

SECTION

DOOR HARDWARE

PART 1 – GENERAL

1.1 SUMMARY

A. Section Includes: Finish hardware in accordance with the requirement of the Contract Documents. Work includes architectural hardware for all interior and exterior doors unless otherwise specified elsewhere. Work includes but are not limited to :

1. Lever handle.
2. Rose/Escutcheon.
3. Locks.
4. Cylinder.
5. Hinges.
6. Door closer and Floor Springs.
7. Electro-magnetic locks.
8. Panic exit device.
9. W/C Indicator.
10. Door stop.
11. Flush bolt.
12. Dustproof socket.
13. Door selector.
14. Pull handle and Push Plates.
15. Kick plates.
16. Seals, Thresholds, and Weather Stripping.
17. Silencers.
18. Door Signs.
19. Automatic door operator.

B. Related Sections:

1. Section 08110 – Steel Doors and frames
2. Section 08211 – Flush Wood Doors
3. Section 08311 – Access Doors and Frames
4. Section 08331 – Overhead Coiling Doors
5. Section 08711 – Hardware set schedule
6. Section 08800 –Glazing –Frameless Glass Doors & Screens
7. Section 08900 – Glazed Curtain Wall
8. Section 09900 – Painting

1.2 REFERENCES

- A. Euronorm - European Standards - : (EN), AND
American National Standards Institute (ANSI)
1. EN 12365 : For Gaskettes and weather stripping.
 2. BS EN 1125, EN 179 : Panic exit devices
& ANSI 156.3
 3. BS EN 1154 : Controlled door closing devices (CE)
 4. BS EN 1155 : Electrically powered hold open devices for swing doors
 5. BS EN 1303 : Cylinders for locks
 6. BS EN 1527 : Hardware for sliding doors and folding doors
 7. BS EN 1670 : Corrosion resistance
 8. BS EN 1906 : Lever handles and knob furniture
 9. BS EN 1935 : Hinges
& ANSI 156.1
 10. BS EN 12051 : Door and window bolts
 11. BS EN 12209 : Locks and latches (CE)
 12. BS EN 12320 : Padlocks and padlock fittings
 13. BS EN 14637 : Electrically continued hold open systems
 14. BS EN 14846 : Electromechanically operated locks
- B. Disability discrimination Act (DDA) and American disability act 1990 (ADA).
- C. Conformance European (CE) - marking for consumer health and safety.
- D. Door Hardware Federation (DHF).
- E. Association of Building Hardware Manufacturers (ABHM).
- F. Automatic door operator: ANSI standards for pedestrian door and UL label.
- G. Fire resisting Certification : UL, Certifire, BRE, and Warringtonfire;
- BS EN 1125 & BS EN 179 Smoke code
 - EN 1634

1.3 SUBMITTALS

- A. Manufacturer's Literature Catalogue Cuts : Submit to the Engineer's Representative, for information only, copies of manufacturer's specifications, maintenance and keying manuals, and installation instructions (templates to suit each particular installation), for each item of finish hardware. Include photographs, catalogue cuts, marked template and other data as may be required to show compliance with these Specifications. Only original manufacturer's catalogue will be acceptable.
- B. Samples, Items: In conjunction with the submission of the finish hardware schedule, submit to the Engineer's representative, in accordance with the requirements of the Contract Documents, one sample of each typical item of exposed hardware. Engineer's representative review of samples will be for design, pattern, finish and colour only. All other requirements are the exclusive responsibility of the Contractor.

- C. Shop Drawings, finish Hardware Schedule: Subm it to the Engineer’s representative for review, in accordance with the req uirements of the Contract Documents, copies of finish hardw are schedule covering complete identification of all items required for the project. Include manufacture’s names and identification of finishes. Include a separate schedule of key and master key system with final submittal of schedule.

Engineer’s Representative’s review of schedules shall neither be constructed as a complete check nor shall it relieve the Contactor of responsibility for errors, deviations or omission from requirement to provide complete hardware for the project.

