

SECTION 08110 - STEEL DOORS AND FRAMES

PART 1 - GENERAL

RELATED DOCUMENTS:

Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.

DESCRIPTION OF WORK:

Extent of steel doors, frames and hollow metal work is as shown and scheduled on drawings.

Door Hardware is specified elsewhere in Division 8.

QUALITY ASSURANCE:

Provide doors and frames complying with The National Association of Architectural Metal Manufacturers recommended specifications for Custom Hollow Metal Doors and Frames and as herein specified.

Structural Performance Requirements: Provide steel frames and doors that comply with performance requirements indicated, as demonstrated by testing manufacturer's assemblies in accordance with the SBCCI Test Standard for determining Impact Resistance from Windborne Debris, SSTD-12-99. Provide test reports from an approved testing agency, certifying compliance with all requirements, including the following:

Wind Loads: Florida Building Code 2007-B, requires exterior cladding and components including exterior glass and frame assemblies to be designed to meet the wind load requirements of FBC Chapter 16 and ASCE-7. Refer to Structural Drawings and Specification Notes for wind load criteria, including speed and importance factor.

Large Missile Impact Test: In accordance with impact criteria per SBC/SSTD 12-99.

Cyclic Load Test: In accordance with cyclic loading criteria per SBC/SSTD 12-99.

Structural performance, when tested, shall conform to ASTM E 330-70.

Deflection of framing members shall not exceed 1/175 of actual span, when subjected to wind load, per FBC. Deadload deflection of intermediate horizontal members shall not exceed 1/8". Deflection of anchorage elements shall not exceed 1/16" in any direction as measured at the point of maximum deflection for any element under consideration

Provide internal reinforcing as required.

SUBMITTALS:

Product Data: Submit manufacturer's specifications for fabrication and installation, including data substantiating that products comply with requirements.

Shop Drawings: Submit for fabrication and installation of steel doors and frames. Include details of each frame type, elevations of door design types, conditions at openings, details of construction, location and installation requirements of finish hardware and reinforcements, and details of joints and connections. Show frame anchorage and accessory items.

Certification: Structural Calculations signed and sealed by a Structural Engineer licensed in the State of Florida certifying compliance with the structural design criteria and other applicable codes shall be submitted with the shop drawings. Calculations shall include anchor type, size, and spacing for securing exterior frames to main wind-resisting structure.

PART 2 - PRODUCTS

HARDWARE PREPARATION:

Finish hardware preparation: Prepare doors and frames to receive mortised and concealed finish hardware in accordance with final Finish Hardware Schedule and templates provided by hardware supplier. Comply with applicable requirements of ANSI A 115 series specifications for door and frame preparation for hardware.

Locate finish hardware as shown on final shop drawings or, if not shown, in accordance with "Recommended Locations for Builder's Hardware", published by Door and Hardware Institute.

CLEARANCES:

Edge clearances shall be provided as follows: 1/8" between door and frame, and at head and jambs; 3/4" maximum at door sills where no threshold is used; 1/8" max. above threshold at door sills where threshold is used; and 1/8" between meeting edges of pairs of doors.

ACCEPTABLE MANUFACTURERS:

Subject to compliance with requirements, manufacturers offering steel door and frame products which may be incorporated in the Work of the Project include, but may not be limited to, the following:

- Steelcraft, Div. I-R Security (B door)
- Ceco Door Products (Medallion door)
- Curries (747 Door)

Manufacturers must be able to provide exterior frame and door assemblies which have been successfully tested in configurations required by the project design under conditions which equal or exceed wind loading and other forces anticipated at the Project site.

HOLLOW METAL DOORS:

Materials, Exterior Hollow Metal doors, and interior hollow metal doors where specified for indicated openings, shall be of commercial grade hot dip galvanized steel conforming to ASTM Designation A 525, A60 galvanized coating. Face sheets for exterior doors shall be not less than 16 gage.

Design and Construction:

All doors shall be custom made, of the types and sizes shown on approved shop drawings, and shall be fully welded seamless construction with no visible seams or joints on their faces or vertical edges. Minimum door thickness shall be 1-3/4".

All doors shall be strong, rigid, neat in appearance, free from warpage or buckle. Corner bends shall be true and straight and of minimum radius for the gage of metal used.

Face sheets stiffened by continuous vertical formed steel sections spanning interior between door faces. Stiffeners minimum 22 gage, spaced maximum 6" apart, spot welded to face sheets maximum 5" on center. Spaces between stiffeners sound deadened, insulated full height of door with 3 pound minimum density mineral wool batts.

Door faces joined at vertical edges by continuous weld extending the full height of door. Welds ground, filled, dressed to smooth, flush invisible seam.

Top and bottom edges: All doors shall be closed with continuous recessed steel channel not less than 16 gage, extending full width of door and spot welded to both faces. Exterior doors shall have additional flush closing channel at their top edges and, where required for attachment of weatherstripping, a flush closure also at their bottom edges. Openings shall be provided in the bottom closure of exterior door to permit escape of entrapped moisture. Joints at closing channel at top edges of exterior doors shall be filled and dressed smooth to make them invisible and provide a smooth flush surface.

Edge profiles shall be provided on both vertical edges of doors as follows:

Single-acting swing doors - beveled 1/8" in 2".

All hardware furnished by the hardware contractor for a single-acting door shall be designed for beveled edges as specified above.

Hardware Reinforcements: Doors shall be mortised, reinforced, drilled and tapped at the factory for fully templated hardware only, in accord with the approved hardware schedule and templates provided by the hardware contractor. Where surface-mounted hardware is to be applied, doors shall have reinforcing plates only; drilling and tapping shall be done by others.

Minimum gages for hardware reinforcing plates shall be as follows:

Hinge and pivot reinforcements - 1-1/2" x 10" x 3/16".

Reinforcements for lock face, flush bolts, concealed holders, concealed or surface mounted closers - 12 gage.

Reinforcements for all other surface mounted hardware - 16 gage.

STEEL FRAMES:

Materials, Steel Frames for Use in Exterior and Interior Openings: commercial grade hot dipped galvanized steel conforming to ASTM Designated A 525, not less than 16 gage, and shall have an A60 coating.

Design and Construction of Steel Frames: All frames shall be custom made welded units with integral trim of the sizes and shapes shown on approved shop drawings. Knocked-down frames will not be accepted.

Quality and Appearance: Finished work shall be strong and rigid, neat in appearance, square, true, and free of defects, warp or buckle. Molded members shall be clean cut, straight and of uniform profile throughout their lengths. Exposed welds shall be ground smooth.

Jamb Profile: Jamb depths, trim, profile and backbends shall be as scheduled by the Architect and shown on approved shop drawings.

Corner joints shall have all contact edges closed tight, with trim faces mitered and continuously welded, and stops butted. The use of gussets will not be permitted. Corner joint detail shall be NAAMM Method B, machine mitered and full welded.

Minimum depth of stops shall be 5/8". Cut-off sanitary or hospital type stops, where scheduled, shall be capped at 45° at heights shown on approved shop drawings; and all jamb joints below cut-off stops shall be ground and filled smooth, making them imperceptible.

Frame Unit Assembly: When shipping limitations so dictate, frames for large openings shall be fabricated in sections designed for field assembly and welding by hollow metal supplier. Provide splice joints using full sleeve splice in same configuration as hollow metal frame. Weld joints and grind smooth. No exposed metal screws permitted.

Joinery of Frame Members: Frames for multiple or special openings shall have mullion and/or rail members which are close tubular shapes having no visible seams or joints. All joints between faces of abutting members shall be securely welded and finished smooth.

Internal Reinforcement: Exterior steel frames composed of multiple openings forming "window walls" shall be internally reinforced as necessary to comply with structural design criteria.

Hardware Reinforcements:

Frames shall be mortised, reinforced, drilled, and tapped at the factory for fully templated mortised hardware only, in accord with approved hardware schedule and templates provided by the hardware contractor. Where surface mounted hardware is to be applied, frames shall have reinforcing plates only; all drilling and tapping shall be done by others.

Minimum thickness of hardware reinforcing plates shall be as follows:

Hinge and pivot reinforcements: 3/16", 1-1/4' x 10" minimum size.

Strike reinforcements, flush bolt reinforcements, closer reinforcements, reinforcements for surface mounted hardware, hold-open arms, and surface panic devices: 12 gage.

Frame Anchors, General: Impact design criteria referenced above in "Structural Performance Requirements" article applies to selected hollow metal door/frame assemblies, generally at exterior wall openings. Where required by impact design and testing, furnish anchors in required number, of required type and size, and install at required locations to comply with tested products. The following paragraphs relating to "Floor Anchors" and "Jamb Anchors" govern requirements for door/frame assemblies whether or not subject to impact design requirements.

Floor anchors shall be securely welded inside each jamb, with two holes provided at each jamb for floor anchorage. Minimum thickness of floor anchors shall be 14 gage.

Where separate topping of finish is scheduled over concrete slabs, adjustable floor anchors, providing not less than 2" height adjustment, shall be provided. Terminate bottom of frames at finish floor surface.

Jamb anchors: Frames for installation in stud partitions shall be provided with steel anchors of suitable design, not less than 16 gage thickness, securely welded inside each jamb as follows:

Frames up to 7'-6" height: 4 anchors.

All frames shall be provided with a steel spreader temporarily attached to the feet of both jambs as a brace during shipping and handling. Shipping bar shall be removed before setting frame. General Contractor to install 2x spreader bars to maintain proper frame widths.

Punch door stops to receive rubber silencers as required. Provide for three silencers on lock side of single door frames and two silencers at head of double door frames.

PART 3 - EXECUTION

INSPECTION:

Installer must examine substrate and conditions under which steel doors and frames are to be installed and must notify the Architect in writing of any conditions detrimental to proper and timely completion of work. Do not proceed with work until unsatisfactory conditions have been corrected in manner acceptable to installer.

INSTALLATION:

General: Install standard steel doors, frames, and accessories in accordance with final shop drawings, manufacturer's data, and as herein specified.

Placing Frames: Comply with provisions of NAAMM Hollow Metal Technical and Design Manual, Section 6 - Installation of Doors and Frames, unless otherwise indicated.

Secure each frame floor clip to concrete floors with two 1/4" diameter galvanized bolts set in drilled-in tamp-ins. Secure each frame floor clip to wood floors with two 1/4" diameter galvanized lag screws. Power nailing to floor may be used where practical.

Door Installation:

Fit hollow metal doors accurately in frames, within clearances specified in NAAMM Hollow Metal Technical and Design Manual and as specified herein.

ADJUST AND CLEAN:

Prime Coat Touch-Up: Immediately after erection, sand smooth any rusted or damaged areas of prime coat and apply touch-up of compatible air-drying primer.

Final Adjustments: Check and readjust operating finish hardware items, leaving steel doors and frames undamaged and in complete and proper operating condition.

END OF SECTION 08110

Steel Door Curtain Slats: Flat profile, structural-quality, cold-rolled galvanized steel sheets, ASTM A 653/A 653M, with G90 (Z275) zinc coating.

Insulation: Fill slat with rigid cellular polystyrene or polyurethane-foam-type thermal insulation with maximum flame-spread and smoke-developed indices of 75 and 450, respectively, per ASTM E 84. Enclose insulation completely within metal slat faces.

Inside Curtain Slat Face: 24 gage galvanized steel, match finish of outside slats.

Endlocks, General: Locate locks on every other curtain slat for curtain alignment and resistance against lateral movement.

Windlocks: Malleable-iron castings secured to curtain slats with galvanized rivets or high-strength nylon, as required to comply with wind load.

Bottom Bar: Continuous hot-dipped galvanized steel angles, minimum 1/8" thickness, finish to match slats. Provide with combination bottom astragal and sensor edge.

Curtain Jamb Guides: Galvanized steel angles or channels and angles, with sufficient depth and strength to retain curtain, allow curtain to operate smoothly, withstand loading.

Service Doors: Build up units with not less than 3/16-inch thick, galvanized steel sections complying with ASTM A 36/A 36M, and ASTM A 123. Slot bolt holes for guide adjustment. Prevent overtravel of curtain with removable stops on guides and hold windlocks with continuous bar.

HOODS AND ACCESSORIES

Hood: Form to enclose coiled curtain and operating mechanism at opening head and act as weatherseal. Contour to suit end brackets to which hood is attached. Roll and reinforce top and bottom edges for stiffness. Provide closed ends for surface-mounted hoods. Provide intermediate support brackets as required to prevent sag.

Fabricate from not less than 24 gage, hot-dip galvanized steel sheet, match slat finish.

Weatherseals: Replaceable, adjustable, continuous, compressible weather-stripping gaskets fitted to bottom and at top of exterior doors, unless otherwise indicated. At door head, use 1/8-inch- (3-mm-) thick, replaceable, continuous sheet secured to inside of curtain coil hood.

Jamb Seals: Replaceable, adjustable, continuous, flexible, 1/8-inch- (3-mm-) thick seals of flexible vinyl, rubber, or neoprene at door jambs for weathertight installation.

Fabricate locking device assembly with lock, spring-loaded dead bolt, operating handle, cam plate, and adjustable locking bar to engage through slots in tracks.

Locking Bars: Single-jamb side.

Operation: From inside and outside.

Lock Cylinder: As specified in Division 8 Section "Door Hardware".

Chain Lock Keeper: Suitable for padlock.

Counterbalancing Mechanism: Adjustable, oil-tempered, heat-treated steel helical torsion springs mounted around structural carbon-steel pipe, and contained in barrel of sufficient diameter and wall thickness to support rolled-up curtain without distortion of slats and to limit barrel deflection to not more than 0.03 in./ft. of span under full load; with grease-sealed bearings or self-lubricating graphite bearings.

Provide springs designed for 50,000 cycle operation.

Mounting Brackets: Cast-iron or cold-rolled steel plate with bell-mouth guide groove for curtain.

Manual Door Operator: Chain hoist.

PART 3 - EXECUTION

INSTALLATION

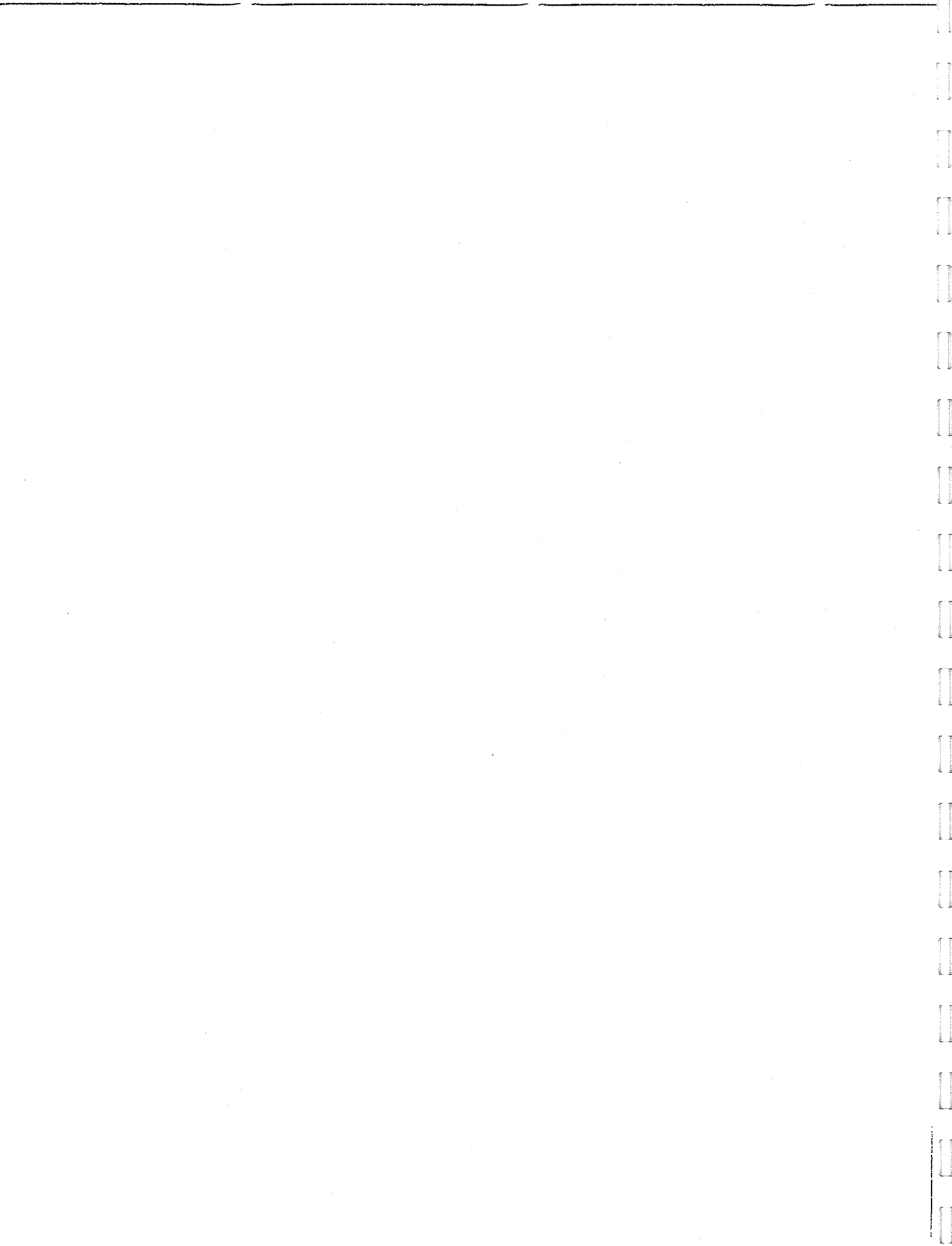
General: Install door and operating equipment complete with necessary hardware, jamb and head mold strips, anchors, inserts, hangers, and equipment supports.

Lubricate bearings and sliding parts; adjust doors to operate easily, free from warp, twist, or distortion and fitting weathertight for entire perimeter.

DEMONSTRATION

Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain doors. Refer to Division 1 Section "Closeout Procedures."

END OF SECTION 08331



SECTION 08710 – FINISH HARDWARE

PART 1 - GENERAL

WORK INCLUDED

The work in this section shall include furnishing of all items of finish hardware as hereinafter specified or obviously necessary to complete the building, except those items which are specifically excluded from this section of the specification.

RELATED WORK SPECIFIED ELSEWHERE

Hollow Metal Doors and Frames

DESCRIPTION OF WORK

Furnish labor and material to complete hardware work indicated, as specified herein, or as may be required by actual conditions at building. Include all necessary screws, bolts, expansion shields, other devices, if necessary, as required for proper hardware application. The hardware supplier shall assume all responsibility for correct quantities.

All hardware shall meet the requirements of Federal, State and Local codes having jurisdiction over this project, notwithstanding any real or apparent conflict therewith in these specifications.

Wind resistance Florida Building Code: Furnish finish hardware for all exterior doors that has been tested and certified by an engineer registered in the State of Florida in an approved testing lab as defined by the Test Protocols for High Velocity Hurricane Zones. Hollow metal doors and frames shall also share the same testing and approval criteria. For projects in zones rated at or in excess of 120 MPH or coastal areas designated as Wind Borne Debris regions, furnished hardware and door products must be tested for the missile impact criteria and certified for the static and cyclic loading as defined by positive and negative PSF factors shown in the drawings.

Fasteners: Hardware as furnished shall conform to published templates generally prepared for machine screw installation.

Furnish each item complete with all screws required for installation. Insofar as practical, furnish concealed type fasteners for hardware units which are exposed. Screws shall be furnished with Phillips flatheads, finished to match adjacent hardware. Door closers and exit devices to be installed on wood or composite fire doors shall be attached with closed head through bolts (sex bolts).

QUALITY ASSURANCE

The material herein specified shall establish the standard for the material used, and shall be considered the minimum quality acceptable.

SUBMITTALS

The finish hardware supplier shall prepare and submit to the architect five (5) copies of a complete schedule identifying each door and each hardware set number, following the Architect's numbering system and not creating any separate system himself. He shall submit the schedule for review, make corrections as directed and resubmit the corrected schedule for final approval. Approval of schedule will not relieve Contractor of the responsibility for furnishing all necessary hardware, including the responsibility for furnishing correct quantities.

No manufacturing orders shall be placed until detailed schedule has been submitted to the architect and written approval received.

After hardware schedule has been approved, furnish templates required by manufacturing contractors for making proper provisions in their work for accurate fitting of finished hardware in scheduled setting. Furnish templates in ample time to facilitate progress of work.

DELIVERY, STORAGE, AND HANDLING

Wrap and protect finished hardware items for shipment. Deliver to manufacturing contractors hardware items required by them for their application; deliver balance of hardware to job; store in designated location. Each item shall be clearly marked with its intended location.

WARRANTY

The materials furnished shall be under warranty for one year after installation or longer as individual manufacturers' general or special warranties may provide.

Submit manufacturers' warranties at completion of Work in accord with Division 01 section, "Project Closeout".

PART 2 - PRODUCTS

ACCEPTABLE MANUFACTURERS

To the greatest extent possible, obtain each kind of hardware from one manufacturer only.

All numbers and symbols used herein have been taken from the current catalogs of the following manufacturers:

<u>Products</u>	<u>Specified Manufacturer.</u>	<u>Acceptable Substitute.</u>
1. Butt Hinges Continuous Hinges	Hager	McKinney, Stanley, Markar
2. Locksets, Latchsets, Privacy Sets, Deadlocks, Cylinders, Keys & Keying	Schlage Lock Company	None (facility standard)
3. Exit Devices, Removable Mullions	Von Duprin	None (facility standard)
4. Door Closers Magnetic Door Holders	LCN	None (facility standard)
5. Overhead Stops and Holders	Glynn-Johnson	Rixson, Sargent
6. Push Plates, Pull Plates, Protection Plates, Wall Bumpers, Floor Stops, Stop and Holders, Flush Bolts, Dust Proof Strikes	Rockwood Manufacturing	H. B. Ives, Trimco
7. Automatic Flush Bolts, Dust Proof Strikes, Coordinators, Brackets	H. B. Ives	Door Controls, Rockwood
8. Thresholds, Sound Seal, Drip Caps, Automatic Door Bottoms	Pemko Manufacturing	National Guard, Reese
9. Weatherstrip, Door Bottom Sweeps	(By exterior door manuf.)	None (Required for Hurricane Code Compliant Door Assemblies)

FINISH OF HARDWARE

The basic finish hardware shall be US26D satin chrome. Door closers shall be sprayed lacquer to match. Exterior hinges, continuous hinges, protection plates, door pulls, overhead stops and holders, and wall bumpers, and other hardware as shown in the hardware sets shall be US32D satin stainless steel. Thresholds and weatherstrip to be natural anodized to match.

HINGES AND PIVOTS

Exterior butts shall be solid stainless steel base metal as scheduled. Butts on all outswinging exterior doors shall be furnished with non-removable pins (NRP).

Interior butts shall be as listed.

Doors 5' or less in height shall have two (2) butts. Furnish one (1) additional butt for each 2'-6" in height or fraction thereof. Dutch door shall have two (2) butts per leaf.

KEYING

All locks and cylinders shall be removable core keyed as directed by the Owner to the existing building's system. Furnish all locks and cylinders with temporary cores for construction. Permanent cylinder cores and keys shall be sent directly to the Owner as directed. At the conclusion of the project, the general contractor shall assist the Owner in the change over from construction to permanent cylinder cores. All permanent cylinders and keys shall be sent directly from the factory to the Owner.

Existing Keyway: Verify

LOCKSETS

Locksets shall be heavy-duty D series cylindrical type, unless specified otherwise, in Rhodes lever design as manufactured by Schlage Lock Company.

EXIT DEVICES

All devices shall be Von Duprin 99 series in types and functions tested for use in opening assemblies specified in Hardware Schedule. All devices must be listed under "Panic Hardware" in accident equipment list of Underwriters Laboratories (UL). All labeled doors with "Fire Exit Hardware" must have labels attached and be in strict accordance with UL.

DOOR CLOSERS

Closers shall be LCN Series 1000 and 4000 having non-ferrous covers, forged steel arms, separate valves for adjusting back check, closing and latching cycles, and adjustable spring. Furnish with extra duty parallel arms (EDA) mounted on all doors opening into corridors or other public spaces. Mount to permit 180 degrees door swing wherever wall conditions permit. Furnish with non-hold open arms unless otherwise indicated.

