



PO Box 508
Barton, VT 05822
Phone: (802) 525-9506
Fax: (802) 525-4616
www.jpsicard.com

Submittal Data Sheet

Submittal #: _____ 5

Submission #: _____ 1

Date: _____ 1/20/2015

Project Name: _____ Randolph BRO (1444) Bridge Replacement

Owner: _____ Town of Randolph, VT

Engineer: _____ VTrans

Contractor: _____ J.P. Sicard, Inc.

Item Number: _____ 900.64

Supplier: _____ J.P. Carrara & Sons, Inc.

Description of Item: _____ Precast Concrete Structure (NEXT Beam/Superstructure)

Substitution: _____ NO

Engineers Review Comments: _____

Submitted By: _____ Brad Drake

Title: _____ Project Manager

Company: _____ JP Sicard, Inc.

JOSEPH P. CARRARA & SONS, INC.

LETTER OF TRANSMITTAL

2464 CASE STREET
MIDDLEBURY, VERMONT 05753

TEL (802) 388-6363
FAX (802) 388-9010

TO: **J.P. Sicard, Inc**
761 May Pond Road PO Box 508
Barton, VT 05822

DATE:	January 20, 2015	JOB NO.:	23449-014
ATTENTION:	Brad Drake		
RE:	Palmer Road Bridge #35		
	Randolph, VT		
	VTAOT Project BRO 144(57)		
	P 802-525-9506		F 802-525-4616

WE ARE SENDING YOU Attached Under separate cover via _____ the following items:

Shop Drawings Prints Plans Samples Specifications

Copy of Letter Change Order Other: _____

COPIES	DATE	NO.	DESCRIPTION
1			Lifting Loop Calculations: Dated 12/12/14
1			Shop Drawings: Dated 11/18/14
			Sheets: F1-F5, AB1-AB5, NB1-NB3, WW1-WW2, M1

THESE ARE TRANSMITTED as checked below :

For approval Approved as submitted Resubmit _____ copies for approval

For your use Approved as noted Submit _____ copies for distribution

As requested Returned for corrections Return _____ corrected prints

For review and comment _____

FOR BIDS DUE _____ 20 _____ PRINTS RETURNED AFTER LOAN TO US

REMARKS:

George

COPY TO :

SIGNED :

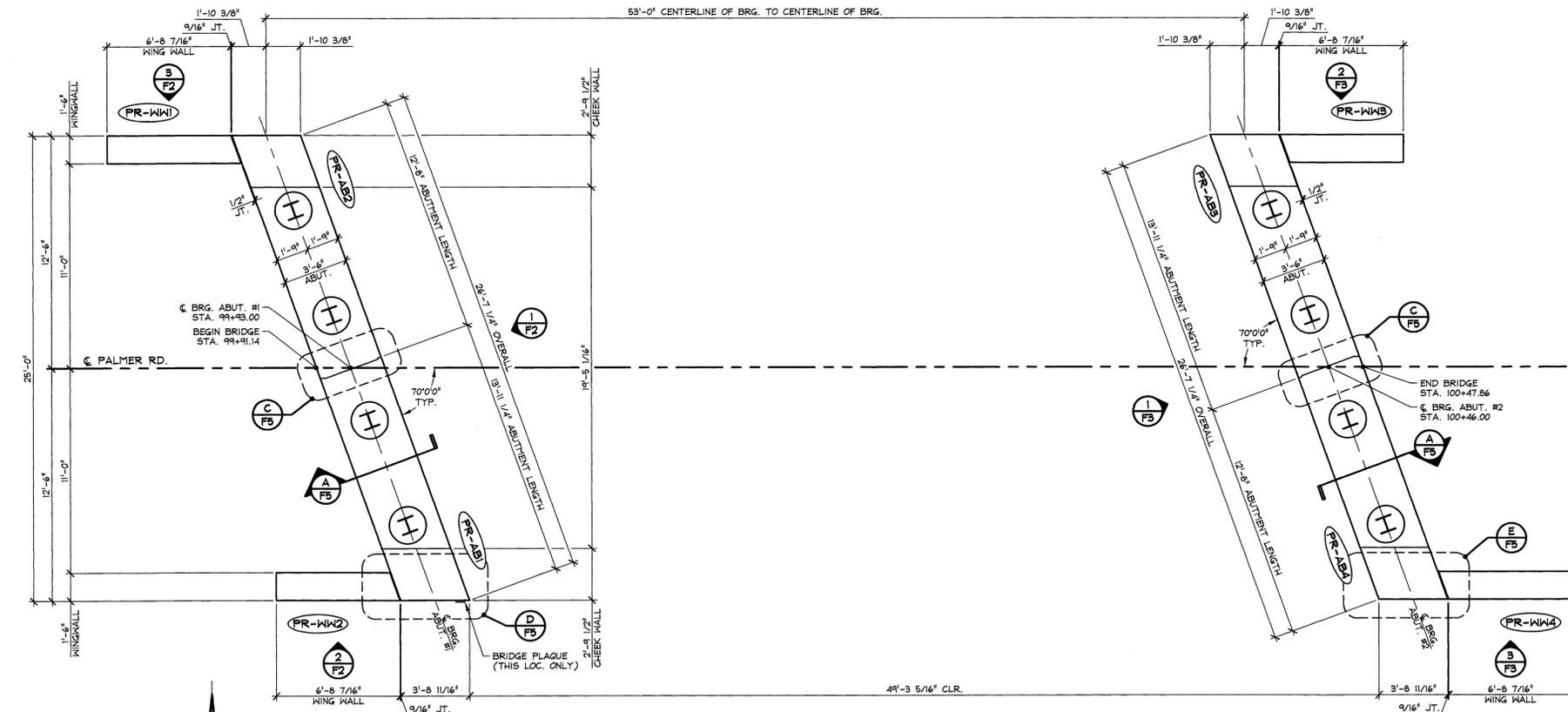


Michael A. Davis

If enclosures are not as noted, please notify us at once.

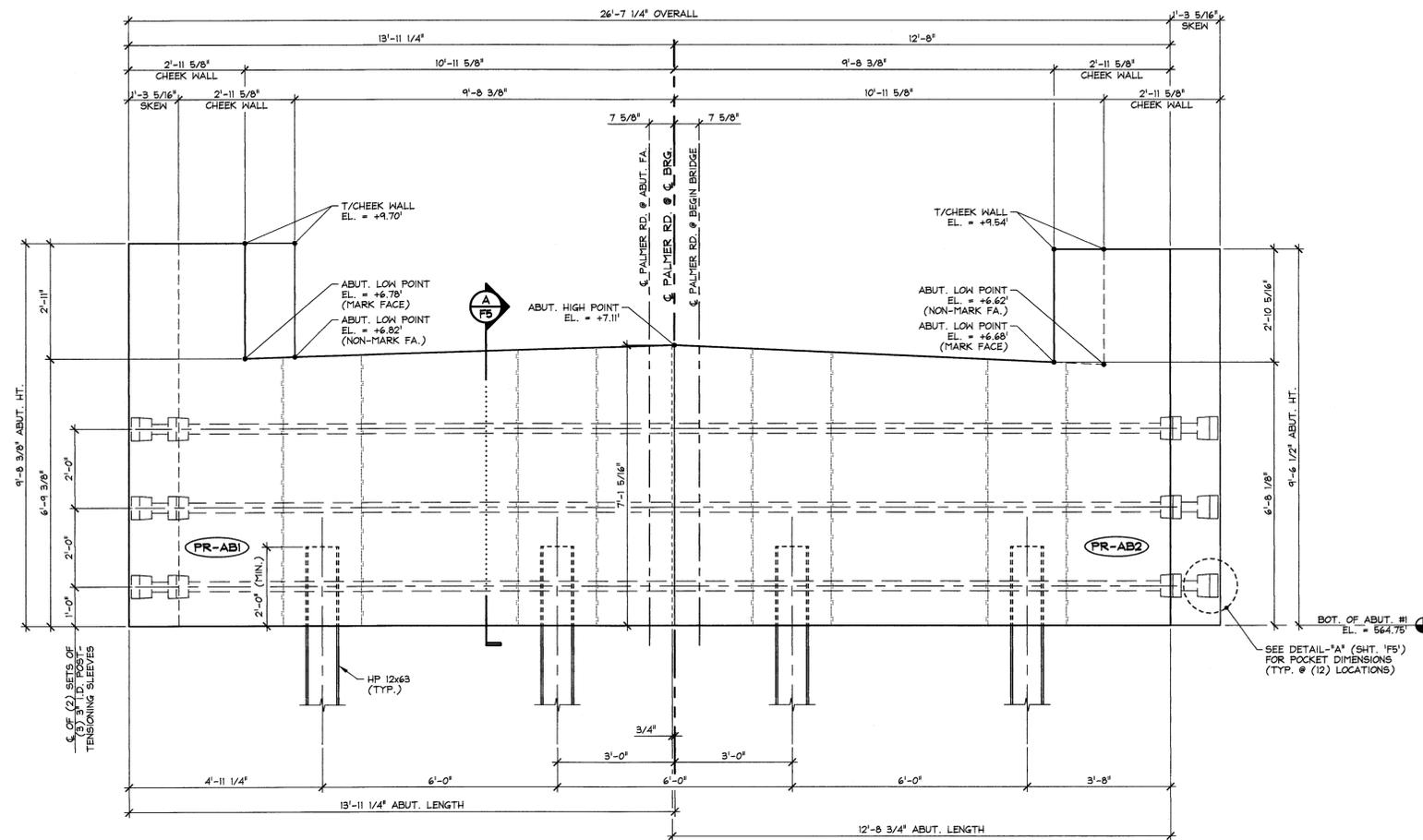
ABUTMENT & WING WALL GENERAL NOTES

1. MIN. CONCRETE STRENGTH AT 28 DAYS SHALL BE 5,000 PSI.
2. MIN. CONCRETE STRENGTH AT STRESS TRANSFER SHALL BE 3,500 PSI (UNLESS NOTED OTHERWISE).
3. REINFORCING STEEL SHALL BE GR-60, ASTM A-615 (AASHTO M61) LEVEL 1 (EPOXY COATED) OR LEVEL 1 (BLACK STEEL) (AS NOTED ON SHOP DRAWINGS).
4. THE TOP OF ABUTMENTS SHALL RECEIVE A RAKE FINISH ROUGHENED TO 1/4" AMPLITUDE (UNLESS NOTED OTHERWISE).
5. THE TOP OF WING WALLS SHALL RECEIVE A SMOOTH SCREED FINISH (UNLESS NOTED OTHERWISE).
6. PRECAST CONCRETE UNITS SHALL BE HANDLED AND ERECTED USING THE LIFTING INSERTS ONLY. THE MINIMUM SLING ANGLE FROM THE HORIZONTAL SHALL BE 60°. NON-PRESTRESSED UNITS SHALL BE STORED & TRANSPORTED WITH TIMBER SUPPORTS AT 5ft POINTS, UNLESS APPROVED BY J.P. CARRARA & SONS, INC.
7. MATERIAL SPECIFICATION AND MIX DESIGN SHALL CONFORM TO VERMONT SPEC. PS10.02 AND PS10.05 RESPECTIVELY.
 DESIGN MIX:
 WING WALLS: J.P.C. BRIDGE MIX #445MSCC
 ABUTMENTS: J.P.C. BRIDGE MIX #445MSCC
8. QUALITY CONTROL PROCEDURES ARE IN ACCORDANCE WITH PCI REQUIREMENTS. J.P. CARRARA & SONS, INC. IS A PCI CERTIFIED PLANT.
9. CURING METHOD: AS SOON AS THE TOP OF PRECAST CONCRETE UNITS ARE FINISHED, A COVER OF POLY WILL BE PLACED OVER THE UNIT. NATURAL CURE WITH NO EXTERNAL HEAT APPLIED.
10. ABUTMENT POST-TENSIONING SEQUENCE:
 A. ERECT PRECAST CONCRETE ABUTMENTS, AND POST-TENSION CENTER TENDON TO APPROXIMATELY 5,000 LBS.
 B. GROUT SHEAR KEY.
 C. ONCE SHEAR KEY GROUT HAS ATTAINED A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI, POST-TENSION TENDONS TO 32,000 LBS.

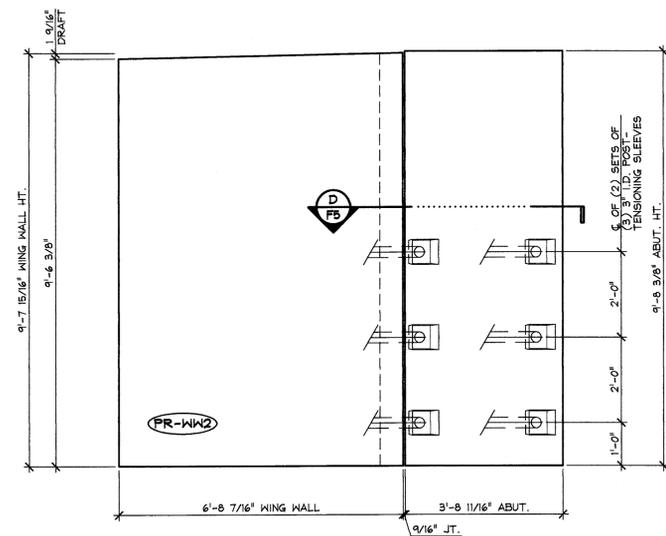


1 PRECAST ABUTMENT LAYOUT
 1/4" = 1'-0"

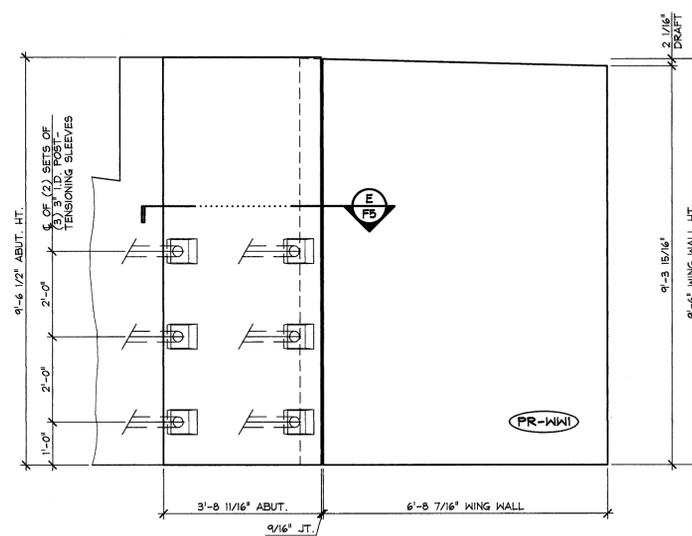
APPROVAL STAMP:	J.P. CARRARA & SONS INC. Precast & Prestress Manufacturer <small>2444 CASE STR., MIDDLEBURY, VERMONT 05753 Phone: (802)388-6361 Fax: (802)388-9010</small>		J.P. SICARD, INC. CONTRACTOR BARTON, VERMONT	
	STATE OF VERMONT AGENCY OF TRANSPORTATION COUNTY OF ORANGE		DATE: NOV. 18, 2014	
	TOWN OF RANDOLPH TOWN HIGHWAY 65 (PALMER ROAD) CLASS 3 LOCAL ROAD BRIDGE NO.: 35 PROJECT NO.: BRO 1444(57)		SCALE: NOTED	
	PRECAST ABUTMENT & WING WALL LAYOUT		CHKD: B.C. DFTM: B.L. JOB NO: 23449-014 DWG. NO: F1	



1 ABUTMENT #1 ELEVATION
F2 1/2" = 1'-0"

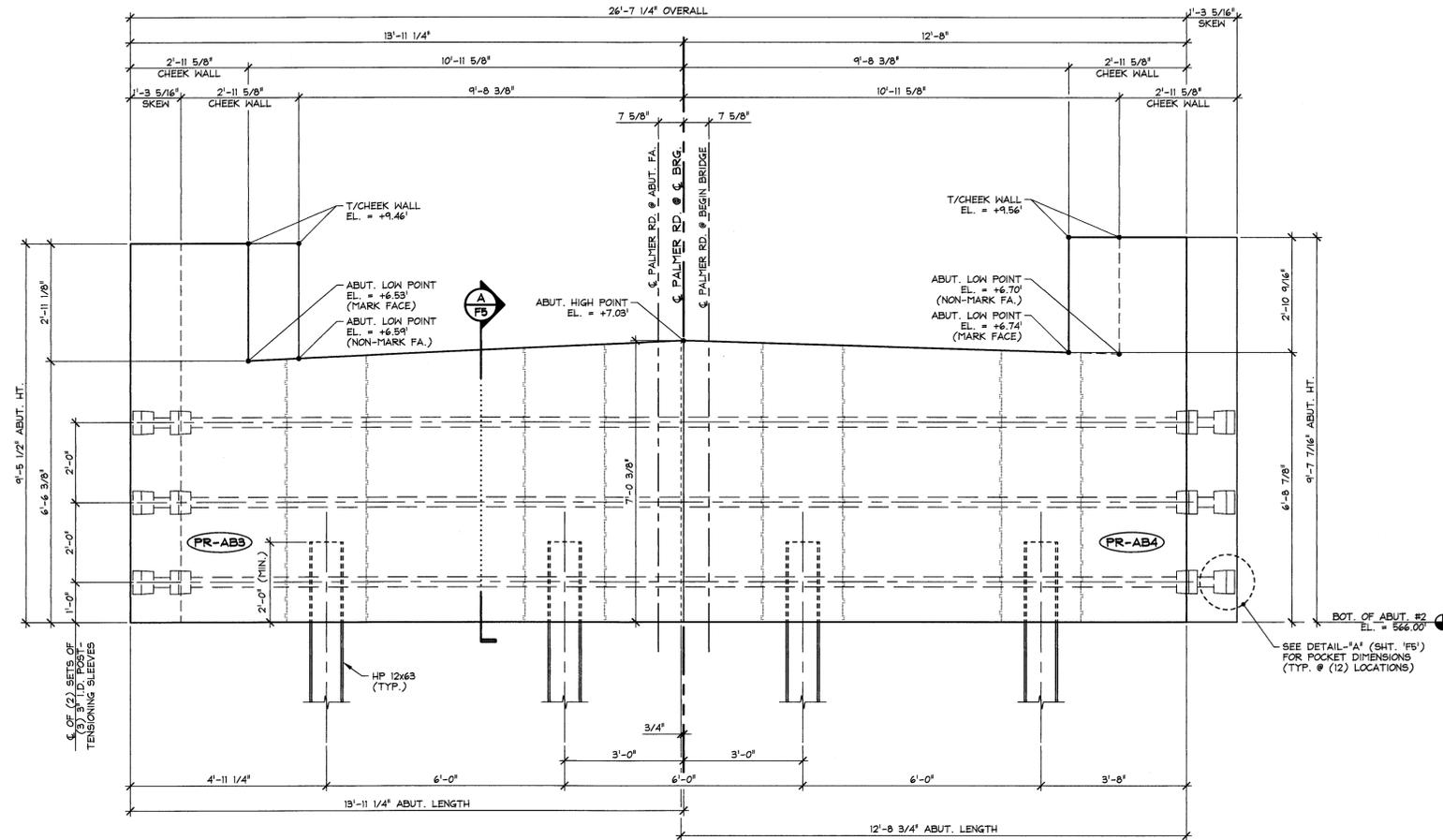


2 WING WALL ELEVATION "PR-WW2"
F2 1/2" = 1'-0"

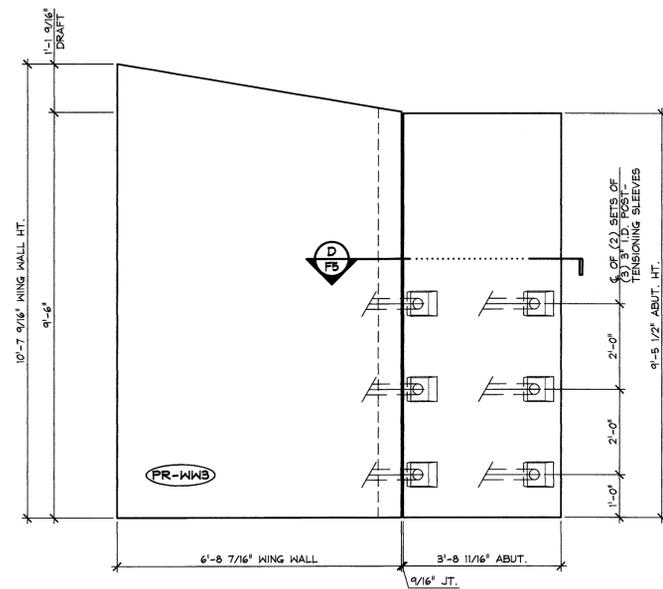


3 WING WALL ELEVATION "PR-WW1"
F2 1/2" = 1'-0"

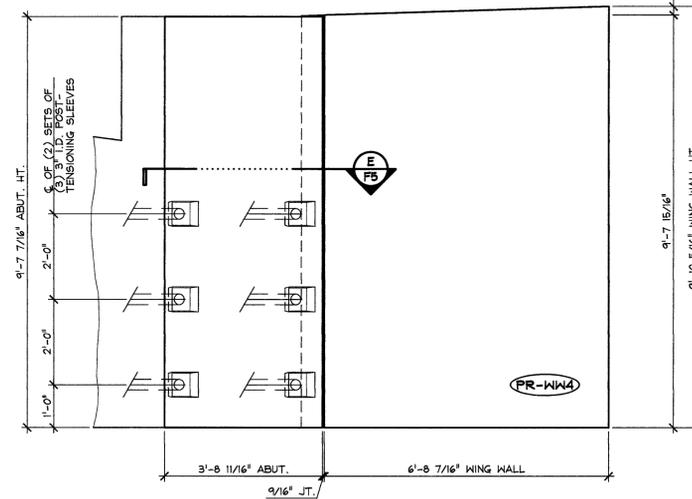
APPROVAL STAMP:	J.P. CARRARA & SONS INC. Precast & Prestress Manufacturer 244 GAGE ST., MIDDLEBURY, VERMONT 05753 Phone: (802)388-6361 Fax: (802)388-9010		J.P. SICARD, INC. CONTRACTOR BARTON, VERMONT	
	STATE OF VERMONT AGENCY OF TRANSPORTATION COUNTY OF ORANGE		DATE: NOV. 18, 2014	
	TOWN OF RANDOLPH TOWN HIGHWAY 65 (PALMER ROAD) CLASS 3 LOCAL ROAD BRIDGE NO.: 35 PROJECT NO.: BRO 1444(57)		SCALE: NOTED	
	PRECAST ABUTMENT #1 ELEVATIONS		CHKD: B.C. DFTM: B.L. JOB NO: 23449-014 DWG. NO: F2	



