PART 1: GENERAL

1.01 Related Documents:

A. All applicable provisions of the Bidding and Contract Requirements, and Division 1 - General Requirements shall govern the work under this section.

1.02 Description of Work:

A. Provide all labor, materials, necessary equipment and services to complete the Automatic Vertically Retractable Acoustic Interior Glass Wall(s) (from here on called Operable Wall), as indicated on the drawings, or as specified herein or both.

B. Related work by others:

1. Section: Masonry/Concrete.

2. Section: Bulkheads and sound insulation above, below and in the fixed walls at both ends of the operable wall, as per ASTM E557.

3. Section: Primary structural support, including steel beam for the operable wall as well as the miscellaneous support steel for the lifting machinery for the operable wall.

4. Section: Ceiling storage pockets along axis of operable wall.

5. Section: Painting of trim, gypsum drywall and other adjacent materials.

6. Section: All site wiring and connections for main power, including disconnect switches at each motor location. All site wiring and connections for control, including installation of key switches.

1.03 Quality Assurance:

A. The products herein specified establish the standard of quality for the operable walls based on Skyfold Mirage® Automatic Vertically Retractable Acoustic Interior Glass Wall by Skyfold Inc. of Baie d'Urfe (Montréal), Québec, Canada. Proposals for substitution of products or techniques not conforming to these specifications must be submitted at least ten (10) days prior to bidding. Any proposed substitute wall must be manufactured by a certified ISO-9001-2008 company or an equivalent quality control system and independent test reports which meet the requirements and design specified herein must be submitted to obtain approval.

B. The operable walls herein specified shall be furnished and installed by an authorized local distributor licensed by the operable wall manufacturer. Local distribution is required to ensure prompt project coordination and future customer service.

C. The operable wall shall be designed to have a design life of at least 10,000 complete closed to opened to closed cycles.

1.04 Site Conditions:

A. The floor underneath the operable wall along its axis shall be flat to within +/- 1/4" (6 mm) over the entire length of the operable wall. The peak to valley undulation of +/- 1/4" (6 mm) shall not be closer together than 24" (610 mm) and a peak to valley undulation of +/- 1/8" (3 mm) shall not be closer than 12" (305 mm).

B. Support steel above the operable wall along its axis shall be parallel to the floor within +/- 1/2" (12.7 mm) for the entire length of the operable wall. This includes loaded deflection. The beam must also be parallel to the center line of the operable wall within $\pm$ 1/8" (3 mm), left to right.

C. The fixed walls at either end of the operable wall shall be within +1/4" (6 mm)-0", from plumb vertical.

D. The fixed walls at either end of the operable wall shall be flat to within +0", -1/4" (6 mm).

1.05 Submittals:

A. Submit manufacturer's technical data for each type of operable wall specified herein.

B. Submit shop drawings showing complete layout of operable wall system based on field verified dimensions. The drawings shall include dimensional relationship to adjoining work. Include details indicating materials, finishes, and tolerances, methods of attachment to building steel and electrical requirements.

1.06 Warranty:

A. Basic Warranty: The operable wall shall be warranted free from defects in material and workmanship for a period of two (2) years or five thousand (5,000) cycles, whichever occurs first, from the date of shipment. Extended Parts Warranty (optional): An extended warranty on parts is available in addition to the basic warranty. It includes coverage on all parts for a period of ten (10) years or five thousand (5,000) cycles, whichever occurs first from date of shipment. Refer to Owner's manual for full warranty details.

B. Parts and labor required to maintain the operable wall and part subject to normal wear and tear are not covered under the warranty and are the owner's responsibility. (Refer to Manufacturer's Recommended Maintenance Program).

PART 2: PRODUCT

2.01 Acceptable Manufacturer:

A. Manufacturer:
Skyfold Inc. Baie d'Urfe (Montréal), Québec, Canada and
Railtech Composites Inc., Plattsburgh, New York, USA
(514) 457-4767.

