

PART 1 - GENERAL

1. RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions, and division 1 specification sections.

2. SUMMARY

- A. Section includes components tested and labeled in accordance with ICC-500 (2020), including:
 - 1. Tornado-Resistant Integrated Framing Assemblies (IFAs ®)
 - 2. Tornado-Resistant Hollow Metal Doors
 - 3. Tornado-Resistant Finish Hardware
- B. Section does not include:
 - 1. Installation of Integrated Framing Assemblies (IFAs ®)
 - 2. Installation of Doors and Hardware
 - 3. Field Painting

3. RELATED SECTIONS

- A. Division 3: Insulated Concrete Forms
- B. Division 3: Integrated Framing Assemblies (IFAs ®)
- C. Division 8: Finish Hardware
- D. Division 9: Painting
- E. Division 28: Access Control

1.04 SUBMITTALS

- A. General:
 - 1. Submit the following in accordance with conditions of Contract and division 1 requirements; advise Architect within submittal of incompatibility or issues which may detrimentally affect the work of this section:
- B. Product Data:
 - 1. For each type of product specified, include details of construction, material descriptions, hardware preparations, internal components, profiles, and finishes.
 - 2. Include details of each assembly type, elevations of assemblies, conditions at openings, location and installation requirements of assembly hardware and reinforcements.
- C. Shop Drawings:
 - 1. Provide door and frame schedule of assemblies using architect's door numbers, elevations, and notes. Include assembly details including dimensions, elevations, profiles, materials, etc. for each tag.
 - 2. Provide hardware schedule indicating complete designations of every item required for each assembly including model, description, quantity, etc. using architect's headings, door numbers, and notes.
 - 3. After final approval of door, frame, and hardware schedules, provide listing of manufacturer's hardware locations and templates for each item of hardware.

5. QUALITY ASSURANCE

- A. Qualification:

INSULATED CONCRETE FORM ACCESSORIES FOR STORM SHELTERS
TORNADO-RESISTANT IFA® ASSEMBLIES

1. Obtain Tornado-Resistant IFA® Assemblies from a single source manufacturer specializing in manufacturing Tornado-Resistant IFA® Assemblies in accordance with ICC-500 (2020).
 - B. Regulatory Requirements:
 1. Provide Tornado-Resistant IFA® Assemblies complying with ICC-500 (2020) and labeled by a qualified, accredited testing agency.
 2. Maintain a current copy of ICC-500: ICC/NSSA Standard for the Design and Construction of Storm Shelters in the project field office.
 3. Maintain a current copy of manufacturers installation instructions in the project field office and always refer to these instructions during installation.
 4. Provide complete assemblies for Tornado-Resistant storm shelters and other areas of refuge complying with and tested according to ICC-500 (2020).
 5. Label Tornado-Resistant IFA® Assemblies with permanently affixed labels to clearly denote compliance with ICC-500 (2020).
 6. Each door and frame will have its own permanent label showing what criteria the assembly was tested in accordance with. The label will show which independent laboratory tested the assembly. The label will show design pressure in pounds per square foot and impact rating with test missile size and speed.
 - C. Installer Qualifications:
 1. Qualified tradesmen skilled in the application of Tornado-Resistant doors and frames who have a record of successful installation performance on projects similar in size and scope to this project.
 2. Prior to assembly conduct a pre-installation meeting with the job superintendent or general contractor, ICF contractor, mason, and other necessary trades to coordinate proper installation, form product, and spatial requirements for form assembly, alignment, forming, and bracing.
 - D. Single Source Responsibility:
 1. Except for cylinders, Tornado-Resistant doors, frames, and hardware for storm shelter openings shall be supplied as complete assemblies in accordance with ICC-500 (2020).
6. DELIVERY, STORAGE, HANDLING
- A. Tag each item or package separately with identification related to the final door, frame, and hardware schedule, and include installation instructions and templates with each delivery.
 - B. Deliver doors and hardware in manufacturer's standard packaging, palletized, wrapped, or crated to provide protection during transit and project-site storage.
 - C. Deliver IFAs® with two removable spreader bars across the bottom of the assemblies, tack welded to jambs and mullions.
 - D. Inspect door, frame, and hardware assemblies upon delivery for damage. Do not accept damaged products. Return for replacement with undamaged products.
 - E. Handle, store, and protect products in accordance with manufacturer's instructions and ANSI/SDI/NAAMM recommendations.
 1. Storage of Doors:
 - a. Store doors vertically in a dry area, under proper cover. Place units on wood sills minimum of 4" AFF in a manner that will prevent rust and damage. Provide space between doors to permit air circulation.
 2. Storage of IFAs®:
 - a. Store frames in an upright position with heads uppermost, under proper cover. Place units on wood sills minimum of 4" AFF in a manner that will prevent rust and damage. Provide a 2" space between frames to permit air circulation.

