STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

SPECIFICATIONS

DESIGN: AASHTO LRFD Bridge Design Specifications, Third Edition, 2004.

DESIGN LOADING

Live Load ..... HL - 93 Modified for Strength I

TRAFFIC DATA

Current (2004) AADT	2830
Future (2024) AADT	4020
DHV - % of AADT	10
Design Hour Volume	381
% Heavy Trucks (AADT)	42
% Heavy Trucks (DHV)	42
Directional Distribution (DHV)	56
80 kN Equivalent P 2.0	1315
80 kN Equivalent P 2.5	1254
Design Speed (km/h)	70

HYDROLOGIC DATA

Drainage Area	3691 km²
Design Discharge (Q50)	816 m³/s
Check Discharge (Q100)	921 m³/s
Headwater Elevation (Q50)	23.57 m
Headwater Elevation (Q100)	23.90 m
Discharge Velocity (Q50)	0.99 m/s
Discharge Velocity (Q100)	1.03 m/s

MATERIALS

Concrete	
Curbs, Median, Trans. Barriers, Wearing Surface	Class "LP"
Seals	Class "S"
Precast	Class "P"
All other	Class "A"
Prestressing Strands	ASTM A 416M, Grade 270 (Low Relaxation)
Reinforcing Steel	
Curbs, Median, Trans. Barriers	ASTM A 615/A 615M, Grade 520 (MMFX 2)
All other	ASTM A 615/A 615M, Grade 420

BASIC DESIGN STRESSES

Concrete	
Class "LP"	f 'c = 35 MPa
Class "S"	f 'c = 20 MPa
Class "P"	f 'c = 56 MPa f 'ci = 42 MPa
Class "A"	f 'c = 35 MPa
Prestressing Strands	f pu = 1 860 MPa
Reinforcing Steel	
ASTM A 615/A 615M, Grade 520	f y = 520 MPa
ASTM A 615/A 615M, Grade 420	f y = 420 MPa

UTILITIES

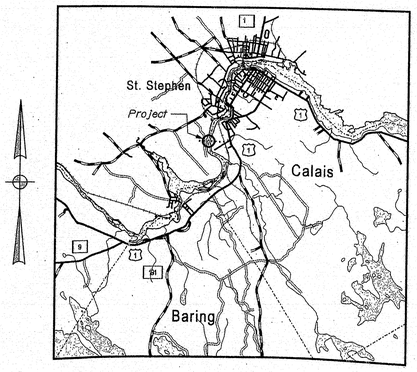
Provision for future utilities.

MAINTENANCE OF TRAFFIC

New highway alignment - no traffic maintenance.

ST. STEPHEN, N.B., CANADA
CALAIS, MAINE, U.S.A.
ST. CROIX RIVER BRIDGE
OVER
ST. CROIX RIVER
CANADA / U.S.A. ROUTE 1

PROJECT NO. NCPD/CBI-8483(360)X
PROJECT LENGTH 0.270 km
NEW BRIDGE CONSTRUCTION
BRIDGE NO. 6440



LOCATION MAP

2 0 2 4

Scale in Kilometers

LIST OF DRAWINGS

Title Sheet	1
Estimated Quantities	2
General Plan	3
Profile	4
Interpretive Subsurface Profile	5
Boring Logs	6-9
Highway Approach Cross Sections	10-16
Abutment No. 1 Footing	17
Abutment No. 1 Shaft	18
Abutment No. 1 Rebar	19
Abutment No. 2 Footing	20
Abutment No. 2 Shaft	21
Abutment No. 2 Rebar	22
Pier No. 1 Footing	23
Pier No. 1 Shaft	24
Pier No. 2 Footing	25
Pier No. 2 Shaft	26
Pier No. 3 Footing	27
Pier No. 3 Shaft	28
Pier Details	29
Bearings	30
Framing Plan	31
Precast Girders	32
Precast Girder Details	33
Abutment Diaphragms	34
Abutment Diaphragm Sections	35
Intermediate Diaphragms	36
Pier Diaphragms	37
Pier Diaphragm Sections	38
Utility Details	39
Superstructure Plan	40
Superstructure Sections	41
Superstructure Reinforcing	42
Superstructure Reinforcing Details	43
Bridge Drains	44
Lighting	45
Duct Bank Profile	46
Construction Access Plan	47

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION
APPROVED
COMMISSIONER: DATE 7/6/06
CHIEF ENGINEER: 11600

STATE OF MAINE ★ ENGINEER ★ PROFESSIONAL
M. Asif Iqbal 11600

M. Asif Iqbal
SIGNATURE
11030
P.E. NUMBER
7/19/2006
DATE

PROJECT INFORMATION		
PROGRAM	BRIDGE PROGRAM	
PROJECT MANAGER	DEVIN ANDERSON	
DESIGNER	M. ASIF IQBAL	
CONSULTANT (Pier Design)	CASWELL ENGINEERING	
PROJECT RESIDENT	CARL DODGE	
CONTRACTOR		
PROJECT COMPLETION DATE		

PIN 008483.36

NCPD\CBI-8483(360)X

ST. STEPHEN - CALAIS
ST. CROIX RIVER BRIDGE

TITLE SHEET

SHEET NUMBER
1
OF 47

143-174A

Filename: ...\36\BRIDGE\MSTA\001_Title.dgn Division: BRIDGE Username: dana.damren Date:7/19/2006

METRIC	1. All dimensions are in millimeters unless otherwise noted. 2. All elevations and stations are in meters.	F.H.W.A. REG. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
		1	MAINE	NCPD\CBI-8483(360)X	2	47

8483.36

ESTIMATED QUANTITIES

ITEM NO.	DESCRIPTION	QUANTITY	UNIT
201.11	CLEARING	2	HA
203.20	COMMON EXCAVATION	50	M3
203.2318	DISPOSAL OF SPECIAL WASTE	100	MG
203.24	COMMON BORROW	7 500	M3
203.25	GRANULAR BORROW	1615	M3
206.082	STR EARTH EXC - MAJOR STRUCTURES	1200	M3
206.092	STR ROCK EXC - MAJOR STRUCTURES	30	M3
206.10	STR EARTH EXC - PIERS	6 000	M3
304.10	AGGR SUBBASE COURSE - GRAVEL	2 143	M3
501.50	STEEL H-BEAM PILES 132 KG/M, DELIVERED	425	M
501.501	STEEL H-BEAM PILES 132 KG/M, IN PLACE	425	M
501.90	PILE TIPS	48	EA
501.91	PILE SPLICES	12	EA
501.92	PILE DRIVING EQUIPMENT MOBILIZATION	1	LS
502.21	STR CONC ABUT & RET WALL	190	M3
502.219	STR CONC ABUT & RET WALL (1045 M3)	1	LS
502.239	STR CONC PIERS (2 010 M3)	1	LS
502.24	STR CONC PIERS UNDER WATER	5 800	M3
502.261	STR CONC RD&SW SLAB ON CONC BR (1302 M3)	1	LS
502.29	STR CONC WEARING SUR ON BR (208 M3)	1	LS
502.31	STR CONC APPROACH SLAB (44 M3)	1	LS
502.49	STRUCT. CONCRETE CURBS AND SIDEWALKS (89 M3)	1	LS
503.12	REINF STEEL, FAB & DEL	370 000	KG
503.13	REINF STEEL, PLACING	370 000	KG
503.24	MMFX 2 REINF STEEL, FAB & DEL	9 600	KG
503.25	MMFX 2 REINF STEEL, PLACING	9 600	KG
507.0811	STEEL BRIDGE RAILING, 2 BAR (682 M)	1	LS
511.07	COFFERDAM: ABUT. NO. 1	1	LS
511.07	COFFERDAM: ABUT. NO. 2	1	LS
511.07	COFFERDAM: PIER NO. 1	1	LS
511.07	COFFERDAM: PIER NO. 2	1	LS
511.07	COFFERDAM: PIER NO. 3	1	LS
512.081	FRENCH DRAINS (140 M)	1	LS
514.06	CURING BOX FOR CONC CYLINDERS	1	EA
515.21	PROTECTIVE COAT FOR CONC SURFACES (4 880 M2)	1	LS
520.21	EXPANSION DEVICE - GLAND SEAL	4	EA
523.5401	LAMINATED ELASTOMERIC BEARINGS, FIXED	60	EA
523.5402	LAMINATED ELASTOMERIC BEARINGS, EXPANSION	20	EA
526.301	TEMPORARY CONCRETE BARRIER, TYPE I (55 M)	1	LS
526.34	PERMANENT CONC TRANSITION BARRIER	8	EA
535.61	PRESTRESSED STR CONC I-GIRDER (1707 M)	1	LS
607.235	CHAIN LINK FENCE, 3.7 M	230	M
610.08	PLAIN RIPRAP	1100	M3
613.319	EROSION CONTROL BLANKET	100	M2
615.07	LOAM	80	M3
618.1401	SEEDING METHOD NUMBER 2 - PLAN QUANTITY	16	UN
618.15	TEMPORARY SEEDING	10	KG
619.1201	MULCH - PLAN QUANTITY	16	UN
620.58	EROSION CONTROL GEOTEXTILE	1000	M2
626.21	METALLIC CONDUIT	6	M
626.22	NON - METALLIC CONDUIT	43	M
629.05	HAND LABOR, STRAIGHT TIME	100	HR
631.12	ALL-PURPOSE EXC (INC OPERATOR)	10	HR
631.172	TRUCK-LARGE (INC OPERATOR)	10	HR
634.251	SERVICE POLE, 7.6 M	2	EA
638.01	EMBEDDED WORK IN STRUCTURES	1	LS
639.18	FIELD OFFICE TYPE A	2	EA
652.38	FLAGGER	100	HR
652.39	WORK ZONE TRAFFIC CONTROL	1	LS
656.75	TEMP. SOIL EROSION AND WATER POLLUTION CONTROL	1	LS
659.10	MOBILIZATION	1	LS
890.01	SPECIAL WORK #1	1	LS

ESTIMATED QUANTITIES

ITEM NO.	DESCRIPTION	QUANTITY	UNIT

GENERAL CONSTRUCTION NOTES

1. For easements, construction limits, and right - of - way lines, refer to the Construction Access Plan.

2. The Canadian approach road is currently under construction and will be available for access to the bridge site.

3. Place a 600 mm wide strip of temporary erosion control blanket on the side slopes along the top of the riprap and behind the wingwalls.

4. Place loam 50 mm deep on all sideslopes.

5. Protective coating for concrete surfaces shall be applied to the following areas:

   All exposed surfaces of concrete curbs and median.
   Fascias down to the drip notch.
   All exposed surfaces of concrete transition barriers,
   Concrete wearing surfaces,
   Top of abutment backwalls and to 300 mm below the top of backwalls on the back side.

6. Place riprap on sideslopes up to elevation 24.5.

7. Construct the riprap shelf at each abutment at elevation 24.5.

8. Bidders and Contractors may obtain a copy of the Hydrology and Hydraulic Report of the bridge site by contacting the Project Manager. The report is based on the Department's interpretation of information obtained for the subject site. No assurance is given that the information or the conclusions of the report will be representative of actual conditions at the time of construction.

9. Bidders and Contractors may obtain a copy of the project Geotechnical Report, "Report on Proposed St. Croix River Bridge Project, PIN 8483.32, 8 February 2005, File No. 30059-001," by contacting the Project Manager.

10. Geotechnical information furnished or referred to in this plan set is for the Bidder's and Contractor's use. No assurance is given that the information or interpretations will be representative of actual subsurface conditions at the time of construction. The Department will not be responsible for the Bidder's and Contractor's interpretations of, or conclusions drawn from, the Geotechnical Information. The boring logs contained in the plan set present factual and interpretive subsurface information collected at discrete locations. Data provided may not be representative of the subsurface conditions between boring locations.

11. Reinforcing Steel Schedules will be the responsibility of the Contractor. Refer to Subsection 503.03 of the Standard Specifications for more information. Payment for all work associated with developing reinforcing steel schedules will be considered incidental to the related contract items.

12. Bending details and hooks for reinforcing steel shall conform to the recommendations of the current revision of ACI Standards 315 and 318.

13. Minimum splice lengths for plain reinforcing steel not otherwise shown shall be as given the table in Subsection 503.07 of the Standard Specifications.

14. All reinforcing steel in the curbs and median, which includes the longitudinal straight bars and the vertical stirrups, shall be MMFX 2 rebar. Payment will be made under the appropriate reinforcing steel pay items.

15. All reinforcing steel in the transition barriers shall be MMFX 2 rebar. No separate payment will be made.

16. Payment for Abutment No. 2 Footing will be made under Item No. 502.21, Structural Concrete Abutments and Retaining Walls (Cubic Meter).

17. At the option of the Contractor, one field office structure with the floor area equivalent of two Field Office Type A may be supplied, as approved by the Resident. Payment for a single combined structure will be based on the contract bid price for two Field Office Type A.

143-174B

BRIDGE NO. 6440

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

ST. CROIX RIVER BRIDGE
OVER
ST. CROIX RIVER
BETWEEN
ST. STEPHEN, N.B., CANADA
CALAIS, MAINE, U.S.A.

ESTIMATED QUANTITIES

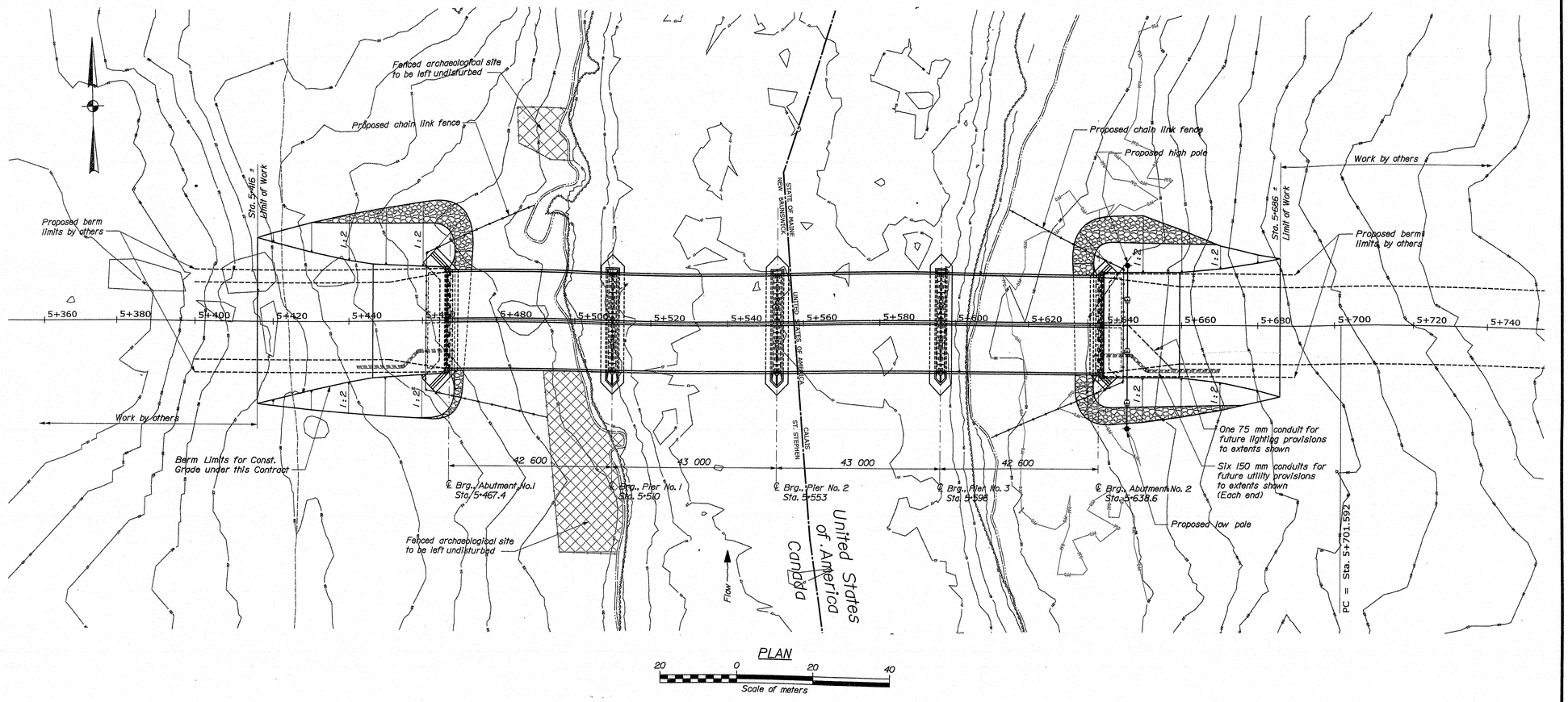
AUGUSTA, MAINE

PROJECT DESIGN ENGINEER	BY	DATE
DESIGN-DETAILED	M. A. Iqbal	Team 4 & 5
CHECKED	-------	-------
REVISIONS	-------	-------
FIELD CHANGES	-------	-------

PLANS

Filename: ...\bridge\vmsta\002_Estimate.dgn Division: BRIDGE Username: dana.damren Date:8/31/2006

METRIC	1. All dimensions are in millimeters unless otherwise noted. 2. All elevations and stations are in meters.	F.I.S.N.A. REG. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
		1	MAINE	NCPD\CBI-8483(360)X	3	47



PLAN

20 0 20 40

Scale of meters

PROJECT DESIGN ENGINEER	BY	DATE
DESIGNED	M. A. Abbé	
DETAILED	Team 4 & 5	
CHECKED	———	———
REVISIONS	———	———
FIELD CHANGES	———	———

PLANS

143-175A

BRIDGE NO. 6440

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

ST. CROIX RIVER BRIDGE
OVER
ST. CROIX RIVER
BETWEEN
ST. STEPHEN, N.B., CANADA
CALAIS, MAINE, U.S.A.

GENERAL PLAN

AUGUSTA, MAINE

Filename: ...\msta\003_General Plan.dgn Division: BRIDGE Username: dana.damren Date:8/31/2006

Filename: ...\36\bridge\msta\004_Profile.dgn Division: BRIDGE Username: dana.damren Date:8/31/2006

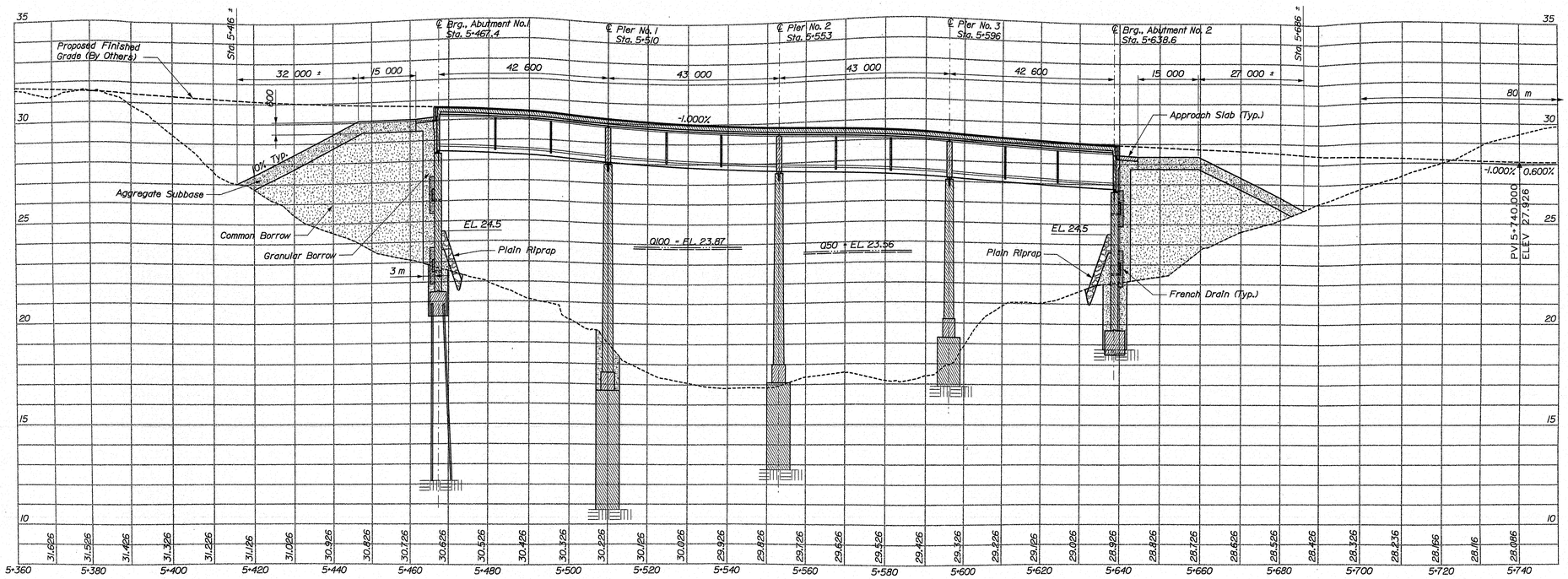
PROJECT DESIGN ENGINEER	BY	DATE
DESIGN-PST-MLED	M.A. Iqbal	Item 4 & 5
CHECKED		
REVISIONS		
FIELD CHANGES		

PLANS

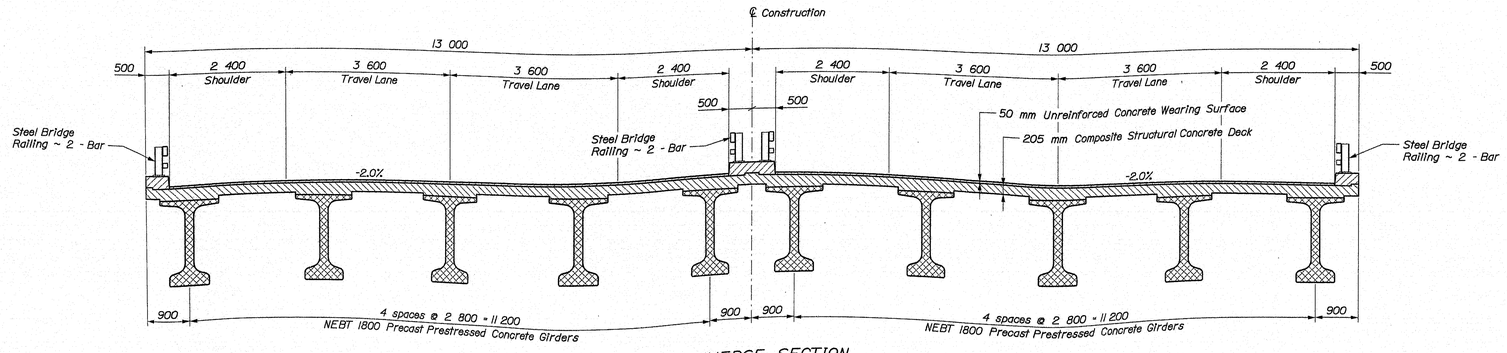
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2. All elevations and stations are in meters.

F.H.W.A. REG. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
1	MAINE	NCPD\CBI-8483(360)X	4	47

8483.36



PROFILE



TRANSVERSE SECTION

143-175B

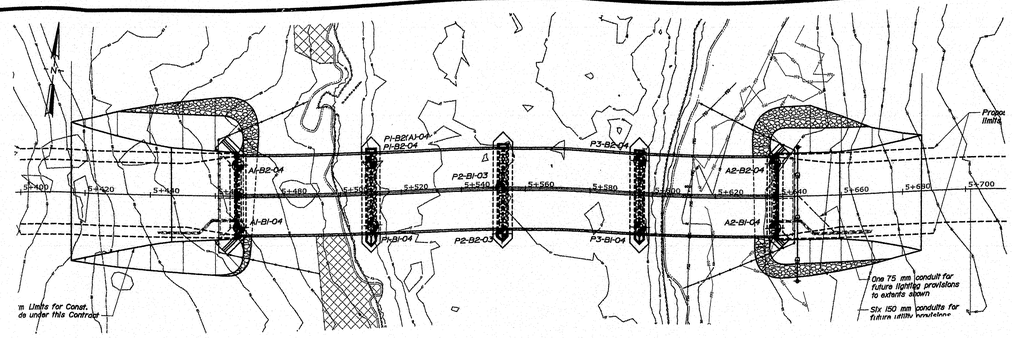
BRIDGE NO. 6440

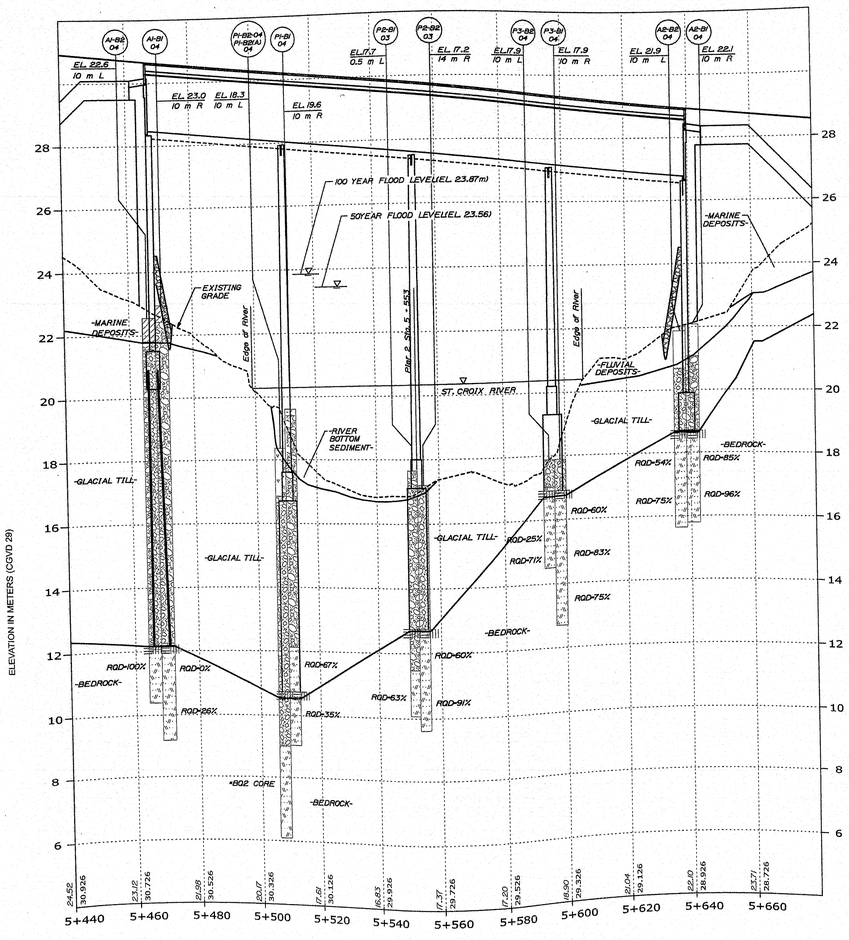
STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

ST. CROIX RIVER BRIDGE
OVER
ST. CROIX RIVER
BETWEEN
ST. STEPHEN, N.B., CANADA
CALAIS, MAINE, U.S.A.

PROFILE

AUGUSTA, MAINE





PROJECT DESIGN ENGINEER	KSD	BY	DATE
PLANS	DESIGN-DETAILED		
	CHECKED		
	REVISIONS		
	FIELD CHANGES		

METRIC 1. All dimensions are in millimeters unless otherwise noted.
2. All elevations and stations are in meters.

F.A.H.W.A. REG. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
1	MAINE	NCPD/CSL-8483(36)0IX	5	47

8483.36

NOTES :

1. SITE BACKGROUND INFORMATION, CONTOURS OF GROUND SURFACE ELEVATION, AND LOCATION OF PROPOSED ABUTMENTS AND PIERS ARE TAKEN FROM A PLAN PROVIDED BY T.Y. LIN INTERNATIONAL. THIS PLAN WAS MODIFIED BY HALEY & ALDRICH, INC. TO SHOW THE LOCATION OF SUBSURFACE EXPLORATIONS.
2. TEST BORINGS WERE DRILLED BY MAINE TEST BORINGS, INC. OF BREWER, MAINE.
3. TEST BORINGS WERE MONITORED BY HALEY & ALDRICH, INC. PERSONNEL.
4. LOCATIONS OF TEST BORINGS ARE APPROXIMATE AND WERE DETERMINED IN THE FIELD BY MAINE DEPARTMENT OF TRANSPORTATION.
5. GROUND SURFACE ELEVATIONS AT TEST BORING LOCATIONS ARE APPROXIMATE AND WERE DETERMINED USING SITE TOPOGRAPHIC INFORMATION PROVIDED BY T.Y. LIN INTERNATIONAL.
6. GROUND SURFACE ELEVATIONS ARE IN METERS AND REFERENCE CANADIAN GEODETIC VERTICAL DATUM OF 1929 (CGVD)
7. THE GRAPHIC LOG LABELED P1-B2/B2A-04 IS A COMPOSITE OF CONDITIONS ENCOUNTERED IN BORINGS P1-B2-04 AND P1-B2(A)-04.

LEGEND:

- P1-B1-03, P3-B1-04 — DESIGNATION AND APPROXIMATE LOCATION OF TEST BORING DRILLED BY MAINE TEST BORINGS, INC. DURING THE PERIOD 20 THROUGH 27 JULY FOR PIERS NO. 1 AND 3
- P2-B1-03 — DESIGNATION AND APPROXIMATE LOCATION OF TEST BORING DRILLED BY MAINE TEST BORINGS, INC. DURING THE PERIOD 11 THROUGH 17 DECEMBER 2003 FOR PIER NO. 2
- A1-B1-04, A2-B1-04 — DESIGNATION AND APPROXIMATE LOCATION OF TEST BORING DRILLED BY MAINE TEST BORINGS, INC. DURING THE PERIOD 24 AND 25 MARCH 2004 AND 12 AND 13 APRIL 2004 FOR ABUTMENT STRUCTURES
- GSA-1 — DESIGNATION AND APPROXIMATE LOCATION OF TEST BORING DRILLED BY MAINE TEST BORINGS, INC. ON 7 APRIL 2004 FOR THE GSA FACILITIES
- RQD — ROCK QUALITY DESIGNATION

PROFILE KEY/GEOLOGIC UNITS

MARINE DEPOSITS- PRIMARILY SILTY CLAY, NON-PLASTIC TO SLIGHTLY PLASTIC

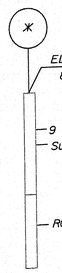
RIVER BOTTOM SEDIMENT- GRAVELLY SAND WITH COBBLES

FLUVIAL DEPOSITS- SILTY FINE SAND (ALLUVIUM)

GLACIAL TILL- HETEROGENEOUS MIX OF SAND SILT AND GRAVEL WITH COBBLES AND OCCASIONAL BOULDERS

BEDROCK SURFACE- INTERPOLATED OR EXTRAPOLATED FROM BEDROCK CORES OR REFUSALS

LEGEND



- BORING NUMBER
- EL. 23.0 / 8L — GROUND SURFACE ELEVATION / OFFSET FROM CENTER LINE
- 9 / Su-72.7 kPa — SPT N-VALUE / FIELD VANE SHEAR STRENGTH
- STRATA INTERFACE
- RQD-98% — ROCK QUALITY DESIGNATION FOR ROCK CORE SAMPLE
- BOE EL. 17.83 — BOTTOM OF EXPLORATION ELEVATION

143-176A

BRIDGE NO. 6440

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

ST. CROIX RIVER BRIDGE
OVER
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ST. STEPHEN, N.B., CANADA
CALAIS, MAINE, U.S.A.

INTERPRETIVE SUBSURFACE PROFILE

AUGUSTA, MAINE

METRIC 1. All dimensions are in millimeters unless otherwise noted.
2. All elevations and stations are in meters.

F.H.W.A. REG. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
1	MAINE	NCPD/CSI-8483(306)X	6	47

8483.36

Haley & Aldrich, Inc.

Soil/Rock Exploration Log — METRIC UNITS

Project: Calais, ME & St. Stephen, NB
Location: St. Croix River Bridge
File No. 30059-001

Boring No.: A2-B2-04
PIN: 8483.36

Driller:	D. McKeen	Elevation (m):	21.90
Operator:	Maine Test Borings, Inc.	Datum:	CGVD28 metric
Logged By:	T. Erickson	Rig Type:	Mobile B-53 Barnbarder
Date Start/Finish:	3/28/04 – 3/28/04	Drilling Method:	Drive and Wash
Boring Location:	Sta 5 + 839, 10 m, L	Casing ID/OD:	HW 7.6 cm/8.3 cm HW 10.2 cm
Auger ID/OD:	– / –		
Sampler:	3.5 cm – I.D. Spoon		
Hammer Wt./Fall:	140 lb/76.6 cm – 300 lb./0.6 cm		
Core Barrel:	NX Standard		
Water Level *:	123.76; Time water at 2.3 m		

Definitions:
S_u = Intu Field Vane Shear Strength (kPa)
T_v = Pocket Torvane Shear Strength (kPa)
q_u = Unconfined Compressive Strength (Pc)
N_{60} (#) = Lab Vane Shear Strength (kPa)
WOH = weight of 64 kg hammer
WOR = weight of rods

Definitions:
WC = water content, percent
LL = Liquid Limit
PL = Plastic Limit
PI = Plasticity Index
G = Grain Size Analysis
C = Consolidation Test

Sample Information

Depth (m)	Sample No.	Rec/Pen (cm)	Sample Depth (m)	Blows (100 mm) Shear Strength (kPa) S_u or RQD (%)	Pl-value	Casing Blows	Elevation (m)	Graphic Log
0	D1	61.0/43.2	0.00 – 0.61	3/3/3/3	3	SSA	21.78	
						SSA		
1						SSA		
						SSA	20.74	
2	D2	61.0/60.5	1.52 – 2.13	39/32/35/32	67	30		
						140		
						136		
3						300(0.3)		
						50*(0.1)		
	D3	15.3/12.7	3.05 – 3.20	70/200(0.2)		60*(0.2)	18.76	
	R1	152.4/ 167.6	3.14 – 6.19	ROD = 29%		3		
4						3	3.14	
						4		
	R2	152.4/ 167.6	6.19 – 9.18	ROD = 75%		3		
5						3		
						3.5		
6							15.71	
7							6.19	

Visual Description and Remarks

–TOPSOIL–

Yellow-brown, damp to moist, very loose, silty fine SAND with trace roots, poorly-graded, non-plastic
–FLUVAL DEPOSITS–(SM) — 0.12

1.18

Brown, damp, very dense, poorly-graded SAND with some silt, little gravel, trace clay, non-plastic, occasional silt laminae, loosely bonded
–GLACIAL TILL–(SM)

Note: (*) Indicates that drill hole was washed out prior to driving casing.

Olive-brown, wet, very dense GRAVEL with some sand and trace silt, non-plastic, poorly-graded — 3.14
–GLACIAL TILL–(GP)

Light gray and white, aphanitic to medium grained, igneous, hard to very hard, fresh to very slightly weathered, primary joint set is dipping at horizontal to low angles, very close to moderately close, tight to open, no infilling, no secondary joint set present. Core contains granite intrusions at 3.17 m, 4.48 m and 4.79 m.

RMD=Poor
Recovery=84%

–GABBRO–(Silt Granite)
Light gray, white, trace dark green, aphanitic to very coarse grained (Quartz Vein), igneous, hard to very hard, fresh to slightly weathered at 5.67 m. Primary joint set is dipping at horizontal to low angle, very close to moderately close, open, minor soil infilling at 5.94 m. Secondary joint set is dipping moderately steep and is moderately close, tight, no infilling, gently stained throughout core run 30%, quartz intrusion 2.54 cm in width trending along the secondary joint set observed at 4.89 m. — 15.71

RMD=Good
Recovery=100%

–GABBRO–(75%)
–GRANITE–(25%) — 6.19

Bottom of Exploration at 6.19 m below ground surface.

