
PART 1 - GENERAL**1.01 SUMMARY:**

- .01 Provide special fiberglass reinforced plastic (FRP) shapes in accordance with the requirements of the contract documents.
- .02 The installing contractor shall be responsible for verifying that all required blocking is provided and installed in the correct locations for FRP components proper installation.

1.02 WORK INCLUDED:

- .01 Supply of FRP units.
- .02 Erection / installation.
- .03 Joint treatment.
- .04 Supply and installation of backup supports, shimming, labor and materials, etc.

1.03 RELATED WORK SPECIFIED ELSEWHERE:

- .01 Masonry work.
- .02 Structural steel: Support framing for fiberglass components.
- .03 Rough carpentry.
- .04 Joint sealants.
- .05 Finishing: Paint manufacturer shall recommend paint suitable for FRP surfaces.

1.04 RELATED DOCUMENTS:

- .01 Composites Fabricators Associations (CFA) Guidelines and Recommended Practices for Fiberglass Reinforced Plastic Architectural Products.

1.05 QUALITY ASSURANCE:

- .01 Materials and work shall conform to the latest edition of reference specifications specified herein and to applicable codes and requirements of local authorities having jurisdiction.

1.06 QUALIFICATION:

- .01 The manufacturer of FRP work shall submit evidence of satisfactory projects it has achieved in the last 10 years.
- .02 The installer of the work specified herein shall be approved by the manufacturer of the specified material.
- .03 The installer of the work, with more than 5 years experience in the installation of FRP units, shall carry out the installation efficiently and co-operate fully with other trades.

1.07 CERTIFICATION & REFERENCES:

- .01 Submit manufacturer's product data, including copies of fire test reports.
- .02 Except as otherwise additionally indicated on the drawings or specified herein, the standards referred to below, shall apply to work under this section.
 - .1 ASTM D-256 - Impact Resistance
 - .2 ASTM D-570 - Water Absorption
 - .3 ASTM D-638 - Ultimate Tensile Strength
 - .4 ASTM D-638 - Young's Modulus
 - .5 ASTM D-648 - Deflection Temperature
 - .6 ASTM D-696 - Coefficient of Linear Thermal Expansion
 - .7 ASTM D-790 - Flexural Properties
 - .8 ASTM D-2583 - Barcol Hardness
 - .9 ASTM E-84 - Surface Burning

1.08 DESCRIPTION OF WORK:

- .01 This specification is intended to outline the general requirements of the DecoForm (FRP) units as they pertain to the overall design of the project. The manufacturer's recommendations shall not govern the work in this section.
- .02 The installing contractor shall perform all work in this section, including installation, caulking (filling) and patching and will assume responsibility for coordinating installation with the work and associated trades.

1.09 DESIGN CRITERIA:

- .01 Unless otherwise stated on DecoForm's drawings, fabrication tolerances are as indicated below.
 - .1 Dimensional - all directions (0' - 10') $\pm 1/8"$
 - .2 Dimensional - all directions (10' - 20') $\pm 3/16"$
 - .3 Straightness along an edge or surface $\pm 1/16"/\text{linear ft.}$
 - .4 All reveals, grooves, setbacks or returns 3° draft (min.)
 - .5 All outside corners $1/16" - 1/8"$ radius

1.10 SAMPLES:

- .01 Submit duplicate, minimum 6" x 6" FRP samples.

1.11 SHOP DRAWINGS:

- .01 Submit for approval, shop drawings of units which show sections, details, joint treatment and the relation of the FRP units to adjoining components

1.12 SCHEDULING:

- .01 Special scheduling for site coordination must be specified at time of bidding.

1.13 DELIVERY, STORAGE AND HANDLING:

- .01 Units shall be handled and transported per manufacturer's recommendation, in a manner so as not to create damage or excessive stresses.
- .02 FRP units shall be stored level on a clean dry surface in an area protected from weather, moisture and damage. The units shall not be stacked or leaned unless instructed otherwise by the manufacturer.
- .03 The installer is responsible for chipping, cracking, or other damage to fiberglass components, after delivery to the job-site and until installation is completed and inspected approved by the Owner's representative.