INSULATED CONCRETE FORM ACCESSORIES FOR STORM SHELTERS
TORNADO-RESISTANT IFA® ASSEMBLIES

3. Provide proper storage of doors, frames, and hardware to maintain quality and integrity.
 4. Sand, touch up, and clean prime painted surfaces prior to finishing in accordance with manufacturer's instructions.
- F. Maintain manufacturer recommended environmental conditions throughout storage and installation.
- G. Handle doors, frames, and hardware in a manner to avoid damage, marking, or scratching. Correct, replace, or repair products damaged during work.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

- A. Acceptable manufacturers for Tornado-Resistant IFA® Assemblies are listed below. Only the products of the listed manufacturers will be accepted.
1. Stala Integrated Assemblies, LLC, ICC-500 Solutions (Basis-of-Design)
502-526-6127, info@stalaframing.com
www.stalaframing.com

2.02 MATERIALS

- A. Integrated Framing Assemblies (IFAs®) shall be made of commercial grade zinc coated steel conforming to ASTM Designation A-526, not less than 14-gauge.
1. Tornado-Resistant IFAs® shall be custom made welded units of types and styles as shown on drawings and schedules.
 2. Assemblies shall be 14-gauge, full profile weld.
 3. 16-gauge continuous alignment anchors.
 - a. Jamb alignment anchor flanges shall be welded and bent at an adequate degree to establish anchorage in the concrete wall for the full height of assembly while allowing unrestricted flow of concrete between EPS wall members. Alignment anchor flanges shall assist in assembling and aligning of ICF wall and shall be constructed such that concrete shall not penetrate or fill hardware reinforcements or preps.
 4. Head alignment anchor flanges shall run the entire length of the assembly head and allow unrestricted flow of concrete between the EPS wall members. Head alignment flanges shall assist in assembling and aligning of ICF wall.
 5. 7-gauge hinge reinforcements
 6. 12-gauge strike reinforcements
 7. 12-gauge closer reinforcement
 8. 10-gauge floor anchors securely welded on the inside of each jamb.
 9. Floor anchors shall be securely welded on the inside of each jamb.
- B. Doors shall be made of commercial grade zinc coated steel conforming to ASTM Designation A-526, not less than 14-gauge.
1. Tornado-Resistant Doors shall be custom made welded units of types and styles shown on drawings and schedules.
 2. Door skins shall be 14-gauge with interlocking edge, bondo filled.
 3. 12-gauge hinge and lock edge channels, full height.
 4. 16-gauge top channel, inverted top channel, and inverted bottom channel.
 5. 18-gauge steel stiffened core, back-to-back, spot welded to each face.

6. 14-gauge lock body reinforcements
7. 11-gauge hinge reinforcement
8. 14-gauge closer reinforcement
9. 11-gauge lock channel reinforcements

2.04 FINISHING

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Apply manufacturer standard primer immediately after cleaning and pretreating.
 1. After fabrication, all tool marks and surface imperfections shall be removed, and exposed faces of all welded joints shall be dressed smooth. Assemblies shall then be chemically treated to ensure maximum paint adhesion and shall be coated on all accessible surfaces with a rust inhibitive primer which is fully cured before shipment.

