



Design of lifting attachments in accordance with Subsections 540.04(h) and 105 is outstanding at this time. However, fabrication in accordance with these plans may proceed at the Fabricator's option with future submittal of the lifting device calculations.

TY-LIN INTERNATIONAL
 The stamped documents are hereby:
 Approved _____
 Approved as noted _____
 Revised and resubmit _____
 See transmittal for additional information as applicable.
 This review is for general conformance with design concept only. Any deviation from the plans or specifications not clearly noted by the Contractor has not been reviewed. Review by the Engineer shall not relieve the Contractor of the contractual responsibility for any errors or deviation from the contract requirements.
 Josh Olund 09/13/2016
 Reviewer Date

Vermont Agency of Transportation
RECEIVED
 CK'D BY TYLin OK'D BY KMH
 September 14, 2016
 RESUBMIT No Approved AsNoted
 BY Kristin Higgins DATE 09/14/2016

- GENERAL NOTES:**
- THE PLANS ARE INTENDED TO BE DRAWN TO SCALE. HOWEVER, IF A CRITICAL DIMENSION IS NOT PROVIDED, MICHE CORPORATION SHOULD BE CONTACTED FOR VERIFICATION.
 - 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.
 - 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.
 - MAINTAIN MINIMUM 60 DEGREE SLING ANGLE WHEN HANDLING PRECAST COMPONENTS.
 - PRECAST COMPONENTS SHALL REACH A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI PRIOR TO SHIPPING, AND THE MINIMUM DESIGN COMPRESSIVE STRENGTH PRIOR TO SHIPPING, UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
 - HORIZONTAL JOINTS AND VOIDS SHALL BE FILLED WITH NON-SHRINK GROUT.
 - SHOP DRAWINGS WERE DEVELOPED USING THE FOLLOWING RESOURCES FOR THE CONTRACT:
 ** TOWN OF DUXBURY, DUXBURY, VERMONT, VT100 ROAD CULVERT PROJECT PLANS.
 - 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 MICHE CORPORATION. FAILURE TO MAKE SUCH ADDITIONAL INFORMATION AVAILABLE SHALL RELIEVE MICHE CORPORATION OF ALL LIABILITIES ARISING FROM ERRORS OR OMISSIONS RELATED TO THE OMITTED INFORMATION.
 - ALL VOIDS SHALL BE FILLED WITH NON SHRINK GROUT.

- ARCH CULVERT NOTES:**
- ARCH CULVERT SECTIONS ARE DESIGNED IN ACCORDANCE WITH:
 - AASHTO "LRFD BRIDGE DESIGN SPECIFICATIONS", 6TH EDITION.
 - STANDARD SPECIFICATION AND GENERAL SPECIAL PROVISIONS SECTION 540.
 - THE FOLLOWING CRITERIA WAS USED FOR DESIGN:
 - LIVE LOAD: HL-93
 - EARTH COVER: 8.6 FEET
 - BACKFILL SOIL UNIT WEIGHT: 140 PCF
 - BACKFILL SOIL FRICTION ANGLE: 30 DEGREES
 - CONCRETE STRENGTH: 6,500 PSI
 - STEEL YIELD STRENGTH: 50,000 PSI
 - ARCH CULVERT AND HEADWALL CONCRETE SHALL BE SELF-CONSOLIDATING CONFORMING TO SECTION 540 WITH A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 6,000 PSI. AGGREGATE SHALL CONFORM TO SECTION 540 WITH A MAXIMUM DIAMETER OF 3/4". CEMENT SHALL CONFORM TO ASTM C150. MICHE MIX 6535CAS
 - REINFORCING SHALL BE GRADE 60, EPOXY COATED, CONFORMING TO ASTM A-615. ALL BARS SHALL BE BENT COLD.
 - ALL EXPOSED EDGES EXCEPT WHERE NOTED SHALL BE CHAMFERED 3/4".
 - SUBGRADE PREPARATION SHALL CONFORM TO PROJECT PLANS.
 - UNLESS OTHERWISE SPECIFIED IN THE CONTRACT DOCUMENTS, BACKFILL SHALL CONFORM TO VIRANS SECTION 708.04 GRANULAR BACKFILL FOR STRUCTURES. BACKFILL SHALL EXTEND BEYOND THE HORIZONTAL LIMITS OF THE STRUCTURE AS DETAILED IN THE CONTRACT DOCUMENTS. PLACEMENT SHALL CONFORM TO VIRANS SECTION 204.08.
 - EXPOSED SURFACES SHOULD BE COATED ON SITE WITH WATER REPELLENT, SILANE (SUPPLIED BY OTHERS).
 - EACH SECTION SHALL BE PROVIDED WITH BOLT POCKETS FOR ATTACHMENT TO ADJACENT SECTIONS. 7/8" DIA. GALV. THREADED ROD, WASHERS AND NUTS SHALL BE PROVIDED FOR ASSEMBLY IN THE FIELD. CLOSED-CELL NEOPRENE JOINT SEALANT SHALL BE USED IN ALL JOINTS UNLESS NOTED OTHERWISE.
 - 2FT WIDE ROYSTON JOINT WRAP WITH ADHESIVE PROVIDED BY MICHE CORP. INSTALLED BY OTHERS, CENTER ON JOINT AFTER HORIZONTAL GROUTING. BARRIER MEMBRANE PROVIDED AND INSTALLED BY OTHERS OVER TOP OF STRUCTURE. AND DOWN SIDES TO 6" BELOW HORIZONTAL JOINT.

