Revision

N

Xpress Pay Terminal
Installation Manual

INSTALLATION MANUAL

Revision N

This manual provides comprehensive installation procedures for the Xpress Pay Terminal (XPT). It includes the process of site planning, site preparation, the mechanical installation of the XPT, and the electrical wiring of the unit.

Note: DRB Systems is <u>not</u> responsible for the installation and electrical wiring of the XPT system. The customer and/or distributor are responsible for all procedures outlined in this manual, unless otherwise noted.

If further assistance is needed, please contact the distributor from which the XPT was purchased.

When calling for assistance, you must have the following information available:

Xpress Pay Terminal Serial Number: _____

Distributor Name: _____

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Chapter 1

1 Installation Overview

The XPT provides the most versatile carwash entry system available today. The industry's most advanced carwash entry system requires the industry's most complete technical support. It must be properly installed, configured, and maintained. This manual is designed to provide you with the information needed to properly install the system.

The Xpress Pay Terminal (XPT) installation procedure is made up of three stages: site planning, mechanical installation, and electrical installation. Each stage builds upon the procedures of the previous stage.

1.1 Site Planning

In the site planning stage, you will develop your installation strategy. Proper planning leads to smooth installation, and you can save yourself hours of frustration by making sure you have everything in place before you begin the mechanical and electrical installation stages. This stage includes the following steps:

- Identify the exact location for the XPT, gates, and merge loops.
- Ensure the site has met the appropriate wiring requirements.
- Verify all equipment and parts are present and accounted for.

1.2 Mechanical Installation

In the mechanical installation stage, you will physically install the XPT unit. This stage consists of two steps, both of which will go smoothly if proper planning has been made.

- Install the physical base (either the standard base or a bricked-in foundation).
- Mount the XPT unit to the installed base.

1.3 Electrical Installation

In this stage, you will connect the wiring to the XPT. Make sure to take all appropriate precautions before you work on any high-voltage electrical wiring.

- Wire the main power.
- Wire the network connection.
- Wire any lights or third-party devices to the control module.
- Wire the security camera, intercom, and external alarm (if applicable).
- Wire the in-bay automatic controller to the control module (if applicable).

1.4 System Setup and Configuration

Most of the software configuration needed to sell wash services to customers at an XPT is done in the SiteWatch database through Site Manager. The DRB Systems Implementation staff will perform this configuration after the XPT has been installed and is operational.

1.5 Testing Procedures

System testing is performed to ensure that all the previous steps in this guide were performed correctly.

Before testing the entry system, verify or complete the following procedures:

- Wiring is completed for the terminal and any attached hardware.
- 120 VAC power is available to the hardware at the machine room circuit breakers.
- Power is on at each of the units (terminal, gate, etc.).
- The XPT software is running as indicated by an "Out of Service" screen on the terminal.

Chapter 2

2 Site Planning

In the site planning stage you have three objectives:

- Determine the site layout.
- Ensure that all cabling requirements are met.
- Ensure that you have all the necessary tools and parts.

2.1 Determine the Site Layout

You have four primary concerns when determining the site layout. They are:

- Positioning the XPT unit.
- Designing the conduit runs.
- Determining which base you will install the XPT unit on.
- If installing gates, the position of the gates and their merge loops.

The following sections provide guidelines for determining the position of the unit. They also provide general information that should be taken into account when designing your site's layout.

2.1.1 Positioning the XPT Unit

By determining the position of the unit first, you will have all the information you will need to install the required conduit runs. You will also be able to determine the installation requirements for the unit base.

If the XPT will be facing direct sunlight, the installation of a canopy is highly recommended to reduce sun glare, make the LCD more visible, and to greatly improve barcode reader performance. A canopy also helps maintain a stable operating temperature for the XPT.

The XPT unit's placement should be based on your site layout and usage of the terminal. If you are adding a single unit at an express lane, position it just before the location in which you want XPT customers to merge with the full service customers on the way to the tunnel entrance. If you are using XPTs in all lanes, allow room for 3-5 cars to stack between the terminals and the tunnel entrance. If you are installing gates to control traffic flow, be sure to allow room for the gate after each terminal. See section 2.1.4 for more details.

If the XPT is being used as an entrance terminal for an in-bay automatic wash, it should be placed 12 feet before the entrance of the wash bay so there is room for a car sitting at the terminal to purchase a wash without interfering with the operation of the bay.

Adequate site lighting in each XPT lane is highly recommended to improve usability after dusk, improve barcode reading performance, and enhance after-hours security.

Additionally, a concrete post, or bollard, can be positioned just to the front left corner of the unit to act as a protective buffer. A typical size for this is 32" tall and 4" in diameter.