1.14 WARRANTY:

- .01 The manufacturer warrants that the delivered material supplied will conform to samples and to specifications and will be free from defects in workmanship or material under normal use and conditions for a period of ONE year from date of shipment. Should defects, attributable to the manufacturer, appear within one year of the date of shipment, the manufacturer has the option of replacing or repairing the defective material.
- .02 Limitations: The aforementioned general warranty is exclusive. All other warranties whether expressed or implied or arising by operation of law, usage of trade, course of dealings or otherwise, are excluded. The only warranties are those expressed above. The manufacturer shall not be liable for any penalty or for any loss or damages associated with the removal or installation of its product or claims of third parties against the Purchaser.

PART 2 - PRODUCTS**2.01****.01 MANUFACTURER:**

DecoForm Architect Inc.
26 Ashwarren Road
Toronto, Ontario
CANADA M3J 1Z5
Phone: (416) 745-4970
FAX: 416 745-6636
E-mail: sales@decoform.com
Website : www.decoform.com

2.02 MATERIALS:

- .01 Show face shall be as per the TYPE selected and may include the following special features: ISO/NPG, ultra violet stabilized, polyester gel-coat minimum thickness 15-20mil. Color to be matt white, ready for field painting.
- .02 Fiberglass reinforcement shall consist of a glassfiber reinforced polyester composite with glass content and thickness to meet structural design. Additional stiffeners (as required) shall be encased in the fiberglass composite to ensure straightness and strength. Flat surfaces equal to or greater than 12" x 12" or any running surface equal to or greater than 9" in width, shall be fabricated with a minimum 1/4" thick sandwich core.
- .03 Anchors and fasteners: Type 304 stainless steel where exposed; hot dip galvanized steel where unexposed.
- .04 Form stripping agent must be compatible with and for application of sealant and applied finishes.
- .05 Units will be reinforced (by design) with additional materials (such as wood, metal, etc.) as required.
- .06 Caulk joints where required with, one-compound elastomeric low modulus urethane sealant equivalent to Sonolastic Ultra. Do not use acrylic based products. Color of caulk to be selected by Architect.

.03 PHYSICAL PROPERTIES:

- | | | |
|--------------------------------------|--------------|-----------------------------|
| .01 Glass Content | | - 25% by weight |
| .02 Specific Gravity | | - 1.7 |
| .03 Shell Thickness | | - 1/8" min. |
| .04 Flame Spread Index (FSI) | (ASTM E84) | - 20 (Class 1)(Class A) |
| .05 Smoke Developed (SD) | (ASTM E84) | - 375 (Class 1)(Class A) |
| .06 Flexural Strength | (ASTM D790) | - 24.4×10^3 p.s.i. |
| .07 Flexural Modulus | (ASTM D790) | - 1.03×10^6 p.s.i. |
| .08 Tensile Strength | (ASTM D638) | - 10.6×10^3 p.s.i. |
| .09 Young's Modulus | (ASTM D638) | - 1.45×10^6 p.s.i. |
| .10 Ultimate Elongation | (ASTM D638) | - 1.09% |
| .11 Impact Strength (Method A) | (ASTM D256) | - 11.4 ft.-lb./in. |
| .12 BarcolHardness | (ASTM D2583) | - 45 - 51 |
| .13 Water Absorption | (ASTM D570) | - Mean value - .350%/24hrs. |
| .14 Heat Deflection | (ASTM D648) | - >220°C |
| .15 Coefficient of Thermal Expansion | (ASTM D696) | - 2.06×10^{-5} 1°C |
| .16 Crosshatch Adhesion* | (ASTM D3359) | -Coating not scored |
| .17 Weight | | - 1.65 to 2.3 lbs/sq.ft. |

PART 3 - EXECUTION**3.01 EXAMINATION:**

- .01 Prior to the manufacture of components, the installer shall check all pertinent site dimensions and conditions against the manufacturer's drawings and relay discrepancies to the manufacturer for inclusion in the drawings.
- .02 Prior to installation, the installer shall compare job site dimensions and conditions against the Architect's drawings and shall report any discrepancies to the General Contractor, the Architect and the manufacturer. Work shall not proceed until discrepancies are corrected.
- .03 Prior to installation, the installer shall examine pertinent job-site conditions to insure proper arrangement and fit of the work. Start of work implies acceptance of job-site condition.
- .04 All surfaces or framing structures shall be plumb and true as required.

