1. General

Door Detail:

1.1.1. Provide a horizontal rolling hangar door for a clear opening ___wide by ___high in a __bi-parting, __unidirectional, __ floating group, or __independent configuration.
1.1.2. The hangar door shall consist of ___door leaves.
1.1.3. The hangar door shall be ___manually operated or ___motor operated.
1.1.4. Door manufacturer will furnish and warranty this horizontal rolling hangar door and all required accessories as specified herein.

Performance Requirements

1.1.5. Design horizontal rolling door including comprehensive engineering analysis by a qualified Florida professional engineer, using performance requirements and design criteria indicated.

1.1.6. Structural Performance: Provide horizontal rolling door capable of withstanding the effects of gravity loads and the following loads and stresses without evidence of permanent deformation of door components:

- Wind Load: Exterior and interior wind load pressure indicated on Project Drawings.
- Door Deflection Limits: Maximum deflection of L/120.
- Structural Deflection: Design horizontal sliding hangar doors as a system to withstand the upward and downward deflections of the cantilevered structure supporting and bracing the top of the hangar door system.

Wind Loads and Design Data:

This door shall be designed per the following:
1.1.7. _____ MPH Ultimate
1.1.8. ASCE 7-10
1.1.9. Exposure C
1.1.10. Risk factor 2
1.1.11. Enclosure classification +0.18 / -0.18 (GC pi)

Door Manufacturer & Installer

1.1.12. Hangar door basis of design shall be:
AeroDoor International, 2770 Dillard Road, Eustis. FL 32726 USA
Web: www.aero-door.com
Phone: 866.226.3667

1.1.13. Qualification Data: Door to be manufactured and installed by a company with at least 15 years experience in doors of this nature.
1.1.14. Metal building manufacturers are not an acceptable choice of hangar door manufacturer.
1.1.15. Doors shall be produced in a factory environment and with the highest level of quality control.

Delivery, Storage & Handling

1.1.16. Deliver materials which are not shop installed on the doors in original rolls, packages, containers, boxes, or crates bearing the manufacturer's name, brand, and model number. Store materials and equipment in dry locations with adequate ventilation, free from dust and water, and to permit access for inspection and handling. Handle doors carefully to prevent damage. Remove damaged items that cannot be restored to like-new condition and provide new items.

Submittals

1.1.17. Drawings showing detailed construction of the framing including bottom rail, top guide rails, structural door frame, wheels, top guide rollers, weather seals and any special additions. Signed and sealed by a registered P.E.

1.1.18. Engineering calculations package signed and sealed by a registered P.E.

1.1.19. Mill certifications for structural steel.

1.1.20. Drawings shall denote weld identifications, connection hardware, and any electrical door opener and control panel locations.

1.1.21. Wiring schematics shall include field wiring, location of junction boxes and physical locations of devices.

1.1.22. Product data for components within any electrical door opener and control panel.

1.1.23. User manual covering normal operation of all components, troubleshooting, and adjustments.

1.1.24. Manufacturer warranty certificate in Owner’s name.

Warranty

1.1.25. Door shall have a 5-year structural and workmanship warranty.

1.1.26. Electrical components and mechanical components shall have a 1-year warranty.

2. Products

Bottom Rail

2.1.1. Rail shall be provided per the size requirements of the door specifications.

2.1.2. Rail shall be fabricated from a minimum ASCE rail of 25lbs. per yard, mounted on leveling plates and tack welded to ensure level installation.

2.1.3. Leveling plates and double-nut anchor bolts shall be provided every 5ft on center.

Structural Door Frame

2.1.4. Main members both vertical and horizontal, shall be of continuous sections of new hot rolled structural steel equal to or exceeding ASTM A-36/A992 and comply with AISC specifications. Welds will be ground smooth and buffed.

2.1.5. Cold-formed C shapes shall be used only for girts and interior bracing and not as structural framing members. These will be spaced horizontally every 5ft.

2.1.6. All framing members shall be true to dimension and square without warping or bending more than 1/8” in twenty feet. Diagonal bracing shall be provided so

that the completed door section assembly will be adequately braced to withstand design loads.