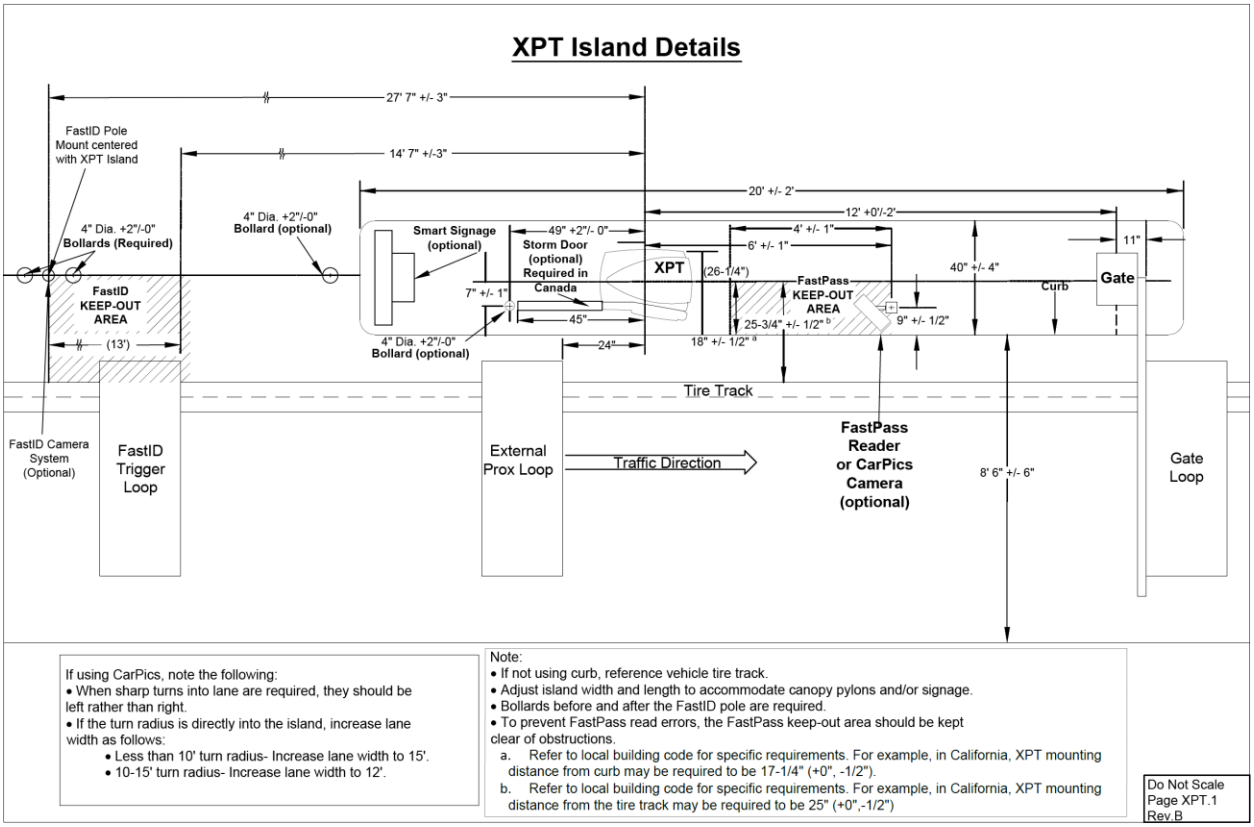


Figure 1. Positioning the XPT Unit

2.1.2 Conduit Run Considerations

The XPT has a rectangular service entrance port in the bottom of the main case that aligns to a series of 4 conduit holes in the standard base frame. The base frame conduit holes are sized for three 3/4" conduits and one 1" conduit. If more than 4 conduits are needed, they can be cut 3" to 6" shorter than the top of the base frame, and multiple wires can be pulled through the same conduit hole in the base and into the service entrance port on the XPT. If the XPT brick-in adapter is used, conduits should be routed through its rectangular cutout and cut 3" shorter than the XPT. Wires can then be pulled from the conduits up through the XPT service entrance port. See Appendix A for a detailed diagram of the XPT footprint.

Warning: Never run cabling to the XPT base outside of a conduit.

When installing the conduit:

- Conduit containing AC power wiring should be 3/4" diameter.
- Conduit containing the external prox loop leads should be 1/2" PVC (if using non-Ethernet gate).
- Conduit containing Cat-6 cable, external alarm wiring, security camera Cat-6 cable, and intercom wiring should be 1" in diameter.

While the prox loop conduit must be PVC to prevent loop interference, all other above-ground conduits should be metal rather than PVC, to prevent communication errors and maximize protection against lighting surges. However, if PVC conduit is used instead, all signal and communication wiring should be shielded, with the shield drain connected to earth ground at only one end.

Regardless of the type of conduit used, power and Class 1 signal wiring should maintain a minimum separation of **12 inches** from Class 2 signal and communications wiring, particularly where the conduits run parallel for more than 6 feet. This spacing becomes even more critical near conduits carrying motor and high voltage lighting power wiring.

