

- GENERAL NOTES**
- MIN. CONCRETE STRENGTH AT 28 DAYS SHALL BE 6,000 PSI.
  - MIN. CONCRETE STRENGTH AT STRESS TRANSFER SHALL BE 4,800 PSI.
  - REINFORCING STEEL SHALL BE GR-60, ASTM A-615 (AASHTO M31) AND SHALL BE BLACK STEEL.
  - PRESTRESSING STRANDS SHALL CONFORM TO ASTM A-416 (AASHTO M203) AND SHALL CONSIST OF 1/2" x 210 KSI 1 WIRE LOW RELAXATION STRANDS.
  - PRESTRESSING STRANDS SHALL EACH BE FILLED 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.
  - ENDS OF PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH END OF BOX BEAMS AND EPOXY PAINTED.
  - BEARING PADS SHALL CONFORM TO VERMONT SPEC. T31.03.
  - ALL EXPOSED CORNERS SHALL BE CHAMFERED 3/4".
  - THE TOPS OF THE SLABS SHALL RECEIVE A SMOOTH FLOAT FINISH.
  - SHEAR KEY SURFACES SHALL BE SANDBLAST CLEAN.
  - 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.
  - MATERIAL SPECIFICATION AND MIX DESIGN SHALL CONFORM TO VERMONT SPEC. PS10.02 AND PS10.05 RESPECTIVELY.  
DESIGN MIX: J.P.C. BRIDGE MIX #450R  
152 LBS. TYPE II CEMENT - GLENS FALLS CEMENT  
1215 LBS. FINE AGGREGATE  
1650 LBS. COARSE AGGREGATE  
32 GAL. WATER - 261 LBS.  
58 - 78 AIR CONTENT ( 8 OZ. DAREX II ) ADJUST AS REQUIRED  
8.0 OZ. ADVA PER 100 LBS. CEMENT, MAX. 7' SLUMP  
6 OZ. DARACEM PER 100 LBS. CEMENT
  - QUALITY CONTROL PROCEDURES ARE IN ACCORDANCE WITH PCI REQUIREMENTS. J.P. CARRARA & SONS INC. IS A PCI CERTIFIED PLANT.
  - THE VERMONT AGENCY OF TRANSPORTATION WILL BE NOTIFIED IN A TIMELY MANNER SO THAT ALL PRECAST OPERATIONS MAY BE WITNESSED (IF APPLICABLE).
  - THE VOIDS MUST BE VENTED DURING CURING PERIOD.
  - CURING METHOD: AS SOON AS THE TOP OF THE BEAM 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.
  - TRANSVERSE POST-TENSIONING SEQUENCE:  
A. ONCE VOIDED SLABS ARE ERECTED, POST-TENSION TENDONS TO APPROXIMATELY 5,000 LBS.  
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" x 210 KSI  
AREA: 0.153 IN<sup>2</sup>  
TENSION: 31,000 LB EACH STRAND  
GRIP TO GRIP: 142'-9 3/4" = 142.813'  
Es = 28,600,000 PSI (ASSUMED FOR THESE CALCULATIONS; VALUE TO BE OBTAINED FOR STRAND SPOOL ACTUALLY USED)

EXAMPLE:  
$$\Delta = \frac{PL}{AE} = \frac{(31,000 - 3,000) \times 142.813 \times 12}{0.153 \times 28,600,000} = 14.81'$$

TOLERANCES: ± 5%  
THEREFORE  
$$\Delta \text{ UPPER LIMIT} = 1.05 \times 14.81' = 15.55' = 15 \text{ 9/16}''$$
  
$$\Delta \text{ LOWER LIMIT} = 0.95 \times 14.81' = 14.07' = 14 \text{ 1/16}''$$

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:**
- PULL EACH STRAND INITIALLY TO 3,000\* LB AND MARK STRAND.
  - 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.

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NO.	DATE	REVISION

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

STATE OF VERMONT  
ESTATE J. BROD  
No. 2114  
REGISTERED  
PROFESSIONAL ENGINEER

**J.P. CARRARA & SONS INC.**  
Precast & Prestress Manufacturer  
2464 DEXE STR. WOODSBURY, VERMONT 05753  
Phone: (802)388-6361  
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Double-Tees    Hollow-Core Plank    Flat Panels

