STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

SPECIFICATIONS

Design: Load and Resistance Factor Design per AASHTO LRFD Bridge Design Specifications, Fourth Edition 2007 and Interim Specifications through 2008.

DESIGN LOADING

Live Load ..... HL - 93 Modified

TRAFFIC DATA

Current (2008) AADT	2660
Future (2028) AADT	3190
DHV - % of AADT	11%
Design Hour Volume	351
% Heavy Trucks (AADT)	6%
% Heavy Trucks (DHV)	6%
Directional Distribution (DHV)	55%
18 kip Equivalent P 2.0	103
18 kip Equivalent P 2.5	98
Design Speed (mph)	25

HYDROLOGIC DATA

Drainage Area	96.8 sq mi
Design Discharge (Q50)	3830 cfs
Check Discharge (Q100)	4330 cfs

MATERIALS

Concrete: (Precast)	Class "P"
(Curbs, Sidewalks, Texas Bridge Rail & Transition Barriers)	Class "LP"
(Seal)	Class "S"
(All Others)	Class "A"
Reinforcing Steel	ASTM A615, Grade 60
Prestressing Strand	AASHTO 203 (ASTM A416), Grade 270, Low Relaxation

BASIC DESIGN STRESSES

Concrete	f 'c = 4,350 psi
Concrete (Precast)	f ' c = 6,500 psi
	f ' ci = 4,550 psi
Concrete (Seal)	f'c = 2,900 psi
Reinforcing Steel	f y = 60,000 psi
Prestressing Strand	F μ = 270,000 psi

UTILITIES

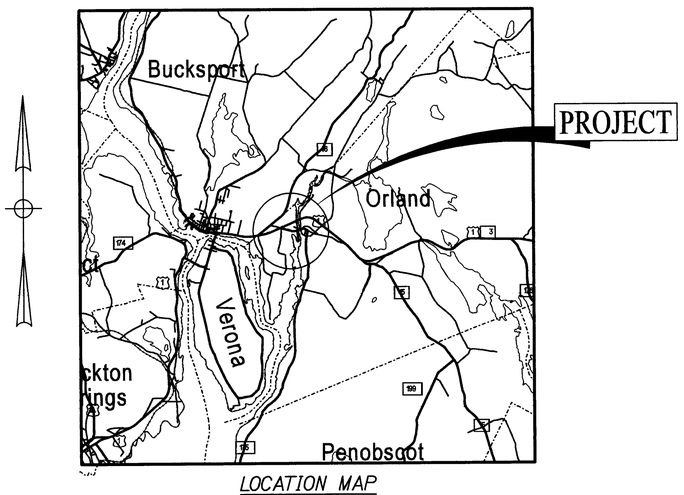
Central Maine Power Company
Town of Orland/Bucksport Sewer District
FairPoint Communications
Time Warner Cable

MAINTENANCE OF TRAFFIC

Route 175 over Orland River to be closed during construction, Traffic to be detoured via Route 1.

TOWN OF ORLAND
HANCOCK COUNTY
ORLAND RIVER BRIDGE
OVER
NARRAMISSIC RIVER
MAINE ROUTE 175

BR-1510(300)X
PROJECT LENGTH 0.047 mi.
BRIDGE REPLACEMENT
BRIDGE NO. 2632



LOCATION MAP

2 0 2 4

Scale in Miles

LIST OF DRAWINGS

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Special Work #1: SEWER MAIN

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PIN 15103.00

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION
APPROVED — DATE
COMMISSIONER:
CHIEF ENGINEER:

STATE OF MAINE — JOHN L. FRYER — No. 9655 — LICENSED PROFESSIONAL ENGINEER
P.E. NUMBER 9655
SIGNATURE
DATE 5/5/09

	NATE BENOIT	DATE
PROJ. MANAGER		
DESIGN-DETAILED	RMM	1/09
CHECKED-REVIEWED	RDR	1/09
DESIGN2-DETAILED2	JLF	
DESIGN3-DETAILED3		
REVISIONS 1		
REVISIONS 2		
REVISIONS 3		
REVISIONS 4		
FIELD CHANGES		

TOWN OF ORLAND
ORLAND RIVER BRIDGE
OVER NARRAMISSIC RIVER

TITLE SHEET

CLD CONSULTING ENGINEERS
Park Place Corporate Center
316 US Route 1, Suite D · York, ME 03909
(207) 363-0669 · Fax: (207) 363-2384
cld@cldengineers.com · www.cldengineers.com
Maine · New Hampshire · Vermont

SHEET NUMBER
1
OF 28

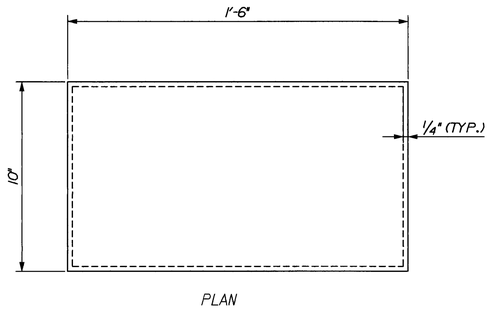
ELASTOMERIC BEARINGS NOTES:

1. THE SHEAR MODULUS OF THE ELASTOMER SHALL BE BETWEEN 130 AND 200 psi.

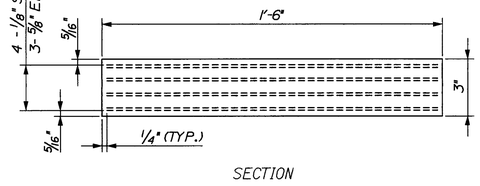
2. BEARINGS SHALL BE COVERED DURING TRANSIT.