3.02 PREPARATION:

- .01 Examine the contract drawings and specifications in order to ensure the completeness of the work required under this section.
- .02 Verify measurements and dimensions at the job-site and cooperate in the coordination and scheduling of the work of this section with the work of related trades, so as not to delay job progress.

3.03 ERECTION:

- .01 Install work as indicated on drawings, as specified herein and in accordance with approved shop drawings and manufacturer's recommendations.
- .02 Provide all support framing/reinforcing/support brackets required for work of this section and to ensure solid and secure installation.
- .03 Provide temporary supports to maintain position as units are being installed.
- .04 FRP units shall be handled with care and lifted with appropriate equipment.
- .05 FRP units shall be installed true and plumb, shimmed where necessary.
- .06 Caulk or fill all joints as required following Manufacturers recommendations. Control joints shall be provided where required as specified by Architect.
- .07 Where a Monolithic Joint has been specified, fill with Autobody filler or an equivalent product and sand the complete component assembly following Manufacturers recommendations under "Typical Monolithic Joint Installation". Use a primer which is compatible with high solids polyurethane paints for exterior and acrylic, polyurethane or oil based enamel paints for interior applications.
- .08 Expansion joints shall be installed as per Architect's recommendation.

3.04 TOLERANCES - ERECTED UNITS

- | | | |
|-----|---|----------------------|
| .01 | Face width of joint | $\pm 1/8"$ (3.2 mm.) |
| .02 | Variation from plumb (in any dist. of 20' max.) | $\pm 1/8"$ (3.2 mm.) |
| .03 | Variation from level (in any dist. of 20' max.) | $\pm 1/8"$ (3.2 mm.) |
| .04 | Max. differential between adjacent units in erected position (non-cumulative) | $\pm 1/8"$ (3.2 mm) |

3.05 PATCHING AND CLEANING:

- .01 Repair any defects found after the work of all trades has been completed, regardless of how, or by whom, the damage was caused. Patching shall match the original work. Use Manufacturers recommended materials when available.
- .02 Patch all countersunk fasteners and damages to match unit texture, finished flush with face of unit. . Use Manufacturers recommended materials when available

3.06 FINISHING:

- .01 Reference shall be made to the painting/texturing section of the specifications.

Decoform

Material Safety Data Sheet

Section 1 Product and Company Information

PRODUCT NAME: **Fiberglass Reinforced Polyester (FRP)**

PRODUCT USE: Architectural Decorations

MANUFACTURER: DecoForm Architect Inc.
26 Ashwarren Road
Toronto, ON
Canada M3J 1Z5
Tel.: 416-745-4970
Fax: 416-745-6636

Section 2 Important Product Information

Fiberglass Reinforced Polyester is classified as an 'article' under the Hazard Communication Standard (29 CFR 1901200) by the US Occupational Safety and Health Administration (OSHA).

This product is therefore considered to be non-hazardous based on evaluations made by Maxxam Analytics under the OSHA Hazard Communication Standard (29 CFR 1901200).

An 'article' is defined as a manufactured item, other than fluid or a particle, which:

- ♦ Is formed to a specific shape or design during manufacture
- ♦ Has end use function(s) dependent in whole or part upon its shape or design during end use.
- ♦ Under normal conditions of use does not release more than very small quantities, e.g. minute or trace amounts of hazardous chemical and does not pose a physical hazard or health risk to individuals who might come in contact with the finished product.

Section 3 Hazard Identification

EMERGENCY OVERVIEW

This product is not expected to produce any unusual hazards during normal use.

When fiberglass reinforced polyester is abraded, machined or mechanically disturbed, excessive dust may be released. Adequate control of released dust must be established (e.g., vacuum up any dust deposits or clean the area by applying wet methods).

Exposure to high dust levels may irritate the skin, eyes, nose, throat or upper respiratory tract.

Section 4 First Aid Measures

FIRST AID PROCEDURES

Eyes: Flush thoroughly with water. If irritation persists, consult a physician.

Skin: Wash with mild soap and water. Commercially available hand lotion may be used to treat dry skin areas. If irritation persists consult a physician.

Inhalation: Remove to fresh air. Other measures are usually not necessary, however if conditions warrant consult a physician.

Ingestion: This product is not intended to be ingested or eaten. If gastric disturbance occurs, call a physician.

Section 5 Fire Fighting Measures

Flash Point: N/A

Flammability: FRP meets the requirements for a Class 1 fire rating with Flame Spread Index (FSI) of 14 and Smoke Developed Index (SDI) of 375.

