

SECTION 08111

STANDARD STEEL DOORS AND FRAMES

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. Drawings and General Provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.02 SUMMARY

- A. Section includes: Work of this Section consists of installing all materials furnished under this Section, including all equipment, labor, services, and incidental items required to complete work as shown on Drawings and specified in this Section.

1. SDI Level 1 (standard-duty Level C according to ANSI A250.4) Model 1 full flush (no seams on face surfaces) doors for :
  - a. General interior nonrated door applications no covered by higher SDI Levels.
  - b. Interior nonrated closet doors.
2. SDI Level 2 (heavy-duty Level B according to ANSI A250.4) Model 1 full flush (no seams on face surfaces) doors for :
  - a. Fire-rated entrance to stairwell (temperature-rise opening).
  - b. Interior fire-rated doors (nontemperature-rise).
  - c. Entrance to toilet rooms.
  - d. Entrance to hospital patient rooms.
  - e. Entrance to operating rooms.
3. SDI Level 3 (extra-heavy-duty Level A according to ANSI A250.4) Model 1 full flush (no seams on face surfaces) doors for :
  - a. Exterior thermally-rated entrance doors.
  - b. Exterior thermally-rated stairwell doors.
4. Welded steel frames for all openings.
5. Tempered safety glass factory-installed in steel doors.
6. Fire-rated wire glass factory-installed in fire-rated steel doors.
7. factory-primed stand steel doors and frames for field-painting (provided by Section 09900)

- B. Related Sections include the following:

1. 04200 "Unit Masonry" for installation of metal frames in masonry construction.
2. 07901 "Joint Sealants" for sealing perimeter of metal frames to adjacent construction.
3. 08211 "Flush Wood Doors" for installation of wood doors in metal frames.
4. 08710 "Door Hardware" for application of finish hardware to metal doors and frames.
5. 08800 "Glazing" for installation of glazing in metal borrow-light frames.
6. 09900 "Painting" for field-applied finish paint to factory-primed metal doors and frames.

1.03 SUBMITTALS

- A. Door Schedule: Use same reference designations indicated on Drawings.

1.04 QUALITY ASSURANCE

A. Reference Standards:

1. Steel Door and Frame Standard: Comply with ANSI A250.8.
2. Fire-Rated Doors Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by testing and inspecting agency acceptable to authorities having jurisdiction according to NFPA 252.
  - a. Test Pressure: Test at atmospheric pressure.
  - b. Temperature Rise Rating: Max. 450 deg. F in 30 minutes of fire exposure.
3. Fire-rated Window (Borrow Light) Assemblies: Comply with NFPA, listed and labeled, based on testing according to NFPA 257.

1.05 DELIVERY, STORAGE AND HANDLING

A. Delivery:

1. Deliver doors and frames cardboard-wrapped or crated to provide protection during transit and job storage.
2. Inspect doors and frames on delivery for damage.
3. Remove and replace damaged items as directed.

B. Storage:

1. Store doors and frames at building site under cover.
2. Place units on min. 4 in. high wood blocking.
3. Avoid use of nonvented plastic or canvas shelters that could create humidity chamber.
4. If cardboard wrapper on door becomes wet, remove carton immediately.
5. Provide 1/4 in. spaces between stacked doors to promote air circulation.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Steel Doors and Frames: Benchmark Commercial Door, Div. (General Products Co.), Curries Co., Meskar Door Co., Pioneer Industries Inc., Republic Builders Products, Steelcraft Div. (Ingersoll-Rand).

2.02 MATERIALS

A. Steel:

1. Exterior Locations - Galvanized steel Sheets: Zinc-coated carbon cold-rolled (per ASTM A366) steel Commercial Quality, comply with ASTM A653, Type B with A40 (ZF126) zinc-iron alloy (galvannealed) coating; stretcher-leveled standard for flatness.
2. Interior Locations – Electrolytic Zinc-Coated Steel Sheet: ASTM A591, Commercial cold-rolled (per ASTM A366) Steel (CS) Class B coating; mill-phosphatized; suitable for unexposed applications; stretcher-leveled standard of flatness where used for face sheets.

B. Anchors and Fasteners:

1. Supports and Anchors: Fabricate of min. 18 ga. steel, galvanized where used with galvanized frames.

2. Inserts, Bolts and Fasteners: Manufacturer's standard units, except hot-dip galvanize items to be built into exterior walls, comply with ASTM A153, Class C or D, as applicable.
- C. Shop-Applied Primer Paint:
1. Rust-inhibitive primer enamel or paint, either air-dried or baked, suitable as base for specified finish paints.
  2. Comply with ANSI A 224.1, Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames.
- D. Glazing – Safety: ASTM C1048, Type I (patterned and wired glass, flat), Class 1 (clear), Quality q8 (glazing), Mesh M2 (square), Form 1 (wired, polished both sides), 1/4 in. thick.

## 2.03 FABRICATION

### A. General:

1. Fabricate units to be rigid, neat in appearance and free from defects, warp, or buckle.
2. Wherever practicable, fit and assemble units in manufacturer's plant.
3. To assure proper assembly at Project site, clearly identify work that cannot be permanently factory-assembled before shipment.
4. Comply with ANSI/SDI-100 requirements.
5. Clearances:
  - a. Max. 1/8 in. at jambs and heads, except max. 1/4 in. between nonfire-rated pairs of doors.
  - b. Max. 3/4 in. at bottom.
6. Tolerances: Comply with SDI 117, Manufacturing Tolerances Standard Steel Doors and Frames.
7. Exposed Fasteners: Unless otherwise indicated, provide countersunk flat or oval heads for exposed screws and bolts.

### B. Doors:

1. Provide metal doors of types and styles or grades and models indicated on Drawings and Schedules.
2. Face Thickness:
  - a. Level 1: 0.032 in. (20 ga.).
  - b. Level 2: 0.042 in. (18 ga.).
  - c. Level 3: 0.053 in. (16 ga.).
3. Internal Construction:
  - a. Interior – Nonrated and Fire-Rated (nontemperature-rise openings): Manufacturer's standard honeycomb, fully-bonded, heat-cured, nip-rolled.
  - b. Interior – Fire-Rated Temperature-Rise Openings: Rigid mineral fiber core with internal sound deadener on inside of face sheets.
  - c. Exterior – Uninsulated: Manufacturer's standard honeycomb.
  - d. Exterior – Insulated: Manufacturer's standard foam.
4. Close top and bottom edges of exterior doors as integral part of door construction or by addition of min. 0.053 in. thick inverted steel channels.
5. Single-Acting, Door-Edge Profile: Beveled edge.

- C. Vision Lite Systems: Manufacturer's standard kits, consisting of glass lite moldings to accommodate glass thickness and size of vision lite indicated.
- D. Frames:
1. General:
    - a. Provide steel frames that comply with ANSI A250.8 and with details indicated for type and profile.
    - b. Conceal fastenings, unless otherwise indicated.
  2. Frame Thickness – Steel Doors:
    - a. Level 1: 0.042 in. (18 ga.).
    - b. Level 2: 0.053 in. (16 ga.).
    - c. Level 3: 0.067 in. (14 ga.).
  3. Frame Thickness – Wood Doors:
    - a. Interior Closets and Storage Rooms: 0.042 in. (18 ga.).
    - b. Interior Passage Doors: 0.053 in. (16 ga.).
  4. Frame Thickness – Borrow Lights: 0.067 in. (14 ga.).
  5. Door Silencers: Except on weatherstripped frames, drill stops to receive 3 silencers on strike jambs of single door frames and 2 silencers on heads of double door frames.
  6. Supports and Anchors:
    - a. Fabricated from min. 0.042 in. (18 ga.) thick, electrolytic zinc-coated for interior locations or metallic-coated steel sheet for exterior locations.
    - b. Wall anchors in Masonry Construction: 0.177 in. dia. Steel wire complying with ASTM A510 may be used in place of steel sheet.
  7. Inserts, Bolts, and Fasteners:
    - a. Manufacturer's standard units.
    - b. Where zinc-coated items are to be built into exterior walls, comply with ASTM A153, Class C or D as applicable.
- E. Thermal-Rated (Insulating) Assemblies:
1. Exterior Locations: As Scheduled, provide doors that have been fabricated as thermal insulating door and frame assemblies and tested to comply with ASTM C236.
  2. Unless otherwise indicated, provide thermal-rated assemblies with 0.24 Btu per hr. sq. ft. deg. F or better U-factor.
- F. Sound-Rated (Acoustical) Assemblies:
1. Where shown or scheduled, provide door and frame assemblies that have been fabricated as sound-reducing-type, tested in accordance with ASTM E90, and classified in accordance with ASTM E413.
  2. Unless otherwise indicated, provide acoustical assemblies with STC 33 or better sound ratings.

- G. Labeled and Fire-Rated Assembly: In addition to general fabrication requirements for doors and frames, provide assemblies complying with following performance criteria.
1. Doors: 0.167 in. (7 ga.) steel plate hinge reinforcement, 0.093 in (112 ga.) closer reinforcement, and 0.093 in (112 ga.) lock front reinforcement.
  2. Frames: 0.053 in. (16 ga.) welded at miter point and ground smooth.
  3. Labeling: Underwriter's Laboratories (UL), Factory Mutual (FM), or Warnock Hersey.
- H. Glazing Stops:
1. Metal Thickness: Min. 0.032 in. (20 ga.) steel.
  2. Provide nonremovable stops on outside of exterior doors and on secure side of interior doors for glass, louvers, and other door panels.
  3. Provide screw-applied removable glazing beads on inside of glass, louvers, and other door panels.
- I. Finish Hardware Preparation:
1. Prepare doors and frames to receive mortised and concealed finish hardware in accordance with final Finish Hardware Schedule and templates provided by hardware supplier.
  2. Comply with applicable requirements of ANSI A115 Series Specifications for door and frame preparation for hardware.
  3. Reinforce to receive surface-applied hardware.
  4. Drilling and tapping for surface-applied finish hardware may be done at Project site.
  5. 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.
- J. Shop-Painting – Prime Finish: Manufacturer's standard, factory-applied coat of rust-inhibiting primer complying with ANSI A250.10 for acceptance criteria.

### PART 3 - EXECUTION

#### 3.01 INSTALLATION

- A. General: Install standard steel doors, frames and accessories in accordance with final shop drawings, manufacturer's data, and as specified.
- B. Placing Frames:
1. Comply with provisions of SDI-105, Recommended Erection Instructions for Steel Frames, unless otherwise indicated.
  2. Except for frames located at in-place concrete or masonry and at drywall installations, place frames before construction of enclosing walls and ceilings.
  3. Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set.
  4. After wall construction is complete, remove temporary braces and spreaders, leaving surfaces smooth and undamaged.
  5. Masonry Construction: Locate 3 wall anchors per jamb at hinge and strike levels.
  6. In-Place Concrete or Masonry Construction: Set frames and secure to adjacent construction with machine screws and masonry anchorage devices.
  7. Install fire-rated frames in accordance with NFPA 80.
  8. Metal Stud Partitions: Install at least 3 wall anchors per jamb at hinge and strike levels.

C. Door Installation:

1. For hollow metal doors accurately in frames within clearances specified in ANSI A250.8 and shim as required to comply with SDI 122 and ANSI/DHI A115.1G
2. Place fire-rated doors with clearances as specified in NFPA 80.
3. Install smoke control doors to Comply with NFPA 105.

3.02 ADJUSTING AND CLEANING

- A. Prime Coat Touchup: Immediately after erection, sand smooth any rusted or damaged areas of prime coat and apply compatible air-drying primer touchup.
- B. 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 08111

SECTION 08710  
FINISH HARDWARE

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. All of the Contract Documents, including General and Supplementary Conditions and Division 01 Specification Sections, apply to the work of this Section.

1.02 DESCRIPTION OF WORK

- A. The work of this section includes, but is not limited to, the following:
1. Providing hardware for all doors, except doors provided with their own hardware.
  2. Providing lock cylinders for all work requiring cylinders.
  3. Providing the services of a qualified hardware consultant to prepare detailed schedules of hardware required for the project.

1.03 RELATED WORK

- A. Carefully examine all of the Contract Documents for requirements which affect the work of this section. Other specifications sections which directly relate to the work of this section include, but are not limited to, the following,
1. Section 08111 – Steel Doors and Frames; work requiring template coordination, metal astragals for fire-rated doors.

1.04 INTENT

- A. A major intent of the work of this section is to provide hardware for every door in the project, except as indicated, so that each door functions correctly for its intended use. Provide only hardware that complies with applicable codes and requirements for barrier-free accessibility.

1.05 QUALITY ASSURANCE

- A. Hardware supplier shall have in its employ one or more members of the Door and Hardware Institute to include at least one Certified Architectural Hardware Consultant in good standing, who shall be responsible for preparation of the Finish Hardware Schedule. This Consultant shall be acceptable to the Architect and is to ensure that the intent requirement of this specification is fulfilled, and to certify that the work of this section meets or exceeds the requirement specified in this section and the requirements of authorities having jurisdiction.
- B. Hardware supplier shall warrant and guarantee, in writing, that hardware supplied is free of defective material and workmanship. Supplier shall further warrant and guarantee for a period of one year from Owner's Use and Occupancy that the hardware shall function in a satisfactory manner without binding, collapse, or dislodging of its parts, provided the installation is made to the manufacturer's recommendation.
- C. The hardware supplier shall repair or remedy, without charge, any defect of workmanship or material for which he is responsible hereunder.

1.06 SUBMITTALS

A. Submit the following in accordance with Section 01300 – SUBMITTALS:

1. Schedule: Submit to the Architect six (6) copies of the complete hardware schedule within fourteen (14) days after receipt of contract award. Submit therewith complete catalog cuts and descriptive data of all products specifically scheduled therein. Form and detail of hardware schedule shall be in vertical format in conformance to the door and hardware industry standards. All hardware sets shall be clearly cross-referenced to the hardware set numbers listed in this specification.
2. Samples: If requested, submit to the Architect for approval, a complete line of samples as directed. Samples shall be plainly marked giving hardware number used in this specification, the manufacturer's numbers, types and sizes. The Architect will deliver approved samples to the project site to be stored. Samples will remain with the Architect until delivery of all hardware to the project is complete, after which time they will be turned over to the General Contractor for incorporation into the work.
3. Keying System Submission: Before cylinders are ordered, submit a complete proposed keying system for approval. This should be done after a keying meeting has been held with the owner's representative.

1.07 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Delivery of hardware shall be made to the project by the Hardware Supplier in accordance with the instructions of the General Contractor.
- B. The finish hardware shall be delivered to the jobsite and received there by the General Contractor. The General Contractor shall prepare a locked storage room with adequate shelving, for all hardware. The storage room shall be in a dry, secure area, and shall not include storage of other products by other trades.
- C. The General Contractor shall furnish the Hardware Supplier with receipts from all hardware and accessory items received, and shall send copies of these receipts to the Architect, if requested.

1.08 REGULATORY REQUIREMENTS

- A. Conform to all applicable codes. Provide all throws, projections, coatings, knurling, opening and closing forces, and other special functions required by State and Local Building Codes, and all applicable Handicap Code requirements.
- B. For fire rated openings provide hardware complying with NFPA 80 and NFPA 101 without exception. Provide only hardware tested by UL for the type and size of door installed and fire resistance rating required.

1.09 SPECIAL REQUIREMENTS

- A. Hardware Supplier shall determine conditions and materials of all doors and frames for proper application of hardware.
- B. The Hardware Schedule shall list the actual product series numbers. Bidders are required to follow manufacturers' catalog requirement for the actual size of doors closers, brackets and holders. All door opening sizes are as noted on the Door Schedule and all hardware shall be in strict accordance with requirements of height, width, and thickness.



PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

Hinges	McKinney Stanley Bommer	Scranton, PA New Britain, CT Landrum, SC
Geared Hinges	Pemko McKinney Select	Memphis, TN Scranton, PA Kalamazoo, MI
Locksets	Schlage (No Substitutions)	Colorado Springs, CO
Exit Devices	Von Duprin (No Substitutions)	Indianapolis, IN
Door Closers	LCN (No Substitutions)	Princeton, IL
Overhead Stops	Sargent Glynn Johnson ABH	New Haven, CT Indianapolis, IN Elk Grove Village, IL
Coordinators	Glynn Johnson Door Controls Rockwood	Indianapolis, IN Dexter, MI Rockwood, PA
Flush Bolts	Glynn Johnson Door Controls Rockwood	Indianapolis, IN Dexter, MI Rockwood, PA
Door Stops	Glynn Johnson Ives Rockwood	Indianapolis, IN New Haven, CT Rockwood, PA
Push/Pulls	Rockwood Burns Ives	Rockwood, PA Erie, PA New Haven, CT
Protective Plates	Rockwood Burns Ives	Rockwood, PA Erie, PA New Haven, CT
Thresholds/Weather Stripping/Rain Drips	NGP Pemko Reese	Memphis, TN Memphis, TN Rosemount, MN
Silencers	Ives Glynn Johnson Rockwood	New Haven, CT Indianapolis, IN Rockwood, PA
Key Cabinet	MMF Industries Telkee	Wheeling, IL Glen Riddle, PA

2.02 MATERIALS AND QUALITY

- A. All hardware shall be of the best grade of solid metal entirely free from imperfections in manufacturer and finish.
- B. Qualities, weights, and sizes given herein are the minimum that will be accepted. It is the responsibility of the Hardware Supplier to supply the specified size and weight of hardware and the proper function of hardware in each case and to provide UL approved hardware at all fire-rated doors.

- C. Provide, as far as possible, locks of one lock manufacturer and hinges of one hinge manufacturer. Modifications to hardware that are necessary to conform to construction shown or specified shall be provided as required for the specified operation and functional features.

#### 2.03 HARDWARE DESIGNATIONS

- A. All items of hardware are referenced by manufacturer's names and numbers. The manufacturer's name and numbers are used to define the function, design, and quality of the material to be supplied.
- B. Substitution of products other than those listed shall be submitted to the Architect at least ten (10) days PRIOR to the bid date. The Architect shall be the sole judge of any proposed substitution.

#### 2.04 TEMPLATES

- A. Hardware supplier shall immediately, but not later than three (3) days after approval of his Schedule by the Architect, furnish the General Contractor with complete template information necessary for the fabrication of doors, frames, etc. No templates shall be furnished prior to the approval of the hardware schedule.

#### 2.05 HARDWARE FOR LABELED FIRE DOORS, EXIT DEVICES AND SMOKE DOORS

- A. Hardware shall conform to requirements of NFPA 80 for labeled fire doors and to NFPA 101 for exit doors, as well as to other requirements specified. Labeling and listing by UL Building Materials Directory, for class of door being used will be accepted as evidence of conformance to these requirements. Install minimum latch throw as specified on label of individual doors. Provide hardware listed by UL except where heavier materials, larger sizes, or better grades are specified herein under paragraph entitled "Hardware Sets". In lieu of UL labeling and listing, test reports from a nationally recognized testing agency may be submitted showing that hardware has been tested in accordance with UL test methods and that it conforms to NFPA requirements. Specific hardware requirements of door or frame manufacturers which exceed sizes or weights of hardware herein listed shall be provided with no additional charge.

#### 2.06 KEYS AND KEYING

- A. The hardware supplier shall review the specific hardware functions with architect and owner at the time of the keying review, to assure the appropriateness of each of the hardware functions. Failure to make this review does not relieve the hardware supplier from providing the proper functions.
- B. Key System: All cylinders shall be Masterkeyed to the existing Schlage interchangeable core system as directed.
  - 1. Master Keys, Grandmaster Keys: Furnish six (6) keys for each set, if required.
  - 2. All cylinders for use at the Aluminum doors, as well as the cylinders being used with the Exit Devices, are to be of the interchangeable core type. These cylinders are to be furnished complete with temporary removable construction cores for use by the contractor during construction period. These construction cores are to be operated by the same construction key that is established for the balance of the locksets, cylinders.
  - 3. Furnish three (3) change keys for each cylinder keyed differently; six (6) change keys for each set keyed alike, and in sets where only (2) cylinders are keyed alike, four (4) change keys will be required.
  - 4. All keying is to be done at the factory to avoid duplication of the new cylinders.
  - 5. Master Keys shall be sent to the Owner by registered mail, return receipt required.
  - 6. Supply a bitting list for all change keys and master keys to the Owner.

7. Provide interchangeable construction cores for use by the Contractor during the construction period. Furnish ten (10) construction keys and two (2) control keys for removing the construction cores.

#### 2.07 FASTENERS

- A. Manufacture hardware to conform to published templates, generally prepared for machine screw installation.
- B. Furnish screws for installation, with each hardware item. Provide Phillips flat-head screws except as otherwise indicated. Furnish exposed screws to match the hardware finish, or, if exposed in surfaces of other work, to match the finish of such other work as closely as possible, except as otherwise indicated.
- C. Provide concealed fasteners for hardware units which are exposed when the door is closed, except to the extent no standard manufactured units of the type specified are available with concealed fasteners. Do not use thru-bolts unless specifically approved by the Architect.
- D. All hardware shall be installed only with fasteners supplied by manufacturers of specific products.

#### 2.08 PACKING AND MARKING

- A. All hardware shall have the required screws, bolts and fastenings necessary for proper installation and shall be wrapped in the same package as the hardware item for which it is intended and shall match finish of hardware with which to be used.
- B. Each package shall be clearly labeled indicating the portion of the work for which it is intended.

#### 2.09 ENVIRONMENTAL CONCERN FOR PACKAGING

- A. The hardware shipped to the jobsite is to be packaged in biodegradable packs such as paper or cardboard boxes and wrapping. If non-biodegradable packing such as plastic, plastic, plastic bags or large amounts of Styrofoam is utilized, then the Contractor will be responsible for the disposal of the non-biodegradable packing to a licensed or authorized collector for recycling of the non-biodegradable packing.

#### 2.10 FINISH HARDWARE DESCRIPTION

- A. Hardware items shall conform to respective specifications and standards and to requirements specified herein.

#### B. MATERIALS AND FINISH: MATERIALS AND FINISHES SHALL BE

1. Interior Butts: US26D (BHMA 652)
2. Exterior Geared Hinges: US28 (BHMA 628)
3. Continuous Stainless Steel Hinges: 32D (BMMH 630)
4. Door Closers: Sprayed to match hardware finish
5. Exit Devices: US26D (BHMA 626) /32D (BHMA 630)
6. Kick, Push Plates: US32D (BHMA 630)
7. All other hardware shall be: US26D (BHMA 626), or as scheduled.

#### C. HINGES AND PIVOTS

1. Number of hinges or pivots per door: two hinges or pivots are intended to be provided for doors up to and including five feet in height, and an additional hinge for each two and one-half feet or fraction thereof, of the height of the door. Dutch doors are to be provided with four hinges.

2. All hinges on exterior doors shall be full-mortise Continuous Geared Hinges. Geared Hinges shall be manufactured of extruded 6063-T6 aluminum alloy temper. Hinges shall consist of three interlocking extrusions in a pinless assembly applied to the full height of the door and frame. All hinges shall be manufactured non-handed. Door leaf and jamb leaf shall be geared together for the entire length of the hinge and joined by a cover channel. All Geared Hinges shall be heavy duty (HD).

3. Geared Hinges shall be Pemko, McKinney or Select as follows:

Pemko	CFM SLFHD Series
McKinney	MCK-12HD
Select	SL11HD

4. Continuous stainless steel hinge (with edge guard).

Markar	HG 305
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5. Hinges on interior doors shall be oil-impregnated bearing, steel and sized as follows, unless otherwise specified in the hardware sets below:

Door Thickness	Door Width	Hinge	Weight Hinge
1-3/4"	40" and under	Regular	4-1/2"
1-3/4"	Over 40"	Extra Heavy	5 x 4-1/2"

Width of hinge shall be determined by trim conditions.

6. All bearing hinges shall have flush bearings and button tips. Plain bearing hinges shall be furnished only on doors so noted in Hardware Sets.

7. Hinges shall be McKinney, Stanley, or Bommer as follows:

McKinney	Stanley	Bommer
T2714	F179	5000
TA2714	FBB179	BB5000
T4A3786	FBB168	BB5004

**D. DOOR CLOSURES**

1. All door closers shall be LCN 4000 series without substitution.
2. Door closers shall have fully hydraulic, full rack and pinion action. Cylinder body shall be 1-1/2" in diameter, and double heat treated pinion shall be 1 1/16" in diameter.
3. Hydraulic fluid shall be of a type requiring no seasonal closer adjustment for temperatures ranging from 120 degrees F to -30 degrees F.
4. Spring power shall be continuously adjustable over the full range of closer sizes, and allow fir reduced opening force for the physically handicapped. Hydraulic regulation shall be by tamper-proof, non-critical valves. Closers shall have separate adjustment for latch speed, general speed, and hydraulic back-check.
5. All closers shall have solid forged steel main arms (and forged forearms for parallel arm closers).
6. Closers arms (and metal covers when specified) shall have a powder coating finish.
7. Provide drop, mounting plates where required.
8. Do not locate closers on the side of doors facing corridors, passageways and similar type areas. Where it is necessary, due to certain conditions and approval of the Architect, to have closers in corridors, provide such closers with parallel or track type arms.
9. All door closers shall be adjusted by the installer in accordance with the manufacturer's templates and written instructions. Closers with parallel arms shall have back-check features adjusted prior to installation.

