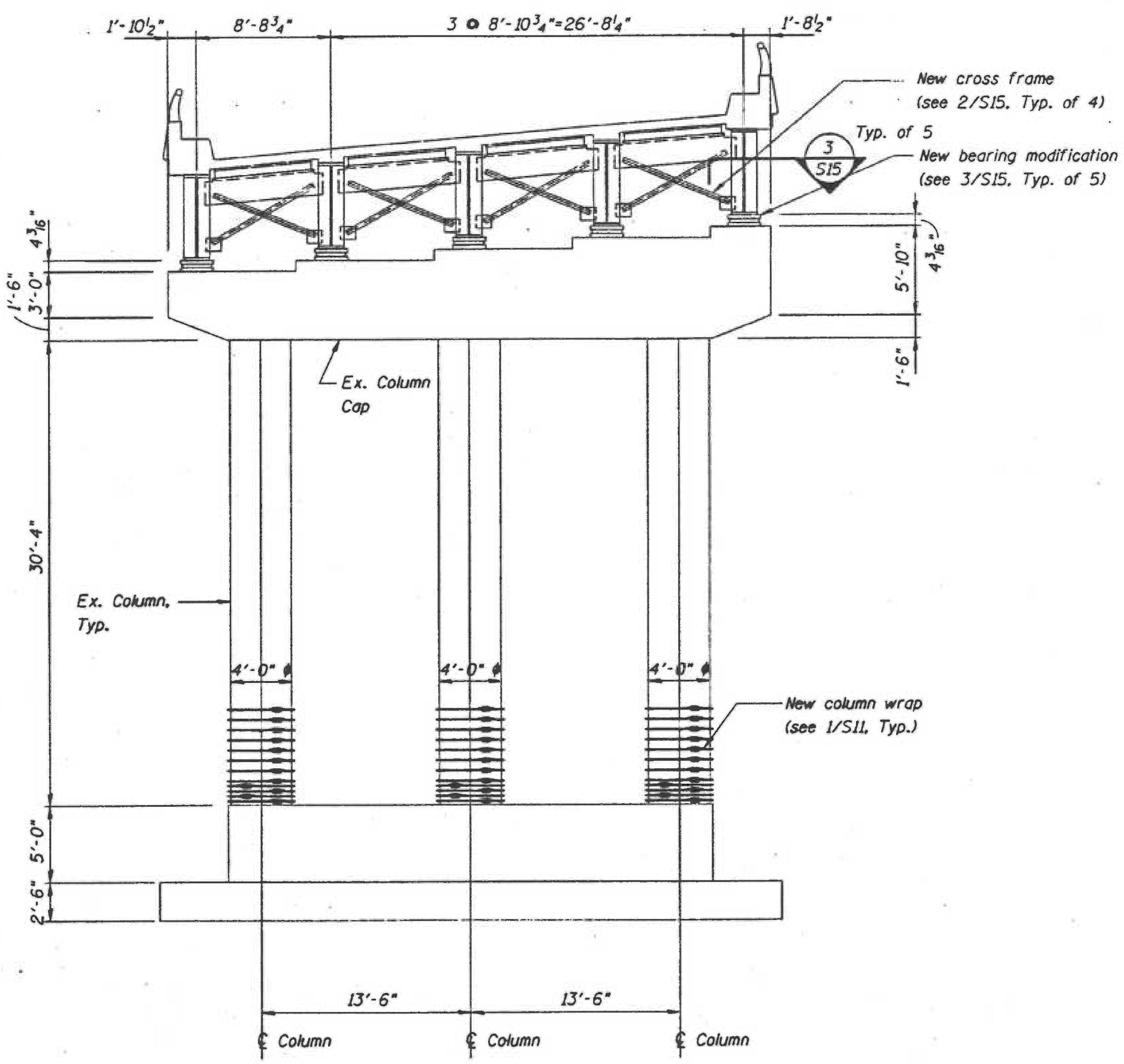
STRUCTURE NO.

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 70	*	ST. CLAIR	91	35
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

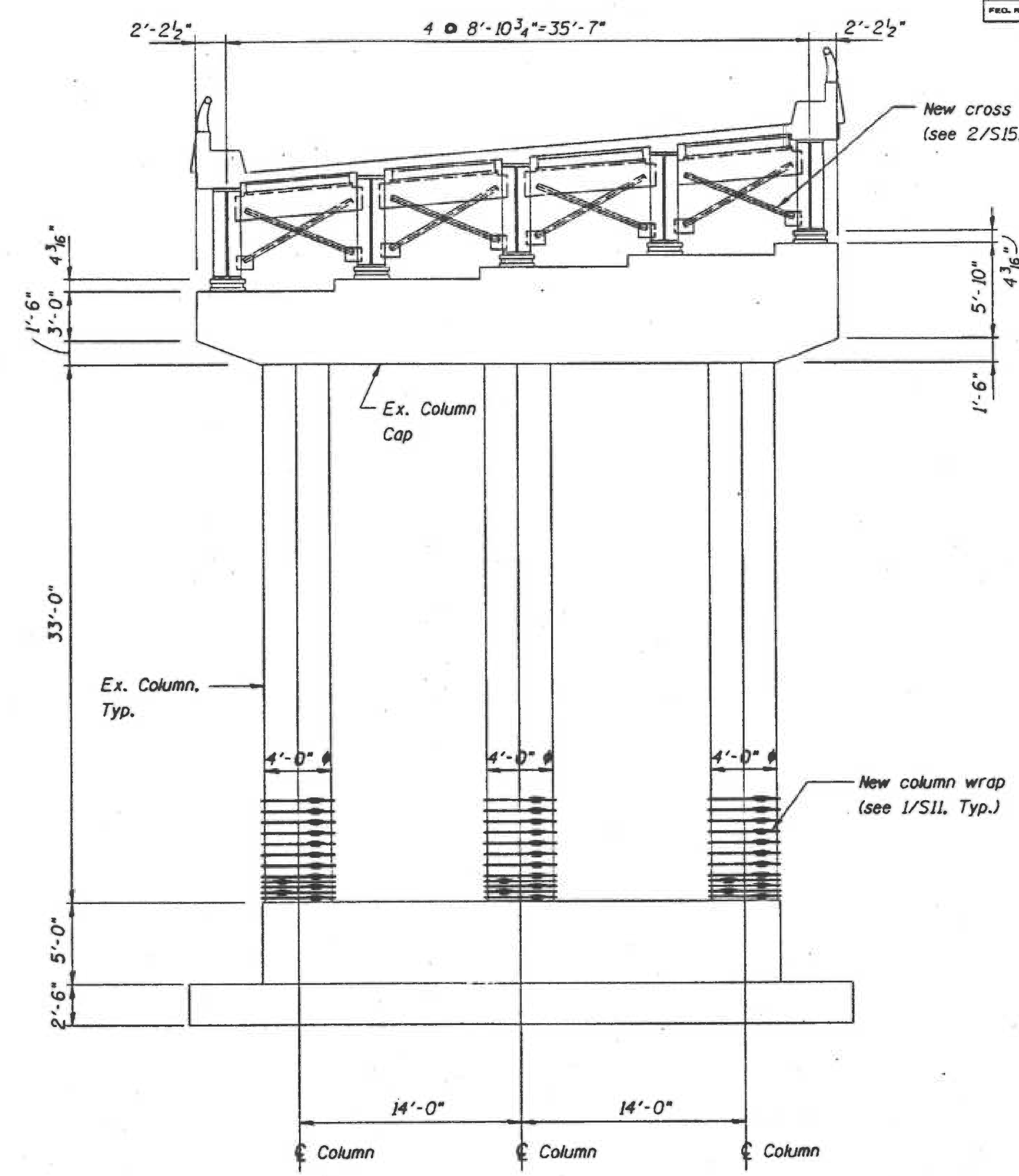
* 82-3HVB-2R-1-1

SHEET NO. S-37

SHEETS



1 / S37 ELEVATION PIER R1-1



2 / S37 ELEVATION PIER R2-1

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

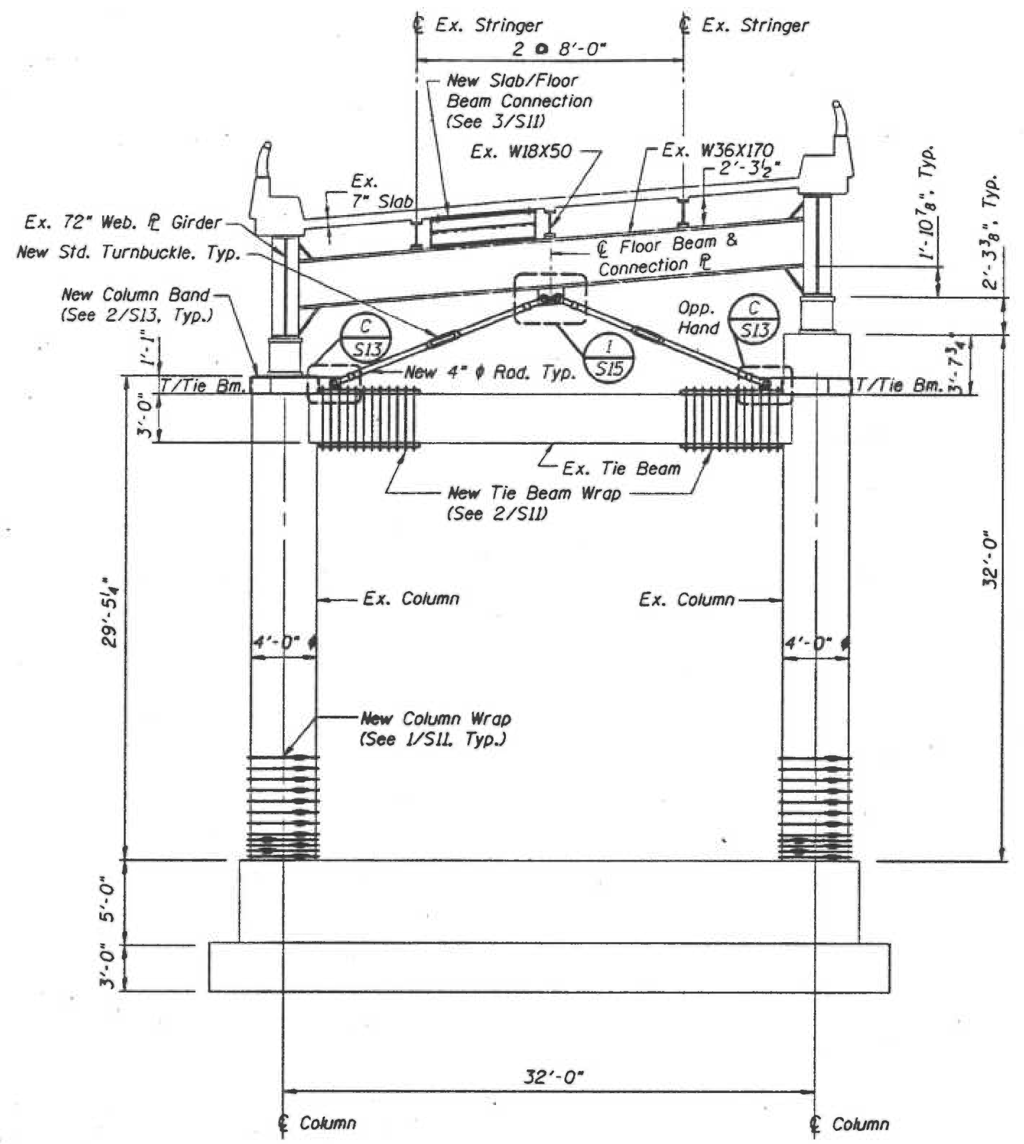
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
FAI ROUTE 70
POPLAR STREET [illegible]
ST. [illegible]
[illegible] ROADW[illegible]
[illegible] 254 BROADWAY [illegible]
[illegible] JN
DATE [illegible]-23-98 CHECKED BY HM

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 70	*	ST. CLAIR	91	38
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

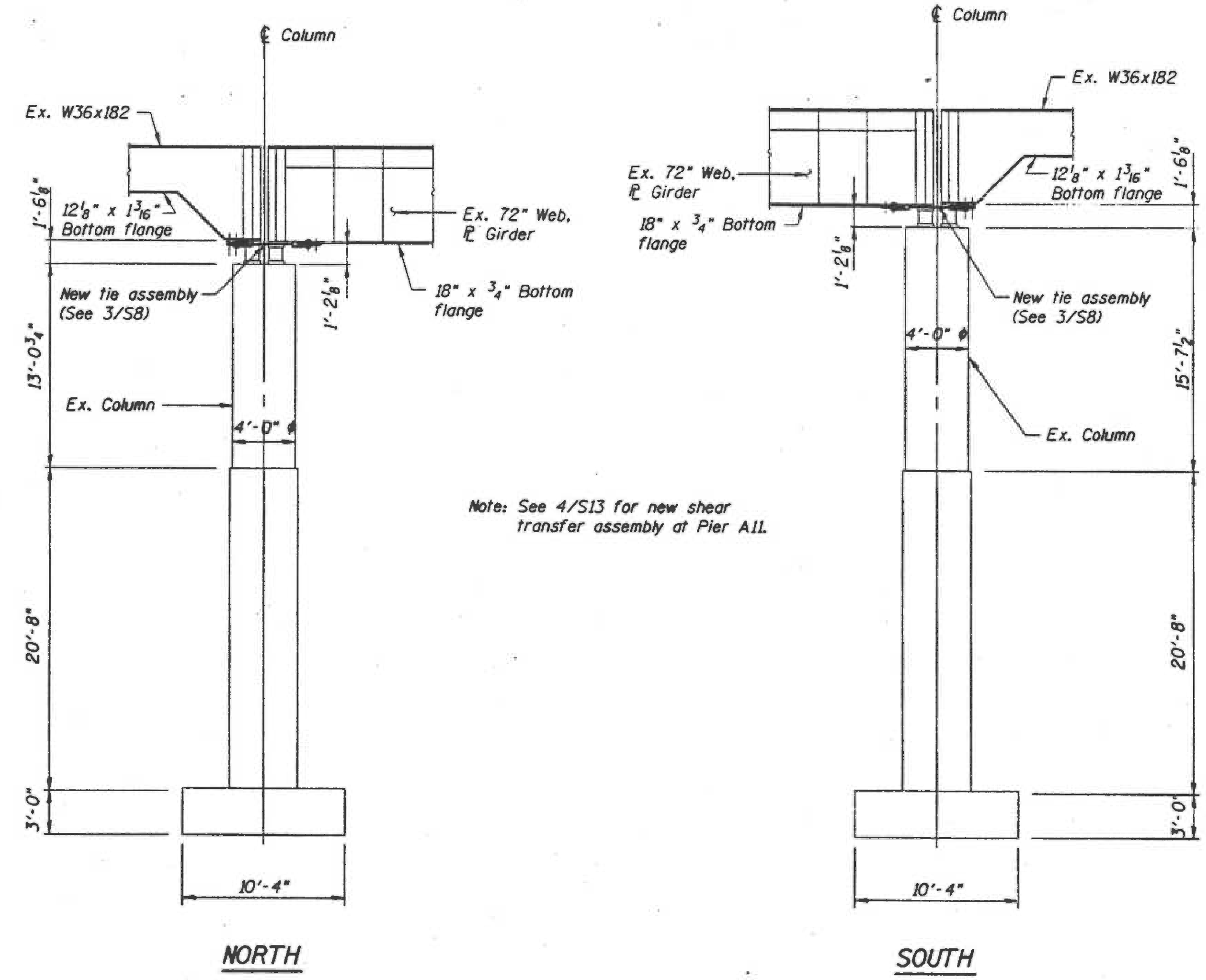
SHEET NO. S-32

SHEETS

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



1 / S32 ELEVATION PIER A9



2 / S32 ELEVATIONS PIER A11

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 APPR[illegible]
ST. CLAIR C[illegible]NTY

SCALE: NONE

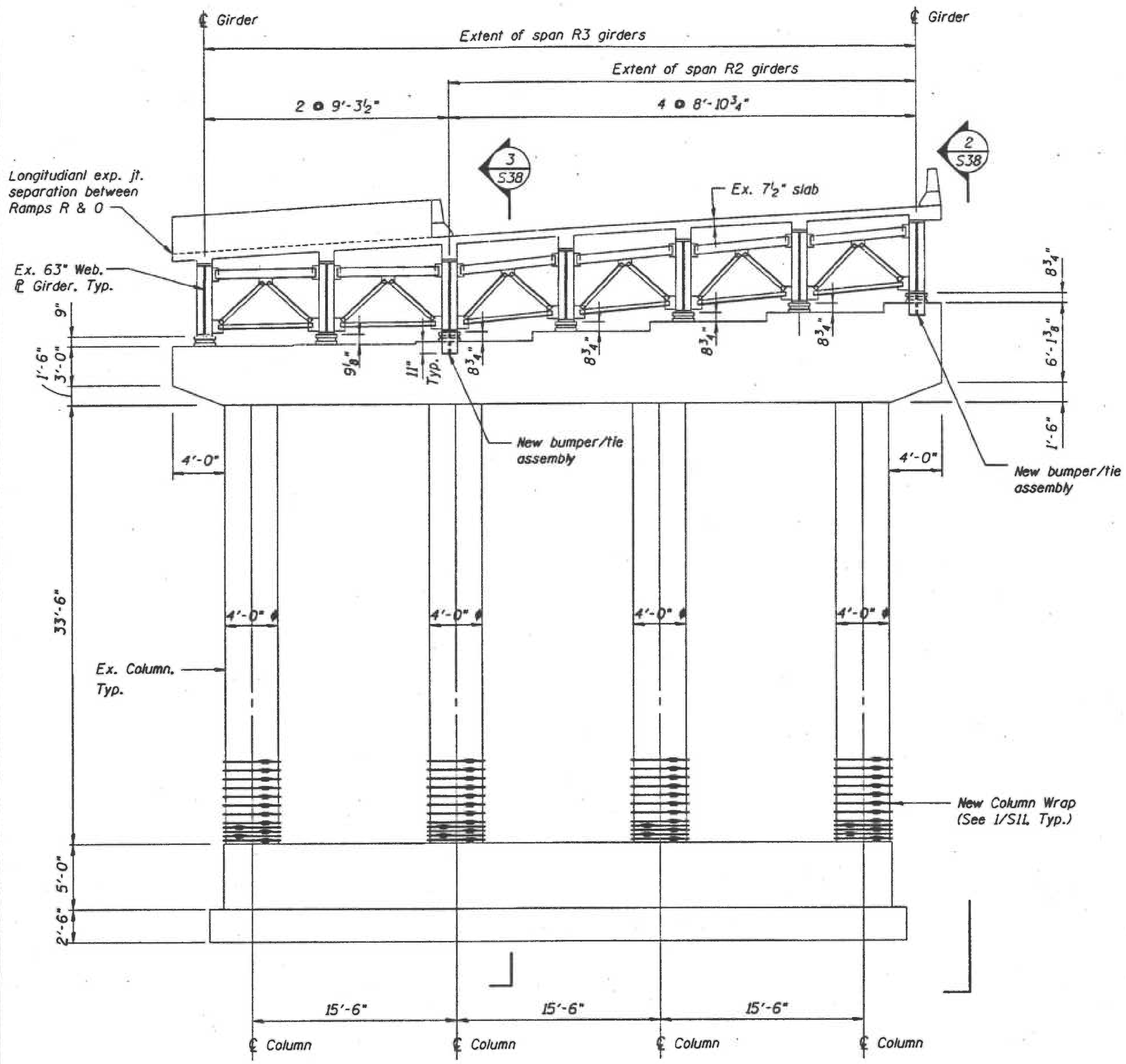
DATE 1-23-98 CHECKED BY HH

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 70	*	ST. CLAIR	91	36
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

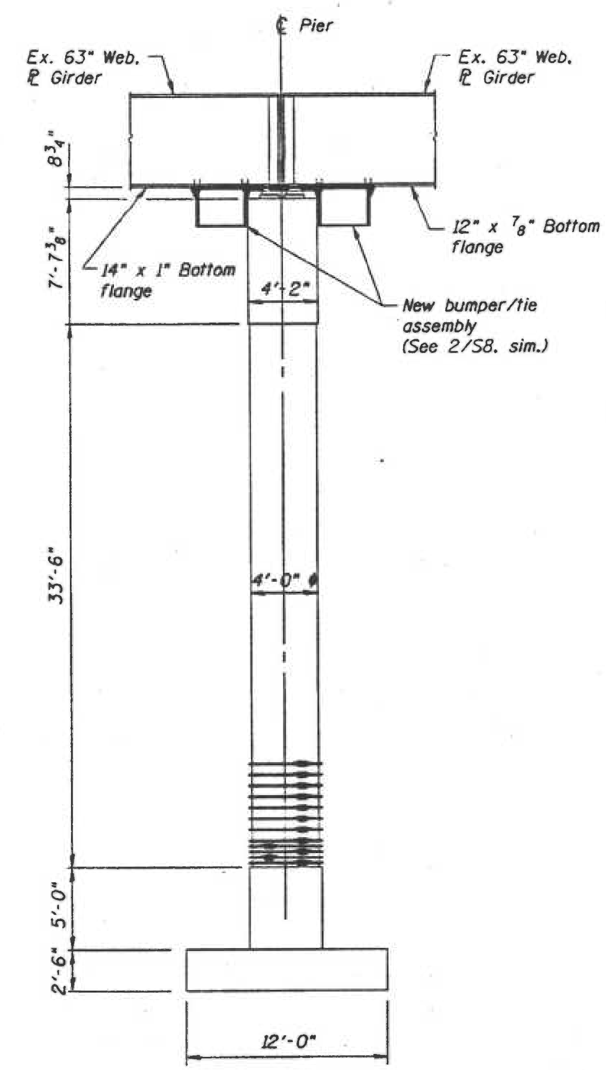
* 82-3HVB-2R-1-1

SHEET NO. S-38

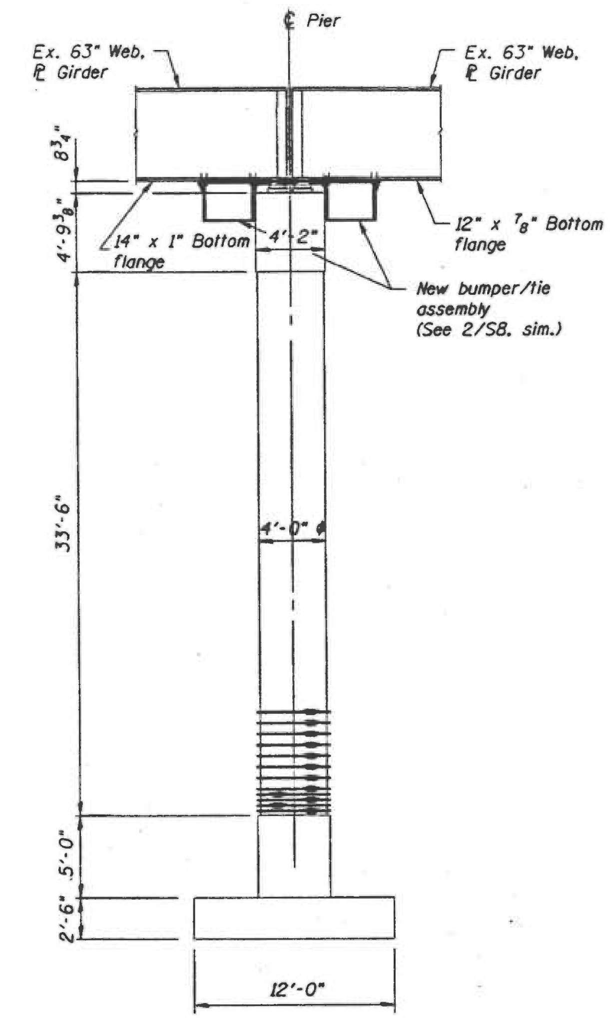
SHEETS



1
S38
ELEVATION PIER R3-1



2
S38
ELEVATION PIER R3-1



3
S38
ELEVATION PIER R3-1

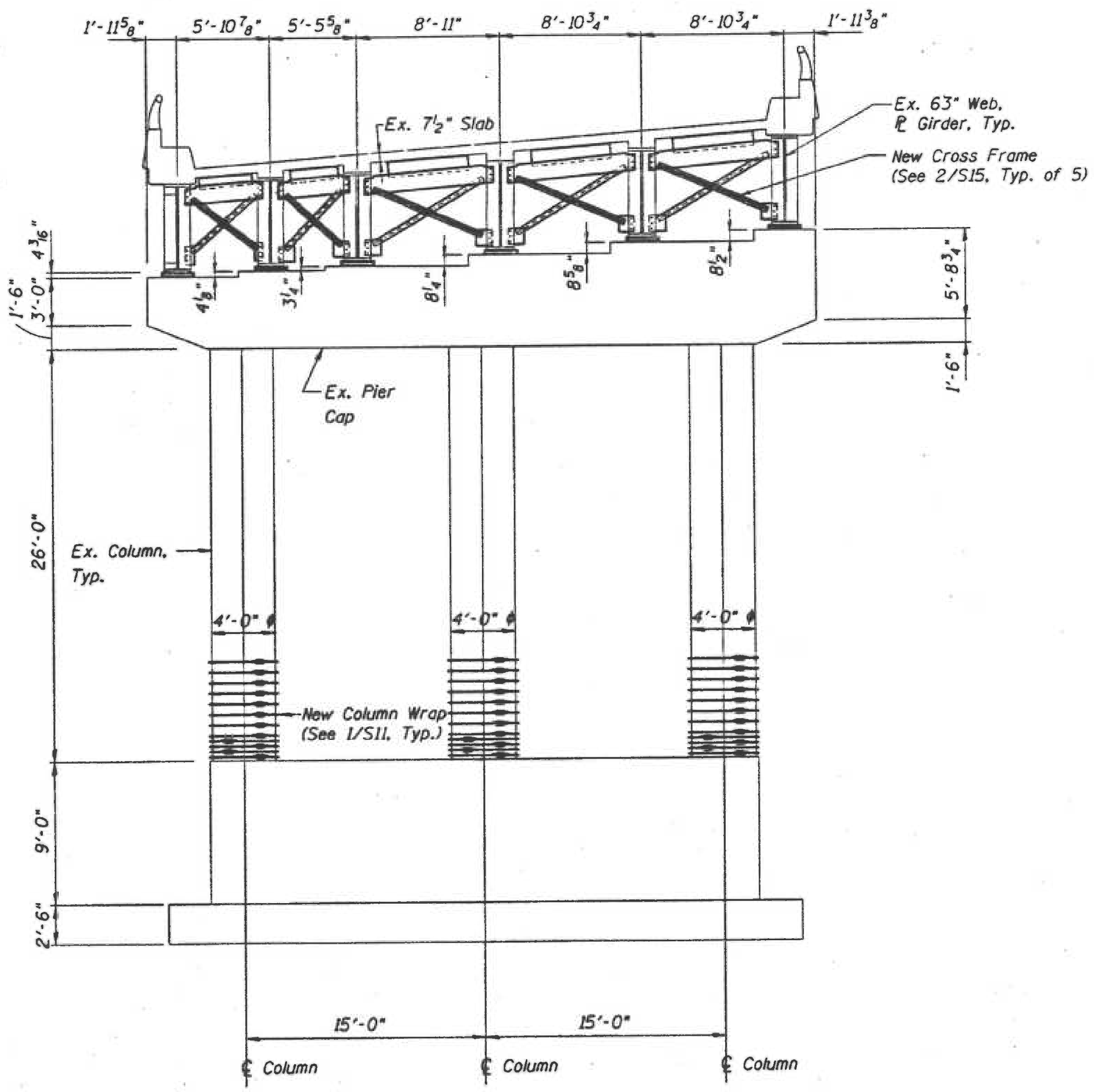
BILL OF MATERIAL - PIER R3-1		
ITEM	UNIT	QUANTITY
Furnish and erect structural steel	LBS.	2835
Foundation wall dowel modification	EACH	40
Column wrap	SQ. FT.	326.8

PIER R3-1 RETROFIT

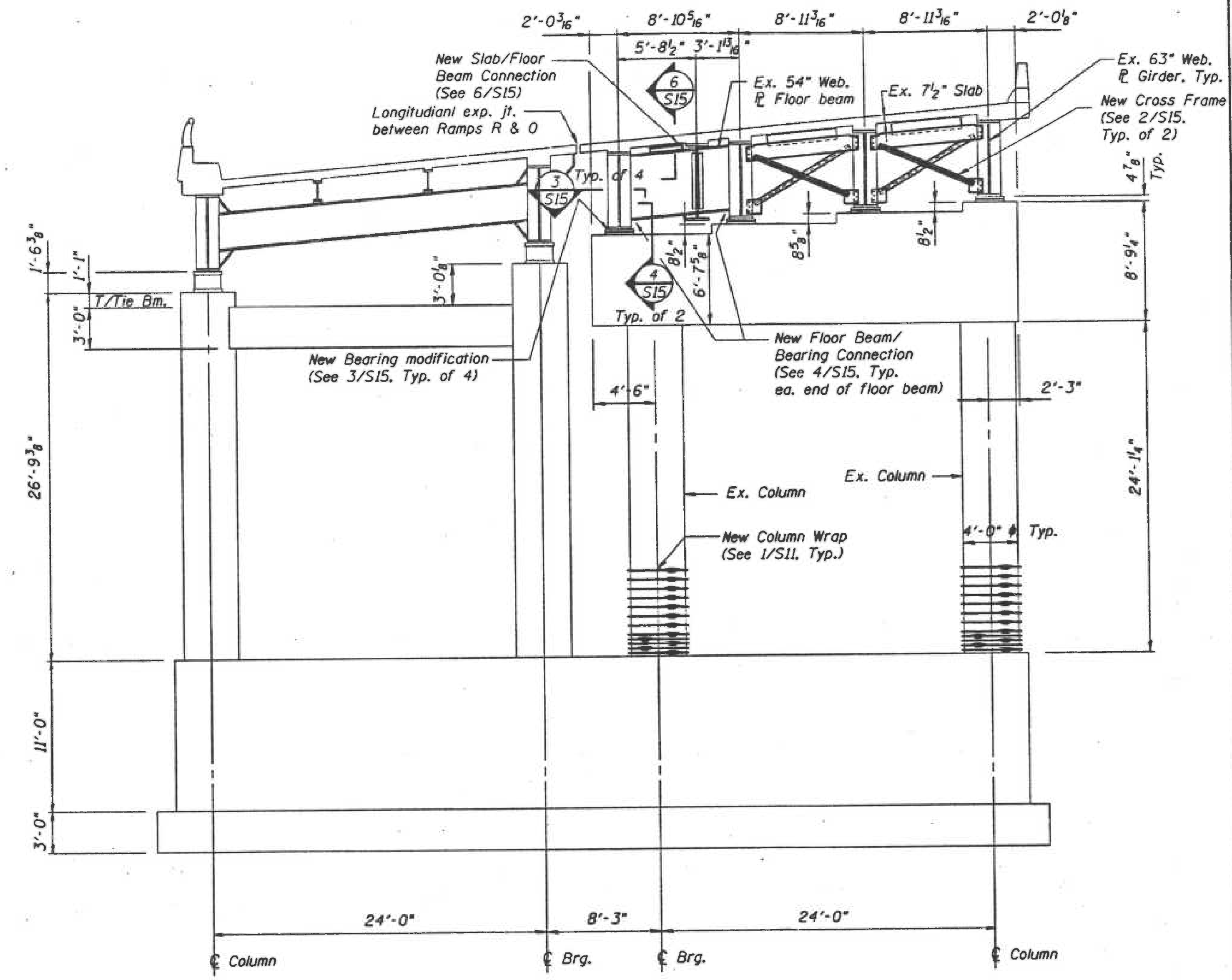
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
FAI R[illegible]E 70
POPLAR [illegible] APPROACHES

STRUCTURE NO. [illegible]
STRUCTURE NO. [illegible] 082-0201
SCALE: NONE
DATE 1-23-98
DRAWN BY JA
CHECKED BY HH

\ST[illegible]CTUR\97422\SET1\STIPR38.dgn



(1/S39) ELEVATION PIER R4-1



(2/S39) ELEVATION PIER 01-R

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	[illegible] FT.	245.1

BILL OF MATERIAL - PIER 01-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 & 01-R RETROFITS

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

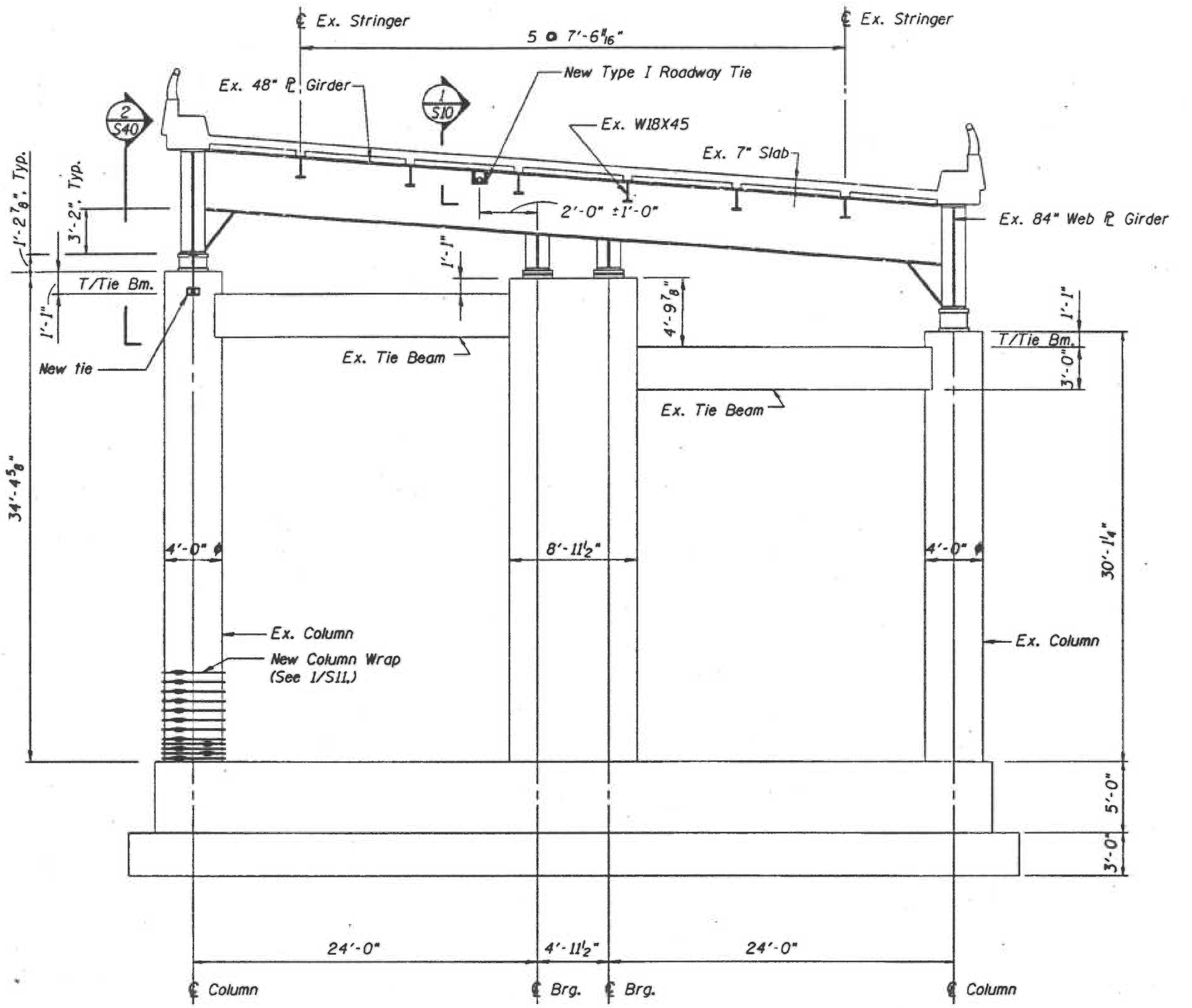
DATE 1-23-98
CHECKED BY HH

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 70	*	ST. CLAIR	91	38
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

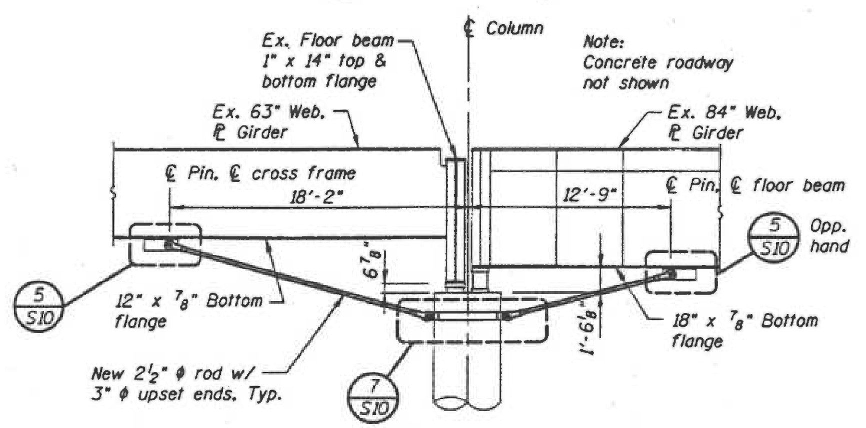
SHEET NO. S-40

SHEETS

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



1 S40 ELEVATION PIER G1



ELEVATION EXISTING ROADWAY GIRDERS AT PIER G1

BILL OF MATERIAL - PIER G1

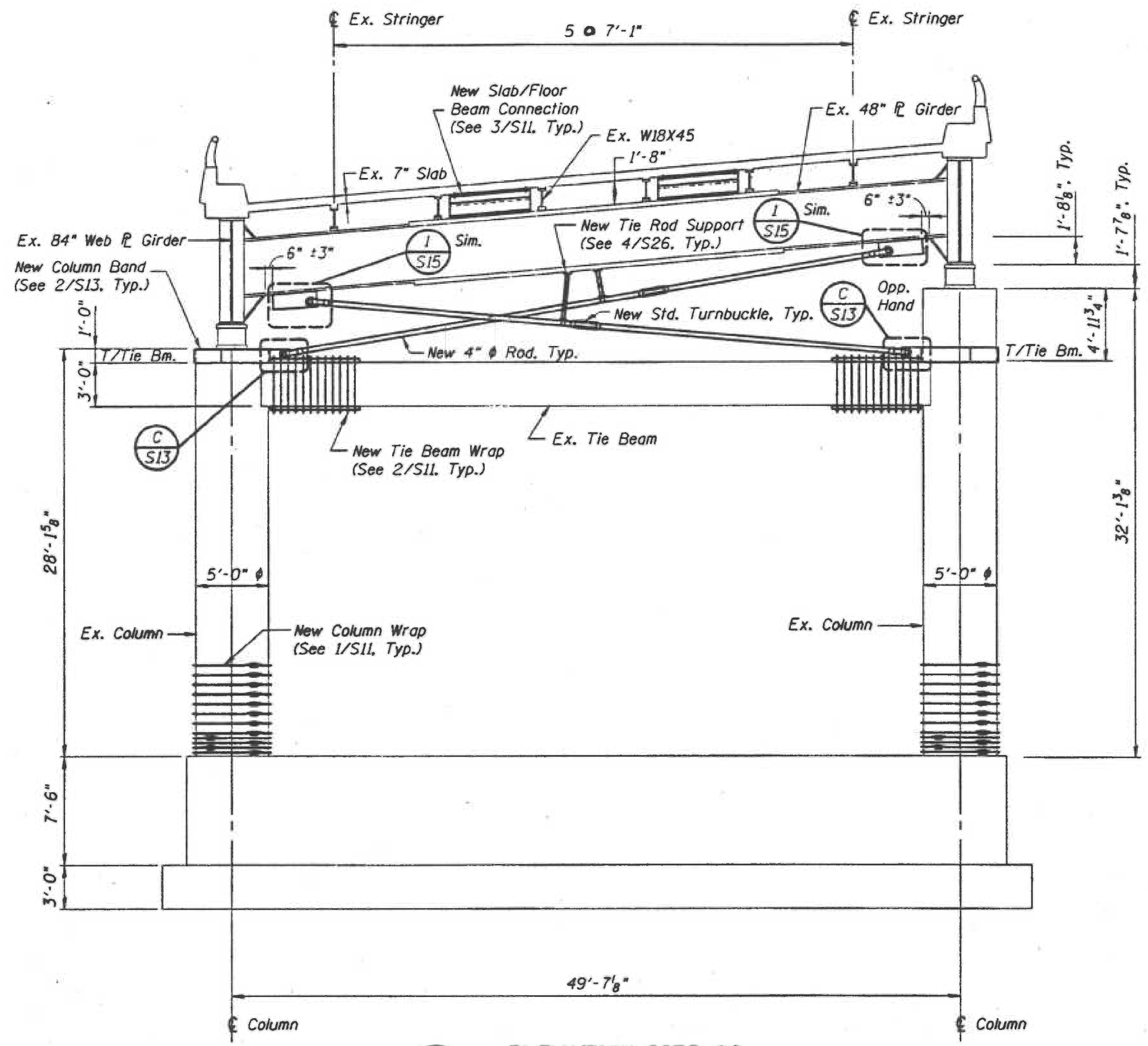
ITEM	UNIT	QUANTITY
Concrete removal	CY	5.6
Furnish and erect structural steel	LBS.	3135
Epoxy grouted dowels	EACH	28
Column wrap	SQ. FT.	81.7

PIER G1 RETROFIT

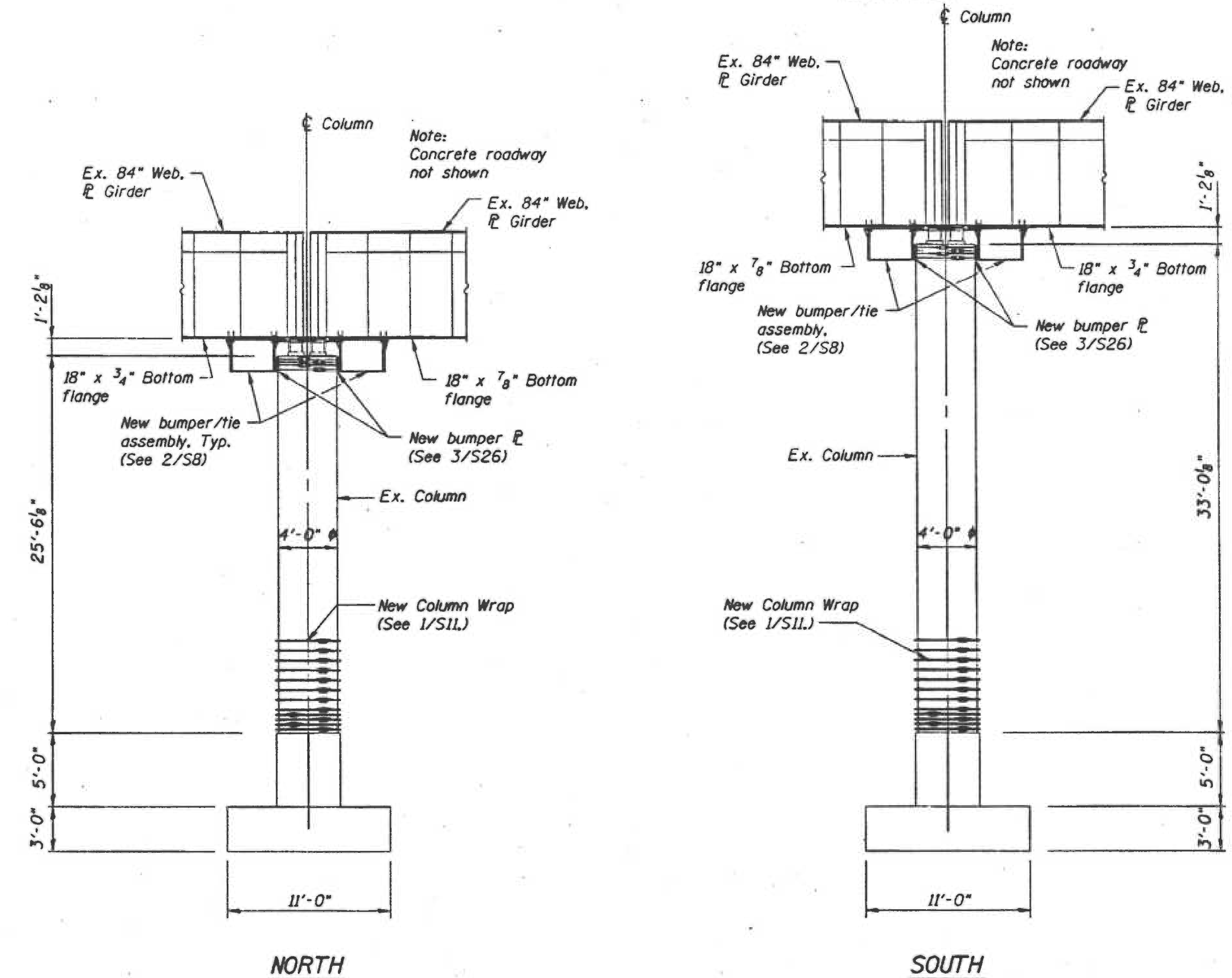
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
FAI ROUTE 70
POPLAR STREET BRIDGE APPROACHES
ST. CL[illegible] UNTY