**TOWN OF BRIDGEWATER**  
P.O. BOX 14  
BRIDGEWATER, VERMONT 05034

Project Name:  
**TOWN OF BRIDGEWATER**  
#47 LOWER BOOTH BRIDGE  
BRIDGEWATER, VERMONT

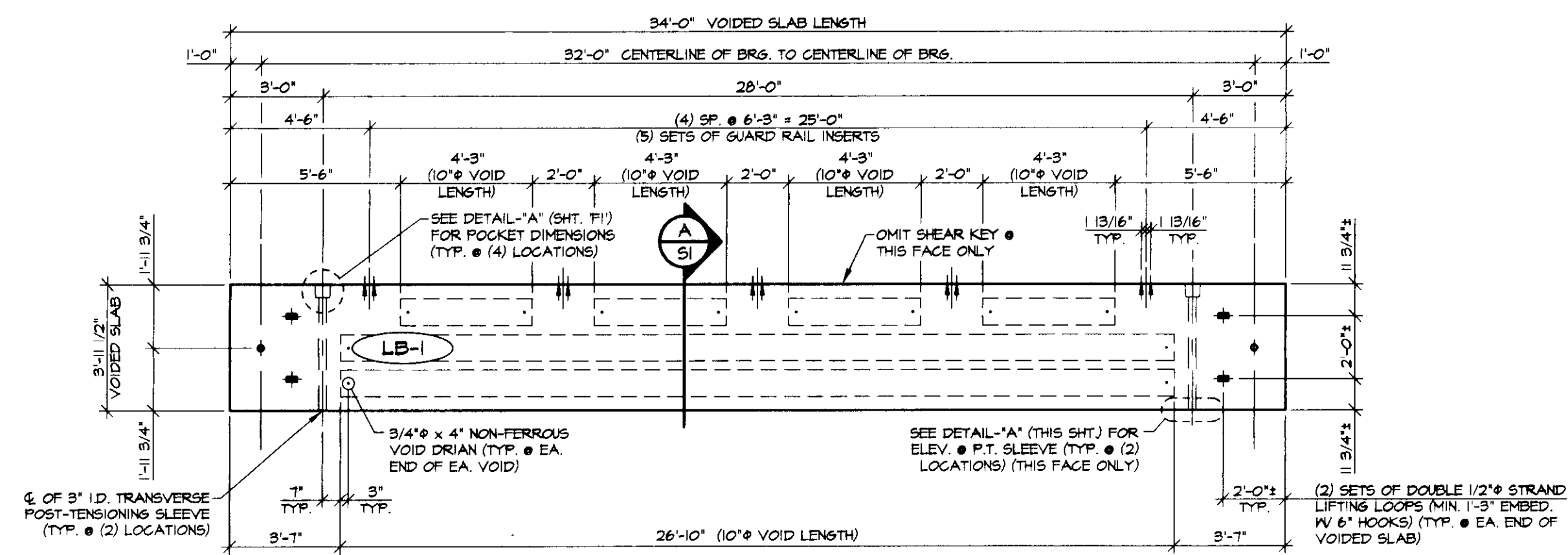
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JOB #: 23131-01

