98516 #66 03-08-02 FAP 885 Union Sec 104BY-1 — I&R #66

66

99%
8-16-2003

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
885	104BY-1	UNION	37	1

PROJECT F-885(24)

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

FOR INDEX OF SHEETS, SEE SHEET NO. 2
FOR SUMMARY OF QUANTITIES, SEE SHEET NO. 3

PROPOSED HIGHWAY PLANS

D-99-013-98

LOCATION OF SECTION INDICATED THUS: –

FAP ROUTE 885 (IL ROUTE 146)
SECTION 104BY-1
PROJECT F-885(24)
UNION COUNTY
C-99-070-01

BRIDGE REPLACEMENT OVER GREEN CREEK

PROJECT ENGINEER: DAVID PICHE (618) 549-2171 CENTREX (217) 782-4554

091-0072

METRIC RATIOS

1 m 0 2 m — 1 : 50
0 5 m 10 m — 1 : 100
10 m 0 20 m — 1 : 250
5 m 0 20 m — 1 : 500

FULL SIZE PLANS HAVE BEEN PREPARED USING STANDARD ENGINEERING SCALES, REDUCED SIZED PLANS WILL NOT CONFORM TO STANDARD SCALES, IN MAKING MEASUREMENTS ON REDUCED PLANS, THE ABOVE SCALES MAY BE USED.

J.U.L.I.E.
JOINT UTILITY LOCATION INFORMATION FOR EXCAVATION
1-800-892-0123 WEBSITE www.julie1call.com

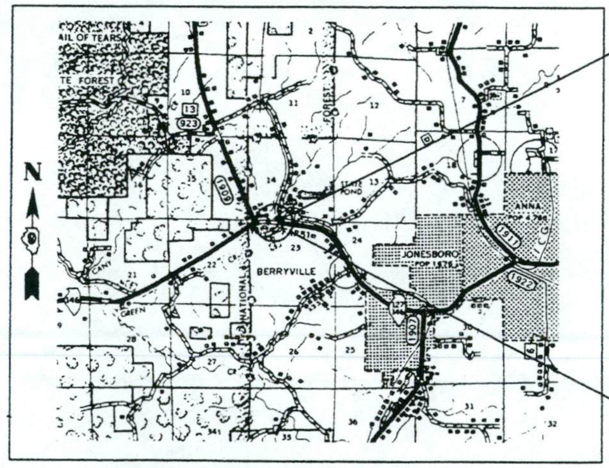
2000 ADT = 5500
12.0% TRUCKS,
MU = 425, SU = 175
POSTED SPEED 90 km/h

CONTRACT NO. 98516

091-0072

REPLACED 091-0029

910072 EVIRTS



LOCATION MAP

ROADWAY LENGTH = 182.441 m
BRIDGE LENGTH = 34.445 m
GROSS LENGTH 216.886 m = 0.217 km
NET LENGTH 216.886 m = 0.217 km

BEGIN SECTION 104BY-1
STA. 15+182.207

BRIDGE REPLACEMENT
STA. 15+288.500
36.142 m BK. TO BK. ABUTMENTS
x 13.200 m O. TO O. DECK WITH
P.C.C. BRIDGE APPROACH PAVEMENTS
45° LEFT AHEAD SKEW
STRUCTURE NO. 091-0072

END SECTION 104BY-1
STA. 15+399.093

TRACY M. LAWLESS 62-47331 LICENSED PROFESSIONAL ENGINEER STATE OF ILLINOIS

Tracy M. Lawless Signed 9-5-01
TRACY M. LAWLESS
FREEBURG, ILLINOIS
ILLINOIS LICENSED PROFESSIONAL ENGINEER NO. 62-47331
EXPIRES NOV. 30, 2001

RHUTASEL and ASSOCIATES, INC.
CONSULTING ENGINEERS • LAND SURVEYORS
CENTRALIA, ILLINOIS FREEBURG, ILLINOIS
IL. LICENSE NO. 184-000287

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

SUBMITTED Jan 9, 2002
[signature]
DISTRICT ENGINEER

February 1, 2002
Michael Hine
ENGINEER OF DESIGN AND ENVIRONMENT

February 1, 2002
James C. Easterly
DIRECTOR, DIVISION OF HIGHWAYS

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9-173

COUNTY: UNION SECTION: 104BY-1 ROUTE: FAP 885 (IL 146)

B.M. #29 - Chiseled square cut in southeast wingwall of existing Structure No. 091-0029 - Elev. 125.131

Existing Structure: S.N. 091-0029 built in 1931 and rebuilt in 1976 as a single span PPC deck beams & T- beam girder/slab bridge with closed abutments on pile supported footings. 16.41 m Bk./Bk. x 13.41 m wide.

Traffic to be maintained utilizing stage construction.

Note: All dimensions are in millimeters (mm) except as noted.

No salvage.

SEISMIC DATA

Seismic Performance Category (SPC) = B
Bedrock Acceleration Coefficient (A) = 0.15g
Site Coefficient (S) = 1.0

DESIGN SPECIFICATIONS

AASHTO - 1996 16th Edition
with 1997 thru 2000 Interims

LOADING MS18

Allow 2.4 kN/m^2 for future wearing surface.

DESIGN STRESSES

FIELD UNITS

f'_c = 24 MPa
f_y = 400 MPa (Reinf.)
f_y = 345 MPa (M270M Grade 345W)

+0.12%

Sta. 15+250.000
Elev. 125.197

Sta. 15+325.000
Elev. 125.288

PROFILE GRADE

Along ℄ Roadway

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F. A. P. 885	104BY-1	UNION	37	17
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

SHEET NO. 1
21 SHEETS

Long Wingwall (Northeast Corner only)

1.350 m Welded Plate Girder

H.W. Elev. 122.73 ▽

750± Min. vert. cl.

Flowline Elev. 119.500

8.500 m

Exist. Ground Line

Drilled Shaft

Traffic Barrier Terminal Std. 631031-Type 6 (Typ.)

Estimated Top of Rock Elev. 115.4

Stone Riprap Class A5 1:2 (V:H) at Rt. angles to Channel (Typical)

Estimated top of rock varies north to south from Elev. 115.2 to 116.8

F

E

ELEVATION

STA. 15+288.500
BUILT 200_ BY
STATE OF ILLINOIS
F.A.P. 885 SECTION 104BY-1
LOADING MS18
STR. NO. 091-0072

PROJECT F-885(24)

NAME PLATE

(See State Standard 515001 for details)

See Stone Riprap Treatment Detail on Sheet 2 of 21

A

For Section A-A see sheet 2 of 21

Stone Riprap Class A5

1:3

1:2

Boring 1S
Sta. 15+278.000
Lt. 4.600 m

Flow

12.0 m

17.5 m

℄ Brg. West Abut.
Sta. 15+271.801
Elev. 125.224

9 m Bridge Approach Pavement Std. 420401 (Typ.)

Bk. West Abut.
Sta. 15+270.429
Elev. 125.222

Temporary Sheet Piling (Typ.)

℄ Structure
Sta. 15+288.500

7.083 m Stage II Const.

6.100 m

483

13.200 m Out to Out

Boring 4S
Sta. 15+303.300
Lt. 3.800 m

End of Long Wingwall
Sta. 15+321.002

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

Direction of Stationing

45°

℄ Roadway

N

Boring 3S
Sta. 15+270.500
Rt. 4.400 m

Name Plate Location

Limits of Existing Structure

6.117 m Stage I Const.

6.100 m

Stage Const. Line

Bk. East Abut.
Sta. 15+306.571
Elev. 125.266

℄ Brg. East Abut.
Sta. 15+305.199
Elev. 125.264

R. 2 W., 3rd P.M.

T. 12 S.

15 14 22 23

CREEK

GREEN

146

Project Location

LOCATION SKETCH

Existing Structure

4.185 m | 4.300 m | 4.300 m | 4.300 m | 4.300 m | 4.300 m | 4.300 m | 4.185 m

160 ϕ floor drain spacing (Typ. both sides)

Boring 2S
Sta. 15+296.000
Rt. 7.600 m

Stone Riprap Class A5

1:3

1:2

500

1.372 m

33.398 m ℄ Brg. to ℄ Brg.

36.142 m Bk. to Bk. Abutments

1.372 m

PLAN

GARY L. HAHN
81-4853
LICENSED STRUCTURAL ENGINEER
STATE OF ILLINOIS

Gary L. Hahn 01-11-02

GARY L. HAHN
CENTRALIA, ILLINOIS
ILLINOIS LICENSED STRUCTURAL ENGINEER NO. 81-4853
EXPIRES NOV. 30, 2002

GENERAL PLAN
ILL. ROUTE 146 OVER
GREEN CREEK
FAP 885 - SECTION 104BY-1
UNION COUNTY
STATION 15+288.500
STRUCTURE NO. 091-0072

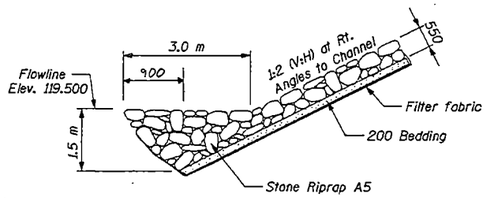
RHUTASEL and ASSOCIATES, INC.
CONSULTING ENGINEERS • LAND SURVEYORS
FREEBURG, ILLINOIS CENTRALIA, ILLINOIS

01/11/2002

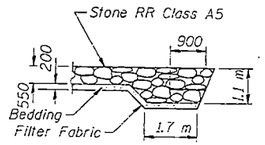
ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F. A. P. 885	104BY-1	UNION	37	18
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

SHEET NO. 2
21 SHEETS

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION



STONE RIPRAP TREATMENT



SECTION A-A

TOTAL BILL OF MATERIAL

ITEM	UNIT	SUPER	SUB	TOTAL
Porous Granular Embankment	m Ton		480	480
Stone Riprap, Class A5	m^2		1300	1300
Filter Fabric for Use with Riprap	m^2		1300	1300
Structure Excavation	m^3		424	424
Neoprene Expansion Joint 50mm	m	35.8		35.8
Concrete Structures	m^3		119.5	119.5
Concrete Superstructure	m^3	129.6		129.6
Bridge Deck Grooving	m^2	400		400
Protective Coat	m^2	1048		1048
Furnishing and Erecting Structural Steel	L Sum	1		1
Reinforcement Bars	kg		15110	15110
Reinforcement Bars, Epoxy Coated	kg	16500	8970	25470
Temporary Sheet Piling	m^2		269	269
Bridge Seat Sealer	m^2		32	32
Drilled Shaft in soil 610 mm	m		33.5	33.5
Drilled Shaft in soil 915 mm	m		79.2	79.2
Drilled Shaft in rock 460 mm	m		9.5	9.5
Drilled Shaft in rock 760 mm	m		57.0	57.0
Bar Splicers	Each	259	124	383
Removal of Existing Structures	Each			1
Floor Drains	Each	14		14
Elastomeric Bearing Assembly, Type I	Each	6		6
Stud Shear Connectors	Each	1206		1206
Names Plates	Each	1		1

GENERAL NOTES

Saw cut the abutments at stage removal line prior to any removal of the existing superstructure.

Fasteners shall be high strength bolts (AASHTO M164M, Type 3). Bolts M20, open holes 24 mm ϕ, unless otherwise noted.

Calculated mass of Structural Steel M 270M Grade 345W = 76480 kg.

All Structural Steel shall be AASHTO M 270M Grade 345W.

Field welding of construction accessories will not be permitted to the bottom flange of girder. Field welding in other areas will be permitted only when approved by the Engineer.

Anchor bolts shall be set before bolting cross frames over supports.

The structural steel bearing plates of the Elastomeric Bearing Assembly shall conform to the requirements of AASHTO M 270M Grade 345W.

The main load carrying member components subject to tensile stress shall conform to the Supplemental Requirements for Notch Toughness Zone 2. These components are the web and tension flange of the girder.

Reinforcement bars shall conform to the requirements of AASHTO M 31M, M 42M or M 53M, Grade 400.

Layout of Stone Riprap may be varied in the field to suit ground conditions as directed by the Engineer.

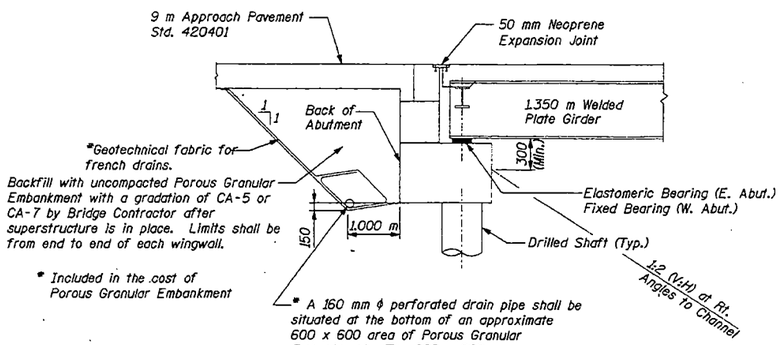
The concrete for bridge floors finished according to Article 503.17 of the Standard Specifications, shall be placed and compacted parallel to the skew in uniform increments along the centerline of the bridge. The finishing machine, when required, shall be set parallel to the skew for striking off and screeding the concrete.

Bridge Seat Sealer shall be applied to the seat area of the Abutments.

All dimensions are in millimeters (mm) except as noted.

AASHTO M 270M Grade 345W structural steel shall only be painted for a distance of three times the depth of the girders (but not exceeding 3 m) from the deck joints. All structural steel shall be cleaned as specified in the Special Provision for "Surface Preparation and Painting Requirement for Weathering Steel".

The SSPC-QP1 Painting Contractor Certification will not be required for this bridge.



SECTION THRU ABUTMENT

WATERWAY INFORMATION

Drainage Area = 10.288 km^2 Low Grade Elev. 123.887 at Sta. 15+00

Flood	Freq. Yr.	Q m^3/s	Opening (m^2) Exist.	Opening (m^2) Prop.	Nat. H.W.E.	Head (m) Exist.	Head (m) Prop.	Headwater Elev. Exist.	Headwater Elev. Prop.
Design	50	72.1	29.28	48.32	122.73	0.43	0.30	123.16	123.03
Base	100	84.2	31.21	52.24	122.91	0.53	0.38	123.44	123.29
Overtopping	-	-	-	-	-	-	-	-	-
Max. Calc.	500	108.4	34.73	59.77	123.24	1.05	0.55	124.29	123.79

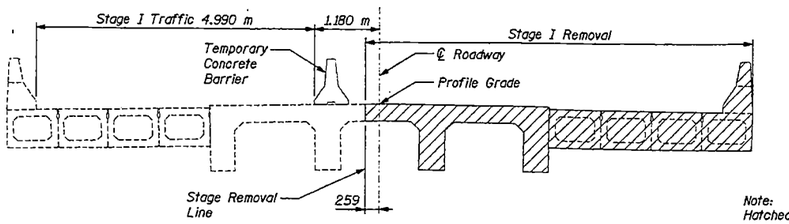
GENERAL DATA
ILL. ROUTE 146 OVER
GREEN CREEK
FAP 885 - SECTION 104BY-1
UNION COUNTY
STATION 15+288.500
STRUCTURE NO. 091-0072

01/15/2002

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F. A. P. 885	104BY-1	UNION	37	19
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

SHEET NO. 3
21 SHEETS

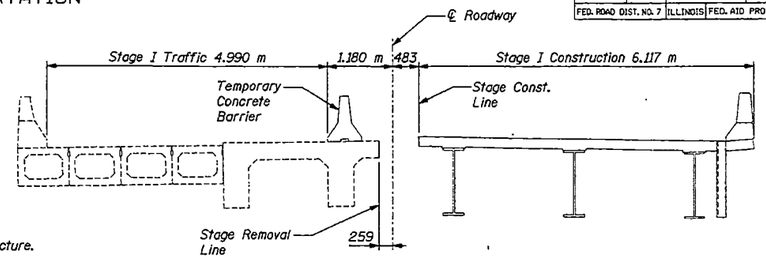
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION



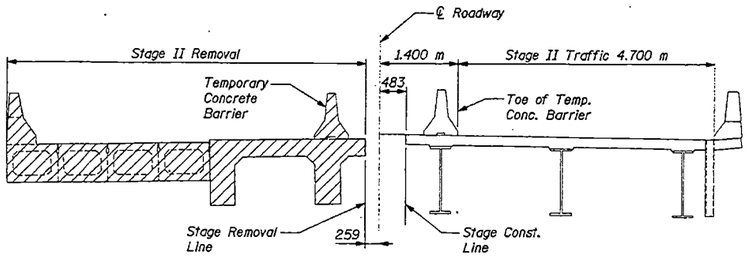
STAGE I REMOVAL
Looking East

Note:
Hatched area indicates Removal of Existing Superstructure.

