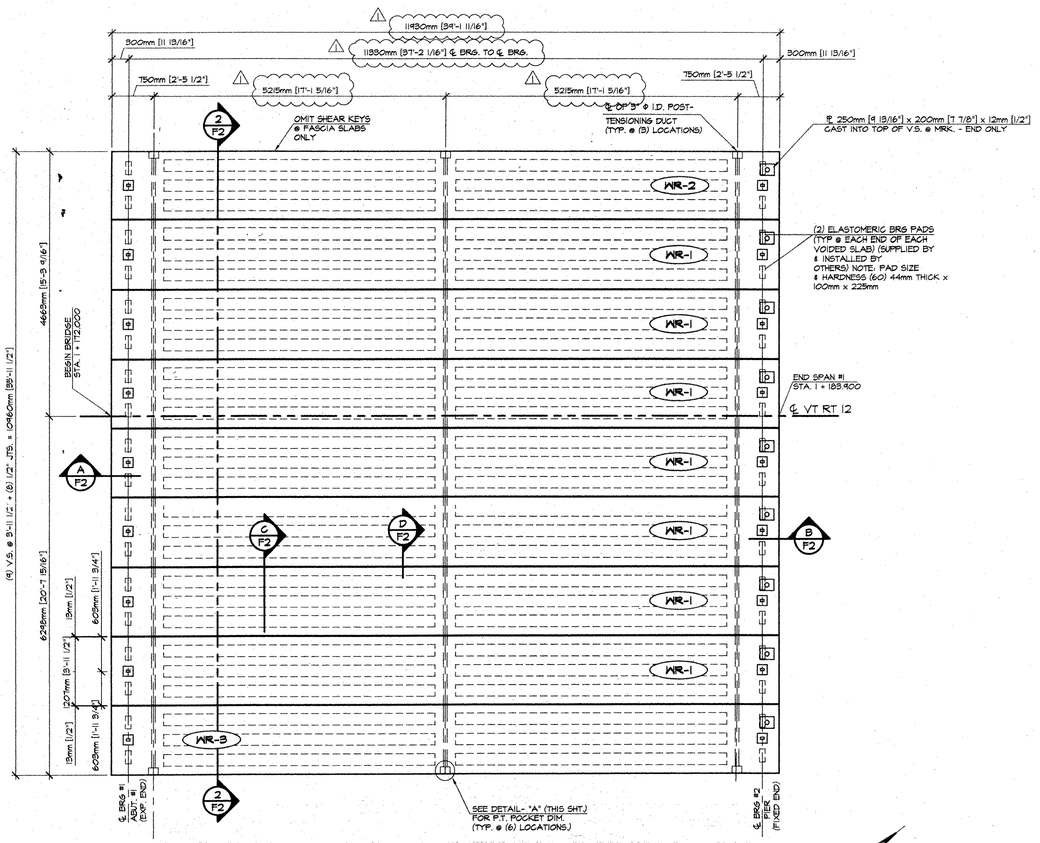
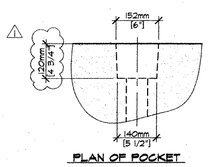
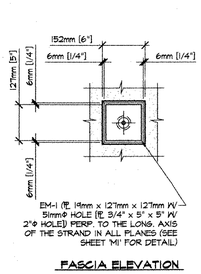