Note: Many sites contain "Floor Heat," an under-concrete heat exchanger system consisting of an elaborate network of plumbing through which antifreeze circulates. Review any site floor heat diagrams before marking and drilling into any area.

Many sites will install gates, gate loops, and merge loops. Those sites require conduit to the gate to supply AC power. A conduit also needs to be run between the gate and the XPT for Cat-6 (or better) or communication wire to control the gate, as well as a PVC conduit running from the gate to each loop area for the loop detector. The conduits carrying loop lead-in wires must be PVC to prevent loop interference.

If the site has an in-bay automatic controller interface, FastPass reader, or lane available light, each needs additional conduit runs to communicate.

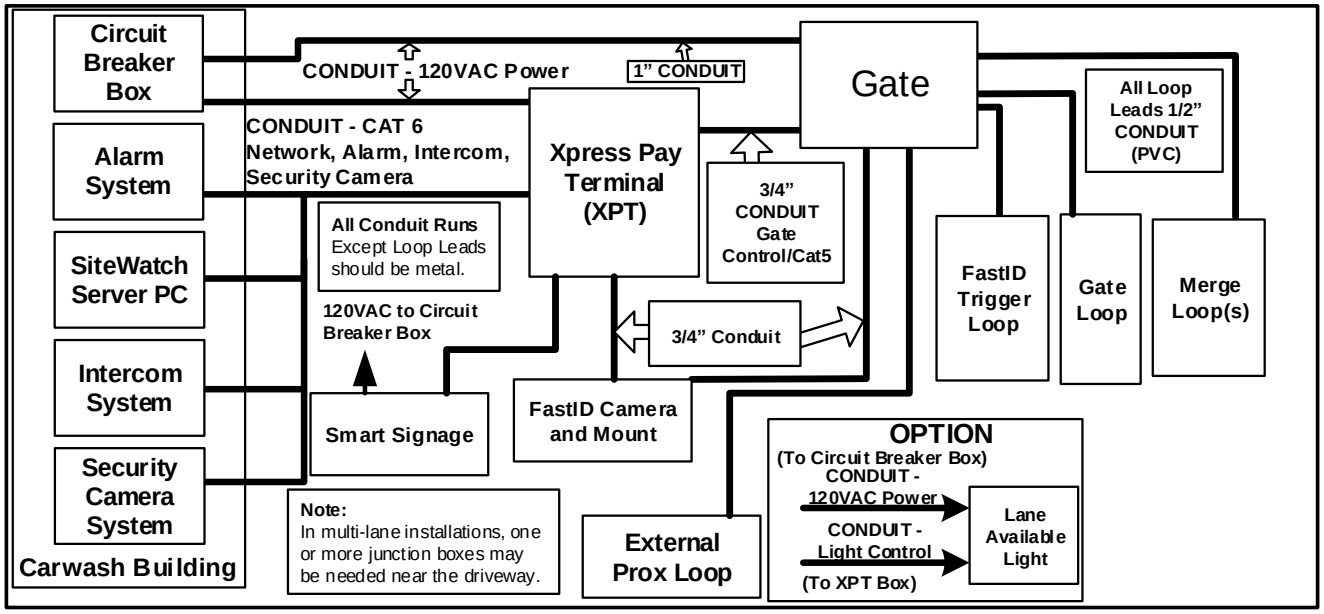


Figure 2. Conduit Plan for XPT with Gate

When a gate is added to an XPT installation, a 3/4" conduit is needed (Figure 2) to carry Cat-6 (or better) or control wiring between the terminal and the gate, as well as a PVC conduit for the gate loop in the pavement under the gate.

If there are multiple terminals and gates, merge loops are strongly recommended. An additional PVC conduit (Figure 3) is needed to connect the loop with its controller mounted in the gate housing.

If there are three or more lanes with XPTs, and the gates <u>are not</u> Ethernet controlled, a merge loop redundancy connection should be made between each XPT. This parallel connection allows each XPT to detect all of the merge loops if one or more XPTs are turned off. The wires connecting each XPT must not share a conduit with AC power and may require an additional 3/4" conduit. See Appendix C for more information on determining the merge loop requirements based on the site layout.

Note:

- If the gate is Ethernet controlled (the preferred method), run the external prox loop lead-in to the gate. If the gate is not Ethernet controlled, run the loop lead-in to the XPT and purchase the external prox kit.
- The gate loop and merge loop lead-ins must be run to the loop detector(s) inside the gate(s).