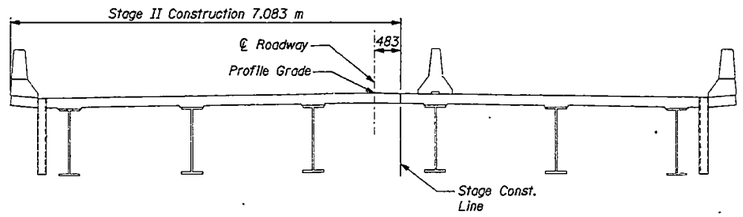
For quantity of Temporary Concrete Barrier, see roadway plans.



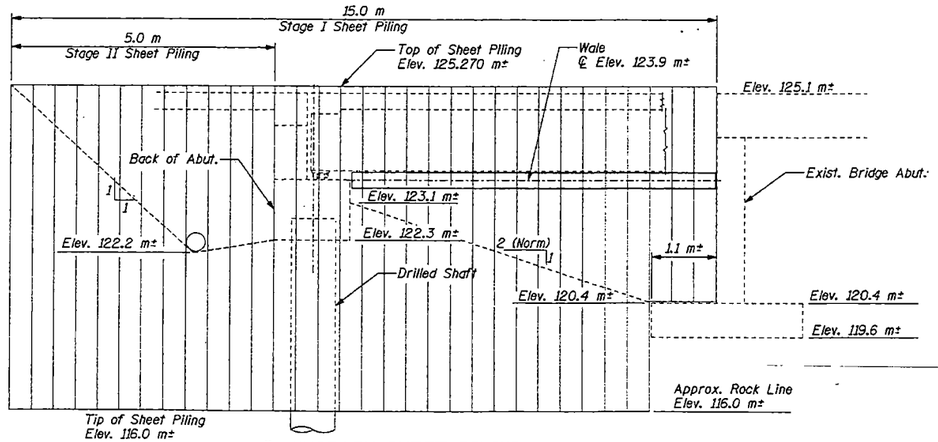
STAGE I CONSTRUCTION
Looking East



STAGE II REMOVAL
Looking East



STAGE II CONSTRUCTION
Looking East



TEMPORARY SHEET PILING

Due to subsurface conditions limiting the sheet piling embedment. it appears that a cantilevered design is not feasible and a wale restraining or other system will be required. The Contractor shall submit a design and computations to the Engineer for review and acceptance.

The Contractor shall anchor the sheet piling to the existing abutment wall. The connection shall be approved by the Engineer.

Cost of wale system and connection is included in the cost of Temporary Sheet Piling.

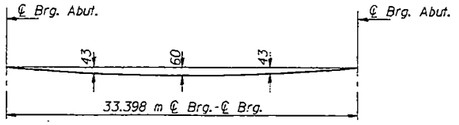
STAGE CONSTRUCTION DETAILS
ILL. ROUTE 146 OVER
GREEN CREEK
FAP 885 - SECTION 104BY-1
UNION COUNTY
STATION 15+288.500
STRUCTURE NO. 091-0072

01/09/2002

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F. A. P. 885	104BY-1	UNION	37	20
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

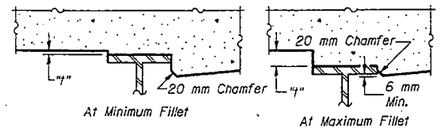
SHEET NO. 4
21 SHEETS



DEAD LOAD DEFLECTION DIAGRAM

(Includes weight of concrete only)

Note: The above deflections are not to be used in the field if the Engineer is working from the Theoretical Grade Elevations Adjusted for Dead Load Deflections as shown below.
All dimensions are in millimeters (mm) except as noted.
All offsets are in meters.



To determine "T": After all structural steel has been erected, elevations of the top flanges of the beams shall be taken at intervals shown below. These elevations subtracted from the "Theoretical Grade Elevations Adjusted for Dead Load Deflection" shown below, minus slab thickness, equals the fillet heights "T" above top flange of beams.

FILLET HEIGHTS

GIRDER 1

Location	Station	Offset	Theoretical Grade Elevations	Theoretical Grade Elevations Adjusted For Dead Load Deflection
Bk. W. Abut.	15+276.129	5.700 Lt.	125.133	125.133
℄ Brg. W. Abut.	15+277.501	5.700 Lt.	125.135	125.135
A	15+280.501	5.700 Lt.	125.138	125.155
B	15+283.501	5.700 Lt.	125.142	125.174
C	15+286.501	5.700 Lt.	125.145	125.191
D	15+289.501	5.700 Lt.	125.149	125.204
E	15+292.501	5.700 Lt.	125.153	125.212
F	15+295.501	5.700 Lt.	125.156	125.216
G	15+298.501	5.700 Lt.	125.160	125.216
H	15+301.501	5.700 Lt.	125.164	125.211
I	15+304.501	5.700 Lt.	125.167	125.202
J	15+307.501	5.700 Lt.	125.171	125.190
℄ Brg. E. Abut.	15+310.899	5.700 Lt.	125.175	125.175
Bk. E. Abut.	15+312.271	5.700 Lt.	125.177	125.177

GIRDER 2

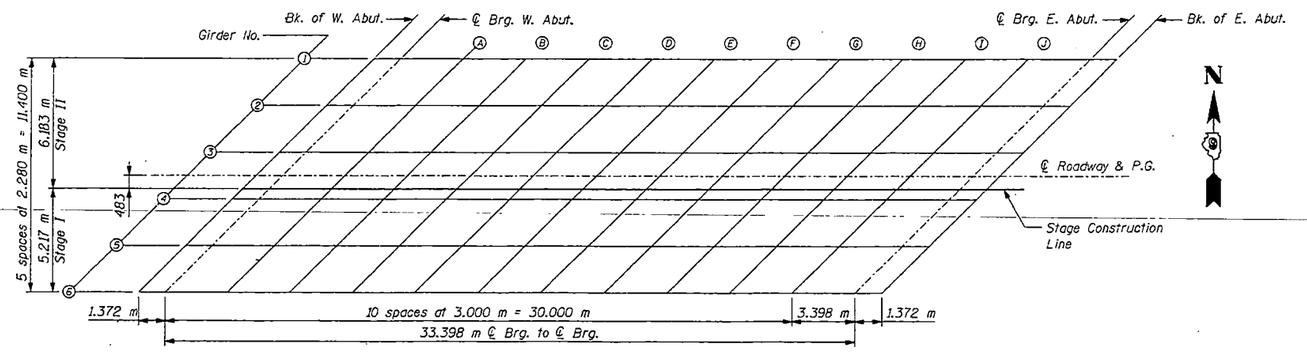
Location	Station	Offset	Theoretical Grade Elevations	Theoretical Grade Elevations Adjusted For Dead Load Deflection
Bk. W. Abut.	15+273.849	3.420 Lt.	125.175	125.175
℄ Brg. W. Abut.	15+275.221	3.420 Lt.	125.177	125.177
A	15+278.221	3.420 Lt.	125.180	125.197
B	15+281.221	3.420 Lt.	125.184	125.216
C	15+284.221	3.420 Lt.	125.187	125.233
D	15+287.221	3.420 Lt.	125.191	125.246
E	15+290.221	3.420 Lt.	125.195	125.254
F	15+293.221	3.420 Lt.	125.198	125.258
G	15+296.221	3.420 Lt.	125.202	125.257
H	15+299.221	3.420 Lt.	125.206	125.252
I	15+302.221	3.420 Lt.	125.209	125.244
J	15+305.221	3.420 Lt.	125.213	125.232
℄ Brg. E. Abut.	15+308.619	3.420 Lt.	125.217	125.217
Bk. E. Abut.	15+309.991	3.420 Lt.	125.219	125.219

GIRDER 3

Location	Station	Offset	Theoretical Grade Elevations	Theoretical Grade Elevations Adjusted For Dead Load Deflection
Bk. W. Abut.	15+271.569	1.140 Lt.	125.206	125.206
℄ Brg. W. Abut.	15+272.941	1.140 Lt.	125.208	125.208
A	15+275.941	1.140 Lt.	125.211	125.228
B	15+278.941	1.140 Lt.	125.215	125.247
C	15+281.941	1.140 Lt.	125.218	125.264
D	15+284.941	1.140 Lt.	125.222	125.277
E	15+287.941	1.140 Lt.	125.226	125.285
F	15+290.941	1.140 Lt.	125.229	125.289
G	15+293.941	1.140 Lt.	125.233	125.288
H	15+296.941	1.140 Lt.	125.237	125.283
I	15+299.941	1.140 Lt.	125.240	125.275
J	15+302.941	1.140 Lt.	125.244	125.263
℄ Brg. E. Abut.	15+306.339	1.140 Lt.	125.248	125.248
Bk. E. Abut.	15+307.711	1.140 Lt.	125.250	125.250

℄ ROADWAY & P. G.

Location	Station	Offset	Theoretical Grade Elevations	Theoretical Grade Elevations Adjusted For Dead Load Deflection
Bk. W. Abut.	15+270.429	0	125.222	125.222
℄ Brg. W. Abut.	15+271.801	0	125.224	125.224
A	15+274.801	0	125.227	125.244
B	15+277.801	0	125.231	125.263
C	15+280.801	0	125.234	125.280
D	15+283.801	0	125.238	125.293
E	15+286.801	0	125.242	125.301
F	15+289.801	0	125.245	125.305
G	15+292.801	0	125.249	125.305
H	15+295.801	0	125.253	125.300
I	15+298.801	0	125.256	125.291
J	15+301.801	0	125.260	125.279
℄ Brg. E. Abut.	15+305.199	0	125.264	125.264
Bk. E. Abut.	15+306.571	0	125.266	125.266



FRAMING PLAN

TOP OF SLAB ELEVATIONS
ILL. ROUTE 146 OVER
GREEN CREEK
FAP 885 - SECTION 104BY-1
UNION COUNTY
STATION 15+288.500
STRUCTURE NO. 091-0072

01/09/2002

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F. A. P. 885	104BY-1	UNION	37	21
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

SHEET NO. 5
21 SHEETS

STAGE CONSTRUCTION LINE

Location	Station	Offset	Theoretical Grade Elevations	Theoretical Grade Elevations Adjusted For Dead Load Deflection
Bk. W. Abut.	15+269.946	0.483 Rt.	125.214	125.214
℄ Brg. W. Abut.	15+271.318	0.483 Rt.	125.216	125.216
A	15+274.318	0.483 Rt.	125.219	125.236
B	15+277.318	0.483 Rt.	125.223	125.255
C	15+280.318	0.483 Rt.	125.226	125.272
D	15+283.318	0.483 Rt.	125.230	125.285
E	15+286.318	0.483 Rt.	125.234	125.293
F	15+289.318	0.483 Rt.	125.237	125.297
G	15+292.318	0.483 Rt.	125.241	125.296
H	15+295.318	0.483 Rt.	125.245	125.291
I	15+298.318	0.483 Rt.	125.248	125.283
J	15+301.318	0.483 Rt.	125.252	125.271
℄ Brg. E. Abut.	15+304.716	0.483 Rt.	125.256	125.256
Bk. E. Abut.	15+306.088	0.483 Rt.	125.258	125.258

GIRDER 4

Location	Station	Offset	Theoretical Grade Elevations	Theoretical Grade Elevations Adjusted For Dead Load Deflection
Bk. W. Abut.	15+269.289	1.140 Rt.	125.204	125.204
℄ Brg. W. Abut.	15+270.661	1.140 Rt.	125.206	125.206
A	15+273.661	1.140 Rt.	125.209	125.211
B	15+276.661	1.140 Rt.	125.213	125.216
C	15+279.661	1.140 Rt.	125.216	125.220
D	15+282.661	1.140 Rt.	125.220	125.225
E	15+285.661	1.140 Rt.	125.224	125.229
F	15+288.661	1.140 Rt.	125.227	125.232
G	15+291.661	1.140 Rt.	125.231	125.236
H	15+294.661	1.140 Rt.	125.235	125.239
I	15+297.661	1.140 Rt.	125.238	125.241
J	15+300.661	1.140 Rt.	125.242	125.243
℄ Brg. E. Abut.	15+304.059	1.140 Rt.	125.246	125.246
Bk. E. Abut.	15+305.431	1.140 Rt.	125.248	125.248

GIRDER 5

Location	Station	Offset	Theoretical Grade Elevations	Theoretical Grade Elevations Adjusted For Dead Load Deflection
Bk. W. Abut.	15+267.009	3.420 Rt.	125.167	125.167
℄ Brg. W. Abut.	15+268.381	3.420 Rt.	125.169	125.169
A	15+271.381	3.420 Rt.	125.172	125.189
B	15+274.381	3.420 Rt.	125.176	125.208
C	15+277.381	3.420 Rt.	125.179	125.225
D	15+280.381	3.420 Rt.	125.183	125.238
E	15+283.381	3.420 Rt.	125.187	125.246
F	15+286.381	3.420 Rt.	125.190	125.250
G	15+289.381	3.420 Rt.	125.194	125.249
H	15+292.381	3.420 Rt.	125.198	125.244
I	15+295.381	3.420 Rt.	125.201	125.236
J	15+298.381	3.420 Rt.	125.205	125.224
℄ Brg. E. Abut.	15+301.779	3.420 Rt.	125.209	125.209
Bk. E. Abut.	15+303.151	3.420 Rt.	125.211	125.211

GIRDER 6

Location	Station	Offset	Theoretical Grade Elevations	Theoretical Grade Elevations Adjusted For Dead Load Deflection
Bk. W. Abut.	15+264.729	5.700 Rt.	125.119	125.119
℄ Brg. W. Abut.	15+266.101	5.700 Rt.	125.121	125.121
A	15+269.101	5.700 Rt.	125.124	125.141
B	15+272.101	5.700 Rt.	125.128	125.160
C	15+275.101	5.700 Rt.	125.131	125.177
D	15+278.101	5.700 Rt.	125.135	125.190
E	15+281.101	5.700 Rt.	125.139	125.198
F	15+284.101	5.700 Rt.	125.142	125.202
G	15+287.101	5.700 Rt.	125.146	125.201
H	15+290.101	5.700 Rt.	125.150	125.196
I	15+293.101	5.700 Rt.	125.153	125.188
J	15+296.101	5.700 Rt.	125.157	125.176
℄ Brg. E. Abut.	15+299.499	5.700 Rt.	125.161	125.161
Bk. E. Abut.	15+300.871	5.700 Rt.	125.163	125.163