1 ABUTMENT #2 ELEVATION
 F3 1/2" = 1'-0"

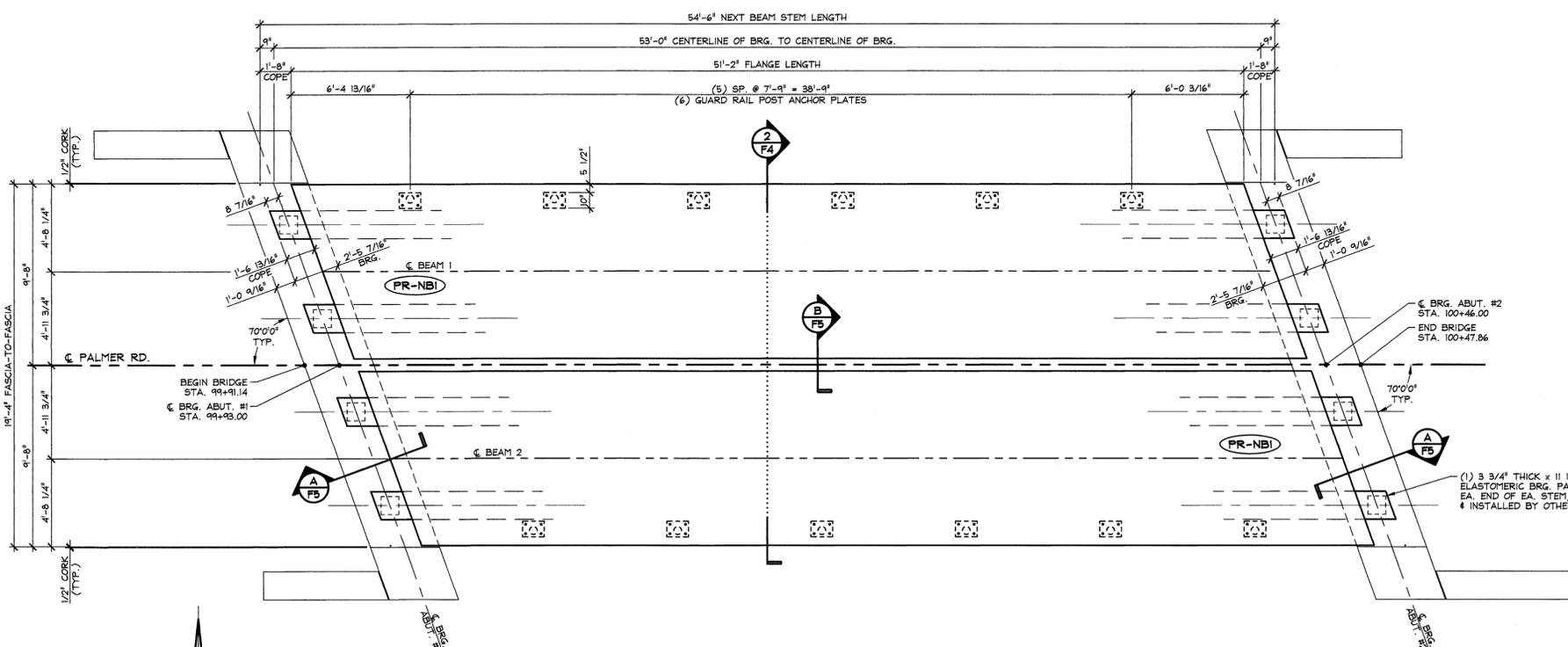


2 WING WALL ELEVATION "PR-WW3"
 F3 1/2" = 1'-0"



3 WING WALL ELEVATION "PR-WW4"
 F3 1/2" = 1'-0"

APPROVAL STAMP:	J.P. CARRARA & SONS INC. Precast & Prestress Manufacturer 2464 GASE STR., MIDDLEBURY, VERMONT 05753 Phone: (802)388-6361 Fax: (802)388-9010		J.P. SICARD, INC. CONTRACTOR BARTON, VERMONT
	STATE OF VERMONT AGENCY OF TRANSPORTATION COUNTY OF ORANGE		DATE: NOV. 18, 2014 SCALE: NOTED
	TOWN OF RANDOLPH TOWN HIGHWAY 65 (PALMER ROAD) CLASS 3 LOCAL ROAD BRIDGE NO.: 35 PROJECT NO.: BRO 1444(57)		CHKD: B.C. DFTM: B.L. JOB NO: 23449-014
	PRECAST ABUTMENT #2 ELEVATIONS		DWG. NO: F3



1 PRESTRESSED NEXT BEAM LAYOUT
1/4" = 1'-0"

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

SIZE & GRADE: 0.60" x 270 KSI
 AREA: 0.217 IN²
 TENSION: 44,000 LB. EACH STRAND
 GRIP-TO-GRIP: 252'-0" = 252.00'
 Es = 28,600,000 PSI (ASSUMED FOR THESE CALCULATIONS; VALUE TO BE OBTAINED FOR STRAND SPOOL ACTUALLY USED)

EXAMPLE:
 $\Delta = \frac{P \cdot L}{A \cdot E} = \frac{(44,000 - 3,000) \times 252.00 \times 12}{0.217 \times 28,600,000} = 19.977'$
 THEREFORE: (TOLERANCES ± 5%)
 Δ UPPER LIMIT = 1.05 x 19.977' = 20.98' = 21'
 Δ LOWER LIMIT = 0.95 x 19.977' = 18.98' = 19'

EXTRA FORCE REQUIRED TO COMPENSATE FOR 1/2" CHUCK SLIPPAGE:
 $\Delta P = \frac{0.5 \times 41,000}{19.977} = 1,026$ LBS.

TOTAL TENSIONING FORCE = 44,000 + 1,026 = 45,026 LBS.

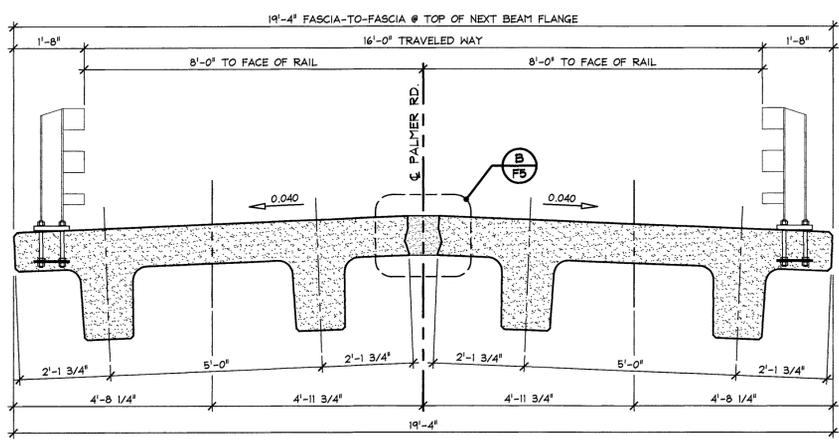
STRAND TENSIONING PROCEDURE:

- PULL EACH STRAND INITIALLY TO 3,000* LBS. AND MARK STRAND.
- THEN PULL EACH STRAND TO A TOTAL TENSION OF 45,026* LBS. AND MEASURE ELONGATION AFTER SEATING. IT MUST BE BETWEEN 19* AND 21*.

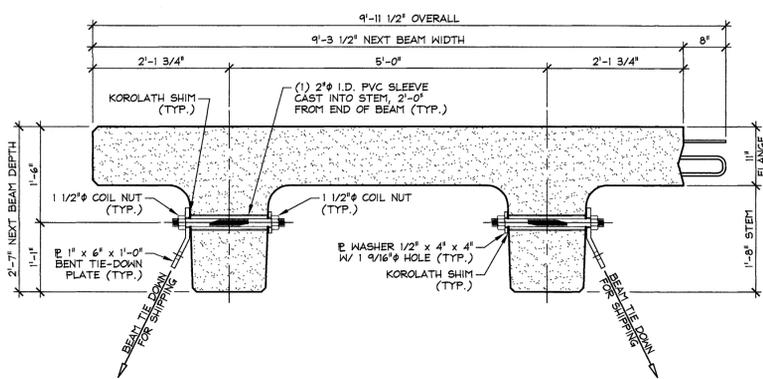
*NOTE: FORCES READ ON STRESSING JACK GAUGES MUST BE MADE TO CORRESPOND TO ABOVE VALUES BASED ON CALIBRATION DATA FOR SPECIFIC JACK USED.

- NEXT BEAM 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) LEVEL 1 (EPOXY COATED).
 - PRESTRESSING STRANDS SHALL CONFORM TO ASTM A-416 (AASHTO F228) AND SHALL CONSIST OF 0.60" x 270 KSI 7-WIRE LOW RELAXATION STRANDS.
 - PRESTRESSING STRANDS SHALL EACH BE PULLED TO HAVE A NET TENSION OF 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.)
 - ENDS OF PRESTRESSING STRANDS SHALL BE CUT FLUSH WITH END OF NEXT BEAM STEMS (UNLESS NOTED OTHERWISE) AND EPOXY PAINTED.
 - ALL EXPOSED CORNERS SHALL BE CHAMFERED 3/4" (UNLESS NOTED OTHERWISE).
 - THE TOP OF BEAMS SHALL RECEIVE A TRANSVERSE LIGHT BROOM FINISH (UNLESS NOTED OTHERWISE).
 - SHEAR KEY SURFACES SHALL BE SAND BLASTED CLEAN.
 - BEAMS SHALL BE HANDLED AND ERECTED USING THE LIFTING LOOPS ONLY. RIGGING SHALL BE CONFIGURED SUCH THAT EQUAL AND VERTICAL FORCES ARE APPLIED TO EACH OF THE TWO LIFTING LOOPS AT EACH END OF THE BEAM. THE PINS OF THE SHACKLES SHALL BE PLACED THROUGH THE LIFTING LOOPS. SEE DETAIL, THIS SHEET. BEAMS SHALL BE STORED AND TRANSPORTED WITH TIMBER SUPPORTS WITHIN 2'-0" OF THE BEAM ENDS, UNLESS APPROVED BY J.P. CARRARA & SONS, INC.
 - MATERIAL SPECIFICATION AND MIX DESIGN SHALL CONFORM TO VERMONT SPEC. F510.02 AND F510.05 RESPECTIVELY.
DESIGN MIX: J.P.C. BRIDGE MIX #425M (NO DCI)
 - QUALITY CONTROL PROCEDURES ARE IN ACCORDANCE WITH PCI REQUIREMENTS. J.P. CARRARA & SONS, INC. IS A PCI CERTIFIED PLANT.
 - CURING METHOD: AS SOON AS THE TOP OF BEAM IS FINISHED, A COVER OF INSULATED POLY. THE DESIRED CURING TEMPERATURE RANGE SHALL NOT DROP BELOW 70°. THE TEMPERATURE SHALL BE RECORDED BY AUTOMATIC SENSOR INSTRUMENTS ON GRAPH CHARTS, SPACED NOT MORE THAN 100' APART AND SHALL CONTINUE UNTIL RELEASE STRENGTH IS ACHIEVED. EACH CHART SHALL BE MARKED WITH THE CASTING DATED AND LOCATION OF THE RECORDER. IF NECESSARY TO MAINTAIN CASTING BED TEMPERATURE PRIOR TO CONCRETE PLACEMENT OR TO ACCELERATE EARLY AGE STRENGTH GAIN, EXTERNAL RADIANT HEAT MAY BE EMPLOYED VIA HOT WATER DUCTS BENEATH AND WITHIN THE PERIPHERY OF THE CASTING BED. MAXIMUM CURING TEMPERATURE SHALL NOT EXCEED PCI SPECIFIED LIMITS.
 - OWNER SHALL PROVIDE APPROPRIATE WATERPROOFING TO GROUTED AND/OR EPOXIED SHEAR KEYS. J.P. CARRARA & SONS, INC. SHALL NOT BE HELD LIABLE FOR PROBLEMS ASSOCIATED WITH MOISTURE INFILTRATING GROUTED AND/OR EPOXIED SHEAR KEYS.

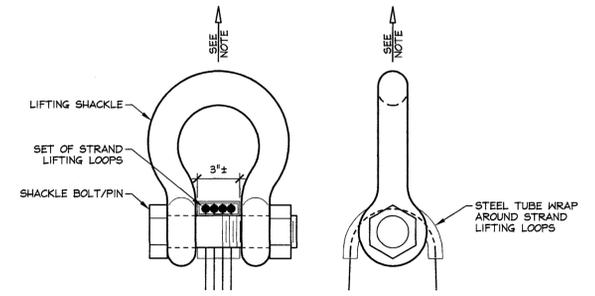
DESIGN LIVE LOAD: HL-93



2 TRANSVERSE SECTION
1/2" = 1'-0"



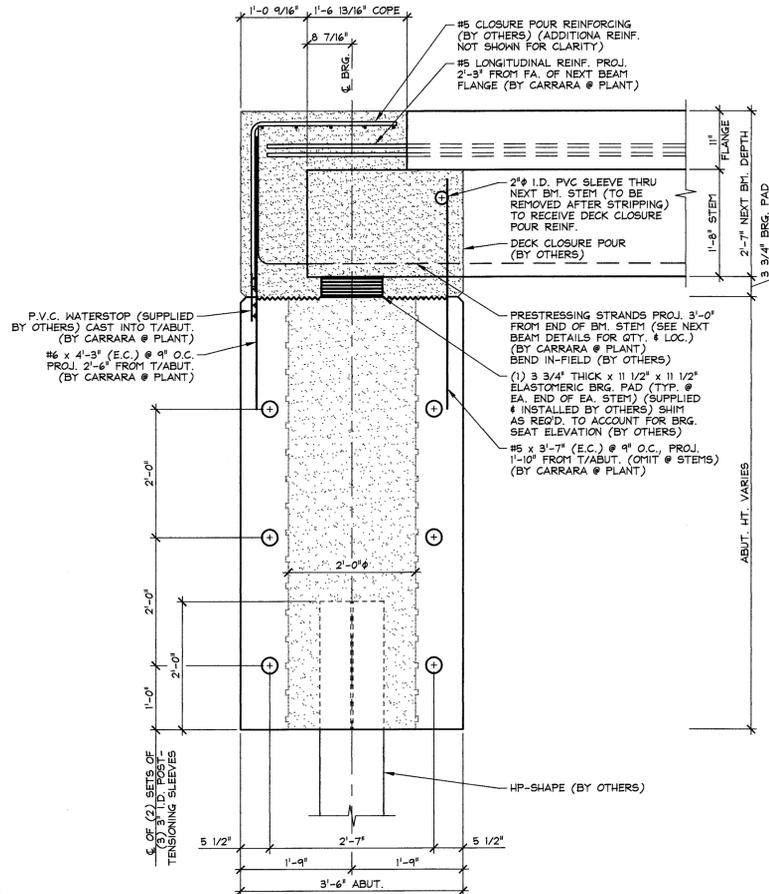
MODIFIED NEXT BEAM 28D HOLD-DOWN DETAIL FOR SHIPPING
3/4" = 1'-0"



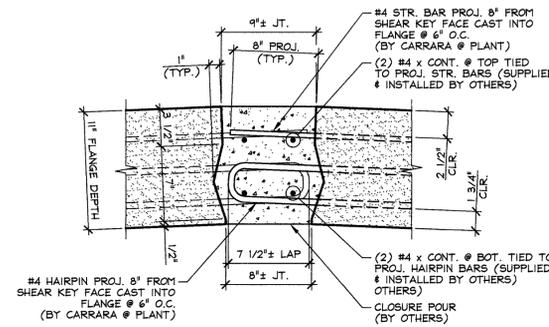
NOTE: BEAMS SHALL BE HANDLED AND ERECTED USING THE LIFTING LOOPS ONLY. RIGGING SHALL BE CONFIGURED SUCH THAT EQUAL AND VERTICAL FORCES ARE APPLIED TO EACH SET OF LIFTING LOOPS AT EACH END OF THE BEAM. SHACKLE BOLT/PIN SHALL BE PLACED UNDER LIFT LOOPS AS SHOWN. DESIGN AND CONFIGURATION OF RIGGING BY PURCHASER.

LIFTING SHACKLE DETAILS
N.T.S.