Interior doors where scheduled: Furnish LCN 1461 closer.

Exterior doors: Furnish LCN 4041 closer, except provide 4600 series where remote-activated power-actuated closer is indicated / scheduled.

TRIM AND PLATES

Kickplates shall be .050 gauge US32D satin stainless steel finish (as listed). Kickplates shall be eight (8) inches high. Armor plates shall be thirty six (36) inches high. All plates shall be two (2) inches less full width of door.

Push plates, pull plates, door pulls, and miscellaneous door trim shall be shown in the hardware schedule.

DOOR STOPS

Door stops shall be furnished for all doors to prevent damage to doors or hardware from striking adjacent walls or fixtures. Wall bumpers equal to Rockwood 409 or 411 are preferred but where not practical, furnish floor stops equal to Rockwood 440/442 series. Where conditions prohibit the use of either wall or floor type, furnish overhead door stays equal to Glynn-Johnson 450 Series.

THRESHOLDS AND WEATHERSTRIP

Thresholds and weatherstrip shall be as listed in the hardware schedule.

DOOR SILENCERS

Furnish rubber door silencers equal to Ives 20 for all new interior hollow metal frames, (2) per pair and (3) per single door frame.

PART 3 - EXECUTION

INSTALLATION

All hardware shall be applied and installed in accordance with best trade practice. Care shall be exercised not to mar or damage surfaces adjacent to work.

Provide secure lock-up for hardware delivered to the project but not yet installed. Control the handling and installation of hardware items which are not immediately replaceable, so that the completion of the work will not be delayed by hardware losses both before and after installation.

Hardware locations. Dimensions shall be as follows:

Distance from finish floor to center line of:	
Door Lever	40 5/16"
Door Pull	42"
Deadlock	48"
Exit Device Touch Bar	39 13/16"
Push Plate	45"
Butt Hinges	Bottom Hinge: Finish floor to bottom of hinge: Mfgr's. Standard. Top Hinge: Head rabbet to top of hinge: Mfgr's. Standard. Center Hinge: Equi-Distant between top and bottom hinges.

Other than those doors that are restricted to less than 180 degrees opening by building or by overhead holders or stops, all butts and/or closer arms shall be of sufficient size to allow full 180 degrees opening of doors.

ADJUSTING AND CLEANING

Contractor shall adjust all hardware in strict compliance with manufacturer's instructions. Prior to turning project to owner, contractor shall clean and make any final adjustments to the finish hardware.

PROTECTION

Contractor shall protect hardware as it is stored on construction site in a covered and dry place.

Contractor shall protect exposed hardware installed on doors during the construction phase.

Hardware damaged prior to substantial completion shall be replaced.

HARDWARE SCHEDULE

The schedule given on the drawings is furnished for whatever assistance it may afford the contractor; do not consider it as entirely inclusive. Should any particular door or item be omitted in any scheduled hardware group, provide door or item with hardware same as required for similar purposes. Quantities listed are for each pair of doors; or for each single door.

HW SET 1

EACH TO HAVE:

3.0 PR BUTTS 4 ½ X 4 ½-BB1199-32D-NRP
1.0 EXIT DEVICE CD99NL-26D
1.0 CYLINDER 20-057-ICX-26D
1.0 PRIMUS CORES 20-740-26D
1.0 DOOR CLOSERS PA4041-EDA X 62A SHOE X TB
1.0 THRESHOLD 2005AV-LAR X ES
1.0 SET WEATHERSTRIP S88D17

HW SET 2

EACH TO HAVE:

1.5 PR BUTTS 4 ½ X 4 ½-BB1279-26D
1.0 LOCKSET ND80TD-RHO-26D X 10-025
1.0 PRIMUS CORE 20-740-26D
1.0 DOOR CLOSER 4041-EDA-AL X TB
1.0 KICKPLATES 8" X 2" LDW-32D
1.0 THRESHOLD 2005AV-LAR X ES
1.0 SET WEATHERSTRIP S88D17

END OF SECTION 08710

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FINISH HARDWARE