SECTION 08 34 00

CUSTOM SINGLE-PANEL HYDRAULIC DOORS

\*\* NOTE TO SPECIFIER \*\* PowerLift Doors; hydraulic doors.
This section is based on the products of PowerLift Doors, which is located at:
305 4th Street, Suite B
Brookings, SD 57006
Toll Free Tel: 855-368-9595
Tel: 507-368-9500
Fax: 507-368-1358
Email: info@powerliftdoors.com
Web: [http://www.powerliftdoors.com](http://www.powerliftdoors.com/)

Since 1992, PowerLift has exemplified quality, reliability and service in the development of hydraulic door systems to suit any application. Every door is custom built, delivered and installed by factory trained, certified PowerLift professionals.
PowerLift has a sterling reputation through unwavering commitment to innovation, quality and customer service. Established in 1992, the PowerLift design became the gold standard in aviation, agriculture, commercial and architectural doors. Rapid expansion led to construction of a much larger shop. PowerLift door inquiries began coming in from all over North America.
Realizing that it is impossible for one manufacturing facility to offer local installation, service and support across a continent we entered a new expansion phase. We found other steel fabricators who share our customer centered quality and service ideals. Instead of a single production point, PowerLift now has over 40 manufacturing and service centers across North America.
Our single source accountability business model means every PowerLift location offers professional design, sales, manufacturing, delivery, installation and support.
Please see our ' Locations' page for a location near you. Look over our project pictures for details on PowerLift projects in many applications.

1. GENERAL
	1. SECTION INCLUDES

\*\* NOTE TO SPECIFIER \*\* Delete items below not required for project.

* + 1. Custom designed single-panel hydraulic doors.
	1. RELATED SECTIONS

\*\* NOTE TO SPECIFIER \*\* Delete any sections below not relevant to this project; add others as required.

* + 1. Section 05 50 00 - Metal Fabrications. Door opening jamb and head members.
		2. Section 06 10 00 - Rough Carpentry. Door opening jamb and head members.
		3. Section 07 20 00 - Thermal Protection.
		4. Section 08 31 16 - Access Panels and Frames. Access doors.
		5. Section 08 70 00 - Hardware.
		6. Section 09 70 00 - Wall Finishes.
		7. Section 09 91 00 - Painting. Field painting.
		8. Division 26 - Electrical wiring and conduit, fuses, disconnect switches, connection of operator to power supply, installation of control station and wiring, and connection to alarm system.
	1. REFERENCES

\*\* NOTE TO SPECIFIER \*\* Delete references from the list below that are not actually required by the text of the edited section.

* + 1. ASTM International (ASTM):
			1. ASTM A500 - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
			2. ASTM A36 – Standard Specification for Carbon Structural Steel.
		2. American Society of Civil Engineers (ASCE):
			1. ASCE 7 - Minimum Design Loads for Buildings and Other Structures.
		3. American Welding Society (AWS).
		4. Hydraulics Institute (HI).
		5. International Building Code (IBC).
		6. National Electric Code (NEC),
		7. National Fire Protection Association (NFPA).
	1. SUBMITTALS
		1. Product Data:
			1. Manufacturer's data sheets on each product to be used.
			2. Preparation instructions and recommendations.
			3. Storage and handling requirements and recommendations.
			4. Typical installation methods.
		2. Shop Drawings: Include details of materials, construction and finish. Include relationship with adjacent construction.
		3. Delegated-Design: For systems indicated by a Registered Professional Engineer, Certified and Licensed in the state or municipality the project is located:
			1. Details of fabrication of components.
			2. Signed and sealed design calculations for systems indicated used to determine load carrying capacities.
			3. Analysis data, signed and sealed.
			4. Sizing methods and calculations, signed and sealed.
	2. QUALITY ASSURANCE
		1. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with a minimum five years documented experience.
		2. Installer Qualifications: Company specializing in performing Work of this section with minimum two years documented experience with projects of similar scope and complexity.
		3. Source Limitations: Provide each type of product from a single manufacturing source to ensure uniformity.
	3. DELEGATED DESIGN
		1. Engage a qualified professional engineer, as defined in Section 01 40 00 - Quality Requirements "Quality Requirements," to design indicated systems and equipment.
			1. Must be licensed in State or Municipality the project is located.
			2. Comply with performance requirements and design criteria.
	4. DELIVERY, STORAGE, AND HANDLING
		1. Store and handle in strict compliance with manufacturer's written instructions and recommendations.
		2. Protect from damage due to weather, excessive temperature, and construction operations.
	5. PROJECT CONDITIONS
		1. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.
	6. WARRANTY
		1. Manufacturer's standard limited warranty including seven (7) year warranty on materials and workmanship of the door structure and three (3) year warranty on electrical and hydraulic components.
1. PRODUCTS
	1. MANUFACTURERS
		1. Acceptable Manufacturer: PowerLift Doors, which is located at: 1482 200th Ave. P.O. Box 311; Lake Benton, MN 56149; Toll Free Tel: 855-368-9595; Tel: 507-368-9500; Fax: 507-368-1358; Email: [request info (info@powerliftdoors.com)](https://admin.arcat.com/users.pl?action=UserEmail&company=PowerLift+Doors&coid=49211&rep=&fax=507-368-1358&message=RE:%20Spec%20Question%20(08340pwl):%20%20&mf=); Web: <http://www.powerliftdoors.com>

