GENERAL NOTES:

1. THE PLANS ARE INTENDED TO BE DRAWN TO SCALE. HOWEVER, IF A CRITICAL DIMENSION IS NOT PROVIDED, WHITE MOUNTAIN PRECAST, LLC SHOULD BE CONTACTED FOR VERIFICATION.

2. IF ANY OF THE WORK TO BE DONE AS SHOWN ON THE DRAWINGS DOES NOT CORRESPOND WITH THE EXISTING FIELD CONDITIONS, CONTACT THE ENGINEER PRIOR TO PROCEEDING WITH THE WORK IN QUESTION.

3. FIELD–VERIFY ALL ELEVATIONS PRIOR TO THE START OF CONSTRUCTION. IF THERE ARE ANY DISCREPANCIES, CONSULT THE ENGINEER PRIOR TO PROCEEDING WITH THE WORK IN QUESTION.

4. MAINTAIN MINIMUM 60 DEGREE SLING ANGLE WHEN HANDLING PRECAST COMPONENTS.

5. PRECAST COMPONENTS SHALL REACH A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI PRIOR TO STRIPPING, AND HANDLING, THEN THE MINIMUM DESIGN COMPRESSIVE STRENGTH PRIOR TO SHIPPING, UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

6. ALL HORIZONTAL JOINTS AND VOIDS SHALL BE FILLED WITH NON–SHRINK GROUT. VERTICAL SURFACE GAPS BETWEEN UNITS TO BE FILLED WITH FIVE STAR STRUCTURAL CONCRETE V/0 (VERTICAL/OVERHEAD PERMANENT REPAIR).

7. ALL EXPOSED EDGES TO BE CHAMFERED ¾" UNLESS OTHERWISE NOTED. ALL EXPOSED SURFACES SHOULD BE COATED IN THE FIELD WITH AN OWNER–APPROVED WATER REPELLANT (SUPPLIED AND APPLIED BY OTHERS).

8. SHOP DRAWINGS WERE DEVELOPED USING THE FOLLOWING RESOURCES:
- STATE OF VERMONT AGENCY OF TRANSPORTATION PLANS FOR TOWN OF RICHMOND, COUNTY OF CHITTENDEN, ROUTE No. US 2, RURAL MAJOR COLLECTOR, BRIDGE #32, APPROVED 9/8/2016.
- VAOT STANDARD SPECIFICATION FOR CONSTRUCTION, 2011, SECTION 540.

9. IF THERE IS ADDITIONAL INFORMATION PERTINENT TO THE FABRICATION AND INSTALLATION OF THESE UNITS THAT IS NOT CONTAINED WITHIN THE RESOURCES LISTED ABOVE IT SHALL BE BROUGHT TO THE ATTENTION OF WHITE MOUNTAIN PRECAST, LLC. FAILURE TO MAKE SUCH ADDITIONAL INFORMATION AVAILABLE SHALL RELIEVE WHITE MOUNTAIN PRECAST, LLC OF ALL LIABILITIES ARISING FROM ERRORS OR OMISSIONS RELATED TO THE OMITTED INFORMATION.

THREE SIDED RIGID FRAME NOTES:

1. THREE SIDED RIGID FRAME SECTIONS ARE DESIGNED IN ACCORDANCE WITH
- AASHTO "LRFD BRIDGE DESIGN SPECIFICATIONS", 6TH EDITION.
- VTDOT "SPECIFICATIONS FOR CONSTRUCTION, DATED 2011"

2. THE FOLLOWING CRITERIA WAS USED FOR DESIGN:
- LIVE LOAD: AASHTO HL–93
- EARTH COVER: 1.99' MAX. (NO EARTH FILL ACTUAL – DESIGN ACCOUNTS FOR ASPHALT/FUTURE WEARING)
- BACKFILL SOIL UNIT WEIGHT: 140 PCF
- MINIMUM LATERAL EARTH PRESSURE: 30PSF
- MAXIMUM LATERAL EARTH PRESSURE: 60 PSF
- CONCRETE STRENGTH: 6,500 PSI
- STEEL YIELD STRENGTH: 60,000 PSI
- MINIMUM STRIPPING/HANDLING STRENGTH: 3,000 PSI

3. RIGID FRAME CONCRETE SHALL BE SELF–CONSOLIDATING CONFORMING TO ASTM C260 WITH A MINIMUM 28–DAY COMPRESSIVE STRENGTH OF 6,500 PSI. AGGREGATE SHALL CONFORM TO ASTM C–33 AND VTRANS SECTION 540.02, WITH A MAXIMUM DIAMETER OF 3/4". CEMENT SHALL CONFORM TO ASTM C150.