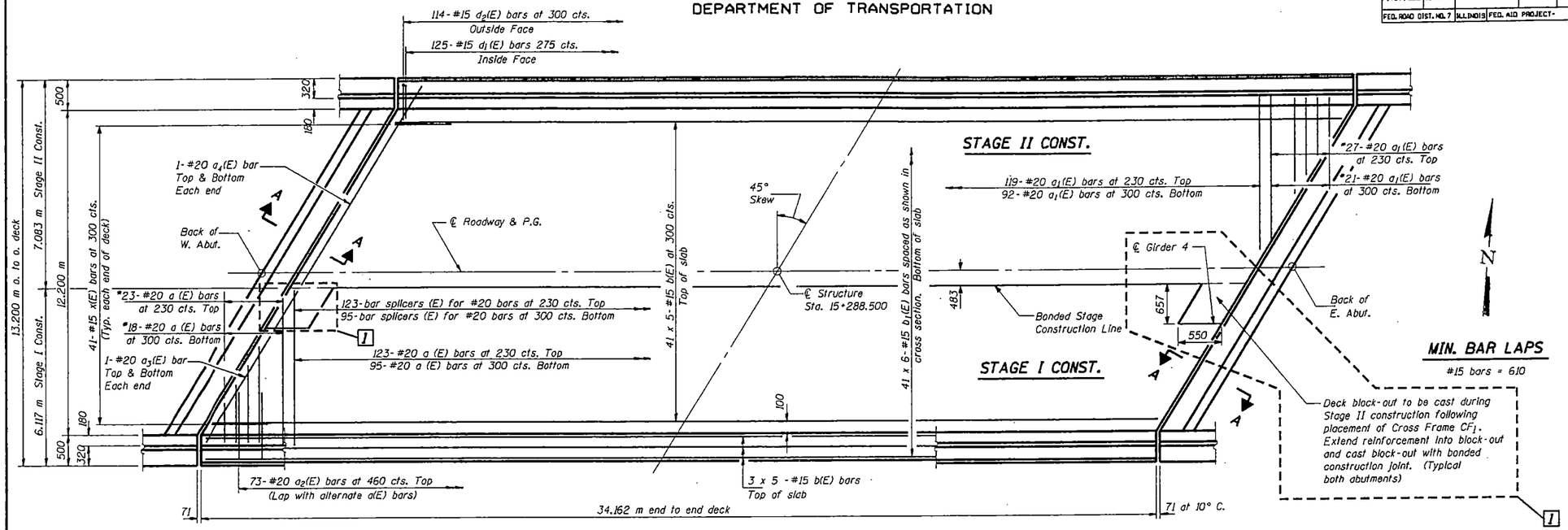
01/09/2002

TOP OF SLAB ELEVATIONS
ILL. ROUTE 146 OVER
GREEN CREEK
FAP 885 - SECTION 104BY-1
UNION COUNTY
STATION 15+288.500
STRUCTURE NO. 091-0072

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F. A. P. 885	104BY-1	UNION	37	22
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

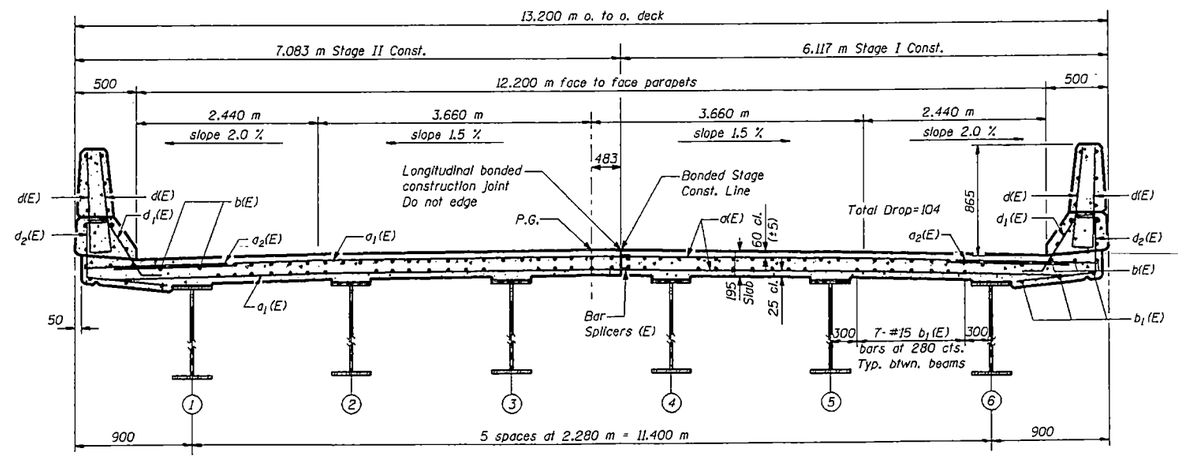
SHEET NO. 6
21 SHEETS

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION



PLAN

* Order d(E) & a_1(E) bars full length. Cut to fit skew and use remainder of bars in opposite end.



CROSS SECTION
(Looking East)

Notes:

See Sheet 7 of 21 for Section A-A, superstructure details, and Bill of Material.

Reinforcement bars designated (E) shall be epoxy coated.

Bars indicated thus 20 x 3-#15 etc. indicates 20 lines of bars with 3 lengths per line.

See Sheet 1 of 21 for location of floor drains.

See Sheet 7 of 21 for parapet reinforcement.

All dimensions are in millimeters (mm) except as noted.

See Sheet 18 of 21 for Bar Splicer details.

SUPERSTRUCTURE
ILL. ROUTE 146 OVER
GREEN CREEK
FAP 885 - SECTION 104BY-1
UNION COUNTY
STATION 15+288.500
STRUCTURE NO. 091-0072

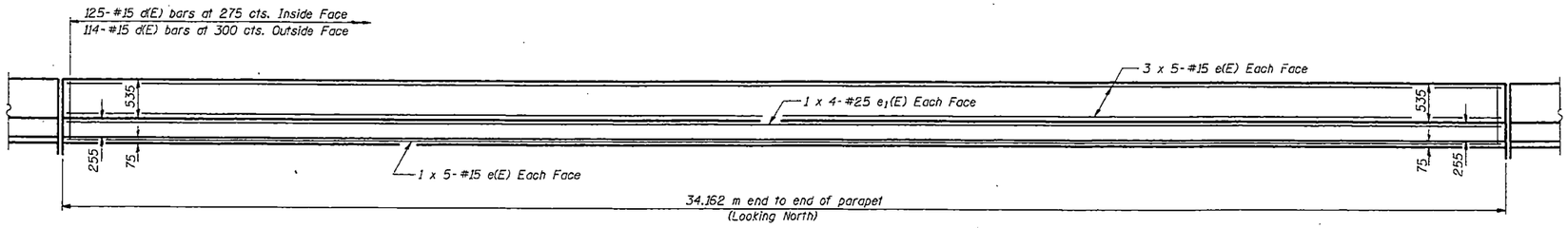
01/11/2002

1 Revised 6/4/2002 GLH

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F. A. P. 885	184BY-1	UNION	37	23
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

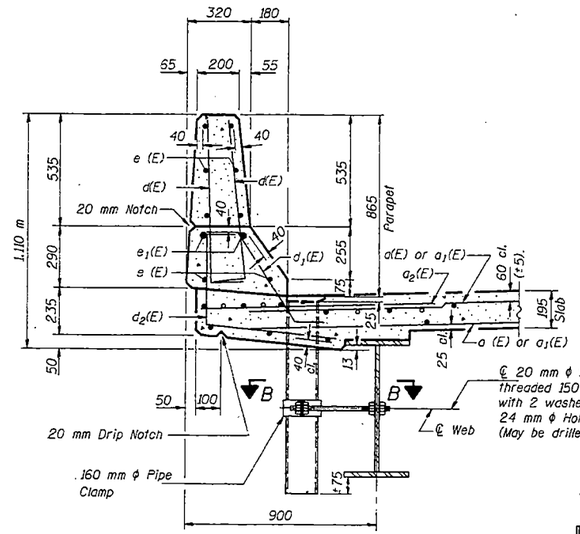
SHEET NO. 7
21 SHEETS



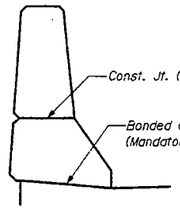
INSIDE ELEVATION OF PARAPET

PARAPET MIN. BAR LAPS

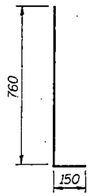
#15 bars = 490
#25 bars = 1.100 m



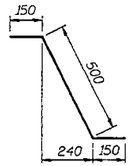
SECTION THRU PARAPET



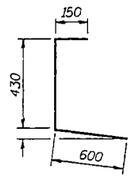
PARAPET JOINT DETAILS



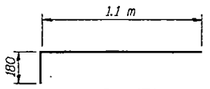
BAR d(E)



BAR d_1(E)



BAR d_2(E)

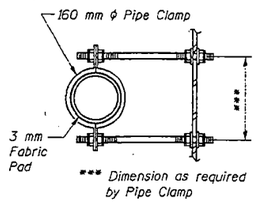


BAR x(E)

SUPERSTRUCTURE BILL OF MATERIAL

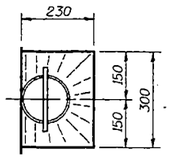
Bar	No.	Size	Length (m)	Shape
d(E)	259	#20	5.80	——
a_1(E)	259	#20	6.80	——
a_2(E)	146	#20	1.20	——
a_3(E)	4	#20	8.20	——
a_4(E)	4	#20	9.60	——
b(E)	235	#15	7.33	——
b_1(E)	246	#15	6.31	——
d(E)	478	#15	0.91	⌊
d_1(E)	250	#15	0.80	⌐
d_2(E)	228	#15	1.18	⌊
e(E)	80	#15	7.33	——
e_1(E)	16	#25	9.44	——
x (E)	82	#15	1.28	⌐
Reinforcement Bars, Epoxy Coated			kg	16500
Concrete Superstructure			m^3	129.6
Bar Splicers			Each	259

Reinforcement bars designated (E) shall be epoxy coated.
Bars indicated thus 1 x 5-#15 etc., indicates 1 line of bars with 5 lengths per line.

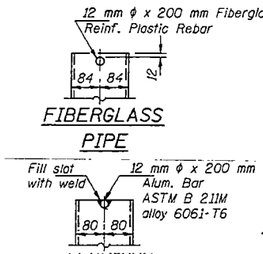


*** Dimension as required by Pipe Clamp

SECTION B-B



TOP PLAN

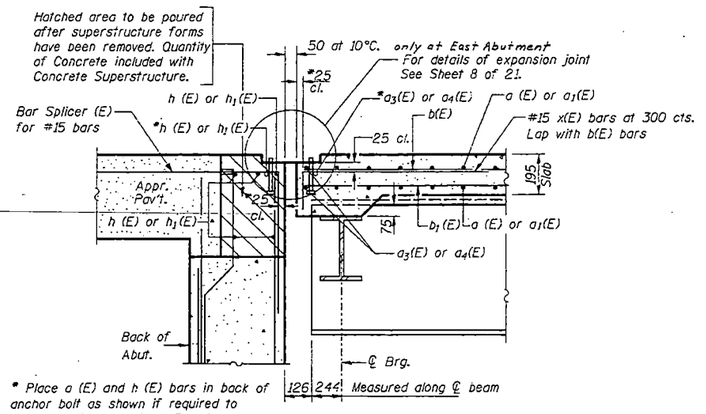


FIBERGLASS PIPE

ALUMINUM TUBE

TOP PLAN
(Showing Aluminum Tube)

Notes:
The floor drains shall not be painted.
Fiberglass pipe shall conform to ASTM D 2996, with short-time rupture strength hoop tensile stress of 200 MPa minimum.
All dimensions are in millimeters (mm) except as noted.



* Place a (E) and h (E) bars in back of anchor bolt as shown if required to maintain 25 mm cl. (+0 -3 mm). Anchor bolts should be tied to a (E) and h (E) bars.

SECTION A-A

SUPERSTRUCTURE DETAILS
ILL. ROUTE 146 OVER
GREEN CREEK
FAP 885 - SECTION 104BY-1
UNION COUNTY
STATION 15+288.500
STRUCTURE NO. 091-0072

01/09/2002

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F. A. P. 885	104BY-1	UNION	37	24
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

SHEET NO. 8
21 SHEETS

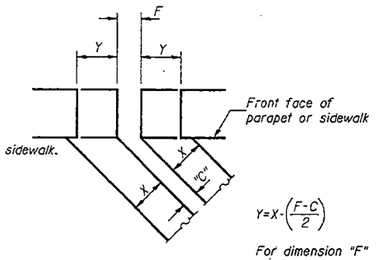
Joint Size	*"C" at 10 °C	*"D" at 10 °C
50	50	40 Min.
65	65	45 Min.
100	75	65 Min.

INSTALLATION NOTES

(1) Install continuous seal in roadway, parapet, curb, and sidewalk.

(2) Install anchor blocks as indicated.

NOTE A: Maximum spacing of anchor bolts shall be 300 centers.



$Y = X - \left(\frac{F-C}{2}\right)$

For dimension "F" see Sheet 6 of 21

FORMING BLOCKOUT SKETCH

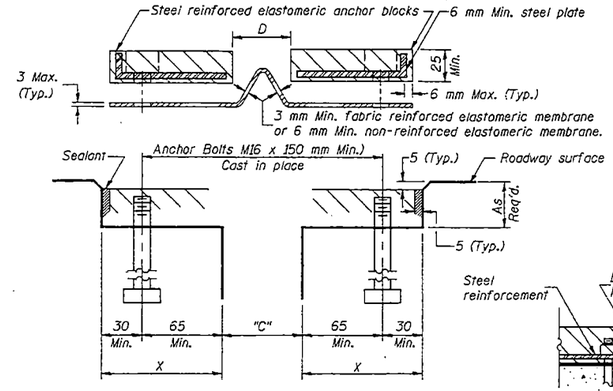
SKEW LIMITATIONS

The details of the anchor blocks and the elastomeric membrane in the parapet, as shown, are for up to 50° skews.

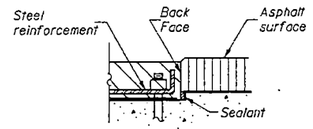
For skews greater than 50°, the anchor blocks and the elastomeric membrane, installed according to dimension "D", might require modifications to insure a minimum clearance of 40 mm from centerline of anchor studs to edge of parapet opening. The anchor blocks and the elastomeric membrane shall also be installed to the top of the parapet with the anchor studs spaced at ±300 cts.

* Temperature adjustment applies at East Abutment Only.

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION



CROSS SECTION



ANCHOR BLOCK WITH ASPHALT SURFACE

GENERAL NOTES

Continuous Seal Neoprene Expansion Joint shall consist of molded anchor blocks of elastomer and steel, field assembled over continuous lengths of elastomeric membrane.

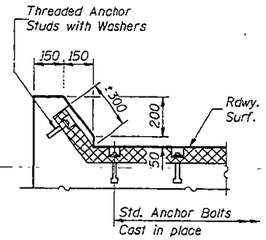
The elastomeric membrane shall be premolded with a single or a double upward convolution that will have a "memory" to return to its molded position upon joint closure.

The convolution length shall be such that the extended length will not be greater than the manufactured length when the joint is fully expanded in its design range and will not protrude above the anchor blocks when the joint is fully compressed.

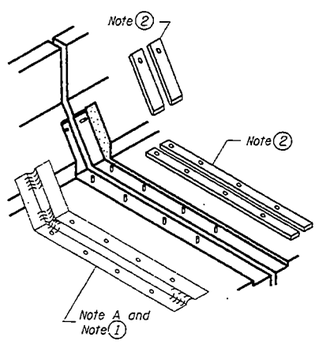
* Joint openings shall be adjusted according to Article 503.10(c) of the Standard Specifications when the deck is poured at an ambient temperature other than 10 °C.

The parapet and roadway membrane shall be made continuous by an approved vulcanizing process. Lapping will not be permitted.

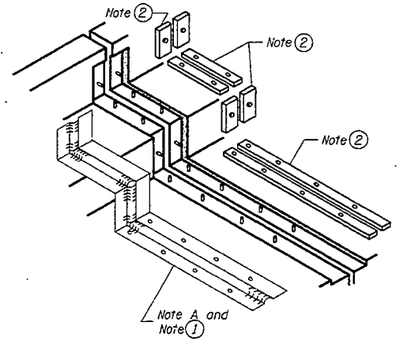
All dimensions are in millimeters (mm) except as noted.



