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Name / Signature Date
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T. 01 Scope

A. Work Included

1. Seller shall design, manufacture, furnish and deliver F.O.B jobsite and unloading in accordance with this specification.

2. The work to be performed under this specification includes but is not limited to the following:

   a. Fire labeled and nonlabeled hollow metal doors (including embedment work of electrical wire within the door leaf), door louvers, and glazing stops and beads.
   b. Door hardware with necessary templates for cut-outs.
   c. Weather stripping seals.
   d. Transom panels.
   e. Pad locks and keys for wire mesh doors.
   f. Shop prime coat.
   g. Cylinders/keys for other special doors.

B. Related Work Not Included

The following work will be done by others:

1. Steel channel frames.
2. Wire mesh doors and hardware. (Except pad locks and keys)
3. Field finish painting of metal door and frames.
4. Elevator doors and frames.
5. Electrical wiring work for signal and alarm devices. (Except electrical wiring work within the door leaf)
6. Access door and hatches.
7. Toilet partition doors.
8. Caulking and sealant (Will be purchased and furnished by Section D.17, Caulking and Sealant Contractor)

T. 02 SUPPLEMENTS, CODES, STANDARDS AND QUALITY REQUIREMENTS

A. GENERAL

Seller shall control the quality of Goods and services to meet the requirements of the Specification, applicable codes and standards and other procurement documents.

B. SUPPLEMENTS

1. The supplements listed herein form a part hereof.

2. References throughout the Technical Specifications Section or the Design Drawings to specific supplements which are among those listed herein, and/or to specific Articles or Paragraphs of the supplements listed herein are for convenience only and shall not relieve Seller from all obligations of all requirements of other applicable supplements listed herein or from all other specific Articles and Paragraphs indicated.

3. Design Drawings

<table>
<thead>
<tr>
<th>Number</th>
<th>Title</th>
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<tr>
<td>9–300–A115–001,002</td>
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<td>9–300–A116–016</td>
<td>Special Door Schedule</td>
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</tbody>
</table>

C. INDUSTRY CODE AND STANDARD EFFECTIVE DATE

All codes and standards shall be the edition in effect as of December 31, 1993 unless indicated otherwise.
D. INDUSTRY CODES AND STANDARDS

The materials shall conform to the applicable requirements of the following documents and applicable supplements (Which are referenced herein and not attached):

<table>
<thead>
<tr>
<th>Sponsor</th>
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<tr>
<td>ANSI</td>
<td>A115.1</td>
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<td>ANSI</td>
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<td>ASTM</td>
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<td>Fire Door Test of Door Assemblies</td>
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<td>ASTM</td>
<td>E283</td>
<td>Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors.</td>
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<tr>
<td>ASTM</td>
<td>A525-G90</td>
<td>Steel Sheet, Zinc-coated(Galvanized)by the Hot-Dip process General Requirements</td>
</tr>
<tr>
<td>SDI</td>
<td>100</td>
<td>Recommended Spec. for Standard Steel Door and Frame</td>
</tr>
<tr>
<td>SDI</td>
<td>116</td>
<td>Standard Test Procedure and Acceptance Criteria for Rate of Air Flow through closed Steel Door and Frame Assemblies</td>
</tr>
<tr>
<td>UL</td>
<td>10B</td>
<td>Fire Tests of Door Assemblies</td>
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<tr>
<td>UL</td>
<td>63</td>
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<tr>
<td>NFPA</td>
<td>80</td>
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<tr>
<td>KS</td>
<td>D3512</td>
<td>Cold Rolled Carbon Steel Sheets and Strip</td>
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<td>KS</td>
<td>F2268</td>
<td>Method of Fireprotecting Test of Fire Door of Building</td>
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<tr>
<td>KS</td>
<td>F4519</td>
<td>Butt Hinge</td>
</tr>
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E. QUALITY REQUIREMENTS

The quality class of all seller furnished material shall be to industrial standards.
T. 03 SUBMITTALS

A. DRAWING, DATA AND PROCEDURES

1. Seller shall submit shop drawings showing construction, reinforcing, and anchorage details. Shop drawings shall bear titles corresponding to those of the design drawings and shall identify each door and frame by door number as indicated on the door schedule.

2. Seller shall submit a schedule of finish hardware list showing the manufacturer, catalog number, design or pattern, and finish for each item of hardware for each door.

3. Seller shall submit hardware samples for the functions, finishes, and designs or patterns of proposed items to the Owner for approval.

4. Installation manual for each type door and hardware set.

B. QUALITY VERIFICATION REPORTS AND RECORDS

1. Documentation of test results for all fire assemblies according to UL 10B and UL 63 or KS F2268.

2. Air leakage test reports for ventilation barrier doors according to ASTM E283 or Section 7 of KS F2268

3. Certificate of conformance asserting conformance with all of the requirements of the specifications.

T. 04 DESIGN REQUIREMENTS

A. GENERAL

1. Unless shown or specified otherwise, doors and frames shall be heavy duty, conforming to the applicable provisions of SDI 100. Fire rated doors shall be provided where indicated on the design drawings.

2. Hollow metal fire doors shall conform the applicable requirements of NEPA 80 and UL 108, UL 63 or KS F2268 for fire door frame and assemblies. Each fire door and frame shall bear the metal tag label reflecting the testing agency's rating, temperature, serial no. etc. as indicated on Design Drawing.

