

## **ADDENDUM #1- Missing Specifications**

### **Notice to All Bidders**

**Invitation to Bid #1847-24**

**East Hartford School District  
Exterior Door & Window Replacement and HVAC Upgrades at Goodwin  
Elementary School**

***Purpose: Important specifications for the above project were found to be omitted from the original bid publication for Goodwin Elementary School posted on December 18<sup>th</sup>. The following additional specifications are included in this addendum:***

- ***Section 087100 – Door Hardware - 21 Pages***
- ***Section 088853 – Security Glazing – 9 Pages (note that security glass is required only the entrance doors)***

***Important Reminder:*** This bid has a Mandatory Pre-Bid Meeting scheduled for December 28, 2023 at 10:00 a.m. beginning at Goodwin Elementary School, 1235 Forbes Street, East Hartford

*Questions about this project are due by January 4<sup>th</sup>, 2024 and answers will be posted on January 9<sup>th</sup> 2024*

*This Addendum must be acknowledged and included in bidders submission packet by completing the acknowledgement page located on the last page of this addendum.*

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## SECTION 087100 - DOOR HARDWARE

## PART 1 - GENERAL

## 1.1 RELATED DOCUMENTS

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

## 1.2 SECTION INCLUDES

- A. Furnish and deliver all finish hardware necessary for all doors, also hardware as specified herein and as enumerated in hardware sets and as indicated and required by actual conditions at the building. The hardware shall include the furnishing of all necessary screws, bolts, expansion shields, drop plates, and all other devices necessary for the proper application of the hardware.
- B. Related Sections: Examine Contract Documents for requirements that affect work of this Section. Other Specification Sections that directly relate to work of this Section include, but are not limited to:
  - 1. Division 1 Section "Construction and Demolition Waste Management."
  - 2. Division 8 Section "FRP Doors."
  - 3. Division 8 Section "Aluminum-Framed Entrances and Storefronts."
  - 4. Division 8 Section "Glazing."
  - 5. Specific Omissions: Hardware for the following is specified or indicated elsewhere, unless specifically listed in the hardware sets:
    - a. Windows.

## 1.3 HIGH PERFORMANCE BUILDINGS GENERAL REQUIREMENTS

- A. Implement practices and procedures to meet the project's environmental goals, which include complying with Connecticut Standard Guidelines Compliance Manual for High Performance Buildings, September 2011, with additional mandatory building project requirements for schools. Specific project goals which may impact this and the other sections of this specification include: use of recycled-content materials; use of locally-manufactured materials; use of low-emitting materials; use of certified wood products; construction waste recycling; and the implementation of a construction indoor air quality management plan. Ensure that the requirements related to these goals, as defined in this Section and other Sections of the contract documents, are implemented to the fullest extent. Substitutions or other changes to the work shall not be allowed if such changes substantially compromise the stated High Performance Building criteria.
- B. Comply with Connecticut Standard Guidelines Compliance Manual for High Performance Buildings, September 2011, with additional mandatory building project requirements for

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schools and the Department of Administrative Services / Office of School Construction Grants & Review High Performance School Construction Bulletin, June 2017.

#### 1.4 REFERENCES

- A. International Code Congress (ICC)/American National Standards Institute (ANSI):
  - 1. ICC/ANSI A117.1, Accessible and Usable Buildings and Facilities.
  - 2. ANSI/BHMA A156.1 – A156.24 – Standards for Hardware and Specialties.
- B. National Fire Protection Association (NFPA):
  - 1. NFPA 80 - Standard for Fire Doors and Fire Windows
  - 2. NFPA 101 - Life Safety Code
  - 3. NFPA 105 - Smoke and Draft Control Door Assemblies
- C. Underwriters Laboratories, Inc. (UL):
  - 1. UL 10C - Positive Pressure Test of Fire Door Assemblies
  - 2. UL 1784 - Air Leakage Tests of Door Assemblies
  - 3. UL 305 - Panic Hardware
- D. Applicable state and local building codes.
- E. Accessibility
  - 1. ADA - Americans with Disabilities Act
  - 2. Massachusetts Architectural Access Board Regulation – 521 CMR
- F. Door and Hardware Institute (DHI):
  - 1. Sequence and Format for the Hardware Schedule.
  - 2. Recommended Locations for Builders Hardware

#### 1.5 SUBMITTALS

- A. Product Data: Include manufacturers' technical product data for each item of door hardware, installation instructions, maintenance of operating parts and finish, and other information necessary to show compliance with requirements.
- B. Final Hardware Schedule Content: Based on hardware indicated, organize schedule into "hardware sets" indicating complete designations of every item required for each door or opening. Include the following information:
  - 1. Type, style, function, size, and finish of each hardware item.
  - 2. Name and manufacturer of each item.
  - 3. Fastenings and other pertinent information.
  - 4. Location of each hardware set cross-referenced to indications on Drawings.
  - 5. Explanation of all abbreviations, symbols, and codes contained in schedule.
  - 6. Mounting locations for hardware.
  - 7. Mounting type for closers.
  - 8. Door and frame sizes, materials, degree of opening, handing, and fire/smoke rating.
  - 9. Name and phone number for the local manufacturer's representative for each product.

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EXTERIOR DOOR & WINDOW REPLACEMENTS  
AND HVAC UPGRADES**

- C. Key Schedule: After a keying meeting between representatives of the Owner, Architect, and the hardware supplier, provide a keying schedule, listing the levels of keying, as well as an explanation of the key system's function, the key symbols used, and the door numbers controlled. This schedule can be submitted as a part of the hardware schedule or as a separate schedule.
- D. Samples: If requested by the Architect, submit samples of each type of exposed hardware unit in finish indicated and tagged with full description for coordination with schedule.
1. Samples will be returned to the supplier in like-new condition. Units that are acceptable may, after final check of operations, be incorporated in the Work, within limitations of key coordination requirements.
- E. Templates: After final approval of the hardware schedule, provide templates for doors, frames, and other work specified to be factory prepared for the installation of door hardware.
- F. Wiring Diagrams: After final approval of the hardware schedule, submit wiring diagrams as required for the proper installation of all electrical, electro-mechanical, and/or electro-magnetic products.
- G. Operations and Maintenance Data: Provide in accordance with Section 01 78 23 and include the following:
1. Complete information on care, maintenance, and adjustment; data on repair and replacement parts, and information on preservation of finishes.
  2. Catalog pages for each product.
  3. Name, address, and phone number of local representative for each manufacturer.
  4. Parts list for each product.
  5. Copy of final approved hardware schedule, edited to reflect "As installed."
  6. Copy of final keying schedule.
  7. As installed "Wiring Diagrams" for each opening connected to power, both low voltage and 110 volts.
  8. One (1) complete set of special tools required for maintenance and adjustment of hardware, including changing of cylinders.
  9. Copy of warranties including appropriate reference numbers for manufacturers to identify the project.
- H. High Performance Building Submittal Requirements: The contractor or subcontractor shall submit the following High Performance Building certification items:
1. A Connecticut High Performance Building Compliance letter shall be provided verifying agreement with relevant High Performance requirements. Information to be supplied includes, but is not limited to:
    - a. The percentage by weight of recycled content in the product(s). Identify post-consumer and/or pre-consumer recycled content.
    - b. The manufacturing location for the product(s); and the location (source) of the raw materials used to manufacture the product(s).

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EXTERIOR DOOR & WINDOW REPLACEMENTS  
AND HVAC UPGRADES**

- c. Provide material costs for the materials included in the contractor's or subcontractor's work. Material cost does not include costs associated with labor and equipment.
2. Letters of Certification, provided from the product manufacturer on the manufacturer's letterhead, to verify the amount of recycled content.
3. Product Cut Sheets for all materials of this Section that meet High Performance Building Requirements.
4. Material Safety Data Sheets (MSDS), for all applicable products. Applicable products include, but are not limited to adhesives, sealants, carpets, paints and coatings applied on the interior of the building. MSDS shall indicate the Volatile Organic Compound (VOC) limits of products submitted (If an MSDS does not include a product's VOC content, then product data sheets, manufacturer literature, or a letter of certification from the manufacturer can be submitted in addition to the MSDS to indicate the VOC content).