1. Coordinate hardware schedule with door manufacturers’ ‘Door Schedule’
Submit required template to door manufacture to enable proper and accurate sizing and location of hardware.
2. Keying Schedule: Separate detailed schedule indicating clearly how the Employer’s final instructions on keying of locks has been fulfilled.

- D. Statement o f Applicatio n: Subm it to the Eng ineer’s Representative, in acco rdance with the requirement of the Contract Documents, one copy of a statement confirming that the finish hardware work complies with these specifications, and that the methods of installation were proper and adequate for the condition of installation and use. The Statement of Application shall be signed by the Contractor.

- E. All door fram es shall be furnished with door silencers of plug in type, except frames having weather stripping or smoke seal. Furnish each single door frame with 3 Nos. silencers and each double door frame with 4 Nos. silencers.

1.4 QUALITY ASSURANCE

- A. Manufacturer: Obtain each type of hardware from single manufacturer. Although several may be indicated as offering products complying with requirements, only comp anies specializing in manufacturing door hardware with five (5) years experience will be acceptable.

B. Installer Qualification:

1. The hardware ins taller shall have ex tensive experience of not less than five (5) years in the installation of hardware to si milar type/ size projects and must produce evidence in the for m of references from similar (size or type) previous jobs.
2. The hardware installer must provide an experienced qualified architectural hardware consultant, who has been with the hardware in staller or manufacturer for a minimum of five (5) years. He m ust be a available –as needed- during the delivery and installation period, and must be able to attend the building site at other times as required by Engineer’s Representative.

C. Requirements of Regulatory Agencies:

1. **Hardware at Rated Openings:** Furnish hardware in accordance with NFPA standard No. 80 for openings specified, shown or scheduled for a fire rated opening to receive specified fire rating. In case of conflict between type of hardware specified and type required for fire protection, furnish type required to meet the local authorities.
Furnish hardware of type listed for usage with the types and sizes of fire doors and frames required. Unless otherwise shown or specified, arrange doors at fire rated openings to remain in the normally closed position by furnishing each unit with an automatic closing device. Furnish active latch bolts that cannot be held in the retracted position.

- D. Pre-Installation Meetings:** After delivery of hardware and prior to its installation, meet with the Engineer's representative to compare final samples with actual hardware delivered, to assure acceptability. Review catalogues, brochures, templates, installation instructions and the final hardware schedule. Rehearse installation procedures and workmanship, with special emphasis on unusual conditions, so as to ensure correct technique of installation, and coordination with other work.
Finish and color of each hardware item is to match approved sample furnished.

1.5 DELIVERY, STORAGE AND HANDLING

- A.** Package and label each item of hardware separately. Tag each item in accordance with the final hardware schedule. Each package shall contain appropriate fastenings, instructions and installation templates. Protect all items from loss or damage in shipment.
- B.** All hardware shall be stored in a dry, secure area and in a manner to facilitate sorting, checking and unpacking.

1.6 PROJECT CONDITIONS

Coordination: Coordinate work of this section with other directly affected sections, involving manufacturer of any internal reinforcement, or cutting for door hardware.

1.7 WARRANTY

- A.** **Special Project Warranty:** Submit a written warranty, executed by the Contractor, Installer, Manufacturer agreeing to repair or replace components or entire units which fail in materials or workmanship within specified warranty period. Failure include, but are not necessarily limited to deterioration of metals, metal finishes and other materials beyond normal weathering and defects in hardware.
- B.** Warranty Period for door hardware shall be five (5) years after the date of Substantial Completion.

1.8 MAINTENANCE

- 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 MANUFACTURES

Manufacturers are suggested as per product. The manufacturer's name in one product category may not be acceptable for other products.