1 / F1 PRESTRESSED VOIDED SLAB LAYOUT
1:50

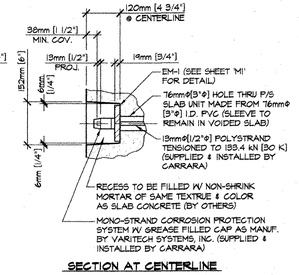
DESIGN LOAD: AASHTO MS-22.5 LIVE LOAD



PLAN OF POCKET

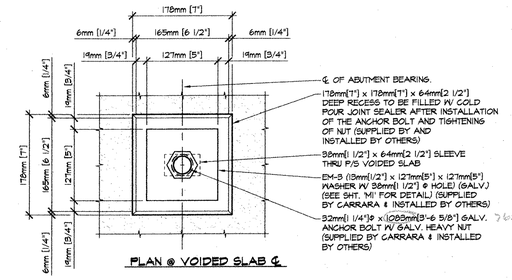


FASCIA ELEVATION

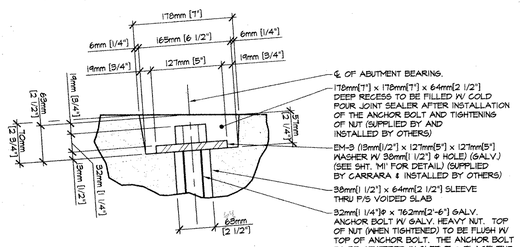


SECTION AT CENTERLINE

DETAIL - "A"
1:10



PLAN @ VOIDED SLAB ℄



SECTION @ VOIDED SLAB ℄

DETAIL - "B"
1:5

GENERAL NOTES

1. MIN. CONCRETE STRENGTH AT 28 DAYS: f'c = 45 MPa [6,500 PSI] MIN. CONCRETE STRENGTH AT STRESS TRANSFER, f'ci = 30 MPa [4,350 PSI]
2. REINFORCING STEEL SHALL BE GR-420 [GR-60]. AASHTO M 31M ASTM A-615 AND SHALL BE EPOXY COATED.
3. PRESTRESSING STRANDS SHALL CONFORM TO ASTM A-416 (AASHTO M 203M) AND SHALL CONSIST OF 15mm[0.60"]ø x 1860 MPa [270 KSI] 7-WIRE LOW RELAXATION STRANDS.
4. PRESTRESSING STRANDS SHALL EACH BE PULLED TO HAVE A NET TENSION OF 195.5 kN [44.0 K] AFTER ACCOUNTING FOR CHUCK SLIPPAGE. TENSION SHALL BE VERIFIED BY MEASURING STRAND ELONGATION. SEE EXAMPLE ELONGATION CALCULATION AND TENSIONING PROCEDURE. (THIS SHEET).
5. END OF PRESTRESSING STRANDS SHALL BE CUT WITH A TORCH, RECESSED & PATCHED, WITH AN APPROVED VT DOT MATERIAL. (2)
6. TOP OF THE BEAMS SHALL RECEIVE A RAKE FINISH ROUGHNESS TO 6mm (1/4") AMPLITUDE (UNLESS NOTED OTHERWISE).
7. SLABS SHALL BE HANDLED AND ERECTED USING THE LIFTING LOOPS ONLY. THE MINIMUM SLING ANGLE FROM THE HORIZONTAL SHALL BE 60°. SLABS SHALL BE STORED AND TRANSPORTED WITH TIMBER SUPPORTS WITHIN 610mm[2'-0"] OF THE SLAB ENDS, UNLESS APPROVED BY J.P. CARRARA & SONS, INC.
8. SHEAR KEY SURFACES SHALL BE BLAST CLEAN.
9. DESIGN MIX: J.P.C. BRIDGE MIX #45IMESCC (2)
   - 107kg [180 LBS] FLY ASH - ISG RESOURCES
   - 427.2 kg [720 LBS.] TYPE III CEMENT - GLENS FALLS CEMENT
   - 742 kg [1250 LBS.] FINE AGGREGATE
   - 860 kg [1450 LBS.] COARSE AGGREGATE
   - 168 L [34.0 GAL.] WATER - 128.4 kg [283 LBS.]
   - 4.5% - 8.5% AIR CONTENT (242 mL [8.18 OZ.] DAREX II) ADJ. AS REQ.
   - 586.7 mL MB 3400 PER 100 kg CEMENT, SPREAD 559mm - 711mm [4.00 OZ. MB 3400 PER 100 LBS. CEMENT, SPREAD 22" - 28"]
   - 196 mL DIT OR D65 PER 100 kg CEMENT [6.62 OZ. DIT OR D65 PER 100 LBS. CEMENT]
   - 14.85 L [3.92 GAL.] DCI
10. QUALITY CONTROL PROCEDURES ARE IN ACCORDANCE WITH PCI REQUIREMENTS. J.P. CARRARA & SONS, INC. IS A PCI CERTIFIED PLANT.
11. THE ENGINEER OF RECORD WILL BE NOTIFIED (7) WORKING DAYS SO THAT ALL PRECAST OPERATIONS MAY BE WITNESSED.
12. THE VOIDS MUST BE VENTED DURING THE CURING PERIOD.
13. CURING METHOD: (2) NATURAL CURE: AS SOON AS THE TOP OF THE BEAM IS FINISHED, COVER WITH POLY UNTIL RELEASE STRENGTH IS ACHIEVED.
14. TRANSVERSE POST-TENSIONING SEQUENCE:
    - A. ONCE VOIDED BEAMS ARE ERECTED, POST-TENSION TENDONS TO APPROXIMATELY 22 kN [4,946 LBS].
    - (2) B. GROUT SHEAR KEYS (BY OTHERS)
    - C. ONCE SHEAR KEY GROUT HAS ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 10.3 MPa [1,500 PSI], POST-TENSION TENDONS TO 133.4 kN [30,000 LBS].
15. POST-TENSIONING STRANDS SHALL CONFORM TO AASHTO M 203M [ASTM A-416] AND SHALL CONSIST OF 13mm[1/2"]ø x 1860 MPa [270 KSI] POLYSTRAND.
16. NO INSERTS SHALL BE FIELD INSTALLED IN SLABS WITHOUT APPROVAL OF J.P. CARRARA & SONS, INC.