- WING WALL NOTES:**
- SECTIONS ARE DESIGNED IN ACCORDANCE WITH:
 - AASHTO "LRFD BRIDGE DESIGN SPECIFICATIONS", 6TH EDITION
 - STANDARD SPECIFICATION AND GENERAL SPECIAL PROVISIONS SECTION 540.
 - THE FOLLOWING SOIL PROPERTIES WERE USED IN THE DESIGN:

SOIL WEIGHT [PCF]	FRICTION ANGLE [DEG]
RETAINED SOIL	32
FOUNDATION SOIL	32
LIVE LOAD SURCHARGE = 2'	
BACKSLOPE ANGLE: ±8:1	
ALLOWABLE BEARING RESISTANCE = 6,000 PSF	
 - CONCRETE SHALL BE SELF-CONSOLIDATING CONFORMING TO SECTION 540 WITH A MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 4,000 PSI. AGGREGATE SHALL CONFORM TO SECTION 540 WITH A MAXIMUM DIAMETER OF 3/4". CEMENT SHALL CONFORM TO ASTM C150. MICHE MIX 5035CAS.
 - REINFORCING SHALL BE GRADE 60, EPOXY COATED, CONFORMING TO ASTM A-774. ALL BARS SHALL BE BENT COLD.
 - ALL EXPOSED EDGES EXCEPT WHERE NOTED SHALL BE CHAMFERED 3/4".
 - UNLESS OTHERWISE SPECIFIED IN THE CONTRACT DOCUMENTS, BACKFILL SHALL CONFORM TO VIRANS SECTION 708.04 GRANULAR BACKFILL FOR STRUCTURES. BACKFILL SHALL EXTEND BEYOND THE HORIZONTAL LIMITS OF THE STRUCTURE AS DETAILED IN THE CONTRACT DOCUMENTS. PLACEMENT SHALL CONFORM TO VIRANS SECTION 204.08.

- CURING**
- THIS SECTION APPLIES TO ALL PRECAST PIECES CAST IN EACH RESPECTIVE LOT. AS SOON AS PRACTICAL AFTER CASTING, AND ONCE THE STRIPPING STRENGTH HAS BEEN ACHIEVED, THE PIECES WILL BE REMOVED FROM THE FORM AND PLACED ON FLAT BED TRAILERS. THE PIECES WILL THEN BE MOVED TO YARD STORAGE UNTIL DESIGN STRENGTH IS MET AND THEY CAN BE STAGED FOR SHIPPING/STORAGE.
- FINISH**
- ALL PRECAST COMPONENTS WILL HAVE A STEEL FORM FINISH ON THE VISIBLE FACES. THE BURIED SIDE OF THE WINGWALLS AND CURBWAYS WILL BE THE POUR FACE AND WILL HAVE A STEEL TROWEL FINISH. THE ARCH SECTIONS WILL HAVE A STEEL FORM FINISH ON ALL FACES EXCEPT ONE END FOR POURING. THIS END WILL HAVE A STEEL TROWEL FINISH.
 - ANY AND ALL REPAIR PROCEDURES WILL ADHERE TO NPQA BEST PRACTICES, AND WILL BE GENERATED SPECIFICALLY FOR THE APPLICATION AT THE TIME OF NEED.
- HANDLING/STORAGE**
- 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 FLATED TRAILERS AND TRANSPORTED TO THE STORAGE YARD WHERE THEY WILL EITHER BE PLACED ON DUNNAGE (WINGWALLS) OR DIRECTLY ON THE GROUND (CULVERT). ONCE DESIGN STRENGTH HAS BEEN MET THEY 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 2/3 RULE OR BE PLACED UNDER THE LIFTERS, HOWEVER FINAL DECISIONS REGARDING PLACEMENT WILL BE THAT OF THE MANUFACTURER/DESIGNER.

- PRODUCTION CONTROL PROCEDURES**
- CYLINDER SAMPLING AND CURING:
 - 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.
 - 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 VIRANS 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.
 - CYLINDER BREAKS:
 - 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.
 - ALL CAST CYLINDERS WILL BE CURED IN THE SAME MANNER AS THE PIECES THEY REPRESENT.
 - 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
 - CONCRETE TESTING AND AIR METER CALIBRATION WILL BE DONE BY PLANT PERSONNEL (ACI GRADE I CERTIFIED) ALL TESTING PRODUCERS WILL BE OBSERVED BY VERMONT INSPECTORS OR AUTHORIZED REPRESENTATIVES.

DESIGNED AND DETAILED BY:
DELTA
 ENGINEERS, ARCHITECTS, & LAND SURVEYORS
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Scale: AS SHOWN
 Checked by: DDB/A
 Drawn by: CSC
 Project No: 7347
 Date: 02/01/16

VT 100 Road Culvert
 Duxbury, Vermont
 Culvert Layout - Plan and Elevation

PREPARED FOR:
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