Remarks:

Note: HW casing driven to 3.14 m.

Note: Sample D3 taken from 3.05–3.20 m. Could only advance NX core barrel to 3.14 m. Began NX rock core at 3.14 m.

Stratification lines represent approximate boundaries between soil types; transitions may be gradual.

* Water level readings have been made at times and under conditions stated. Groundwater fluctuations may occur due to conditions other than those present at the time measurements were made.

03 February 2009b.GP

Page 1 of 1
Boring No.: A2-B2-04

Haley & Aldrich, Inc.

Soil/Rock Exploration Log — METRIC UNITS

Project: Calais, ME & St. Stephen, NB
Location: St. Croix River Bridge
File No. 30059-001

Boring No.: P1-B1-04
PIN: 8483.32

Driller:	M. Portier	Elevation (m):	19.60
Operator:	Maine Test Borings, Inc.	Datum:	CGVD28 metric
Logged By:	R. Estes	Rig Type:	CME-45 / Barge
Date Start/Finish:	7/30/04 – 7/31/04	Drilling Method:	Cased Wash Boring
Boring Location:	Sta. 5 + 510, 10 R	Casing ID/OD:	HW 7.6 cm / 8.9 cm
Auger ID/OD:	– / –		
Sampler:	3.5 cm – SPT spoon, 3.5 cm I.D.		
Hammer Wt./Fall:	63.5 kg / 76.2 cm		
Core Barrel:	HQ2 5.1 cm I.D. Atlantic premium, 1.5 m shoe, dual tube		
Water Level *:	–		

Definitions:
D = Split Spoon Sample
xD = Unrecovered Split Spoon Sample attempt
U = Thin Wall Tube Sample
R = Rock Core Sample
V = Intu Vane Shear Test
SSA = Solid Stem Auger

Definitions:
S_u = Intu Field Vane Shear Strength (kPa)
T_v = Pocket Torvane Shear Strength (kPa)
q_u = Unconfined Compressive Strength (Pc)
N_{60} (#) = Lab Vane Shear Strength (kPa)
WOH = weight of 64 kg hammer

Definitions:
WC = water content, percent
LL = Liquid Limit
PL = Plastic Limit
PI = Plasticity Index
G = Grain Size Analysis
C = Consolidation Test

Sample Information

Depth (m)	Sample No.	Rec/Pen (cm)	Sample Depth (m)	Blows (100 mm) Shear Strength (kPa) S_u or RQD (%)	Pl-value	Casing Blows	Elevation (m)	Graphic Log
0	D1	61.0/33.0	0.00 – 0.81	2/3/8/24	11	17	19.45	
						79		
1						83		
						153		
						340		
2	D2	61.0/43.2	1.52 – 2.13	24/36/60/104	96	72		
						128		
						88		
3						55		
						59	16.79	
	D3	27.9/2.5	3.05 – 3.33	20/80		111		
						103		
4						142		
						101		
						165		
	D4	61.0/20.3	4.57 – 5.18	27/23/13/31	42	86		
5						108		
						200		
						251		
6	D5	33.0/43.2	8.10 – 8.43	40/46/50		86		
						100		
7						123		
						135		
						365	13.10	
	R1	152.4/ 167.6	7.62 – 9.14	ROD = 67%		3:20		
8						3:10		
						4:00		
						3:35		
9						4:30		
	R2	121.9/ 167.6	9.14 – 10.67	ROD = 35%		4:25		
						5:45		
10						5:30		
						7:20		
						6:55	9.08	
11								
12								
13								
14								
15								

Visual Description and Remarks

Brown to gray-brown, saturated, very loose SAND with little gravel, trace silt, well-graded
–RIVER BOTTOM SEDIMENTS–(SW) — 0.15

Gray, wet, medium dense to very dense, silty SAND with little gravel, trace clay, well-graded, slightly bonded with occasional cobble
–GLACIAL TILL–(SM)

Brownish-gray, damp, very dense silty SAND with little gravel, trace clay, well-graded, bonded
–GLACIAL TILL–(SM)

Brown to olive-brown, wet, dense gravelly SAND with trace silt, well-graded, with occasional cobble
–GLACIAL TILL–(SW) — 2.80

3.32–3.47 m cobble

3.47 encountered artesian flow in casing (bottom of casing at 3.33 m) +1.01 m above river water surface, washed ahead to 4.05 m, water level +1.28 m

Olive-brown, wet, dense, gravelly SAND with trace silt, well-graded with occasional cobble
–GLACIAL TILL–(SW)

SM
Wc=7.5%

Olive-brown, wet, very dense, gravelly SAND with trace silt, well-graded with occasional cobble
–GLACIAL TILL–(SW)

7.55 = TOP OF BEDROCK – Roller cone to 7.62 m
Hard, fresh, white and black, coarse grained GRANITE. Primary joints are close to moderately spaced and horizontal. Secondary joints moderately to wide spaced and moderately dipping. Joints are undulating and rough, fresh to discolored, mostly slightly open, no infilling. A few weathered zones. — 7.50

Bottom of Exploration at 10.52 m below ground surface. — 0.52

Remarks:

7/30/04 Water depth 2.13 m, collected river bottom sediment samples D1 & D2 for environmental analysis. Water level is about 0.81 m lower than 12/03 check with Vance Pike (DOT) for elevations.

Stratification lines represent approximate boundaries between soil types; transitions may be gradual.

* Water level readings have been made at times and under conditions stated. Groundwater fluctuations may occur due to conditions other than those present at the time measurements were made.

03 February 2009b.GP

Page 2 of ??
Boring No.: P1-B1-04

Haley & Aldrich, Inc.

Soil/Rock Exploration Log — METRIC UNITS

Project: Calais, ME & St. Stephen, NB
Location: St. Croix River Bridge
File No. 30059-001

Boring No.: P1-B2(A)-04
PIN: 8483.32

Driller:	M. Portier	Elevation (m):	18.30
Operator:	Maine Test Borings, Inc.	Datum:	CGVD28 metric
Logged By:	R. Estes	Rig Type:	CME-45 / Barge
Date Start/Finish:	7/31/04 – 7/32/04	Drilling Method:	Cased Wash Boring
Boring Location:	1.3 m N of P1-B2-04	Casing ID/OD:	HW 7.6 cm / 8.9 cm
Auger ID/OD:	– / –		
Sampler:	3.5 cm – SPT spoon, 3.5 cm I.D.		
Hammer Wt./Fall:	63.5 kg / 76.2 cm		
Core Barrel:	BQ2 3.5 cm I.D.		
Water Level *:	–		

Definitions:
D = Split Spoon Sample
xD = Unrecovered Split Spoon Sample attempt
U = Thin Wall Tube Sample
R = Rock Core Sample
V = Intu Vane Shear Test
SSA = Solid Stem Auger

Definitions:
S_u = Intu Field Vane Shear Strength (kPa)
T_v = Pocket Torvane Shear Strength (kPa)
q_u = Unconfined Compressive Strength (Pc)
N_{60} (#) = Lab Vane Shear Strength (kPa)
WOH = weight of rods

Definitions:
WC = water content, percent
LL = Liquid Limit
PL = Plastic Limit
PI = Plasticity Index
G = Grain Size Analysis
C = Consolidation Test

Sample Information

Depth (m)	Sample No.	Rec/Pen (cm)	Sample Depth (m)	Blows (100 mm) Shear Strength (kPa) S_u or RQD (%)	Pl-value	Casing Blows	Elevation (m)	Graphic Log
0								
1								
2								
3	D1	2.5/2.5	3.05 – 3.07	100		70	15.40	
						110		
4						94		
						220		
						649		
5	D2	61.0/27.9	4.57 – 5.18	18/19/15/23	34	77		
						66		
6						96		
						116		
						247	12.38	
7	D3	61.0/30.5	8.10 – 8.71	72/88/95/67	181	70		
						100		
8						215		
						184		
						333		
9	R1	5.1/0.0	7.62 – 7.67	100		311	10.64	
10								
	*R1	152.4/ 157.5	9.30 – 10.88	ROD = **%		3:30	8.04	
						4:00		
11						3:20		
						3:10		
12						3:45		
	*R2	152.4/ 159.7	10.88 – 12.28	ROD = **%		11:30		
						11:50		
13						2:55		
						3:20		
14						3:45	6.02	
15								

Visual Description and Remarks

0.00–2.90 m

See Boring Log for P1-B1-04

Olive-brown to grayish-brown, saturated, very dense, gravelly SAND with trace silt, well-graded, with occasional cobble and boulders
–GLACIAL TILL–(SW) — 2.90

Brown, saturated, dense, gravelly SAND with trace silt, well-graded, with occasional cobble
–GLACIAL TILL–(SW) — 6.91

Cobble at 5.91 m

Brown to olive-brown, wet, very dense, gravelly SAND with trace silt, well-graded, with occasional cobble
–GLACIAL TILL–(SW)

Moderately to severely weathered GRANITE
–BEDROCK–

Roller cone to 9.36 m – competent rock and begin core * — 7.86

Hard, fresh, (slightly weathered at top) white and black, coarse grained GRANITE. Joints are close to moderately dipping, undulating and rough, discolored to slightly decomposed, mostly slightly open, some infilling at depths. — 9.36

Bottom of Exploration at 12.28 m below ground surface. — 2.28

Remarks:

7/31/04 Water depth = 2.53 m, water level is about 0.81 m lower than 12/03.

* – Unable to use N core barrel, switch to BQ Core.
** – RQD Calculation is based on BQ core.

Stratification lines represent approximate boundaries between soil types; transitions may be gradual.

* Water level readings have been made at times and under conditions stated. Groundwater fluctuations may occur due to conditions other than those present at the time measurements were made.

03 February 2009b.GP

Page 2 of ??
Boring No.: P1-B2(A)-04

PROJECT DESIGN ENGINEER: KSD	BY	DATE
DESIGN DETAILED		
CHECKED		
PLANS REVISIONS		
FIELD CHANGES		

143-176B

BRIDGE NO. 6440

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

ST. CROIX RIVER BRIDGE
OVER
ST. CROIX RIVER
BETWEEN
ST. STEPHEN, N.B., CANADA
CALAIS, MAINE, U.S.A.
BORING LOGS

AUGUSTA, MAINE

METRIC 1. All dimensions are in millimeters unless otherwise noted. 2. All elevations and stations are in meters.

F.H.W.A. REG. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
1	MAINE	NCPD/CBI-B483(360)X	7	47

8483.36

Haley & Aldrich, Inc.

Soil/Rock Exploration Log

METRIC UNITS

Project: Calais, ME & St. Stephen, NB
Location: St. Croix River Bridge
File No. 30059-001

Boring No.: A1B1-04
PIN: 8483.36

Driller:	D. McKeen	Elevation (m):	23.00
Operator:	Maine Test Borings, Inc.	Datum:	CGVD28 metric
Logged By:	T. Eriksson	Rig Type:	Mobile Drill B-53 Barnbardier
Date Start/Finish:	4/13/04 – 4/12/04	Drilling Method:	HW Casing/Spin NW Casing
Boring Location:	Sta. 5 + 467, 10 m, P	Casing ID/OD:	10.2cm/10.8cm–7.6cm/8.3cm

Auger ID/OD:	8.4 cm / 7.6 cm
Sampler:	3.5 cm – I.D. Spoon
Hammer Wt./Fall:	140 lb./76.2 cm
Core Barrel:	–
Water Level *:	–

Definitions:
D = Split Spoon Sample
MD = Unsuccessful Split Spoon Sample attempt
U = Thin Wall Tube Sample
R = Rock Core Barrel
V = Insitu Vane Shear Test
SSA = Solid Stem Auger

Definitions:
S_u = Insitu Field Vane Shear Strength (kPa)
T_v = Pocket Torvane Shear Strength (kPa)
q_u = Unconfined Compressive Strength (Pa)
$S_{u(Lab)}$ = Lab Vane Shear Strength (kPa)
WOH = weight of 64 kg hammer
WOR = weight of rods

Definitions:
WC = water content, percent
LL = Liquid Limit
PL = Plastic Limit
PI = Plasticity Index
G = Grain Size Analysis
C = Consolidation Test

Sample Information

Depth (m)	Sample No.	Pen./Rec. (cm)	Sample Depth (m)	Blows (100 mm) Sheet Strength, qu or SPT (N)	N'-value	Casing Blows	Elevation (m)	Graphic Log
0						SSA		
	D1	61.0/35.6	0.15 – 0.76	1/2/6/9	8	SSA	22.85 / 22.79	
						SSA	20.45	
1						SSA		
	D2	61.0/58.1	1.37 – 1.88	14/20/14/13	44	SSA		
2						SSA		
						SSA		
						SSA	20.66	
3	D3	61.0/45.7	2.90 – 3.51	8/10/10/13	20	SSA		
						26		
4						25		
						54		
						78		
						103		
	D4	48.3/40.6	4.57 – 5.08	17/51/58/50(.03m)	109	Spin NW		
5						Spin NW		
						Spin NW		
						Spin NW		
6	D5	61.0/17.8	6.10 – 6.71	26/36/31/67	67	Spin NW		
						Spin NW		
7						Spin NW		
						Spin NW		
						Spin NW		
8	D6	61.0/35.6	7.62 – 8.23	36/51/72/116	127	Spin NW		
						Spin NW		
9						Spin NW		
						Spin NW		
						Spin NW		
	D7	61.0/35.6	9.14 – 9.75	31/47/57/34	104	Spin NW		
10						Spin NW		
						Spin NW		
						Spin NW		
	D8	7.6/5.3	10.97 –	100(.05m)				
11	R1	136.7/99.3	10.82 – 12.38	ROD = 0%			12.27	
							9.28	
12								
	R2	137.2/ 137.2	12.24 – 13.73	ROD = 20%				
13								
14								
15								
16								

Visual Description and Remarks

0.00 – 0.15 Note: cobble present from 0.0–0.15 m.

0.15 –TOPSOIL–(OL/OH)

0.21 Olive-brown, dry to moist, medium stiff, silty CLAY with little fine sand, laminated, cobbles, non-plastic

0.55 –MARINE DEPOSITS–(CL)

Brown and olive-brown, moist, dense, poorly-graded SAND with some gravel, little silt, loosely bonded
–GLACIAL TILL–(SP)

Note: strata color change from brown to gray at 2.44 m.

2.44

Gray, wet, very stiff, gravelly lean CLAY with trace silt, non-plastic, moderately well-bonded
–GLACIAL TILL–(CL)

Note: drove HW casing to 4.57 m to allow NW casing to spin more easily from 4.57 m downward.

Note: Density increased at 4.06 m.

Gray, wet, very dense, clayey GRAVEL with trace silt and fine sand, poorly-graded, moderately bonded
–GLACIAL TILL–(GC)

Note: roller bit used through granite boulder from 5.39–5.73 m, small cobble at 5.06 m.

Gray, wet, very dense, poorly-graded gravelly SAND with little silt and/or clay, loosely to moderately bonded
–GLACIAL TILL–(SP)

Gray-brown and olive-brown, wet, very dense, well-graded SAND with some gravel and little silt, trace clay, moderately bonded
–GLACIAL TILL–(SW)

Gray and olive-brown, wet, very dense, poorly-graded SAND with some gravel, little silt and trace clay, well-bonded
–GLACIAL TILL–(SP)

Note: fine brown sand layers present from 9.75–10.36 m.

Note: frequent cobbles from 10.36–10.67 m.

Poor recovery, wash sample
–GLACIAL TILL–(SP) 10.73

Top of Bedrock at 10.73 m.

Note: Roller bit advanced to 10.72 m. Cored boulder from 10.82–12.38 m. Bedrock is light gray and tan, fine-grained to coarse grained, igneous, hard, slightly weathered, primary joint set is dipping moderate, very close to close, light to open, minor brown silt infilling, secondary joint set is dipping horizontal to low angle, very close to close, open, no infilling. Tertiary joint set is dipping steeply (80 degrees), close to moderate, open with no infilling.

RMD=Very poor
Recovery=69%

Note: two 10.16–15.24 cm seams observed while coring from 10.97–11.13 m and 11.89–12.04 m.
Light gray and tan, fine-grained to coarse grained, igneous, hard, fresh to slightly weathered. Primary joint set is dipping at moderate angles, very close to moderate, light to open, minor brown silt infilling. Secondary joint set is dipping at horizontal to low angles, very close to moderate, open, minor gray-brown silt infilling. tertiary joint set is vertical, close to moderate, light to open with minor brown silt infilling.

RMD=Poor
Recovery=100%

–GRANITE– 13.72

Bottom of Exploration at 13.72 m below ground surface.

Remarks:

Stratification lines represent approximate boundaries between soil types; transitions may be gradual.

* Water level readings have been made at times and under conditions stated. Groundwater fluctuations may occur due to conditions other than those present at the time measurements were made.

03 February 2009b:56

Page 2 of 2
Boring No.: A1B1-04

Haley & Aldrich, Inc.

Soil/Rock Exploration Log

METRIC UNITS

Project: Calais, ME & St. Stephen, NB
Location: St. Croix River Bridge
File No. 30059-001

Boring No.: A1B2-04
PIN: 8483.36

Driller:	D. McKeen	Elevation (m):	22.60
Operator:	Maine Test Borings, Inc.	Datum:	CGVD28 metric
Logged By:	T. Eriksson	Rig Type:	Mobile Drill B-53 Barnbardier
Date Start/Finish:	4/13/04 – 4/12/04	Drilling Method:	Spin NW / Drive and Wash
Boring Location:	Sta. 5 + 487, 10 m, L	Casing ID/OD:	7.6 cm / 8.3cm

Auger ID/OD:	SSA (0.0–3.0 m)
Sampler:	S Spoon
Hammer Wt./Fall:	140 lb./76.2 cm–300 lb./91.4 cm
Core Barrel:	NX Standard
Water Level *:	0.8 m, Note at 6.4 m

Definitions:
D = Split Spoon Sample
MD = Unsuccessful Split Spoon Sample attempt
U = Thin Wall Tube Sample
R = Rock Core Barrel
V = Insitu Vane Shear Test
SSA = Solid Stem Auger

Definitions:
S_u = Insitu Field Vane Shear Strength (kPa)
T_v = Pocket Torvane Shear Strength (kPa)
q_u = Unconfined Compressive Strength (Pa)
$S_{u(Lab)}$ = Lab Vane Shear Strength (kPa)
WOH = weight of 64 kg hammer
WOR = weight of rods

Definitions:
WC = water content, percent
LL = Liquid Limit
PL = Plastic Limit
PI = Plasticity Index
G = Grain Size Analysis
C = Consolidation Test

Sample Information

Depth (m)	Sample No.	Pen./Rec. (cm)	Sample Depth (m)	Blows (100 mm) Sheet Strength, qu or SPT (N)	N'-value	Casing Blows	Elevation (m)	Graphic Log
0	D1	61.0/43.2	0.00 – 0.61	2/1/2/2	3	SSA	22.57	
						SSA		
1						SSA	21.84	
						SSA		
						SSA		
2	D2	61.0/43.2	1.52 – 2.13	10/12/13/21	27	SSA		
						SSA		
3						SSA		
						SSA	20.18	
	D3	61.0/53.3	3.05 – 3.66	10/19/25/35	44	15		
4						25		
						62		
						90		
5						151		
	B1	33.0/33.0	4.88 – 4.99	ROD = 46%		NW Spin	17.64	
	D4	61.0/38.1	5.00 – 5.61	31/84/43/49	127	NW Spin		
6						NW Spin		
						NW Spin		
						NW Spin		
7						NW Spin		
	D5	61.0/25.4	6.10 – 6.71	15/10/38/62	48	NW Spin		
						NW Spin		
8						NW Spin		
	R2	71.1/22.9	7.35 – 8.06	ROD = 0%		NW Spin		
	D6	30.5/17.8	8.05 – 8.35	75/139	214	NW Spin	14.55	
9						NW Spin		
						NW Spin		
						NW Spin		
10						NW Spin		
	D7	27.9/17.8	9.14 – 9.43	54/150(12.7)	204	NW Spin		
						NW Spin		
11						NW Spin		
						NW Spin	12.09	
	R3	120.6/ 152.4	10.67 – 12.19	ROD = 100%				
12								
13								
14								
15								
16								

Visual Description and Remarks

0.00 –TOPSOIL–(OL/OH)

0.03 Olive-brown, moist, soft, silty CLAY with trace roots and wood, slightly plastic, laminated and mottled
–MARINE DEPOSITS–(OL)

0.76 Note: drill action indicates a strata change at 0.76 m.

Brown and olive-brown, moist to wet, poorly-graded SAND with some silty clay, little silt, little fine gravel, moderate to well-bonded, medium dense
–GLACIAL TILL–(SP)

Note: strata color change from brown to gray at 2.44 m.

2.44

Gray, moist to wet, hard, gravelly CLAY and SILT, trace fine sand, non-plastic, moderately well-bonded
–GLACIAL TILL–(CL/ML)

4.66 Note: roller bit used from 4.54–4.63 m through cobble.

Note: cored a cobble from 4.66–4.88 m.
Gray, wet, very dense, silty GRAVEL with little clay, trace fine sand, well- bonded
–GLACIAL TILL–(GM)

Olive-gray, wet, dense, poorly-graded SAND with some silt and gravel, well-bonded
–GLACIAL TILL–(SP)

Note: NW casing spun to 7.32 m.

–GRANITE–boulder cored from 7.35–8.06 m.

8.05 Brown and olive-brown, wet, very dense, gravelly SAND with trace silt, poorly-graded, well-bonded
–GLACIAL TILL–(SP)

Brown and olive-brown, wet, very dense, gravelly SAND with trace silt, poorly-graded, mostly fine sand, well-bonded
–GLACIAL TILL–(SP)

Note: roller bit used through cobble from 10.00–10.12 m and 10.33–10.45 m.

Note: spun NW casing to final depth of 10.58 m.

Note: advanced roller bit to 10.67 m.

10.52 –TOP OF BEDROCK at 10.52 m

Light gray and tan, coarse to fine-grained, igneous, hard to very hard, fresh, no joints present, rock core is a solid 152.4 cm stem.

RMD=Excellent
Recovery=100%

Visible minerals present include plagioclase feldspar, quartz, chlorite, hornblende.

12.19 –GRANITE–

Bottom of Exploration at 12.19 m below ground surface.

Remarks:

Stratification lines represent approximate boundaries between soil types; transitions may be gradual.

* Water level readings have been made at times and under conditions stated. Groundwater fluctuations may occur due to conditions other than those present at the time measurements were made.

03 February 2009b:56

Page 2 of 2
Boring No.: A1B2-04

Haley & Aldrich, Inc.

Soil/Rock Exploration Log

METRIC UNITS

Project: Calais, ME & St. Stephen, NB
Location: St. Croix River Bridge
File No. 30059-001

Boring No.: A2-B1-04
PIN: 8483.36

Driller:	D. McKeen	Elevation (m):	22.10
Operator:	Maine Test Borings, Inc.	Datum:	CGVD28 metric
Logged By:	T. Eriksson	Rig Type:	Mobile B-53 Barnbardier
Date Start/Finish:	3/31/04 – 3/31/04	Drilling Method:	Drive and Wash
Boring Location:	Sta. 5 + 639, 10 m, R	Casing ID/OD:	HW 7.6 cm / 8.3 cm

Auger ID/OD:	– / –
Sampler:	3.5 cm – I.D. Spoon
Hammer Wt./Fall:	140 lb./76.2 cm 300 lb./91.0 cm
Core Barrel:	NX Standard
Water Level *:	3.0 m, Hole caved at 3.0 m

Definitions:
D = Split Spoon Sample
MD = Unsuccessful Split Spoon Sample attempt
U = Thin Wall Tube Sample
R = Rock Core Barrel
V = Insitu Vane Shear Test
SSA = Solid Stem Auger

Definitions:
S_u = Insitu Field Vane Shear Strength (kPa)
T_v = Pocket Torvane Shear Strength (kPa)
q_u = Unconfined Compressive Strength (Pa)
$S_{u(Lab)}$ = Lab Vane Shear Strength (kPa)
WOH = weight of 64 kg hammer
WOR = weight of rods

Definitions:
WC = water content, percent
LL = Liquid Limit
PL = Plastic Limit
PI = Plasticity Index
G = Grain Size Analysis
C = Consolidation Test

Sample Information

Depth (m)	Sample No.	Pen./Rec. (cm)	Sample Depth (m)	Blows (100 mm) Sheet Strength, qu or SPT (N)	N'-value	Casing Blows	Elevation (m)	Graphic Log
0	D1	61.0/53.3	0.00 – 0.61	5/3/1/1	3	SSA	21.89	
						SSA		
1						SSA		
						SSA	21.10	
						SSA		
2	D2	61.0/43.2	1.68 – 2.29	6/10/11/15	21	7		
						26		
3						73		
						219		
						83		
	D3	30.5/12.7	3.05 – 3.35	113/141	331	100(.06m)	18.81	
4	R1	124.8/ 152.4	3.81 – 4.85	ROD = 85%			18.63	
							15.79	
5	R2	144.8/ 152.4	4.85 – 6.29	ROD = 96%				
6								
7								
8								
9								
10								
11								
12								
13								
14								
15								
16								

Visual Description and Remarks

0.00 –TOPSOIL–(OL/OH)

0.21 Yellow-brown, damp to moist, very loose, silty fine SAND with trace root matter, poorly-graded, non-plastic, occasional silt laminae
–FLUVIAL DEPOSITS–(SM)

1.01 Olive-brown, damp, medium dense, poorly-graded fine silty SAND with trace fine and lean clay, non-plastic, occasional silt and lean clay laminae, loose to moderately bonded (cobble at 1.22 m)
–GLACIAL TILL–(SM)

Olive, wet, very dense, poorly-graded sandy GRAVEL with trace silt, non-plastic, very loosely bonded
–GLACIAL TILL–(GP)

Note: (*) indicates washed ahead before driving casing.

3.29 Weathered Bedrock

3.47 Light gray and white, aphanitic to medium grained (diabase), fine to coarse grained (Granite), igneous, hard to very hard, fresh. Discontinuity is dipping low angle, light with no infilling.

RMD=Good
Recovery=92%

–DIABASE–(3.51–3.66 m, 3.87–4.16 m, 4.48–4.85 m)
–GRANITE–(3.66–3.87 m, 4.16–4.46 m)

Light gray, aphanitic to medium grained igneous, hard to very hard, primary joint set is dipping horizontal, moderately close, light, with no infilling, no secondary joint set present.

RMD=Excellent
Recovery=100%

6.31 –DIABASE–(with minor granite intrusions)

Bottom of Exploration at 6.31 m below ground surface.

Remarks:

Stratification lines represent approximate boundaries between soil types; transitions may be gradual.

* Water level readings have been made at times and under conditions stated. Groundwater fluctuations may occur due to conditions other than those present at the time measurements were made.

03 February 2009b:56

Page 1 of 1
Boring No.: A2-B1-04

PROJECT DESIGN ENGINEER	KSD	DATE
	DESIGN DETAILED	BY
PLANS	CHECKED	
	REVISIONS	
	FIELD CHANGES	

143-177A

BRIDGE NO. 6440

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

ST. CROIX RIVER BRIDGE
OVER
ST. CROIX RIVER
BETWEEN
ST. STEPHEN, N.B., CANADA
CALAIS, MAINE, U.S.A.
BORING LOGS

AUGUSTA, MAINE

METRIC 1. All dimensions are in millimeters unless otherwise noted. 2. All elevations and stations are in meters.

F.H.WA. REQ. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
1	MAINE	NCPD/CBI-8483(360)X	8	47

8483.36

Haley & Aldrich, Inc.

Soil/Rock Exploration Log — METRIC UNITS

Project: Calais, ME & St. Stephen, NB
Location: St. Croix River Bridge
File No. 30059-001
Boring No.: P1-B2-04
PIN: 8483.32

Driller:	M. Porter	Elevation (m):	18.30
Operator:	Maine Test Borings, Inc.	Datum:	COV028 metric
Logged By:	R. Estes	Rig Type:	CME-45 / Barge
Date Start/Finish:	7/21/04 - 7/21/04	Drilling Method:	Cased Wash Boring
Boring Location:	Sta. 5 + 910, 10 L	Casing Barrel:	N20 5.1 cm I.D.
Casing ID/OD:	NW 7.6 cm / 8.9 cm	Water Level *:	-

Auger ID/OD: - / -
Sampler: 3.5 cm - Split Spoon; 5.5 cm I.D.
Hammer Wt./Fall: 63.5 kg / 76.2 cm

Definitions:
D = Split Spoon Sample
WD = Unsuccessful Split Spoon Sample attempt
U = Thin Wall Tube Sample
R = Rock Core Sample
V = Inelu Vane Shear Test
Wo = Solid Stem Auger

Definitions:
S_v = Inelu Field Vane Shear Strength (kPa)
T_v = Pocket Torvane Shear Strength (kPa)
q_p = Unconfined Compressive Strength (Pa)
N_{60} (or) = Lab Vane Shear Strength (kPa)
WOH = weight of 64 kg hammer
WOR = weight of rods

Definitions:
WC = water content, percent
LL = Liquid Limit
PL = Plastic Limit
PI = Plasticity Index
G = Grain Size Analysis
C = Consolidation Test

Elevation (m)	Sample No.	Rec./Run (cm)	Sample Depth (m)	Blows (300 mm) Shear Strength (kPa) or RQD (%)	Pen.+Blows	Casing Blows	Elevation (m)	Graphic Log
0	D1	61.0/17.8	0.00 - 0.61	WOR/WOR/WOR/2	0	WOC		
						3		
-1						38	17.01	
						100	17.54	
						340		
-2	D2	61.0/361	1.52 - 2.13	32/35/30/42	70	85	15.81	
						85	16.75	
						330		
-3						78	15.59	
						180		
	R1	30.5/25.4	3.05 - 3.35			507	15.31	
-4							14.86	

Graylish-brown, saturated, very loose sandy organic soil, some wood
-RIVER BOTTOM SEDIMENT-(OL) — 0.49
Graylish-brown, saturated, loose, silty SAND with trace gravel, poorly-graded
-RIVER BOTTOM SEDIMENT-(SM) — 0.76
Gray, silty SAND with little gravel, well-graded
-RIVER BOTTOM SEDIMENT-(SM) — 1.40
Olive-brown silty SAND layer
-GLACIAL TILL-(SM) — 1.55
Brownish-gray, damp, very dense, silty SAND with little gravel, trace clay, well-graded, bonded
-GLACIAL TILL-(SM) — 2.41
Cobble from 2.41-2.59 m — 2.59
Roller zone into boulder 2.99-3.14 m, core through boulder to 3.44 m, unable to advance casing through boulder. Shut casing, refusal at 3.05 m. — 3.44
Bottom of Exploration at 3.44 m below ground surface.

Remarks:
Abandoned boring - Refusal on boulder, move drill rig
7/21/04 Water depth = 2.33 m
Water level is about 0.61 m lower than 12/03
1.22 m N and P1- B2 A-04

Lab Testing Results/ AASHTO and Unified Class.

Stratification lines represent approximate boundaries between soil types: transitions may be gradual.
* Water level readings have been made at times and under conditions stated. Groundwater fluctuations may occur due to conditions other than those present at the time measurements were made.
03 February 2009-36

Page 1 of ??
Boring No.: P1-B2-04

Haley & Aldrich, Inc.

Soil/Rock Exploration Log — METRIC UNITS

Project: Calais, ME & St. Stephen, NB
Location: St. Croix River Bridge
File No. 30059-001
Boring No.: P2-B1-03
PIN: 8483.32

Driller:	Maine Test Borings, Inc.	Elevation (m):	17.70
Operator:	M. Porter	Datum:	COV028 metric
Logged By:	R. Estes	Rig Type:	CME-45 / Skid - Barge
Date Start/Finish:	12/17/03 - 12/17/03	Drilling Method:	Cased Wash Boring
Boring Location:	Sta. 5 + 553, 0.5 m, L	Casing ID/OD:	7.6 cm / 8.9 cm

Auger ID/OD: - / -
Sampler: 3.5 cm - Split Spoon
Hammer Wt./Fall: 140 lb. / 76.2 cm
Core Barrel: NQ
Water Level *: 22.1 m, Artesian

Definitions:
D = Split Spoon Sample
WD = Unsuccessful Split Spoon Sample attempt
U = Thin Wall Tube Sample
R = Rock Core Sample
V = Inelu Vane Shear Test
Wo = Solid Stem Auger

Definitions:
S_v = Inelu Field Vane Shear Strength (kPa)
T_v = Pocket Torvane Shear Strength (kPa)
q_p = Unconfined Compressive Strength (Pa)
N_{60} (or) = Lab Vane Shear Strength (kPa)
WOH = weight of 64 kg hammer
WOR = weight of rods

Definitions:
WC = water content, percent
LL = Liquid Limit
PL = Plastic Limit
PI = Plasticity Index
G = Grain Size Analysis
C = Consolidation Test

Elevation (m)	Sample No.	Rec./Run (cm)	Sample Depth (m)	Blows (300 mm) Shear Strength (kPa) or RQD (%)	Pen.+Blows	Casing Blows	Elevation (m)	Graphic Log
0	D1	61.0/27.9	0.00 - 0.61	9/12/13/20	27	25	17.61	
						48		
-1						48		
						61		
						100		
-2	D2	61.0/25.4	1.83 - 2.44	18/18/19/20	37	94		
						99		
						340		
-3	D3	61.0/22.9	3.35 - 3.96	22/33/24/53	57	115		
						115	14.41	
						91		
-4	D4	12.7/0.0	4.88 - 5.00	100/12.7 core/Retrieval on cobble		91		
						122		
						128		
-5						184		
						289		
						184		
-6	D5	61.0/28.1	5.49 - 6.10	17/35/75/125	108	129	12.21	
						530	11.85	
	R1	152.4/0.0	6.10 - 7.62	RQD = 63%			11.48	
-7							10.87	
							10.08	
-8								
-9								
-10								
-11								
-12								
-13								
-14								
-15								

Brown, wet, loose gravelly SAND, well-graded, with occasional cobbles
-RIVER BOTTOM SEDIMENT-(SW) — 0.09
Brownish-gray, wet, medium dense silty SAND with little gravel, well-graded
-GLACIAL TILL-(SM)
Brownish-gray, moist to wet, dense silty SAND with some gravel, well-graded
-GLACIAL TILL-(SM) — 3.20
Brown to brownish-gray, wet, very dense gravelly SAND with trace silt, with occasional cobbles, well-graded
-GLACIAL TILL/OUTWASH-(GW)
(*) Artesian conditions observed in casing with abundant "air" bubbles. — 5.19
Olive-brown, moist to wet, very dense silty SAND with some gravel, poorly-graded
-GLACIAL TILL-(SM) — 5.65
Moderately weathered BEDROCK, highly fractured with olive-brown silty sand, infilling (WX/SW) — 6.22
BEDROCK at 6.22 m
Gray, fine to medium-grained, igneous, hard, fresh GABBRO. Joints are low angle to moderately dipping, close, mostly tight.
RMD=Poor — 6.83
White to gray, medium to coarse grained, igneous, hard, fresh, GRANITE. Joints are low angle, moderately close, mostly tight, one open with brown silt and sand infilling
RMD=Excellent — 7.62
Bottom of Exploration at 7.62 m below ground surface.

Lab Testing Results/ AASHTO and Unified Class.
ML Wo=9.8%

Remarks:

Stratification lines represent approximate boundaries between soil types: transitions may be gradual.
* Water level readings have been made at times and under conditions stated. Groundwater fluctuations may occur due to conditions other than those present at the time measurements were made.
03 February 2009-05

Page 2 of ??
Boring No.: P2-B1-03

Haley & Aldrich, Inc.

