



Architectural
Direct Drive Doors

OPERABLE CURTAIN WALL

[Product Specification]

SECTION 08440

OPERABLE CURTAIN WALL

PART 1 GENERAL

PART 1.1 SECTION INCLUDES

- A. Upward Acting Direct Drive doors.
- B. Electric motor operators.

PART 1.2 RELATED SECTIONS

- A. Section 03300 - Cast-In-Place Concrete: Prepared opening in concrete. Execution requirements for placement of frame mount anchors in concrete wall construction.
- B. Section 04200 - Unit Masonry Assemblies: Prepared opening in masonry. Execution requirements for placement of frame mount anchors in masonry wall construction.
- C. Section 05500 - Metal Fabrications: Steel frame and supports.
- D. Section 06105 - Wood Blocking and Curbing: Rough wood framing and blocking for door opening.
- E. Section 07920 - Joint Sealers: Perimeter sealant and backup materials.
- F. Section 08710 - Door Hardware
- G. Section 09910 - Paints and Coatings:
- H. Section 11150 – Equipment: Control system door operator
- I. Section 26726 - Wiring Connections: Electrical service to door operator.

PART 1.3 REFERENCES

- A. AS1170.2:2002 - Structural Design Actions - General Principles.
- B. AS4100-1990- SAA Steel Structures Code.
- C. AS 1288 - Glass in Buildings - Selection and Installation.
- D. AA-6063-T6 - Standards for Aluminum Alloy and Temper.
- E. ASTM A513, Type 1 – Steel Tubes.
- F. ASTM A1008 – Sheet Steel for Covers.
- G. ASTM A36 – Steel Bars.

PART 1.4 PERFORMANCE REQUIREMENTS

- A. Wind Loads: Design and size components to withstand loads caused by pressure and suction of wind acting normal to plane of wall as calculated in accordance with applicable code.

1. Design pressure not less than 50 lb/sq ft as independently tested
 2. Members connection to structure in accordance with IBC & ASCE 7-10 capable of wind speeds equal to 200mph and wind pressure on the door of 180psf (Ultimate) as independently tested.
 3. Maximum deflection of 1/120 of opening width.
- B. Certified third party validation of the following performance standards:
1. ASTM E283 – Air Infiltration Test – Reading of 0.00 cfm/sq.ft. at both 1.57psf. and 6.24 psf
 2. ASTM E330 –Wind Load – Passing design load test positive and negative of 25psf and positive design load test to 61psf
 3. ASTM E331 – Water Penetration – Passing result up to 17psf water pressure.
 4. ASTM E1186 – Large Missile Impact Test – Passing Result on 3 Impacts
 5. ANSI/NFRC 102 – Thermal Transmittance – Meet or exceed 0.45 Btu/hr-ft²-F.
 6. ASCE 7-10 – Wind Pressure – Meet or exceed wind speed equal to 200mph, Exposure D, with total wind pressure on the door of 180psf (Ultimate) and total wind load transmitted to the base building of 9600 pounds (ASD).
- C. Single-Source System: Provide doors, motors, glazing and / or cladding, finish, accessories, self-supported drive system frame and on-site pre-installation conference from one manufacturer for each door.

PART 1.5 SUBMITTALS

- A. Product Data: Manufacturer's data sheets on each product to be used, including:
1. Preparation instructions and recommendations
 2. Storage and handling requirements and recommendations
 3. Installation manuals.
 4. Wiring Diagrams
 5. Owner's Manual
- B. Shop Drawings: Indicate plans and elevations based on contract documents including opening dimensions and required tolerances, accessories and anchors, jamb details, connection details, anchorage spacing, hardware locations, and installation details. Contractor to field verify all dimensions.
1. Wiring Diagrams: Detail wiring for power, signal and control systems.
- C. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.
- D. Verification Samples: For each finish product specified, two samples, representing actual product, color, and patterns for approval
- E. Installer Certificates: Signed by manufacturer certifying that installers comply with specified requirements.
- F. 3rd Party Test Data: Provide 2018 International Building Code and ASCE 7-10 Exposure D wind load analysis data.
- G. Operation and Maintenance Data as specified in Owner's Manual

PART 1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing upward acting, vertically operating direct drive door products specified in this section with a record of successful in-service experience.

