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Product Guide Specification

Specifier Notes: This product guide specification is written according to the Construction Specifications Institute (CSI) 3-Part Format, including *MasterFormat, SectionFormat,* and *PageFormat,* as described in *The Project Resource Manual—CSI Manual of Practice, Fifth Edition.*

The section must be carefully reviewed and edited by the Architect to meet the requirements of the project and local building code. Coordinate this section with other specification sections and the Drawings. Delete all "Specifier Notes" after editing this section.

Section numbers are from *MasterFormat 1995 Edition*, with numbers from *MasterFormat 2004 Edition* in parentheses. Delete version not required.

SECTION 13040 (13 25 00)

ABOVEGROUND STORM SHELTER SYSTEM

Specifier Notes: This section covers Norplex-Micarta "StormBlocker™" storm shelter system. Consult Norplex-Micarta for assistance in editing this section for the specific application.

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Aboveground storm shelter system using composite panel walls and ceiling.

1.2 RELATED SECTIONS

Specifier Notes: Edit the following list of related sections as required for the project. List other sections with work directly related to this section.

A. Section 03300 (03 30 00) – Cast-in-Place Concrete.

B. Section 06110 (06 11 00) – Wood Framing.

1.3 REFERENCES

Specifier Notes: List standards referenced in this section, complete with designations and titles. This article does not require compliance with standards, but is merely a listing of those used.

A. ASTM A 153/A 153M – Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.

B. ASTM A 653/A 653M – Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.

C. ASTM D 709 – Standard Specification for Laminated Thermosetting Materials.

D. Federal Emergency Management Agency (FEMA) 320 – Mitigation Directorate, Taking Shelter From the Storm.

E. International Code Council/National Storm Shelter Association (ICC/NSSA) 500 – Standard on the Design and Construction of Storm Shelters.

F. ISO 9001:2000 – Quality Management Systems.

1.4 SYSTEM DESCRIPTION

A. Storm Shelter System:
   1. Description: Aboveground, freestanding walls and ceiling of high-strength, thermoset composite panels encapsulating exterior of independently reinforced wood frame on reinforced concrete slab with steel door and frame.
   2. Designed and Tested:
      a. FEMA 320.
      b. ICC/NSSA 500.

1.5 SUBMITTALS

A. Comply with Section 01330 (01 33 00) – Submittal Procedures.

B. Product Data: Submit manufacturer's product data, including installation instructions.

C. Samples:
   1. Submit manufacturer's sample of composite panels.
   2. Size: 4 inches by 4 inches minimum.

D. Manufacturer's Certification: Submit manufacturer's certification that composite panels comply with specified requirements and are suitable for intended application.

E. Warranty: Submit manufacturer's standard warranty for composite panels.

1.6 QUALITY ASSURANCE

A. Manufacturer's Qualifications:
   1. Manufacturer regularly engaged, for preceding 5 years, in manufacture of composite panels of similar type to that specified.

2. Certification: ISO 9001:2000.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Delivery: Deliver composite panels to site clearly identifying product name and manufacturer.

B. Storage: Store materials in clean, dry area indoors in accordance with manufacturer's instructions.

C. Handling: Protect materials during handling and installation to prevent damage.

PART 2 PRODUCTS

2.1 MANUFACTURER

A. Composite Panel Manufacturer: Norplex-Micarta, 665 Lybrand Street, Postville, Iowa 52162. Toll Free (800) 568-8108. Phone (817) 329-6191. Fax (817) 421-4208. Website www.stormblocker.com. E-mail support@stormblocker.com.

2.2 ABOVEGROUND STORM SHELTER SYSTEM

A. Composite Panels: "StormBlocker".
   1. Description: High-strength fiberglass/phenolic composite panel.
   2. Typical Properties: ASTM D 709.
      a. Rockwell Hardness, M-Scale: 95.
      b. Moisture Absorption: 1.4 percent.
      c. Flexural Strength:
         1) Lengthwise: 19,100 psi.
         2) Crosswise: 14,500 psi.
      d. Flexural Modulus:
         1) Lengthwise: 4.3×10^6 psi.
         2) Crosswise: 3.0×10^6 psi.
      e. Impact Strength:
         1) Lengthwise: 22.0 psi.
         2) Crosswise: 15.0 psi.
      f. Tensile Strength:
         1) Lengthwise: 26,200 psi.
         2) Crosswise: 18,300 psi.
      g. Compressive Strength, Flatwise: 22,700 psi.
   3. Thickness: 5/16 inch.
   4. Density: 2.5 psf.

Specifier Notes: Specify required panel size for wall height.

   5. Size: [48 inches by 96 inches] [48 inches by 108 inches] [48 inches by 120 inches] [As indicated on the Drawings].
   6. Tested to resist impact from flying debris and wind loads associated with 250-mph winds, when installed on shelter exterior with edges vertical in accordance with FEMA 320 and ICC/NSSA 500.

B. Fasteners for Attaching Composite Panels to Stud Framing:
   1. Ring-Shank Nails: 0.120 inch by 2.375 inches, full head.
   2. Self-Tapping Screws: 1/4 inch by 3 inches.
   3. Wood-Deck Screws: #8 by 3 inches.

C. Batten Strips:
   1. Material: Same as composite panels.
   2. Each Batten Strip:
      a. Maximum Pieces: 2.
      b. Minimum Width: 4 inches.
      c. Minimum Length: 16 inches.
   3. Fasteners:
      a. Wood-Deck Screws: Two #8 by 3 inches.
      b. Ring-Shank Nails: Two 0.120 inch by 2.375 inches, full head.
      c. Nails: Two 10d by 1-1/2 inches at 4 inches O.C.