\*\* NOTE TO SPECIFIER \*\* Delete one of the following two paragraphs; coordinate with requirements of Division 1 section on product options and substitutions.

* + 1. Substitutions: Not permitted.
		2. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00 – Product Requirements.
	1. PERFORMANCE AND DESIGN REQUIREMENTS

\*\* NOTE TO SPECIFIER \*\* Wind load and Dead load are dependent upon location-specific geographic features, design wind speeds, risk category, and cladding and insulation weights.

* + 1. The Custom hydraulic door design is to comply with relevant IBC, NEC, and NFPA standards and relevant local codes governed by authorities having jurisdiction at the Project location. Where standards and local codes differ, the stricter is to apply.
		2. Typical Hydraulic Door Reaction Design Parameters:
			1. Wind Load:
				1. Equal to **(specifier to complete)** miles per hour wind speed.
				2. Wind Exposure **(specifier to complete B, C, or D).**
				3. Risk Category **(specifier to complete I, II, III, or IV).**
			2. Door Final Clear Opening Size: **(specifier to complete)** feet wide by **(specifier to complete)** feet tall.
			3. Door Manufacturer to provide specific door reaction design parameters including all anticipated cladding and insulation upon award of contract.
	1. HYDRAULIC DOORS
		1. Basis of Design: PowerLift Hydraulic Door as designed and furnished by a licensed PowerLift manufacturing location.
			1. Construction of Panel and Frame Sections:
				1. Framing:

 Structural steel tubing: ASTM A500 minimum

 Structural steel flats, bars, angles: ASTM A36 minimum

 Hinge Pins: ASTM 1144 Stress Proof or AISI 4140 Heat Treated

* + - * 1. Frames: Structural steel tubing and other structural steel shapes:

 Design to same loading requirements for live, dead and wind loads as the surrounding construction.

 Maximum Spacing:

 Between Vertical Members: 96 inches (2438 mm).

 Between Horizontal Members: 48 inches (1219 mm).

* + - * 1. Panel Frame: Factory-welded at all joints and connections, with smooth welds minimum 1/4 inch (6 mm) thick.
				2. Frame and Panel System: Swinging door leaf panel mounted to manufactured door frame:

 Door leaf panel NOT to be mounted directly to building header

* + - * 1. Cane Bolts: On larger width doors, cane bolts may be added to inside of bottom door truss near door center adding strength at the door truss location:

 If Severe or Abnormal Weather is Anticipated: Cane bolts are to engage by lowering bolt into a hole in the floor slab. This will aid in preventing building or door damage.

 Normal Weather Conditions: Cane bolt may be left in the raised disengaged position.

 Never operate door when cane bolts are in the lower engaged position.

* + - 1. Hinges: Silent, greaseless, efficient, with zero maintenance:
				1. Permanent Bronze Bushings: Teflon impregnated providing a greaseless solution to hinge lubrication.
				2. Hinge Pin: Yield Strength: 100,000 psi (689475.7 kPa).
			2. Factory-Supplied Upper Weather Stripping: Shipped with frame and door panel for field-install.
			3. Factory-Supplied Lower Weather Stripping: Installed on door panel before installation.
			4. Hydraulic Doors: Operated by hydraulic cylinders mechanically fastened to swinging door leaf and door frame.
			5. Two Hydraulic Cylinders: open and close hydraulic door. Design to carry required loads during operation, open position, and closed position:
				1. Internal Stops: Installed to prevent over-extension of cylinders, restricting system from opening or closing beyond its limits.
				2. Equipped with restrictors to control oil flow on the down cycle.
				3. Hidden Cylinder Design: Doors up to 30 feet wide and 12 feet tall may be constructed such that the hydraulic cylinders are completely hidden when the hydraulic door is in the closed position, visible in the open position.
			6. System to Lock Closed: Hydraulic cylinders to provide a minimum of 1,000 lbf of total closing force.
			7. Electric over hydraulic locks on cylinder ports:
				1. Standard for all SuperMax doors (optional all other sizes).
				2. Normally closed hydraulic valve opens when power unit toggle switch is pressed, closes when toggle switch is released.

