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DIVISION 6

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06105 Rough Carpentry

06530 Pre-Engineered Fibreglass Reinforced Plastic Access Cover

ROUGH CARPENTRY

1. General

1.1 Work Included

- .1 Roof parapets
- .2 Blocking in wall
- .3 Wood furring and grounds
- .4 Concealed wood blocking for support of items and equipment supported by walls
- .5 Wood treatment

1.2 Related Sections

- .1 Cast-in-place Concrete: Concrete openings to receive wood blocking: Section 03300
- .2 Concrete Unit Masonry: Masonry openings to receive wood blocking: Section 04220
- .3 Modified Bituminous Roofing: Section 07525

1.3 References

- .1 CSA O80M - Wood Preservation
- .2 NLGA - Standard Grading Rules for Canadian Lumber
- .3 CSA O121M - Douglas Fir Plywood
- .4 CSA O141 - Softwood Lumber
- .5 CSA O151M - Canadian Softwood Plywood

1.4 Quality Assurance

- .1 Lumber grading agency: NLGA
- .2 Wood treatment: CSA O80M

1.5 Delivery, Storage, and Handling

- .1 Protect Products of this Section under waterproof coverings

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2. PRODUCTS

2.1 Materials

- .1 Softwood lumber: CSA O141, non-structural light grading 19 percent maximum moisture content.
- .2 Plywood: CSA O121M - Douglas fir CSA O151M - softwood type, with waterproof glue.
- .3 Fasteners: Electro Hot dipped galvanized steel for exterior, high humidity, and treated wood locations; plain finish elsewhere; size and type to suit condition.
- .4 Anchors: toggle bolt type for anchorage to hollow masonry expansion shield and lag bolt type for anchorage to solid masonry or concrete bolts or ballistic fasteners for anchorages to steel.

2.2 Wood Treatment

- .1 Wood preservative pressure treatment: CSA O80M using waterborne preservative with 0.30 percent retainage, manufactured by Wolman.

3. EXECUTION

3.1 Site Applied Wood Treatment

- .1 Apply preservative treatment in accordance with CSA O80M manufacturer's instructions.
- .2 Treat Site-sawn ends
- .3 Allow preservative to cure prior to erecting members.

3.2 Installation

- .1 Erect wood framing members level and plumb.
- .2 Space framing and furring as noted on the Drawings.
- .3 Construct curb members of single pieces.
- .4 Curb all roof openings except where prefabricated curbs are provided. Form corners by lapping side members alternately.
- .5 Provide blocking, sized to suit, for support of surface mounted accessories and equipment.
- .6 Provide wood blocking around each door frame opening.

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- .7 Place miscellaneous blocking, furring, strapping, canting, nailing strips, framing and sheathing where indicated on Drawings and as required for secure support of anchorage of other specified materials. Place members true to lines and levels. Secure rigidly in place.
- .8 Coordinate the installation of bucks, anchors, blocking, which is to be placed in or behind partitions. Allow such items to be installed after partition framing is complete. Ensure that allowance is made for thickness of wall finish to be applied.
- .9 Place sheathing with end joints staggered. Secure sheets over firm bearing. Maintain minimum 1.5 mm and maximum 3 mm spacing between joints on walls. Place perpendicular to framing members.

END OF SECTION

PRE-ENGINEERED FIBREGLASS REINFORCED PLASTIC ACCESS COVER

1. GENERAL

1.1 Scope

- .1 This Section specifies the supply and installation of fibreglass access covers as outlined herein and shown on the Drawings. It is the intent of this Specification to purchase access covers of existing design standard which has been in service and performing satisfactorily for a period of not less than five years.

