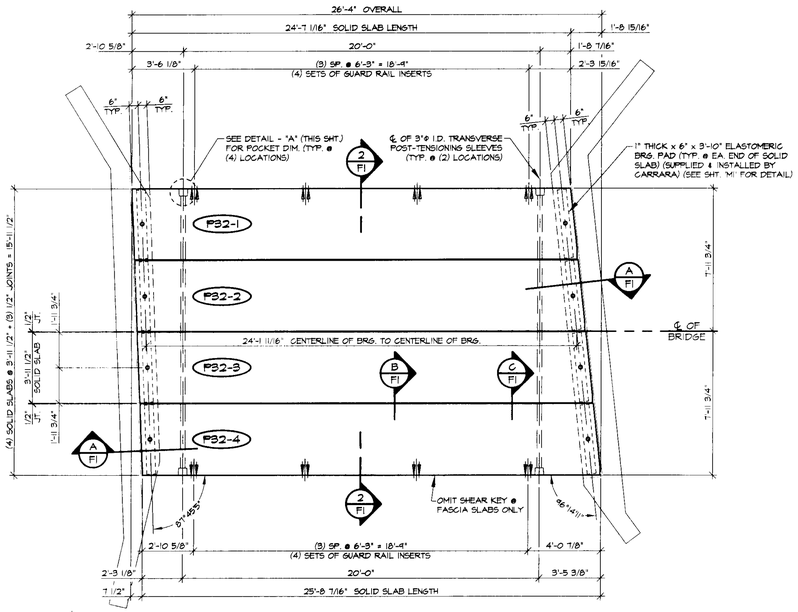
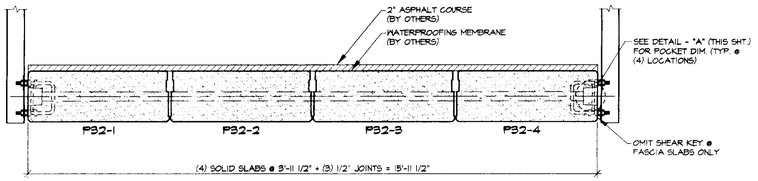


1 / F1 PRESTRESSED SOLID SLAB LAYOUT

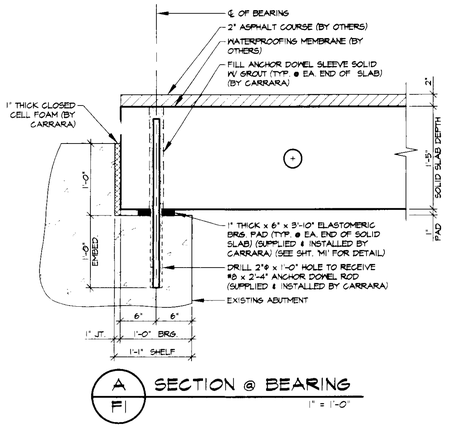
1/4" = 1'-0"

DESIGN LOAD: HS-25



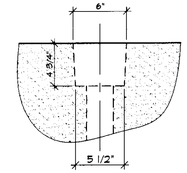
2 / F1 TRANSVERSE SECTION

1/2" = 1'-0"

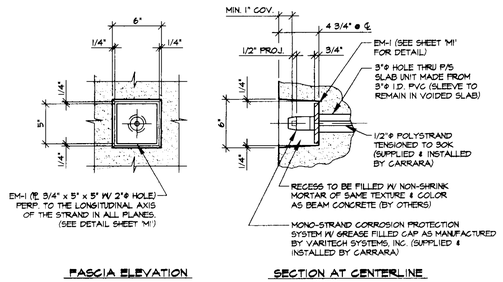


A / F1 SECTION @ BEARING

1" = 1'-0"



PLAN OF POCKET

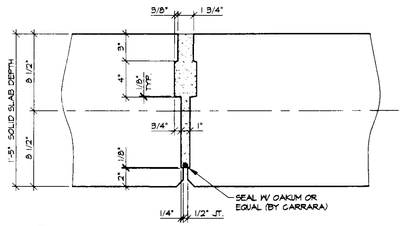


FASCIA ELEVATION

SECTION AT CENTERLINE

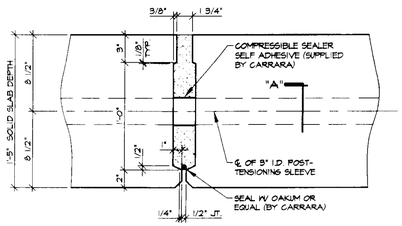
DETAIL - "A"

1 1/2" = 1'-0"



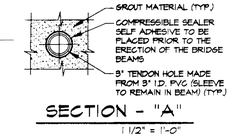
B / F1 TYP. SHEAR KEY SECTION

1 1/2" = 1'-0"



C / F1 SHEAR KEY SECTION @ P.T. SLEEVE

1 1/2" = 1'-0"



SECTION - "A"

1 1/2" = 1'-0"