Soil/Rock Exploration Log — METRIC UNITS

Project: Calais, ME & St. Stephen, NB
Location: St. Croix River Bridge
File No. 30059-001
Boring No.: P2-B2-03
PIN: 8483.32

Driller:	Maine Test Borings, Inc.	Elevation (m):	17.20
Operator:	M. Porter	Datum:	COV028 metric
Logged By:	R. Estes	Rig Type:	CME-45 / Skid - Barge
Date Start/Finish:	12/11/03 - 12/16/03	Drilling Method:	Cased Wash Boring
Boring Location:	Sta. 5 + 553, 14.5 m, R	Casing ID/OD:	7.6 cm / 8.9 cm

Auger ID/OD: - / -
Sampler: 3.5 cm - Split Spoon
Hammer Wt./Fall: 140 lb. / 76.2 cm
Core Barrel: NQ
Water Level *: 22.2 m, Artesian

Definitions:
D = Split Spoon Sample
WD = Unsuccessful Split Spoon Sample attempt
U = Thin Wall Tube Sample
R = Rock Core Sample
V = Inelu Vane Shear Test
Wo = Solid Stem Auger

Definitions:
S_v = Inelu Field Vane Shear Strength (kPa)
T_v = Pocket Torvane Shear Strength (kPa)
q_p = Unconfined Compressive Strength (Pa)
N_{60} (or) = Lab Vane Shear Strength (kPa)
WOH = weight of 64 kg hammer
WOR = weight of rods

Definitions:
WC = water content, percent
LL = Liquid Limit
PL = Plastic Limit
PI = Plasticity Index
G = Grain Size Analysis
C = Consolidation Test

Elevation (m)	Sample No.	Rec./Run (cm)	Sample Depth (m)	Blows (300 mm) Shear Strength (kPa) or RQD (%)	Pen.+Blows	Casing Blows	Elevation (m)	Graphic Log
0	D1	61.0/20.3	0.00 - 0.61	19/12/12/20	24	35	17.14	
						155		
-1						167		
						66		
						109		
-2	D2	61.0/23.5	1.52 - 2.13	24/22/12/38	94	46	15.28	
						110		
						64		
-3						198		
						128		
	D3	61.0/15.2	3.05 - 3.66	28/36/29/40	65	129		
						90		
-4						74		
						78		
							12.79	
-5	D4	0.0/0.0	4.57 - 4.57	90/0 cm / Return on cobble		266		
	R1	152.4/ 152.4	4.57 - 6.10	RQD = 100%				
-6							11.77	
-7	R2	147.3/ 147.3	8.10 - 7.57	RQD = 91%				
							9.64	
-8								

Brown, wet, loose gravelly SAND, well-graded, with occasional cobbles
-RIVER BOTTOM SEDIMENT-(SW) — 0.06
Brownish-gray, wet, medium dense silty SAND, with some gravel, well-graded
-GLACIAL TILL-(SM)
Brownish-gray, wet, dense to very dense silty SAND, with some gravel, well-graded
-GLACIAL TILL-(SM) — 1.82
1.82-2.04 m gravelly layer, increase in gravel to 3.04 m.
Brownish-gray, wet, very dense gravelly SAND with some silt, with occasional cobble, well-graded
-GLACIAL TILL-(GW)
(*) Artesian conditions observed in casing.
Top of Bedrock at 4.45 m. — 4.45
Gray, fine to medium-grained, igneous, hard, fresh GABBRO with granite veins. Joints are low angle to moderately dipping, very close to close, mostly tight, few open with brown silt infilling.
RQD=Poor — 5.43
White to gray, medium to coarse grained, igneous, hard, fresh GRANITE.
Joints ranged from horizontal to vertical, moderately close, mostly tight, few open with brown silt infilling, few discolored.
RMD=Good to excellent
Bottom of Exploration at 7.58 m below ground surface. — 7.58

Lab Testing Results/ AASHTO and Unified Class.
SM Wo=13.0%

Remarks:

Stratification lines represent approximate boundaries between soil types: transitions may be gradual.
* Water level readings have been made at times and under conditions stated. Groundwater fluctuations may occur due to conditions other than those present at the time measurements were made.
03 February 2009-30

Page 1 of ??
Boring No.: P2-B2-03

PROJECT DESIGN ENGINEER	KSD			
DESIGN-DETAILED				
CHECKED				
REVISIONS				
FIELD CHANGES				
	BY			
	DATE			

PLANS

143-177B

BRIDGE NO. 6440

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

ST. CROIX RIVER BRIDGE
OVER
ST. CROIX RIVER
BETWEEN
ST. STEPHEN, N.B., CANADA
CALAIS, MAINE, U.S.A.
BORING LOGS

AUGUSTA, MAINE

METRIC 1. All dimensions are in millimeters unless otherwise noted.
2. All elevations and stations are in meters.

F.H.W.A. REG. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
1	MAINE	NCPD/CBI-8483(360)X	9	47

8483.36

Haley & Aldrich, Inc.

Soil/Rock Exploration Log

METRIC UNITS

Project: Calais, ME & St. Stephen, NB
Location: St. Croix River Bridge
File No. 30059-001

Boring No.: P3-B1-04
PIN: 8483.32

Driller:	M. Porter	Elevation (m):	17.60
Operator:	Maine Test Borings, Inc.	Datum:	CGVD28 metric
Logged By:	K. Stone	Rig Type:	MD D-47, Skid on Barge
Date Start/Finish:	7/26/04 - 7/28/04	Drilling Method:	Drive and Wash
Boring Location:	Sta. 5 + 590, 10 R	Casing ID/OD:	7.6 cm / 8.9 cm

Auger ID/OD:	- / -
Sampler:	Split Spoon
Hammer Wt./Fall:	63.5 kg / 76.2 cm
Core Barrel:	NQ2 Standard
Water Level *:	2.4 m to top of hole

Definitions:
D = Split Spoon Sample
UD = Unsuccessful Split Spoon Sample attempt
U = Thin Wall Tube Sample
R = Rock Core Sample
V = Insitu Vane Shear Test
WSS = Wash Sand Sampler
S_u = Insitu Field Vane Shear Strength (kPa)
T_v = Pocket Torvane Shear Strength (kPa)
q_u = Unconfined Compressive Strength (Pa)
S_u(Lab) = Lab Vane Shear Strength (kPa)
WOH = weight of 44 kg hammer
WOR = weight of rods

Definitions:
W.C. = water content, percent
LL = Liquid Limit
PL = Plastic Limit
PI = Plasticity Index
G = Grain Size Analysis
C = Consolidation Test

Depth (m)	Sample No.	Rec./Pen. (cm)	Sample Depth (m)	Blows (100 mm) Shear Strength (kPa) S_u (Lab)	Blows/ 15 cm	Graphic Log	Visual Description and Remarks	Laboratory Testing Results / AASHTO and Unified Class.
0	D1	61.0/27.9	0.00 – 0.61	9/19/27/26	46		Brown, wet, very dense, well-graded sandy GRAVEL with some silt –GLACIAL TILL–(GW)	
					107			
					157			
					150			
1	R1	101.6/ 101.6	1.16 – 2.17	RQD = 60%	3:30		Bedrock at 1.07 m	
					3:30		Dark gray with porphyry, aphanitic to medium grained, igneous, moderately hard to hard, fresh. Primary joint set dipping steep, joint present at 1.48 m, tight to open, trace silt infilling. Secondary joint set dipping horizontal to low angle. RMD=Fair Recovery=100%	
2					5:00			
	R2	152.4/ 139.7	2.19 – 3.72	RQD = 83%	5:00		Dark gray with porphyry, aphanitic to medium grained, metamorphic, moderately hard to hard, fresh. Primary joint set dipping low angle to horizontal, close to moderate, tight, occasional trace silt infilling RMD=Good Recovery: 92% –GABBRO–	
					3:00			
3					3:00			
					3:00			
	R3	142.0/ 139.7	3.72 – 5.14	RQD = 75%	3:00		Dark gray with porphyry, aphanitic to medium grained, igneous, moderately hard to hard, fresh. Primary joint set dipping, steep to vertical, tight to open, close to moderate, occasionally present at 4.48 m, trace silt infilling. Secondary joint set dipping horizontal to low angle, tight to open, very close to moderate, trace silt infilling. RMD=good Recovery 93%	
4					3:00			
					3:00			
					4:00			
5					3:00			
6								
7								

Bottom of Exploration at 5.13 m below ground surface.

Remarks:
Casing refusal at 1.07 m, drilled to 1.16 m, began core at 1.16 m.

Stratification lines represent approximate boundaries between soil types; transitions may be gradual.

* Water level readings have been made at times and under conditions stated. Groundwater fluctuations may occur due to conditions other than those present at the time measurements were made.

03 February 2009h:56

Page 1 of ??

Boring No.: P3-B1-04

Haley & Aldrich, Inc.

Soil/Rock Exploration Log

METRIC UNITS

Project: Calais, ME & St. Stephen, NB
Location: St. Croix River Bridge
File No. 30059-001

Boring No.: P3-B2-04
PIN: 8483.32

Driller:	M. Porter	Elevation (m):	17.90
Operator:	Maine Test Borings, Inc.	Datum:	CGVD28 metric
Logged By:	K. Stone	Rig Type:	MD D-47, Skid on Barge
Date Start/Finish:	7/26/04 – 7/27/04	Drilling Method:	Drive and Wash
Boring Location:	Sta. 5 + 590, 10 L	Casing ID/OD:	7.6 cm / 8.9 cm

Auger ID/OD:	- / -
Sampler:	Split Spoon
Hammer Wt./Fall:	63.5 kg / 76.2 cm
Core Barrel:	NQ2 Standard
Water Level *:	4.32 m water in top of hole

Definitions:
D = Split Spoon Sample
UD = Unsuccessful Split Spoon Sample attempt
U = Thin Wall Tube Sample
R = Rock Core Sample
V = Insitu Vane Shear Test
WSS = Wash Sand Sampler
S_u = Insitu Field Vane Shear Strength (kPa)
T_v = Pocket Torvane Shear Strength (kPa)
q_u = Unconfined Compressive Strength (Pa)
S_u(Lab) = Lab Vane Shear Strength (kPa)
WOH = weight of 44 kg hammer
WOR = weight of rods

Definitions:
W.C. = water content, percent
LL = Liquid Limit
PL = Plastic Limit
PI = Plasticity Index
G = Grain Size Analysis
C = Consolidation Test

Depth (m)	Sample No.	Rec./Pen. (cm)	Sample Depth (m)	Blows (100 mm) Shear Strength (kPa) S_u (Lab)	Blows/ 15 cm	Graphic Log	Visual Description and Remarks	Laboratory Testing Results / AASHTO and Unified Class.
0	D1	61.0/25.4	0.00 – 0.61	7/35/33/24	58		Gray to light brown, wet, very dense, well-graded sand with gravel –RIVER BOTTOM SEDIMENT–(SW)	
					214			
					215			
	D2	22.9/7.6	0.61 – 0.84	90/75	150		Gray to black, wet, very dense, poorly graded sandy gravel, possibly weathered bedrock –RIVER BOTTOM SEDIMENT–(GP)	
1	R1	101.6/55.9	0.65 – 1.67	RQD = 20%	3:30		Bedrock at 0.85 m	
					1:15		Gray to dark gray aphanitic to fine grained, igneous, moderately hard to hard, slightly weathered to fresh. Primary joint set dipping steep, close, tight to open, no infilling, slight rust discoloration. Secondary joint set dipping low angle, very close to close, tight to open, no infilling, slight rust discoloration. RMD=Poor Recovery=55% –GABBRO–	
					11:30			
2	R2	142.2/ 124.5	1.66 – 3.28	RQD = 71%	7:30			
					8:30			
					4:45			
3					4:00			
					8:30			
4								
5								
6								
7								

Bottom of Exploration at 3.32 m below ground surface.

Remarks:
Casing refusal at 1.1 m, cobble from 0.24–0.49 m, drove casing to 0.85 m.

Stratification lines represent approximate boundaries between soil types; transitions may be gradual.

* Water level readings have been made at times and under conditions stated. Groundwater fluctuations may occur due to conditions other than those present at the time measurements were made.

03 February 2009h:56

Page 1 of ??

Boring No.: P3-B2-04

PROJECT DESIGN ENGINEER	KSD		
DESIGN-DETAILED			
CHECKED			
REVISIONS			
FIELD CHANGES			
	BY		DATE

PLANS

143-178A

BRIDGE NO. 6440

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

ST. CROIX RIVER BRIDGE
OVER
ST. CROIX RIVER
BETWEEN
ST. STEPHEN, N.B., CANADA
CALAIS, MAINE, U.S.A.
BORING LOGS

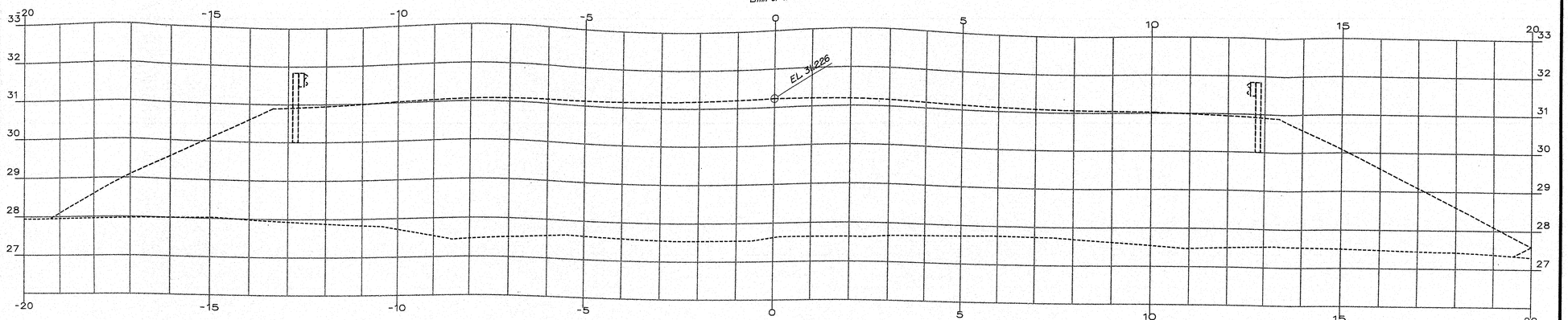
AUGUSTA, MAINE

METRIC	1. All dimensions are in millimeters unless otherwise noted. 2. All elevations and stations are in meters.

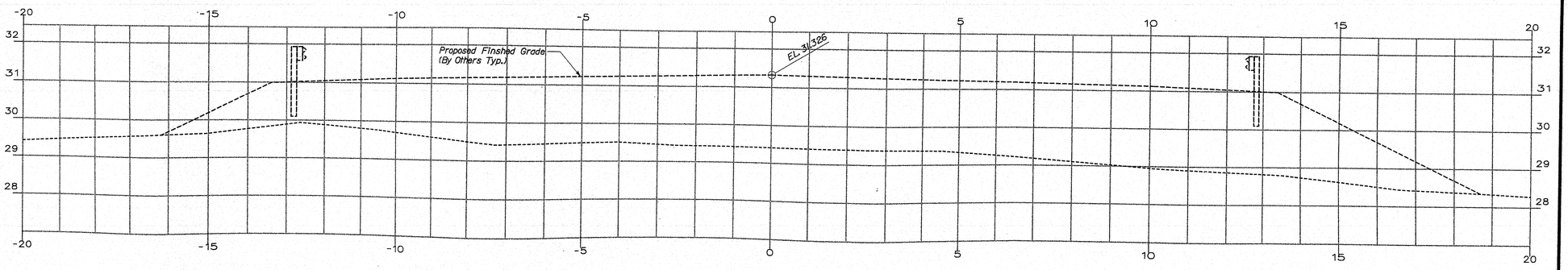
F.H.W.A. REG. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
1	MAINE	CPD\CBI-8483(360)X	10	47

8483.36

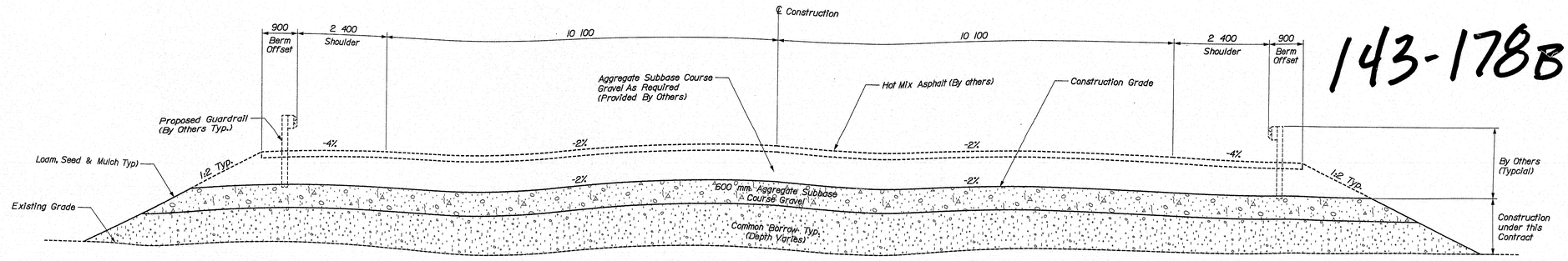
5+416 ±
Limit of Work



5+410.000



5+400.000



TYPICAL APPROACH SECTION

143-178B

PROJECT DESIGN ENGINEER	BY	DATE
DESIGN-DETAILED	M.A. Iqbal	Team 4 & 5	
CHECKED	———	———	———
REVISIONS	———	———	———
FIELD CHANGES	———	———	———

PLANS

Filename: ...\010_XSMCON_5400 - 5410.dgn Division: BRIDGE Username: dana.damren Date:8/31/2006

ST. STEPHEN, N.B., CANADA

CANADA \U.S. ROUTE 1

STA. X+XXX TO STA. Y+YYY

METRIC 1. All dimensions are in millimeters unless otherwise noted.
2. All elevations and stations are in meters.

F.H.W.A. REG. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
1	MAINE	CPD\CBI-8483(360)	X 11	47

8483.36

PROJECT DESIGN ENGINEER	BY	DATE
DESIGN-DETAILED	M. A. Iqbal	
CHECKED		
PLANS REVISIONS	Com. 4 & 5	
FIELD CHANGES		

Filename: ...\011_XSMCON_5420 - 5430.dgn Division: BRIDGE Username: dana.damren Date:8/31/2006

143-179A

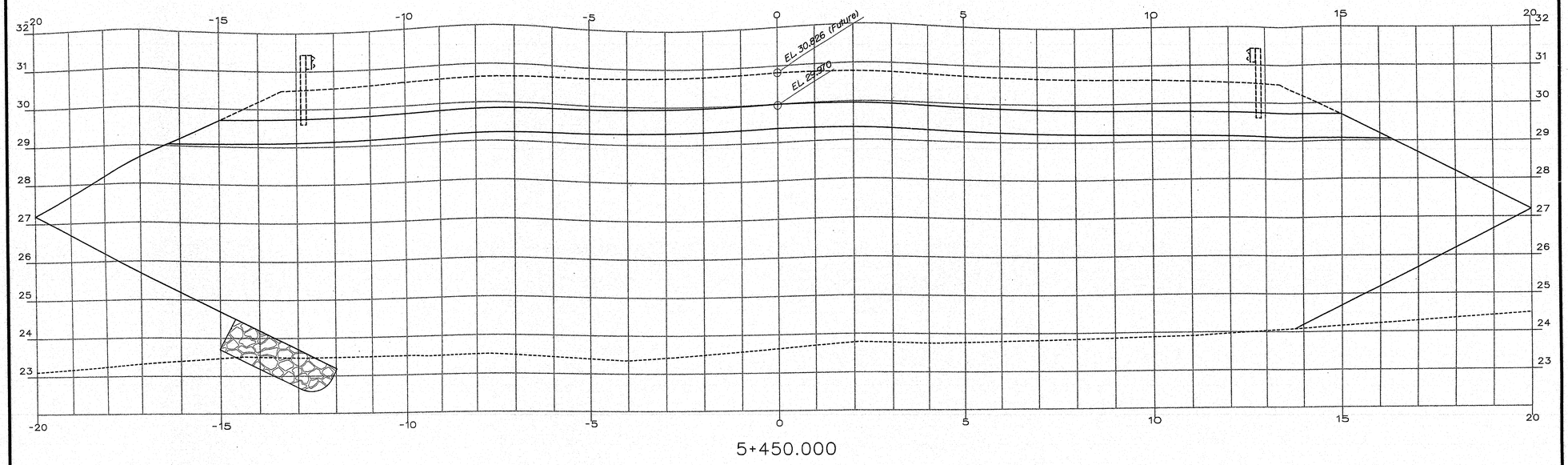
ST. STEPHEN, N.B., CANADA

CANADA \U.S. ROUTE 1

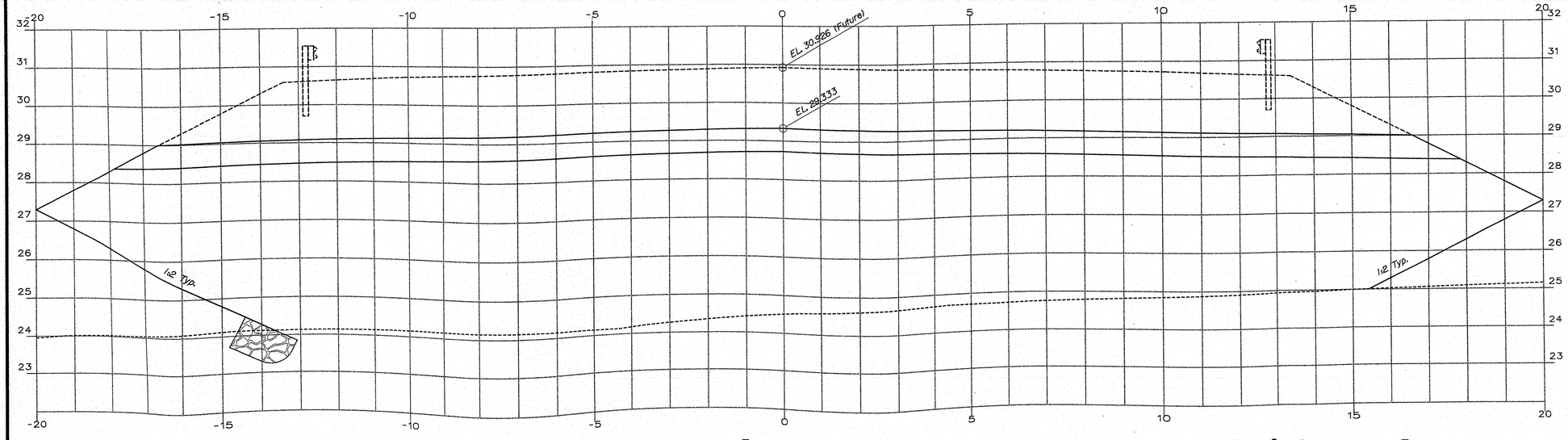
STA. X+XXX TO STA. Y+YYY

METRIC	1. All dimensions are in millimeters unless otherwise noted. 2. All elevations and stations are in meters.	F.H.W.A. REG. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
		1	MAINE	DPD\CBI-8483(360)X	12	47

8483.36



5+450.000



5+440.000

PROJECT DESIGN ENGINEER	BY	DATE
DESIGN-DETAILED	M. A. Iqbal	from 4 & 5
CHECKED		
REVISIONS		
FIELD CHANGES		

PLANS

Filename: ...\012_XSMCON_5440 - 5450.dgn Division: BRIDGE Username: dana.damren Date: 8/31/2006

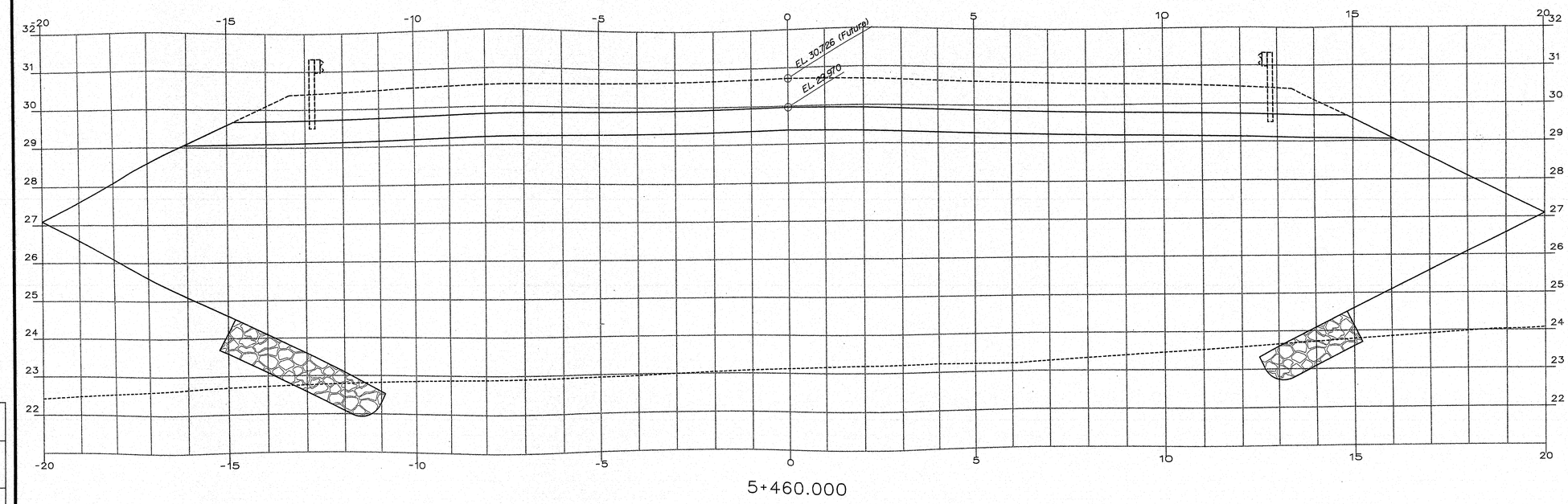
143-179B

ST. STEPHEN, N.B., CANADA

CANADA \U.S. ROUTE 1

STA. X+XXX TO STA. Y+YYY

METRIC	1. All dimensions are in millimeters unless otherwise noted. 2. All elevations and stations are in meters.	F.H.W.A. REG. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
		1	MAINE	CPD\CBI-8483(360)X	13	47
				8483.36		



5+460.000

143-180A

ST. STEPHEN, N.B., CANADA

CANADA \U.S. ROUTE 1

STA. X+XXX TO STA. Y+YYY

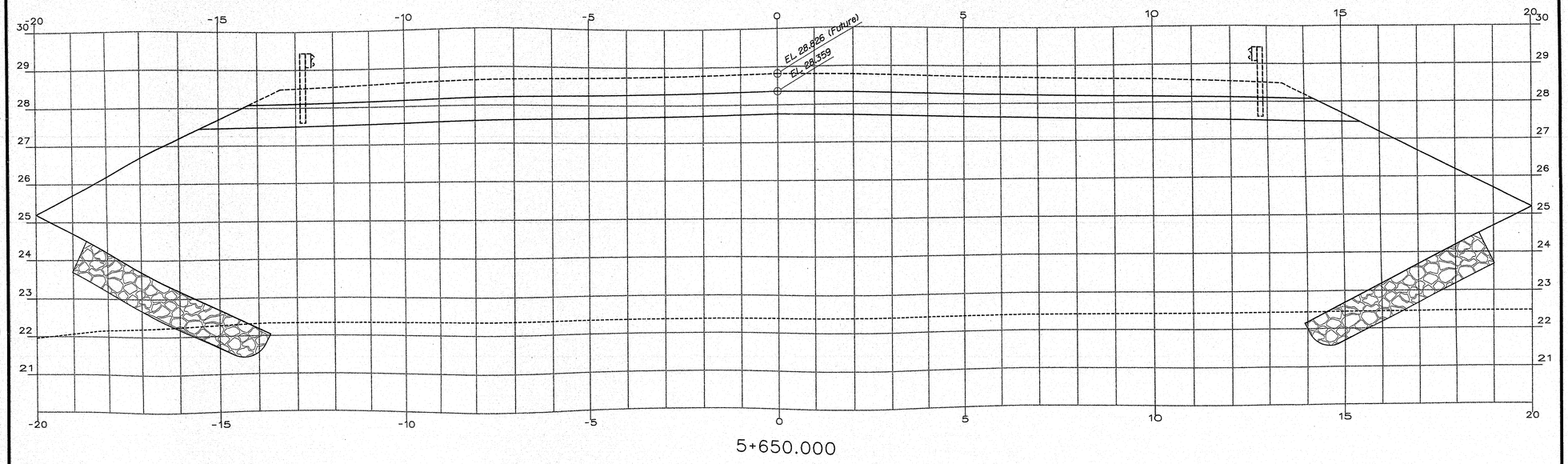
PROJECT DESIGN ENGINEER		BY	DATE
PLANS	DESIGN-DETAILED	M. A. Iqbal	Team 4 & 5	
	CHECKED	———	———	———
	REVISIONS	———	———	———
	FIELD CHANGES	———	———	———

Filename: ...\msta\013_XSMCON_5460.dgn Division: BRIDGE Username: dana.damren Date:8/31/2006

METRIC
1. All dimensions are in millimeters unless otherwise noted.
2. All elevations and stations are in meters.

F.H.W.A. REG. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
1	MAINE	CPD\CBI-8483(360)X	14	47

8483.36



5+650.000

PROJECT DESIGN ENGINEER	BY	DATE
DESIGNED / FIELD CHECKED	M. A. Iqbal	Item 4 & 5
CHECKED		
REVISIONS		
FIELD CHANGES		

PLANS

143-180B

ST. STEPHEN, N.B., CANADA

CANADA \U.S. ROUTE 1

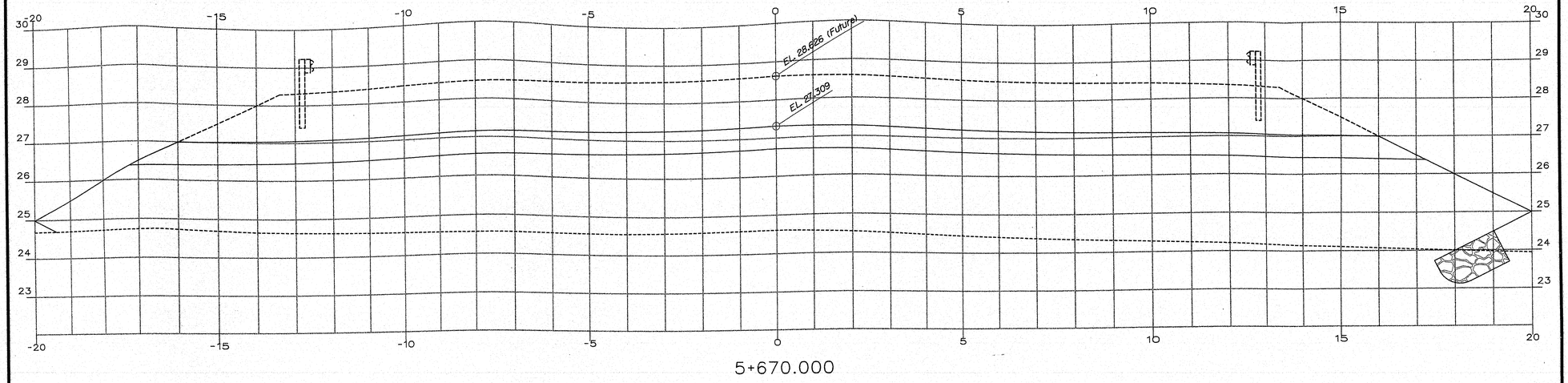
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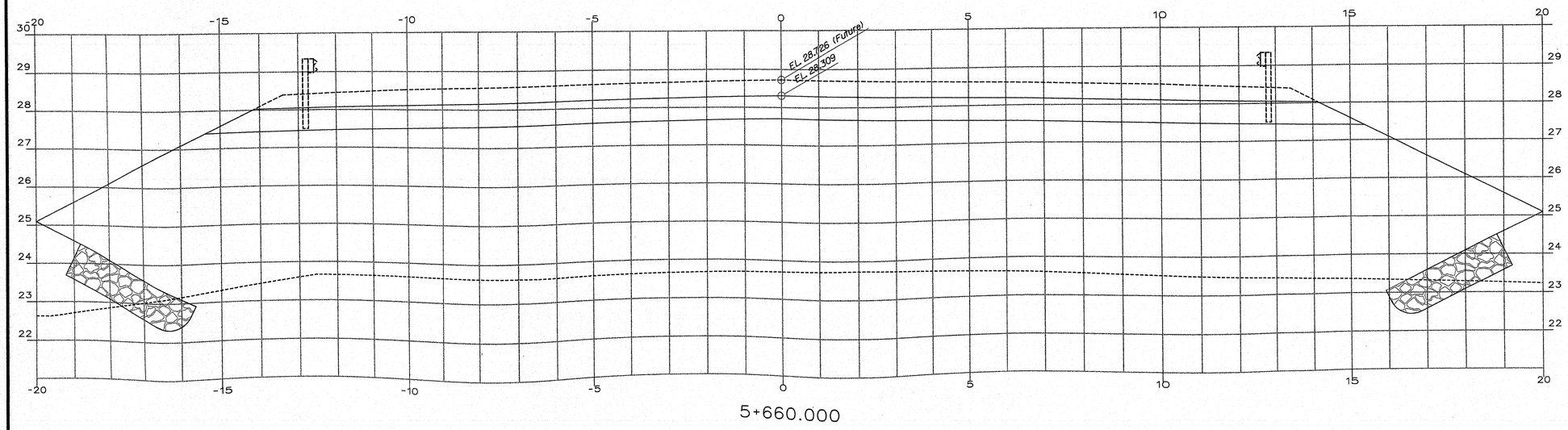
METRIC 1. All dimensions are in millimeters unless otherwise noted.
2. All elevations and stations are in meters.

F.H.W.A. RRA NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
1	MAINE	CPD\CBI-8483(360)X	15	47

8483.36



5+670.000



5+660.000

PROJECT DESIGN ENGINEER		BY	DATE
PLANS	DESIGN-DETAILED	M. A. Iqbal	Team 4 & 5	
	CHECKED			
	REVISIONS			
	FIELD CHANGES			

143-181A

ST. STEPHEN, N.B., CANADA

CANADA \U.S. ROUTE 1

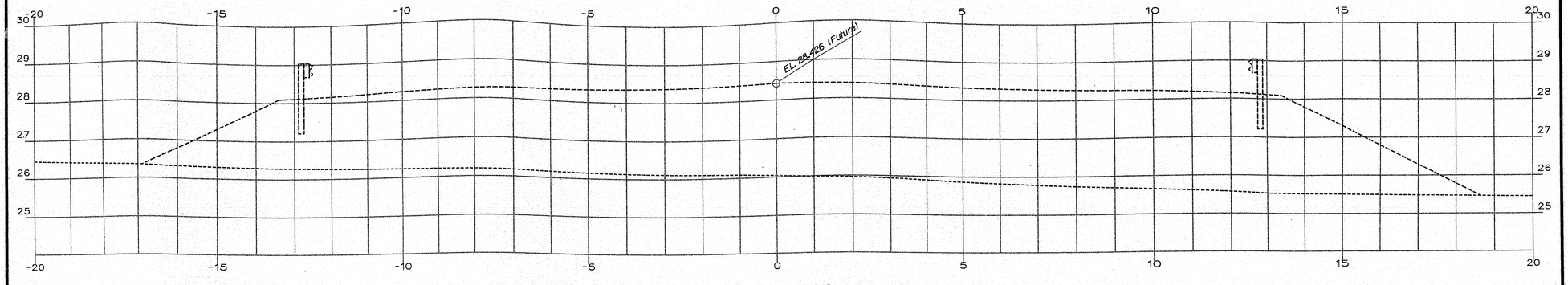
STA. X+XXX TO STA. Y+YYY

Filename: ...\015_XSMCON_5660 - 5670.dgn Division: BRIDGE Username: donu.damren Date:8/31/2006

METRIC 1. All dimensions are in millimeters unless otherwise noted.
2. All elevations and stations are in meters.

