



Hydra Wedge™ (SM50)

Installation Instructions



Models

- HydraWedge SM50
- HydraWedge SM50 UPS
- HydraWedge SM50 Twin
- HydraWedge SM50 Twin UPS



Pictured: Two controllers for twin model



a company of TheNiceGroup

800-321-9947 www.hysecurity.com

Domestic & internationally certified, shallow mount wedge barrier with HydraSupply XL and Smart Touch Controller

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HydraWedge SM50: Plan Site Design

HydraWedge SM50



Remember to order hose through HySecurity! In addition to conduit length, make sure to measure hose requirements inside the wedge plate and HydraSupply XL.

1 Read & Plan

Prior to installing the HydraWedge SM50 and HydraSupply XL, read and follow the *Important Safety Information* provided in the *Programming and Operations Manual*. Make sure to conform to site specifications and all local and federal regulations and codes.

2 Measure and Calculate

Pay attention to clearance requirements for rebar around the foundation. See page 4 and page 6. Allow for access to mechanical parts. Consider placement of the HydraSupply XL cabinet and accommodate for door swing.

3 Design Vehicle Loops

Keep in mind the shallow depth of the rebar and the size of the wedge base frame. To avoid signal interference, use shielded wire, conduit for the lead in loop wires and design a minimum spacing of 8 inches (20 cm) between the wedge base frame and loop edge.

NOTE: Loop layout is dependent on uni- or bi-directional traffic, width of wedge and roadway. For smaller-sized vehicles, detection loss may occur if vehicle remains on wedge plate.

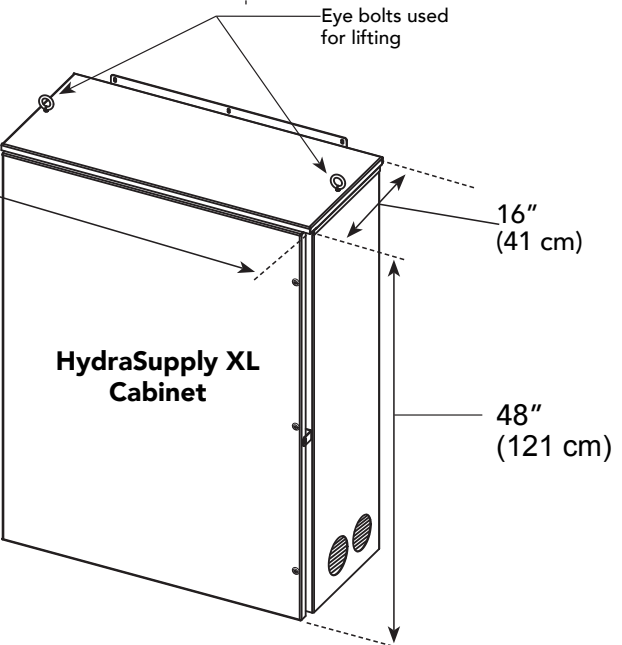
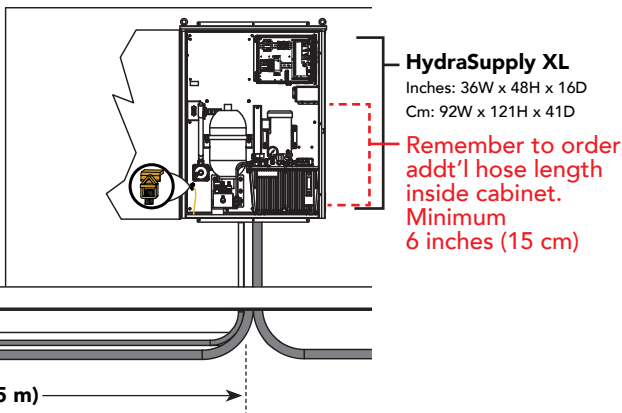
4 Install Conduit for Communication and Power

Locate and install the HydraSupply XL within 80 feet (25 m) of the HydraWedge SM50.

NOTE: Order hose through HySecurity. See CAUTION above.

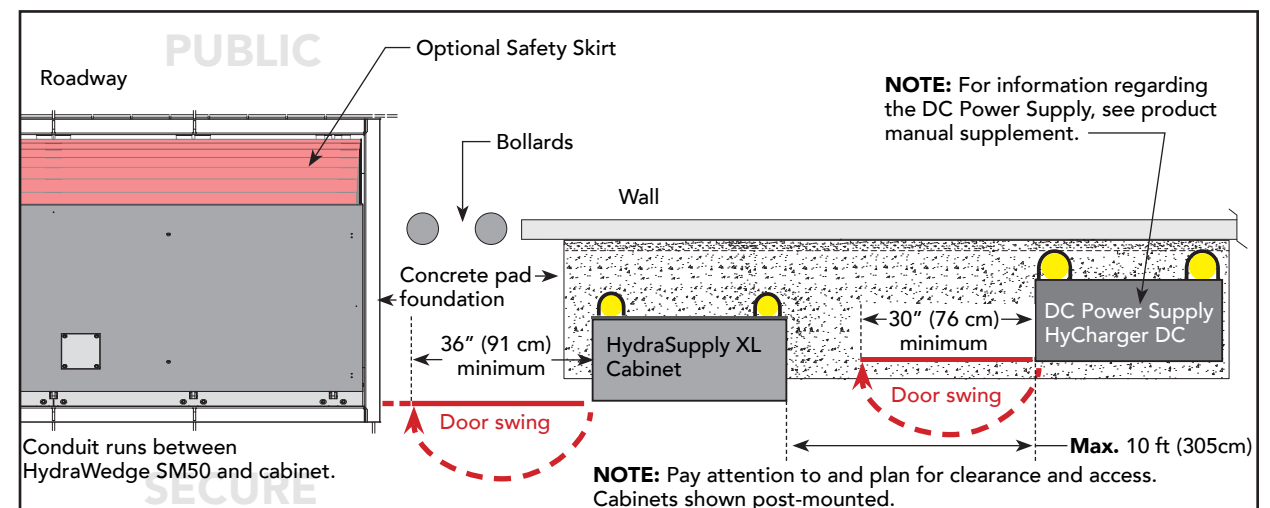
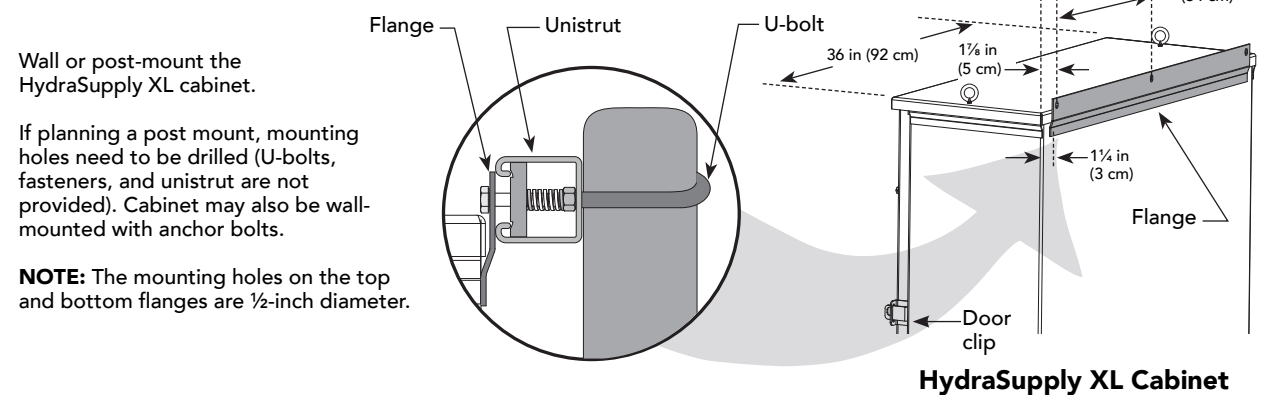
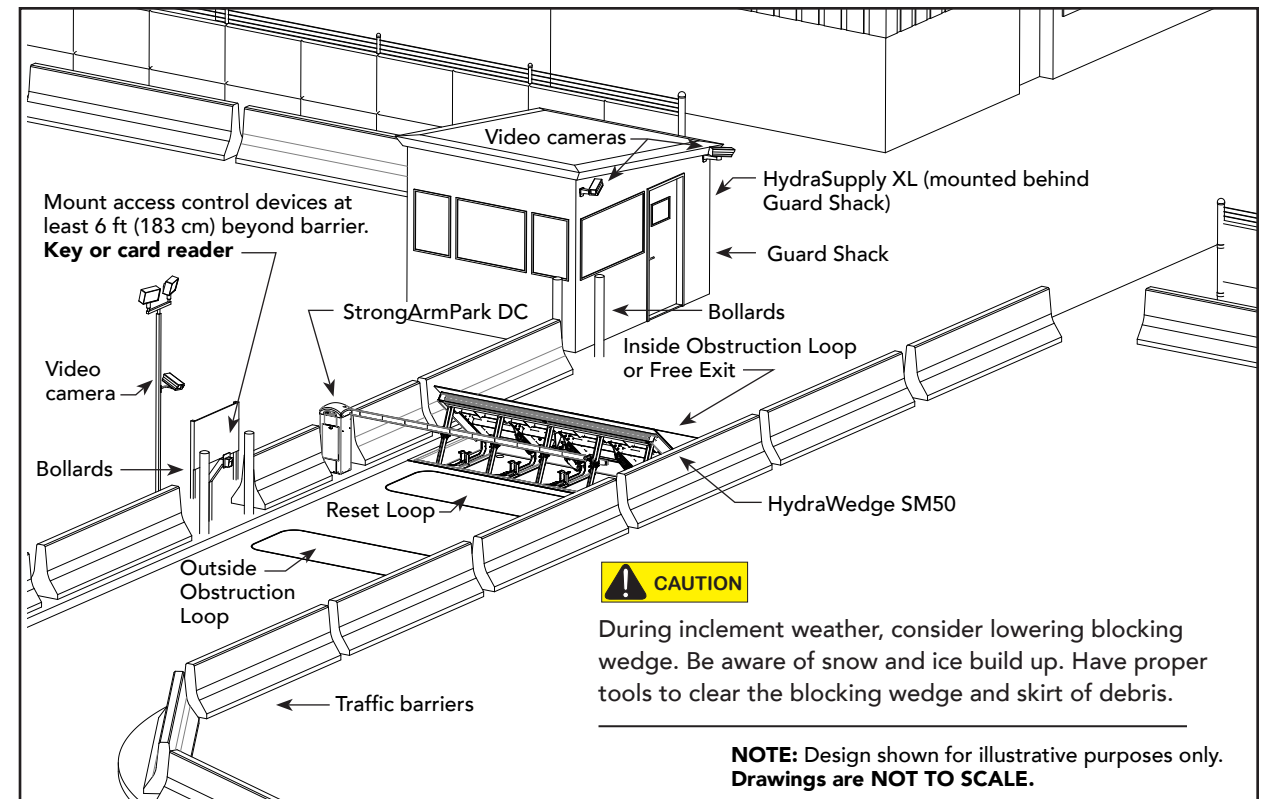
Hose length in feet (Total Run)	Hose Diameter	mm
0 to 50 ft (15 m)	3/8 inch	10
50 to 100 ft (15 to 31 m)	1/2 inch	13

Minimum conduit required	No.	Min. Size	mm
Hydraulic hoses	1	3 inch (4 inch conduit recommended)	76 (101)
Limit switches	1	3/4 inch	20
AC Main power	1	1 inch	25



Life-threatening danger due to incorrect installation and initial commissioning. Installation errors and improper electrical connections may cause life-threatening situations or a considerable extent of property damage which is not covered by the Warranty. To mitigate danger to life and property, thoroughly read these installation instructions and the Important Safety Information found in the Programming and Operations Manual. Plan site design and construction for proper operation and commissioning. Consult with qualified and authorized engineers.

Drawings are NOT TO SCALE.



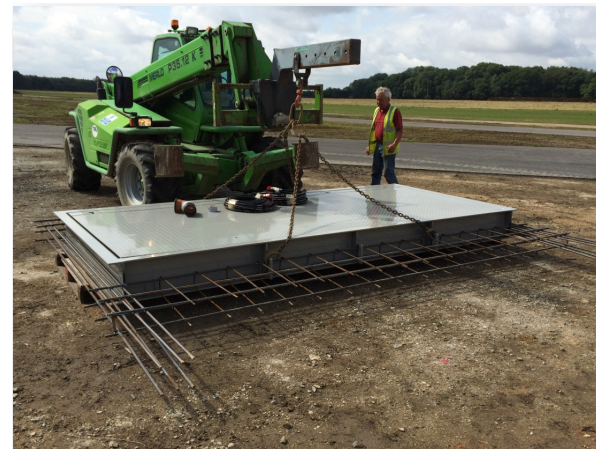
HydraWedge SM50: Attach Rebar

1 Moving the HydraWedge SM50 on Site

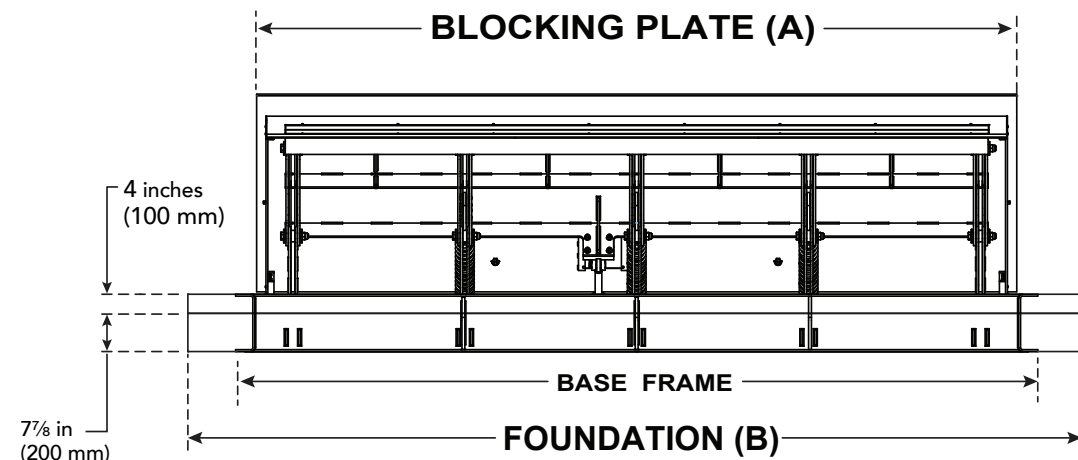
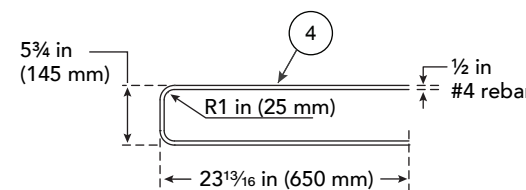
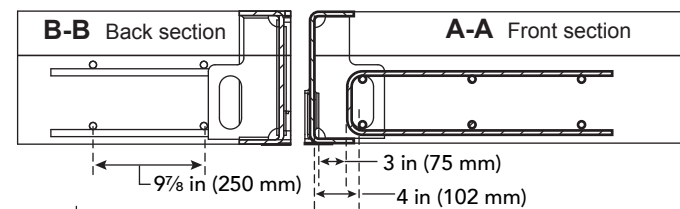
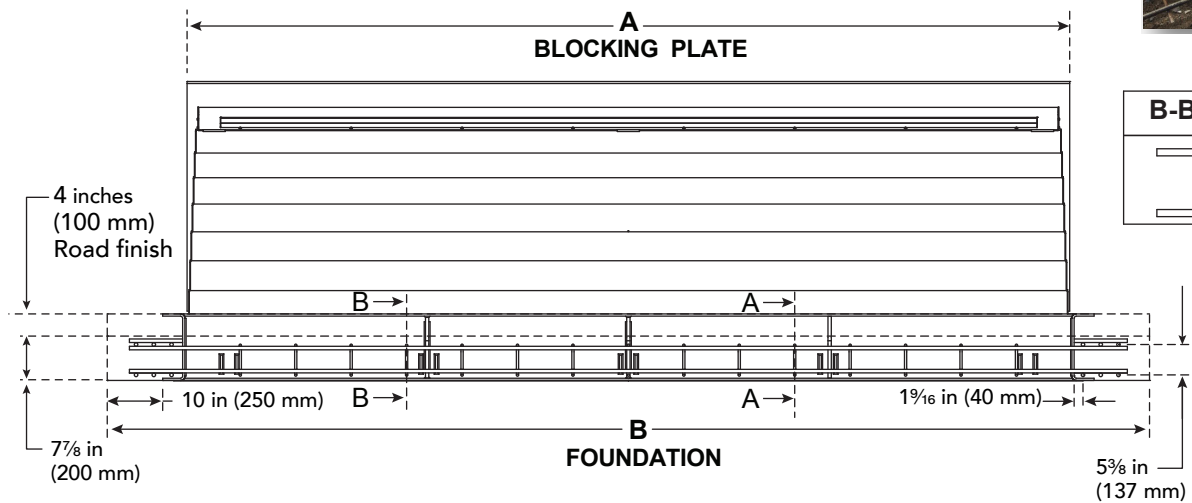
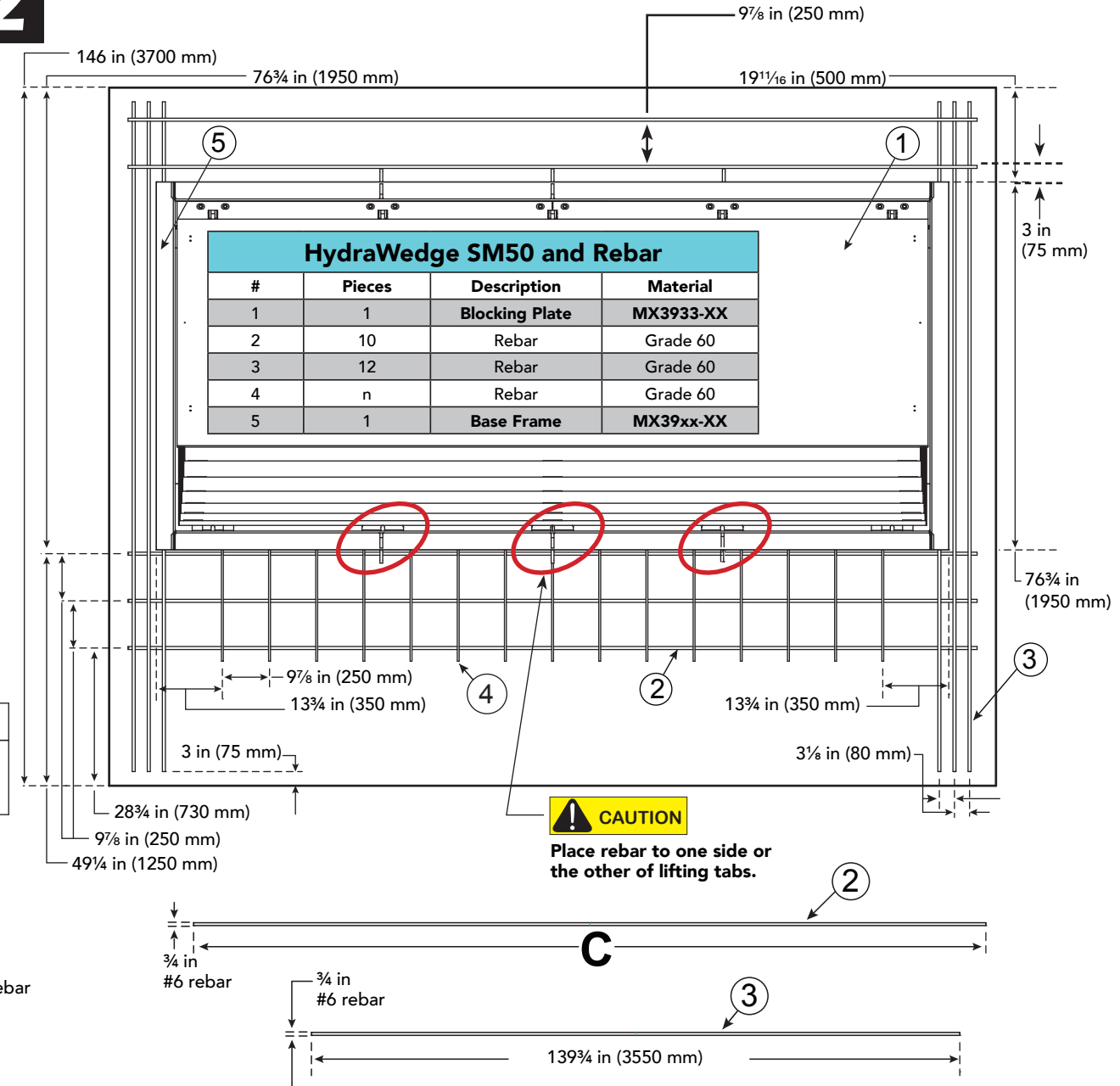


If improperly shipped or transported, damage may occur to the equipment and void the Warranty. Considerable property damage can ensue.

- To avoid shifting during transport, all equipment must be securely fastened by means of shims and tie downs (lashing straps).
- During lifting and transport, use all four lifting points (HydraWedge SM50) and the two eye bolts (HydraSupply XL) provided.
- To transport and move the HydraWedge SM50 and HydraSupply XL, use only those vehicles that are approved for, and meet, the necessary load-bearing requirements.
- Observe and follow all local and federal regulations regarding suspended loads.
- Proceed with caution when unloading the equipment. Observe, read, and follow all equipment labels, precautions, and instructions.
- At the site, remove packing materials before assembly and installation.
- Observe, read and follow all safety instructions for the moving equipment used to transport the HydraWedge SM50 or HydraSupply XL at the site location.
- The HydraWedge SM50 and HydraSupply XL are delivered fully assembled. Rebar supports for the HydraWedge SM50 must be supplied and fitted on site by a third party.



2 Attach Rebar



HydraWedge SM50: Blocking Plate (A), Foundation (B) & Rebar (C)

	2.0 m Blocking Plate		2.5 m Blocking Plate		3.0 m Blocking Plate		3.5 m Blocking Plate		4.0 m Blocking Plate	
	Inches	mm	Inches	mm	Inches	mm	Inches	mm	Inches	mm
A	78	1980	97 1/2	2480	117	2980	137	3480	156 1/2	3980
B	106 1/2	2700	126	3200	146	3700	165	4200	185	4700
C	98 1/2	2500	118	3000	138	3500	157 1/2	4000	177	4500
n		7		9		11		13		15

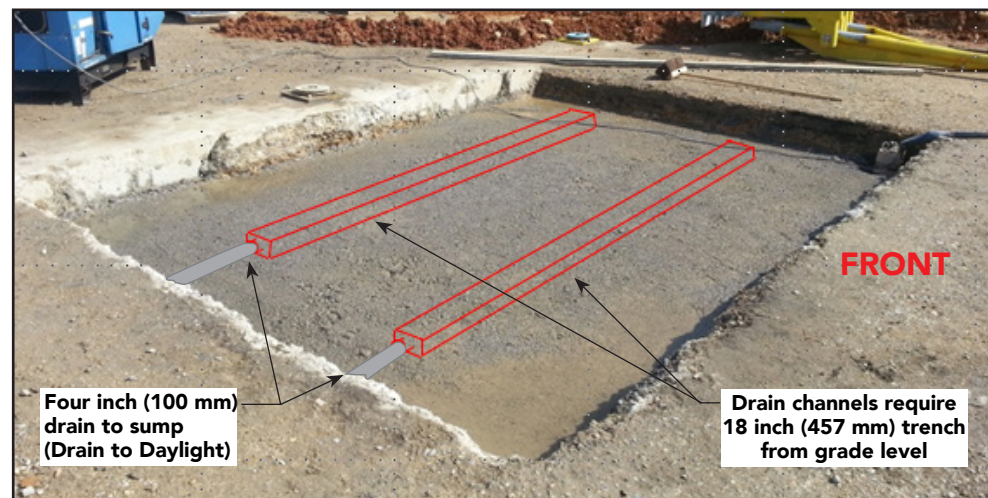
HydraWedge SM50: Prep Foundation

1 Prepare HydraWedge SM50 foundation

To ensure the stability of the HydraWedge SM50, the foundation must be constructed in accordance with the following guidelines:

- Excavate a hole for the foundation to house the base frame, blocking plate, and drainage assemblies. Soil compression under and around the foundation shall be compacted to a soil density of 95% of standard proctor (ASTM-698) and must meet local code regulations.
- Add gravel where necessary to ensure a solid soil base. Soil must be stable and adequate to support the weight of the base frame. Drainage or drainage channels must be incorporated in the design and final pour to adequately handle surface runoff and wet environs.
- The concrete properties must be, at minimum 4600 psi. A smooth finish is required and the foundation must sit flat, level, and plumb.

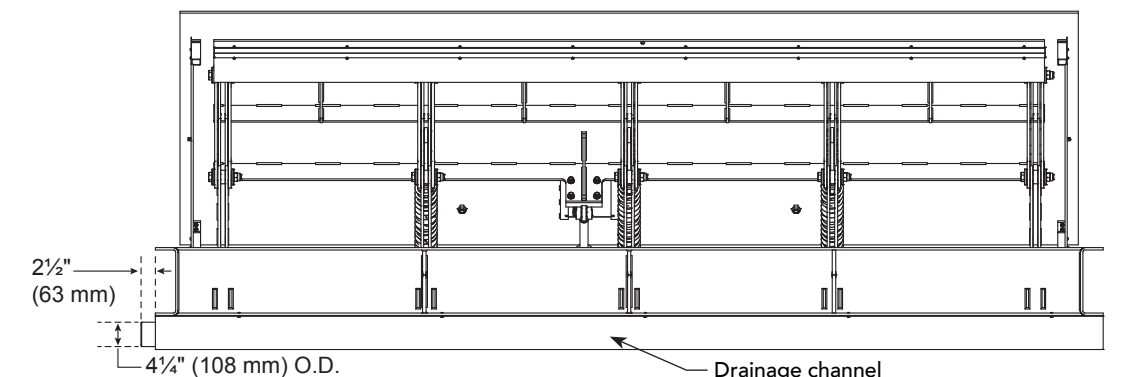
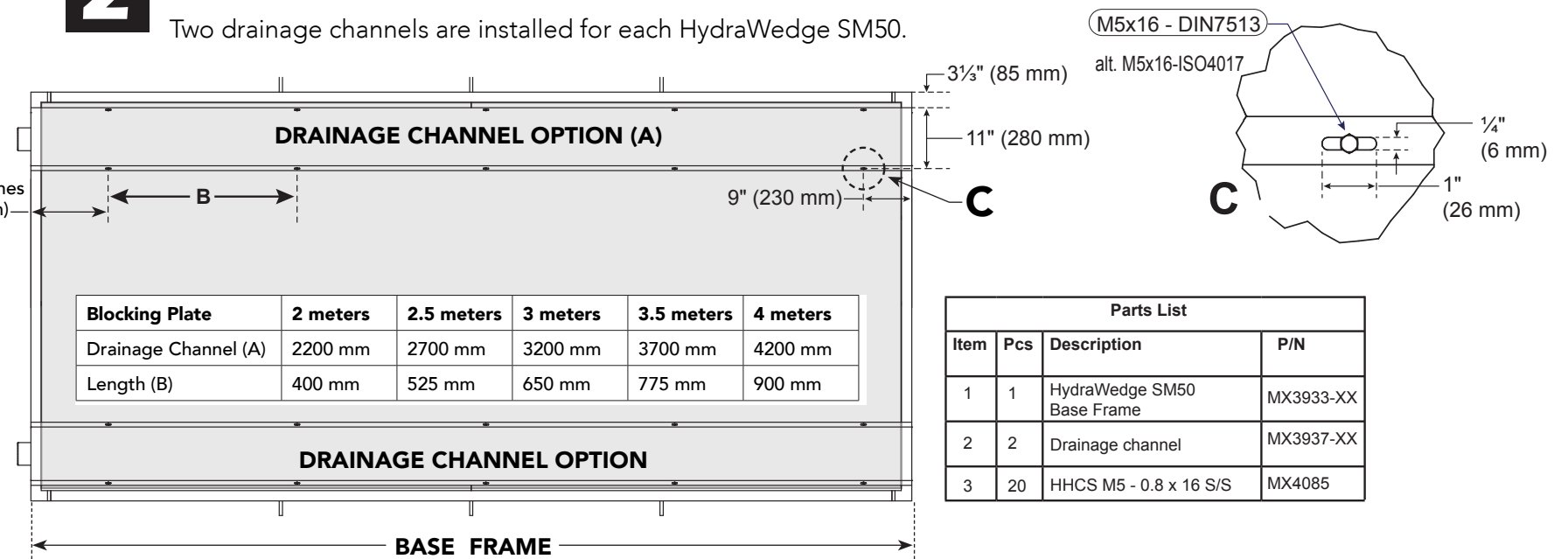
NOTICE: Softer soils require a larger footing. Employ the services of a structural or civil engineer for site specific considerations. In Northern latitudes, consider the frost line.



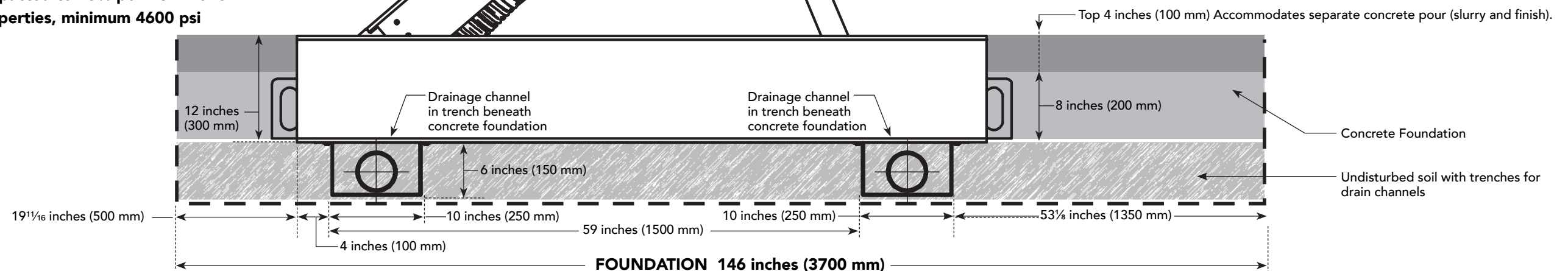
Drainage Channels approximate Locations
Soil Density compacted to 95% per ASTM-698
Concrete properties, minimum 4600 psi

2 Attach Drainage Channel Option: Top View (Plan View)

Two drainage channels are installed for each HydraWedge SM50.



Drainage Channel: Front View

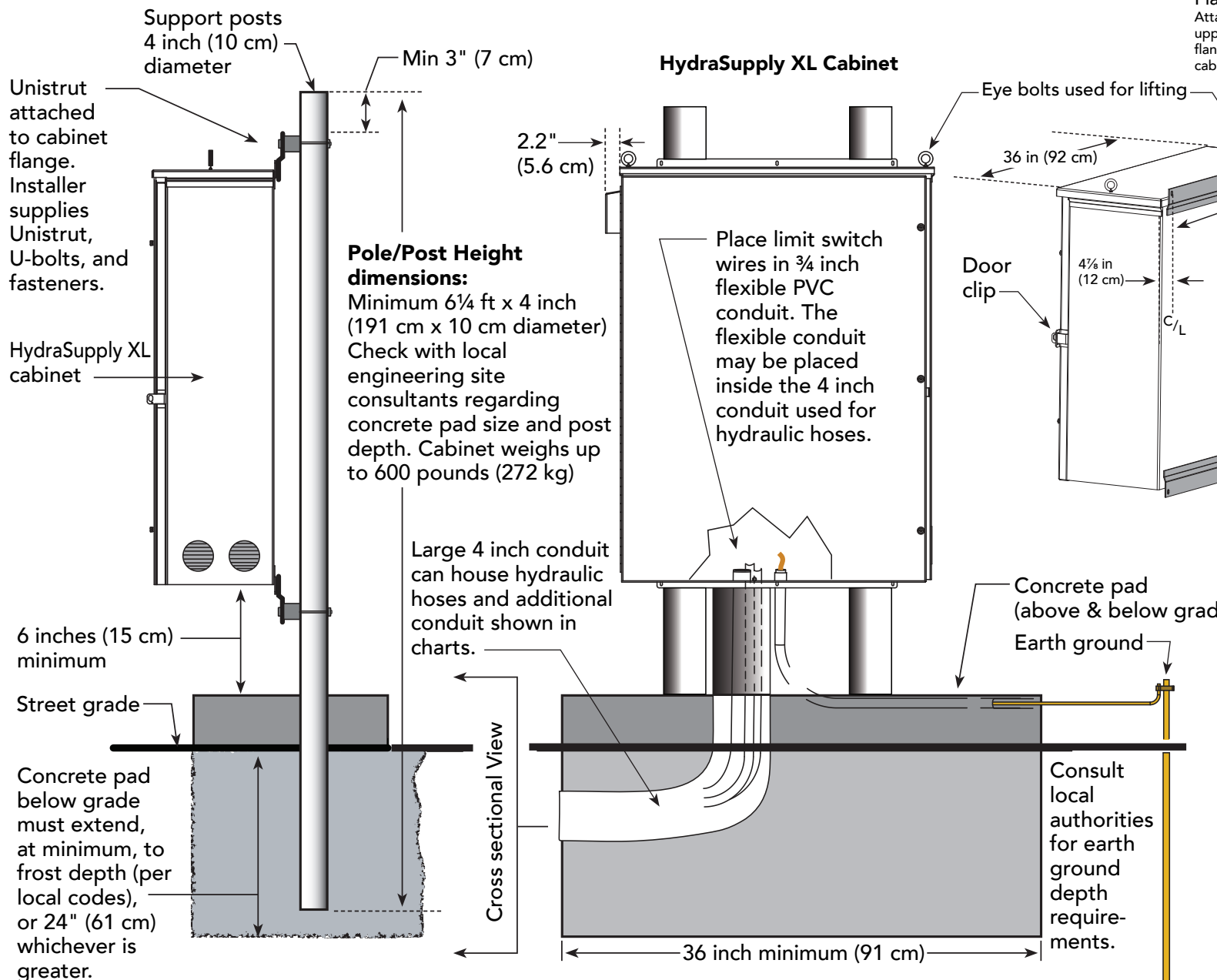
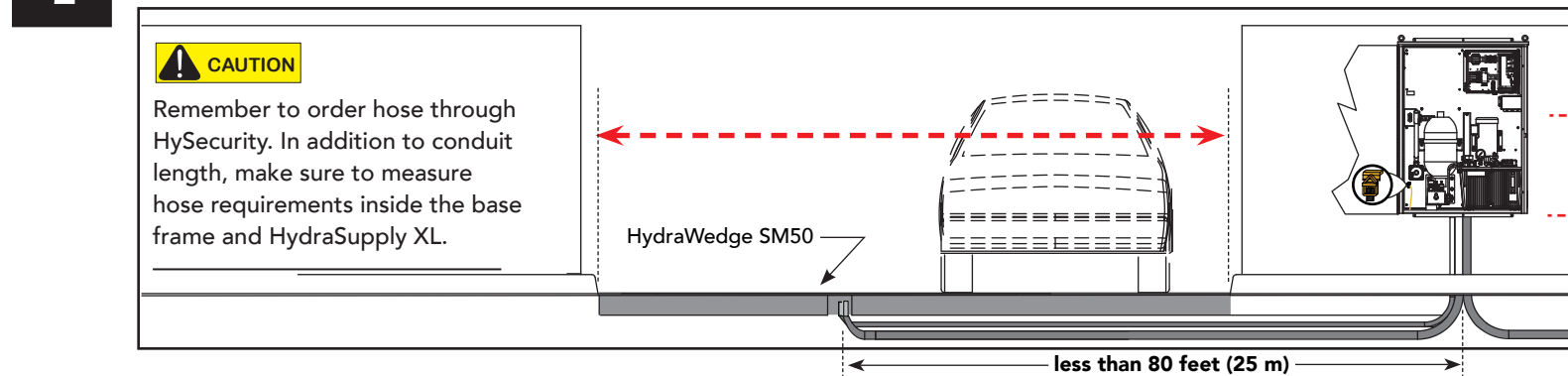


Drainage Channel: Side View

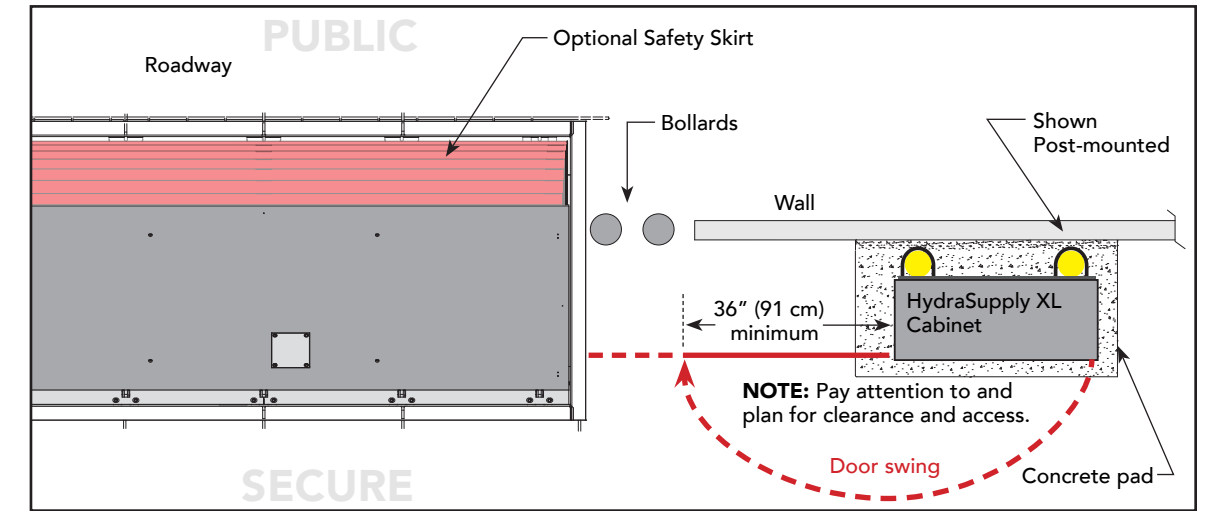
Drawings NOT to Scale

HydraSupply XL: Installation

1 HydraSupply XL Mounting Options, Clearance and Foundation



HydraSupply XL Cabinet Clearances

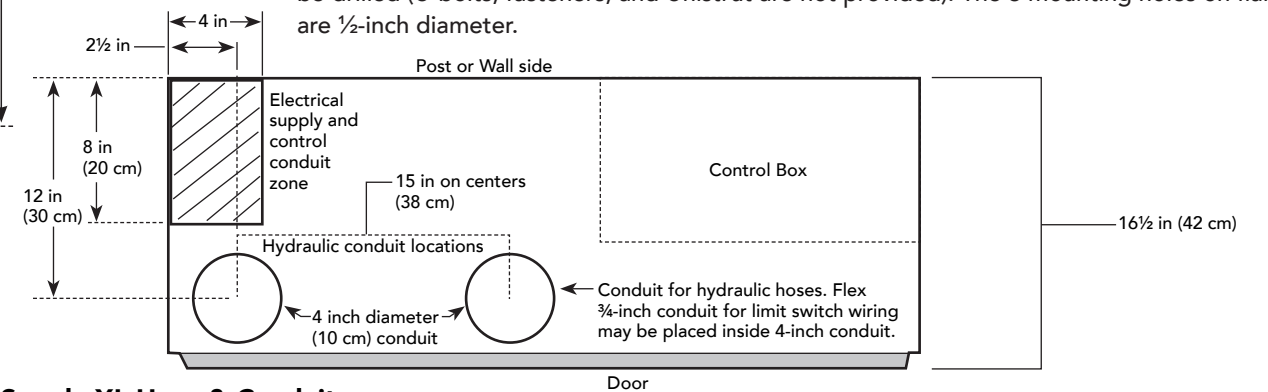


NOTE: Conduit runs between HydraWedge SM50 and HydraSupply XL cabinet.

2 Set Up HydraSupply XL

1. Assemble and secure chassis to mounting surface.*
2. Feed hoses through conduit and connect them to the QD fittings (quick disconnects).
3. Wire to the earth ground rod per local codes.

* NOTE: Wall- or post-mount the cabinet. If planning a post-mount, mounting holes need to be drilled (U-bolts, fasteners, and Unistrut are not provided). The 3 mounting holes on flanges are 1/2-inch diameter.



HydraSupply XL Hose & Conduit

NOTE: Order hose through HySecurity.

Hose length in feet (Total Run)	Hose Diameter	mm
0 to 50 ft (15 m)	3/8 inch	10
50 to 100 ft (15 to 31 m)	1/2 inch	13

Minimum conduit required	No.	Min. Size	mm
Hydraulic hoses	1	4 inch	100
Limit switch wires to operator	1	3/4 inch	20
AC Main power	1	1 inch	25
Control wires	2	1 inch	25

Add'l conduit may needed for:	No.	Min. Size	mm
Dual gate connection for low voltage wiring	1	1 inch	25
Heater or Emergency Release options	2	3/4 inch	20
Conduit for earth ground	1	3/4 inch	20

Drawings NOT to Scale

HydraWedge SM50: Cast Foundation

1 Transport: Blocking Plate, Base Frame & Rebar

Review *Moving the HydraWedge SM50 on Site on page 4.*

1. **Use proper lifting machinery** to transport the HydraWedge SM50.
2. **Designate the site layout (lay lines).**
3. **Assemble and fasten rebar to base frame.** See *Attach Rebar on page 4.*

WARNING

- Installation and initial commissioning must be carried out by personnel who are authorized by HySecurity to install this product.
- All electrical work must be carried out by qualified electrical technicians.
- Keep unqualified personnel away from the construction area.
- Consult the manufacturer in case of subsequent relocation.
- Seal off the entire construction site to prevent access from unauthorized persons.
- During assembly & installation all regulations and safety precautions for persons and machines must be adhered to without fail.
- **Turn OFF AC power at the source (circuit breaker panel) and DC disconnect switch inside the HydraSupply XL cabinet. Follow standard facility Lock Out/Tag Out procedures.**

2 Foundation: Prep, Level and Cast

1. **Set the base frame, rebar and drainage channels in foundation pit.**
2. **Re-measure and adjust** to correct mis-alignment issues. Surface water runoff must drain away from wedge base frame.
3. **Align and level the base frame.** If necessary, use steel shims to align frame horizontally and vertically.
4. **Properly cast the concrete** (voids in the finished concrete are not permitted). The concrete properties must be, at minimum, 4600 psi. A smooth finish is required and the foundation must sit flat, level, and plumb. Drainage or drainage channels must be incorporated in the design and final pour. See *Drainage Channel: Side View on page 5.*



Transport base and assemble rebar reinforcement



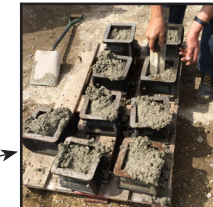
Designate site layout for resurfacing



Survey site location. Verify depth to grade



Place HydraWedge SM50 in foundation pit



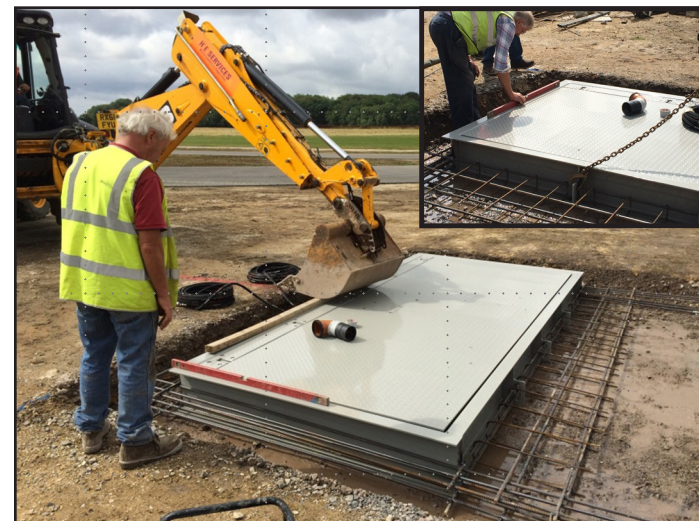
Use steel shims to level and align base frame



Remove soil



Compact soil and prep drainage channels



Level and align



Remove air pockets. Smooth and finish.

HydraWedge SM50: Wiring AC Power



Turn OFF AC power at the source (circuit breaker panel) before accessing the wires in the HydraSupply XL. Follow facility Lock Out/Tag Out procedures. Make sure all power switches are in the OFF position. Follow all electrical code standards and regulations.

Power Connection

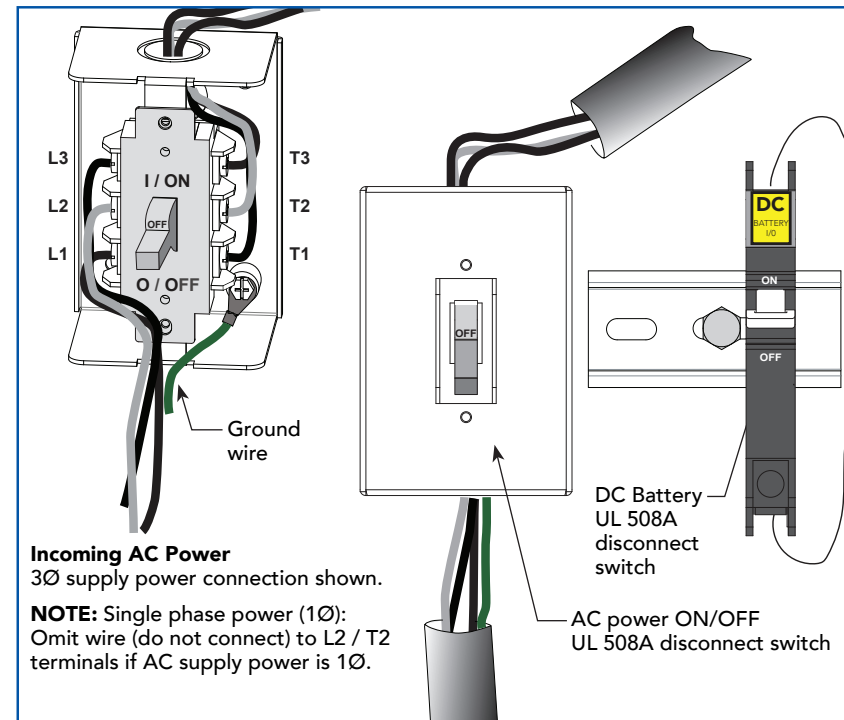
Size the primary wires, appropriately. Consider the voltage, horsepower, and length of the wire run from the main power panel. See

Verify you have the proper input voltage and make sure the motor and transformer are wired correctly.

NOTE: Use a 20A (minimum) protected with a 20A Inverse Time Breaker for all AC motor connections. Exception: 230VAC 1Ø with 5 hp motor requires a 30A circuit, minimum.

- AC Wires:** Pull 3 or 4 conductor wires through conduit. Connect power source (1Ø or 3Ø) to the UL 508A approved disconnect switch.
- Connect AC Power:** Attach incoming power wires to their appropriate terminals. Attach the ground wire to the chassis. See *Wiring Diagrams: AC on page 11.*

NOTE: For 1Ø wiring, only the two outside terminals (L1 and L3) are used.



HydraSupply XL AC Power and DC Power disconnect switches



Gate operator wiring must conform to NFPA and NEC standards and comply with all local codes. When the installation is compliant and complete, turn on AC power at the source and at the control box.

Wire Size Charts

HydraSupply XL Wire Size Chart – 2 Horsepower, 60 Hz					
Phase Ø	Single	Single	Three Phase	Three Phase	Three Phase
VAC	208	230	208	230	460
Amps	14.2	13.6	6.5	6.2	3.1
Wire Gauge	12	10	8	6	4
Distance	110 (33m)	130 (40m)	245 (75m)	280 (85m)	1130 (344m)
Distance	175 (53m)	205 (62m)	390 (119m)	450 (137m)	1800 (549m)
Distance	280 (85m)	325 (99m)	615 (187m)	710 (216m)	2840 (866m)
Distance	445 (135m)	515 (157m)	975 (297m)	1130 (344m)	4550 (1387m)
Distance	710 (216m)	815 (248m)	1545 (471m)	1790 (546m)	7200 (2194m)
Distance	1130 (344m)	1305 (398m)	n/a	n/a	n/a

HydraSupply XL Wire Size Chart – 5 Horsepower, 60 Hz				
Phase Ø	Single	Three Phase	Three Phase	Three Phase
VAC	230	208	230	460
Amps	27.0	16	15.4	7.7
Wire Gauge	12	10	8	6
Distance	65 (20m)	100 (30m)	115 (35m)	455 (139m)
Distance	105 (32m)	160 (49m)	180 (55m)	725 (221m)
Distance	165 (50m)	250 (76m)	285 (87m)	1150 (350m)
Distance	260 (79m)	400 (122m)	455 (139m)	1800 (549m)
Distance	410 (125m)	630 (192m)	720 (219m)	2900 (884m)
Distance	650 (198m)	995 (303m)	n/a	n/a



DO NOT connect HydraSupply XL operators to 115/120VAC, 1Ø power or 575V, 3Ø power. If any attempts are made to do so, serious injury and possible electrical shock may result. Any electrical damage occurring to the operator will not be covered by the Warranty.

NOTE: Refer to the *HydraWedge SM50 Programming and Operations* manual for Safety, programming, troubleshooting, maintenance and general information

Site Considerations

HySecurity operators are intended for permanent installation. Make sure you prepare the site with the following main power considerations:

- Make sure all electrical wiring is properly routed via conduits.
- To avoid excess voltage drop, check the distance of the wire size and wire run from the main panel to the gate operator. See *Wire Size Charts* below.
- Verify the available power source matches the electrical requirements specified on the voltage nameplate.
- Check that a 20A circuit (minimum) protected with a 20A Inverse Time Breaker is provided.

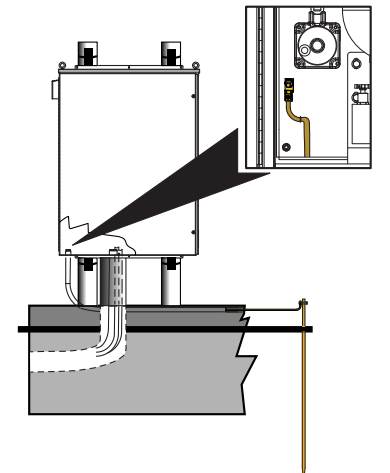
NOTE: Single phase (1Ø), 230VAC, 5 hp motor requires a 30A circuit, minimum. A 30A breaker must be provided in the field.

- Verify that the operator is electrically grounded per NFPA 780 and NEC Article 250, and local codes.

NOTE: Properly grounding the gate operator is critical to gate operator performance and the life of its electrical components. Use sufficient wire size during installation. If you do not ground the operator with a separate earth ground, you risk voiding the HySecurity Warranty.

Grounding

HySecurity requires grounding the operator with a separate earth ground rod (or a similar device) per NFPA to shield the operator against electromagnetism and other electrical signals that may cause, erratic operation with, or damage to, the Smart Touch Controller and other electrical components.



Turning the Power Switch ON

The AC power disconnect switch (ON/OFF switch) and Smart Touch Controller are located in the HydraSupply XL enclosure. When power is turned ON, a green status light on the Smart Touch Controller blinks. The status light appears below the disc battery and indicates that the processor is receiving power.

NOTE: A DC Power Supply option exists for the HydraSupply XL. Refer to the supplement that accompanies the unit.



Each gate operator is built to run on a specific voltage and phase. Failure to ensure the source voltage, phase and frequency match what is specified for the equipment, may result in severe damage to the equipment.

HydraWedge SM50: Operation Guidelines

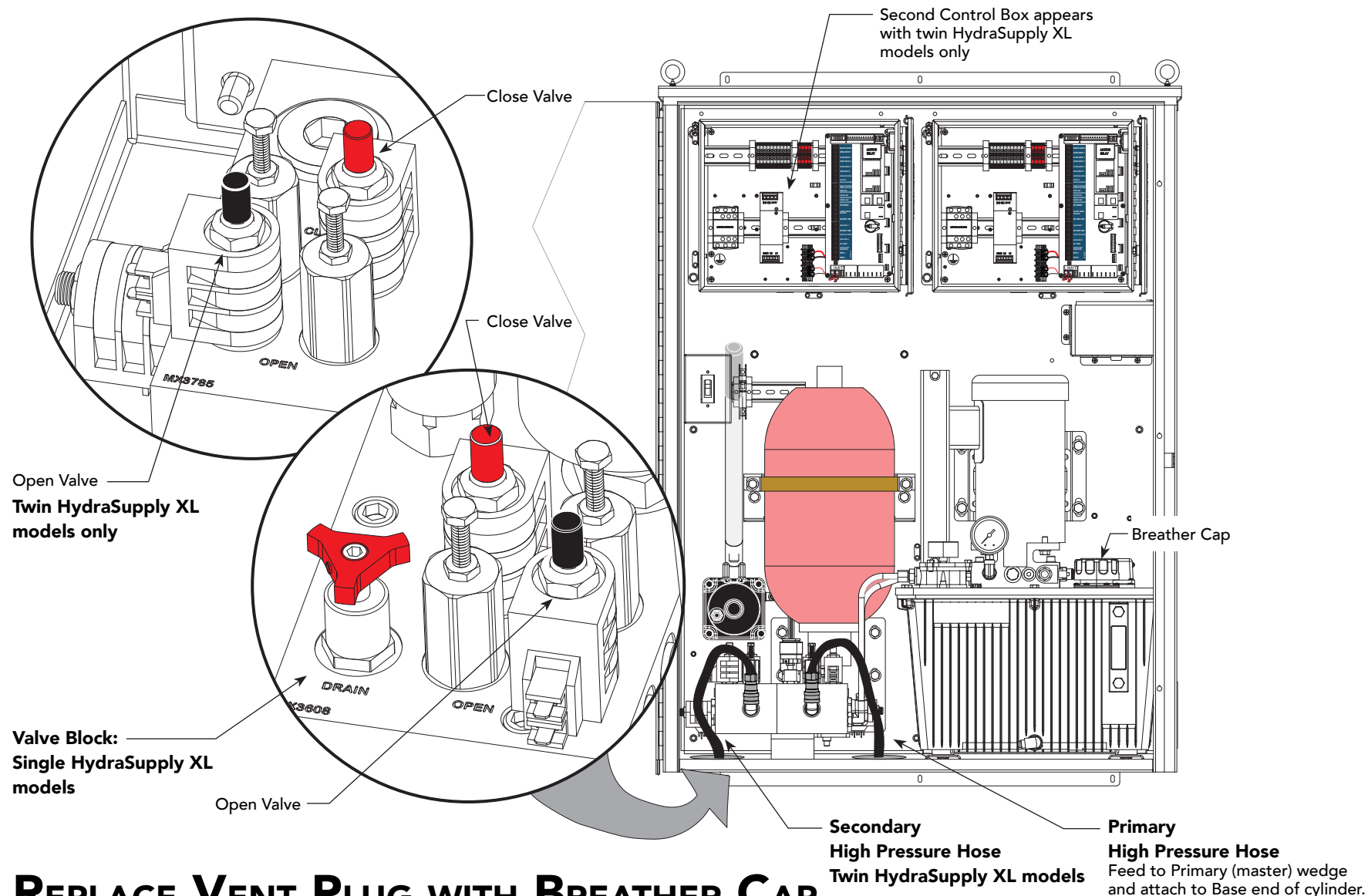


DANGER

SERVICE USE ONLY!

Opening drain valve directs fluid from accumulator back to reservoir tank.

DO NOT turn drain valve while wedge is operating. ONLY use drain valve for service and maintenance purposes.



REPLACE VENT PLUG WITH BREATHER CAP

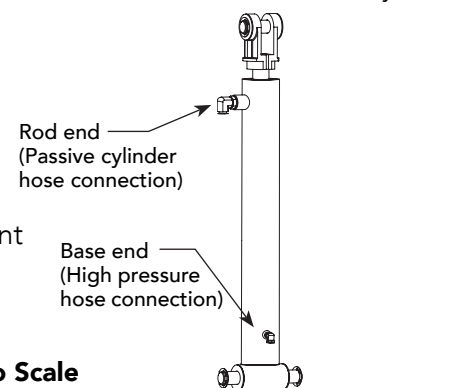


DANGER

Failure to perform the following procedure will cause premature pump shaft failure and void the Warranty.

The gate operator has a filler/breather cap that keeps the hydraulic fluid from spilling during shipment and allows the reservoir to breath during operation.

- Remove the shipping plug and discard it.
- Replace the shipping plug with the filler/ breather cap.



Drawings NOT to Scale

HydraWedge SM50 Installation and Assembly

INITIAL SETUP: CONFIGURING THE CONTROLLER

Review the *Programming and Operations Manual* that accompanies the HydraSupply XL. The manual provides additional safety instructions, initial Smart Touch Controller setup, and Emergency Fast Close functions. It also provides programming and relay input tables, troubleshooting, and maintenance procedures.

OPERATION DURING POWER FAILURE



DANGER

Stay clear of the blocking plate and base frame when using the manual override. Severe injury and death can occur if public or personnel are caught inside the base frame or come in contact with the blocking plate. Check the area around the HydraWedge SM50 and verify personnel and public are a safe distance from the base frame and blocking wedge before attempting a manual override.

Lowering the Blocking Plate

Given the weight of the blocking plate, gravity causes the blocking plate to lower to grade level when the OPEN solenoid valve is activated. To manually lower the blocking plate:

1. Pull up on the **black** OPEN solenoid valve knob located on the accumulator manifold and hold it in an elevated (activated) position.
2. When the blocking plate is lowered and on grade, close the valve by releasing it (reseats it). If valve does not reseat, rotate knob slightly.

Raising the Blocking Plate (Hand Pump Operation)

NOTE: Make sure the OPEN solenoid valve on the accumulator manifold is closed. See step 2 above.

1. Check the pressure in the accumulator. If pressure exists, it'll be easier to raise the blocking plate with the hand pump.
2. Pull up on the **red** CLOSE solenoid valve knob. Twist and release it. The valve stem must remain elevated (activated).
3. Place the handle in the hand pump bracket. Insert the locking pin to secure it.
4. Begin pumping and continue until the blocking plate is raised to the level you desire.
5. When the blocking plate is raised. Close the solenoid valve by turning the **red** knob until it retracts. Be sure the valve stem drops and re-seats closed.

NOTE: If the blocking plate is raised for an extended period of time without AC or DC power, use a service strut similar to what appears on page 10.



CAUTION

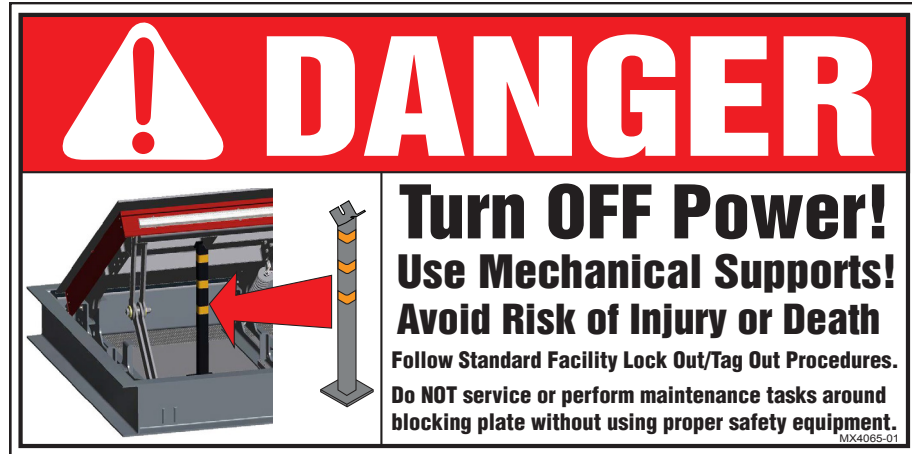
Remember to close the solenoid valves. If either the OPEN and CLOSE solenoid valves or the drain valve remains open, the hydraulic fluid will flow back to tank, draining the accumulator completely. The accumulator pressure gauge will show 0 psi. Without accumulator pressure, the EFO will not operate.

HydraWedge SM50: Adjustments & Service

SERVICING AND USING THE SERVICE STRUT

Always use the service struts when working in or around the blocking wedge while it is raised. Make sure main power and disconnect switches are turned off and the raised blocking plate is properly supported so it does not injure or crush personnel or tools or have the potential to cause death.

Place DANGER signs along the front lip of the blocking wedge so they can be easily seen when the blocking plate is raised.

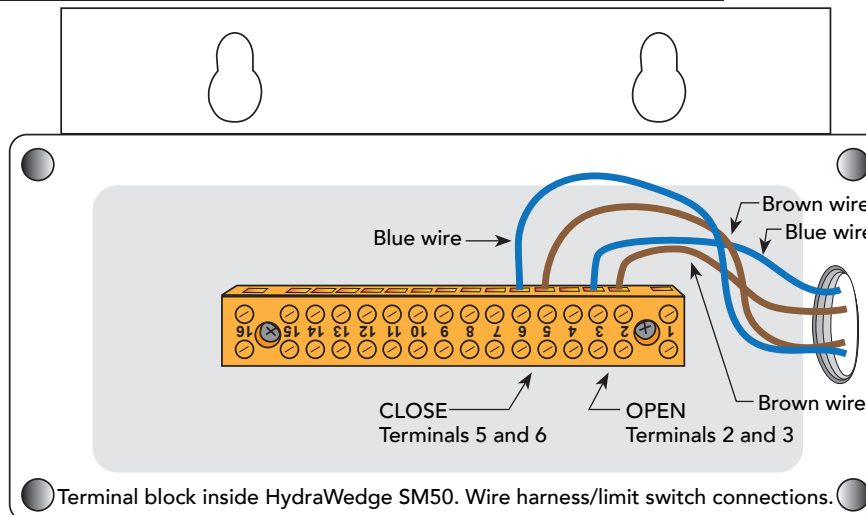
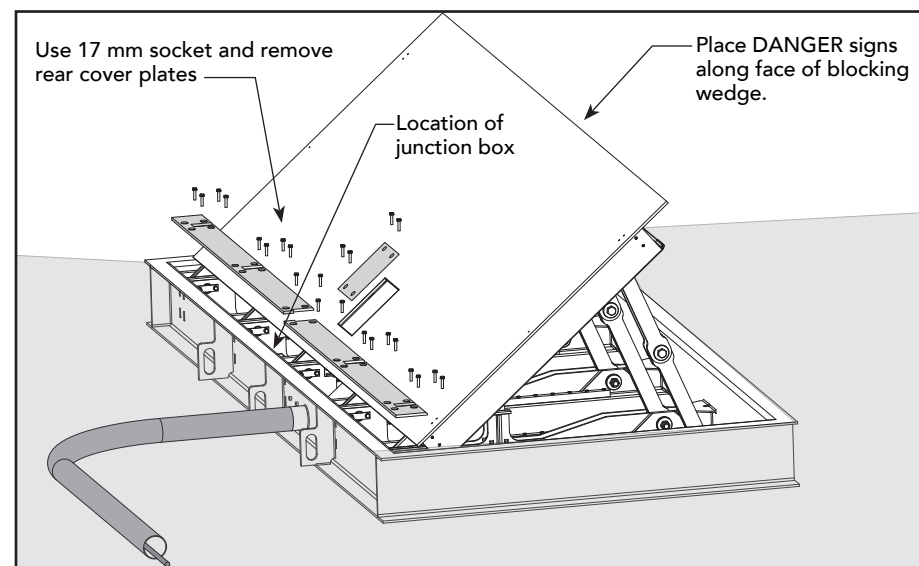


CONNECTING THE LIMIT SWITCHES & LIGHTS

A terminal block for the limit switches and lights exists beneath the cover plates at the rear of the wedge base frame.

1. Use a 17 mm socket to loosen fasteners and remove rear cover plates.
2. Use a Phillips head screwdriver to remove 4 screws on the junction box cover plate.

NOTE: The limit switch wires in the junction box need to be paired to the appropriate colored wire on the terminal block in the HydraSupply XL Smart Touch Controller. Refer to the wiring diagrams.



OPEN LIMIT Pair	Match to Hydrasupply XL terminals:
Brown lead	Red wire spade
Blue lead	Black wire spade

CLOSE LIMIT Pair	Match to HydraSupply XL terminals:
Brown lead	Red wire spade
Blue lead	Black wire spade

3. Make sure limit switch control cables are connected in the wedge barrier. Wires for the optional lighting may be connected, as well.
4. Feed cables through conduit and strain reliefs.
5. Attach the opposite ends of the wires to the terminal block in the HydraSupply XL control box. See illustrations.

INITIAL COMMISSIONING



Property damage or damage to the HydraWedge SM 50 or HydraSupply XL may occur from improper initial commissioning which will void the Warranty. For Warranty to remain effective, initial commissioning must be carried out by Individuals who are authorized by HySecurity to install this product.

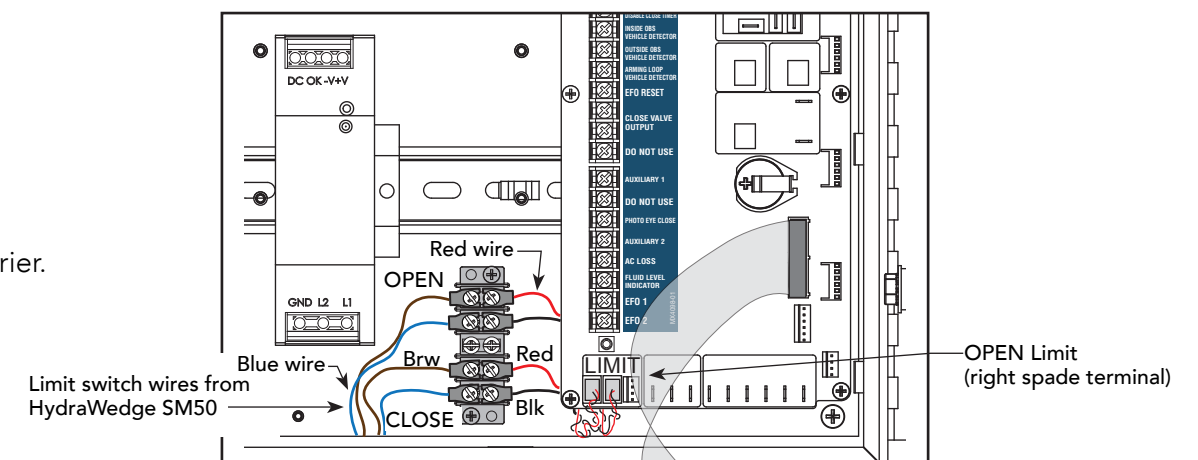


RISK OF INJURY DUE TO MOVING PARTS! The unintentional raising or lowering of the blocking wedge plate may cause severe injuries and even death.

- Prior to initial commissioning and correct adjustment of all safety devices, operate the unit only when a deadman switch/device is available and in use.
- Pass over the blocking wedge plate on foot or vehicle only when the blocking plate is in a completely lowered (on grade) position.

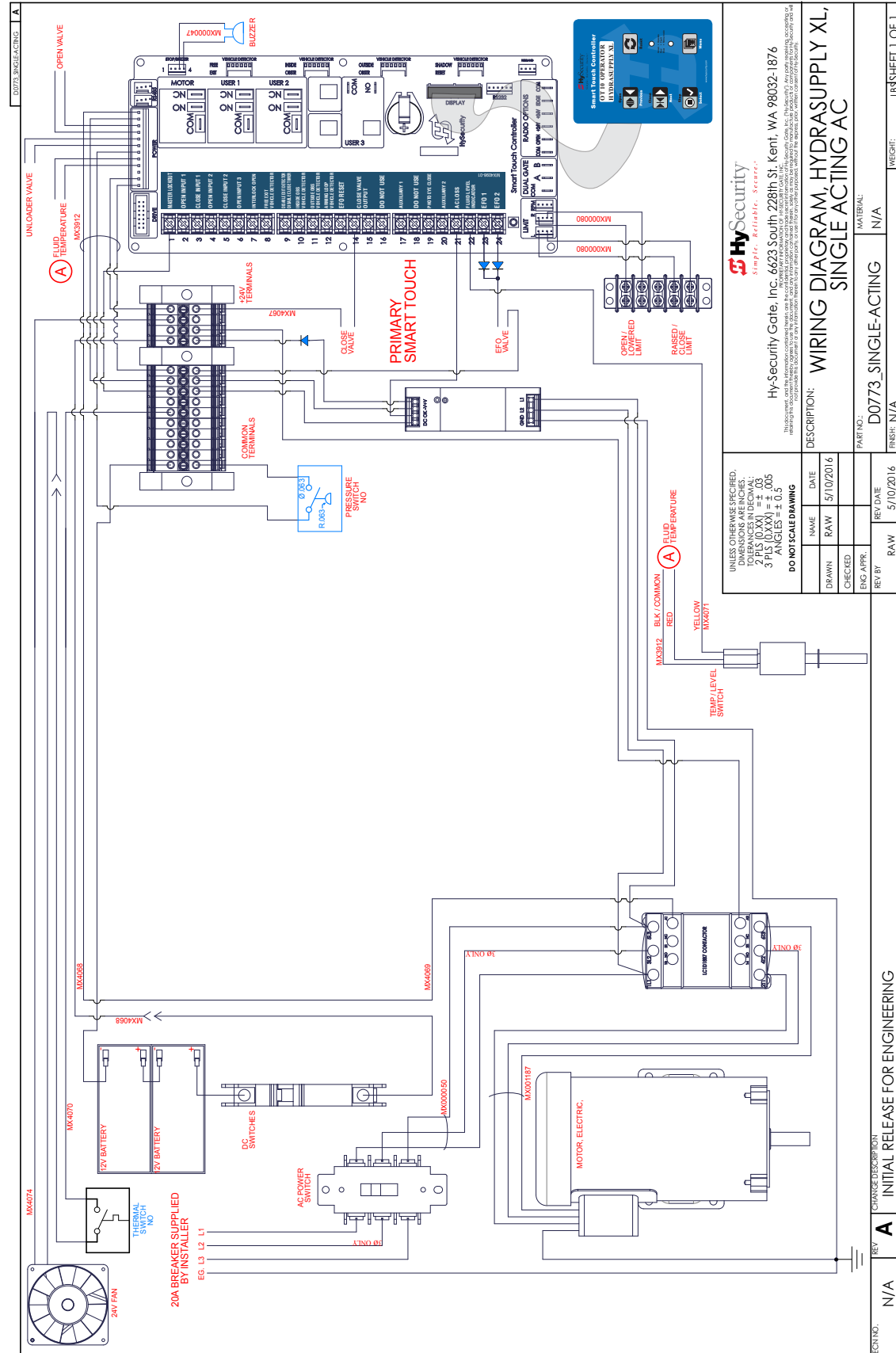
Final Check List

- Conduct electrostatic discharge prior to servicing or commissioning HydraSupply XL. If proper precautions are not taken, electrostatic discharge has the potential to damage electrical components.
- Verify, using the wiring diagrams, that the connection of the main power supply voltage was completed and wired correctly.
- Turn on main power switches.
- Check the proper function of all components, control devices, and all safety devices.
- Check state of the Smart Touch Controller display.
- Set Close Timer and configure other menu items, if applicable.
- Close & secure HydraSupply XL cabinet.
- Hand over HydraWedge SM50 to the end user making reference to the product manual and accompanying product literature shipped with the Crash product.

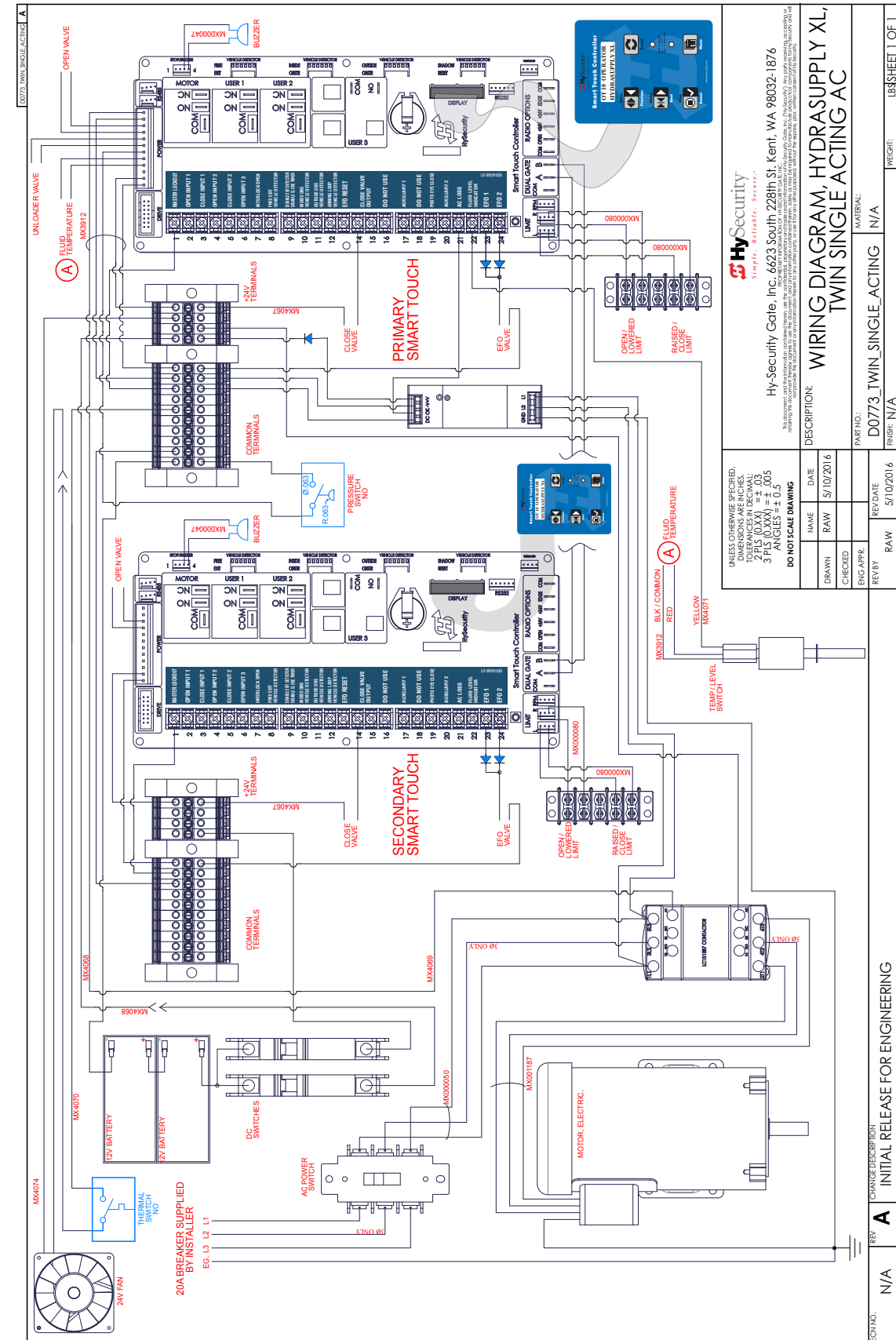


NOTE: More wiring diagrams may be found in the Programming & Operations Manual.

AC SINGLE-ACTING: HYDRASUPPLY XL

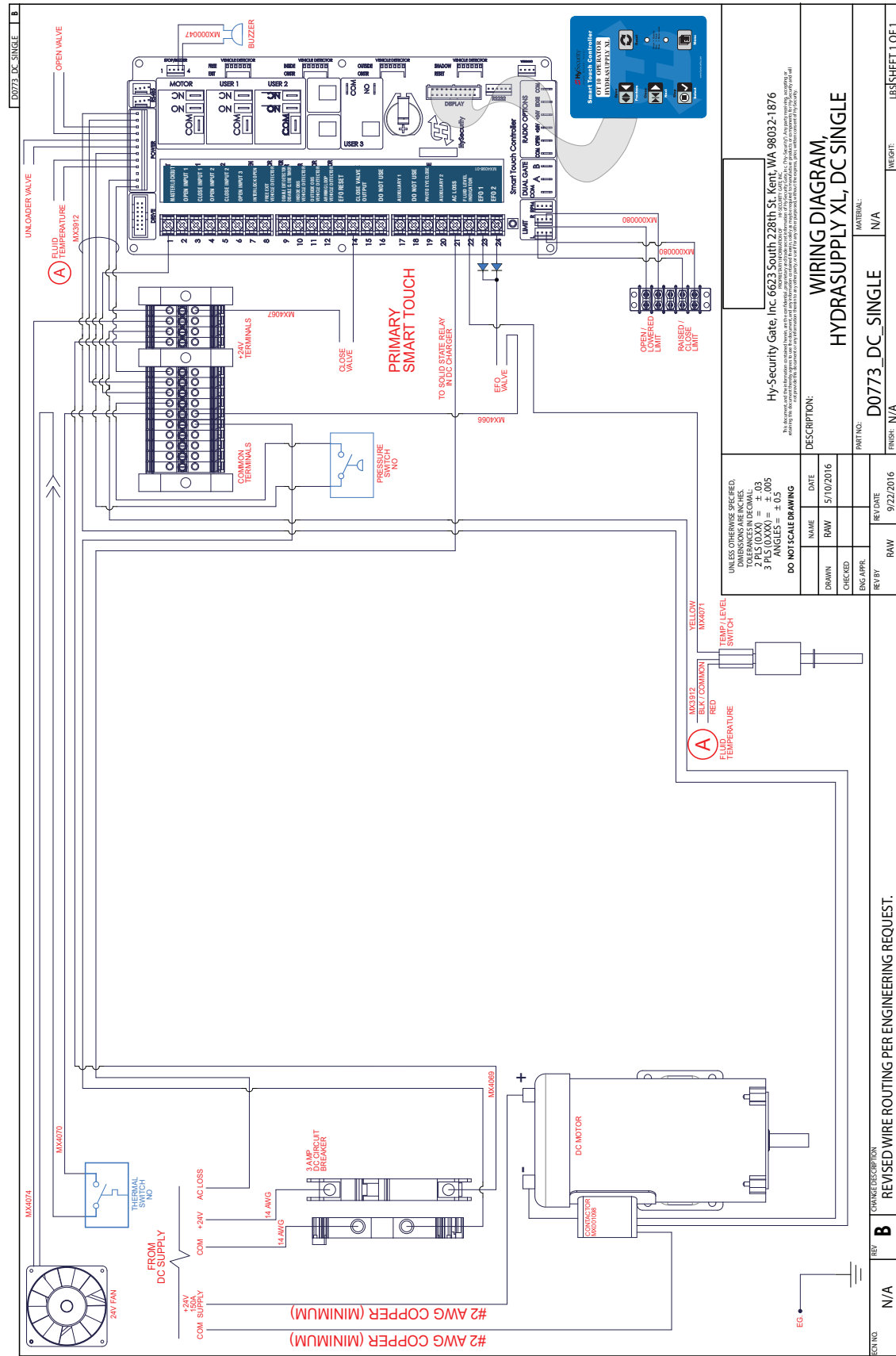


AC TWIN: HYDRASUPPLY XL



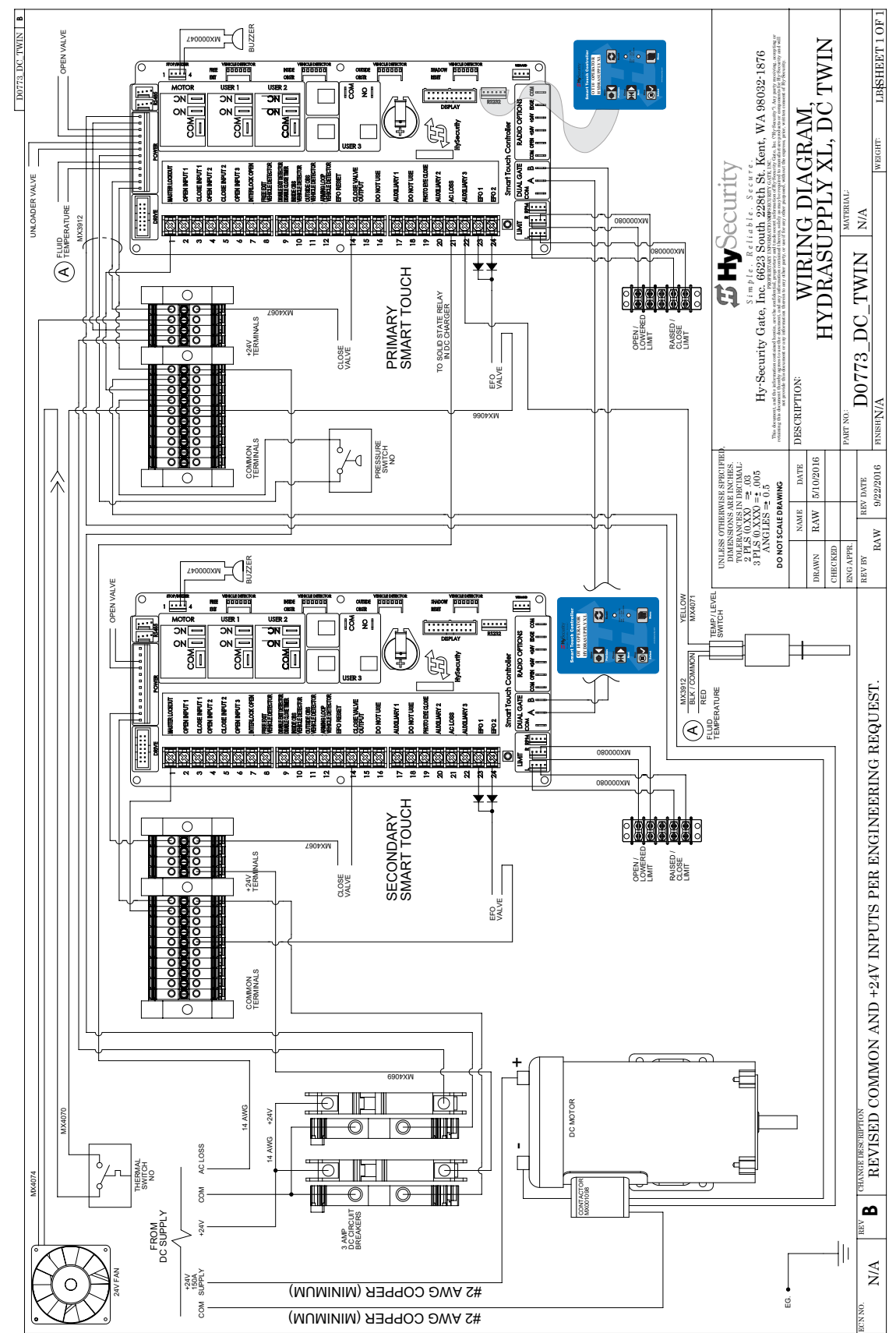
NOTE: More wiring diagrams may be found in the Programming & Operations Manual.

DC SINGLE-ACTING: HYDRASUPPLY XL



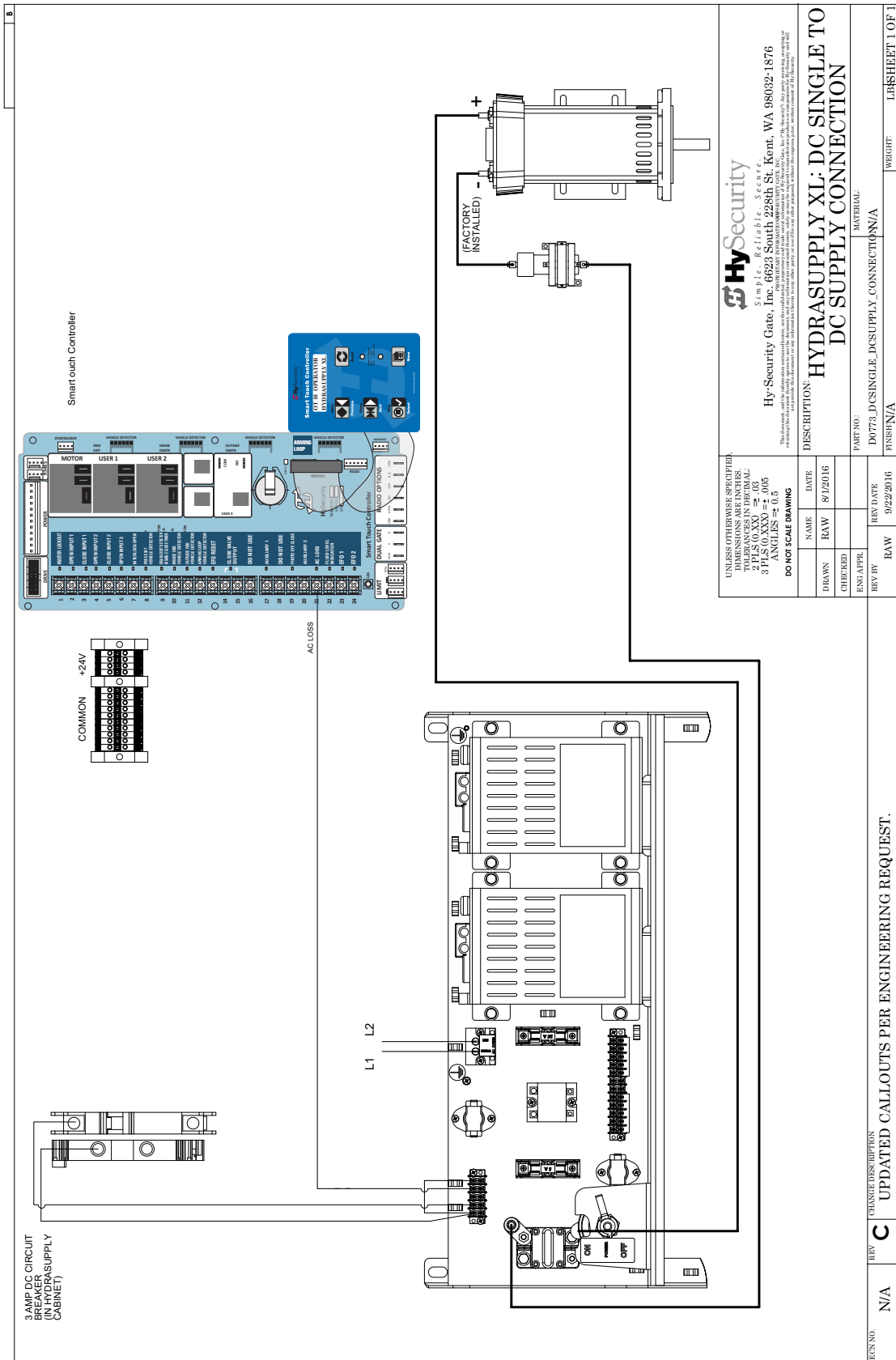
Wiring Diagrams DC

DC TWIN: HYDRASUPPLY XL

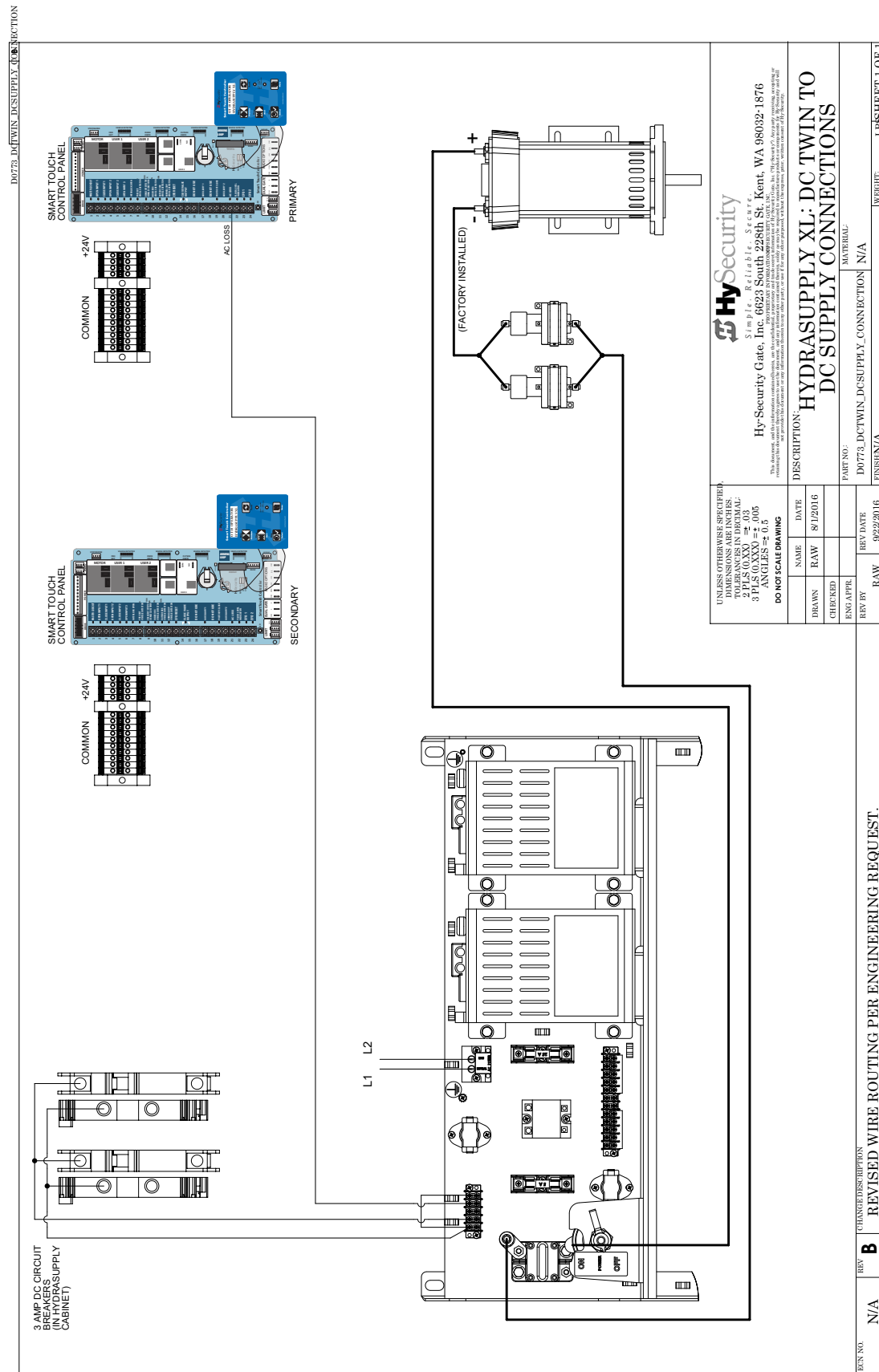


NOTE: More wiring diagrams may be found in the Programming & Operations Manual.

CONNECTION: HYDRASUPPLY XL DC SINGLE TO DC SUPPLY



CONNECTION: HYDRASUPPLY XL DC TWIN TO DC SUPPLY





Crash Certified: Domestic ASTM F2656-15 M50-P1
International IWA 14-1 V/7200[N3C]/80/90:0.0
PAS68 V/7500[N3]/80/90:0.0/20.7 with no penetration

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