3. Design, type, and size of doors and frames, and other pressed metal items, shall be shown on the shop drawings.
B. DESIGN CONDITIONS

1. Fire rated doors shall be seamless hollow steel construction conforming to ANSI A123.1 with each door formed with two face sheets of steel. No seam shall occur on the door faces or sides. The top and bottom of the door shall be closed, and the internal construction shall consist of steel rib stiffeners, as indicated on the design drawings. Non-fire rated doors shall be mechanically interlocked or seamless hollow steel construction, with each door formed with two face sheets of steel. No seam shall occur on the door faces. The top and bottom of the door shall be closed, and the internal construction shall consist of steel rib stiffeners, as indicated on the design drawings.

All doors shall be insulated with fibrous glass or mineral wool of 3.0 pcf density.

2. Classes of Construction

Non-fire rated doors shall be one of the following two classes of construction. Complete with all reinforcement and preparation for hardware, as indicated on the design drawings and hardware manufacturer’s instruction.

a. Class I: Mechanical interlocked or seamless hollow steel construction, with 16 gauge face sheets and additional tubular reinforcement at head, and necessary reinforcement for jamb and locksets or push–pulls, and prepared for surface hinges and through–bolted to door, unless otherwise indicated.

b. Class II: Mechanical interlocked or seamless hollow steel construction, with 18 gauge face sheets and additional channel reinforcement at head, and prepared for mortise hinges, unless otherwise indicated.

Fire rated doors shall be seamless hollow steel construction, with 16 gauge face sheets and additional channel reinforcement at head, and necessary reinforcement for jamb and locksets or push–pulls, and prepared for surface hinges and through–bolted to door or mortise hinges as per approved hardware schedule.

3. Doors and frames including hardware for installation in fire resistive openings shall be manufactured according to KS F2268 or UL 63 standards for fire door frames and UL 10B for door assemblies. The following listed fire label doors, frames and hardwares shall be used in fire wall separations:
HOLLOW METAL DOORS AND HARDWARES

a. "A" Label in 3-hour fire walls

b. "B" Label in 2-hour fire walls

4. The maximum rate of acceptance air leakage of hollow metal doors in ventilation barrier shall not exceed 1.25 CFM per foot of crack length at a static air pressure of 1.567 PSF and the test shall be performed in accordance with ASTM E283 or Section 7 of KS F2268.

5. Door Details
   a. Clearance
      Between doors and frame, at head and jambs–1/8” max.

      At door sills
      Where no threshold is used–5/8” maximum above finished floor.

      Where threshold is used–3/4” max. above finished floor and 1/8” max. between door bottom and top of threshold.

      Between meeting edges of pairs of doors–1/8” max.

   b. Butt preparation

      For doors with full surface butts: Holes through face sheets for through-bolting shall be provided.

      For doors with full mortise butts: Doors and frames shall be mortised to receive butts.
      Butt sizes shall be as indicated on the design drawings.

   c. Bottom drips: Shall be provided on all exterior doors as indicated on the design drawings.

   d. Door closer: Shall be provided as indicated on the design drawings.
      Maximum two door closers may be used on one door considering room pressure difference and door weight.

   e. Door stop seals: Shall be provided as indicated on the design drawings.

   f. Astragals: Shall be provided on the active leaf of all double doors, as indicated on the design drawings.

   g. Glazing details: Shall be provided as indicated on the design drawings, with fixed glass stop on the exterior side and removable glazing bead on the interior side of a door.
h. Kick plates: Shall be provided in toilet or sanitary room as like washing room.

6. Exterior doors and frames except pre-installed steel channels shall be fabricated from galvanized steel for good rust inhibition.

7. Before fabrication of door and frame, all hardware schedule should be decided and incorporated in door shop drawings considering template for hardware.

T. 05 MATERIAL, FABRICATION AND COATING

A. MATERIAL

1. Steel plates for hollow metal door leaf shall conform to ASTM A36 or KS D3512.

2. Hardware for hollow metal doors shall be as follows.

a. Hinges

a1. Hinges shall conform to ANSI A156.1 for main buildings and, KS F4519 for yard ancillary buildings and office areas in Access Control building.

a2. Type and size

a2.1 Provide a minimum of two butts for doors up to and including 5’-0” in height, and an additional butt for each additional 2’-6” or fraction thereof of the height of the door, except as noted for exterior and class I doors.

a2.2 Exterior doors located in channel iron frames shall be furnished with 2 pairs of six-inch steel, heavy weight, four ball bearing races, full surface butts primed for painting. Butts shall be through-bolted to the door with self-locking, cadmium plated machine screws. Butts shall be attached to the jamb with stainless steel machine screws. Then welded in place.
Exterior doors located in pressed metal frames shall be furnished with 2 pairs of six-inch steel, heavy weight, four ball races, half surface butts primed for painting. Butts shall be through-bolted to the door with self-locking, cadmium plated machine screws. Butts shall be fastened to the pressed metal frame with stainless steel machine screws.

a.2.3 Interior class I doors located in channel iron frames shall be furnished with 2 pairs of six-inch steel, heavy weight, four ball races, full surface butts primed for painting. Butts shall be through-bolted to the door with self-locking, cadmium plated machine screws. Butts shall be fastened to channel iron frame with stainless steel machine screws, then welded in place. Interior class I doors located in pressed metal frames shall be furnished with 2 pairs of six-inch steel, heavy weight, four ball races, half-surface butts through-bolted to the door with self-locking, cadmium plated machine screws. Butts shall be fastened to pressed metal frame with stainless steel machine screws.