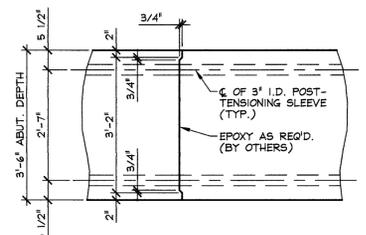
APPROVAL STAMP:	J.P. CARRARA & SONS INC. Precast & Prestress Manufacturer 2404 OASE STR., MIDDLEBURY, VERMONT 05753 Phone: (802)388-6361 Fax: (802)388-6010		J.P. SICARD, INC. CONTRACTOR BARTON, VERMONT
	STATE OF VERMONT AGENCY OF TRANSPORTATION COUNTY OF ORANGE		DATE: NOV. 18, 2014
	TOWN OF RANDOLPH TOWN HIGHWAY 65 (PALMER ROAD) CLASS 3 LOCAL ROAD BRIDGE NO.: 35 PROJECT NO.: BRO 1444(57)		SCALE: NOTED
	PRESTRESSED NEXT BEAM LAYOUT & SECTION		CHKD: B.C. DFTM: B.L. JOB NO: 23449-014 DWG. NO: F4



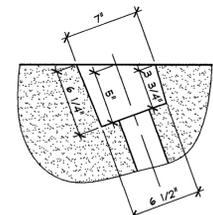
A BEARING SECTION
 F5 NEXT BEAM STEM BEARING 3/4\"/>



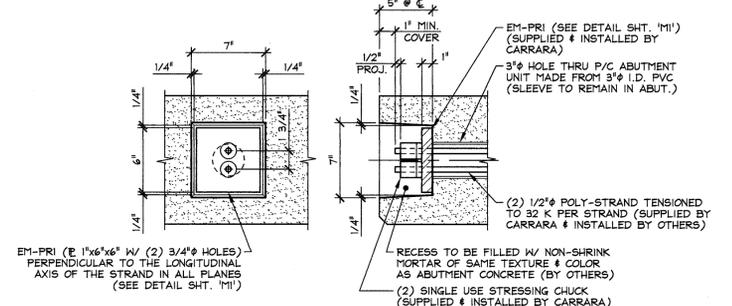
B NEXT BEAM CLOSURE POUR
 F5 1 1/2\"/>



C MATCH CAST SECTION @ P.T. SLEEVE
 F5 1/2\"/>

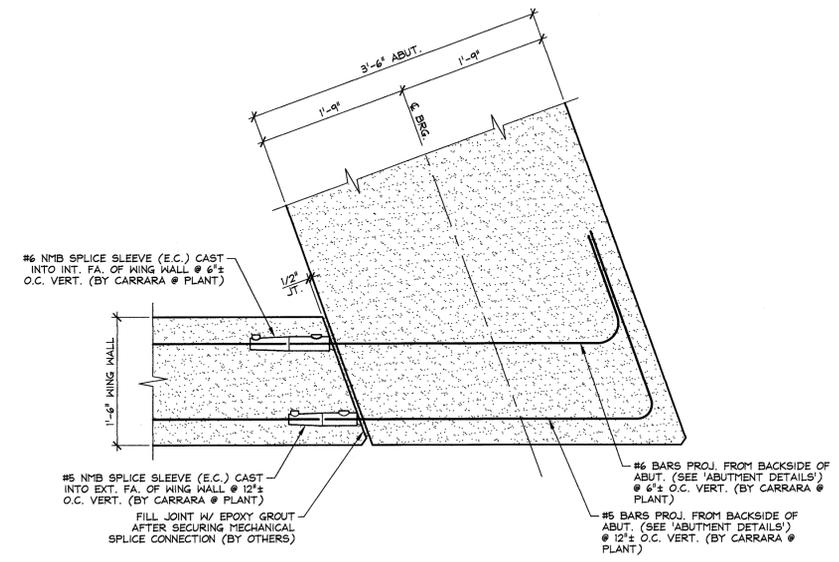


PLAN OF POCKET

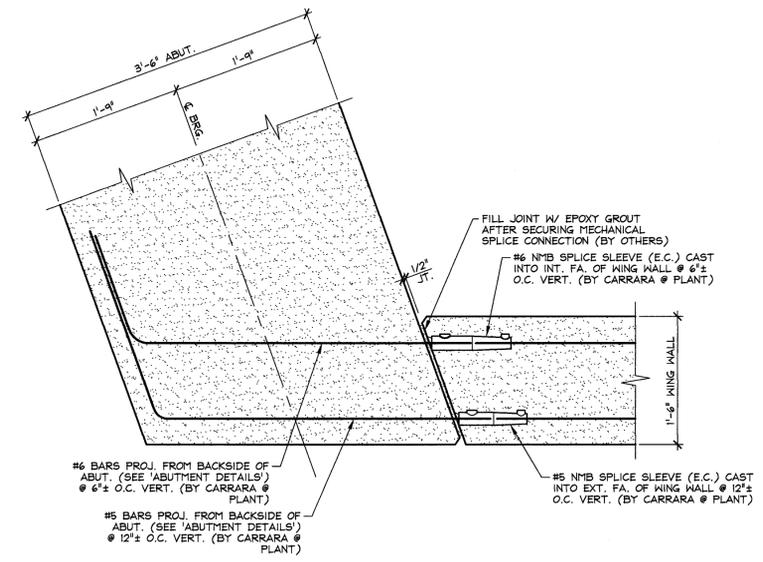


ABUTMENT ELEVATION SECTION AT CENTERLINE

DETAIL - \"A\"
 1 1/2\"/>



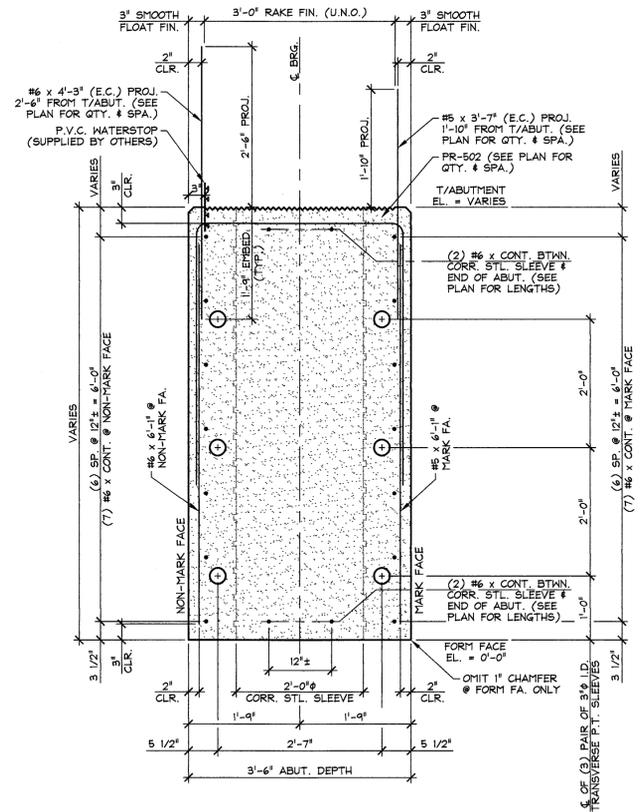
D WING WALL CONNECTION DETAIL
 F5 1\"/>



E WING WALL CONNECTION DETAIL
 F5 1\"/>

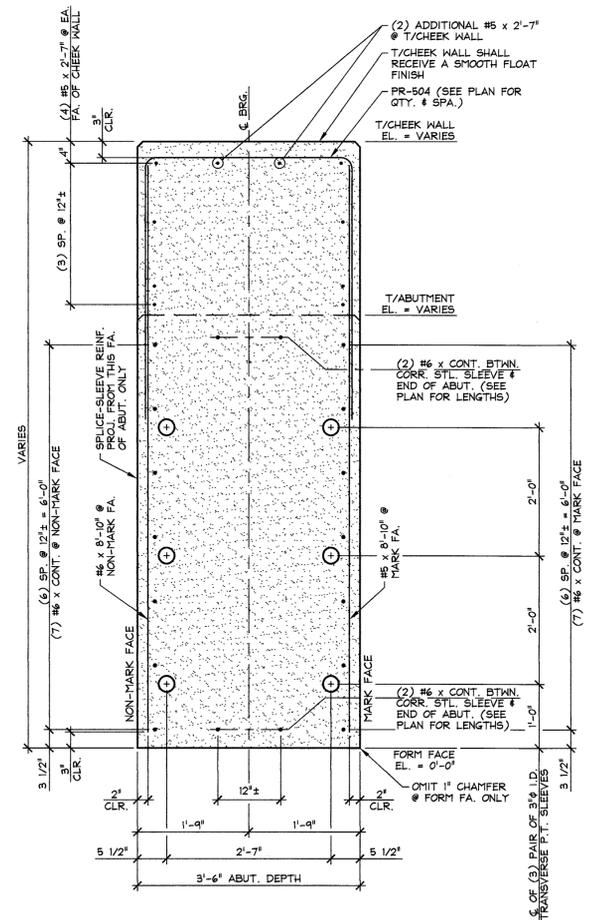
GENERAL NOTE:
 ALL SPLICE SLEEVES TO BE GROUTED W/ NMB SS MORTAR PER MANUFACTURERS INSTRUCTION, (BY OTHERS)

APPROVAL STAMP:	J.P. CARRARA & SONS INC. Precast & Prestress Manufacturer 2464 CASE STR., MIDDLEBURY, VERMONT 05753 Phone: (802)388-6361 Fax: (802)388-9010		J.P. SICARD, INC. CONTRACTOR BARTON, VERMONT	
	STATE OF VERMONT AGENCY OF TRANSPORTATION COUNTY OF ORANGE		DATE: NOV. 18, 2014	SCALE: NOTED
	TOWN OF RANDOLPH TOWN HIGHWAY 65 (PALMER ROAD) CLASS 3 LOCAL ROAD BRIDGE NO.: 35 PROJECT NO.: BRO 1444(57)		CHKD: B.C.	DFTM: B.L.
	ABUTMENT SECTIONS & DETAILS		JOB NO: 23449-014	DWG. NO: F5



A ABUTMENT SECTION
 3/4" = 1'-0"

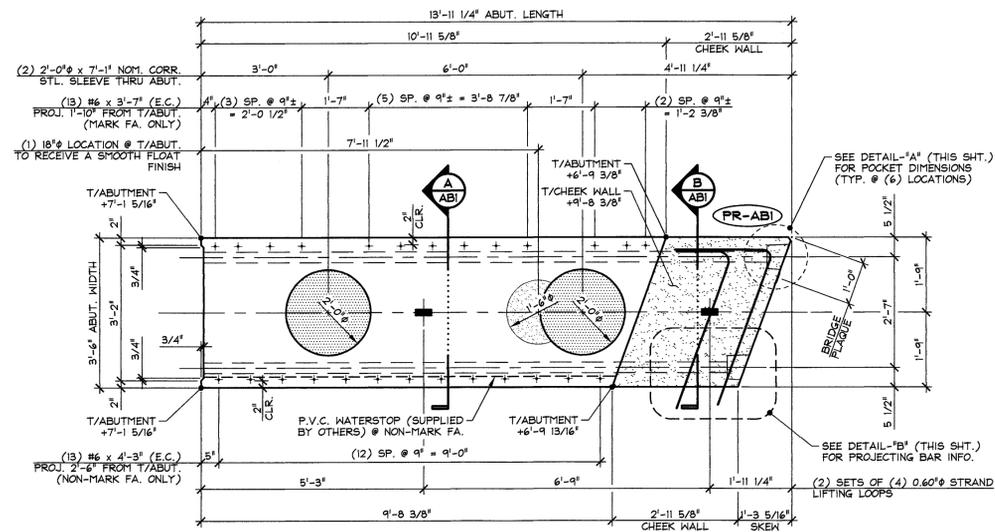
SHOP NOTE:
 ALL EDGES OF ABUTMENT SHALL
 RECEIVE A 1" CHAMFER (U.N.O.)



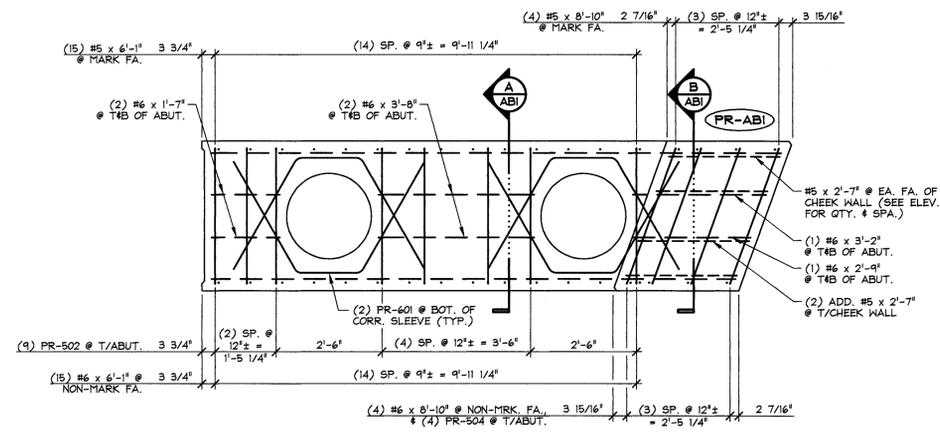
B ABUTMENT SECTION
 3/4" = 1'-0"

SHOP NOTE:
 ALL EDGES OF ABUTMENT SHALL
 RECEIVE A 1" CHAMFER (U.N.O.)

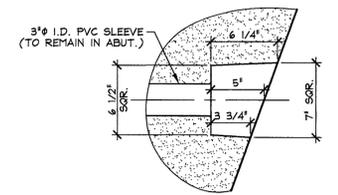
APPROVAL STAMP:	J.P. CARRARA & SONS INC. Precast & Prestress Manufacturer <small>2464 CASE ST., MIDDLEBURY, VERMONT 05753 Phone: (802)388-6361 Fax: (802)388-9010</small>		J.P. SICARD, INC. CONTRACTOR BARTON, VERMONT
	STATE OF VERMONT AGENCY OF TRANSPORTATION COUNTY OF ORANGE		DATE: NOV. 18, 2014
	TOWN OF RANDOLPH TOWN HIGHWAY 65 (PALMER ROAD) CLASS 3 LOCAL ROAD BRIDGE NO.: 35 PROJECT NO.: BRO 1444(57)		SCALE: NOTED
	PRECAST ABUTMENT DETAILS		CHKD: B.C. DFTM: B.L. JOB NO: 23449-014 DWG. NO: ABI



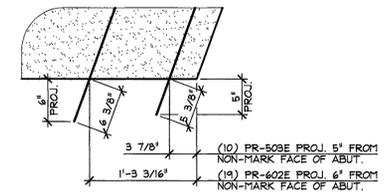
1 PRECAST ABUTMENT PLAN VIEW IN FORM
AB2 1/2" = 1'-0"



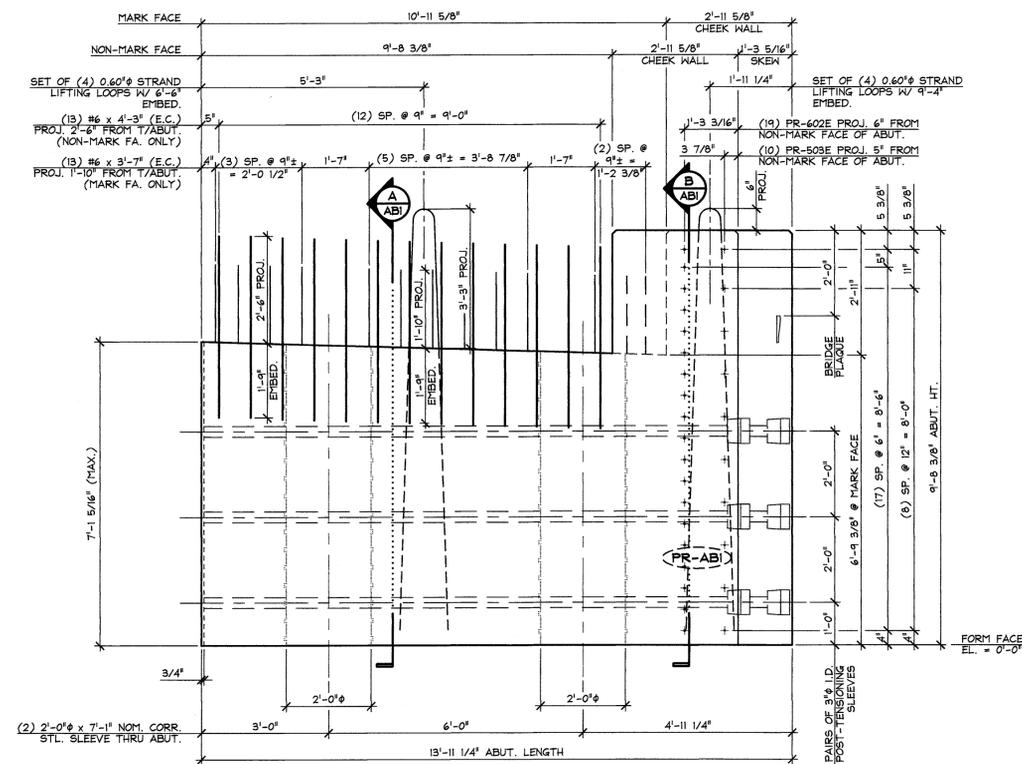
3 REINFORCING PLAN VIEW IN FORM
AB2 1/2" = 1'-0"



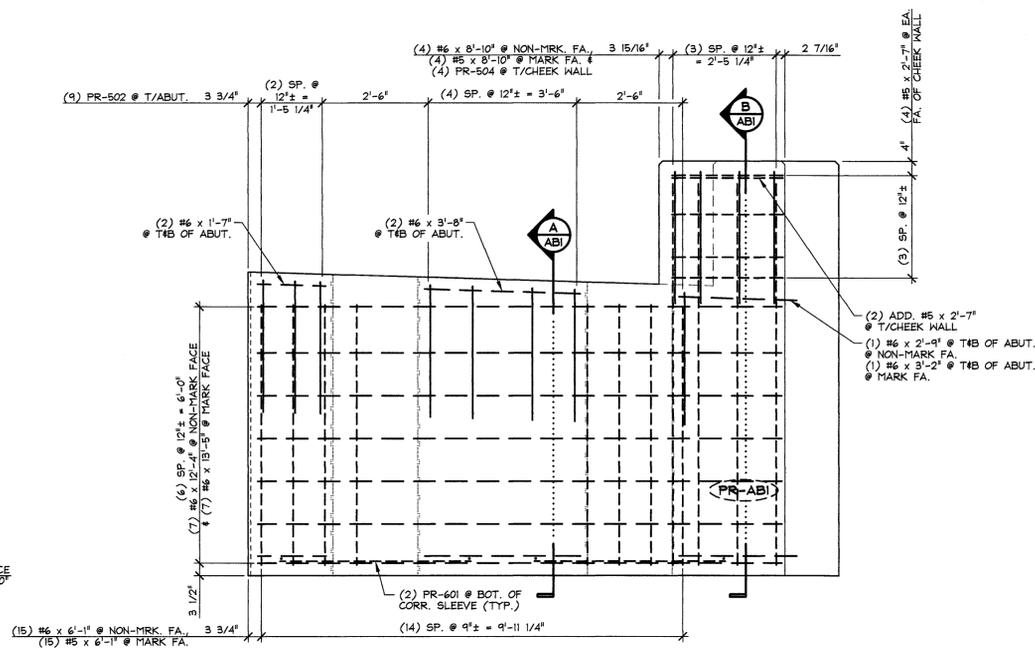
DETAIL - "A"
1 1/2" = 1'-0"



DETAIL - "B"
1" = 1'-0"



2 PRECAST ABUTMENT ELEVATION
AB2 NON-MARK FACE 1/2" = 1'-0"



4 REINFORCING ELEVATION
AB2 NON-MARK FACE 1/2" = 1'-0"

MARK: PR-ABI QTY: 1 WT.: 23.08 T VOL.: 11.40 cy			
MATERIAL LIST / ABUTMENT			
ITEM	MARK	DESCRIPTION	QTY.
1	PR-502	#5 BENT BAR	9
2	PR-503E	#5 BENT BAR (EPOXY COATED)	10
3	PR-504	#5 BENT BAR	4
4		#5 x 2'-7"	10
5		#5 x 6'-1"	15
6		#5 x 8'-10"	4
7			
8	PR-601	#6 BENT BAR	4
9	PR-602E	#6 BENT BAR (EPOXY COATED)	19
10		#6 x 4'-3" (EPOXY COATED)	13
11		#6 x 3'-7" (EPOXY COATED)	13
12		#6 x 6'-1"	15
13		#6 x 12'-4"	7
14		#6 x 13'-5"	7
15		#6 x 1'-7"	4
16		#6 x 3'-8"	4
17		#6 x 2'-9"	2
18		#6 x 3'-2"	2
19		#6 x 8'-10"	4
20			
21		P.V.C. WATERSTOP (SUPPLIED BY OTHERS)	9.67 LF
22		BRIDGE PLAQUE (SUPPLIED BY OTHERS)	1
23		2'-0" x 7'-1" (NOM.) CORRUGATED STEEL SLEEVE	2
24		SET OF (4) 0.60" STRAND LIFTING LOOPS	2
25			

APPROVAL STAMP:

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

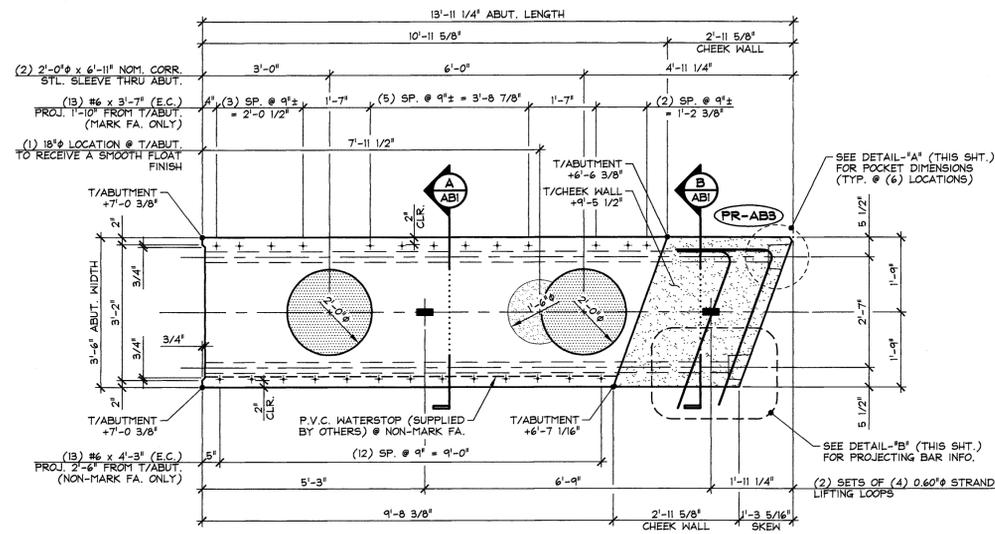
J.P. SICARD, INC.
CONTRACTOR
BARTON, VERMONT