2.1.7. For any door member, the deflection due to design wind load shall not exceed the member's length divided by 120.

Top Guide Rail, *also known as top track.*

2.1.8. Top guide rails will be an "I" beam shape and shall conform to ASTM specification A992 Grade 50 or better. Size, weight and length shall be as required for door design, wind loads and building requirements.

2.1.9. The bottom flange of the upper guide rail shall act as a retainer in conjunction with the upper guide roller assemblies to prevent the doors from accidental disengagement.

2.1.10. Guides shall be hot sections mounted to the building structure by welding or bolting. Steel hot rolled sections shall be butted to each section and aligned prior to welding.

2.1.11. End of travel bumpers are provided at the end of door travel.

2.1.12. Building supports every 10ft on center to be provided by others.

Top Guide Rollers

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NOTE: Select one type of top guide roller and delete other type
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2.1.13. The top guide roller is the telescoping type. Designed to move up and down within the specified live loading deflection of the roof in the vicinity of the door opening.

- Horizontal type with single or double steel rollers of suitable diameter and thickness for satisfactory performance under the designated load conditions.
- Horizontal and vertical wheels which are connected in such a manner as to transmit the specified wind loads from the door to the hangar structure and to prevent disengagement of the door from the upper guide rail.
- Wheels are equipped with lifetime lubricated bronze bushings to provide maintenance-free operation.
- Calculations to demonstrate the ability of transmitting tributary wind loads shall be provided.

2.1.14. The top guide roller is the fixed type. It has a fixed live load deflection limit.

- Horizontal type with single or double steel rollers of suitable diameter and thickness for satisfactory performance under the designated load conditions.
- Horizontal and vertical wheels which are connected in such a manner as to transmit the specified wind loads from the door to the hangar structure and to prevent disengagement of the door from the upper guide rail.
- Wheels are equipped with lifetime lubricated bronze bushings to provide maintenance-free operation.

Bottom Wheels

2.1.15. Provide a minimum of two wheels per door leaf. Wheels to be sized correctly to fit the bottom rail.

2.1.16. Wheels shall be manufactured from steel plates having a minimum tread diameter as required for the actual wheel loading. Treads to be machined concentric with the bearing seats.

2.1.17. Wheel Bearings: Shall be internal tapered roller type, arranged so that both horizontal and vertical loads shall be transferred to the rail only through the bearing. Bearings are equipped with dust seals and high-pressure grease fittings.

2.1.18. Wheels shall be removable from the housing without the need to remove the door from its position on the rail.

2.1.19. Wheels 18 inches or greater in diameter shall be heat-treated to obtain a rim hardness of 320 Brinell.

Weather Stripping

2.1.20. Weather stripping shall consist of 1/8" two-ply cloth inserted neoprene.

2.1.21. Vertical weather seals between the door leaves and the building jambs shall be flap type, full height of the door, held in place by metal retaining strips with rust resistant fasteners.

2.1.22. Leading edge leaves will have a bulb seal, full height of the door, held in place by metal retaining strips with rust resistant fasteners.

2.1.23. For telescoping top guide rollers there is an adjustable head flashing with floating seals attached to the telescopic guides to provide a seal at the top of the door.

2.1.24. For fixed top guide rollers the weather seal is secured to the exterior sheeting at the top of the door, and extends vertically upward until it creates an overlapping seal with the soffit closure plate.

2.1.25. Brush seal is provided to clear debris from the railhead as the door leaf is moved.

Electrical Door Opener & Controls

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NOTE: Select one type of door opener and delete other type (learn about both options here)

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2.1.26. Electric Motor operation shall be by Internal door opener.

- A complete drive system mounted internally within the door framing on each leading edge door leaf.
- The unit shall consist of the gear head motor operator, gearbox reducer, sprockets, chains, and electrical material to make a complete and operable system.
- Controls: door control buttons are by constant pressure. To stop door movement, release pressure from the control button. Heavy duty buttons located in oil-tight enclosures with mushroom head buttons.
- Electrical equipment meets the latest NEMA standards.
- Limit switches are provided to stop the travel of the door in both their fully open and closed positions.
- Warning Horn: Installed on the powered leaf of the door system not less than 45db. Automatically signals movement of the door and sounds continuously throughout door operation.
- In the event of a power failure the operator may be disconnected and operated manually without damage to the motor and gearbox.
- Each operator shall be provided with an acceptable means of emergency conversion to tug towing.