- B. Installer Qualifications: Documented authorized representative of the manufacturer certifying installers are a manufacturer factory trained installation company.
- C. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories, Inc. acceptable to authority having jurisdiction as suitable for purpose specified. Source Limitations: Obtain Upward Acting, Vertically Operating Direct Drive Doors through one source from a single manufacturer.
 - 1. Obtain operators and controls from the door manufacturer.
 - 2. Door Sections Shipped with Factory Installed, Specified Finish Cladding by door manufacturer.
 - 3. Obtain finish from the vertically operating door manufacturer.
 - 4. Obtain accessories from the vertically operating door manufacturer.
 - 5. Conduct on-site pre-installation conference with door manufacturer's authorized representative.
- F. Listing and Labeling: Provide electrically operated fixtures specified in this Section that are listed and labeled.

PART 1.7 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened labeled packaging until ready for installation.
- B. Store materials in a clean, dry, ventilated, weathertight, secure location.
- C. Protect materials from soiling, abuse, loss and moisture damage.

PART 1.8 PROJECT CONDITIONS

- A. Pre-Installation Conference: Conduct an on-site, pre-installation conference with manufacturer's representative prior to commencement of field operations to establish procedures to maintain optimum working conditions and to coordinate this work with related and adjacent work.
- B. Opening shall be free and clear of debris, stored materials, scaffolding, and temporary walls for preinstallation site visit and during installation as necessary for installers to safely perform the installation.
- C. Floor between jambs shall be flat, even and level with exterior sloping away from opening

PART 1.9 WARRANTY

- A. Manufacturer warrants to the original purchaser that the door will be free of manufacturer's defects in workmanship and material. Should any manufacturer's defect in workmanship or material appear within TWO (2) YEARS of the original date of shipment, DoorWall Systems Corporation shall, upon written notification from purchaser stated above, correct such non-conformity at its option, by repairing or replacing any defective part(s).
- B. Manufacturer warrants the frame and painted steel components against rust-through, in non-damaged condition for a period of FIVE (5) years from original ship date. This warranty does not apply to scratched, dented, damaged or corroded

areas of the frame. This warranty does not include normal wear and tear, damage beyond the manufacturer's control or damage due to negligence, improper use or installation not in accordance with manufacturer's instructions. Manufacturer may request return of defective material for inspection / verification. Manufacturer's warranty requires system must be operated semi-annually.

PART 2 PRODUCTS

PART 2.1 MANUFACTURERS

- A. Acceptable Manufacturer: This Section is based on the products of DoorWall Systems Corporation located at One Overhead Way, Warwick, RI 02888. Tel: 844-492-7233. Web: www.doorwallsystems.com.
- B. Basis of Design Product: DoorWall Systems, Architectural Direct Drive System
- C. Substitutions: Not permitted.