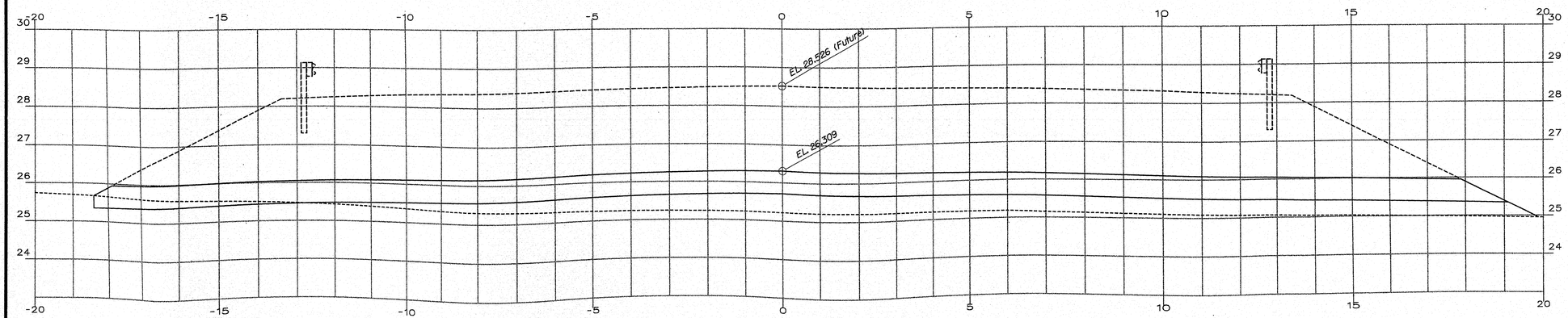
F.H.W.A. REG. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
1	MAINE	CPD\CBI-8483(360)X	16	47

8483.36



5+690.000

5+686 ±
Limit of Work



5+680.000

PROJECT DESIGN ENGINEER		BY	DATE
PLANS	DESIGN-DETAILED	M. A. Iqbal	
	CHECKED	Team 4 & 5	
	REVISIONS		
	FIELD CHANGES		

143-181B

ST. STEPHEN, N.B., CANADA

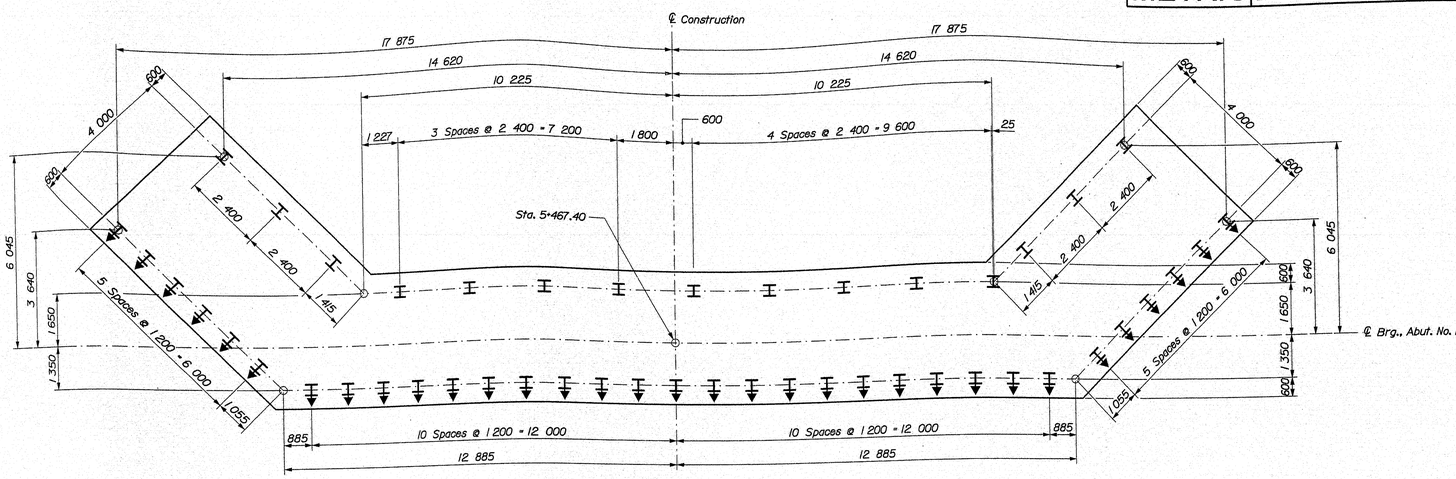
CANADA \U.S. ROUTE 1

STA. X+XXX TO STA. Y+YYY

Filename: ...\mista\016_XSMCON_5680-5700.dgn Division: BRIDGE Username: dana.damren Date:8/31/2006

METRIC	1. All dimensions are in millimeters unless otherwise noted. 2. All elevations and stations are in meters.	F.H.W.A. REG. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
		1	MAINE	CPD\CBI-8483(360)	X 17	47

8483.36

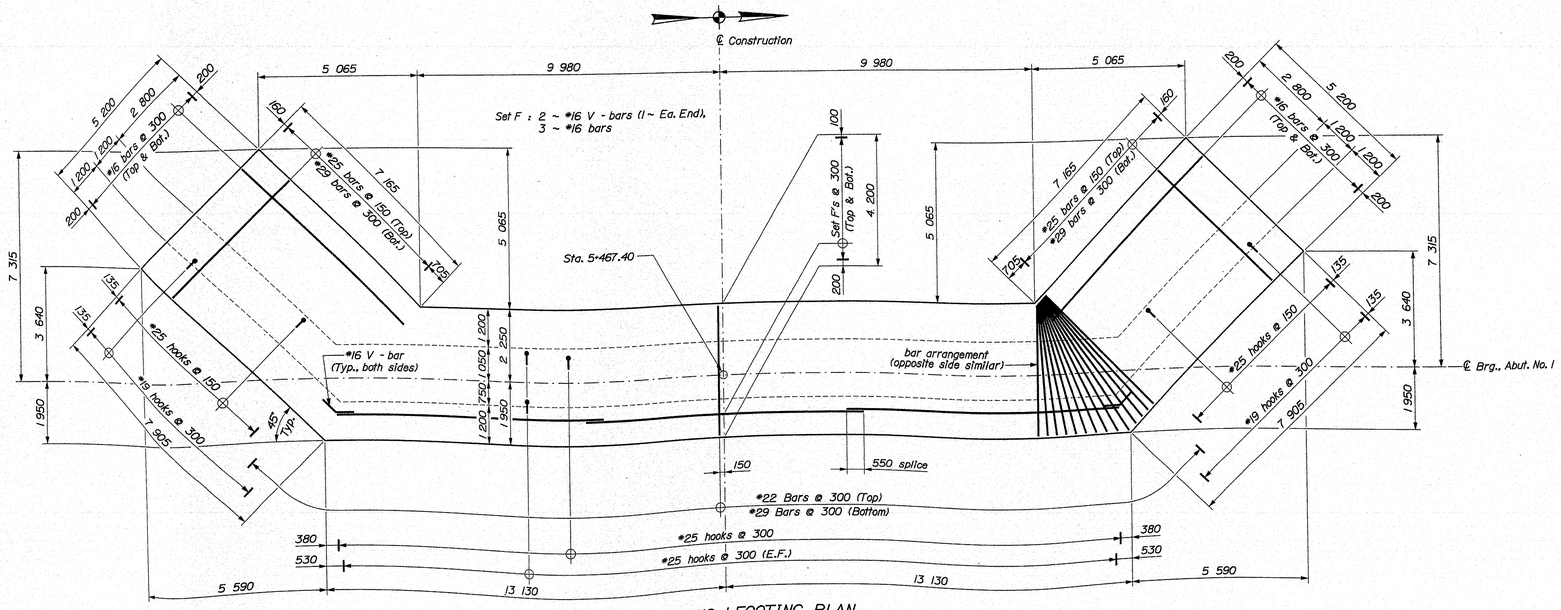


ABUTMENT NO. 1 PILE PLAN

Battered piles shown at bottom of abutment footing is at EL. 20.300, bottom of wingwall footing is at EL. 20.500.

PILE NOTES

1. *Piles marked thus H→, shall be battered 100 V : 25 H in the direction of the arrow.*
2. *Maximum calculated pile loads: 1090 kN*
3. *Estimate of piles required:*
   Abutment Number 1: 48 - HP 360 x 132 @ 8.7 meters
4. *Piles shall not be out of position shown by more than 50 mm in any direction.*
5. *The Contractor shall perform and submit a wave equation analysis for review and acceptance by the Resident. The submittal analysis shall include the proposed stopping criteria based on the wave equation analysis and the proposed driving system. The stopping criteria shall include the blows per 25 mm and number of 25 mm driving intervals at which pile installation may be terminated. The cost of performing the wave equation analysis will be considered incidental to pay Item 501.92, Pile Driving Equipment Mobilization.*
6. *All piles shall be equipped with a pile tip in accordance with Standard Specification Section 501.10*
7. *The Contractor shall perform three (3) dynamic load tests to confirm the ultimate capacity of the piles and verify driving criteria. The ultimate capacity shall be the maximum calculated design load times 2.25 per LFD Specifications. At the start of production pile driving, one (1) battered pile and one (1) plumb pile from different locations within the pile foundation, shall be dynamically tested. One (1) additional pile will be tested after approximately one-half of the piles have been installed.*
8. *H-pile material shall be ASTM A572, Grade 50.*



ABUTMENT NO. 1 FOOTING PLAN

Flow →

PROJECT DESIGN ENGINEER		BY	DATE
DESIGNED	M.A. Iqbal	Item 4 & 5	
DETAILED			
CHECKED			
REVISIONS			
FIELD CHANGES			

PLANS

143-182A

BRIDGE NO. 6440

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

ST. CROIX RIVER BRIDGE
OVER
ST. CROIX RIVER
IN THE TOWN OF
ST. STEPHEN, N.B., CANADA
CALAIS, MAINE, U.S.A.

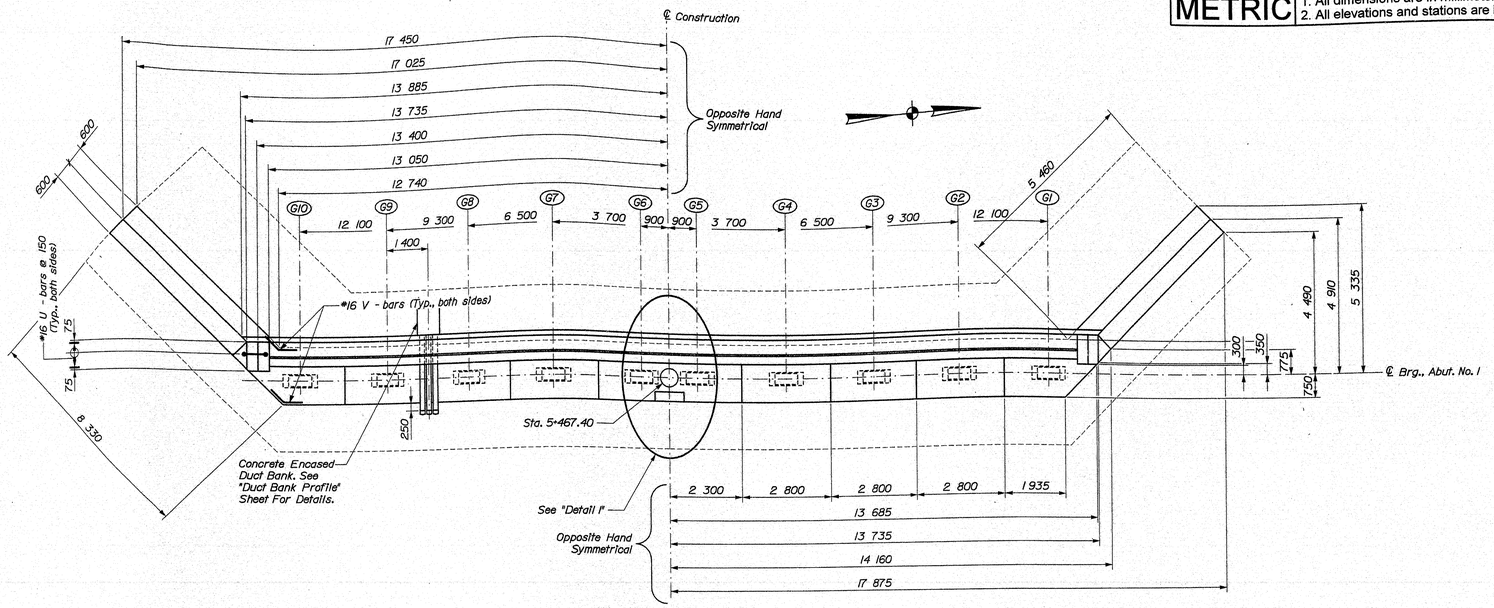
ABUT. NO. 1 FOOTING

AUGUSTA, MAINE

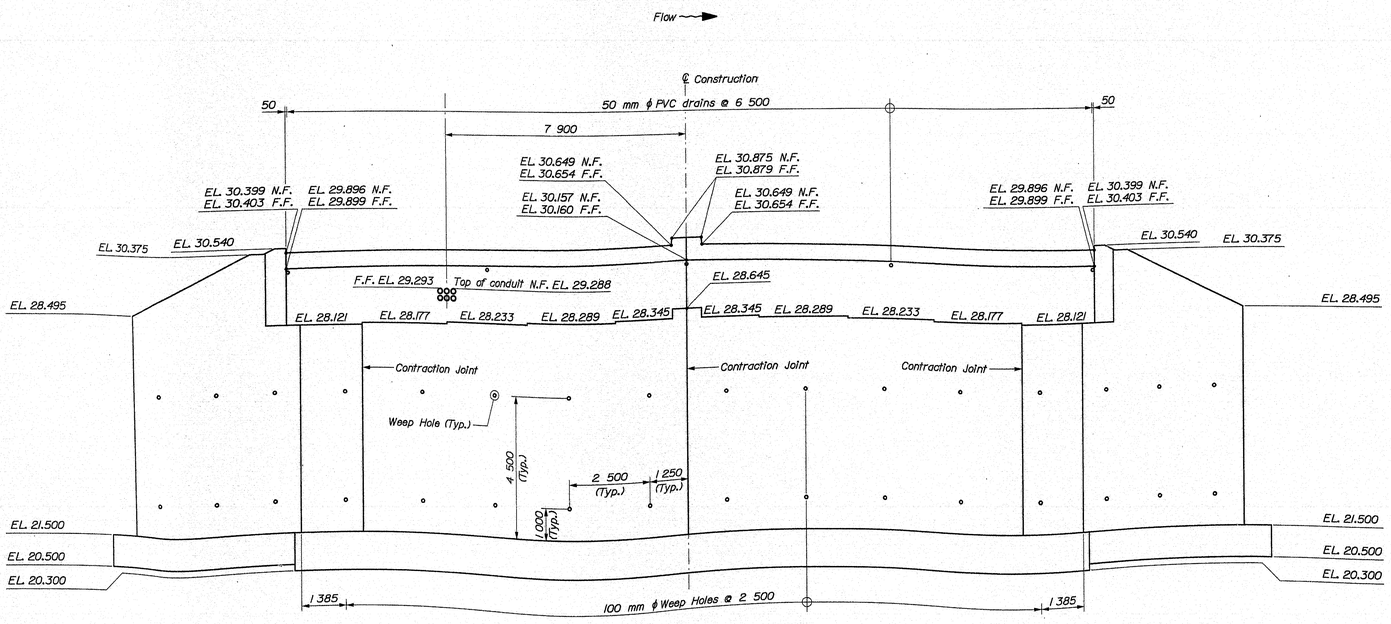
Filename: ...\017_Abutment_1_Footing.dgn Division: BRIDGE Username: dana.damren Date:8/31/2006

METRIC	1. All dimensions are in millimeters unless otherwise noted. 2. All elevations and stations are in meters.	F.H.W.A. REG. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
		1	MAINE	NCPD\CBI-8483(360)X	18	47

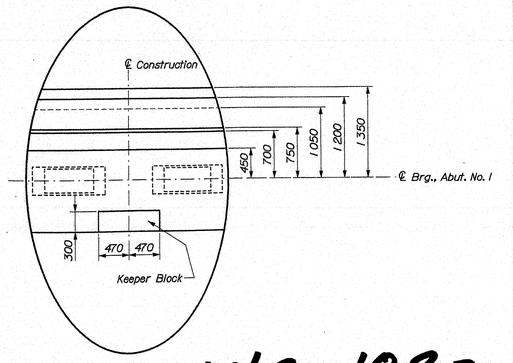
8483.36



ABUTMENT NO. 1 STEM PLAN



ABUTMENT NO. 1 ELEVATION



DETAIL 1

ABUTMENT NOTES

1. Reinforcing steel shall have 50 mm cover in the walls and 75 mm cover in the footings unless otherwise noted.
2. Cover joints in accordance with Standard Detail 502(01) where waterstops are not required.
3. Construct French drains behind the abutments and wings in accordance with Standard Specification Section 512, French Drains.
4. Abutments and wings shall be backfilled with granular borrow. Pay limits will be the structural excavation limits in cut areas and a vertical plane located 3 m behind the walls in fill areas.

PROJECT DESIGN ENGINEER			
DESIGN-DETAILED	N. A. Iqbal	Items 4 & 5	
CHECKED	———	———	———
REVISIONS	———	———	———
FIELD CHANGES	———	———	———

PLANS

143-182B

BRIDGE NO. 6440

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

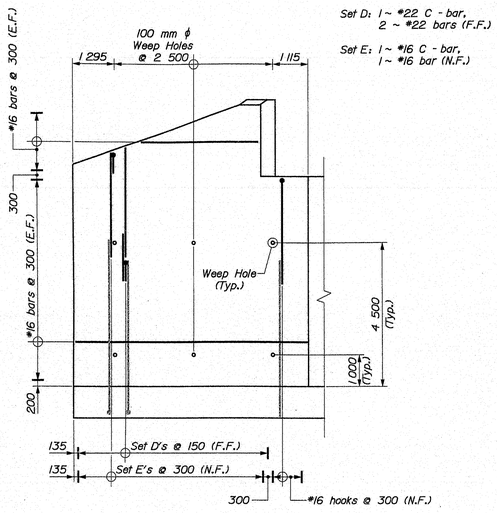
ST. CROIX RIVER BRIDGE
OVER
ST. CROIX RIVER
IN THE TOWN OF
ST. STEPHEN, N.B., CANADA
CALAIS, MAINE, U.S.A.

ABUTMENT NO. 1

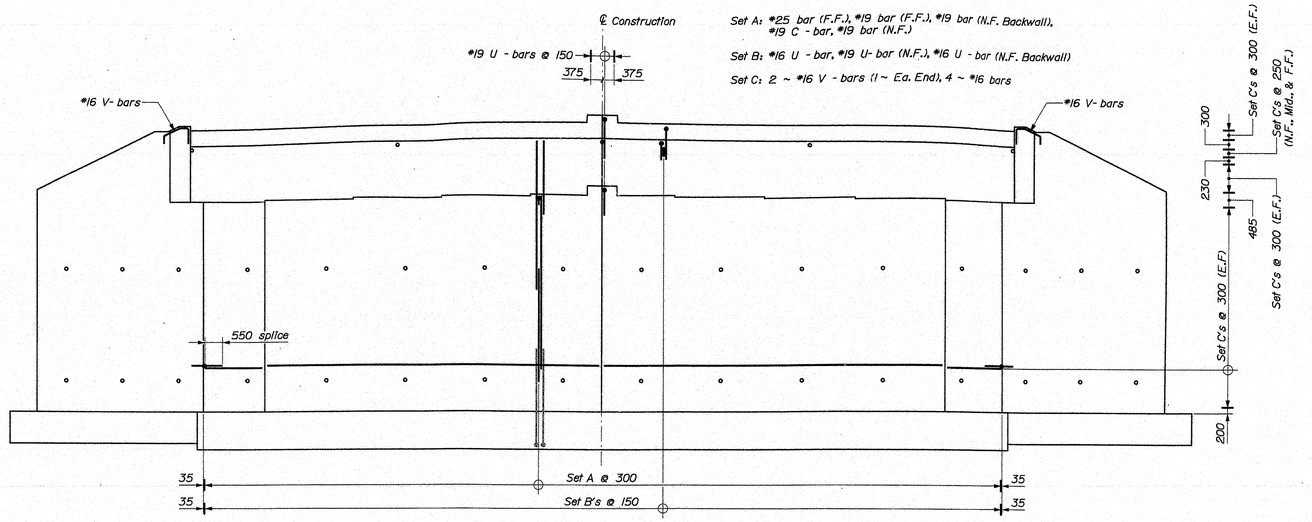
AUGUSTA, MAINE

Filename: ...\msta\018_Abutment_1_Shaft.dgn Division: BRIDGE Username: dana.damren Date:8/31/2006

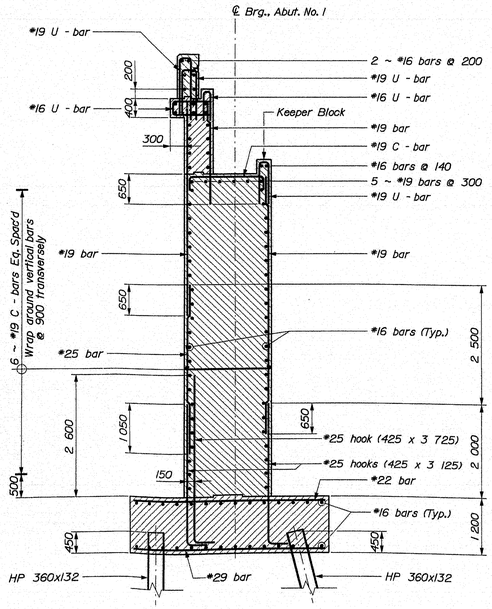
METRIC	1. All dimensions are in millimeters unless otherwise noted. 2. All elevations and stations are in meters.	F.H.W.A. REG. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
		1	MAINE	CPD\CBI-8483(360)X 8483.36	19	47



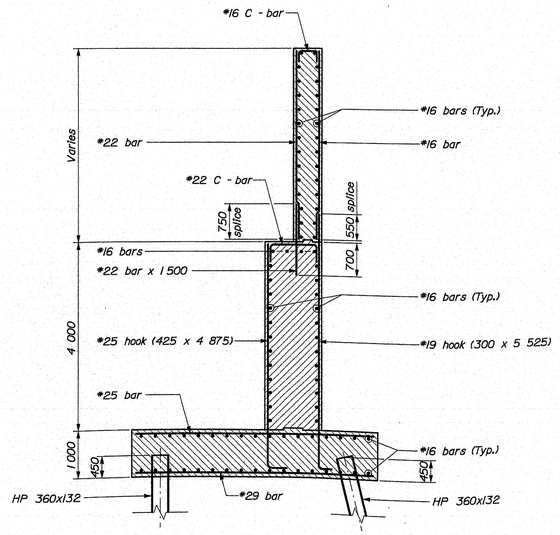
SOUTH WINGWALL REINFORCING
North wingwall similar



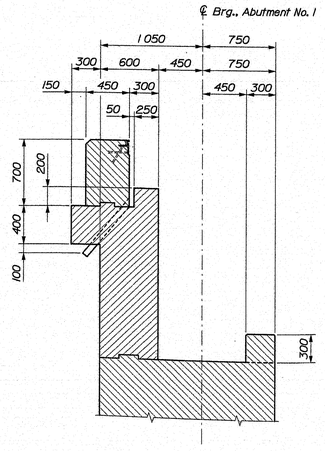
ABUTMENT NO. 1 REINFORCING



TYPICAL ABUTMENT SECTION
(At Centerline Construction)



TYPICAL WINGWALL SECTION



BACKWALL SECTION

143-183A

BRIDGE NO. 6440

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

ST. CROIX RIVER BRIDGE
OVER
ST. CROIX RIVER
IN THE TOWN OF
ST. STEPHEN, N.B., CANADA
CALAIS, MAINE, U.S.A.

ABUT. NO. 1 REINFORCING

AUGUSTA, MAINE

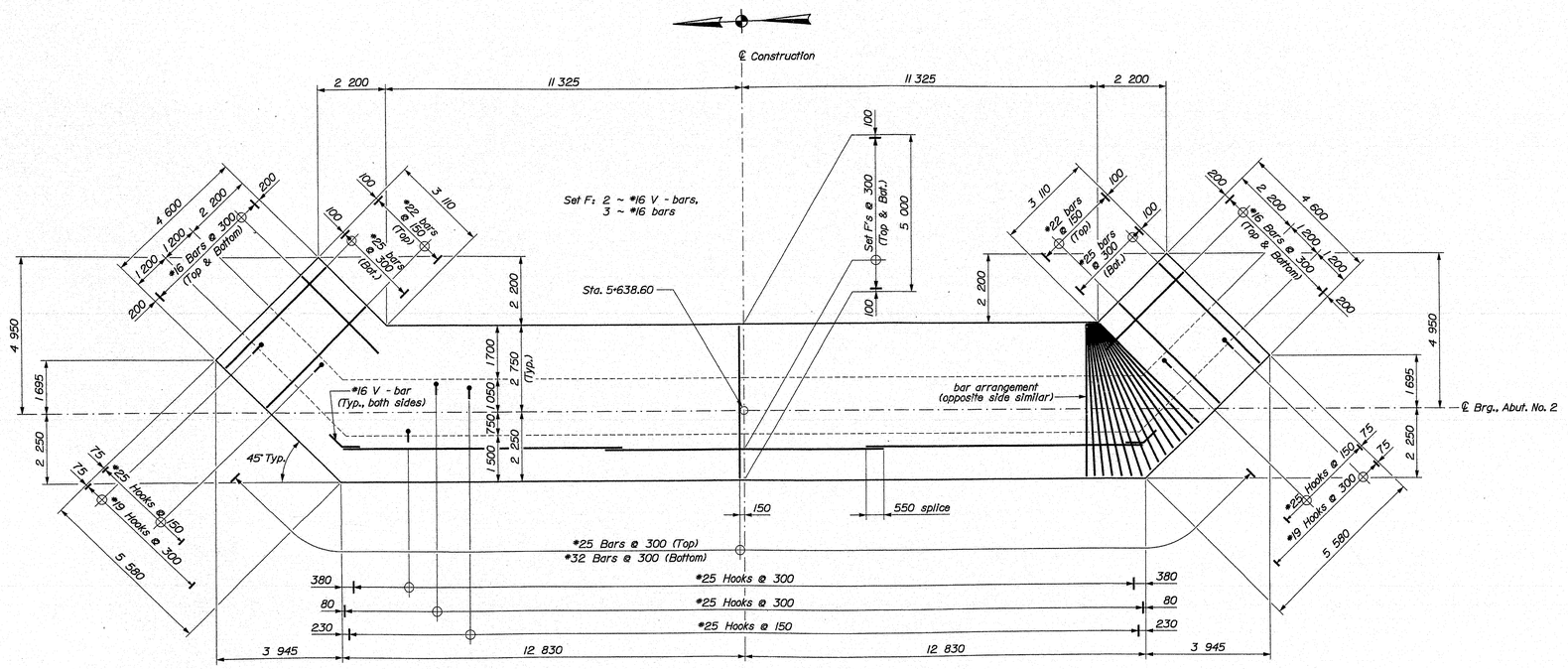
PROJECT DESIGN ENGINEER	BY	DATE
DESIGN-DETAILED	M. A. Iqbal	Item 4 & 5
CHECKED		
REVISIONS		
FIELD CHANGES		

PLANS

Filename: ...\msta\019_Abutment_1_Rebar.dgn Division: BRIDGE Username: dana.damren Date:8/31/2006

METRIC	1. All dimensions are in millimeters unless otherwise noted. 2. All elevations and stations are in meters.	F.H.W.A. REG. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
		1	MAINE	CPD\CBI-8483(360)X	20	47

8483.36



ABUTMENT NO. 2 FOOTING PLAN

Flow

143-183B

BRIDGE NO. 6440

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

ST. CROIX RIVER BRIDGE
OVER
ST. CROIX RIVER
IN THE TOWN OF
ST. STEPHEN, N.B., CANADA
CALAIS, MAINE, U.S.A.

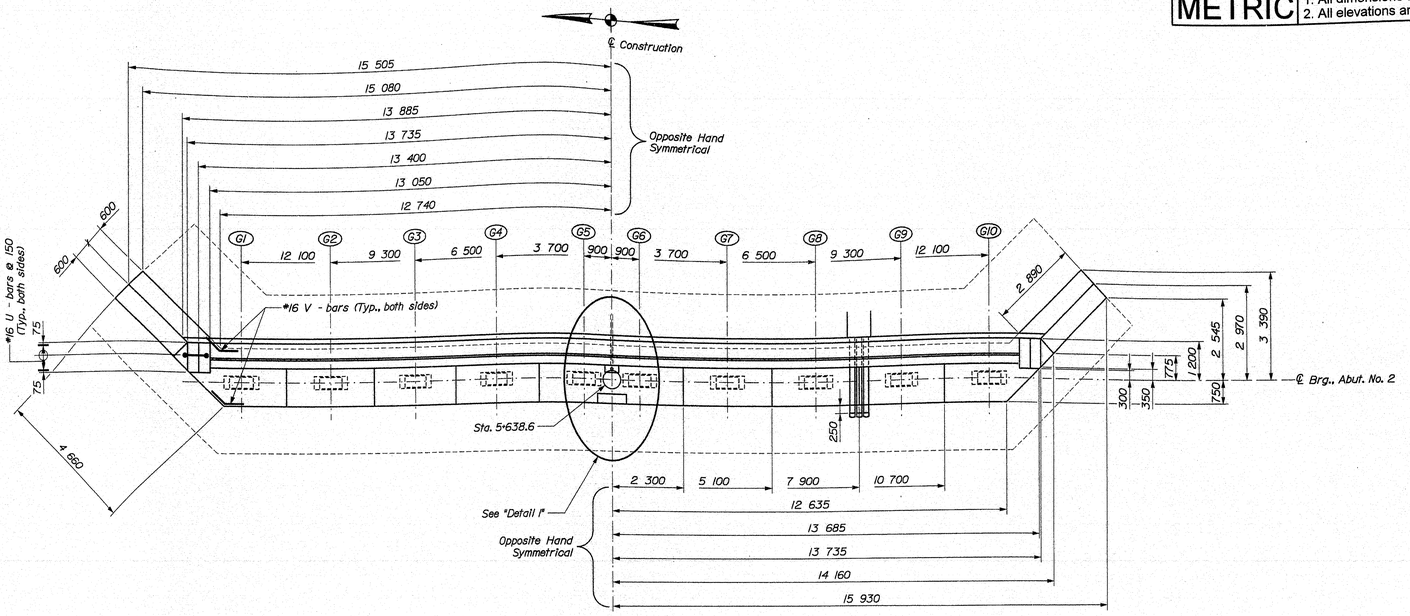
ABUT. NO. 2 FOOTING

AUGUSTA, MAINE

PROJECT DESIGN ENGINEER	BY	DATE
DESIGN DETAILED	M. A. Abdul Karim 4 & 5	
CHECKED		
PLANS REVISIONS		
FIELD CHANGES		

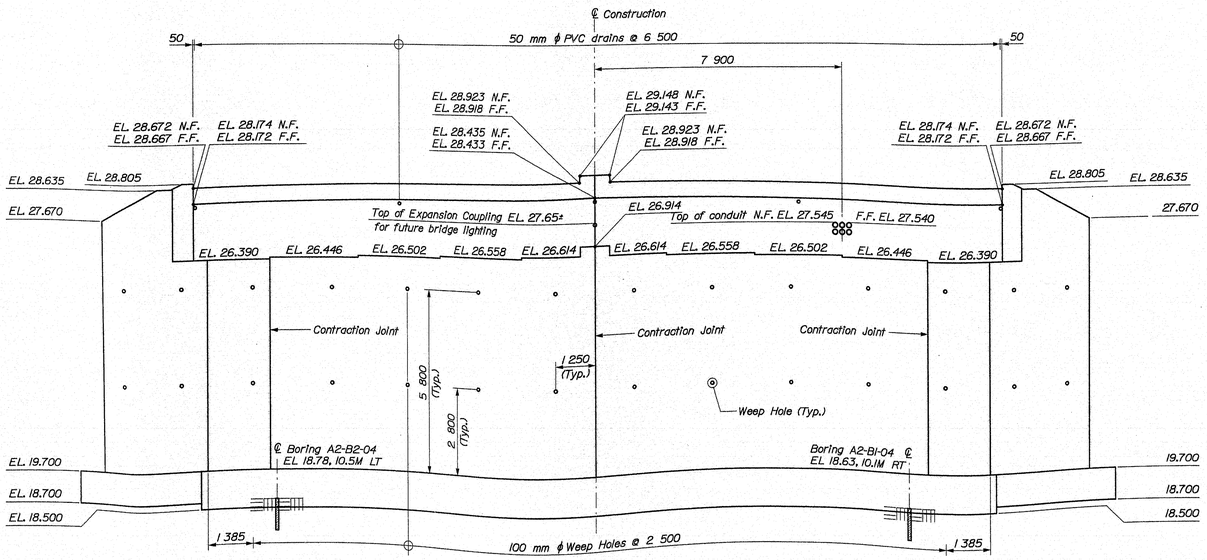
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METRIC	1. All dimensions are in millimeters unless otherwise noted. 2. All elevations and stations are in meters.	F.H.W.A. REG. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
		1	MAINE	NCPD\CBI-8483(360)X	21	47
				8483.36		

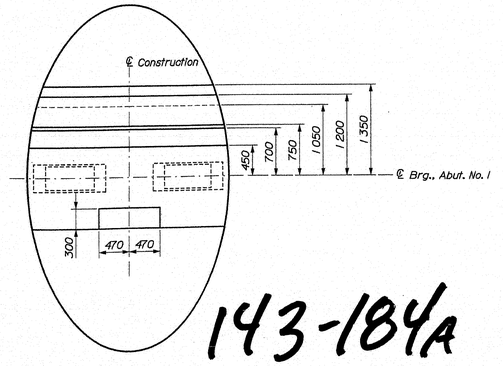


ABUTMENT NO. 2 STEM PLAN

Flow



ABUTMENT NO. 2 ELEVATION



DETAIL 1

143-184A

ABUTMENT NOTES

1. Reinforcing steel shall have 50 mm cover in the walls and 75 mm cover in the footings unless otherwise noted.
2. Cover joints in accordance with Standard Detail 502(01) where waterstops are not required.
3. Construct French drains behind the abutments and wings in accordance with Standard Specification Section 512, French Drains.
4. Abutments and wings shall be backfilled with granular borrow. Pay limits will be the structural excavation limits in cut areas and a vertical plane located 3 m behind the walls in fill areas.
5. Maximum calculated footing pressure is 705 kPa.
6. The bedrock surface shall be cleared of all weathered and fractured rock and loose soil. The final bedrock surface shall be approved by the Resident prior to placement of abutment foundations.
   Where the bedrock surface slopes toward the river channel, the bedrock surface shall be stepped to create level benches or excavated to be level overall, as approved by the Resident. Elsewhere the bedrock surface slope shall be less than 1H : 6 V or it shall be benched in level steps or excavated to be completely level.