STATE OF VERMONT AGENCY OF TRANSPORTATION
COUNTY OF ORANGE

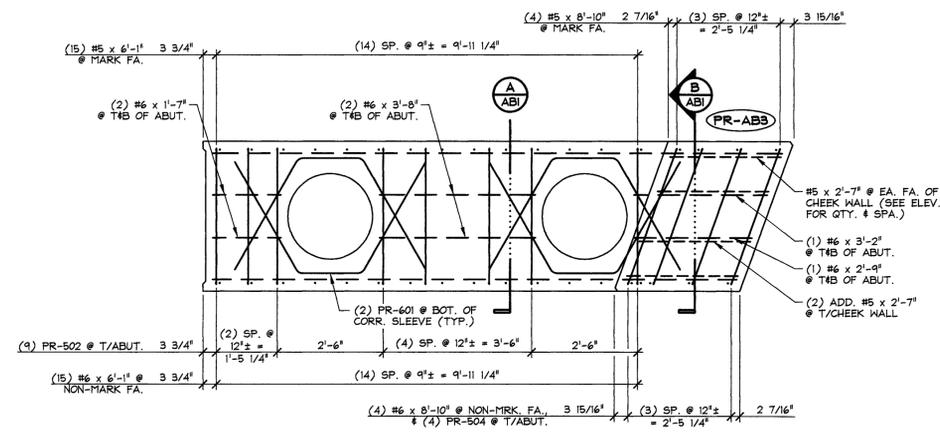
TOWN OF RANDOLPH
TOWN HIGHWAY 65 (PALMER ROAD) CLASS 3 LOCAL ROAD
BRIDGE NO.: 35 PROJECT NO.: BRO 1444(57)

DATE: NOV. 18, 2014
SCALE: NOTED
CHKD: B.C. DFTM: B.L.
JOB NO: 23449-014

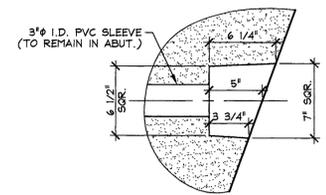
PRECAST ABUTMENT DETAILS
DWG. NO: AB2



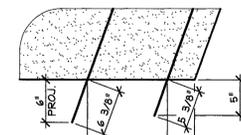
1 PRECAST ABUTMENT PLAN VIEW IN FORM
 AB3 1/2" = 1'-0"



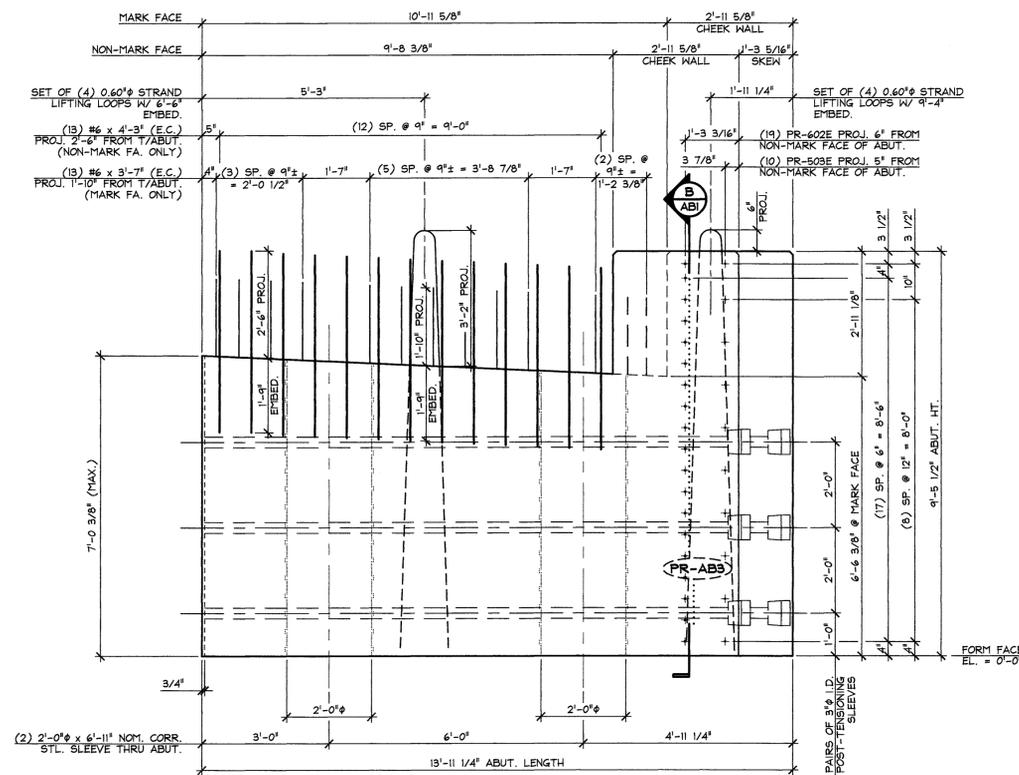
3 REINFORCING PLAN VIEW IN FORM
 AB3 1/2" = 1'-0"



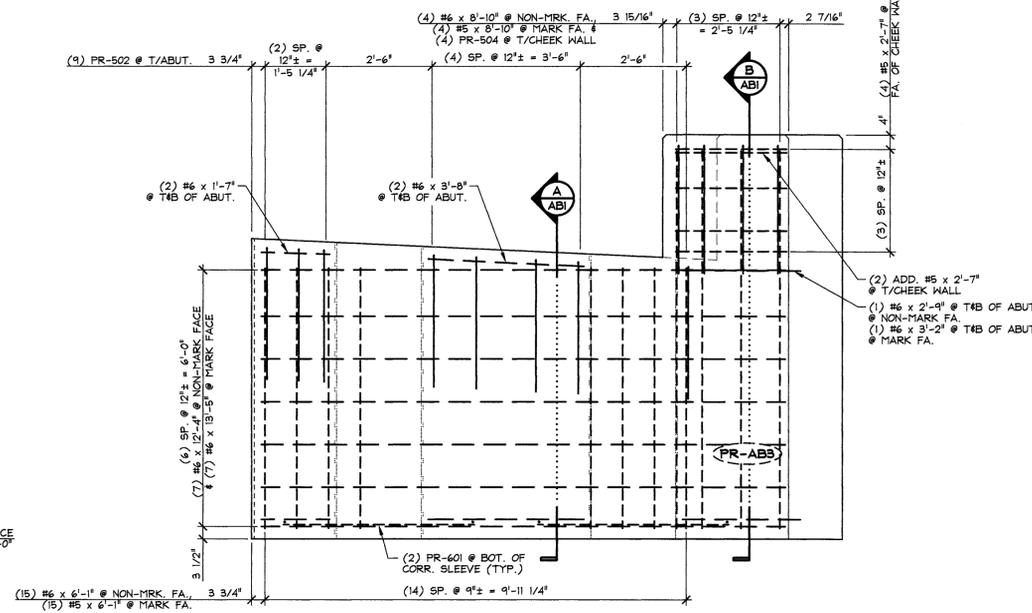
DETAIL - "A"
 1 1/2" = 1'-0"



DETAIL - "B"
 1" = 1'-0"



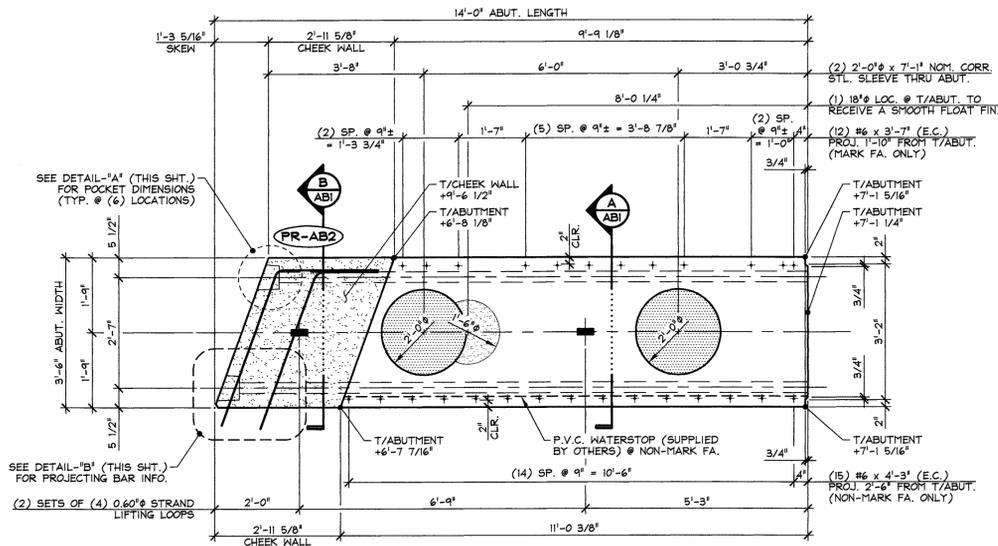
2 PRECAST ABUTMENT ELEVATION
 AB3 NON-MARK FACE 1/2" = 1'-0"



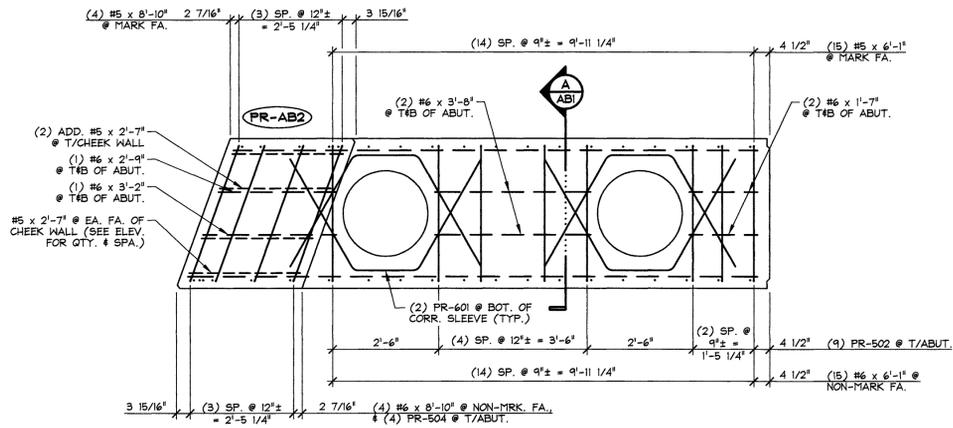
4 REINFORCING ELEVATION
 AB3 NON-MARK FACE 1/2" = 1'-0"

MARK: PR-AB3 QTY.: 1 WT.: 22.57 T VOL.: 11.14 cy			
MATERIAL LIST / ABUTMENT			
ITEM	MARK	DESCRIPTION	QTY.
1	PR-502	#5 BENT BAR	9
2	PR-503E	#5 BENT BAR (EPOXY COATED)	10
3	PR-504	#5 BENT BAR	4
4		#5 x 2'-7"	10
5		#5 x 6'-1"	15
6		#5 x 8'-10"	4
7			
8	PR-601	#6 BENT BAR	4
9	PR-602E	#6 BENT BAR (EPOXY COATED)	19
10		#6 x 4'-3" (EPOXY COATED)	13
11		#6 x 3'-7" (EPOXY COATED)	13
12		#6 x 6'-1"	15
13		#6 x 12'-4"	7
14		#6 x 13'-5"	7
15		#6 x 1'-7"	4
16		#6 x 3'-8"	4
17		#6 x 2'-9"	2
18		#6 x 3'-2"	2
19		#6 x 8'-10"	4
20			
21		P.V.C. WATERSTOP (SUPPLIED BY OTHERS)	9.67 LF
22		2'-0" x 6'-11" (NOM.) CORRUGATED STEEL SLEEVE	2
23		SET OF (4) 0.60" STRAND LIFTING LOOPS	2
24			
25			

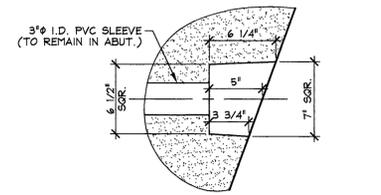
APPROVAL STAMP:	J.P. CARRARA & SONS INC. Precast & Prestress Manufacturer 2444 CASE STR., MIDDLEBURY, VERMONT 05753 Phone:(802)388-6361 Fax:(802)388-9010		J.P. SICARD, INC. CONTRACTOR BARTON, VERMONT	
	STATE OF VERMONT AGENCY OF TRANSPORTATION COUNTY OF ORANGE		DATE: NOV. 18, 2014	
	TOWN OF RANDOLPH TOWN HIGHWAY 65 (PALMER ROAD) CLASS 3 LOCAL ROAD BRIDGE NO.: 35 PALMER PROJECT NO.: BRO 1444(57)		SCALE: NOTED	
	PRECAST ABUTMENT DETAILS		CHKD: B.C. DFTM: B.L. JOB NO: 23449-014 DWG. NO: AB3	



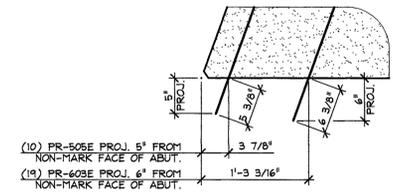
1 PRECAST ABUTMENT PLAN VIEW IN FORM
AB4 1/2" = 1'-0"



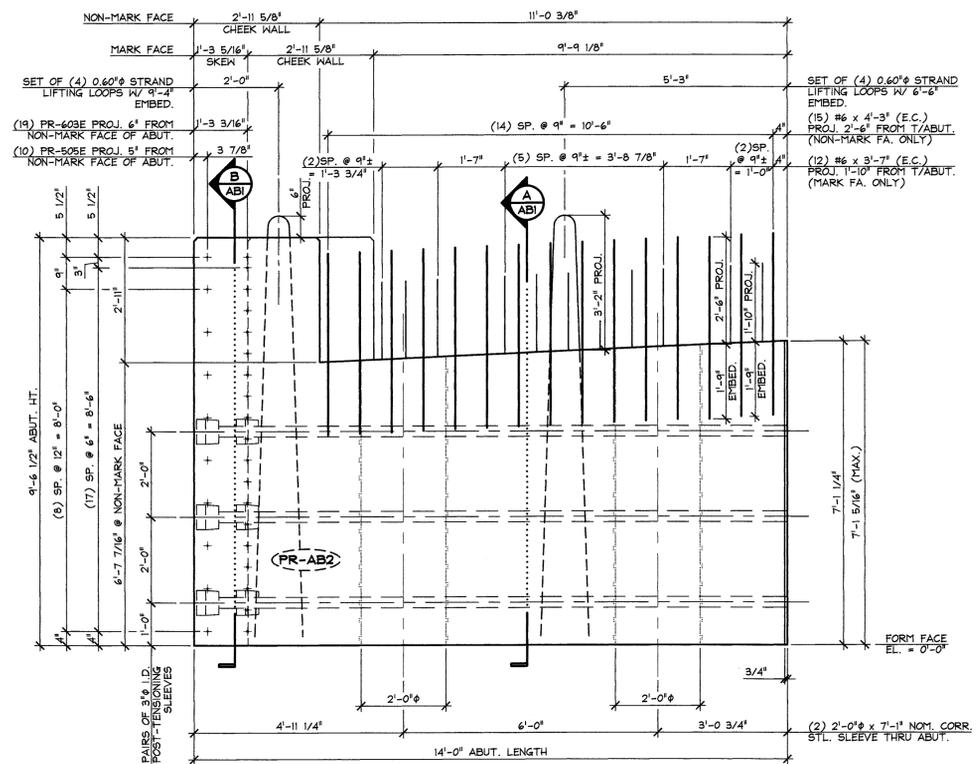
3 REINFORCING PLAN VIEW IN FORM
AB4 1/2" = 1'-0"



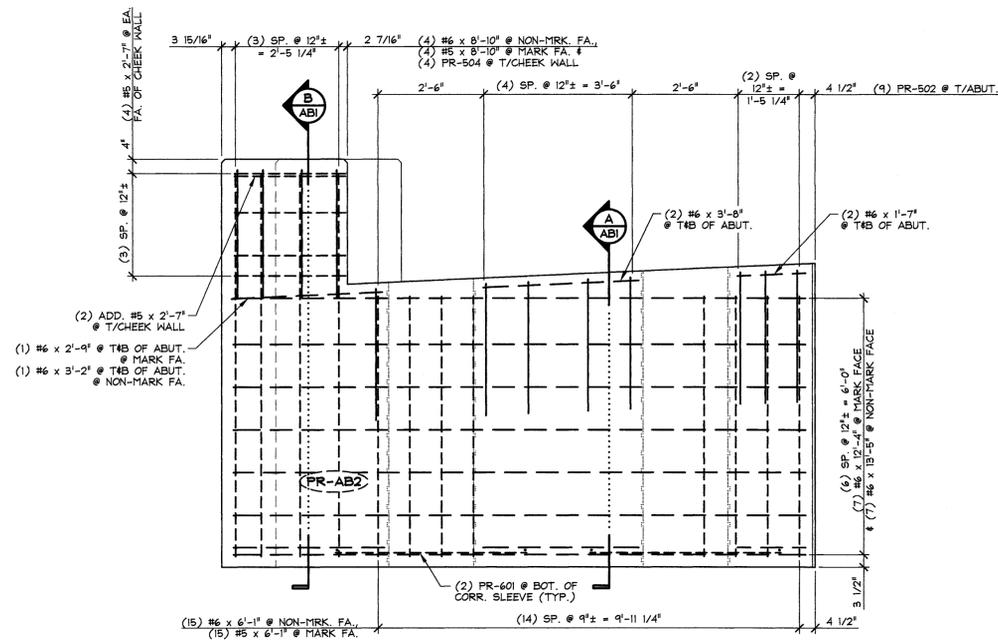
DETAIL - "A"
1/2" = 1'-0"



DETAIL - "B"
1" = 1'-0"



2 PRECAST ABUTMENT ELEVATION
AB4 NON-MARK FACE 1/2" = 1'-0"



4 REINFORCING ELEVATION
AB4 NON-MARK FACE 1/2" = 1'-0"

MARK: PR-AB2 QTY.: 1 WT.: 22.96 T VOL.: 11.34 cy			
MATERIAL LIST / ABUTMENT			
ITEM	MARK	DESCRIPTION	QTY.
1	PR-502	#5 BENT BAR	9
2	PR-504	#5 BENT BAR	4
3	PR-505E	#5 BENT BAR (EPOXY COATED)	10
4		#5 x 2'-7"	10
5		#5 x 6'-1"	15
6		#5 x 8'-10"	4
7			
8	PR-601	#6 BENT BAR	4
9	PR-603E	#6 BENT BAR (EPOXY COATED)	19
10		#6 x 4'-3" (EPOXY COATED)	15
11		#6 x 3'-7" (EPOXY COATED)	12
12		#6 x 6'-1"	15
13		#6 x 12'-4"	7
14		#6 x 13'-5"	7
15		#6 x 1'-7"	4
16		#6 x 3'-8"	4
17		#6 x 2'-9"	2
18		#6 x 3'-2"	2
19		#6 x 8'-10"	4
20			
21		P.V.C. WATERSTOP (SUPPLIED BY OTHERS)	11 LF
22		2'-0" x 7'-1" (NOM.) CORRUGATED STEEL SLEEVE	2
23		SET OF (4) 0.60" STRAND LIFTING LOOPS	2
24			
25			

APPROVAL STAMP:

J.P. CARRARA & SONS INC.
Precast & Prestress Manufacturer
2444 CASE ST., MIDDLEBURY, VERMONT 05753 Phone: (802)388-6361 Fax: (802)388-9010