3. THE BEARINGS ARE DESIGNED SO THAT THE SUPERSTRUCTURE MAY BE ERECTED WHEN THE AMBIENT AIR TEMPERATURE IS WITHIN THE RANGE OF 65°F AND 90°F. IF THE AMBIENT AIR TEMPERATURE IS OUTSIDE THIS RANGE, THE BEARINGS SHALL BE RESET AS DIRECTED BY THE RESIDENT.

4. ALL BEARINGS SHALL BE MARKED PRIOR TO SHIPPING. THE MARKS SHALL INCLUDE THE BEARING LOCATION ON THE BRIDGE, AND A DIRECTION ARROW THAT POINTS UP-STATION. ALL MARKS SHALL BE PERMANENT AND SHALL BE VISIBLE AFTER THE BEARING IS INSTALLED.



PLAN



SECTION

ELASTOMERIC BEARING

ABUTMENT NO. 1

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

BR-1510(300)X

PIN 15103.00

BRIDGE PLANS

2632

STATE OF MAINE — JOANN L PFEIFER No. 9555 — LICENSED PROFESSIONAL ENGINEER

P.E. NUMBER 9555

SIGNATURE

4/15/09

DATE

	BY	DATE
PROJ. MANAGER	NATE BENOIT	
DESIGN-DETAILED	RMM	1/09
CHECKED-REVIEWED	RDR	1/09
DESIGN2-DETAILED2		
DESIGN3-DETAILED3		
REVISIONS 1		
REVISIONS 2		
REVISIONS 3		
REVISIONS 4		
FIELD CHANGES		

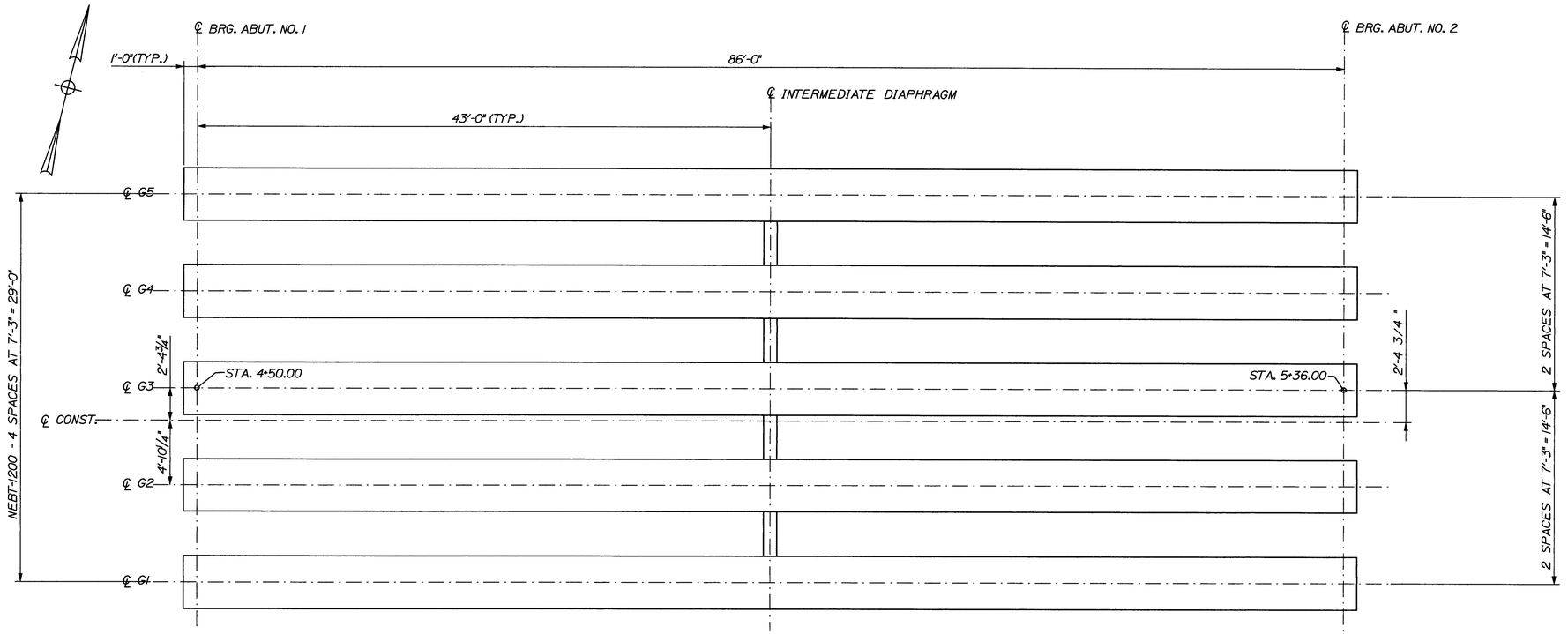
TOWN OF ORLAND
MAINE ROUTE 175
OVER ORLAND RIVER

