MILLER CONSTRUCTION, INC.

P.O. BOX 86 ASCUTNEY BLVD WINDSOR, VERMONT 05089-0086
TELEPHONE (802) 674-5525 / FAX (802) 674-5245

TRANSMITTAL

TO: Jennifer Fitch, PE Project Manager Vermont Agency of Transportation	DATE	PROJECT NO.
	8/25/2014	Brookfield BRF FLBR (2)

XX WE ENCLOSE THE FOLLOWING: _____ UNDER SEPARATE COVER WE ARE SENDING THE FOLLOWING

COPIES	NUMBER	DESCRIPTION	CODE
1		Galvanized Steel Protective End Cap	H
1		3M 5200 Marine Sealant Product Data	

CODE:

A FOR INITIAL APPROVAL
B FOR FINAL APPROVAL
C APPROVED AS NOTED-RESUBMISSION REQUIRED
D APPROVED AS NOTED-RESUBMISSION NOT REQUIRED
E DISAPPROVED-RESUBMIT
F QUOTATION REQUESTED
G APPROVED
H FOR APPROVAL
I AS REQUESTED OR REQUIRED
J FOR USE IN ERECTION
K LETTER FOLLOWS
L FOR FIELD CHECK
M FOR YOUR USE

BY: Paul Miller

MILLER CONSTRUCTION, INC.

PO BOX 86
WINDSOR, VT 05089

(802) 674-5525
Fax (802) 674-5245

August 25, 2014

State of Vermont
Southeast Regional Construction Office
PO Box 1837
Wilder, VT 05088

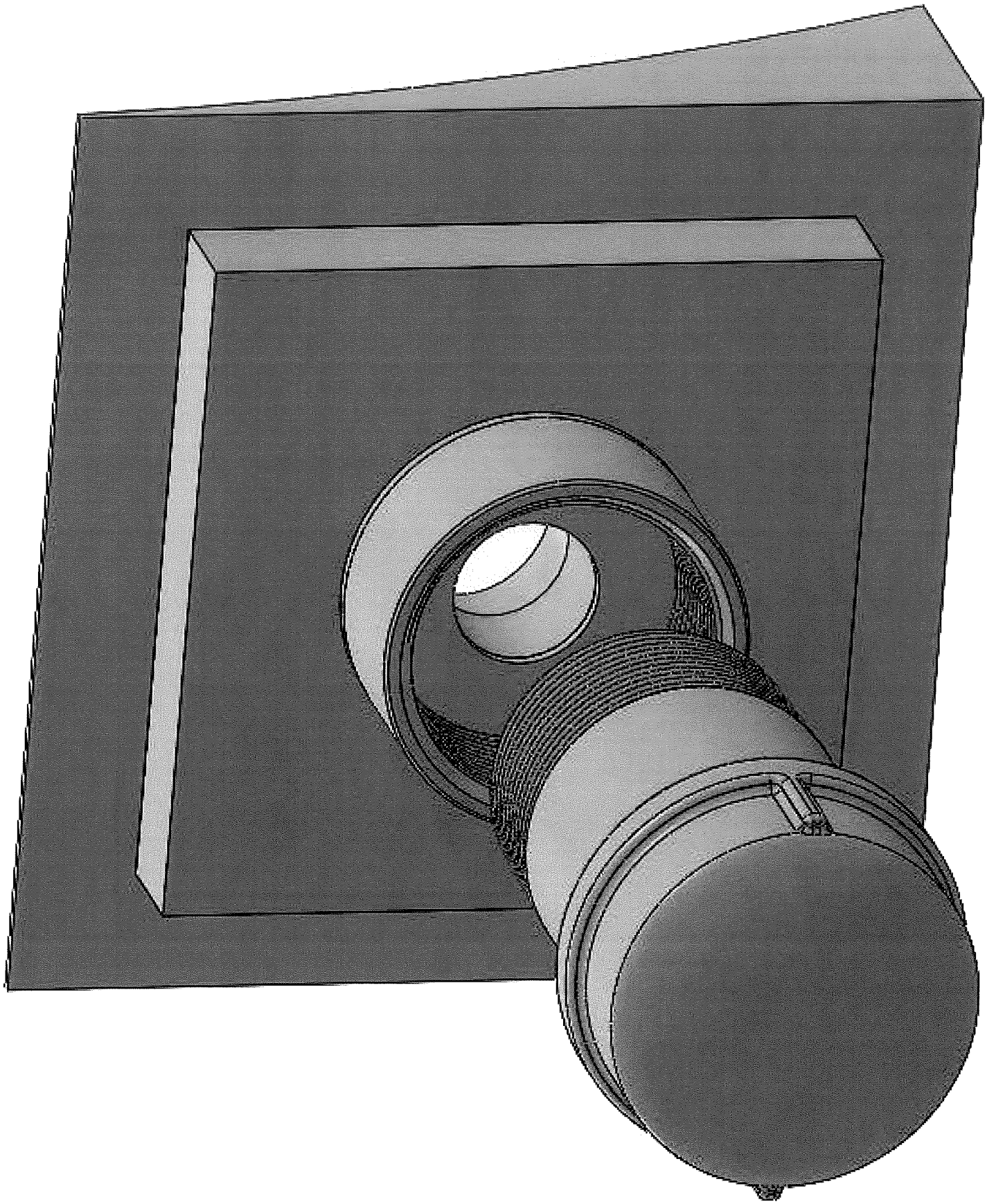
RE: Brookfield BRF FLBR (2) – Galvanized Steel Protective End Cap Securing Method

