SECTION 08360(08344) – HORIZONTAL BI-FOLD DOOR

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and General Provisions of Contract, including General and Supplementary Conditions, apply to this contract.

2. SIZE OF DOOR – Clear Open Width & Height

2.1 Hangar Door in open position shall have a minimum clear width of _____ and a minimum clear height of _____ above the finished floor elevation as shown in the plans.

3. GENERAL / CONTRACTORS REQUIREMENTS – DESIGN CRITERIA

3.1 The bi-fold door shall be designed to the same loading requirements for live, dead and wind loads as the hangar/building.

3.2 The doors shall be engineered to resist all anticipated loads without sagging, bowing, or restricting its operation.

3.3 Design for wind load shall be as required by current local building code.

3.4 The building header shall be designed to accommodate horizontal and vertical building deflections to support the bi-fold door in all positions with proper lateral bracing

3.5 The building door columns shall be of proper design and size to carry all loads and vibrations imposed thereon by the bi-fold door.

4. GENERAL / ELECTRICAL REQUIREMENTS

4.1 The building contractor shall furnish and install a factory assembled electrical door operator to operate the bi-fold door

4.2 The contractor is responsible and required to completely install the electrical door operator, push button controls, accessories, and electrical conduit and wiring to the door operator controls.

4.3 Standard controls to include control panel, up/down/stop switch and latch disconnect switches to override operation of door when door is latched.

5. GENERAL / ELECTRIC POWER OPERATOR FOR BI-FOLD DOOR

5.1 All electrical controls and devices shall conform to the requirements of the current National Electrical Code 513, NEMA, and be UL approved.

5.2 Provide electric operator size and type as recommended by the manufacturer

5.3 The operator is furnished complete with a motor and factory assembled control panel consisting of a magnetic reversing starter, limit switches, push button controls, control circuit transformers, timing devices and thermal overload protection.

6. SUBMITTALS

6.1 Product data: Submit manufacturer's literature and spec sheet on the bi-fold door. Include details to allow building manufacturer to sufficiently design the building to accommodate the loads of the door. Including:

A. Summary of the forces imposed on the building header and jambs.

B. Details of proper sheeting and trim requirements to complete installation of the door.

6.2 Shop Drawings: Submit shop drawings for approval prior to fabrication. Including plan showing elevations, required clearance, and details of framing members and accessories.

6.3 Submit ____ copies of each of the following manufactures manuals

A. Bi-Fold Door Literature

B. Operators Manual

C. Building Design Spec Sheets

D. Installation Manual

7. QUALITY ASSURANCE

7.1 Source Limitations: Obtain Bi-Fold Doors through one source from a single manufacturer

7.2 Manufacturer Qualifications: Engage in a firm experienced in manufacturing bi-fold doors similar to those indicated for this project and with a record of successful in-service performance.

7.3 Installer Qualifications: Utilize an installer who is an authorized representative of the door manufacturer for both installation and maintenance.

7.4 Pre-Construction Conference: Schedule a pre-installation conference prior to the installation of the bi-fold door to establish optimum working conditions and coordinate the door install with adjacent work.

7.5 The contractor shall touch up all scratches and abrasions with same type of paint as originally applied.

8. DELIVERY STORAGE AND HANDLING

8.1 Delivery of materials and products and storing at jobsite shall adhere to manufacturer's instructions and recommendations. Protect from weather, excessive temperatures, and construction operations to avoid damage.

8.2 Inspect bi-fold doors upon delivery for damage. Notify manufacturer immediately if damages have occurred during shipment.

8.3 When storing bi-fold frames, place on blocking to elevate sections off the ground. Ensure that electrical components are protected from the elements.

8.4 The contractor shall store sheet, panels, components and other manufactured items to avoid damage. Store sheet metal or panels to ensure water will drain freely off product. Do not store sheets or panels in direct contact with other materials as this may cause staining.

9. APPROVED MANUFACTURERS

9.1 The bi-fold doors shall be supplied by a manufacturer who is regularly engaged in the manufacture of aircraft hangar doors for a minimum of ten years, and upon request from the owner shall provide a list of completed projects.

A. Standard of bi-fold door shall be Midland Bi-Fold Doors, 1021 7th St. NE, West Fargo, ND 58078, phone 701-277-8836 or equal.

10. BI-FOLD DOOR FRAMEWORK

10.1 Hangar doors shall be of the electrically operated bi-fold canopy type and shall be integral with the hangar building design.