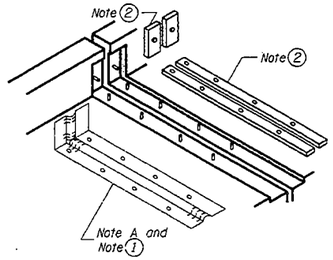
AT CURB



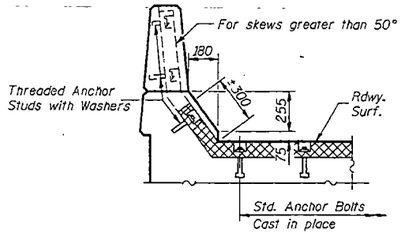
AT PARAPET



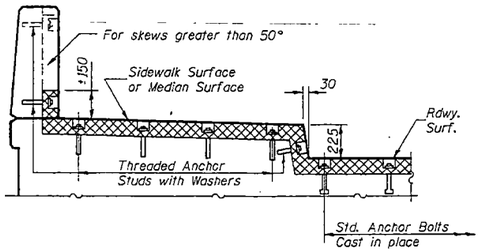
AT SIDEWALK OR MEDIAN



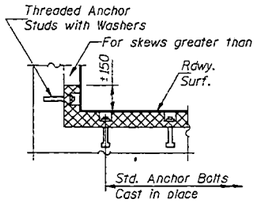
AT WALL



AT PARAPET



AT SIDEWALK OR MEDIAN
TYPICAL END TREATMENTS



AT WALL

NEOPRENE EXPANSION JOINTS
ILL. ROUTE 146 OVER
GREEN CREEK
FAP 885 - SECTION 104BY-1
UNION COUNTY
STATION 15+288.500
STRUCTURE NO. 091-0072

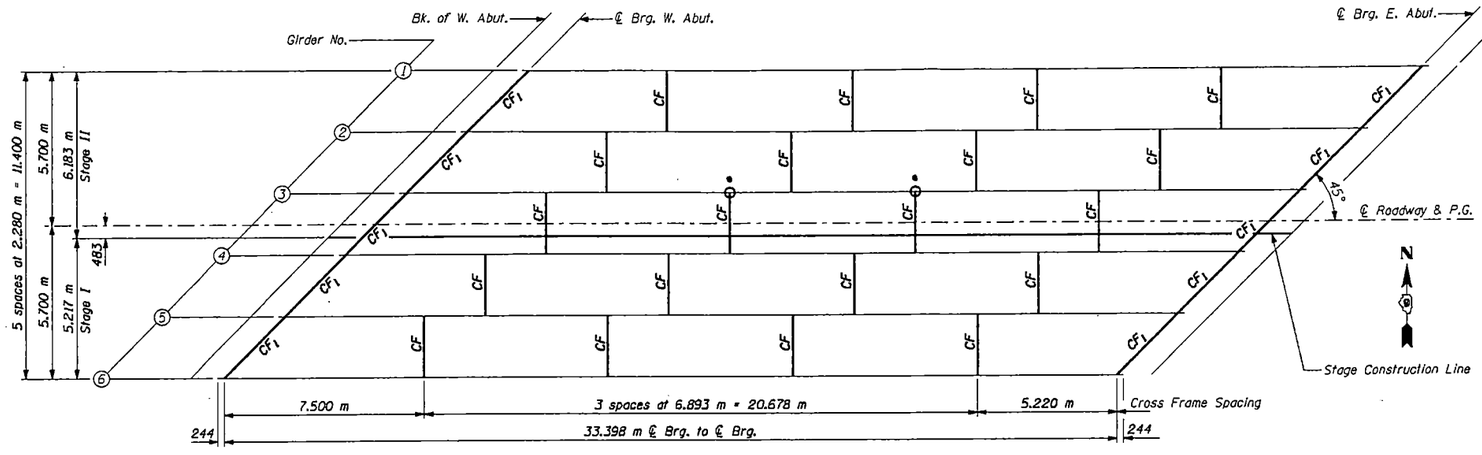
01/09/2002

EJ-CS (M) 4-30-97

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F. A. P. 885	104BY-1	UNION	37	25
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

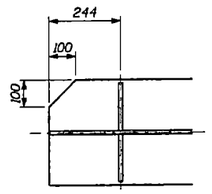
SHEET NO. 9
21 SHEETS

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

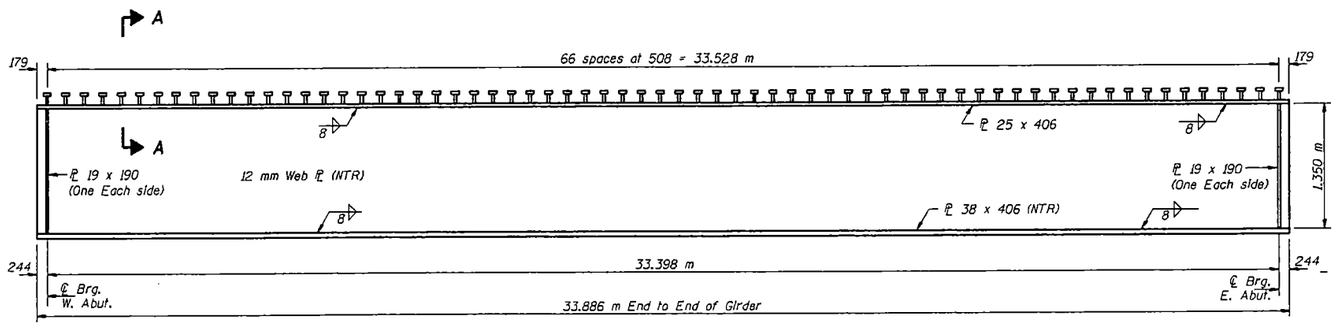


FRAMING PLAN

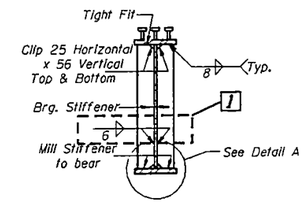
O* Location of temporary bracing for Stage Construction. See Sheet 10 of 21.



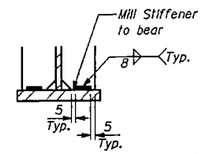
END OF GIRDER PLAN
Top and Bottom Flanges



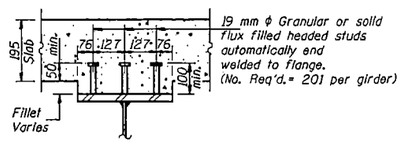
GIRDER ELEVATION
"NTR" denotes plates to which notch toughness requirements are applicable.



SECTION AT ABUTMENT



DETAIL A



SECTION A-A

Note:
See Sheet 12 of 21 for Bearing Details

FRAMING PLAN - GIRDER ELEVATION
ILL. ROUTE 146 OVER
GREEN CREEK
FAP 885 - SECTION 104BY-1
UNION COUNTY
STATION 15+288.500
STRUCTURE NO. 091-0072

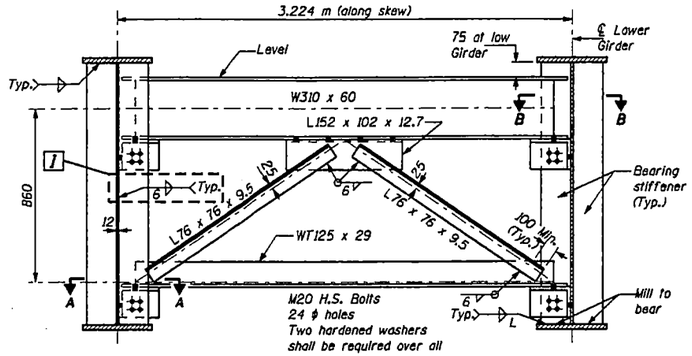
1 Revised 6/4/2002 GLH

01/09/2002

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F. A. P. 885	104BY-1	UNION	37	28
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

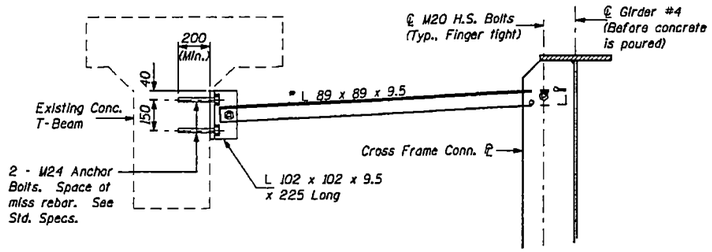
SHEET NO. 18
21 SHEETS

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION



CROSS FRAME CF1

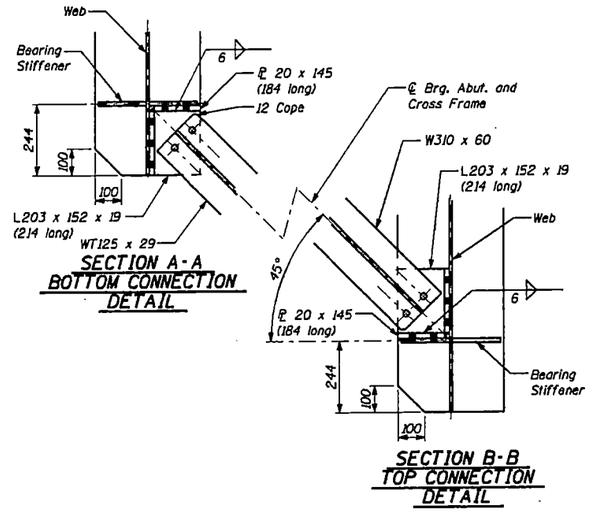
(All dimensions are along skew, unless otherwise noted)
(No. Required = 10)



TEMPORARY BRACING FOR STAGE I CONSTRUCTION

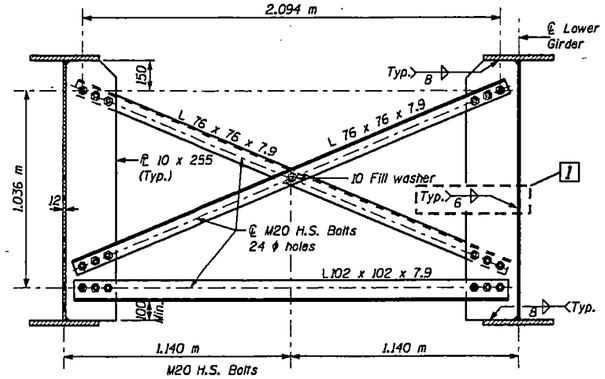
(No. Required = 2)

The horizontal dimension between the holes in the Cross Frame Connection Plate and the L 102 x 102 shall be measured in the field. The holes in the L 89 x 89 shall be field drilled at this dimension. Included in the cost of "Structural Steel".



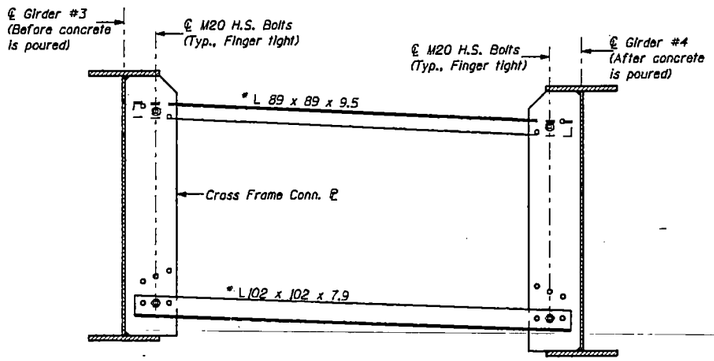
SECTION A-A BOTTOM CONNECTION DETAIL

SECTION B-B TOP CONNECTION DETAIL



CROSS FRAME CF

(All dimensions are measured at right L's to ℄ Girder)
(No. Required = 20)



TEMPORARY BRACING FOR STAGE II CONSTRUCTION

(No. Required = 4)

* L's shown to be used as temporary bracing during Stage I & Stage II deck pour. Remove and replace with Cross Frame CF after Stage II deck pour is completed. Use between girders 3 and 4 only. Included in the cost of "Structural Steel".

STRUCTURAL STEEL DETAILS
ILL. ROUTE 146 OVER
GREEN CREEK
FAP 885 - SECTION 104BY-1
UNION COUNTY
STATION 15+288.500
STRUCTURE NO. 091-0072

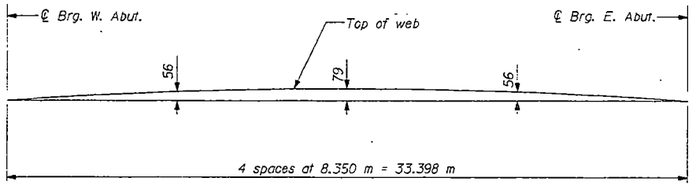
01/09/2002

1 Revised 6/4/2002 GLH

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F. A. P. 885	104BY-1	UNION	37	27
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

SHEET NO. 11
21 SHEETS



CAMBER DIAGRAM

TOP OF WEB ELEVATIONS

Location	℄ Brg. W. Abut.	℄ Brg. E. Abut.
Girder 1	124.895	124.935
Girder 2	124.937	124.977
Girder 3	124.968	125.008
Girder 4	124.966	125.006
Girder 5	124.929	124.969
Girder 6	124.881	124.921

Note: Top of Web Elevations are given for fabrication only.

INTERIOR GIRDER MOMENT TABLE		
		0.5 Span
Is	(10^6 mm^4)	14549
Ic (n)	(10^6 mm^4)	33804
Ic (3n)	(10^6 mm^4)	24442
Ss	(10^3 mm^3)	23220
Sc (n)	(10^3 mm^3)	30398
Sc (3n)	(10^3 mm^3)	27891
D	(kN/m)	14.32
M℄	(kN·m)	1995
s℄	(kN/m)	7.60
Ms℄	(kN·m)	1060
M½	(kN·m)	1563
M (Imp)	(kN·m)	345
$5/3$[M½+M(Imp)]	(kN·m)	3188
Ma	(kN·m)	8117
Mu	(kN·m)	12305
fs℄ (non-comp)	(MPa)	86.0
fs℄ (comp)	(MPa)	38.0
fs $5/3$ (½+Imp)	(MPa)	104.8
fs (Overload)	(MPa)	228.8
fs (Total)	(MPa)	297.5
VR	(kN)	244

INTERIOR GIRDER REACTION TABLE			
		W. Abut.	E. Abut.
R℄	(kN)	367	367
R½	(kN)	200	200
Imp.	(kN)	44	44
R (Total)	(kN)	611	611

Is and Ss are the moment of inertia and section modulus of the steel section used in computing fs (Total & Overload).

Ic(n) and Sc(n) are the moment of inertia and section modulus of the composite section used in computing stresses due to Live Load.

Ic(3n) and Sc(3n) are the moment of inertia and section modulus of the composite section used in computing stresses due to superimposed dead loads. (see AASHTO 10.38)

VR is the maximum Live Load + Impact shear range in span.

Ma (Applied Moment)=1.3[M℄ + Ms℄ + $5/3$(M½ + M(Imp))].

The Plastic Moment capacity (Mu) is computed according to AASHTO 10.48.1 and 10.50.1.1.

fs (Overload) is the sum of the stresses due to M℄ + Ms℄ + $5/3$(M½ + M(Imp)).

M℄ - Moment due to dead loads on non-composite section.

Ms℄ - Moment due to dead loads on composite section.

M½ - Moment due to live loads on composite section.

Imp - Live load impact.

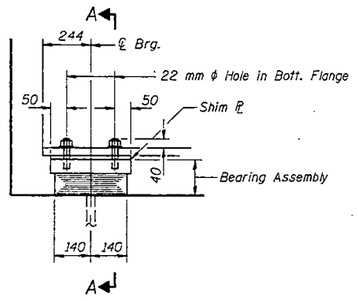
STRUCTURAL STEEL DETAILS
ILL. ROUTE 146 OVER
GREEN CREEK
FAP 885 - SECTION 104BY-1
UNION COUNTY
STATION 15+288.500
STRUCTURE NO. 091-0072

01/15/2002

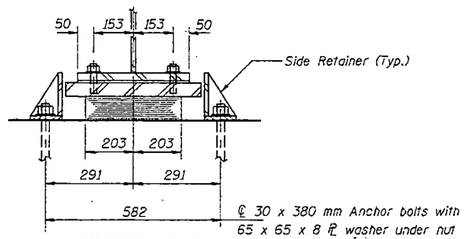
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F. A. P. 885	104BY-1	UNION	37	28
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

SHEET NO. 12
21 SHEETS

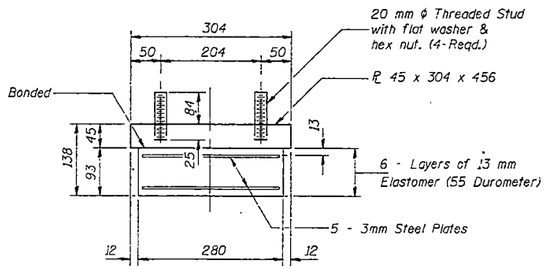


ELEVATION AT ABUT.



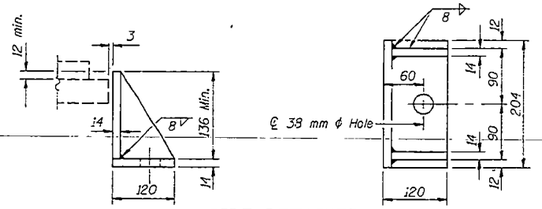
SECTION A-A

TYPE I ELASTOMERIC EXP. BRG.



BEARING ASSEMBLY

Note: Shim plates shall not be placed under Bearing Assembly.



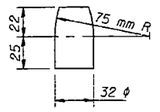
SIDE RETAINER

Equivalent rolled angle with stiffeners will be allowed in lieu of welded plates. Weight included with Structural Steel.

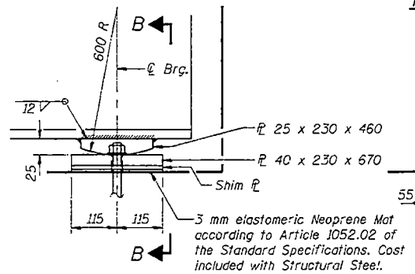
BILL OF MATERIAL

Item	Unit	Total
Elastomeric Bearing Assembly Type I	Each	6

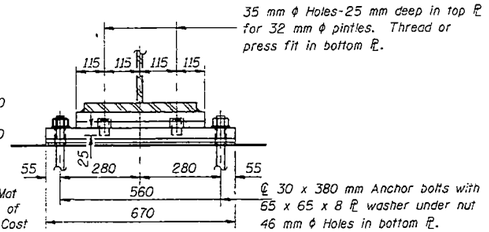
Notes:
Anchor bolts at fixed bearings may be built into the masonry.
See Sheet 13 of 21 for Anchor Bolt installation.
All dimensions are in millimeters (mm) except as noted.



PINTLE



ELEVATION AT ABUT.



SECTION B-B

FIXED BEARING

BEARING DETAILS
ILL. ROUTE 146 OVER
GREEN CREEK
FAP 885 - SECTION 104BY-1
UNION COUNTY
STATION 15+288.500
STRUCTURE NO. 091-0072

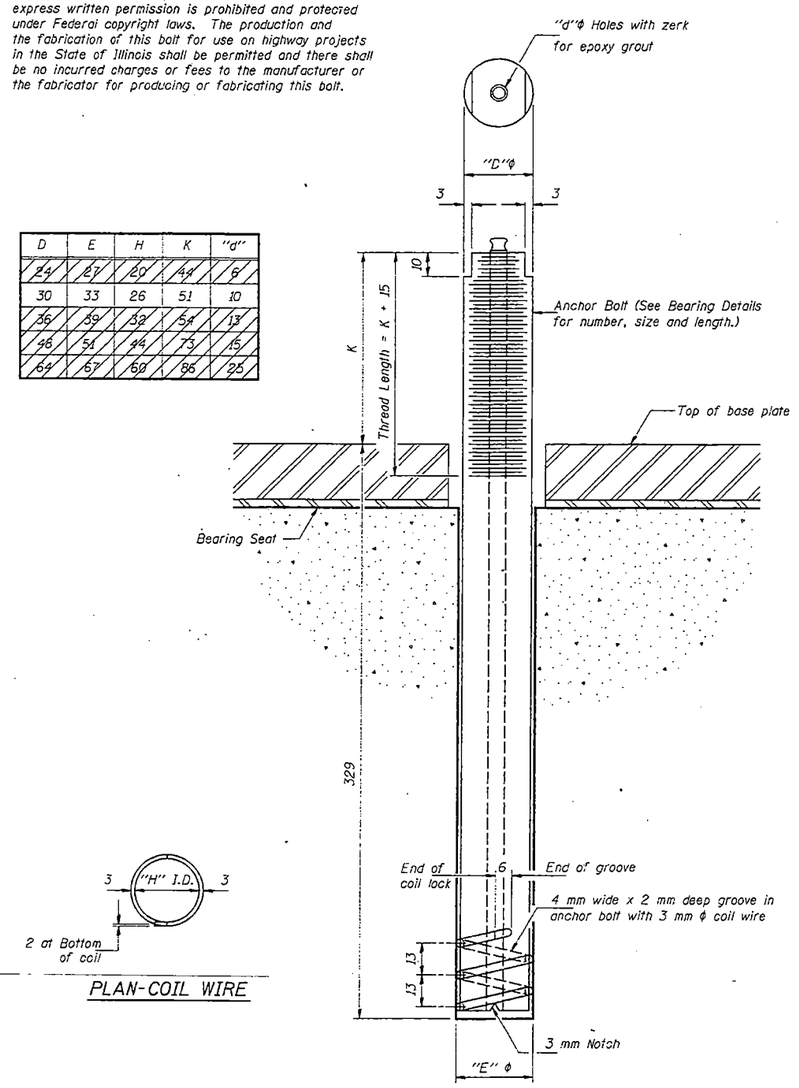
01/09/2002

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F. A. P. 885	104BY-1	UNION	37	29
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

SHEET NO. 13
21 SHEETS

D	E	H	K	"d"
24	27	20	48	8
30	33	26	51	10
36	39	32	54	13
48	54	44	73	15
64	67	60	86	25



ILLINOIS COIL-LOCK ANCHOR BOLT

PLAN-COIL WIRE

MATERIALS FOR ILLINOIS COIL-LOCK ANCHOR BOLT

The anchor bolt shall be fabricated from cold drawn or hot finished seamless carbon steel mechanical tubing conforming to ASTM A 519, Grade 1026, CW and supplied with hexagonal nuts and cut washers.

The coil wire shall be made of any suitable soft steel wire.

The finished anchor bolt shall be cleaned of rust and other foreign materials and wrapped or packaged to prevent contamination until they are installed.

The epoxy grout shall be a two-component, epoxy resin bonding system conforming to ASTM C 881, Type I, Grade 1 and of a Class suitable for the temperature at installation.

INSTALLATION PROCEDURE for the ILLINOIS COIL-LOCK ANCHOR BOLT

1. With the coil wire in place, the bolt shall be inserted into the hole and turned clockwise to a snug fit in the hole. Nut and washer shall be placed on the bolt. The nut shall be tensioned until the steel base plates are held securely to the concrete bearing seat.
2. Epoxy grout shall be pumped through the zerk fitting with a pressure gun. Pumping shall continue until the epoxy overflows the hole around the bolt shank. After pumping is discontinued, excess epoxy shall be immediately wiped off.

ALTERNATE ANCHOR BOLTS

The Contractor may use, at his option, the capsule or the adhesive cartridge type anchor rods that have been previously tested and given a prior approval by the Department. The Contractor shall install these anchor rods in pre-drilled holes according to the manufacturer's recommendations and procedures.

The capsule or the adhesive cartridge type anchor rods shall be a two part system composed of:

1. A threaded rod stud with nut and washer of the type specified.
2. A sealed glass capsule or a sealed glass adhesive cartridge containing premeasured amounts of the adhesive chemical.

Location	Type
W. Abut.	A307
E. Abut.	A307

ASTM F 1554 (Fy = 724 MPa), ASTM A 449 and AASHTO M 314 (Fy = 724 MPa) anchor bolts may be substituted for the anchor bolts shown above.

GENERAL NOTES

Holes in the masonry for anchor bolts shall be drilled through the base plates to the diameter and depth shown or according to the manufacturer's recommendation after beams or girders have been erected and adjusted.

Prior to setting the bolts, the holes shall be dry and all dust and loose particles shall be removed by the use of compressed air or vacuuming.

The anchor bolts, furnished and installed and including the epoxy grout or capsules shall not be paid for separately but shall be included in the unit bid price for "Furnishing and Erecting Structural Steel".

All dimensions are in millimeters (mm) except as noted.

ANCHOR BOLT DETAILS
ILL. ROUTE 146 OVER
GREEN CREEK
FAP 885 - SECTION 104BY-1
UNION COUNTY
STATION 15+288.500
STRUCTURE NO. 091-0072

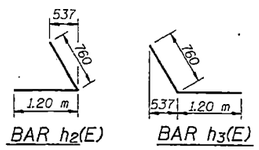
01/09/2002

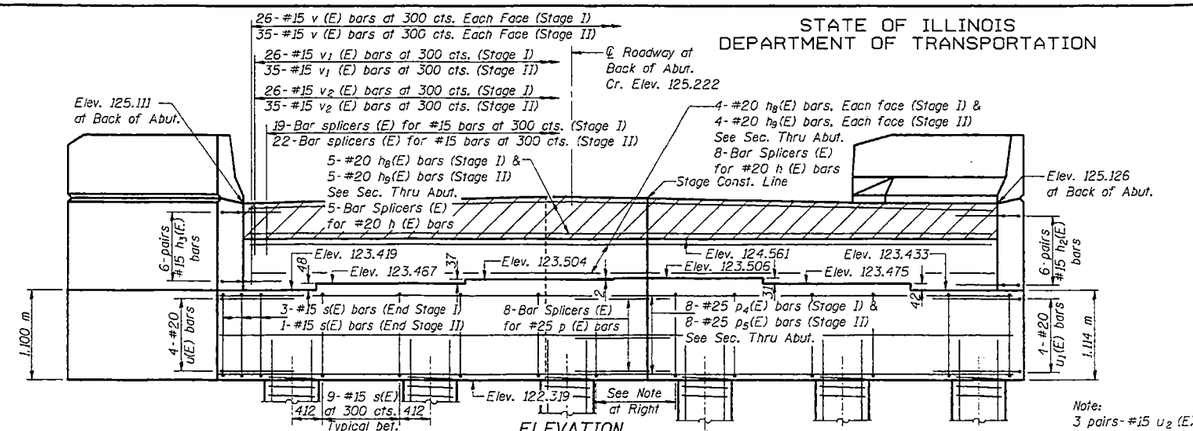
ABB-1 (M) 4-30-99

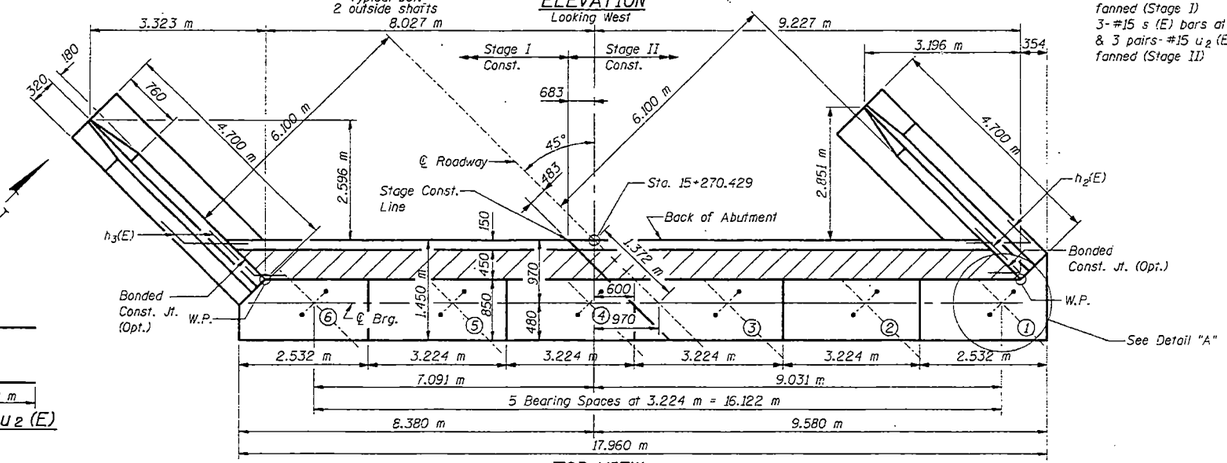
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

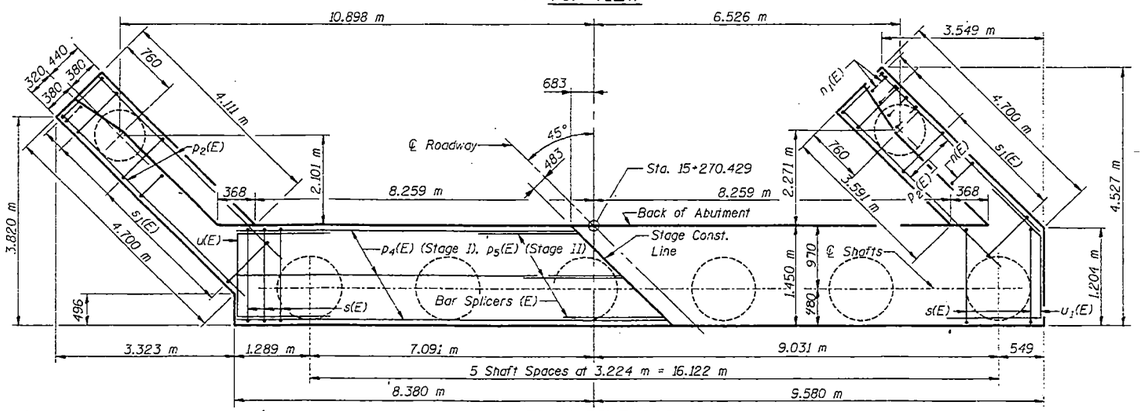
ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F. A. P. 885	104BY-1	UNION	37	38
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

SHEET NO. 14
21 SHEETS

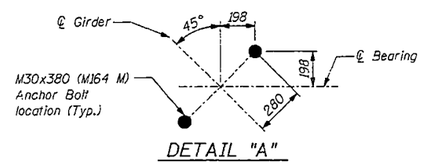








Note:
3 pairs-#15 u_2 (E) bars fanned (Stage I)
3-#15 s (E) bars at 300 cts. & 3 pairs-#15 u_2 (E) bars fanned (Stage II)



DETAIL "A"

WEST ABUTMENT BILL OF MATERIAL

Bar	No.	Size	Length (m)	Shape
h_2(E)	12	#15	1.96	
h_3(E)	12	#15	1.96	
h_4(E)	24	#15	4.60	
h_5(E)	16	#15	4.60	
h_8(E)	13	#20	9.05	
h_9(E)	13	#20	10.16	
n(E)	24	#20	3.06	
n_1(E)	16	#20	1.54	
p_2(E)	12	#25	4.70	
p_4(E)	8	#25	9.05	Cut in Field
p_5(E)	8	#25	10.16	Cut in Field
s(E)	43	#15	4.98	
s_1(E)	28	#15	2.92	
u(E)	4	#20	3.70	
u_1(E)	4	#20	3.49	
u_2(E)	12	#15	3.20	
v(E)	122	#15	1.60	
v_1(E)	61	#15	1.12	
v_2(E)	61	#15	0.60	
v_3(E)	28	#20	2.53	
v_4(E)	6	#20	2.17	
v_5(E)	32	#20	2.48	
v_9(E)	16	#25	1.50	
v_{10}(E)	72	#30	2.00	
v_{11}	16	#25	8.80	
v_{12}	72	#30	13.90	
Sp_3	2	#15	8.80*	
Sp_4	6	#15	13.90*	

Structure Excavation	m^3	200
Concrete Structures	m^3	55.7
Reinforcement Bars	kg	8560
Reinforcement Bars, Epoxy Coated	kg	4300
Drilled Shaft in Soil 610 mm	m	13.8
Drilled Shaft in Soil 915 mm	m	41.5
Drilled Shaft in Rock 460 mm	m	3.8
Drilled Shaft in Rock 760 mm	m	42.0
Bar Splicers	Each	62

*Length is height of spiral.