#### 1.6 QUALITY ASSURANCE

- A. Substitutions: Submit substitutions in accordance with Division 01.
- B. Supplier Qualifications: A recognized architectural hardware supplier, with warehousing facilities in the Project's vicinity, that has a record of successful in-service performance for supplying door hardware similar in quantity, type, and quality to that indicated for this Project and that employs an accredited Architectural Hardware Consultant (AHC), who is available to Owner, Architect, and Contractor, at reasonable times during the course of the Work for consultation.
- C. Product Single Source Responsibility: Obtain each type of hardware (latch and locksets, hinges, closers, etc.) from a single manufacturer.
- D. Supplier Single Source Responsibility: Procure hardware for all doors from a single supplier.
- E. Fire-Rated Openings: Provide door hardware for fire-rated openings that complies with NFPA 80 and requirements of authorities having jurisdiction. Provide only items of door hardware that are listed and are identical to products tested by Underwriters Laboratories, Warnock Hersey, Factory Mutual, or other testing and inspecting organization acceptable to the authorities having jurisdiction for use on types and sizes of doors indicated in compliance with requirements of fire-rated door and door frame labels.
- F. Electronic Security Hardware: When electrified hardware is included in the hardware specification, the hardware supplier must employ an individual knowledgeable in electrified components and systems, who is capable of producing wiring diagrams and consulting as needed. Coordinate installation of the electronic security hardware with the Architect and electrical engineers and provide installation and technical data to the Architect and other related sub-contractor. Upon completion of electronic security hardware installation, verify that all components are working properly, and state in the required guarantee that this inspection has been performed.

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EXTERIOR DOOR & WINDOW REPLACEMENTS  
AND HVAC UPGRADES**

- G. High Performance Building Requirements:
1. Adhesives, sealants, paints or coatings used for work in this section for interior applications shall meet the requirements of Division 1 Section "Volatile Organic Compound (VOC) Limits for Adhesives, Sealants, Paints and Coatings", where applicable.
  2. Materials manufactured within a radius of 500 miles from the project site where all or a portion of the raw resources also originate within a radius of 500 miles shall be documented in accordance with the High Performance Building Requirements of this Section.
  3. Materials that contain recycled content shall be documented in accordance with the High Performance Building Requirements of this Section.

1.7 DELIVERY, STORAGE AND HANDLING

- A. Tag each item or package separately with identification related to final hardware schedule, and include basic installation instructions with each item or package.
- B. Each article of hardware shall be individually packaged in manufacturer's original packaging.
- C. Contractor will provide secure lock-up for door hardware delivered to the Project, but not yet installed. Control handling and installation of hardware items so that completion of the Work will not be delayed by hardware losses both before and after installation.
- D. Items damaged in shipment shall be replaced promptly and with proper material and paid for by whomever did the damage or caused the damage to occur.
- E. All the hardware shall be handled at this project in a manner to avoid damage, marring or scratching. Any irregularities that occur to the hardware after it has been delivered to the project shall be corrected, replaced or repaired by the Contractor at their expense. All hardware items shall be protected against malfunction due to paint, solvent, cleanser or any chemical agent.
- F. No direct shipments will be allowed unless approved by the Contractor.

1.8 WARRANTY

- A. Starting date for warranty periods to be date of manufacture of that hardware item.
- B. No liability is to be assumed where damage or faulty operation is due to improper installation, improper usage or abuse.
- C. Provide guarantee from hardware supplier as follows:
  1. Hinges: Life of the building.
  2. Closers – All openings, except STC Assemblies: Life of the building.
  3. Closers – STC Assemblies: Twenty-Five (25) years.
  4. Locksets: Life of the building; except electrified locksets, five (5) years.
  5. Exit Devices: Five (5) years; except electrified devices, one (1) year.

**EAST HARTFORD PUBLIC SCHOOLS  
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EXTERIOR DOOR & WINDOW REPLACEMENTS  
AND HVAC UPGRADES**

6. All other Hardware: One (1) year.

- D. Products judged to be defective during the warranty period shall be replaced or repaired in accordance with the manufacturer's warranty, at no additional cost to the Owner.

## 1.9 MAINTENANCE

- A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

## PART 2 - PRODUCTS

### 2.1 MANUFACTURERS

- A. Approval of manufacturers other than those listed shall be in accordance with Paragraph 1.6A.
- B. Note that even though an acceptable substitute manufacturer may be listed, the product must provide all the functions and features of the specified product or it will not be approved.
- C. Hand of Door: Drawings show direction of slide, swing, or hand of each door leaf. Furnish each item of hardware for proper installation and operation of door movement as shown.
- D. Where the exact types of hardware specified are not adaptable to the finished shape or size of the members requiring hardware, furnish suitable types having as nearly as possible the same operation and quality as the type specified, subject to Architect's approval.

### 2.2 MATERIALS

- A. Fasteners:
1. Provide hardware manufactured to conform to published templates, generally prepared for machine screw installation.
  2. Furnish screws for installation with each hardware item. Finish exposed (exposed under any condition) screws to match hardware finish or, if exposed in surfaces of other work, to match finish of this other work as closely as possible including "prepared for paint" surfaces to receive painted finish.
  3. Provide concealed fasteners for hardware units that are exposed when door is closed except to the extent that no standard units of type specified are available with concealed fasteners. Do not use thru-bolts for installation where bolt head or nut on opposite face is exposed in other work unless their use is the only means of reinforcing the work adequately to fasten the hardware securely.
  4. All hardware shall be installed with the fasteners provided by the hardware manufacturer.

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EXTERIOR DOOR & WINDOW REPLACEMENTS  
AND HVAC UPGRADES**

**2.3 HINGES**

- A. Provide five-knuckle, concealed bearing hinges of type, material, and height as outlined in the following guide for this specification:
- B. 1-3/4 inch thick doors, up to and including 36 inches wide:
  - 1. Exterior: standard weight, stainless steel, 4-1/2 inches high
  - 2. Interior: standard weight, steel, 4-1/2 inches high
- C. 1-3/4 inch thick doors over 36 inches wide:
  - 1. Exterior: heavy weight, stainless steel, 5 inches high
  - 2. Interior: heavy weight, steel, 5 inches high
- D. 2 inches or thicker doors:
  - 1. Exterior: heavy weight, stainless steel, 5 inches high
  - 2. Interior: heavy weight, steel, 5 inches high
- E. Provide three hinges per door leaf for doors 90 inches or less in height, and one additional hinge for each 30 inches of additional door height.
- F. Hinge Pins: Except as otherwise indicated, provide hinge pins as follows:
  - 1. Steel Hinges: Steel pins
  - 2. Non-Ferrous Hinges: Stainless steel pins
  - 3. Out-Swinging Exterior Doors: Non-removable pins
  - 4. Out-Swinging Interior Lockable Doors: Non-removable pins
  - 5. Interior Non-lockable Doors: Non-rising pins
- G. The width of hinges shall be 4-1/2 inches at 1-3/4 inch thick doors, and 5 inches at 2 inches or thicker doors. Adjust hinge width as required for door, frame, and/or wall conditions to allow proper degree of opening.
- H. Provide hinges with electrified option where specified. Provide with sufficient number and gage of concealed wires to accommodate electric function of specified hardware. Locate electric hinge at second hinge from bottom or nearest to the electrified locking component.
- I. Provide mortar guard for each electrified hinge specified, unless specified in hollow metal frame specification.
- J. Acceptable manufacturers and/or products: Stanley CB series, Hager AB series, and McKinney TCA/T4CA series.

**2.4 CONTINUOUS HINGES - GEARED**

- A. Provide aluminum geared continuous hinges conforming to ANSI A156.25, Grade 1.
- B. Provide aluminum geared continuous hinges, where specified in the hardware sets, fabricated from 6063-T5 aluminum.



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JOSEPH O. GOODWIN ELEMENTARY SCHOOL  
EXTERIOR DOOR & WINDOW REPLACEMENTS  
AND HVAC UPGRADES**

- C. Provide split nylon bearings at each hinge knuckle for quiet, smooth, self-lubricating operation. Provide hinge with no less than 32 bearings.
- D. Hinges shall be capable of supporting door weights up to 600 pounds, and shall be successfully tested for 1,500,000 cycles.
- E. On fire-rated doors, provide aluminum geared continuous hinges that are classified for use on rated doors by a testing agency acceptable to the authority having jurisdiction.
- F. Provide aluminum geared continuous hinges with electrified option where specified. Provide with sufficient number and gage of concealed wires to accommodate electric function of specified hardware.
- G. Install hinges with fasteners supplied by manufacturer.
- H. Acceptable manufacturers and products: Stanley, 661HD series, and Select SL11HD series.