A. HINGES

1. HAGER, Mckinney
139 Victor Street
St. Louis, MO 63104
Phone: +1 800 3259995
Fax: +1 800 7820149
2. HOPPE AG
Via Friedrich Hoppe
CH-7537 Müstair
Phone: +41 81 851 66 00
Fax: +41 81 851 66 66
3. BSW
Locher Str. 25
42719 Solingen, Germany
Phone: +49 212 3960
Fax: +49 212 39645

B. LOCKS

1. HOPPE AG
Via Friedrich Hoppe
CH-7537 Müstair
Phone: +41 81 851 66 00
Fax: +41 81 851 66 66
2. WILKA Schließtechnik GmbH
Mettmanner Str. 58-64
D- 42549 Velbert, Germany
Phone: +49 (0) 20 51 - 20 81 – 147
Fax: +49 (0) 20 51 - 20 81 – 21 47
3. CES
P.O. Box 101180 D42547,
Velbert Germany
Tel: +49 2051 204116
Fax: +49 2051 204231

C. CYLINDERS

1. CES
P.O. Box 101180
D42547, Velbert, Germany
Phone: +49 2051 204116
Fax: +49 2051 204231
2. WILKA Schließtechnik GmbH
Mettmanner Str. 58-64
D- 42549 Velbert, Germany
Phone: +49 (0) 20 51 - 20 81 – 147
Fax: +49 (0) 20 51 - 20 81 – 21 47
3. ABUS
KG Linker Kreuthweg 5
86444, Affing, Germany
Phone: +49 8207 95990-0
Email: info.de@abus-sc.com

D. LEVER HANDLE

1. HOPPE AG
Via Friedrich Hoppe
CH-7537 Müstair
Phone: +41 81 851 66 00
Fax: +41 81 851 66 66
2. FSB
Neheimer str. 38
33034 Brakel, Germany
Phone: +49 5272 608268
Email: architektur@fsb.de
3. All Good PLC.
18 Holborn, London
EC1N2LE
Phone: +44 1708 345067
Fax: +44 1708 341452

E. PUSH AND PULL HANDLE

1. HOPPE AG
Via Friedrich Hoppe
CH-7537 Müstair
Phone: +41 81 851 66 00
Fax: +41 81 851 66 66

2. Hager Companies
139 Victor Street
St. Louis, MO 63104
Tel: +1 314 633 2883
Fax: +1 800 7820149

3. FSB
Neheimer str. 38
33034 Brakel, Germany
Phone: +49 5272 608268
Email: architektur@fsb.de

F. DOOR CLOSER

1. GEZE
21-29 Reinhold Voster – Str
D-71229 Leonberg
Germany
Phone: +49 7152 2030
Fax: +49 7152 2033 10

2. HOPPE AG
Via Friedrich Hoppe
CH-7537 Müstair
Phone: +41 81 851 66 00
Fax: +41 81 851 66 66

3. All Good PLC.
18 Holborn, London
EC1N2LE
Phone: +44 1708 345067
Fax: +44 1708 341452

G. ELECTRO MAGNETIC LOCKS

1. HOPPE AG
Via Friedrich Hoppe
CH-7537 Müstair
Phone: +41 81 851 66 00
Fax: +41 81 851 66 66

2. EFF EFF
Bildstockstrade 20
72458 Albstadt, Germany
Phone: +49 7431 123-0
Fax: +49 7431 123 240

3. All Good PLC.
18 Holborn, London
EC1N2LE
Phone: +44 1708 345067
Fax: +44 1708 341452

H. PANIC EXIT DEVICE

1. DORMA Gmbh
P.O Box 4009
D58247 Ennepetal, Germany
Tel: +49 2333 793 -0
Fax: +49 2333 793495
2. HOPPE AG
Via Friedrich Hoppe
CH-7537 Müstair
Phone: +41 81 851 66 00
Fax: +41 81 851 66 66
3. Vachette
50, Rue De La Park
F-10000 Trojes, France
Phone: +33 2542 3001
Fax: +33 2542 3030

I. FLUSH BOLTS / DOOR SIGN/ DOOR STOPS

1. HOPPE AG
Via Friedrich Hoppe
CH-7537 Müstair
Phone: +41 81 851 66 00
Fax: +41 81 851 66 66
2. Hager Companies
139 Victor Street
St. Louis, MO 63104
Phone: +1 314 633 2883
Fax: +1 800 7820149
3. Frank Allart
15/35 Great Tindl Street
Birmingham B16 8DR, UK
Phone: +44 121 410 6000
Email: sales@frankallart.co.uk