DATE: 1-9-02  
SHEET #: F1

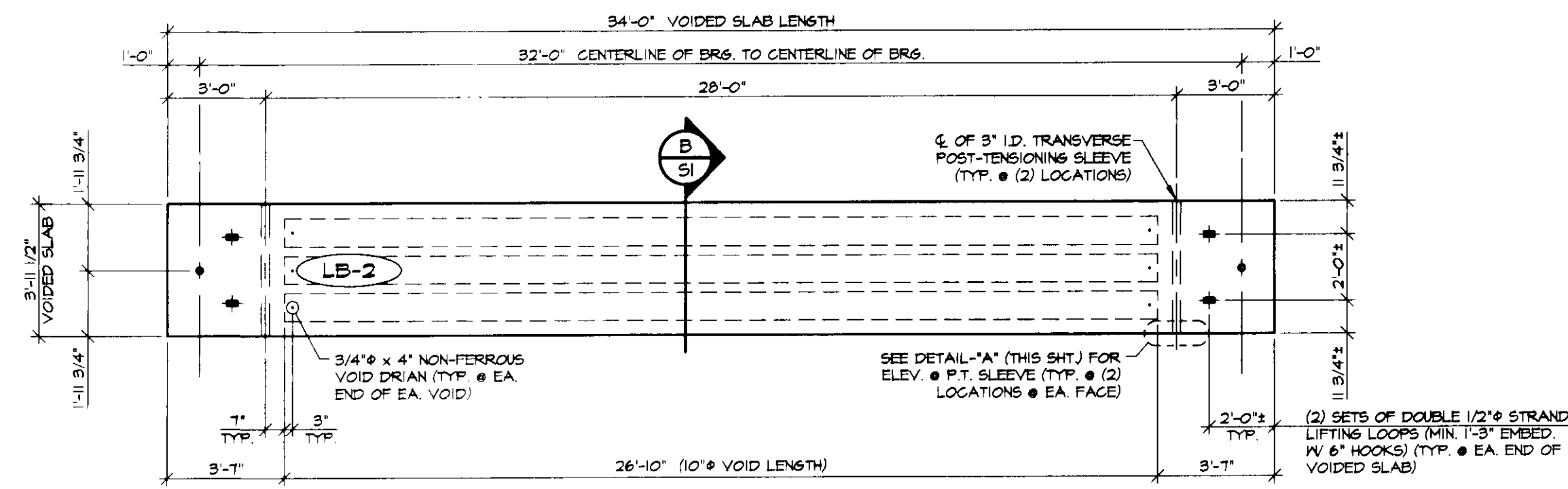
**SUPERSTRUCTURE PLAN & DETAILS**

SCALE: NOTED  
JOB #: 23131-01

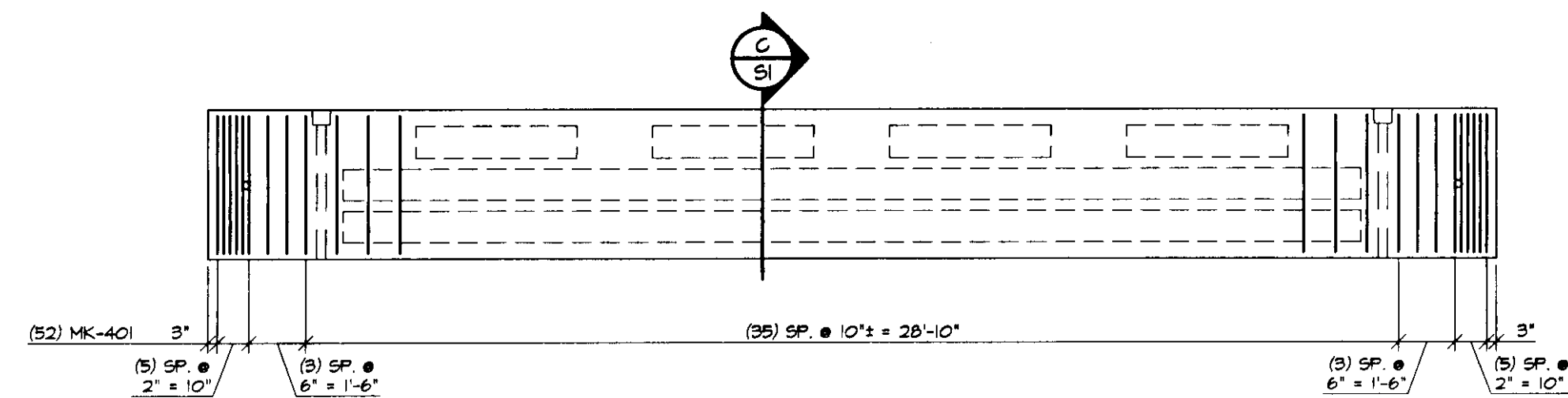
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SHEET #: F1