B. Product:
Skyfold Mirage® Automatic Vertically Retractable Acoustic Interior Glass Wall

2.02 Operation:

A. Operable walls shall refer specifically to automatic vertically retractable acoustic interior glass walls that, when in the down position (closed) are hard, rigid, flat, plumb walls, made of a grid of rectangular panels, and when are lifted (opened), fold upward (vertically) without the use of any manual labor, in a manner similar to an accordion, into a pocket in the ceiling, between roof joists, or up between built in bulkheads.

B. The operable wall shall be opened and closed using two push button switches wired in series with power controlled by a single, three position key switch. Turning the key from the "off" position shall cause the operable wall to move in the designated direction "up" or "down" once both push buttons are depressed. When hand pressure is removed, the operable wall shall immediately stop. The operable wall shall stop in a quick and positive fashion without coasting. As a normal part of the operation, it shall be possible to partially open (or close) the operable wall, stop it and then reverse the operation. There shall be two (2) switches per operable wall, located on opposite sides of the operable wall at opposite ends of the wall, wired in series. One switch shall be equipped with an LED that flashes fault codes in case of a failure with the electrical system.

C. The motor assembly is mounted directly above the centre line of the operable wall. Support steel is only required at one location

D. Electrical:

1. The operable wall shall be equipped for a three phase power supply to the electrical control box.

2. Standard electrical control box will be NEMA 1. NEMA 4 is also available upon request.

3. Low voltage wiring (by others). 18 gauge wiring from the switches to the control box.

4. Switches: Two (2) push button switches wired in series with power controlled by a single, three position key switch. One switch shall be equipped with an LED that flashes fault codes in case of a failure with the electrical system. (Installation and wiring by others).

E. Safety Equipment:

1. The operable wall shall employ an electromagnetic type of brake which shall activate firmly, without hesitation, when power is lost to the system. This brake shall have a minimum retarding torque rating equal to 200% of the power drive full load torque. The drive system shall be equipped with a manual override and brake release lever. The operable wall shall employ a dynamic brake, distinct and separate from the brake above, in order to lower the operable wall at a controlled speed of no more than approximately 150% of the normal down speed, in the case of a catastrophic failure in the power train. Alternately, the operable wall shall employ a brake, distinct and separate from the brakes above, in order to completely halt the downward motion of the operable wall in the case of a catastrophic failure in the power train.

2. The operable wall shall employ electrical or other limit switches in order to stop the wall at the up and down travel limits.

3. The operable wall shall employ an over torque detector in order to sense a jam in the system and to act as an over travel limit in the up direction should the primary limit switch fail to act. This over torque sensor shall be mechanical, using the motor's torque arm in it's over torque detection.

4. The lifting equipment shall use the latest in industry standards in thermal protection, overload protection, quick acting fuses, etc., in order to ensure the safety and reliability of the system.

5. The operable wall shall be equipped with an optical sensor, which shall cut power to the lifting equipment if an object or person passes between the emitter(s) and receiver(s). The operable wall will then automatically reverse direction for approximately 3 seconds to clear the object. Regular operation of the operable wall shall resume once the key switch has been released and the obstruction removed.

2.03 Panel Construction:

A. Panels shall be architecturally flat with no bowing, oil canning, warping, waviness or any other surface deformation and discontinuity.

B. The operable wall shall be visibly flat and rigid in the down (closed) position.

C. There shall be no exposed hinges, brackets and screws visible when the operable wall is in the down (closed) position. All of the panel edges shall be right angled, with a minimum radius not more than 1/16" (1.6mm). All of the panels shall be rectangular, nominally of the same size, unless requested otherwise by the architect. Horizontal joints between panels shall be no more than approximately ½" (12.7mm) wide.

D. The operable wall shall not weigh more than 8 lbs per square foot (39.1 Kg per square meters), not including the lifting equipment.