\*\* NOTE TO SPECIFIER \*\* Hydraulic doors will be powered by one or more of the following options. While these are the most common operating systems for a PowerLift door there may be special circumstances that require a different operating system. Please contact your PowerLift installer if you have additional questions regarding your operating system. Delete options not required.

* + - 1. Hydraulic Power Unit:
				1. Power: 1 HP:

 110 VAC Single-Phase: Requires 20 Amp breaker.

 Toggle Style Switch:

 Push in desired direction according to labels; raise or lower.

 Switch requires constant pressure to operate.

 When pressure on switch is released, pump operation stops causing door to stop and stay at door's present position.

* + - * 1. Power: 3 HP:

 230 VAC Single-Phase: Requires 30 Amp breaker.

 Toggle Style Switch:

 Push in desired direction according to labels; raise or lower.

 Switch requires constant pressure to operate.

 When pressure on switch is released, pump operation stops causing door to stop and stay at door's present position.

* + - * 1. Power: 5 HP:

 230 VAC Single-Phase: Requires 40 Amp Breaker

 230 VAC 3-Phase: Requires 40 Amp breaker.

 460 VAC 3-Phase: Requires 20 Amp breaker.

 Toggle Style Switch:

 Push in desired direction; raise or lower.

 Switch requires constant pressure to operate.

 When pressure on switch is released, pump operation stops causing door to stop and stay at door's present position.

\*\* NOTE TO SPECIFIER \*\* For Max/ MaxPlus PowerLift Doors. Delete options not required.

* + - * 1. Power: 10 HP:

 230 VAC Single-Phase: Requires 70 Amp breaker.

 230 VAC 3-Phase: Requires a 70 Amp breaker.

 460 VAC 3-Phase: Requires a 35 Amp breaker.

 Double Push Button Controls:

 Push button for desired direction; raise or lower.

 Buttons require constant pressure to operate.

 When pressure on button is released, pump operation stops causing door to stop and stay at door's present position.

\*\* NOTE TO SPECIFIER \*\* Only on SuperMax PowerLift Doors. Delete options not required.

* + - * 1. Power: 15 HP:

 230 VAC 3-Phase: Requires 110 Amp breaker.

 460 VAC 3-Phase: Requires 50 Amp breaker.

 Double Push Button Controls:

 Push button for desired direction; raise or lower.

 Buttons require constant pressure to operate.

 When pressure on button is released, pump operation stops causing door to stop and stay at door's present position.

\*\* NOTE TO SPECIFIER \*\* Only on SuperMax PowerLift Doors. Delete options not required.

* + - * 1. Power: 20 HP:

 230 VAC 3-Phase: Requires 140 Amp breaker.

 460 AC 3-Phase: Requires 70 Amp breaker.

 Double Push Button Controls:

 Push button for desired direction; raise or lower.

 Buttons require constant pressure to operate.

 When pressure on button is released, pump operation stops causing door to stop and stay at door's present position.

* + - * 1. Electric motor and pump are combined into one self-contained unit located adjacent to the door.

 Fastened to Framing: Four, 1/4 inch (6 mm) lags.

* + - * 1. The Owner is responsible for providing electrical power connections for the pump unit.
				2. Electrical power installation is to meet federal, state and local codes.
				3. Pre-wired and factory tested. Final hook-up by others.
				4. Controls: Wired for constant-hold operation to raise or lower the door.

 Controls Height: 72 inches (1829 mm) or higher from finished floor.

* + - * 1. Hydraulic Oil: ISO 32 or ISO 22
			1. Alternative Hydraulics: Allow door operation when electrical pump has lost power.
				1. Two Male Pioneer Style Hydraulic Connections: Pump side, adjacent to pump.
				2. Hydraulic Oil in Pump Reservoir: Must be compatible with equipment to operate door.
				3. Parker Couplers: Allow hook up to hydraulics under pressure.
		1. Finishes:
			1. System Frames and Panels: Cleaned and painted with direct to metal paint, prepared for field finish.
			2. Exterior Field Finish: By others. Door Manufacturer is to approve finishing and application.
			3. Interior Field Finish: By others. Door Manufacturer is to approve finishing and application.