BRIDGE NO. 6440

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

ST. CROIX RIVER BRIDGE
OVER
ST. CROIX RIVER
IN THE TOWN OF
ST. STEPHEN, N.B., CANADA
CALAIS, MAINE, U.S.A.

ABUTMENT NO. 2

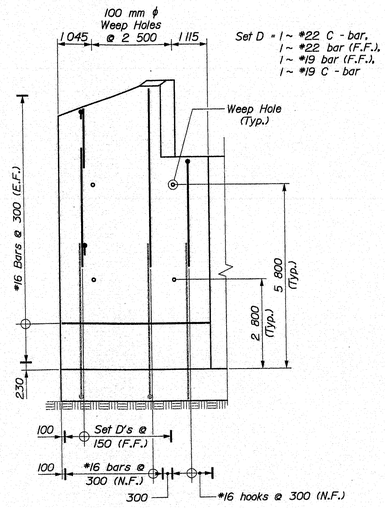
AUGUSTA, MAINE

PROJECT DESIGN ENGINEER	BY	DATE
DESIGN-DETAILED	M. A. Iqbal	Team 4 & 5	
CHECKED			
PLANS REVISIONS			
FIELD CHANGES			

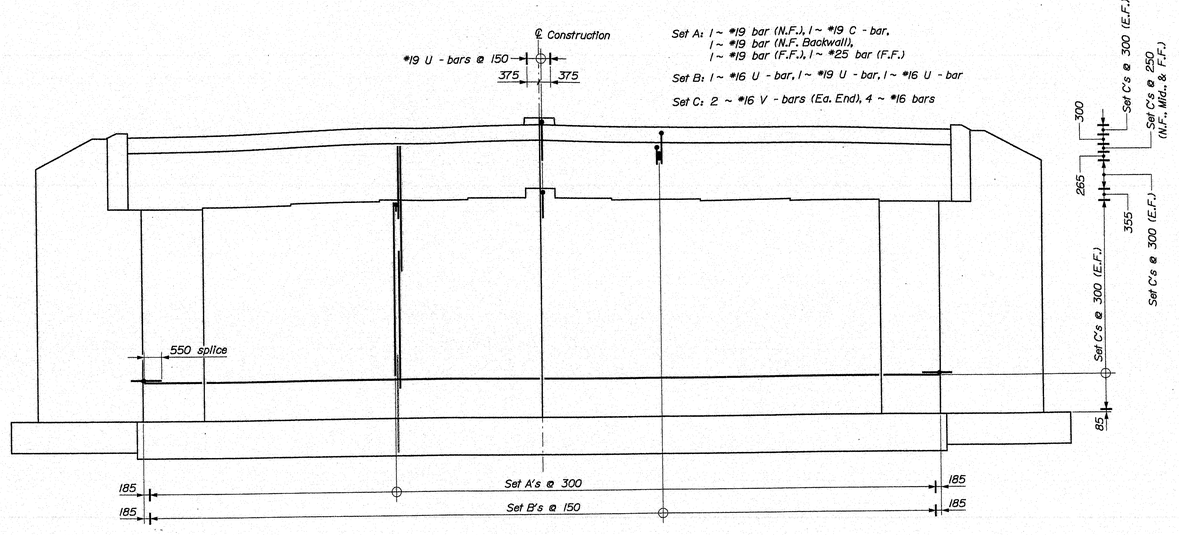
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METRIC	1. All dimensions are in millimeters unless otherwise noted. 2. All elevations and stations are in meters.	F.H.W.A. REG. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
		1	MAINE	NCPD\CBI-8483(360)X	22	47

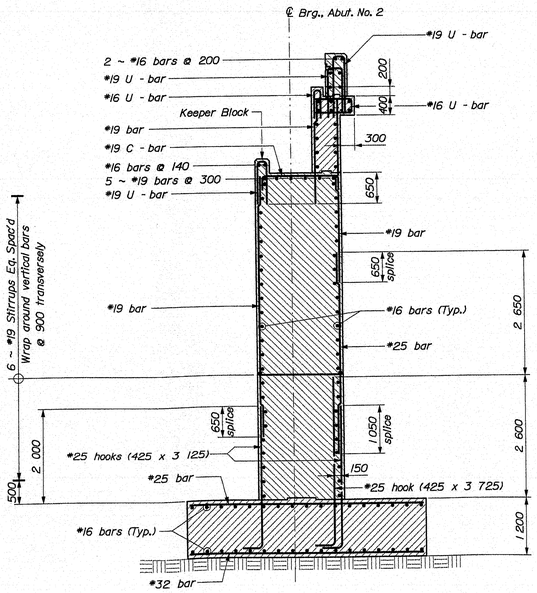
8483.36



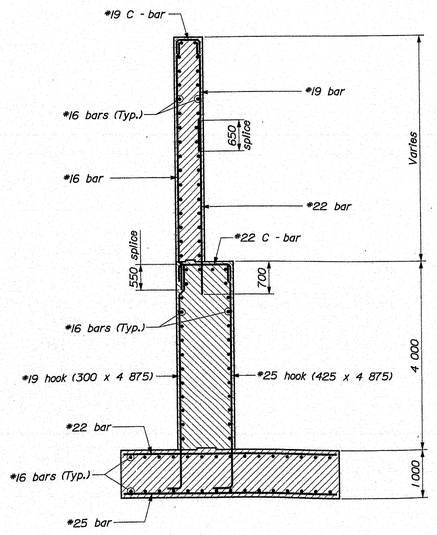
NORTH WINGWALL REINFORCING
South wingwall similar



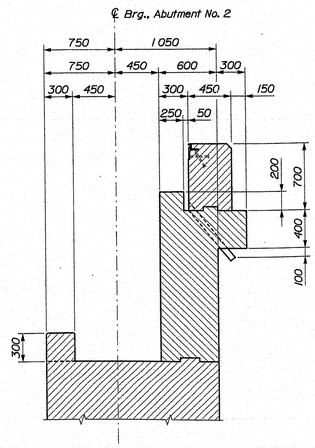
ABUTMENT NO. 2 REINFORCING



TYPICAL ABUTMENT SECTION
(At Centerline Construction)



TYPICAL WINGWALL SECTION



BACKWALL SECTION

143-184B

BRIDGE NO. 6440

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

ST. CROIX RIVER BRIDGE
OVER
ST. CROIX RIVER
IN THE TOWN OF
ST. STEPHEN, N.B., CANADA
CALAIS, MAINE, U.S.A.

ABUT. NO. 2 REINFORCING

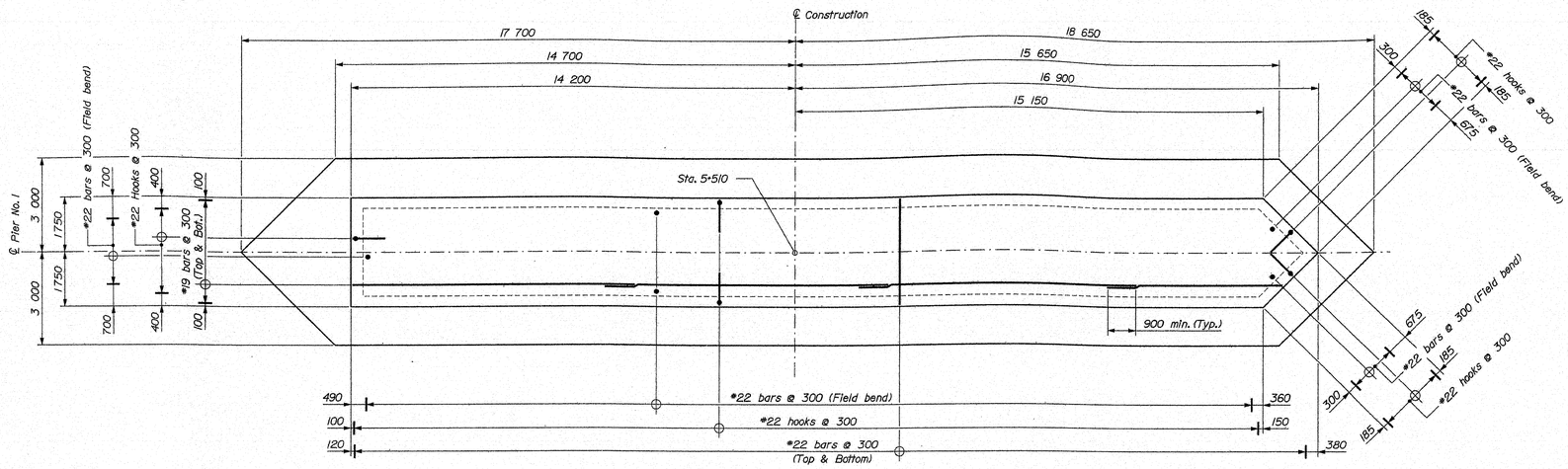
AUGUSTA, MAINE

PROJECT DESIGN ENGINEER	BY	DATE
PLANS — DESIGN-DETAILED	M. A. Iqbal	Team 4 & 5	
CHECKED	------	------	
REVISIONS	------	------	
FIELD CHANGES	------	------	

Filename: ...\mstu\022_Abutment_2_Rebar.dgn Division: BRIDGE Username: dana.damren Date:8/31/2006

METRIC	1. All dimensions are in millimeters unless otherwise noted. 2. All elevations and stations are in meters.	F.H.W.A. REG. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
		1	MAINE	NCPD\CBI-8483(360)X	23	47

8483.36



PIER NO. 1 FOOTING PLAN

PIER NOTES

1. Reinforcing steel shall have 75 mm minimum cover unless otherwise noted.
2. Maximum calculated footing pressure = 1200 kPa.
3. L 152x152x9.5 and anchor studs shall be galvanized after fabrication in accordance with ASTM A123.
4. Payment for L 152x152x9.5 and the anchor studs shall be considered incidental to Item 502.23 - Structural Concrete, Piers.
5. Development and Splices of Pier Reinforcement

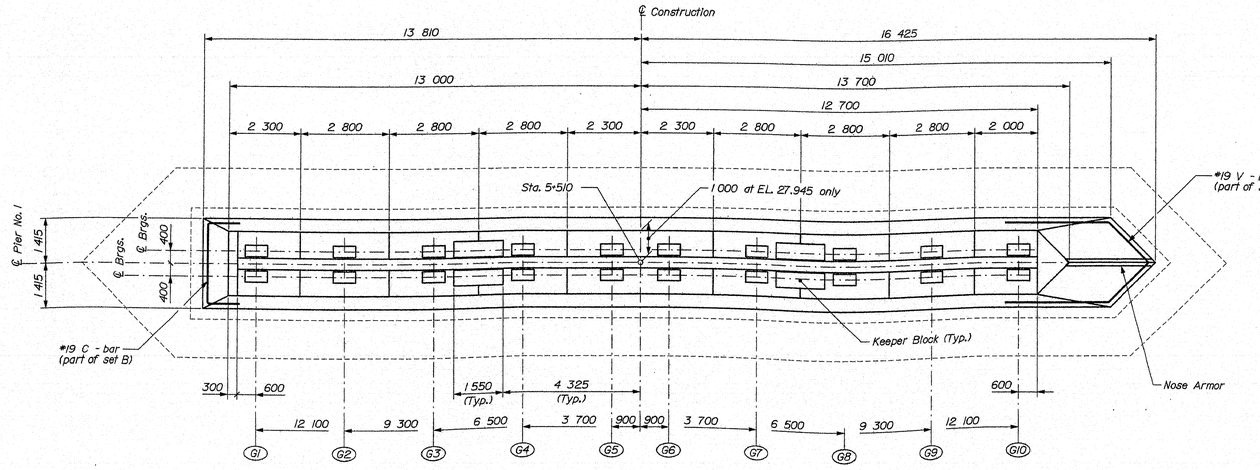
Bar size	Location	Development Length	Splice Length
#19	Vertical	375 mm	650 mm
#19	Horizontal	550 mm	900 mm
#22	Vertical	450 mm	750 mm
#22	Horizontal	600 mm	1000 mm

DESIGN CRITERIA

1. Critical AASHTO Loading Group VII.
2. Buoyancy - Water level assumed at Elevation 23.59 (050).
3. Stream flow - Velocity of 1.0 m/s skewed at 10 degrees from centerline of pier.
4. Wind - 160 km/h.
5. Ice - Dynamic Loading: Thickness 450 mm, pressure 1400 kPa at Elevation 22.18 (01.1). 30 per cent of nose force applied transverse to pier. Static Loading: 75 kN/m on pier side at elevation 22.18 (01.1).

SEAL COFFERDAM NOTES

1. The seal concrete placement dimensions represent the minimum seal necessary for design and are not based on any particular sheet pile section.
2. The horizontal pay limit for seal concrete, structural earth excavation - piers and disposal of riverbed excavation shall be to the dimensions shown on the plans. No additional payment will be made for concrete placement, excavation or disposal outside these limits.
3. When sheet piling is used for seal cofferdams:
   Appropriate rolled corners shall be used.
   The inside face of the sheet piling shall be at or outside of the seal concrete dimensions shown.
4. The depth of the seal is set for a water elevation of 22.18 (01.1). If the water elevation at the time of construction is higher, the depth of the seal shall be adjusted.
5. The Resident shall approve the method of placing dowels in the seal concrete.
6. Pier seal concrete at all piers shall be placed on sound bedrock cleaned of all weathered rock, fractured rock, or loose soil. The bedrock surface at Pier 3 shall be benched if the slope exceeds 6H:1V. All seal cofferdam excavations shall be cleaned and inspected in conformance with Special Provision Section 511-Cofferdams.
7. Each seal shall be cored full depth in at least three locations to ensure that the seal was satisfactorily placed. These locations will be approved by the Resident. In the event that voids or any other defects are found, the Contractor shall correct any and all defects in a manner approved by the Resident. For each core that reveals a void or defect, two additional cores shall be taken after repairs are made. One additional core shall be taken in approximately the same location as the original core. The other core will be located by the Resident. All core holes shall be refilled using a non-shrink grout. The cost of all coring and repairs will be considered incidental to related contract items.



PIER NO. 1 PLAN

Flow

143-185A

BRIDGE NO. 6440

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

ST. CROIX RIVER BRIDGE
OVER
ST. CROIX RIVER
IN THE TOWN OF
ST. STEPHEN, N.B., CANADA
CALAIS, MAINE, U.S.A.

PIER NO. 1 FOOTING AND SHAFT PLAN

AUGUSTA, MAINE

STATE OF MAINE
JOHN A. BURGESS
4574
REGISTERED
PROFESSIONAL ENGINEER

John A. Burgess

PROJECT DESIGN ENGINEER	BY	DATE
DESIGN-DETAILED	M. A. Iqbal	Team 4 & 5
CHECKED	———	———
REVISIONS	———	———
FIELD CHANGES	———	———

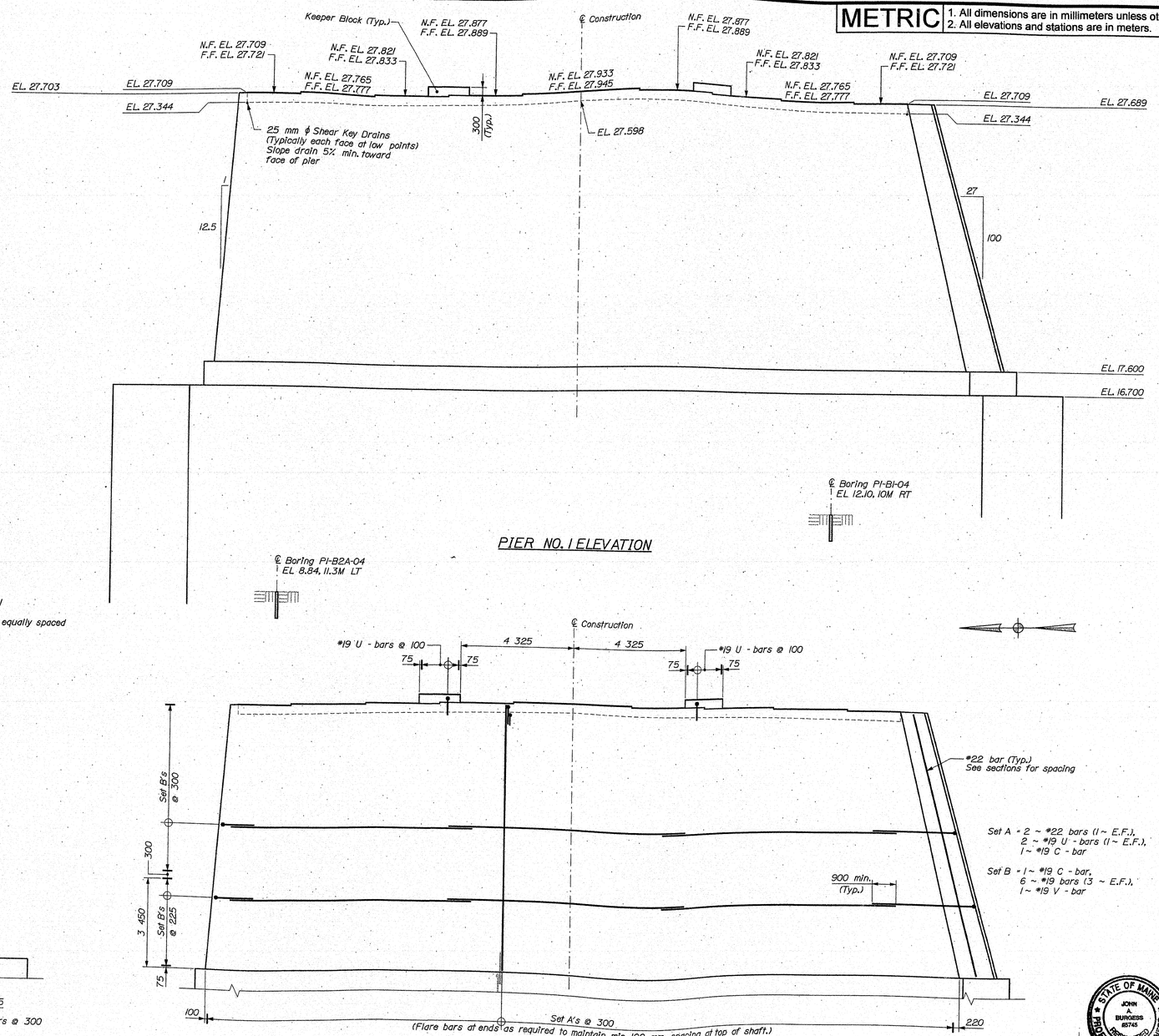
PLANS

Filename: ...\023_Pier_1_Footing.dgn Division: BRIDGE Username: Jack Date:07/27/2006

METRIC 1. All dimensions are in millimeters unless otherwise noted.
2. All elevations and stations are in meters.

F.A./W.A. REG. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
1	MAINE	NCPD\CBI-8483(360)X	24	47

8483.36



PROJECT DESIGN ENGINEER	BY	DATE
DESIGN-DETAILED	M. A. Iqbal	
CHECKED	Team 4 & 5	
PLANS REVISIONS	------	------
FIELD CHANGES	------	------

Filename: ...\mstx\024_Pier_1_Shaft.dgn Division: BRIDGE Username: dana.damren Date:5/3/2006

143-185B

BRIDGE NO. 6440

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

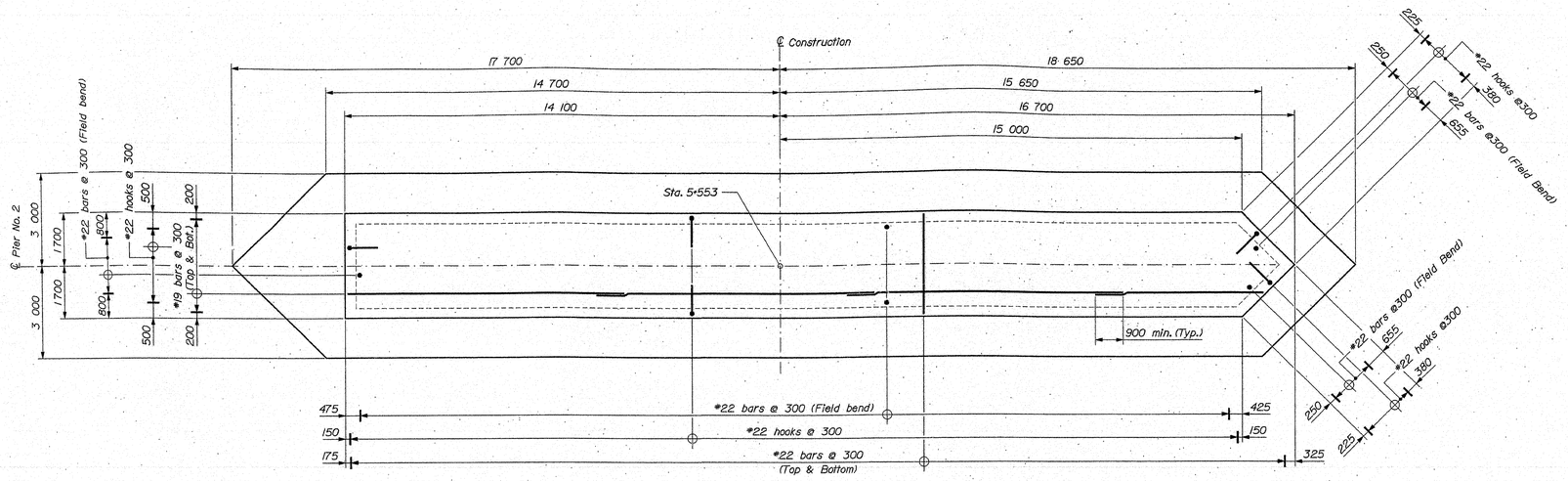
ST. CROIX RIVER BRIDGE
OVER
ST. CROIX RIVER
IN THE TOWN OF
ST. STEPHEN, N.B., CANADA
CALAIS, MAINE, U.S.A.
PIER NO. 1 SHAFT REINFORCEMENT

AUGUSTA, MAINE

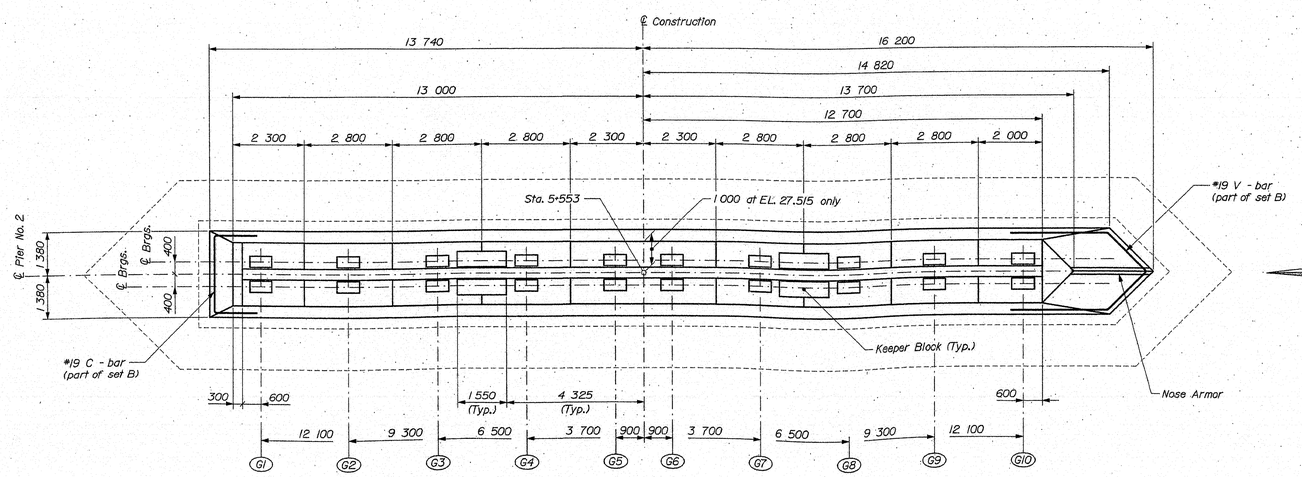
STATE OF MAINE
JOHN A. BURGESS
#5745
REGISTERED
PROFESSIONAL ENGINEER

METRIC	1. All dimensions are in millimeters unless otherwise noted. 2. All elevations and stations are in meters.	F.H.W.A. REGI. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
		1	MAINE	NCPD\CBI-8483(360)X	25	47

8483.36



PIER NO. 2 FOOTING PLAN



PIER NO. 2 SHAFT PLAN

143-186A

PROJECT DESIGN ENGINEER	BY	DATE
DESIGNED/DETAILED	M. A. Iqbal	
CHECKED	Item 4 & 5	
REVISIONS		
FIELD CHANGES		

PLANS

BRIDGE NO. 6440

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

ST. CROIX RIVER BRIDGE
OVER
ST. CROIX RIVER
IN THE TOWN OF
ST. STEPHEN, N.B., CANADA
CALAIS, MAINE, U.S.A.
PIER NO. 2 FOOTING AND SHAFT PLAN

AUGUSTA, MAINE

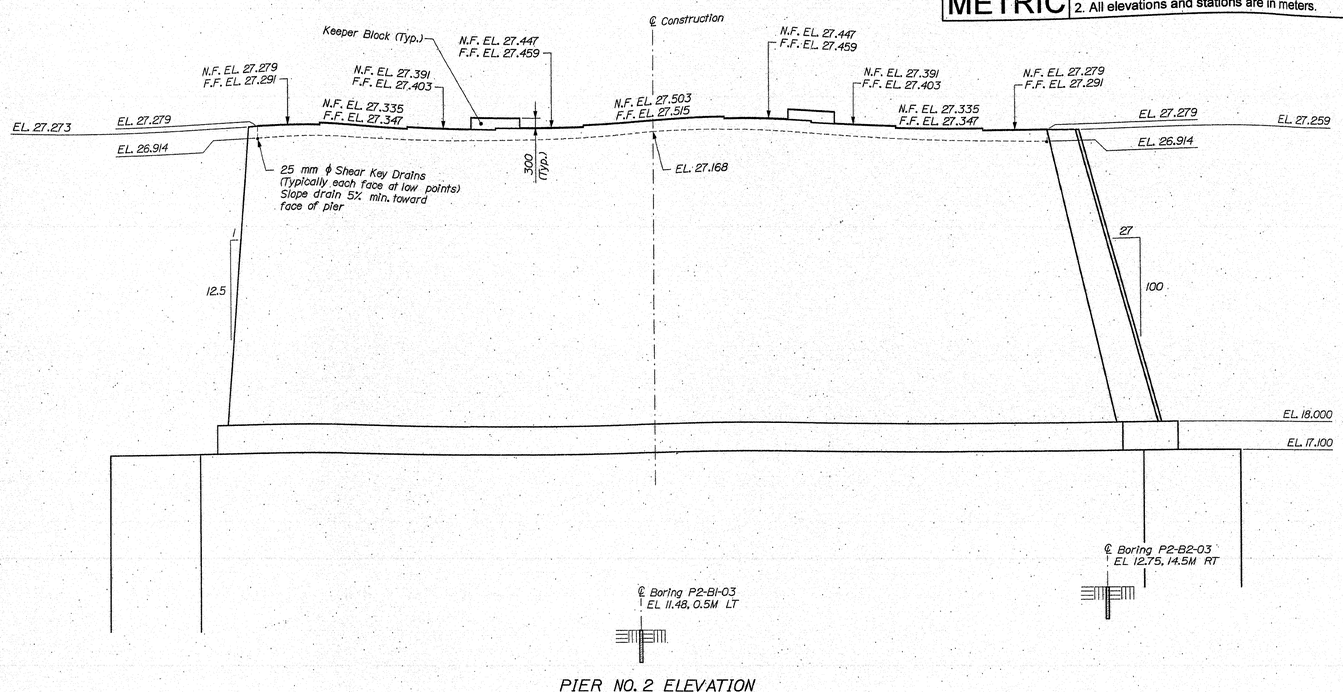
STATE OF MAINE
JOHN A BURGESS
REGISTERED
PROFESSIONAL ENGINEER

John A. Burgess

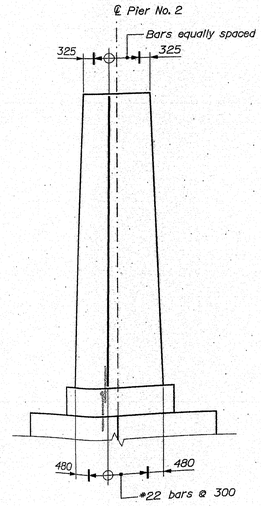
Filename: ...\msta\025_Pier_2_Footing.dgn Division: BRIDGE Username: dana.damren Date:5/3/2006

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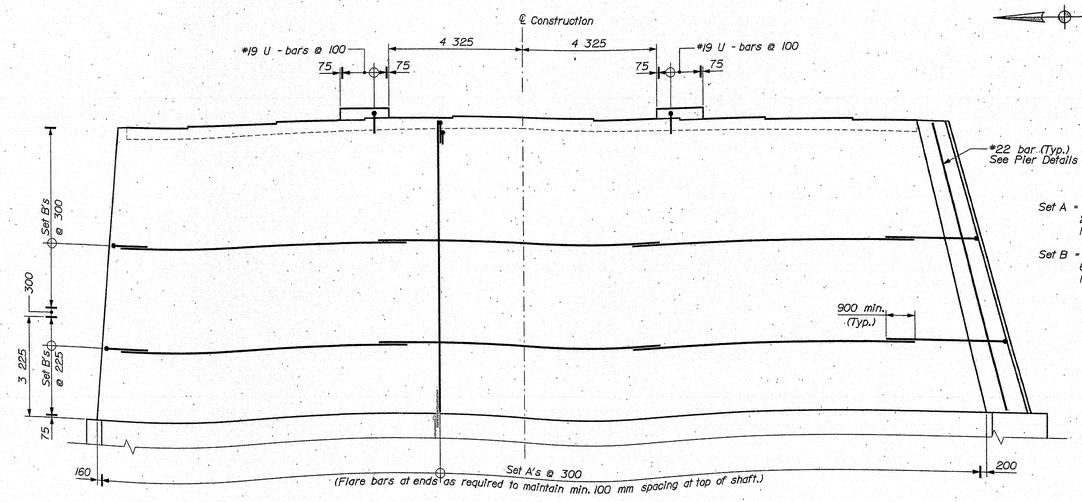
F.H.W.A. REG. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
1	MAINE	NCPD\CBI-8483(360)X 8483.36	26	47



PIER NO. 2 ELEVATION



NORTH END ELEVATION PIER NO. 2



PIER NO. 2 SHAFT REINFORCEMENT ELEVATION

Set A = 2 ~ #22 bars (1 ~ E.F.), 2 ~ #19 U - bars (1 ~ E.F.), 1 ~ #19 C - bar

Set B = 1 ~ #19 C - bar, 6 ~ #19 bars (3 ~ E.F.), 1 ~ #19 V - bar

143-186B

BRIDGE NO. 6440

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

ST. CROIX RIVER BRIDGE
OVER
ST. CROIX RIVER
IN THE TOWN OF
ST. STEPHEN, N.B., CANADA
CALAIS, MAINE, U.S.A.
PIER NO. 2 SHAFT REINFORCEMENT

AUGUSTA, MAINE

STATE OF MAINE * JOHN A. BURGESS 8745 * REGISTERED PROFESSIONAL ENGINEER

John A. Burgess

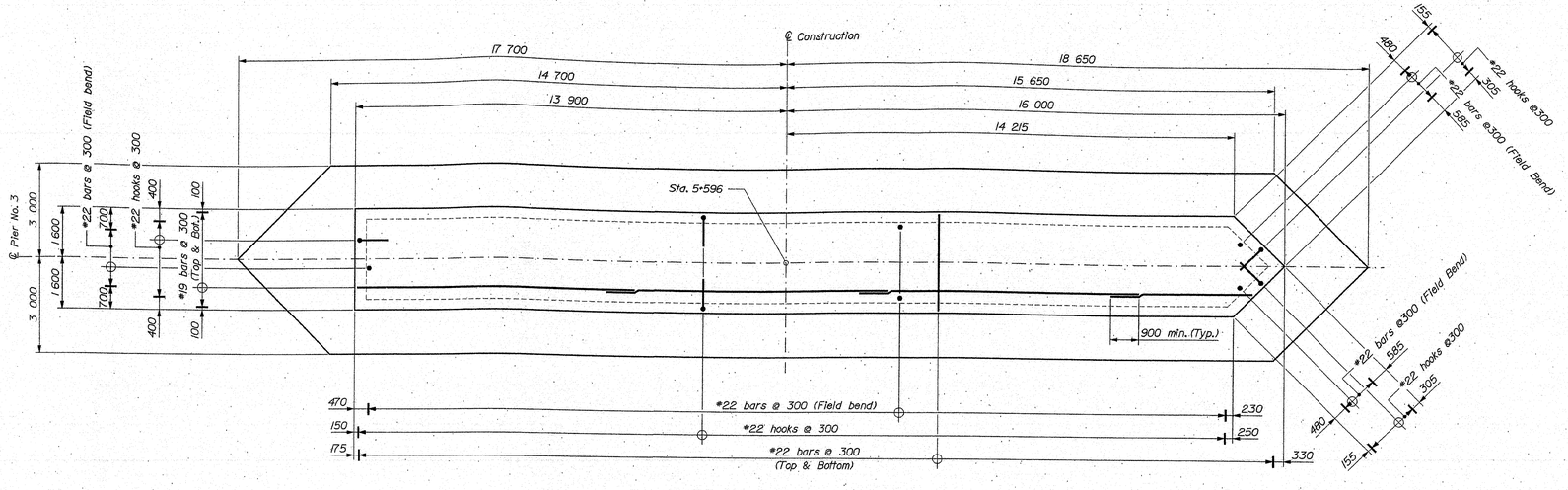
PROJECT DESIGN ENGINEER	BY	DATE
DESIGN-DETAILED	M. A. Abdi	
CHECKED	------	
REVISIONS	Team 4 & 5	------
FIELD CHANGES	------	------

PLANS

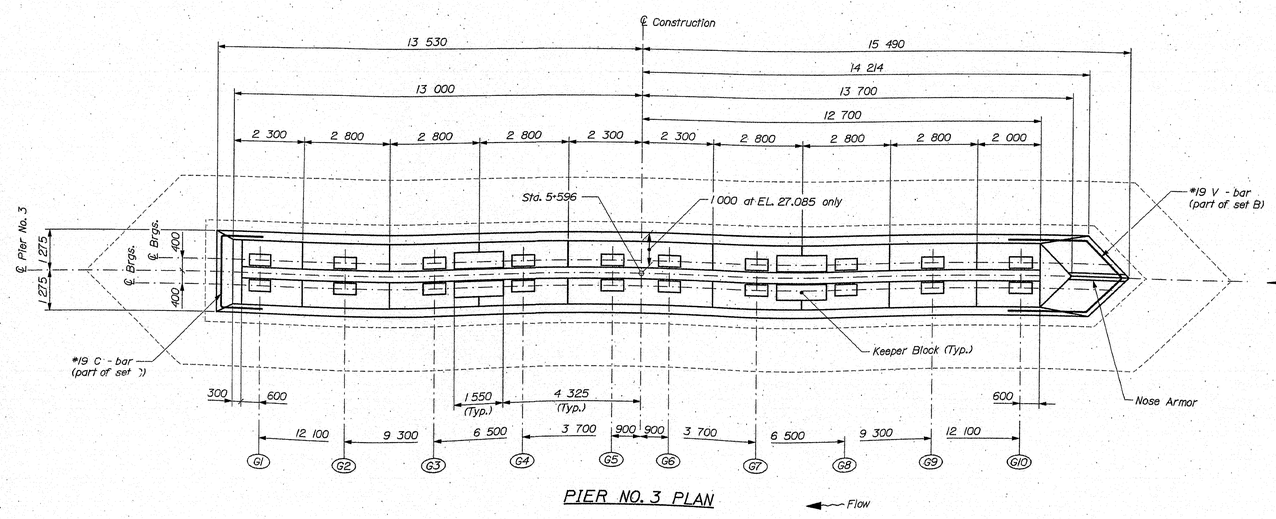
Filename: ...\mstg\026_Pier_2_Shaft.dgn Division: BRIDGE Username: dana.damren Date: 5/3/2006

METRIC	1. All dimensions are in millimeters unless otherwise noted. 2. All elevations and stations are in meters.	F.H.W.A. REG. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
		1	MAINE	CPD\CBI-8483(360)X	27	47

8483.36



PIER NO. 3 FOOTING PLAN



PIER NO. 3 PLAN

Flow

143-187A

BRIDGE NO. 6440

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

ST. CROIX RIVER BRIDGE
OVER
ST. CROIX RIVER
IN THE TOWN OF
ST. STEPHEN, N.B., CANADA
CALAIS, MAINE, U.S.A.