a.2.4 Interior class II doors located in channel iron frames, shall use 4-1/2" steel, heavy weight, four ball races, half mortise butts primed for painting for max. 2’-6” wide doors, and 5 inch half mortised butts for 2’-8” wide doors and wider. Interior class II doors located in pressed metal frames, shall use 4-1/2” x 4-1/2” steel, heavy weight, four ball races, full mortise butts primed for painting for max. 2’-6” wide doors and 5” x 4-1/2” full mortise butts for 2’-8” wide doors and wider. Door and frame shall be mortise to receive butts.

a3. Acceptable hinge manufacturer’s are STANLEY, HAGER, MCKINNEY, LAWRENCE or approved equal, steel heavy weight hinges for main building.

a4. All doors shall be provided with self-lubricating, ball bearing butts with stainless steel non-removable pins. Primed for painting(USP).

a5. All butts shall be field painted to match door.
b. Mortise locks and latches
   b1. Mortise locks and latches shall conform to ANSI A156.13

   b2. Type and size

   b2.1 All locks and dead bolts shall be provided with 7 pin
       interchangeable removable core cylinders with restricted non-
       commercial key way.

   b2.2 Removable core cylinder for all locks including special door
       locks shall be furnished by the hardware supplier.

b3. Mortise locksets in fire doors shall have as a minimum, the same fire
    label rating as the door.

b4. Mortise lock and latches shall be YALE 8700 or CORBIN 9500 Series,
    with US 26D finish (Satin Chromium Plated) or approved equal. Trim
    design will be selected by the Owner.

c. Exit device
   c1. Exit devices and exit device accessories shall conform to ANSI A156.3

   c2. Type and size.

   c2.1 Exit devices lock shall be provided with 7 pin interchangeable
       removable core cylinders with restricted non-commercial key
       way.

   c2.2 Removable core cylinder for all locks including special door
       locks shall be furnished by the hardware supplier.

c3. Design requirement/Design condition

   c3.1 All label "A" or "B" fire doors shall be furnished with UL.
       listed exit devices where specified on these schedules.

   c3.2 Exit devices specified on pairs of doors shall only be provided on the active
       door leaf unless otherwise noted.

   c3.3 All exit devices specified with (EM) on design drawing shall be equipped with
       YALE E7000 or VON DUPRIN SS signal switch rated at 0.5 Amp. 24V DC min.
       to interrupt power supply to electromagnetic door locks/holders as required by
c4. Exit devices shall be YALE 7000 or VON DUPRIN 99 Series or approved equal.

c5. Model numbers and functions shall be as follows.

<table>
<thead>
<tr>
<th>Function</th>
<th>Model Number</th>
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<tbody>
<tr>
<td>01</td>
<td>7030 or 9975 (990E0)</td>
</tr>
<tr>
<td></td>
<td>(Exit only no exterior trim)</td>
</tr>
<tr>
<td>08</td>
<td>7030L8 or 9975L</td>
</tr>
<tr>
<td>09</td>
<td>7030L8 or 9975L</td>
</tr>
<tr>
<td>13</td>
<td>7030L8 or 9975L</td>
</tr>
<tr>
<td></td>
<td>(Blank escutcheon with lever only)</td>
</tr>
</tbody>
</table>

d. Door Closers

d1. Door closers shall conform to ANSI A156.4

d2. Type and size

The hardware supplier shall determine the appropriate combination of closer types and sizes to assure proper door operation under all Positive differential pressures exceeding (+0.125 in. wg). All closer sizes shall be selected and installed by the hardware Supplier in strict accordance with closer manufacturer’s written instructions for interior and exterior door sizes.

d3. Design requirement/Design condition

d3.1 LCN "Super Smoothee 4040 Series", NORTON "7500 Series" or approved equal closers shall be used on doors when net negative (−) differential pressure is smaller than +0.125 as indicated on hardware schedule.

d3.2 LCN "Smoothee 4110 Series", NORTON "7700 Series" or approved equal closers shall be used on all doors when the net positive (+) differential pressure is greater than +0.125 as indicated on hardware schedule.
d.3.3 All interior door leafs where net positive pressure exceeds +0.125 shall be furnished with 2 closers per leaf, and mounted on pull side of door except exterior doors unless noted otherwise in door schedule. Brackets shall be furnished for all exterior doors and/or as required for other usages. Contractor shall adjust closers in field to proper settings after ventilation system is operational.

d3.4 Door closers for class I doors shall be through-bolted to doors with self locking stainless steel machine screws and grommet nuts or sex nuts.

d4. Door closer shall be LCN Super Smoothee 4040 Series and Smoothee 4110 Series, NORTON 7500 Series and 7700 or approved equal.

d5. Door closers shall be furnished USP (primed for painting) for painting in field to match door.

e. Astragals shall be furnished on the active leaf of all pairs of doors in accordance with detail 16 on DWG. 9–300–A115–001, in addition fire listed astragal seals shall be furnished on all pairs of doors that specify door seals in the hardware schedule in accordance with detail 17 on DWG. 9–300–A115–001. All astragal seals shall be NATIONAL GUARD PRODUCTS, INC. FS125DB or approved equal.

f. Self latching flush bolts
   f1. Self latching flush bolts shall be mounted on the inactive leaf of all labeled pairs of doors. Furnish self latching flush bolts as indicated in the hardware schedule as following (A). Furnish with required brackets and dust proof strikes.