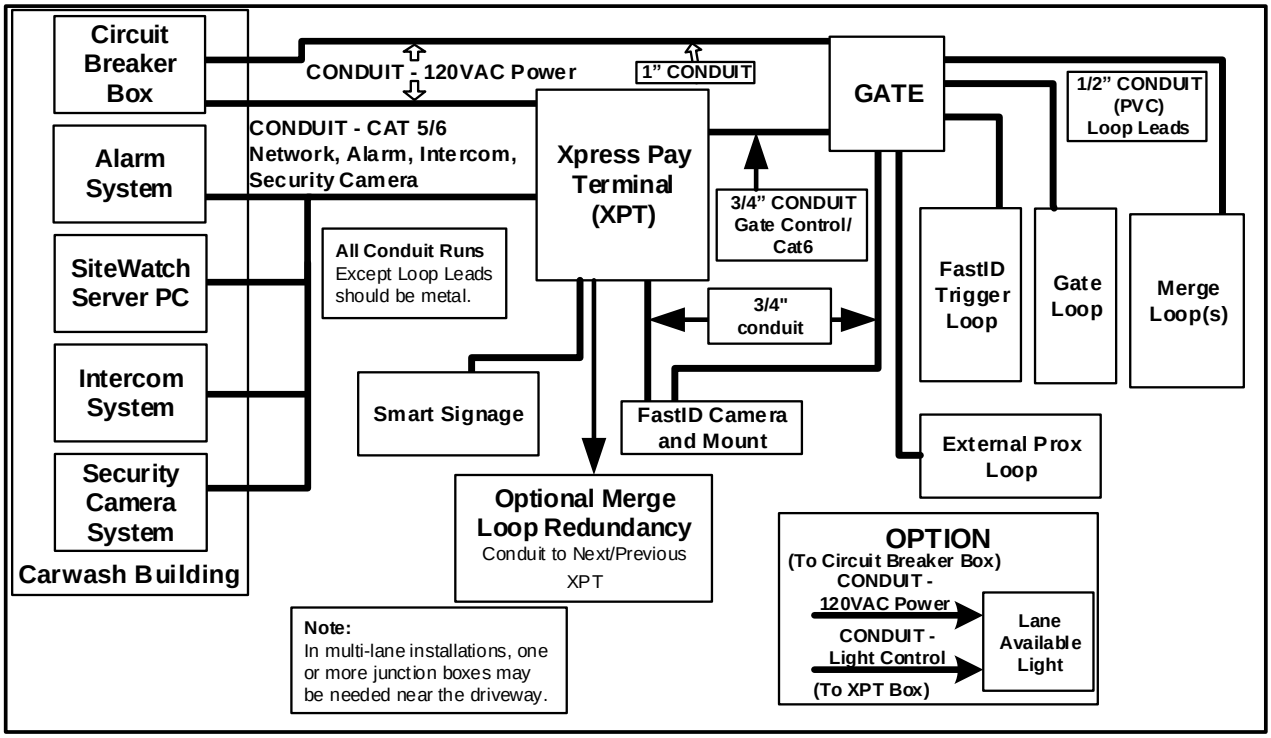


Figure 3. Conduit Plan for XPT with Gate, Merge Zone, Optional Merge Loop Redundancy, and Optional Light

2.1.3 XPT Base Considerations

The primary concerns in determining what type of base to install for the XPT are location and security. The most secure method of installing the XPT is to build a brick enclosure around the unit, mounting it on a concrete base. This is also the only option for XPTs sold into Canada, because the brick enclosure provides a thermal mass that will help regulate the internal temperatures in a cold environment.

Ultimately, the distributor and owner share the responsibility for deciding whether to use a brick enclosure. If a brick enclosure is not possible, DRB Systems offers a standard base or a curb height base. The standard base is 35" tall; and the curb-height base is 29" tall, making it ideal for sites with 6" curbs.

The standard base consists of a steel frame mounted 6" deep into a 1' to 2' deep concrete slab measuring 4' wide by 4' long. DRB Systems recommends the concrete pad be 2' deep. A polyethylene sheath covers the steel frame, giving it an attractive exterior that matches the XPT. The base is extremely strong, but if the site owner wants an additional level of security, the sheath can be filled with concrete.

2.1.4 Gate and Merge Loop Locations

Sites that are installing gates to control traffic flow to the wash tunnel need to allow room for the gates between the XPT position and the queue of cars to the tunnel. The gates are typically installed 12' from the XPT centerline. Provision also needs to be made for a gate loop in or on the road surface under and even with the gate arm to close the gate after each car has passed the loop.