Specifier Notes: Delete the following paragraph if the concrete slab is existing.

D. Concrete Slab:
   1. Concrete: As specified in Section 03300 (03 30 00).
   2. Minimum Compressive Strength, 28 Days: 3,000 psi.
   3. Normal weight.
   4. Minimum Thickness: 4 inches.
   5. Steel Reinforcement:
      a. As indicated on the Drawings.
      b. Minimum Yield Strength: 60 ksi.
      c. Splices: Do not splice steel reinforcement under or around storm shelter system.

E. Wood:
   1. Wood Framing: As specified in Section 06110 (06 11 00).
   2. Lumber:
      a. Solid lumber.
      b. Finger-Jointed or Engineered-Wood Studs: Not allowed.
   3. Vertical Studs: 2 by 4 SPF or DFL stud-grade lumber.
   4. Top Plates: 2 by 4 SYP#2 or DFL#2 lumber.
   5. Sill Plates: Pressure-treated SYP lumber.
   6. Joists and Headers: 2 by 6 SYP#2 or DFL#2 lumber.
      a. Clear Span Greater than 96 Inches: 2 by 8 joists.
   7. Notches in Studs or Joists: 3/4-inch maximum.
   8. Plywood: 3/4 inch, CDX.
   9. Fasteners into Pressure-Treated Lumber: Hot-dipped galvanized steel, ASTM A 153.

F. Connectors:
   1. Simpson Strong-Tie or approved equal.
   2. Finish for Connectors in Contact with Pressure-Treated Lumber: ASTM A 653, G185. Simpson “ZMAX”.

G. Steel Door and Frame:
   1. Debris Impact and Wind Force Protection: FEMA 320 and ICC/NSSA 500.
   2. Door Size: 2’-8” by 6’-8”.
   3. Door Hardware: FEMA 320 and ICC/NSSA 500.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine area and concrete slab to receive storm shelter system.

B. Notify Architect of conditions that would adversely affect installation or subsequent use.

C. Do not begin installation until unacceptable conditions are corrected.

3.2 INSTALLATION

A. Install storm shelter system in accordance with manufacturer's instructions at location indicated on the Drawings.

B. Install storm shelter system plumb, level, square, and true to line.

C. Do not attach storm shelter system to host building walls, ceilings, or trusses with construction connectors, plates, or ties. Make attachment of adjoining walls with standard framing nail connections.

D. Secure storm shelter system to concrete slab with anchor bolts securely in place as indicated on the Drawings.

E. Composite Panels:
   1. Install composite panels as exterior sheathing to walls and ceiling.
   2. Cut, drill, and nail composite panels in accordance with manufacturer's instructions.
   3. Ceiling Panel Penetrations:
      a. Maximum of 1 for exhaust/ventilation, 2 for HVAC, and three 1-inch size for electrical.
      b. Do not cut 2 penetrations in same joist channel.
      c. Separate each penetration by a minimum of 16 inches O.C.
      d. Maximum Penetration Size: 3-1/2-inch diameter.
   4. Exterior Wall Panel Penetrations: Not allowed.
   5. Attach to Stud Framing:
      a. Nails: Install 2 every 4 inches around panel perimeter and 2 every 6 inches in field.
      b. Screws: Install 1 every 4 inches around panel perimeter and 1 every 6 inches in field.
   6. Batten Strips:
      a. Walls: Install 4-inch batten strips over vertical panel seams.
      b. Ceilings: Not required.

F. Anchor Bolts:
   1. Install anchor bolts plumb at locations indicated on the Drawings.
   2. Install "Titen HD" 5/8-inch by 6-inch anchor bolts (Simpson "THD62600HMG") into 5/8-inch hole or 5/8-inch threaded rod (Simpson "RFB#5x8HDG") into 3/4-inch hole with Simpson "Epoxy-Tie (SET)" adhesive with 3-inch embedment.
   3. Threaded Rod: Expose 4 inches above slab.
   4. Place a maximum of 8 inches from corner of room and 16 inches O.C. along length of wall.

5. Do not place within 5 inches of slab edge.
6. Bearing Plates: LBP5/8 or equivalent.

G. Wood:
1. Drill Holes in Studs and Joists:
   a. Diameter: 1 inch maximum.
   b. Distance to Edge: 5/8 inch minimum.
   c. Not located in same section as cut or notch.
2. Install plywood horizontally as interior sheathing to walls and ceiling.

H. Connectors:
1. Fill all round holes on connectors with fasteners.
2. Install Connectors with 10d by 1-1/2-Inch Nails: SPH4Z stud plate ties, LGT2 girder ties, and H8 hurricane ties.

I. Door Frame:
1. Install door frame plumb, level, and square.
2. Rough Opening: Minimum 32-1/2 inches by 81-1/4 inches.
3. Attach to stud framing at 11 points with 3/16-inch by 3-inch wood screws.
4. Use all predrilled holes in door frame to secure door assembly to shelter.
5. Drill 6 bolt holes to full oval opening in frame to depth of 1-1/2 inches.

3.3 ADJUSTING

A. Adjust door to swing freely, without binding in frame.

B. Adjust door hardware to operate properly.

3.4 PROTECTION

A. Protect completed storm shelter system from damage during construction.

END OF SECTION