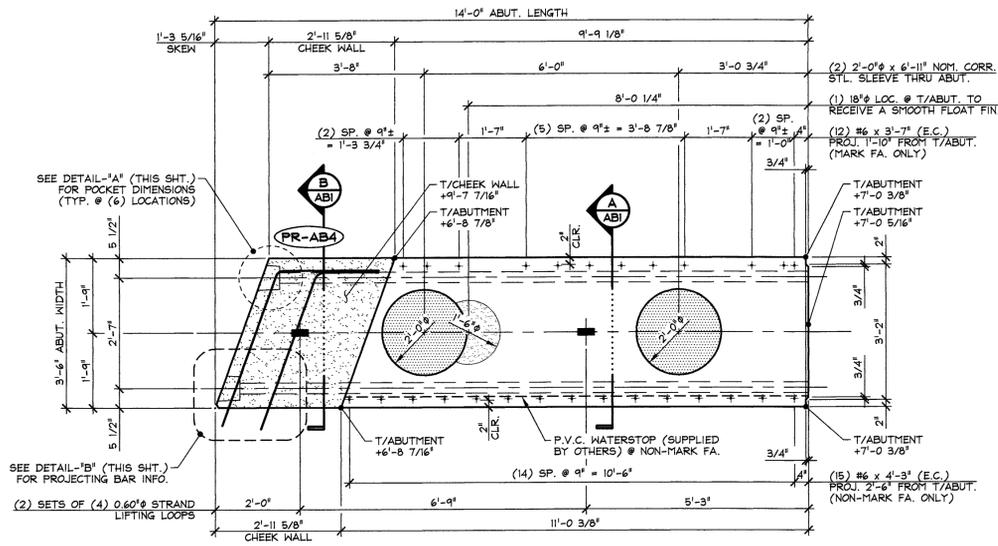
J.P. SICARD, INC.
CONTRACTOR
BARTON, VERMONT

STATE OF VERMONT AGENCY OF TRANSPORTATION
COUNTY OF ORANGE

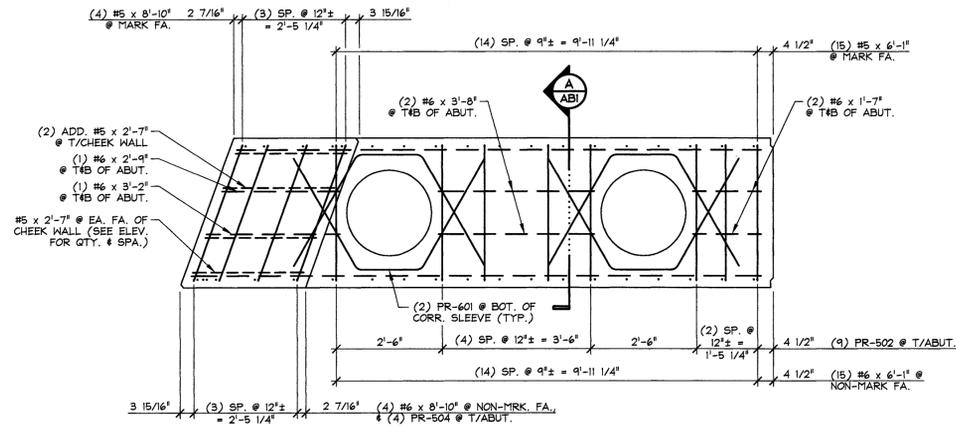
TOWN OF RANDOLPH
TOWN HIGHWAY 65 (PALMER ROAD) CLASS 3 LOCAL ROAD
BRIDGE NO.: 35 PROJECT NO.: BRO 1444(57)

DATE: NOV. 16, 2014
SCALE: NOTED
CHKD: B.C. DFTM: B.L.
JOB NO: 23449-014

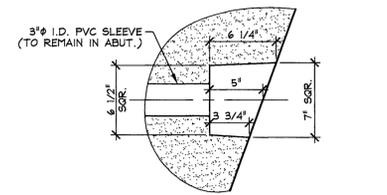
PRECAST ABUTMENT DETAILS
DWG. NO: AB4



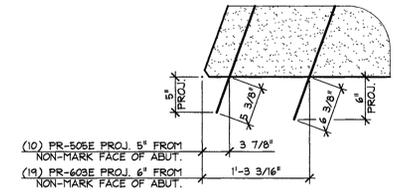
1 PRECAST ABUTMENT PLAN VIEW IN FORM
AB5 1/2" = 1'-0"



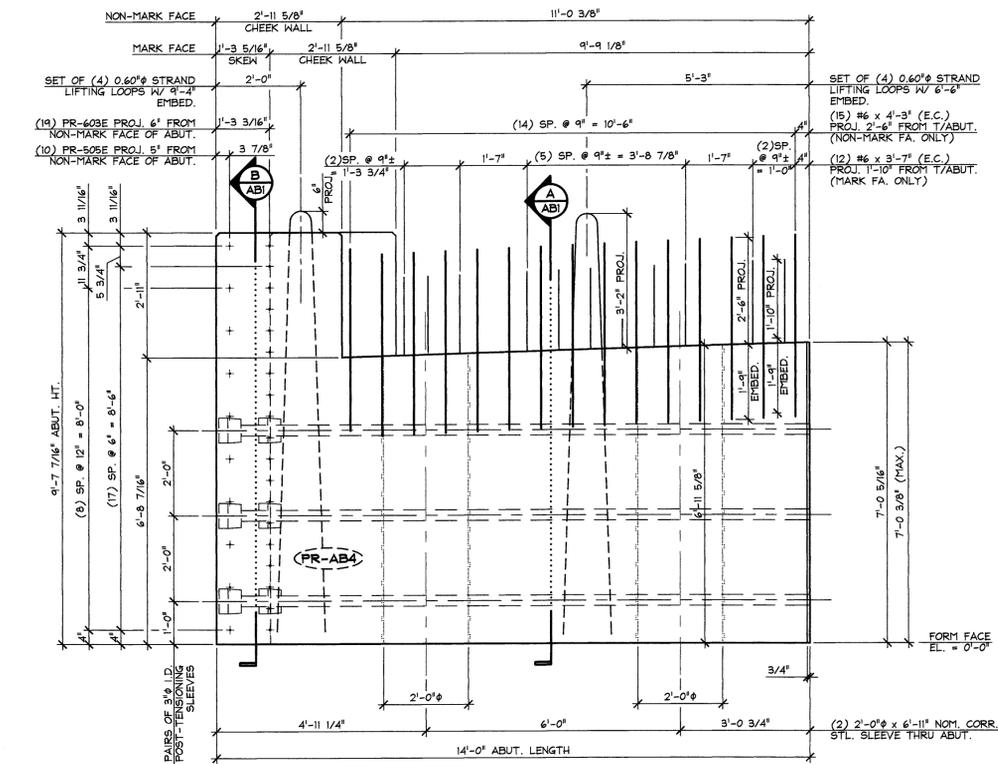
3 REINFORCING PLAN VIEW IN FORM
AB5 1/2" = 1'-0"



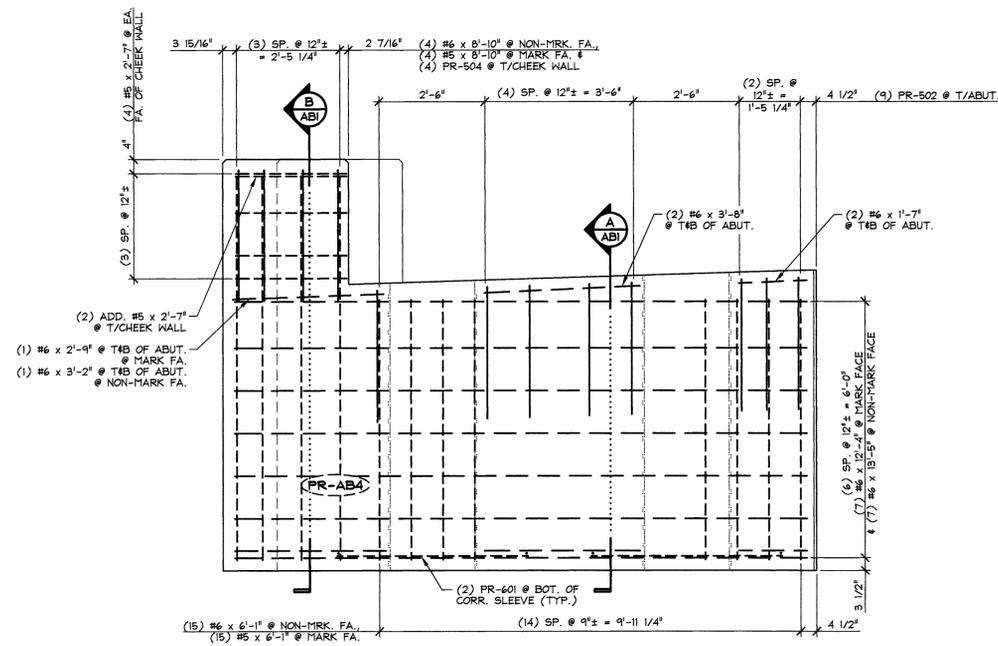
DETAIL - "A"
1 1/2" = 1'-0"



DETAIL - "B"
1" = 1'-0"



2 PRECAST ABUTMENT ELEVATION
AB5 NON-MARK FACE 1/2" = 1'-0"



4 REINFORCING ELEVATION
AB5 NON-MARK FACE 1/2" = 1'-0"

MARK: PR-AB4 QTY.: 1 WT.: 23.12 T VOL.: 11.42 cy			
MATERIAL LIST / ABUTMENT			
ITEM	MARK	DESCRIPTION	QTY.
1	PR-502	#5 BENT BAR	9
2	PR-504	#5 BENT BAR	4
3	PR-505E	#5 BENT BAR (EPOXY COATED)	10
4		#5 x 2'-7"	8
5		#5 x 6'-1"	15
6		#5 x 8'-10"	4
7			
8	PR-601	#6 BENT BAR	4
9	PR-603E	#6 BENT BAR (EPOXY COATED)	19
10		#6 x 4'-3" (EPOXY COATED)	15
11		#6 x 3'-7" (EPOXY COATED)	12
12		#6 x 6'-1"	15
13		#6 x 12'-4"	7
14		#6 x 13'-5"	7
15		#6 x 1'-7"	4
16		#6 x 3'-8"	4
17		#6 x 2'-9"	2
18		#6 x 3'-2"	2
19		#6 x 8'-10"	4
20			
21		P.V.C. WATERSTOP (SUPPLIED BY OTHERS)	11 LF
22		2'-0" x 6'-11" (NOM.) CORRUGATED STEEL SLEEVE	2
23		SET OF (4) 0.60" STRAND LIFTING LOOPS	2
24			
25			

APPROVAL STAMP:

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

J.P. SICARD, INC.
CONTRACTOR
BARTON, VERMONT

STATE OF VERMONT AGENCY OF TRANSPORTATION
COUNTY OF ORANGE

DATE: NOV. 18, 2014

TOWN OF RANDOLPH
TOWN HIGHWAY 65 (PALMER ROAD) CLASS 3 LOCAL ROAD
BRIDGE NO.: 35 PROJECT NO.: BRO 1444(57)

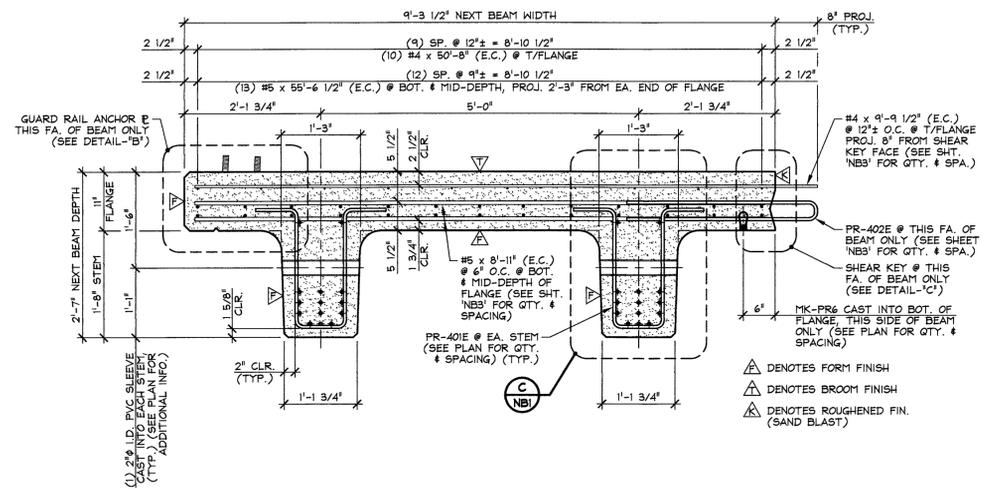
SCALE: NOTED

CHKD: B.C. DFTM: B.L.

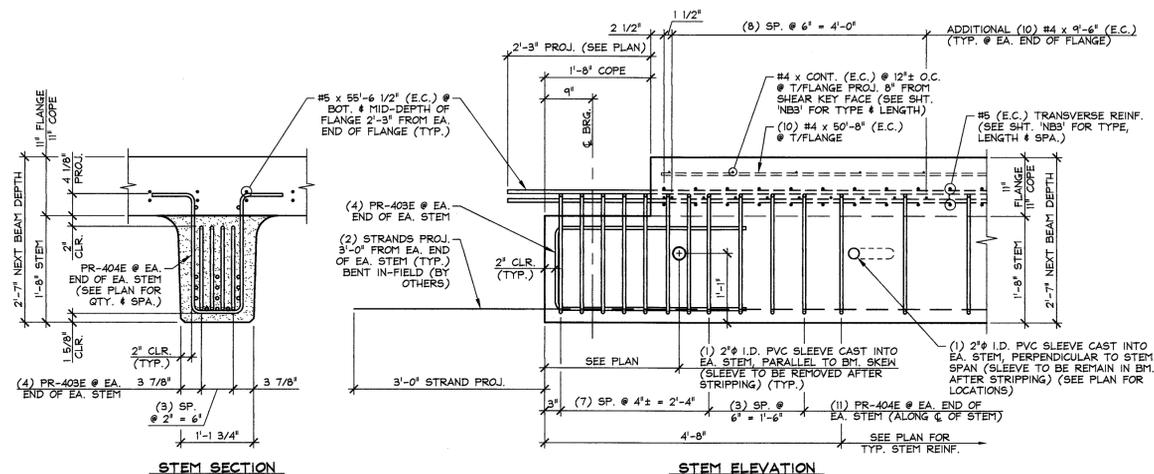
JOB NO: 23449-014

PRECAST ABUTMENT DETAILS

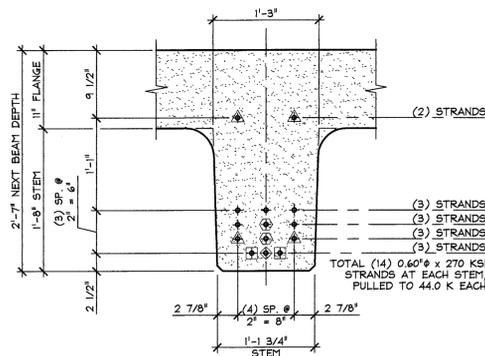
DWG. NO: AB5



A DIMENSIONAL & REINFORCING SECTION
 NBI 3/4" = 1'-0"

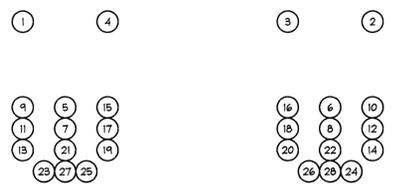


B END BLOCK STEM REINFORCING DETAILS
 NBI 3/4" = 1'-0"

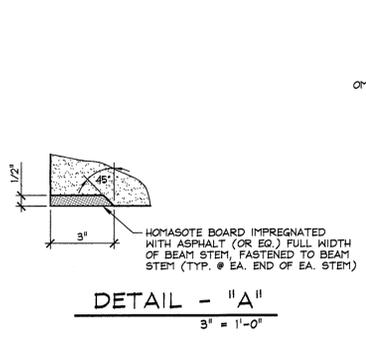


C STEM STRAND PATTERN
 NBI 1" = 1'-0"

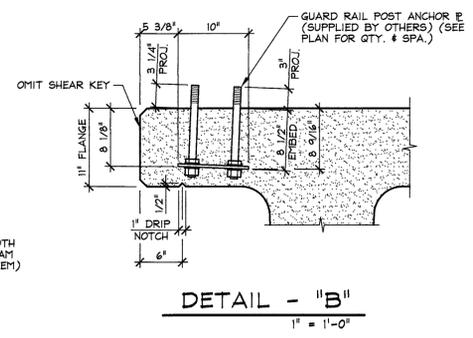
- PRESTRESSING NOTATIONS**
- ◆ DENOTES STRAIGHT STRANDS TO BE CUT FLUSH WITH EA. END OF EA. STEM
 - ⊕ DENOTES STRAIGHT STRANDS TO PROJECT 3'-0" FROM EA. END OF EA. STEM
 - ⊖ DENOTES STRAIGHT STRANDS TO BE DEBONDED 6" FROM EA. END OF EA. STEM
 - ⊗ DENOTES STRAIGHT STRANDS TO BE DEBONDED 4'-0" FROM EA. END OF EA. STEM
 - ⊙ DENOTES STRAIGHT STRANDS TO BE DEBONDED 6'-0" FROM EA. END OF EA. STEM



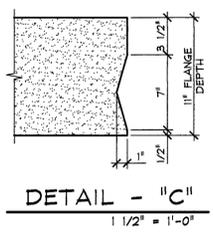
D DETENSIONING SCHEDULE
 N.T.S.



DETAIL - "A"
 3" = 1'-0"

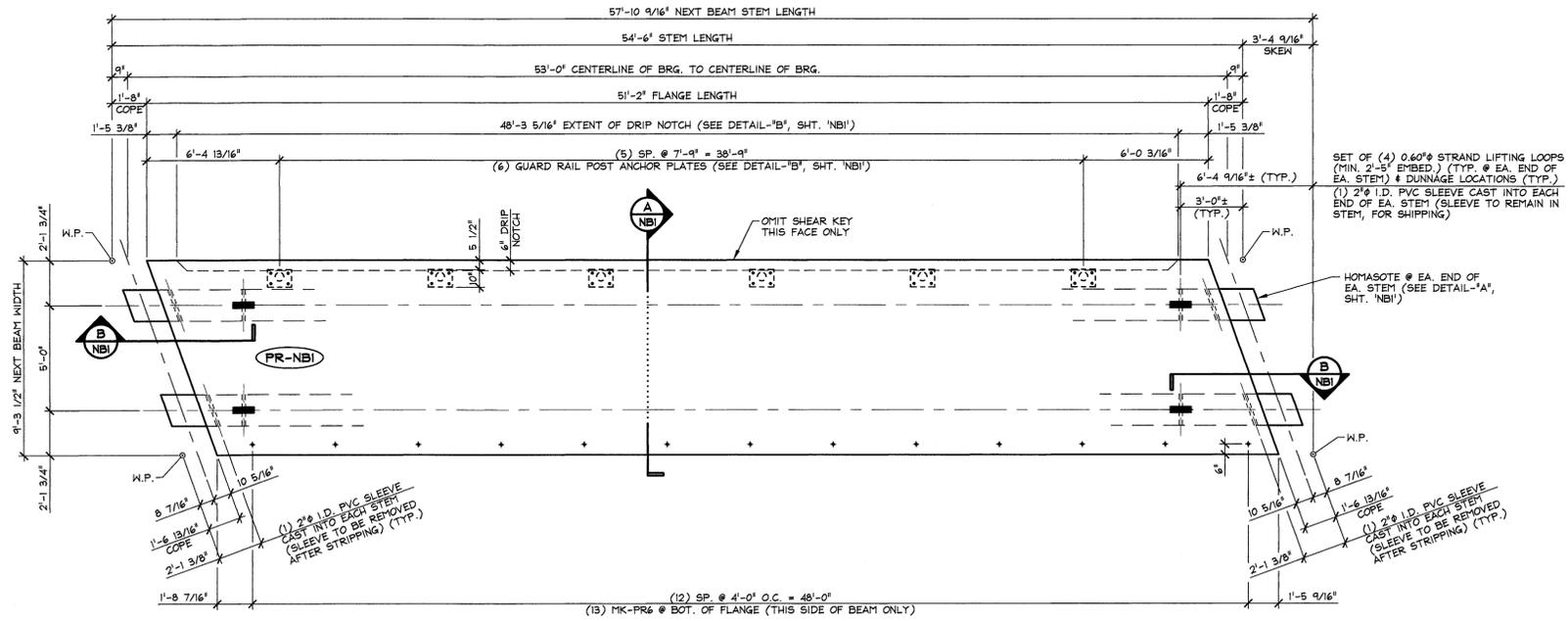


DETAIL - "B"
 1" = 1'-0"

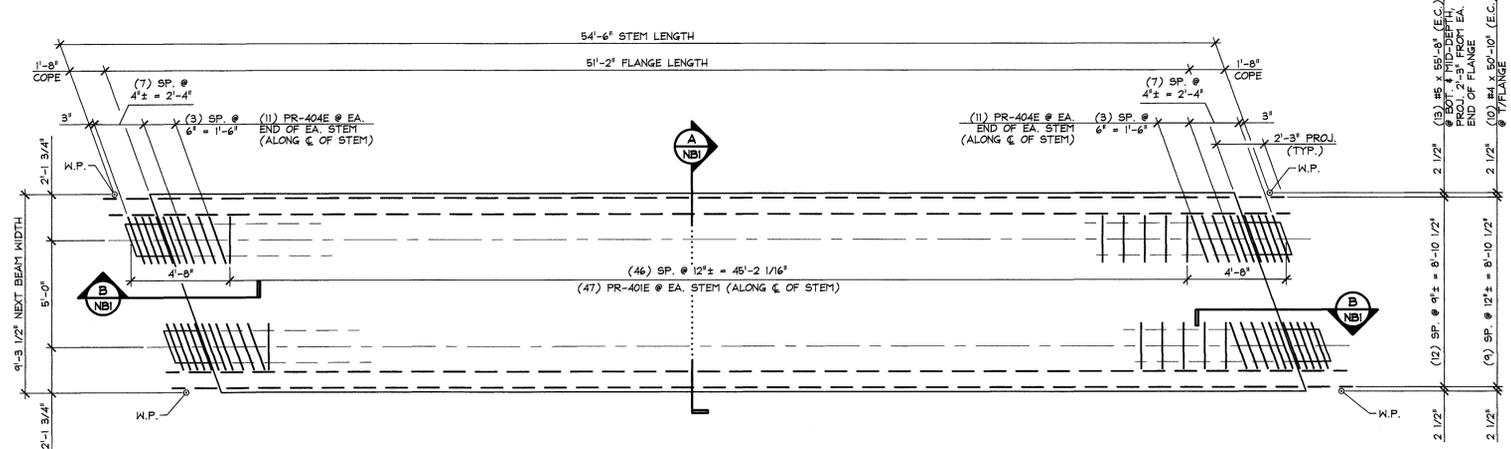


DETAIL - "C"
 1 1/2" = 1'-0"

APPROVAL STAMP:	J.P. CARRARA & SONS INC. Precast & Prestress Manufacturer 2464 GAGE STR., MIDDLEBURY, VERMONT 05753 Phone: (802)388-6361 Fax: (802)388-9010		J.P. SICARD, INC. CONTRACTOR BARTON, VERMONT	
	STATE OF VERMONT AGENCY OF TRANSPORTATION COUNTY OF ORANGE		DATE: NOV. 18, 2014	
	TOWN OF RANDOLPH TOWN HIGHWAY 65 (PALMER ROAD) CLASS 3 LOCAL ROAD BRIDGE NO.: 35 PROJECT NO.: BRO 1444(57)		SCALE: NOTED	
	PRESTRESSED NEXT BEAM DETAILS		CHKD: B.C. DFTM: B.L. JOB NO: 23449-014 DWG. NO: NBI	



1 DIMENSIONAL PLAN VIEW IN FORM
 NB2 1/4" = 1'-0"



2 REINFORCING PLAN VIEW IN FORM
 NB2 SEE SHEET 'NB3' FOR TRANSVERSE AND SHEAR KEY REINFORCING 1/4" = 1'-0"

MARK: PR-NB1 QTY.: 2 WT.: 49.16 T VOL.: 24.28 cy			
MATERIAL LIST / NEXT BEAM			
ITEM	MARK	DESCRIPTION	QTY.
1	PR-401E	#4 BENT BAR (LEVEL 1, EPOXY COATED)	94
2	PR-402E	#4 BENT BAR (LEVEL 1, EPOXY COATED)	79
3	PR-403E	#4 BENT BAR (LEVEL 1, EPOXY COATED)	16
4	PR-404E	#4 BENT BAR (LEVEL 1, EPOXY COATED)	44
5	PR-405E	#4 BENT BAR (LEVEL 1, EPOXY COATED)	21
6	PR-406E	#4 BENT BAR (LEVEL 1, EPOXY COATED)	2
7	PR-407E	#4 BENT BAR (LEVEL 1, EPOXY COATED)	2
8	PR-408E	#4 BENT BAR (LEVEL 1, EPOXY COATED)	2
9	PR-409E	#4 BENT BAR (LEVEL 1, EPOXY COATED)	2
10		#4 x 9'-6" (LEVEL 1, EPOXY COATED)	20
11		#4 x 5'-0" (LEVEL 1, EPOXY COATED)	4
12		#4 x 9'-9 1/2" (LEVEL 1, EPOXY COATED)	46
13		#4 x 50'-10" (LEVEL 1, EPOXY COATED)	10
14			
15		#5 x 4'-0" (LEVEL 1, EPOXY COATED)	16
16		#5 x 8'-11" (LEVEL 1, EPOXY COATED)	154
17		#5 x 8'-11 3/4" (LEVEL 1, EPOXY COATED)	4
18		#5 x 9'-1" (LEVEL 1, EPOXY COATED)	4
19		#5 x 9'-3" (LEVEL 1, EPOXY COATED)	4
20		#5 x 9'-6" (LEVEL 1, EPOXY COATED)	36
21		#5 x 55'-8" (LEVEL 1, EPOXY COATED)	26
22			
23	MK-PR6	DAYTON 3/4" F-42 LOOP FERRULE INSERT (GALV.)	13
24		GUARD RAIL ANCHOR PLATE (SUPPLIED BY OTHERS)	6
25		SET OF (4) 0.60" STRAND LIFTING LOOPS	4

APPROVAL STAMP:

J.P. CARRARA & SONS INC.
 Precast & Prestress Manufacturer
 2444 GEE STR., WOODBURY, VERMONT 05753 Phone: (802)388-6361 Fax: (802)388-9010

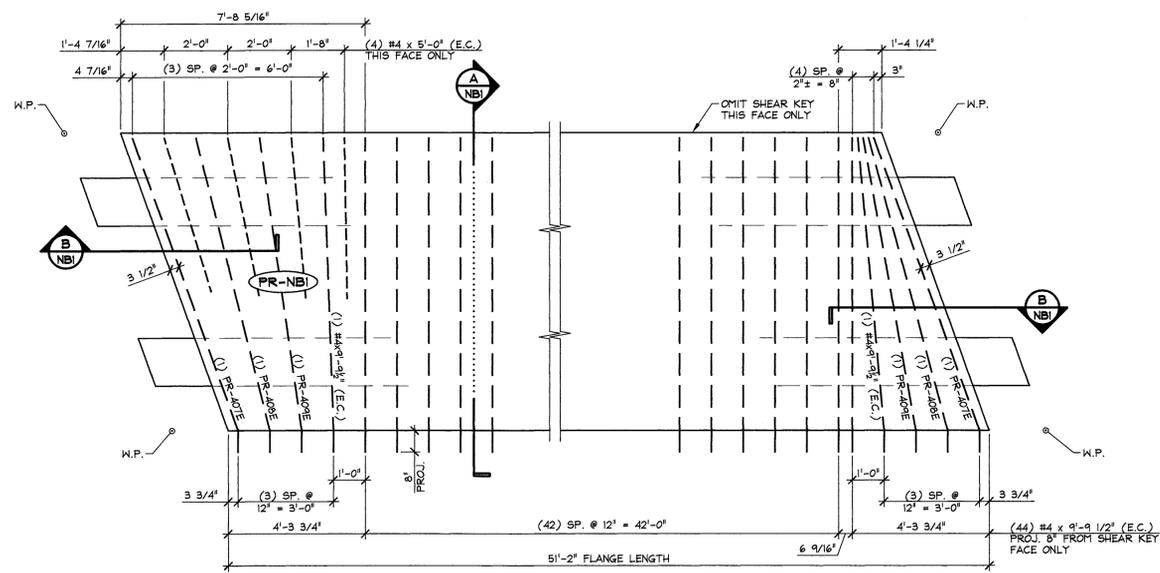
J.P. SICARD, INC.
 CONTRACTOR
 BARTON, VERMONT

STATE OF VERMONT AGENCY OF TRANSPORTATION
 COUNTY OF ORANGE

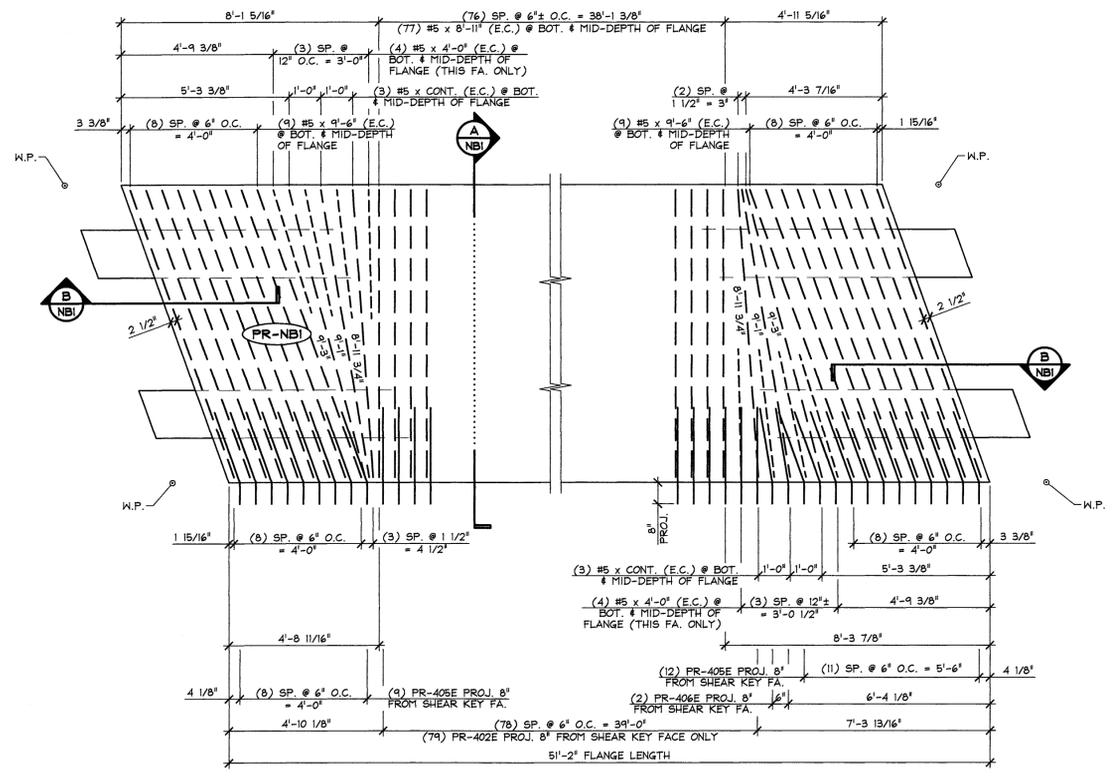
TOWN OF RANDOLPH
 TOWN HIGHWAY 65 (PALMER ROAD) CLASS 3 LOCAL ROAD
 BRIDGE NO.: 35 PROJECT NO.: BRO 1444(57)

DATE: NOV. 18, 2014
 SCALE: NOTED
 CHKD: B.C. DFTM: B.L.
 JOB NO: 23449-014
 DWG. NO: **NB2**

PRESTRESSED NEXT BEAM PLANS

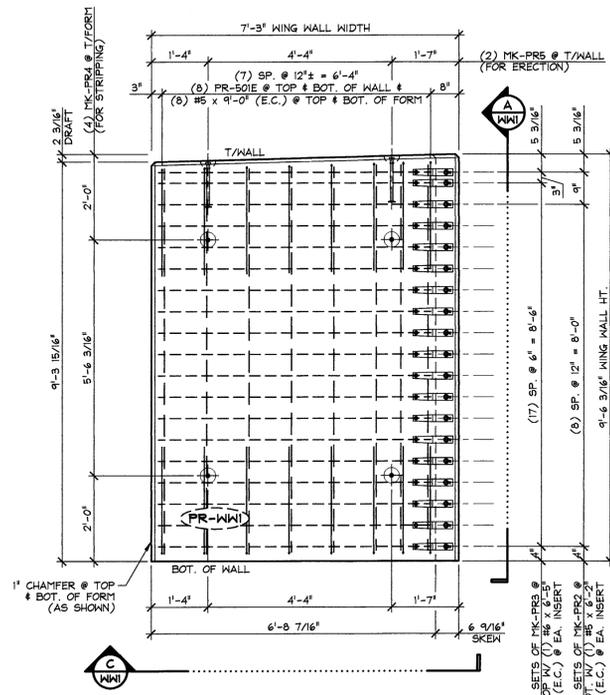


1 T/FLANGE #4 (E.C.) TRANSVERSE REINFORCING PLAN
 NB3 LONGITUDINAL REINFORCING NOT SHOWN FOR CLARITY 3/8" = 1'-0"

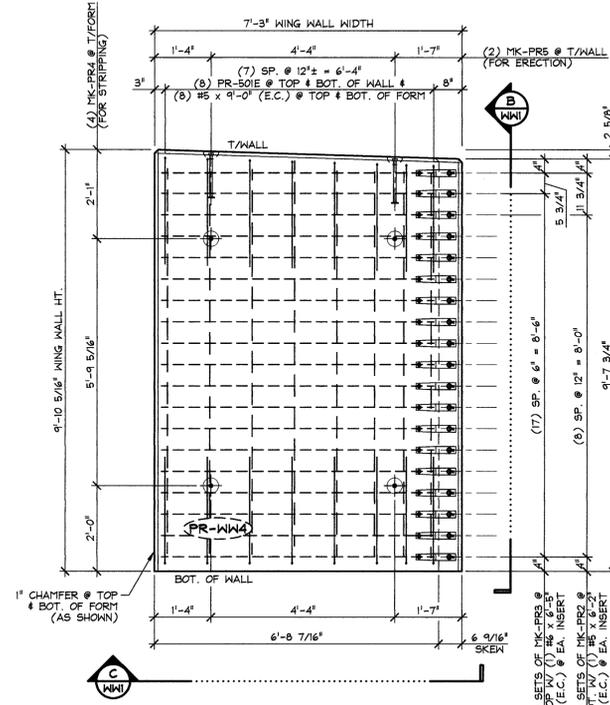


2 BOT. # MID-DEPTH #5 (E.C.) TRANSVERSE REINFORCING PLAN
 NB3 - LONGITUDINAL REINFORCING NOT SHOWN FOR CLARITY
 - ADDITIONAL #4 (E.C.) TRANSVERSE REINFORCING NOT SHOWN FOR CLARITY (SEE DETAIL "B/NBI") 3/8" = 1'-0"

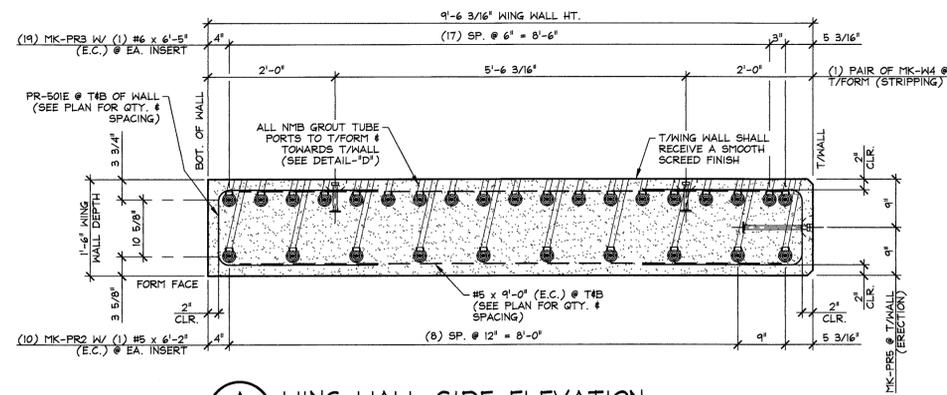
APPROVAL STAMP:	J.P. CARRARA & SONS INC. Precast & Prestress Manufacturer <small>2484 OASE STR. MIDDLEBURY, VERMONT 05753 Phone:(802)388-6361 Fax:(802)388-9010</small>		J.P. SICARD, INC. CONTRACTOR BARTON, VERMONT	
	STATE OF VERMONT AGENCY OF TRANSPORTATION COUNTY OF ORANGE		DATE: NOV. 18, 2014	
	TOWN OF RANDOLPH TOWN HIGHWAY 65 (PALMER ROAD) CLASS 3 LOCAL ROAD BRIDGE NO.: 35 PROJECT NO.: BRO 1444(57)		SCALE: NOTED	
	PRESTRESSED NEXT BEAM FLANGE REINFORCING		CHKD: B.C. DFTM: B.L. JOB NO: 23449-014 DWG. NO: NB3	



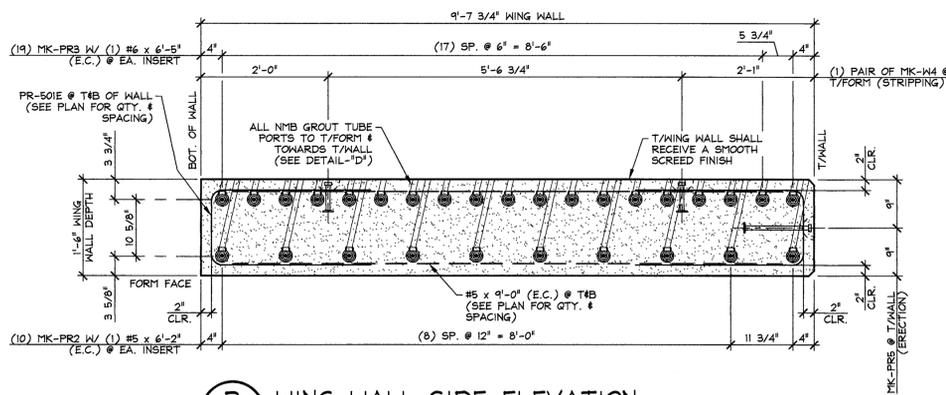
PLAN VIEW IN FORM - "PR-WW1"
1/2" = 1'-0"



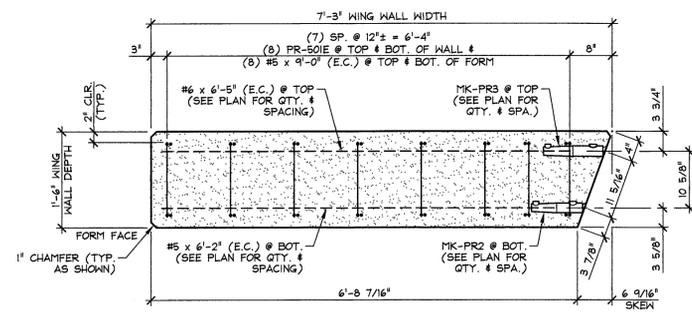
PLAN VIEW IN FORM - "PR-WW4"
1/2" = 1'-0"



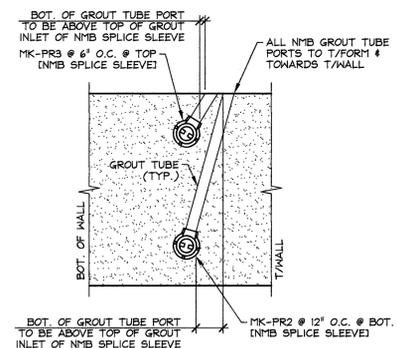
A WING WALL SIDE ELEVATION
3/4" = 1'-0"



B WING WALL SIDE ELEVATION
3/4" = 1'-0"



C WING WALL BOTTOM ELEVATION
3/4" = 1'-0"



DETAIL - "D"
3/4" = 1'-0"

