

The logo features a red stylized 'H' with a curved arrow on the left, followed by the word 'WedgeSmart' in blue and black fonts, and a black square with 'DC' in white on the right.

# WedgeSmart DC™

## Installation Instructions

### Models

WedgeSmart DC

WedgeSmart DCS (Solar)

The logo consists of a red stylized 'H' with a curved arrow on the left, followed by the word 'HySecurity' in a grey serif font.

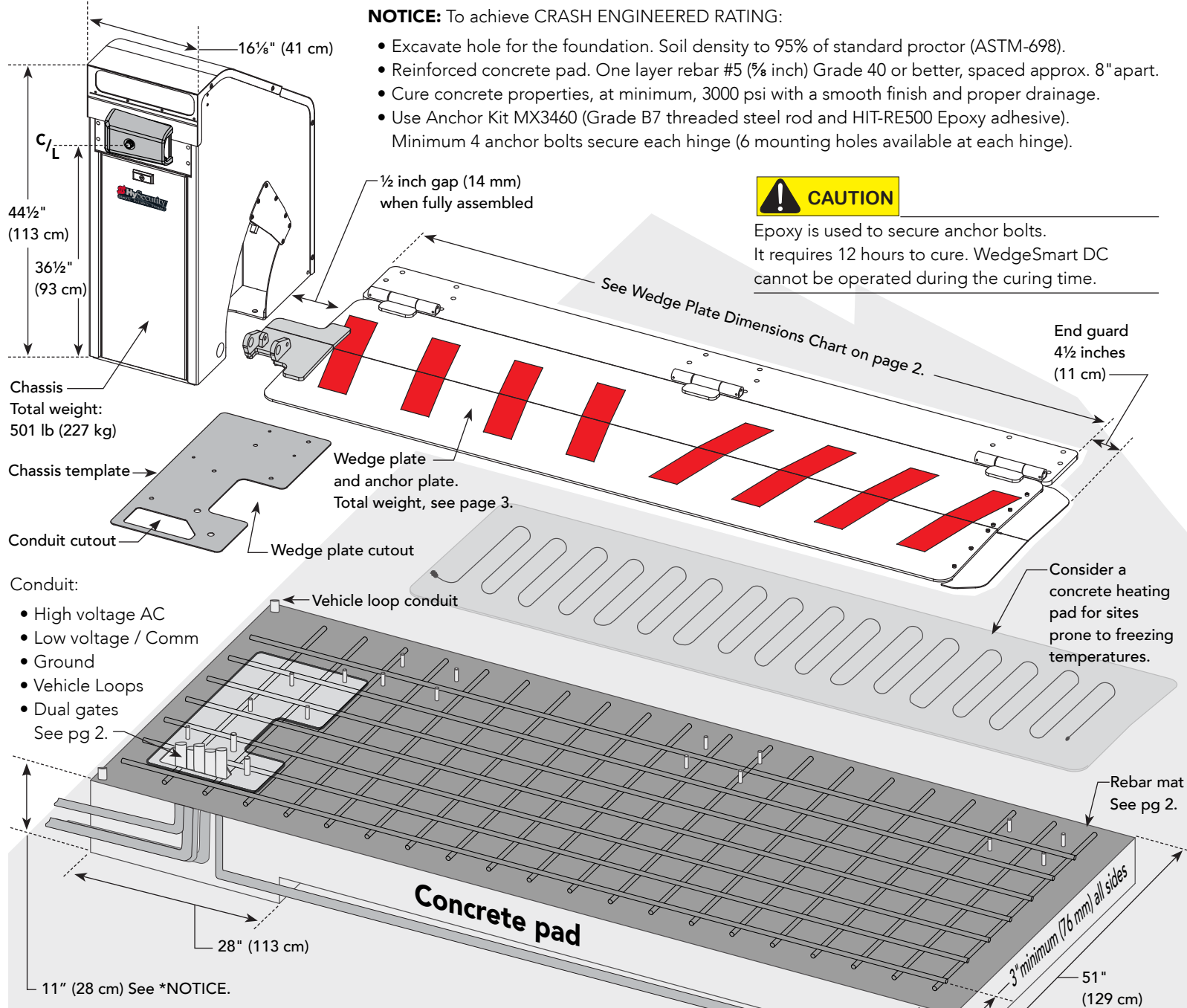
**HySecurity**  
*Simple. Reliable. Secure.®*

**Surface mount parking wedge with electromechanical barrier arm operator and Smart DC Controller**

# WedgeSmart DC: Plan Site Design

## 1 Read & Plan

Read and follow the *Important Safety Information* provided in the *Programming and Operations Manual* prior to installing the WedgeSmart DC. Review the following installation instructions and make sure to conform to UL 508A site specifications and all local and federal regulations and codes.

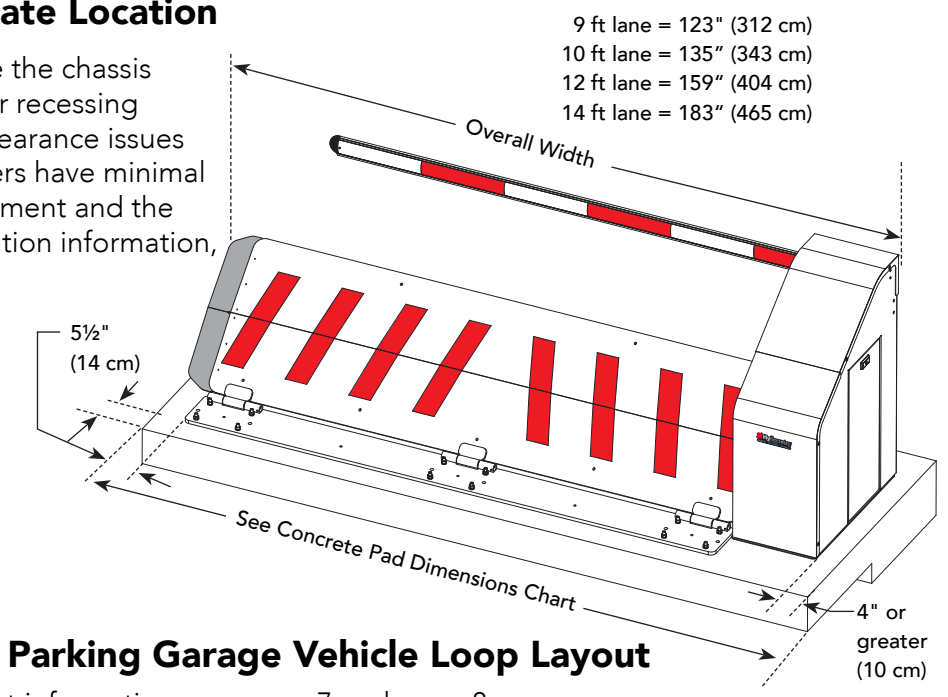


Concrete Pad Dimensions		
Lane Width (Ft)	Pad Length (Inch)	Pad Width/Length (cm)
9	128	274 x 325
10	140	304 x 355
12	164	365 x 416
14	188	426 x 477

\* **NOTICE:** Eleven inch minimum depth required to accommodate 3/4-inch anchor bolts used to secure wedge plate strap.

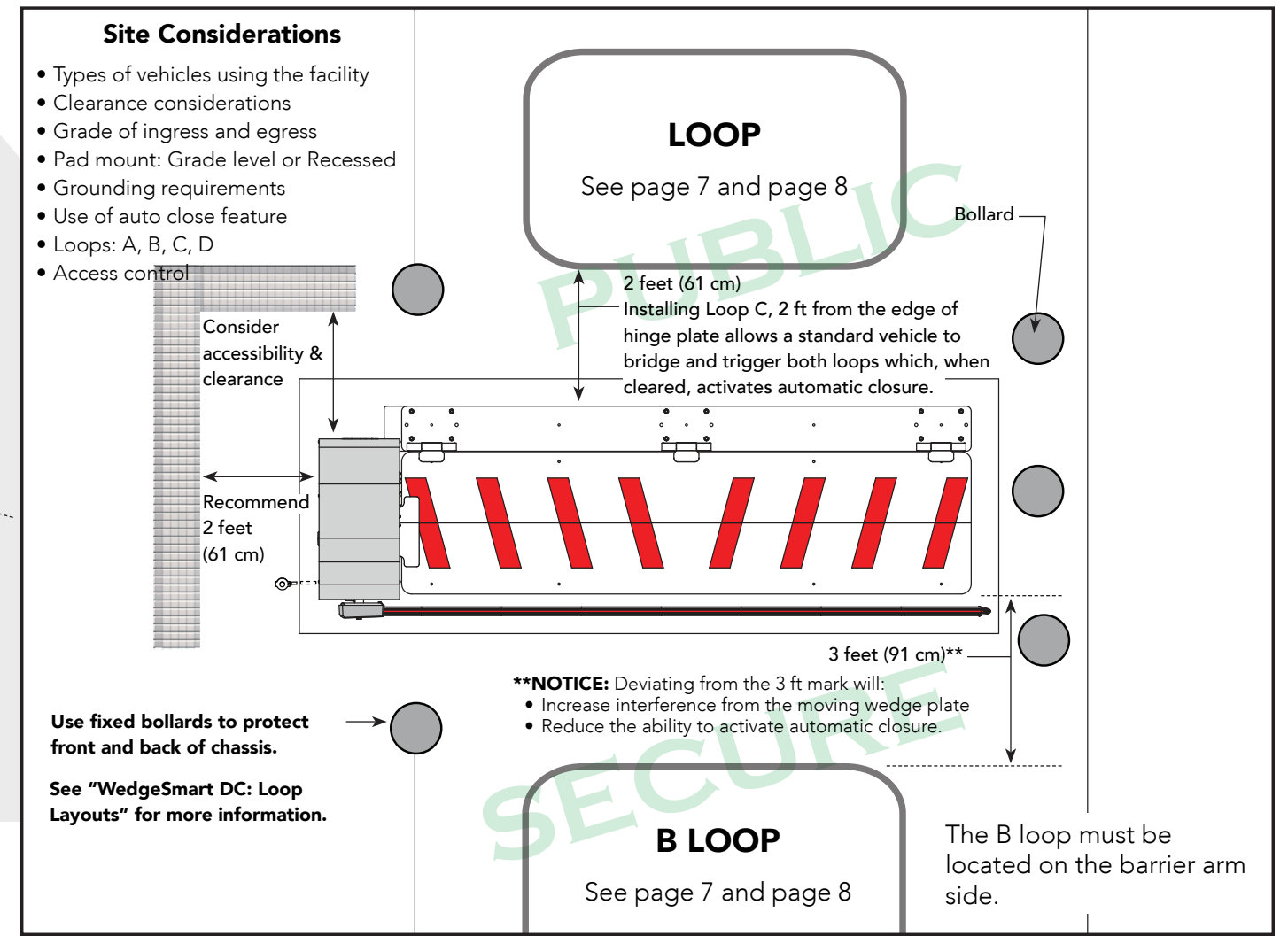
## 2 Determine Wedge Plate Location

For alignment purposes, use the chassis template provided. Consider recessing the wedge plate if vehicle clearance issues exist. For example, car haulers have minimal clearance between the pavement and the trailer. For additional foundation information, see page 2.



## 3 Typical Single Lane Parking Garage Vehicle Loop Layout

For additional Loop Layout information, see page 7 and page 8.



# WedgeSmart DC: Install Foundation

## Tools Required

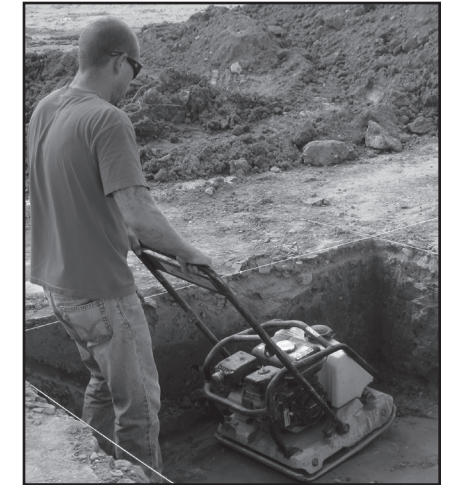
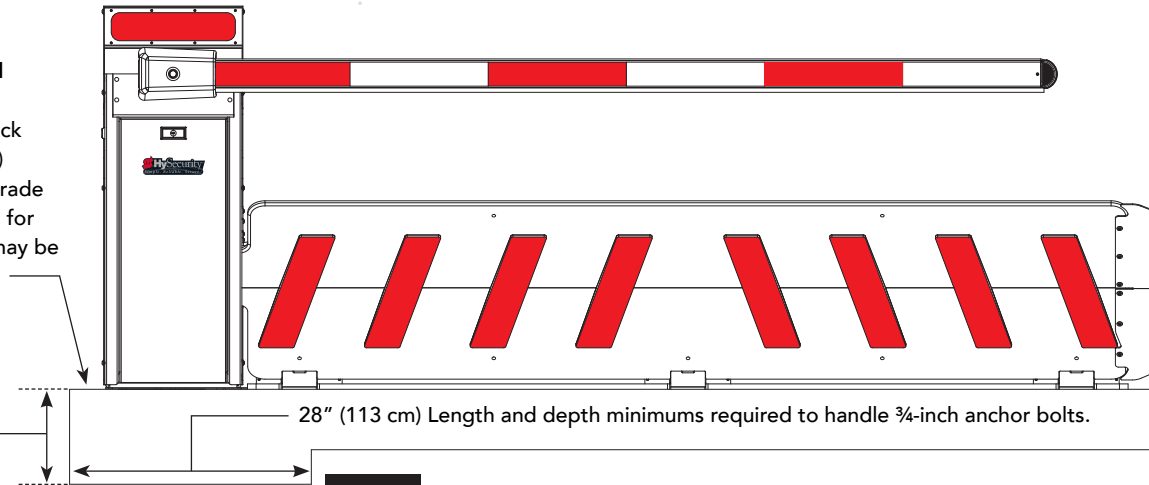
- Forklift, crane or other heavy lifting equipment
- Lifting straps rated to minimum of 4000 lbs
- Lifting hooks or D connectors
- Hammer drill with 9/16-inch and 7/8-inch bits. (1/4-inch optional)
- Reciprocating saw or grinder
- Standard set of box end wrenches and sockets (using 3/4-inch and 1 1/4-inch)
- Phillips head and flat head screwdrivers
- Standard set of hex keys
- Wire cutters
- Wire strippers
- Protective material (cardboard) to prevent scuffing



Example Concrete Template Chassis base & conduit

**Road surface level**  
Consider vehicle clearance (semi truck and car hauler rigs) and road surface grade changes. The need for recessed mounts may be a site requirement.

11" (28 cm)  
See \*NOTICE on page 1.



Soil Density compacted to 95% per ASTM-698

## 1 Set the Foundation

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

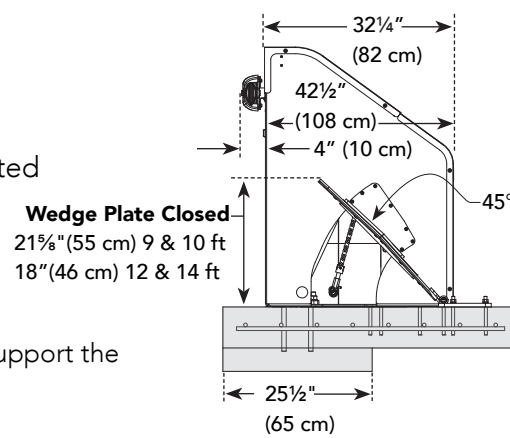
- Excavate a hole for the foundation to house the rebar mat and anchor bolt assemblies. Soil compression under and around the foundation shall be compacted to a soil density of 95% of standard proctor (ASTM-698).
- Add gravel where necessary to ensure a solid soil base. Soil must be stable and adequate to support the weight of the foundation.

*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.*

- **The WedgeSmart DC must be installed on a level surface.** The chassis and wedge plate must be plumb, level and on grade with the roadway surface.

*NOTICE: Be aware of low clearance vehicles, such as car haulers. Recess the concrete pad accordingly.*

- Cure concrete properties, at minimum, 3000 psi with a smooth finish and proper drainage. Slope drainage 1/4-inch per foot within 2 feet of the operator (2 cm per meter).
- Use Anchor Kit MX3460 (Grade B7 threaded steel rod and HIT-RE500 Epoxy adhesive). A minimum of 4 anchor bolts required to secure each hinge (6 mounting holes available at each hinge).



## 3

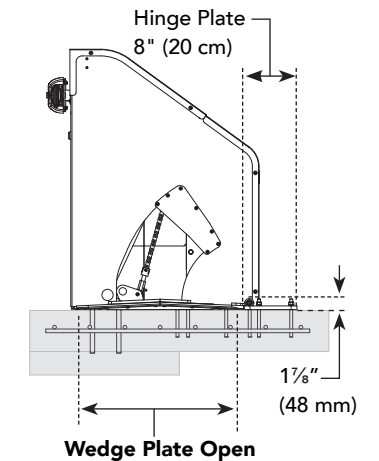
### Excavate for Concrete Pad and Rebar Mat

Dimensions: Wedge Plate & Arm				
Lane Width	Wedge Plate Length	Wedge Plate Width	Arm Length	Plate Height
9 ft	102"	29 1/2"	9 ft	21 5/8"
10 ft	114"	29 1/2"	10 ft	21 5/8"
12 ft	138"	24 1/2"	10 ft	18"
14 ft	162"	24 1/2"	10 ft	18"

## 4

### Assemble Rebar Mat

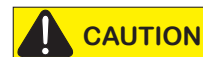
1. Place one layer rebar mat at 8-inch on center (OC)
2. Stagger rebar mat between anchor bolts.
3. Use rebar #5 (5/8 inch), Grade 40 or better.



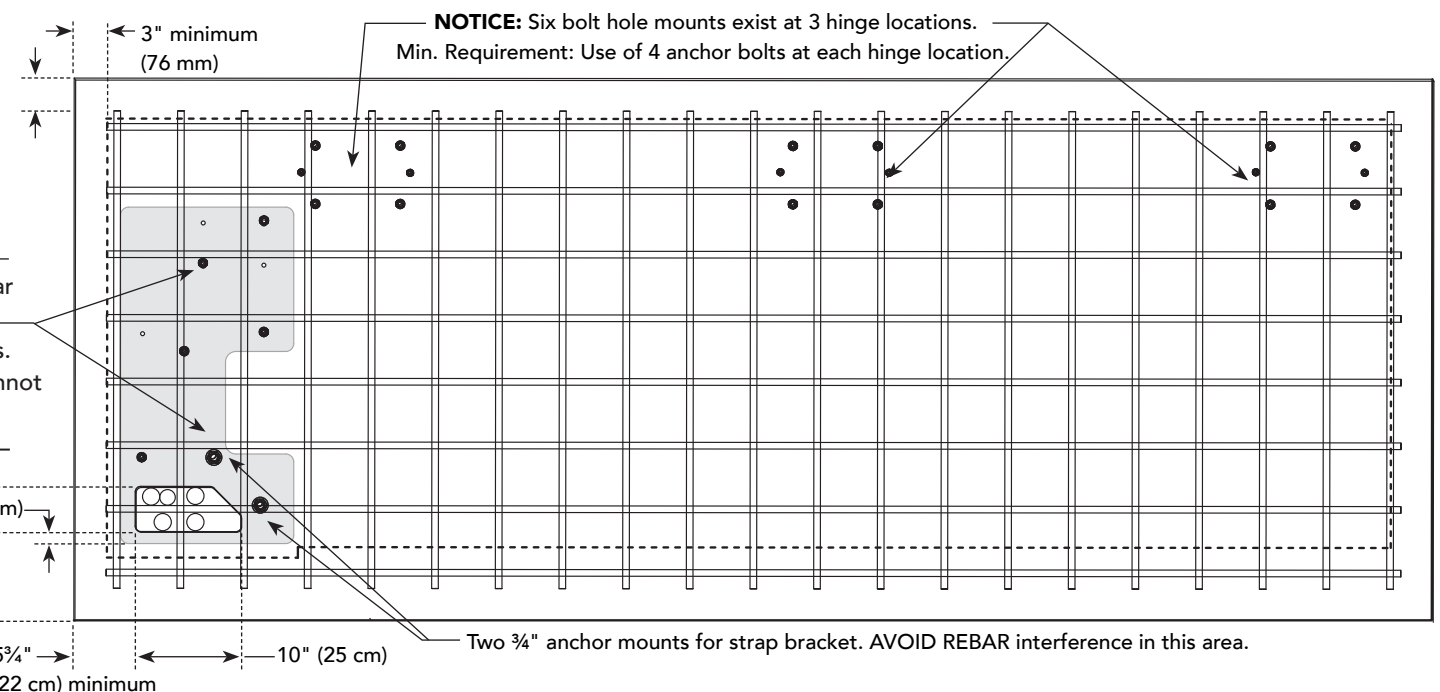
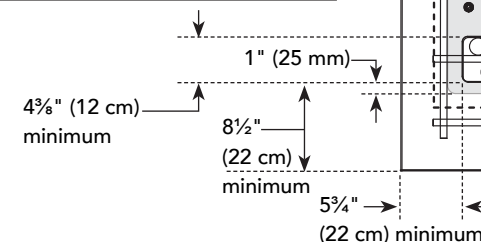
## 2 Measure and Lay Conduit for Communication & Power

Conduit Description	Min. Size	cm
AC Main power	1 inch	2.5
Low voltage power (accessories) and controls	1 inch	2.5
Earth Ground	3/4 inch	2
Vehicle Loop wires (IALD, Center, OALD, and/or Free Exit)	1 inch	2.5

Dual Gate systems conduit required for:	No.	Min. Size	cm
AC power in	1	1 inch	2.5
Low voltage systems/communications	1	1 inch	2.5



**CAUTION**  
Use the template to make sure rebar #5 (5/8 inch), Grade 40 or better, does not interfere with anchor bolts. Also, note that the anchor holes cannot be drilled with the chassis in place.



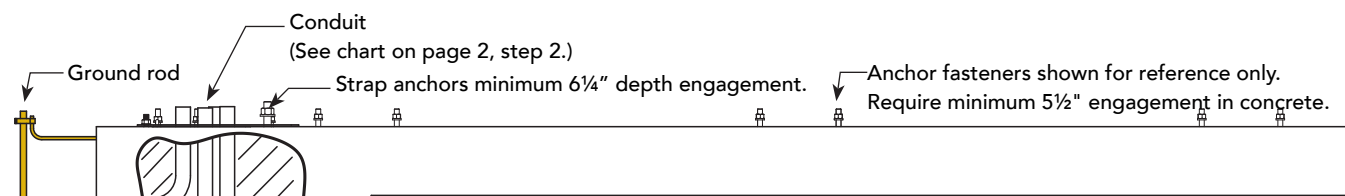
# WedgeSmart DC: Drill & Set Anchors

**CAUTION**

Verify conduit aligns with chassis template window. If not, shift both wedge plate and template positions to fit.

- Use the chassis template as a guide to drill anchor holes. Mounting holes cannot be drilled through chassis.
- Secure chassis template with temporary concrete screws while drilling holes for wedge base.
- **DRILL 7/8" anchor bracket holes (chassis template) first BEFORE the remaining 9/16" anchor holes.** Use a 1/4" bit to hammer drill a pilot hole, centered in each of the two 7/8" chassis template's anchor bracket holes (used for 3/4" anchors). If the drill bit hits rebar before reaching the required 6 1/4" minimum depth, shift both the wedge plate and chassis template positions to find obstruction free concrete.
- If the drill hits rebar, use one of the other 9/16" chassis template anchor holes provided.
- Use epoxy and anchor bolts on all mounting locations **AFTER** setting chassis and properly aligning holes.

**1** When the concrete has sufficiently hardened, move the wedge plate into the designated clear opening on its concrete pad. To prevent scuffing, use cardboard underlayment. Align the wedge plate with the plastic chassis template. Lifting straps and eye bolts kit is available for purchase.

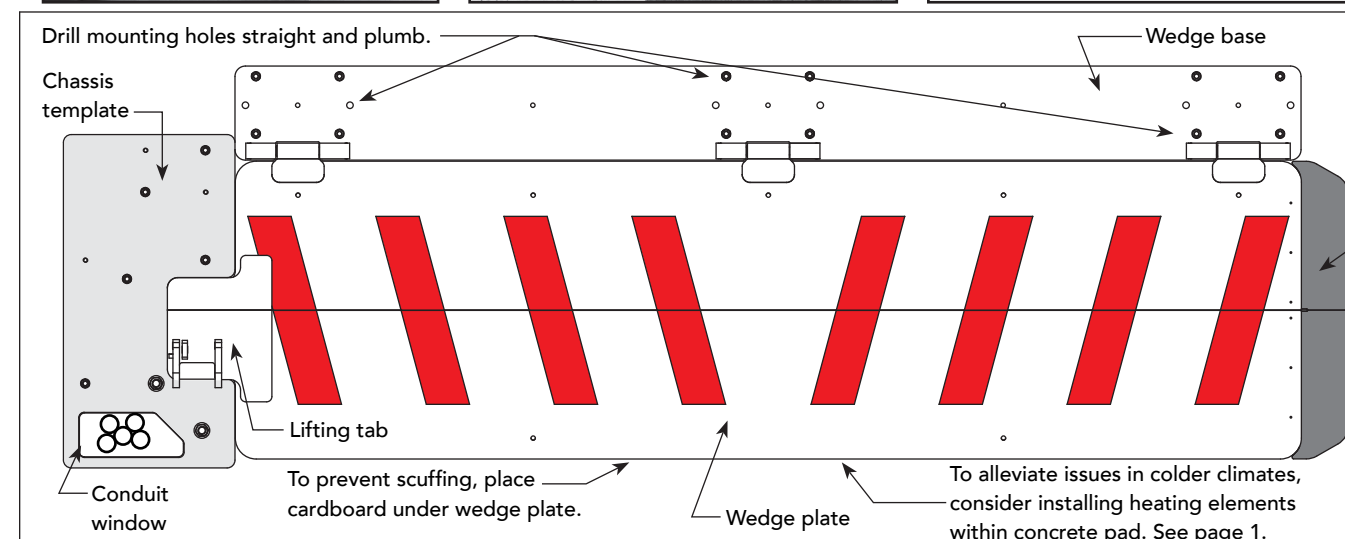


**Cutaway View Concrete Pad**

**a** Position the wedge plate. Use heavy-lifting equipment and straps rated to 4000 lbs minimum. Kit MX3700.

**b** Align wedge plate with chassis template. Note conduit and loop wires. Temporarily, stabilize template with concrete screws.

**c** Use wedge base holes as drill template (9/16" drill bit for 1/2" all thread). Use tape to mark drill bit depth. See chart for depth requirements



**2**

**IMPORTANT: Vacuum all concrete dust from the anchor holes.**

**Position equipment on the anchor holes. Add epoxy and anchors. Allow 12 hours for epoxy to cure.**

**a** Remove covers and door panels including the interior covers from the chassis.

**b** Lift the chassis into position with heavy-lifting equipment and straps. Large slots at the top of the chassis are used for lifting.

**c** Set the chassis on the plastic template; it serves as a corrosion barrier. Align the chassis with its anchor holes. **Add epoxy & anchors.**

**Anchoring the WedgeSmart DC**  
Review **CAUTION**

Where used	Hammer Drill Bit Size	Depth minimum	Size of Anchor	Epoxy & insert anchor rods*	Torque nuts**	Auxiliary Hole Usage
Chassis, strap anchor bracket	7/8"	6 1/4"	3/4" (2X)	Fill hole ~ 1/2 full & twirl in anchor rods	150 ft-lbs	None
Chassis	9/16"	5 1/2"	1/2" (5X)	Fill hole ~ 1/2 full & twirl in anchor rods	30 ft-lbs	Use 4 of 6 holes provided at each hinge.
Wedge base plate	9/16"	5 1/2"	1/2" (min. 4X per hinge)	Fill hole ~ 1/2 full & twirl in anchor rods	30 ft-lbs	Use 4 of 6 holes provided at each hinge.

\* Allow a minimum of 12 hours for the epoxy to cure.

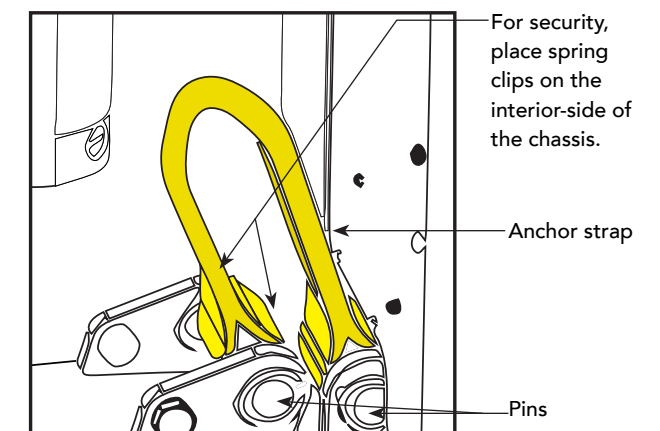
\*\* After the required epoxy curing time has elapsed, install lock washers and nuts onto the anchor rods. Torque to specs found in chart. To protect vehicle tires from damage, cut or grind any threaded rod extending past the nuts.

**3**

**Attach the anchor strap and wedge lifting chain.** When the epoxy has cured (minimum 12 hours), place the anchor strap pivot bracket over the two 7/8" anchors protruding from the concrete pad.

**NOTE:** The anchor strap folds easier in one direction compared to the other. Orient the strap so it bends in the easier direction while connecting it to the anchor bracket.

- a** Remove the spring clips and slide the pins into the anchor and through the bushing end of the anchor strap.
- b** Pins slide in from the plate side of the operator allowing the spring clips to be on the secure inside of the operator.
- c** Install cover guard.



# WedgeSmart DC: Attach Chain & Arm

## 1 Attach the Wedge Plate Chain

A counter balance spring is used to assist the motor when lifting the wedge plate from the Open (down) position. The spring is shipped extended (unloaded). To lower and attach the plate side chain you must use the manual hand wheel to compress the spring.

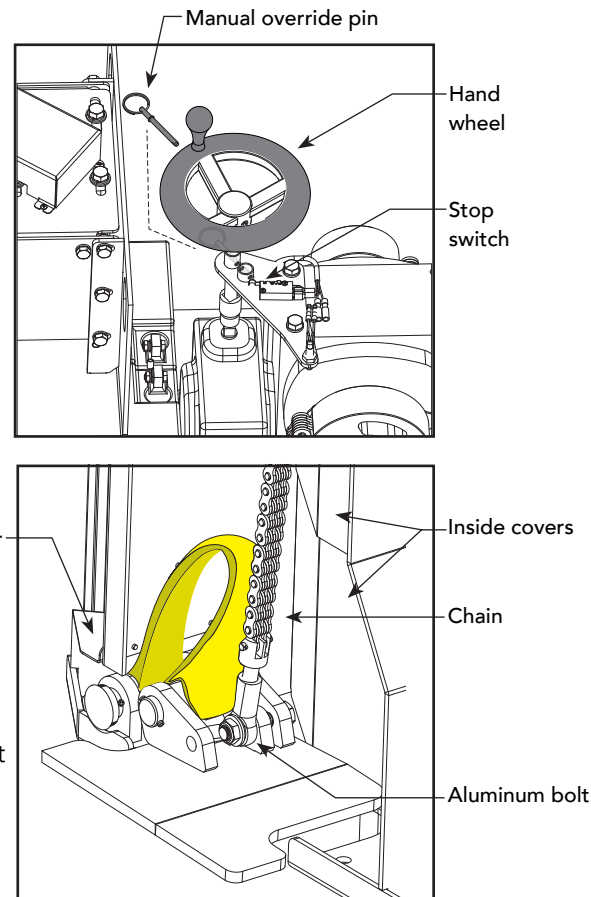
- Verify both the AC & DC power is OFF
- Pull the manual override pin allowing the hand crank to drop down and engage the square output shaft on the gearbox.
- Turn the hand wheel to lower the chain. Continue turning until ball swivel reaches the wedge plate connection point.
- Attach chain with aluminum bolt. Use washers to align chain with the gear box pulley. Tighten securely. (Snug with additional 1/4 turn.)

**NOTE:** Removing the pin opens the stop switch which sends a stop command to the ST Controller to prevent the operator from running.

**NOTE:** Turning the hand wheel will grow more difficult as the chain wraps the sprocket and compresses the spring.

**NOTE:** This aluminum bolt serves as a shearing connection if the wedge plate is ever struck from the opposite direction. Using a steel bolt at this connection may damage the gearbox and chassis and void the HySecurity warranty.

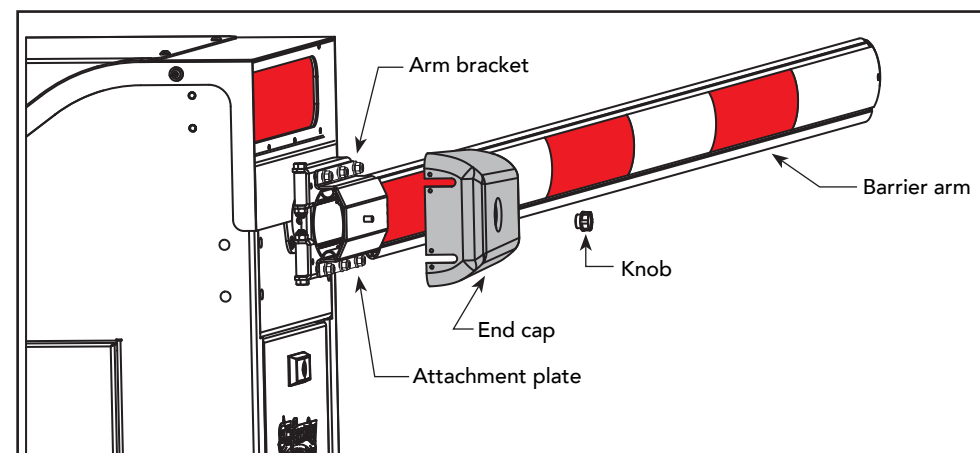
- Turn the manual override hand wheel in the opposite direction to lift the wedge plate. The anchor strap will limit travel of the plate at 45 degrees.
- Turn the manual override to lower the plate. Verify the anchor strap folds in the correct direction.
- Attach the two inside covers and the anchor strap cover.
- Lift the manual override hand wheel to align the holes and insert the manual override pin.
- Verify the end of the pull pin trips the STOP switch.



## 2 Install the Barrier Arm

The barrier arm bracket, attachment plate and end cap are assembled on the gate operator chassis.

1. Loosen the knob to remove the end cap.
2. Loosen the nuts (do not remove them) on the attachment plate and slide the arm into place.
3. Re-tighten the nuts, securely.



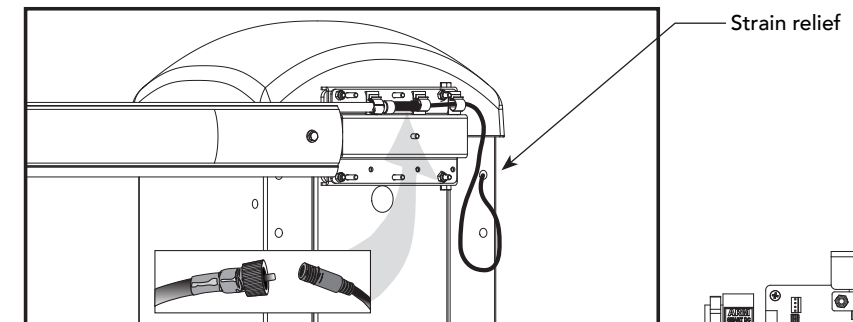
## 3 Connect Arm Lights to Smart DC Controller

**NOTE:** The top Smart DC Controller affects the arm while the bottom Controller affects the wedge. Arm and signal lights are handled through wired connections on the bottom wedge Controller. Only the Arm Controller has relays available for accessories.

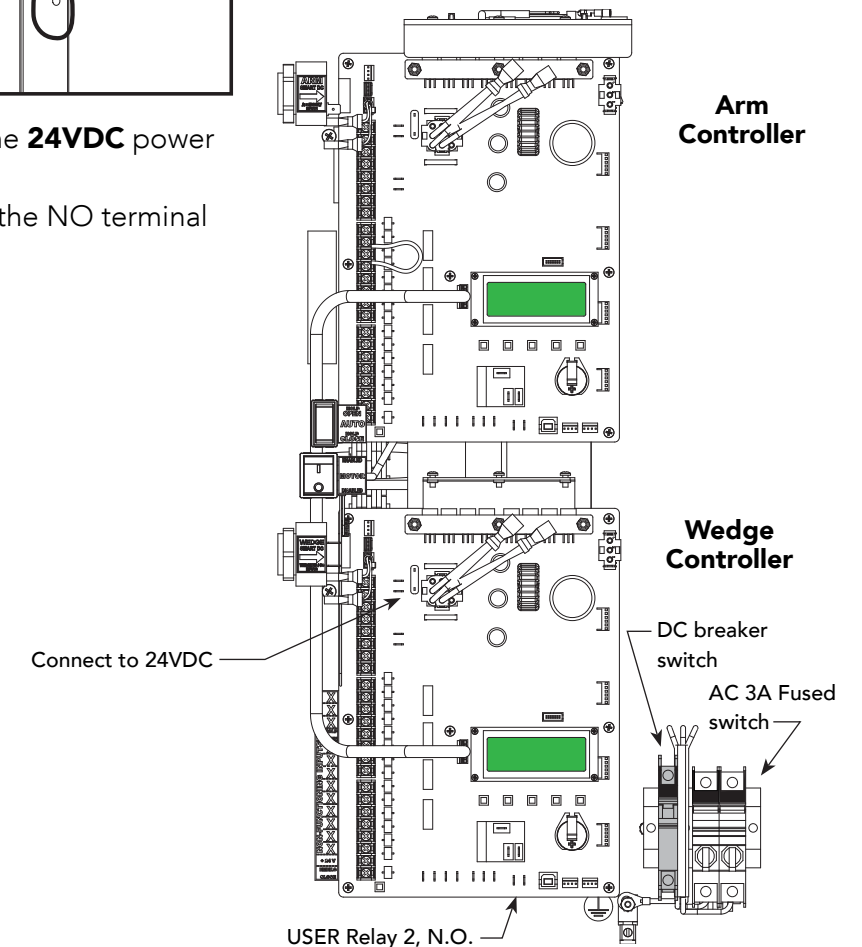
1. Make sure both AC and DC power switches are turned OFF.
2. Insert leads of wire harness through the hole in chassis. Feed the cable through the interior of the chassis. Pull enough cable to reach the Smart DC Controller terminals.

**NOTE:** Connect wire lead to 24VDC!  
Lights are dim when connected to 12VDC.

3. Attach the end of the wire harness (on outside of chassis) to the LED light connector on the arm.
4. Secure the harness to the chassis with the strain relief bushing.



5. Connect the one wire lead to the **24VDC** power supply terminal.
6. Connect the other wire lead to the NO terminal on User 2 Relay.



# Connect Power, Battery & Set Targets



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

## 1 Connect DC Wire Harnesses on both Controllers.

With the motor switch toggled to "Disabled" and the AC and DC disconnect switches OFF, connect the 9 pin harness blocks at the center of each Controller.



Be sure AC and DC disconnect switches are in the OFF position before connecting the 9-pin wire harnesses. An electrical spark will occur if power is present.

## 2 Connect to AC Power

1. Turn off the AC and DC disconnect switches and connect two wires and a ground to the terminals on the power module.
2. Place the incoming power wires into their appropriate slots. Attach the ground wire to the chassis. Tighten the terminals securely with a screwdriver.

**NOTE:** Wiring of gate operators must conform to NEC standards and comply with all local codes.

## 3 Establish Limits (Home Target)

1. When the installation is compliant and complete, turn AC power ON at the source (circuit breaker panel).
2. Turn ON the AC and DC disconnect switches and toggle the motor switch to "Enabled." A prompt on the arm controller display requests that the installer initiates a target search.

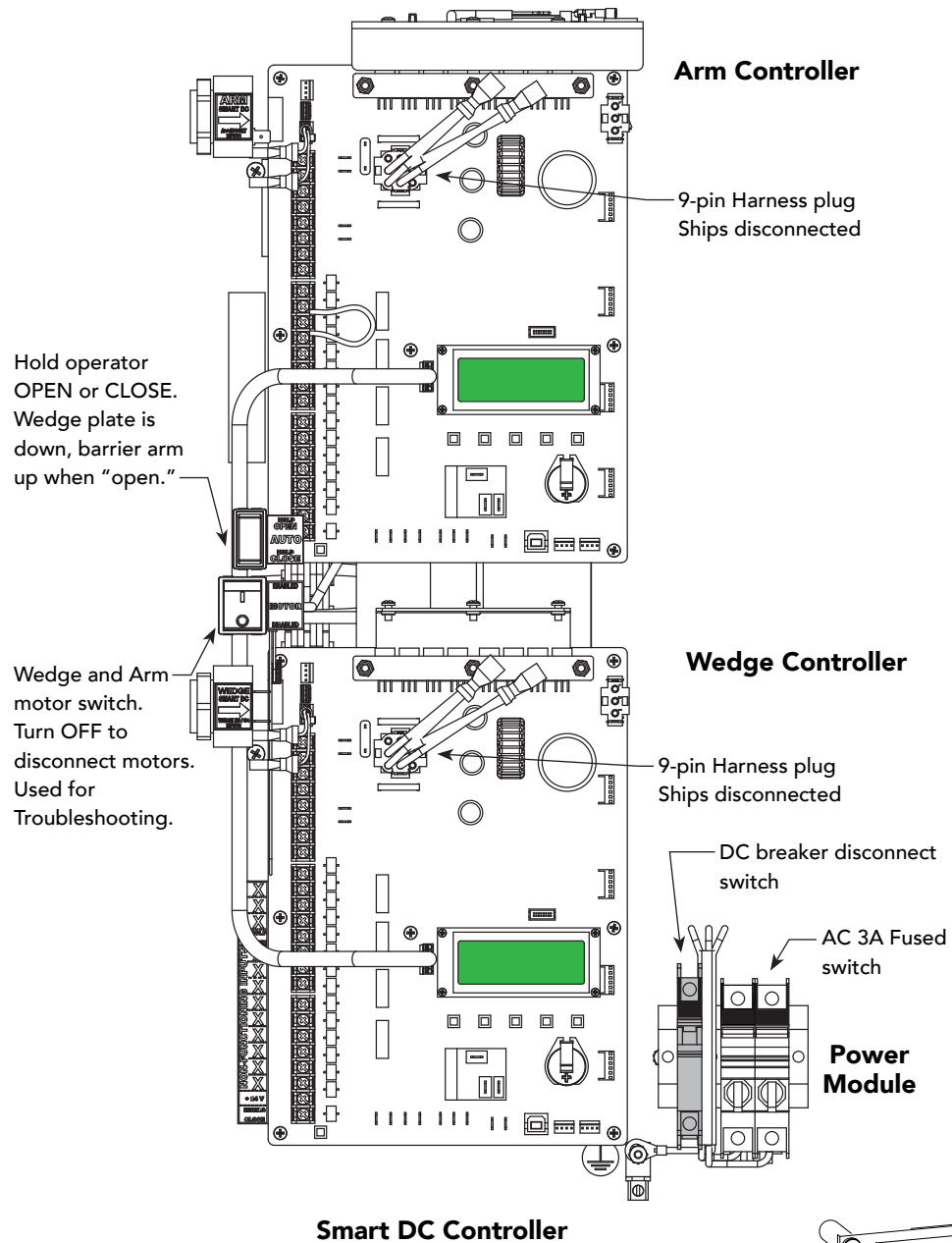
**NOTE:** An Error 12 "ARM-WEDGE COMM" will appear on the display that is waiting to learn its home target. The error message disappears when a target is set for both controllers.

3. Press OPEN on the Arm Controller. The barrier arm moves and establishes the OPEN/CLOSE limits.
4. After anchors are set, the wedge plate may be lying flat on grade, in the open position. When prompted, establish the OPEN limits for the wedge plate by pressing and holding the OPEN button on the Wedge Controller. If you go too far past the desired open position, you can press CLOSE to reverse direction.

**NOTE:** Some amount of slack needs to be in the chain when the wedge plate is open. The same is true for the yellow strap when the wedge plate is closed. Be sure to check these items. Too taut and binding may occur. Too much tension causes a greater load on either chain or strap and can reduce its life span.

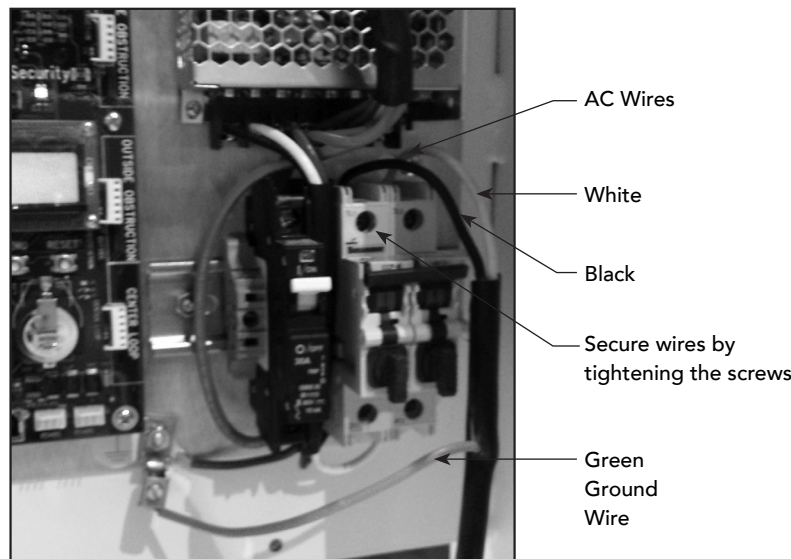
5. Check for slack in the chain. Use the OPEN or CLOSE buttons to make appropriate adjustments and press SELECT twice on the Wedge Controller (lower board). An audible beep indicates that the open limit has been established and stored in memory.
6. When prompted, press and hold the CLOSE button while the degrees increase toward 45 and the wedge plate reaches the desired full closed position.
7. Release the CLOSE button as the wedge plate nears full closed. The motor slows as do the numbered increments on the display. To preserve the CLOSE limit position, press SELECT twice. A buzzer chirps twice and the full CLOSE position is retained in memory.
8. An ALERT - 15 appears in the Arm's Smart DC display.
9. Using the Arm Controller, cycle the operator, by pressing OPEN and then CLOSE. When the open/close cycle is complete, ALERT - 15 disappears from the display and a HySecurity gate status appears.

At this point, the limits (target home positions) are established.

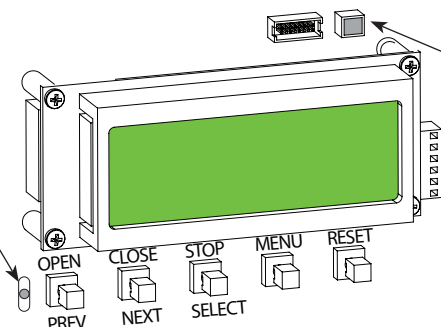


Hold operator OPEN or CLOSE. Wedge plate is down, barrier arm up when "open."

Wedge and Arm motor switch. Turn OFF to disconnect motors. Used for Troubleshooting.



Power Module



LED indicator changes color:  
 GREEN = AC power present and operator is stopped awaiting Run commands.  
 Flashing YELLOW = operator is running, barrier/gate moving  
 Solid YELLOW = Menu mode  
 RED = operator experiencing an Alert, Fault, or Error  
 Not lit = AC power lost. Pressing SHOW LED's button indicates which inputs, if any are active

RED "Heart Beat" indicates Controller is receiving power. Flashing indicates AC or DC present. When AC power is lost, rate of RED blinking LED slows down.

## 1 Configure the AL (Arm Lights) settings.

Check that the arm lights blink while the arm cycles and searches for the target home position. See page 5.

When the arm has stopped moving, the arm lights continue to blink. (If you want lights to remain lit without blinking, access the User Menu.)

The default (0) setting assures the arm lights flash constantly while closing and opening and when fully closed (barrier arm down, wedge plate up).

If you prefer lights to remain lit without blinking when operator is fully closed, access the User Menu and change the AL setting. Use the Arm Controller display menu buttons.

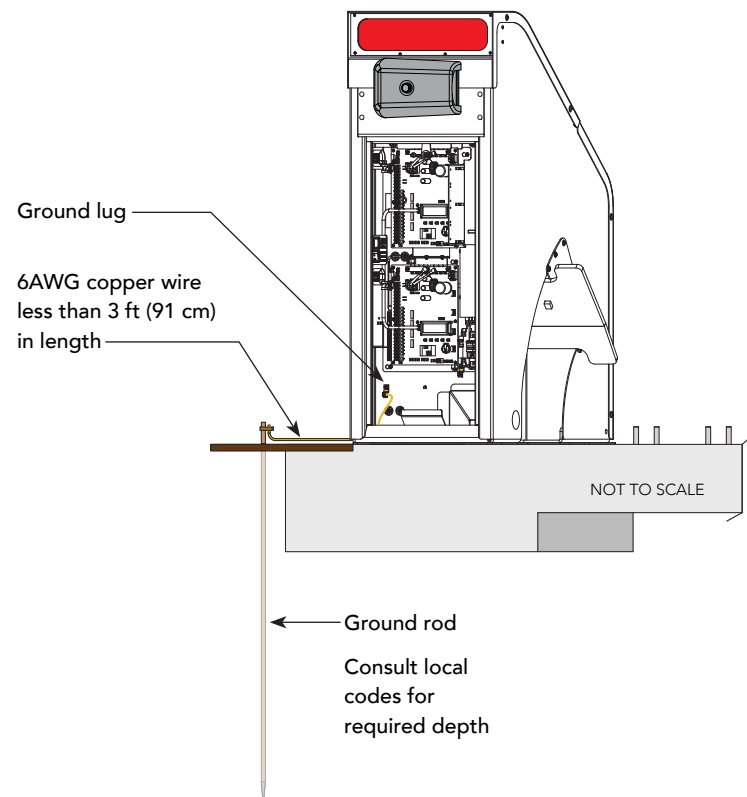


Configure the User Menu: AL

1. Press MENU twice and press NEXT until AL appears in the display.
2. Press SELECT. "AL" blinks indicating it can accept changes. Press NEXT to display 1.
3. Press SELECT and "AL" stops blinking.
4. Press MENU to exit Menu Mode.



**The potential for lightning discharge exists with all gates, barrier arms, fences, and gate operators. National Electric Code (NEC) requires a separate earth ground in addition to the required equipment ground.**



## 2 Be sure to Ground the Operator

For earth grounding requirements in the U.S.A., refer to the National Fire Protection Association (NFPA) 780 - Standard for the Installation of Lightning Protection Systems.

Highlights of the standard include:

- The ground rod must be UL listed copper-clad steel, solid copper, hot-dipped galvanized steel, or stainless steel. Minimum requirements: ½ inch (13 mm) diameter and 8 feet (244 cm) in length.
- The ground rod is driven into the earth (refer to local codes for proper depth requirements).
- The ground rod is electrically bonded to the chassis with a single length of unspliced 6AWG copper wire less than 3 feet (91cm) long. Due to the large concrete foundation, make the necessary adjustments to accommodate for earth ground requirements.
- Local jurisdictions may impose additional or different requirements above the NEC and NFPA 780. Consult the local codes and regulations regarding requirements in your area.

**NOTICE:** Properly grounding the gate operator is critical to gate operator performance and personnel safety. Equipment containing electronics may benefit when the earth ground discharges excessive voltage. Use sufficient wire size during installation. If you do not ground the operator with a separate earth ground rod, you risk voiding the Warranty.

1. Install the grounding rod per local building codes.
2. Attach a large earth ground wire (6AWG) from the grounding rod to the lug nut on the chassis. Feed the 6AWG wire from the chassis to the earth ground rod.

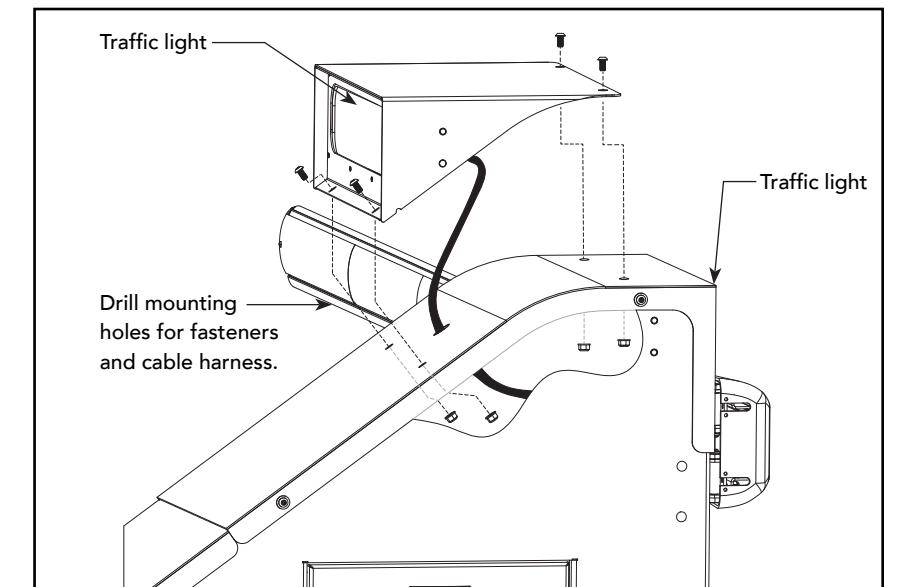
## 3 Complete the Installation

To configure User and Installer Menu options such as arm speed, Close Timer, etc..., refer to the *Programming and Operations Manual*

- Make sure the operator is grounded.
- Review, with the end user, the *Important Safety Instructions* and the proper use of WedgeSmart DC operator. Include how to manually operate the wedge plate.
- Replace operator's covers and side panels. Secure with a key latch.
- Take photos of the installation site.

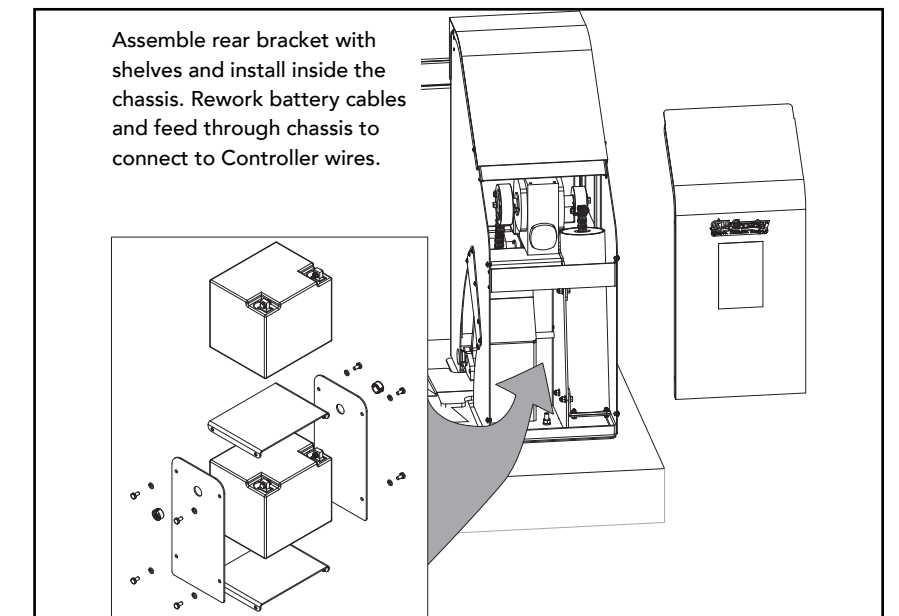
## TRAFFIC LIGHT OPTION

An additional traffic light can be mounted on the chassis and is useful in bi-directional traffic situations. The packaged option kit (MX3805) comes equipped with mounting hardware and cable harness.



## REAR BRACKET BATTERY SHELF

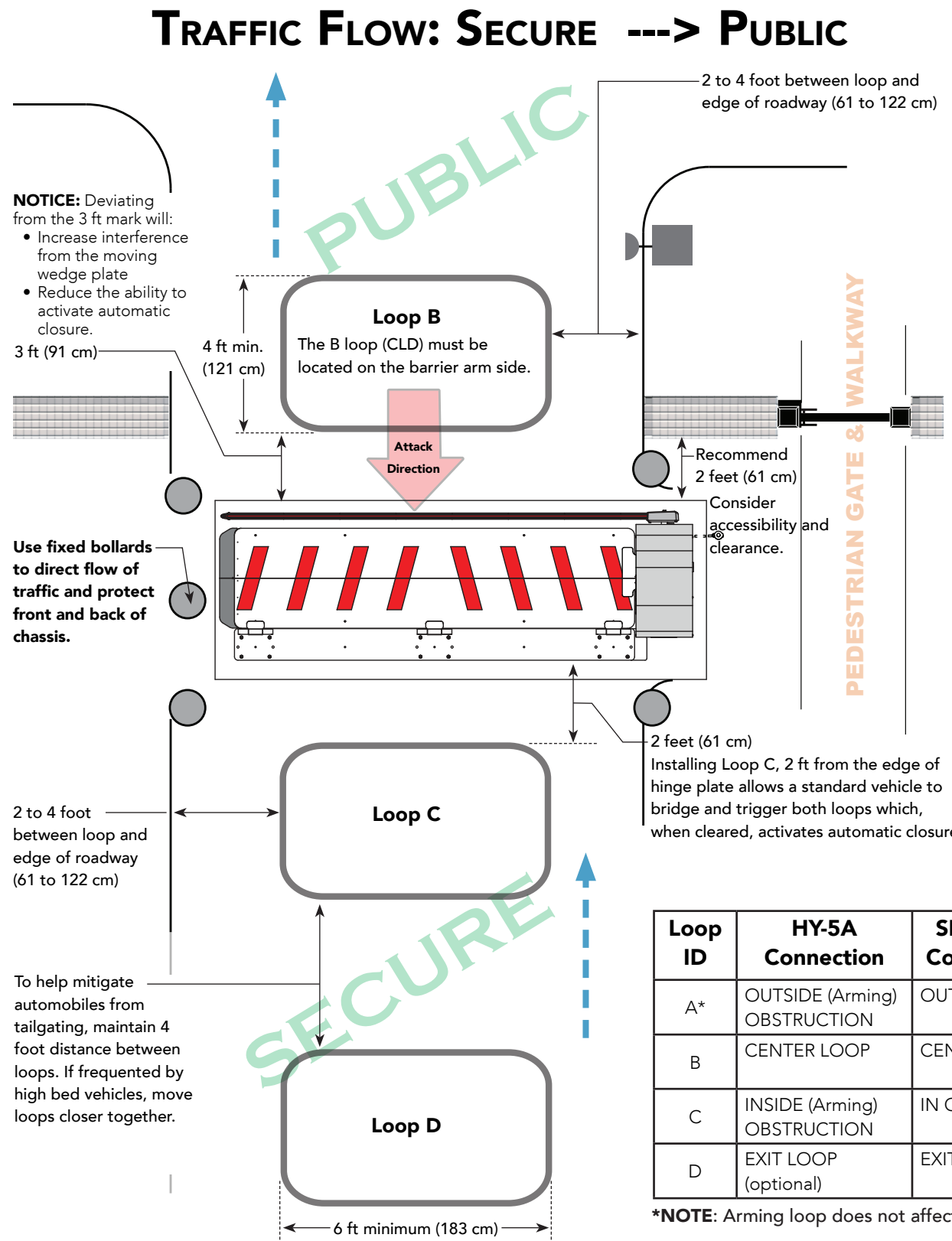
If the operator is mounted close to a wall, the side door access may be blocked. A rear bracket battery shelf option is available. The packaged option kit (MX3900) comes equipped with mounting hardware and battery extension wires and fittings.



# WedgeSmart DC: Loop Layouts

## Threat Protection: Prevent Unauthorized Entry

For threat protection applications, use site scenarios similar to the illustrations shown on this page.

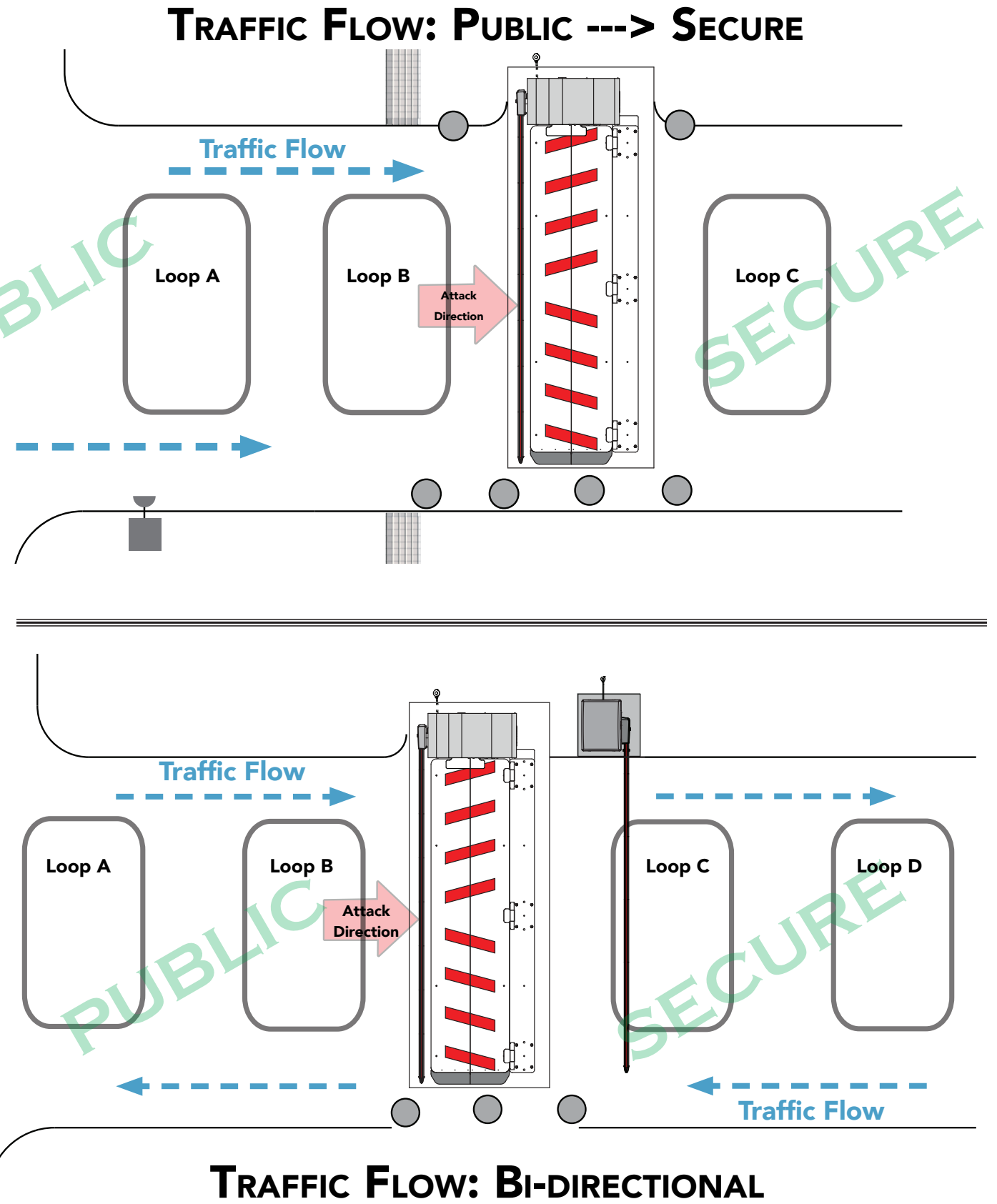


**Site Considerations**

- Types of vehicles using the facility
- Clearance considerations
- Grade of ingress and egress
- Pad mount: Grade level or Recessed
- Grounding requirements
- Use of auto close feature
- Loops: A, B, C, D
- Access control

Loop ID	HY-5A Connection	SDC Input Connection:	Installer Menu Settings
A*	OUTSIDE (Arming) OBSTRUCTION	OUT OBS LOOP	OALD, OOLD, OR
B	CENTER LOOP	CENTER	CLD, CR, CP
C	INSIDE (Arming) OBSTRUCTION	IN OBS LOOP	IALD, OALD, IR
D	EXIT LOOP (optional)	EXIT LOOP	ELD, DT, EB, CB

\*NOTE: Arming loop does not affect operation.





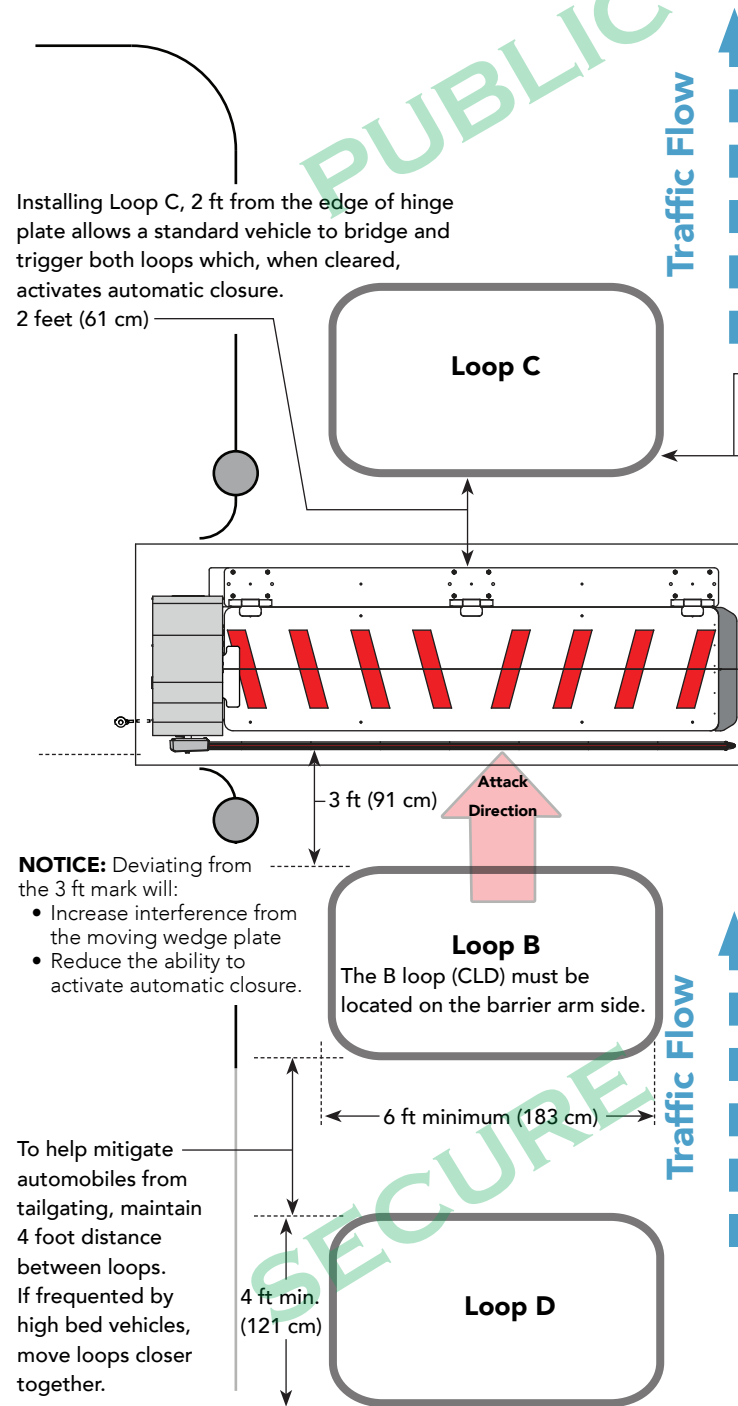
# WedgeSmart DC: Loop Layouts

## Theft Prevention: Prevent Unauthorized Exit

For theft prevention applications, use site scenarios similar to the illustrations shown on this page.

### TRAFFIC FLOW: SECURE ---> PUBLIC

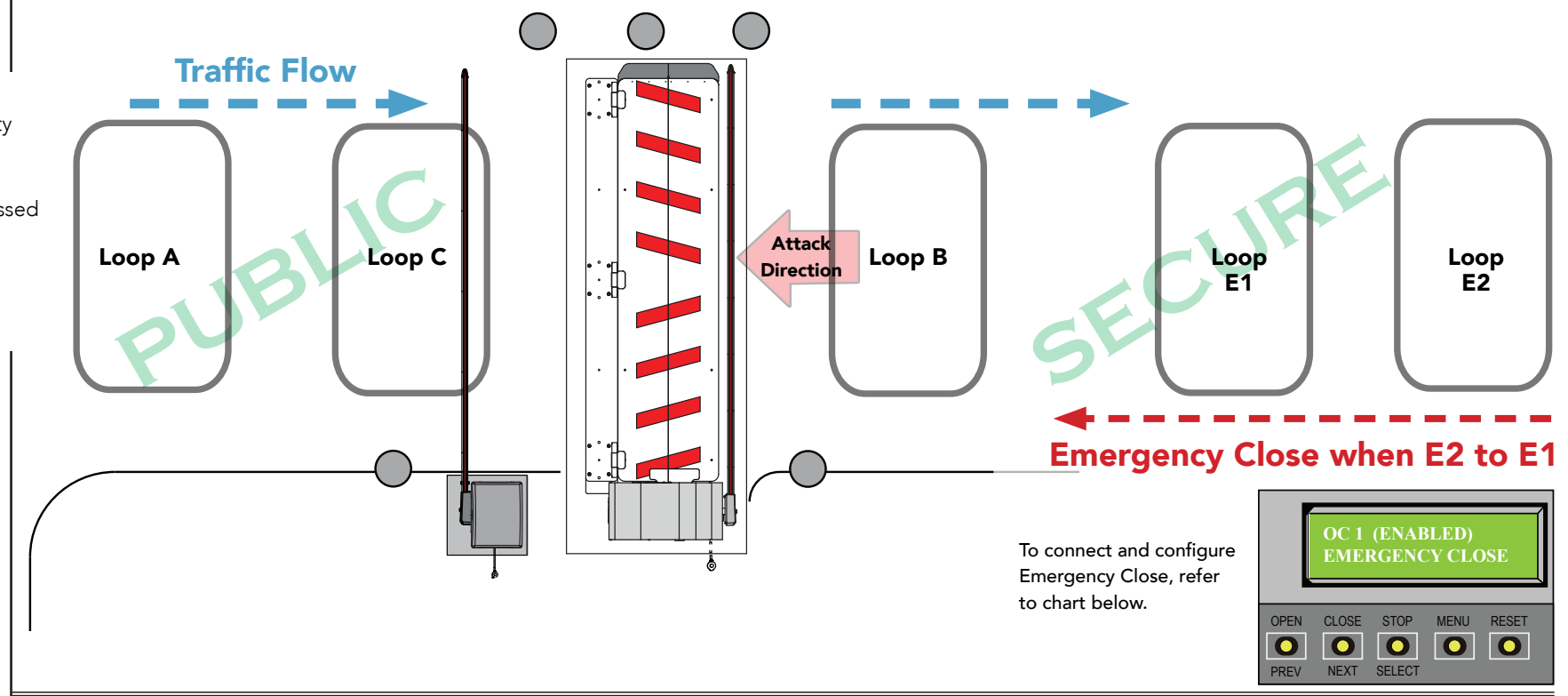
To configure loops, refer to chart below and to the *Programming and Operations Manual*.



#### Site Considerations

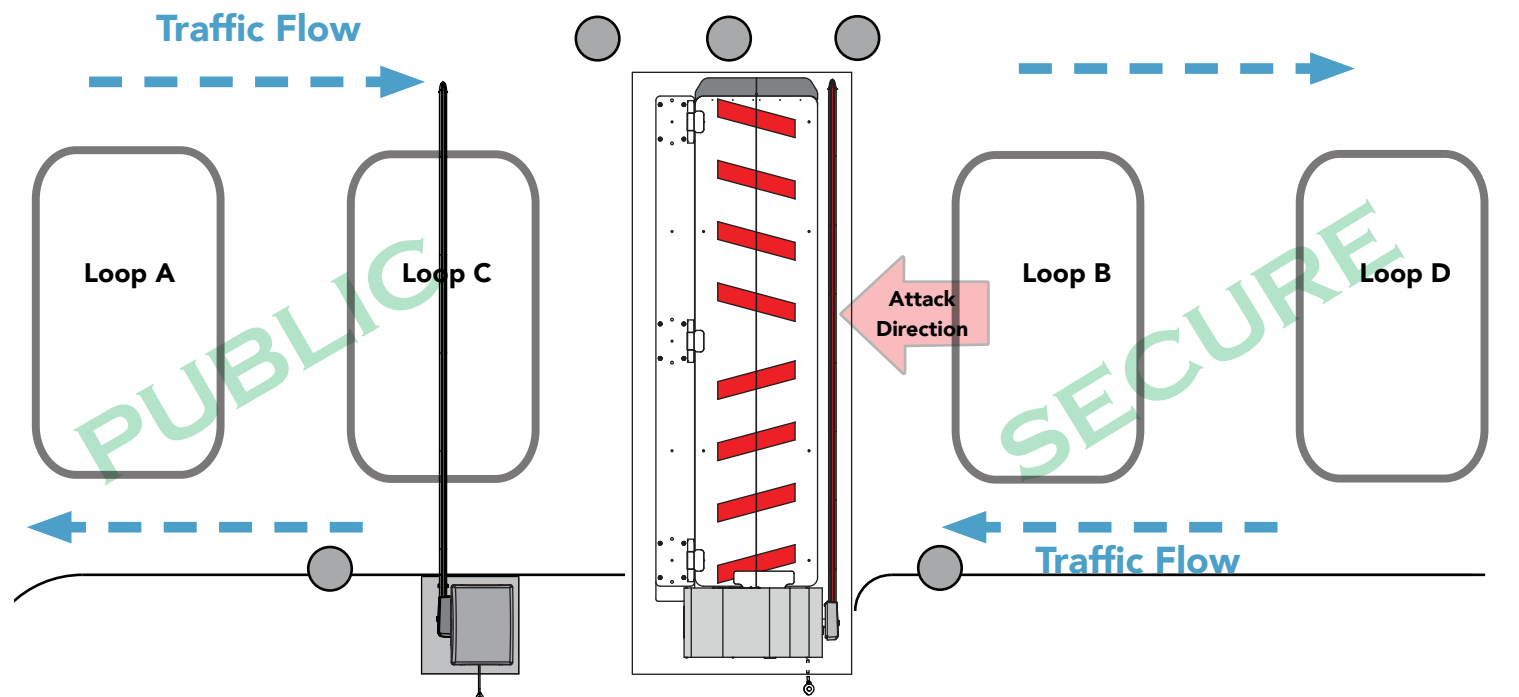
- Types of vehicles using the facility
- Clearance considerations
- Grade of ingress and egress
- Pad mount: Grade level or Recessed
- Grounding requirements
- Use of auto close feature
- Loops: A, B, C, D
- Access control

### TRAFFIC FLOW: PUBLIC ---> SECURE WITH EMERGENCY CLOSE



Loop ID	HY-5A Connection	SDC Input Connection:	Installer Menu Settings
A*	OUTSIDE (Arming) OBSTRUCTION	OUT OBS LOOP	OALD, OOLD, OR
B	CENTER LOOP	CENTER	CLD, CR, CP
C	INSIDE (Arming) OBSTRUCTION	IN OBS LOOP	IALD, OALD, IR
D	EXIT LOOP (optional)	EXIT LOOP	ELD, DT, EB, CB
E1	Requires 2 channel box detector. Connect to Emer Open and +24V on the Wedge Smart DC Controller (SDC). Configure Installer Menu on the Wedge SDC: Set OC to 1. Emergency Close triggers when vehicles detected crossing from E2 to E1 loop.		
E2			

\*NOTE: Arming loop does not affect operation.



### TRAFFIC FLOW: BI-DIRECTIONAL



 **HySecurity**<sup>®</sup>  
*Simple. Reliable. Secure.®*