#### 2.5 ELECTRIC POWER TRANSFER

- A. Provide power transfer sufficient for number and gage of wires to accommodate electric function of specified hardware.
- B. Electric power transfer is to be located per manufacturer's template and UL requirements, unless interference with operation of door or other hardware items.
- C. Acceptable manufacturers and/or products: Precision, Adams Rite, Von Duprin.

#### 2.6 FLUSH BOLTS

- A. Provide automatic and manual flush bolts with forged bronze face plates, extruded brass levers, and with wrought brass guides and strikes. Provide 12 inch steel or brass rods at doors up to 90 inches in height. Top rods at manual flush bolts for doors over 90 inches in height shall be increased by 6 inches for each additional 6 inches of door height. Provide dust-proof strikes at each bottom flush bolt.
- B. Acceptable manufacturers and/or products: Trimco, Burns, Don-Jo Mfg.

#### 2.7 COORDINATORS

- A. Provide a bar-type coordinating device, surface applied to the underside of the stop at the frame head where pairs of doors are equipped with automatic flush bolts, an astragal, or other hardware that requires synchronized closing of the doors.
- B. Provide a filler bar of the correct length for the unit to span the entire width of the opening, and appropriate brackets for parallel arm door closers and surface vertical rod exit device strikes. Factory-prep coordinators for vertical rod devices if required.

**EAST HARTFORD PUBLIC SCHOOLS  
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EXTERIOR DOOR & WINDOW REPLACEMENTS  
AND HVAC UPGRADES**

- C. Acceptable manufacturers and/or products: Trimco, Burns, Don-Jo Mfg.

2.8 MORTISE LOCKS

- A. Provide mortise locks that comply with ANSI A156.13, Series 1000, BHMA Grade 1 Operational and Grade 2 Security and are ULC listed, and appear in BHMA's "Directory of Certified Locks & Latches".
- B. Locks shall have stamped steel case with steel or brass parts, and levers constructed of forged or cast brass, bronze or stainless steel construction.
- C. Lever design shall be Best 15R.
- D. Provide function numbers and descriptions indicated at the end of this Section.
- E. Lock throw shall comply with testing requirements for length of bolts to comply with labeled fire door requirements, and as follows:
1. Mortise Locks: Minimum 3/4-inch latch bolt throw.
  2. Mortise Locks & Latches shall have an anti-friction, 3/4-inch throw latch bolt with anti-friction piece made of self-lubricated stainless steel. Latch bolt with plastic insert and three-piece latch bolt are unacceptable on this project.
  3. Mortise Locks & Latches shall have levers to be operated with a roller bearing spindle hub mechanism.
- F. Acceptable manufacturers and/or products: Best 45H series, Schlage L9000 series, and Sargent 8200 series.

2.9 EXIT DEVICES

- A. Provide exit devices tested to ANSI/BHMA A156.3 Grade 1, and UL listed for Panic Exit and/or Fire Exit Hardware.
- B. Provide touchpad type exit devices, fabricated of stainless steel, plated to the standard architectural finishes to match the balance of the door hardware.
- C. Touchpad shall extend a minimum of one half of the door width, but not the full length of the exit device rail.
- D. Devices to incorporate a deadlatching feature.
- E. Provide manufacturer's standard strikes.
- F. Provide exit devices cut to door width and height. Locate exit devices at a height recommended by the exit device manufacturer, allowable by governing building codes, and approved by the Architect.

**EAST HARTFORD PUBLIC SCHOOLS  
JOSEPH O. GOODWIN ELEMENTARY SCHOOL  
EXTERIOR DOOR & WINDOW REPLACEMENTS  
AND HVAC UPGRADES**

- G. Where lever handles are specified as outside trim for exit devices, provide heavy-duty lever trims with forged or cast escutcheon plates.
  - 1. Lever style will match the lever style of the locksets.
- H. Exit devices for fire rated openings shall be UL labeled fire exit hardware.
- I. Provide electrical options as scheduled.
- J. Acceptable manufacturers and/or products: Precision Apex series, Von Duprin 98 series, and Sargent 80 series.

#### 2.10 POWER SUPPLIES

- A. Provide power supplies, recommended and approved by the manufacturer of the electrified locking component, for the operation of electrified locks, electrified exit devices, magnetic locks, electric strikes, and other components requiring a power supply.
- B. Provide the appropriate quantity of power supplies necessary for the proper operation of the electrified locking component and/or components as recommended by the manufacturer of the electrified locking components with consideration for each electrified component utilizing the power supply, the location of the power supply, and the approved wiring diagrams. Locate the power supplies as directed by the Architect.
- C. Provide a power supply that is regulated and filtered 24 VDC, or as required, and UL class 2 listed.
- D. Provide a power supply, where specified, with the internal capability of charging optional sealed backup batteries 24 VDC, or as required, in addition to operating the DC load.
- E. Provide a power supply complete requiring only 120VAC to the fused input and shall be supplied in an enclosure.
- F. Provide a power supply with emergency release terminals, where required, that allow the release of all devices upon activation of the fire alarm system complete with fire alarm input for initiating “no delay” exiting mode.
- G. Acceptable manufacturers and/or products: Precision ELR series, Dorma PS series, Dynalock 5000 series, Security Door Controls 600 series.

#### 2.11 DOOR CLOSERS – HEAVY DUTY

- A. Provide door closers certified to ANSI/BHMA A156.4 Grade 1 requirements by a BHMA certified independent testing laboratory. Door closers shall have fully hydraulic, full rack and pinion action with a high strength cast iron cylinder. Cylinder body shall be 1-1/2 inch diameter.

**EAST HARTFORD PUBLIC SCHOOLS  
JOSEPH O. GOODWIN ELEMENTARY SCHOOL  
EXTERIOR DOOR & WINDOW REPLACEMENTS  
AND HVAC UPGRADES**

- B. Provide hydraulic fluid requiring no seasonal closer adjustment. Fluid shall be fireproof and shall pass the requirements of the UL10C “positive pressure” fire test.
- C. Spring power shall be continuously adjustable over the full range of closer sizes, and allow for reduced opening force as required by accessibility codes and standards. Closers shall have separate adjustment for latch speed, general speed, and backcheck.
- D. Provide closers with heavy-duty forged forearms for parallel arm closers.
- E. Closers shall not incorporate Pressure Relief Valve (PRV) technology.
- F. Provide special templates, drop plates, mounting brackets, or adapters for arms as required for details, overhead stops, and other finish hardware items interfering with closer mounting.
- G. Mount closers on room side of corridor doors, inside of exterior doors, and stair side of stairway doors from corridors. Closers shall not be visible in corridors, lobbies and other public spaces unless approved by Architect.
- H. Door closers meeting this specification: Stanley Commercial Hardware QDC100 series, LCN 4040XP Series, and Sargent 280 series.

2.12 DOOR CLOSERS – STC ASSEMBLIES

- A. Provide door closers certified to ANSI/BHMA A156.4 Grade 1 requirements by a BHMA certified independent testing laboratory. Door closers shall have fully hydraulic, full rack and pinion action with an aluminum cylinder.
- B. Provide hydraulic fluid requiring no seasonal closer adjustment. Fluid shall be fireproof and shall pass the requirements of the UL10C “positive pressure” fire test.
- C. Spring power shall be continuously adjustable over the full range of closer sizes, and allow for reduced opening force as required by accessibility codes and standards. Closers shall have separate adjustment for latch speed, general speed, and backcheck.
- D. Provide closers with heavy-duty forged forearms for parallel arm closers.
- E. Closers shall not incorporate Pressure Relief Valve (PRV) technology.
- F. Provide special templates, drop plates, mounting brackets, or adapters for arms as required for details, overhead stops, and other finish hardware items interfering with closer mounting.
- G. Mount closers on room side of corridor doors, inside of exterior doors, and stair side of stairway doors from corridors. Closers shall not be visible in corridors, lobbies and other public spaces unless approved by Architect.
- H. Door closers meeting this specification: Dorma 8900 series, or approved equivalent.

**EAST HARTFORD PUBLIC SCHOOLS  
JOSEPH O. GOODWIN ELEMENTARY SCHOOL  
EXTERIOR DOOR & WINDOW REPLACEMENTS  
AND HVAC UPGRADES**

## 2.13 DOOR TRIM

- A. Provide push plates 8 inches wide x 16 inches high x 0.050 inch thick and beveled 4 edges. Where width of door stile prevents use of 4 inches wide plate, adjust width to fit.
- B. Provide anti-vandal pulls of solid stock, and length as scheduled.
- C. Provide pull plates 4 inches wide x 16 inches high x 0.050 inch thick, beveled 4 edges, and prepped for pull. Where width of door stile prevents use of 4 inches wide plate, adjust width to fit.
- D. Acceptable manufacturers and/or products: Trimco, Burns, Don-Jo Mfg.