PIER NO. 3 FOOTING AND SHAFT PLAN

AUGUSTA, MAINE

STATE OF MAINE
JOHN A. BURGESS
#12745
REGISTERED
PROFESSIONAL ENGINEER

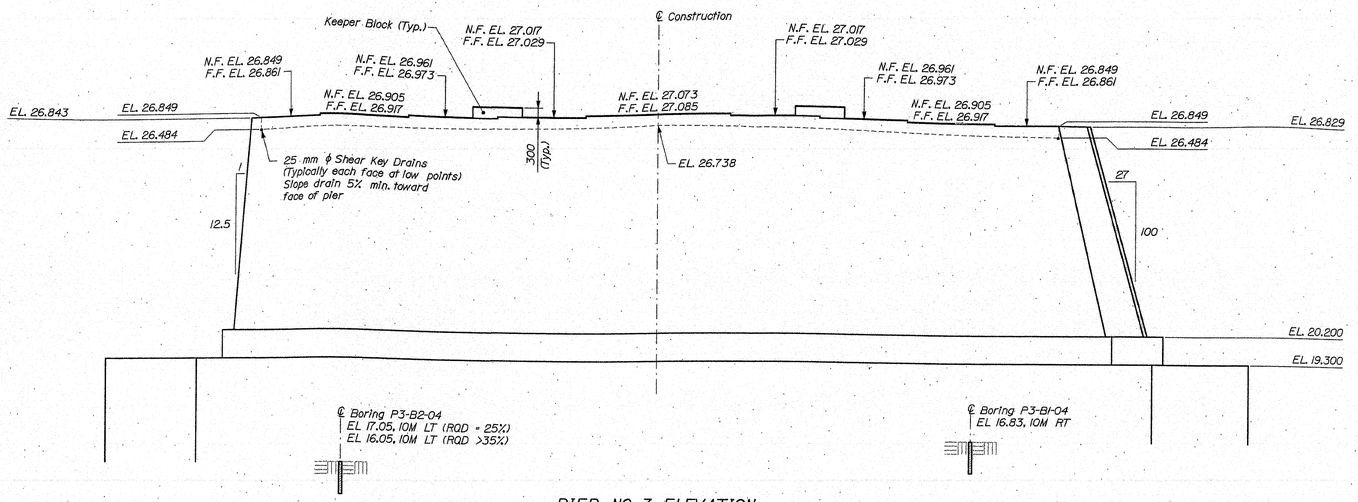
PROJECT DESIGN ENGINEER	BY	DATE
DESIGN-DETAILED	M. A. Iqbal	Trans 4 & 5
CHECKED	------	------
REVISIONS	------	------
FIELD CHANGES	------	------

PLANS

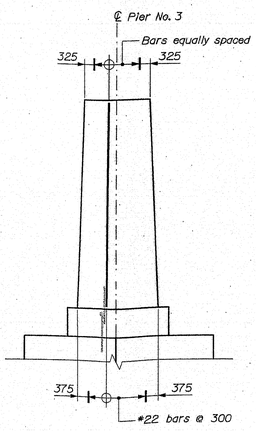
Filename: ...\mslo\027_Pier_3_Footing.dgn Division: BRIDGE Username: dana.damren Date:5/3/2006

METRIC 1. All dimensions are in millimeters unless otherwise noted.
2. All elevations and stations are in meters.

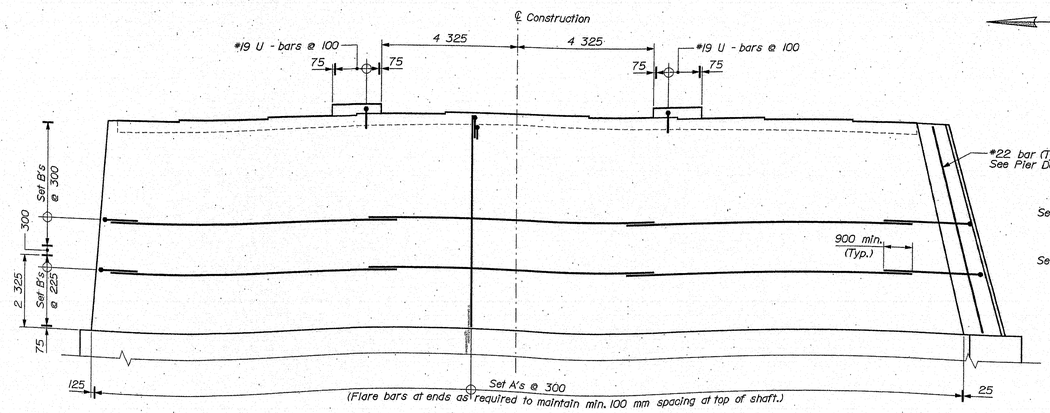
F.A.U.R.A. RSG. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
1	MAINE	NCPD\CBI-8483(360)X	28	47
		8483.36		



PIER NO. 3 ELEVATION



NORTH END ELEVATION PIER NO. 3



PIER NO. 3 SHAFT REINFORCEMENT ELEVATION

Set A = 2 ~ #22 bars (1 ~ E.F.),
2 ~ #19 U - bars (1 ~ E.F.),
1 ~ #19 C - bar

Set B = 1 ~ #19 C - bar,
6 ~ #19 bars (3 ~ E.F.),
1 ~ #19 V - bar

143-187B

BRIDGE NO. 6440

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

ST. CROIX RIVER BRIDGE
OVER
ST. CROIX RIVER
IN THE TOWN OF
ST. STEPHEN, N.B., CANADA
CALAIS, MAINE, U.S.A.
PIER NO. 3 SHAFT REINFORCEMENT

AUGUSTA, MAINE

STATE OF MAINE * JOHN A. BURGESS 6574 REGISTERED PROFESSIONAL ENGINEER *

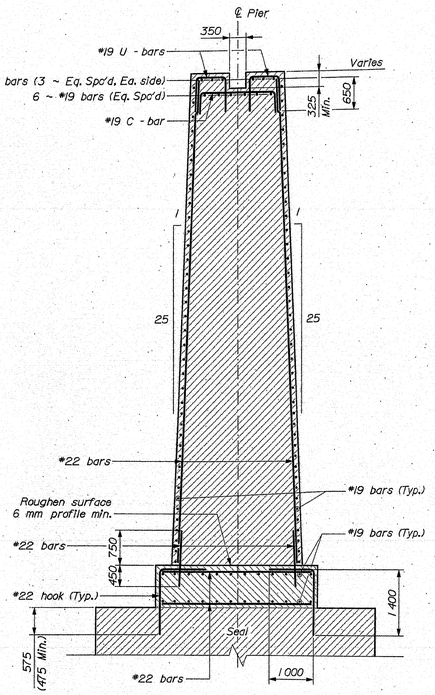
John A. Burgess

PROJECT DESIGN ENGINEER	BY	DATE
DESIGN-DETAILED	M. A. Ibbs	Team 4 & 5
CHECKED	------	------
REVISIONS	------	------
FIELD CHANGES	------	------

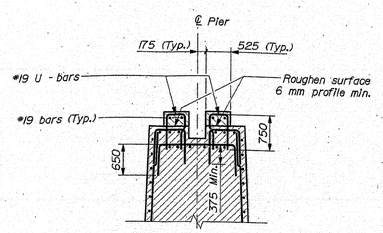
PLANS

Filename: ...\msta\028_Pier_3_Shaft.dgn Division: BRIDGE Username: dana.damren Date:5/3/2006

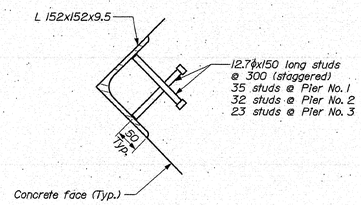
METRIC	1. All dimensions are in millimeters unless otherwise noted. 2. All elevations and stations are in meters.	F.H.W.A. REG. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
		1	MAINE	NCPD\CBI-8483(360)X 8483.36	29	47



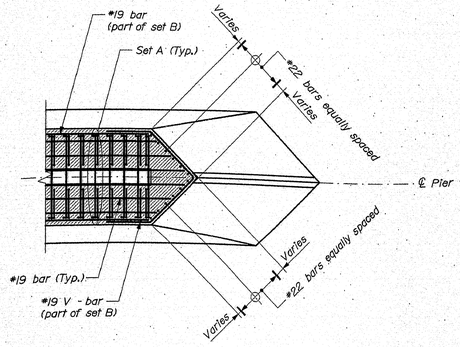
SECTION AT CENTERLINE CONSTRUCTION



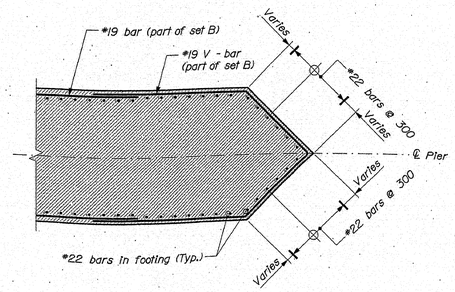
SECTION AT KEEPER BLOCK



NOSE ARMOR DETAIL



SECTION AT TOP OF PIER SHAFT



SECTION AT BOTTOM OF PIER SHAFT

143-188A

BRIDGE NO. 6440

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

ST. CROIX RIVER BRIDGE
OVER
ST. CROIX RIVER
IN THE TOWN OF
ST. STEPHEN, N.B., CANADA
CALAIS, MAINE, U.S.A.

PIER DETAILS

AUGUSTA, MAINE

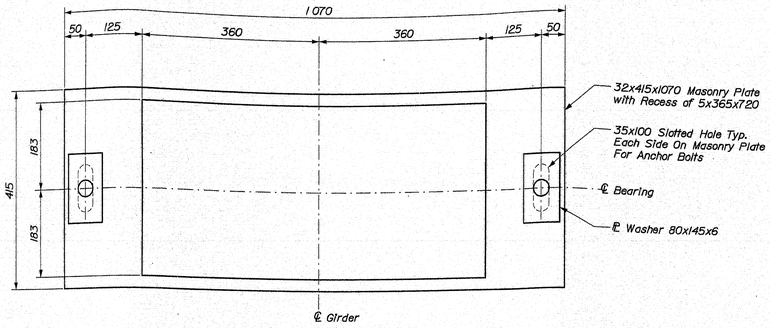
STATE OF MAINE
JOHN A. BURGESS
15749
REGISTERED
PROFESSIONAL ENGINEER

PROJECT DESIGN ENGINEER	BY	DATE
DESIGNED AS DETAILED	M. A. Iqbal	Sam. 4 & 5
CHECKED	-----	-----
REVISIONS	-----	-----
FIELD CHANGES	-----	-----

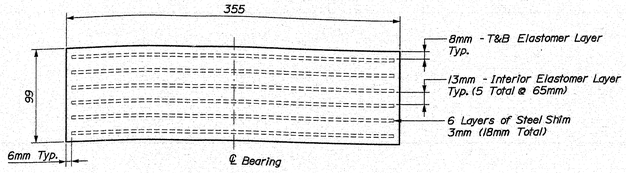
PLANS

Filename: ...\msta\029_Pier_Details.dgn Division: BRIDGE Username: dana.damren Date:5/3/2006

METRIC	1. All dimensions are in millimeters unless otherwise noted. 2. All elevations and stations are in meters.	F.H.W.A. REG. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
		1	MAINE	NCPD\CBI-8483(360)X	30	47
				8483.36		



MASONRY PLATE PLAN



ELASTOMERIC BEARING TYPE "A"

ELASTOMERIC BEARINGS NOTES

1. The shear modulus of the elastomer shall be between 0.70 and 0.90 MPa.

2. The masonry plate shall meet the requirements of ASTM A 709/A 709M, Grade 345. Anchor bolts shall meet the requirements of ASTM F 1554, Grade 105.

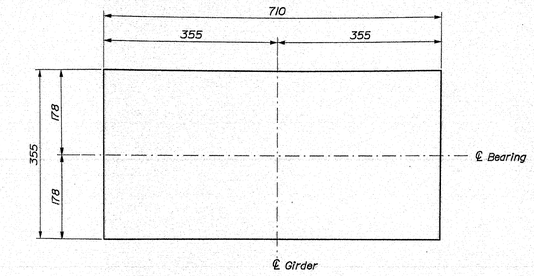
3. The masonry plate shall be galvanized in accordance with Section 506. Anchor bolts, washers and nuts shall be galvanized to ASTM A 153 or ASTM B 695, Class 50, Type I.

4. All bearings shall be marked prior to shipping. The marks shall include the bearing location on the bridge and a direction arrow which points upstation. All marks shall be permanent and shall be visible after the bearing is installed.

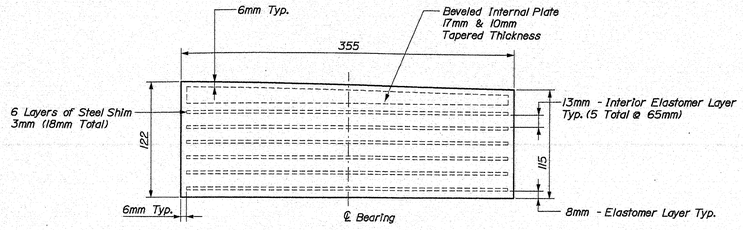
5. Bearings shall be covered during transit.

6. The bearings are designed so that the superstructure may be erected when the ambient air temperature is within the range of 2 °C and 17 °C. If the ambient temperature is outside this range, the bearings shall be reset as directed by the Resident.

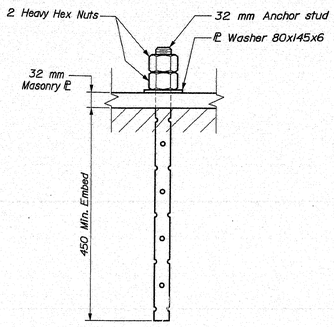
7. Upset the threads on the anchor bolts after assembly.



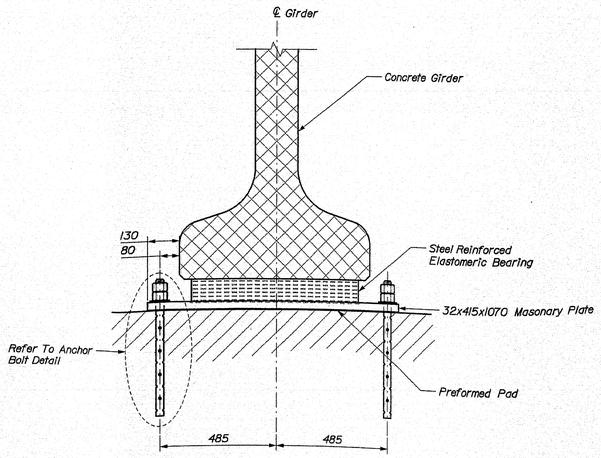
ELASTOMERIC BEARING PLAN



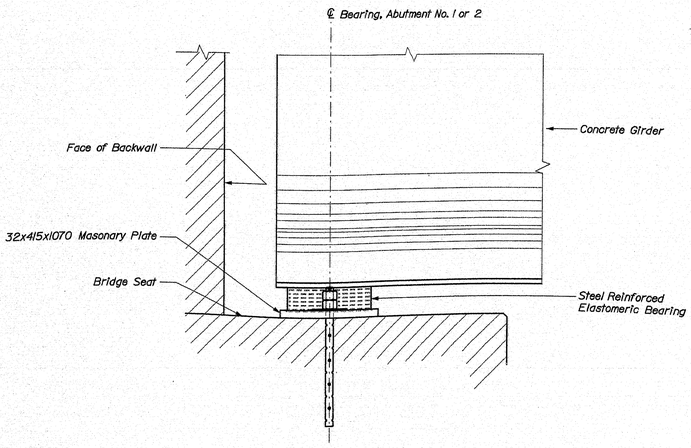
ELASTOMERIC BEARING TYPE "B"



ANCHOR BOLT DETAIL



EXPANSION BEARING SECTION



EXPANSION BEARING DETAIL

BEARING TABLE	
LOCATION	ELASTOMERIC BEARING TYPE
Abutment No. 1	Type "A" with Masonry Plate
Pier No. 1, Span No. 1	Type "B"
Pier No. 1, Span No. 2	Type "A"
Pier No. 2, Span No. 2	Type "B"
Pier No. 2, Span No. 3	Type "A"
Pier No. 3, Span No. 3	Type "B"
Pier No. 3, Span No. 4	Type "A"
Abutment No. 2	Type "B" with Masonry Plate

PROJECT DESIGN ENGINEER	BY	DATE
DESIGN-DETAILED	M. A. Iqbal	
CHECKED	R. Clavette	
REVISIONS		
FIELD CHANGES		

PLANS

BRIDGE NO. 6440

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

ST. CROIX RIVER BRIDGE
OVER
ST. CROIX RIVER
BETWEEN
ST. STEPHEN, N.B., CANADA
CALAIS, MAINE, U.S.A.

BEARINGS

AUGUSTA, MAINE

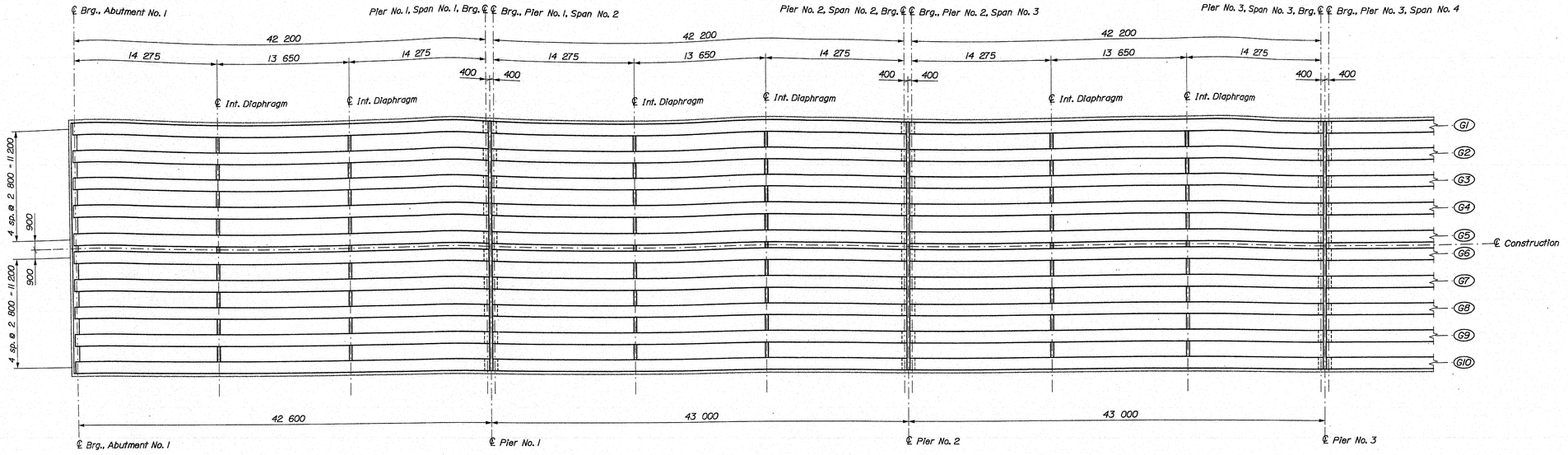
143-188B

Filename: ...\bridge\vmsta\030_Bearings.dgn Division: BRIDGE Username: dana.damren Date:8/31/2006

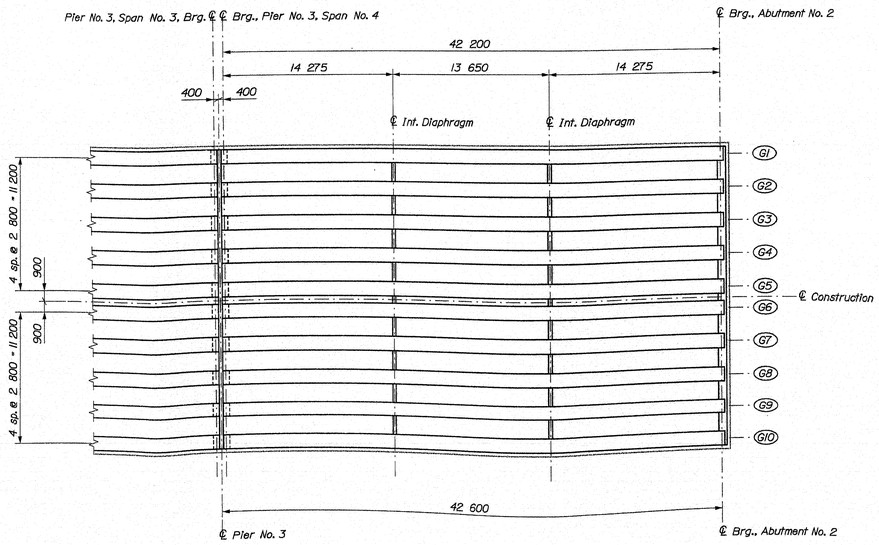
METRIC 1. All dimensions are in millimeters unless otherwise noted.
2. All elevations and stations are in meters.

F.H.W.A. REG. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
1	MAINE	NCPD\CBI-8483(360)X	31	47

8483.36



PART FRAMING PLAN



PART FRAMING PLAN

FRAMING NOTES

1. Payment for the abutment, intermediate and pier diaphragms will be made under Item No. 502.261, Structural Concrete Superstructure Slabs on Concrete Bridges.

PROJECT DESIGN ENGINEER		BY	DATE
PLANS	DESIGN-DETAILED	M. A. Iqbal	Item 4 & 5		
	CHECKED	———	———	———	———
	REVISIONS	———	———	———	———
	FIELD CHANGES	———	———	———	———

Filename: ...\mstc\031_Framing_Plan.dgn Division: BRIDGE Username: dana.damren Date:8/31/2006

143-189A

BRIDGE NO. 6440

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

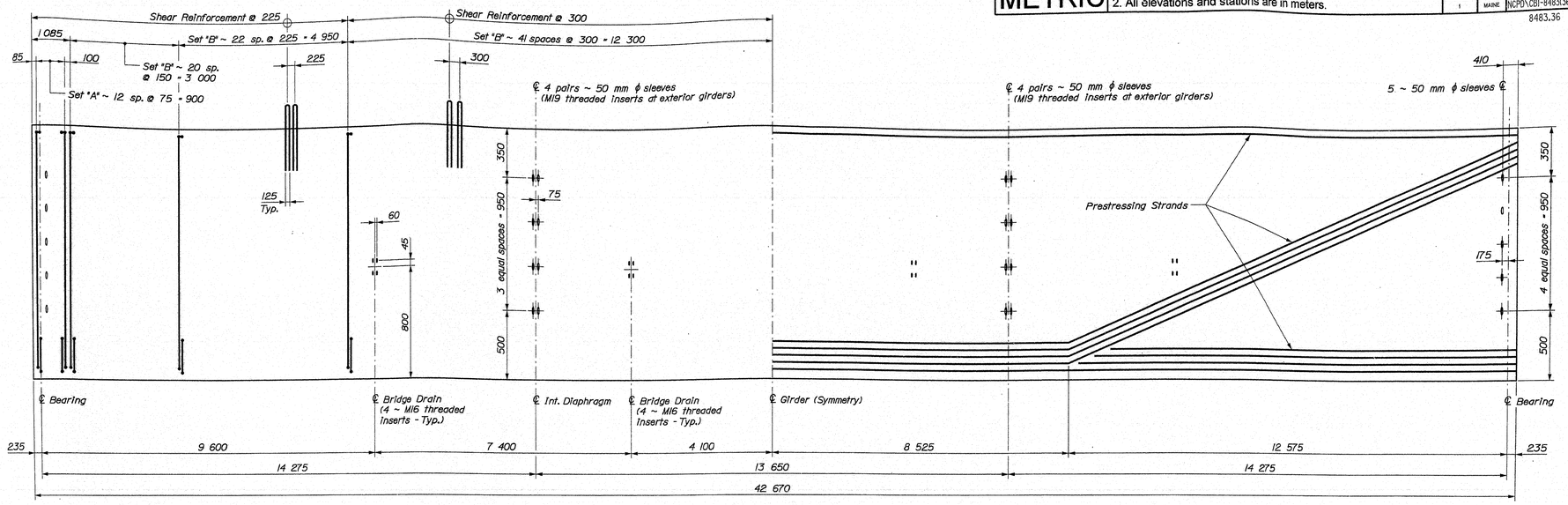
ST. CROIX RIVER BRIDGE
OVER
ST. CROIX RIVER
BETWEEN
ST. STEPHEN, N.B., CANADA
CALAIS, MAINE, U.S.A.

FRAMING PLAN

AUGUSTA, MAINE

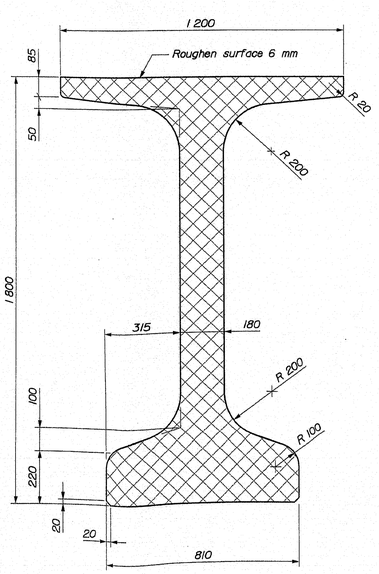
METRIC	1. All dimensions are in millimeters unless otherwise noted. 2. All elevations and stations are in meters.	F.H.W.A. REG. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
		1	MAINE	NCPD\CBI-8483(360)X	32	47

8483.36

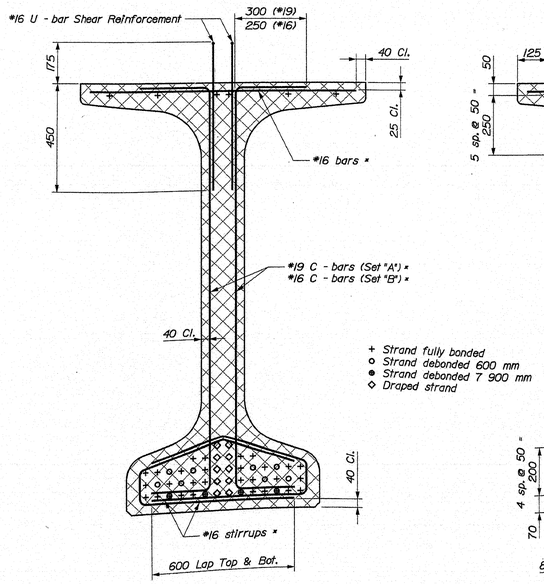


TYPICAL GIRDER ELEVATION

Vertical Exaggeration 4 : 1
Bridge Drain spacing shown for Spans No. 2 & 3

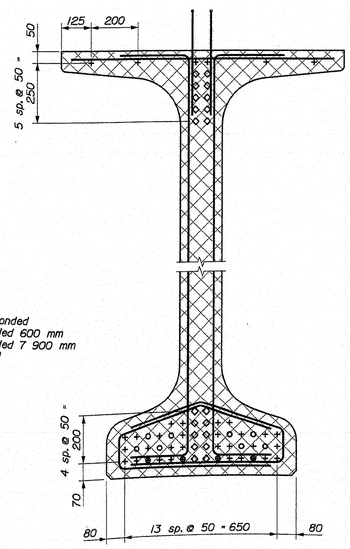


TYPICAL GIRDER SECTION

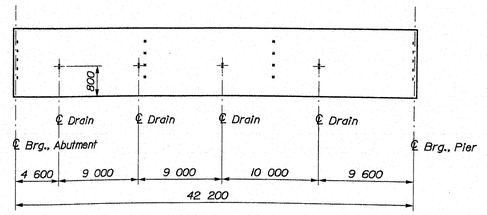


GIRDER REINFORCING

* Bars Included in Sets "A" & "B"



PRESTRESSING STRANDS



END SPAN GIRDER ELEVATION

Bridge Drain spacing shown for Spans No. 1 & 4

143-189B

BRIDGE NO. 6440

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

ST. CROIX RIVER BRIDGE
OVER
ST. CROIX RIVER
BETWEEN
ST. STEPHEN, N.B., CANADA
CALAIS, MAINE, U.S.A.

PRECAST GIRDERS

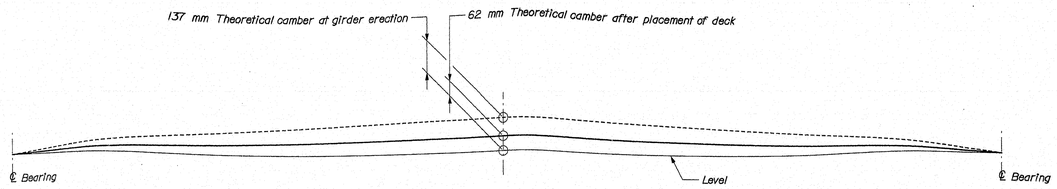
AUGUSTA, MAINE

PROJECT DESIGN ENGINEER	BY	DATE
DESIGN-DETAILED	M. A. Iqbal	Team 4 & 5	------
CHECKED	------	------	------
REVISIONS	------	------	------
FIELD CHANGES			

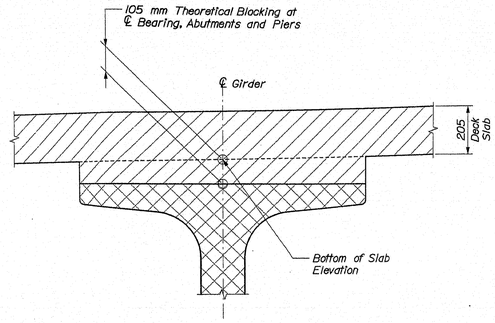
PLANS

Filename: ...\mstaV032_Precast_Girders.dgn Division: BRIDGE Username: dana.damren Date:8/31/2006

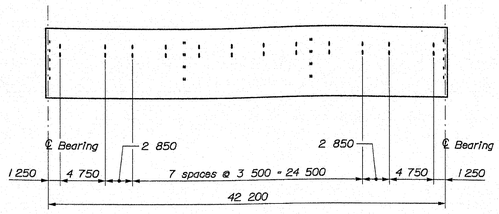
METRIC	1. All dimensions are in millimeters unless otherwise noted. 2. All elevations and stations are in meters.	F.H.W.A. REG. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
		1	MAINE	NCPD\CBI-8483(360)X	33	47
				8483.36		



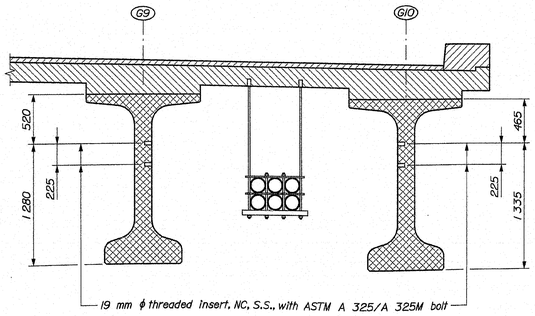
CAMBER DIAGRAM



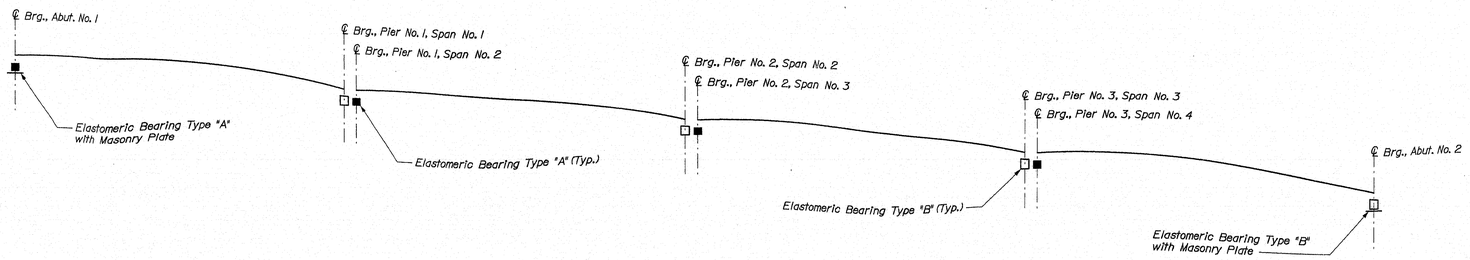
BLOCKING DETAIL



ELEVATION ~ GIRDER UTILITY INSERTS



GIRDER UTILITY INSERTS



BEARING LAYOUT DETAIL

BOTTOM OF SLAB ELEVATIONS

Location	Girder G1 & G10	Girder G2 & G9	Girder G3 & G8	Girder G4 & G7	Girder G5 & G6
℄ Brg., Abut. No. 1	30.155	30.211	30.267	30.323	30.379
0.1 Span	30.162	30.218	30.274	30.330	30.386
0.2 Span	30.158	30.214	30.270	30.326	30.382
0.3 Span	30.144	30.199	30.255	30.311	30.367
0.4 Span	30.118	30.174	30.230	30.286	30.342
0.5 Span	30.081	30.137	30.193	30.249	30.305
0.6 Span	30.033	30.089	30.145	30.201	30.257
0.7 Span	29.975	30.031	30.087	30.143	30.199
0.8 Span	29.905	29.961	30.017	30.073	30.129
0.9 Span	29.825	29.881	29.937	29.993	30.049
℄ Brg., Pier No. 1, Sp. 1	29.733	29.789	29.845	29.901	29.957
℄ Brg., Pier No. 1, Sp. 2	29.725	29.781	29.837	29.893	29.949
0.1 Span	29.732	29.788	29.844	29.900	29.956
0.2 Span	29.728	29.784	29.840	29.896	29.952
0.3 Span	29.713	29.769	29.825	29.881	29.937
0.4 Span	29.688	29.744	29.800	29.856	29.912
0.5 Span	29.651	29.707	29.763	29.819	29.875
0.6 Span	29.603	29.659	29.715	29.771	29.827
0.7 Span	29.545	29.601	29.657	29.713	29.769
0.8 Span	29.475	29.531	29.587	29.643	29.699
0.9 Span	29.395	29.451	29.507	29.563	29.619
℄ Brg., Pier No. 2, Sp. 2	29.303	29.359	29.415	29.471	29.527
℄ Brg., Pier No. 2, Sp. 3	29.295	29.351	29.407	29.463	29.519
0.1 Span	29.302	29.358	29.414	29.470	29.526
0.2 Span	29.298	29.354	29.410	29.466	29.522
0.3 Span	29.283	29.339	29.395	29.451	29.507
0.4 Span	29.258	29.314	29.370	29.426	29.482
0.5 Span	29.221	29.277	29.333	29.389	29.445
0.6 Span	29.173	29.229	29.285	29.341	29.397
0.7 Span	29.115	29.171	29.227	29.283	29.339
0.8 Span	29.045	29.101	29.157	29.213	29.269
0.9 Span	28.965	29.021	29.077	29.133	29.189
℄ Brg., Pier No. 3, Sp. 3	28.873	28.929	28.985	29.041	29.097
℄ Brg., Pier No. 3, Sp. 4	28.865	28.921	28.977	29.033	29.089
0.1 Span	28.872	29.928	28.984	29.040	29.096
0.2 Span	28.868	28.924	28.980	29.036	29.092
0.3 Span	28.853	28.909	28.965	29.021	29.077
0.4 Span	28.828	28.884	28.940	28.996	29.052
0.5 Span	28.791	28.847	28.903	28.959	29.015
0.6 Span	28.743	28.799	28.855	28.911	28.967
0.7 Span	28.685	28.741	28.797	28.853	28.909
0.8 Span	28.615	28.671	28.727	28.783	28.839
0.9 Span	28.535	28.591	28.647	28.703	28.759
℄ Brg., Abut. No. 2	28.443	28.499	28.555	28.611	28.667

PRECAST GIRDER NOTES

1. All reinforcing steel in the girders shall be epoxy coated.
2. Drain inserts are required only on the inside face of exterior girders G1 and G10.
3. Utility inserts are required only on girders G9 and G10 as shown.
4. Payment for inserts will be considered incidental to the precast concrete girder pay item.
5. All inserts shall be installed in accordance with the manufacturer's recommendations.