[illegible] STRUCTURE NO. 082-[illegible] (RAMP R)

CHECKED BY HH



1/S41 ELEVATION PIER G2



2/S41 ELEVATIONS PIER G5

BILL OF MATERIAL - 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

BILL OF MATERIAL - PIER G2

ITEM	UNIT	QUANTITY
Furnish and erect structural steel	LBS.	9776
Epoxy grouted dowels	EACH	26
Foundation wall dowel modification	EACH	28
[illegible]	SQ. FT.	[illegible]

BILL OF MATERIAL - PIER G3 *

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

* Elevation not shown

BILL OF MATERIAL - PIER G4 *

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

* Elevation not shown

BILL OF MATERIAL - PIER G6 *

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

* Elevation not shown

PIERS G2 & G5 RETROFITS

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

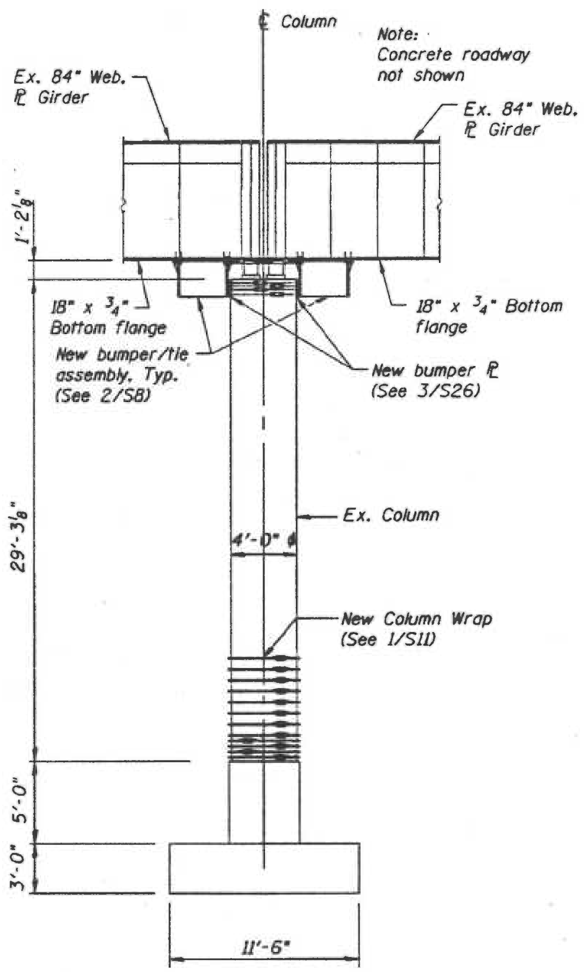
SCALE:
DATE 1-23-98
CHECKED BY HH

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 70	*	ST. CLAIR	91	40
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

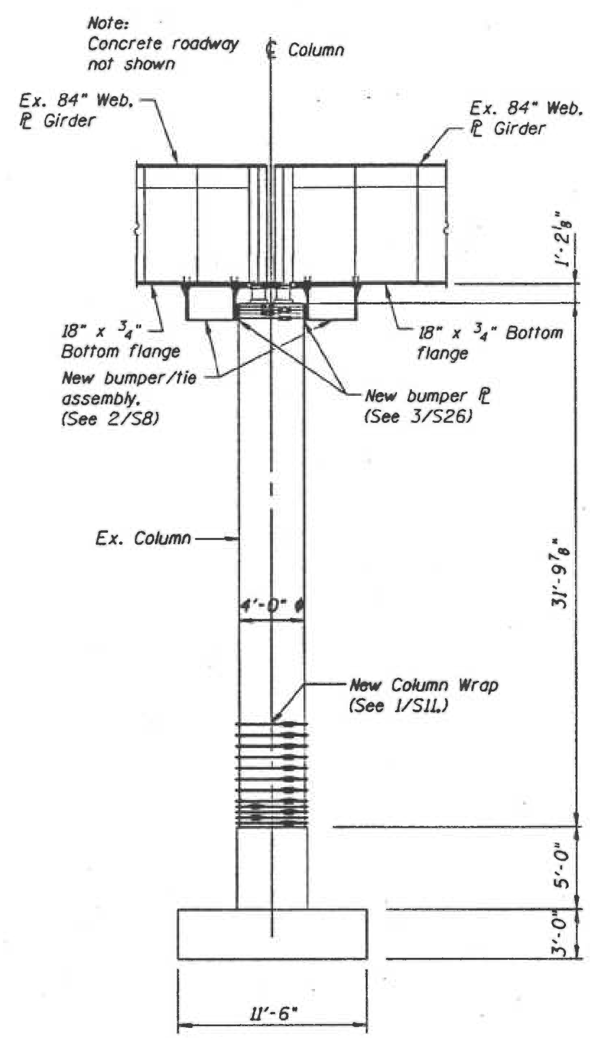
* 82-3HVB-2R-1-1

SHEET NO. S-42

SHEETS

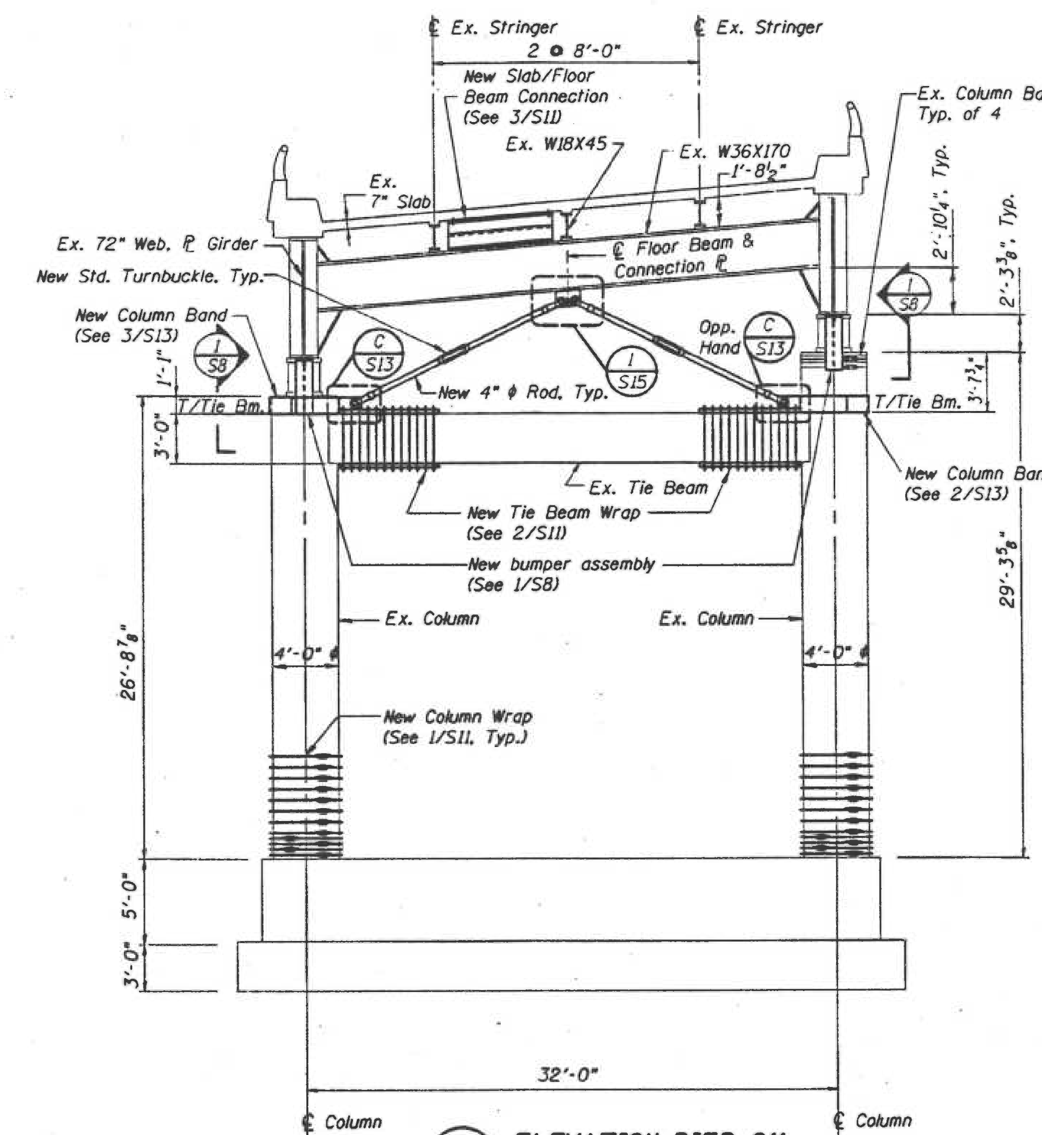


NORTH



SOUTH

1/S42 ELEVATIONS PIER G9



2/S42 ELEVATION PIER G11

BILL OF MATERIAL - PIER G7 *

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

* Elevation not shown

BILL OF MATERIAL - PIER G8 *

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

BILL OF MATERIAL - PIER G9

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.	[illegible]

BILL OF MATERIAL - PIER G10 *

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

BILL OF MATERIAL - PIER G11

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

PIERS G9 & G11 RETROFITS

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
FAI ROUTE 7[illegible]
POPLAR STREET [illegible]
-0141 [illegible]
2-0254 [illegible]

DATE 1-23-98 | CHECKED BY HH | JN

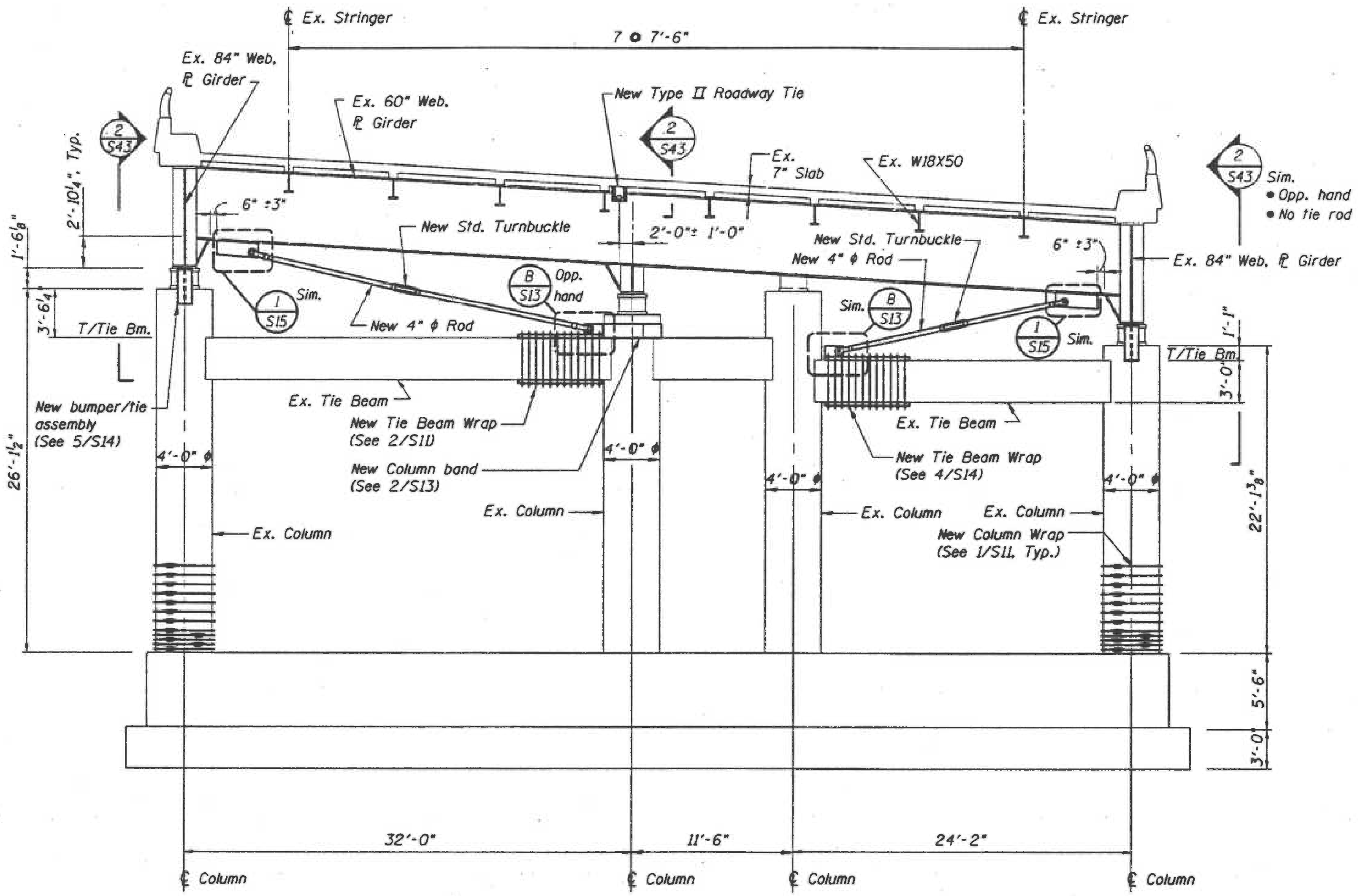
\STRUCTURES\7422\SET1\ST1PRS42.dgn

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 70	*	ST. CLAIR	91	41
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

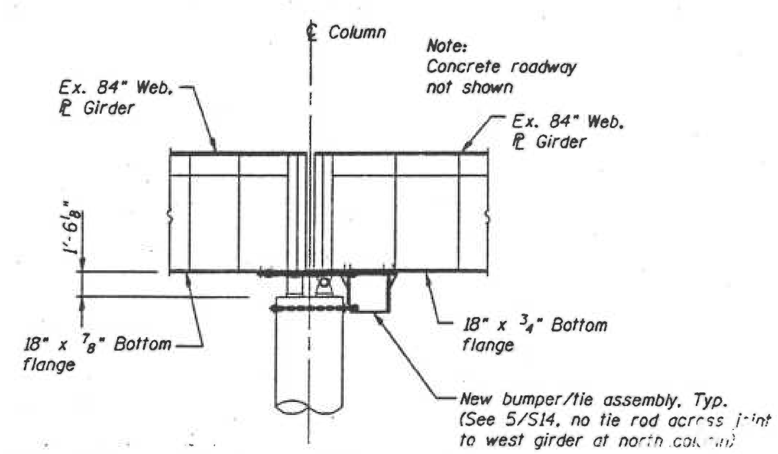
SHEET NO. S-43

SHEETS

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



1 S43 ELEVATION PIER G12



2 S43 ELEVATION EXISTING ROADWAY GIRDERS AT PIER G12

BILL OF MATERIAL - PIER G12		
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
FA[illegible]TE 70
POPL[illegible]ROACHES

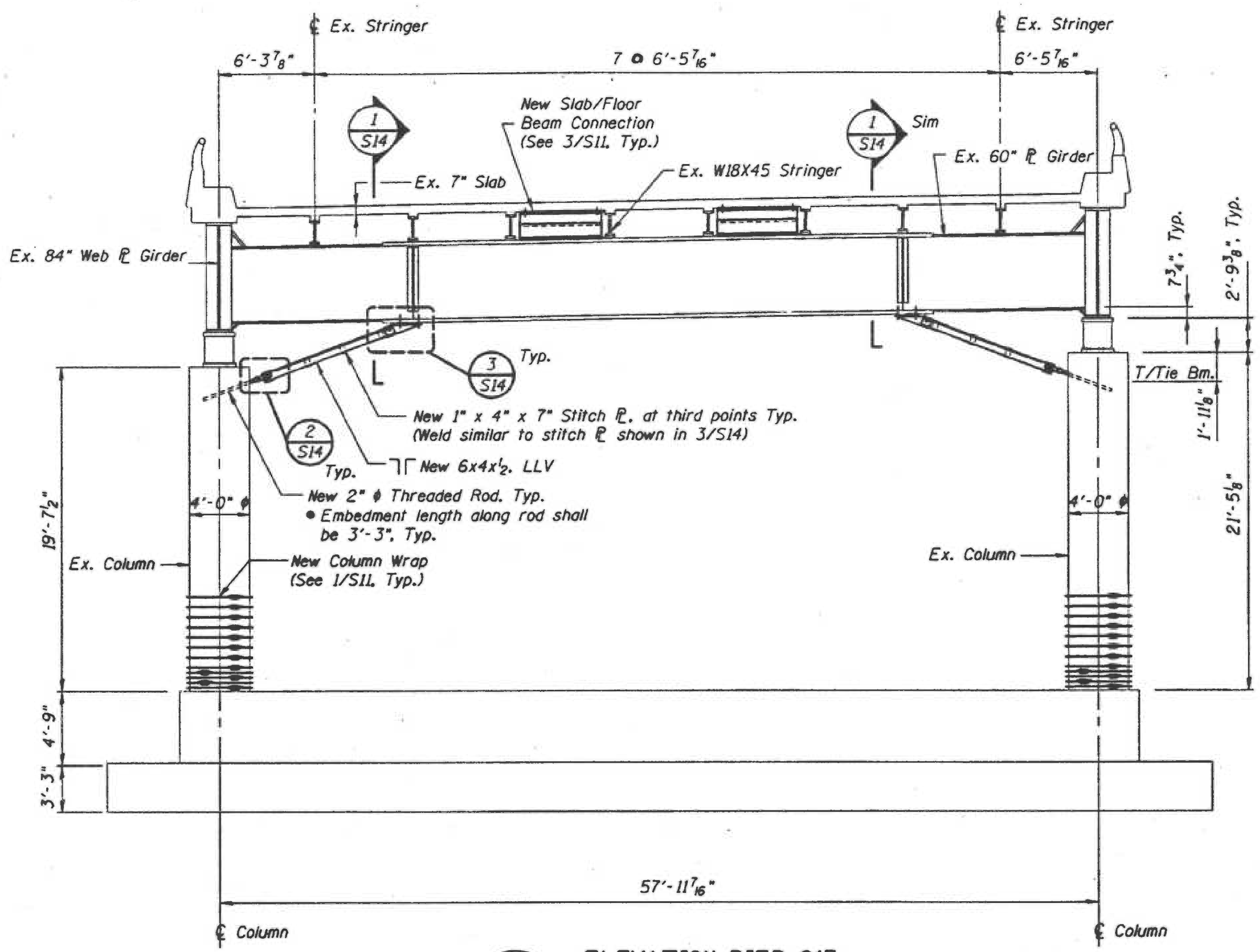
[illegible] NO. [illegible] 082-[illegible]
[illegible]CTURE NO. [illegible] NO. 082-[illegible]
[illegible]ALE: NONE DRAWN BY JN
DATE 1-23-98 CHECKED BY HH

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 70	*	ST. CLAIR	91	42
FED. ROAD DIST. NO. 7		ILLINOIS	FED. AID PROJECT-	

SHEET NO. S-44

SHEETS

* 82-3HV8-2R-1-1



1/S44 ELEVATION PIER G13

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
IR COUNTY

DATE 1-23-98 CHECKED BY HH

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 70	*	ST. CLAIR	91	43
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

SHEET NO. S-1

SHEETS

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

D-98-012-95

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

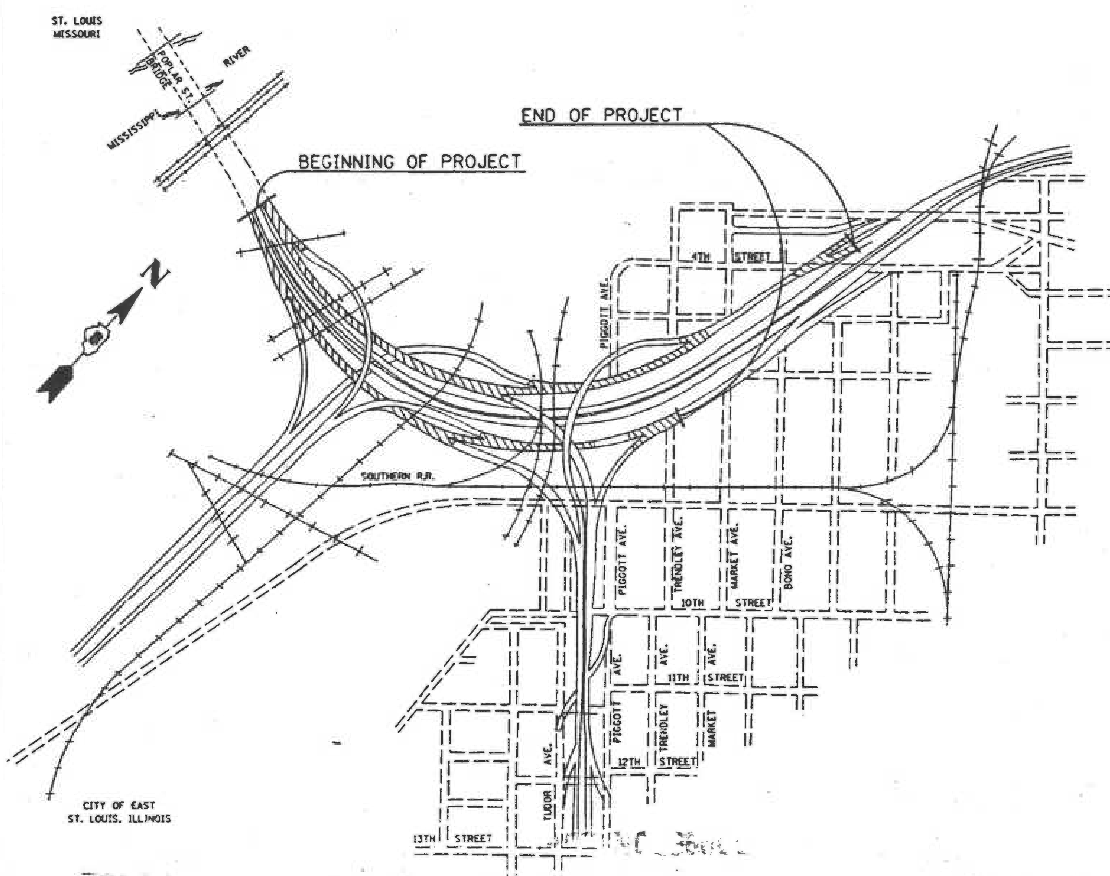
SET 2 OF
4 SETS

PLANS FOR PROPOSED SEISMIC AND REDUNDANCY RETROFIT REPAIRS *

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

* ENCOMPASSING THE FOLLOWING ROADWAYS
- ROADWAY D. STRUCTURE NO. 082-0144
- RAMP Q. STRUCTURE NO. 082-0255
- RAMP P. STRUCTURE NO. 082-0203
- ROADWAY H. STRUCTURE NO. 082-0256

INDEX OF SHEETS



LOCATION OF SECTION INDICATED THUS:-

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

SUBMITTED __________ 19 ____

DISTRICT ENGINEER

__________ 19 ____

ENGINEER OF PROJECT DEVELOPMENT AND IMPLEMENTATION

__________ 19 ____

ENGINEER OF DESIGN AND ENVIRONMENT

__________ 19 ____

DIRECTOR, DIVISION OF HIGHWAYS

CONTRACT NO. [illegible]

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 70	*	ST. CLAIR	91	44

SHEET NO. S-2
SHEETS

* 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 [illegible] 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 ¾ in. or greater than 2½ in. in width. During concrete removal, exercise reasonable care to avoid cracking of underlying sound concrete.

GENERAL NOTES

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
FAI ROUTE 70
POPLAR [illegible] BRIDGE APPROACH[illegible]
[illegible] COUNTY

STRUCTURE NO. [illegible] STRUCTURE NO. [illegible]
SCALE: NONE DRAWN [illegible]
DATE 1-23-98 CHECKED BY [illegible]

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 70	*	ST. CLAIR	91	45
FED. ROAD DIST. NO. 7		ILLINOIS	FED. AID PROJECT-	

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

SHEET NO. S-3

SHEETS

SCOPE OF WORK

SEISMIC RETROFIT

1. Install column wraps on the following piers.
   - Structure No. 082-0144 (Roadway D, 22 locations)
     D2 D8 D14 D19 D25
     D4 D9 D15 D20 D26
     D5 D10 D16 D21
     D6 D12 D17 D23
     D7 D13 D18 D24
   - Structure No. 082-0255 (Ramp Q, 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 Q, 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

SCOPE OF WORK

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
FAI ROUTE 70
POP[illegible]REET BRIDGE APPRO[illegible]CHES
[illegible] COUNTY
[illegible] 2-0[illegible] STRUCT[illegible]
[illegible] 0256 (ROADW[illegible] STRUCTURE

SCALE: NONE | DR[illegible] JN
DATE 1-23-98 | CHECKED BY HH

[illegible]UCTUR\97422\SET2\S72SCPS3.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

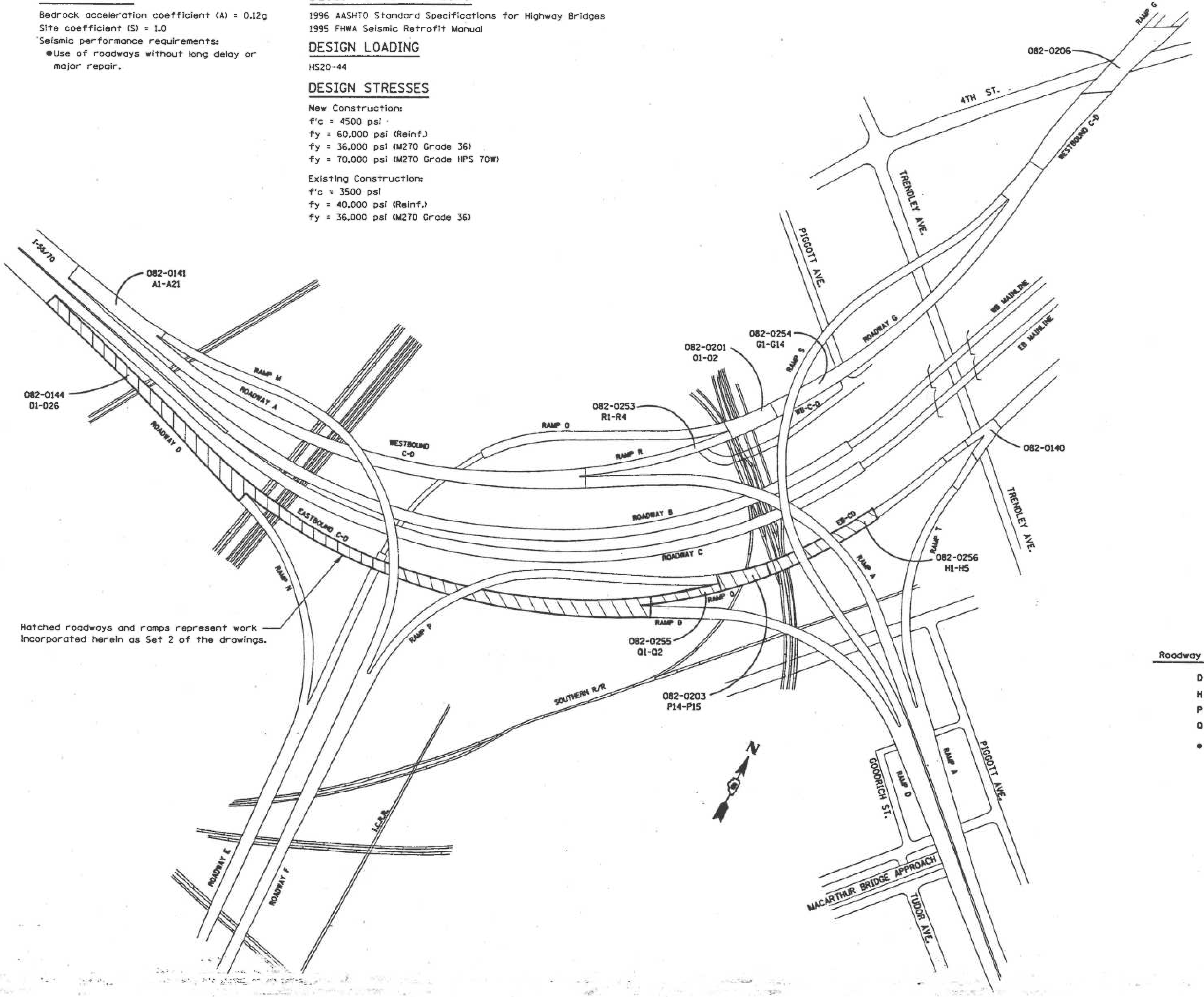
New Construction:
f'c = 4500 psi
fy = 60,000 psi (Reinf.)
fy = 36,000 psi (M270 Grade 36)
fy = 70,000 psi (M270 Grade HPS 70W)

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.
F.A.I. 70	*	ST. CLAIR	91	46
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

SHEET NO. S-4
SHEETS

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



LOCATION SKETCH

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 70
POPLA[illegible] TREET BRIDGE APPROACHES
[illegible] COUNTY

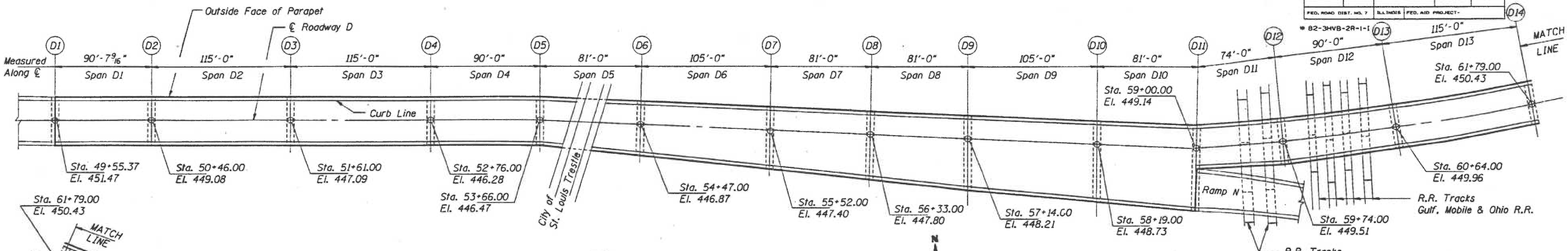
[illegible] NO. 082-0144 [illegible]
[illegible] NO. 082-[illegible]
[illegible]: NONE
DRAWN BY JN
DATE 1-23-98
CHECKED BY HH

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 70	*	ST. CLAIR	91	47
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

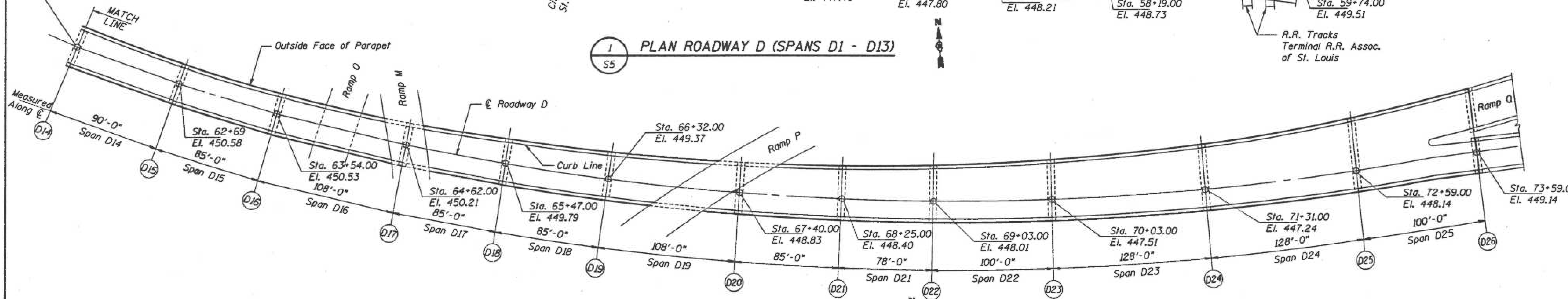
SHEET NO. S-5

SHEETS

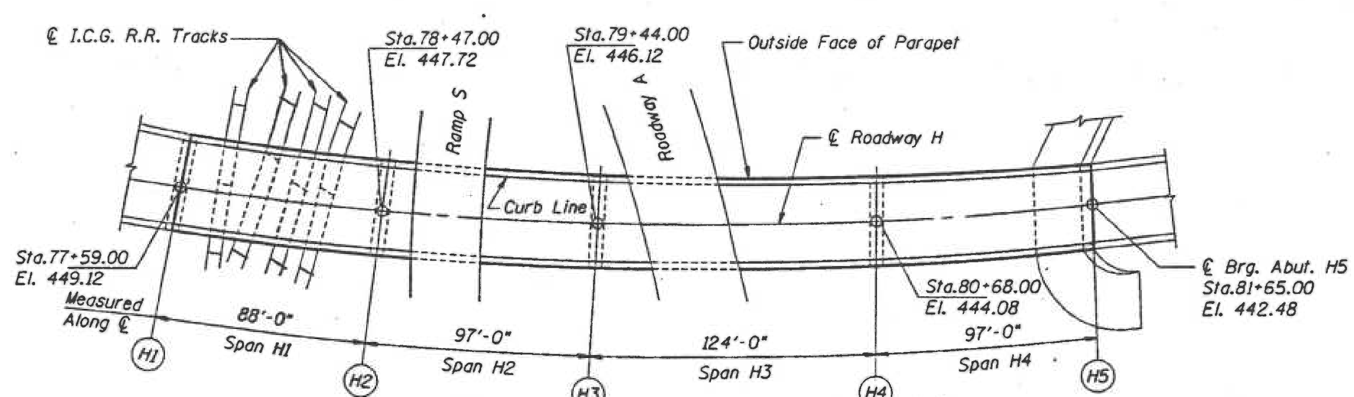
* 82-3HVB-2R-1-1



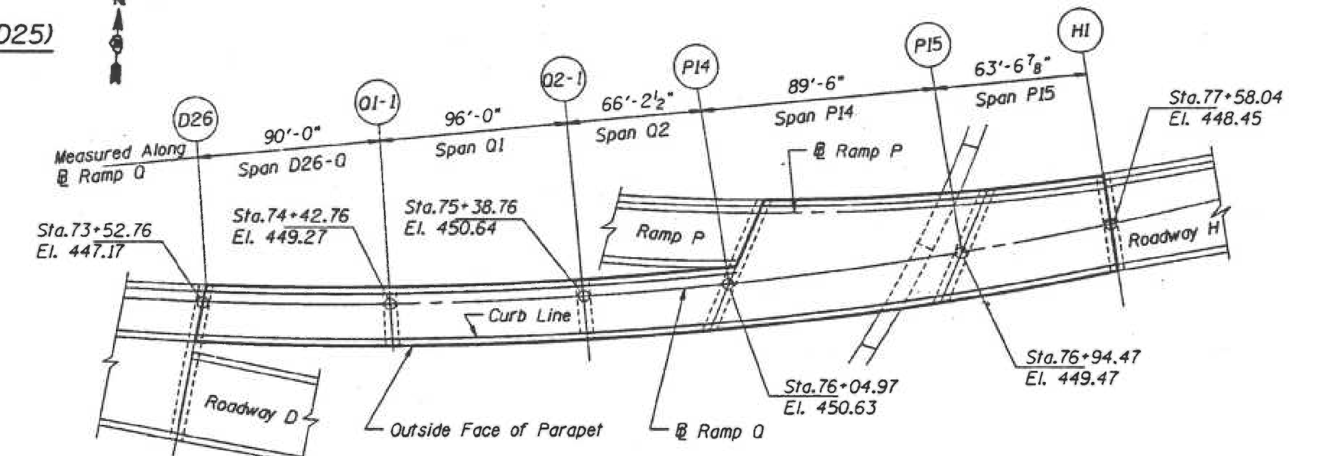
1/S5 PLAN ROADWAY D (SPANS D1 - D13)



2/S5 PLAN ROADWAY D (SPANS D14 - D25)



3/S5 PLAN ROADWAY H



4/S5 PLAN RAMPS Q & P

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

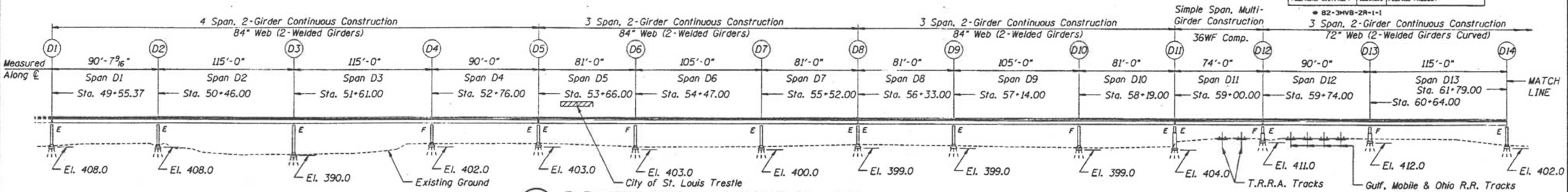
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
FAI ROUTE 70
POPLAR STREET BRIDGE APPROACHES
ST. CLAIR [illegible]
STRUCTURE [illegible] 082-0144 (ROA[illegible]) [illegible] 203 (RAMP [illegible])
[illegible] 2-0255 (ROADWAY [illegible])

DATE 1-23-98 [illegible] BY HH

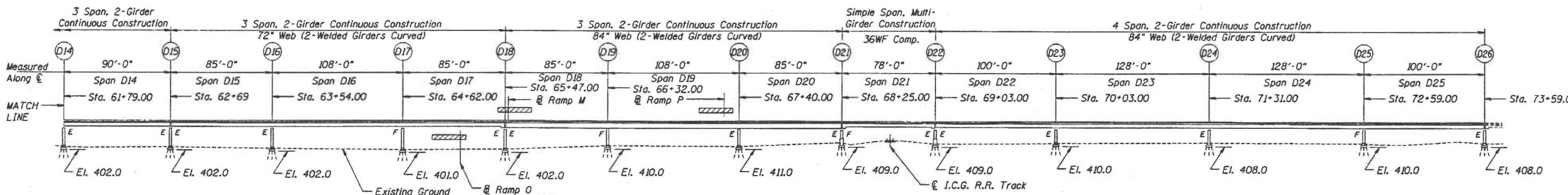
ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 70	*	ST. CLAIR	91	48
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

SHEET NO. S-6 SHEETS

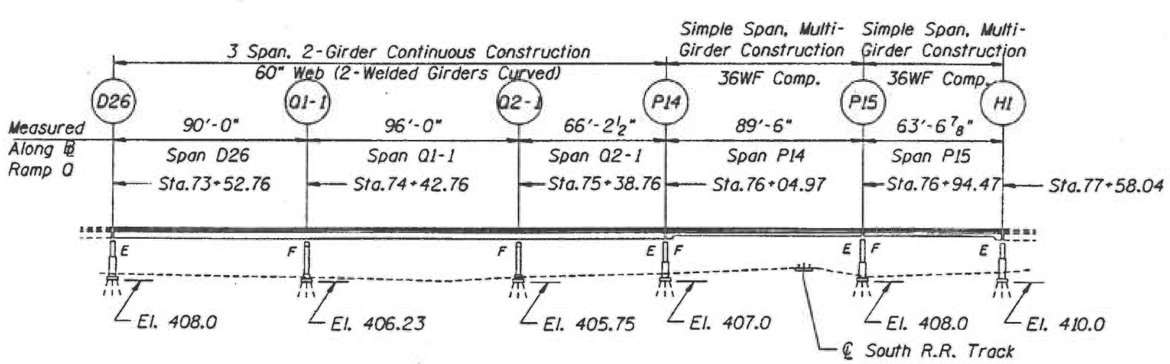
* 82-3HVB-2R-1-1



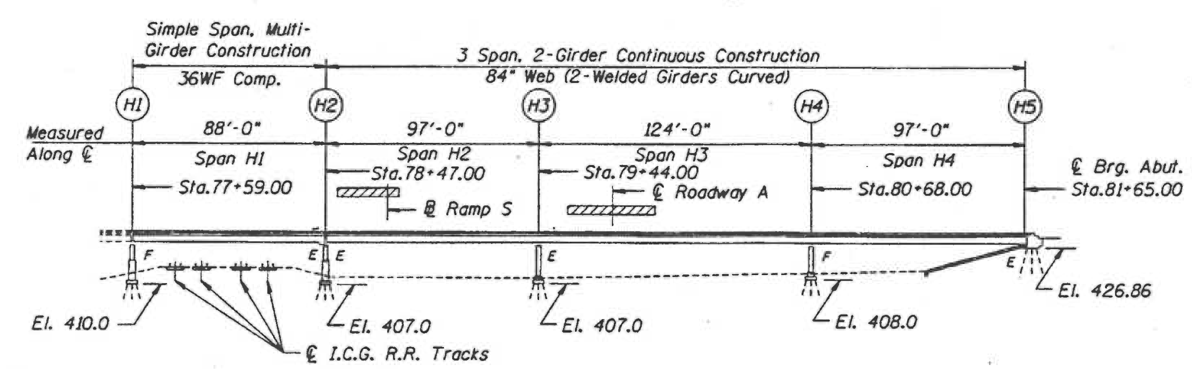
1 / S6 ELEVATION ROADWAY D (SPANS D1 - D13)



2 / S6 ELEVATION ROADWAY D (SPANS D14 - D25)



3 / S6 ELEVATION RAMPS Q & P



4 / S6 ELEVATION ROADWAY H

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

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
FAI ROUTE 70
[illegible]R STREET BRIDGE [illegible]
ST. CLAIR C[illegible]

SCALE: NONE
DATE 1-23-9[illegible]
CHECKED BY [illegible]

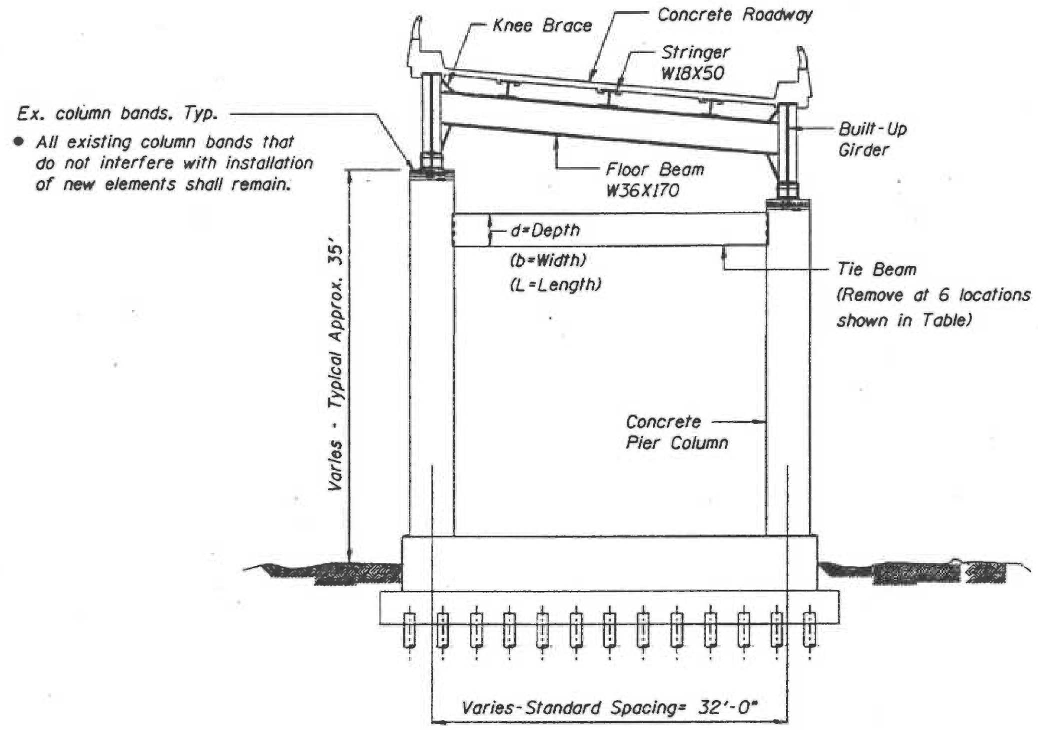
ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 70	*	ST. CLAIR	91	49

FED. ROAD DIST. NO. 7 | ILLINOIS | FED. AID PROJECT-

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

SHEET NO. S-7

SHEETS



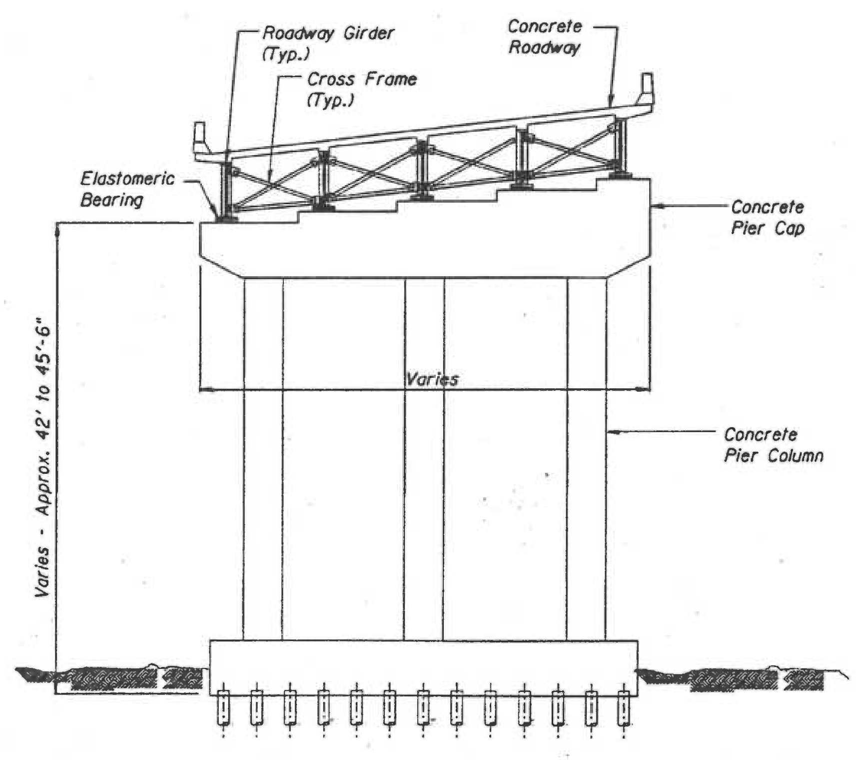
1 / S7 TYPICAL SECTION THROUGH TWO GIRDER ROADWAY
(Section through Ramp Similar)

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.