1 DIMENSIONAL PLAN VIEW IN FORM  
1/4" = 1'-0"

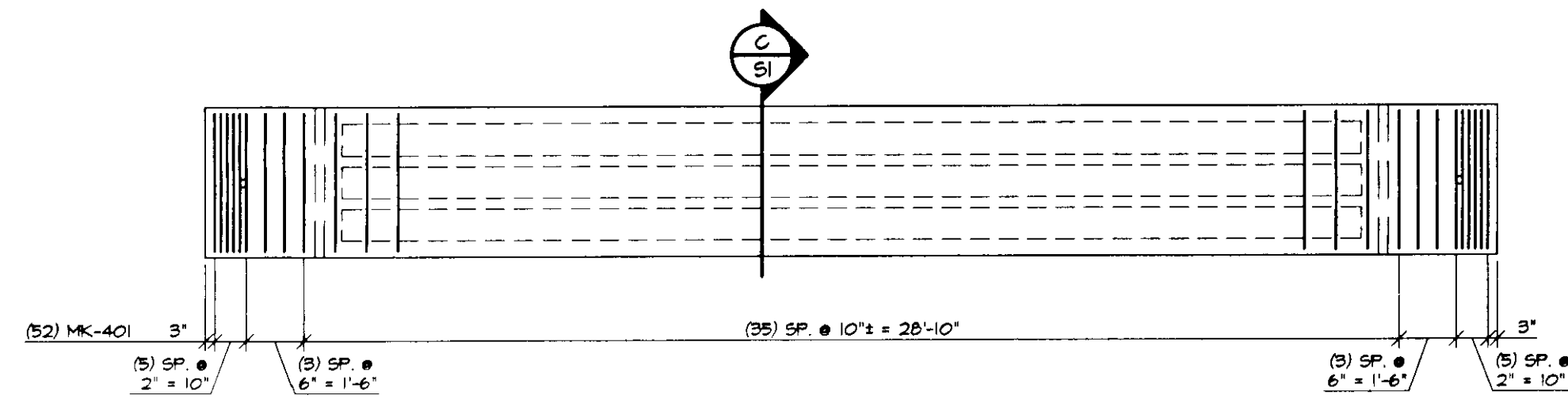


3 DIMENSIONAL PLAN VIEW IN FORM  
1/4" = 1'-0"



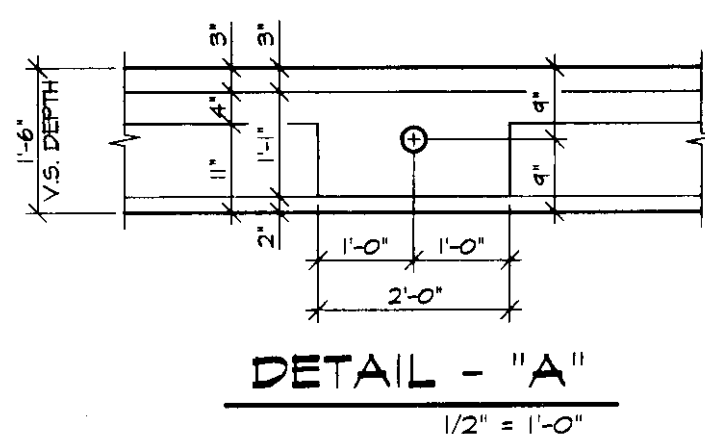
2 REINFORCING PLAN VIEW IN FORM  
1/4" = 1'-0"

SHOP NOTE:  
ADJUST REINFORCING AS REQUIRED TO CLEAR P.T. SLEEVES, ETC.