PROJECT DESIGN ENGINEER		BY	DATE
PLANS	DESIGN-DETAILED	M. A. Iqbal	T.Team 4 & 5	
	CHECKED			
	REVISIONS			
	FIELD CHANGES			

BRIDGE NO. 6440

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

ST. CROIX RIVER BRIDGE
OVER
ST. CROIX RIVER
BETWEEN
ST. STEPHEN, N.B., CANADA
CALAIS, MAINE, U.S.A.

PRECAST GIRDER DETAILS

AUGUSTA, MAINE

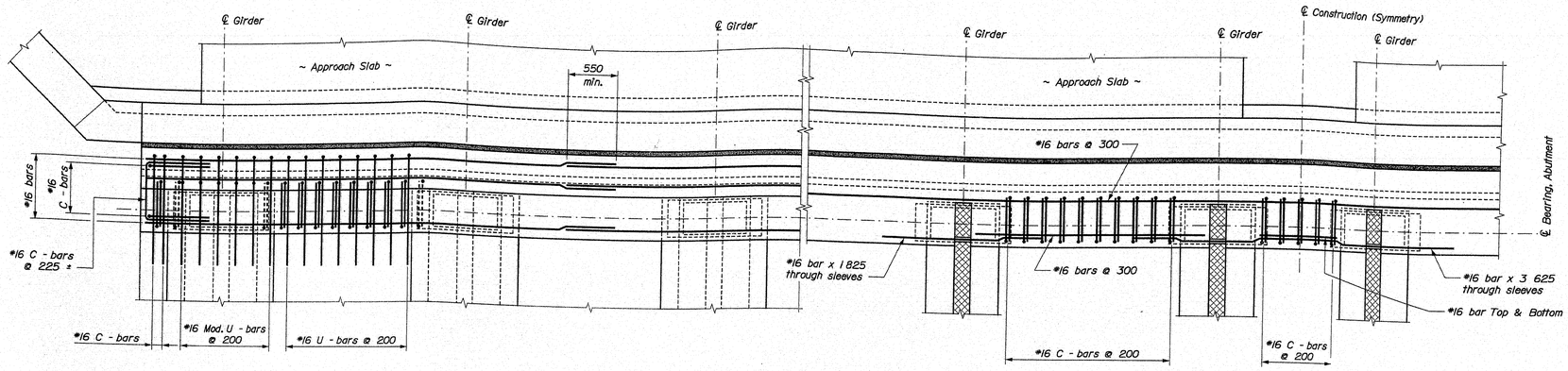
143-190A

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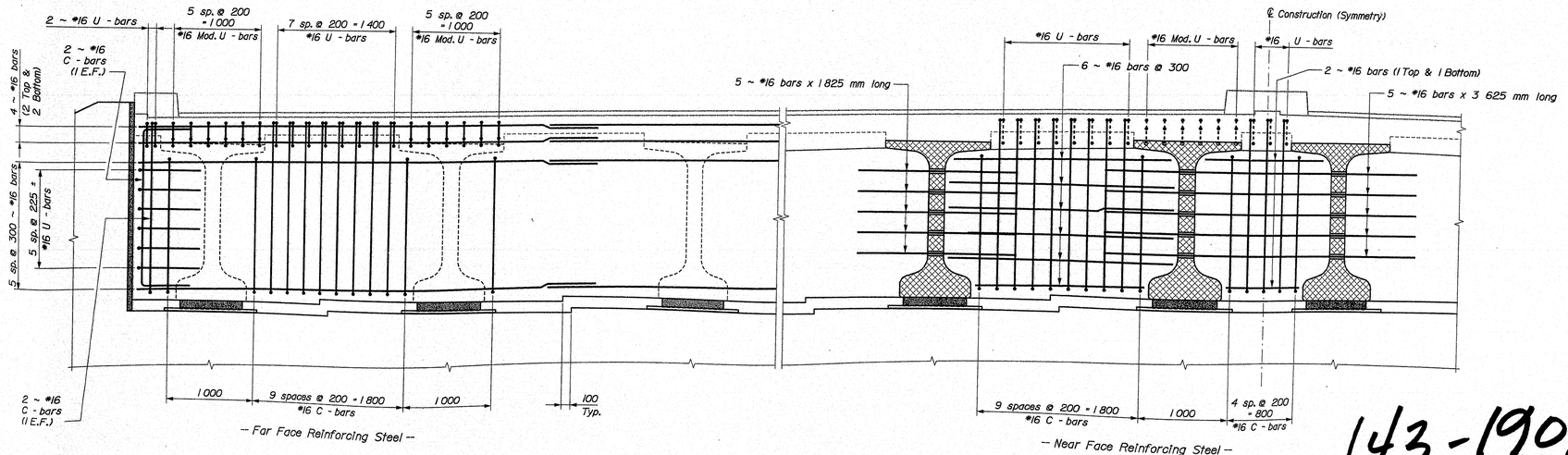
METRIC 1. All dimensions are in millimeters unless otherwise noted. 2. All elevations and stations are in meters.

F.H.W.A. REG. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
1	MAINE	NCPD\CBI-8483(360)X	34	47

8483.36



ABUTMENT DIAPHRAGM PLAN



ABUTMENT DIAPHRAGM ELEVATION

143-190B

BRIDGE NO. 6440

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

ST. CROIX RIVER BRIDGE
OVER
ST. CROIX RIVER
BETWEEN
ST. STEPHEN, N.B., CANADA
CALAIS, MAINE, U.S.A.

ABUTMENT DIAPHRAGMS

AUGUSTA, MAINE

PROJECT DESIGN ENGINEER	BY	DATE
DESIGNED	M. A. Iqbal	Item 4 & 5
CHECKED		
REVISIONS		
FIELD CHANGES		

PLANS

Filename: ...\034_Abutment_Diaphragms.dgn Division: BRIDGE Username: dana.damren Date:8/31/2006

Filename: ...\035_Abutment_Diaphragm Sections.dgn Division: BRIDGE
Username: dana.damren Date:8/31/2006

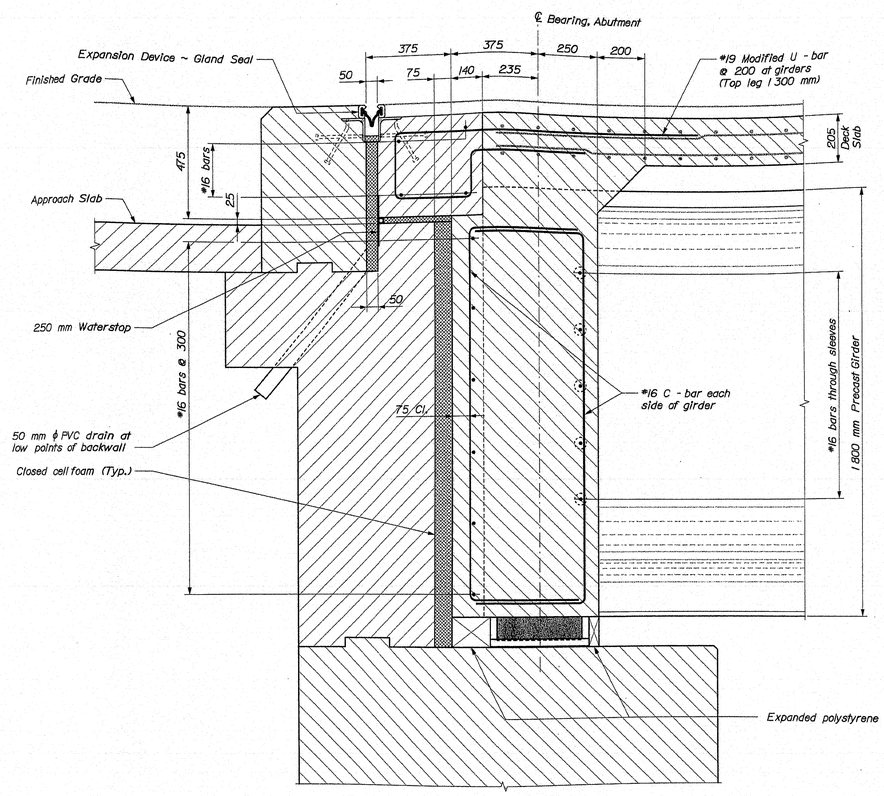
PROJECT DESIGN ENGINEER	BY	DATE
DESIGNED / RALED	M. A. Ajdd	Item 4 & 5
CHECKED	------	------
REVISIONS	------	------
FIELD CHANGES	------	------

PLANS

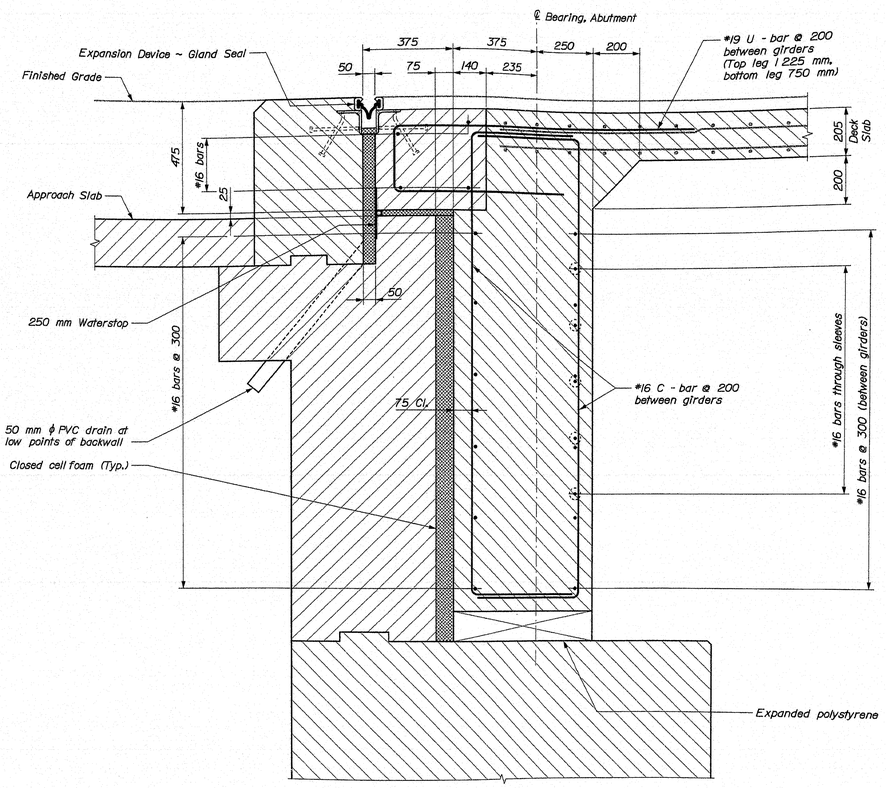
METRIC 1. All dimensions are in millimeters unless otherwise noted.
2. All elevations and stations are in meters.

F.H.W.A. REG. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
1	MAINE	NCPD\CBI-8483(360)X	35	47

8483.36



ABUTMENT DIAPHRAGM SECTION
(Section at girder)



ABUTMENT DIAPHRAGM SECTION
(Section between girders)

143-191A

BRIDGE NO. 6440

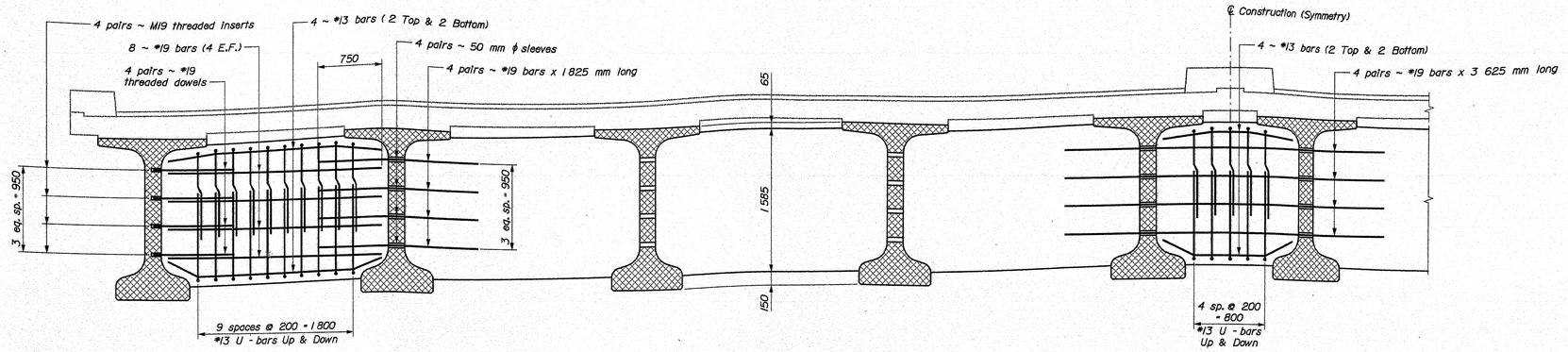
STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

ST. CROIX RIVER BRIDGE
OVER
ST. CROIX RIVER
BETWEEN
ST. STEPHEN, N.B., CANADA
CALAIS, MAINE, U.S.A.

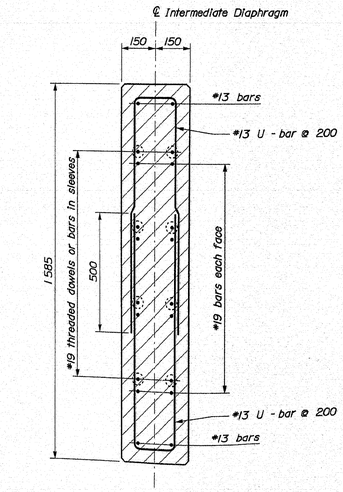
ABUT. DIAPH. SECTIONS

AUGUSTA, MAINE

METRIC	1. All dimensions are in millimeters unless otherwise noted. 2. All elevations and stations are in meters.	F.H.W.A. REG. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
		1	MAINE	NCPD\CBI-8483(360)X	36	47
				8483.36		



INTERMEDIATE DIAPHRAGM ELEVATION



INTERMEDIATE DIAPHRAGM SECTION

PROJECT DESIGN ENGINEER		BY	DATE
ISSUED FOR BIDDING	PLANS	M. A. Iqbal	Team 4 & 5		
REVISIONS					
FIELD CHANGES					

Filename: ...\1036_Intermediate_Diaphragms.dgn Division: BRIDGE Username: dana.damren Date:8/31/2006

143-191B

BRIDGE NO. 6440

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

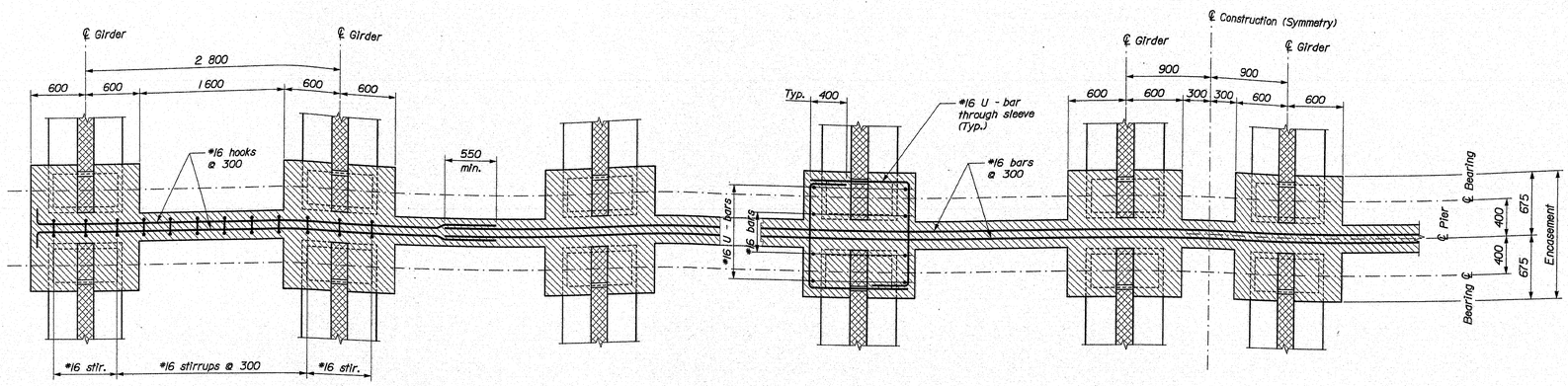
ST. CROIX RIVER BRIDGE
OVER
ST. CROIX RIVER
BETWEEN
ST. STEPHEN, N.B., CANADA
CALAIS, MAINE, U.S.A.

INTERMEDIATE DIAPHRAGMS

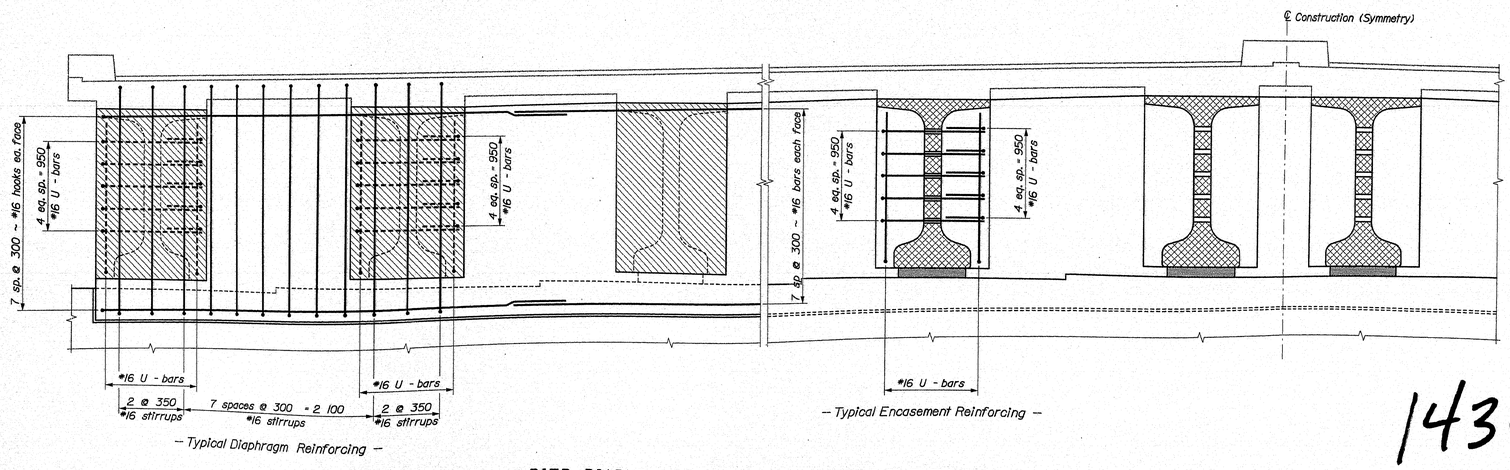
AUGUSTA, MAINE

METRIC	1. All dimensions are in millimeters unless otherwise noted. 2. All elevations and stations are in meters.	F.H.W.A. RES. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
		1	MAINE	NCPD\CBI-8483(360)X	37	47

8483.36



PIER DIAPHRAGM & GIRDER ENCASEMENT PLAN



PIER DIAPHRAGM & GIRDER ENCASEMENT ELEVATION

143-192A

PROJECT DESIGN ENGINEER	BY	DATE
DESIGN-DETAILED	M. A. Iqbal	Team 4 & 5
CHECKED	———	———
PLANS REVISIONS	———	———
FIELD CHANGES	———	———

BRIDGE NO. 6440

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

ST. CROIX RIVER BRIDGE
OVER
ST. CROIX RIVER
BETWEEN
ST. STEPHEN, N.B., CANADA
CALAIS, MAINE, U.S.A.

PIER DIAPHRAGMS

AUGUSTA, MAINE

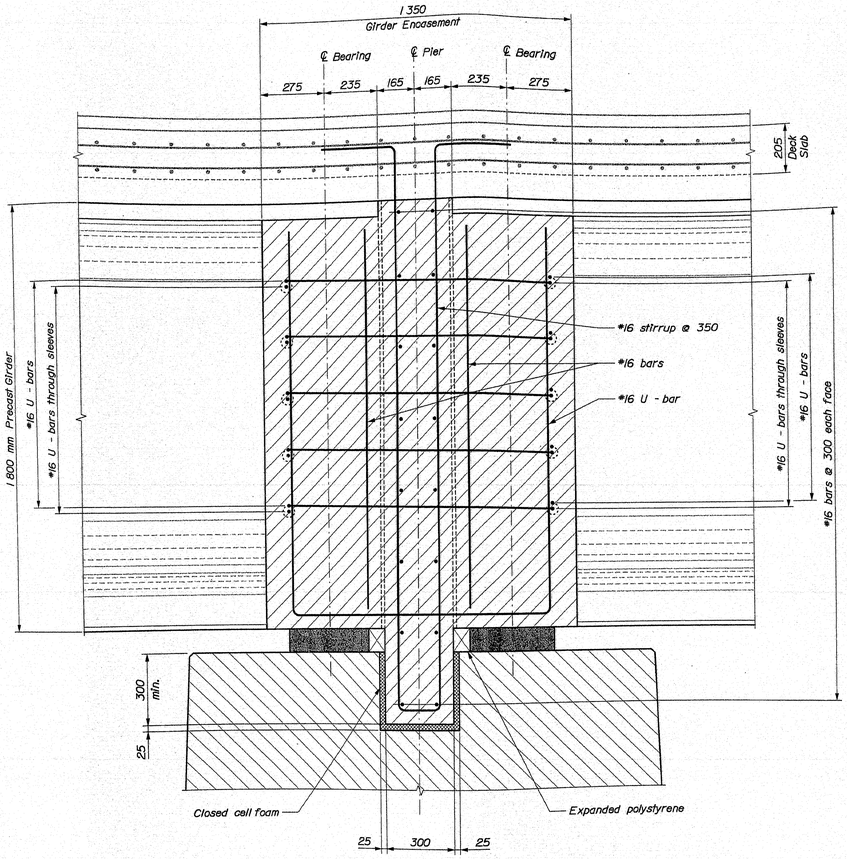
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Filename: ...\038_Pier_Diaphragm_Sections.dgn Division: BRIDGE Username: dana.damren Date:8/31/2006

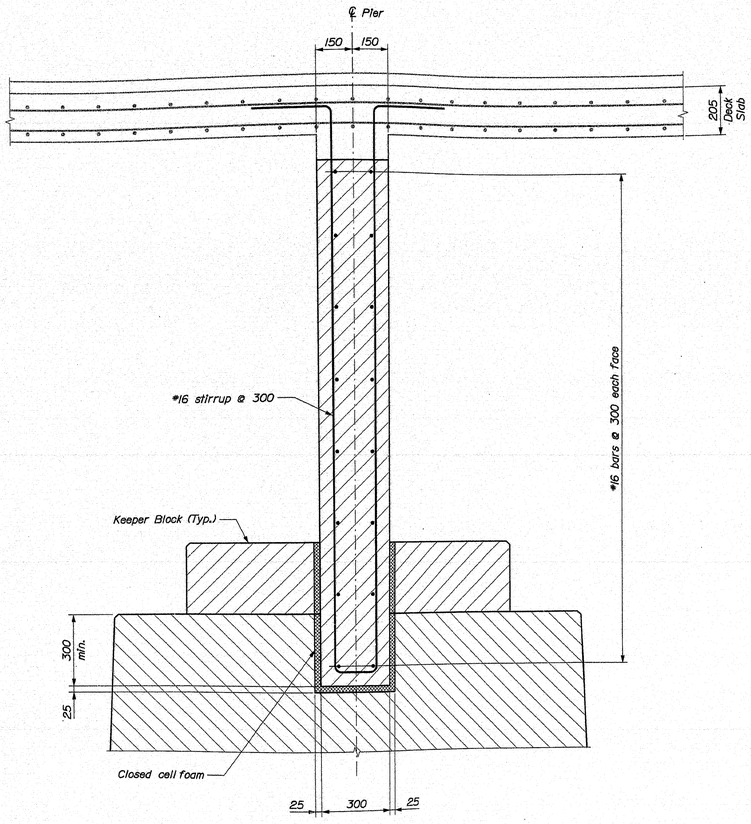
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F.H.W.A. REG. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
1	MAINE	X\CPD\CBI-8483(360)	X 38	47

8483.36



PIER DIAPHRAGM SECTION
(Section through girder encasement)



PIER DIAPHRAGM SECTION
(Section between girders at Keeper Block)

PROJECT DESIGN ENGINEER	BY	DATE
DESIGN-DETAILED	M. A. Iqbal	
CHECKED	Item 4 & 5	
QUANTITIES	———	
FIELD CHANGES	———	

PLANS

143-192B

BRIDGE NO. 6440

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

ST. CROIX RIVER BRIDGE
OVER
ST. CROIX RIVER
BETWEEN
ST. STEPHEN, N.B., CANADA
CALAIS, MAINE, U.S.A.

PIER DIAPHRAGM SECTIONS

AUGUSTA, MAINE

Filename: ...\msta\039_Utility Details.dgn Division: BRIDGE Username: dana.damren Date:9/5/2006

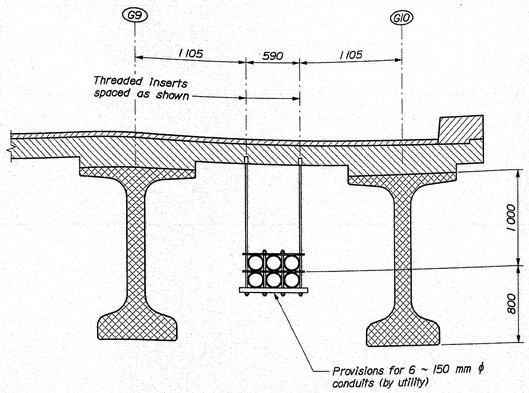
PROJECT DESIGN ENGINEER	BY	DATE
DESIGN-DETAILED	M. A. Iqbal	Team 4 & 5
DRAWN BY	------	------
REVISIONS	------	------
FIELD CHANGES	------	------

PLANS

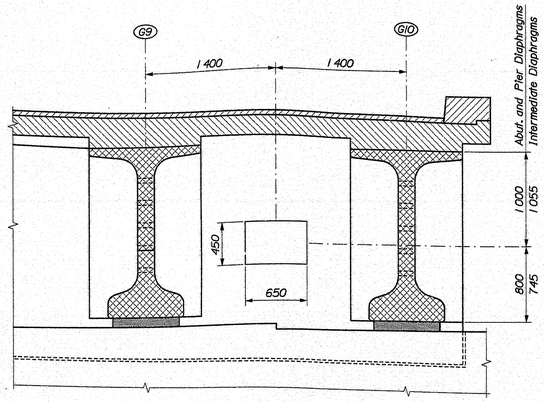
METRIC 1. All dimensions are in millimeters unless otherwise noted.
2. All elevations and stations are in meters.

F.H.W.A. REG. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
1	MAINE	NCPD\CBI-8483(360)X	39	47

8483.36



UTILITY HANGER SYSTEM

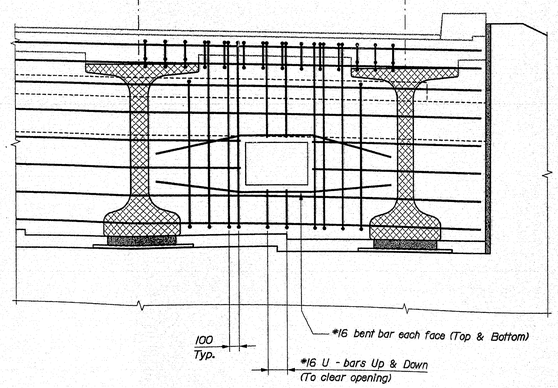


TYPICAL DIAPHRAGM OPENING

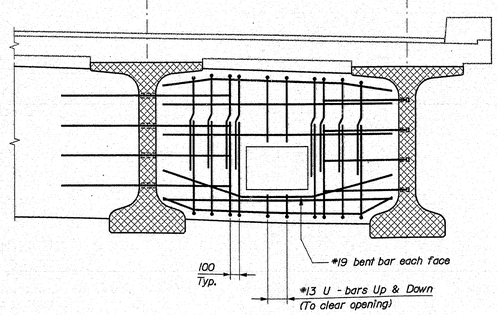
UTILITY CONDUIT NOTES

1. Threaded inserts shall be 19 mm ϕ stainless steel with a load capacity of 9 kN for each insert. Payment for inserts will be considered incidental to the concrete roadway slab pay item.

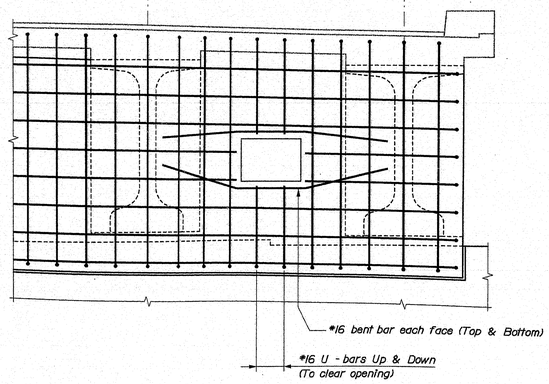
2. Utility hanger system, excluding the under deck conduits, shall be paid for by Special Work No. 1.



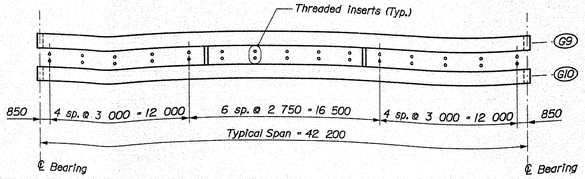
ABUTMENT DIAPHRAGM UTILITY ELEVATION



INTERMEDIATE DIAPHRAGM UTILITY ELEVATION



PIER DIAPHRAGM UTILITY ELEVATION



CONDUIT INSERT PLAN

143-193A

BRIDGE NO. 6440

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

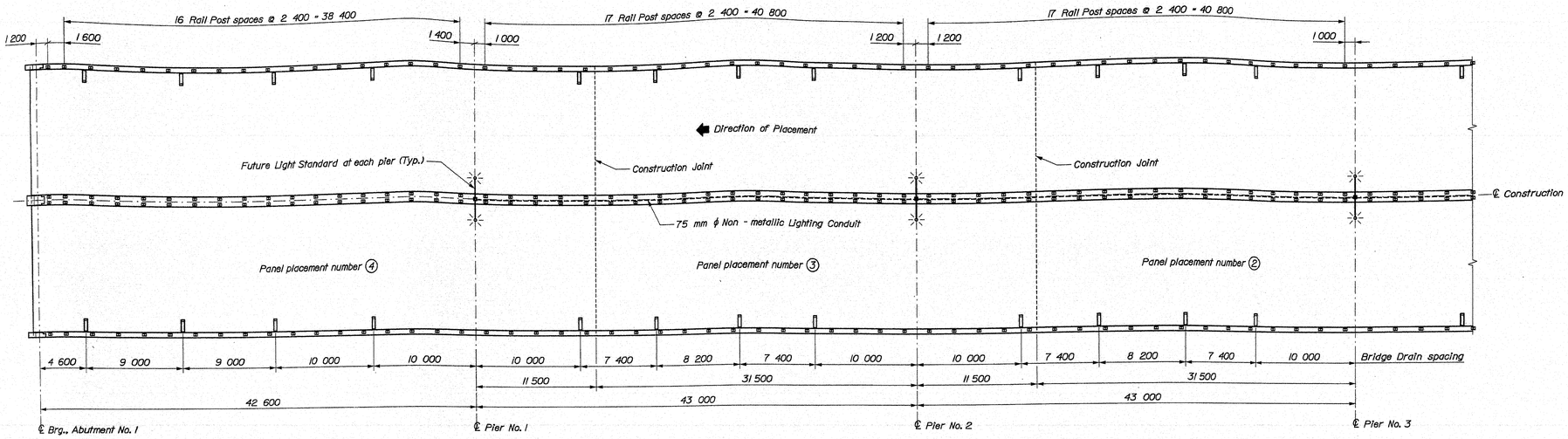
ST. CROIX RIVER BRIDGE
OVER
ST. CROIX RIVER
BETWEEN
ST. STEPHEN, N.B., CANADA
CALAIS, MAINE, U.S.A.

UTILITY DETAILS

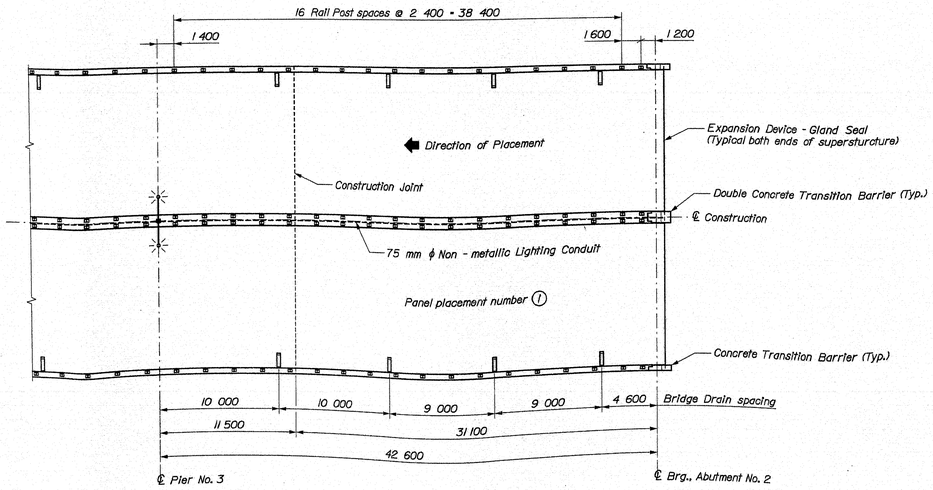
AUGUSTA, MAINE

METRIC	1. All dimensions are in millimeters unless otherwise noted. 2. All elevations and stations are in meters.	F.H.W.A. REG. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
		1	MAINE	NCPD\CBI-8483(360)	X 40	47

8483.36



PART SUPERSTRUCTURE PLAN



PART SUPERSTRUCTURE PLAN

SUPERSTRUCTURE NOTES

1. Form a 30 mm V - groove on the fascias at the horizontal joint between the curb and slab.

2. Reinforcing steel shall have a minimum cover of 50 mm unless otherwise noted.

3. Adjust reinforcing steel to fit around the bridge drains in a manner approved by the Resident. Do not cut transverse reinforcing bars.