\*\* NOTE TO SPECIFIER \*\* The available accessories are optional. Delete options not required or delete the paragraph in its entirety.

* + 1. Available Accessories and Options:
			1. Walk-door framing.
			2. Window framing.
			3. Inside-facing bottom door truss.
			4. Secondary Bottom Door Seal:
				1. Foam core seal for heated/cooled facilities
			5. Backup Operating System:
				1. Self-contained power unit mounted to a two wheeled cart.
				2. Requires 12 VDC deep cycle battery; group 27 recommended.
				3. Door Operation Pendant:

 Push desired button on pendant to raise and lower door.

 Pendant buttons require constant pressure to operate.

 When button pressure is released, the pump stops causing the door to stop moving and stay at its present position.

* + - 1. Radio Remote Control System:
				1. Remote operates power unit motor by energizing internally wired relays.
				2. Two wireless transmitters standard.

 Additional transmitters available.

* + - * 1. Shared power between power unit and remote system.
				2. Push desired button to raise and lower door.
				3. Operation of remote transmitter requires constant button pressure to operate.
				4. Small lights on remote will flash when sending a signal to receiver.
				5. When button pressure is released pump operation stops causing door to stop moving and stay at the door's present position.
				6. Remote control requires batteries.

 Change out batteries and inspect remote yearly to prevent damage to remote.

* + - * 1. Should the remote not energize the motor verify that the motor has electrical power or replace the remote control batteries.
				2. If the battery shows signs of corrosion, change them out immediately to prevent damage to the transmitter.
			1. Cellular Phone Remote Control System:
				1. System functions on standalone Wi-Fi network isolated from Internet using a cellular phone app:

 Plastic electrical enclosure mounted adjacent to pump:

 Dimensions: 14 inches tall by 11 inches wide by 8 inches deep.

 Electrical connections to power unit routed through flexible liquid tight conduit.

 Shared power between power unit and remote system

 Wi-Fi access point mounted to exterior of building adjacent to door on power unit side minimum 10 feet above finished floor.

 Ethernet cable routed from electrical enclosure to Wi-Fi access point.

* + - * 1. Wi-Fi signal operates power unit motor by energizing internally wired relays.
				2. Push desired button on cellular phone application to raise and lower door.
				3. Operation requires constant button pressure to operate.
				4. When button pressure is released pump operation stops causing door to stop moving and stay at door's present position.
			1. Electric over hydraulic locks on cylinder ports:
				1. Normally closed hydraulic valve opens when power unit toggle switch is pressed, closes when toggle switch is released.
			2. Powder coat paint finish: Frame and door leaf Panel.
			3. Battery Back-Up System: 24 VDC:
				1. Integrated with power units 10 horsepower and up
			4. Warning horn with strobe light assembly.
			5. Key operation switch:
				1. A key is required to open and close the door.
		1. Operation: Constant-contact toggle switch or key switch operates hydraulic cylinders mounted to door. Hydraulic system extends and retracts hydraulic cylinders to open and close door.
1. EXECUTION
	1. EXAMINATION
		1. Do not begin installation until substrates have been properly constructed and prepared.
		2. If substrate preparation is the responsibility of another installer, notify Architect in writing of unsatisfactory preparation before proceeding.
		3. Building rough opening jambs and header to be plumb and level within ¼” from end to end.
		4. Foundation below door to be level and flat within ½” variation across door opening.
	2. PREPARATION
		1. Clean surfaces thoroughly prior to installation.
		2. No materials of any kind may protrude from building surface between manufacturer door frame and building structure (jambs, header).
	3. INSTALLATION
		1. Install in accordance with manufacturer's instructions, approved submittals, and in proper relationship with adjacent construction.
			1. Installation of custom designed hydraulic door completed by licensed door manufacturer personnel only.
				1. Wood Rough Opening: Door frame attached to building using wood lag screws.
				2. Concrete Rough Opening: Door frame attached to building jamb and header using concrete wedge, screw, or epoxy anchors.
				3. Steel Rough Opening: Door frame stitch welded to building jamb and header.
	4. FIELD QUALITY CONTROL
		1. Field Inspection: Coordinate field inspection in accordance with appropriate sections in Division 01.

\*\* NOTE TO SPECIFIER \*\* Include if manufacturer provides field quality control with onsite personnel for instruction or supervision of product installation, application, erection or construction. Delete if not required.

* + 1. Manufacturer's Services: Coordinate manufacturer's services in accordance with appropriate sections in Division 01.
	1. CLEANING AND PROTECTION
		1. Clean products in accordance with the manufacturers recommendations.
		2. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION