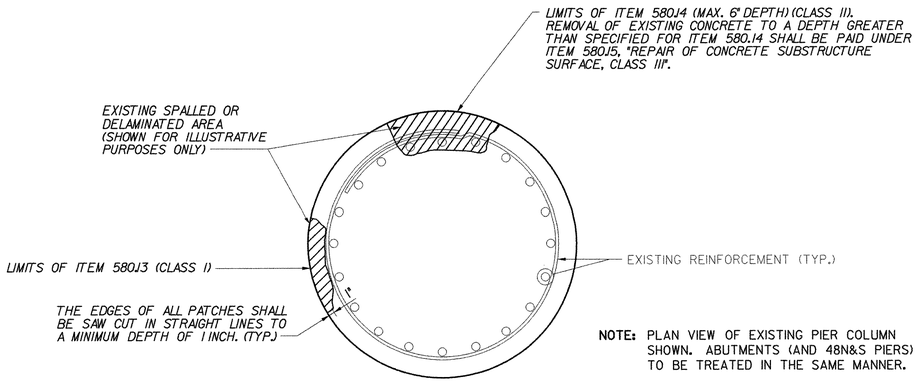


NOTE: PLAN VIEW OF EXISTING PIER COLUMN SHOWN. ABUTMENTS (AND 48N&S PIERS) TO BE TREATED IN THE SAME MANNER.

CONCRETE REPAIR DETAIL

SCALE: 1" = 1'-0"

SUBSTRUCTURE REPAIR NOTES:

1. COLUMNS, ABUTMENTS, AND 48N&S PIERS SHALL BE REPAIRED USING THE FOLLOWING ITEMS:
   - 580.13 REPAIR OF CONCRETE SUBSTRUCTURE SURFACE, CLASS I
   - 580.14 REPAIR OF CONCRETE SUBSTRUCTURE SURFACE, CLASS II
   - 580.15 REPAIR OF CONCRETE SUBSTRUCTURE SURFACE, CLASS III

2. THIS WORK SHALL INCLUDE REMOVAL AND DISPOSAL OF UNSOUND AND DELAMINATED CONCRETE FROM ALL ABUTMENTS AND PIERS AS DIRECTED BY THE ENGINEER. THE PREPARED SURFACES SHALL BE THOROUGHLY BLASTED TO REMOVE ALL LOOSE MATERIAL AND ANY CONTAMINANTS OR EFFLORESCENCE. THE REINFORCING STEEL (IF EXPOSED) SHALL BE BLASTED. THE MATERIAL USED TO FILL A PATCH SHALL BE PLACED AND FINISHED OR FORMED SO THAT THE FINAL SURFACE WILL HAVE THE SAME SCORE MARKS AND EXTERIOR FACE APPEARANCE AS THE ORIGINAL SURFACES BEING REPAIRED. THE SURFACE SHALL BE THOROUGHLY WETTED PRIOR TO PLACEMENT OF PATCHING MATERIAL OR NEW CONCRETE. IMMEDIATELY PRIOR TO PLACEMENT, THE SURFACE SHALL BE COATED WITH NEAT CEMENT PASTE, MIXED TO THE CONSISTENCY OF THICK LATEX PAINT (THOROUGHLY BRUSHED INTO THE SURFACE). WHEN "OVERHEAD AND VERTICAL CONCRETE REPAIR MATERIAL" CONFORMING WITH SUPPLEMENTAL SPECIFICATION 780.02 IS USED, THE BONDING AGENT (IF ANY REQUIRED) AND ITS APPLICATION PROCEDURE SHALL COMPLY WITH THE REQUIREMENTS OF THE PATCHING MATERIAL MANUFACTURER. PAYMENT FOR BONDING AGENT SHALL BE INCIDENTAL TO ITEM 580.13, 580.14, OR 580.15.