MARK: PR-WW1	QTY.: 1	WT.: 7.39 T	VOL.: 3.65 cy
MARK: PR-WW4	QTY.: 1	WT.: 7.65 T	VOL.: 3.78 cy

MATERIAL LIST / WING WALL				
ITEM	MARK	DESCRIPTION	QTY./WALL	
			WW1	WW4
1	PR-501E	#5 BENT BAR (LEVEL 1, EPOXY COATED)	16	16
2		#5 x 6'-2" (LEVEL 1, EPOXY COATED)	10	10
3		#5 x 9'-0" (LEVEL 1, EPOXY COATED)	16	16
4				
5		#6 x 6'-5" (LEVEL 1, EPOXY COATED)	19	19
6				
7				
8				
9				
10				
11	MK-PR2	NMB SPLICE SLEEVE 5U-X(PG) (EPOXY COATED)	10	10
12	MK-PR3	NMB SPLICE SLEEVE 6U-X(PG) (EPOXY COATED)	19	19
13	MK-PR4	4T x 5 1/2" SWIFT LIFT LIFTER	4	4
14	MK-PR5	8T x 13 3/8" SWIFT LIFT LIFTER	2	2
15				

APPROVAL STAMP:

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

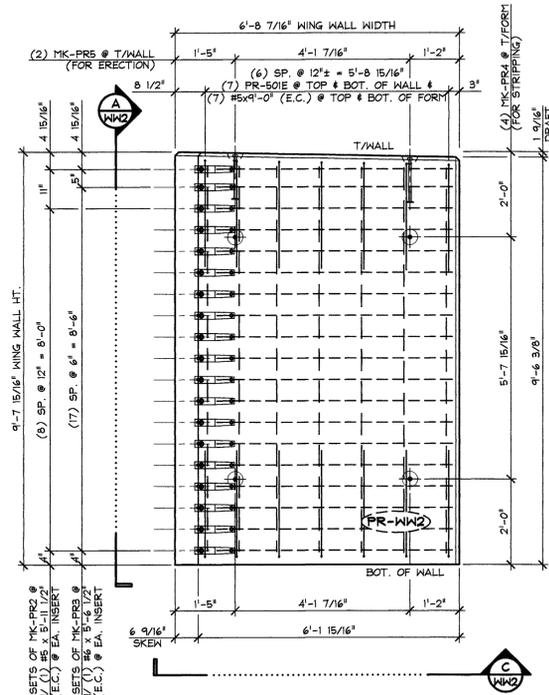
J.P. SICARD, INC.
CONTRACTOR
BARTON, VERMONT

STATE OF VERMONT AGENCY OF TRANSPORTATION
COUNTY OF ORANGE

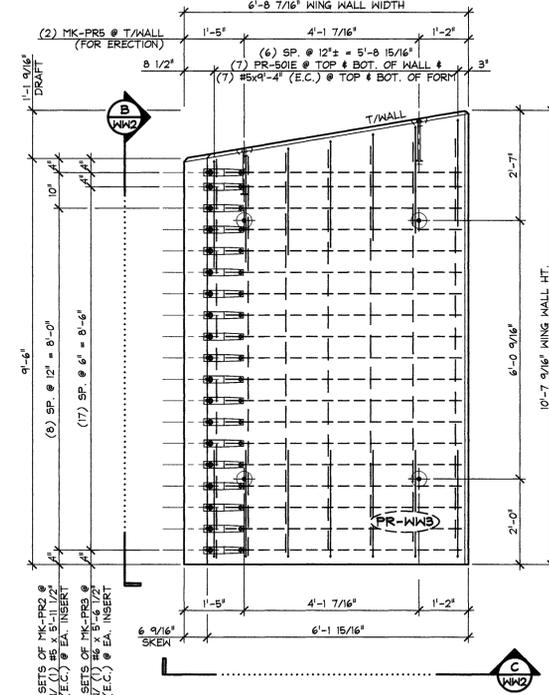
TOWN OF RANDOLPH
TOWN HIGHWAY 65 (PALMER ROAD) CLASS 3 LOCAL ROAD
BRIDGE NO.: 35 PROJECT NO.: BRO 1444(57)

DATE: NOV. 18, 2014
SCALE: NOTED
CHKD: B.C. DFTM: B.L.
JOB NO: 23449-014

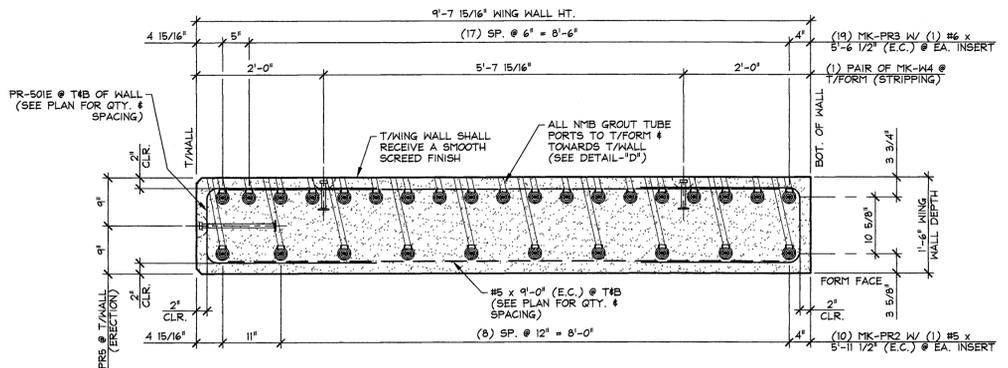
PRECAST WING WALL DETAILS
DWG. NO: WW1



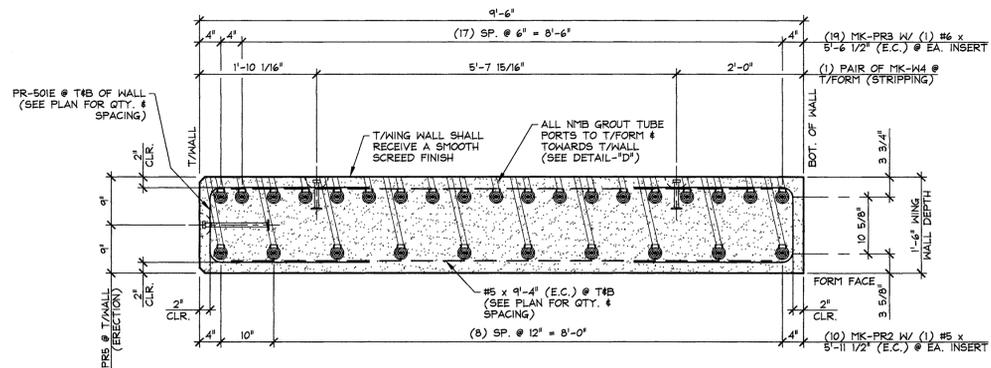
PLAN VIEW IN FORM - "PR-WW2"
1/2" = 1'-0"



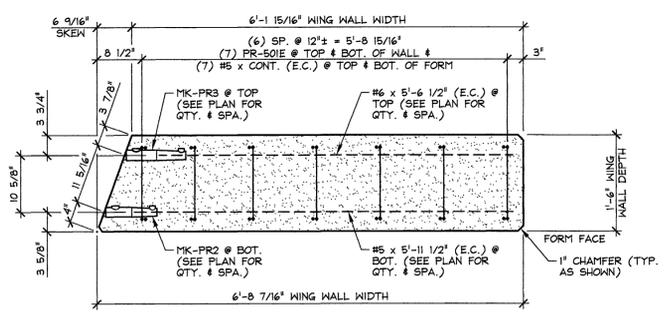
PLAN VIEW IN FORM - "PR-WW3"
1/2" = 1'-0"



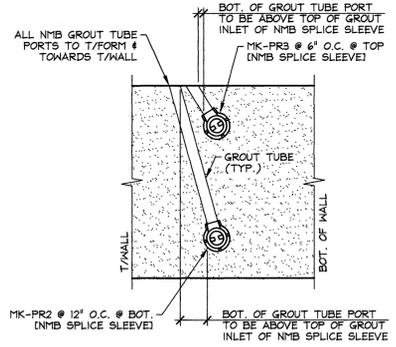
A WING WALL SIDE ELEVATION
3/4" = 1'-0"



B WING WALL SIDE ELEVATION
3/4" = 1'-0"



C WING WALL BOTTOM ELEVATION
3/4" = 1'-0"



DETAIL - "D"
3/4" = 1'-0"

MARK: PR-WW2	QTY.: 1	WT.: 6.94 T	VOL.: 3.42 cy
MARK: PR-WW3	QTY.: 1	WT.: 7.24 T	VOL.: 3.57 cy

MATERIAL LIST / WING WALL				
ITEM	MARK	DESCRIPTION	QTY./WALL	
			WW2	WW3
1	PR-501E	#5 BENT BAR (LEVEL 1, EPOXY COATED)	14	14
2		#5 x 5'-11 1/2" (LEVEL 1, EPOXY COATED)	10	10
3		#5 x 9'-0" (LEVEL 1, EPOXY COATED)	14	
4		#5 x 9'-4" (LEVEL 1, EPOXY COATED)		14
5				
6		#6 x 5'-6 1/2" (LEVEL 1, EPOXY COATED)	19	19
7				
8				
9				
10				
11	MK-PR2	NMB SPLICE SLEEVE 5U-X(PG) (EPOXY COATED)	10	10
12	MK-PR3	NMB SPLICE SLEEVE 6U-X(PG) (EPOXY COATED)	19	19
13	MK-PR4	4T x 5 1/2" SWIFT LIFT LIFTER	4	4
14	MK-PR5	8T x 13 3/8" SWIFT LIFT LIFTER	2	2
15				

APPROVAL STAMP:

J.P. CARRARA & SONS INC.
Precast & Prestress Manufacturer
2444 CASE STR., MIDDLEBURY, VERMONT 05753 Phone: (802)388-6361 Fax: (802)388-9010

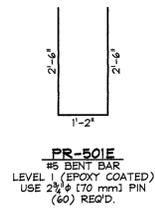
J.P. SICARD, INC.
CONTRACTOR
BARTON, VERMONT

STATE OF VERMONT AGENCY OF TRANSPORTATION
COUNTY OF ORANGE

TOWN OF RANDOLPH
TOWN HIGHWAY 65 (PALMER ROAD) CLASS 3 LOCAL ROAD
BRIDGE NO.: 35 PROJECT NO.: BRO 1444(57)

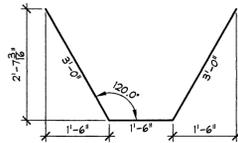
DATE: NOV. 18, 2014
SCALE: NOTED
CHKD: B.C. DFTM: B.L.
JOB NO: 23449-014

PRECAST WING WALL DETAILS
DWG. NO: WW2



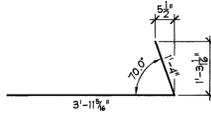
PR-501E
#5 BENT BAR
LEVEL 1 (EPOXY COATED)
USE 2 3/8" (70 mm) PIN
(60) REQ'D.

PRECAST WING WALLS

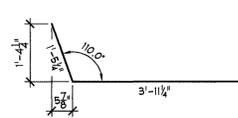


PR-601
#6 BENT BAR
LEVEL 1 (BLACK STEEL)
USE 4" (100 mm) PIN
(16) REQ'D.

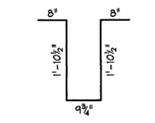
PRECAST ABUTMENTS



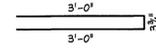
PR-602E
#6 BENT BAR
LEVEL 1 (EPOXY COATED)
USE 4" (100 mm) PIN
(38) REQ'D.



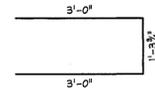
PR-603E
#6 BENT BAR
LEVEL 1 (EPOXY COATED)
USE 4" (100 mm) PIN
(38) REQ'D.



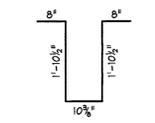
PR-401E
#4 BENT BAR
LEVEL 1 (EPOXY COATED)
USE 2 1/2" (50 mm) PIN
(188) REQ'D.



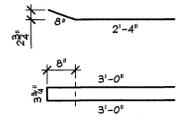
PR-402E
#4 BENT BAR
LEVEL 1 (EPOXY COATED)
USE 2 1/2" (50 mm) PIN
(158) REQ'D.



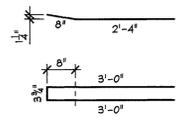
PR-403E
#4 BENT BAR
LEVEL 1 (EPOXY COATED)
USE 2 1/2" (50 mm) PIN
(32) REQ'D.



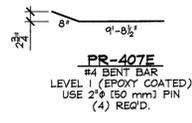
PR-404E
#4 BENT BAR
LEVEL 1 (EPOXY COATED)
USE 2 1/2" (50 mm) PIN
(88) REQ'D.



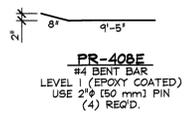
PR-405E
#4 BENT BAR
LEVEL 1 (EPOXY COATED)
USE 2 1/2" (50 mm) PIN
(42) REQ'D.



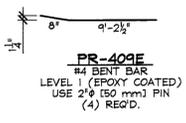
PR-406E
#4 BENT BAR
LEVEL 1 (EPOXY COATED)
USE 2 1/2" (50 mm) PIN
(4) REQ'D.



PR-407E
#4 BENT BAR
LEVEL 1 (EPOXY COATED)
USE 2 1/2" (50 mm) PIN
(4) REQ'D.

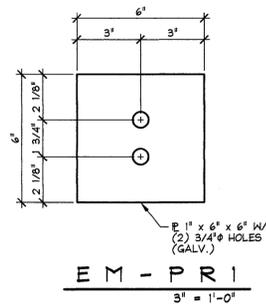


PR-408E
#4 BENT BAR
LEVEL 1 (EPOXY COATED)
USE 2 1/2" (50 mm) PIN
(4) REQ'D.



PR-409E
#4 BENT BAR
LEVEL 1 (EPOXY COATED)
USE 2 1/2" (50 mm) PIN
(4) REQ'D.

PRESTRESSED NEXT BEAMS



MISCELLANEOUS MATERIALS				
ITEM	MARK	QTY.	DESCRIPTION	REMARKS
1		20	#5 x 5'-11 1/2" (LEVEL 1, EPOXY COATED)	
2		20	#5 x 6'-2" (LEVEL 1, EPOXY COATED)	
3		46	#5 x 9'-0" (LEVEL 1, EPOXY COATED)	
4		14	#5 x 9'-4" (LEVEL 1, EPOXY COATED)	
5				
6		38	#6 x 5'-6 1/2" (LEVEL 1, EPOXY COATED)	
7		38	#6 x 6'-5" (LEVEL 1, EPOXY COATED)	
8				
9				
10				
11	MK-PR2	40	NMB SPLICE SLEEVE 5U-X(PG) (EPOXY COATED)	
12	MK-PR3	76	NMB SPLICE SLEEVE 6U-X(PG) (EPOXY COATED)	
13	MK-PR4	16	4T x 5 1/2" SWIFT LIFT LIFTER	
14	MK-PR5	8	8T x 13 3/8" SWIFT LIFT LIFTER	
15				
16	EM-PR1	24	E 1" x 6" x 6" W/ (2) 3/4" HOLES (GALV.)	FOR ERECTION; SEE DETAIL THIS SHEET
17		24	1/2" x 24" POLY-STRAND	FOR ERECTION
18		48	1/2" SINGLE USE STRESSING CHUCK	FOR ERECTION
19				
20		40	#5 x 2'-7"	
21		60	#5 x 6'-1"	
22		16	#5 x 8'-10"	
23				
24		56	#6 x 4'-3" (LEVEL 1, EPOXY COATED)	
25		50	#6 x 3'-7" (LEVEL 1, EPOXY COATED)	
26		60	#6 x 6'-1"	
27		28	#6 x 12'-4"	
28		28	#6 x 13'-5"	
29		16	#6 x 1'-7"	
30		16	#6 x 3'-8"	
31		8	#6 x 2'-9"	
32		8	#6 x 3'-2"	
33		16	#6 x 8'-10"	
34				
35		41.33 LF	P.V.C. WATERSTOP	SUPPLIED BY OTHERS
36		1	BRIDGE PLAQUE	SUPPLIED BY OTHERS
37		4	2'-0" x 7'-1" (NOM.) CORRUGATED STEEL SLEEVE	
38		4	2'-0" x 6'-11" (NOM.) CORRUGATED STEEL SLEEVE	
39		8	SET OF (4) 0.60" STRAND LIFTING LOOPS	
40				
41		40	#4 x 9'-6" (LEVEL 1, EPOXY COATED)	
42		8	#4 x 5'-0" (LEVEL 1, EPOXY COATED)	
43		92	#4 x 9'-9 1/2" (LEVEL 1, EPOXY COATED)	
44		20	#4 x 50'-10" (LEVEL 1, EPOXY COATED)	
45				
46		32	#5 x 4'-0" (LEVEL 1, EPOXY COATED)	
47		308	#5 x 8'-11" (LEVEL 1, EPOXY COATED)	
48		8	#5 x 8'-11 3/4" (LEVEL 1, EPOXY COATED)	
49		8	#5 x 9'-1" (LEVEL 1, EPOXY COATED)	
50		8	#5 x 9'-3" (LEVEL 1, EPOXY COATED)	
51		72	#5 x 9'-6" (LEVEL 1, EPOXY COATED)	
52		52	#5 x 55'-8" (LEVEL 1, EPOXY COATED)	
53				
54	MK-PR6	26	DAYTON 3/4" F-42 LOOP FERRULE INSERT	GALVANIZE
55		12	GUARD RAIL ANCHOR PLATE	SUPPLIED BY OTHERS
56		8	SET OF (4) 0.60" STRAND LIFTING LOOPS	
57				
58				
59				
60				

APPROVAL STAMP:	J.P. CARRARA & SONS INC. Precast & Prestress Manufacturer 2484 GISE ST., MIDDLEBURY, VERMONT 05753 Phone:(802)388-6361 Fax:(802)388-9010		J.P. SICARD, INC. CONTRACTOR BARTON, VERMONT	
	STATE OF VERMONT AGENCY OF TRANSPORTATION COUNTY OF ORANGE		DATE: NOV. 18, 2014	
	TOWN OF RANDOLPH TOWN HIGHWAY 65 (PALMER ROAD) CLASS 3 LOCAL ROAD BRIDGE NO.: 35 PROJECT NO.: BRO 1444(57)		SCALE: NOTED	
	MATERIALS LIST		CHKD: B.C. DFTM: B.L. JOB NO: 23449-014 DWG. NO: M1	

PRECAST WING WALLS
PRECAST ABUTMENTS
PRESTRESSED NEXT BEAMS



LIFTING LOOP/INSERT DESIGN CALCULATIONS
(WORK W/ CARTARA SHOP DRAWINGS)

MODIFIED NEXT BEAM ZED

$$f'_c = 6000 \text{ PSI} \quad f'_{cc} = 4800 \text{ PSI}$$

$$WT = 49.16^T$$

THERE ARE (4) LIFTING LOOP LOCATIONS

ASSUME 60° SLING ANGLE W/ THE HORIZONTAL

$$\text{DESIGN LOAD/LIFT LOOP LOCATION} = \frac{49.16 \times 2}{4 \times 0.866} = 28.3^k$$

FROM ATTACHED PCI LITERATURE

USE (4) 0.600" ϕ STRANDS LIFT LOOP, MIN EMBED 29"

$$SWL(4:1 \text{ S.F.}) = 1.1 \left(\frac{24 + 34}{2} \right) = 32^k > 28.3^k \text{ O.K.} \\ \text{(BY INTERPOLATION)}$$

WIND WALLS

$$f'_c = 5000 \text{ PSI} \quad f'_{cc} = 3500 \text{ PSI}$$

$$WT \text{ OF HEAVIEST WINDWALL} = 7.65^T$$

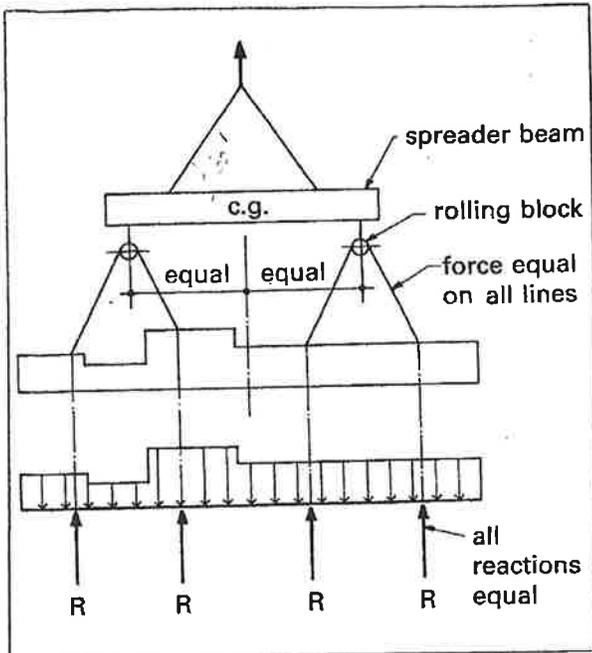
FOR STRIPPING USE (4) $4^T \times 5\frac{1}{2}^T$ S.L. $f'_{cc} = 3500 \text{ PSI}$

$$\text{LOAD/LIFT} = \frac{7.65 \times 2}{4} = 3.8^k$$

FROM ATTACHED PRODUCT LITERATURE

$$SWL(4:1 \text{ S.F.}) = 7400 \text{ LB} > 3.8^k, \text{ O.K.}$$

Fig. 5.2.10 Arrangement for equalizing lifting loads



lines equal. The member can then be analyzed as a beam with varying load supported by equal reactions.

