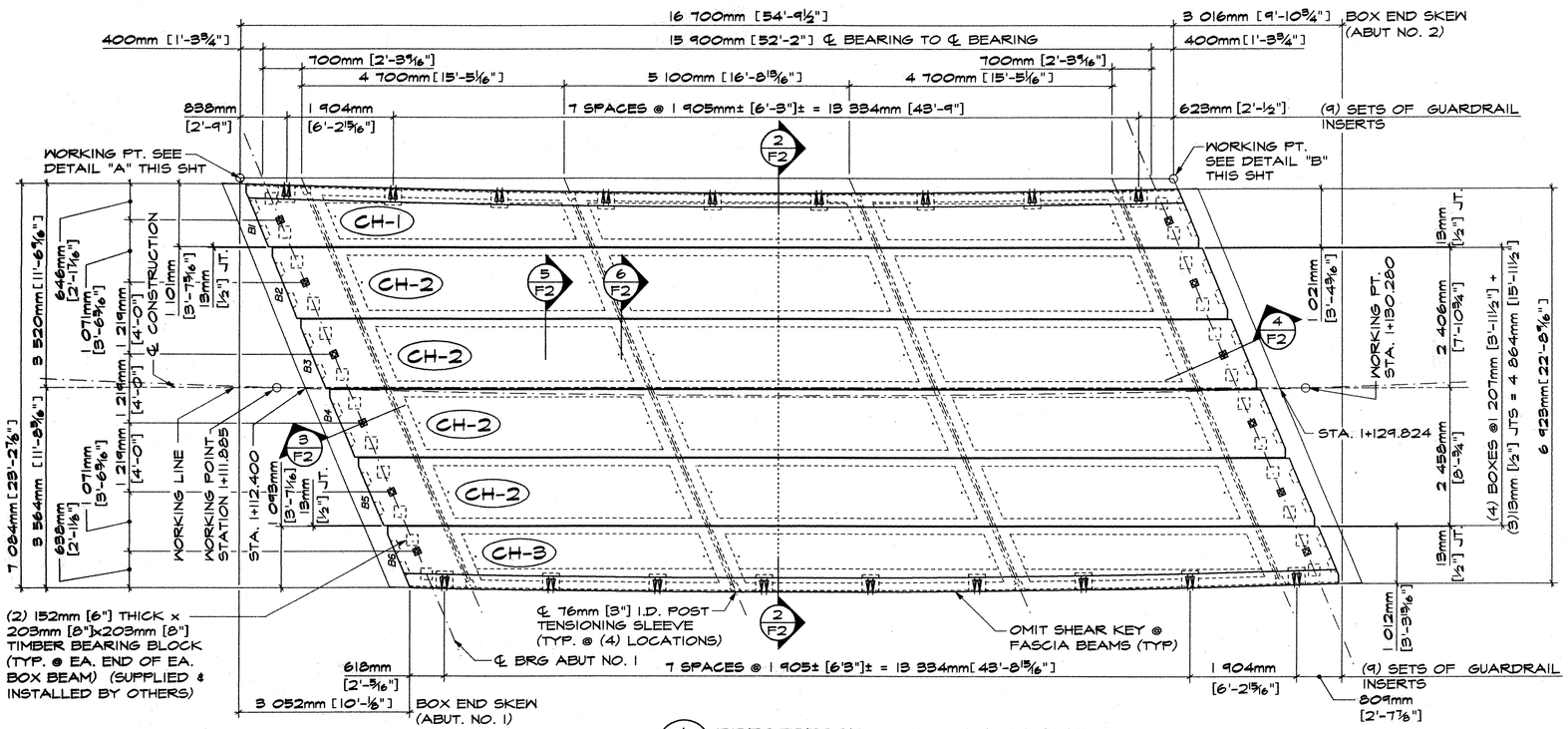
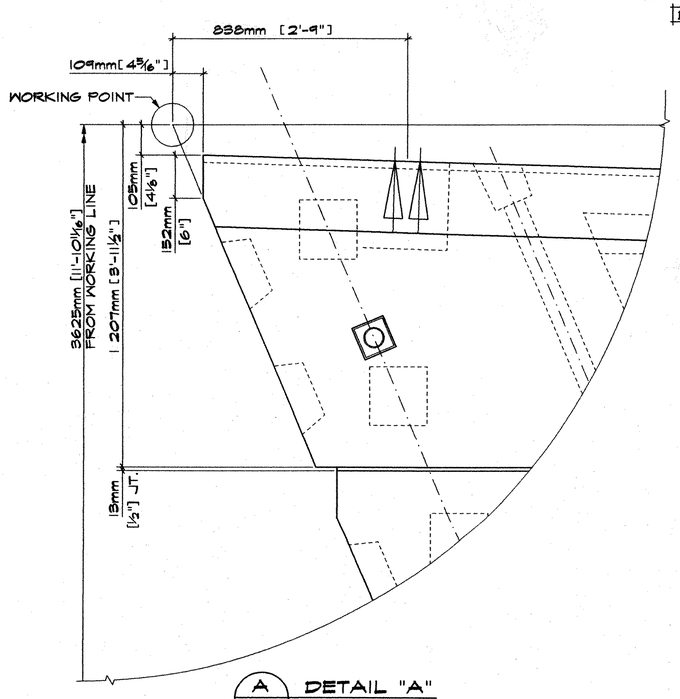
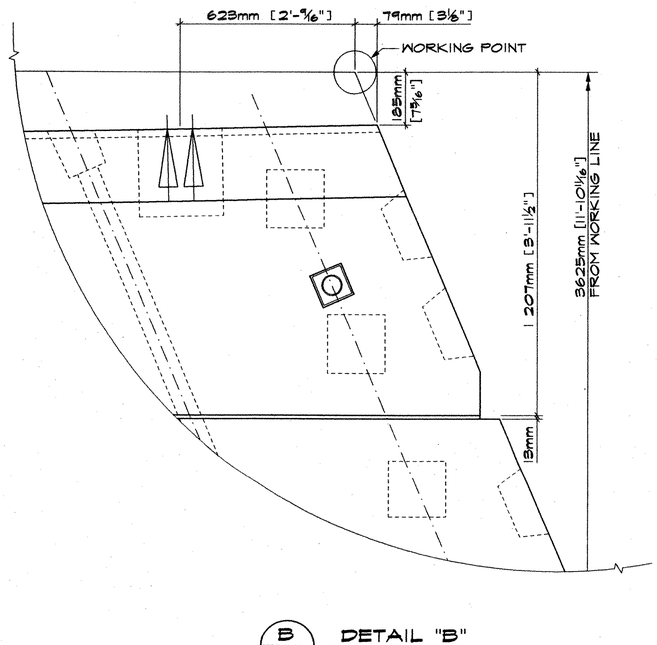


