SECTION 08710

FINISH HARDWARE

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Finish Hardware for All Doors
B. Thresholds
C. Weather Stripping
D. Door Silencers

1.2 RELATED WORK

A. Section 01340 - Submittals
B. Section 06100 - Rough Carpentry
C. Section 08110 - Steel Doors and Frames

1.3 REFERENCES

A. ANSI A115 - Standards for Door and Frame Preparation
B. ANSI A156 - Standards for Finish Hardware
C. NFPA 80 - Fire Doors and Windows
D. Other Applicable Life Safety or Building Codes.

1.4 SUBMITTALS

A. The finish hardware supplier shall submit for review a complete and detailed finish hardware schedule using a vertical typewritten format. The finish hardware schedule shall contain a listing of the name of each manufacturer and the product listing for the series included in the hardware schedule.
B. Provide catalog cuts on specified hardware.
C. It shall be the responsibility of the finish hardware supplier to obtain from the owner or the owner's representative, a detailed keying schedule listing the respective key symbol and location for the locksets having the corresponding key symbol.
D. The finish hardware supplier shall make available to the general contractor a detailed list of template numbers and templates required for each of the door manufacturers that require templates.
E. Submit the finished hardware suppliers field report indicating that the finished hardware has been installed and is working properly. The report shall note all deficiencies and conditions required to correct them. Refer to "Field Quality Control" as specified herein.

1.5 QUALITY ASSURANCE

A. The hardware supplier shall have in his employ an architectural hardware consultant (AHC) or a person with equivalent number of years required for AHC qualifications. This person shall be recognized as having the ability to be fully responsible for the scheduling, detailing and execution of this section of the

specifications and related items. This qualified consultant shall be responsible for processing all submissions, correspondence, technical matters related to the finish hardware and it's application specified in this section.

1.6 QUALIFICATIONS

A. Steel Doors and Frames - Section 08110, Fiberglass Reinforced Plastic Doors and Frames, Section 08220, and Finished Hardware - Section 08710 shall be provided by a single supplier.

1.7 DELIVERY, STORAGE AND HANDLING

A. The finish hardware shall be delivered to the job site 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.

B. All finish hardware shall have the necessary screws, bolts and other fastenings required for correct installation of each item. The cylinders, locksets, exit devices, door closers, shall be clearly marked with the respective individual door or heading number.

C. After the hardware has been installed and prior to the acceptance of the building by the Owner, it shall be the General Contractors responsibility to properly protect the hardware and the hardware finish from all dents, scratches, defacing that may occur during the construction period. Hardware that is considered damaged or scratched during the construction period shall be replaced by the General Contractor at no cost to the owner or hardware supplier. Hardware items with paint on them shall be cleaned and/or replaced by the General Contractor at no charge to the owner.

1.8 WARRANTY

A. The finish hardware specified for this project shall be guaranteed against defects in material and workmanship for a period of one (1) year from date of completion and acceptance of this building. In addition, door closers shall carry a guarantee of five (5) years from date of completion and acceptance of this building.

B. If an item of hardware is found to be defective by reasons of defects in material and workmanship, it shall be replaced by the hardware supplier at no charge to the owner. The installation of the replacement item shall be the responsibility of the General Contractor if within the building guarantee period specified under general conditions, or by the Owner if beyond the building guarantee period.

1.9 MAINTENANCE SERVICE

A. Provide special wrenches and tools applicable to each different or special hardware component.

B. Provide maintenance tools and accessories supplied by hardware component manufacturer.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Hinges
   1. Stanley Hardware Division
   2. Hager
   3. McKinney

B. Locksets
   1. Schlage
   2. Sargent
   3. Corbin/Russwin

C. Exit Devices
   1. Sargent
   2. Von Duprin

D. Door Closers
   1. Sargent
   2. LCN
   3. Corbin/Russwin

E. Kick Plates
   1. Burns
   2. Rockwood
   3. or equal

F. Weather Stripping
   1. National Guard Products
   2. Pemco

G. Thresholds
   1. National Guard Products
   2. Reese
   3. Wooster Safety Products (cast aluminum)

2.2 HINGES

A. All hinges for this project shall be stainless steel, ball bearing type.

B. The following is a guide for hinge size and type required for this specification.

1. MANUFACTURER

1-3/4 inch	Stanley	FBB191-4 1/2 inches
Doors up to	Hager	BB1191-4 1/2 inches
3'0" wide	McKinney	TA2314-4 1/2 inches
1-3/4 inch	Stanley	FBB199-4 1/2 inches
Doors over	Hager	BB1199-4 1/2 inches
3'0" wide	McKinney	T4B3386-4 1/2 inches

2. The width of hinges shall be sufficient to clear all trim.
3. Doors in channel iron frames shall have half mortise hinges of a comparable weight as listed for full mortise hinges.
4. Hinges of foreign manufacture shall not be considered acceptable for this project.