2 TYP... SECTION THROUGH MULTI - GIRDER ROADWAY

TYPICAL SUBSTRUCTURE DETAILS

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

DATE

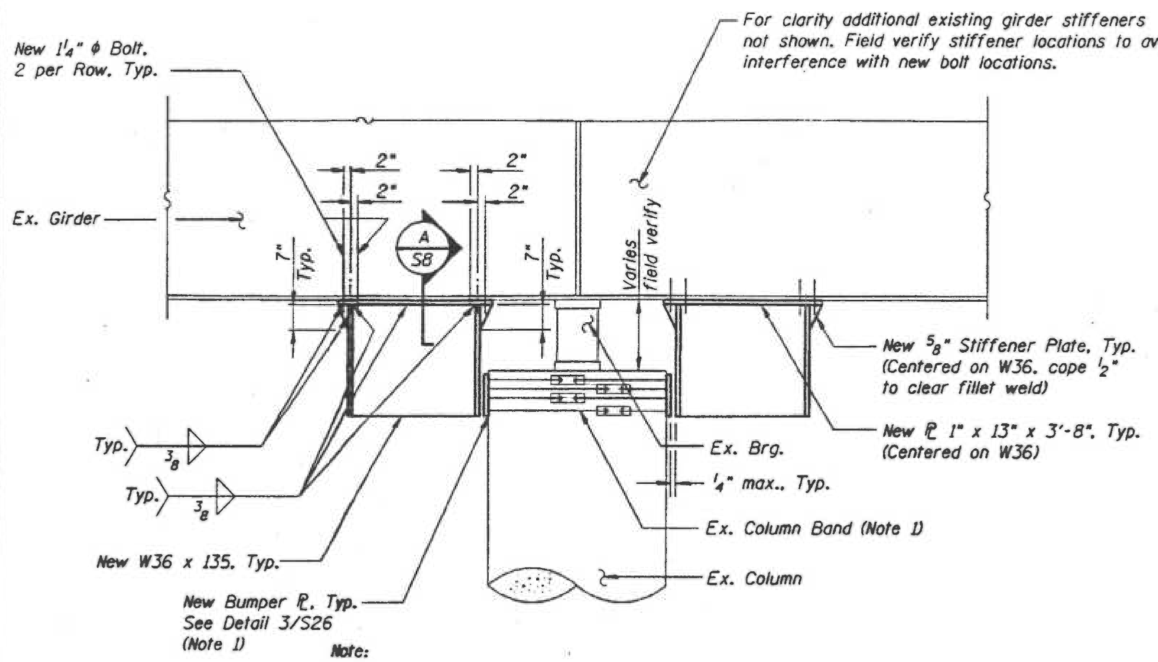
CHECKED BY HH

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 70	*	ST. CLAIR	91	50
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT		

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

SHEET NO. S-8

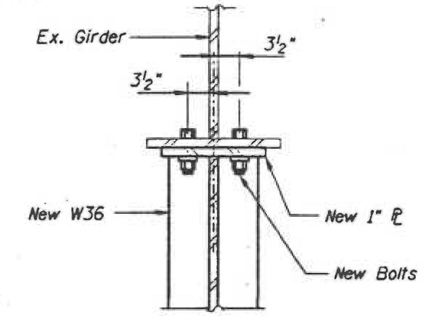
SHEETS



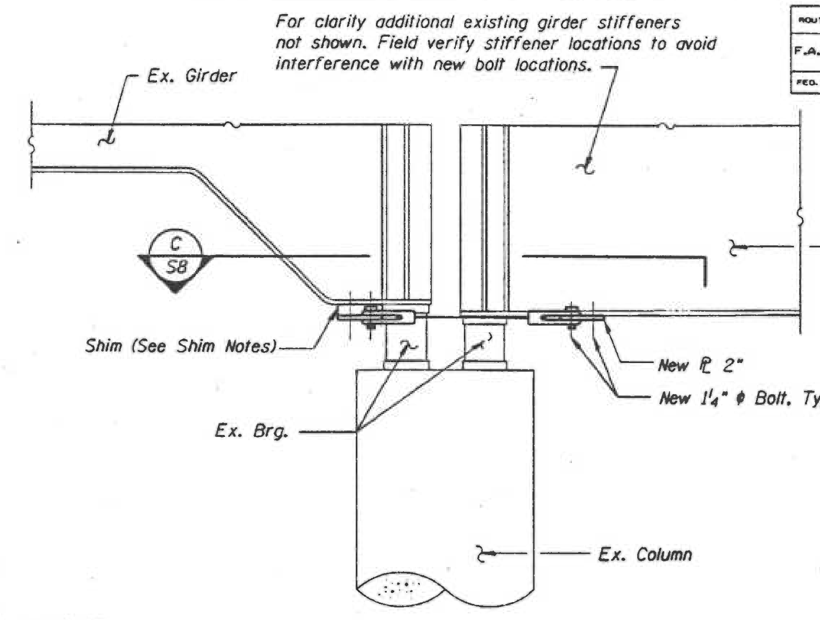
Note:

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

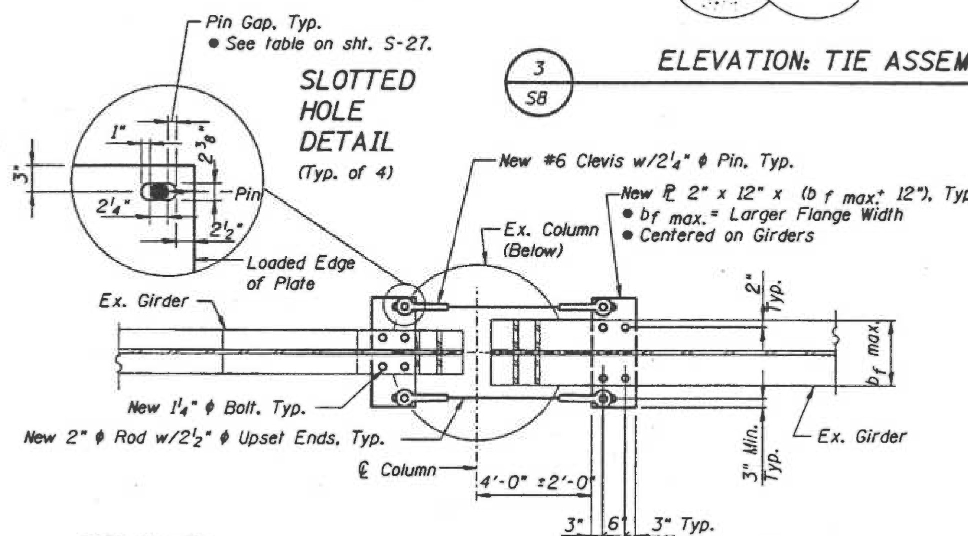
1/S8 ELEVATION: BUMPERS AT CONTINUOUS GIRDER



A/S8 SECTION



3/S8 ELEVATION: TIE ASSEMBLY



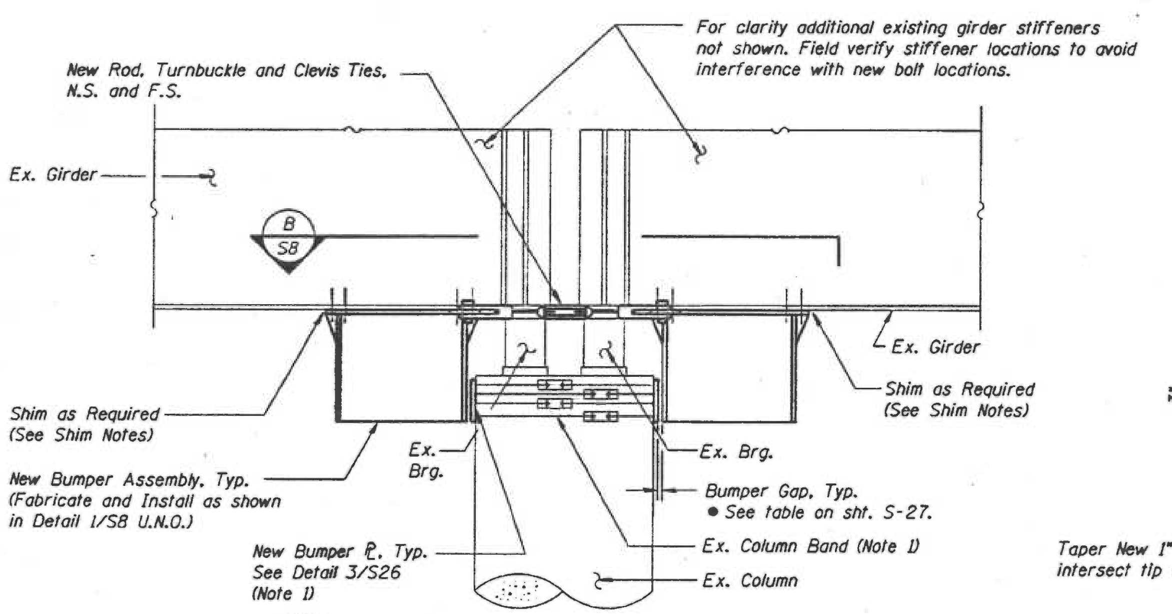
C/S8 SECTION

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:

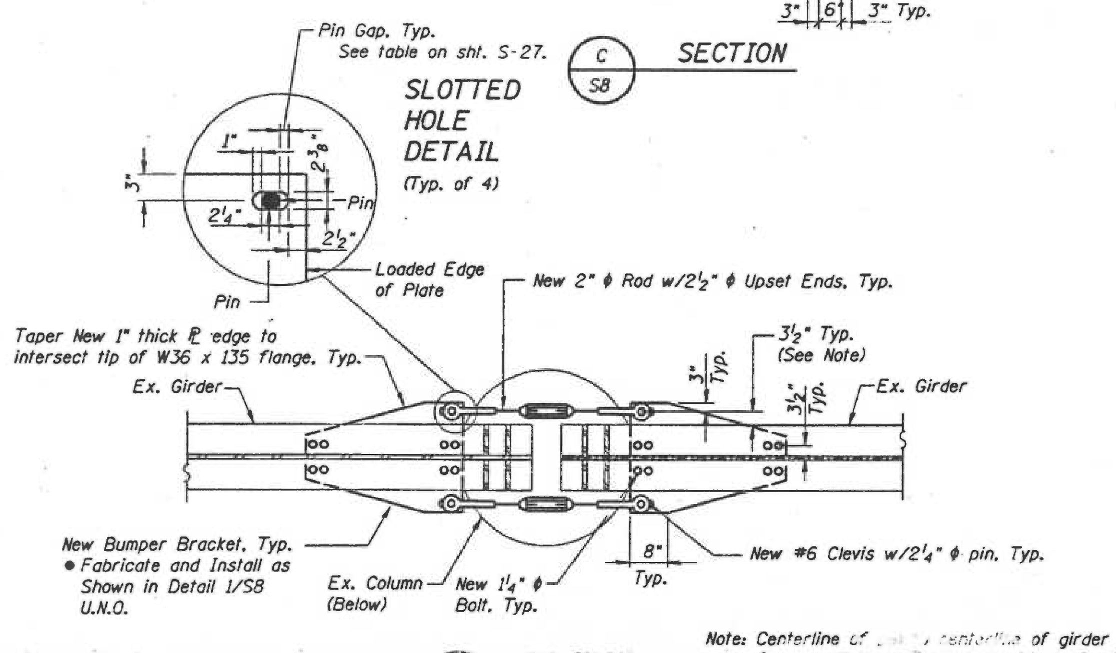
1. All bolt holes shall be standard round holes (ϕ+1/16") Unless Noted Otherwise.
2. All bumpers and tie rod connection plates shall be centered on the existing girder.
3. Tie Rods may be multiple bar sections with turnbuckles or single rods without turnbuckles.
4. The total length of the unthreaded 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.



Note:

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

2/S8 ELEVATION: BUMPER/TIE ASSEMBLY



Note: Centerline of ... centerline of girder

B/S8 SECTION

SEISMIC RETROFIT DETAILS

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

-0144 ... 082-0203

2-0256 ...

DRAWN BY JN

DATE 23-98

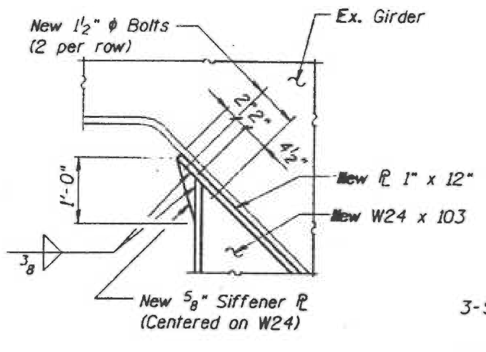
CHECKED BY HH

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 70	*	ST. CLAIR	91	51
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

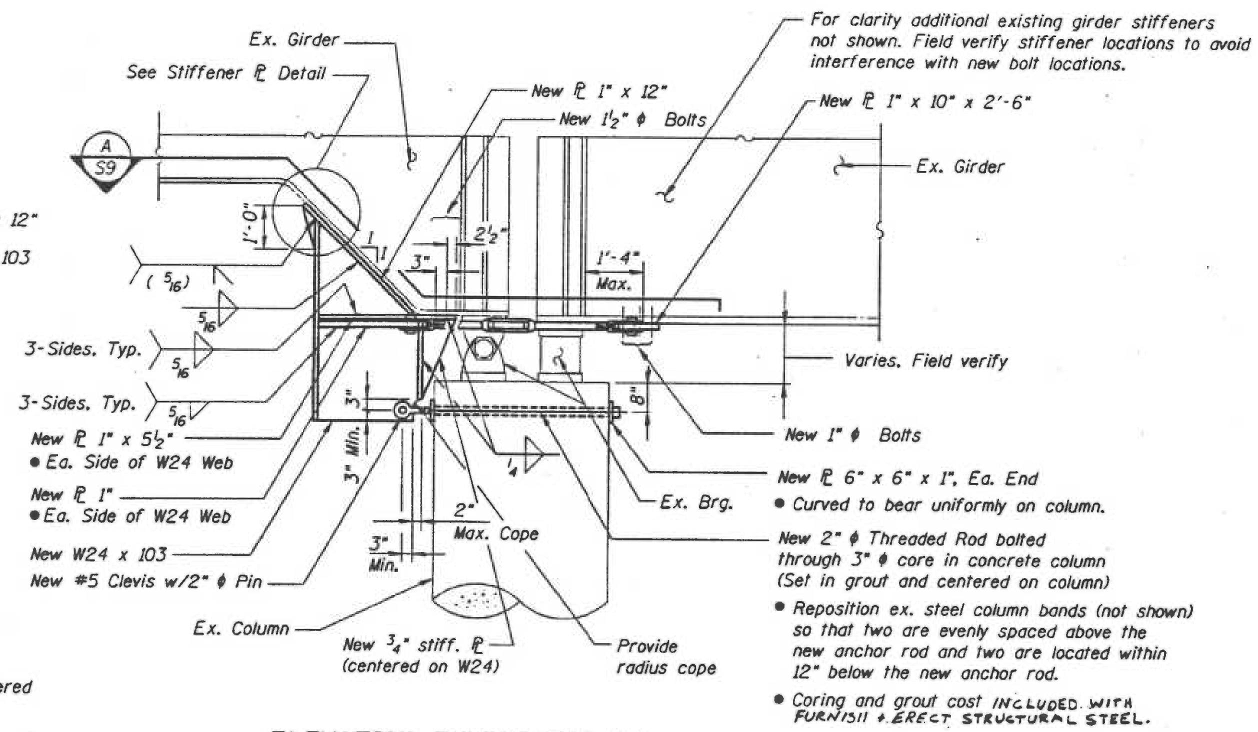
* 82-3HV8-2R-1-1

SHEET NO. S-9

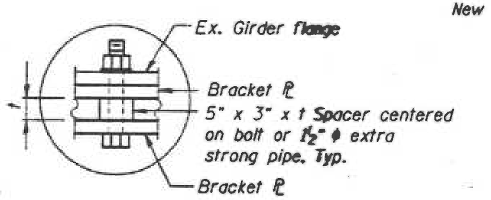
SHEETS



STIFFENER PL DETAIL

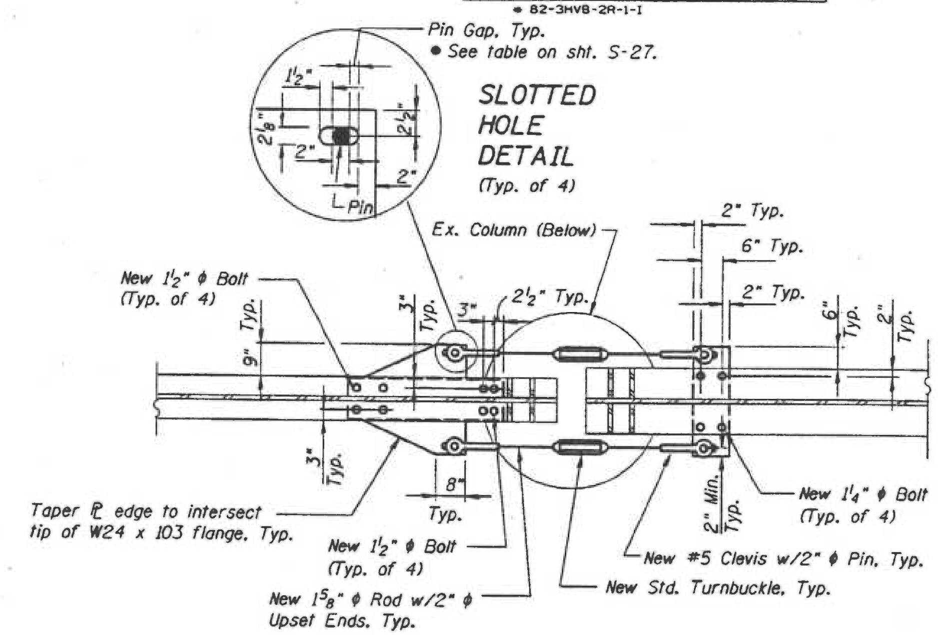


1
S9
ELEVATION: BUMPER/TIE AT HAUNCHED GIRDER WITH FIXED BEARING

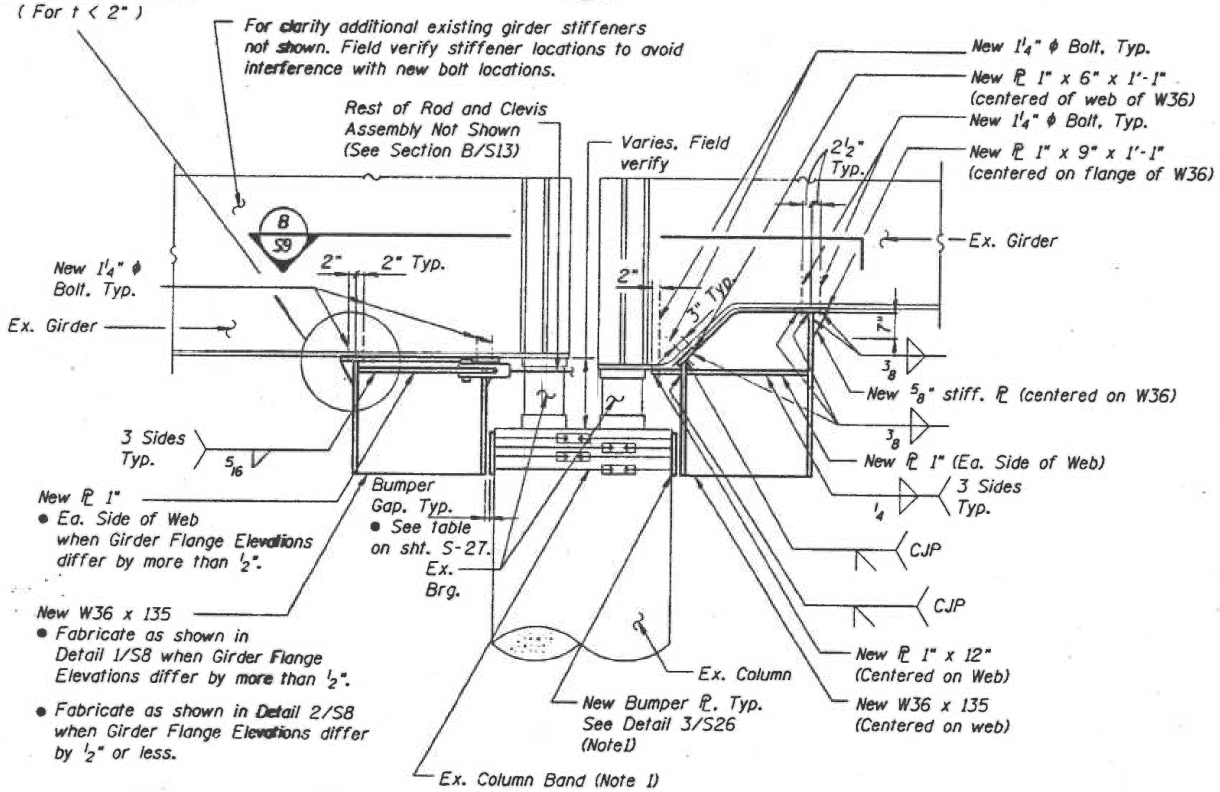


SPACER DETAIL

(For t < 2")



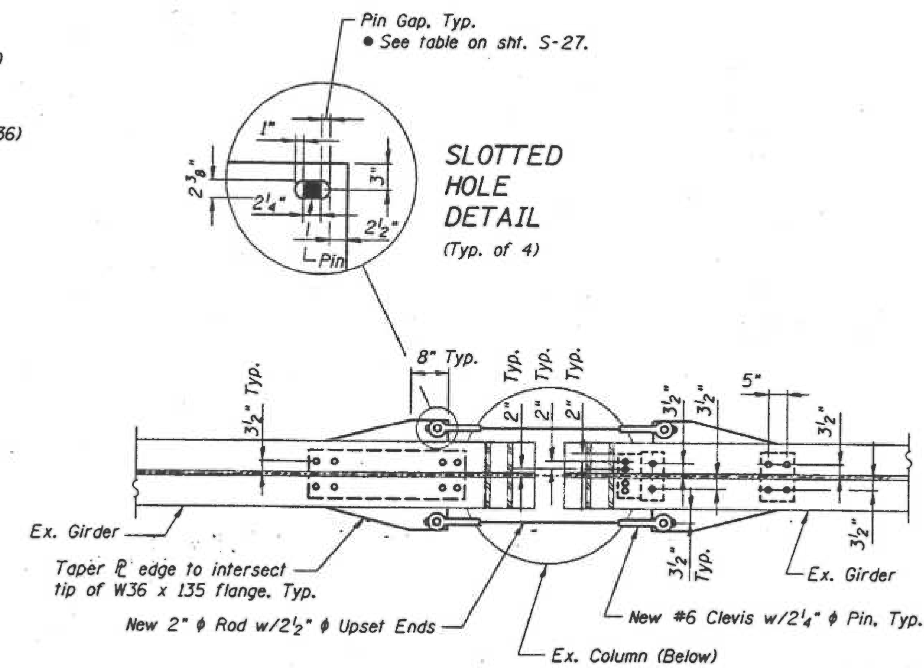
A
S9
SECTION



Note:

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

2
S9
ELEVATION: BUMPER/TIE AT HAUNCHED GIRDER



B
S9
SECTION

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 ¾" max. into clevis and turnbuckle openings U.N.O.

SEISMIC RETROFIT DETAILS

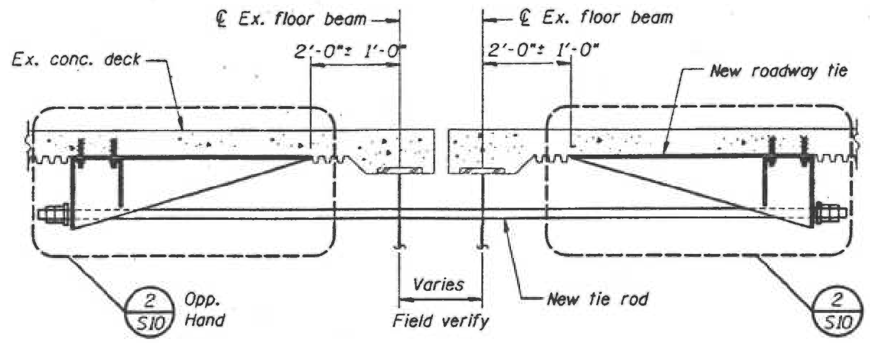
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
FAI ROUTE 70
POPLAR STREET BRIDGE APPROACHES
ST. CLAIR COUNTY
SCALE: NONE
DRAWN BY
DATE 1-23-98
CHECKED BY HH

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 70	*	ST. CLAIR	91	52
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT		

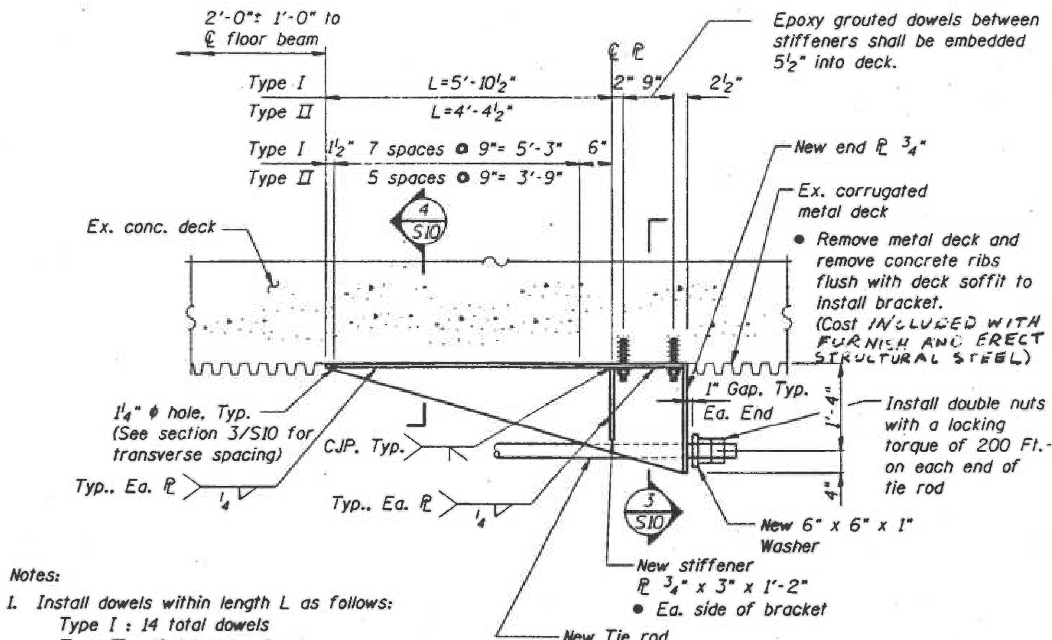
* 82-3HVB-2R-1-1

SHEET NO. S-10

SHEETS



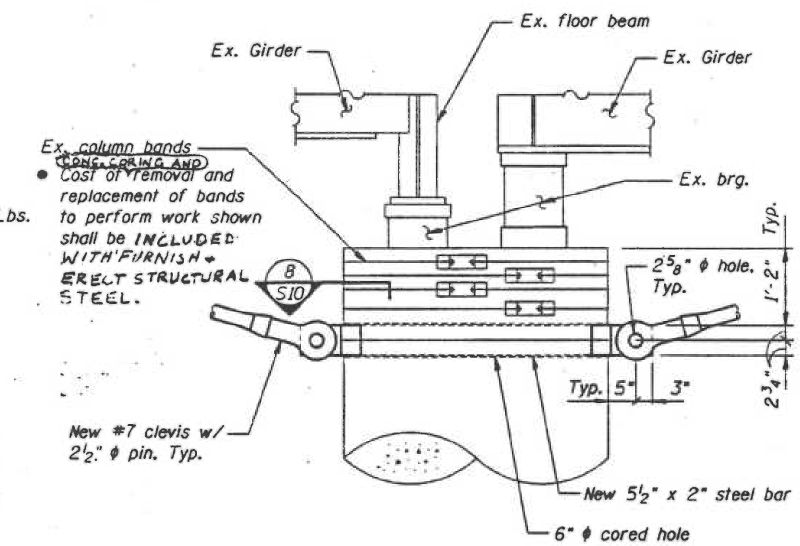
1/S10 ELEVATION - ROADWAY TIE



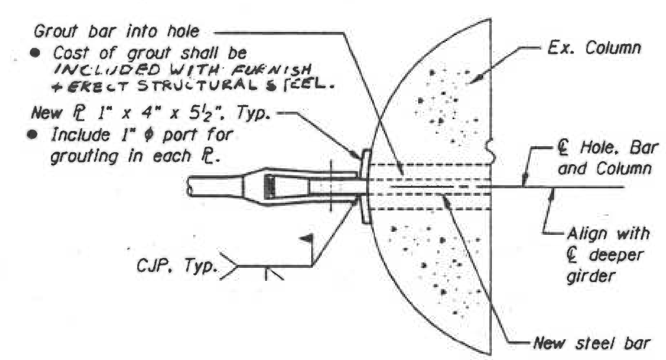
Notes:

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 4½" 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.

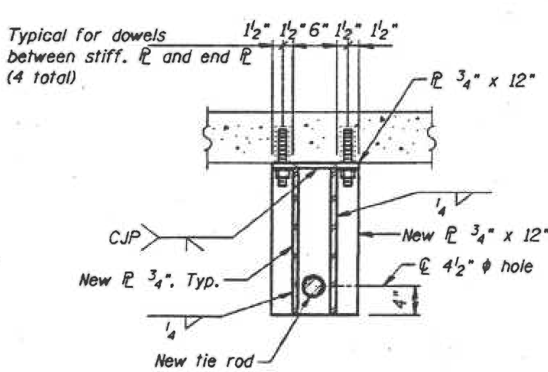
2/S10 ELEVATION - ROADWAY TIE



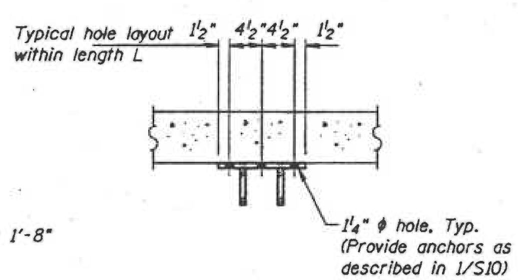
7/S10 ELEVATION



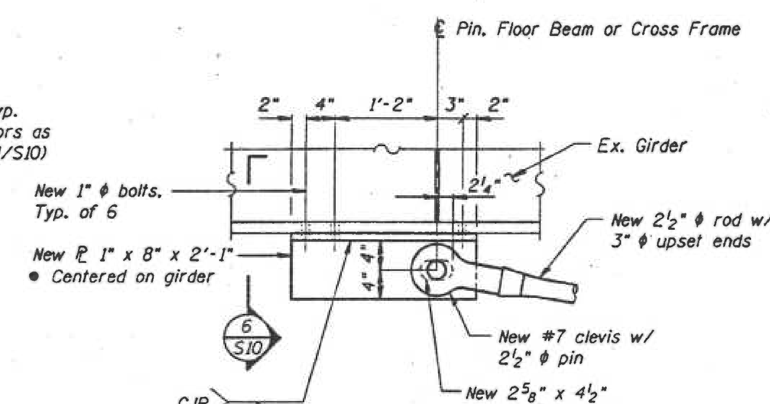
8/S10 SECTION



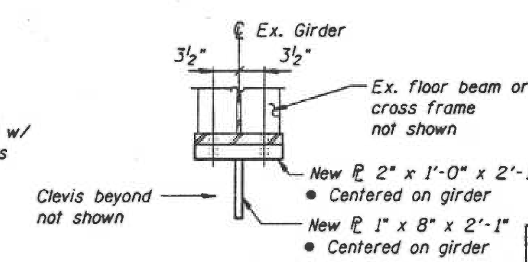
3/S10 SECTION



4/S10 SECTION



5/S10 DETAIL



6/S10 SECTION

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. 082-0144 (ROADWAY 0) STRUCTURE NO. [illegible]
STRUCTURE NO. 082-0256 (ROADWAY [illegible]) STRUCTURE [illegible]
SCALE: NONE
DATE 1-23-98 CHECKED BY [illegible]

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 70	*	ST. CLAIR	91	53
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

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

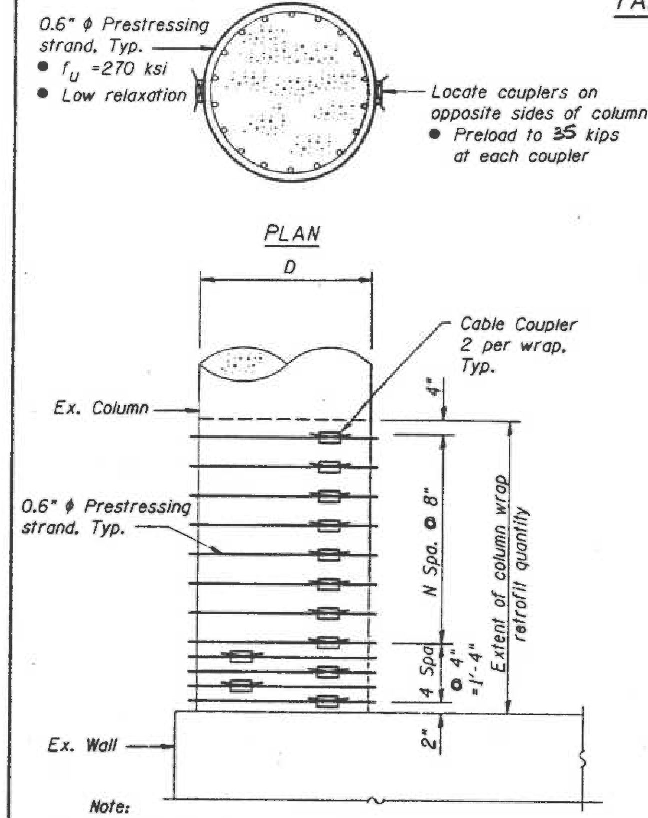
SHEET NO. S-11 SHEETS

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
Q1-1	2	48	7	—	—	—	
Q2-1	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:

1. Complete all specified dowel bar modifications and concrete repairs at least 3 days before wrapping any member.
2. See detail 1/S11 for column wrap U.N.O.
3. See detail 2/S11 for tie beam wrap U.N.O.
4. See detail 6/S12 for column wrap.
5. See detail 2/S13 for modifications to the tie beam wrap.
6. 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.
7. 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.

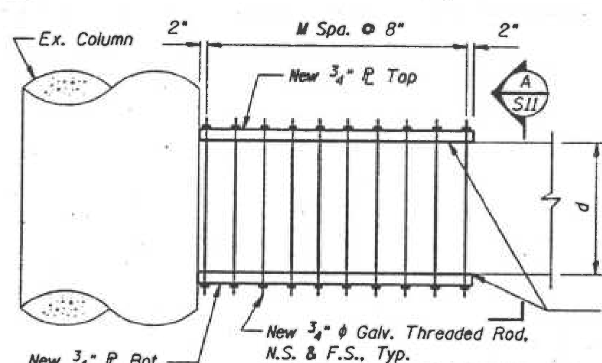


Note:

1. See table for dimensions not shown and additional notes.
2. Alternative column wraps may be used. See Special Provisions.

1/S11 ELEVATION - TYPICAL COLUMN WRAP

Scale : NTS

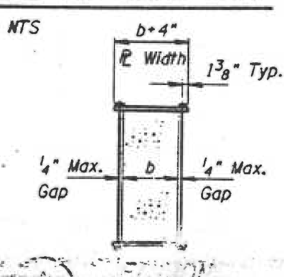


Concrete grinding cost, if required to provide uniform ℙ bearing, shall be INCLUDED WITH FURNISH + ERECT STRUCTURAL STEEL.

Notes: 1. See table for dimensions not shown and additional notes.
2. Wrap each end as shown.

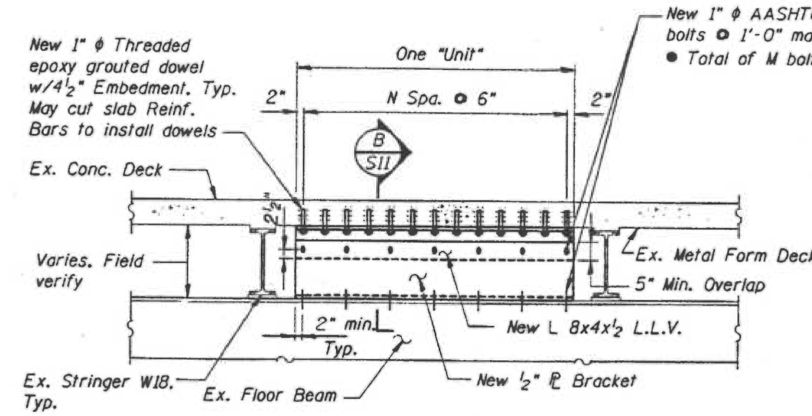
2/S11 ELEVATION - TYPICAL TIE BEAM WRAP

Scale : NTS



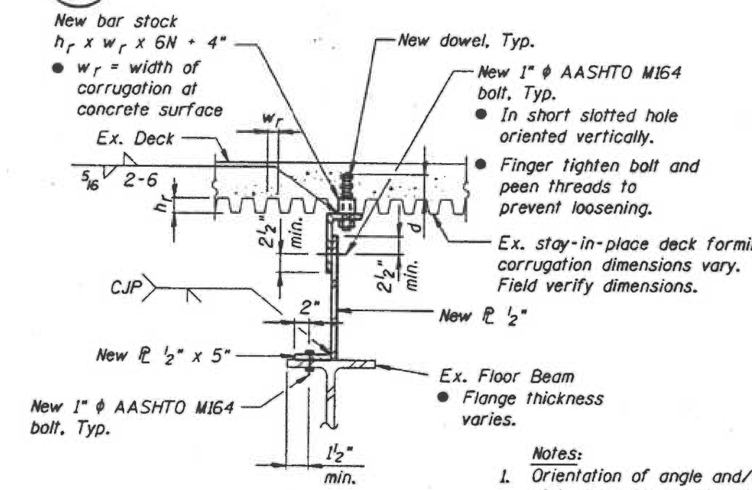
A/S11 SECTION

Scale : $1/2$"=1'-0"



Notes: 1. See table for number of "units", per pier.
2. See table for N.

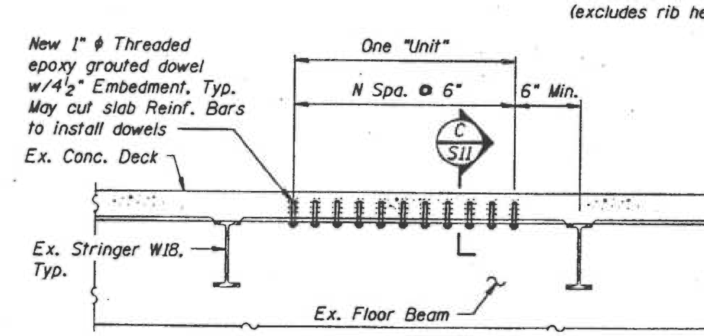
3/S11 ELEVATION - SLAB FLOOR BEAM CONNECTION



B/S11 SECTION

Notes:

1. Orientation of angle and/or plate assembly may be opposite hand to that shown.
2. 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: 1. See table for number of "units" per pier.
2. See table for N.

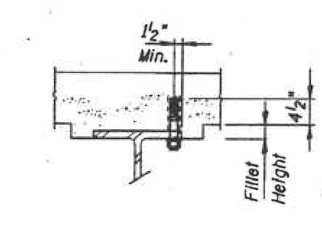
4/S11 ELEVATION - SLAB FLOOR BEAM CONNECTION

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-11	
D3	1	5	3	3/S-11	
D4	2	8	5	3/S-11	
D6	2	8	5	3/S-11	
D7	2	5	3	3/S-11	
D9	2	7	4	3/S-11	
D10	2	7	4	3/S-11	
D11	1	7	4	4/S-11	See Note 1
D13	2	8	5	3/S-11	
D14	1	8	5	3/S-11	
D16	1	9	5	3/S-11	
D17	2	7	4	3/S-11	
D19	2	9	5	3/S-11	
D20	1	10	6	3/S-11	
D22	1	7	4	4/S-11	See Note 2
D23	4	7	4	3/S-11	
D24	4	7	4	3/S-11	
D25	2	8	5	3/S-11	
H3	2	8	5	3/S-11	
H4	2	10	6	3/S-11	

Notes:

1. West side expansion joint only.
2. East side expansion joint only.



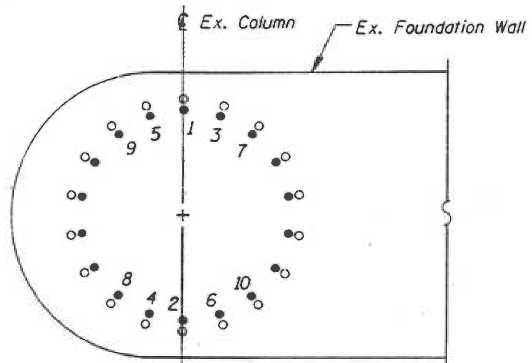
C/S11 SECTION

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 AND REDUNDANCY RETROFIT REPAIRS
FAI ROUTE 70
POPLAR STRE[illegible] APPROACHES

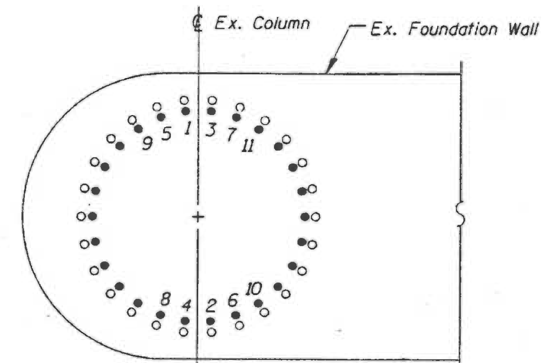
SCALE: AS NOTED
DATE 1-23-98
DRAWN BY
CHECKED BY HH



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

1/S12 SECTION - FOUNDATION WALL DOWELS

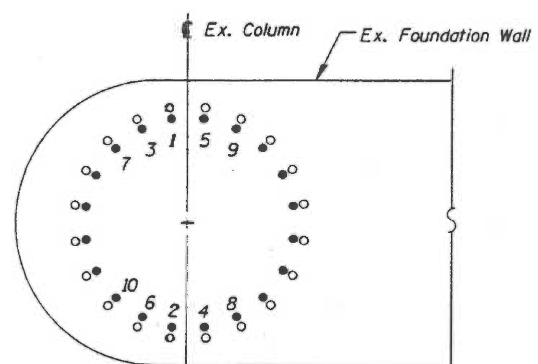
(18 Bar Layout)



● Foundation Wall dowel bar (#11 bar)
○ Outline of column bar

4/S12 SECTION - FOUNDATION WALL DOWELS

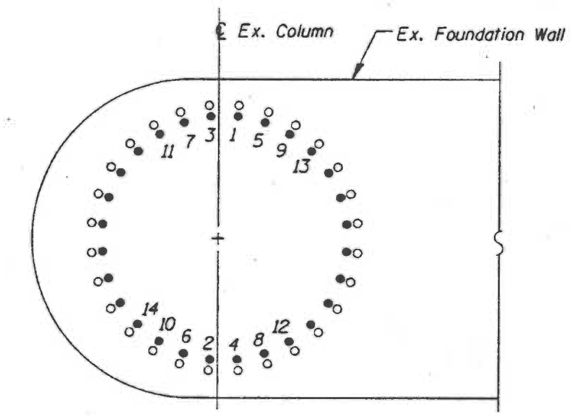
(26 Bar Layout)



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

2/S12 SECTION - FOUNDATION WALL DOWELS

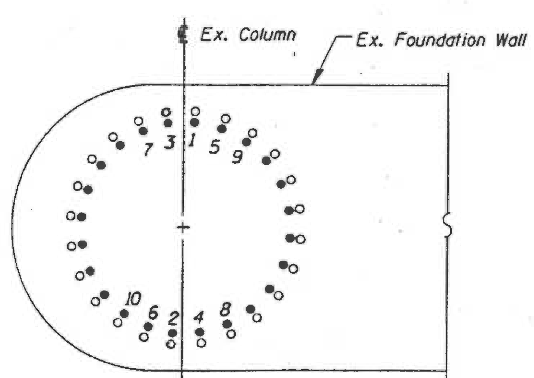
(20 Bar Layout)



● Foundation Wall dowel bar (#11 bar)
○ Outline of column bar

5/S12 SECTION - FOUNDATION WALL DOWELS

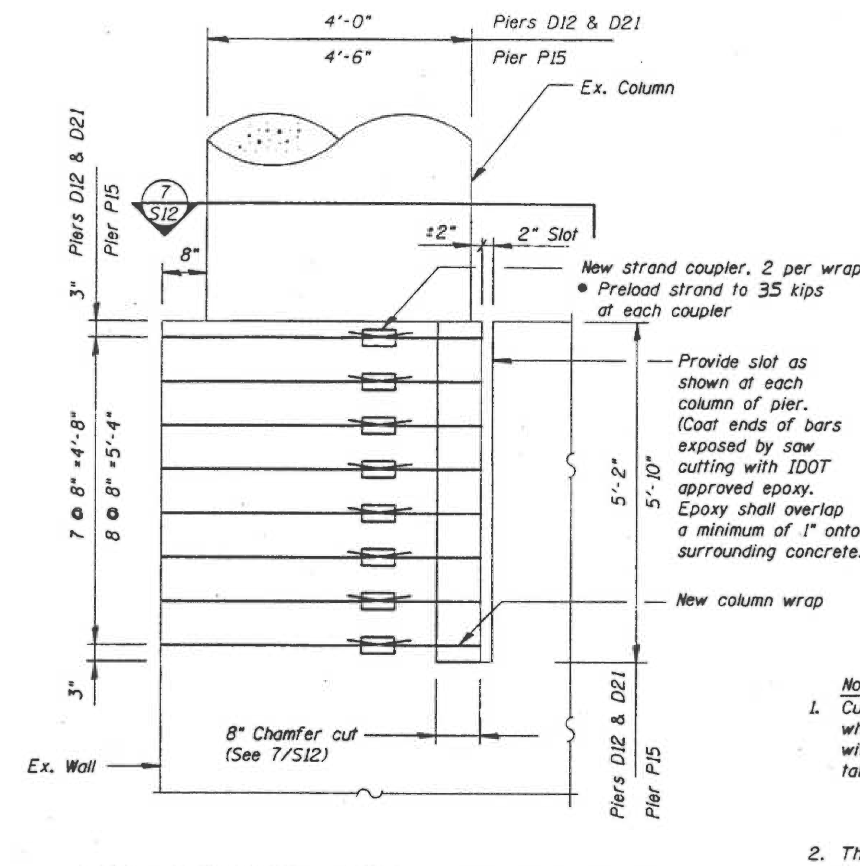
(28 Bar Layout)



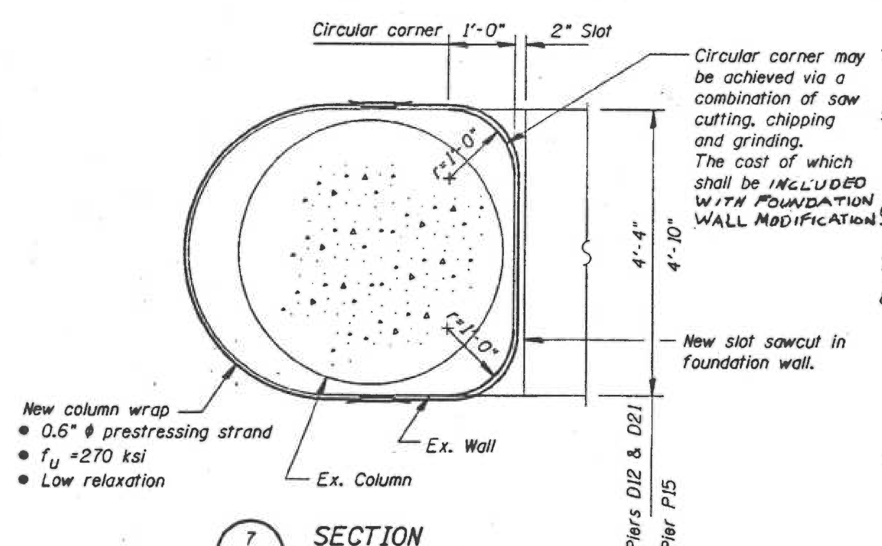
● Foundation Wall dowel bar (#11 bar)
○ Outline of column bar

3/S12 SECTION - FOUNDATION WALL DOWELS

(24 Bar Layout)



6/S12 ELEVATION - PIERS D12, D21 & P15



7/S12 SECTION

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 1½" 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.