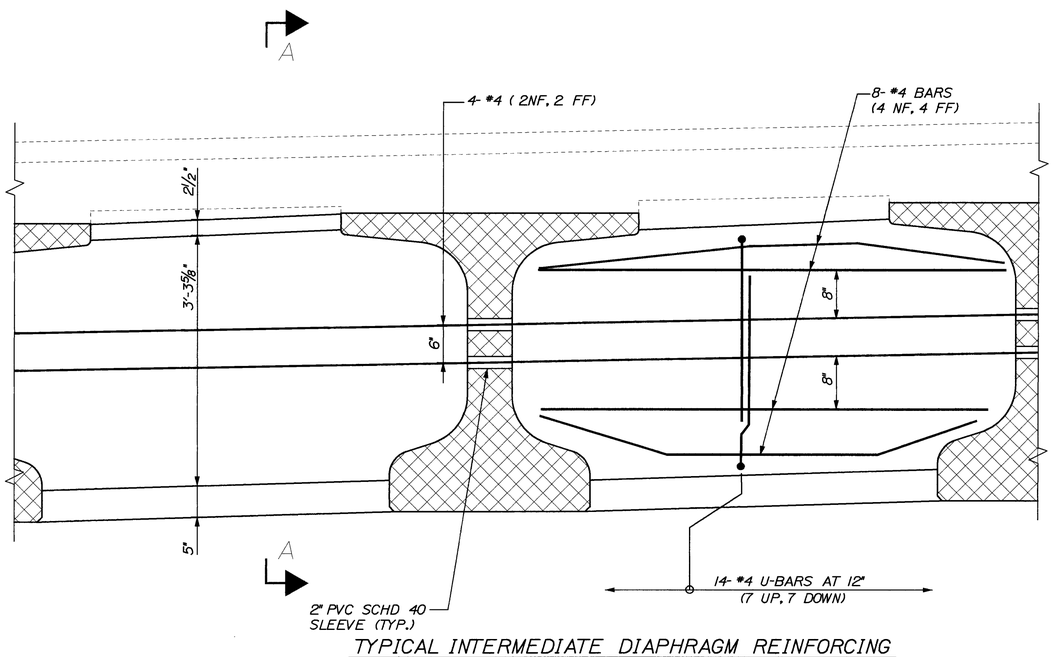
BEARING DETAILS

SHEET NUMBER

18

OF 28

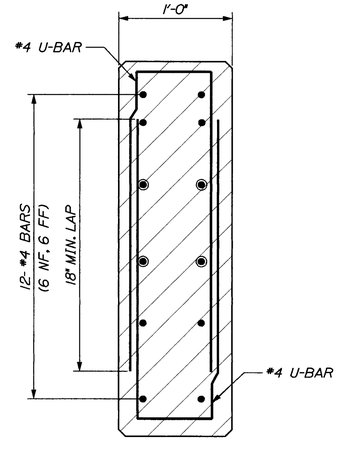




TYPICAL INTERMEDIATE DIAPHRAGM REINFORCING

(INTERIOR BEAMS ONLY)

NOTE: EXTERIOR BEAMS SHALL HAVE 4 THREADED INSERTS W/A 2'-2" LAP SPLICE TO CONTINUOUS BARS.



SECTION A-A

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

BR-1510(300)X

PIN 15103.00

BRIDGE PLANS

2832

STATE OF MAINE JOHN FRYER No. 9656 LICENSED PROFESSIONAL ENGINEER

P.E. NUMBER

4/15/09
DATE

PROJ. MANAGER	NATE BENOIT		
DESIGN-DETAILED	RMM	BY	DATE
CHECKED-REVIEWED	RDR	DND	1/09
DESIGN2-DETAILED2		JLF	1/09
DESIGN3-DETAILED3			
REVISIONS 1			
REVISIONS 2			
REVISIONS 3			
REVISIONS 4			
FIELD CHANGES			

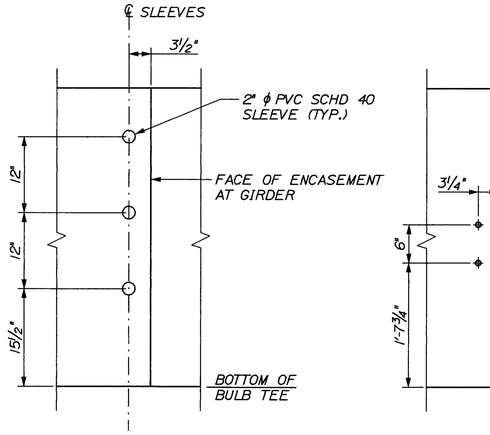
TOWN OF ORLAND
MAINE ROUTE 175
OVER ORLAND RIVER

FRAMING PLAN

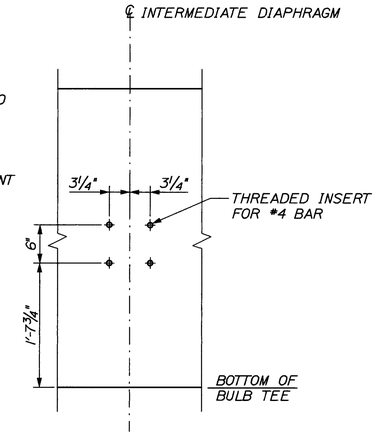
SHEET NUMBER

19

OF 28

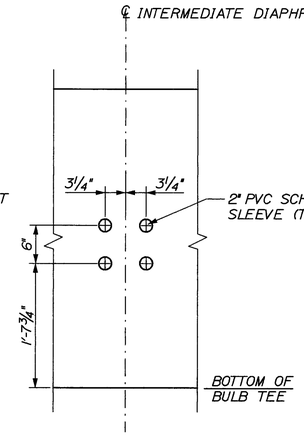


ABUTMENT NO. 1 & NO.2 ENCASEMENT SLEEVES



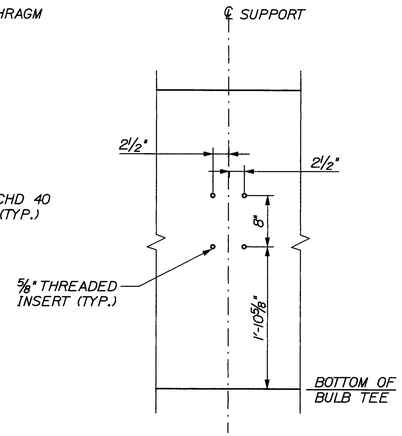
INTERMEDIATE DIAPHRAGM INSERTS

(GI & G5, INTERIOR FACE ONLY)



INTERMEDIATE DIAPHRAGM SLEEVES

(INTERIOR GIRDERS ONLY G2, G3, G4)



UTILITY SUPPORT INSERTS

(G5, EXTERIOR FACE ONLY)

PRECAST CONCRETE SUPERSTRUCTURE NOTES

1. Prestressing strands shall be 0.6-in. diameter. The tensioning force is 44 kips per prestressing strand.

2. Reinforcing steel shall have a minimum concrete cover of 2 inches unless otherwise noted.

3. The top surface of the upper flange of the prestressed beams shall be raked to a surface roughness of ±¼ inch, except at locations corresponding to the blocking points. At these locations a flattened area of sufficient size shall be finished to facilitate taking elevations for setting bottom of slab elevations.