10.2 When in the open position, the doors shall have a slight slope to ensure proper drainage of moisture away from the building.

10.3 Door shall be hinged horizontally at the top and center, and be designed to open by moving up and out.

10.4 Door frame shall have pre-located top hinges to align with the building truss members.

10.5 Door shall be self contained with only the top hinges, bottom rollers and column followers/wind rails outside of the frame.

10.6 Door frame shall be jig welded steel tube sections engineered by the door manufacturer to withstand all anticipated loads without bowing, sagging or restricting its operation.

10.7 Structural steel door framing members shall be ASTM A500 Grade B square or rectangular structurally welded steel tubing.

10.8 All labor, materials, accessories, equipment and services necessary to furnish a complete installation of a bi-fold door as indicated by the manufacturer. Including frame, brackets, guides, hardware, seals, and operators.

11. DRIVESHAFT / LIFT DRUM

11.1 BOTTOM OPERATOR: The solid steel drive shaft (ASTM 1018 Cold Finished Round) with cable lift drums shall be mounted on the bottom of door frame and run continuously along the entire door width to provide an even lift of the door.

11.2 TOP OPERATOR: The solid steel drive shaft (ASTM 1018 Cold Finished Round) shall be welded to cable drum to allow cable attachment in the header of the building.

11.3 The drive shaft shall be attached to the door frame / operator with cast iron 4-Bolt greaseable flange bearings to minimize stress on the shaft.

11.4 Drive shaft and cable drums shall be in sufficient quantity to ensure a 5:1 safety factor.

12. LIFTING METHODS

12.1 BOTTOM OPERATOR LIFT

A. Cables are fastened to bottom of top hinge tube, thereby transmitting forces directly to the header of the building. Cables are fastened to the lift drum by means of a slotted guide and swedging cable stops on the ends of the cables.

B. Lifting cables shall be ¼" galvanized aircraft cable minimum in sufficient quantity to ensure a 5:1 safety factor.

C. Lift drums shall be properly shielded to prevent possible danger to people.

12.2 TOP OPERATOR LIFT

A. Cables are fastened to the bottom truss of the door. Cables are fastened to the lift drum by means of a welded guide and swedging cable stops on the ends of the cables. Operator is mounted above opening in the header of the building.

B. Lifting cables shall be ¼" galvanized aircraft cable minimum in sufficient quantity to ensure a 5:1 safety factor.

13. HEAVY DUTY HINGES

13.1 High strength A715 grade 50 steel formed hinges shop welded to frame. Hinge pins are 5/8" or ¾" cold rolled hinge pins – lubricated on install

14. DOOR TRUSS

14.1 Interior Truss – Standard

A. High strength structural tube truss mounted in the interior center of the door. An additional truss will be mounted at the interior base of the door.

14.2 Exterior Truss – Optional

A. High strength structural tube truss mounted in the center of the door on the exterior of the door. An additional truss will be mounted at the interior base of the door.

15. HEAVY DUTY SIDE ROLLERS

15.1 Door side rollers shall be minimum 3" diameter bottom rollers with sealed bearings mounted on the bottom of the door at each jamb.

16. WINDRAILS

16.1 Wind rails are formed angle brackets mounted to the exterior frame and hold base of the door against jamb when in the closed position.

17. MANUAL LATCHING SYSTEM

17.1 Standard Over-center Cam Latch

A. One latch shall be provided near the center of the door.

B. Manual latching system requires operator to unlatch door before opening and latching of door when closed.

18. PRIMER

18.1 Door frame and parts shall be factory painted with a gray primer.

19. TOP AND BOTTOM RUBBER SEAL

19.1 Provide manufacturer's standard continuous rubber seal at the top and bottom of door.

20. METAL SHEETING FOR DOOR

20.1 Install door skin and trim to cover bi-fold door frame according to manufacturer recommendations.

20.2 Utilize same material used to side the exterior of the hangar/building.

21. ELECTRIC OPERATOR (Choose)

21.1 TOP MOUNT OPERATOR: Drive unit shall be mounted in the header of the building.

A. Service: 240 VAC, single phase

B. Motor: 1-1/2HP minimum totally enclosed fan cooled continuous duty with overload protection, belt driven to gear reducer (HP determined by size of door).

C. Control Box: 24 volt transformer, limit switches, contactors and control wiring is contained in a single enclosed unit.