## 2.14 PROTECTION PLATES

- A. Provide kick plates, and mop plates, minimum of 0.050 inch thick as scheduled. Furnish with machine or wood screws, finished to match plates. Sizes of plates shall be as follows:
  - a. Kick Plates – 8 inches high x 2 inches less width of door on single doors, 1 inch less width of door on pairs
  - b. Mop Plates – 4 inches high x 2 inches less width of door on single doors, 1 inch less width of door on pairs
- B. Acceptable manufacturers and/or products: Trimco, Don-Jo Mfg., Burns.

## 2.15 OVERHEAD STOPS

- A. Provide heavy duty concealed mounted overhead stop as specified for exterior and interior vestibule single acting doors.
- B. Provide medium duty surface or concealed mounted overhead stop for interior doors as specified. Provide medium duty surface mounted overhead stop for interior doors and at any door that swings more than 140 degrees before striking a wall, open against equipment, casework, sidelights, and/or where conditions do not allow a wall stop or a floor stop presents a tripping hazard.
- C. Acceptable manufacturers and/or products: Dorma, ABH Manufacturing, Glynn-Johnson.

## 2.16 DOOR STOPS AND HOLDERS

- A. It shall be the responsibility of the hardware supplier to provide door stops for all doors in accordance with the following requirements:
  - 1. Use wall stops wherever possible; only on CMU walls.
  - 2. Where wall bumpers cannot be used, provide dome type floor stops of the proper height.
  - 3. At any opening where a wall or floor stop cannot be used, a heavy-duty overhead stop will be required.

**EAST HARTFORD PUBLIC SCHOOLS  
JOSEPH O. GOODWIN ELEMENTARY SCHOOL  
EXTERIOR DOOR & WINDOW REPLACEMENTS  
AND HVAC UPGRADES**

- B. Acceptable manufacturers and/or products: Trimco, Don-Jo Mfg., Burns.

2.17 THRESHOLDS, SEALS, DOOR SWEEPS, AUTOMATIC DOOR BOTTOMS, AND GASKETING

- A. Provide thresholds, weatherstripping (including door sweeps, seals, astragals) and gasketing systems (including smoke, sound, and light) as specified and per architectural details. Match finish of other items as closely as possible. Size of thresholds shall be as follows:
1. Exterior Saddle Thresholds – 1/2 inch high x jamb width x door width
  2. Interior Saddle Thresholds – ¼ inch high x jamb width x door width
  3. Bumper Seal Thresholds – 1/2 inch high x 5 inches wide x door width
- B. Provide door sweeps, seals, astragals, and auto door bottoms only of type where resilient or flexible seal strip is easily replaceable and readily available.
- C. Acceptable manufacturers and/or products: National Guard, Zero, Reese.
- D. Extended thresholds required at all doors into Gymnasium (Room 326).

2.18 MAGNETIC HOLDERS

- A. Provide wall or floor mounted electromagnetic door release as specified with a minimum of 25 pounds of holding force. Projection of holder and armature must be coordinated with other hardware and wall conditions to ensure that door sits parallel to wall when fully open. Where magnetic holders are used on fire-rated doors, they must be wired into the fire control panel for fail-safe operation.
- B. Acceptable manufacturers and/or products: Dorma, ABH Manufacturing, Rixson.

2.19 SILENCERS

- A. Furnish “push-in” type silencers for each hollow metal or wood frame, three (3) for each single frame, two (2) for each pair frame. Omit where gasketing is scheduled.
- B. Acceptable manufacturers and/or products: Trimco, Don-Jo Mfg., Burns.

2.20 FINISHES

- A. With the exception of items listed below, the finish of hardware items shall be US26D - satin chrome or US32D - satin stainless steel.
- B. Exceptions are as follows:
1. Aluminum Geared Continuous Hinges: US28 (BHMA 628).
  2. Push Plates, Pulls, Anti-Vandal Pulls: US32D (BHMA 630).
  3. Exit Devices: US32D (BHMA 630).

**EAST HARTFORD PUBLIC SCHOOLS  
JOSEPH O. GOODWIN ELEMENTARY SCHOOL  
EXTERIOR DOOR & WINDOW REPLACEMENTS  
AND HVAC UPGRADES**

4. Protection Plates: US32D (BHMA 630).
5. Overhead Stops: Painted to Match.
6. Door Closers: Powder Coat to Match.
7. Wall Stops: US32D (BHMA 630).
8. Weatherstripping: Clear Anodized Aluminum.
9. Thresholds: Mill Finish Aluminum.

#### 2.21 CYLINDERS AND KEYING

1. Provide a key system conforming to the Owner's existing Best Cormax key system and the following requirements:
2. Provide removable core cylinders at all keyed devices. The manufacturer's agent, accompanied by the Owner or Owner's security agent, shall install permanent keyed cores upon completion of the project. The temporary construction cores are to be returned to the manufacturer.
3. The manufacturers' agent, shall meet with Owner and Architect to review keying requirements and lock functions prior to ordering finish hardware. Submit a keying schedule to Architect for approval.
4. Lock core and keying provided by owner.
5. Provide keys as follows:
  - a. Ten grand master keys for each set.
  - b. Ten master keys for each set.
  - c. Three keys per core and/or cylinder.
  - d. Two construction core control keys
  - e. Two permanent core control keys
  - f. Six construction master keys for each type (Contractor is to provide one set of construction keys to Architect)
6. Visual key control:
  - a. Keys shall be stamped with their respective key set number and stamped "DO NOT DUPLICATE".
  - b. Grand master and master keys shall be stamped with their respective key set letters.
  - c. Do not stamp any keys with the factory key change number.
  - d. Do not stamp any cores with key set on face (front) of Core. Stamp on back or side of cores so not to be visible when core is in cylinder.
7. Deliver grand master keys, master keys, change keys, and/or key blanks from the factory or directly to the Owner in sealed containers, return receipt requested. Failure to comply with these requirements may be cause to require replacement of all or any part of the keying system that was compromised at no additional cost to the Owner.

#### 2.22 KEY CONTROL SYSTEM

- A. Provide a key control system, including envelopes, labels, tags with self-locking key clips, receipt forms, 3-way visible card index, temporary markers, permanent markers, and standard metal cabinet, all as recommended by system manufacturer, with capacity for 150% of the number of locks required for the Project.
  1. Provide complete cross index system set up by the hardware supplier, and place keys on markers and hooks in the cabinet as determined by the final key schedule.

**EAST HARTFORD PUBLIC SCHOOLS  
JOSEPH O. GOODWIN ELEMENTARY SCHOOL  
EXTERIOR DOOR & WINDOW REPLACEMENTS  
AND HVAC UPGRADES**

2. Provide hinged-panel type cabinet for wall mounting.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Prior to installation of any hardware, examine doors, frames, walls and related items for conditions that would prevent proper installation of finish hardware. Correct defects prior to proceeding with installation.
- B. Pre-Installation Conference: Prior to the installation of hardware, manufacturer's representatives for locksets, closers, and exit devices shall arrange and hold a jobsite meeting to instruct the installing contractor's personnel on the proper installation of their respective products. A letter of compliance, indicating when the meeting was held and who was in attendance, shall be sent to Architect and Owner.

#### 3.2 INSTALLATION

- A. Hardware shall be installed by qualified tradesmen skilled in application of commercial grade hardware. For technical assistance if necessary, installers may contact manufacturer's representative for the item in question, as listed in the hardware schedule.
- B. Mount hardware units at heights indicated in "Recommended Locations for Builders Hardware for Standard Steel Doors and Frames" by the Door and Hardware Institute.
- C. Install each hardware item in compliance with the manufacturer's instructions and recommendations, using only the fasteners provided by the manufacturer.
- D. Do not install surface mounted items until finishes have been completed on the substrate. Protect installed hardware during painting.
- E. Set units level, plumb and true to line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation.
- F. Operating parts shall move freely and smoothly without binding, sticking, or excessive clearance.
- G. Set thresholds for exterior doors in full bed of butyl rubber or polyisobutylene mastic sealant complying with requirements specified in Section 07 92 00.