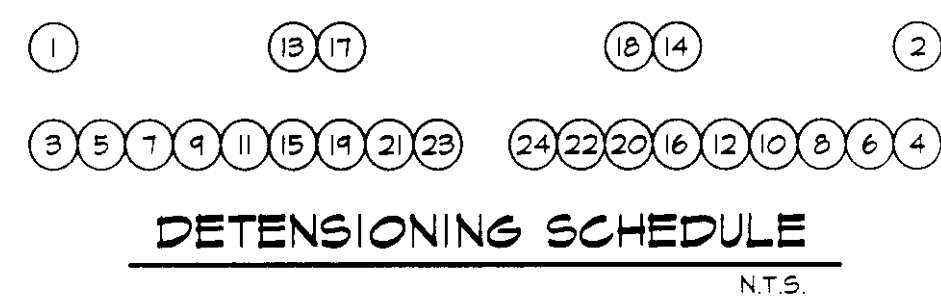


4 REINFORCING PLAN VIEW IN FORM  
1/4" = 1'-0"

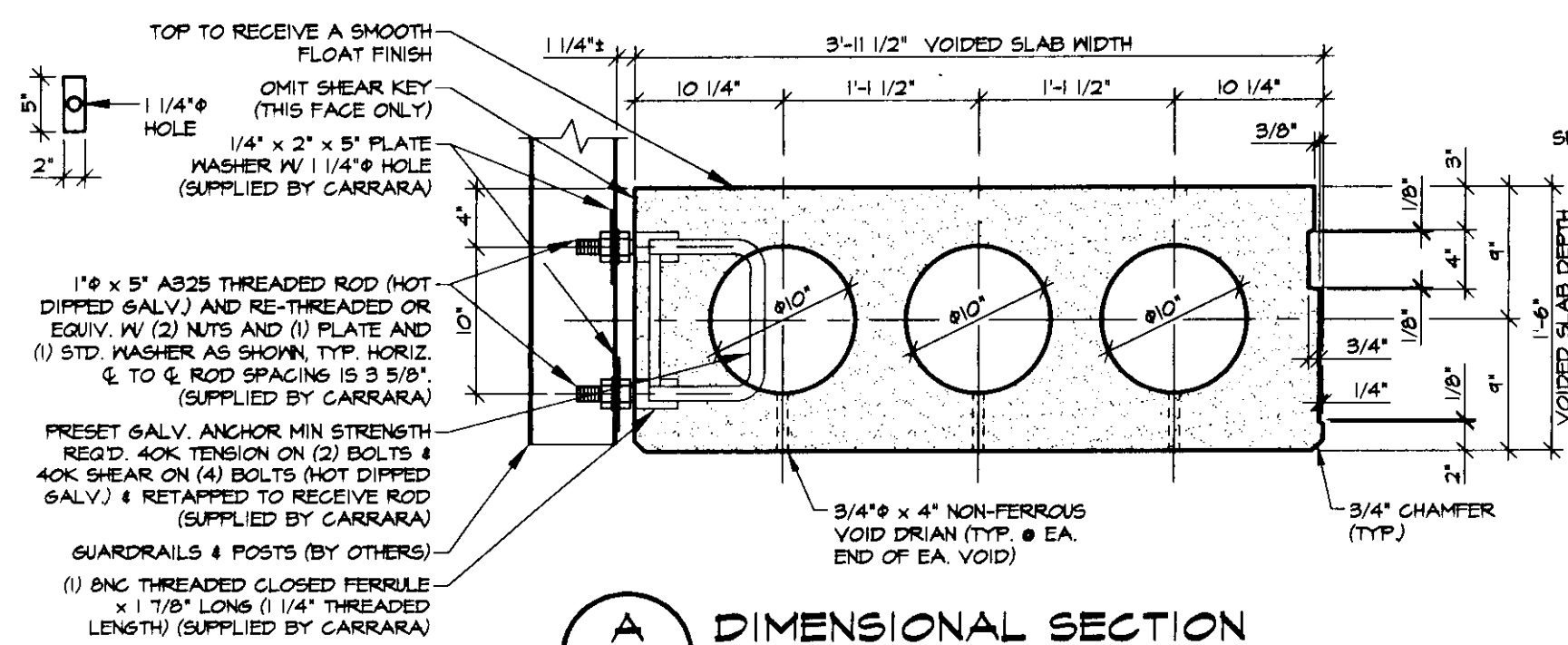
SHOP NOTE:  
ADJUST REINFORCING AS REQUIRED TO CLEAR P.T. SLEEVES, ETC.



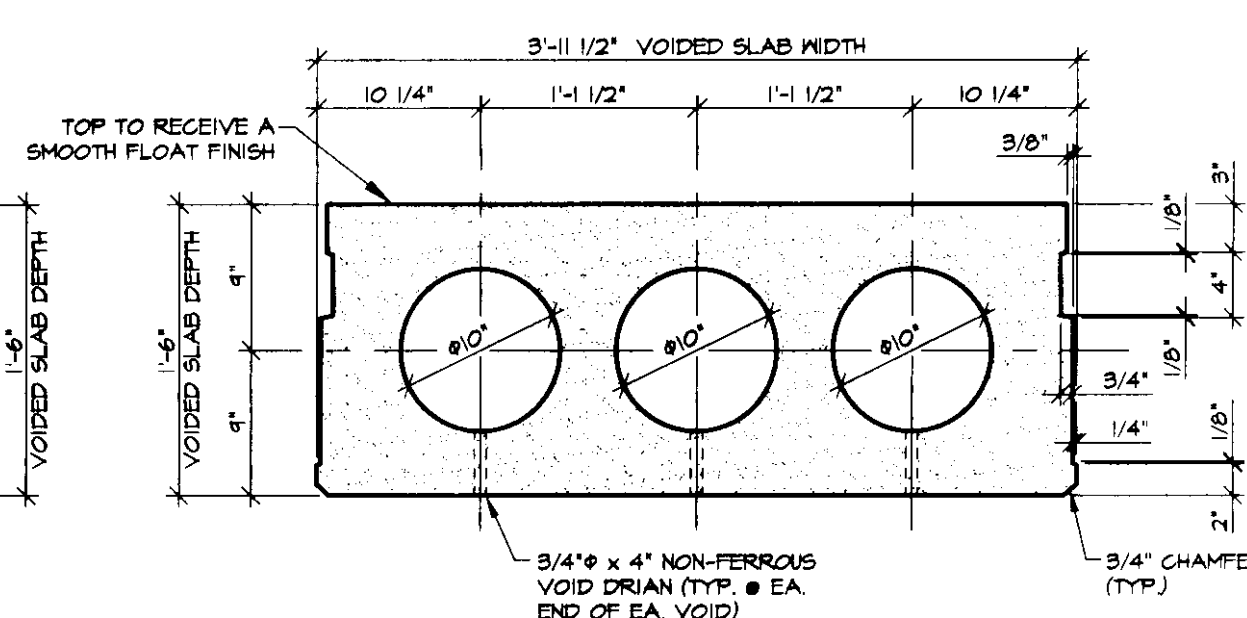
DETAIL - "A"  
1/2" = 1'-0"