SEISMIC RETROFIT DETAILS

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

SCALE:

DATE 1-23-98

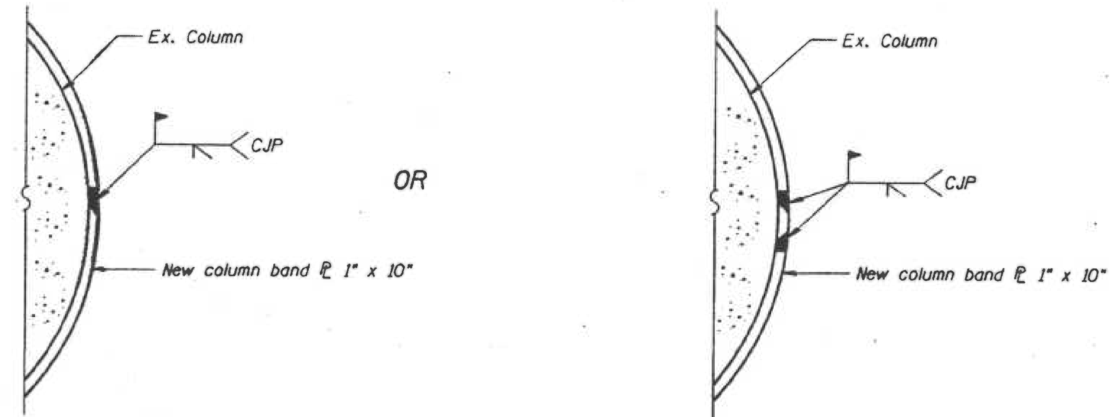
CHECKED BY

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 70	*	ST. CLAIR	91	55
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

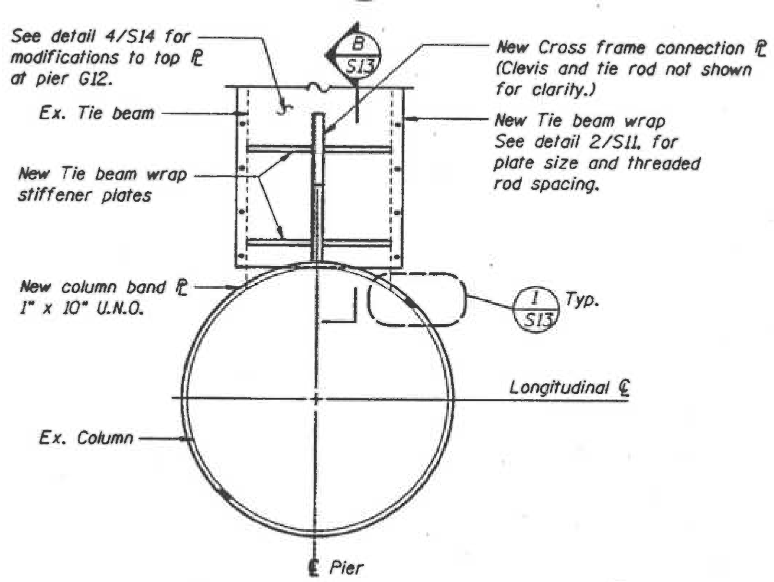
* 82-3HVB-2R-1-I

SHEET NO. S-13

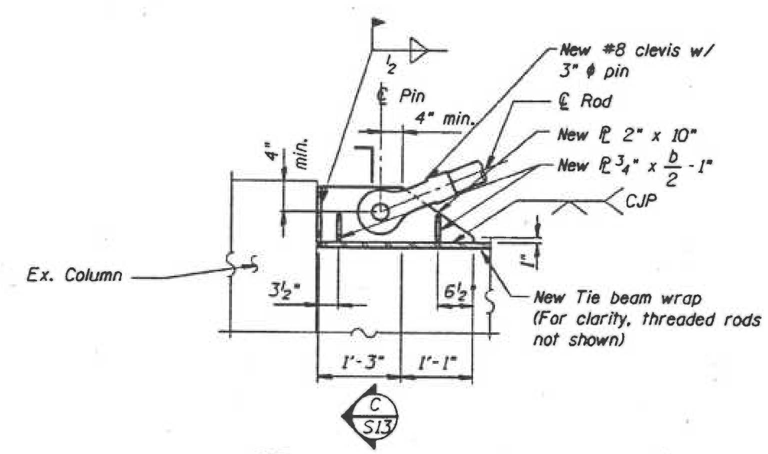
SHEETS



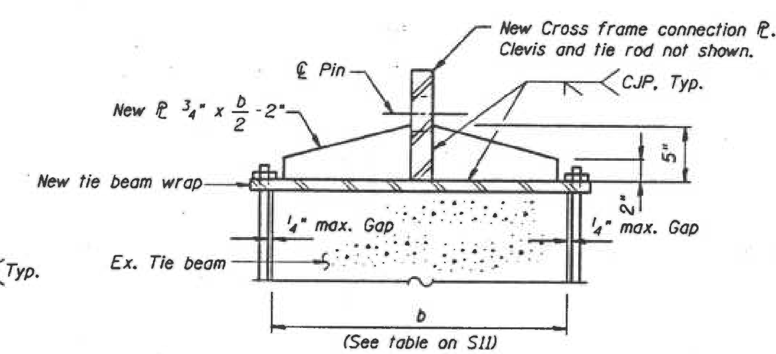
1/S13 COLUMN BAND CONNECTION OPTIONS



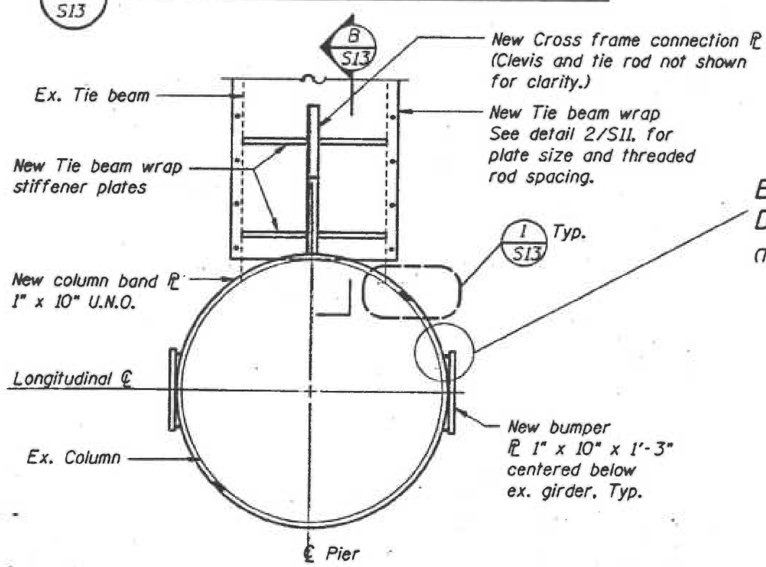
2/S13 CROSS FRAME COLUMN BAND DETAIL

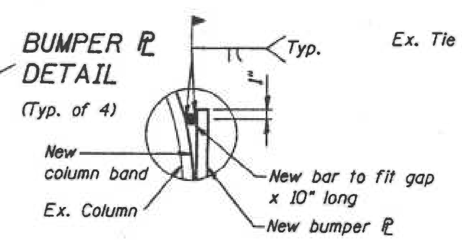


B/S13 DETAIL



C/S13 SECTION





COLUMN BAND DETAIL AT PIERS ...H BUMPERS & CROSS FRAMES

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
S... ...TY

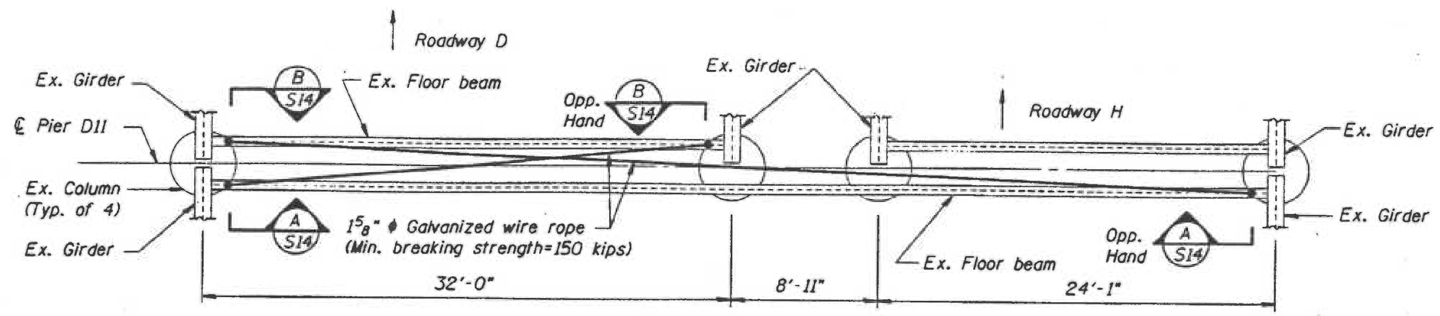
...UCTURE NO. 082-0144 ... ...E NO. 082-020...
...RE NO. 082-0256 ... ... 082-03...
... ...ONE ... ...RAWN BY
DATE ...-23-98 CHECKED BY ...

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

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

SHEET NO. S-14

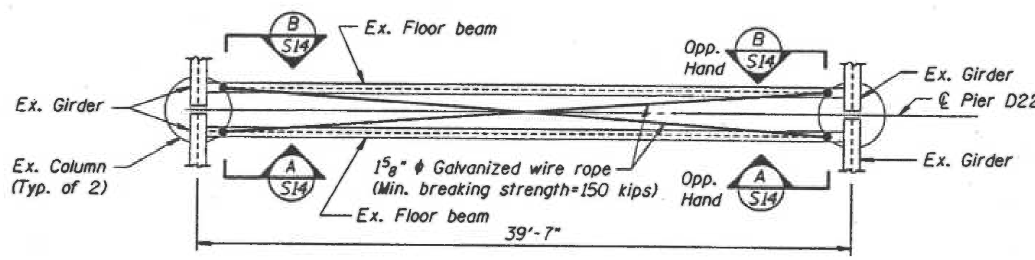
SHEETS



Note: Decks and stringer beams not shown.

N

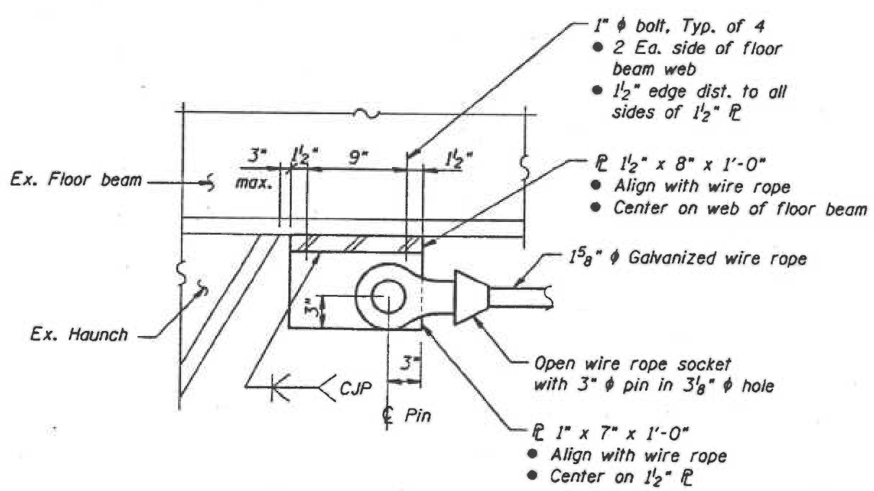
1/S14 SHEAR TRANSFER ASSEMBLY AT PIER D11



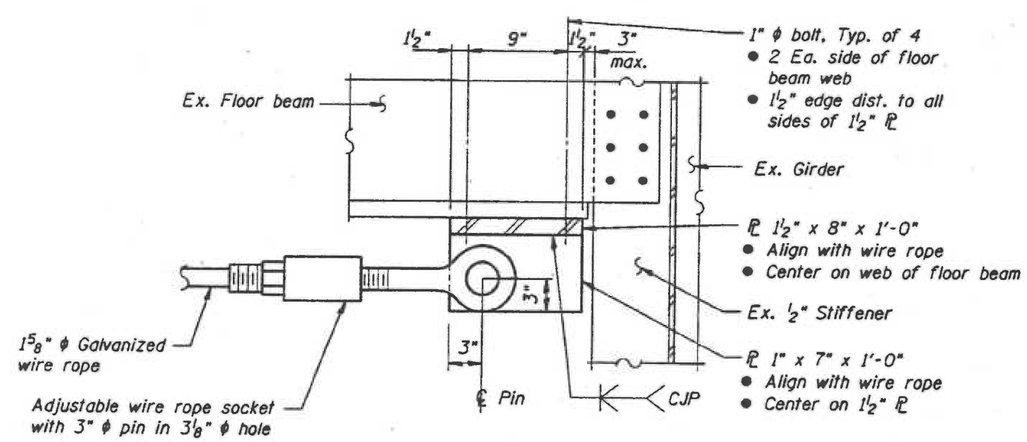
Note: Decks and stringer beams not shown.

N

2/S14 SHEAR TRANSFER ASSEMBLY AT PIER D22



A/S14 SECTION



B/S14 SECTION

SEISMIC RETROFIT DETAILS

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

STRUCTURE NO. ... STRUCTURE NO. 082-
STRUCTURE NO. 082-0325 ... STRUCTURE NO. 082-

SCALE: 1-2_-98 DRAWN BY

DATE AS NOTED CHECKED BY HH

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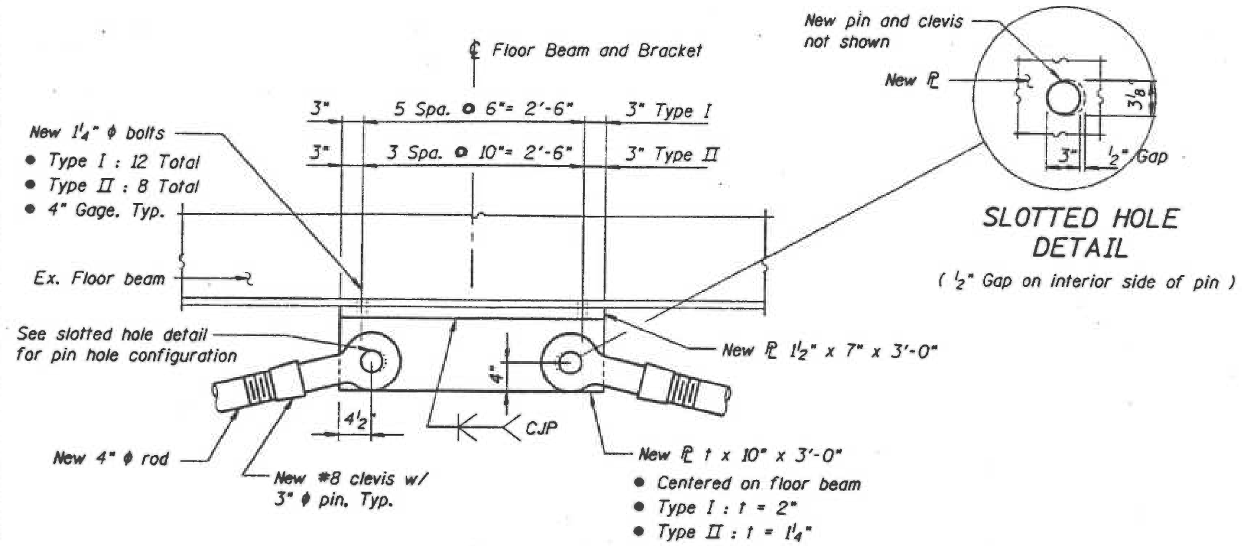
ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 70	*	ST. CLAIR	91	57
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

SHEET NO. S-15

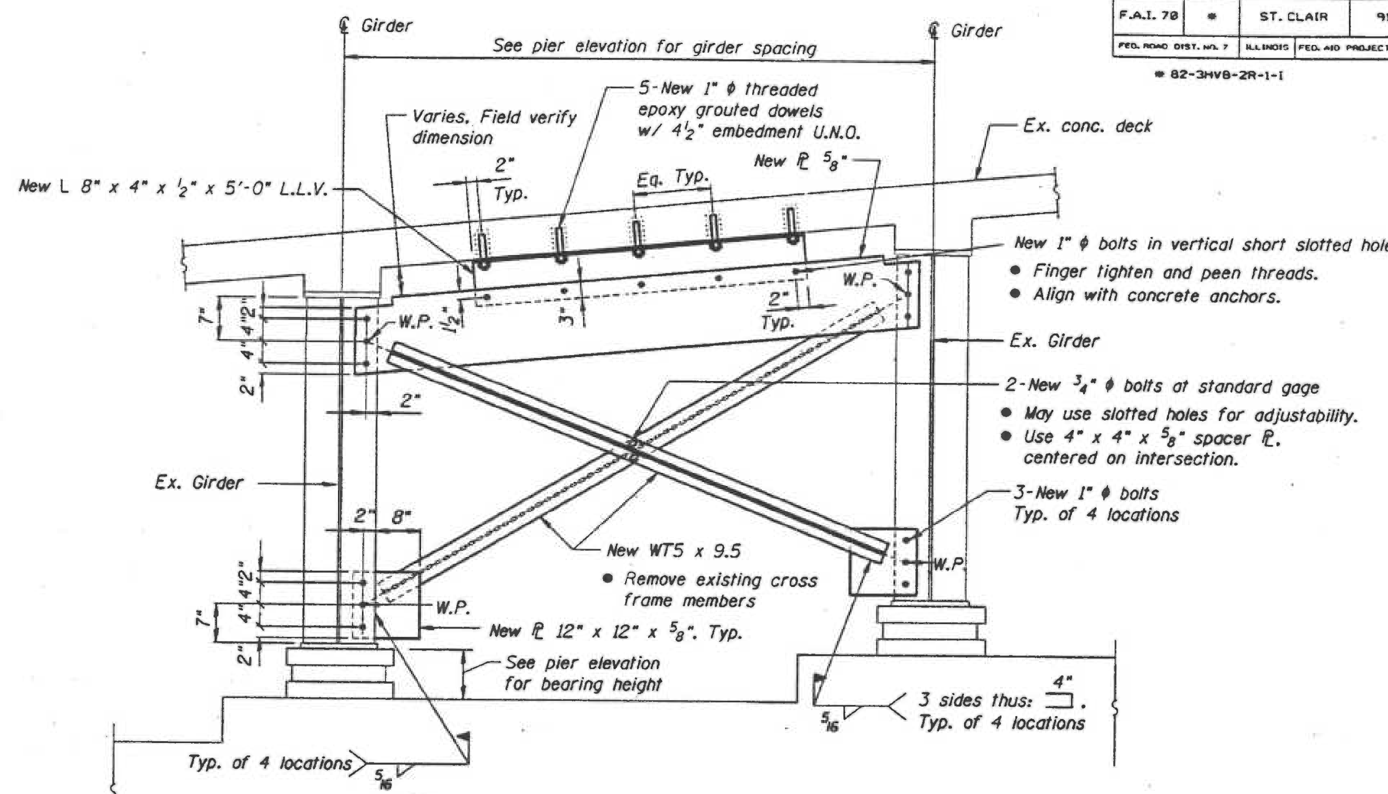
SHEETS

* 82-3HV8-2R-1-1



Note: Piers D23 and D24 shall be Type I connections.
All other piers shall be Type II connections.

1/S15 TIE ROD CONNECTION PLATE DETAIL



2/S15 MULTI - GIRDER CROSS FRAME

SEISMIC RETROFIT DETAILS

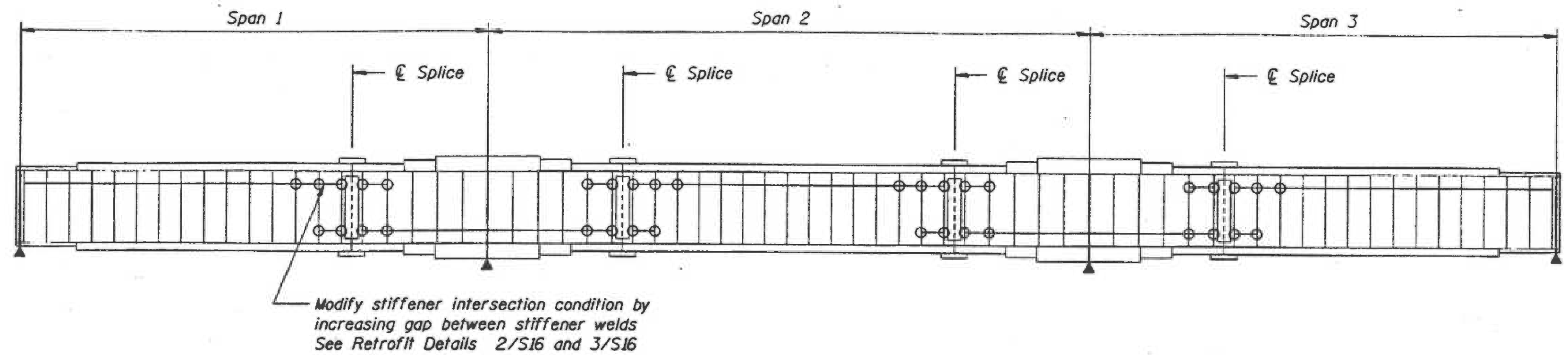
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
FAI ROUTE 70
[illegible]AR STREET BRID[illegible]
ST. CLA[illegible]
[illegible] ROADWAY [illegible]
[illegible] ROADWAY [illegible]
SCA[illegible]
DATE 1-23-98
CHECKED BY HH

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

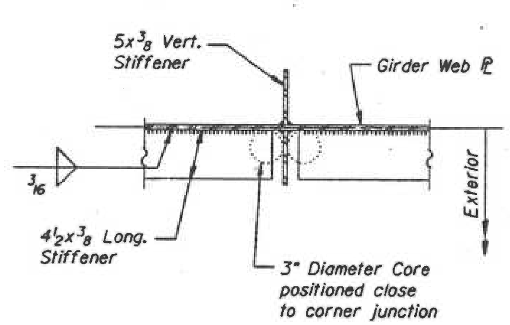
* 82-3HVB-2R-1-I

SHEET NO. S-16

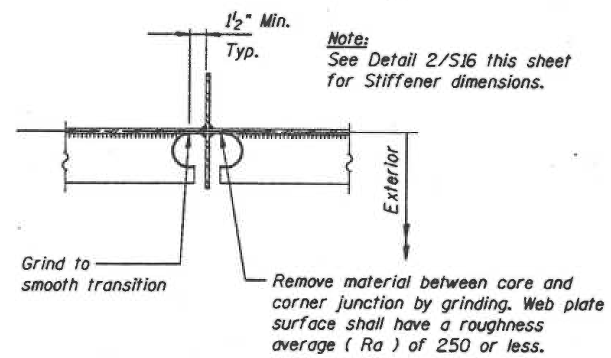
SHEETS



1/S16 GIRDER ELEVATION INDICATING TYPICAL FRACTURE CONTROL MODIFICATION LOCATIONS



2/S16 STIFFENER INTERSECTION MODIFICATION DETAIL



Note: See Detail 2/S16 this sheet for Stiffener dimensions.

3/S16 STIFFENER INTERSECTION MODIFICATION DETAIL

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 (R_a)of 250 or less.
3. Remove all burrs from cut edge and check for irregularities. Cored surface shall have an R_a 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 [illegible] APPROACHES

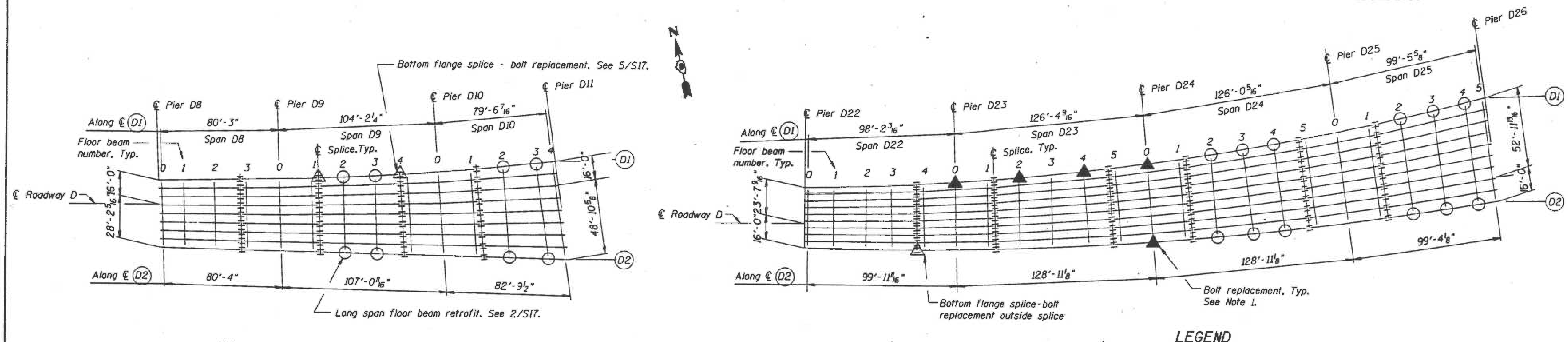
[illegible]E NO. 0[illegible]
[illegible]E NO. 082-02[illegible]
NONE
DATE 1-23-98
DRAWN BY JN
CHECKED BY HH

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 70	*	ST. CLAIR	91	59
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

SHEET NO. S-17

SHEETS

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



1/S17 SPANS D8 THRU D10 AND D22 THRU D25 (FRAMING PLAN)

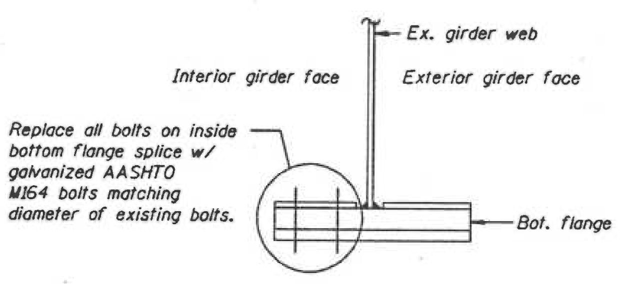
LEGEND

○ Long span floor beam retrofit (14 locations, this sheet). See 2/S17.

△ Bottom flange splice - bolt replacement (3 locations, this sheet). See 5/S17.

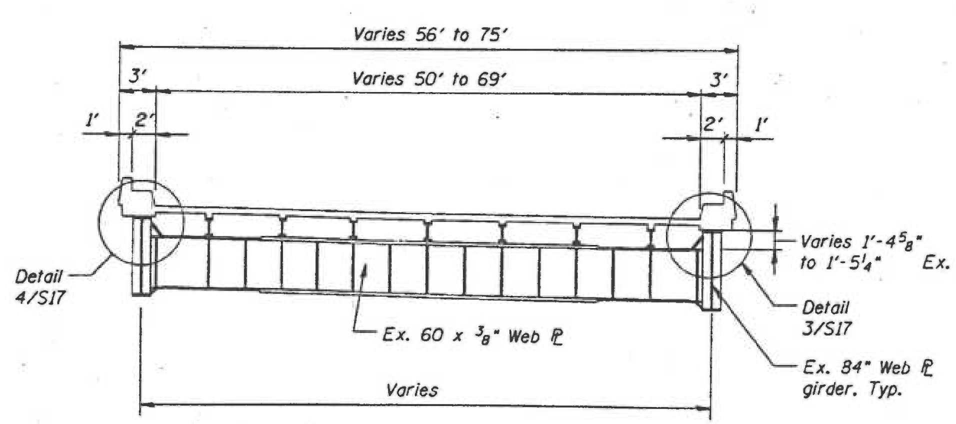
▲ Bolt replacement (17 bolts, this sheet) See Note 1.

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.

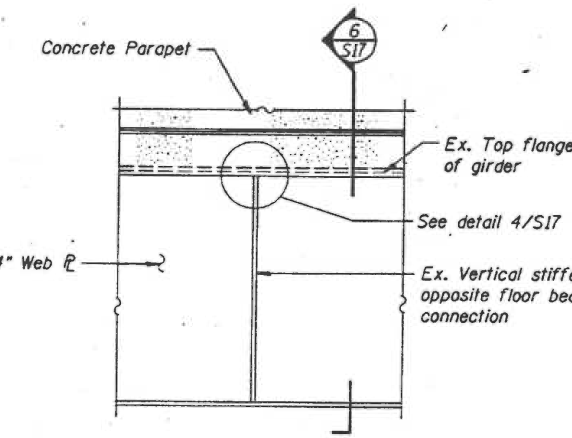


5/S17 BOTTOM FLANGE SPLICE - BOLT REPLACEMENT

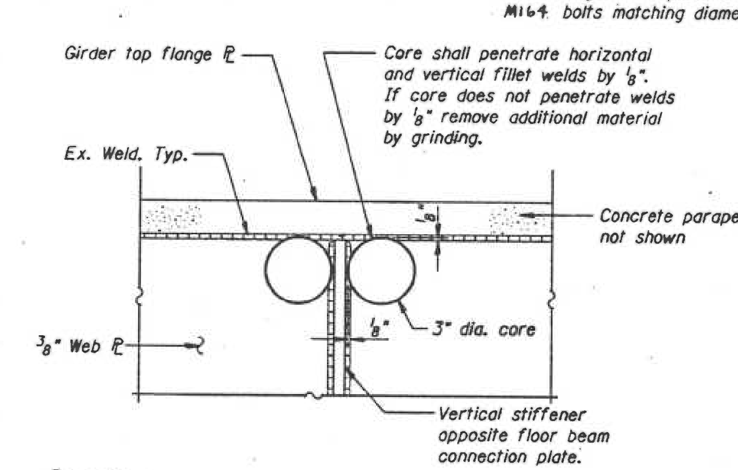
BILL OF MATERIAL		
ITEM	UNIT	QUANTITY
Long span floor beam retrofit	EACH	20
Bottom flange splice - bolt replacement	EACH	8
Bolt replacement	EACH	18



LONG SPAN FLOOR BEAMS (> 50')



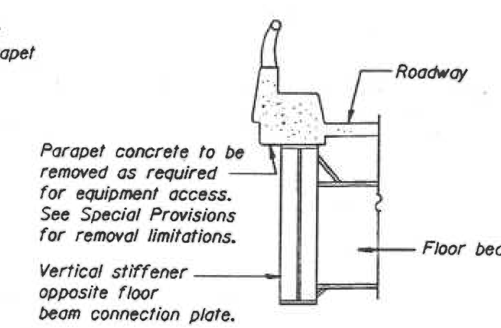
3/S17 EXTERIOR ELEVATION OF GIRDER AT FLOOR BEAM CONNECTION



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 ⅛". If core does not penetrate weld by ⅛", remove additional material by grinding. Remove all burrs from cored or ground surface. Surface shall have a roughness average (R_a) 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.

4/S17 LONG SPAN FLOOR BEAM RETROFIT



6/S17 SECTION THRU GIRDER

LONG SPAN FLOOR BEAM RETROFIT & BOLT REPLACEMENT

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
FAI ROUTE 70
[illegible] BRIDGE APPROACHES
[illegible] COUNTY
STRUCTURE [illegible]
STRUCTURE [illegible]

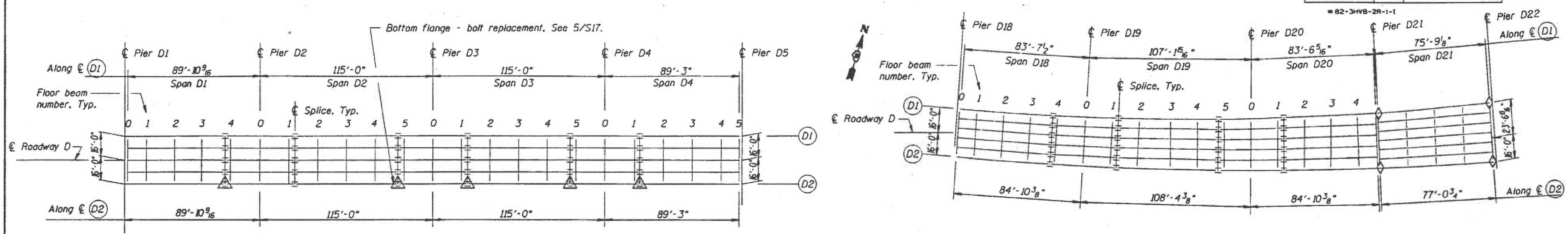
SCALE: NONE | DRAWN BY JN
DATE 1-23-98 | CHECKED BY HH

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 70	*	ST. CLAIR	91	60
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

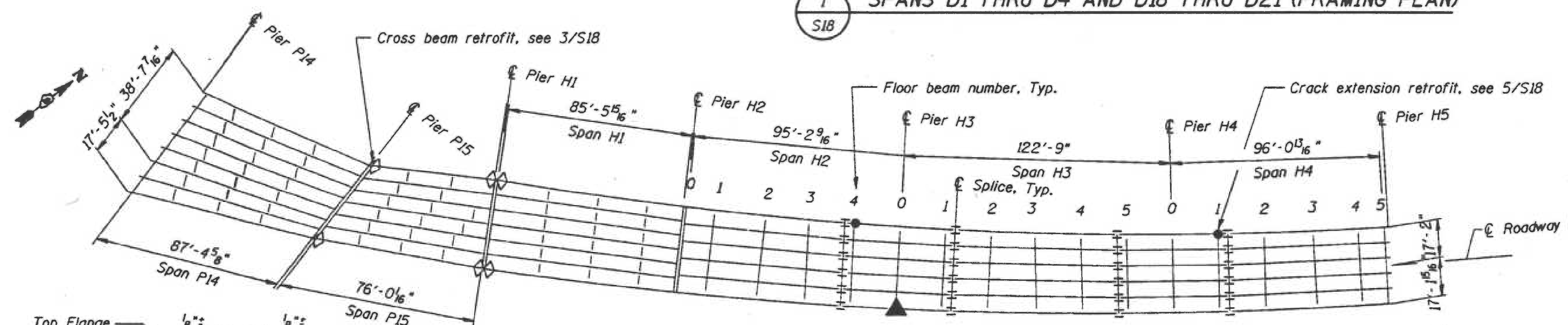
SHEET NO. S-18

SHEETS

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



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



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

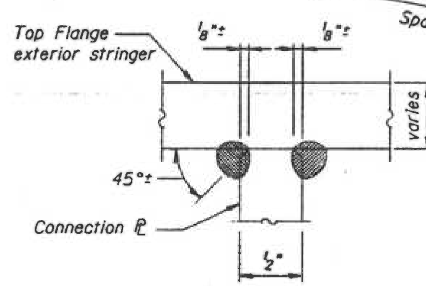
LEGEND

△ Bottom flange splice - bolt replacement (5 locations, this sheet). See 5/S17.

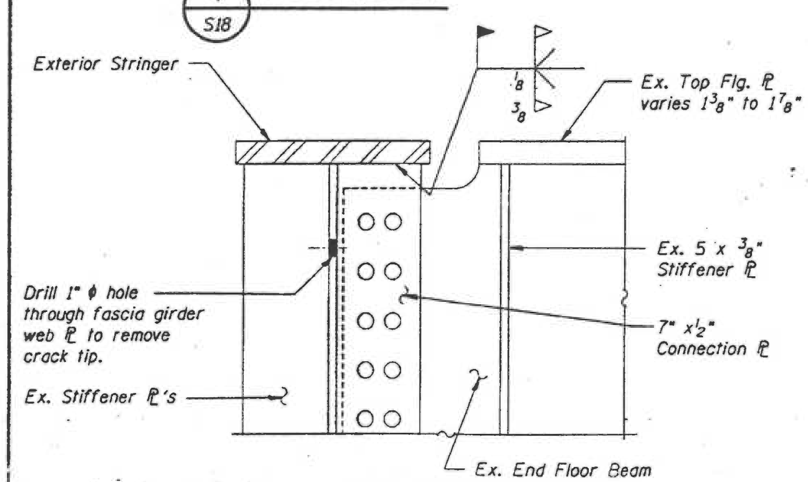
◊ Cross beam retrofit (10 locations). See 3/S18

● Crack extension retrofit (2 locations, this sheet). See 5/S18

▲ Bolt replacement (1 bolt this sheet) See Note 1, sheet S17.