1/F1 **PRESTRESSED BOX BEAM LAYOUT**
50:1

DESIGN LIVE LOAD = HL-93



A/F1 **DETAIL "A"**
1:10



B/F1 **DETAIL "B"**
1:10

GENERAL NOTES

1. MIN. CONCRETE STRENGTH AT 28 DAYS SHALL BE 45 MPa [6525 PSI]
2. MIN. CONCRETE STRENGTH AT STRESS TRANSFER SHALL BE 40 MPa [5800 PSI]
3. REINFORCING STEEL SHALL BE GR-420 [GR-60], ASTM A-615, AASHTO M31M AND SHALL BE EPOXY COATED
4. PRESTRESSING STRANDS SHALL CONFORM TO ASTM A-416 (AASHTO M203M) AND SHALL CONSIST OF 15mm [0.6"] Φx1860 MPa [270KSI] 7 WIRE LOW RELAXATION STRANDS.
5. PRESTRESSING STRANDS SHALL EACH BE PULLED TO HAVE A NET TENSION OF 195.5 kN [44.0K] AFTER ACCOUNTING FOR CHUCK SLIPPAGE. TENSION SHALL BE VERIFIED BY MEASURING STRAND ELONGATION. SEE EXAMPLE ELONGATION CALCULATION AND TENSIONING PROCEDURE, THIS SHEET.
6. ENDS OF PRESTRESSING STRANDS SHALL BE CUT, RECESSED AND GROUTED FLUSH EXCEPT WHERE NOTED.
7. THE TOPS OF THE SLABS SHALL RECEIVE A SMOOTH FLOAT FINISH (U.N.O.)
8. BEAMS SHALL BE HANDLED AND ERECTED USING THE LIFTING LOOPS ONLY. THE MINIMUM SLING ANGLE FROM THE HORIZONTAL SHALL BE 60°. BEAMS SHALL BE STORED AND TRANSPORTED WITH TIMBER SUPPORTS WITHIN 610mm [2'-0"] OF THE SLAB ENDS, UNLESS APPROVED BY J.P. CARRARA & SONS INC.
9. SHEAR KEY SURFACES SHALL BE BLAST CLEANED.
10. DESIGN MIX: J.P.C. BRIDGE MIX #45IMESCC
11. QUALITY CONTROL PROCEDURES ARE IN ACCORDANCE WITH PCI REQUIREMENTS. J.P. CARRARA & SONS INC IS A PCI CERTIFIED PLANT.
12. THE ENGINEER OF RECORD WILL BE NOTIFIED SEVEN (7) WORKING DAYS PRIOR TO START SO THAT ALL PRECAST OPERATIONS MAY BE WITNESSED.
13. THE VOIDS MUST BE VENTED DURING THE CURING PERIOD.
14. CURING METHOD
    NATURAL CURE: AS SOON AS THE TOP OF THE BEAM IS FINISHED, COVER WITH POLY UNTIL RELEASE STRENGTH IS ACHIEVED.
15. TRANSVERSE POST-TENSIONING SEQUENCE:
    A. ONCE VOIDED SLABS ARE ERECTED, POST TENSION TENDONS TO APPROXIMATELY 22kN [5,000 LBS].
    B. GROUT SHEAR KEYS. ACCORDING TO PROJECT SPECIFICATIONS
    C. ONCE SHEAR KEY GROUT HAS ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 10.3 MPa [1,500 PSI] POST-TENSION TENDONS TO 133.5kN [30,000 LBS]
16. POST-TENSIONING STRANDS SHALL CONFORM TO AASHTO M203M [ASTM A-416] AND SHALL CONSIST OF 13mm [½"]Φx1860 MPa [270 KSI] POLYSTRAND.
17. NO INSERTS SHALL BE FIELD INSTALLED IN SLABS WITHOUT APPROVAL OF J.P. CARRARA & SONS, INC.