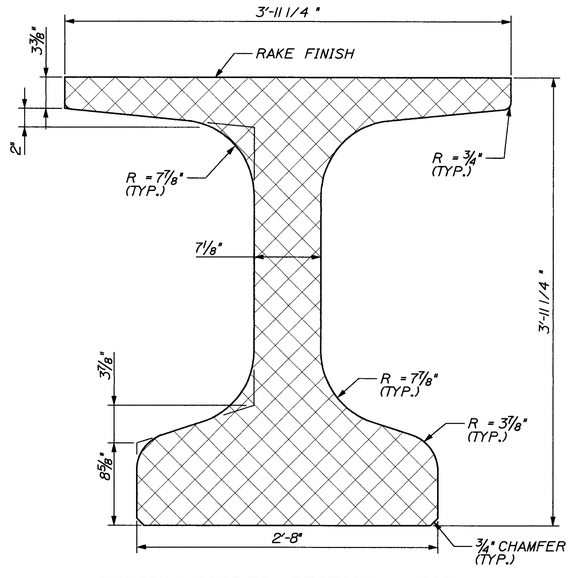
4. The drilling of holes in the prestressed beams and the use of power actuated tools on the beams will not be permitted.

5. Neoprene pads for bearings at Abutment No. 2 shall be either polychloroprene or natural polyisoprene of 50 ± 5 Shore A durometer hardness, and shall conform to the requirements of Division 2, Section 18.2 of AASHTO Standard Specifications for Highway Bridges. Neoprene pads will not be paid for directly but will be considered incidental to related contract items.

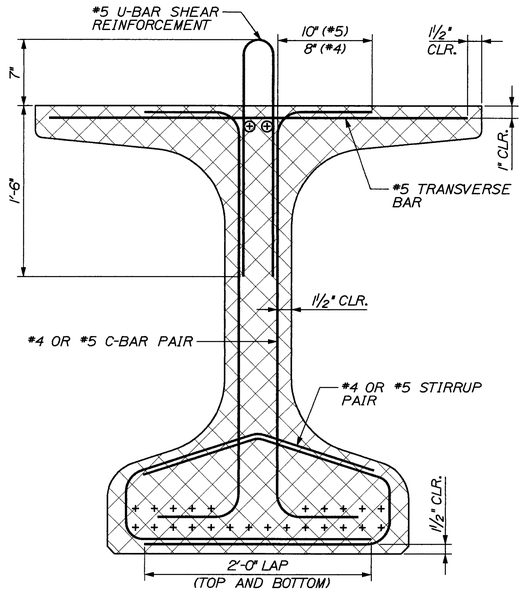
6. Bearings at Abutment No. 1 shall be elastomeric bearings paid under appropriate contract items. See Sheet 18 for details.

7. Utility support inserts shall be equal to "F-50 Rocket/Kohler Ferrule Insert" as manufactured by Dayton Superior, or approved equal, with ⅝" bolt diameter, 11 NC threads per inch, hot dip galvanized steel finish, 3-⅜" insert length, 2-¾" bolt engagement and 0.306" strut thickness (2 struts). Minimum safe working load of the inserts shall be 3000 lbs in tension and 3000 lbs in shear. Installation shall be in strict accordance with manufacturer's recommendations.
Applied insert loadings are as follows (loads are per insert):

Top:	Tension	= 1600 lbs
	Shear	= 500 lbs
Bottom:	Tension	= 1600 lbs
	Shear	= 900 lbs

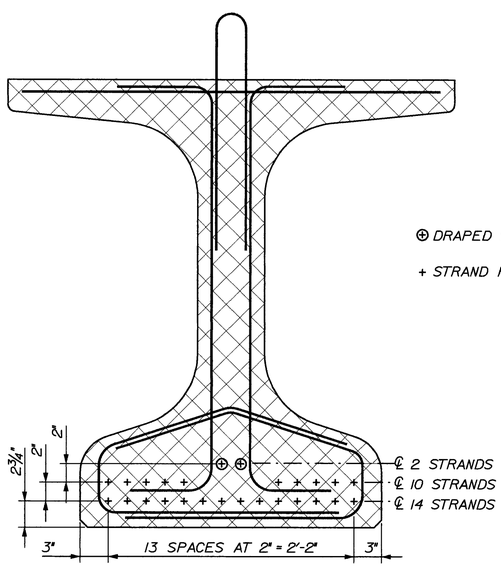


TYPICAL GIRDER SECTION - NEBT 1200

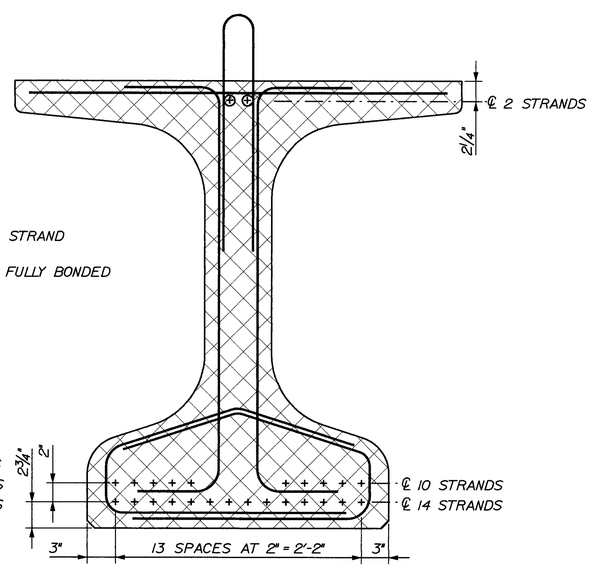


GIRDER REINFORCING SECTION

(STRAND PATTER AT BEAM SHOWN. OTHER LOCATIONS SIMILAR)