4/S18 WELD DETAIL

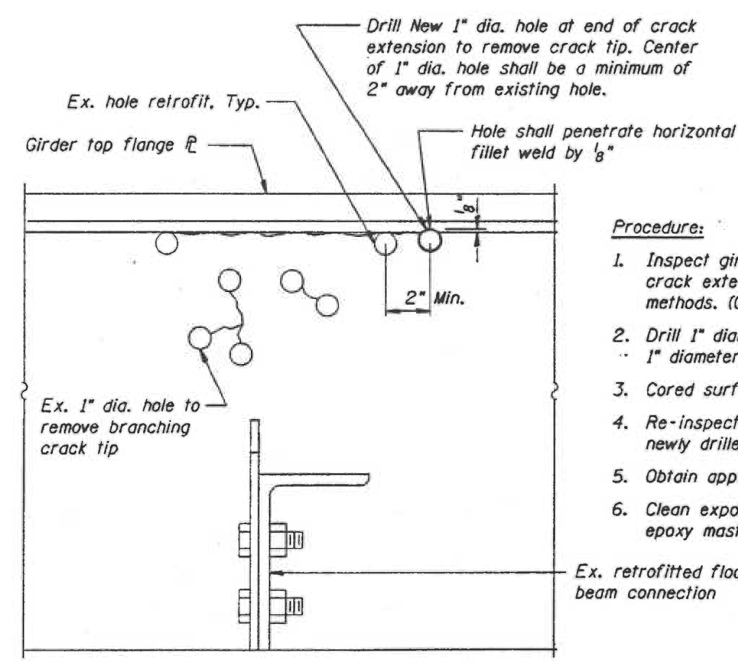


3/S18 CROSS BEAM RETROFIT

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/S18 CRACK EXTENSION RETROFIT AT FIRST INTERIOR FLOOR BEAMS

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 at 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 5/S18.
3. Cored surfaces shall have a Roughness Average (R_a) 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
POPLAR STREET BRIDGE APPROACHES
ST. CLAIR COUNTY

DATE 1-25-99

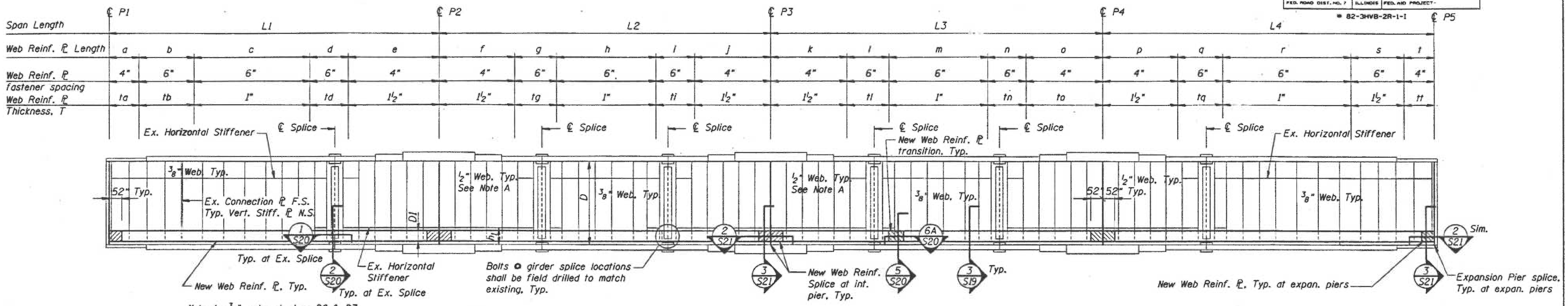
CHECKED BY HH

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 70	*	ST. CLAIR	91	61
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

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

SHEET NO. S-19

SHEETS



Note A: 3/8" webs at piers D6 & D7

5/8" webs at piers D23, D24 & D25

1/S19 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									
		P1	L1	a	ta	b	tb	c	d	td	e	P2	L2	f	g	tg	h	l	tl	j	P3	L3	k	l	tl	m	n	tn	o	to	P4	L4	p	q	r	s	ts	t	tt	P5
			ft.	ft.	in.	ft.	in.	ft.	ft.	in.	ft.		ft.	ft.	ft.	in.	ft.	ft.	in.	ft.		ft.	ft.	ft.	in.	ft.	ft.	in.	ft.	in.		ft.	ft.	ft.	ft.	ft.	ft.	ft.	in.	
D	1	D1	89.88	3.67	1	0.00	1	63.00	15.50	1½	7.67	D2	115.00	7.33	16.50	1½	68.00	16.00	1½	7.00	D3	115.00	7.00	15.50	1½	64.00	21.50	1½	6.67	1½	D4	89.25	6.67	21.50	58.00	0.00	1	3.33	1	D5
D	2	D1	89.25	3.67	1	0.00	1	62.50	15.50	1½	7.33	D2	115.00	7.33	16.50	1½	68.00	16.00	1½	7.00	D3	115.00	7.00	15.50	1½	64.00	21.50	1½	6.67	1½	D4	89.88	7.00	21.50	58.50	0.00	1	3.33	1	D5
D	1	D5	80.25	3.67	1	0.00	1	54.50	13.50	1½	8.33	D6	105.00	9.67	14.00	1½	52.50	16.50	1½	12.33	D7	80.25	12.33	12.50	1	50.00	0.00	1	5.33	1	D8									
D	2	D5	80.33	3.67	1	0.00	1	54.50	13.50	1½	8.33	D6	105.11	9.67	14.50	1½	52.50	16.50	1½	12.00	D7	80.33	12.33	12.50	1	50.00	0.00	1	5.33	1	D8									
D	1	D8	80.25	4.33	1	0.00	1	37.50	12.00	1½	26.33	D9	104.19	22.00	10.50	1½	36.50	10.00	1½	25.00	D10	79.54	24.67	9.00	1½	32.00	8.00	1½	5.67	1½	D11									
D	2	D8	80.33	4.33	1	0.00	1	37.50	12.00	1½	26.33	D9	107.06	22.67	11.00	1½	37.50	10.00	1½	26.00	D10	82.79	25.67	9.50	1½	33.50	8.50	1½	6.00	1½	D11									
D	1	D12	88.45	12.33	1	0.00	1	43.50	10.00	1	22.33	D13	113.98	22.67	11.00	1	47.00	10.50	1	22.67	D14	88.45	22.33	10.50	1	43.50	0.00	1	12.00	1	D15									
D	2	D12	90.04	12.33	1	0.00	1	44.50	10.00	1	23.00	D13	116.02	23.00	11.50	1	48.00	11.00	1	22.67	D14	90.04	23.00	10.50	1	44.50	0.00	1	12.00	1	D15									
D	1	D15	83.50	11.00	1	0.00	1	42.50	9.50	1	20.33	D16	107.05	20.33	11.00	1	45.50	10.50	1	20.00	D17	83.56	20.00	10.50	1	42.50	0.00	1	10.67	1	D18									
D	2	D15	85.00	11.33	1	0.00	1	43.00	10.00	1	20.33	D16	108.95	20.67	11.00	1	46.50	10.50	1	20.33	D17	84.94	20.33	10.50	1	43.00	0.00	1	11.00	1	D18									
D	1	D18	83.63	0.00	1	0.00	1	64.00	15.00	1½	4.33	D19	107.16	3.67	15.00	1½	69.00	15.50	1½	4.00	D20	83.53	4.33	15.50	1	64.00	0.00	1	0.00	1	D21									
D	2	D18	84.87	0.00	1	0.00	1	65.00	15.50	1½	4.33	D19	108.78	3.67	15.50	1½	70.00	15.50	1½	4.00	D20	84.87	4.33	15.50	1	65.00	0.00	1	0.00	1	D21									
D	1	D22	98.18	5.00	1½	13.50	1½	37.50	8.50	1½	33.67	D23	126.38	34.33	9.50	1½	37.00	8.50	1½	37.00	D24	125.48	36.67	9.00	1½	34.00	8.00	1½	38.00	1½	D25	124.40	48.67	9.50	39.00	8.50	1½	18.67	1½	D26
D	2	D22	99.97	5.00	1½	13.50	1½	38.00	9.00	1½	34.33	D23	128.93	35.00	10.00	1½	37.50	9.00	1½	37.33	D24	128.93	36.67	9.00	1½	35.00	8.00	1½	39.00	1½	D25	99.34	39.00	7.50	31.00	7.00	1½	14.67	1½	D26
H	1	H2	95.21	10.33	1	0.00	1	52.00	13.00	1½	19.67	H3	122.75	20.33	13.00	1½	57.00	14.00	1½	18.33	H4	96.07	19.33	13.00	1½	55.00	0.00	1	8.67	1	H5									
H	2	H2	97.30	10.33	1	0.00	1	53.50	13.50	1½	19.67	H3	125.26	20.67	13.50	1½	58.00	14.50	1½	18.33	H4	97.94	19.67	13.00	1½	56.00	0.00	1	9.00	1	H5									

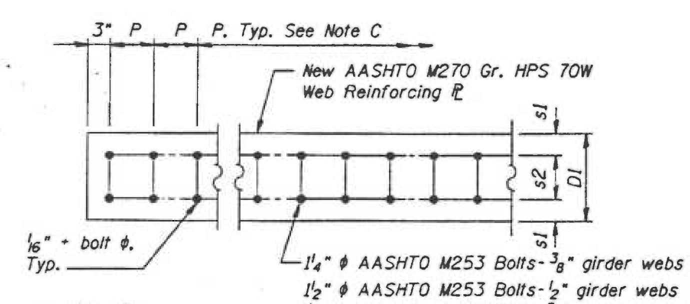
Note D: See S-20 and S-21 for additional web plate details.

MINIMUM BOLT LENGTH

Bolt Diameter	Girder Web Plate	Total Reinforcement Plate Thickness							
		1	1½	2	2½	3	3¼	3½	3¾"
in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
1½	5/8	na	4½	na	na	na	na	na	6¾
1½	½	3¾	4¼	4¾	5¼	5¾	6	6¼	6½
1¼	3/8	3½	4	4½	5	5½	na	na	na

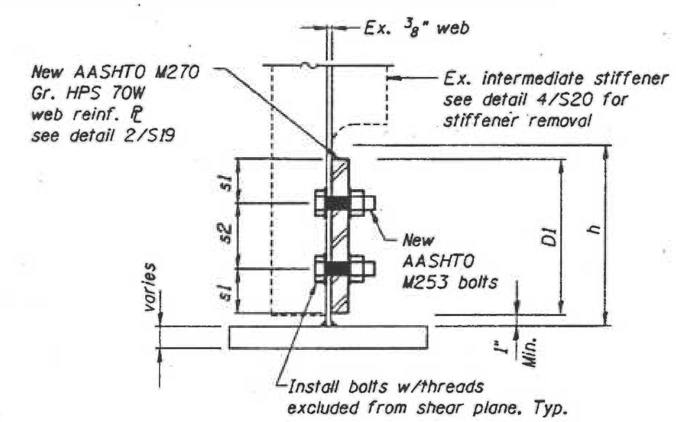
Note B : Includes (1) 5/32" hardened washer each end.

Roadway Spans	Web Reinforcement Plate					
	D	D1	s1	s2	h	h1
	in.	in.	in.	in.	in.	in.
D1-D4	84	14	4	6	15	17
D5-D7	84	14	4	6	15	17
D8-D10	84	14	4	6	15	17
D12-D14	72	12	3	6	13	15
D15-D17	72	12	3	6	13	15
D18-D20	84	14	4	6	15	17
D22-D25	84	14	4	6	15	17
H2-H4	84	14	4	6	15	17



Note C:
Bolt hole locations must be field verified.
Longitudinal hole positions will require adjustments in the vicinity of floor beam connections, interior stiffener plates and web splices.

2/S19 WEB REINFORCEMENT PLATE ELEVATION



3/S19 TYPICAL WEB REINFORCEMENT PLATE

BILL OF MATERIAL

ITEM	UNIT	QUANTITY
Steel girder web reinforcement plate	Lbs.	371100
Vertical (WEB) stiffener REMOVAL	EACH	1226

REDUNDANCY RETROFIT DETAILS

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

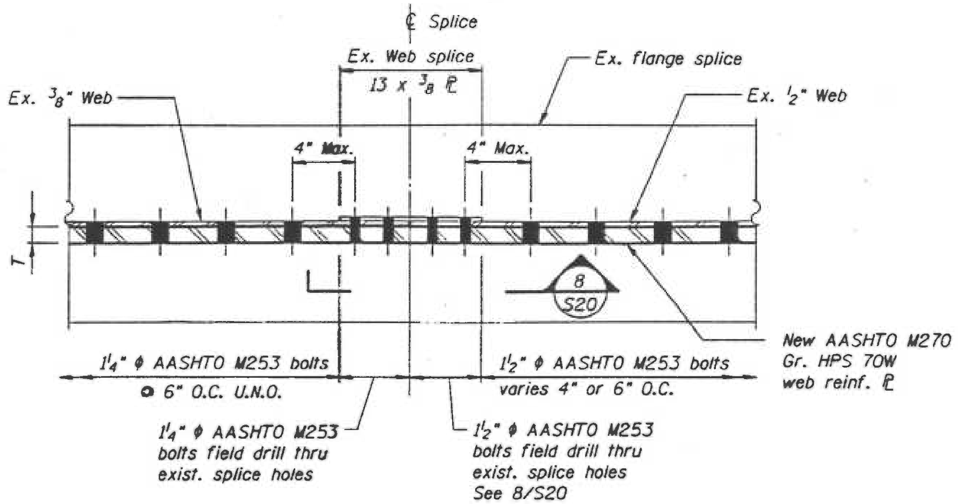
CHECKED BY HH

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 70	*	ST. CLAIR	91	62
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

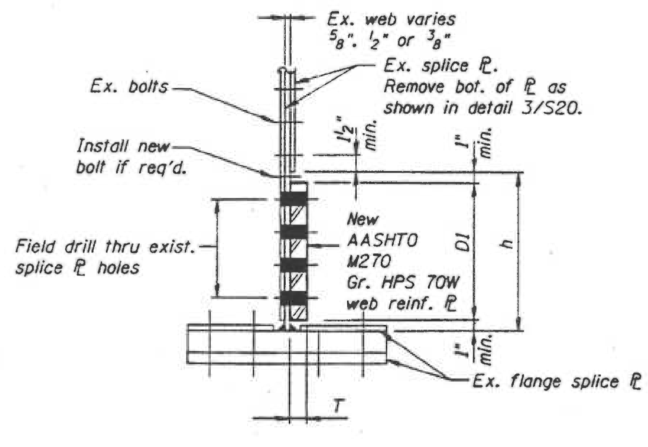
* 82-3HVB-2R-1-1

SHEET NO. S-20

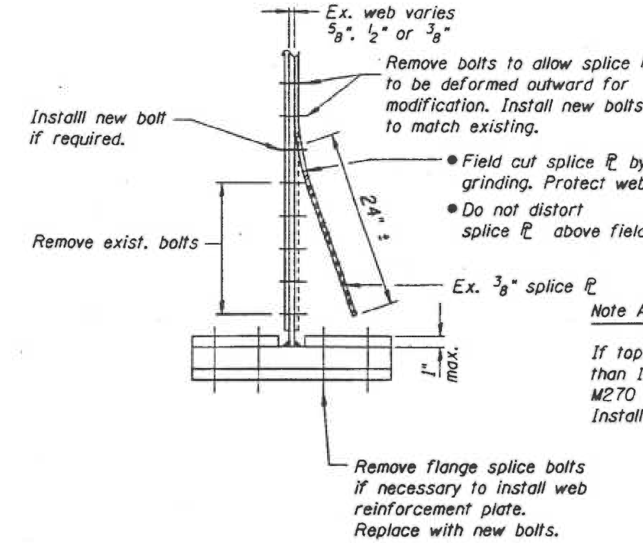
SHEETS



1/S20 WEB REINFORCEMENT PLATE AT GIRDER WEB SPLICE



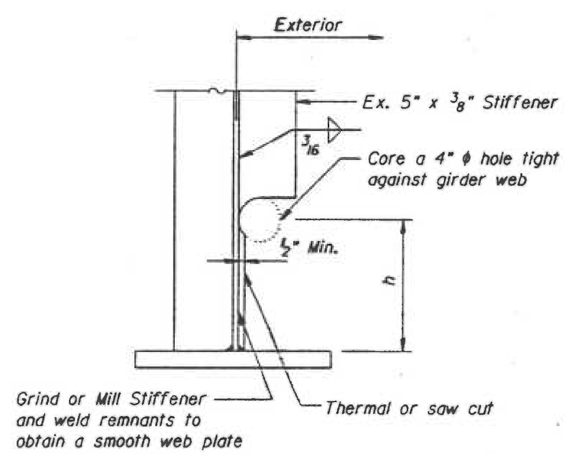
2/S20 WEB REINFORCEMENT PLATE AT GIRDER WEB SPLICE



Note A :

If top exterior splice plate is thicker than 1", fabricate new 1" thick AASHTO M270 Gr. 36 plate to match existing. Install with new AASHTO M164 bolts.

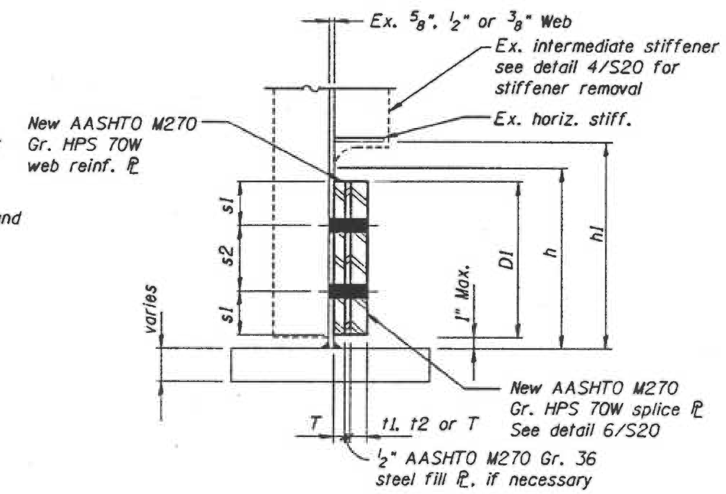
3/S20 GIRDER SPLICE PLATE MODIFICATION



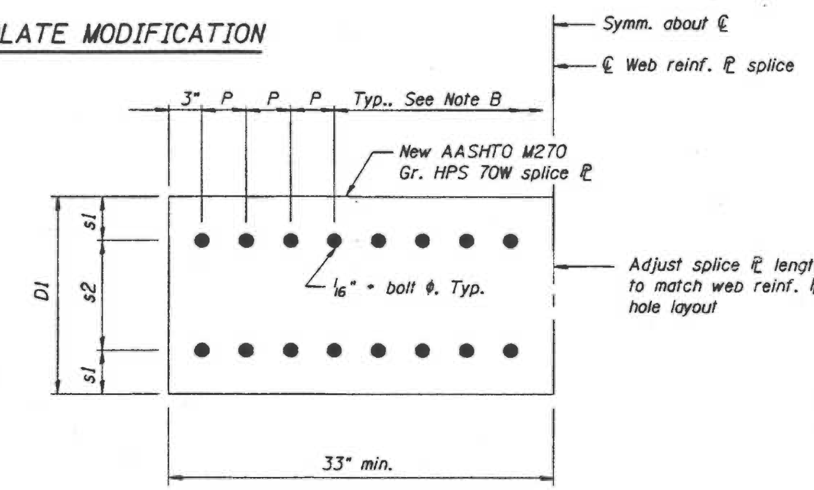
Procedure :

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.

4/S20 VERTICAL STIFFENER MODIFICATION



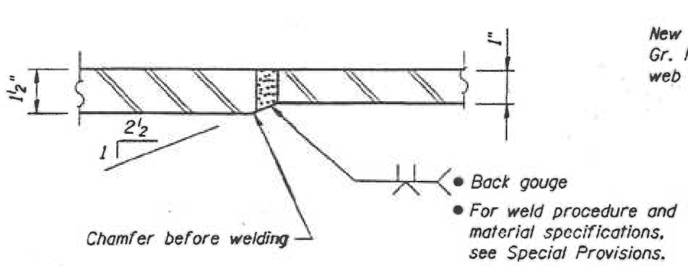
5/S20 TYPICAL WEB REINFORCEMENT PLATE SPLICE



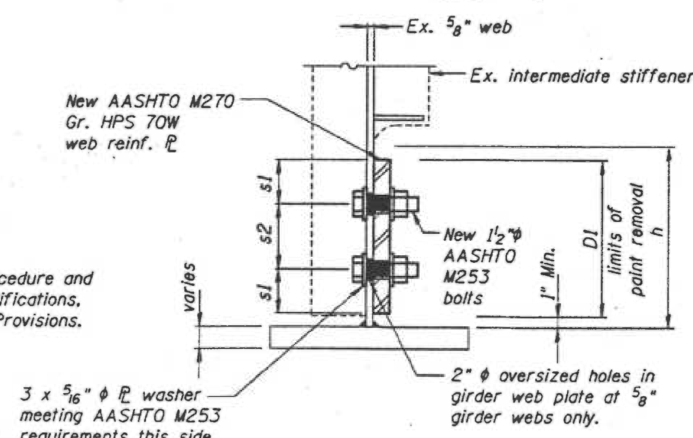
6/S20 TYPICAL WEB REINFORCEMENT SPLICE PLATE

Note B : For splice locations other than at piers

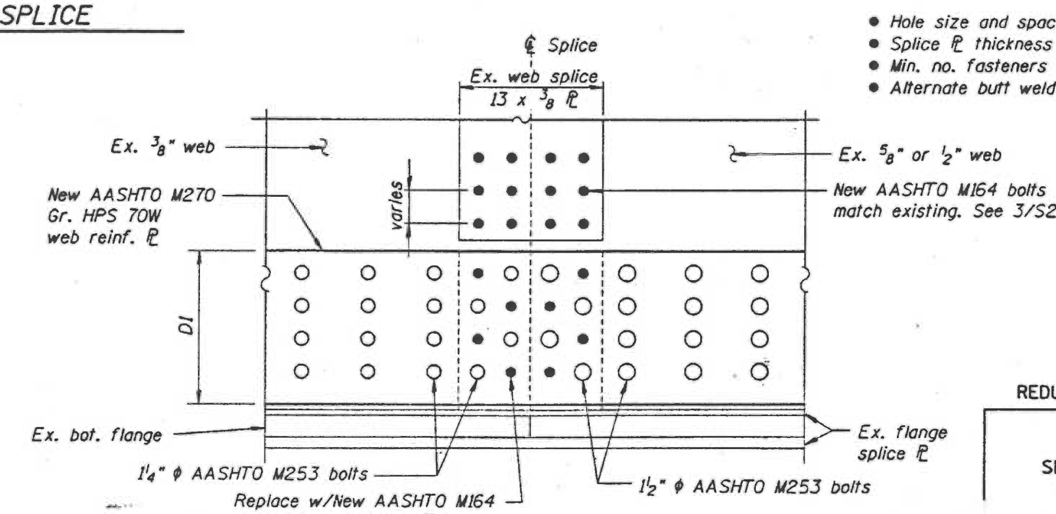
- Hole size and spacing to match web reinf. ℄.
- Splice ℄ thickness to match greater web reinf. ℄ thickness.
- Min. no. fasteners = 32
- Alternate butt weld (See detail 6A/S20)



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

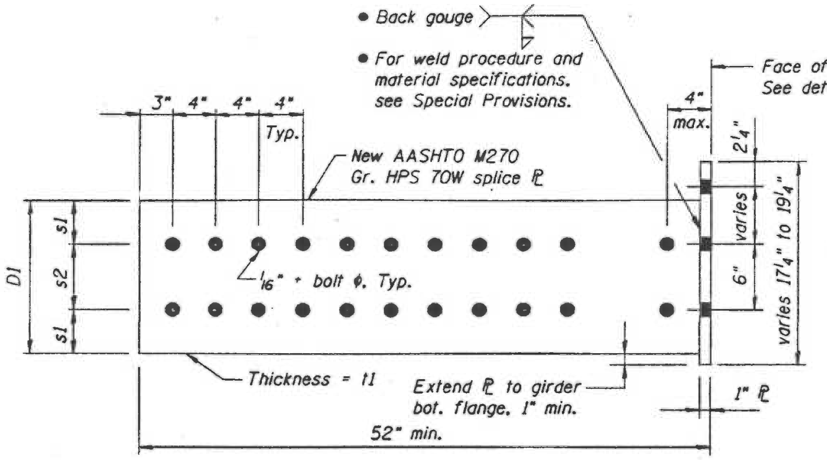
Notes :

1. See sheet S-19 for dimensions D1, h, h1, s1 & s2.
2. See sheet S-21 for dimensions t1 & t2.
3. T = thickness of web reinf. ℄.

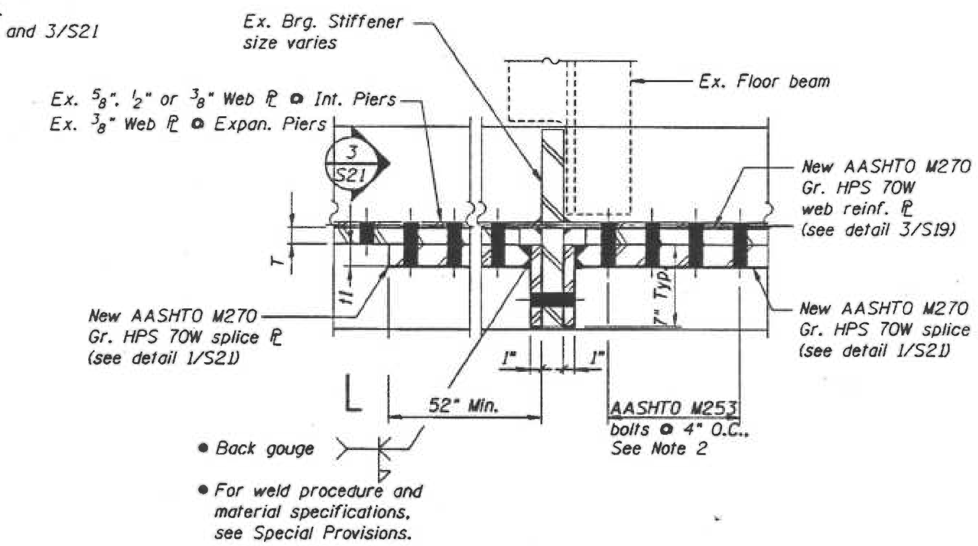
REDUNDANCY RETROFIT DETAILS

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

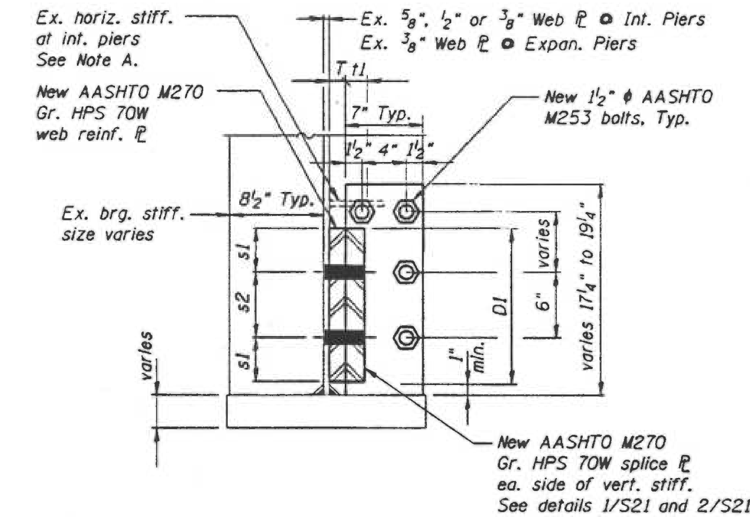
STRUCTURE NO. 082-0203
STRUCTURE NO. 082-0251
DRAWN BY
DATE -23-98
CHECKED BY HH



1/S21 TYPICAL WEB REINFORCEMENT SPLICE PLATE AT PIERS



2/S21 WEB REINFORCEMENT PLATE SPLICE AT BEARING STIFFENER



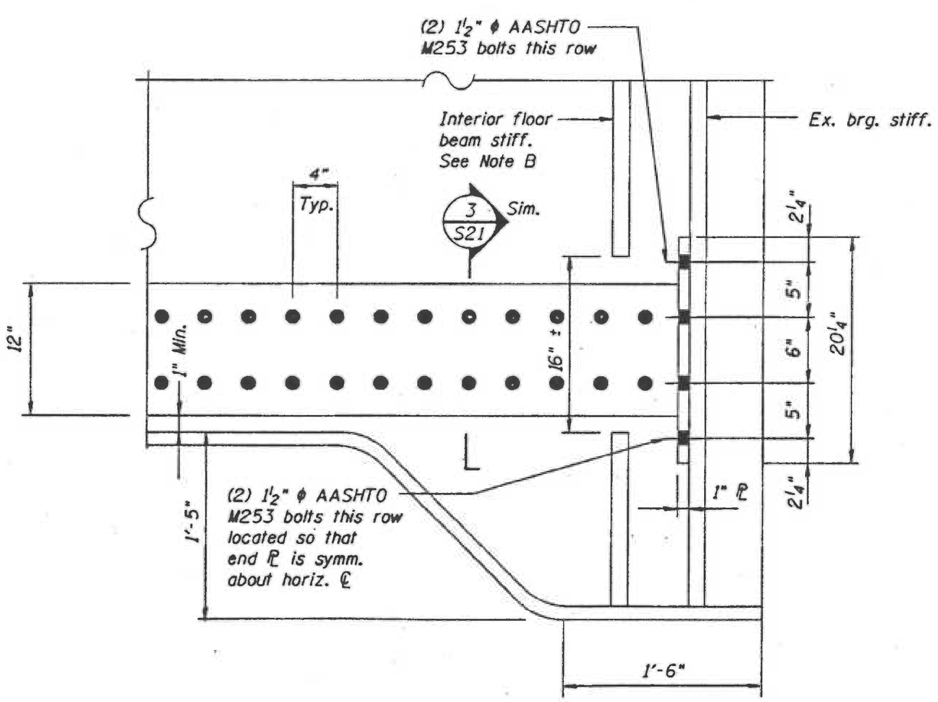
3/S21 WEB REINFORCEMENT PLATE AT PIERS

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

Notes:

1. Web reinforcement plate splice symmetric around interior bearing stiffener.
2. 1½" ϕ AASHTO M253 bolts in all 5/8" girder webs. (See detail 7/S20)
   1½" ϕ AASHTO M253 bolts in all ½" girder webs, threads excluded from shear plane.
   1¼" ϕ AASHTO M253 bolts in all 3/8" girder webs, threads excluded from shear plane.
3. Preload 1½" ϕ AASHTO M253 bolts to proof load.
   Preload 1¼" ϕ AASHTO M253 bolts to proof load.

Roadway Spans	Splice Plate Int. Pier t1 in.	Splice Plate Expan. Pier t2 in.
D1-D4	1½	1½
D5-D7	1½	1½
D8-D10	1¾	1½
D12-D14	2	1½
D15-D17	2	1½
D18-D20	1½	1½
D22-D25	2¼	1½
H2-H4	1½	1½



4/S21 WEB REINFORCEMENT SPLICE PLATE AT HAUNCH

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.

REDUNDANCY RETROFIT DETAILS

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

SCALE: NONE

DATE 1-23-98

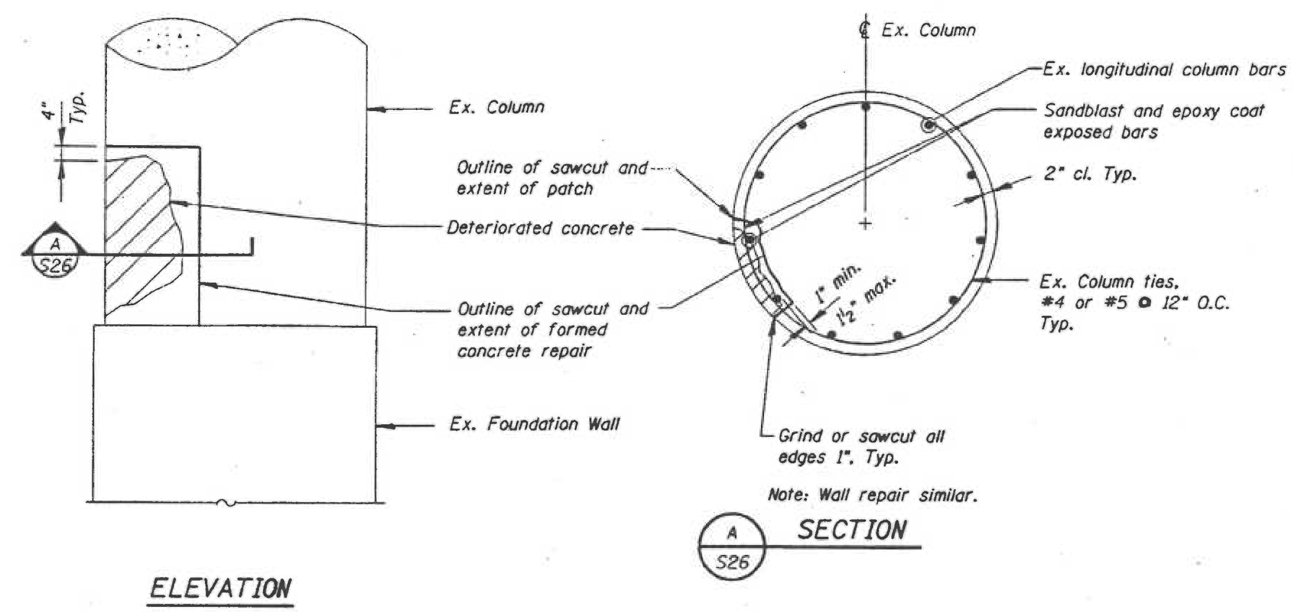
CHECKED

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 70	*	ST. CLAIR	91	64
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

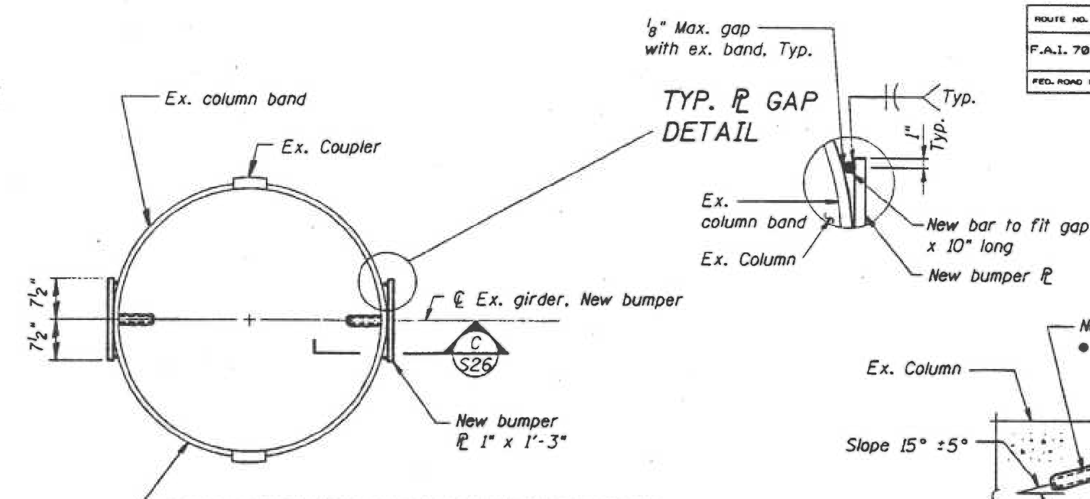
* 82-3HVB-2R-1-1

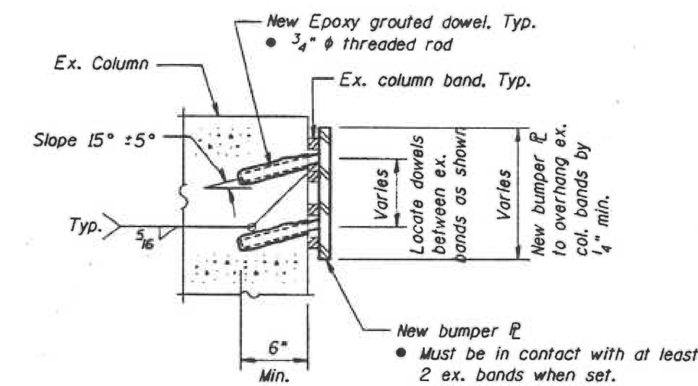
SHEET NO. S-26

SHEETS



1 S26 TYPICAL CONCRETE COLUMN REPAIR



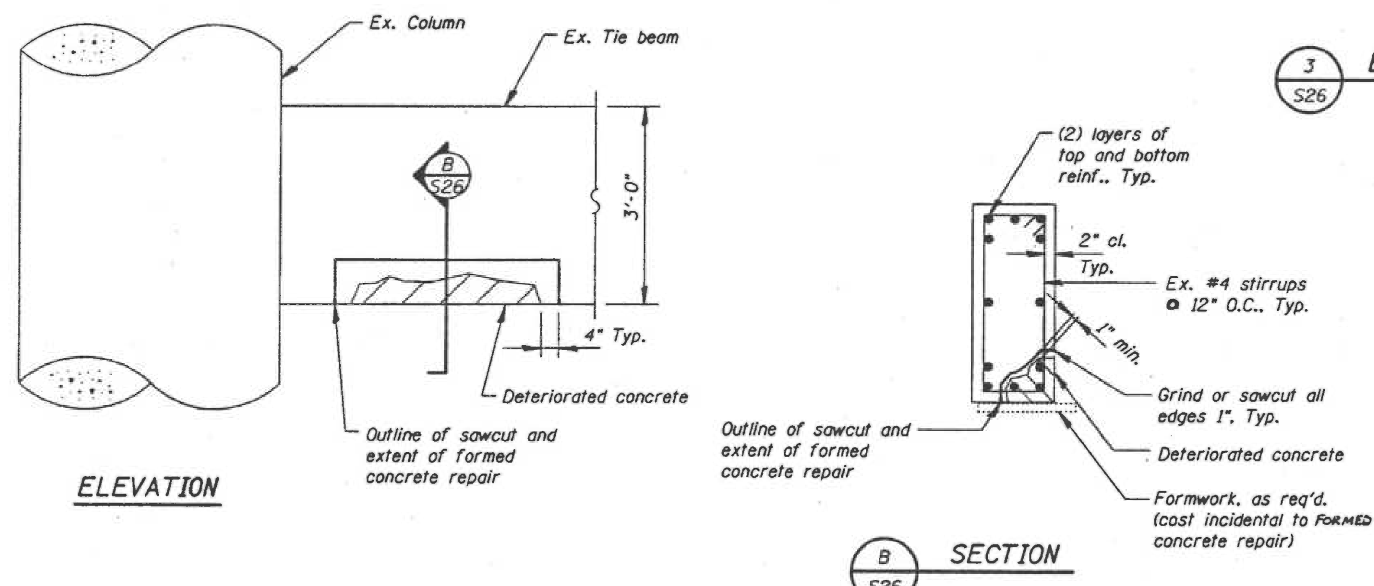


C S26 SECTION

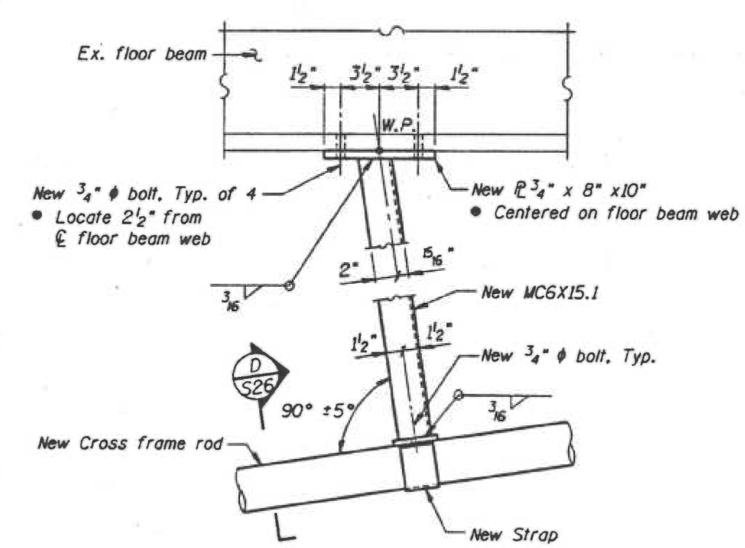
Loosen and reposition ex. column bands if necessary to eliminate interference between ex. coupler and new bumper ℘. This work shall be INCLUDED WITH FURNISH + ERECT STRUCTURAL STEEL.

- 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 3¼" 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.

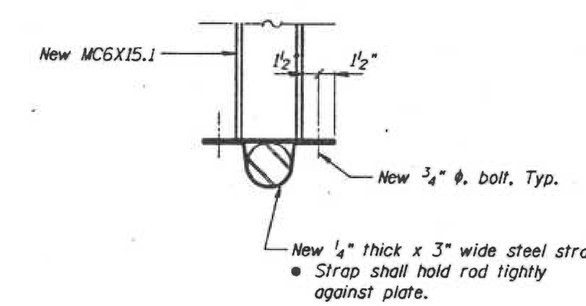
3 S26 BUMPER PLATE DETAIL



2 S26 TYPICAL CONCRETE TIE BEAM REPAIR



4 S26 TIE ROD SUPPORT DETAIL



D S26 SECTION

CONCRETE REPAIR DETAILS

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

082-0144 (ROADWAY ... RAMP

... (ROADWAY) ... RAMP

JN

DATE 1-23-98 ... BY HH

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-	

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

SHEET NO. S-27

SHEETS

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:

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

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

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

SEISMIC RETROFIT DETAILS

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
FAI ROUTE 70
POPLAR STREET BR[illegible]DGE APPROACHES
[illegible]UNTY

STRUCTURE NO. [illegible] STRUCTURE NO. [illegible]

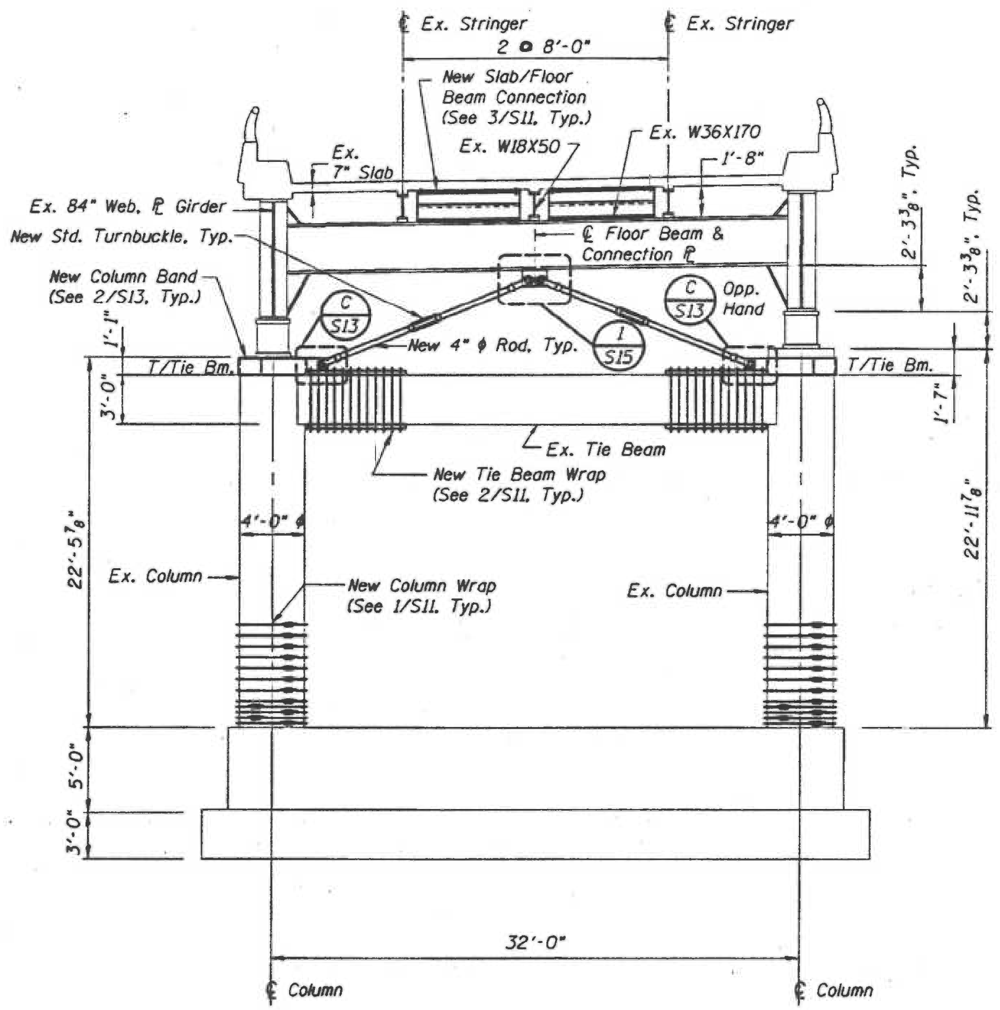
DRAWN BY [illegible]

DATE 1-23-98 CHECKED BY [illegible]

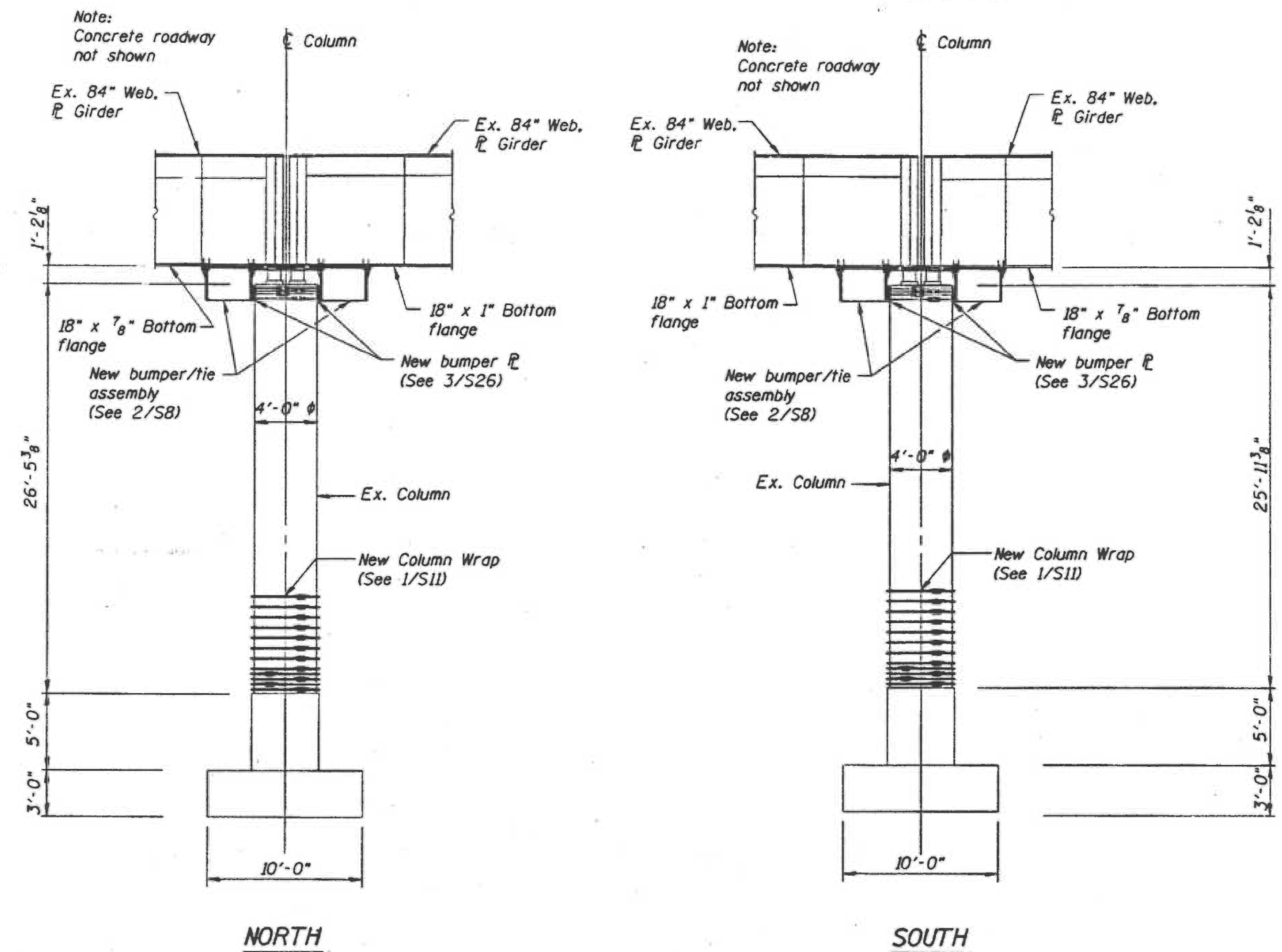
ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 70	*	ST. CLAIR	91	66
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

SHEET NO. S-29 SHEETS

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



1/S29 ELEVATION PIER D2



2/S29 ELEVATIONS PIER D5

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
C[illegible] wrap	SQ. FT.	163.4