#### 3.3 ADJUSTING, CLEANING AND DEMONSTRATING

- A. Adjust and check each operating item of hardware and each door, to insure proper operation or function of every unit. Replace units that cannot be adjusted to operate freely and smoothly.



**EAST HARTFORD PUBLIC SCHOOLS  
JOSEPH O. GOODWIN ELEMENTARY SCHOOL  
EXTERIOR DOOR & WINDOW REPLACEMENTS  
AND HVAC UPGRADES**

- B. Where door hardware is installed more than one (1) month prior to acceptance or occupancy of a space or area, return to the installation during the week prior to acceptance or occupancy and make a final check and adjustment of hardware items in such space or area. Clean operating items as necessary to restore proper function and finish of hardware and doors. Adjust door control devices to compensate for final operation of heating and ventilating equipment.
- C. Clean adjacent surfaces soiled by hardware installation. Remove bulk trash from the building, clean up any dust/debris caused by the installation of hardware.
- D. Instruct Owner's personnel in the proper adjustment, lubrication, and maintenance of door hardware and hardware finishes.

### 3.4 FIELD QUALITY CONTROL

- A. At completion of the project, a qualified factory representative for the manufacturers of locksets, closers, and exit devices shall inspect installations of their products. After the inspections, a letter shall be sent to the Architect reporting on conditions, verifying that their respective products have been properly installed and adjusted.
- B. Six-Month Adjustment: Approximately six months after the date of Substantial Completion, the installer, accompanied by representatives of the manufacturers of latchsets and locksets, door control devices, and of other major hardware suppliers, shall return to the Project to perform the following work:
  - 1. Examine and re-adjust each item of door hardware as necessary to restore function of doors and hardware to comply with specified requirements.
  - 2. Consult with and instruct Owner's personnel in recommended additions to the maintenance procedures.
  - 3. Replace hardware items that have deteriorated or failed due to faulty design, materials, or installation of hardware units.
  - 4. Prepare a written report of current and predictable problems (of substantial nature) in the performance of the hardware.

### 3.5 PROTECTION

- A. Provide for the proper protection of items of hardware until Owner accepts the project as complete. Damaged or disfigured hardware shall be replaced or repaired by the responsible party.

### 3.6 HARDWARE SCHEDULE

- A. Provide hardware for each door to comply with requirements of hardware set numbers indicated in door schedule, and in the following schedule of hardware sets.
- B. It is intended that the following schedule includes all items of finish hardware necessary to complete the work. If a discrepancy is found in the schedule, such as a missing item, improper hardware for a frame, door or fire codes, the preamble will be the deciding document.

**EAST HARTFORD PUBLIC SCHOOLS  
JOSEPH O. GOODWIN ELEMENTARY SCHOOL  
EXTERIOR DOOR & WINDOW REPLACEMENTS  
AND HVAC UPGRADES**

## C. Hardware sets:

NOTE: ALL ELECTRONIC HINGES AND HARDWARE ON RIGHT HAND DOORS

## SET #01 – EXTERIOR PAIR– MAIN ENTRY – Door 102A

2	Continuous Hinge	CONTINUOUS HINGE BY DOOR MFG.		
1	Removable Mullion	KR822	689	PR
1	Exit Device	C ELR TS 2103 x C03 LD	630	PR
1	Exit Device	C ELR TS 2101 LD	630	PR
1	Anti-Vandal Pull	1097PHI-21 S-N	630	TR
1	Anti-Vandal Pull	1097PHI-21 S-C	630	TR
2	Rim Cylinder	AS REQUIRED	626	BE
2	Door Closer	QDC115 R	689	SH
2	Overhead Stop	CONCEALED HEAVY DUTY 910 S SERIES	689	DM
2	Door Holder	EM508 24120	689	DM
1	Video Intercom/Card Reader	PROVIDED/SPECIFIED BY SECURITY VENDOR		
2	Wire Harness	WH-192		ST
2	Power Transfer	EPT-12C		PR
2	Door Contact	PROVIDED/SPECIFIED BY SECURITY VENDOR		
1	Door Seals	INTEGRAL SEALS BY FRAME MFR.		
1	Door Sweep	C627 A (DOOR WIDTH)		NA
1	Saddle Threshold	1/2" HIGH X JAMB WIDTH X OPENING WIDTH AL (PAIR) SEE DETAILS		NA

NOTE: ALL WIRING AND CONNECTIONS BY DIVISION 26 &amp; 28.

## OPERATIONAL DESCRIPTION:

IMMEDIATE EGRESS ALWAYS ALLOWED. ACCESS BY KEY OR BY VIDEO INTERCOM/CARD READER. VIDEO INTERCOM/CARD READER WILL RETRACT EXIT DEVICE LATCHBOLTS AND ALLOW ACCESS. REQUEST TO EXITS AND DOOR CONTACTS TO BE CONNECTED TO BUILDING'S SECURITY SYSTEM.

## SET #02 - INTERIOR - LOBBY/ENTRY – Door 102B

2	Continuous Hinge	CONTINUOUS HINGE BY DOOR MFG.		
1	Removable Mullion	KR822	689	PR
1	Anti-Vandal Pull	1097PHI-21 S-C	630	TR
1	Exit Device	C ELR TS 2103 x C03 LD	630	PR
1	Exit Device	C ELR TS 2101 LD	630	PR
2	Rim Cylinder	AS REQUIRED	626	BE
2	Door Closer	QDC115 R	689	SH
2	Overhead Stop	CONCEALED HEAVY DUTY 910 S SERIES	689	DM
2	Door Holder	EM508 24120	689	DM
2	Door Holder	EM508 24120	689	DM
2	Door Contact	PROVIDED/SPECIFIED BY SECURITY VENDOR		
1	Door Seals	INTEGRAL SEALS BY FRAME MFR.		
1	Saddle Threshold	1/2" HIGH X JAMB WIDTH X OPENING WIDTH AL (PAIR) SEE DETAILS		NA

**EAST HARTFORD PUBLIC SCHOOLS  
JOSEPH O. GOODWIN ELEMENTARY SCHOOL  
EXTERIOR DOOR & WINDOW REPLACEMENTS  
AND HVAC UPGRADES**

NOTE: ALL WIRING AND CONNECTIONS BY DIVISION 26 & 28.

OPERATIONAL DESCRIPTION:

IMMEDIATE EGRESS ALWAYS ALLOWED. ACCESS BY KEY OR BY VIDEO INTERCOM/CARD READER. VIDEO INTERCOM/CARD READER WILL RETRACT EXIT DEVICE LATCHBOLTS AND ALLOW ACCESS. REQUEST TO EXITS AND DOOR CONTACTS TO BE CONNECTED TO BUILDING'S SECURITY SYSTEM.

SET #03 – EXTERIOR PAIR – SIDE ENTRY – Doors 107, 108 & 115

2	Continuous Hinge	CONTINUOUS HINGE BY DOOR MFG		
1	Removable Mullion	KR822	689	PR
1	Exit Device	C ELR TS 2103 x C03 LD	630	PR
1	Exit Device	C ELR TS 2101 LD	630	PR
1	Anti-Vandal Pull	1097PHI-21 S-N	630	TR
1	Anti-Vandal Pull	1097PHI-21 S-C	630	TR
2	Rim Cylinder	AS REQUIRED	626	BE
2	Door Closer	QDC115 R	689	SH
2	Overhead Stop	CONCEALED HEAVY DUTY 910 S SERIES	689	DM
2	Door Holder	EM508 24120	689	DM
1	Video Intercom/Card Reader	PROVIDED/SPECIFIED BY SECURITY VENDOR		
2	Wire Harness	WH-192		ST
2	Power Transfer	EPT-12C		PR
2	Door Contact	PROVIDED/SPECIFIED BY SECURITY VENDOR		
1	Door Seals	INTEGRAL SEALS BY FRAME MFR.		
2	Door Sweep	C627 A (DOOR WIDTH)		NA
1	Saddle Threshold	1/2" HIGH X JAMB WIDTH X OPENING WIDTH AL (PAIR) SEE DETAILS		NA

NOTE: ALL WIRING AND CONNECTIONS BY DIVISION 26 & 28.

OPERATIONAL DESCRIPTION:

IMMEDIATE EGRESS ALWAYS ALLOWED. ACCESS BY KEY OR BY VIDEO INTERCOM/CARD READER. VIDEO INTERCOM/CARD READER WILL RETRACT EXIT DEVICE LATCHBOLTS AND ALLOW ACCESS. REQUEST TO EXITS AND DOOR CONTACTS TO BE CONNECTED TO BUILDING'S SECURITY SYSTEM.

SET #04 – EXTERIOR PAIR – SIDE ENTRY – Doors 101, 105, 109 & 114

2	Continuous Hinge	CONTINUOUS HINGE BY DOOR MFG		
1	Removable Mullion	KR822	689	PR
1	Exit Device	C ELR TS 2103 x C03 LD	630	PR
1	Exit Device	C ELR TS 2101 LD	630	PR
1	Anti-Vandal Pull	1097PHI-21 S-N	630	TR
1	Anti-Vandal Pull	1097PHI-21 S-C	630	TR
2	Rim Cylinder	AS REQUIRED	626	BE
2	Door Closer	QDC115 R	689	SH
2	Overhead Stop	CONCEALED HEAVY DUTY 910 S SERIES	689	DM
1	Video Intercom/Card Reader	PROVIDED/SPECIFIED BY SECURITY VENDOR		
2	Wire Harness	WH-192		ST
2	Power Transfer	EPT-12C		PR

**EAST HARTFORD PUBLIC SCHOOLS  
JOSEPH O. GOODWIN ELEMENTARY SCHOOL  
EXTERIOR DOOR & WINDOW REPLACEMENTS  
AND HVAC UPGRADES**

2 Door Contact	PROVIDED/SPECIFIED BY SECURITY VENDOR		
1 Door Seals	INTEGRAL SEALS BY FRAME MFR.		
2 Door Sweep	C627 A (DOOR WIDTH)		NA
1 Saddle Threshold	1/2" HIGH X JAMB WIDTH X OPENING WIDTH AL (PAIR) SEE DETAILS		NA

NOTE: ALL WIRING AND CONNECTIONS BY DIVISION 26 & 28.

OPERATIONAL DESCRIPTION:

IMMEDIATE EGRESS ALWAYS ALLOWED. ACCESS BY KEY OR BY VIDEO INTERCOM/CARD READER. VIDEO INTERCOM/CARD READER WILL RETRACT EXIT DEVICE LATCHBOLTS AND ALLOW ACCESS. REQUEST TO EXITS AND DOOR CONTACTS TO BE CONNECTED TO BUILDING'S SECURITY SYSTEM.

SET #04 - EXTERIOR SINGLE AT CLASSROOM – EXIT ONLY – Doors 103, 104, 110 & 113

1 Continuous Hinge	CONTINUOUS HINGE BY DOOR MFG		
1 Exit Device	2101 LD	630	PR
1 Door Closer	QDC115 R	689	SH
1 Overhead Stop	CONCEALED HEAVY DUTY 910 S SERIES	689	DM
1 Door Contact	PROVIDED/SPECIFIED BY SECURITY VENDOR		
1 Door Seals	INTEGRAL SEALS BY FRAME MFR.		
1 Drip Cap	16 A - 4" ODW		NA
1 Door Sweep	C627 A (DOOR WIDTH)		NA
1 Saddle Threshold	1/2" HIGH X JAMB WIDTH X OPENING WIDTH AL (SGL.) SEE DETAILS		NA

SET #05 - EXTERIOR PAIR – GYM - Door 111 & 112

2 Continuous Hinge	CONTINUOUS HINGE BY DOOR MFG		
1 Exit Device	2201 LD	630	PR
1 Exit Device	2203 X 4903A LD	630	PR
1 Rim Cylinder	AS REQUIRED	626	BE
2 Door Closer	QDC113 R	689	SH
2 Door Contact	PROVIDED/SPECIFIED BY SECURITY VENDOR		
2 Door Sweep	C627 A (DOOR WIDTH)		NA
1 Drip Cap	16 A - 4" ODW		NA
1 Perimeter Seal	706 E (HEAD & JAMBS - PAIR)		NA
1 Astragal Set	115 NA SET (DOOR HEIGHT)		NA
1 Saddle Threshold	1/2" HIGH X JAMB WIDTH X OPENING WIDTH AL (PAIR) SEE DETAILS		NA

NOTE: ALL WIRING AND CONNECTIONS BY DIVISION 26.

OPERATIONAL DESCRIPTION:

IMMEDIATE EGRESS ALWAYS ALLOWED. DOOR CONTACTS TO BE CONNECTED TO BUILDING'S SECURITY SYSTEM.

SET #06 - EXTERIOR SINGLE – Door 117, 119, & 122

1 Continuous Hinge	CONTINUOUS HINGE BY DOOR MFG		
1 Exit Device	2201 LD	630	PR

**EAST HARTFORD PUBLIC SCHOOLS  
JOSEPH O. GOODWIN ELEMENTARY SCHOOL  
EXTERIOR DOOR & WINDOW REPLACEMENTS  
AND HVAC UPGRADES**

1 Exit Device	2203 X 4903A LD	630	PR
1 Rim Cylinder	AS REQUIRED	626	BE
1 Door Closer	QDC113 R	689	SH
1 Door Contact	PROVIDED/SPECIFIED BY SECURITY VENDOR		
1 Door Sweep	C627 A (DOOR WIDTH)		NA
1 Drip Cap	16 A - 4" ODW		NA
1 Perimeter Seal	706 E (HEAD & JAMBS - PAIR)		NA
1 Astragal Set	115 NA SET (DOOR HEIGHT)		NA
1 Saddle Threshold	1/2" HIGH X JAMB WIDTH X OPENING WIDTH AL (PAIR) SEE DETAILS		NA

NOTE: ALL WIRING AND CONNECTIONS BY DIVISION 26.

OPERATIONAL DESCRIPTION:

IMMEDIATE EGRESS ALWAYS ALLOWED. DOOR CONTACTS TO BE CONNECTED TO BUILDING'S SECURITY SYSTEM.

SET #07 - EXTERIOR PAIR – Door 116, 118, 120, & 121

2 Continuous Hinge	CONTINUOUS HINGE BY DOOR MFG		
1 Exit Device	2201 LD	630	PR
1 Exit Device	2203 X 4903A LD	630	PR
1 Rim Cylinder	AS REQUIRED	626	BE
2 Door Closer	QDC113 R	689	SH
2 Door Contact	PROVIDED/SPECIFIED BY SECURITY VENDOR		
2 Door Sweep	C627 A (DOOR WIDTH)		NA
1 Drip Cap	16 A - 4" ODW		NA
1 Perimeter Seal	706 E (HEAD & JAMBS - PAIR)		NA
1 Astragal Set	115 NA SET (DOOR HEIGHT)		NA
1 Saddle Threshold	1/2" HIGH X JAMB WIDTH X OPENING WIDTH AL (PAIR) SEE DETAILS		NA

NOTE: ALL WIRING AND CONNECTIONS BY DIVISION 26.

OPERATIONAL DESCRIPTION:

IMMEDIATE EGRESS ALWAYS ALLOWED. DOOR CONTACTS TO BE CONNECTED TO BUILDING'S SECURITY SYSTEM.

SET #08 - EXTERIOR PAIR – Door 106

2 Continuous Hinge	CONTINUOUS HINGE BY DOOR MFG		
1 Exit Device	2201 LD	630	PR
1 Exit Device	2203 X 4903A LD	630	PR
1 Rim Cylinder	AS REQUIRED	626	BE
2 Door Closer	QDC113 R	689	SH
2 Door Contact	PROVIDED/SPECIFIED BY SECURITY VENDOR		
2 Door Sweep	C627 A (DOOR WIDTH)		NA
1 Drip Cap	16 A - 4" ODW		NA
1 Perimeter Seal	706 E (HEAD & JAMBS - PAIR)		NA
1 Saddle Threshold	1/2" HIGH X JAMB WIDTH X OPENING WIDTH AL (PAIR) SEE DETAILS		NA

22014

**EAST HARTFORD PUBLIC SCHOOLS  
JOSEPH O. GOODWIN ELEMENTARY SCHOOL  
EXTERIOR DOOR & WINDOW REPLACEMENTS  
AND HVAC UPGRADES**

END OF SECTION 087100

**EAST HARTFORD PUBLIC SCHOOLS  
JOSEPH O. GOODWIN ELEMENTARY SCHOOL  
EXTERIOR DOOR & WINDOW REPLACEMENTS  
AND HVAC UPGRADES**

## SECTION 088853 – SECURITY GLAZING

## PART 1 - GENERAL

## 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
- B. Carefully review and examine all other Contract Documents for requirements therein affecting the work of this Section. Furthermore, coordinate and sequence the work of this Section with all other trades affected

## 1.2 SUMMARY

- A. This Section includes glass and glazing for the following products and applications, including those specified in other Sections where glazing requirements are specified by reference to this Section:
  - 1. Exterior Aluminum doors and frames.
  - 2. Exterior Aluminum windows and curtain wall.
- B. Related Requirements:
  - 1. Section 084113 "Aluminum Windows" for aluminum windows receiving glass and glazing.
  - 2. Section 084413 "Glazed Aluminum Curtain Walls."