POST-TENSION TENDONS TO 133.5kN [30,000 LBS] ONCE SHEAR KEY GROUT COMPRESSIVE STRENGTH IS BETWEEN 10.3MPa [1500PSI] AND THE COMPRESSIVE STRENGTH REQUIRED BY PROJECT SPECIFICATIONS.

OK 8/15

EXAMPLE PRESTRESSING STRAND ELONGATION CALC. AND TENSIONING

(NOT TO BE USED FOR CONSTRUCTION)

SIZE AND GRADE: 0.60"Φx270 KSI AREA: 0.217 IN²

TENSION: 44,000 LB EACH STRAND GRIP TO GRIP: 192'-9¾" = 192.813'

E_s = 28,600,000 PSI (ASSUMED FOR THESE CALCULATIONS; VALUE TO BE OBTAINED FOR STRAND SPOOL ACTUALLY USED)

EXAMPLE:

$$\Delta = \frac{PL}{AE} = \frac{(44{,}000-3{,}000) \times 192.813 \times 12}{0.217 \times 28{,}600{,}000} = 15.29"$$

TOLERANCES: ±5%

THEREFORE ΔUPPER LIMIT= 1.05 x 15.29" = 16.05" = 16⅛"

ΔLOWER LIMIT= 0.95 x 15.29" = 14.52" = 14½"

EXTRA FORCE REQUIRED TO COMPENSATE FOR ½" CHUCK SLIPPAGE

$$\Delta P = \frac{0.5 \times 41{,}000}{15.29} = 1341 \text{ LB}$$

TOTAL TENSIONING FORCE = 44,000 + 1341 = 45,341 LB [201.7 kN]

STRAND TENSIONING PROCEDURE

1. PULL EACH STRAND INITIALLY TO 3,000* LB AND MARK STRAND.
2. THEN PULL EACH STRAND TO A TOTAL TENSION OF 45,341* LB AND MEASURE ELONGATION AFTER SEATING. IT MUST BE BETWEEN 368mm[14½"] AND 408mm[16⅛"]

* NOTE: FORCES READ ON STRESSING JACK GAUGES MUST BE MADE TO CORRESPOND TO ABOVE VALUES BASED ON CALIBRATION DATA FOR SPECIFIC JACK USED.

APPROVAL STAMP:

RECEIVED
CK'D BY _____ OK'D BY _____
AUG 04 2006
RESUBMIT _____ APPROVED
BY _____ DATE AUG 10 2006

J.P. CARRARA & SONS INC.
Precast & Prestress Manufacturer
2464 CASE STR., MIDDLEBURY, VERMONT 05753 Phone:(802)388-6361 Fax:(802)388-9010

TREMBLAY CONSTRUCTION, LLC.
CONTRACTOR
WASHINGTON, VT.

STATE OF VERMONT A.O.T.
COUNTY OF ORLEANS

DATE: 7-16-06
SCALE: NOTED

TOWN OF CHARLESTON
PROJECT NUMBER BRO-1449(22)
TH41, CLASS 2 TOWN HIGHWAY, BRIDGE NO. 16

CHKD: DFTM: ETC
JOB NO: 23241-06

SUPERSTRUCTURE PLAN

DWG NO: F1

Filename: ...\MSTA\F1_Charleston_Plan.dgn
Date:7/30/2006