EXAMPLE PRESTRESSING STRAND ELONGATION CALCULATION AND TENSIONING
(NOT TO BE USED FOR CONSTRUCTION)

SIZE & GRADE: 0.60"ø x 270 KSI

AREA: 0.217 IN^2

TENSION: 44,000 LBS. EACH STRAND

GRIP TO GRIP: 192'-9 3/4" = 192.813'

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

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

THEREFORE: TOLERANCES: ± 5%
- Δ UPPER LIMIT = 1.05 x 15.29" = 16.05" = 16 1/16"
- Δ LOWER LIMIT = 0.95 x 15.29" = 14.53" = 14 1/2"

EXTRA FORCE REQUIRED TO COMPENSATE FOR 1/2" CHUCK SLIPPAGE:

$\Delta P = \frac{0.5 \times 41{,}000}{15.29} = 1{,}341$ LBS.

TOTAL TENSIONING FORCE = 44,000 + 1,341 = 45,341 LBS. [201.7 kN]

STRAND TENSIONING PROCEDURE

1. PULL EACH STRAND INITIALLY TO 13.34 kN* [3,000 LBS]* & MARK STRAND.
2. THE PULL EACH STRAND TO A TOTAL TENSION OF 201.7 kN* [45,341 LBS]* AND MEASURE ELONGATION AFTER SEATING. IT MUST BE BETWEEN 369mm[14 1/2"] AND 408mm[16 1/16"].

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

REV. 2 11-7-05 GEN. REV. PER ENGR. COMM. T. D.
REV. 1 9-7-05 GEN. REV. PER ENGR. COMM. TJD.

APPROVAL STAMP:

RECEIVED
OK'D BY KMH OK'D BY M G
NOV 10 2005
RESUBMIT ____ APPROVED ✓ As Noted
BY GJoW DATE 11/4/05

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

KUBRICKY CONST. CORP.
CONTRACTOR
GLENS FALLS, NEW YORK

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

TOWN OF BETHEL - BRIDGE #31
VT RT 12 OVER 3RD BRANCH OF WHITE RIVER

SUPERSTRUCTURE PLAN & DETAILS

DATE: JULY 13, 2005
SCALE: NOTED
CHKD: - DFTM: T.J.D.
JOB NO: 23224-05
DWG. NO: F1
146 PC