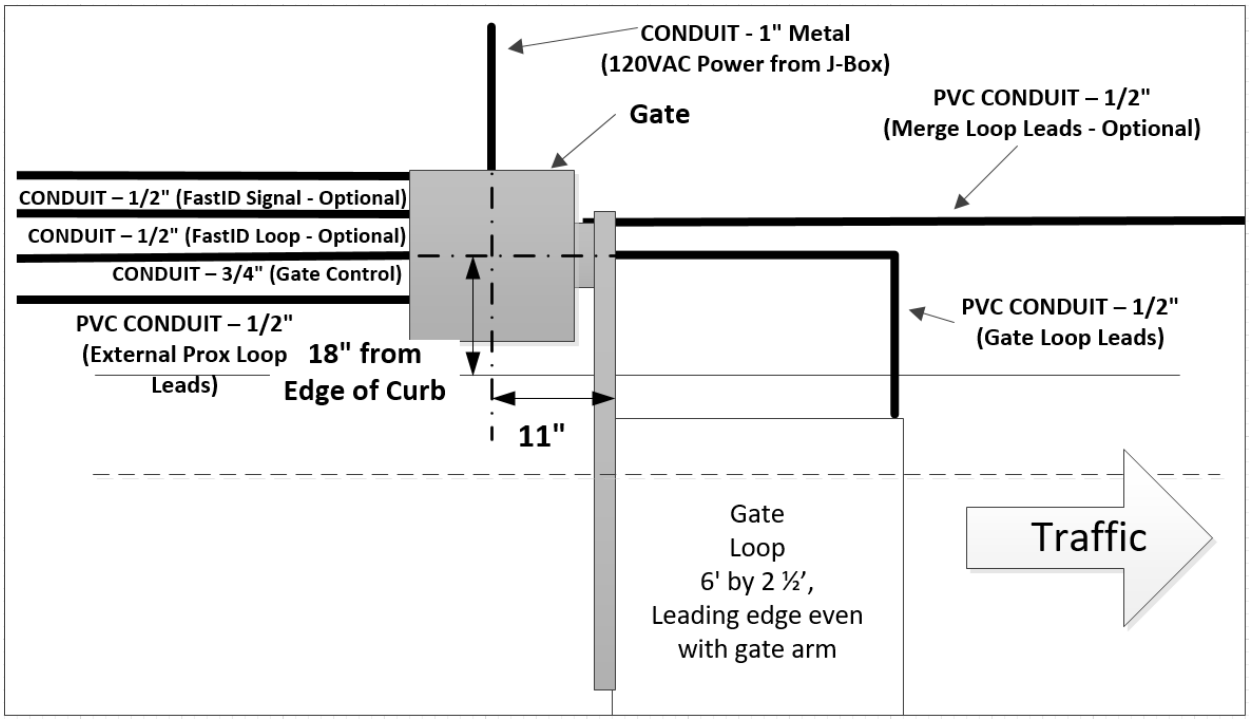


Figure 4. Gate Installation

To keep cars from getting out of order and receiving the wrong wash when using multiple lanes, it is necessary to install merge loops in the road surface. The merge loops must be placed so that a car is detected before it has completely left the gate loop, and continues to be detected by one of the merge loops until it reaches a choke point, where it cannot be passed by other cars. The trailing edge of the merge loop must also be spaced a minimum of 1 car length beyond the trailing edge of the gate loop, so that when SiteWatch opens the next gate, the next car is able to pull all the way through to the choke point.

DRB Systems includes one merge loop per gated XPT lane in a standard system order. An example of a two lane setup is shown below.