Miller Construction, Inc. submits the following method for securing the Galvanized Steel Protective End Cap.

The Galvanized Steel Protective End Cap shall be fabricated so that a 1/8" back plate (washer) with a threaded (NPT) collar can be installed in conjunction with the double nut.

The nut on the tie rod will secure the coupler to the FRP Blister. After final tensioning, the NPT nipple and cap will be threaded into the coupling.

Placing a bead of 3M Marine Sealant between the washer and the base plate, as well as the base plate and the FRP Blister will ensure a watertight installation.



Document Library
Technical Data Sheet

Rev: 2
Effective: 12/1/2004

Status: Active
Supersedes: 07/06/2000

3M™ Marine Adhesive/Sealant 5200

3M Part No.(s)	3M Part Descriptor(s)
06500	10 fl. oz. cartridge (295 ml) - White
05203	3 fl. oz. tube (90 ml) - White
05206	1fl. oz. tube (30 ml) - White
21463	5 gal. pail (18.93 L) – White
06504	10 fl. oz. cartridge (295 ml) - Black
05205	3 fl. oz. tube (90 ml) – Black
06502	10 fl. oz. cartridge (295 ml) - Mahogany

Description

3M™ Marine Adhesive/Sealant 5200 is a one-part polyurethane that chemically reacts with moisture to deliver strong, flexible bonds. It has excellent adhesion to wood, gelcoat and fiberglass. It forms a watertight, weather-resistant seal on joints and boat hardware, above and below the waterline. In addition, its flexibility allows for dissipation of stress caused by shock, vibration, swelling or shrinking.

Features

- Tough/flexible polyurethane polymer
- Non-shrinking
- One-part moisture cure
- Long working time

Typical Physical Properties

Base	Polyurethane
Density lbs/Gallon (Approx.)	11.3 lbs/gallon
Color	White
Solids Content (Approx.)	97%
Consistency	Medium paste
Service Temperature - °F	-40°F (-40°C) to 190°F (88°C)
Shore A Hardness (cured)	68
Specific Gravity	1.36
Coverage (10 oz.)	1/8 inch (0.3175 cm) bead = 120 lineal feet (36.6 m)

Performance Properties

Tensile, Elongation, and effect of water submersion:
A 1/8-inch (0.3175 cm) dumbbell specimen with a 1/8-inch (0.3175 cm) square cross section was tested at 2.0 inches/minute (5.08 cm/minute). All samples tested at 50% Relative Humidity and 70°F (21°C).

Environmental Conditions	Time	Tensile Strength psi (kg/cm^2)	Elongation (%)
50% R.H./ 70°F (21°C)	*52 days*	*705 (49.6)*	*762*
Fresh Water	*52 days*	*634 (44.6)*	*805*
Salt Water	*52 days*	*638 (44.9)*	*802*

Overlap Shear Strength

One inch (2.54 cm) overlap specimens (0.093 inch (0.2362 cm thickness). Samples cured at 70°F (21°C), 50% Relative Humidity.

Substrate	psi	kg/cm^2
Wood(s):		
Teak	502	35.3
Pine	680	47.8
Oak	549	38.6
Maple	656	46.1
Fir	700	49.2
Mahogany	564	39.7
Metal(s):		
Steel	538	37.8
Stainless Steel	352	24.7
Aluminum	393	27.6
Brass	474	33.3
Bronze	252	17.7
Copper	198	13.9
Lead	107	7.5
Zinc (Galvanized)	484	34.0
Plastics/Polymers:		
Fiberglass	362	25.5
Gelcoat	519	36.5
Polycarbonate	381	26.8
Acrylic	217	15.3
Nylon	175	12.3
ABS	231	16.2
Polypropylene	55	3.9
Polyethylene	48	3.4

Note: Because actual use conditions can vary for each application, each user must determine the suitability of 3M Marine Adhesive/Sealant 5200 for the intended use.

Application Information

Directions for Use

Surface Preparation:

There are waxes, coatings, sealants, grease, oil and other contaminants used in the marine industry, making it very important to clean all surfaces to be bonded before applying 3M™ Marine Adhesive/ Sealant 5200. Recommended procedures include cleaning with 3M™ General Purpose Adhesive Cleaner*, P. N. 08984.