4. REINFORCING SHALL BE GRADE 60 DEFORMED EPOXY BARS CONFORMING TO ASTM A775 AND VTRANS SECTION 507 & CURRENT SP'S. ALL BARS SHALL BE BENT COLD.

5. RIGID FRAME UNITS TO BE STORED UPRIGHT WITHOUT DUNNAGE. UNITS TO BE SHIPPED ON SIDE WITHOUT DUNNAGE.

6. BACKFILL MATERIAL SHALL CONFORM TO VTRANS SECTION 704.08 GRANULAR BACKFILL FOR STRUCTURES. PLACEMENT SHALL CONFORM TO VTRANS SECTION 204.08.

7. EACH SECTION SHALL BE CONNECTED WITH A C.I.P. CLOSURE POUR, BY OTHERS. SEE DETAILS IN DRAWING SET FOR ADDITIONAL INFORMATION. CLOSED–CELL NEOPRENE JOINT SEALANT SHALL BE USED IN ALL JOINTS UNLESS NOTED OTHERWISE.

Yes, item # specifies 5ksi, but design was submitted for 4ksi. Discussed with PM and this is ok.

540.05(e) = 5 ksi minimum 28 day compressive strength

PRECAST CONCRETE PILE CAP NOTES:

1. FOOTING SECTIONS ARE DESIGNED IN ACCORDANCE WITH
- AASHTO "LRFD BRIDGE DESIGN SPECIFICATIONS", 6TH EDITION.
- VTRANS "SPECIFICATIONS FOR CONSTRUCTION" DATED 2011.

2. THE FOLLOWING CRITERIA WAS USED FOR DESIGN:
- BACKFILL SOIL UNIT WEIGHT: 140 PCF
- BACKFILL SOIL FRICTION ANGLE: 31 DEG
- CONCRETE STRENGTH: 4,000 PSI
- STEEL YIELD STRENGTH: 60,000 PSI
- PILE DESIGN BY OTHERS

3. FOOTING CONCRETE SHALL BE SELF–CONSOLIDATING CONFORMING TO ASTM C260 WITH A MINIMUM 28–DAY COMPRESSIVE STRENGTH OF 4,000 PSI. AGGREGATE SHALL CONFORM TO ASTM C–33 WITH A MAXIMUM DIAMETER OF 3/4". CEMENT SHALL CONFORM TO ASTM C150. STRIPPING AND HANDLING AT 3,000 PSI MINIMUM

4. REINFORCING SHALL BE GRADE 60 DEFORMED BLACK BARS CONFORMING TO ASTM A–615/AASHTO M31/VTRANS SECTION 507 AND CURRENT SP'S. ALL BARS SHALL BE BENT COLD.

5. FOOTINGS TO BE STORED AND SHIPPED UPRIGHT WITHOUT DUNNAGE.

6. SUBGRADE PREPARATION SHALL CONFORM TO VTRANS SECTION 704.08. FOOTINGS SHALL BE PLACED AT ELEVATIONS SHOWN ON A MINIMUM OF 1'–0" OF CRUSHED STONE CONFORMING TO VTRANS 704.05(A). ALL TOPSOIL, LOOSE FILL, AND DELETERIOUS MATERIALS SHALL BE REMOVED BEFORE PLACING BACKFILL.

7. EACH FOOTING SECTION SHALL BE PROVIDED WITH EXTENDED REBAR FOR ATTACHMENT TO ADJACENT SECTIONS. HPC–RS PER VTRANS SECTION 900 TO BE USED TO INFILL NOTED AREAS BETWEEN UNITS AND CURED (BY OTHERS), PRIOR TO ERECTION OF BRIDGE UNITS.