All dimensions are in millimeters (mm) except as noted.
Reinforcement bars designated (E) shall be epoxy coated.
For anchor bolt installation, see details on Sheet 13 of 21.
Minimum lap for spirals = 1½ turns.
Provide min. 4-#15 bars spacers or equivalent.

WEST ABUTMENT
ILL. ROUTE 146 OVER
GREEN CREEK
FAP 885 - SECTION 104BY-1
UNION COUNTY
STATION 15+288.500
STRUCTURE NO. 091-0072

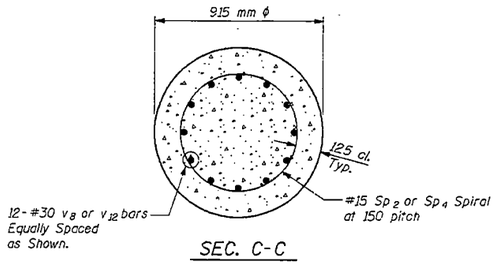
01/09/2002

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

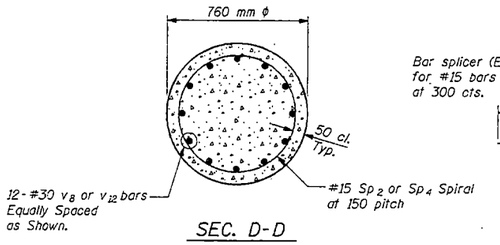
ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F. A. P. 885	104BY-1	UNION	37	31
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

SHEET NO. 15 OF 21 SHEETS

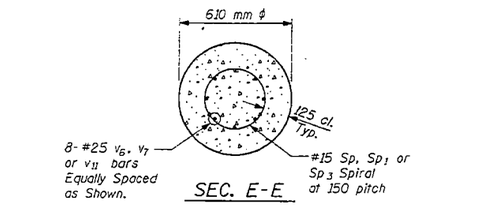
Notes:
Hatched area to be poured after superstructure forms have been removed. Quantity of concrete included with Concrete Superstructure.
Space reinforcement in cap to miss anchor bolts.
Cast steps monolithically with cap.
Reinforcement bars designated (E) shall be epoxy coated.
Quantity of concrete in end post included with Concrete Superstructure on Sheet 7 of 21.
All dimensions are in millimeters (mm) except as noted.
All edges shall have standard 20 mm chamfers.
The quantities and detailing are based on the estimated elevations shown on the plans. The actual elevations may differ at each shaft and corresponding adjustments shall be made to the drilled shaft and reinforcement quantities and payment limits.
Provide 1½ extra turns top and bottom of each drilled shaft. Extend spiral 50 mm into abutment or wing wall cap. Provide 4-#15 spacers or equivalent.



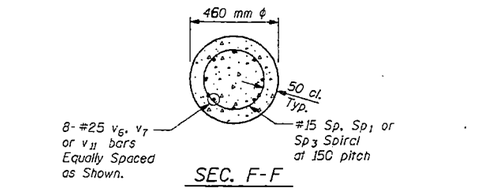
SEC. C-C



SEC. D-D

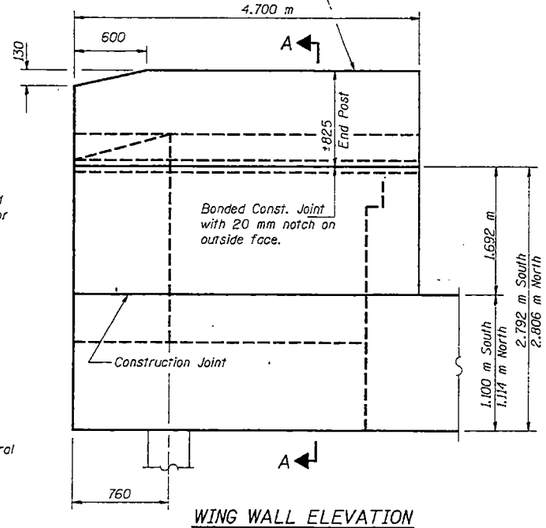


SEC. E-E

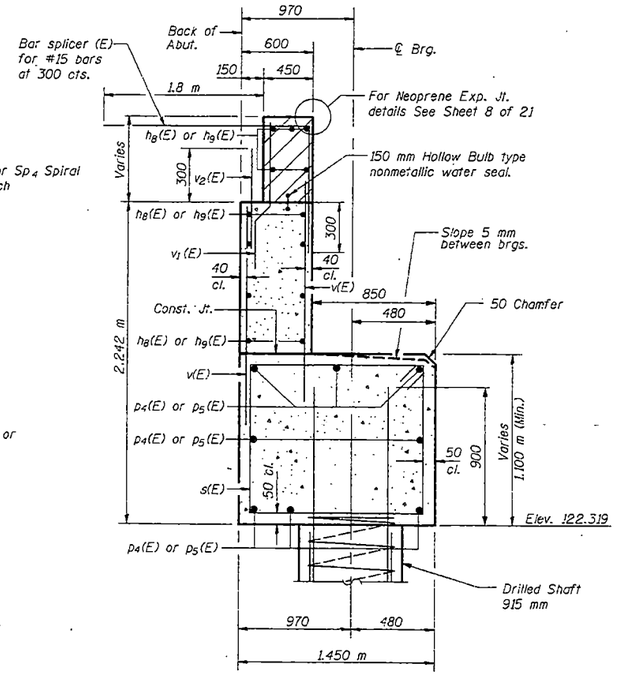


SEC. F-F

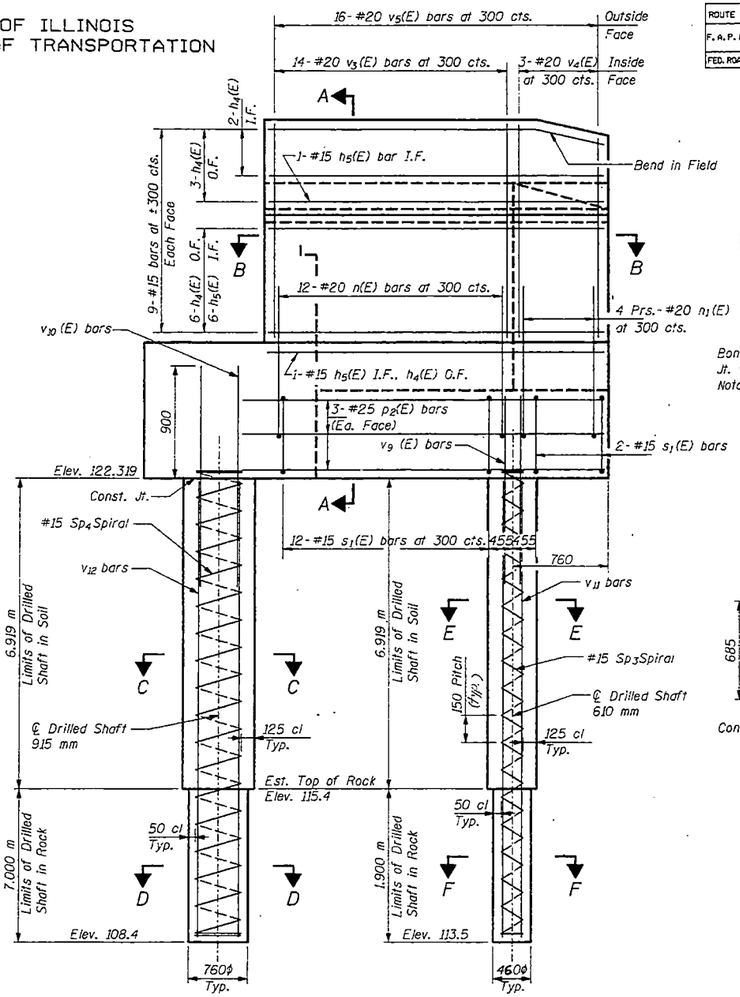
End Post shall be poured after bridge parapet is in place. Form top surface to match parapet grade.



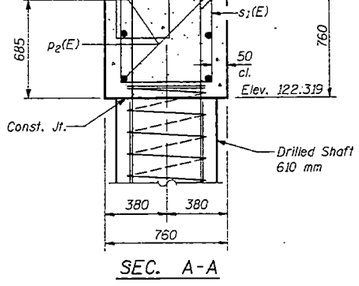
WING WALL ELEVATION
Showing Dimensions



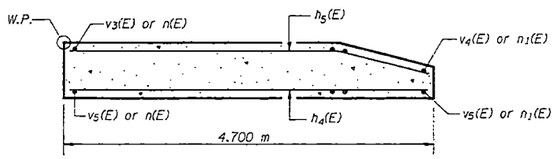
SEC. THRU ABUT.



WING WALL & DRILLED SHAFT ELEVATION
Showing Reinforcement



SEC. A-A



SEC. B-B

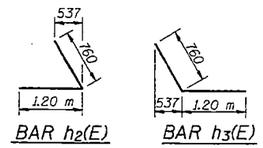
WEST ABUTMENT DETAILS
ILL. ROUTE 146 OVER
GREEN CREEK
FAP 885 - SECTION 104BY-1
UNION COUNTY
STATION 15+288.500
STRUCTURE NO. 091-0072

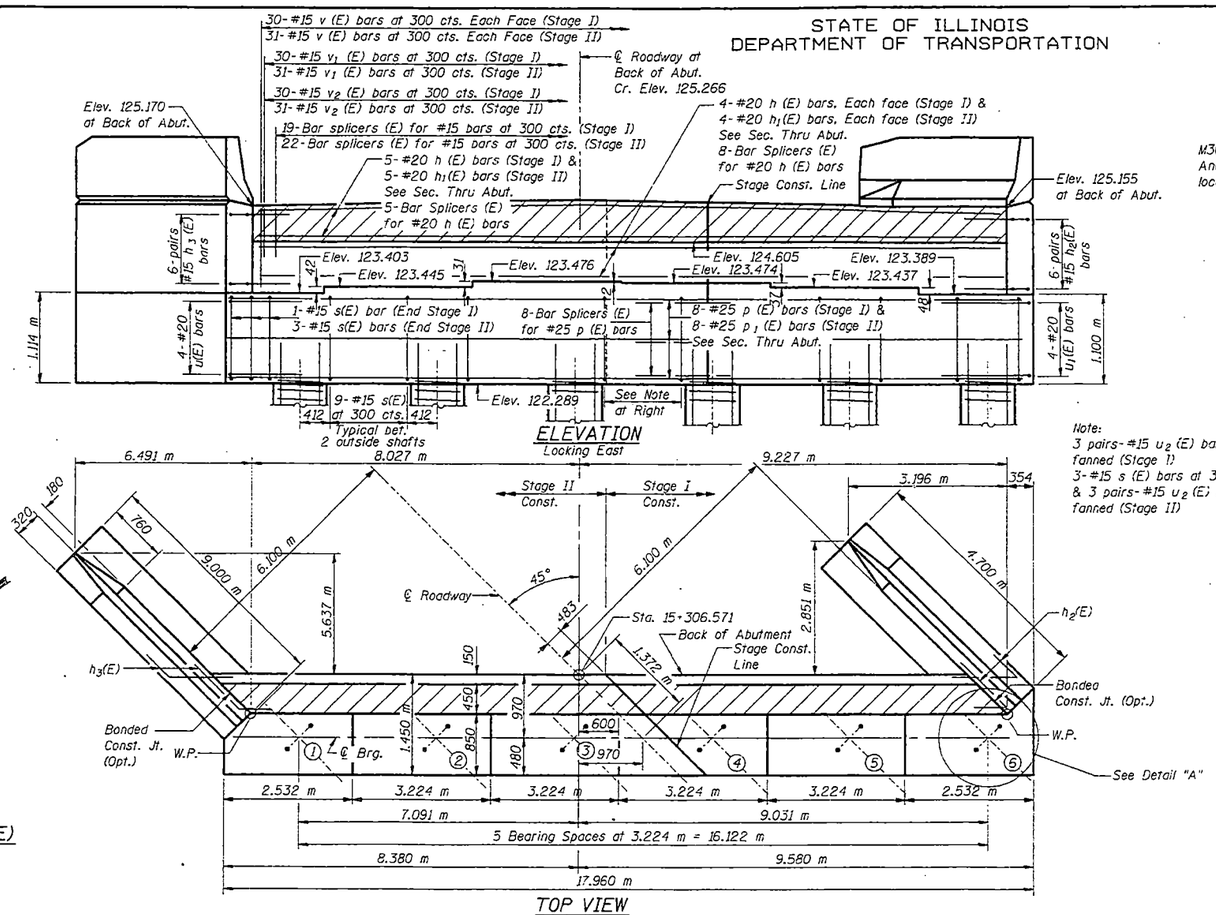
01/11/2002

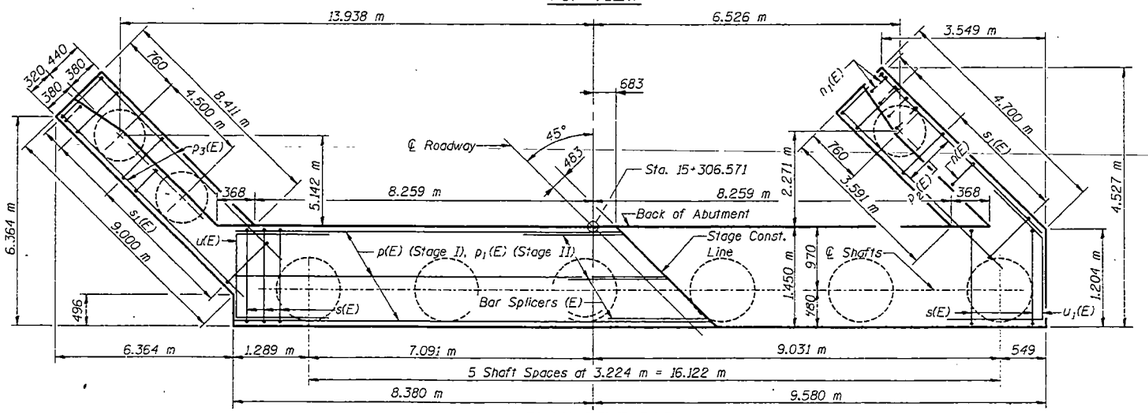
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

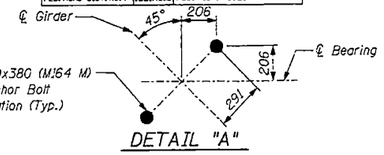
ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F. A. P. 885	104BY-1	UNION	37	32
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

SHEET NO. 16
21 SHEETS









DETAIL "A"

EAST ABUTMENT
BILL OF MATERIAL

Bar	No.	Size	Length (m)	Shape
h(E)	13	#20	8.80	
h1(E)	13	#20	10.40	
h2(E)	12	#15	1.96	
h3(E)	12	#15	1.96	
h4(E)	12	#15	4.60	
h5(E)	8	#15	4.60	
h6(E)	12	#15	8.90	
h7(E)	8	#15	8.90	
n(E)	35	#20	3.06	
n1(E)	22	#20	1.54	
p(E)	8	#25	8.80	
p1(E)	8	#25	10.40	Cut in Field
p2(E)	6	#25	4.70	Cut in Field
p3(E)	6	#25	9.00	
s(E)	43	#15	4.98	
s1(E)	39	#15	2.92	
u(E)	4	#20	3.70	
u1(E)	4	#20	3.49	
u2(E)	12	#15	3.20	
v(E)	122	#15	1.60	
v1(E)	61	#15	1.12	
v2(E)	61	#15	0.60	
v3(E)	42	#20	2.53	
v4(E)	6	#20	2.17	
v5(E)	46	#20	2.48	
v6	8	#25	7.40	
v7	16	#25	9.00	
v8	72	#30	9.60	Cut in Field
v9(E)	24	#25	1.50	
v10(E)	72	#30	2.00	
Sp	1	#15	7.40*	
Sp1	2	#15	9.00*	
Sp2	6	#15	9.60*	Cut in Field

Structure Excavation	m³	224
Concrete Structures	m³	63.8
Reinforcement Bars	kg	6550
Reinforcement Bars, Epoxy Coated	kg	4670
Drilled Shaft in Soil 610 mm	m	19.7
Drilled Shaft in Soil 915 mm	m	37.7
Drilled Shaft in Rock 460 mm	m	5.7
Drilled Shaft in Rock 760 mm	m	15.0
Bar Splicers	Each	62

*Length is height of spiral.