1.2 Related Work

- .1 Cast-in Place Concrete: Section 03300

1.3 Submittals

- .1 In addition to the submittals specified in Section 01300, provide the following:
 - .1 Certification of Materials
 - .1 Provide the Contract Administrator with data showing the characteristics of the materials to be used. This will be for resin (4.1.2), gel coat (4.1.4) and glass (4.1.6). The complete assembly shall conform to Class 'A' Type 1 U.L. Guidelines for classified flame spread rating of less than 25 and a smoke density of less than 50.
 - .2 Certification of Laminates
 - .1 Provide the Contract Administrator with actual laboratory test results by a qualified independent testing laboratory to confirm the values used in the design. These results shall not be older than three years.
- .2 Calculations
 - .1 Complete set of design calculations are to be submitted to the Contract Administrator upon request. Shop Drawings and design calculations are to bear the seal of a Professional Engineer, registered in the Province of Manitoba.

1.4 Guarantee

- .1 The manufacturer is to provide a minimum written guarantee for workmanship and materials for a period of one year.

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2. PRODUCTS

2.1 General

- .1 The manufacturer shall be responsible for the design of the access cover and anchorage to the structure. The design shall provide for expansion and contraction due to climatic change without damage to the access cover. The access cover shall be so designed as to be self-supporting and bear on the concrete structure.
- .2 Panels shall be designed to be interlocking to provide a completely weather-tight seal. A suitable gasket material shall be installed in the interlocking joint and where the panels rest on the outside tank wall. These gaskets shall be joined to provide a weather tight seal.
- .3 Access Cover Support
 - .1 When the concrete structure is required to provide tensile and horizontal restraint for the access cover, due to snow and wind loads, all loads to be transferred into the concrete structure shall be provided to the Contract Administrator prior to construction of the concrete structure and FRP Access Cover.
- .4 Insulation
 - .1 The access cover shall consist of two concentric fibreglass skins, with R10, urethane foam, sandwiched between.
- .5 Panel Jointing
 - .1 Molds shall be so designed that each panel can be laminated in one piece without joining of member by either bonding or bolting unless shown otherwise on Contract Drawings.

2.2 Acceptable Manufacturers

- .1 Known acceptable manufacturers based on fabrication methods, design, and experience are:
 - .1 Nemato Composites Inc. 1605 McEwen Drive, Whitby Ontario, L1N 7L4
 - .2 FiberGlass Reinforced Plastic Systems Ltd., 804 MacDonell Street, Thunder Bay, Ontario, P7B 4A6
 - .3 Fiber-Tech Engineering Inc., 611 Rock Springs Road, Escondido, California, 92025

2.3 Loading Conditions

- .1 Design Loads
 - .1 The entire access cover structure shall be designed to sustain the working loads specified herein with a factor of safety of 4.0.

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.2 Dead Load

- .1 The dead load shall be defined as the weight of the structure and all materials and equipment attached to and supported by the structure.

.3 Live Load

- .1 The snow load shall be assumed to act vertically upon the area of the access cover projected upon a horizontal plane. The design shall take into account the snow build-up and sliding snow accumulation and related forces. The value of the snow load shall be based on a ground snow load (S_s) of 1.7 kPa (unfactored) in accordance with the 1995 National Building Code of Canada.

.4 Unbalancing Load

- .1 Unbalancing snow load to be calculated in accordance with Figure H-2, User's Guide – National Building Code 1995, Structural Commentaries (Part 4)

.5 Wind Load

- .1 The wind loads shall be based on a 1/100 hourly wind pressure of 0.49 kPa (unfactored) in accordance with the National Building Code of Canada and User's Guide – National Building Code 1995, Structural Commentaries (Part 4) and to be assumed acting in any direction.

.6 Additional Considerations

.1 Internal Pressure

- .1 The air handling equipment within the SBR 1 and SBR 2 tank cells may subject the access cover to an internal pressure, negative or positive; not acting simultaneously; of 0.05 kPa less than atmospheric pressure.

.2 Temperature Range

- .1 The access covers shall be designed to accommodate the climatic temperature range of +40°C to -40°C, plus effects of differential solar heating.
- .2 The internal temperature will be maintained from +15°C to +25°C and will not exceed +40°C.