The force in inclined lift lines can be determined from Fig. 5.2.7.

5.2.8 Handling devices

The most common lifting devices are prestressing strand or cable loops projecting from the concrete, threaded inserts, or special proprietary devices.

Since lifting devices are subject to dynamic loads, ductility of the material is part of the design requirement. Deformed reinforcing bars should not be used since the deformations result in stress concentrations from the shackle pin. Also, reinforcing bars are often hard-grade or re-rolled rail steel with little ductility and low impact strength at cold temperatures. Smooth bars of a known steel grade may be used if adequate embedment or mechanical anchorage is provided. The diameter must be such that localized failure will not occur by bearing on the shackle pin.

Prestressing strand is often used for lifting loops. The variables involved make it almost impossible to calculate a capacity which can be used for all situations. Generally, producers will establish standard criteria for use in handling the standard products manufactured by that plant. Table 5.2.3 is an example which has been used successfully.

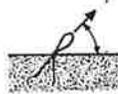
Reduced capacities for shorter embedment lengths may be suitable. In shallow products, providing a 90° bend can reduce the required embedment length significantly. Lightly rusted strand has better bond than bright strand.

The diameter of the bend of the loop should be at least 4 in. For smaller diameters, the loop capacities in Table 5.2.3 should be reduced to:

- 1 in. dia. — 70 %
- 2 in. dia. — 85 %
- 3 in. dia. — 90 %

The angle of incline of lifting has little effect on the strand lifting loop capacity if the angle from the horizontal is more than about 20°. Typical handling methods are usually such that this angle is no less than 60°.

Table 5.2.3 Capacity of 1/2 in. diameter, 270 ksi strands used as lifting loops

Lifting angle	Embedment length (in.)	Single loop (kips)	Double loop (kips)	Triple loop (kips)
45 degrees 	16	5	8.5	11.5
	22	8	13	17.5
	28	10	18	23
	34	11	23	29
Vertical 	16	7.5	12.5	16.5
	22	11.5	19	24.5
	28	15.5	25.5	33
	34	16	32.5	41

1. These values are limited by slippage rather than strand strength, with a factor of safety of 4. For other strand diameters, multiply table values by 0.75 for 3/8 in. diameter, 0.85 for 7/16 in. diameter, and 1.1 for 0.6 in. diameter.
2. Minimum $f'_c = 3000$ psi.
3. Multiple strand loops must be fabricated to ensure equal force on each strand.

P-52 Swift Lift® Anchor Tensile and Shear Capacity

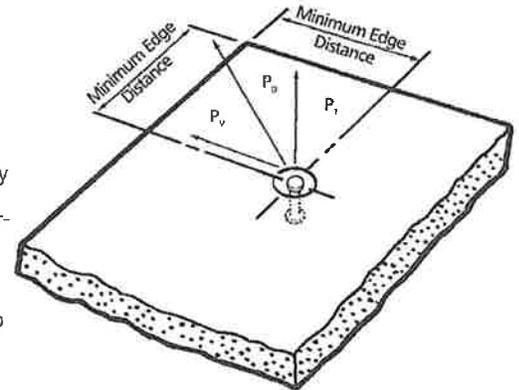
When anchors are used in the face of thin concrete elements

The following table lists the P-52 Swift Lift Anchors that are currently manufactured. Other sizes and lengths are available on special order. However, the sizes and lengths shown will handle the majority of flat precast concrete elements.

When the P-52 Swift Lift Anchor is properly embedded in normal weight concrete, the tabulated working loads are applicable for any direction of load. This applies even if the direction of load is parallel to the axis of the anchor, perpendicular to it or at any other angle.

Minimum distance between anchors is twice the minimum edge distance.

It is critical to remember that in order to obtain the safe working loads listed in the table below, the normal weight concrete must have obtained the minimum concrete strength shown, prior to initial load application.



Swift Lift Anchor Ton x Length	Safe Working Load	Minimum Concrete Strength	Minimum Edge Distance
1 ton x 2-5/8"	1,700 lbs.	3,500 psi	8"
1 ton x 3-3/8"	2,000 lbs.	2,200 psi	10"
1 ton x 4-3/8"	2,000 lbs.	1,600 psi	10"
1 ton x 8"	2,000 lbs.	1,600 psi	10"
1 ton x 9-1/2"	2,000 lbs.	1,600 psi	10"
2 ton x 2-3/4"	2,100 lbs.	3,500 psi	8"
2 ton x 3-3/8"	2,900 lbs.	3,500 psi	10"
2 ton x 5-1/2"	4,000 lbs.	1,600 psi	13"
2 ton x 6"	4,000 lbs.	1,600 psi	13"
2 ton x 6-3/4"	4,000 lbs.	1,600 psi	13"
2 ton x 11"	4,000 lbs.	1,600 psi	14"
4 ton x 3-3/4"	4,000 lbs.	3,500 psi	12"
4 ton x 4-1/4"	4,900 lbs.	3,500 psi	13"
4 ton x 4-3/4"	5,800 lbs.	3,500 psi	14"
4 ton x 5-1/2"	7,400 lbs.	3,500 psi	17"
4 ton x 5-3/4"	7,900 lbs.	3,500 psi	17"
4 ton x 7-1/8"	8,000 lbs.	1,800 psi	20"
4 ton x 9-1/2"	8,000 lbs.	1,600 psi	17"
4 ton x 14"	8,000 lbs.	1,600 psi	18"
4 ton x 19"	8,000 lbs.	1,600 psi	20"
8 ton x 4-3/4"	6,400 lbs.	3,500 psi	16"
8 ton x 6-3/4"	11,200 lbs.	3,500 psi	21"
8 ton x 10"	16,000 lbs.	3,500 psi	19"
8 ton x 13-3/8"	16,000 lbs.	1,600 psi	23"
8 ton x 26-3/4"	16,000 lbs.	1,600 psi	27"
20 ton x 10"	25,000 lbs.	3,500 psi	24"
20 ton x 19-3/4"	40,000 lbs.	3,500 psi	31"

*0.16 W/EDGE DISTANCE USED
ADJUSTED CODE 12
N 2 x 5/8 = 11"*

Safe Working Loads provide a factor of safety of approximately 4 to 1 in normal weight concrete. Safe Working Load is based on anchor setback from face of concrete "X" dimension, as shown on page 26.

FOR ERECTORS USE $(2) 8^T \times 13 \frac{3}{4} S.L.$ $f_y = 5000 \text{ psi}$

$$\text{SHORTEL LOAD/LIFTER} = \frac{7.65 \times 2}{2 \times 2} = 3.82^k \quad (\text{PARALLEL TO FLAT POSITION})$$

$d_c = 9"$ ϕ . ASSUME LIFTER IS LIKE STUD

FROM FIG 8.15.8, ATTACHMENT

$$\phi V_c = \phi V_c C_w C_f C_c$$

$$\phi V_c = 0.85 \times 12.15 \times 9^{1.5} \sqrt{\frac{5000}{1000}} = 20.3^k$$

$$C_w = C_f = C_c = 1.0$$

$$\phi V_c = 20.3 \times 1.0 \times 1.0 \times 1.0 = 20.3^k$$

FOR 4:1 S.F.

$$SWL = \frac{20.3}{4} = 5.1^k > 3.82^k \quad \text{O.K.}$$

USE $8^T \times 13 \frac{3}{4} S.L.$

$$\text{TENSION LOAD/LIFTER} = \frac{7.65 \times 2}{2} = 7.65^k \quad (\text{PARALLEL TO VERTICAL})$$

FROM ATTACHMENT PRODUCT LITERATURE

$$SWL (4:1 S.F.) = 10.2^k > 7.65^k, \text{ O.K.}$$

USE $8^T \times 13 \frac{3}{4} S.L.$

LOCATE ALL LIFTERS SYMMETRICALLY ABOUT CG OF PANEL.

Figure 6.15.8 Shear strength of welded headed studs

I—Design shear strength limited by concrete:

$$\phi V_c = \phi V'_c C_w C_t C_c \quad (\text{Eq. 6.5.7})$$

where:

$$\phi V'_c = \phi 12.5 d_e^{1.5} \lambda \sqrt{f'_c} \quad (\text{Eq. 6.5.8})$$

$$C_w = \left(1 + \frac{b}{3.5 d_e} \right) \leq n_s$$

$$C_t = \frac{h}{1.3 d_e} \leq 1.0$$

$$C_c = \left[0.4 + 0.7 \left(\frac{d_c}{d_e} \right) \right] \leq 1.0$$

Table A gives values for $\phi = 0.85$

Where: n_s = number of studs in back row; see figure for notation

II—Design shear strength limited by steel:

$$\phi V_y = (31,800 d_b^2) n \quad (\text{Eq. 6.5.12a})$$

Table B gives value for $n = 1, \phi = 0.9$

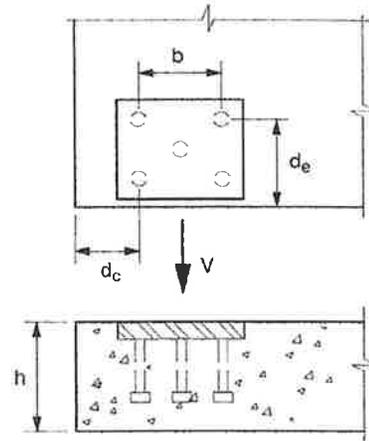


Table A— $\phi V'_c$, kips

f'_c , psi	λ	4000		5000		6000		7000		8000	
		1.0	0.85	1.0	0.85	1.0	0.85	1.0	0.85	1.0	0.85
2		1.90	1.62	2.12	1.81	2.33	1.98	2.51	2.14	2.69	2.29
3		3.49	2.97	3.90	3.31	4.26	3.63	4.62	3.82	4.94	4.20
4		5.38	4.57	6.00	5.11	6.58	5.59	7.11	6.04	7.60	6.46
5		7.51	6.38	8.39	7.14	9.19	7.82	9.94	8.45	10.62	9.03
6		9.88	8.40	11.04	9.39	12.09	10.29	13.08	11.11	13.97	11.87
7		12.45	10.58	13.91	11.82	15.24	12.95	16.46	13.99	17.60	14.96
8		15.20	12.82	16.99	14.44	18.61	15.81	20.12	17.08	21.50	18.27
9		18.14	15.44	20.28	17.24	22.21	18.88	23.99	20.40	25.65	21.80
10		21.25	18.06	23.75	20.18	26.01	22.11	28.11	23.88	30.04	25.53
11		24.52	20.84	27.41	23.30	30.03	25.52	32.43	27.57	34.67	29.47
12		27.94	23.74	31.22	26.53	34.20	29.07	36.94	31.40	39.49	33.67

Table B— ϕV_y , kips

Diameter, in.	1/4	3/8	1/2	5/8	3/4	7/8
ϕV_y	2.0	4.5	8.0	12.4	17.9	24.4

Swift Lift® Anchor Effective Tensile Capacity in Thin Walls

Swift Lift Anchor Tons x Length	Effective Wall Thickness 2de	Actual Edge Distance de	Tensile Safe Working Load Per Anchor				
			Actual Corner Distance				
			12"	18"	24"	36"	45"
8 Tons x 10-3/8" Long	4-3/4"	2-3/8"	4,000 lbs.	4,800 lbs.	5,400 lbs.	6,000 lbs.	6,100 lbs.
	5"	2-1/2"	4,200 lbs.	5,100 lbs.	5,700 lbs.	6,300 lbs.	6,400 lbs.
	6"	3"	5,100 lbs.	6,100 lbs.	6,800 lbs.	7,500 lbs.	7,600 lbs.
	7"	3-1/2"	5,900 lbs.	7,100 lbs.	8,000 lbs.	8,800 lbs.	8,900 lbs.
	8"	4"	6,800 lbs.	8,100 lbs.	9,100 lbs.	10,100 lbs.	10,200 lbs.
	10"	5"	8,500 lbs.	10,200 lbs.	11,400 lbs.	12,600 lbs.	12,700 lbs.
	12"	6"	10,200 lbs.	12,200 lbs.	13,700 lbs.	15,100 lbs.	15,200 lbs.
8 Tons x 12-1/4" Long	4-3/4"	2-3/8"	5,800 lbs.	7,000 lbs.	8,000 lbs.	9,600 lbs.	11,200 lbs.
	5"	2-1/2"	6,100 lbs.	7,400 lbs.	8,500 lbs.	10,100 lbs.	11,800 lbs.
	6"	3"	7,300 lbs.	8,900 lbs.	9,500 lbs.	12,100 lbs.	14,100 lbs.
	7"	3-1/2"	8,500 lbs.	10,300 lbs.	11,800 lbs.	14,200 lbs.	16,000 lbs.
	8"	4"	9,700 lbs.	11,800 lbs.	13,500 lbs.	16,000 lbs.	16,000 lbs.
	10"	5"	12,100 lbs.	14,800 lbs.	16,000 lbs.	16,000 lbs.	16,000 lbs.
	12"	6"	14,500 lbs.	16,000 lbs.	16,000 lbs.	16,000 lbs.	16,000 lbs.

Safe Working Load provides a factor of safety of approximately 4 to 1 in 4,500 psi normal weight concrete.

Swift Lift Anchor Tons x Length	Effective Wall Thickness 2de	Actual Edge Distance de	Tensile Safe Working Load Per Anchor				
			Actual Corner Distance				
			10"	16"	24"	30"	42"
10 Tons x 12-3/4" Long	6-1/2"	3-1/4"	6,200 lbs.	7,500 lbs.	9,400 lbs.	10,300 lbs.	11,500 lbs.
	7"	3-1/2"	6,700 lbs.	8,100 lbs.	10,100 lbs.	11,100 lbs.	12,400 lbs.
	8"	4"	7,600 lbs.	8,900 lbs.	11,500 lbs.	12,600 lbs.	14,200 lbs.
	10"	5"	9,500 lbs.	11,600 lbs.	14,400 lbs.	15,800 lbs.	17,700 lbs.
	12"	6"	11,500 lbs.	14,000 lbs.	17,300 lbs.	19,000 lbs.	22,000 lbs.
	14"	7"	13,400 lbs.	16,300 lbs.	20,100 lbs.	22,100 lbs.	24,800 lbs.

Safe Working Load provides a factor of safety of approximately 4 to 1 in 4,500 psi normal weight concrete.

To determine the safe working load when the anchor is used in a lower strength concrete, multiply the published Safe Working Load by the following reduction factors:

Concrete Strength	Reduction Factor
2,000 psi	.66
2,500 psi	.74
3,000 psi	.81
3,500 psi	.88
4,000 psi	.94
4,500 psi	1.00

ABUTMENTS

WT OF ABUTMENT: PR-ABI = 23^T; OTHER SIM

THERE IS ONE LIFT LOOP @ CG OF PANEL

$$\text{DESIGN LOAD / LIFT LOOP} = 23 \times 2 = 46^{\text{K}}$$

FROM ATTACHED PRODUCT LITERATURE

USE 4 #600⁴ STRANDS LIFT LOOP, MIN EMBEDMENT

$$= 6 \frac{1}{2}''$$

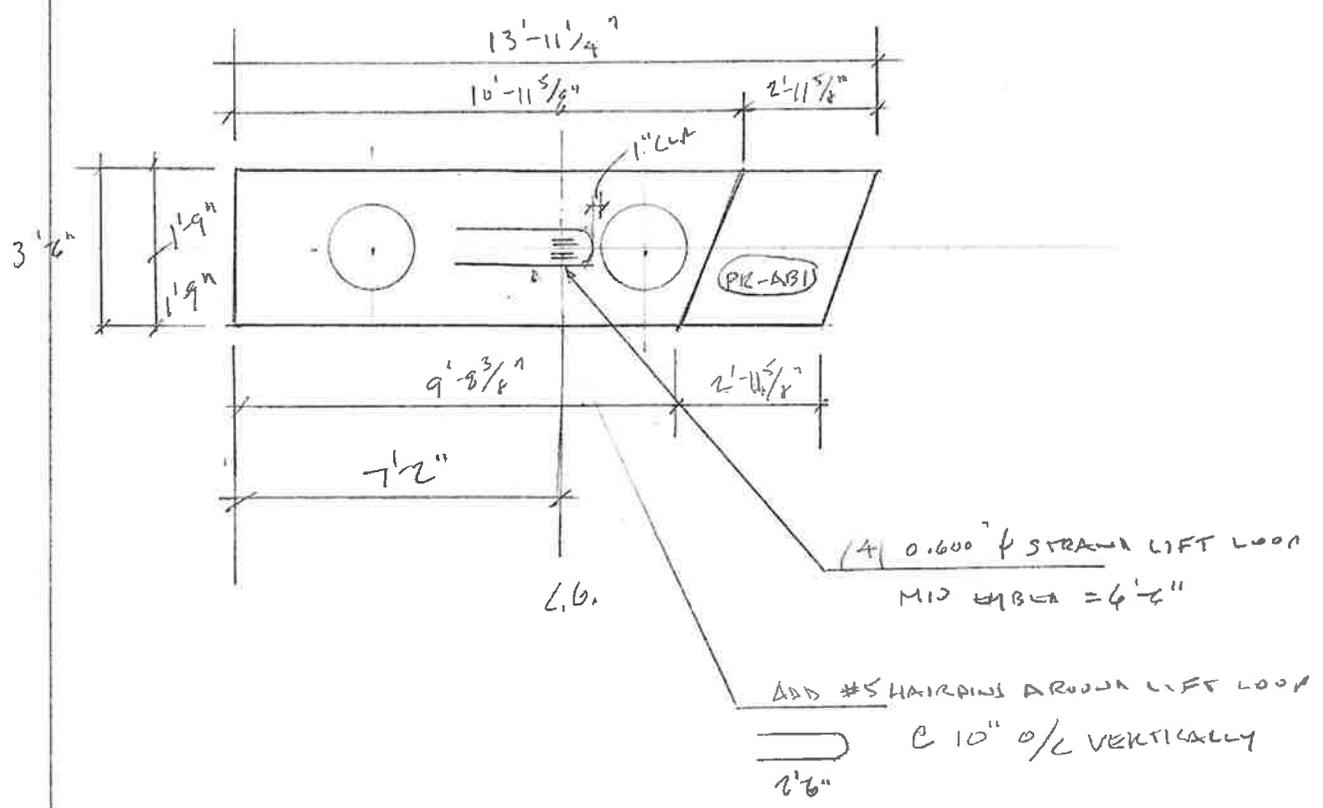
$$SWL = 111 \times 41^{\text{K}} = 45.1^{\text{K}} \approx 46^{\text{K}} \text{ - O.K. (WITH ACCOUNT)}$$

AS (4) STRANDS ARE USED INSTEAD OF THREE

∅ $f'_{LL} = 3500 \text{ PSI} > 3000 \text{ PSI}$ SHOWN IN TABLE.
(ALSO $f'_c = 5000 \text{ PSI}$ @ CIRCULAR)

SEE ATTACHED SKETCH

PLAN VIEW OF PR-AB1, OTHERS SIM
X4 037



J.P. CARRARA & SONS, INC.

ERNEST J. BRON

12-12-14

RANDOLPH BRIDGE

JPC # 22999-014

LIFELINE LOCATIONS FOR ALTERNATE HANDLING METHOD

WT 23T