2.1.27. Electric Motor operation shall be by external door opener.

- A complete drive system with an external mounted rubber tire unit on each leading edge door leaf.

- The unit shall consist of the gear head motor operator, gearbox reducer, sprockets, chains, and electrical material to make a complete and operable system.
- Controls: door control buttons are by constant pressure. To stop door movement, release pressure from the control button. Heavy duty buttons located in oil-tight enclosures with mushroom head buttons.
- Electrical equipment meets the latest NEMA standards.
- Limit switches are provided to stop the travel of the door in both their fully open and closed positions.
- Warning Horn: Installed on the powered leaf of the door system not less than 45db. Automatically signals movement of the door and sounds continuously throughout door operation.
- In the event of a power failure the operator can be raised to allow for manual operation.
- Each operator shall be provided with an acceptable means of emergency conversion to tug towing.

Wiring & Power

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NOTE: Select one type of power and delete other type (learn about both here)
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2.1.28. Power shall be provided by an overhead trolley conductor bar.

2.1.29. The overhead conductor has 4 strips of copper that are energized; three for power and one for ground. The conductor bar system spans the width of the doors opening and is fitted between the top guide rails that require power.

2.1.30. All conduit, fittings and junction boxes to wire and connect to and between all electrical equipment shall be by others unless specified in the installation scope.

2.1.31. Power shall be provided by SOOW Cable.

2.1.32. All conduit, fittings and junction boxes to wire and connect to and between all electrical equipment shall be by others unless specified in the installation scope

3. Execution

Fabrication

3.1.1. All Shop fabrication shall be in accordance with standard practice of the American Welding Society and shall be done in a neat and workmanlike manner.

3.1.2. All primary door frame connections shall be welded or bolted using workmanlike methods. Exposed joints and connections shall be neat, clean and close fitting. All welded joints shall develop 100 percent of the strength of the intersecting members.

3.1.3. Fasteners: All bolts used for structural connections will be Grade 5 or A 325 or better. All fastener, nut and washer finishes shall conform to ASTM Specification

#B-117-57T for 6 hour Salt Spray Test for zinc or cadmium coating. Grade 2 or A 307 bolts are not acceptable for hangar door application.

Fabrication Paint

3.1.4. Door framing members shall be thoroughly cleaned of loose scale, dust or other objectionable materials, which would otherwise interfere with the bond of paint with steel.
3.1.5. All structural steel is cleaned to a minimum of SSPC-SP3 standard.
3.1.6. All shop painting will be done in dry weather, under cover and free from moisture.
3.1.7. All steel shall be cleaned and coated with one coat of rust inhibiting red oxide primer. All finish paint and special coatings if required are to be done by others.

Installation

3.1.8. Installation by hangar door manufacturer is preferable.
3.1.9. Supply anchor bolts for installation by others.
3.1.10. Install levelling angles, bottom rail system, upper top guide rails, door leaves and accessories in accordance with approved shop drawings.
3.1.11. Do not erect the upper guide rails or door leaves until the work of other trades in preparing the opening has been completed and the hangar roof is under full dead load.
3.1.12. Installation shall include electrical components; limit switches, light/buzzer, control panel, overhead trolley conductor bar or SOOW Cable.
3.1.13. Installation shall include all necessary conduit, wire, and j-boxes to interconnect electrical components on the door.

Field Quality Control

3.1.14. Immediately after the door installation is complete, the door manufacturer shall perform a complete operating test in the presence of the Owner and Architect. Correct defects disclosed by the test. Retest the doors and adjust them until the entire installation is fully operational and acceptable to the Owner and Architect.

4. Work Excluded

4.1.1. Concrete work, drainage, rail deicing.
4.1.2. Vertical and horizontal supports every 10 feet on center for doors top guide rails.
4.1.3. Soffit closure plate sandwiched between top guide rails.
4.1.4. Walk Doors, Windows, Exit signs, lights, vents, signage.
4.1.5. Exterior sheeting, insulation, interior liner panels, perimeter trim, flashing.
4.1.6. Service power to be brought to door opening by others.
4.1.7. Touch up coating, finish painting or any specialist coatings.

END OF SECTION
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