C. Two hinges shall be provided for each door leaf up to and including five feet (5'0") in height. An additional hinge shall be required for each additional two and one half feet (2'-6") or fraction thereof in height.

D. All exterior doors, and any interior doors so indicated in hardware sets, shall be furnished with non-removable pins (NRP).

E. Refer to finish section for hinge finish.

2.3 MORTISE LEVER HANDLE LOCKSETS

A. Locksets for this project shall be mortise type with solid cast stainless steel lever handle sectional trim.

B. The following is a guide to the manufacturers and designs acceptable for this project.

Schlage	L9000	Series	06L	Design
Sargent	8200	Series	LNL	Design
Corbin/Russwin	ML2000	Series	NSA	

C. Locksets for labeled fire doors shall have a fusible link or other mechanism to prevent latch bolt retraction in the event of fire.

D. The following is a list of lock functions as indicated under "hardware sets":

FUNCTION	CORBIN	SARGENT	SCHLAGE
A	57	04	80
B	51	05	50
C	10	15	10
D	55	37	70
E	42	16	60
F	30	65	40

2.4 EXIT DEVICES

A. All exit devices for this project shall be of the same series and design, and shall be manufactured by one manufacturer.

B. All exit devices shall have a 14 gauge, stainless steel continuous horizontal mounting rail with a 16 gauge, stainless steel touch pad with a Lexan touch pad protection plate and shall be of the same design, and of similar configuration, for all doors throughout.

C. The chassis shall be a solid cast pressure formed almag or non-ferrous alloy and shall be mounted directly to the door with four (4) wood screws, machine screws, or, through bolted where required for positive attachment for wood fire rated doors.

D. All exit devices for this project shall have the chassis, end cap, and horizontal mounting rail, mount directly to, and flush with, the door surface. No gaps or space shall be permitted between the back of the horizontal mounting rail and the door surface. If required, a continuous solid stainless steel or bronze dull chrome plated spacer bar shall be used to fill the space between the back of the devices and the door surface.

E. The chassis cover shall be 16 gauge, cold formed stainless steel, fastened to the solid cast pressure formed chassis, by four (4) Phillip head machine screws, at the side of the chassis cover.

F. The rail assembly shall be 14 gauge, heavy wrought stainless steel. The rail assembly shall consist of a stainless steel case with a 16 gauge, heavy wrought stainless steel touch pad with a Lexan touch pad protection plate.

G. The end cap shall be a high impact resistant black lexan, fastened to the rail assembly by means of two, stainless steel Phillip head machine screws.

H. The touch pad shall retract the latch bolt by means of a sliding motion of the touch pad towards the lock stile, activating the lever arm for easy operation and reduced friction.

I. All exit devices, regardless of function, except for fire rated devices, shall have one point cylinder dogging. The cylinder for cylinder dogging shall be a six (6) pin cylinder keyed to the building master key system as specified under Section, "Keying 2.6."

J. Trim for exit devices shall be one of the following as specified:
   (a) Pull handles as specified in Section Push and Pull Bars.
   (b) Cast stainless steel lever handle with cast escutcheon [for all fire rated doors].

K. Exit devices, as manufactured by Sargent & Company 88 Series, and Von Duprin Division 98, meeting all of the specification requirements set forth above, shall be considered acceptable for this project.

L. Provide rim exit devices for single doors and mortise lock devices with open back strike and vertical rod devices for pairs of doors.

M. The following is a list of the functions referred to under hardware sets (1, 2, 3) and the model numbers of the acceptable manufacturers.

TYPE	SARGENT	VAN DUPRIN
R-1	8810	98EO
R-2	8804	98NL
R-3	8813	98L
R-4	8815	98LBE

2.5 KEYING

A. All locks and cylinders shall be keyed as required by the owner's instruction and operated by master key group AA and Grand Master key group A.