PIER D2 & D5 RETROFITS

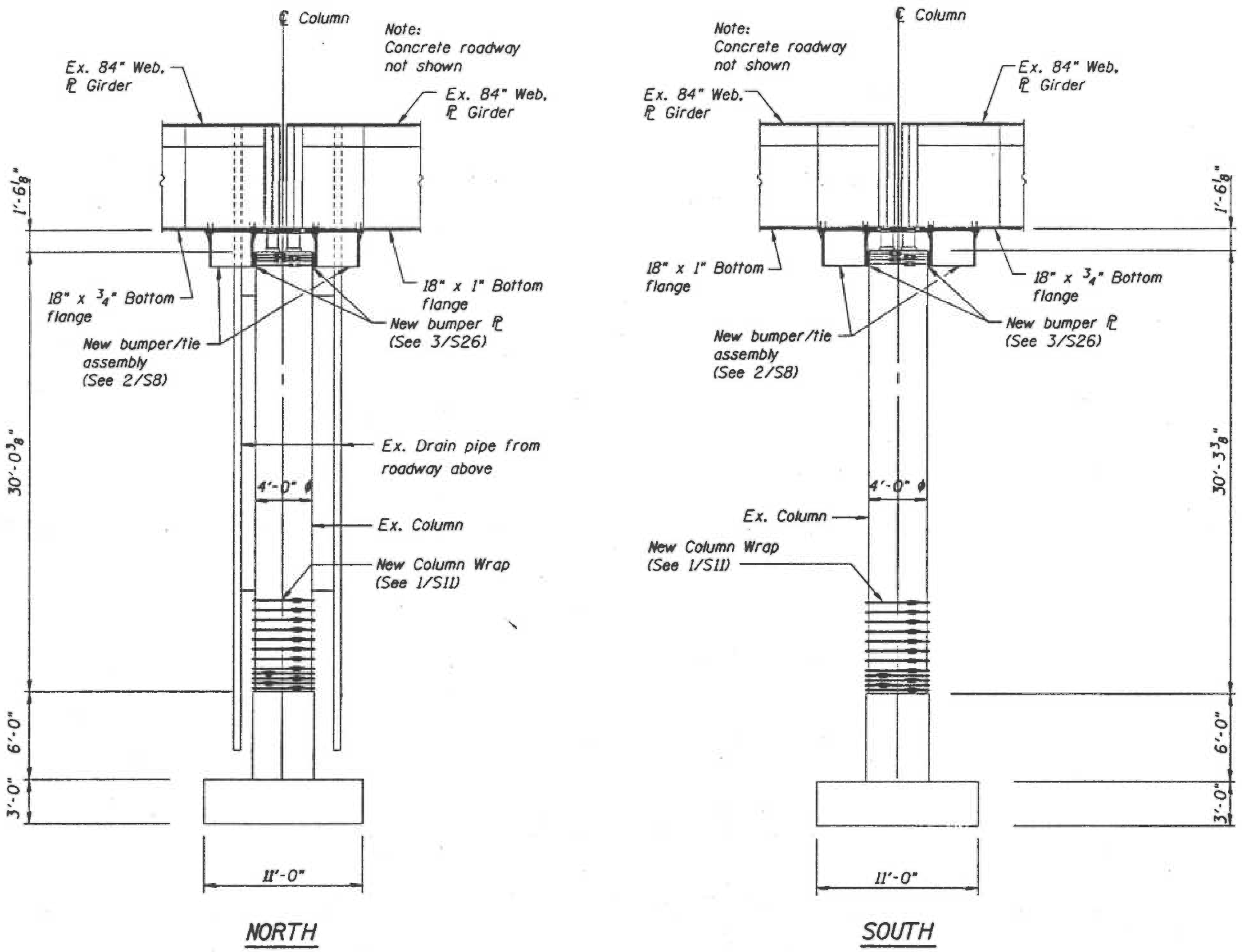
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
FAI ROUTE 70
[illegible] STREET BRIDGE APPROAC[illegible]
ST. CLAIR COU[illegible]
[illegible]
SCALE: NONE
DATE [illegible]-23-[illegible] CHEC[illegible]

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 70	*	ST. CLAIR	91	67
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

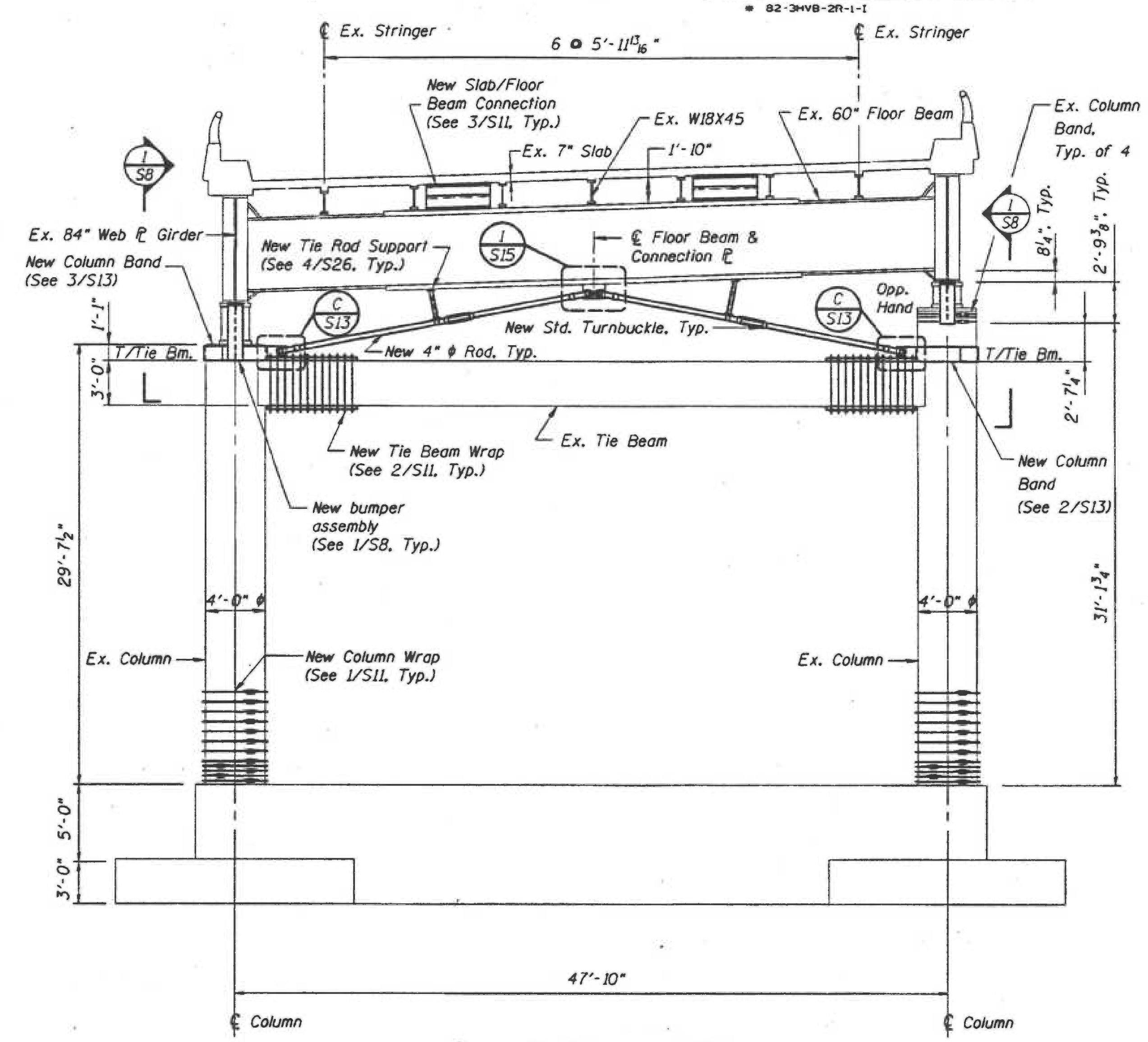
* 82-3HVB-2R-1-I

SHEET NO. S-30

SHEETS



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 [illegible]
ST. [illegible]

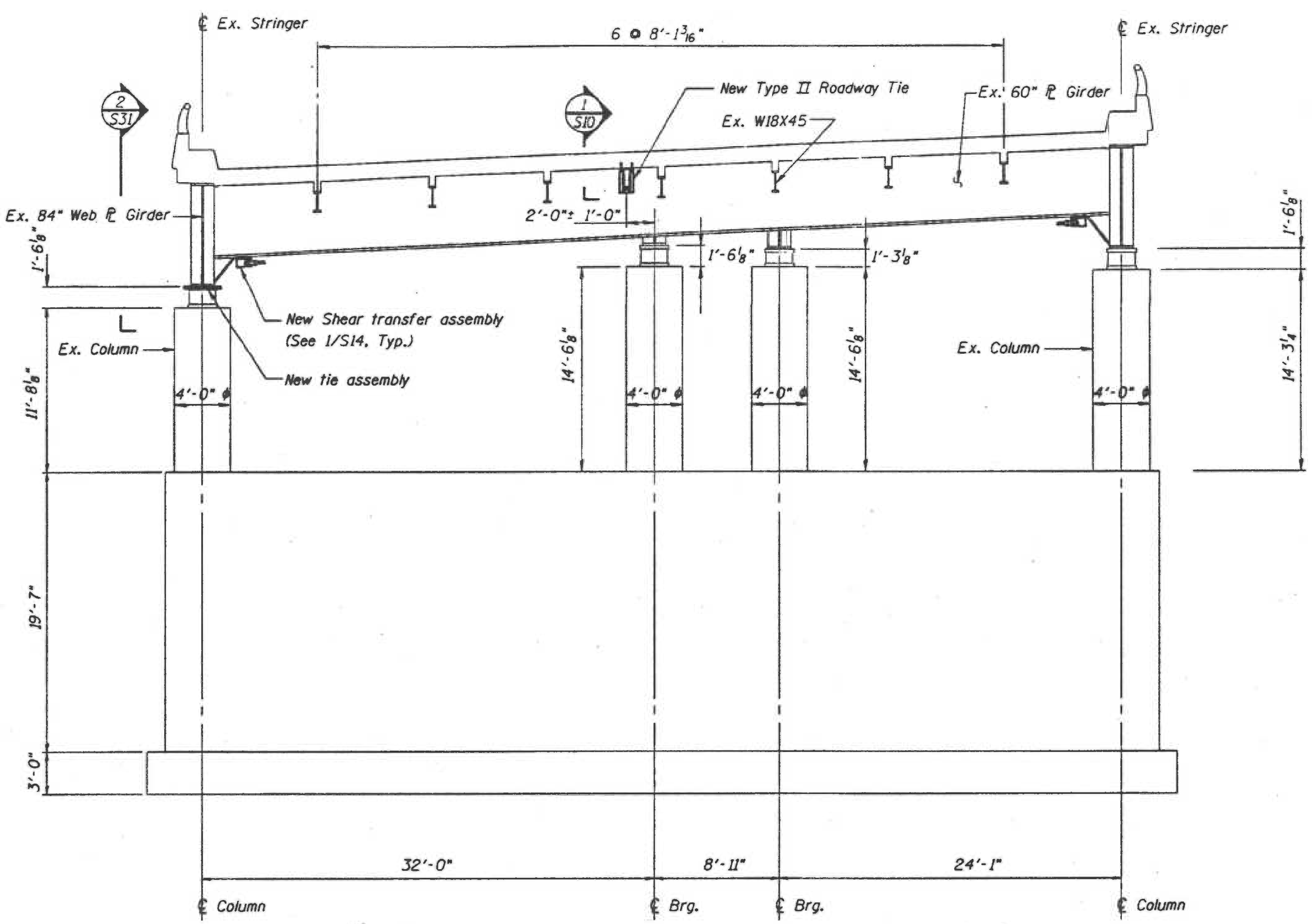
DATE 1-23-98 CHECKED BY HH

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 70	*	ST. CLAIR	91	68
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

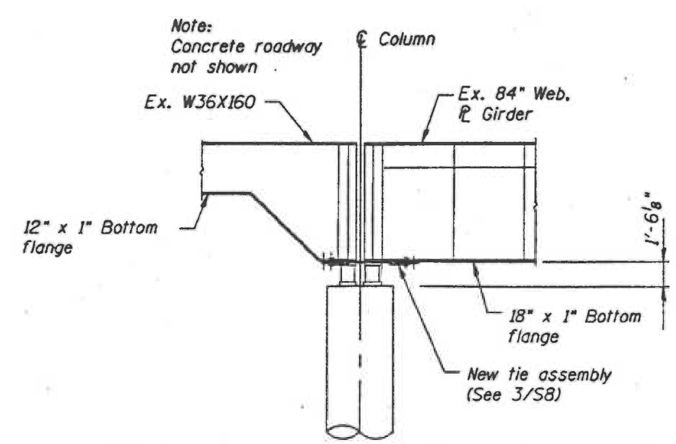
* 82-3HVB-2R-1-1

SHEET NO. S-31

SHEETS



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

* Elevation not shown

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

PIER D11 RETROFITS

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

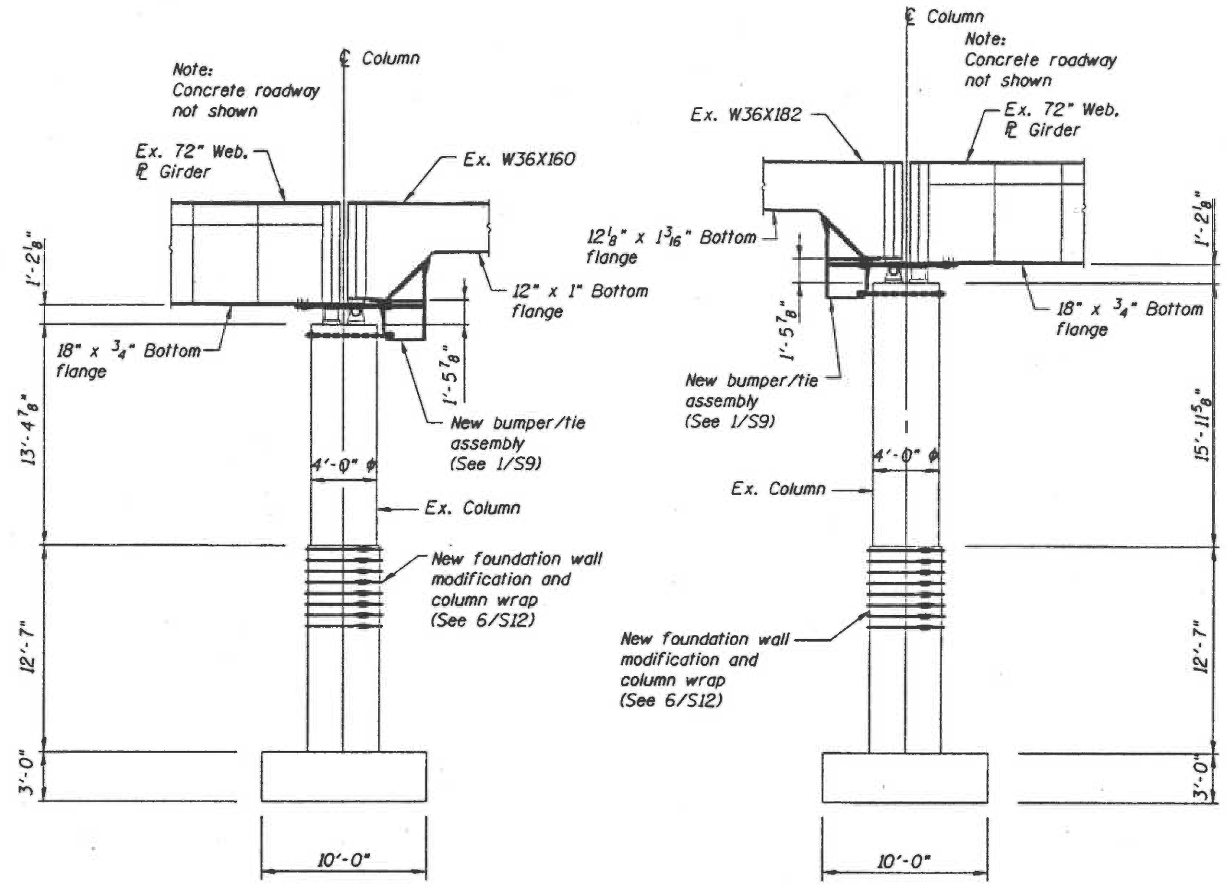
STRUCTURE NO. 082-0144 [illegible] NO. 082-[illegible]
STRUCTURE NO. [illegible] NO. 082-[illegible]
SCALE: NONE DRAWN BY [illegible]
DATE 1-23-98 CHECKED BY HH

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 70	*	ST. CLAIR	91	69
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

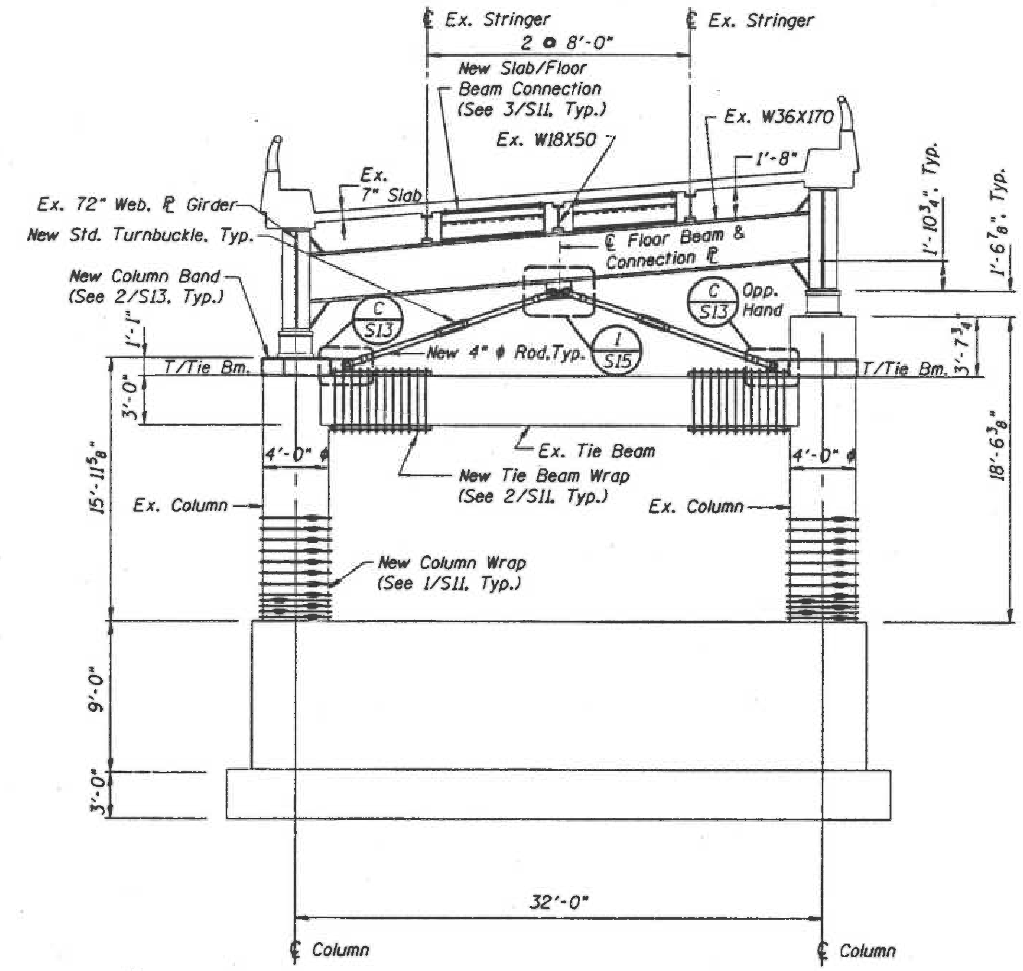
* 82-3HVB-2R-1-I

SHEET NO. S-32

SHEETS



1 S32 ELEVATIONS PIER D12



2 S32 ELEVATION PIER D13

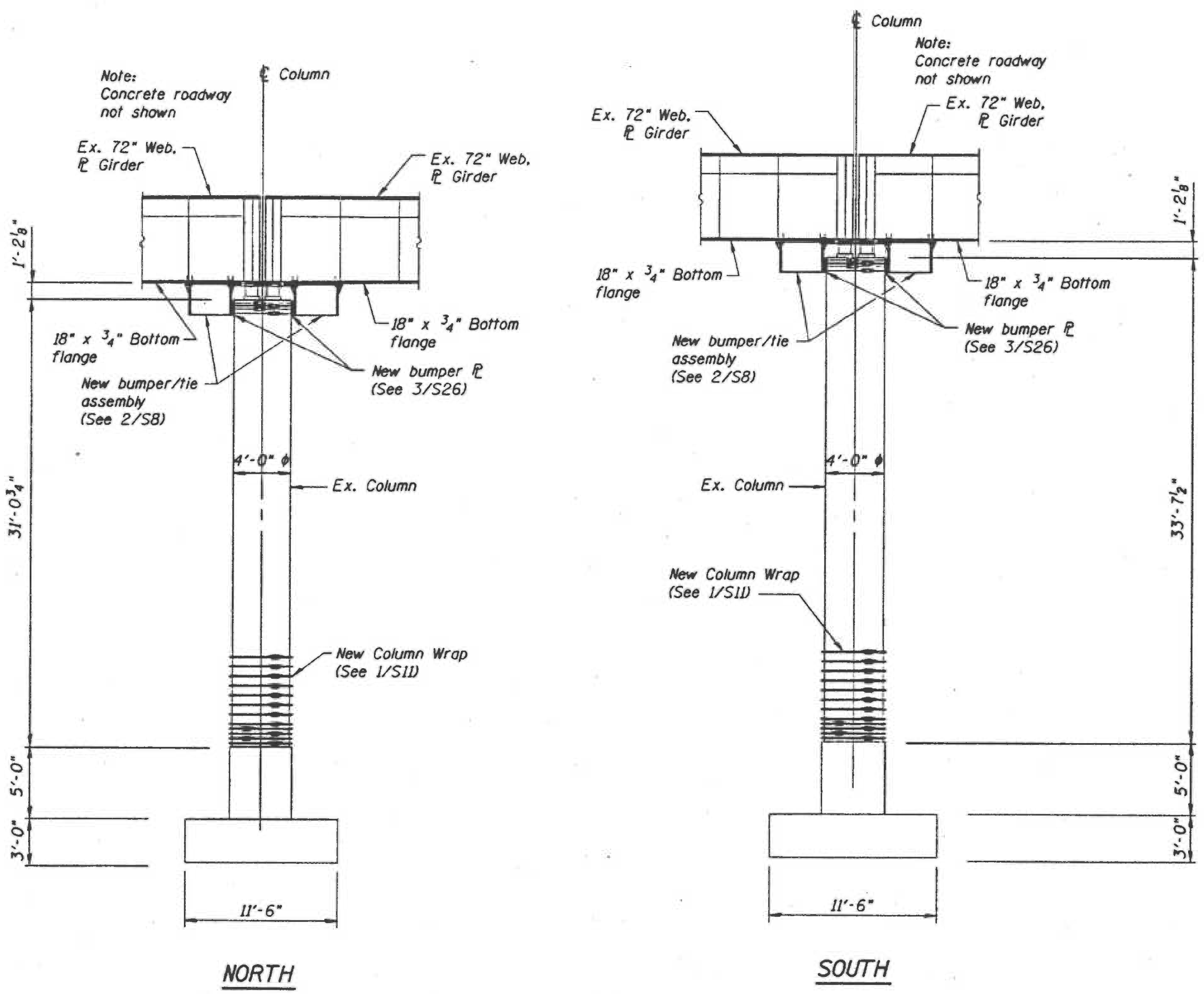
BILL OF MATERIAL - PIER D12		
ITEM	UNIT	QUANTITY
Formed concrete repair	SQ. FT.	150
Furnish and erect structural steel	LBS.	2298
Foundation wall modification	SQ. FT.	45
Column wrap	SQ. FT.	148.8

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

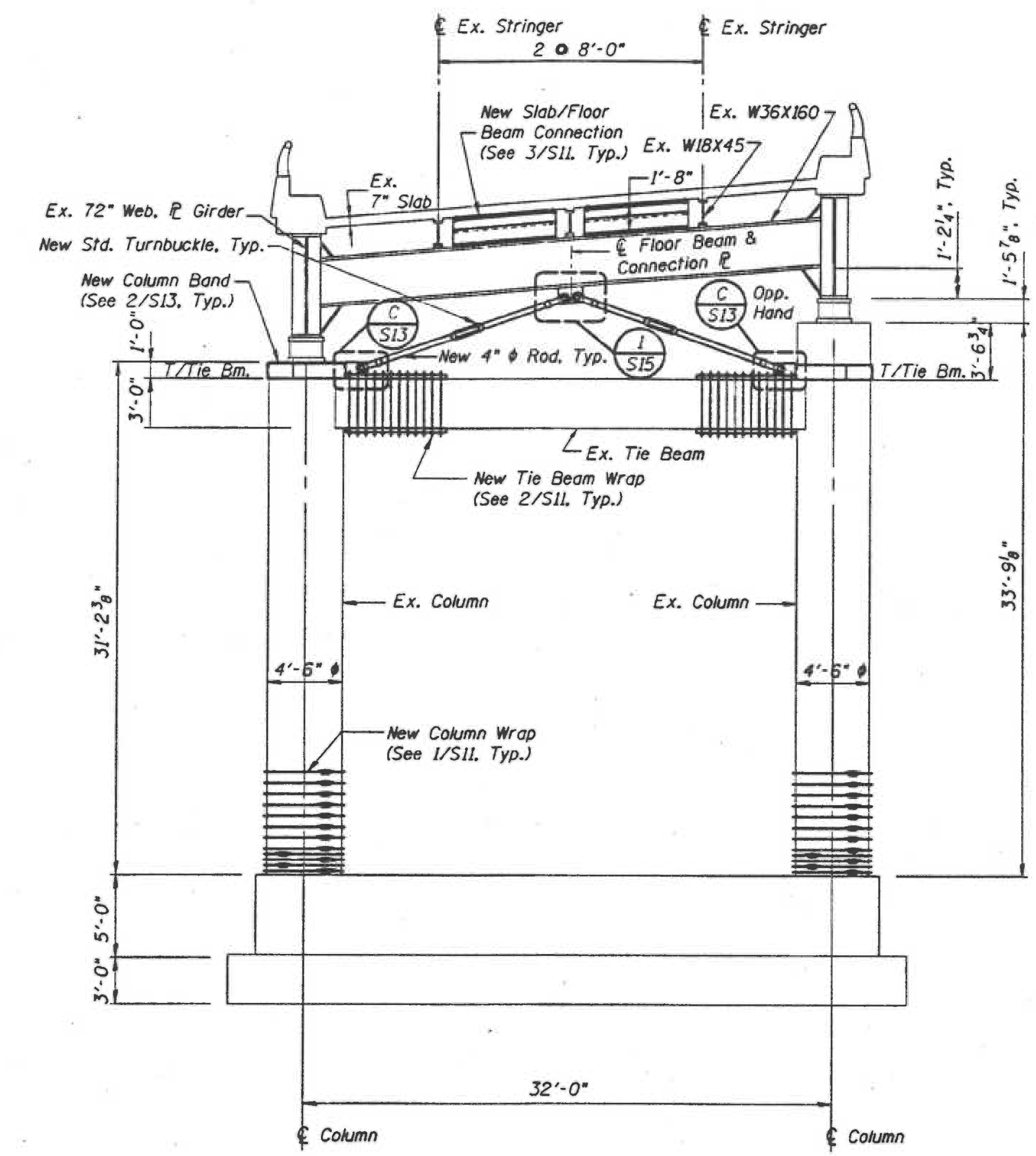
PIERS D12 & D13 RETROFITS

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

SCALE:
DRAWN BY
DATE 1-23-98
CHECKED BY HH



1/S33 ELEVATION PIER D15



2/S33 ELEVATIONS PIER D17

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
POPLAR STREET BRIDGE APPROACHES
ST. CLAIR COUNTY

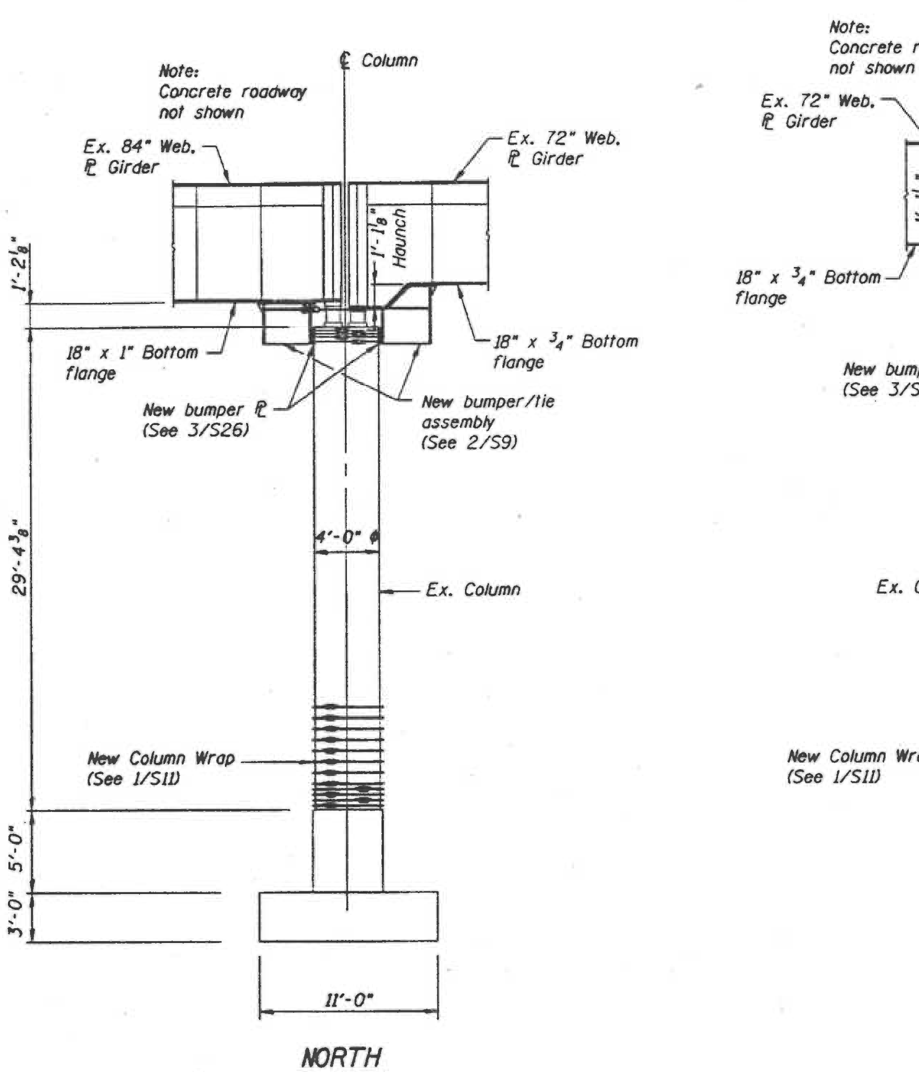
DRAWN BY
DATE 1-23-98
CHECKED BY HH

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 70	*	ST. CLAIR	91	71
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

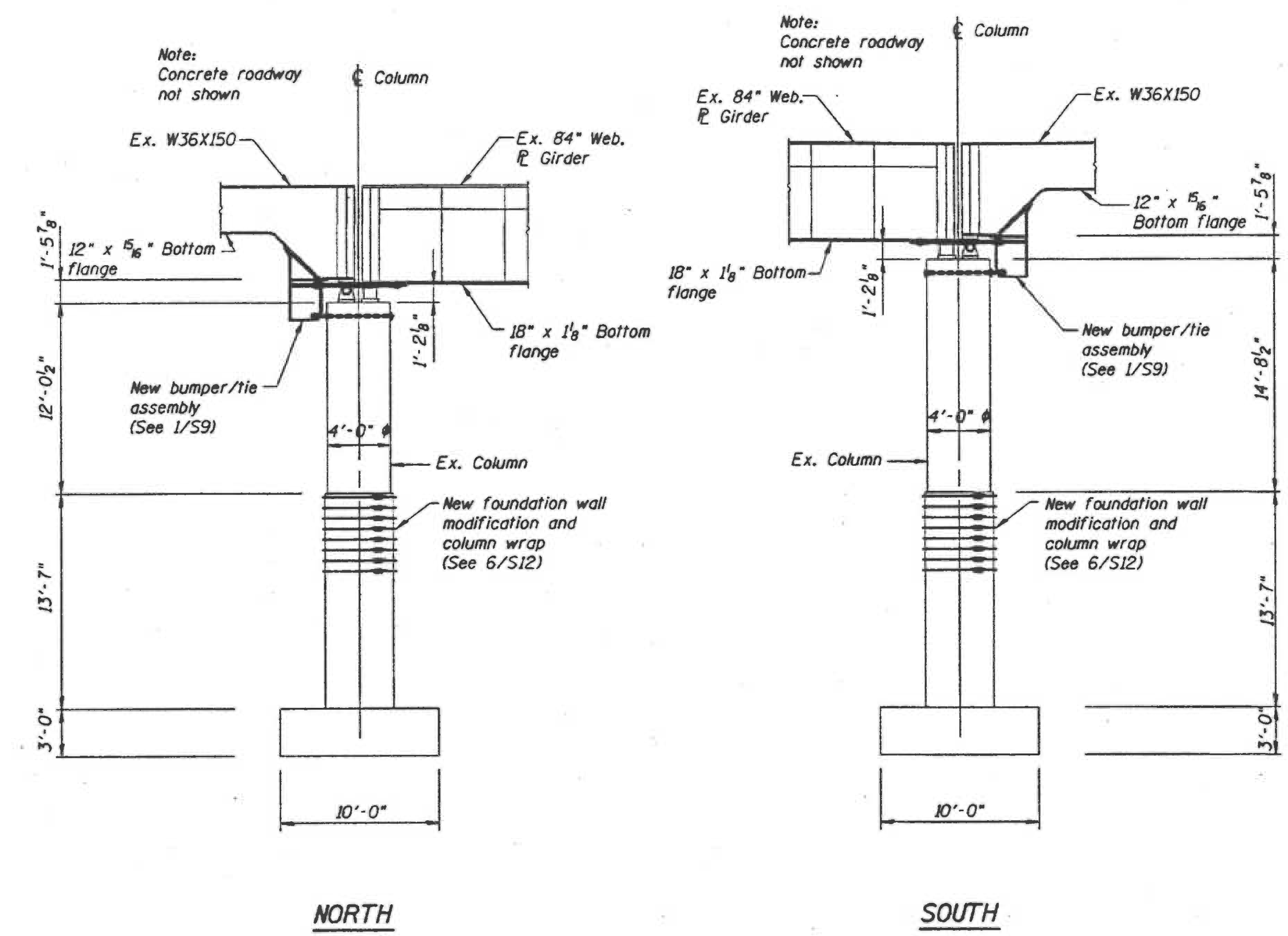
* 82-3HVB-2R-1-1

SHEET NO. S-34

SHEETS



ELEVATIONS PIER D18 (1/S34)



ELEVATIONS PIER D21 (2/S34)

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

* Elevation not shown

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

* Elevation not shown

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

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

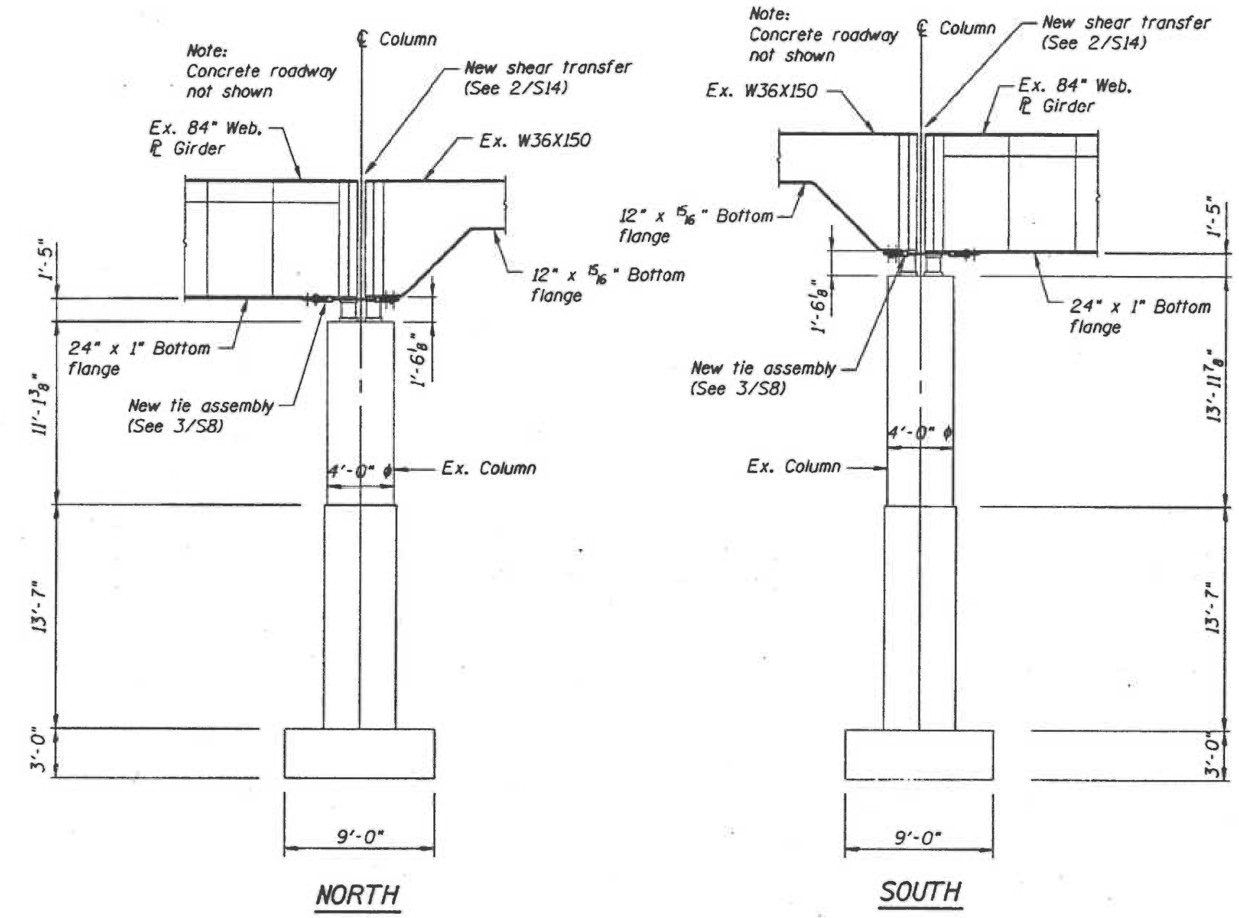
STRUCTURE NO. 082-0144 (ROADWAY
STRUCTURE NO. 082-0256 (ROADWAY
SCALE: NONE
DATE 1-23-98

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 70	*	ST. CLAIR	91	72
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

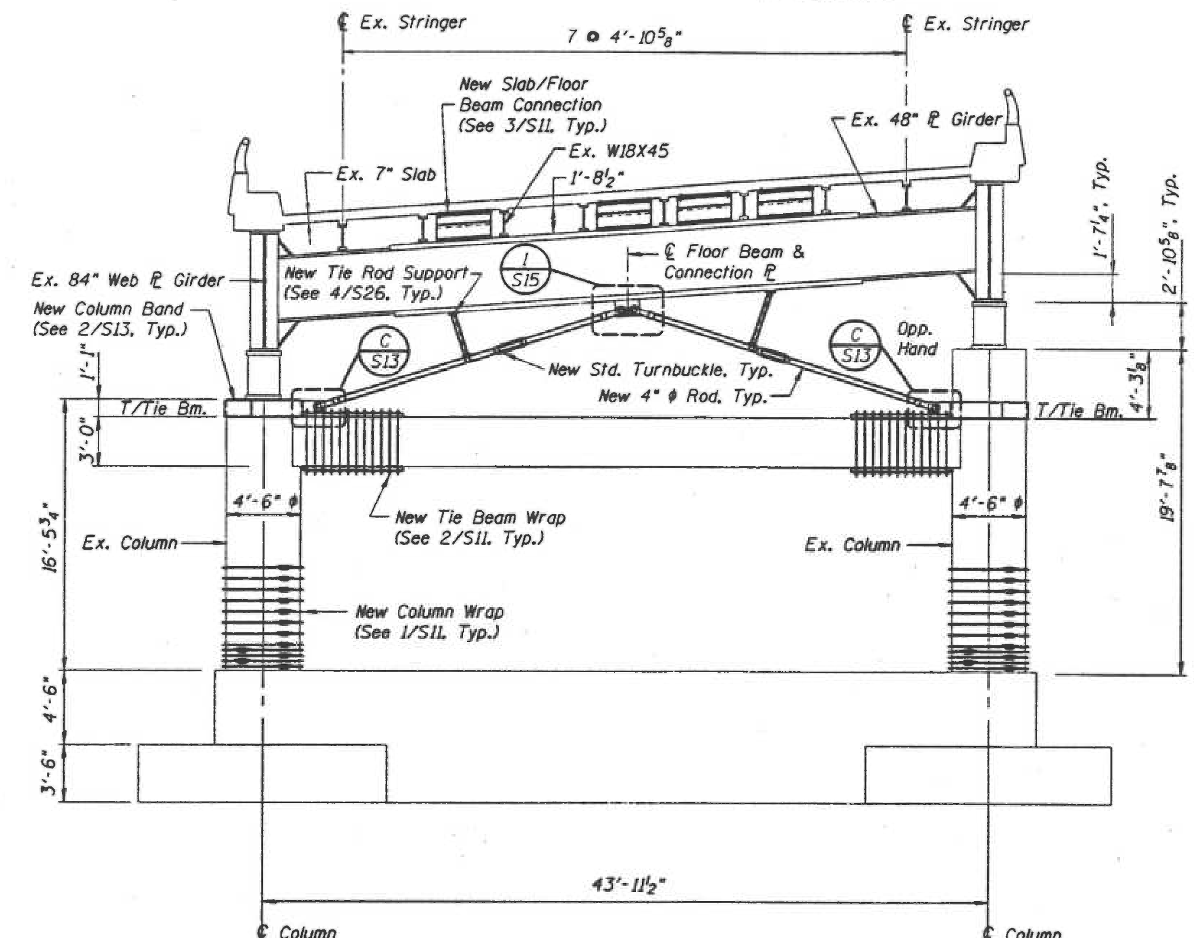
SHEET NO. S-35

SHEETS

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



1/S35 ELEVATIONS PIER D22



2/S35 ELEVATION PIER D23

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 BR... ...ROACHES
ST. C...