All dimensions are in millimeters (mm) except as noted.
Reinforcement bars designated (E) shall be epoxy coated.
For anchor bolt installation, see details on Sheet 13 of 21.
Minimum lap for spirals = 1½ turns.
Provide min. 4-#15 bars spacers or equivalent.

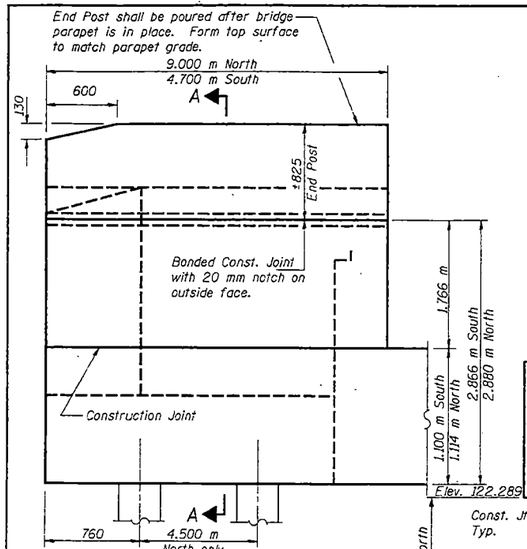
EAST ABUTMENT
ILL. ROUTE 146 OVER
GREEN CREEK
FAP 885 - SECTION 104BY-1
UNION COUNTY
STATION 15+288.500
STRUCTURE NO. 091-0072

01/09/2002

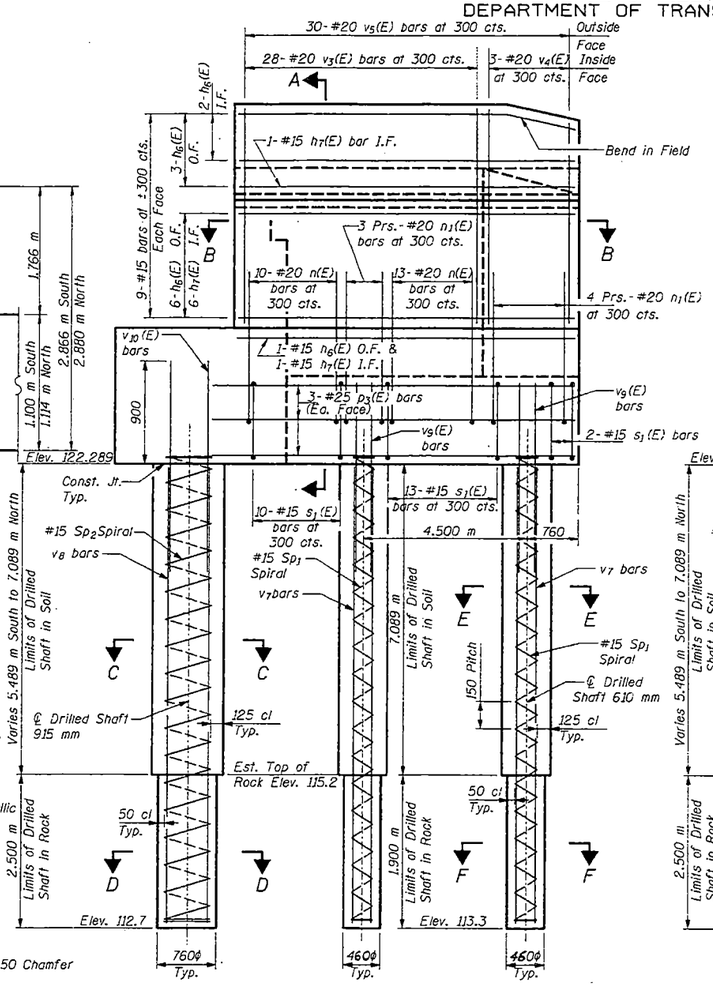
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F. A. P. 885	104BY-1	UNION	37	33
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

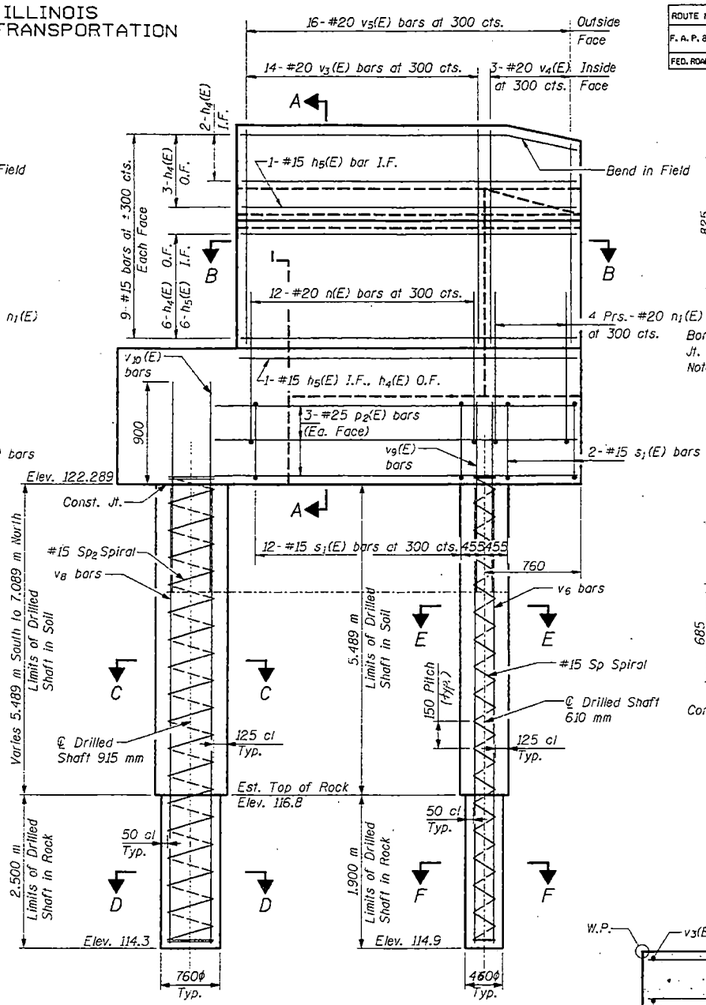
SHEET NO. 17
21 SHEETS



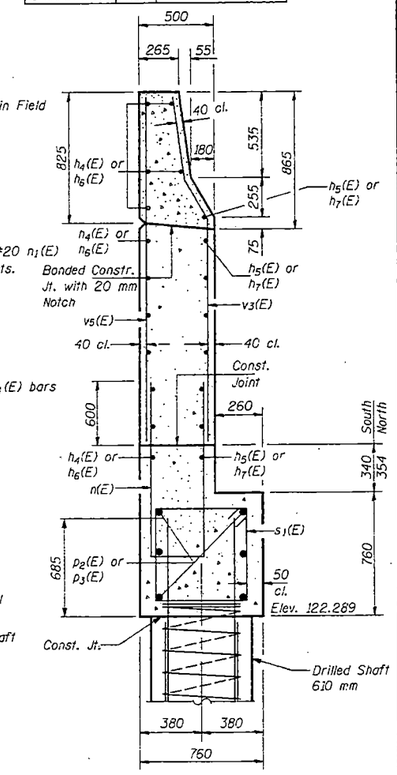
WING WALL ELEVATION
Showing Dimensions



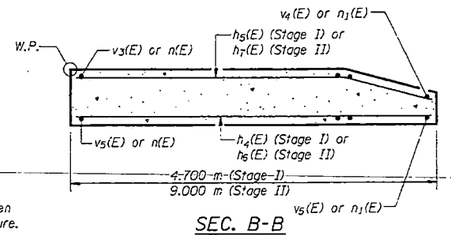
WING WALL & DRILLED SHAFT
ELEVATION (STAGE II)
Showing Reinforcement



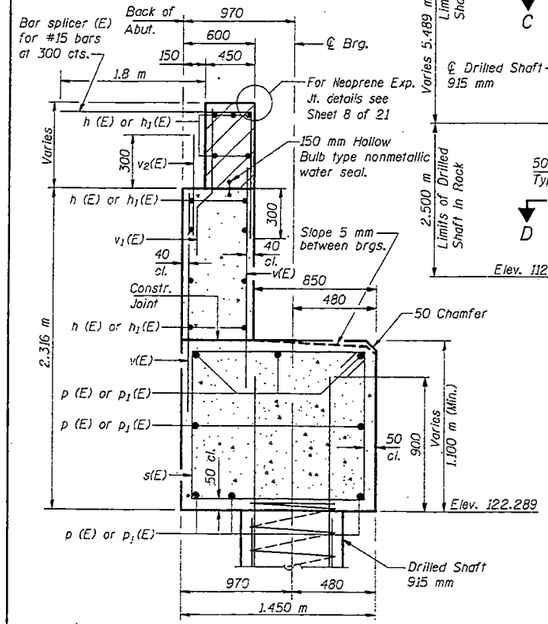
WING WALL & DRILLED SHAFT
ELEVATION (STAGE I)
Showing Reinforcement



SEC. A-A



SEC. B-B



SEC. THRU ABUT.

SEE SHEET 15 OF 21 FOR
DRILLED SHAFT SECTIONS

Notes:

Hatched area to be poured after superstructure forms have been removed. Quantity of concrete included with Concrete Superstructure.

Space reinforcement in cap to miss anchor bolts.

Cast steps monolithically with cap.

Reinforcement bars designated (E) shall be epoxy coated.

Quantity of concrete in end post included with Concrete Superstructure on Sheet 7 of 21.

All dimensions are in millimeters (mm) except as noted.

All edges shall have standard 20 mm chamfers.

The quantities and detailing are based on the estimated elevations shown on the plans. The actual elevations may differ at each shaft and corresponding adjustments shall be made to the drilled shaft and reinforcement quantities and payment limits.

Provide 1½ extra turns top and bottom of each drilled shaft. Extend spiral 50 mm into abutment or wing wall cap. Provide 4-#15 spacers or equivalent.

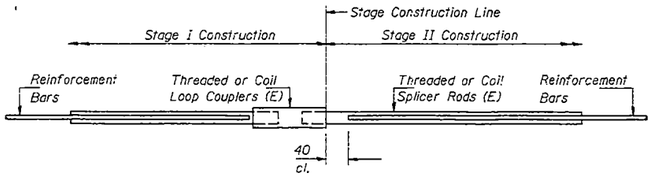
EAST ABUTMENT DETAILS
ILL. ROUTE 146 OVER
GREEN CREEK
FAP 885 - SECTION 104BY-1
UNION COUNTY
STATION 15+288.500
STRUCTURE NO. 091-0072

01/11/2002

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

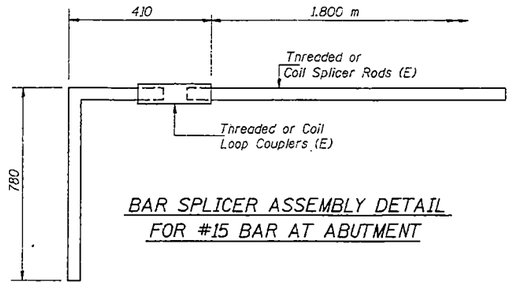
ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F. A. P. 885	104BY-1	UNION	37	34
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

SHEET NO. 18
21 SHEETS

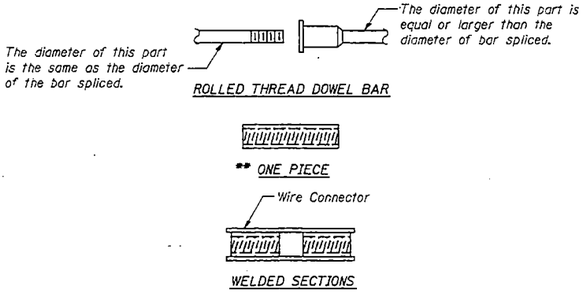


BAR SPLICER ASSEMBLY DETAIL

Bar Size	No. Assemblies Required	Location
#20	259	Deck
#15	82	Abutments
#20	26	Abutments
#25	16	Abutments

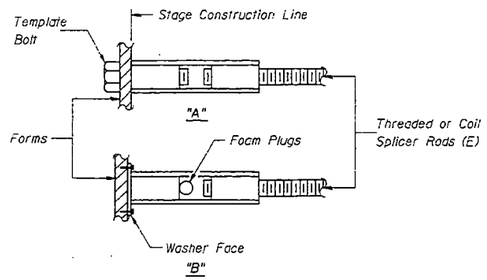


BAR SPLICER ASSEMBLY DETAIL FOR #15 BAR AT ABUTMENT



BAR SPLICER ASSEMBLY ALTERNATIVES

** Heavy Hex Nuts conforming to ASTM A 563M, Grade C, D or DH may be used.



INSTALLATION AND SETTING METHODS

"A" : Set bar splicer assembly by means of a template bolt.
"B" : Set bar splicer assembly by nailing to wood forms or cementing to steel forms.
(E) : Indicates epoxy coating.

NOTES

Bar splicer assemblies shall be of an approved type and shall develop in tension at least 125 percent of the yield strength of the lapped reinforcement bars.

Splicer rods shall be of minimum 400 MPa yield strength, threaded or coiled full length.

All reinforcement bars shall be lapped and tied to the splicer rods or dowel bars.

Bar splicer assemblies shall be epoxy coated according to the requirements for reinforcement bars.

Other systems of similar design may be submitted to the Engineer for approval. Approval shall be based on certified test results from an approved testing laboratory that the proposed bar splicer assembly satisfies the following requirements:

① Minimum Capacity (Tension in kN) = $1.25 \times 10^{-3} \times f_y \times A_t$

② Minimum *Pull-out Strength (Tension in kN) = $1.25 \times 10^{-3} \times fs_{allow} \times A_t$

Where f_y = Yield strength of lapped reinforcement bars in MPa.
fs_{allow} = Allowable tensile stress in lapped reinforcement bars in MPa (Service Load)
A_t = Tensile stress area of lapped reinforcement bars (mm^2).
* = 28 day concrete

BAR SPLICER ASSEMBLIES			
Bar Size to be Spliced	Splicer Rod or Dowel Bar Length	Strength Requirements	
		Min. Capacity kN - tension	Min. Pull-Out Strength kN - tension
#15	610 mm	100	40
#20	790 mm	150	60
#25	1.04 m	250	100
#30	1.37 m	350	140

Bar splicer assemblies shall be according to Section 508 of the Standard Specifications, except as noted. The furnishing and installation of bar splicer assemblies will be measured and paid for at the contract unit price each for "BAR SPLICERS."

All dimensions are in millimeters (mm) except as noted.

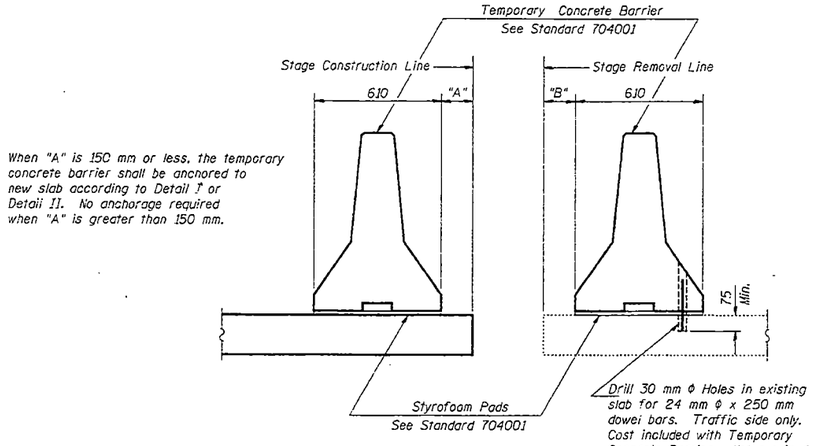
01/09/2002

BAR SPLICER ASSEMBLY DETAILS
ILL. ROUTE 146 OVER
GREEN CREEK
FAP 885 - SECTION 104BY-1
UNION COUNTY
STATION 15+288.500
STRUCTURE NO. 091-0072

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F. A. P. 885	104BY-1	UNION	37	35
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

SHEET NO. 19
21 SHEETS



When "A" is 150 mm or less, the temporary concrete barrier shall be anchored to new slab according to Detail I or Detail II. No anchorage required when "A" is greater than 150 mm.