J. COORDINATORS (DOOR SELECTORS)

1. HOPPE AG
Via Friedrich Hoppe
CH-7537 Müstair
Phone: +41 81 851 66 00
Fax: +41 81 851 66 66
2. All Good PLC.
18 Holborn, London
EC1N2LE
Phone: +44 1708 345067
Fax: +44 1708 341452
3. Hager Companies
139 Victor Street
St. Louis, MO 63104
Phone: +1 314 633 2883
Fax: +1 800 7820149

K. PUSH AND KICK PLATES

1. HAGER
139 Victor Street
St. Louis, MO 63104
Phone: +1 314 633 2883
Fax: +1 800 7820149
2. HOPPE AG
Via Friedrich Hoppe
CH-7537 Müstair
Phone: +41 81 851 66 00
Fax: +41 81 851 66 66
3. Approved local manufacturers

L. AUTOMATIC DOOR BOTTOMS/ WEATHER STRIPPING / THRESHOLD

1. HAGER
139 Victor Street
St. Louis, MO 63104
Phone: +1 314 633 2883
Fax: +1 800 7820149

2. Lorient Polyproducts Limited Fairfax
Road
Heathfield Industrial Estate, Newton Abbot Devon TQ12
6UD
Tel: +44 1626 834252
Fax: +44 1626 833166
Email: sales@lorientuk.com

3. NGP
Merryland International Corporation For Import
18 (A) Champion Street, Down Town
Cairo _ Egypt, Zip Code 11522
Fax:002 02 2575 818 3
Company Telephone: (00202) 25753318-25747331-25741163-
5761464-01002583675

M. AUTOMATIC DOOR OPERATOR

1. HORTON
4242 Baldwin Blvd,
Corpus Christi, Texas 78405-3399
Tel: +1 800 531 3111
Fax: +1 800 531 3108

2. GEZE
21-29 Reinhold Voster – Str
D-71229 Leonberg, Germany
Phone: +49 7152 2030
Fax: +49 7152 2033 10

3. DORMA Gmbh
P.O Box 4009
D58247 Ennepetal
Germany
Tel: +49 2333 793 -0
Fax: +49 2333 793495

N. DOOR SLIDING SYSTEM

1. Hawa Sliding Solutions AG
Untere Fischbachstrasse 4
8932 Mettmenstetten
Switzerland
Phone +41 44 787 17 17
Fax: +41 44 787 1718
Email: info@hawa.com

2. HAGER
139 Victor Street
St. Louis, MO 63104
Phone: +1 314 633 2883
Fax: +1 800 7820149

Substitution: The manufacturers specified hereinafter are specified for the purpose of establishing minimum quality standards. Other manufacturers for similar products that meet the requirements may be acceptable, if above specified manufacturers are not available locally. The decision of acceptability shall rest with the Engineer.

2.2 FINISH PRODUCTS

The products specification listed hereinafter are specified for the purpose of establishing minimum quality standards.

A. Fasteners:

1. Provide concealed fastening where ever possible. The use of self-tapping or sheet metal screws is prohibited except for the application of flush mounted push and kick plates.
 - a. Concealed Fasteners: Furnish hard ware items with appropriate type and length of screws or other fastening suitable to ensure permanent anchorage.
 - b. Exposed Fasteners: Furnish hard ware with countersunk Philips oval head type screws where concealed fastening is not possible. The finish or colour of these screws is to match that of the hardware item being fastened.

B. Hinges:

1. General: Pack all hinges with machine or wood screws as required by door and frame construction. Where door jamb or trim projects to such an extent that the width of leaf specified will not allow the door to clear such frames or trim, furnish hinges with leaves of sufficient width to clear. Furnish template hinges in accordance with door and frame material required.
2. All hinges to be used on exterior doors shall be of non ferrous material as indicated.