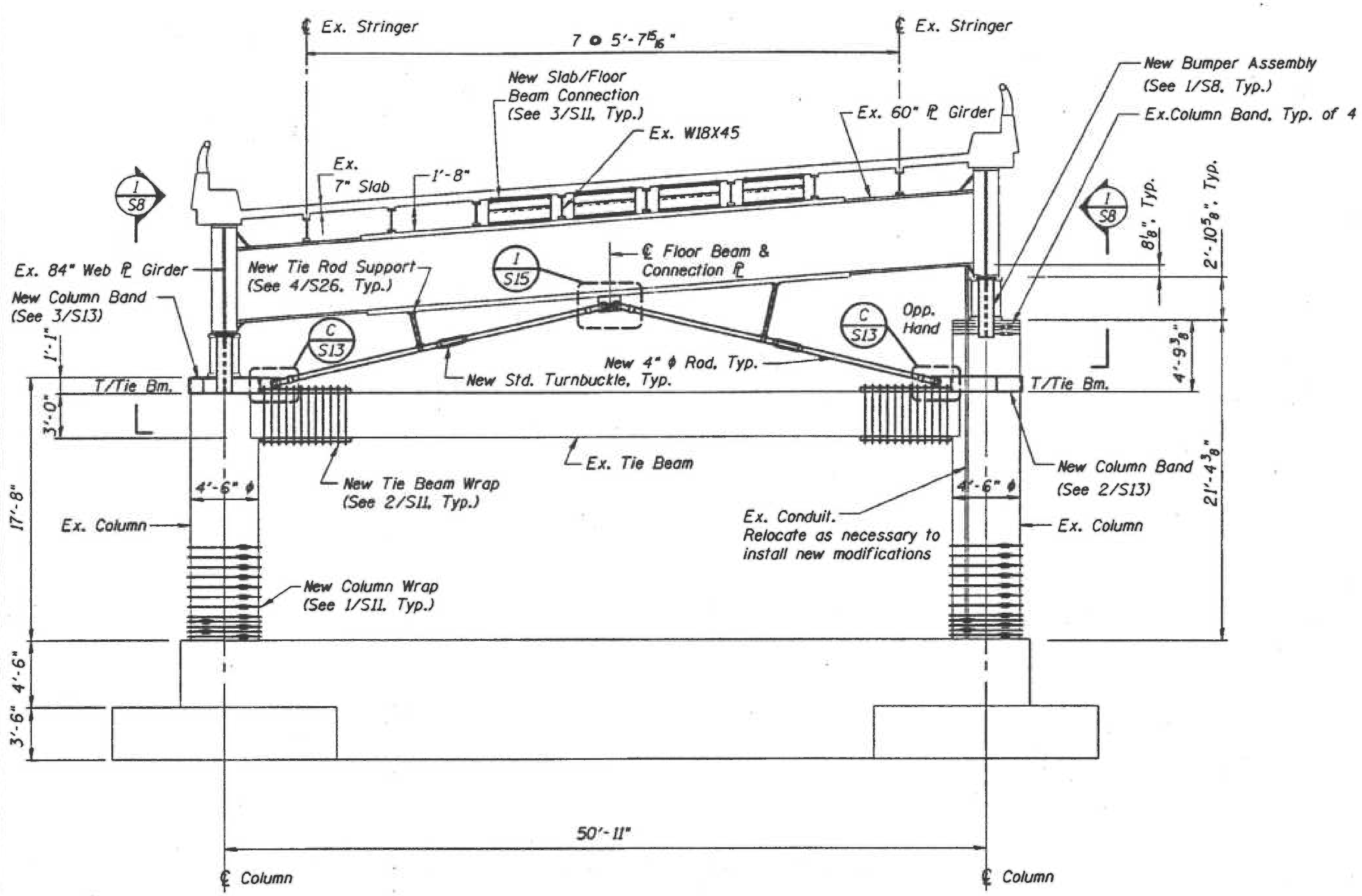
...BY JN

DATE 1-23-98 CHECKED BY HH

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 70	*	ST. CLAIR	91	73
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

SHEET NO. S-36
SHEETS

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



ELEVATION PIER D24 (1/S36)

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

* Elev[illegible] not shown

PIER D24 RETROFITS

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

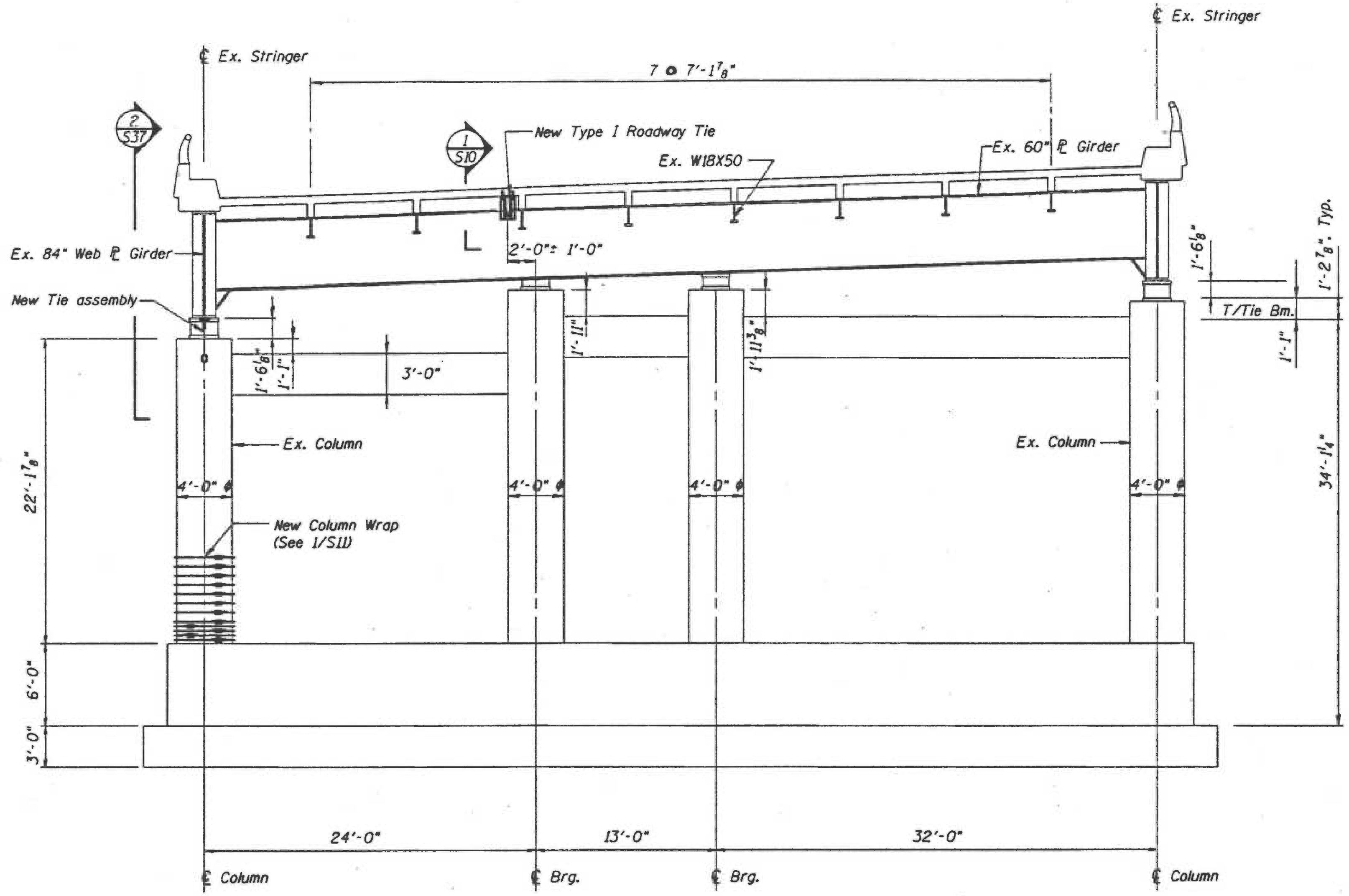
STRUCTURE NO. [illegible] STRUCTURE NO. [illegible]
SCALE: NONE DRAWN [illegible]
DATE 1-23-98 CHECKED BY HH

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 70	*	ST. CLAIR	91	74
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

* 82-3HV8-2R-1-1

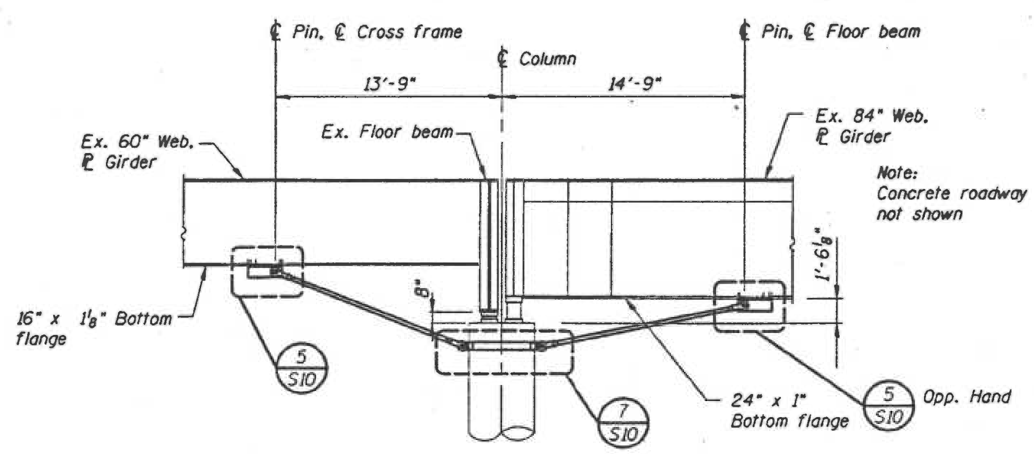
SHEET NO. S-37

SHEETS



1
S37

ELEVATIONS PIER D26



2
S37

ELEVATION EXISTING ROADWAY GIRDERS AT PIER D26

BILL OF MATERIAL - PIER D26		
ITEM	UNIT	QUANTITY
Concrete removal	C.Y.	8.8
Furnish and erect structural steel	LBS.	3095
Epoxy grouted dowels	EACH	28
Foundation wall dowel modification	EACH	8
Column wrap	SQ. FT.	81.7

PIER D26 RETROFITS

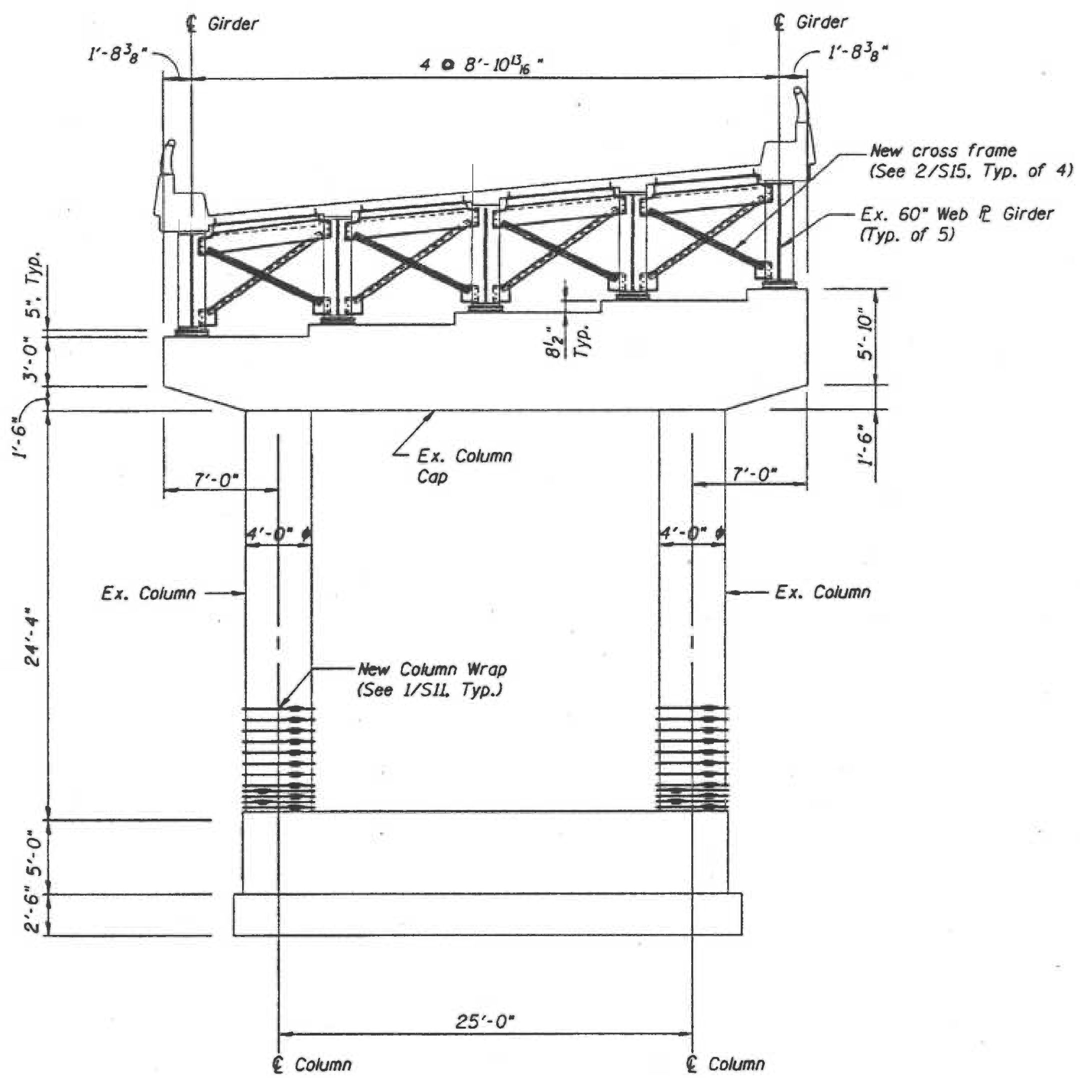
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
FAI ROUTE 70
POPLAR STREET BRIDGE APPROACHES
ST. CLAIR COUNTY

STRUCTURE NO. [illegible] STRUCTURE [illegible]
STRUCTURE NO. [illegible] STRUCTURE [illegible]
SCALE: NONE
DATE 1-23-[illegible] CHECKED [illegible]

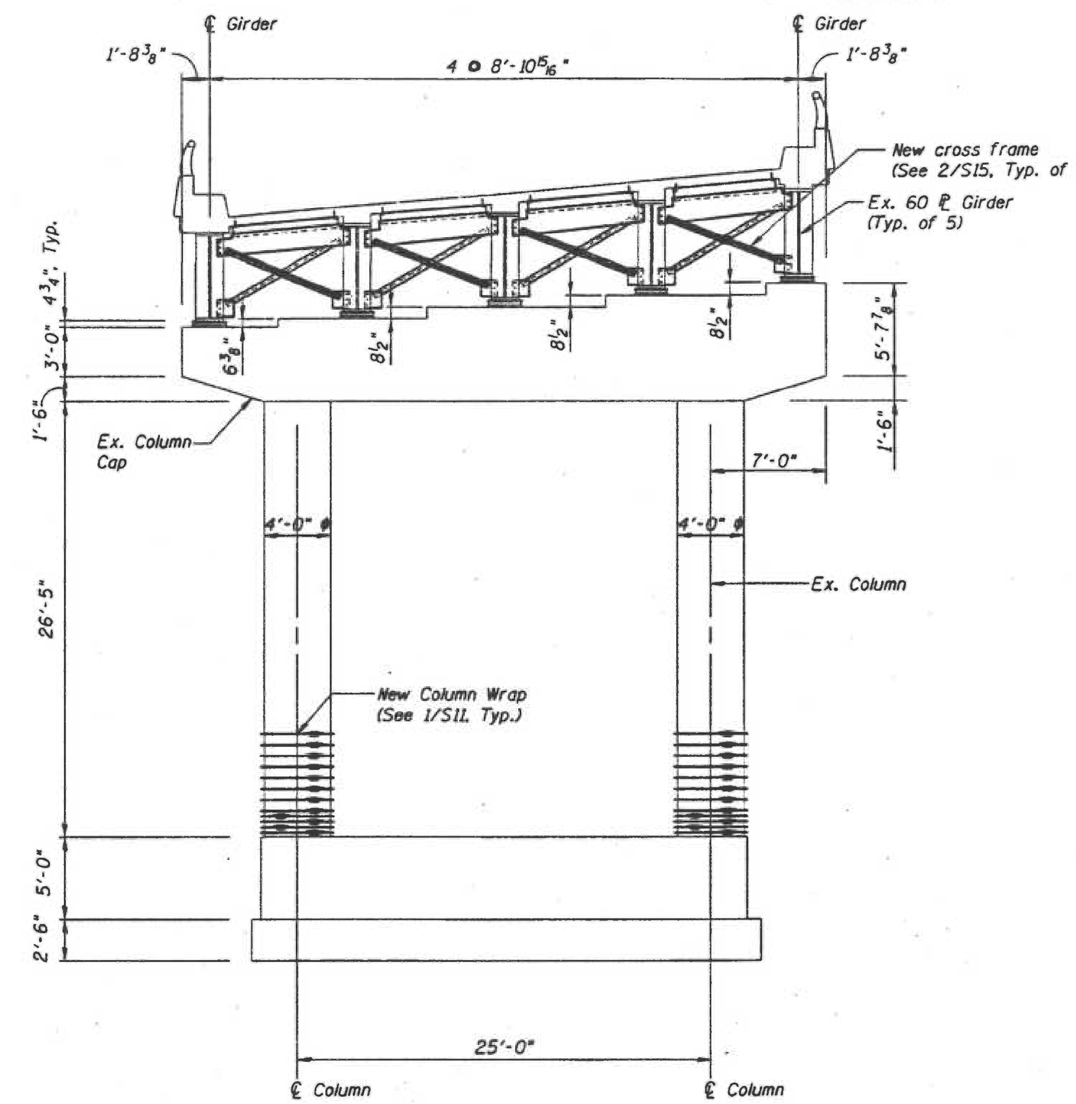
ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 70	*	ST. CLAIR	91	75
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

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

SHEET NO. S-38
SHEETS



1/S38 ELEVATION PIER Q1-1



2/S38 ELEVATION PIER Q2-1

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

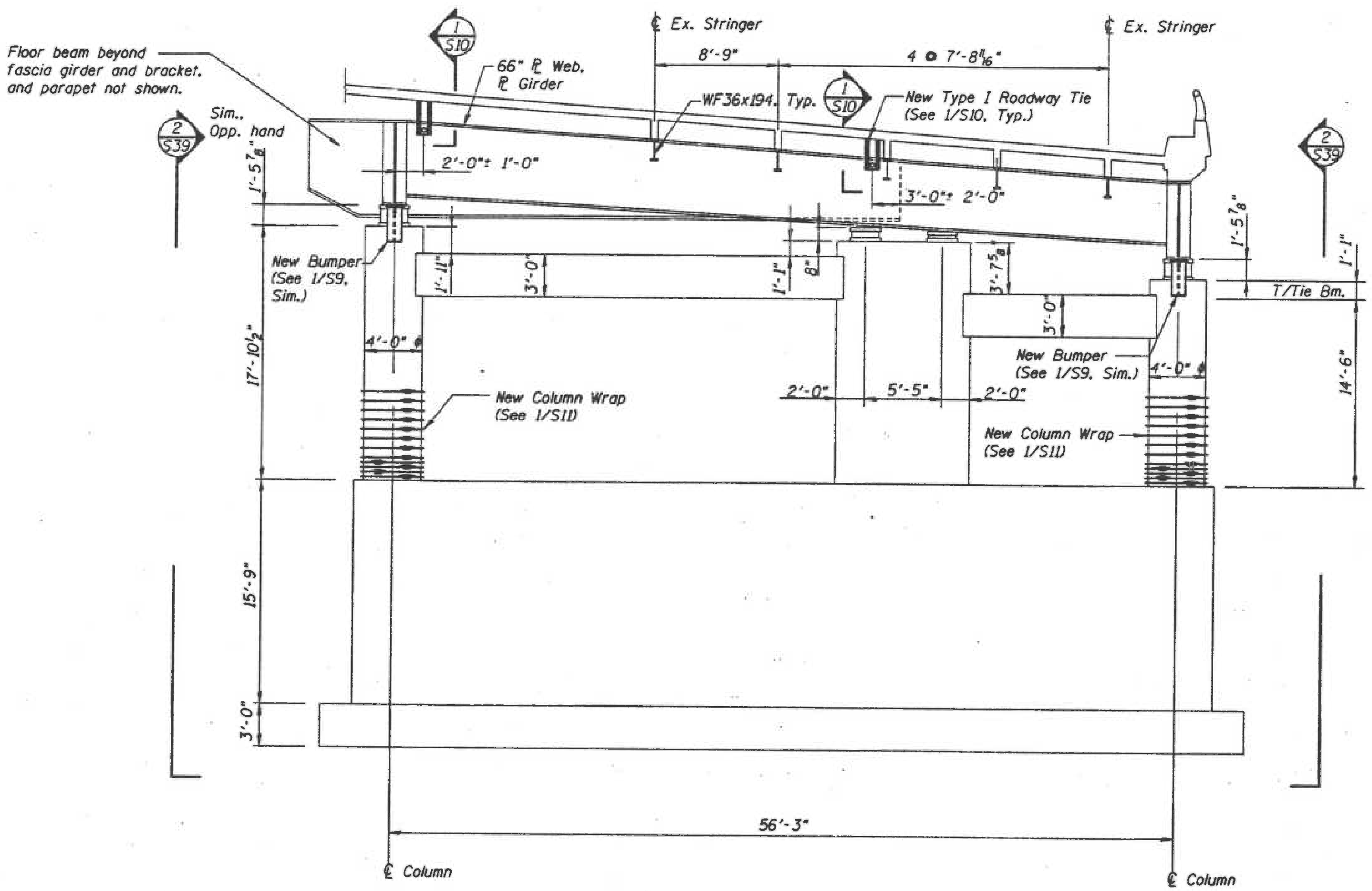
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
FAI ROUTE 70
POPLAR STREET BRIDGE A[illegible]ACHES
ST. CL[illegible]
[illegible]082-0144 [illegible] [illegible]RAMP [illegible]
[illegible]0256 [illegible]
HH

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 70	*	ST. CLAIR	91	76
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

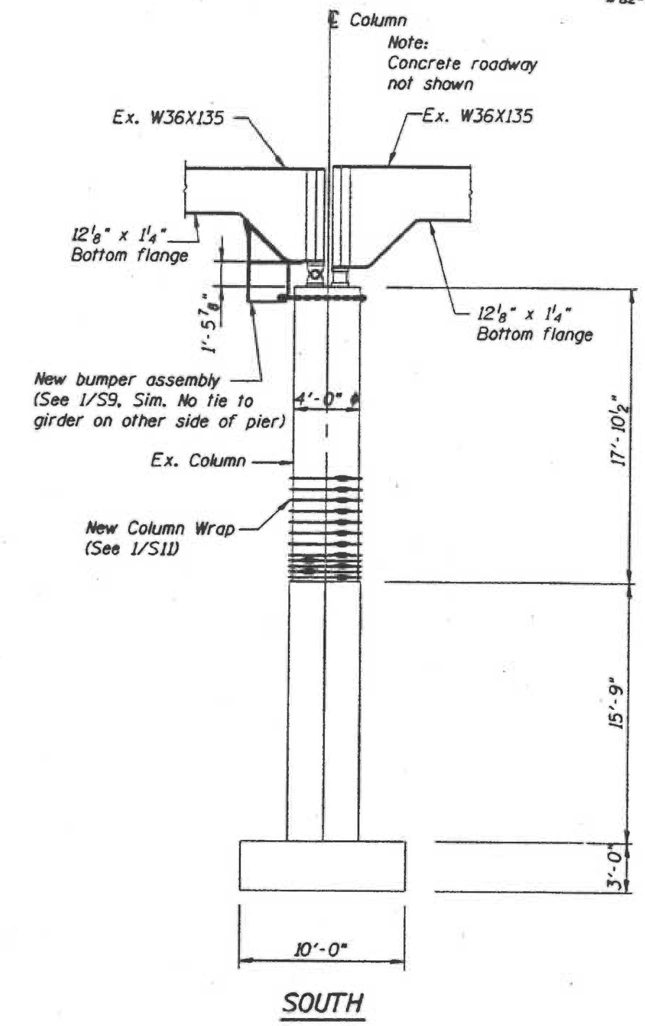
* 82-3HVB-2R-1-1

SHEET NO. S-39

SHEETS



1 / S39 ELEVATION PIER P14



2 / S39 ELEVATION PIER P14

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

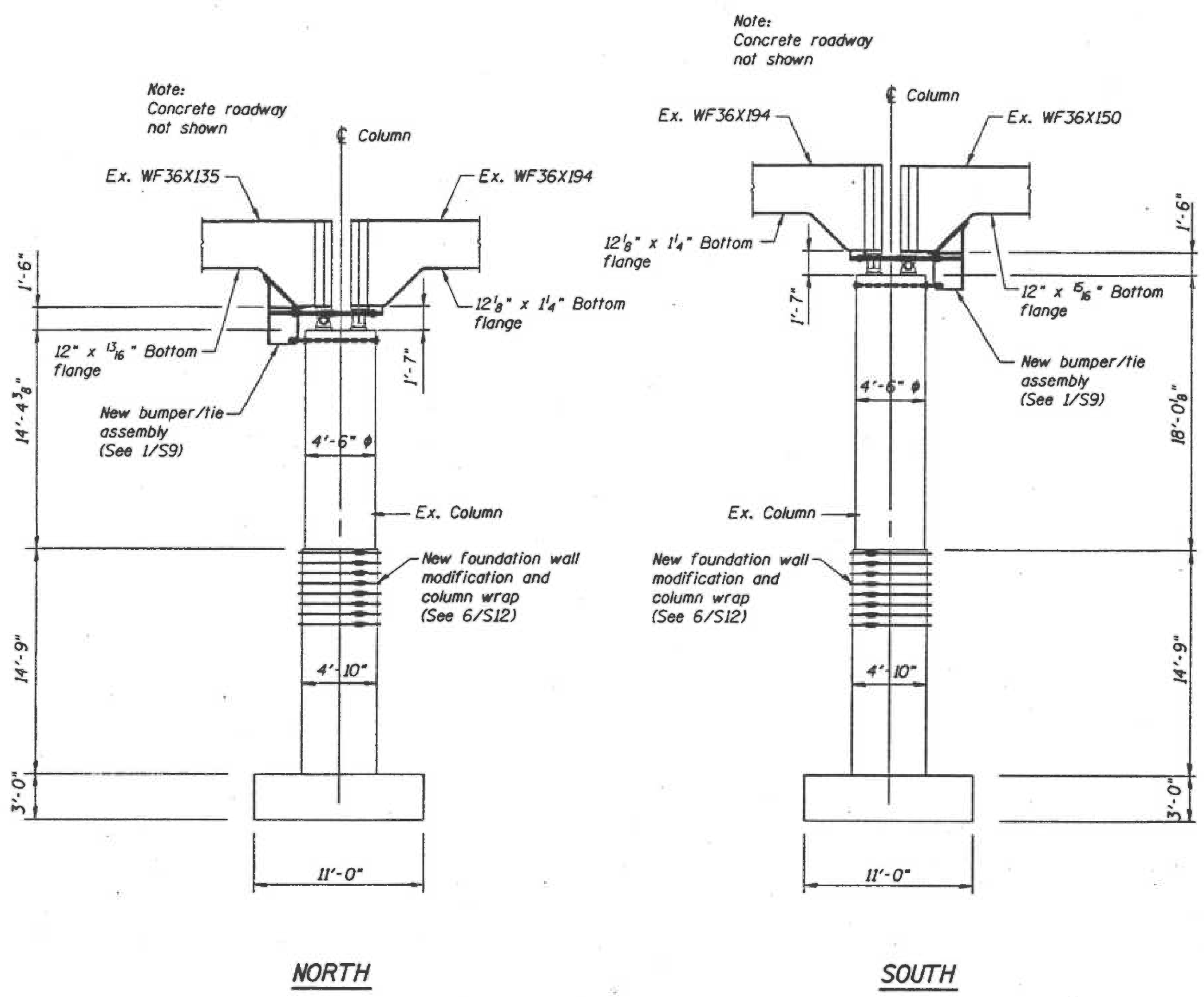
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
FAI ROUTE 70
... BRIDGE APPRO...
... COUNTY

SCALE: ...
DRAWN BY JN
DATE 1-23-98
CHECKED BY HH

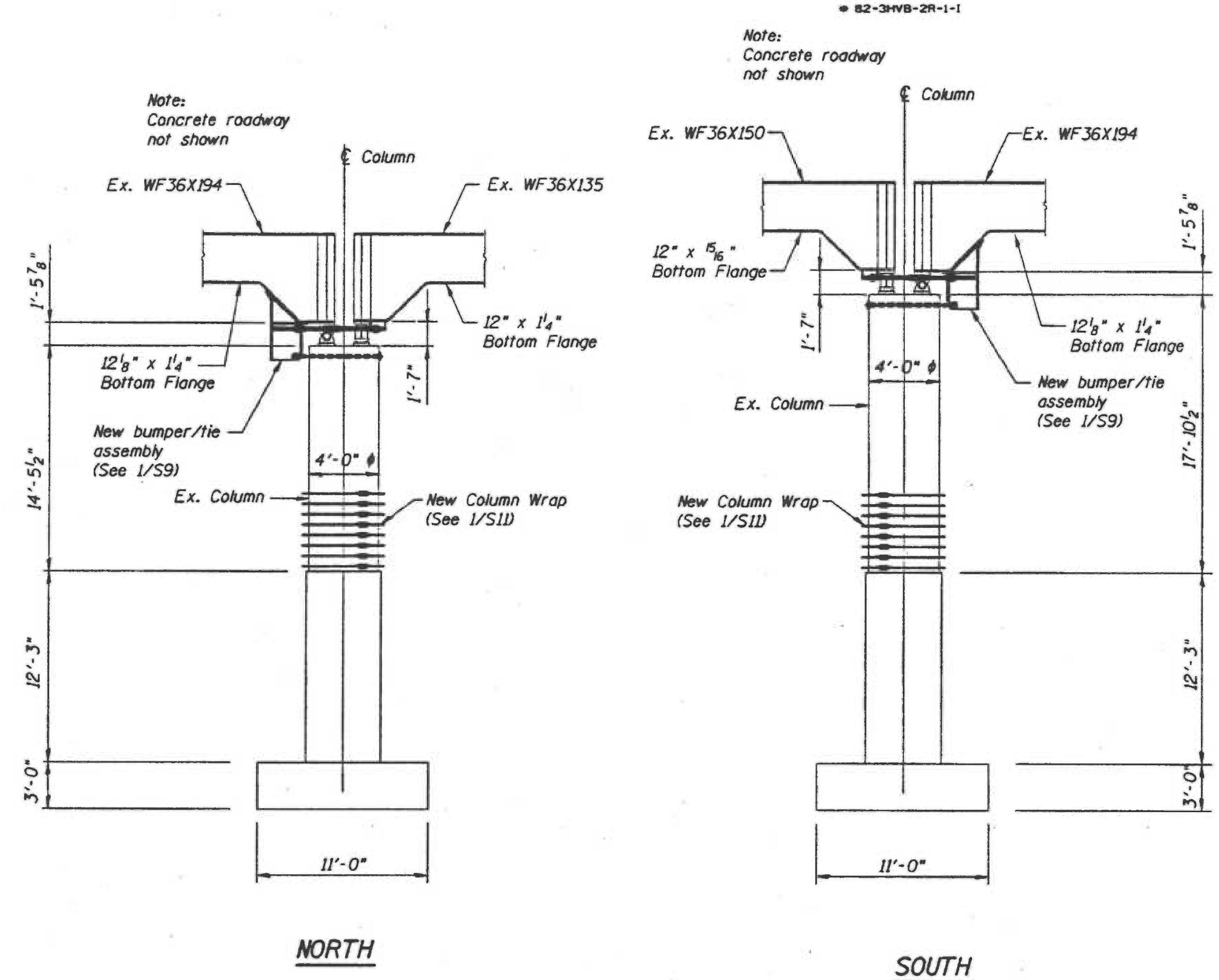
ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 70	*	ST. CLAIR	91	77
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

SHEET NO. S-40
SHEETS

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



1/S40 ELEVATIONS PIER P15



2/S40 ELEVATIONS PIER H1

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 70
P[illegible]AR STREET B[illegible]IDGE APPROACHES
ST. [illegible] COUNTY

[illegible] STRUCTURE NO. [illegible]

SC[illegible] DRAWN BY [illegible]

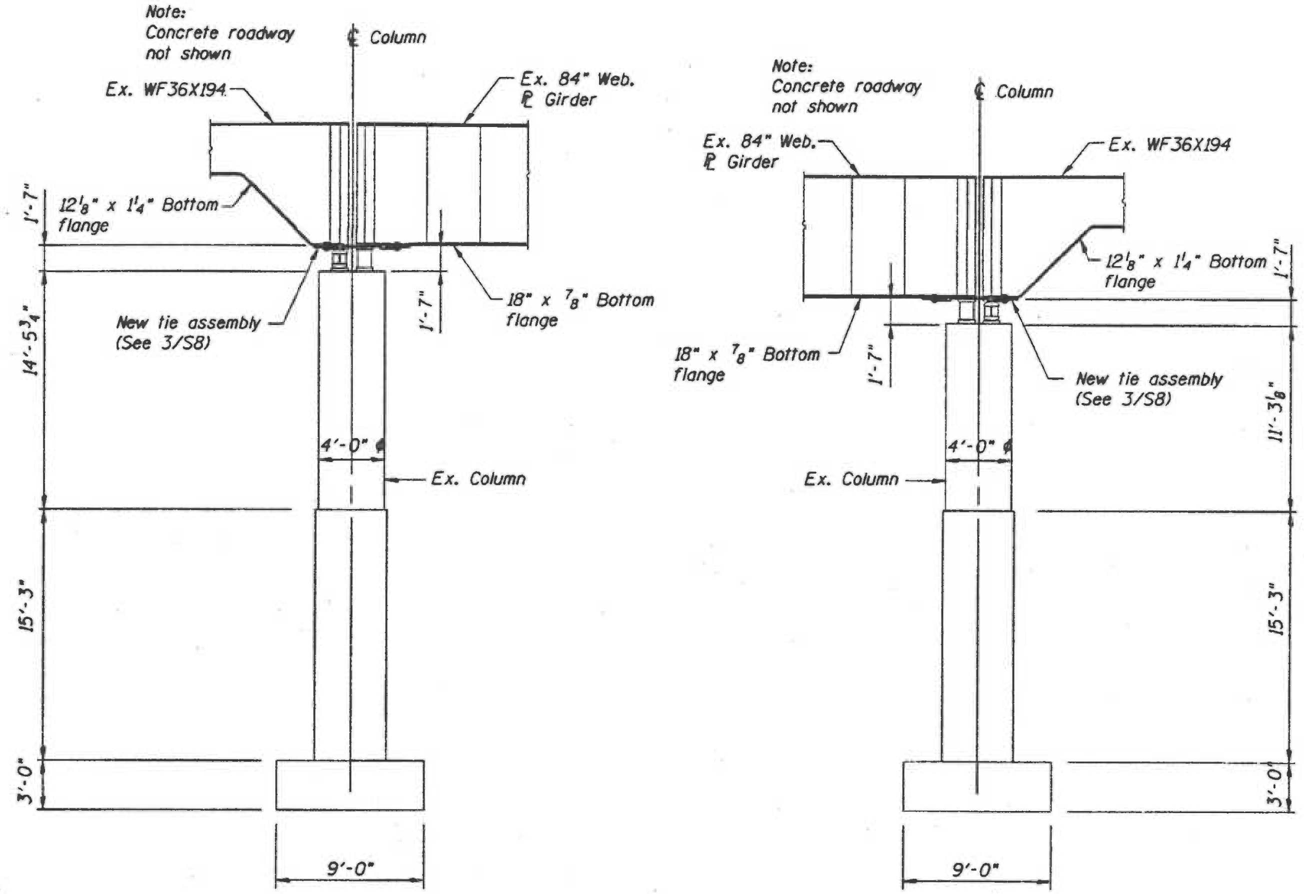
DATE 1-23-[illegible] CHECKED BY HH

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 70	*	ST. CLAIR	91	78
FED. ROAD DIST. NO. 7		ILLINOIS	FED. AID PROJECT-	

SHEET NO. S-41

SHEETS

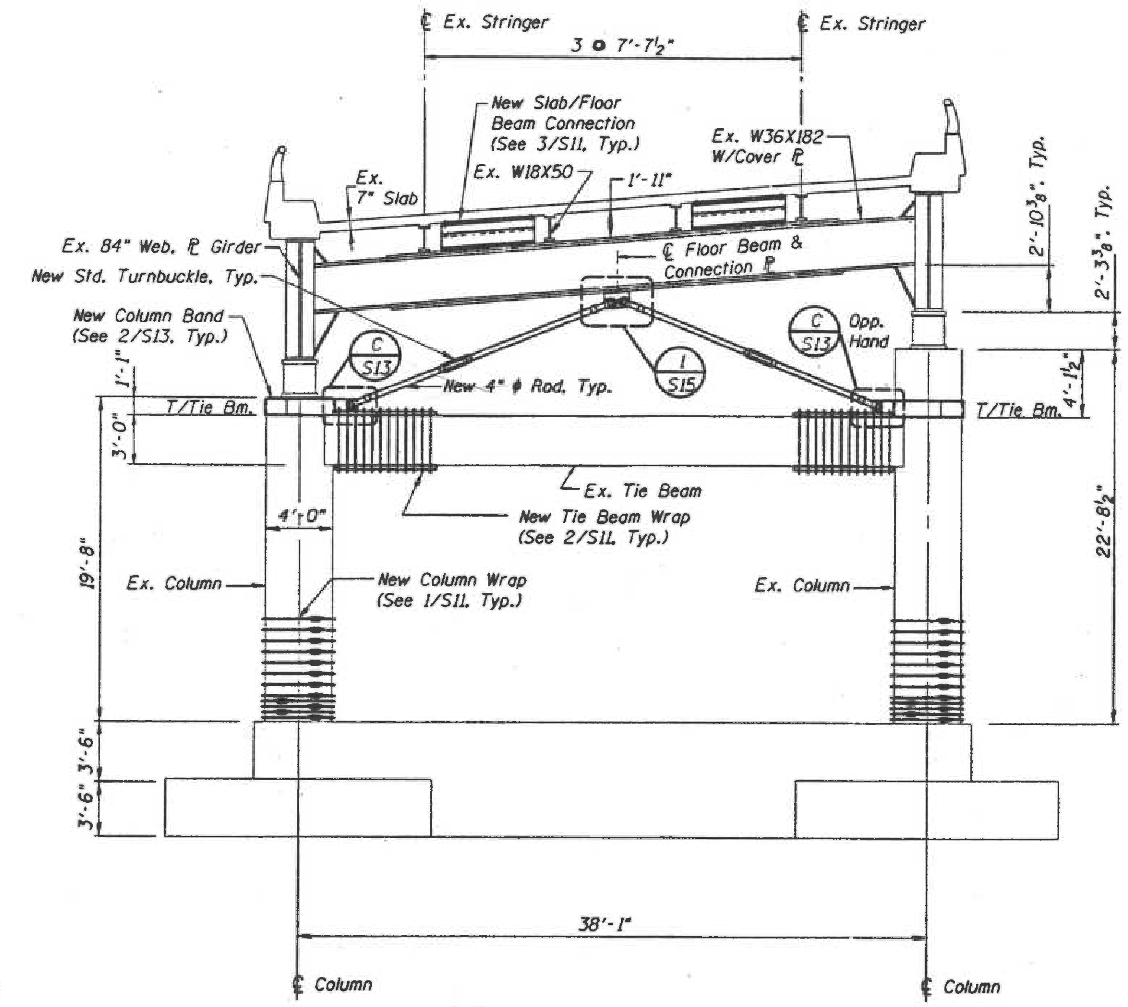
* 82-3HVB-2R-1-I



SOUTH

NORTH

1/S41 ELEVATIONS PIER H2



2/S41 ELEVATION PIER H3

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 70
POPLAR STREET BRIDGE APPROACHES
ST. CLAIR COUNTY

SCALE: NONE | DRAWN BY

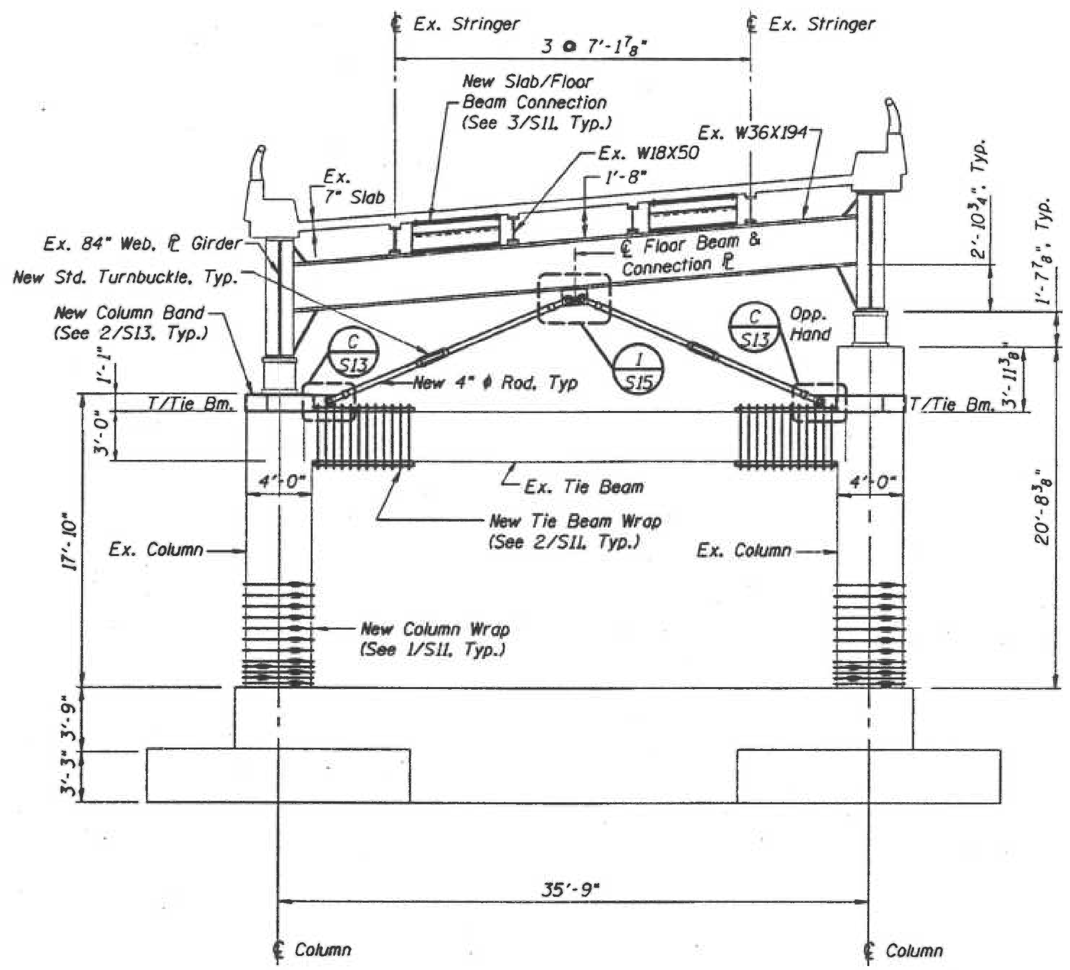
DATE 1-23-98 | CHECKED BY HH

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 70	*	ST. CLAIR	91	79
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

SHEET NO. S-42

SHEETS

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



I S42 ELEVATION PIER H4

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

DATE 1-23-98

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ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 70	*	ST. CLAIR	91	80
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

SHEET NO. S-1
SHEETS

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

D-98-012-05

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

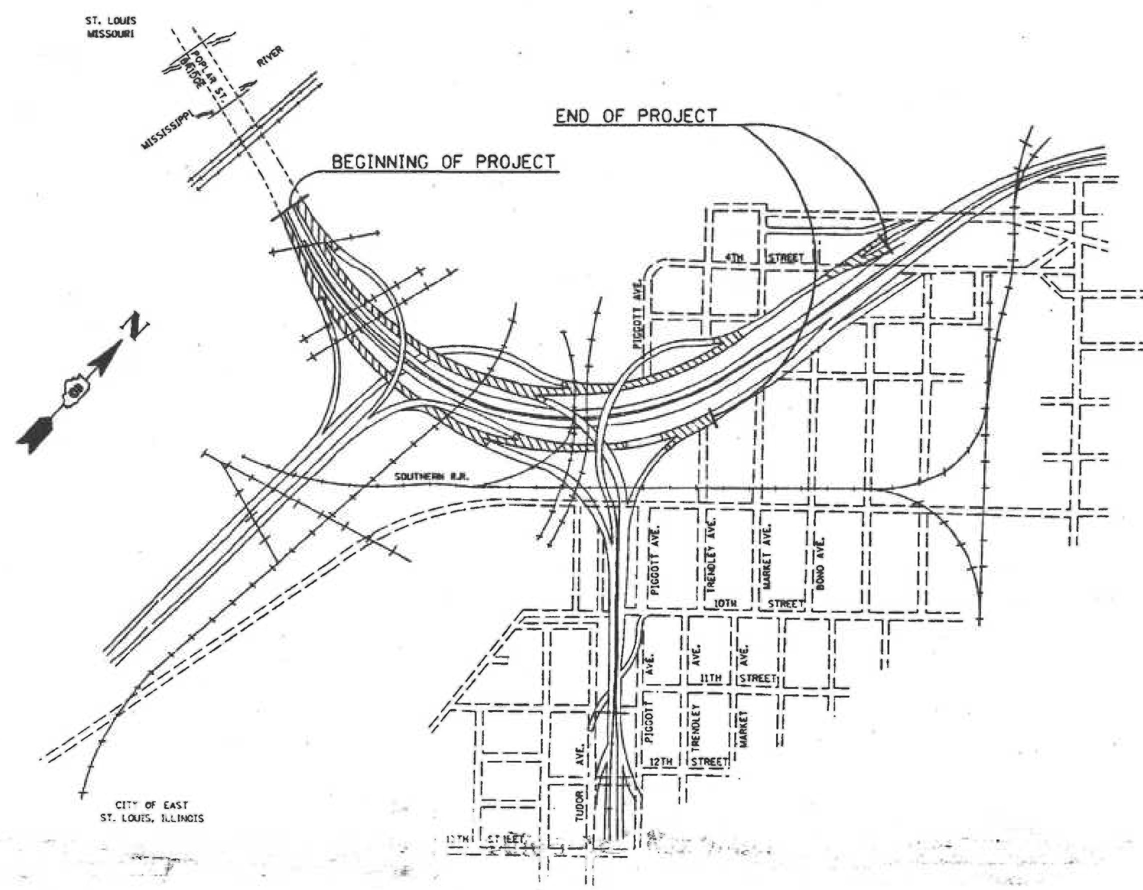
SET 3 OF 4 SETS

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

PLANS FOR PROPOSED SEISMIC RETROFIT REPAIR *

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

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

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

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

SHEET NO. S-2
SHEETS

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

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.

GENERAL NOTES

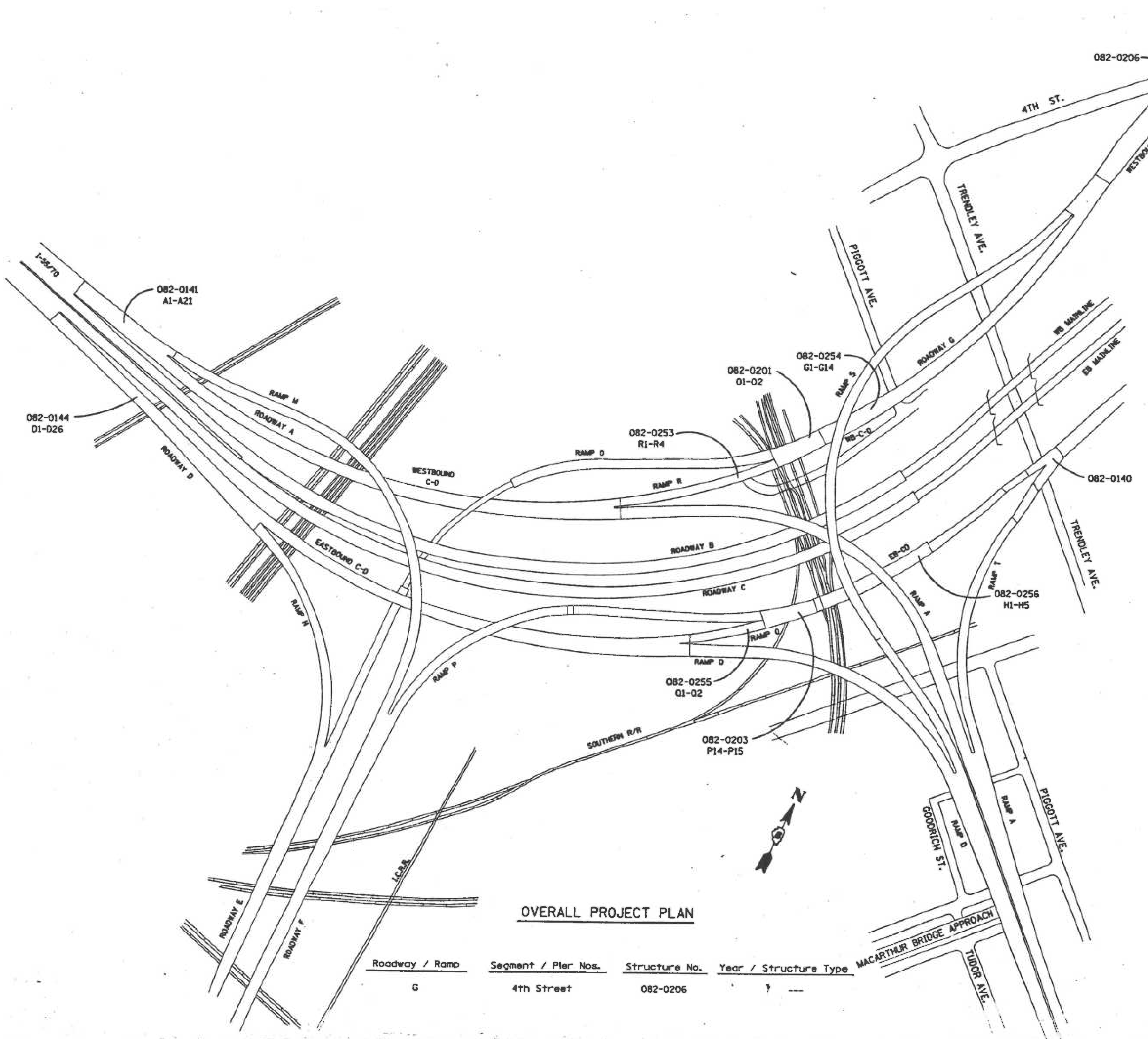
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
FAI ROUTE 70
POPLAR STREET BRIDGE APPROAC
ST. CLAIR COU
082-0206

SCALE:
DATE

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 70	*	ST. CLAIR	91	82
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

SHEET NO. S-3
SHEETS

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



OVERALL PROJECT PLAN

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

LOCATION SKETCH

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)

PROJECT PLAN / SCOPE OF WORK

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

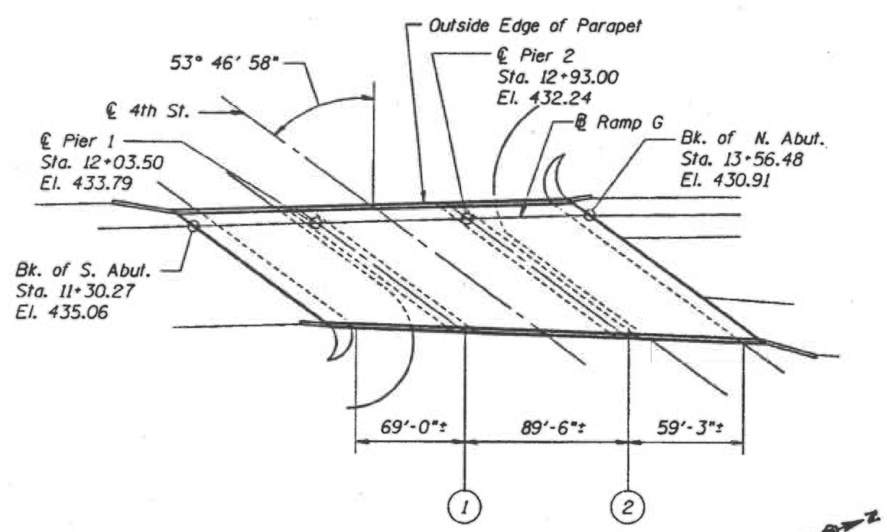
DATE 1-23-98 | JN | CHECKED BY HH

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

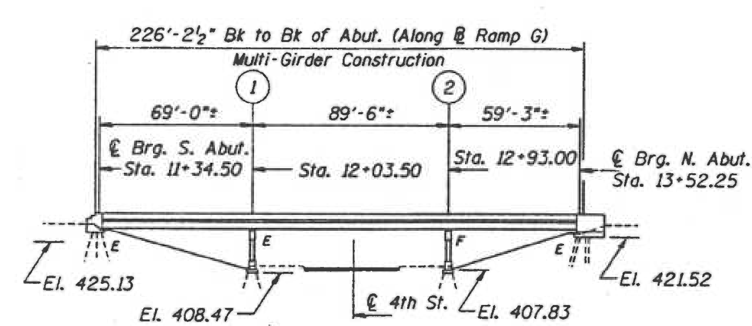
SHEET NO. S-4

SHEETS

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



1
S4
PLAN RAMP G OVER 4TH STREET



2
S4
ELEVATION RAMP G OVER 4TH ST.

KEY PLAN AND ELEVATION FOR RAMP G OVER 4TH STREET

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
F[illegible] ROUTE 70
PO[illegible] APPROACHES
[illegible]

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

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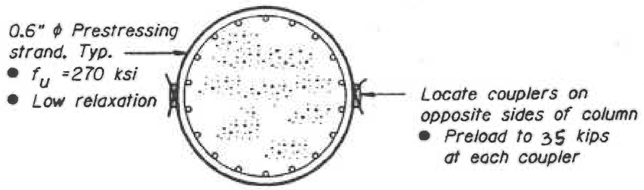
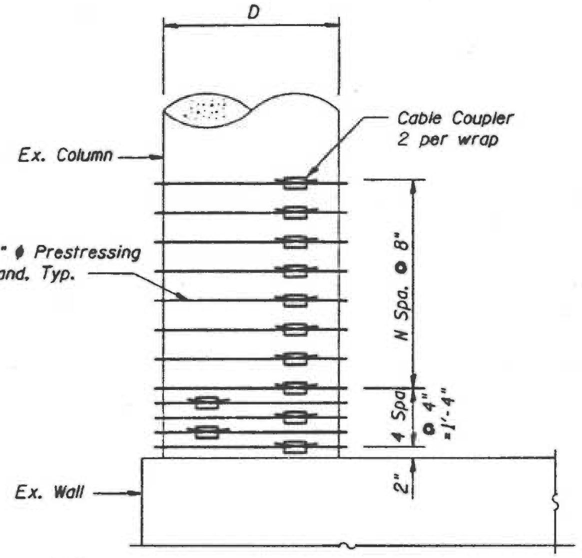


PLAN



Notes:

1. See table for dimensions not shown and additional notes.
2. 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

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:

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

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 70	■	ST. CLAIR	91	84
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

■ 82-3HVB-2R-1-I

SHEET NO. S-5

SHEETS

SEISMIC RETROFIT DETAILS

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
FAI ROUTE 70
[illegible] STREET BRIDGE APPROACHES
[illegible]AIR COUNTY

DATE 1-[illegible] CHECKED BY hm

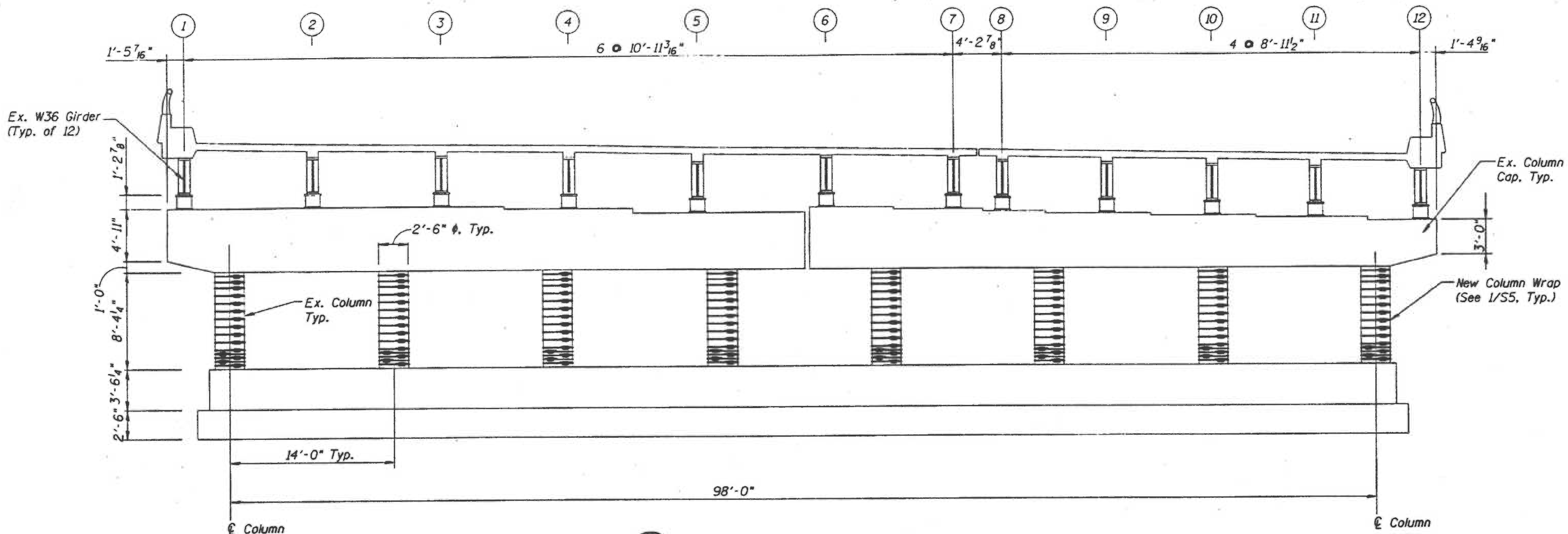
\STRUCTUR\97422\SET3\ST3DTS5.DGN

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

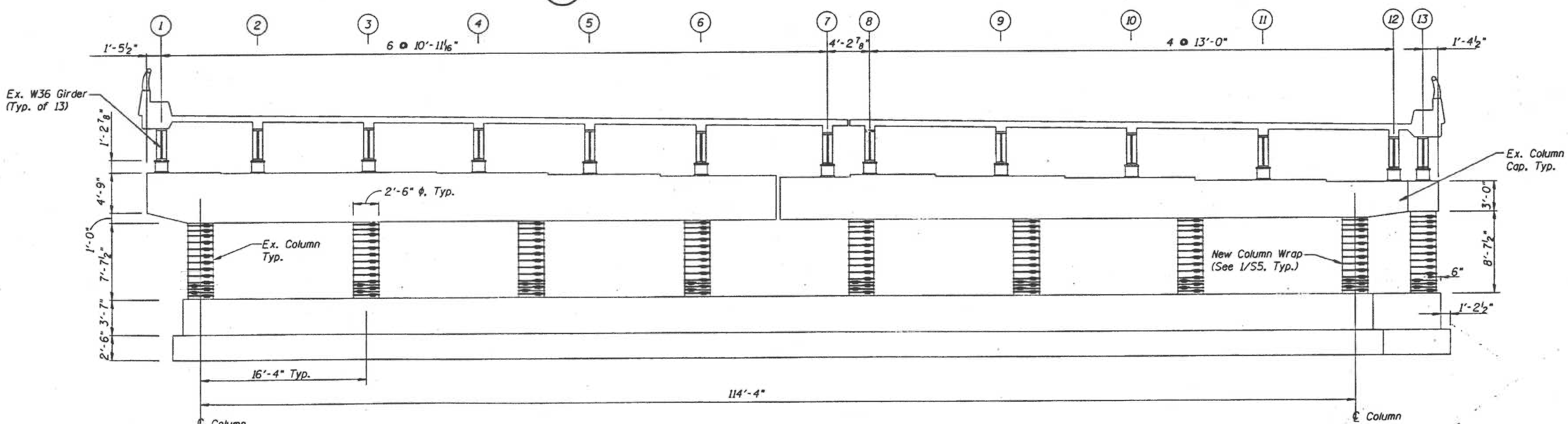
SHEET NO. S 6

SHEETS

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



1/S6 ELEVATION PIER No. 1



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. CLA[illegible] COUNTY

[illegible] 082-C2[illegible] ST[illegible]

CH[illegible] BY

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 70	*	ST. CLAIR	91	86
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT		

SHEET NO. S-1

SHEETS

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

D-98-012-95

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

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

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

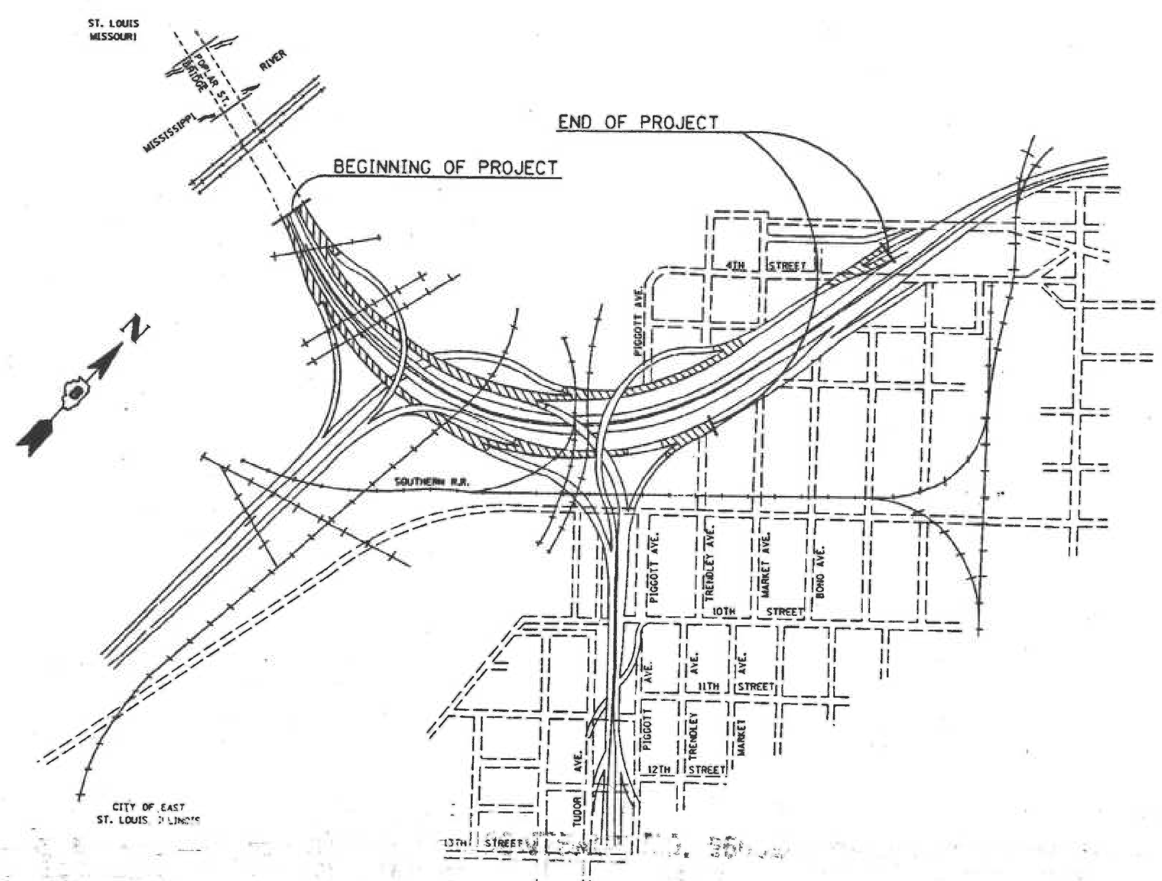
PLANS FOR PROPOSED SEISMIC RETROFIT REPAIR *

FAI ROUTE 70

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

POPLAR STREET BRIDGE APPROACHES

ST. CLAIR COUNTY



LOCATION OF SECTION INDICATED THUS:-

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

SUBMITTED ____________ 19 ____

DISTRICT ENGINEER

____________ 19 ____

ENGINEER OF PROJECT DEVELOPMENT AND IMPLEMENTATION

____________ 19 ____

ENGINEER OF DESIGN AND ENVIRONMENT

____________ 19 ____

DIRECTOR, DIVISION OF HIGHWAYS

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

SHEET NO. S-2

SHEETS

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

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 ¾ in. or greater than 2½ in. in width. During concrete removal, exercise reasonable care to avoid cracking of underlying sound concrete.

GENERAL NOTES

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
FAI ROUTE 70
POPLAR STREET [illegible] APPROACHES
ST. [illegible]

[illegible] BY [illegible]

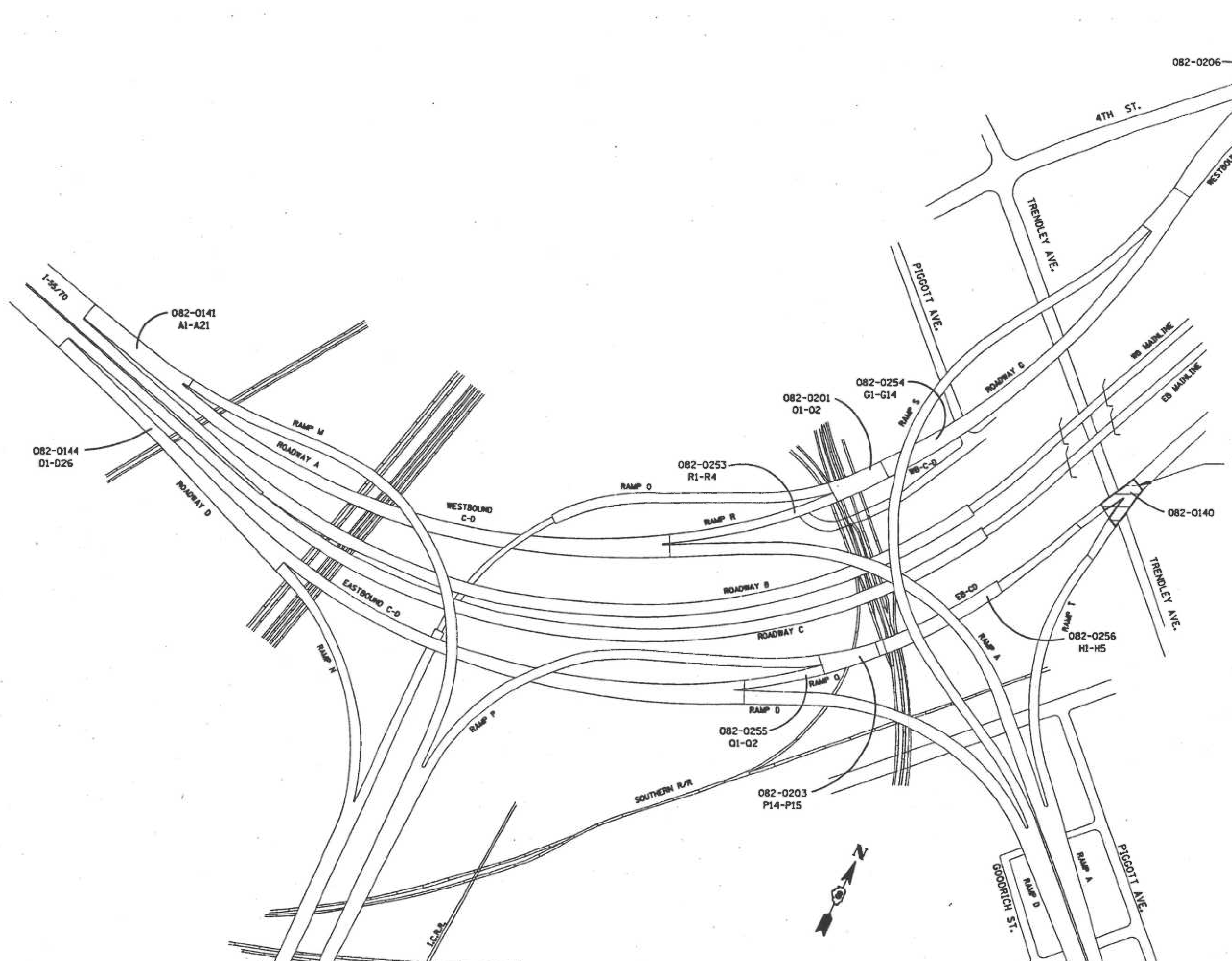
DATE 1-23-98 CHECKED BY HH

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 70	*	ST. CLAIR	91	88
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

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

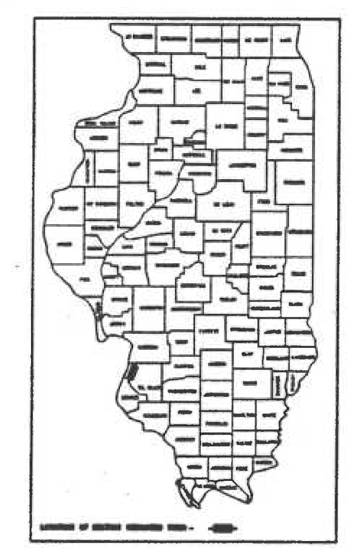
SHEET NO. S-3

SHEETS



OVERALL PROJECT PLAN

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



LOCATION SKETCH

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
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)

PROJECT PLAN / SCOPE OF WORK

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
FAI ROUTE 70
POPLAR [illegible] DGE APPROACHES
[illegible] NTY

STRUCTURE [illegible] TREND[illegible]

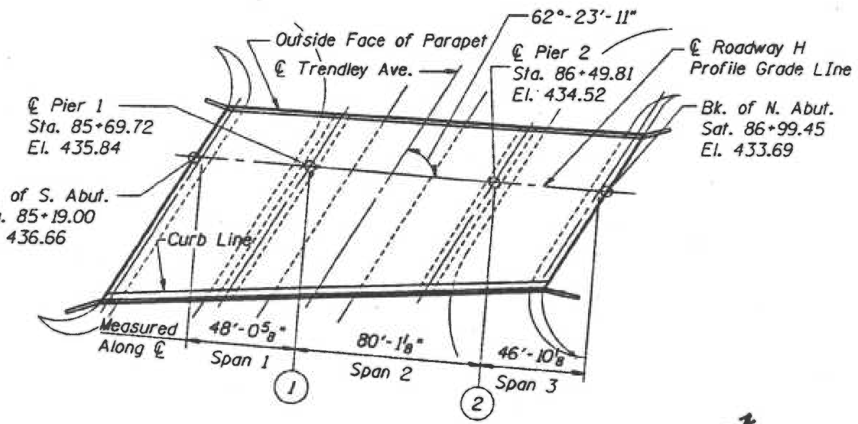
SCALE: NONE DRAWN BY [illegible]
DATE 1-23-98 CHECKED BY HH

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 70	*	ST. CLAIR	91	89
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

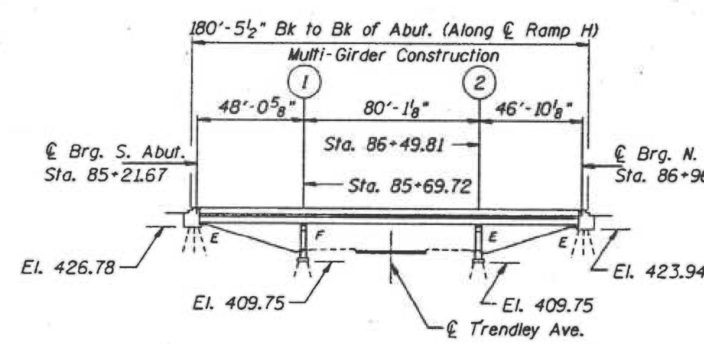
SHEET NO. S-4

SHEETS

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



1 / S4 PLAN RAMP H OVER TRENDLEY AVE.



2 / S4 ELEVATION RAMP H OVER TRENDLEY AVE.

\STRUCTUR\97422\SET4\ST4KPLS4.dgn

KEY PLAN AND ELEVATION FOR RAMP H OVER TRENDLEY AVE.

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
FAI ROUTE 70
...EET BRIDGE APP...
...AIR COUNTY

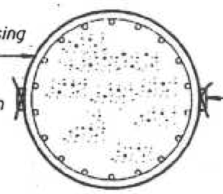
SCALE: NONE
DRAWN
DATE 1-23-98
CHECKED BY HH

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 70	*	ST. CLAIR	91	90
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

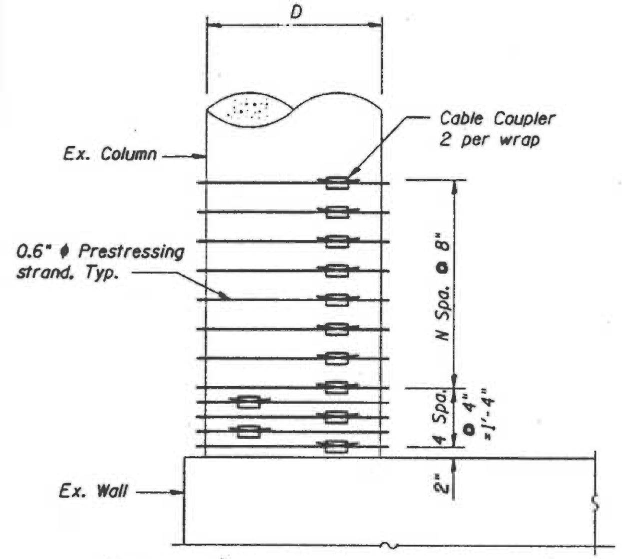
SHEET NO. S-5

SHEETS

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



PLAN



Notes:

1. See table for dimensions not shown and additional notes.
2. 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

TABLE OF COLUMN WRAP PARAMETERS

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

Notes:

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

SEISMIC RETROFIT DETAILS

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

CHECKED HH

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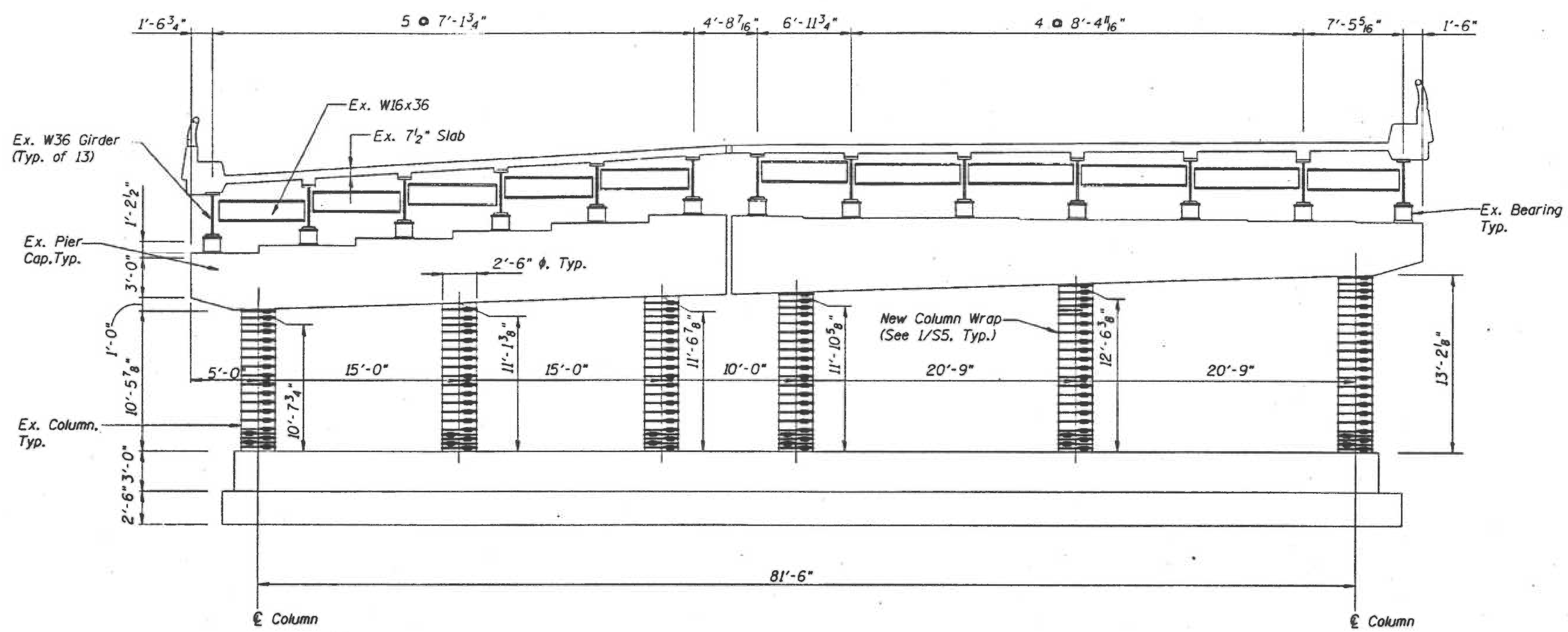
ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.I. 70	*	ST. CLAIR	91	91
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

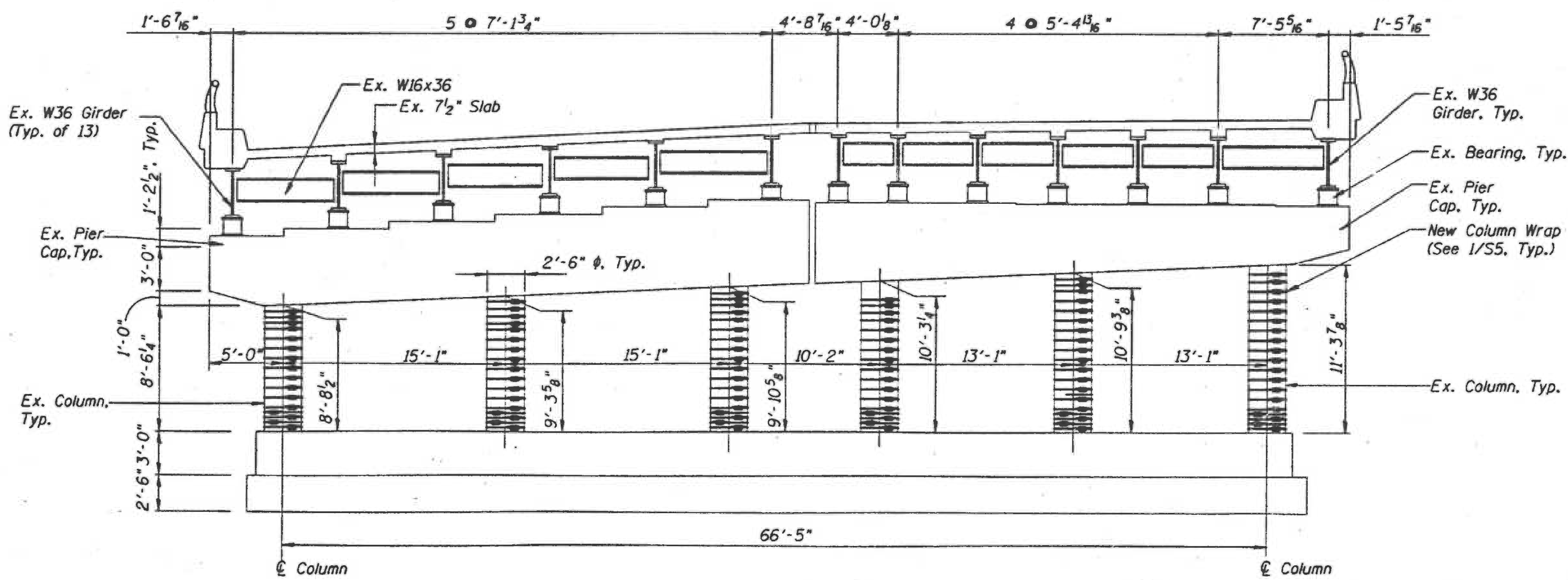
* 82-3HVB-2R-1-1

SHEET NO. S-6

SHEETS



1/S6 ELEVATION PIER NO. 1



2/S6 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

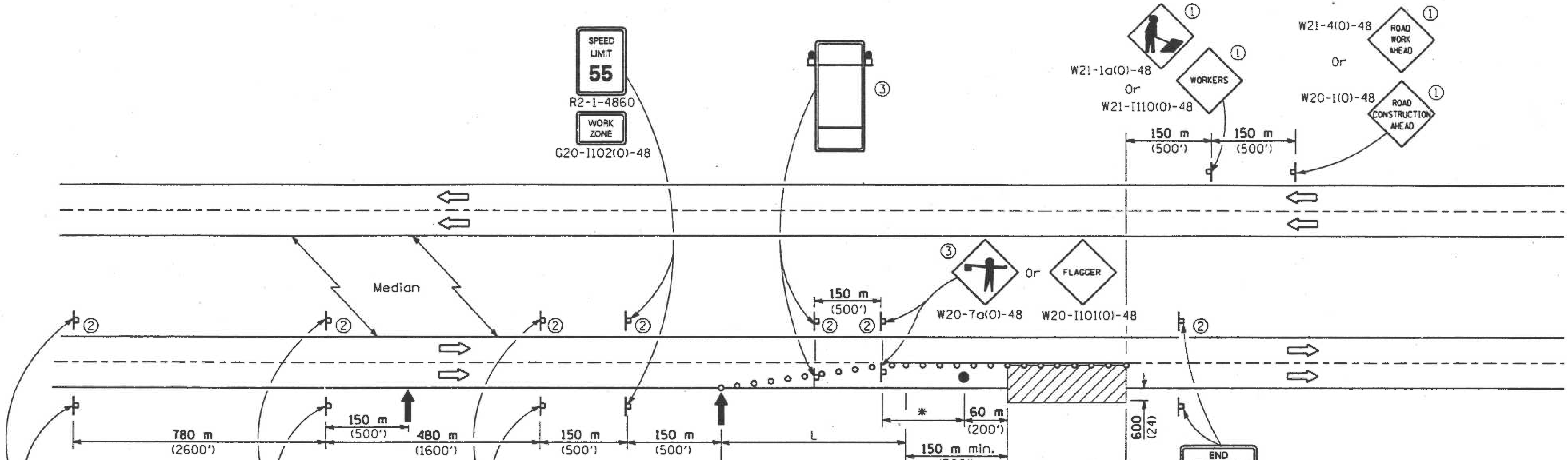
PIER NO. 1 & PIER NO. 2 RETROFITS

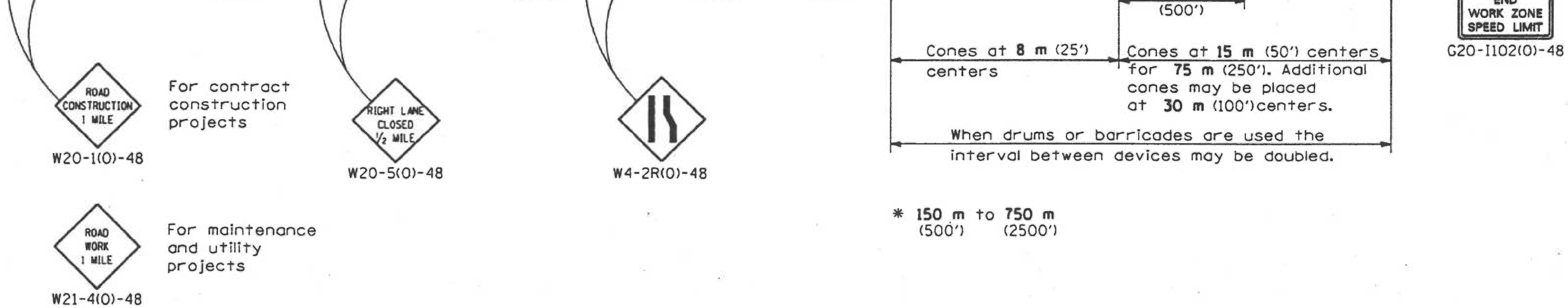
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
SEISMIC AND REDUNDANCY RETROFIT REPAIRS
FAI ROUTE 70
POPLAR STREET BRIDGE APPROACHES
ST. CLAIR COUNTY

DRAWN BY JN

DATE 1-23-98

CHECKED BY HH





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 opposie 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.

TYPICAL APPLICATIONS

Pavement patch

Utility operations

Bituminous resurfacing

L = lane width X taper ratio

Normal Posted Speed km/h	mph	Taper Ratio
110	65	65/1
100	60	60/1
90	55	55/1
80	45	45/1

SYMBOLS

Arrow board

Work area

Sign

Cone, drum or barricade

Flagger with traffic control sign

Construction speed limit sign

Illinois Department of Transportation

APPROVED ... 1997

ENGINEER OF OPERATIONS

APPROVED January 1, 1997

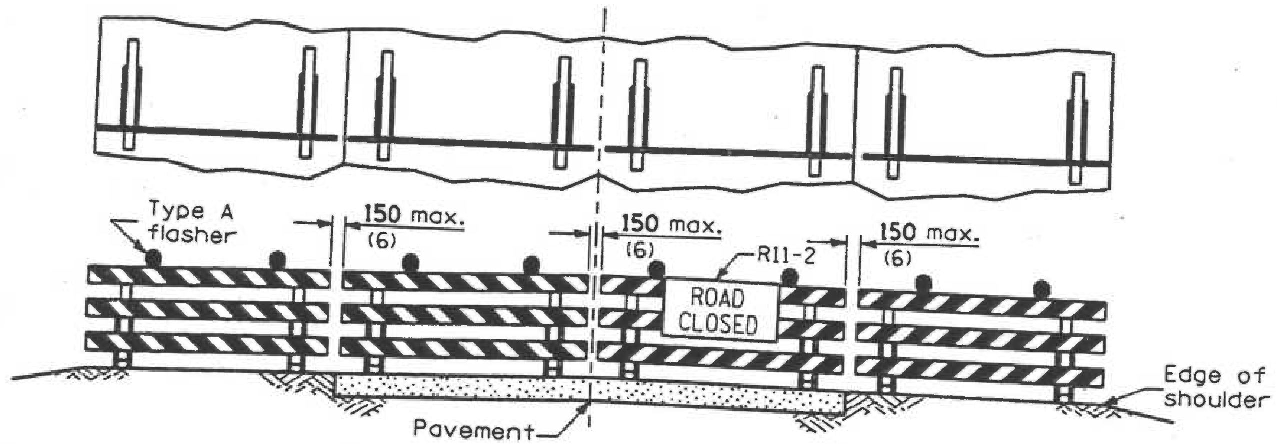
ENGINEER OF DESIGN AND ENVIRONMENT

ISSUED 1-1-97

DATE	REVISIONS
1-1-97	Renum. Standard ...
	Del. ...
	GN & ...
10-1-95	Rev. arrowboard, flagger symbols and W4 signs to be filled in. Rem. DN sym.

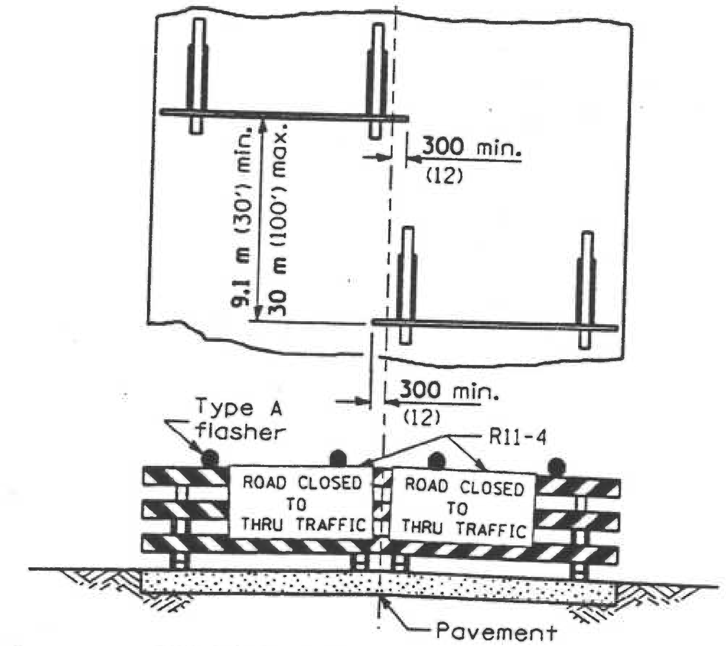
LANE CLOSURE MULTILANE ... OPERATIONS ... FOR SPEEDS ≥ 45 MPH

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.

TYPICAL APPLICATIONS OF TYPE III BARRICADES CLOSING A ROAD

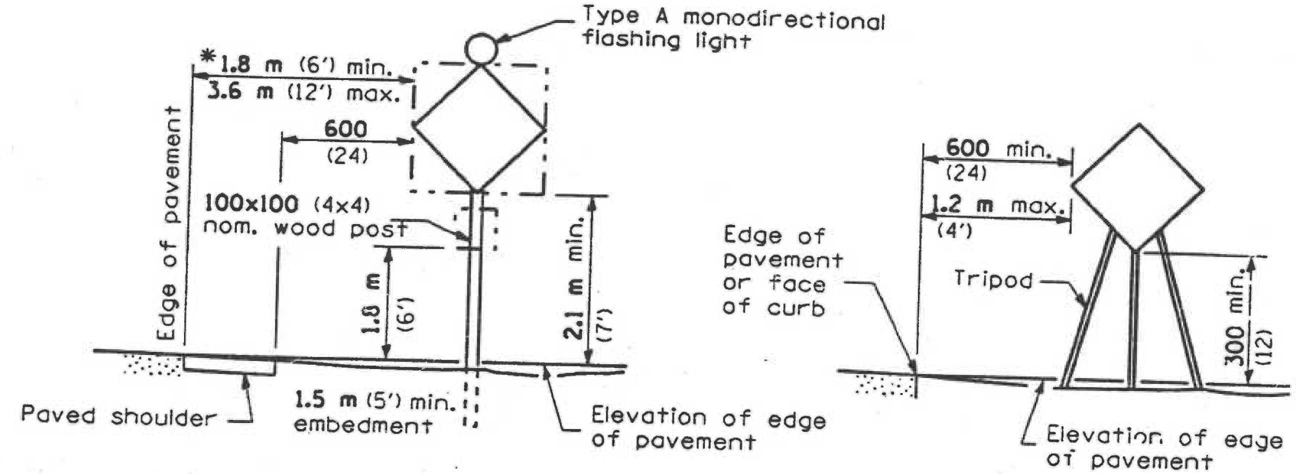
ROAD CONSTRUCTION NEXT X MILES	END CONSTRUCTION
G20-1(0)-6036	G20-2(0)-6024

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

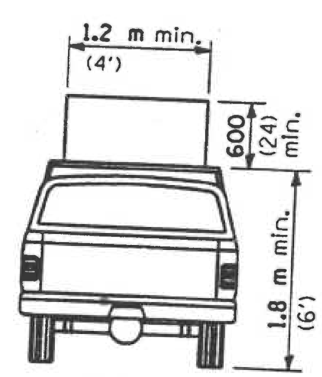
ROAD CONSTRUCTION NEXT X MILES sign shall be placed **150 m** (500') in advance of project.

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

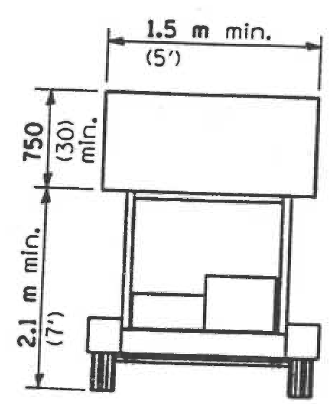
WORK LIMIT SIGNING



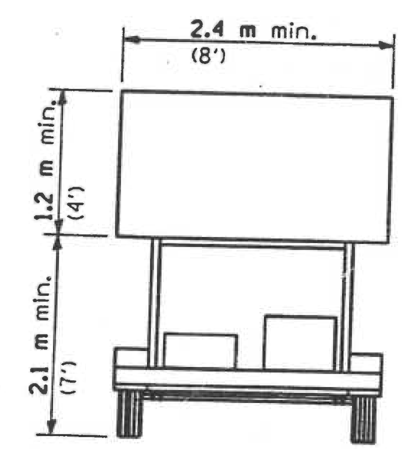
TYPICAL SIGN INSTALLATIONS



TYPE A
ROOF MOUNTED



TYPE B
ROOF OR TRAILER MOUNTED



TYPE C
TRAILER MOUNTED

ARROW BOARDS

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.

...ment of Transportation

APPROVED January 1, 1997

ENGINEER OF DESIGN AND ENVIRONMENT

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

TRAFFIC C... DEVIC...

(SHEET 1 of 3)

STANDARD ...