## 1.3 REFERENCES

- A. Comply with applicable requirements of the following standards and those others referenced in this Section, under the provisions of Division 01 Section "References". Where these standards conflict with other specified requirements, the most restrictive requirements shall govern.
  - 1. ASTM C 1036 - Flat Glass.
  - 2. ASTM C 1048 - Heat-Treated Flat Glass - Kind HS, Kind FT Coated and Uncoated Glass.
  - 3. ANSI Z97.1 - Safety Performance Specifications and Methods of Test for Safety Glazing Used in Buildings.
  - 4. Federal Safety Standards for Architectural Glazing Materials 16CFR1201-I.II.

**EAST HARTFORD PUBLIC SCHOOLS  
JOSEPH O. GOODWIN ELEMENTARY SCHOOL  
EXTERIOR DOOR & WINDOW REPLACEMENTS  
AND HVAC UPGRADES**

1.4 COORDINATION

- A. Coordinate glazing channel dimensions to provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances.

1.5 PREINSTALLATION MEETINGS

- A. Pre-installation Conference: Conduct conference at Project site.
  - 1. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
  - 2. Review temporary protection requirements for glazing during and after installation.

1.6 ACTION SUBMITTALS

- A. Product data sheets on glazing products: Provide chemical, functional, and environmental characteristics, size limitations, special application requirements. Identify available colors.
- B. Glass Samples: For each type of the following products:
  - 1. 12 by 12-inch pieces of each specified type and thickness of glass, bearing labels indicating locations where each type of glass will be used.
  - 2. Glazing tape: 12-inch length of specified type and size.

1.7 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer, manufacturers of insulating-glass units with sputter-coated, low-E coatings and sealant testing agency.
- B. Product Certificates: For glass.
- C. Product Test Reports: For security glass and glazing sealants, for tests performed by a qualified testing agency.
  - 1. For glazing sealants, provide test reports based on testing current sealant formulations within previous 36-month period.
- D. Preconstruction adhesion and compatibility test report.
- E. Sample Warranties: For special warranties.

1.8 QUALITY ASSURANCE

- A. Source: For each glass and glazing type required for work of this Section, provide primary materials which are products of one manufacturer. Provide secondary or accessory materials which are acceptable to manufacturers of primary materials.



**EAST HARTFORD PUBLIC SCHOOLS  
JOSEPH O. GOODWIN ELEMENTARY SCHOOL  
EXTERIOR DOOR & WINDOW REPLACEMENTS  
AND HVAC UPGRADES**

- B. Installer Qualifications: A firm with a minimum of three years experience in type of work required by this Section and which is acceptable to manufacturers of primary materials.
- C. Glass Thickness: Determine and provide size and thickness of glass products that are certified to meet or exceed performance requirements specified in this Section. Provide units with proper thickness, edge clearance and tolerance to comply with recommendations of glass manufacturer.
- D. Perform work in accordance with FGMA Glazing Manual Sealant Manual.

#### 1.9 DELIVERY, STORAGE, AND HANDLING

- A. Protect glazing materials according to manufacturer's written instructions. Prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.
  - 1. Protect materials from moisture, sunlight, excess heat, sparks and flame.
  - 2. Sequence deliveries to avoid delays, but minimize on-site storage.

#### 1.10 FIELD CONDITIONS

- A. Environmental Limitations: Do not proceed with glazing when ambient and substrate temperature conditions are outside limits permitted by glazing material manufacturers and when glazing channel substrates are wet from rain, frost, condensation, or other causes.
  - 1. Do not install liquid glazing sealants when ambient and substrate temperature conditions are outside limits permitted by glazing sealant manufacturer or below 50°F.
- B. Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

#### 1.11 WARRANTY

- A. General: Warranties are in addition to, and not a limitation of, other rights the Owner may have under the Contract Documents.
- C. Manufacturer's Special Project Warranty on Insulating Glass Products:
  - 1. Warranty Period: Manufacturer's standard but not less than 10 years after date of Substantial Completion.

**EAST HARTFORD PUBLIC SCHOOLS  
JOSEPH O. GOODWIN ELEMENTARY SCHOOL  
EXTERIOR DOOR & WINDOW REPLACEMENTS  
AND HVAC UPGRADES**

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Subject to compliance with security glazing performance requirements, provide products by a single manufacturer.
- B. Basis of Design: Laminated Technologies, Inc.; School Guard Glass, SG4.

2.2 SECURITY GLASS PERFORMANCE REQUIREMENTS

- A. Security Glazing: Security glass and surrounding frames shall demonstrate the ability, through independent third-party testing, to provide the following attributes:
  - 1. Products will be tested as a whole system, including glass and doors or frames.
  - 2. Products tested shall be tested in full size, actual doors and framing members usable in a commercial setting, as applicable to project requirements, with security glazing installed as prescribed by the security glazing manufacturer. Testing shall not be done in framing other than what is specified in regards to quality or manufacturer as stated in the Contract Documents.
  - 3. Glass bite during testing shall be no more than the allowable glass bite in the specified door or framing system for this project.
  - 4. The security glass shall resist attack for a minimum of 6 minutes or greater to meet the desired level of protection required by the owner.
  - 5. Attack duration shall be continuous. Breaks between testing phases shall not be counted or timed for total duration.
  - 6. Security glass will be integrated into a framing system in such a way that the frame and glass are able to withstand a constant attack for 6 minutes.
  - 7. Attack resistance shall mean the security glazing is subjected to the following without failure:
    - a. Withstand a minimum of 5 shots from a military style assault rifle with a minimum caliber of 7.62mm.
    - b. Withstand a minimum of abuse as applied by a single assailant at full force and including strikes with feet, bricks, hammers, baseball bats, and sledgehammers without stoppage for 6 or 12 minutes.
  - 8. Failure is defined as a tear in the security glass large enough to allow an object 4-inches in diameter or more to pass through or separation made between the glass and surrounding door frame, storefront or curtain wall framing materials.

**EAST HARTFORD PUBLIC SCHOOLS  
JOSEPH O. GOODWIN ELEMENTARY SCHOOL  
EXTERIOR DOOR & WINDOW REPLACEMENTS  
AND HVAC UPGRADES**

9. Product shall not be damaged or scratched by scissors, writing implements, razor blades or the use of any similar sharp object.
  10. Glass shall not have an optical haze of more than 1.8 percent so glass is indistinguishable from standard tempered glass.
- B. Test reports from a recognized independent testing company shall show testing means and methodology consistent or similar to the 5-aa1 assault test.

### 2.3 GLASS PRODUCTS, GENERAL

- A. General requirements for glass: Of domestic manufacture, conforming to the referenced standards and with the additional requirements specified herein; factory labeled on each pane stating the strength, type, thickness and quality; with all labels remaining on glass until final cleaning.
- B. Fabricate glass as required to openings with edge clearances and bite on glass as recommended by the manufacturer with clean-cut edges where concealed, and smooth ground, polished and seamed edges where exposed to view. Do not cut, seam, nip or abrade glass after tempering.
1. For non-tempered to be cut at site, provide glass larger than required so as to obtain clean cut edges without seaming or nipping. Laminated glass products should not be cut on site.
- C. Glass thickness shown and heat treatment specified are minimum requirements. Provide glass thickness and heat treatment as required to meet specified performance criteria, State and local codes and ordinances.

### 2.4 INSULATED SECURITY GLASS PRODUCTS

- A. Insulating Security Glass: Product established as performance standard. Substitution must provide certified independent testing of performance data equal to specified Security Glass Performance Requirements.
- B. Insulating Glass Units for Vertical Glazing (SG4 IGU)
1. Overall thickness: 1-inch (25.4 mm) insulating glass.
  2. Outer-lite: 1/4-inch (6 mm) tempered glass, low-e coating on the No. 2 surface.
  3. Airspace: 3/8-inch (9.5 mm) thick argon gas filled space, and mill finish air spacer.
  4. Inner-lite: School Guard Glass SG4.
  5. Required Ratings:
    - a. 5-aa1 rated for a minimum of 6 minutes.
  6. Minimum Visible Light Transmittance: 59 percent.
  7. Reflectance Visible Light: 13 percent.
  8. U-Value (Winter): 0.24.
  9. Shading Coefficient: 0.32.