4. Unless the superstructure slab concrete is placed in one continuous operation, the initial placement shall start at the Abutment No. 2 end of the deck slab and shall terminate at the completion of a positive moment section. Successive placements shall proceed from the end of the previous placement, terminate at the completion of a positive moment section, and include two or more spans. The placement sequence of the superstructure slab concrete shall be approved by the Resident.

5. Concrete in a placement shall be kept plastic one complete span behind the span being placed. A minimum of five days shall elapse between successive partial placements.

6. At the Contractor's option, Precast Deck Panels may be used in place of the full depth cast - in - place deck slab in accordance with Special Provision 502, Structural Concrete - Precast Deck Panels, and in accordance with the Standard Details. Precast deck panels shall not be used within 10 meters of the centerline of the piers.

7. If precast deck panels are used, payment for the reinforcing steel fabricated, delivered, and placed in the cast - in - place portion of the structural concrete slab will be considered incidental to the appropriate 502 item.

8. Precast girders shall have a minimum age of 90 days prior to casting the diaphragms and deck.

9. The Contractor shall install vertical type "H" Transition Barrier reinforcing steel prior to the placement of the curb or sidewalk concrete. Reference section 526 of the Standard Details for more information.

10. Each Double Concrete Transition Barrier shall be constructed as one monolithic unit. Payment will be made as two units each.

PROJECT DESIGN ENGINEER	BY	DATE
DESIGN-DETAILED	M. A. Iqbal	Item 4 & 5	
CHECKED	———	———	———
REVISIONS	———	———	———
FIELD CHANGES	———	———	———

PLANS

143-1936

BRIDGE NO. 6440

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

ST. CROIX RIVER BRIDGE
OVER
ST. CROIX RIVER
BETWEEN
ST. STEPHEN, N.B., CANADA
CALAIS, MAINE, U.S.A.

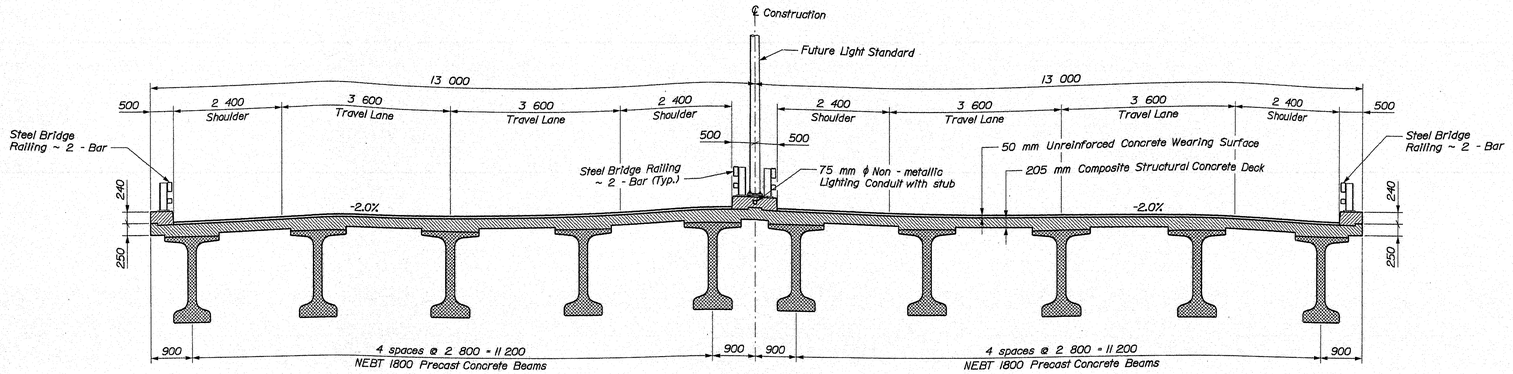
SUPERSTRUCTURE PLAN

AUGUSTA, MAINE

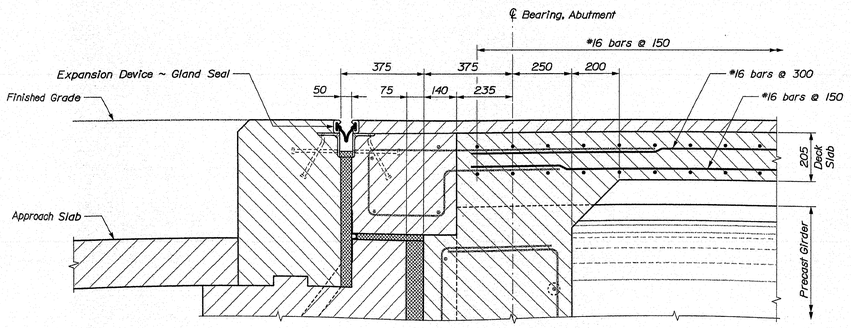
Filename: ...\040_Superstructure_Plan.dgn Division: BRIDGE Username: dana.damren Date:8/31/2006

METRIC	1. All dimensions are in millimeters unless otherwise noted. 2. All elevations and stations are in meters.	F.H.W.A. REG. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
		1	MAINE	NCPD\CBI-8483(360)	X 41	47

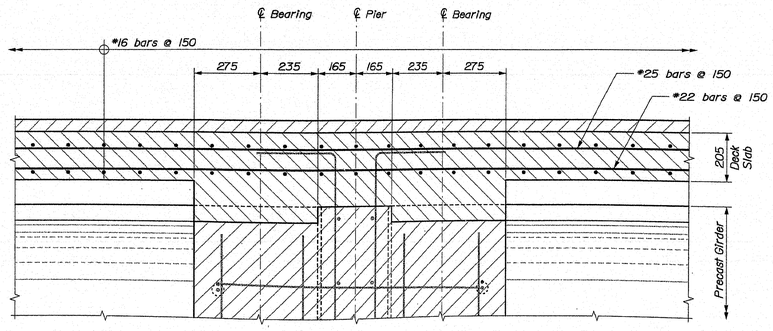
8483.36



TRANSVERSE SECTION



LONGITUDINAL SECTION AT ABUTMENT



LONGITUDINAL SECTION AT PIER

143-194A

BRIDGE NO. 6440

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

ST. CROIX RIVER BRIDGE
OVER
ST. CROIX RIVER
BETWEEN
ST. STEPHEN, N.B., CANADA
CALAIS, MAINE, U.S.A.

SUPERSTRUCTURE SECTIONS

AUGUSTA, MAINE

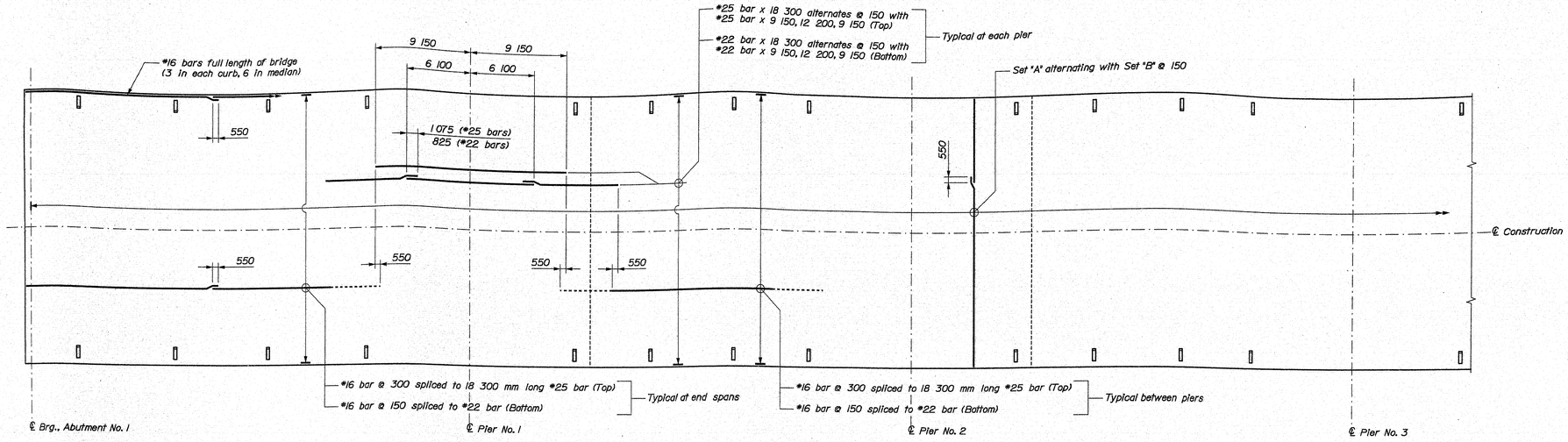
PROJECT DESIGN ENGINEER		BY	DATE
PLANS	DESIGN-DETAILED	M. A. Vogel	
	CHECKED	Team 4 & 5	
	REVISIONS	------	------
	FIELD CHANGES	------	------

Filename: ...\041_Superstructure_Sections.dgn Division: BRIDGE Username: dana.damren Date:8/31/2006

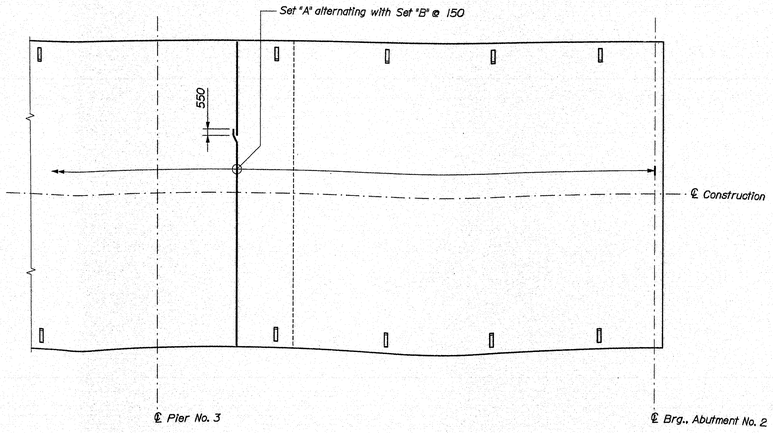
METRIC 1. All dimensions are in millimeters unless otherwise noted.
2. All elevations and stations are in meters.

F.H.W.A. REG. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
1	MAINE	NCPD\CBI-8483(360)X	42	47

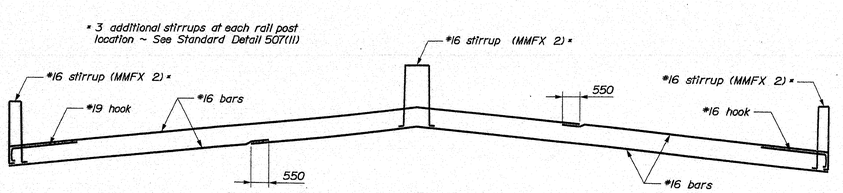
8483.36



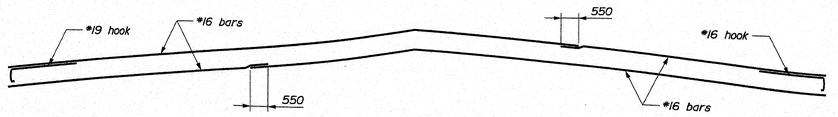
PART REINFORCING PLAN



PART REINFORCING PLAN



SET "A" REINFORCING



SET "B" REINFORCING

PROJECT DESIGN ENGINEER	BY	DATE
DESIGN-DETAILED	M. A. Ugbo	
CHECKED	Kam. K. & S.	
REVISIONS		
FIELD CHANGES		

PLANS

BRIDGE NO. 6440
STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

ST. CROIX RIVER BRIDGE
OVER
ST. CROIX RIVER
BETWEEN
ST. STEPHEN, N.B., CANADA
CALAIS, MAINE, U.S.A.

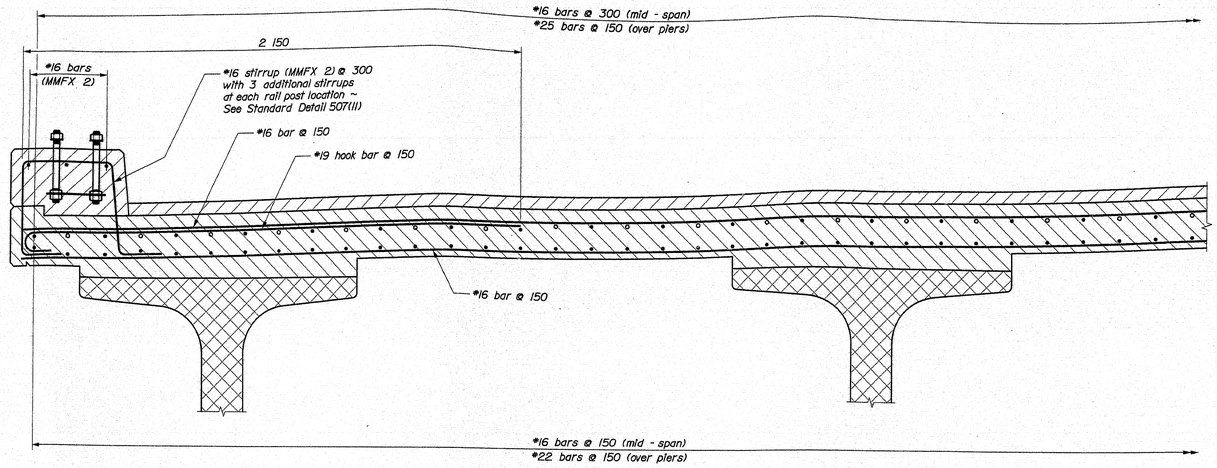
SPRSTR. REINFORCING

AUGUSTA, MAINE

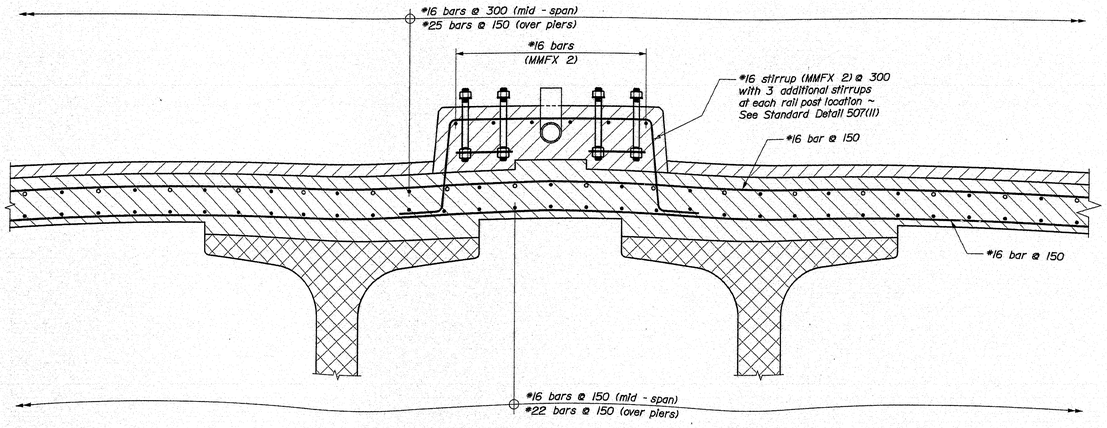
143-194B

Filename: ...\042_Superstructure_Reinforcing.dgn Division: BRIDGE Username: dana.damren Date:8/31/2006

METRIC	1. All dimensions are in millimeters unless otherwise noted. 2. All elevations and stations are in meters.	F.H.W.A. REG. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
		1	MAINE	NCPD\CBI-8483(360)X 8483.36	43	47



TYPICAL REINFORCING SECTION



REINFORCING SECTION AT MEDIAN

PROJECT DESIGN ENGINEER		BY	DATE
	DESIGN-DETAILED	M. A. Rod	Team 4 & 5
PLANS	CHECKED		
	REVISIONS		
	FIELD CHANGES		

143-195A

BRIDGE NO. 6440

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

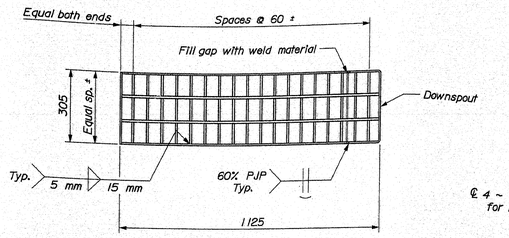
ST. CROIX RIVER BRIDGE
OVER
ST. CROIX RIVER
BETWEEN
ST. STEPHEN, N.B., CANADA
CALAIS, MAINE, U.S.A.

SPRSTR. REINF. DETAILS

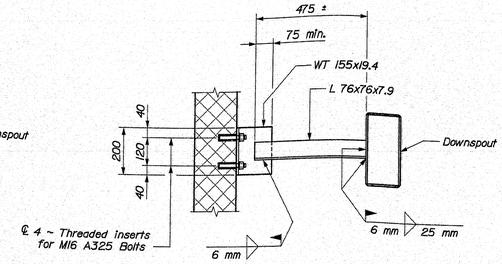
AUGUSTA, MAINE

Filename: ...\043_Superstructure_Reinf. Details.dgn Division: BRIDGE Username: dana.damren Date:8/31/2006

METRIC	1. All dimensions are in millimeters unless otherwise noted. 2. All elevations and stations are in meters.	F.H.W.A. REG. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
		1	MAINE	NCPD\CBI-8483(360)X	44	47
				8483.36		



BRIDGE DRAIN PLAN



SECTION A - A
(Support Assembly)

BRIDGE DRAIN NOTES

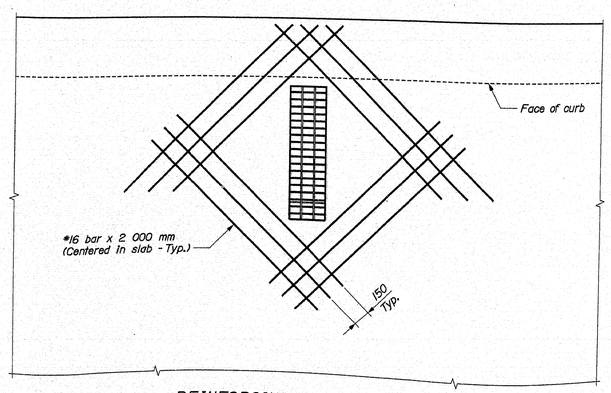
1. All plates shall be 6 mm thick and shall conform to AASHTO M 270M/M 270 Grade 36 (ASTM A 36/A 36M).

2. The downspout shall be a TS 305x152x6.4 conforming to ASTM A 500.

3. Grating shall be a commercial heavy - duty grating with 38 x 8 mm bearing bars and 10 mm ϕ cross bars.

4. Payment for bridge drains will be as specified under Subsection 502.19 of the Standard Specifications.

BRIDGE DRAIN SECTION



REINFORCING PLAN AT DRAIN

PROJECT DESIGN ENGINEER	BY	DATE
DESIGN-DETAILED	M. A. Iqbal	Item 4 & 5
CHECKED	———	———
REVISIONS	———	———
FIELD CHANGES	———	———

PLANS

Filename: ...\msta\044_Bridge_Drains.dgn Division: BRIDGE Username: dana.damren Date:8/31/2006

143-195B

BRIDGE NO. 6440

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

ST. CROIX RIVER BRIDGE
OVER
ST. CROIX RIVER
BETWEEN
ST. STEPHEN, N.B., CANADA
CALAIS, MAINE, U.S.A.

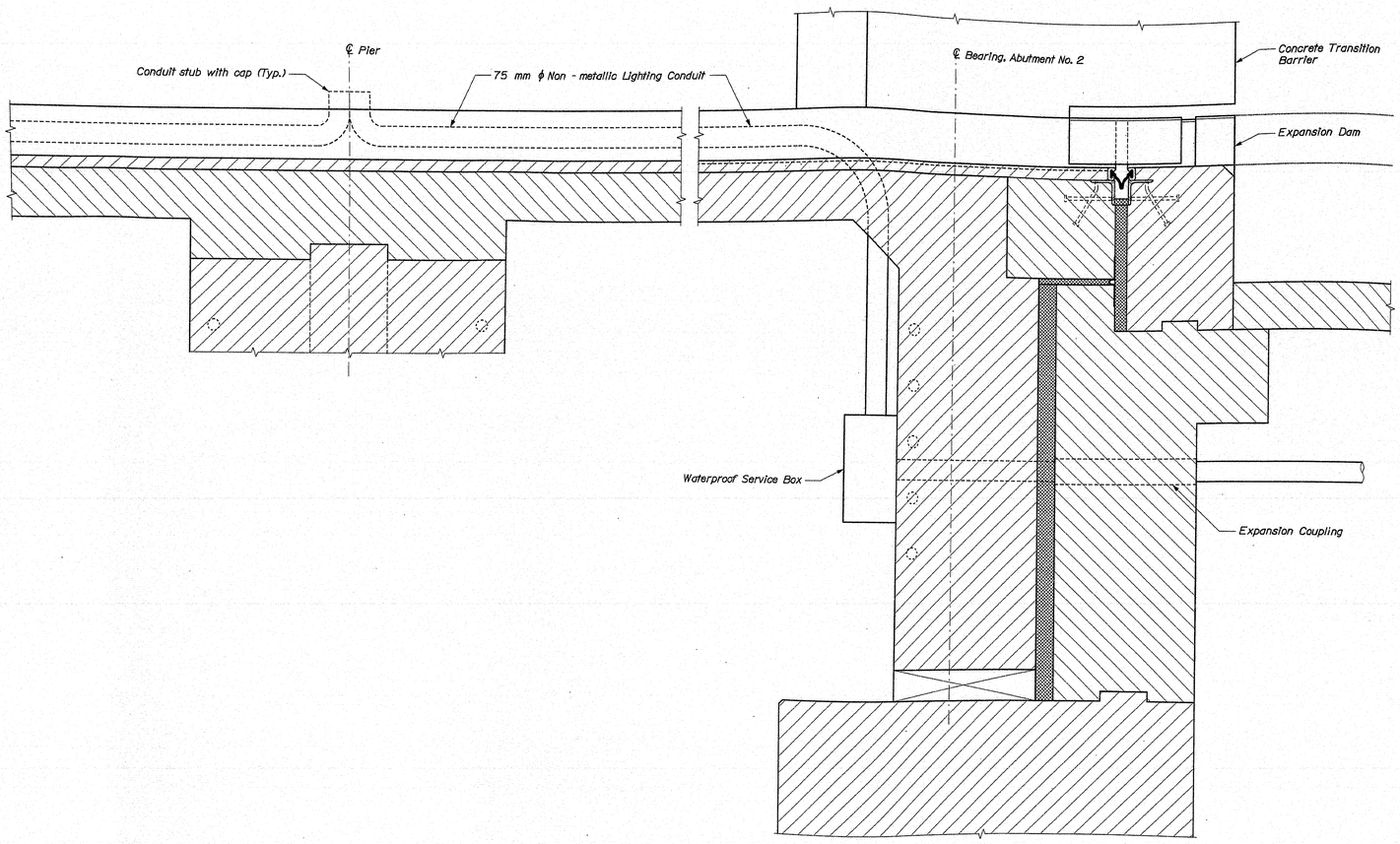
BRIDGE DRAINS

AUGUSTA, MAINE

METRIC 1. All dimensions are in millimeters unless otherwise noted.
2. All elevations and stations are in meters.

F.H.W.A. REG. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
1	MAINE	NCPD\CBI-8483(360)X	45	47

8483.36



LONGITUDINAL SECTION AT MEDIAN

LIGHTING NOTES

1. Lighting conduit shall feed from the Abutment No. 2 end of the bridge. Provision shall be made to accomodate movement between the superstructure and the abutment and to drain the conduit as approved by the Resident.

2. Provide a waterproof expansion coupling in the conduit every nine (9) meters.

3. Provide a capped stub at each future light standard location.

4. Payment for the lighting conduit will be made under Item No. 638.01, Embedded Work In Sturctures.

146-196A

BRIDGE NO. 6440

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

ST. CROIX RIVER BRIDGE
OVER
ST. CROIX RIVER
BETWEEN
ST. STEPHEN, N.B., CANADA
CALAIS, MAINE, U.S.A.

LIGHTING

AUGUSTA, MAINE

PROJECT DESIGN ENGINEER		BY	DATE
PLANS	DESIGN-DETAILED	W. A. Iqbal	Team 4 & 5	
	CHECKED	-------	-------	
	REVISIONS	-------	-------	
	FIELD CHANGES	-------	-------	

Filename: ...\bridge\rnsta\045_Lighting.dgn Division: BRIDGE Username: dana.damren Date:8/31/2006

Filename: ...\046_Duct_Bank_Profile and Details.dgn Division: BRIDGE Username: dana.damren Date:8/31/2006

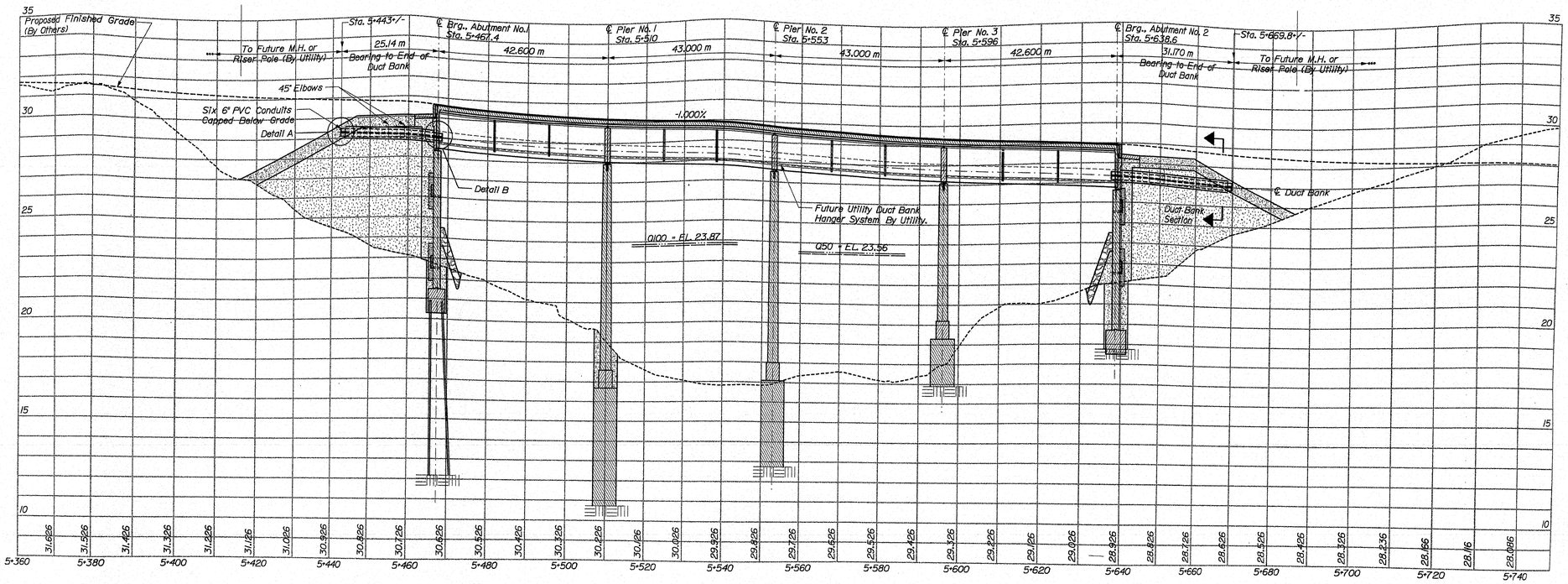
PROJECT DESIGN ENGINEER	BY	DATE
DESIGN-DETAILED	M. A. Iqbal	
CHECKED	Item 4 & 5	
REVISIONS		
FIELD CHANGES		

PLANS

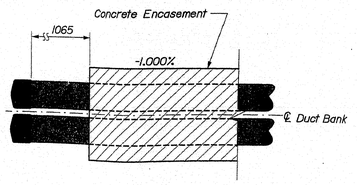
METRIC 1. All dimensions are in millimeters unless otherwise noted. 2. All elevations and stations are in meters.

FHWA REG. NO.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
1	MAINE	NCPD\CBI-8483(360)X	46	47

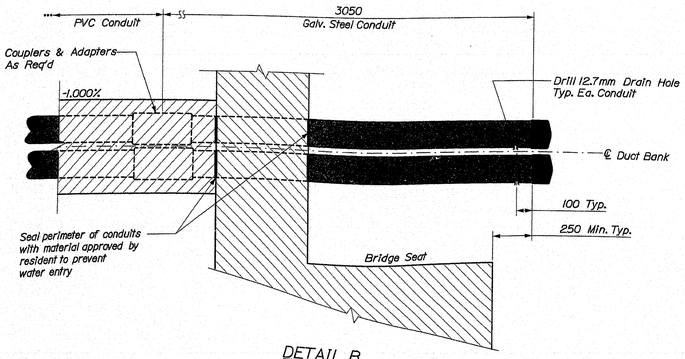
8483.36



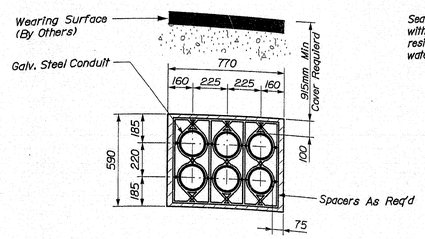
PROFILE



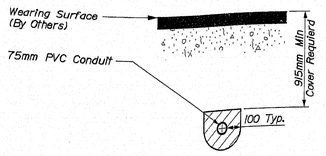
DETAIL A
(Abut. No. 2 Opposite Hand)



DETAIL B
(Abut. No. 2 Opposite Hand)



DUCT BANK SECTION
* For Both Approaches



LIGHTING CONDUIT SECTION

UTILITY NOTES

1. All conduits shall be schedule 40, and 150mm in diameter unless otherwise noted.
2. Galvanized conduits shall have threaded ends and shall be capped.
3. Concrete encasement, shall be Class B and maintain cover as shown.
4. Horizonally, the duct banks shall not contain no more than two 45 degree sweeps. Vertically, the duct system shall maintain a 1% slope as shown.
5. Duct bank spacers shall be utilized as required.
6. The utility hanger system and concrete encased duct banks at both approaches shall be paid for by Item No. 890.01, Special Work No. 1 (1 Lump Sum). The Utility Company shall be responsible for the actual "under deck" conduit.

143-196B

BRIDGE NO. 6440

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

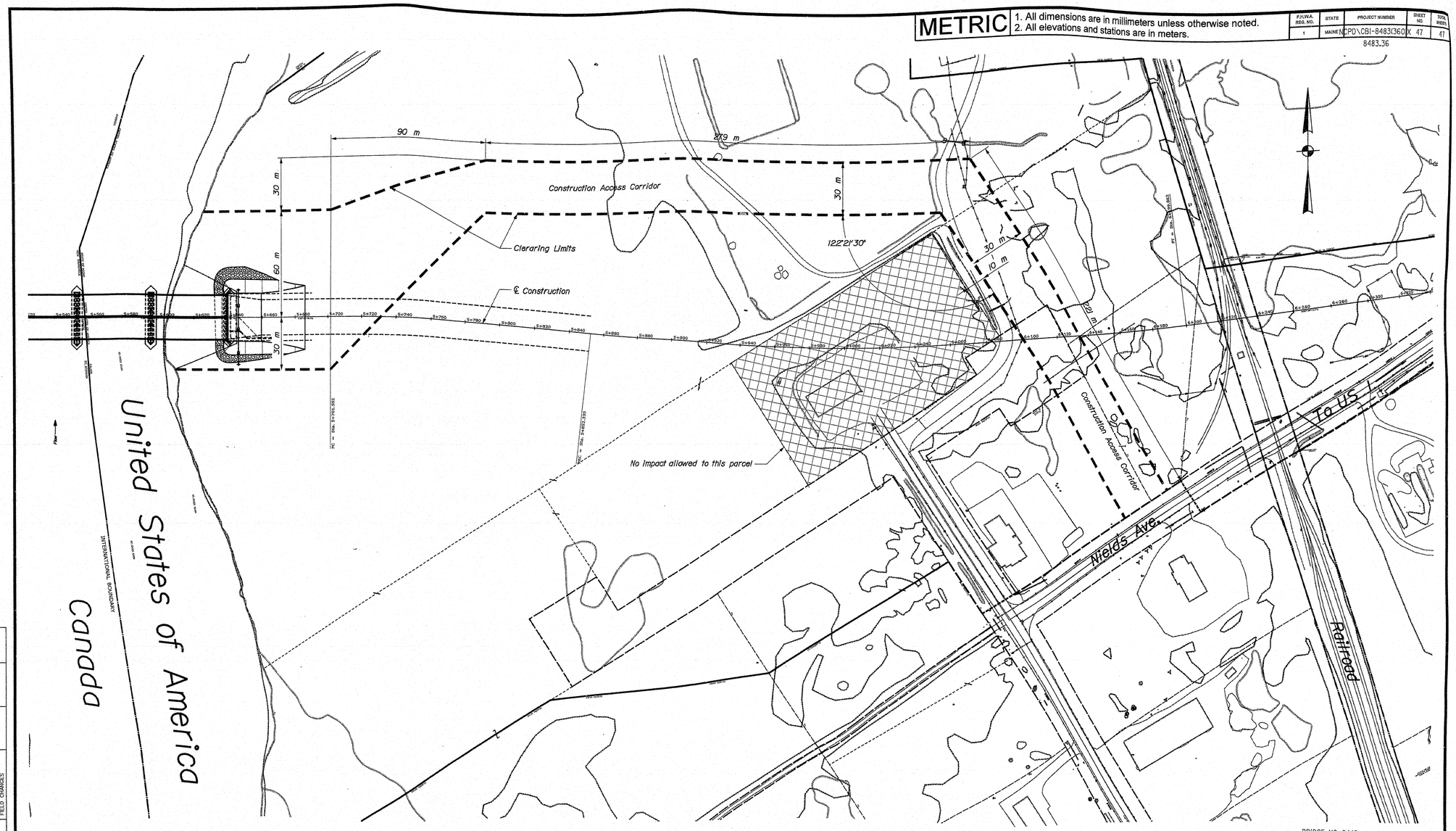
ST. CROIX RIVER BRIDGE
OVER
ST. CROIX RIVER
BETWEEN
ST. STEPHEN, N.B., CANADA
CALAIS, MAINE, U.S.A.

DUCT BANK PROFILE

AUGUSTA, MAINE

METRIC	1. All dimensions are in millimeters unless otherwise noted. 2. All elevations and stations are in meters.	FUNC. CLASS.	STATE	PROJECT NUMBER	SHEET NO.	TOTAL SHEETS
		1	MAINE	NCPD\CBI-8483(360)X	47	47

8483.36



BRIDGE NO. 6440

STATE OF MAINE
DEPARTMENT OF TRANSPORTATION

ST. CROIX RIVER BRIDGE
OVER
ST. CROIX RIVER
BETWEEN
ST. STEPHEN, N.B., CANADA
CALAIS, MAINE, U.S.A.

CONSTRUCTION ACCESS PLAN

AUGUSTA, MAINE

143-197

PROJECT DESIGN ENGINEER		BY	DATE
PLANS	DESIGN-DETAILED	M. A. Iqbal	from 4 & 5
	CHECKED	———	———
	REVISIONS	———	———
	FIELD CHANGES	———	———

Filename: ...\047_Construction Access Plan.dgn Division: BRIDGE Username: dana.damren Date:8/31/2006