   f2. Self latching fire rated/listed flush–bolts shall be H.B. IVES No.357 with dull chrome (B26D) finish or approved equal, and furnished with all necessary strikes & face plates.
HOLLOW METAL DOORS AND HARDWARES

g. Manual flush bolts

g1. Manual flush bolts shall conform to ANSI A156.16.

g2. Manual flush bolts shall be used on the inactive leaf of all non-labeled pairs or doors.
Furnish manual flush bolts as indicated on the hardware schedule as follow (M). Furnish with required brackets and dust proof strikes.

g3. Manual flush bolts shall be QUALITY HARDWARE Manf. CO.
Number 1358–UL with dull chrome (B26D) finish or approved equal, and furnished with all necessary strikes & face plates.

h. Electric power bolts as indicated in the hardware schedule shall be
FOLGER ADAM Co. number 401 fail safe dead bolt W/401–RM housing US26D furnish or approved equal.

i. All electromagnetic door locks furnished by Owner shall be UL. listed for use on fire rated doors and frames as a “fail safe” auxiliary lock and installed in strict accordance with manufacturer’s and UL written instructions.

j. All electrical power transfer devices shall be model NO. EPT–218 as manufactured by VON DUPRIN or approved equal. EPT shall be UL. listed for use on fire doors and frames and mortised in doors and frames to accommodate all required wiring to the electronic magnetic lock release switch located in the adjacent panic device. See detail 3 DWG.
9–300–A115–001 for EPT locations on door/frame assemblies.

k. Push and pull plates as indicated in the hardware schedule shall be model No.521 with US26D finish, as manufactured by BROOKLINE or approved equal.
l. Latch position switch as indicated in the hardware schedule shall be FOLGER ADAM Co. ASSW-104A keeper switch or approved equal. Furnished with 3'–0" for single doors and 12'–0" for pair doors long wire leads. All latch position switches located in pairs of doors shall be shop installed by door manufacturer including all required wiring to electric power transfer devices located in inactive leaf. All wiring shall be installed internal to door, fully concealed without cutting of main door reinforcement or negating fire label in any way. Door manufacturer shall provide temporary sheet metal closure as required for protection of latch protection of latch position switch.

m. Floor mounted door stops as indicated in hardware schedule shall be CORBIN number 384 1/2 with US26D finish or approved equal.

n. Wall mounted door stop as indicated in hardware schedule shall be CORBIN number 137H with US26D finish or approved equal.

o. Kick plates as indicated PL for pull side and PS for push side schedule shall be 14 gauge, 10" high x width of door minus 2" beveled stainless steel with US32D finish, as manufactured by BROOKLINE or approved equal.

p. Type 1 thresholds indicated in hardware schedule, for exterior doors shall be ferrogrit stop type, model No. 115-S 4" wide as manufactured by WOOSTER PRODUCTS Inc. or approved equal.

q. Type 2 thresholds indicated in hardware schedule, for interior doors shall be aluminum saddle type, model No. 8143S. 3" wide as manufactured by NATIONAL GUARD PRODUCTS, Inc. or approved equal.

r. Mortised automatic door bottom shall be as manf. by ZERO INTERNATIONAL Inc. model No. 360 or approved equal. Mortised automatic door bottom shall be furnished for all single leaf non-labeled doors as indicated in the hardware schedule.
s. Surface mounted automatic door bottom with fire rated/listed gasketing material shall be furnished for all labeled doors and all pairs of doors as indicated in the hardware schedule. Labeled automatic door bottoms shall be as manf. by NATIONAL GUARD PRODUCTS, Inc. model No. FS420DKB or approved equal.

t. Perimeter door seal with fire rated/listed gasketing material shall be furnished on all doors as indicated in the hardware schedule. Door seal shall be as manf. by NATIONAL GUARD PRODUCTS, Inc. model No. FS190DKB or approved equal.

u. Lock guard/astragal as indicated in hardware schedule shall be as manf. by as FOLGER ADAM Co. model No. 310-2–3 with US26D finish or approved equal.

v. Door holders as indicated in the hardware schedule shall be HD80M series with stop only feature, with US26D finish as manf. by GLYNN–JOHNSON Corp. or approved equal.

w. Coordinators as indicated in the hardware schedule shall be model No. 469 with B26D finish, as manf. by IVES or approved equal. For doors over 3'–4" wide use 469 1/2.

x. The door location description shown the hollow metal door schedules describes the key side of door.

y. Unless otherwise indicated, all locks shall be grand master keyed. All keying shall be directed by the Owner. 3 keys per lock shall be furnished, together with 5 master keys for each master key set. All keying shall be done by lock manufacturer.

y1. Furnish Y–4 Bow on all keys. Furnish minimum 300 extra blank keys considering YGN 5&6 key sections.

y2. All permanent keys shall be engraved with the door No. and others of Owner’s order.
z. All locks shall be keyed with a temporary construction master key as directed by owner. Fifteen construction master keys per each similar group shall be furnished to Owner.

aa. Pushbutton as indicated in the hardware schedule shall be model.
   No. 601 or 7001P with US 32D finish as manf. by LOCKNETICS or approved equal.

ab. Key cabinet
   Key cabinet control system shall conform to ANSI A156.5 Capacity shall be as required and cabinet shall be properly labeled for key identification. Except that one tag key system may be permitted for key capacity of 20 or less.