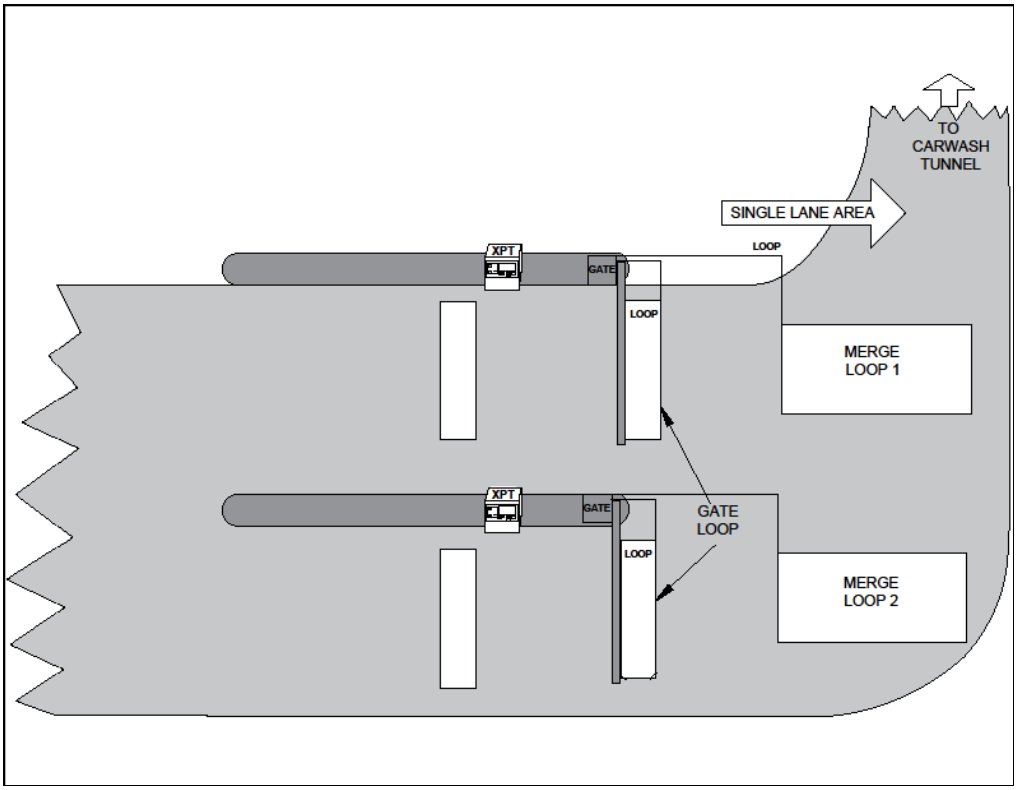


Figure 5. Merge Loop Locations for Two Lanes

See Appendix C for more details on layout and installation of gates and loops.

Some sites have a mixture of attended full service lanes and unattended self-serve lanes with XPTs. It is possible to control the gate in an attended lane from an XPT lane to allow queuing from all of the lanes to the tunnel entrance. An XPT can be used to control one attended lane gate in addition to its own.

2.1.5 Electrical Planning

After determining the positioning of the unit and the base you will be using, you will need to verify the electrical requirements of the XPT are met.

2.1.6 Site Grounding Considerations

Ensure the protective earth ground wire does not carry any motor return current. Only the neutral wire should carry return current.

2.1.7 Required Electrical Wiring

You will be connecting the main power wiring, the external prox loop, gate, merge loop interface wiring, and (2) Cat-6 network connections to the XPT.

Note: Follow local electrical code when wiring the XPT.

2.1.7.1 Pulling Wires

There should be at least 6' of wire between the ground-level conduit and the wire terminations. The following table provides the number of wires, the wire description, and the wire color you will need to wire the XPT.

Table 1. Wire Pull Chart

Conductors	Wire Description	Wire Gauge/Spec	Wire Color
3	115-120 VAC hot, neutral, earth ground. Must have a dedicated conduit run.	16AWG (min.) stranded	Black, white, green
†	External prox loop (connects to gate if using Ethernet controlled gate) † Loop wire is a continuous run with a variable number of turns.	16 or 18 AWG stranded, tinned copper with XLPE insulation rated for 600V	Any color
8	Network communications to gate (for Ethernet controlled gate only)	Cat-6 **Note**: Must be shielded if using PVC conduit for power and signal.	Any color
6	Gate control (for non-Ethernet controlled gate only)	22 AWG stranded **Note**: Must be shielded if using PVC conduit for power and signal.	Electrician's discretion. Recommend using different color for each wire.
†	Gate loop † Loop wire is a continuous run with a variable number of turns.	16 or 18 AWG stranded, tinned copper with XLPE insulation rated for 600V	Any color

Conductors	Wire Description	Wire Gauge/Spec	Wire Color
†	Merge loop † Loop wire is a continuous run with a variable number of turns.	16 or 18 AWG stranded, tinned copper with XLPE insulation rated for 600V	Any color
1	Merge loop signal (if using 2 or more gates)	22 AWG stranded **Note**: Must be shielded if using PVC conduit for power and signal.	Any color
8	(Qty. 2) SiteWatch network communications line. (**Note**: Two network runs are required for each XPT to segregate cardholder data traffic from other network traffic).	Cat-6 **Note**: Must be shielded if using PVC conduit for power and signal.	Any color
8	(Qty.1 or 2) FastID camera network communications line. (**Note**: If only 1 FastID camera is in line with the XPT, only 1 communication line is needed. IF 2 FastID cameras are in line with the XPT, 2 communication lines are needed.	Weather resistant Cat-6 **Note**: Must be shielded if using PVC conduit for power and signal.	Any color
7	FastPass	22 AWG stranded, shielded	Recommended to include Red, Black, Red/Black, White/Black, Blue Orange, Green, White

Conductors	Wire Description	Wire Gauge/Spec	Wire Color
4	Intercom Connection	22AWG shielded twisted pair	Any color
*	In-bay automatic wash controller wiring (if applicable) * Dependent upon wash equipment requirement.	Dependent upon wash equipment requirement	See wash equipment manufacturer documentation.
2	External alarm connection	22AWG twisted pair **Note**: Must be shielded if using PVC conduit for power and signal.	Any color
8	Security Camera (if installed)	Cat-6 **Note**: Must be shielded if using PVC conduit for power and signal.	Any color
8	Smart Signage Network line	Cat-6	Any color

2.1.7.2 Main Power Wiring

The XPT requires 115-120 VAC computer grade power on a dedicated 8-amp (minimum) breaker. A dedicated earth ground should be properly bonded at the breaker panel and run to the XPT.