PRESTRESSING STRANDS AT BEAM MIDSPAN



PRESTRESSING STRANDS AT BEAM END

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

BR-1510(300)X

PIN 15103.00

BRIDGE PLANS

2832

STATE OF MAINE — JOHN P. DUDLEY — 12833 — REGISTERED PROFESSIONAL ENGINEER

P.E. NUMBER 12833

SIGNATURE

4/15/09

DATE

	BY	DATE
PROJ. MANAGER	NATE BENOIT	
DESIGN-DETAILED	RMM	1/09
CHECKED-REVIEWED	RDR	1/09
DESIGN2-DETAILED2		
DESIGN3-DETAILED3		
REVISIONS 1		
REVISIONS 2		
REVISIONS 3		
REVISIONS 4		
FIELD CHANGES		

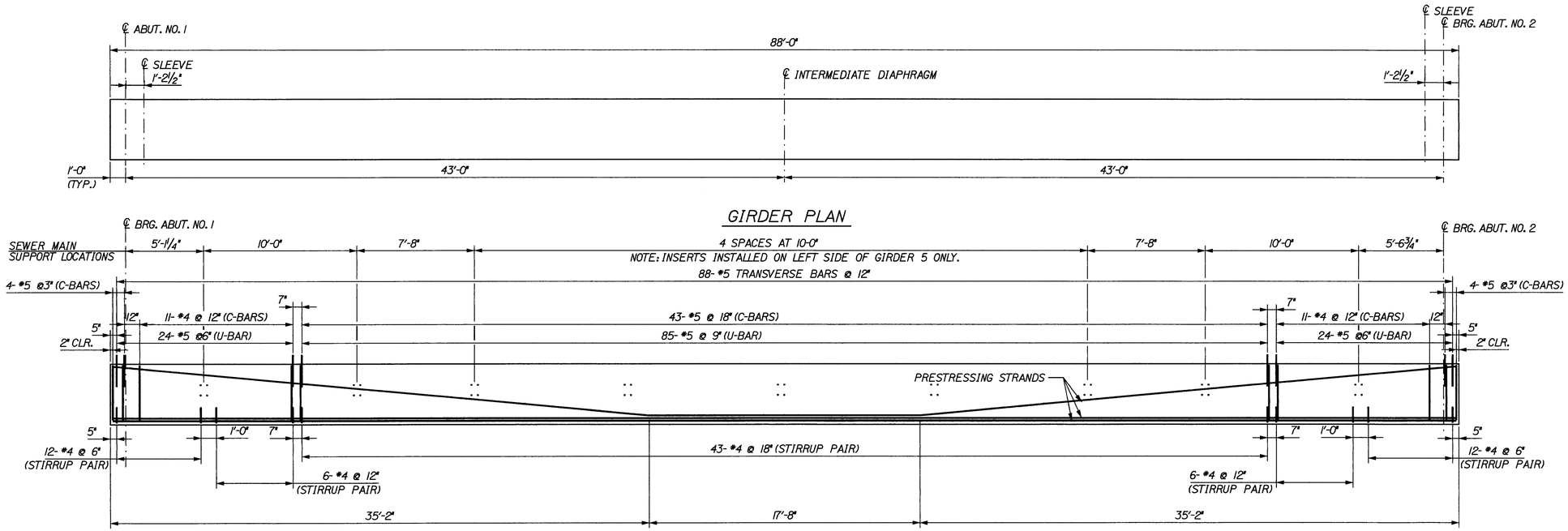
TOWN OF ORLAND
MAINE ROUTE 175
OVER ORLAND RIVER