PART 3 - EXECUTION

3.01 EXAMINATION AND PREPARATION

- A. Prior to installation of IFAs®, examine supporting structure and conditions under which IFAs® are to be installed. Correct all defects or unacceptable conditions prior to proceeding with installation.
- B. Where on-site modification of doors, frames, or hardware is required, prepare hardware locations in accordance with the following:
 1. Tornado-Resistant IFA® Assemblies shall not be unduly modified. Consult with the manufacturer or the Authority Having Jurisdiction as needed to maintain the labeled approval of the Tornado-Resistant IFA Assembly, complying with ICC-500 (2020).
 2. For surface applied door hardware, drill and tap doors and frames according to ANSI/SDI A250.6.
 3. Where doors are in rated assemblies, complete with NFPA 80 for restrictions regarding on-site door hardware preparation.

3.02 INSTALLATION

- A. Care should be taken in handling assemblies during unloading, moving, and setting in place so assemblies remain square, plumb, and straight as manufactured.
 1. When using mechanical equipment such as lulls to move assemblies, it is recommended that lumber (2" x 10") of adequate length or a transport frame be used to avoid crimping or point loads.
 2. The spreader bars at the bottom of the assemblies or internal "x" bracing should not be used to lift assemblies as this can cause distortion. Spreader bars are not intended for final placement but to aid in transportation.
- B. Assemblies are permanent units and require being set square and plumb to receive doors and hardware as specified. Periodically check assemblies during wall erection and initial set-up.
- C. Jambs are to be placed after the floor slab has been poured and anchored in place.
 1. Spreader bars are used only for handling and additional wood struts should be used at floor level to control tolerances, twists, and stability of the frame assembly during construction.

INSULATED CONCRETE FORM ACCESSORIES FOR STORM SHELTERS
TORNADO-RESISTANT IFA® ASSEMBLIES

2. Provide horizontal wall supports adjacent to assembly jambs. Wall should be supported on both sides to keep assemblies' plumb and straight within the wall plane.
 3. Bracing should be within the concrete area of the assembly and spread with blocking. Bracing shall be placed to avoid torque on the assembly jambs and head.
 4. Bracing should be applied so it is in line with the loads from the concrete.
- D. Assemblies provide anchorage to the ICF block, provide a bulkhead system for wall construction, and need to be braced to receive temporary construction loads above the openings to limit assembly jamb and head deflections.
1. Installation and function of doors will be compromised if deflections are not controlled and checked during the process and as the wall cures.
 2. Wall concrete needs to be cured sufficiently to carry dead and live loads around the opening for pours above the openings as designed.
 3. Temporary door assembly bracing and supports should not be removed until the adjacent concrete has gained enough strength for beam action per structural drawings.
- E. Concrete shall be placed balanced on both sides of the assembly jambs (with one-foot maximum differential). Unbalanced loads could cause twisting and torque on the frame if not braced for such with enough "x" bracing or bulkhead.
- F. Avoid discharging concrete from the pump directly onto the assembly jambs or head.
1. Concrete should be placed such that pumping impact is limited and concrete vibrated, so it flows along the assembly jambs and head until covered completely and no void exists.
 2. Caution not to over vibrate.
- G. Watch combined loadings on bracing and supports. It has been best practice to keep vertical loads from the concrete placement above assemblies' head separate from other bracing and to be transferred through assembly bracing down to the footings by struts and not back into the ICF form or into horizontal wall bracing.
1. Various bracing options and pour sequences should be considered and will be acceptable if the assembly remains stable and within acceptable tolerances to allow for operation of doors.
 2. Most assemblies can be braced with basement jacks or struts and blocking with limited risk if pours are controlled, impact and unbalanced loads are avoided, and concrete is set prior to going above the frame head. Assemblies wider than six feet require additional consideration; please contact Stala Integrated Assemblies for assistance.
- H. Install doors and hardware per manufacturer templates, recommendations, and instructions.

3.02 CLEANING AND TOUCH UP

- A. Remove any concrete debris on assembly which occurred during installation.
- B. Immediately after erection, sand smooth any rusted or damaged areas of prime coat on door assemblies and apply touch-up of compatible air-drying primer. Repair with galvanizing repair paint in accordance with manufacturer's written instructions if needed.

END OF SECTION