Note: Follow local electrical code when wiring the XPT.

The XPT unit requires power wiring to be 16 AWG or larger. Failure to adhere to this standard could result in a fire or injury.

You will need sufficient wire to reach from the circuit breaker to the XPT unit, plus an additional 6' to ensure there is enough wiring to make all the electrical connections.

2.1.7.3 Intercom Wiring

The number of wires you need depends on the intercom system selected for the site. The XPT can be used with 2, 3, or 4-wire systems. Factory configuration is for a 2-wire system. See the system instructions for the intercom system selected for the site.

2.1.7.4 LAN Wiring

XPTs require the installation of two local area network (LAN) runs to separate cardholder data environment (CDE) from non-cardholder data environment network traffic, for the most

secure installation. One network cable connects the XPT control module EMV reader to the CDE segment of the SiteWatch network, while the other cable connects the network switch inside the XPT to the non-CDE segment of the SiteWatch network for Ethernet controlled gate and CarPics camera communication.

2.1.7.5 In Bay Automatic Wash Controller Wiring

Generally, most wash manufacturers use a five-wire system to provide the arming signals for the selected wash packages. One common line and four arming input wires are fed from the wash's Programmable Logic Controller (PLC) to the XPT. In addition to these five, a Wash-In-Use Hot and Wash-In-Use Neutral are required to reset the wash electronics. Typically, these are also provided by the PLC.

You will need sufficient cabling to reach from the wash's PLC to the XPT, plus an additional 6' of wiring (measuring from the base of the unit to the end of the wires) to ensure there is enough wiring to make all the electrical connections.

Each wash manufacturer has its own color code system and wash relay pin-outs. Please review the appropriate wash documentation to prepare for the electrical stage of the installation.

2.1.7.6 External Alarm Wiring

The XPT is capable of connecting to an external alarm system through a relay on the power module. This normally open or normally closed output activates and deactivates in parallel with the internal siren.

2.1.7.7 Security Camera Wiring

The factory-installed security camera is designed to interface directly with a site camera monitoring system, and is not controlled or used by SiteWatch. A Cat-6 cable should be run from the site camera monitoring system to the XPT security camera for this connection. The camera is PoE powered, so the site's camera monitoring system must provide PoE power through the Cat-6 cable.

2.2 Mechanical Installation Tools

The following tools are recommended for the typical mechanical installation of this XPT unit and base:

- 3/4" deep well socket and socket wrench
- Open end 9/16" wrench
- Small, thin blade, flat-tip screwdriver
- Hammer
- Dual-plane level
- 50' tape measure

The following items are required only when installing the XPT into an existing concrete base:

- Hammer drill
- 2.5" concrete hammer drill bit

2.3 Electrical Installation Tools

In addition to the mechanical assembling of the XPT unit to the base (and the base to the concrete), a number of electrical connections must be made. These connections will require the use of the following common hand tools:

- Small, thin tipped, straight screwdriver (1/8" tip, for green Phoenix connectors)
- Wire strippers (capable of handling 10-23 AWG wire)
- Side cutters

The following items are required for network installation:

- RJ-45 crimp tool
- 4 RJ-45 Cat-6 modular plugs
- LAN tester

2.4 Part Verification

Prior to beginning the installation, take the time to verify that all the following required parts are present and accounted for.

2.4.1 Standard Installation

The following parts will be included in the standard installation:

- XPT
- Installation and hardware service manuals
- Key set for main door
- Key set for vault door (if applicable)
- Key set for the bill dispenser cassettes (if applicable)

2.4.2 Brick-In Installation (Optional)

- Brick-in adaptor plate
- 4 anchor "J" bolts
- 4 nuts (to attach the brick-in adaptor plate to the concrete base)
- 4 mounting bolts (to attach the XPT to the brick-in adaptor plate)

2.4.3 XPT – Base (Optional)

If the owner has chosen not to brick in the XPT, verify you have received the following parts:

- Base frame
- Plastic sheath for base frame
- 3 large washers (1.06" Min O.D. X 0.12" thick)
- 3 hex nuts (½ -13)

Chapter 3

3 Mechanical Installation

	**Caution:**	Only mount the XPT to an approved base provided by DRB Systems. Other bases may not provide enough security or proper air circulation through the internal heat exchanger.

3.1 Standard Base Installation

The standard and curb-height bases consist of a metal tube frame, which must be mounted to a concrete slab, and a molded plastic sheath that slides over the frame. For additional security, the plastic case may be filled with concrete after sliding it over the frame.