8. CAST–IN PILE BLOCKOUTS TO BE CORRUGATED METAL PIPE PER ASTM A760.

WING WALL NOTES:

1. SECTIONS ARE DESIGNED IN ACCORDANCE WITH
- AASHTO "LRFD BRIDGE DESIGN SPECIFICATIONS", 6TH EDITION
- VTRANS "STANDARD SPECIFICATIONS FOR CONSTRUCTION" DATED 2011.

2. THE FOLLOWING SOIL PROPERTIES WERE USED IN THE DESIGN:

	SOIL WEIGHT [PCF]	FRICTION ANGLE [DEG]
• RETAINED SOIL	140	31
• FOUNDATION SOIL	140	31

- LIVE LOAD SURCHARGE = 2FT EQUIVALENT HEIGHT OF SOIL AS REQ'D. SEE WW DESIGN.
- BACKSLOPE ANGLE: NONE, WALL DESIGNED FULL HEIGHT.
- ANTICIPATED BEARING PRESSURE = 3,000PSF (SERVICE I), 4,000PSF (STRENGTH I)

CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT THE FOUNDATION MATERIAL ACHIEVES THE DESIGN FACTORED BEARING RESISTANCE.

3. CONCRETE SHALL BE SELF–CONSOLIDATING CONFORMING TO ASTM C260 WITH A MINIMUM 28–DAY COMPRESSIVE STRENGTH OF 5,000 PSI. AGGREGATE SHALL CONFORM TO ASTM C–33 AND VTRANS SECTION 540.02, WITH A MAXIMUM DIAMETER OF 3/4". CEMENT SHALL CONFORM TO ASTM C150. STRIPPING AND HANDLING AT 3,000 PSI MINIMUM.

4. REINFORCING SHALL BE GRADE 60 DEFORMED EPOXY BARS CONFORMING TO ASTM A775 AND VTRANS SECTION 507 & CURRENT SP'S. ALL BARS SHALL BE BENT COLD.

5. WING WALLS TO BE STORED AND SHIPPED FACE DOWN WITH FULL–LENGTH TIMBER DUNNAGE LOCATED BELOW LIFT ANCHOR POINTS.

6. BACKFILL SHALL CONFORM TO VTRANS SECTION 704.08 GRANULAR BACKFILL. PLACEMENT SHALL CONFORM TO VTRANS 204.08.

7. SUBGRADE PREPARATION SHALL CONFORM TO VTRANS SECTION 704.08. FOOTINGS SHALL BE PLACED AT ELEVATIONS SHOWN ON A MINIMUM OF 1'–0" OF CRUSHED STONE CONFORMING TO VTRANS 704.05(A), EXTEND BACKFILL 1'–6" BEYOND THE STRUCTURE. ALL TOPSOIL, LOOSE FILL, AND DELETERIOUS MATERIALS SHALL BE REMOVED BEFORE PLACING BACKFILL.

C:\WORK\39–MICHIE\17–39.01 GW TATRO CONST RICHMOND VT\RFB 25X8 7865–170414.DWG 4/18/2017 3:41 PM

CURING

1. THIS SECTION APPLIES TO ALL PRECAST PIECES CAST IN EACH RESPECTIVE LOT. ALL CURING PROCEDURES SHALL ADHERE TO THE REQUIREMENTS OF SECTION 540.08 OF THE VT STANDARD SPECIFICATIONS FOR CONSTRUCTION 2011 EDITION.
2. AS SOON AS PRACTICAL AFTER PLACEMENT OF FRESH CONCRETE THE CASTING FORMS SHALL BE COVERED WITH POLYETHYLENE SHEETING UNTIL STRIPPING STRENGTH HAS BEEN ACHIEVED.
3. ONCE STRIPPING STRENGTH HAS BEEN ACHIEVED THE PRECAST PRODUCT SHALL BE REMOVED FROM THE FORM AND PLACED IN A DESIGNATED CURING AREA (INTERIOR OR EXTERIOR DEPENDING ON WEATHER CONDITIONS)
4. AT THE DESIGNATED CURING AREA THE PRECAST SHALL BE CURED USING ONE OF THE APPROVED METHODS IN SECTION 501.17 UNTIL DESIGN STRENGTH HAS BEEN ACHIEVED.
–FOR VAOT PROJECT# BF 0284 (28) – RICHMOND, VT ROUTE 2, BRIDGE #32 THE FOLLOWING METHOD WILL BE UTILIZED; 501.17 (4) – WHITE POLYETHYLENE SHEETING METHOD.
5. THE TEMPERATURE MONITORING METHOD WILL BE DETERMINED DURING THE PRE–CONSTRUCTION MEETING WITH THE CONTRACTOR AND VAOT PERSONNEL.
5. AS SOON AS THE DESIGN STRENGTH HAS BEEN ACHIEVED THE PRODUCT WILL BE REMOVED FROM THE CURING AREA AND TRANSPORTED TO THE STAGING AREA WHERE IT WILL BE STORED UNTIL SHIPPING.

FINISH

1. ALL PRECAST COMPONENTS WILL HAVE A STEEL FORM FINISH ON THE VISIBLE FACES. THE BURIED SIDE OF THE WINGWALLS AND CURBWALLS WILL BE THE POUR FACE AND WILL HAVE A STEEL TROWEL FINISH. THE BRIDGE SECTIONS WILL HAVE A STEEL FORM FINISH ON ALL FACES EXCEPT THE TOP OF THE DECK, THIS WILL HAVE A STEEL TROWEL FINISH.
2. ANY AND ALL REPAIR PROCEDURES WILL ADHERE TO NPCA BEST PRACTICES, AND WILL BE GENERATED SPECIFICALLY FOR THE APPLICATION AT THE TIME OF NEED.

HANDLING/STORAGE

1. ONCE STRIPPING STRENGTH HAS BEEN ACHIEVED, ALL PRECAST COMPONENTS WILL BE REMOVED FROM THE FORMS USING OVERHEAD CRANES. THE PIECES WILL THEN BE PLACED ON FLATBED TRAILERS AND TRANSPORTED TO THE CURING AREA, OR STORAGE YARD WHERE THEY WILL EITHER BE PLACED ON DUNNAGE (WINGWALLS) OR DIRECTLY ON THE GROUND (CULVERT). ONCE THE CURING PROCESS HAS REACHED DESIGN STRENGTH, THE PRECAST WILL BE HANDLED USING THE INDICATED LIFTERS/ANCHORS AND APPROPRIATE RIGGING, IN PREPARATION FOR SHIPPING ON FLAT BED TRAILERS. PLACEMENT OF THE DUNNAGE WILL GENERALLY FOLLOW THE ¼ RULE OR BE PLACED UNDER THE LIFTERS, HOWEVER FINAL DECISIONS REGARDING PLACEMENT WILL BE THAT OF THE MANUFACTURER/DESIGNER.

PRODUCTION CONTROL PROCEDURES(TYPICAL ALL PRECAST BRIDGE UNITS, WINGWALLS AND FOOTINGS)

1. CYLINDER SAMPLING AND CURING:
A. A MINIMUM OF EIGHT (8) CYLINDERS PER LOT WILL BE MADE IN ACCORDANCE WITH ASTM C31. CYLINDERS WILL BE TESTED IN ACCORDANCE WITH ASTM C39.
B. UNIT WEIGHT (ASTM C138), AIR CONTENT (ASTM C231), SPREAD PER SCC GUIDELINES, AND TEMPERATURE TESTS WILL BE TAKEN INITIALLY FOR EACH BATCH. NOT TO EXCEED NINE (9) CUBIC YARDS. THE FREQUENCY OF SOME TESTS MAY BE REDUCED WHEN THE VTRANS REPRESENTATIVE DETERMINES THAT THE PRECASTER IS CONSISTENT IN HIS BATCHING OPERATION. THESE TESTS WILL BE TAKEN PRIOR TO PLACING CONCRETE IN FORM.