Drill 30 mm ϕ Holes in existing slab for 24 mm ϕ x 250 mm dowei bars. Traffic side only. Cost included with Temporary Concrete Barrier. Not required when "B" is greater than 300 mm.

NEW SLAB

EXISTING SLAB

NOTES

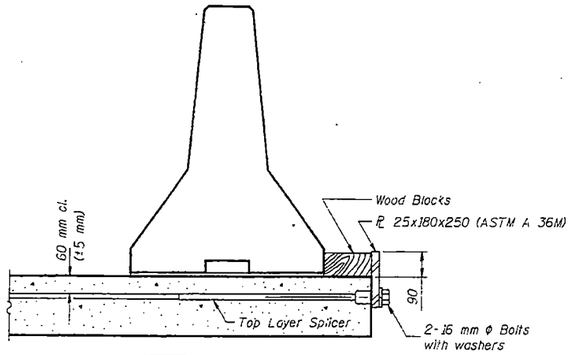
Detail I - With Bar Splicer or Couplers:
Connect one (1) 25x180x250 steel ℙ to the top layer of couplers with 2-16 mm ϕ bolts screwed to coupler at approximate ℄ of each 3 m barrier panel.

Detail II - With Extended Reinforcement Bars:
Connect one (1) 25x180x250 steel ℙ to the concrete slab with 2-16 mm ϕ Expansion Anchors or cast in place inserts spaced between the top layer of reinforcement at approximate ℄ of each 3 m barrier panel.

Cost of anchorage included with Temporary Concrete Barrier.

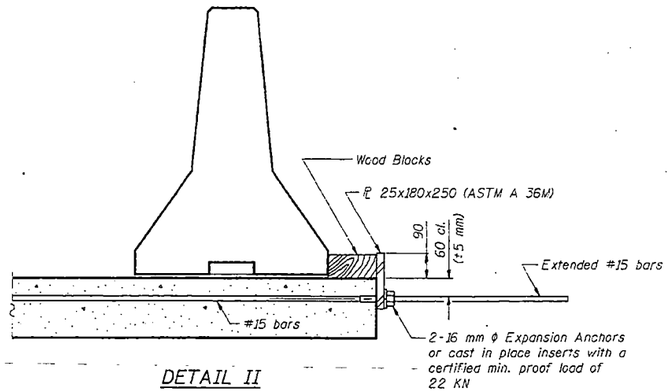
All dimensions are in millimeters (mm) except as noted.

SECTIONS THRU SLAB



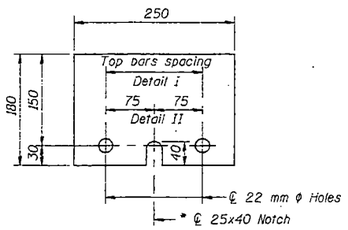
DETAIL I

The 25x180x250 Plate shall not be removed until Stage II Construction forms and reinforcement bars are in place.



DETAIL II

The 25x180x250 Plate shall not be removed until Stage II Construction forms and all reinforcement bars are in place and the concrete is ready to be placed.



ℙ 25x180x250

* Required only with Detail II

TEMPORARY CONCRETE BARRIER
FOR STAGE CONSTRUCTION
ILL. ROUTE 146 OVER
GREEN CREEK
FAP 885 - SECTION 104BY-1
UNION COUNTY
STATION 15+288.500
STRUCTURE NO. 091-0072

01/03/2002

R-27 (M) 4-30-99

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F. A. P. 885	104BY-1	UNION	37	36
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

SHEET NO. 20
21 SHEETS

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

ILLINOIS DEPARTMENT OF TRANSPORTATION
District Nine Materials
Bridge Foundation Boring Log
Sheet 1 of 1

FAP 885 (IL 146) Over Green Creek
Route: FAP 885 Structure Number: 091-0029 Date: 5/21/98
Section 104BY-1 Bored By: RM
County: Union Location: NW corner Section 23, T12S, R2W Checked By: JZ

Boring No 1-S
Station 15+278
Offset 4.6m Lt CL
Ground Surface 125.0 m

Surf Wat Elev: 120.4
Ground Water Elevation
when Drilling 119.1
At Completion 114.3
At: Hrs:

DEPTH	BLOW	Qu kPa	W%	DEPTH	BLOW	Qu kPa	W%
Asphalt & Crushed Aggregate	Augered			Loose to very loose, wet, grey, Broken Limestone Gravel	3	—	
					1		
124.4				116.8			
Medium, moist, brown and grey, Silt Loam A-4	2			Dense, wet, grey Broken Limestone Gravel with Clay A7-6 layer	1		
	3	86.2S	22		35	124.5B	41
	3				11		
123.6				116.0			
Stiff, moist, brown mottled grey, Slt to Silt Loam A-4 1.52	3			Very stiff to Hard, damp to dry, brown Weathered Clay Shale 9.14	13		
	5	114.9S	21		12	—	
	6				13		
				115.4			
	4			Hard, dry, brown, Shale	100/	—	
	6	153.2S	22		1.3cm		
	8			114.8			
122.1				Very dense, dry, brown Weathered Shale with Weathered Clay Shale seams 10.67	15		
Stiff, moist, tan mottled brown, Slt to Silt LoamA-4 3.05	4				45	—	
	5	172.4S	22		25		
	5			113.9			
	2			Stiff, moist to damp, Gold brown mottled grey, Clay A7-6 to highly weathered Clay Shale	3		
	3	134.1S	23		3	114.9S	32
	5				3		
				113.0			
4.57	1			Very soft, wet to damp, gold brown to grey to black, Clay A7-6 with layers of laminated highly weathered Clay Shale 12.19	2		
	3	134.1S	25		1	9.6B	51
	3				1		
119.8							
Medium, very moist, grey mottled brown, Silt Loam to Silty Clay Loam A-4	1						
	2	57.5B	28				
	2						
119.1							
Soft, very moist to wet, grey, Silty Clay Loam A-4 with Sand and Gravel mixed 6.10	WH			No sample, split-spoon lost in hole 13.72	84		
	1	—		111.0	16		
	2			Bottom of hole = 13.9m	100/		
118.3				Elevation referenced to center of exist. bridge; elev.=125.27m	7.6cm		
Medium, wet, grey, Broken Limstone Gravel mixed with Silty Clay Loam A-4	2			To convert N values to N60 values multiply by 1.25.			
	6	—		Free water observed at 5.9m			
	7						
117.5							
7.62	5			15.24			

N-Std Pentr Test: 2" OD Sampler,
140# Hammer, 30" Fall (Type Fail. B-Bulge S-Shear E-Estimated P-Penetrometer)

ILLINOIS DEPARTMENT OF TRANSPORTATION
District Nine Materials
Bridge Foundation Boring Log
Sheet 1 of 1

FAP 885 (IL 146) Over Green Creek
Route: FAP 885 Structure Number: 091-0029 Date: 5/21/98
Section 104BY-1 Bored By: RM
County: Union Location: NW corner Section 23, T12S, R2W Checked By: JZ

Boring No 2-S
Station 15+296
Offset 7.6m Rt CL
Ground Surface 125.0 m

Surf Wat Elev: 120.4
Ground Water Elevation
when Drilling 119.2
At Completion 119.8
At: Hrs:

DEPTH	BLOW	Qu kPa	W%	DEPTH	BLOW	Qu kPa	W%
Crushed Aggregate	Augered			Loose to medium, very moist, grey Broken Gravel with Clay A7-6 mixed	4	—	
					8		
124.2				116.8			
	2			Very dense, dry, grey Limestone	100/		
Medium, very moist, red brown, Clay A7-6	1	57.5B	31		1.3cm		
	1				Refusal		
123.6				80% Recovery, 55% RQD	Cored		
Stiff to medium, moist to very moist, brown mottled grey, Silt Loam to Silty Clay Loam A-4 1.52	3			9.14			
	3	95.8B	23				
	4			115.2			
	4						
	5	105.3B	22				
	6						
122.1				Bottom of hole = 9.8m			
Stiff, moist, grey, Slt Loam A-4 3.05	3			10.67			
	3	172.4B	24	Free water observed at 5.2m			
	4						
				Elevation referenced to center of existing structure; elevation = 125.27m			
121.2	3						
Medium, very moist, grey, brown and black, Broken Limestone, Sandstone and Coal	8	—		To convert N values to N60 values multiply by 1.25.			
	15						
120.6							
Medium, moist to very moist, grey, Silty Clay Loam A-4 4.57	5			12.19			
	4	86.2B	25				
	4						
119.8							
Loose, wet, grey, Broken Gravel with Silty Clay Loam mixed	2						
	2	—					
	5						
119.1							
Loose to medium, very moist to wet, grey, broken Gravel 8.10	3			13.72			
	3	—					
	5						
	5						
	6	—					
	8						
117.5							
7.62	2			15.24			

N-Std Pentr Test: 2" OD Sampler,
140# Hammer, 30" Fall (Type Fail. B-Bulge S-Shear E-Estimated P-Penetrometer)

01/09/2002

BORING LOGS
ILL. ROUTE 146 OVER
GREEN CREEK
FAP 885 - SECTION 104BY-1
UNION COUNTY
STATION 15+288.500
STRUCTURE NO. 091-0072

STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

ROUTE NO.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
F.A.P. 885	104BY-1	UNION	37	37
FED. ROAD DIST. NO. 7	ILLINOIS	FED. AID PROJECT-		

SHEET NO. 21
21 SHEETS

ILLINOIS DEPARTMENT OF TRANSPORTATION
District Nine Materials
Bridge Foundation Boring Log
Sheet 1 of 1

FAP 885 (IL 146) Over Green Creek
Route: FAP 885 Structure Number: 091-0029 Date: 6/22/98
Section 104BY-1 Bored By: RM
County: Union Location: NW corner Section 23, T12S, R2W Checked By: JS

Boring No 3-S
Station 15+270.5
Offset 4.4 m Rt CL
Ground Surface 125.1m

Surf Wat Elev: 120.4
Ground Water Elevation
when Drilling 119.2
At Completion 114.4
At: Hrs:

DEPTH	Description	BLOWS	Qu kPa	W%
	Asphalt and Crushed Aggregate			
124.6				
	Stiff, moist to damp, brown and grey, Silt Loam A-4	4		
		6	105.3S	18
		8		
1.52		3		
		4	105.3S	22
		4		
123.0				
	Medium to soft, very moist to moist, brown and grey, Silt Loam A-4	1		
		1	47.9B	26
		1		
3.05		WH		
		1	47.9B	26
		1		
121.4				
	Soft, very moist, grey, Silt Loam to Silty Clay Loam A-4	WH		
		WH	38.3B	26
		1		
120.7				
4.57	Medium, very moist, grey, Silt Loam A-4	1		
		1	57.5S	23
		1		
119.9				
	Medium to soft, very moist, grey, Silt Loam A-4	WH		
		WH	47.9B	28
		WH		
119.2				
6.10	Medium, very moist to wet, grey, Broken Shale with Sand and Clay mixed	2		
		5	—	
		6		
118.4				
	Very soft, wet, grey, Silt Loam to Silty Clay Loam A-4	WH		
		WH	9.6B	30
		1		
117.6				
7.62		1		

DEPTH	Description	BLOWS	Qu kPa	W%
	Stiff, moist, grey mottled brown, Clay A7-6 with Gravel	2	114.9B	32
118.9		1		
	Medium, moist to very moist, brown mottled grey, Clay A7-6	WH		
		1	76.6B	43
		1		
	REFUSAL 116.3			
	Hard, dry, grey, Limestone Cored (80% recovery, 50% RQD)			
8.14	115.8			
	Hard, damp to dry, brown streaked grey, Clay Shale with layers of Weathered Clay Shale and very dense Shale			
		40		
		45		
		55		
10.67		20		
		76		
		24		
12.19		23		
		42		
112.6		58		

Bottom of hole = 12.47m

Free water observed at 5.9m

Elevation referenced to center of existing structure; elevation = 125.27m

To convert N values to N60 values multiply by 1.25.

13.72		
15.24		

N-Std Pentr Test: 2" OD Sampler,
140# Hammer, 30" Fall (Type Fail. B-Bulge S-Shear E-Estimated P-Penetrometer)

ILLINOIS DEPARTMENT OF TRANSPORTATION
District Nine Materials
Bridge Foundation Boring Log
Sheet 1 of 1

FAP 885 (IL 146) Over Green Creek
Route: FAP 885 Structure Number: 091-0029 Date: 09/27/1999
Section 104BY-1 Bored By: Bryan Keller
County: Union Location: NW corner Section 23, T12S, R2W Checked By: R Moberly

Boring No 4-S
Station 15+306.3
Offset 3.8m Lt CL
Ground Surface 125.3m

Surf Wat Elev: 120.3
Ground Water Elevation
when Drilling 120.3
At Completion
At: Hrs:

DEPTH	Description	BLOW	Qu kPa	W%
	Asphalt and Crushed Aggregate			
124.9				
	Medium to stiff, moist, brown, Silty Clay Loam A-4	2		
		3	95.8B	#41
		4		
1.52		2		
		4	114.9S	#58
		4		
123.2				
	Stiff, moist, brown, Silt Loam A-4	4		
		4	124.5S	#81
		5		
122.4				
3.05	Stiff, moist, grey, Silt Loam A-4	2		
		3	134.1S	#52
		4		
121.7				
	Medium, moist, grey, Silt Loam A-4	1		
		2	67.0B	#53
		2		
120.9				
4.57	Loose, moist, grey, Broken Gravel with Silty Clay Loam	2		
		2		#402
		3		
120.1				
	Very loose, wet, grey, Broken Gravel	WH		
		1		
		2		
119.4				
6.10	Loose, wet, grey, Broken Gravel	WH		
		4		
		2		
		2		
		3		
		2		
117.9				
7.62		WH		

DEPTH	Description	BLOW	Qu kPa	W%
	Medium, moist, brown, Clay A7-6 with Broken Gravel	3	67.0B	#22
		2		
117.1				
	Soft, very moist, brown, Clay A7-6	WH		
		WH	28.7B	#502
		WH		
8.14		WH		
		WH	38.3S	#95
		WH		
115.6				
	Hard, dry, grey, Limestone	100/1cm		
	Auger refusal at 10.06m 115.3			
	Hard, dry, grey, Limestone			
10.67	Cored 10.06m to 11.58m			
	Recovery =100%			
	RQD = 90%			
	Compressive Strength Tests:			
	10.36m: 51823 kPa			
113.7	10.82m: 36392 kPa			
	Hard, dry, grey, Limestone			
12.19	Cored 11.58m to 13.11m			
	Recovery = 92%			
	RQD= 75%			
	Compressive Strength Test:			
	11.89m: 49072 kPa			
112.2				
	Bottom of hole = 13.11 meters			
13.72	Free water observed at 5.03 m			
	Elevation referenced to center of existing structure; Elevation = 125.27m			
	To convert "N" values to "N60" multiply by 1.25			
15.24				

N-Std Pentr Test: 2" OD Sampler,
140# Hammer, 30" Fall (Type Fail. B-Bulge S-Shear E-Estimated P-Penetrometer)

01/09/2002

BORING LOGS
ILL. ROUTE 146 OVER
GREEN CREEK
FAP 885 - SECTION 104BY-1
UNION COUNTY
STATION 15+288.500
STRUCTURE NO. 091-0072