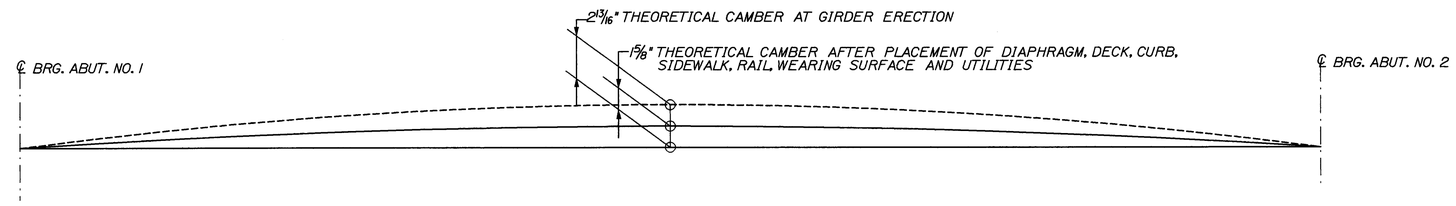
PRECAST GIRDERS

SHEET NUMBER

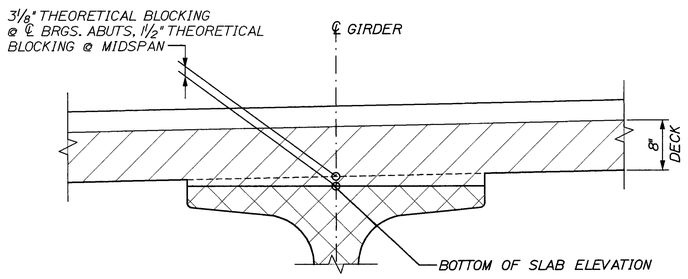
20

OF 28





CAMBER DIAGRAM



BLOCKING DETAIL

BOTTOM OF SLAB ELEVATIONS

BEAM	℄ BRG.	.1 SPAN	.2 SPAN	.3 SPAN	.4 SPAN	.5 SPAN	.6 SPAN	.7 SPAN	.8 SPAN	.9 SPAN	℄ BRG.
G5	16.07	16.53	17.02	17.51	18.00	18.50	19.01	19.53	20.05	20.57	21.01
G4	16.22	16.67	17.16	17.65	18.14	18.64	19.15	19.67	20.19	20.71	21.16
G3	16.36	16.82	17.31	17.80	18.29	18.79	19.30	19.82	20.34	20.86	21.30
G2	16.51	16.96	17.45	17.94	18.43	18.93	19.44	19.96	20.48	21.00	21.45
G1	16.65	17.11	17.60	18.09	18.58	19.08	19.59	20.11	20.63	21.15	21.59

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

BR-1510(300)X

PIN 15103.00

BRIDGE PLANS

2632

STATE OF MAINE — LICENSED — PROFESSIONAL ENGINEER

NATE BENOIT
P.E. NUMBER 9655
SIGNATURE
4/15/09
DATE

	BY	DATE
PROJ. MANAGER	NATE BENOIT	
DESIGN-DETAILED	RMM	1/09
CHECKED-REVIEWED	RDR	1/09
DESIGN2-DETAILED2		
DESIGN3-DETAILED3		
REVISIONS 1		
REVISIONS 2		
REVISIONS 3		
REVISIONS 4		
FIELD CHANGES		

TOWN OF ORLAND
MAINE ROUTE 175
OVER ORLAND RIVER

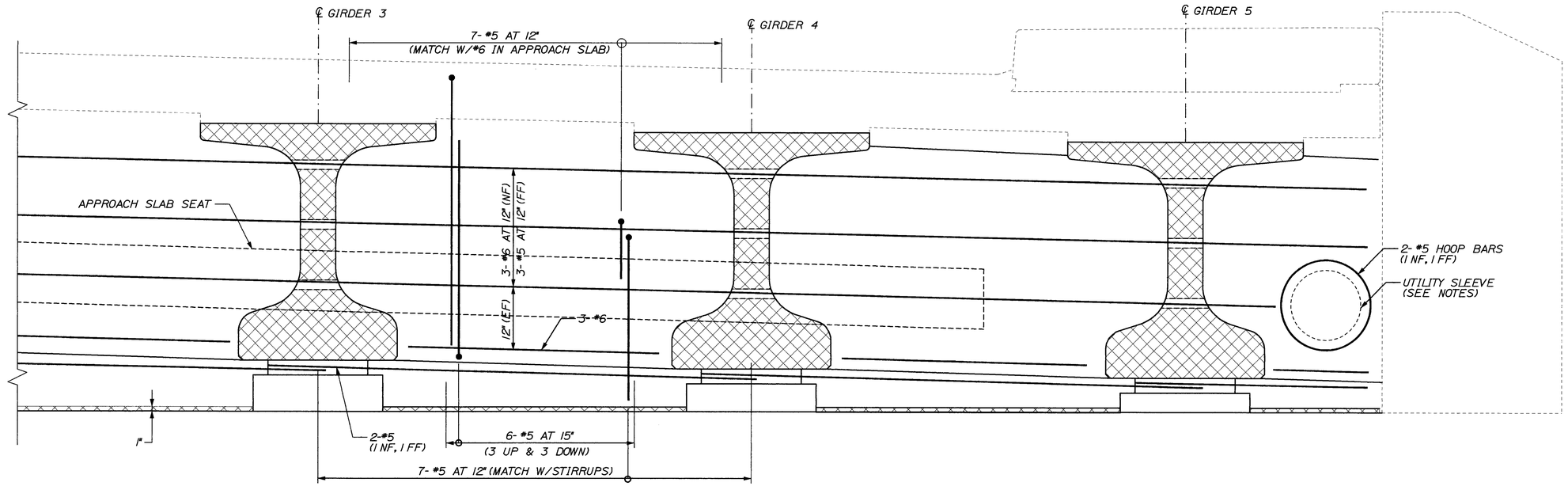
PRECAST GIRDERS

SHEET NUMBER
21
OF 28

UTILITY SLEEVE NOTES:

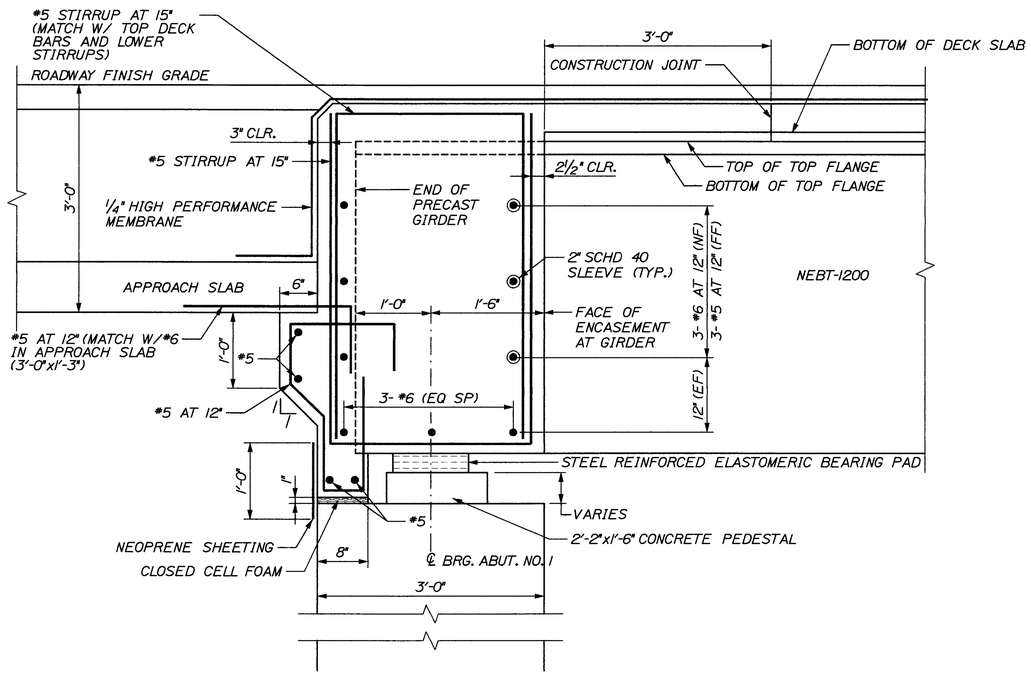
1. Sewer main sleeves through end diaphragms shall be as specified on Plan Sheet 28. Sleeves shall extend 1" beyond concrete face on each side. Contractor shall field verify elevations to fit the new sleeve and reinforcing to the existing sewer main.