**EAST HARTFORD PUBLIC SCHOOLS  
JOSEPH O. GOODWIN ELEMENTARY SCHOOL  
EXTERIOR DOOR & WINDOW REPLACEMENTS  
AND HVAC UPGRADES**

10. Solar Heat Gain Coefficient: 0.28.

## 2.5 GLAZING SEALANTS

### A. General:

1. Compatibility: Compatible with one another and with other materials they contact, including glass products, seals of insulating-glass units, and glazing channel substrates, under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
2. Suitability: Comply with sealant and glass manufacturers' written instructions for selecting glazing sealants suitable for applications indicated and for conditions existing at time of installation.
3. Colors of Exposed Glazing Sealants: As selected by Architect from manufacturer's full range.

B. Glazing Sealant: Silicone Rubber Glazing Sealant; silicone rubber one-part elastomeric sealant; FS TT-S-001543, Class A; acid-type for non-porous channel surfaces, and nonacid type where any of the channel surfaces are porous.

1. Basis of Design: Dow Corning Corporation; 995.

C. Preformed Butyl Rubber Glazing Sealant; tape or ribbon (coiled on release paper) of polymerized butyl, or mixture of butyl and polyisobutylene, compounded with inert fillers and pigments, solvent-based with minimum 95 percent solids, thread or fabric reinforcement, tack-free within 24 hours, paintable, non-staining.

## 2.6 GLAZING TAPES

A. Preformed Butyl Rubber Glazing Sealant; tape or ribbon (coiled on release paper) of polymerized butyl, or mixture of butyl and polyisobutylene, compounded with inert fillers and pigments, solvent-based with minimum 95 percent solids, thread or fabric reinforcement, tack-free within 24 hours, paintable, non-staining.

B. Pure silicone caulk, closed cell PVC tape, or DAP 33 putty as recommended by Technical Glass Products to comply with U.L. Listing. Must be used for fire-rated glass to meet fire rated labeling requirements.

## 2.7 MISCELLANEOUS GLAZING MATERIALS

A. General: Provide products of material, size, and shape complying with referenced glazing standard, with requirements of manufacturers of glass and other glazing materials for application indicated, and with a proven record of compatibility with surfaces contacted in installation.

B. Cleaners, Primers, and Sealers: Type recommended by glazing material manufacturer.

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JOSEPH O. GOODWIN ELEMENTARY SCHOOL  
EXTERIOR DOOR & WINDOW REPLACEMENTS  
AND HVAC UPGRADES**

- C. Glazing Gaskets: Molded Neoprene Glazing Gaskets; molded or extruded neoprene gaskets of the profile and hardness required for watertight construction; ASTM D 2000 designation 2BC 415 to 3BC 620.
- D. Setting Blocks: Neoprene, 70-90 durometer hardness, with proven compatibility with sealants used.
- E. Spacers: Neoprene, 40-50 durometer hardness, with proven compatibility with glazing materials used.
- F. Compressible Filler Rod: Closed-cell or waterproof-jacketed rod stock of synthetic rubber or plastic foam, proven to be compatible with glazing materials used, flexible and resilient, with 5-10 psi compression strength for 25 percent deflection.

### PART 3 - EXECUTION

#### 3.1 EXAMINATION

- A. Inspect receiving surfaces and ensure that are dry and free from dust, or other foreign materials before glazing. Clean all surfaces with cloth saturated with mineral spirits of high-flash naphtha as recommended by glazing tape manufacturer, before glazing.
- B. Verify all openings, prior to glazing, to make certain that the opening is square, plumb and secure in order that uniform face and edge clearances are maintained.
- C. Determine the actual sizes required by measuring the receiving openings. Size glass to permit required clearance and bite around full perimeter of glass, as set forth in the referenced FGMA standards, or as recommended by the glass manufacturer. Do not nip edges, to remove flares or to reduce oversize dimensions, under any circumstance.
- D. Perform glazing work in accordance with FGMA Glazing Manual SIGMA and LSGA standards for glazing and installations methods.
- E. Proceed with installation only after unsatisfactory conditions have been corrected.

#### 3.2 INSTALLATION

- A. Each installation shall withstand normal temperature changes, applicable wind loading, and impact loading (for operating sash and doors) without failure of any kind including loss or breakage of glass, failure of sealants or gaskets to remain watertight and airtight, deterioration of glazing materials and other defects in the Work.
- B. Install glass in accordance with the standards detailed in the "Glazing Manual" of the Glass Association of North America and the "Sealant Manual" of the Flat Glass Marketing Association except as shown and specified otherwise, and except as specifically recommended otherwise by the manufacturers of the glass and glazing materials.

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EXTERIOR DOOR & WINDOW REPLACEMENTS  
AND HVAC UPGRADES**

- C. Unify appearance of each series of lights by setting each piece to match others as nearly as possible. Inspect each piece and set with pattern, draw and bow oriented in the same direction as other pieces.
- D. Install glazing materials in accordance with the manufacturer's printed instructions.

### 3.3 GLAZING, GENERAL

- A. Install setting blocks of proper size at quarter points of sill rabbet. If required to keep in place set blocks in thin course of the heel-bead compound.
- B. Provide spacers inside and out, and of proper size and spacing, for all glass sizes larger than 50 united inches, except where gaskets are used for glazing. Provide 1/8 inch minimum bite of spacers on glass and use thickness equal to sealant width, except with sealant tape use thickness slightly less than final compressed thickness of tape.
- C. Voids and Filler Rods: Prevent exudation of sealant or compound by forming voids or installing filler rods in the channel at the heel of jambs and head (do not leave voids in the sill channels) except as otherwise indicated, depending on light sizes, thickness and type of glass, and complying with manufacturer's recommendations.
- D. Do not cut, seam, nip, or abrade glass which is tempered, heat strengthened, or coated.
- E. Force glazing materials into channel to eliminate voids and to ensure complete "wetting" or bond of glazing material to glass and channel surfaces.
- F. Tool exposed surfaces of glazing sealants and compounds to provide a substantial "wash" away from the glass. Install pressurized tapes and gaskets to protrude slightly out of the channel, so as to eliminate dirt and moisture pockets.
- G. Where wedge-shaped gaskets are driven into one side of the channel to pressurize the sealant or gasket on the opposite side, provide adequate anchorage to ensure that gasket will not "walk" out when subjected to dynamic movement. Anchor gasket to stop with matching ribs, or by proven adhesives, including embedment of gasket tail in cured heel bead.
- H. Gasket Glazing: Miter cut and bond ends together at corners where gaskets are used for channel glazing, so that gaskets will not pull away from corners and result in voids or leaks in the glazing system.

### 3.4 CURE, PROTECTION AND CLEANING

- A. Cure glazing materials in accordance with manufacturer's printed instructions and recommendations, to obtain high early bond strength, internal cohesive strength, and surface durability.
- B. Mark glazed openings immediately upon installation of glass by attaching crossed streamers to framing. Do not apply markers of any type to surfaces of glass.

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EXTERIOR DOOR & WINDOW REPLACEMENTS  
AND HVAC UPGRADES**

- C. Replace glass included in the work which is broken, or otherwise damaged, from the time Work is started at the site until the date of physical completion.
- D. Maintain glass in a reasonably clean condition during construction to protect from buildup of harmful construction contaminants.
  - 1. Clean and trim excess glazing material from the glass and stops or frames promptly after installation.
- E. Remove dirt and other foreign material and wash and polish glass included in the work on both sides.

END OF SECTION 088853

**ADDENDUM #1**

**ITB# 1847-24**

**Door & Window Replacement and HVAC Upgrades at Goodwin Elementary School**

Bidder acknowledges the following included on this addendum:

- *Section 087100 – Door Hardware - 21 Pages*
- *Section 088853 – Security Glazing – 9 Pages (note that security glass is required only the entrance doors)*

Bidder must acknowledge and include this Addendum as part of their bid package submittal.

The bidder acknowledges receipt of Addendum #1:

Date: \_\_\_\_\_

Name of Bidder: \_\_\_\_\_

Title: \_\_\_\_\_

Address: \_\_\_\_\_