2.04 Folding Mechanism:

A. The hanging, folding and extension mechanism shall be, as much as possible, made from structural grade aluminum extrusions and structural shapes, in order to minimize the weight of the system. All wear surfaces, such as bushings, spacers, pins, discs, bearings, sleeves shall be designed to function quietly and with minimum wear, over the 10,000 cycle design life of the operable wall. The hangers, which fasten the lifting mechanism to the support steel, shall be fabricated from steel and shall be welded or bolted to the support steel supplied by others.

2.05 Lifting Equipment:

A. The lifting equipment shall be sized properly so that it can open and close the wall effectively over the 10,000 cycle design life of the wall, at the minimum design speed of approximately 5 to 10 vertical feet per minute (1.5 to 3 meters per minute).

B. The lifting mechanism shall be designed to function as smoothly, quietly and safely as possible. Wherever possible, ball bearings shall be used instead of bushings and wear surfaces. Chain or belt drive systems are not acceptable.

C. There shall be a wire rope cable for every set of lifting mechanisms. This cable shall be of 6 x 31 construction aircraft cable and shall be made of galvanized steel. The diameter of the cables shall be sized so that they shall be able to hold the entire weight of the wall, with the appropriate safety factor.

D. The power drive shall be sized to deliver sufficient amount of torque to safely and effectively raise and lower the operable wall over its design life.

2.06 Finishes:

A. Panels: Acoustical panels shall be double glazed laminated glass, ~1 1/16" (27.0mm) thick

B. Framework: Manufacturer's standard silver metallic

C. Sound seals: Black

2.07 Sound Seals:

A. The operable wall shall automatically and acoustically seal against the floor without the need for any manual intervention. The floor seals shall leave a joint between the floor and the bottom acoustical panels of not more than approximately 2" (51 mm).

B. The operable wall shall seal to the wall track with brush seals and leave a joint between the lifting mechanism and the track of no more than approximately 3/4" (19 mm).

C. The operable wall shall automatically and acoustically seal against the ceiling without any manual intervention. The top seals shall leave a joint between the top acoustical panels and the ceiling of the pocket of not more than approximately 2" (51 mm).

PART 3: EXECUTION

3.01 Preparation:

A. Preparation of opening shall be by general contractor. Any deviation of site conditions contrary to approved shop drawings shall be called to the attention of the architect.

3.02 Delivery and Storage:

A. Delivery to the job site shall be coordinated by general contractor. Proper storage of the operable walls before installation and continued protection during and after installation shall be the responsibility of the general contractor. The operable wall supplier shall not deliver or install this product until the General Contractor can ensure in writing safe storage and protection for the operable wall for the duration of the project.

3.03 Inspection:

A. Inspect the relevant aspects of the site such as the evenness of the floor, walls, structural steel, etc., and ensure that these are within the tolerances stated in Part – 1 (Site Conditions) of this specification. Confirm in writing to the General Contractor or contract manager any deviations from these tolerances. Do not proceed until these conditions are made good. Carry out all appropriate field measurements before manufacturing any components or assemblies.

3.04 Installation:

A. Install operable walls in accordance with the manufacturer's printed instructions. Installation shall be by an authorized factory trained installer. Installation shall be in accordance with ASTM E557 installation procedure.

3.05 Adjusting and Cleaning:

A. Adjust and fine-tune the operable walls to ensure that all seals are operating and sealing properly and that the operable walls are in correct and smooth operation.

B. Clean up any dirt, oil, grime, etc., that may have found its way onto the acoustical panels. Leave the wall in a state of architectural cleanliness.

3.06 Spare Parts:

A. Ensure the manufacturer has ample stock available for repairs.

3.07 Workmanship:

A. The complete installation of the operable wall system as called for and detailed on the drawings shall be provided in strict accordance with the drawings and manufacturers standard printed specifications, instructions and recommendations.

DISTRIBUTOR (New York, New Jersey, and greater Philadelphia area):

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