PART 2.2 DOOR COMPONENTS

- A. DWS Duo: Self-supporting, two Leaf, Hinged, Upward Acting, Vertically Operating, Direct Drive, Operable Curtainwall: Two horizontal sections hinged together, weather lapped at horizontal joint; rising and lowering vertically on ball screw drive system affixed to building structure to stack in a folded position aesthetically exposed in door opening. Straps, cables, springs, belts, pulleys, sheaves, hydraulics and counterweights not allowed. Maximum headroom allowance for door operation equipment and parts not to exceed 22 (Twenty-Two) inches.
- B. DWS Solo: Self-supporting, single panel upward acting, vertically operating, direct drive, operable curtainwall system rising and lowering vertically on ball screw, direct drive system. Straps, cables, springs, belts, pulleys, sheaves, hydraulics and counterweights are not allowed. Maximum headroom allowance for door operation equipment and parts not to exceed "Clear Opening Height" plus 22 (Twenty-Two) inches.
- C. Section Frame: Construct frame from 6063 – T5 aluminum alloy with complete aluminum break. Deflection across the length of the system shall be limited to 1/120 at midpoint.
- D. Mounting Frame: Tube steel mounting frame included as modular assembly with drive system components preassembled by door manufacturer. Entire system shall be self-supporting, transferring system weight directly to the floor, and not relying on the building structure for other than lateral support. All blocking by others.
- E. Direct Drive System: Motor turns horizontal drive shaft connected to gear boxes at either end that in turn simultaneously drive two vertical ball screws that raise and lower door mount blocks. Screw driven mount blocks shall travel along linear guide rails. Horizontal drive shaft shall have a key way extending the entire length of drive shaft to allow for variable placement of motor.
- F. Construct door sections from extruded aluminum complying with ASTM A-513 Type 1 and ASTM A-36.
- G. Mounting Anchor / Bolt: 3/4" Diameter x 4 3/8" Embed Hilti Kwik Bolt 3. Allowable

Tensile Load = 1,316 pounds. Allowable Shear Load = 657 pounds

- H. Drive System Covers: Drive system shall be protected and covered with removable panels. Jamb covers not to extend more than 8" beyond the door opening. Covers finished and fastened to adjacent surfaces per architect specification; quoted separately.
- I. Gear Boxes: Gear boxes shall contain high alloy steel spiral bevel gears, double shielded permanently lubricated ball bearings, stainless steel shafts, be completely sealed, lubricated for life and AGMA Class 1 rated.
- J. Power Outage Operation: Power source to be integrated with building's auxiliary system / generator if required.
- K. Locking: System is inherently self-locking through motor, gearing and direct drive system. Door unlocks with electrical operation of door.

PART 2.3 MOTORS

- A. Direct Drive Door Operating System.
 - 1. Direct Drive Door system shall be opened and closed using a constant contact key switch at site of door.
 - 2. Motor Design: Parallel shaft helical gearmotor with the following:
 - a. 2 HP
 - b. 230 – Three phase
 - c. UL 325 Compliant
 - d. Integrated motor safety brake
 - e. 1510 lb-in Output torque
 - f. NEMA A Design
 - i) maximum 5% slip
 - ii) high to medium starting current
 - iii) normal locked rotor torque
 - iv) normal breakdown torque
 - g. Complies with EISA energy efficiency requirements
 - 3. Exterior Motor Mounting: Not permitted
 - 4. Motor to be mounted fully concealed within drive system covers.
 - 5. Direct Drive System must operate the door continuously throughout the entire open and close cycles without the assistance of counterweights, springs or cables.

- B. Doors shall be electronically operated with control systems pre-wired by door manufacturer.

PART 2.4 MOTOR CONTROL PANEL

- A. Single control panel pre-wired by door manufacturer, configured to the motor and door specifications
- B. Doors shall have ability to provide slow start and soft stop functionality from a variable frequency device integrated within the motor control panel.

PART 2.5 SAFETY

- A. Direct drive system will have a 3-part redundant brake system. Auto stop function shall be integrated into the motor stopping the rotation of the drive shaft either in the event of a power outage or engaged at the control panel to prevent the door from

moving. System shall also include two "load lock" safety mechanisms one on each ball screw that are comprised of compatible metals preventing movement of the door except when operating the door to open or close.

- B. Constant Contact Operator: Key switch activation of door to open and close requires constant contact by operator located at the door to allow for operator supervision and control.
- C. UL 325 compliant constant contact control within 10'-0" unobstructed visual distance from door.
- D. Safety Certification: Door manufacturer's representative will provide and record instructor safety certification program to General Contractor and Owner to be signed upon completion by authorized agent of each. Door should only be operated by individuals with documented and signed safety training. Operation of door by untrained individual will result in nullification of all warranties.