NOTE: 1 AIR TEST PER BATCH (OR DELIVERY TRUCK) IS REQUIRED, AND SHALL NOT BE REDUCED

C. ALL CAST CYLINDERS WILL BE CURED IN THE SAME MANNER AS THE PIECES THEY REPRESENT.

2. CYLINDER BREAKS:
A. FOR EARLY STRENGTH VERIFICATION, CYLINDERS MAY BE BROKEN AT ANY TIME UP TO 28 DAYS AFTER CASTING. IF THE AVERAGE STRENGTH OF TWO (2) CYLINDERS MEETS OR EXCEEDS THE REQUIRED 28 DAY STRENGTH (WITH EACH CYLINDER HAVING A MINIMUM OF 95% OF THE REQUIRED 28 DAY STRENGTH), THE LOT SHALL BE ACCEPTED FOR STRENGTH.

3. QUALITY CONTROL TEST AND EQUIPMENT:

CYLINDER TESTER:	FORNEY 500 SERIES WITH DR–2 DIGITAL READOUT CALIBRATED BIANNUALLY
AIR METER:	PRESSURE METER BY FORNEY (CALIBRATED MONTHLY)
SLUMP CONE:	STANDARD 8" BASE, 4" AT RIM, 12" IN HEIGHT MEASURED IN ACCORDANCE WITH SCC GUIDELINES
SCALES FOR UNIT WEIGHT:	MEASURED IN ACCORDANCE WITH ASTM C143 100 LBS. CAPACITY CALIBRATED ANNUALLY TO THE NEAREST 1/10TH POUND
CYLINDER MOLDS:	4" DIAMETER X 8" PLASTIC

4. CONCRETE TESTING AND AIR METER CALIBRATION WILL BE DONE BY PLANT PERSONNEL (ACI GRADE I CERTIFIED) ALL TESTING PROCEDURES WILL BE OBSERVED BY VERMONT INSPECTORS OR AUTHORIZED REPRESENTATIVES.

BILL OF MATERIALS

QTY	DESCRIPTION			IN STOCK	ORDERED FROM	DATE ORDERED	DATE DELIVERED
	ITEMS CAST-IN						
	RIGID FRAME BRIDGE						
29LF	2.5"DIA PVC PIPE (18-15" PIECES, 2-33" PIECES)						
20	RL-4 8-TON TECH ANCHORS						
8	8NC 6X6 DWA						
8	RAIL POST ANCHOR ASSEMBLIES						
	PILE CAPS						
56LF	24"DIA. CORRUGATED PIPE (15 PIECES, 4'-0 3/8" MAX.)						
16	RL-24 8-TON PLATE ANCHOR (7 1/8")						
	WINGWALLS						
14	5-TON UTILITY ANCHORS						
8	8NC 6X6 DWA						
	APPROACH SLABS						
32	5-TON UTILITY ANCHORS						
16	4" DIA. CORRUGATED POST-TENSION SLEEVES (15" LONG)						
	ITEMS FOR PRESHIPPING/PREP.						
160LF	1" CLOSED CELL NEOPRENE						
1 GAL	RED ADHESIVE						
	ITEMS TO SHIP TO THE JOB						
172LF	24" ROYSTON JOINT WRAP						
3 GAL	ROYBOND 740 ADHESIVE						
46	7/8"X21"GALV. THREADED ROD W/NUTS AND WASHERS						
20	POP-IT PLUGS						
2	(10"X19"X1/2" GALV. STEEL WW PLATE (162 DEG)						
2	(10"X27"X1/2" GALV. STEEL WW PLATE (163 DEG)						
2	(10"X26"X1/2" GALV. STEEL WW PLATE (166DEG)						
2	(10"X18.5"X1/2" GALV. STEEL WW PLATE (149 DEG)						
32	1"DIA X 5" NC THREADED ROD W/NUT						
32	4"X4"X1/4" PLATE WASHER						

REVIEWED By Stephen Coley (stephen.coley@vermont.gov) at 5:40 pm, Apr 24, 2017

REVIEWED By Jim Wild (jim.wild@vermont.gov) at 8:57 am, Apr 25, 2017

REVIEWED By Nick Van Den Berg (nick.vandenberg@vermont.gov) at 6:26 am, May 02, 2017

REVIEWED By Phil Harrington (phillip.harrington@state.vt.us) at 9:14 am, May 02, 2017

Mix designs submitted. Add note with mix numbers and approved date.

Should reference the approved mix design(s) that will be used for the project

verify quantity

6"

LOOSE REINFORCING TO BE SHIPPED TO JOB SITE (EPOXY COATED)

LOCATION	MARK	QTY	SIZE	SPACING	TYPE	CUT LENGTH
APPROACH CLOSURE	FB1	24	#5	––	STR	19'–6"
PILE CAP CLOSURE (HORIZ)	FB2	24	#4	12"	SEE S3.2	6'–6"
PILE CAP CLOSURE (VERT)	FB3	24	#4	––	STR	3'–8"*
RFB CLOSURE	FB4	78	#6	12"	SEE S2.0	SEE DETAIL S2.0
DOWEL–IN BARS	DI	80	#4	12"	L BAR	8"X12"

*CUT OR FIELD BEND TO MAINTAIN COVER FOR VARYING HEIGHT.

REINFORCING FOR TESTING (EPOXY COATED)

LOCATION	QTY	SIZE	NOTES	CUT LENGTH
BAR COUPLER/DOWEL–IN	3	#10	COMPLETE ASSY.	AS DETAILED
GUIDE RAIL W/ANCHOR BOLTS	2	1"ø	SEE S5.0	AS DETAILED
REBAR	1	#4	STR	3'–0"
REBAR	1	#5	STR	3'–0"
REBAR	1	#6	STR	3'–0"
REBAR	1	#7	STR	3'–0"
REBAR	1	#8	STR	3'–0"
REBAR	1	#9	STR	3'–0"
REBAR	1	#10	STR.	3'–0"

The minimum required for testing is two test sections each 2.5' long

The rebar for sampling should be randomly selected from designated groups that have the largest quantities and closest to the sample length. We need 2 pieces with straight sections over 2.5' or one piece with a straight section over 5' for each size and type

SHEET LIST:
S0.0 – NOTES
S1.0 – LAYOUT VIEWS
S2.0 – END ELEVATIONS AND CONNECTION DETAILS
S3.1 – PILE CAP LAYOUT AND DETAILS
S3.2 – PILE CAP DETAILS
S3.3 – PILE CAP DETAILS
S3.4 – APPROACH SLAB DETAILS
S4.0 – RIGID FRAME DETAILS
S5.0 – RIGID FRAME W/HEADWALL DETAILS
S6.0 – WW1 AND WW2 WINGWALL DETAILS
S7.0 – WW3 AND WW4 WINGWALL DETAILS
S8.0 – ANCHOR WALL DETAILS
S9.0 – PILE LAYOUT

SPECIALTY ENGINEERING SERVICES PROVIDED BY:
CONCRETE ENGINEERING SOLUTIONS, LLC
101 PINEVIEW ESTATES
MOUNTAINTOP, PA 18707
PHONE: 570-868-2081
FAX: 570-868-2082

No.	Date	Revision	By
△	04/18/2017	REV. PER COMMENTS	SDG

STATE OF VERMONT
STUART D. GORKA
NO 84443
CIVIL
LICENSED
PROFESSIONAL ENGINEER
4/18/17

WHITE MOUNTAIN PRECAST, LLC
173 BUXTON INDUSTRIAL DRIVE-PO BOX 870
HENNIKER, NH 03242
PHONE: 603-428-3218
FAX: 603-428-7426

US Route 2, Rural Major Collector. Bridge 32
Town of Richmond, Project BF 0284(28)

25'-0" x 5'-3" Rigid Frame Bridge
Notes

Scale: AS SHOWN
Checked By: CFP
Drawn by: SDG
Designed by: SDG
Project No. 7084
Date: 2/9/17

Prepared for:
G.W.Tatro Construction
PO Box 339
5195 VT Rt 15
Jeffersonville, VT 05464

DWG NO.
S0.0