ac. Floor closer
   Floor closers shall be ANSI A156.15, GRADE 1 with dead stop for all exterior doors. Floor closer shall have cement boxes. Pivots used on doors with floor closers shall be of the same manufacturer as the floor closers. Floor plates are not required where thresholds cover the closer cement box, floor closers shall have dual speed adjusting values, back-check, optional delayed action and selective hold-open (except fire rated opening) setting tools shall be furnished for use in installing floor closers.

ad. Pad lock
   Pad lock shall conform to Fed. spec. FF-P-101 unless otherwise approved or specified.

ae. Dead lock
   Dead locks shall conform to ANSI A156.5, mortise type, cylinder operated unless otherwise approved or specified.

of. Bored lock and latch-set
   Bored lock and latch-sets shall conform to ANSI A156.2, GRADE 1. Strikes for bored lock and latches shall conform to ANSI A115.2. Bored-type locks and latches adjustable bevel fronts or otherwise conform to the shape of the door.

af. Bored lock and latchset
   Bored lock ad latchsets shall conform to ANSI A156.2, Grade 1. Strikes For bored lock and latches shall conform to ANSI A115.2. Bored-type Locks shall have adjustable bevel fronts or otherwise conform to the Shape of the door
3. Fasteners: All fasteners for attaching hardware to doors or door frames shall conform to the following requirements:
   a. Machine screws: Shall be as follows:
      □ For hardware on exterior doors: Type 430 stainless steel.
      □ For hardware on interior doors: Brass.
   b. Through-bolts and nuts: Shall be made of steel, cadmium plated, with positive locking action for nuts, to eliminate any tendency for through-bolts to loosen with repeated impact of door closers.

4. Galvanizing
   Unless otherwise indicated, all work indicated to be galvanized shall be hot-dip, in accordance with the ASTM A525-G90. Poorly galvanized work will be rejected.

5. Glazing
   a. Glazing shall conform to the applicable requirements of the glass manufacturers, and as indicated on the design drawings.
   b. Type and thickness: Safety glass minimum 1/4" thick for hollow metal doors

6. Setting blocks and spacer shims for door glazing shall be made of neoprene rubber and shall be provided only if recommended by the glass manufacturer.

7. Caulking and sealants shall be silicone sealant and conform to the requirements of Section D.17, Caulking & sealants. (Will be purchased and furnished by Section D.17, Caulking and Sealant Contractor)

B. FABRICATION
   Fabrication shall be in accordance with the Seller’s accepted design and as shown on Seller’s shop drawings. All materials and Work shall comply with applicable codes. All workmanship shall be of the highest quality consistent with the intentions of this specification. The Seller shall repair, replaces, or otherwise make good any defects in design, workmanship, and material appearing in the work after product is accepted by the Buyer. This shall include reimbursement to Buyer for any extra labor or transportation cost incurred in making any corrections and to which the Seller has agreed.
1. Frames
   a. Assembly: Pressed metal frames shall be fully shop assembled, with mitered and welded corners and all exposed welds ground smooth; and shall be properly braced for shipment. Frames shall be completely provided with door silencers, all details for hardware, all reinforcement, bottom anchors, and all other accessories.
   
   b. Bottom of door frames: Shall be flush with finish floor in all cases, except that where finish is resilient tile flooring, the bottom of frame shall be flush with the surfaces on which this finish is installed. Anchors at bottom of frames shall be adjustable type as indicated on the design drawings.
   
   c. Material: Shall be prime quality cold rolled carbon steel, with gauges for frames, trim and all accessories as indicated on the design drawings.

2. Door Stop Seals and Door Stops
   a. Provisions: Door stop seals and door stops shall be provided as indicated on the design drawings.
   
   b. Details: Head seals and head stops shall be continuous for the full width of frames, and jamb seals and stops shall butt tightly against the underside of the head seals and stops with no openings left where seals or stops butt.

3. The door panels for each opening shall be of similar construction, flush face of a soiled steel plate. Doors shall have a degree of flatness that will allow proper seating around the entire perimeter. Welding of components to doors shall be completed before machining the doors.

4. Transom panels shall be flush and of the same material and construction as that of the adjacent door

5. Moving parts shall operate freely and smoothly without binding, sticking, or excessive clearance.
6. Manufacturing Tolerance
   a. Flatness
      Measured at points between the face of the door and a straight edge laid from corner to corner, the surface cannot be more than $\pm 3/32"$ (Bolt diagonals to be checked on both faces).

   b. Squareness
      Measured diagonally from corner to corner across the face of a door, the two dimensions shall not be exceeded $+/-1/16"$.

7. The location of hardware on doors and frames shall be as indicated on design drawings.

C. COATING WORK
1. Exterior Doors
   a. Both sides of face sheets, all surfaces of internal stiffeners, reinforcing and all other steel accessories forming an integral part of the door shall be hot-dip galvanized in accordance with ASTM A 525–G90

   b. After fabrication of the door is completed, all exposed surfaces shall be properly cleaned and should receive the following wash primer (Dry film thk 0.3 ~ 0.5 mils) and epoxy primer (Dry film thk. 3–5 mils) coats or approved equal according to the manufacturer’s instructions.

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Wash Primer</th>
<th>Epoxy Primer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Caboline Korea Ltd.</td>
<td>N/A</td>
<td>CL 893 RCP</td>
</tr>
<tr>
<td>Han Jin Chemical Ind. Co.</td>
<td>N/A</td>
<td>BAR RUST 235</td>
</tr>
</tbody>
</table>

   c. The handling and storage of coating material, surface preparation, application of coating, inspection, testing and materials for touch up shall be in accordance with the requirements of Appendix 4G2.

2. Interior doors located within level II coating area.
   Both sides of face sheets, all surfaces of internal stiffeners, reinforcing and other corrosive steel accessories forming an integral part of the door shall be coated with epoxy primer (Dry film thk. 3–5 mils) in accordance with the requirements of Appendix 4G2.

3. Interior doors located within industrial coating area. (Not subject to radiation and decontamination)
HOLLOW METAL DOORS AND HARDWARES

a. Both sides of face sheets, all surfaces of internal stiffeners, reinforcing and other corrosive steel accessories forming an integral part of the door should be coated with one epoxy primer (Dry film thk. 3–5 mils) of following products or approved equal, in accordance with the requirements of coating manufacturer instruction.

<table>
<thead>
<tr>
<th>Manufacturer</th>
<th>Primer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carboline Korea Ltd.</td>
<td>CL 893 RCP</td>
</tr>
<tr>
<td>Han Jin Chemical Ind. Co</td>
<td>BAR RUST 235</td>
</tr>
</tbody>
</table>

b. Refer to paragraph T.05.C.1.C for handling and storage of coating material, surface preparation, application, inspection, testing and material for touch up.

T. 06  SHIPPING, HANDLING, STORAGE, PACKING AND MARKING

A. GENERAL

1. Doors and frames shall be engraved at hinge side to indicate size and door numbers as shown on the design drawings.

2. Each door shall be packaged individually in protective material with corner caps, and package shall be clearly marked with the door number.

3. Frames shall be packaged individually, including all parts of the frame. Frames of welded–unit construction shall have temporary spreaders fastened at the bottom of the frame in a manner that will not cause damage to the frame, and shall be easily removed prior to installation. Package shall be clearly marked with door number.

4. Each item of hardware shall be packaged with installation instructions in the manufacturer's original container, clearly marked to identify the content.

5. Hardware items shall be packaged in sets and each set shall be marked with the set number and the number of door opening in which it is to be installed.
B. STORAGE AND HANDLING

1. All doors, door frames, hardware and accessories shall be stored off the ground and shall be protected from weather and damage.

2. All doors and door frames shall be stored in a vertical position.

T. 07 INSPECTION AND TESTING

A. GENERAL

1. Seller shall conduct and be responsible for the tests called for in the Specification/applicable code and standards, and shall furnish all facilities necessary for the performance of such tests.

2. Seller shall submit records and reports for all tests required by this Specification. This record and reports shall be transmitted to the Buyer prior to shipment to the Project site.

B. INSPECTION AND TESTS

Seller shall furnish Test Reports which include the following tests.

1. Fire Test

2. Air Leakage Test
T. 05 MATERIAL, FABRICATION AND COATING (CONT.)

5. Sealant shall be silicone sealant and conform to the requirements of Section 17, Caulking and sealants. (Will be purchased and furnished by Section D.17, Caulking and Sealant Contractor)

6. Material and fabrication not specifically covered by this specification shall be manufacturer’s standard, suitable for the application. All material and fabrication will be subject to review by the Buyer

B. FABRICATION

1. Entrance doors, storefronts, stainless steel curtain wall and window frames shall be fabricated according to approved shop drawings.

2. Fabrication and assembly of the work shall be completed in the shop to the greatest extent possible to minimize field cutting, splicing, fastening, sealing and finishing. Disassemble only as necessary for shipment and erection. Provide secure attachment support at joints, with hairline fit between contacting members.

3. Cutting, fitting, forming, drilling and grinding of metal work shall be completed before cleaning and applying specified finish.

4. Comply with industry standards for welding assembly and fabrication. Grind exposed welds smooth and flush with parent metal using clean grinding wheels of a type which will not result in stains or discoloration.

5. Remove arises from cut edges and corners to a radius of approximately 0.3mm minimum, 0.7mm maximum.

T. 06 SHIPPING, HANDLING, STORAGE, PACKING AND MARKING
A. GENERAL

1. The items procured by this specification are to be shipped, handled, stored, packed and marked in accordance with applicable requirements specified in this specification and Part 2.2 of ASME NQA–2, Level C

B. STORAGE AND HANDLING

The Seller shall provide storage and handling requirements at the jobsite in accordance with ASME NQA–2, Part 2.2 Level C.

T. 07 INSPECTION AND TESTING

A. GENERAL

1. Seller shall conduct and be responsible for the tests called for in the Specification as well as the applicable codes and standards, and shall furnish all facilities necessary for the performance of such tests.

2. Seller shall submit records and reports for all tests and inspections required by this Specification. These records and reports shall be prepared promptly after each test or inspection and shall be transmitted to the Buyer prior to shipment of the equipment to the Project site.
D.5 HOLLOW METAL DOORS AND HARDWARES

D.5.1 REFERENCE CODES AND STANDARDS

All work shall be performed according to the following standards, codes as applicable.

<table>
<thead>
<tr>
<th>Code/Std.</th>
<th>Subject</th>
</tr>
</thead>
<tbody>
<tr>
<td>UL 10B</td>
<td>Fire Tests of Door Assemblies</td>
</tr>
<tr>
<td>UL 63</td>
<td>Fire Door Frames</td>
</tr>
<tr>
<td>NFPA 80</td>
<td>Standard for Fire Door and Window</td>
</tr>
<tr>
<td>KS F2268</td>
<td>Method of Fireprotecting Test of Fire Door of Building</td>
</tr>
</tbody>
</table>

D.5.2 QUALITY CLASS REQUIREMENTS

All work performed under this section, quality class shall be industrial standards.

D.5.3 MATERIALS SUPPLIED BY OWNER

N/A

D.5.4 MATERIALS FURNISHED BY CONTRACTOR

A. The Contractor shall furnish all labor, material, equipment, and supervision for installing the hollow metal door according to this Contract and design drawings.

1. Non-fire rated hollow metal doors, frames and transom panels as indicated on design drawings.

2. Door stops and seals.

3. Louvered doors

4. Vision light doors

5. Automatic door bottoms

6. Astragals/seals
D.5.4 MATERIALS FURNISHED BY CONTRACTOR (CONT.)

7. Door hardware with necessary template for cut-outs.

8. Door thresholds

9. Cylinders/keys for other special doors

10. Trim angle and fasteners for door frames

11. Fire rated hollow metal doors, frames and transom panels as indicated on design drawing.

12. Temporary wood pass doors, frames and hardware.

13. Glazing for hollow metal door

14. Hollow metal door with hardware (For Sanitary Treatment Facility)

B. Whether specified or not, the Contractor shall furnish and install all other miscellaneous hardware, material, and equipment required to properly install and test the Contractor furnished material.

D.5.5 CONTRACTOR FURNISHED MATERIAL SPECIFICATION

Refer to D.5 Attachment 1.

D.5.6 SERVICE CONDITIONS/DESIGN REQUIREMENTS

A. DOOR ALIGNMENT

1. Contractor shall be fully responsible for verifying that all door frames for the WORK, whether provided Contractor or by others, are fully aligned, and are maintained fully aligned, at all times until completion of the WORK. The term “fully aligned” shall mean that frames are square and true to specified vertical and horizontal dimensions and tolerances, and are plumb, unwarped, and in true alignment to provide proper clearance and fit for the permanent doors that the frames are to receive.
2. For steel channel door frames provided by others, Contractor shall be responsible for verifying that frames are fully aligned before siding or masonry is installed. If for any reason, frames are not fully aligned, Contractor shall immediately report such misaligned work to Owner so that proper remedial action can be taken, before siding or masonry is installed around these frames.

B. DOOR DIMENSIONS

Where door frames furnished by others are already in place and fixed by the surrounding construction, Contractor shall be responsible for verifying that Door Manufacturer performs a field check of all such frames before doors are detailed or fabricated, to assure proper fit of doors. Door Manufacturer’s shop drawings shall clearly indicate that this field check has been made for these doors.

C. TEMPORARY WOOD PASS DOORS AND DOOR FRAMES

1. To avoid any damage to permanent doors, temporary wood pass doors will be used for the first stage of construction period where heavy damage expected. Construction of all temporary wood pass doors and wood frames shall be subject to review of Owner and the entire price for temporary wood pass door shall be included in the contract price.

2. Where removable permanent cores are indicated, construction cores shall be provided for use during the hydro test period and until the WORK is turned over to Owner. These construction cores with be returned to the contractor by owner after the permanent cores are installed.

D. HOLLOW METAL FIRE DOORS

Hollow metal fire doors shall conform to applicable requirements of NFPA 80 and UL 10B, UL 63 or KS F2268 for fire door frame and assemblies. Each fire door and frame shall bear the metal tag label reflecting the testing agency’s rating, temperature, serial no. etc. as indicated on design drawings.
5.7 FABRICATION
Refer to D.5 Attachment 1.

5.8 RECEIVING, HANDLING AND STORAGE

A. RECEIVING
Contractor shall receive contractor furnished material without passing through the owner’s storage facilities. The material shall go directly to the installation point or to a storage area controlled by the contractor.

B. HANDLING AND STORAGE

1. All doors, door frames, hardware and accessories shall be stored off the ground and shall be protected from weather and damage.
2. All doors and door frames shall be stored in a vertical position.
3. Contractor shall be fully responsible for the storage and protection of all doors, door frames, and hardware in the manner recommended by the supplier and/or manufacturer.
4. After doors and hardware are installed, contractor shall be fully responsible for protecting these items from being damaged, during the balance of the construction period, or until accepted by owner.

5.9 FIELD OPERATIONS

A. GENERAL

1. Doors, door frames and accessories, shall be installed in strict accordance with Door Manufacturer’s instructions, and this specification.

2. It is critical importance in damage prevention that all finish doors and hardware shall not be installed until after completion of all other major work, and then only when requested by Owner. The term of major work shall be construed to mean all major work by other contractors on the project as well as all major work by Contractor.

B. INSTALLATION REQUIREMENTS

1. Door frames: Metal door frames shall be installed in fully aligned position as indicated in Paragraph D.5.6.A. (Pressed metal frames in concrete masonry unit shall be continuously filled with mortar.)
2. Metal doors: For installation, doors shall be hung in opening plumb and square, and then securely fastened. Also, these doors and hardware shall be fitted and adjusted for free, easy and satisfactory operation, and maintained in this condition until completion of the WORK.

3. Fire doors: The installation of all hollow metal fire doors, frames and hardware shall be in strict accordance with NFPA 80 Chapter 2. "Installation of Swing Doors with Builders. Hardware and all applicable fire testing, configuration and requirements."

4. Door stops: Door stops shall be installed on frames to provide stops fully continuous around top corners, with no openings left where adjacent stops meet. The full surfaces of stops shall be in continuous contact with the faces of doors.

5. Door stop seals: Door stop seals shall be installed on doors and door frames to provide a seal fully continuous around top corners, with no openings left where adjacent seals meet, and with seals on bottom of doors adjusted so that no openings are left between ends of door seals and seals on frames. Also, the full surfaces of the seals on frames shall be in continuous contact with the faces of doors; and the full surfaces of seals on doors shall be in continuous contact with thresholds when doors are in a closed position.

6. Hardware: Door closers, latch position switches, seals and all other hardware as required shall be installed, adjusted and regulated in accordance with the manufacturer’s written instruction after the entire WORK is completed and ready for commercial operation or as otherwise directed by the Owner.

7. Glazing:
   a. Contractor shall be responsible for installing proper size glazing units.
   b. Nipping to remove flares or to reduce oversized dimensions of any type safety glass will not be permitted.
   c. Each door shall remain in the closed position during glazing work.
   d. Proper clearances with setting blocks and spacer shims, if used, shall be maintained.
   e. All glazing units, shall be cleaned of paper labels, dirt, smears, paint, etc., and washed clean, inside and outside, just prior to completion of the WORK.
8. Thresholds : Thresholds shall be set in a full bed of mastic, and fastened in strict accordance with manufacturer’s instructions. Thresholds shall be grouted with mortar as required level With the bottom of doors after doors have been hung and adjusted regardless of floor level, to provide for proper appearance and/or seal.

9. Cleaning and coating :
   a. Contractor shall protect and maintain the prime coated surfaces of the door and frame during installation process.
   b. When damage occurs to the prime coated surfaces for any reason, Contractor shall clean the damaged surfaces and make a timely application of the coating material delivered with doors to preserve the surfaces from rust and corrosion.
   c. Touch up and finish coating will be done by others according to the requirements of the CP_A3 when Contractor has completed the installation of door and frame. Finish coating material shall be the same manufacturer as the primer.

10. Caulking (Will be installed by Section D.17, Caulking and Sealant Contractor):
   a. Exterior door frames shall be continuously caulked to provide weathertight seal at all joints between these frames and masonry wall, concrete wall, and shall be continuously caulked to provide weather tight seal at all joints between these channel frames and door stops.
   b. Interior door frames shall be continuously caulked to provide neat finish appearance to all joints between these frames and masonry wall, concrete wall.

11. All doors and hardware shall be installed and adjusted to operate smoothly and freely without binding, sticking or excessive clearance.

C. TEMPORARY WOOD PASS DOORS

1. Fabrication
a. Temporary wood pass doors, and any temporary fixed panels, shall be made of 1/2" thick exterior grade plywood, suitably reinforced for the service.

b. Temporary wood frames shall, as a minimum, be nominal 2" x 4" lumber, wedged inside the permanent steel frames.

c. Temporary hinges shall be heavy T-hinges, with not less than 1-1/2 pairs for each door. Locking mechanism shall consist of a pivot arm or other suitable locking device. Attachment of temporary hardware to the permanent steel frames will not be permitted.

2. Installation of temporary wood pass doors, door frames and accessories.

a. Temporary pass doors shall be installed where indicated by Owner.

b. Time of installation: Temporary wood pass doors, frames and accessories shall be installed as each structure is enclosed, and shall be kept in place until near completion of all other major work.

c. Maintenance: Contractor shall maintain all temporary wood pass doors, wood frames and accessories in suitable condition, completely satisfactory to Owner, during the entire course of the WORK. This maintenance shall also include all repairs required to maintain the temporary wood doors and wood frames intact.

d. Removal: Contractor shall remove all temporary doors and door frames when required to install permanent doors, or when requested by the Owner.

D. 5. 10 INSPECTION AND TESTING

A. GENERAL

The entire hollow metal door, frame and hardware work shall be subject to inspection by the Owner’s inspector at any and all times during the course of the work and may be checked by cutting a door at random in the field at the contractors expense, when requested by the Owner. Any defective or improper work shall be repaired, or otherwise made good to the satisfaction of the Owner at the Contractor’s expense.
D. 5.11 SUBMITTALS/QUALITY VERIFICATION REPORTS AND RECORDS

A. DRAWINGS, DATA AND PROCEDURE

1. Contractor shall submit shop drawings showing construction, reinforcing, and anchorage details. Shop drawings shall bear titles corresponding to those of the design drawings and shall identify each door and frame by door number as indicated on the door schedule.

2. Contractor shall submit schedules of finish hardware listing and showing the manufacturer, catalog number, design or pattern, and finish for each item of hardware for each door.

3. Contractor shall submit hardware samples for the functions, finishes, and designs or patterns of proposed items to Owner for approval.

4. A work plan procedure and quality control instruction for hollow metal doors shall be submitted to Owner for approval.

B. QUALITY VERIFICATION REPORTS AND RECORDS

1. Inspection and door operation test reports shall be submitted to Owner in which all characteristics required by the specifications appear on a checklist. All inspection and test shall be performed in accordance with the approved Quality Control Instructions and the results recorded.

2. Certificate of Conformance stating that all work performed under this section meets the requirements of this Contract.

D. 5.12 MEASUREMENT AND PAYMENT

Measurement for payment of hollow metal doors, frames and hardware will be the number of doors, frames and hardware installed according to this Contract.