2. Cost of materials and installation for the wall sleeve and appurtenances shall be incidental to related items.



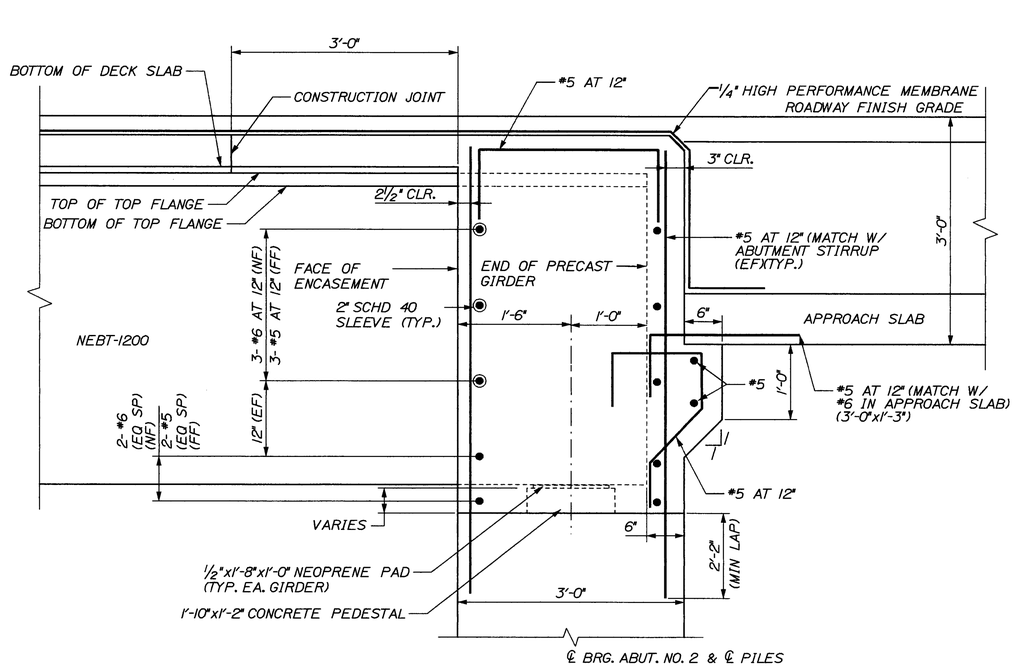
ABUTMENT NO. 1 ENCASEMENT ELEVATION

NOTE: HORIZONTAL BARS IN APPROACH SLAB SEAT NOT SHOWN FOR CLARITY.



ABUTMENT NO. 1 ENCASEMENT SECTION

NOTE: DECK BARS NOT SHOWN BUT SHALL EXTEND TO FAR FACE OF ENCASEMENT.



ABUTMENT NO. 2 ENCASEMENT SECTION

NOTE: DECK BARS NOT SHOWN BUT SHALL EXTEND TO FAR FACE OF ENCASEMENT.

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

BR-1510(300)X

PIN 15103.00

BRIDGE PLANS

2832

STATE OF MAINE JOHN J. FRYER No. 9655 LICENSED PROFESSIONAL ENGINEER

P.E. NUMBER 9655

SIGNATURE

4/15/09

DATE

PROJ. MANAGER	NATE BENOIT		
DESIGN-DETAILED	RMM	DJD	1/09
CHECKED-REVIEWED	RDR	JLF	1/09
DESIGN2-DETAILED2			
DESIGN3-DETAILED3			
REVISIONS 1			
REVISIONS 2			
REVISIONS 3			
REVISIONS 4			
FIELD CHANGES			

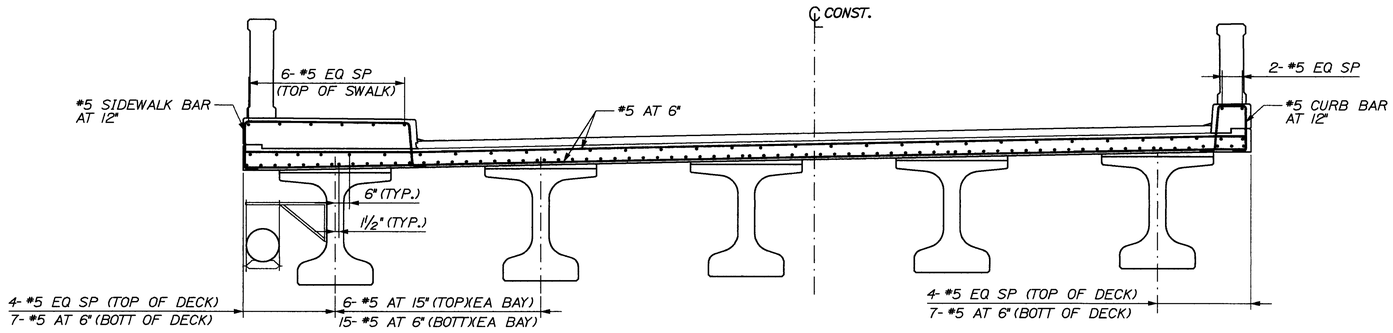
TOWN OF ORLAND
MAINE ROUTE 175
OVER ORLAND RIVER