Application of Adhesive Sealant:

Abrading the surfaces with a 180 grit to 220 grit abrasive, and subsequently wiping off residue, will enhance the bond strength. Cut tip of the nozzle to desired bead size. Puncture seal inside the threaded nozzle end and screw on nozzle. If using a 10 fl. oz. cartridge, knock out the bottom seal with a hammer and place the cartridge in a caulk gun. Apply 3M™ Marine Adhesive/Sealant 5200 to the seam or part to be bonded. Position parts. Tool material to desired appearance. Remove excess material with 3M™ General Purpose Adhesive Cleaner*, P. N. 08984.

Cure:

	Relative Humidity	Temperature	Time	Cure Depth
Open Time	50%	70°F (21°C)	30 hours	N/A
Open Time	90%	90°F (32°C)	4 hours	N/A
Full Cure	50%	70°F (21°C)	5 days	1/8 inch (0.3175 cm)

Cleanup:

For cleaning 3M™ Marine Adhesive/Sealant 5200 before it is cured, use a dry cloth to remove the majority of sealant, followed by a cloth damp with General Purpose Adhesive Cleaner*, P. N. 08984, toluene or acetone. Cured 5200 can be removed mechanically with a knife, razor blade, or sanding.

Limitations -

- Alcohol should not be used in preparation for bonding as it will stop the curing process, causing the adhesive to fail..

- Heat resistance - Due to the decreased value in bond strength at elevated temperatures, we do not recommend use of this product above 190°F (88°C).

- Do not apply at temperatures below 40°F (4°C) or on frost covered surfaces. Do not apply at surface temperatures above 100°F (38°C).

- 3M™ Marine Adhesive/Sealant 5200 is not recommended for use as a teak deck seam sealer. Extended exposure to chemicals (teak cleaners, oxalic acid, gasoline, strong solvents and other harsh chemicals) may cause permanent softening of the sealant.

- 3M™ Marine Adhesive/Sealant 5200 is not recommended for the installation of glass, polycarbonate or acrylic windows that are not also mechanically fastened with a system designed by the manufacturer. Inconsistent adhesion of these unprimed substrates, specific design of the window, and movement due to thermal expansion and flexing, may cause application failure. It is strongly recommended that the customer contact the window/port light/hatch manufacturer for recommendations on proper sealing procedures.

- When using 3M™ Marine Adhesive/Sealant 5200 with metals, it may be necessary to prime the surface to achieve adequate adhesion and durability of the bond. Scotch-Weld™ Structural Adhesive Primer EC-1945 B/A may be used for priming of most metals.

Applications:

Typical bonding and sealing applications include:
- Fiberglass deck to fiberglass hull
- Wood to fiberglass
- Porthole frames
- Deck fittings
- Moldings
- Trunk joints
- Between struts and planking
- Stern joints and hull planking

Structural bonding and sealing of:
- Wood
- Fiberglass
- Gelcoat
- Primed metal

Sealing of:
- Some plastics (test before assembly)
- Glass
- Metals

Storage and Handling:
Recommended Storage Temperature Range: 60°F (16°C) to 80°F (26°C)
Expected Shelf Life at Recommended Storage Temperature: 24 Months

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Precautionary Information
Refer to Product Label and Material Safety Data Sheet for Health and Safety Information before using this product.

Country
US

Important Notice to Purchaser
Technical Data: All physical properties, statements and recommendations are either based on tests we believe to be reliable or our experience, but they are not guaranteed. Because actual use conditions can vary for each application, each user must determine the suitability of 3M Marine Adhesive/Sealant 5200 for the intended use

* If 'Directions for Use' reference P.N.'s 08984, 08986, or 08987, please read. Federal and local air quality regulations may regulate or prohibit the use of surface preparation and cleanup solvents based on VOC content. Consult your local and Federal air quality regulations for information. When using solvents, use in a well ventilated area. Extinguish all sources of ignition in the work area and observe precautionary measures for handling these materials. Refer to product label and MSDS for P.N. 8984, 8986, or 8987 for detailed precautionary information.

Warranty and Limited Remedy: 3M warrants this product will be free from defects in materials and manufacture. **3M MAKES NO OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.** If the product is proved to be defective your exclusive remedy and 3M's and seller's sole obligation will be, at 3M's option, to replace the product or refund the purchase price.

Limitation of Liability: 3M and seller will not be liable for any loss or damage arising from this product, whether direct, indirect, special, incidental or consequential, regardless of the legal theory asserted, including warranty, contract, negligence or strict liability.

For Additional Health and Safety Information
3M Marine
3M Center, Building 223-1N-13
Saint Paul, MN 55144-1000
1-877-366-2746 (1-877-3M MARINE)
http://www.3m.com/marine