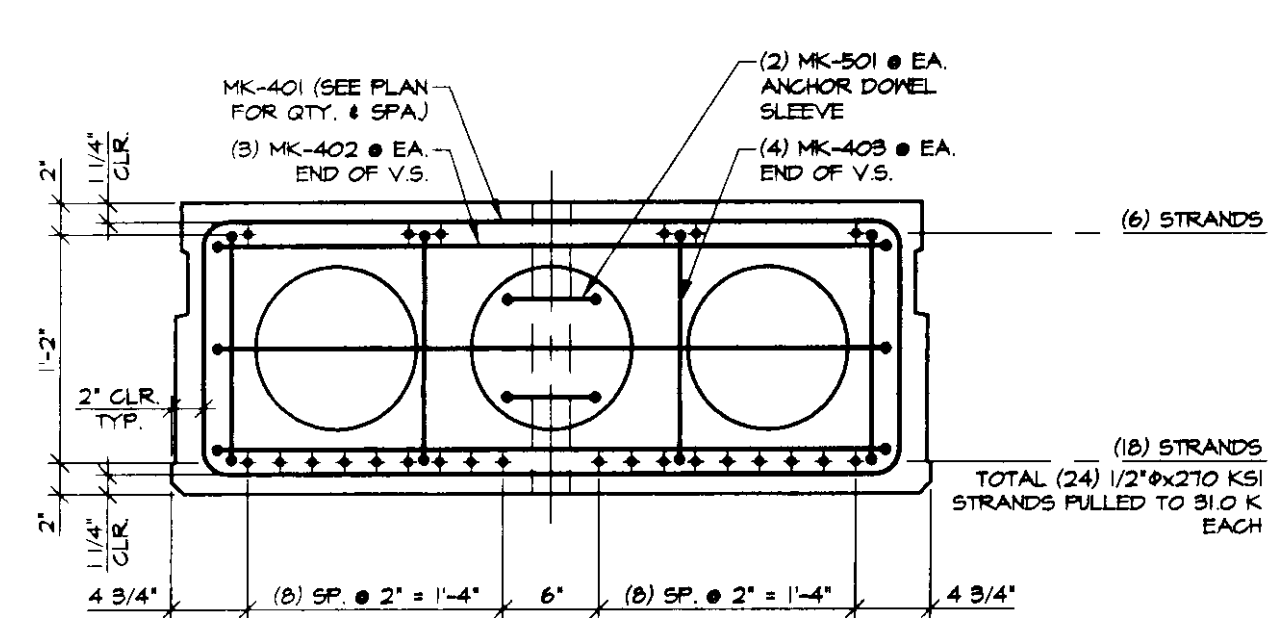
DETENSIONING SCHEDULE  
N.T.S.



A DIMENSIONAL SECTION  
1" = 1'-0"



B DIMENSIONAL SECTION  
1" = 1'-0"



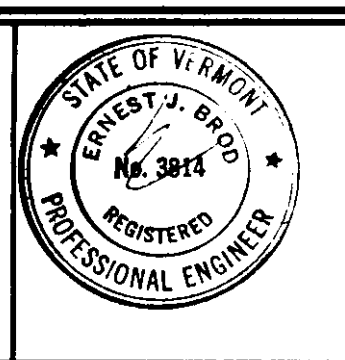
C REINFORCING SECTION  
1" = 1'-0"

MARK: LB-1	QTY.: 2	WT./TONS: 12.10	CU. YDS.: 5.97
MARK: LB-2	QTY.: 2	WT./TONS: 11.55	CU. YDS.: 5.70

MATERIAL LIST / VOIDED SLAB				
ITEM	MARK	DESCRIPTION	QTY./SLAB	
			LB-1	LB-2
1	401	#4 BENT BAR	52	52
2	402	#4 BENT BAR	6	6
3	403	#4 BENT BAR	8	8
4				
5	501	#5 HAIRPIN	4	4
6				
7				
8				
9		1" NUTS (GALV.)	40	
10		STANDARD WASHER (GALV.)	20	
11		1/4" x 2" x 5" PL. WASHER W/ 1/4" HOLE (GALV.)	20	
12		1" x 5" A325 THREADED ROD (HOT DIPPED GALV.)	20	
13		PRESET GALV. ANCHOR	10	
14		8NC THREADED CLOSED FERRULE x 1 7/8" LONG (1 1/4" THREAD LENGTH)	20	
15				
16		3/4" x 4" NON-FERROUS VOID DRAIN	12	6
17		10" VOID x 4'-3"	4	
18		10" VOID x 26'-10"	2	3
19		DOUBLE 1/2" STRAND LIFTING LOOPS	4	4
20				