3. Wood doors without special hinge reinforcement are to be hung on half surface ball bearing hinges using through bolts and grommet nuts.
4. Hinge pins, except as otherwise indicated, shall be as follows:
 - a. Steel hinges : Steel pins
 - b. Exterior doors: Non removable pins (NRP) or security stud.
 - c. Interior doors: Non rising pins.
 - d. Tips: Flat button & matching plug.
5. Provide sufficient hinge width to allow door to clear the trim, if the projection of door trim prevents desired degree of opening.
6. Furnish hinges complying to ANSI A 156.1 or EN 1935, equipped with two ball bearing units and five knuckles as follows:
 - a. Hinge Size:
 - i. 114 x 102 x 3mm for metal doors and frames.
 - ii. 102 x 89 x 3mm for wood doors
 - iii. Concealed Hinges

C. Mortise Locksets:

1. All Locks and Latches shall be with standard size to allow for interchange of functions. Cases shall be closed on all sides for protection of inner mechanism from foreign matter, and shall be silver powder coated to give extra corrosion resistance.

Lock shall be provided with 316 grade stainless steel forend with satin finish. Latch should be site reversible, allowing quick handling on site, without the need to dismantle the lock case.

- a. 60mm back sets.
- b. Latch projection with minimum 11mm.
- c. Smooth action ball bearing follower for 8mm spindle to provide smooth lever operation and reduce wear.
- d. 20mm double throw bolt.
- e. Satin nickel Latch bolt for corrosion resistance.
- f. Suitable for high frequency application with minimum 1 hour fire rating.
- g. Confirm to DIN1825 with 72mm center to center distance (78mm for bathroom locks). A case shall be pierced to accept bolt through fixings.
- h. Confirm to European Standards EN12209 and carry CE Mark.

D. Cylinders:

Provide high grade cylinder conforming to DIN EN 1303, with inserted steel pins providing drill resistance feature. Each cylinder must be provided with 3 long neck keys made of brass material. Paracentric key profile must prevent unauthorized opening with picking tools. Finish of cylinder must match the hardware finish.

E. Lever Handles

1. All handles and plates shall be made of stainless steel grade 304, as a minimum, with an 8mm spindle diameter.
2. Fixing of Roses shall be through back to back screws.
Shape and size guidance is as indicated in BOQ, and subject to engineer's approval
3. Sizes of lever shall be 130mm as a minimum, and 54mm Rose diameter,

F. Pull handles

Furnish all pull handle in a design matching to approved lever handle design with stainless steel material of grade 304 as a minimum. With sizes and fixing method (single bolt through or back to back) as indicated in Bill of Quantity documents.

G. Door Closers and Floor Springs:

1. Provide door closers and floor springs as indicated in the Hardware Set Schedule.
2. The spring power of the closer shall permit adjustment to suit any width of door.
3. Door closers shall be suitable for use on fire rated doors, and carry a five year minimum warranty.
4. Non handed, rack and pinion mechanism for smooth and efficient operation.
5. Furnish heavy duty floor door springs with statically controlled closing speed with back check. Spindles of floor springs should be interchangeable with extensions to meet the required tolerances on bottom of doors.

6. Floor springs shall be fire labeled for fire rated door.
7. Provide cover to the body of door closers and floor springs as shown in the Hardware Schedule.
8. Furnish door closers and floor springs complying to CE, EN 1154

H. Panic Exit Device:

1. Furnish exit devices as indicated in the Hardware set schedule with utilized installation feature to suit various door width.
2. With euro profile cylinder with outside reversible trim.
3. Stainless Steel Touch Bar
 - Compliant to BS/EN 1125, CE.
 - Non handed with security graded bolts.
 - 304 Stainless Steel Finish
 - Certified for 2 hours fire rating on timber doors & 3 hours fire rating on steel doors.

I. Flush Bolts and Dust Proof Sockets:

1. All flush bolts are to be furnished in pairs. Furnish “dust-proof sockets” for bottom bolts.
2. Furnish bolts and automatic flush bolts as indicated in the Hardware sets schedule and complying as follows:
 - a. Flush Bolt: Stainless Steel, with 200 x 25mm size.
 - b. Flush Bolt for Metal Doors: Satin Finish with 170 x 25mm and 300mm rod.
 - c. Automatic Flush bolt: 3 hours fire rating – UL listed – stainless steel finish.
 - d. Dust Proof Strike: Stainless Steel finish.