2.4 Materials

.1 Resin: Characteristics

- .1 All resins shall be chemical resistant resins containing light stabilizers such as Halogenated Isophthalic Resin. The resins shall be suitable for service in temperature ranging from -40°C to +40°C and also capable of withstanding continuous exposure to the internal environment.

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.2 Gel Coat Characteristics

- .1 The gel coat shall consist of thermosetting polyester designed for constant exposure to the outside environment and capable of resisting UV degradation. The use of tints and pigments in the resin will not delete the need for a gel coat.
- .2 City to specify colour of access cover.

.3 Glass Reinforcing Characteristics

- .1 Fibreglass reinforcement shall consist of alternate layers of chopped strand mat and woven roving, shall be equal to Owens Corning, and shall be treated with a finish compatible to the resin being used.

2.5 Material Characteristics

- .1 Ultimate Tensile Strength: ASTM D-638-84, 170 MPa minimum
- .2 Ultimate Flexural Strength: ASTM D-790-84, 170 MPa minimum
- .3 Ultimate Compressive Strength: ASTM D-695-85, 136 MPa minimum
- .4 Modulus of Elasticity: ASTM D-790-84, 6800 MPa minimum
- .5 Glass content: 25 percent minimum
- .6 Linear coefficient of expansion: 15×10^{-6} per °F
- .7 Flame spread: 25 maximum

2.6 Process

- .1 All panels shall be formed on suitable moulds to ensure constant and accurate dimensions. The mould surface shall be coated with resin rich pigmented coat containing proper amounts of wax to ensure complete cure of laminate. Alternate layers of chopped strand mat and woven roving will then be placed to the design thickness. The outer surface shall be coated with a gel-coat (12-15 mils) and cured.
- .2 A 1000 x 1000 mm insulated sample panel is to be made under the supervision of the Contract Administrator and submitted for acceptance before fabrication begins.
- .3 Each access cover shall have a minimum of 3 panels. Panels to have stainless steel lifting rings at each individual panel to allow for removal.
- .4 Each access cover panel shall be insulated consisting of a sandwich construction utilizing two (2) fibreglass skins bonded to an insulating core material of R10 urethane foam which is to follow the contour of the panel, and completely fill space between outer layers.
- .5 Access cover panels to be complete with custom interior and exterior integral drip-edges as indicated on the Drawings.

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- .6 The removal of the finished laminates from the moulds shall be achieved by utilizing air jets and lifting devices which will prevent fracturing or distortion of the panels. Prior to erection all panels shall be stored and supported with adequate protection to prevent warping and fracturing.
- .7 Provide 320 mm x 320 mm (clear inside dimension) access openings into the access cover as indicated on the Drawings. The access openings are to be easily removed without the use of special tools. The access openings are to be weather tight and shall be fabricated to match the access cover materials and insulation.

2.7 Storage

- .1 The Contractor will be responsible for storing the panels off the ground on a level surface to prevent warping or fracturing.

2.8 Instructions

- .1 The manufacturer will provide construction Drawings and installation instructions to the Contractor and Contract Administrator prior to erection.

2.9 Assembly

- .1 The access covers shall be erected following procedures established by the access cover manufacturer.
- .2 The manufacturer is to have a suitably experienced and qualified supervisor, acceptable to the Contract Administrator, in attendance full time for the duration of the erection of all access covers.
- .3 All bolted connections shall be stainless steel type of a size and quality shown on the manufacturer's drawings.
- .4 All anchorage to the concrete structure shall be done on-site after the panels are in their final position by setting suitable stainless steel anchor bolts, acceptable to the Contract Administrator, in the concrete structure. Location of reinforcement is to be determined prior to boring by use of a suitable cover meter. Care is to be taken not to bore through any reinforcement. Washers of a suitable size shall be utilized to avoid stresses in bolting.

END OF SECTION