PART 2.6 CLADDING

- A. *(If using glass)* Application must comply with IBC 2405.1 requirements for sloped glazing. Glazing options available (select one):
 - a. 1 5/16" laminated, insulated glass, 40 STC.
 - b. None.
- B. *(If not using glass)* Solid Panel Glazing: Insert desired non-glass glazing material here.
- C. System to allow glazing from either the interior or exterior.
- D. System to allow cladding thicknesses from .25" to 5"
- E. System to allow for replacement of original cladding in field from interior or exterior

PART 2.7 FINISHES

- A. Finish, Exposed Ferrous Metals: All exposed surfaces except working machine parts shall receive the following factory applied finish (select one):
 - 1. Paint: All paint must be per AMMA-2605 standards
 - 2. Color: DWS standard color / Custom color
 - 3. Film: Wood grain, film finishes per AMMA-2604 standards
 - 4. Anodizing: All anodized finishes to meet AAMA-611 Standards
 - a. Finish options include: Clear, Champagne, Light Bronze, Medium Bronze, Dark Bronze, Extra Dark Bronze and Black.
- B. Dual Finishes: Manufacturer shall provide capability for door sections have interior finish different from exterior finish.
- C. Finish: Exterior Wood Cladding by Others
Wood substrate base of at least 3/4" pressure treated

PART 3 EXECUTION

PART 3.1 EXAMINATION

- A. Examine the areas and conditions where doors are to be installed and correct any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions are corrected to permit proper

installation.

- B. Verify wall openings are ready to receive work and opening dimensions and tolerances are within specified limits.
- C. Verify electric power is available for connection by others at time of installation and of proper specifications.

PART 3.2 PREPARATION

- A. Installation preparation must be completed to manufacture's guidelines before proceeding.
- B. Pre-Installation conference as specified in Part 1.8-A
- C. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

PART 3.3 INSTALLATION

- A. Inserts and Anchorages: Approved inserts and anchoring devices suitable for the installation of the units and consistent with the manufacturer's installation requirements.
- B. Install Upward Acting, Vertically Operating, Direct Drive doors, frame, operating equipment, hardware, seals, stops, inserts, supports and motor in accordance with approved shop drawings and the manufacturer's printed instructions.
- C. Anchor assembly to wall construction and building framing without distortion or stress consistent with the manufacturer's installation instructions.
- D. Coordinate installation of electrical service. Permanent electric wiring shall be brought to the power unit location before installation. After the door is installed, the general contractor assumes the responsibility of any damage to the door, operating system or any other related components during construction until the building is turned over to the owner.
- E. Fit and align door assembly including hardware.
- F. Installation shall be by an approved installer as specified in Part 1.6-B

PART 3.4 CLEANING AND ADJUSTING

- A. Test and adjust door assembly to smooth operation free from warp twist or distortion and in full contact with weather-stripping. Door opening must be free and clear of all obstructions.
- B. Clean doors, frames and glass.
- C. Remove temporary labels and visible markings.

PART 3.5 PROTECTION

- A. Do not permit construction traffic through Upward Acting, Vertically Operating, Direct Drive door openings during installation and / or after adjustment and cleaning. General contractor assumes the responsibility of any damage to the door, operating system or any other related components during construction until the building is turned over to the owner.

PART 3.6 MAINTENANCE

- A. Post Installation Planned Maintenance:
 - 1. Contractor and installer shall provide Owner with complete company name, address phone numbers and assigned contacts for emergency repairs and planned maintenance for the installed door(s).

- B. Owner Training / Instruction for Operation and System Planned Maintenance:
 - 1. Manufacturer's representatives shall instruct Owner's representative in planned maintenance and operation of installed Upward Acting, Vertically Operating, Direct Drive doors. Door should only be maintained and operated by individuals with documented and signed training. Maintenance and / or operation of door by untrained individual will result in nullification of all warranties.

END OF SECTION