J. Door Selector / Gravity Coordinator:

Furnish door selector made of forged brass, confirming to ANSI 156.3 usable for pair of doors with or without astragal, with roller arm and rubber roller for quite and efficient operation.

K. Push /Pull Plates:

Furnish push, pull, pull-on, armour, as indicated in the hardware set schedule:-

1. Push plate :
100 x 400mm size, 1.5mm thickness
2. Pull plate :
Plate size 100 x 400mm, Plate thickness 1.5mm
Pull size 225 x 19mm
3. Finish : Satin Stainless Steel.

L. Kick Plates:

1. General : Kick plates shall be surface mounted, 1.5mm minimum metal thickness and mounted with oval head Philips fasteners. Size 200mm high x door width. Final sizes should be approved by the Engineer’s Representative.
Material : Satin Stainless Steel.
2. Armour Plate: Same as above, but with 40” height.

M. Thresholds and Automatic Drop Seals:

1. Furnish thresholds as indicated in Door schedule.
2. Furnish concealed automatic drop seals to bottom edge of doors, approved for fire, soundproof and external doors.

N. Door Signs (Sex Indicator):

Furnish stainless steel finish sex indicator male/female/handicap, and fire sign, engraved in material and finish as indicated in the Hardware set schedule, size 75mm.

O. Miscellaneous Hardware Fixtures:

Furnish the following miscellaneous hardware fixture in material and finish as indicated in the Hardware set schedule:

- a. Cylinder with master keying system
- b. Door Holder
- c. -----
- d. -----

2.3 KEYING SYSTEM

- A. The system has to be designed by the manufacturer in accordance with the employer's and Engineer's Representative's requirement. Considering the existing and the future keying system requirement.
- B. Cylinders must have features for protection against pick and drilling.
- C. Provide keys of nickel silver or other equal and approved material.

For Master Key system:-

1. Provide 5 keys for grand master key level. Provide 3 keys for master sub-master key level as approved by the Engineer's representative.
2. Finish of cylinders shall match the hardware finish and in accordance with BS EN 1303 standards.
3. Provide temporary cylinders for use during construction period only, **OR** provide a construction keys for each building during construction period.
4. Provide steel key cabinet with cabinet lock having a capacity of 25 percent in excess of the total quantity of master keyed cylinders.
5. On handing over, each key shall be fitted to a coloured nylon key tag with clear labeling of cylinder/key marking. On handing over, all individual keys shall be placed on the hooks inside the key cabinet except the master keys, which shall be handed over in a sealed envelope.

2.4 HARDWARE FINISHES

- A. Hardware shall be of the best grade of material entirely free from manufacturing defects.
- B. All sizes of material given in the hardware sets are only for guidance. It is the responsibility of the Contractor to furnish the exact size and weight of hardware items to ensure proper function in each case. All sizes of door hardware given in hardware set are only for guidance.
- C. Hardware shall be fire rated for the specified fire rated doors.
- D. Produce finishes to exactly match with Engineer's Representative's selected sample(s). Reduce variance in hue in the colour of each finish, as much as possible, whether the base material is cast, forged or stamped, or when plating is applied over steel, brass or bronze. Finishes of the same designation that come from more than one sources shall match, when the items are viewed at arms length and approximately 600 mm apart. Unless otherwise specified, match the finish of each item of hardware with the finish selected for lock sets and latches. Type of finish for each hardware is indicated in the Hardware Schedule. Section 08711.