NO.	DATE	REVISION

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



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Project Name:  
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#47 LOWER BOOTH BRIDGE  
BRIDGEWATER, VERMONT**

P/S VOIDED SLAB DETAILS

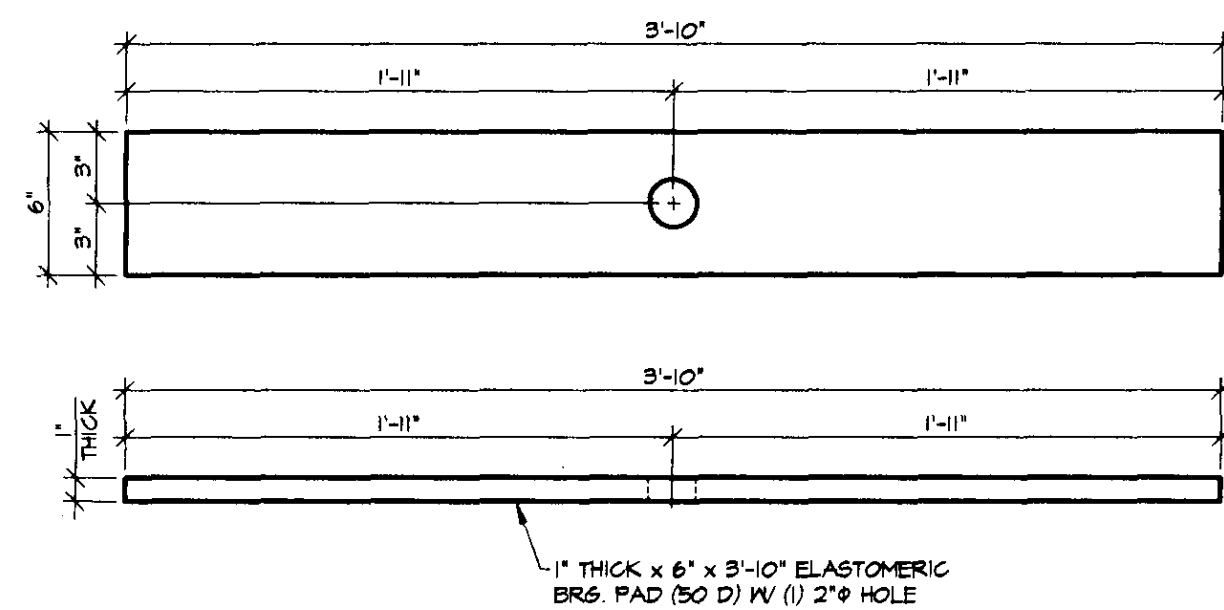
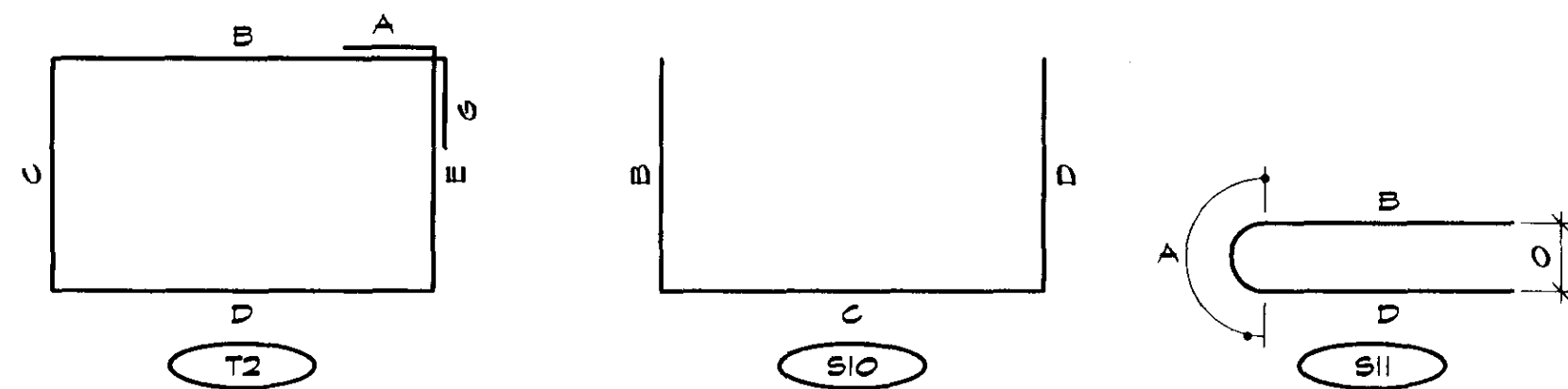
SCALE: NOTED  
JOB #: 23131-01  
DATE: 1-9-02  
SHEET #: 51