B. It is required that the key system have visual key control and that all keys and cylinders be stamped with the alphanumeric key symbol designated for each key

change as recommended by the Nomenclature for Master key Systems established by the Door and Hardware Institute.

C. Provide six (6) construction master keys to be supplied with the locksets to the General Contractor. The construction master key shall operate all locks and cylinders, and shall permit access to all areas by the General Contractor, during the construction period, prior to the owner assuming control of the building.

D. Upon completion of the building, the Contractor or Owner shall remove the construction master key biting section by means of an extractor key to be supplied by the finish hardware contractor. The removal of the construction master key biting section shall prohibit the operation of the construction master key from that moment on.

E. Provide a total of six (6) master keys for each group and six (6) grand master keys. Each keyed different change shall have minimum of four (4) change keys.

F. All change keys, master and grand master keys shall be delivered directly to the owner by the hardware subcontractor who shall obtain a receipt for delivery of same.

2.6 DOOR CLOSERS

A. All door closers for this project shall be the product of one manufacturer, and shall have cast iron cases with full cover and be full rack and pinion type construction, non-handed and non-sized with adjustable back-check effective at 70 degrees for both standard and parallel arm mounting.

B. The following products will be acceptable:

Door Closers			Overhead Stop/Holder
Corbin/Russwin	-	DC2200	Glynn-Johnson450 Series
LCN	-	4111/4011	Stainless Steel or Equal
Sargent	-	280	

C. At areas and routes accessible to persons with disabilities, provide closers that meet all state and federal regulations.

D. The hardware contractor shall insert in the hardware schedule, beside each door listing, the required degree of opening for each door. If the door swing is over 140 degrees, parallel arm type closers shall be used. Door closers mounted on corner brackets, or top jamb application, shall not be permitted.

E. Provide overhead stop/holder, where specified, in accordance with the hardware set numbers, overhead stop/holder shall be stainless steel.

F. Door closers with cush-n-stop arms shall be provided for all exterior, out-swing doors and other openings as specified under hardware sets. They shall have heavy forged steel parallel arms and soffit plates attached to the frame by six (6) screws. The forged steel arm shall have a positive stop bracket with an adjustable tension hold-open feature controlled with a slotted screw permitting adjustment from no hold-open to full restraint of door movement, Cush-N-Stop hold open function. The hold open feature does not apply to fire doors.

G. Where door closers are noted to require delayed action feature, provide closers as specified herein, but having a separate delayed action valve, to permit adjustment of delayed action cycle. When adjusted, the door closer shall close at a controlled rate of speed, through the delayed action cycle range.

H. The installing contractor shall be responsible for proper installation of door closers in accordance with degree of opening indicated on hardware schedule. Adjustment of all valves, for proper control of closing speed, latching speed, delayed action, backcheck, and spring power adjustments, shall be the responsibility of the installing contractor as set forth in Part III Execution.

I. Where top rail of door is insufficient in height to mount the closer directly to the rail, drop brackets shall be provided.

2.7 DOOR STOPS

A. It shall be the responsibility of the hardware supplier to provide door stops for all doors in accordance with the following requirements.

B. Wall type bumpers with a concealed type flange shall be used wherever possible and shall be one of the following:

Ives	-	407 1/2
Door Controls	-	3211T
Rockwood	-	409

C. Where wall type bumpers cannot be used, such as on unreinforced partitions or in situations where door comes in contact with material such as glass, or any other obstruction, provide dome type floor stops of the proper height.

Ives	-	436, 438
Door Controls	-	3310X, 3320X
Rockwood	-	440, 442

D. Exterior doors striking masonry and other doors specified to have door stops and holders shall have cast bronze wall or floor type door stops holders with hook or staple to engage door and to selectively hold in open position. The following will be acceptable:

Ives	-	445, 446
Door Controls	-	3237X, 3347X
Rockwood	-	473, 477

2.8 SILENCERS

A. Provide rubber silencers for all interior steel (hollow metal) frames. Silencers shall be pneumatic type 1/2 inch diameter with 1/8 inch projection.

B. Provide 3 silencers for the strike jamb of steel frames for single doors and two for the head for steel frames for pairs of doors.