10. Closers shall conform to all applicable code requirements relative to setting closing speeds for closers and maximum pressure for operating interior and exterior doors.
11. Door closers meeting this specification are as follows:

LCN

Exterior 4111S-CUSH  
 4111S-H-CUSH

Interior 4011  
 4111  
 4040SE  
 4000T  
 4310ME-SF  
 4040SE-DE

E. EXIT DEVICES

1. Shall be Von Duprin: (No substitutions)

Function	Von Duprin
A	CD99NL-OP
B	CD99EO
C	99L
D	99L-BE
E	99EO-F
F	99L-F
G	99L-F-BE
H	CD9927EO
I	9927L
J	9927L-BE
K	CD27L x LBR
L	9927L x LBR
M	9927L-BE x LBR
N	9927EO-F
O	9927L-F
P	9927L-F-BE
Q	9927EO-F x LBR
R	9927L-F x LBR
S	9927L-F-BE x LBR
T	EL9927BF-F

NOTE: Lever design shall match lock trim

2. Provide EPT power transfer for all electrified exit devices.

F. FLUSH BOLTS

1. Shall be self-latching or automatic type at label doors, manual flush bolts at non-label doors.

		Glynn Johnson	Door Controls	Rockwood
Manual	HM	FB6	780	555
	WD	FB6W	790	557

Self Latching	HM	FB51P	845	1845
	WD	FB61P	945	1945
Automatic	HM	FB31P	842	1842
	WD	FB41P	942	1942

- Dust Proof Strikes shall be furnished at all floor locations.

G. LOCKSETS, LATCH SETS

- Cylindrical type shall be heavy-duty ANSI A156.2, Series 4000, Grade 1, 2-3/4" backset, six pin cylinder with lever handles.

Manufacturer	Series	Lever Design
Schlage (No Substitutions)	D	RHO

- Lock functions as indicated in the hardware schedule shall be as follows:

Function	Schlage	Sargent	Best
A (Storeroom)	80	04	EW
B (Storeroom)	80	04	EW x Knurled O/S Lever
C (Office)	50	05	E
D (Passage)	10	15	N
E (Vestibule)	60	16	B6/B7
F (Classroom)	70	37	J
G (Spec Classroom)	71	38	INL
H (Privacy)	40	65	LF

H. MORTISE DEADLOCKS

- Shall be as mortise type, ANSI A115.5, Grade 1: (No Substitutions)

Function	Schlage
A	L462
B	L460
C	L464
D	L463

I. KICK PLATES, ARMOR PLATES, MOP PLATES

- Kick plates shall be 8 in. high. Armor plates shall be 34 in high. Mop plates shall be 4 in. high. All plates shall be 2 in. less the width of door. Plates shall be .050 thickness, bevel 4 edges, screws shall be oval head counter-sunk.

J. EDGE GUARDS

- Provide stainless steel edge guards where called for in hardware sets equal to Rockwood No. 306B.

K. STOPS

1. Shall be furnished at all doors. Wherever an opened door or any item of hardware thereon strikes a wall, at 90 degrees. Provide wall bumpers, unless otherwise indicated in hardware sets.
2. Where wall bumpers cannot be effectively used, a floor stop shall be furnished and installed.
3. Provide roller bumpers for each door where two doors interfere with each other in swing.

Manufacturer	Wall Bumpers	Floor Stops	Roller Bumpers
Rockwood	409	440, 442	456
Ives	407 1/2	436B, 438B	470 Series
Glynn Johnson	WB 50XT	FB13, FB14	RB-3

4. Where overhead stops are listed they shall be the surface mounted type as follows:

Manufacturer	Series
Glynn Johnson	GJ450
Sargent	1540
ABH	4400

L. THRESHOLDS, WEATHER-STRIP, SEAL

1. Thresholds shall be as detailed and furnished on all doors where shown on drawings. Thresholds shall be aluminum unless otherwise indicated. Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 7 Section "Joint Sealants".
2. Weather-stripping shall be furnished on all exterior doors unless otherwise indicated.