2.5 HARDWARE MOUNTING HEIGHTS

- A. Mounting heights shall generally be in accordance with the "Recommended Locations for Builders Hardware" published by the Doors and Hardware Institute (DHI) and to the approval of the Engineer's Representative.
- B. The following mounting heights shall apply throughout the work, unless otherwise shown.
 1. Lock Sets and Latches: 950mm to centre of handle from floor.
 2. Butt Hinges: 295mm to center of lowest hinge from floor, 181mm to center of upper hinge from top of door, space other hinges equally between lower and upper hinges.
 3. Door Pulls: 1120mm finished floor to centre of pull, centre line in 125mm from edge of flush doors, and centered on stile of narrow stile glass doors.
 4. Deadlocks: Centre line of cylinder to align with centre line of cylinder for lock sets, unless indicated otherwise.
 5. Cross-Bar of Exit Device; 950mm finished floor to centre of cross bar.
 6. Push Bar: 1050mm finished floor to centre of push bar.
 7. Push Plate: 1120 mm finished floor to centre of plate through mounted to pull.
 8. Flush Bolt Operating Mechanism: Top bolt 1650 to 1800mm above finished floor, bottom bolt 250 to 300mm above finished floor.

2.6 SOURCE QUALITY CONTROL

- A. Coordinate the application of hardware items with door and frame details and with method of fastening as hereinafter specified.

- B.** Adaptation of hardware Items: Where the type of hardware specified is not adaptable to the finished size of members requiring hardware, submit an item having a similar operation and quality to the Engineer's Representative for review.
- C.** Templates: Make finish hardware to templates, with wood and/or machine screws as applicable to door and frame detail. Furnish templates and schedules to door and frame manufacturers and other trades requiring same, so that doors and frames can be cut, reinforced and prepared in the shop to receive hardware. Use template hinges conforming to ANSI standards to establish location of holes for each size of hinge.
- D.** No names, designs, or labels will be permitted on the following items: push bars, pull handles, plates (any visible parts) and any other item which the Engineer's Representative designates.
- E.** Single Source: Use only the products of one manufacturer for each type of hardware specified.
- F.** The Contractor should be responsible for the accuracy of the quantities, sizes, finish and proper hardware to be furnished whether specifically mentioned or not and shall be responsible for determining all details such as hand of doors, type of locks, standard required etc.

PART 3 – EXECUTION

3.1 EXAMINATION

Verify that doors and frames are ready to receive work. And dimensions are as indicated on the prepared and reviewed hardware schedule, and as instructed by the manufacturer.

3.2 PREPARATION

- A.** Install each hardware item in compliance with the manufacturer's instructions and recommendations. Wherever cutting and fitting is required to install hardware onto or into surface which are later to be painted or finished in another way, coordinate removal, storage and reinstallation or application of surface protection with finishing work specified in the Division 9 section. Do not install surface-mounted items until finishes have been completed on the substrate.

3.3 INSTALLATION

- A.** Receive hardware for doors as shown and scheduled, and as specified in the applicable hardware portions of these specifications. Store in a locked space to prevent loss.

- B.** Apply to doors as recommended by hardware manufacturer and as required. Fit locks and latch in their respective doors and remove before painting. Reinstall after painting of doors is completed. Upon completion, adjust and lubricate hardware for proper operation.
- C.** Instruct Employer's personnel in the proper adjustment and maintenance of hardware as per the manufacturer's instruction and recommendations.
- D.** Set units level, plumb and true to line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation.

3.4 FINAL ADJUSTMENT AND CHECKING

- A.** The hardware supplier shall assist the contractor in adjusting and checking the installation of finish hardware. Check, test and adjust moving parts to ensure free and smooth operation. Furnish to the Employer the special tools required to adjust and maintain hardware including instruction sheets and operation manuals.
 - 1. After the building is completed and in use, adjust hardware to compensate for air movement and other conditions, so that all items will operate properly.
 - 2. A factory representative of the lock and latch manufacturer shall examine all hardware furnished with the Engineer's representative (6) months after the handing over to the employer. Adjust the hardware for proper operation.
 - 3. Clean and polish all exposed hardware at the time of handing over to the Employer.

END OF SECTION

Note: -

Stainless Steel Grade 316 material should be used in the following applications:

- Hospitals.
- Labs.
- Marine type of facilities.
- Chemical Handling facilities.