**BENT BARS, TIES, & STIRRUPS**

ITEM	MARK	QTY.	SIZE	LENGTH	TYPE	A	B	C	D	E	F/R	G	H	J	K	O	GRADE	REMARKS	
1	401	208	#4	10'-5"	T2	6"	1'-3 1/2"	3'-7 1/2"	1'-3 1/2"	3'-7 1/2"		6"					60		
2	402	24	#4	7'-4 1/4"	S10		2'-0"	3'-6 1/4"	2'-0"								60		
3	403	32	#4	5'-0 1/4"	S10		2'-0"	1'-2 1/4"	2'-0"								60		
4																			
5	501	16	#5	4'-9 1/2"	S10	9 1/2"	2'-0"	2'-0"								6"	60		
6																			
7																			
8																			
9																			
10																			
11																			
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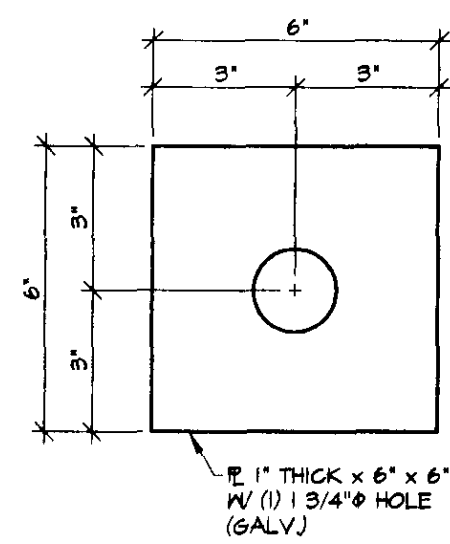
**MISCELLANEOUS MATERIALS**

ITEM	MARK	QTY.	DESCRIPTION	REMARKS
1	EM-1	4	1" THICK x 6" x 6" x 5" W/ (1) 2" HOLE (GALV.)	FOR ERECTION
2		4	SINGLE USE STRESSING CHUCK	FOR ERECTION
3		2	1/2" POLYSTRAND x 17'-11"	FOR ERECTION
4		8	1" THICK x 6" x 3'-10" ELASTOMERIC BRG. PAD W/ (1) 2" HOLE	FOR ERECTION
5				
6		80	1" NUTS (GALV.)	
7		40	STANDARD WASHER (GALV.)	
8		40	1/4" x 2" x 5" PL. WASHER W/ (1) 1/4" HOLE (GALV.)	SEE DETAIL, THIS SHEET
9		40	1" x 5" A325 THREADED ROD	HOT DIPPED GALV.
10		20	PRESET GALV. ANCHOR	
11		40	8NC THREADED CLOSED FERRULE x 1 1/8" LONG (1 1/4" THREAD LENGTH)	
12				
13		36	3/4" x 4" NON-FERROUS VOID DRAIN	
14		8	10" VOID x 4'-3"	
15		10	10" VOID x 26'-10"	
16		16	DOUBLE 1/2" STRAND LIFTING LOOPS	
17				
18				
19				
20				



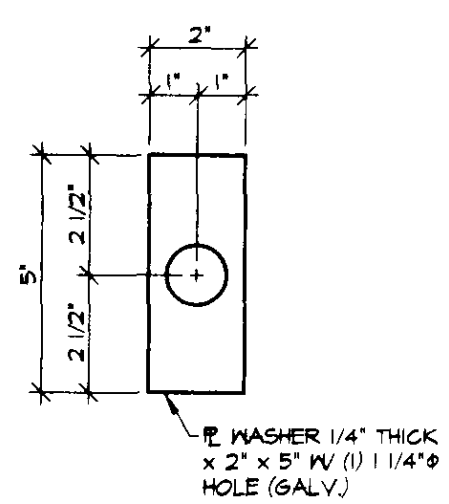
**BEARING PAD DETAIL**

1 1/2" = 1'-0"



**EM - 2**

3" = 1'-0"

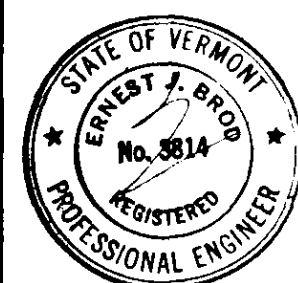


**PL WASHER**

3" = 1'-0"

NO.	DATE	REVISION

DRAWN: **B.M. LOPEZ**  
 DESIGNED: **E.J. BROD**  
 CHECKED: \_\_\_\_\_  
 APPROVED: \_\_\_\_\_



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**MATERIALS LIST**

SCALE: NOTED  
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