Product	Pemko	Reese	NGP
Thresholds as detailed			
Brush Seal	45062AP	970	A626A
Auto. Door	430CR	330	420
Bottom Door Sweep	345AV	353	101AV
Set Astragals	351C x 351CP	95 x 95P	140 x 140P
Astragal	357SP	183S	139SP
Rain Drip	346C	R201A	16AD

M. INTERIOR GASKETING

1. Shall be #105 "Cush-N-Seal" as manufactured by Door and Hardware systems, Inc. – 13 Silver Street – Rochester, New York 14611 – Tel. No. 716-235-8543 – Fax No. 716-235-0431

N. SILENCERS

1. Provide silencers on all metal and wood frames. Silencers shall be Ives 20/21, Glynn Johnson 64/65 or Rockwood 608/609.

O. KEY CABINET

1. Furnish one (1) Aristocrat wall cabinet as manufactured by MMF Industries, Telkee, Inc. or approved equal. Cabinet shall be complete with all hooks, tags, index cards and other accessories for a complete Dual System.
2. Cabinet size shall be sufficient to accommodate all locks related to this Contract, based on two keys per lock, with an allowance for expansion of not less than 50%.
3. Key systems which are construction keyed shall have all permanent keys affixed to hooks with all index cards filled out for the complete cross references. The cabinet shall be delivered to the Contractor only when requested and shall be completely set up.

PART 3 - EXECUTION

3.01 INSPECTION

- A. It shall be the general contractor's responsibility to inspect all door opening and doors to determine that each door and door frame has been properly prepared for the required hardware. If error in dimensions or preparation are encountered, they are to be corrected by the responsible parties prior to the installation of hardware.

3.02 PREPARATION

- A. All doors and frames, requiring field preparation for finish hardware, shall be carefully mortised, drilled for pilot holes, or tapped for machine screws for all items of finish hardware in accordance with the manufacturer's templates and instructions.

3.03 INSTALLATION/ADJUSTMENT/LOCATION

- A. All materials shall be installed in a workmanlike manner following the manufacturer's recommended instructions.
- B. Exit Devices shall be carefully installed so as to permit friction free operation of crossbar, touch bar, lever. Latching mechanism shall also operate freely without friction or binding.
- C. Door Closers shall be installed in accordance with the manufacturer's instructions. Each door closer shall be carefully installed, on each door, at the degree of opening indicated on the hardware schedule. Arm position shall be as shown on the instruction sheets and required by the finish hardware schedule.
- D. The adjustments for all door closers shall be the installer's responsibility and these adjustments shall be made at the time of installation of the door closer. The closing speed and the latching speed valves, shall be adjusted individually to provide a smooth, continuous closing action without slamming. The delayed action feature or back check valve shall also be adjusted so as to permit the correct delayed action cycle or hydraulic back check cushioning of the door in the opening cycle. All valves must be properly adjusted at the time of installation. Each door closer has adjustable spring power capable of being adjusted, in the field, from size 2 thru 6. It shall be the installer's responsibility to adjust the spring power for each door closer in exact accordance with the spring power adjustment chart illustrated in the door closer installation sheet packed with each door closer.
- E. Installation of all other hardware, including locksets, push-pull latches, overhead holders, door stops, plates and other items, shall be carefully coordinated with the hardware schedule and the manufacturer's instructions sheets.
- F. Locations for finish hardware shall be in accordance with dimensions listed in the pamphlet "Recommended locations for Builders' Hardware" published by the Door and Hardware Institute.



3.04 FIELD QUALITY CONTROL

- A. Upon completion of the installation of the finish hardware, it shall be the responsibility of the finish hardware supplier to visit the project and to examine the hardware for each door on which he has provided hardware and to verify that all hardware is in proper working order. Should he find items of hardware not operating properly, he should make a report, in writing, to the general contractor, advising him of the problem and the measures required to correct the problem.

3.05 PROTECTION

- A. All exposed portions of finish hardware shall be carefully protected, by use of cloth, adhesive backed paper or other materials, immediately after installation of the hardware item on the door. The finish shall remain protected until completion of the project. Prior to acceptance of the project by the Architect and Owner, the general contractor shall remove the protective material exposing the finish hardware.

3.06 CLEANING

- A. It shall be the responsibility of the general contractor to clean all items of finish hardware and to remove any remaining pieces of protective materials and labels.

3.07 INSTRUCTIONS AND TOOLS

- A. It is the responsibility of the finish hardware supplier to provide installation and repair manuals and adjusting tools, wrenches, etc...for the following operating products:

1. Locksets (all types)
2. Exit Devices (all types)
3. Door Closers

3.08 HARDWARE SETS

- A. Refer to Drawing A-701.

END OF SECTION 08710