END DIAPHRAGMS

SHEET NUMBER

22

OF 28



SUPERSTRUCTURE REINFORCING SECTION

SUPERSTRUCTURE NOTES

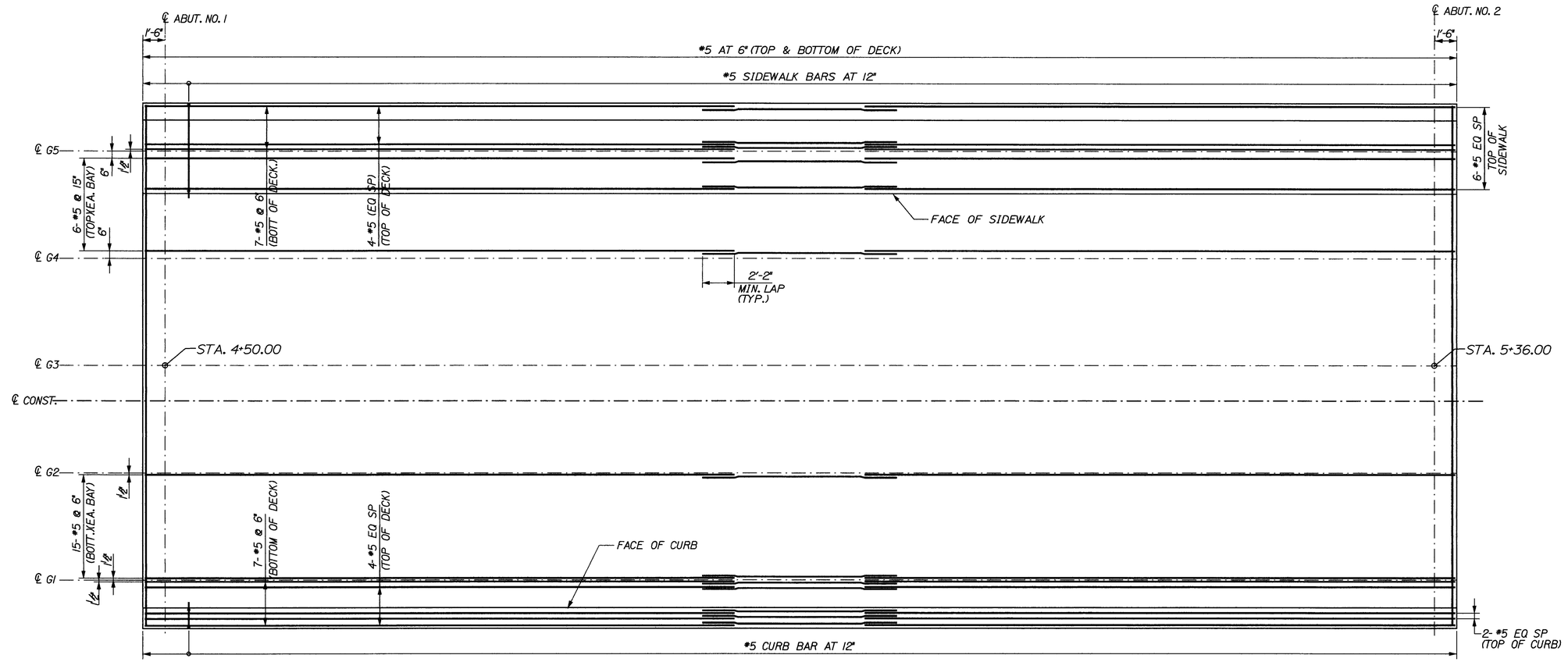
1. The theoretical blocking used for design of the structure is 3⅛ inch at the centerline of bearing at the abutments. Refer to Sheet 21 for blocking details.

2. Reinforcing steel shall have a minimum concrete cover of 2 inches unless otherwise noted.

3. Form a one inch V-groove on the fascias at the horizontal joint between the curb and slab.

4. The superstructure slab concrete for each span shall be placed in one continuous operation and shall be kept plastic until the entire placement has been made.

5. The Contractor shall install Texas Classic Rail vertical closed stirrups, as shown in Standard Details Section 526, prior to the placement of the curb or sidewalk concrete (stirrups incidental to pay Item 526.323, Texas Bridge Rail).



SUPERSTRUCTURE PLAN

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

BR-1510(300)X

PIN 15103.00

BRIDGE PLANS

2832

STATE OF MAINE — JOHN FISHER No. 9655 — LICENSED PROFESSIONAL ENGINEER

P.E. NUMBER 9655

SIGNATURE

DATE 4/15/09

	BY	DATE
PROJ. MANAGER	NATE BENOIT	
DESIGN-DETAILED	RMM	1/09
CHECKED-REVIEWED	RDR	1/09
DESIGN2-DETAILED2	DMD	
DESIGN3-DETAILED3	ALF	
REVISIONS 1		
REVISIONS 2		
REVISIONS 3		
REVISIONS 4		
FIELD CHANGES		

TOWN OF ORLAND
MAINE ROUTE 175
OVER ORLAND RIVER

SUPERSTRUCTURE

SHEET NUMBER

23

OF 28