Explosion Data: N/A

Extinguishing Media: Carbon dioxide, dry chemical powder, foam and water spray.

Section 6
Accidental Release Measures

CONTAINMENT:

No special precautions.

CLEAN-UP:

Use normal clean up procedures.

DISPOSAL:

Follow local, state, provincial and federal regulations when disposing industrial waste. Keep spills and cleaning runoff out of municipal sewers and open bodies of water.

Section 7
Handling and Storage

HANDLING:

Avoid dust contact with eyes. Wear appropriate eye protection against dust. Avoid breathing dust. Wear appropriate respiratory protection against dust in poorly ventilated areas. Use good safety and industrial hygiene practices.

STORAGE:

Store in a cool, dry, ventilated area away from sources of heat, moisture and incompatibilities.

Section 8

The information contained herein is believed to be true and accurate but is not warranted To be, whether originating with DecoForm or not. Customers are advised to confirm that information is current, applicable and suitable to the circumstances.
DecoForm Inc. will not be liable for claims relating to any party's use of or reliance on information and data contained herein regardless of whether it is claimed that the information and data are inaccurate, incomplete or otherwise misleading.

Preparation Date: September 1, 2007 Issue: 2 Replaces Issue: Original

MANUFACTURER CERTIFICATION FOR LEED CREDIT

I, the manufacturer of _____ as specified in Master
Specification Section Number _____

Do herein certify that:

1. The materials were manufactured at our plant in Toronto, Ontario, Canada.
2. The materials were extracted or harvested at the United States Gypsum Company (USG) in Norman, OK.
3. The manufactured product contains 0% Post Consumer recycled materials and 5% Pre Consumer recycled materials.
4. Product data submitted under separate cover.

DecoForm contributes to greener construction management by:

1. Using a single mould to **produce many** parts and **retooling** allows moulds to be **reused** for more than one project.
2. **Minimizing construction waste** with our pre-molded easy to install products.
3. Our glassfiber reinforced gypsum and cement (similar to concrete) can be **reused** as filler in many construction products.

Manufacturer: DecoForm Architect Inc.

Certification by: _____

Date: _____

Name: Henry Liu

Title: President



(1) Locate center of structural column and scribe a line on both sides which extend further than the base to be installed later (step #18).



(2) Use a plumb bob or laser to transfer center line onto ceiling.

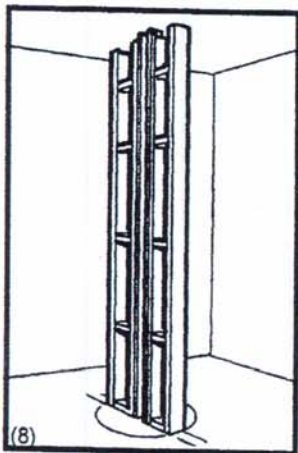


(3) Cut "base" and "capital" plywood templates using paper outline supplied by DecoForm. Place "base" template on floor, center on structural column and trace entire outline. With "capital" template, duplicate this procedure on the ceiling tracing the rectangular profile only.



(4) Fasten framing to structural column on center-line and plumb.

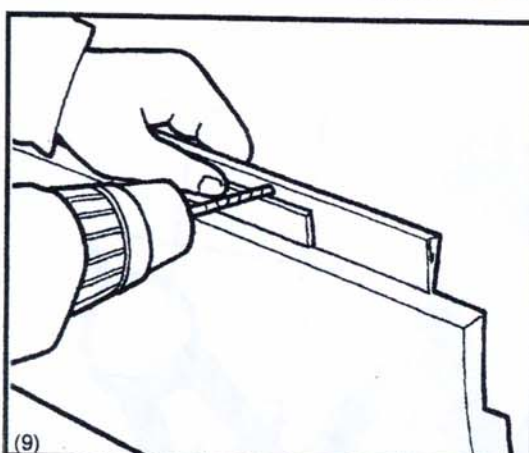
Fasten base blocking on center-line 1" back from circle scribed on floor.



(8) Measure and cut cross-bracing to appropriate lengths and install @ 24" centers.