D. Control Wiring: All control wiring is low voltage (24 VAC) to ensure safety. This includes but is not limited to the 3-push button control station, limit switches, and latch disconnect switches.

E. Control Station: NEMA 1 (Open, Close, Stop) momentary contact 3-push button control station to allow door to be started, stopped and reversed at any point.

F. Top / Bottom Limit Switches: Contained in control box to provide automatic shut-off of power when door reaches full open or closed position.

21.2. BOTTOM MOUNT OPERATOR: Drive unit shall be mounted on bottom frame of door.

A. Service: 240 VAC, single phase

B. Motor: 1-1/2HP minimum totally enclosed fan cooled continuous duty with overload protection, mounted with rear electric brake and gear reducer (HP determined by size of door).

C. Control Box: 24 volt transformer, limit switches, contactors and control wiring is contained in a single enclosed unit.

D. Control Wiring: All control wiring is low voltage (24 VAC) to ensure safety. This includes but is not limited to the 3-push button control station, limit switches, and latch disconnect switches.

E. Control Station: NEMA 1 (Open, Close, Stop) momentary contact 3-push button control station to allow door to be started, stopped and reversed at any point.

F. Top / Bottom Limit Switches: Contained in control box to provide automatic shut-off of power when door reaches full open or closed position.

21.3 All electrical controls and devices shall be designed to meet National Electrical Code Section 513.

22. EXECUTION

22.1 Examine all wall and overhead areas, including opening framing and bracing, to ensure compliance with the requirements for installation tolerances, clearances, and other conditions affecting the performance of work in this section.

23. INSTALLATION

23.1 General

A. Door manufacturer is required to coordinate with the building manufacturer in the design of the exact installation details by providing weights and loads to the building manufacturer.

B. Install door, track, and operating equipment complete with necessary hardware, seals, anchors and equipment supports according to shop drawings, manufacturer's written instructions, and as specified.

C. Building manufacturer to provide sway bracing, diagonal bracing and structural reinforcement to ensure proper installation of bi-fold door.

23.2 Control Box Limit Settings

A. Top and Bottom limit shall be set according to manufacturers recommended height. Do not over travel the door beyond the recommended settings.

23.3 Exterior Door Sheeting

A. Contractor to install the same exterior wall panels as are applied to the exterior wall of the building. Install proper trims per manufacturer's recommendations.

23.4 Apply Proper Safety Markings and Warning Labels

A. Installer shall fasten all safety and warning labels as required by the door manufacturer.

23.5 Installation of bi-fold door shall be completed by a qualified installer or by a manufacturer representative.

24. ELECTRICAL WORK

24.1 The contractor is responsible and required to completely install the pre-wired electrical door operator, push button controls, devices and electrical conduit to the door operator controls.

24.2 Differentiate between manufacturer installed and field installed wiring and between components provided by door manufacturer and those provided by others.

25. ADJUSTMENT & CLEANING

25.1 Lubricate, test and adjust doors to operate free from warp, twist or distortion and creating a weather tight fitting for the entire perimeter.

25.2 Primer touch up

A. Immediately after installation, sand smooth and rusted or damaged areas of prime coat.

B. Touch up damaged coating with rust inhibiting primer.

25.3 Final Adjustments:

A. Lubricate required moving parts and open and close limits to ensure easy operation free from warp, twist, and distortion.

B. Check and readjust operating finish hardware items.

26. DEMONSTRATION

26.1 Start-up services: Manufacturers representative to perform start-up services and to train Owner's personnel as specified:

A. Test and adjust controls and safety switches.

B. Train Owner's maintenance personnel on procedures and schedules related to operation, trouble shooting, servicing, and preventative maintenance.

C. Review data in the operator's manual.

27. WARRANTY

27.1 The contractor shall warrant the door to be free of defects and in accordance with the General Conditions, except the warranty shall be extended by a manufacturer's 3-year written warranty against defects in materials and workmanship.

28. ENTRY DOOR - Optional

28.1 Manufacturer shall provide walk in entry door incorporated within the bi-fold door frame.

28.2 Location of Walk-in Door – standing on the inside of building facing door

A. Inside right

B. Inside left

28.3 Walk-in door shall be insulated with steel skin and jambs. Nominal dimensions shall be 32" width x 72" height.

28.4 Lockset

A. Walk-in door shall be equipped with a cylindrical lock, manufactured by Schlage or equal.

B. Each door shall be keyed differently and shall be master keyed to the remainder of doors on the building.