2.9 KICK PLATES

A. Kick plates shall be .050 gauge solid stainless steel 8 inch (6 inch at full glass doors) high by 1- 1/2 inch less door width for single doors and 1 inch less door width for pairs of doors.

B. Kick plates shall be applied on the push side of all doors where noted.

2.10 THRESHOLD - WEATHER STRIPPING - DOOR BOTTOMS

A. Provide an extruded [or cast] aluminum threshold as shown on Drawings by full width of door opening. Anchor thresholds with no less than four (4) machine screw anchors for 3'0" lengths. Provide nonferrous solid brass or stainless steel screws.

B. Extruded aluminum thresholds shall have factory installed vinyl foot seals.

C. For all exterior hollow metal doors, provide an extruded aluminum perimeter seal with neoprene gasketing material (weather-stripping) for head and jambs. The neoprene seals shall be an airfoil design to permit full and positive closure between door and jamb. The continuous aluminum brackets shall be applied on the stop with stainless steel sheet metal screws at the corner of the rabbet located so as to provide full closure at the head and jamb perimeters. Where the door comes in contact with the frame, the maximum projection for the continuous aluminum weather stripping brackets shall be no more than 1/4 inch.

D. For fiberglass reinforced plastic doors provide a silicone rubber bulb with a self adhesive strip.

E. Weather stripping (gasketing material) shall be classified by Underwriters Laboratories for application on fire door frames, for openings rated up to 3 hours.

F. The finish for the exposed continuous aluminum weather stripping brackets, shall be natural anodized aluminum finish.

G. The door bottom seal for exterior doors shall be concealed in the bottom of the door and shall be a flexible synthetic vinyl that will not take a formal set, nor break or flake in cold weather. The door bottom seal shall extend the full width of the door and shall also extend below the door bottom and compress against the top for the threshold, for complete closure. The door bottom seal shall be fastened to the recessed channel with 3 or 4 screws through the seal or the seal chassis.

H. Door bottom seal for fiberglass reinforced plastic doors: Provide an extruded aluminum seal with flexible neoprene gasketing. Apply with stainless steel screws.

I. Concealed door bottoms must be installed before the door is in place.

2.11 FINISH

A. With the exceptions of door closers, plates, coordinators, thresholds and weather stripping, all hardware items shall be furnished in satin stainless steel finish 32D.

B. Exceptions are as follows:

Door Closers:	Sprayed Aluminum
Thresholds:	Natural Anodized Aluminum
Weather stripping:	Natural Anodized Aluminum

PART 3 - EXECUTION

3.1 INSPECTION

A. It shall be the general contractors responsibility to inspect all door openings and doors to determine that each door and door frame has been properly prepared for

the required hardware. If errors in dimensions or preparation are encountered, they are to be corrected by the responsible parties prior to the installation of hardware.

3.2 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 manufacturers templates and instructions.

3.3 INSTALLATION

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, thumb latch, lever or knob. 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. 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 manufacturers instruction sheets.
E. 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.

3.4 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.

3.5 ADJUSTING

A. The adjustments for all door closers shall be the contractor's responsibility and these adjustments shall be made at the time of installation of the door closer. The closing speed and 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 corrected 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.
B. Each door closer has adjustable spring power capable of being adjusted, in the field, from size 2 through 6. It shall be the contractors 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.

3.6 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.

3.7 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 engineer and owner, the general contractor shall remove the protective material exposing the hardware finish.

3.8 INSTRUCTIONS AND TOOLS

A. It shall be 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

3.9 HARDWARE SET NUMBERS

A. The Hardware Sets listed below indicate the items of hardware required for each opening. It is the bidders responsibility to accurately furnish the proper quantities, items, sizes, weights and functions as required by the plans and this specification. If an opening has, through error, been omitted from the following hardware set numbers listings, it shall be the bidders responsibility to supply hardware of equivalent quality and quantity, as that which is specified for a comparable opening.

Hardware Set No. 1

Each Leaf Shall Have:

Hinges, Exit Device R-3, Closure with Cush-N-Stop.
Weatherstripping, Kickplate, Threshold

Hardware Set No. 2

Each Leaf Shall Have:

Hinges, Lockset Function D, Closure with Cush-N-Stop, Kickplate, Threshold

Hardware Set No. 3

Each Leaf Shall Have:

Hinges, Lockset Function D, Closure with Cush-N-Stop, Weather Stripping, Kickplate, Threshold

END OF SECTION