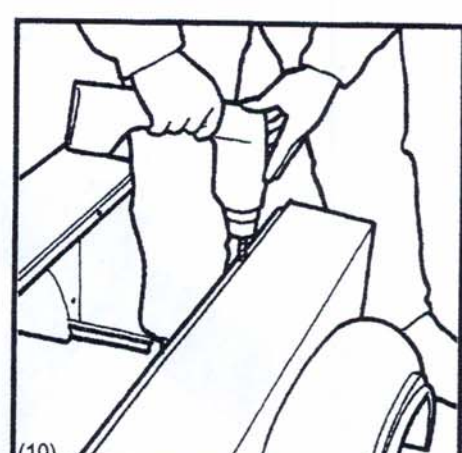
Using straight edge on outer, vertical frame, insure that there is no bowing.

Skeleton should be solid and plumb.



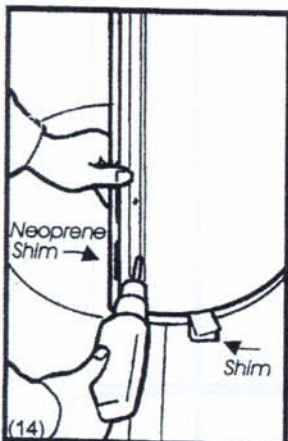
(9) Fabricate a 3/4" wide x 6" long height gauge.

On the column cover half with the larger vertical flange, drill 3/16" dia. clearance hole 6" from lower end of column cover half and at 16" centers thereafter. Repeat on other column cover half starting at 5" from lower end but drill holes in center of flange as well as into the overlap joint at capital.

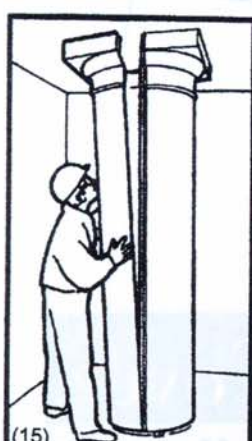


(10) Into the "base" and "capital" caulk recess, drill 3/16" dia. clearance holes in caulk recess, 6" from each end.

Also drill 3/16" dia. clearance holes in caulk recess of 2nd. column cover half, spaced on 16" centers.



(14) Shim bottom of column cover half until top is 1/8" from ceiling. Use neoprene shim between column cover and framing to insure O.D. of column cover is held. Plumb and fasten through previously drilled clearance holes.

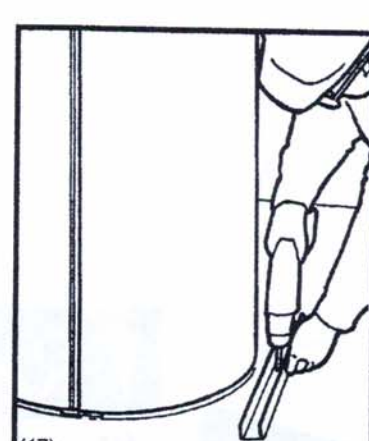


(15) Locate mating column cover half and position around flange on other column half so as to insure proper fit.

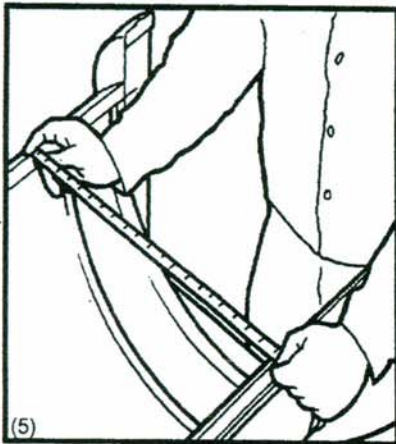
Shim at base to match first column cover half.



(16) While ensuring that the column cover halves are held tight together use #10 x 1 1/4" "TEK" screws and fasten through both flanges into support stud down entire length of column covers.

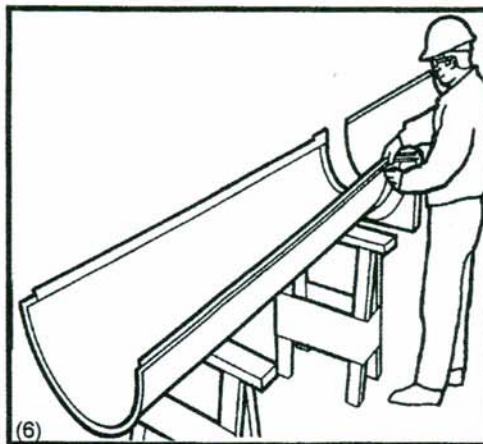


(17) Position blocking along inside of both scribed lines and fasten to floor.