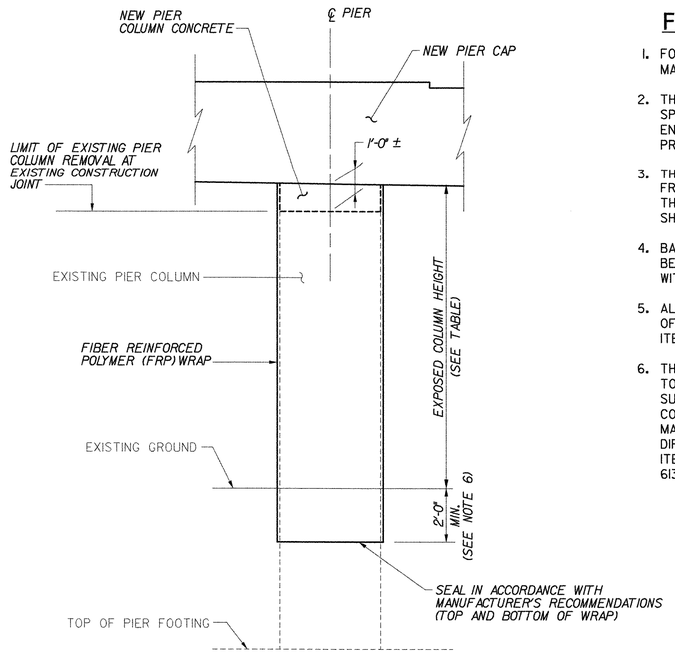
3. THE LIMITS FOR REMOVAL OF CONCRETE UNDER ITEM 580.13, "REPAIR OF CONCRETE SUBSTRUCTURE SURFACE, CLASS I" SHALL BE FROM THE EXISTING CONCRETE SURFACE TO A MAXIMUM DEPTH OF THE OUTSIDE FACE OF THE REINFORCING STEEL. ALL WORK AND MATERIALS NECESSARY FOR PREPARING A PATCH AND FILLING IT SHALL BE INCLUDED IN THE BID PRICE FOR ITEM 580.13. THE FILLING MATERIAL SHALL BE "OVERHEAD AND VERTICAL CONCRETE REPAIR MATERIAL" CONFORMING WITH SUPPLEMENTAL SPECIFICATION 780.02. THE EDGES OF ALL PATCHES SHALL BE SAW CUT IN STRAIGHT LINES TO A MINIMUM DEPTH OF 1 INCH. IF MORE THAN 1/4 OF THE REBAR IS EXPOSED OR THE BOND BETWEEN THE REBAR AND THE CONCRETE IS BROKEN, THEN PROCEED TO ITEM 580.14.

4. FOR CONCRETE NOT TO BE WRAPPED, THE LIMITS FOR REMOVAL OF CONCRETE UNDER ITEM 580.14, "REPAIR OF CONCRETE SUBSTRUCTURE SURFACE, CLASS II" SHALL BE FROM THE EXISTING CONCRETE SURFACE TO A MINIMUM DEPTH OF 3/4" ± 1/4" INSIDE THE INSIDE FACE OF REINFORCING STEEL AND TO A MAXIMUM DEPTH OF 6" FROM THE EXISTING CONCRETE SURFACE. ALL WORK AND MATERIALS NECESSARY FOR PREPARING A PATCH AND FILLING SHALL BE INCLUDED IN THE BID PRICE FOR ITEM 580.14. THE FILLING MATERIAL MAY BE EITHER "OVERHEAD AND VERTICAL CONCRETE REPAIR MATERIAL" CONFORMING WITH SUPPLEMENTAL SPECIFICATION 780.02, "CONCRETE CLASS AA" OR AN ACCEPTABLE PNEUMATICALLY APPLIED CONCRETE (SEE SPECIAL PROVISIONS). THE EDGES OF ALL PATCHES SHALL BE SAW CUT IN STRAIGHT LINES TO A MINIMUM DEPTH OF 1 INCH.

5. FOR CONCRETE TO BE WRAPPED, THE LIMITS FOR REMOVAL OF CONCRETE UNDER ITEM 580.14, "REPAIR OF CONCRETE SUBSTRUCTURE SURFACE, CLASS II" SHALL BE FROM THE EXISTING CONCRETE SURFACE TO A MINIMUM DEPTH OF THE OUTSIDE FACE OF THE REINFORCING STEEL AND TO A MAXIMUM DEPTH OF 6" FROM THE EXISTING CONCRETE SURFACE. MINIMUM DEPTH OF 3/4" INSIDE THE INSIDE FACE OF REINFORCING STEEL IS NOT REQUIRED, AS LONG AS ALL UNSOUND CONCRETE IS REMOVED. ALL WORK AND MATERIALS NECESSARY FOR PREPARING A PATCH AND FILLING SHALL BE INCLUDED IN THE BID PRICE FOR ITEM 580.14. THE FILLING MATERIAL MAY BE EITHER "OVERHEAD AND VERTICAL CONCRETE REPAIR MATERIAL" CONFORMING WITH SUPPLEMENTAL SPECIFICATION 780.02, "CONCRETE CLASS AA" OR AN ACCEPTABLE PNEUMATICALLY APPLIED CONCRETE (SEE SPECIAL PROVISIONS). THE EDGES OF ALL PATCHES SHALL BE SAW CUT IN STRAIGHT LINES TO A MINIMUM DEPTH OF 1 INCH.

6. THE LIMITS FOR REMOVAL OF CONCRETE UNDER THE ITEM 580.15, "REPAIR OF CONCRETE SUBSTRUCTURE SURFACE, CLASS III" SHALL BE FROM THE EXISTING CONCRETE SURFACE TO A DEPTH OF GREATER THAN 6". ALL WORK AND MATERIALS NECESSARY FOR PREPARING A PATCH AND FILLING IT SHALL BE INCLUDED IN THE BID PRICE FOR ITEM 580.15. THE FILLING MATERIAL MAY BE EITHER "CONCRETE CLASS AA, CLASS A, CLASS B" OR AN ACCEPTABLE PNEUMATICALLY APPLIED CONCRETE (SEE SPECIAL PROVISIONS). THE EDGES OF ALL PATCHES SHALL BE SAW CUT IN STRAIGHT LINES TO A MINIMUM DEPTH OF 1 INCH.

7. IF PNEUMATICALLY APPLIED CONCRETE IS SELECTED FOR REPAIR OF CONCRETE SUBSTRUCTURE SURFACE, CLASS II OR III, THEN THIS TYPE OF CONCRETE REPAIR SHALL BE CONFINED ONLY TO VERTICAL AND OVERHEAD SURFACES OF THE SUBSTRUCTURE. ALSO, THE BRIDGE BEARINGS AND BEAMS SHALL BE COMPLETELY PROTECTED FROM REBOUND MATERIAL DURING SHOTCRETE APPLICATION PROCEDURES.



FRP COLUMN WRAP DETAIL

SCALE: 3/8" = 1'-0"

FRP COLUMN WRAP NOTES:

1. FOLLOWING REPAIR OF COLUMNS, ALLOW CURING OF CONCRETE REPAIR MATERIAL FOR 28 DAYS MINIMUM PRIOR TO WRAPPING.

2. THE CONTRACTOR SHALL SUBMIT FRP COLUMN WRAP DATA FROM THE SPECIFIC MANUFACTURER AND INSTALLATION PROCEDURES TO THE ENGINEER FOR APPROVAL, IN ACCORDANCE WITH THE SPECIAL PROVISIONS.

3. THE CONTRACTOR SHALL APPLY A U.V. PROTECTIVE COATING ON THE FRP WRAP FOLLOWING CURING OF THE WRAP IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. THE COATING COLOR SHALL BE A NATURAL CONCRETE GREY, AS APPROVED BY THE ENGINEER.

4. BACKFILL OF EXISTING GROUND AT THE BASE OF THE COLUMNS SHALL BE ACCOMPLISHED AFTER THE COATING HAS CURED, IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

5. ALL COSTS ASSOCIATED WITH WRAPPING COLUMNS, WITH THE EXCEPTION OF CONCRETE REPAIRS, SHALL BE INCLUDED IN THE BID PRICE FOR ITEM 580.40 "FIBER REINFORCED POLYMER WRAP."

6. THE DEPTH OF FRP WRAP SHOWN IS BELOW EXISTING GROUND, NOT BELOW TOP OF STONE FILL. ANY STONE FILL DISTURBED TO ALLOW REPAIR OF SUBSTRUCTURES OR WRAPPING OF PIERS SHALL BE REPLACED TO ITS ORIGINAL CONDITION AS DIRECTED BY THE ENGINEER. THE MINIMUM DEPTH OF FRP WRAP MAY BE INCREASED DUE TO REQUIRED LIMITS OF CONCRETE REPAIR, AS DIRECTED BY THE ENGINEER. REQUIRED EXCAVATION SHALL BE PAID FOR UNDER ITEM 204.25. REQUIRED BACKFILL SHALL BE PROVIDED UNDER ITEMS 204.30, 613.10, 613.11, OR 613.13, AS DIRECTED BY THE ENGINEER AT EACH PIER LOCATION.

BRIDGE	PIER	COLUMNS TO BE WRAPPED	AVERAGE EXPOSED COLUMN HEIGHT (APPROXIMATE)
43N	1	ALL	12'-9"
	2	ALL	9'-6"
43S	1	ALL	12'-9"
	2	ALL	8'-3"
51N	1	1, 2	19'-0"
	2	PIER TO BE REPLACED	-
	3	1, 3, 4	14'-10"
	4	1, 2	12'-2"
51S	1	1, 2, 3	19'-11"
	2	1, 2	19'-1"
	3	PIER TO BE REPLACED	-
	4	1, 2	16'-6"
	5	NONE	14'-5"

* COLUMNS ARE NUMBERED LEFT TO RIGHT LOOKING UPSTATION

STATE OF VERMONT
AGENCY OF TRANSPORTATION

Town Of BOLTON	Bridge No.
Highway No. I-89	Log Sta. / Surv. Sta.

SUBSTRUCTURE REPAIR DETAILS AND NOTES

Designed By P.W. SZUSTAK	Drawn By R.A. BOTZENHART
Checked By J.P. HALSTEAD Date 10/99	Bridge Design Supervisor J.P. HALSTEAD Date 10/99
PROJECT BOLTON	PROJECT NO. IM-089-2(29)
TVGA CAD Drawing No. subrprdt	Date 10/99
Bridge Sheet No. C-45	Sheet 45 of 307

TVGA ENGINEERING, SURVEYING, P.C.