GENERAL NOTES

1. MIN. CONCRETE STRENGTH AT 28 DAYS SHALL BE 5,000 PSI.
2. MIN CONCRETE STRENGTH AT STRESS TRANSFER SHALL BE 4,000 PSI.
3. REINFORCING STEEL SHALL BE GR-60, ASTM A-615 (AASHTO M31) AND SHALL BE BLACK STEEL.
4. PRESTRESSING STRANDS SHALL CONFORM TO ASTM A-416 (AASHTO M203) AND SHALL CONSIST OF 1/2"ø x 270 KSI 7 WIRE LOW RELAXATION STRANDS.
5. PRESTRESSING STRANDS SHALL EACH BE PULLED TO HAVE A NET TENSION OF 31.0K 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 RECESSED AND GROUTED FLUSH (UNLESS NOTED OTHERWISE ON THE DRAWINGS).
7. BEARING PADS SHALL CONFORM TO VERMONT SPEC. 731.03.
8. ALL EXPOSED CORNERS SHALL BE CHAMFERED 3/4".
9. THE TOPS OF THE SLABS SHALL RECEIVE A SMOOTH FLOAT FINISH.
10. 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 2'-0" OF THE SLAB ENDS, UNLESS APPROVED BY J.P. CARRARA & SONS INC.
11. MATERIAL SPECIFICATION AND MIX DESIGN SHALL CONFORM TO VERMONT SPEC. P510.02 AND P510.05 RESPECTIVELY.

    DESIGN MIX: J.P.C. BRIDGE MIX #430A
    675 LBS. TYPE III CEMENT - GLENS FALLS CEMENT
    100 LBS. FLY ASH TYPE-F
    1130 LBS. FINE AGGREGATE
    1870 LBS. COARSE AGGREGATE
    31 GAL. WATER - 254 LBS.
    5% - 7% AIR CONTENT (5.5 OZ. DAREX II) ADJUST AS REQUIRED
    7 OZ. ADVA-FLOW PER 100 LBS. CEMENT, MAX. 7" SLUMP
    2 OZ. DARATARD-17 PER 100 LBS. CEMENT
12. QUALITY CONTROL PROCEDURES AND MIX DESIGN SHALL CONFORM TO PCI REQUIREMENTS. J.P. CARRARA & SONS INC. IS A PCI CERTIFIED PLANT.
13. THE VERMONT AGENCY OF TRANSPORTATION WILL BE NOTIFIED IN A TIMELY MANNER SO THAT ALL PRECAST OPERATIONS MAY BE WITNESSED (IF APPLICABLE).
14. CURING METHOD: AS SOON AS THE TOP OF THE SLAB IS FINISHED, A COVER OF POLY AND A LAYER OF HOMOSOTE (OR BLUE BOARD) WILL BE PLACED OVER THE SLAB. THE DESIRED CURING TEMPERATURE RANGE SHALL NOT DROP BELOW 70 DEGREES F. THE TEMPERATURE SHALL BE RECORDED BY AUTOMATIC SENSOR INSTRUMENTS ON GRAPH CHARTS, SPACED NOT MORE THAN 100' APART AND WILL CONTINUE UNTIL RELEASE STRENGTH IS ACHIEVED (NATURAL CURE WITH NO EXTERNAL HEAT APPLIED). EACH CHART SHALL BE MARKED.
15. TRANSVERSE POST-TENSIONING SEQUENCE.
    A. ONCE SLABS ARE ERECTED, INSTALL TENDONS PRIOR TO GROUTING.
    B. GROUT SHEAR KEYS.
    C. ONCE SHEAR KEY GROUT HAS ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 1,500 PSI, POST-TENSION TENDONS TO 30,000 LBS.

EXAMPLE PRESTRESSING STRAND ELONGATION CALC. AND TENSIONING

(NOT TO BE USED FOR CONSTRUCTION)

SIZE & GRADE: 1/2"ø 270 KSI

AREA: 0.153 IN^2

TENSION: 31,000 LB 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:

$$\Delta = \frac{PL}{AE} = \frac{(31{,}000 - 3{,}000) \times 192.813 \times 12}{0.153 \times 28{,}600{,}000} = 14.81"$$

TOLERANCES: ± 5%

THEREFORE
- Δ UPPER LIMIT = 1.05 x 14.81" = 15.55" = 15 9/16"
- Δ LOWER LIMIT = 0.95 x 14.81" = 14.07" = 14 1/16"

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

$$\Delta P = \frac{0.5 \times 28{,}000}{14.81} = 945 \text{ LB}$$

TOTAL TENSIONING FORCE = 31,000 + 945 = 31,945 LB

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 31,945* LB AND MEASURE ELONGATION AFTER SEATING. IT MUST BE BETWEEN 14 1/16" & 15 9/16"

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

NO.	DATE	REVISION

DRAWN: B.M. LOPEZ
DESIGNED: E.J. BROD
CHECKED: _____
APPROVED: _____

STATE OF VERMONT — ERNEST J. BROD — No. 3814 — REGISTERED PROFESSIONAL ENGINEER

J.P. CARRARA & SONS INC.
Precast & Prestress Manufacturer
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Phone:(802)388-6361
Fax:(802)388-9010
Double-Tees Hollow-Core Plank Flat Panels

TOWN OF PLYMOUTH, VERMONT
HC 70, BOX 39A
PLYMOUTH, VERMONT 05056

Project Name:
PLYMOUTH BRIDGE #32
TH32 OVER BROAD BROOK
PLYMOUTH, VERMONT

SUPERSTRUCTURE PLAN & DETAILS

SCALE:	JOB #:
NOTED	23106-00
DATE:	SHEET #:
8-21-00	F1