(5) Locate column cover half which has the larger vertical flange.

Measure the inner diameter between flanges (at the capital). (Dia. "X").



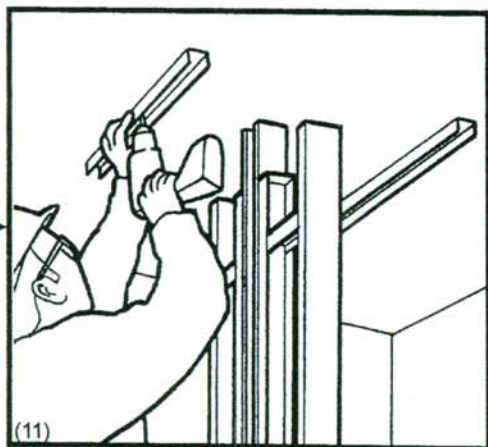
(6) Measure length of column cover half from lower end to the point at which the diameter was measured in step #5. (Dim. "Y").



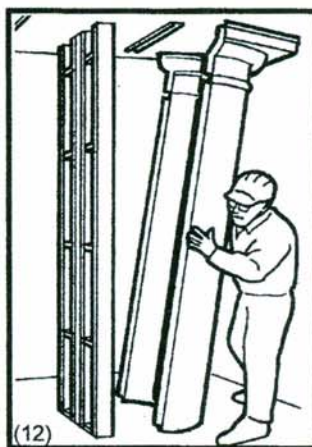
(7) Scribe line on structural column at height "Y" as measured in step (6).

Cut and install top cross brace at height "Y" to insure Dia. "X" minus 1/4".

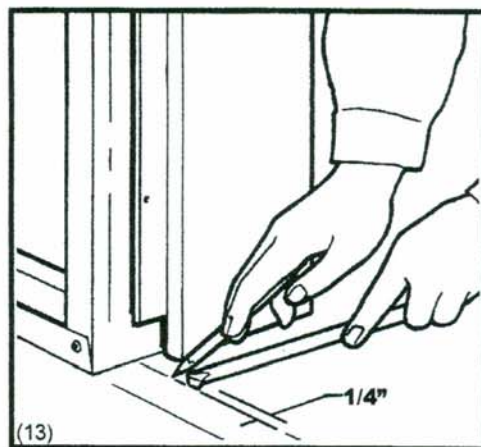
Repeat @ 180 degrees on column.



(11) Install blocking inside scribed lines on ceiling.



(12) Locate column cover half as identified by the larger vertical flange and position over scribed circular line on floor.

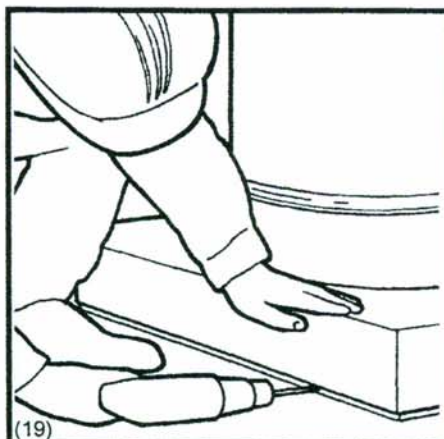


(13) Place the column cover half with the outside diameter, 1/4" back of scribed center line.



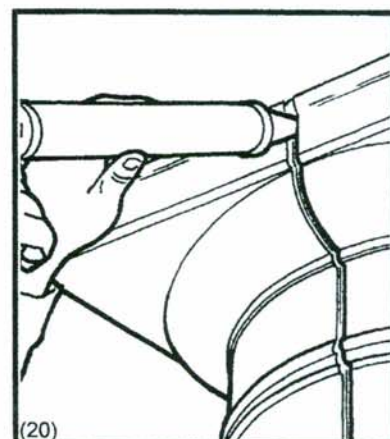
(18) Position both base halves around column cover assembly. Fasten both base halves together through vertical reveals.

Align base assembly with reveal of column cover shaft.



(19) At caulk recess, fasten base assembly through to blocking.

Repeat procedure at capital.



(20) Using a low modulus, paintable caulking, caulk all seams including horizontal reveals at floor and ceiling.