	**Note:**	Pull all wires through conduits before mounting the base. See Section 2.1.7 for wiring requirements. Refer to Appendix A for conduit port locations.

3.1.1 Frame

The standard and curb-height base frames consist of a molded polyethylene sheath over heavy-gauge steel frame. The standard base frame is 35" tall, and the curb-height base frame is 29" tall, for sites with 6" curbs. Select the proper frame and make adjustments as necessary to achieve a height of 35" from the bottom of the XPT to the road surface. **Note**: In some areas, such as California, the required height may vary. Refer to local building code for specific requirements.

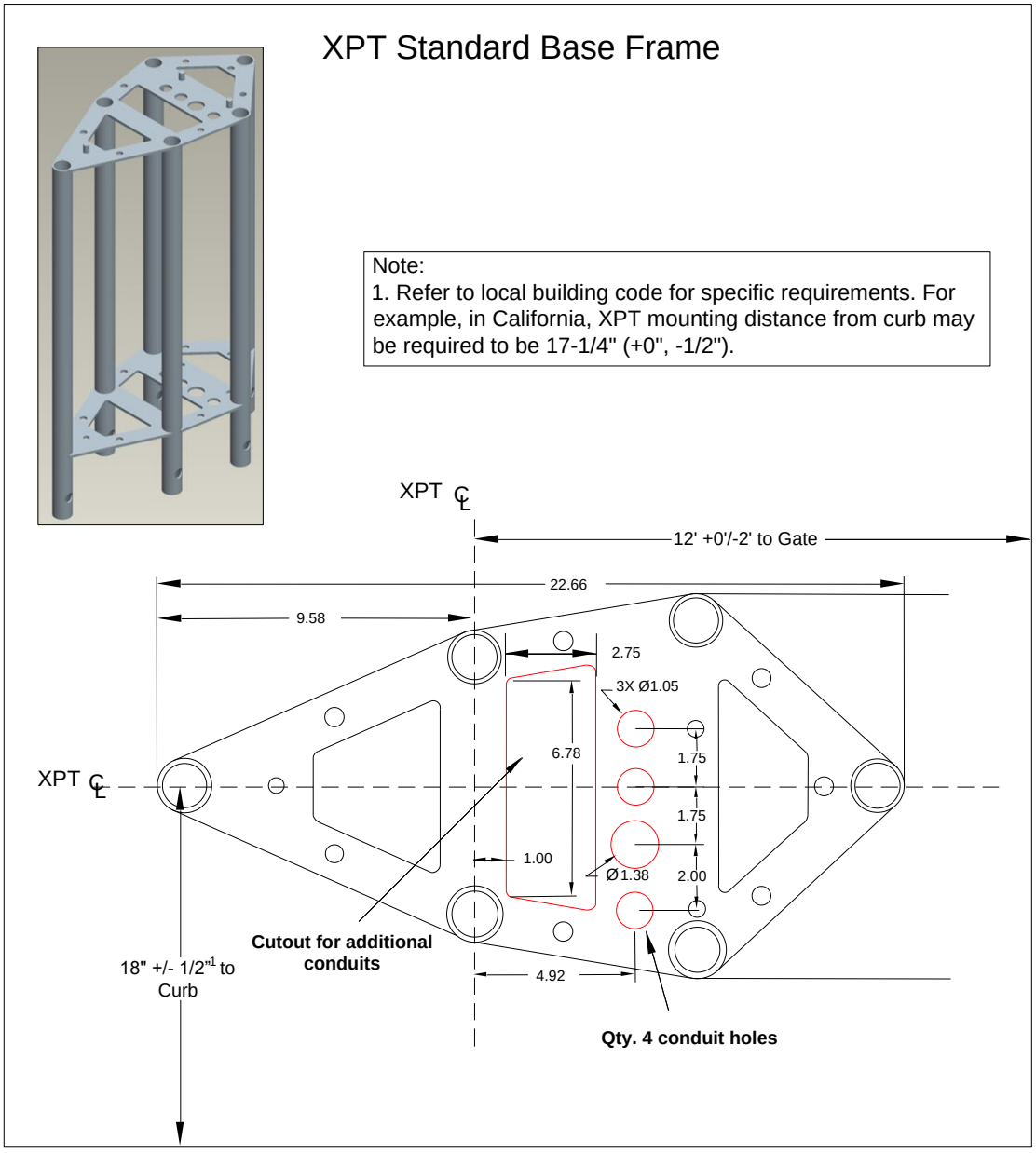


Figure 6. Standard Base Frame

When installing the XPT frame, we recommend undercutting the concrete pad, as illustrated in the figure below. This type of installation provides greater security.

The undercut pad size should have the following dimensions:

Table 2. Pad Dimension Requirements

	Minimum	Recommended
Surface Width	18"	48"
Undercut Depth	8"	24"

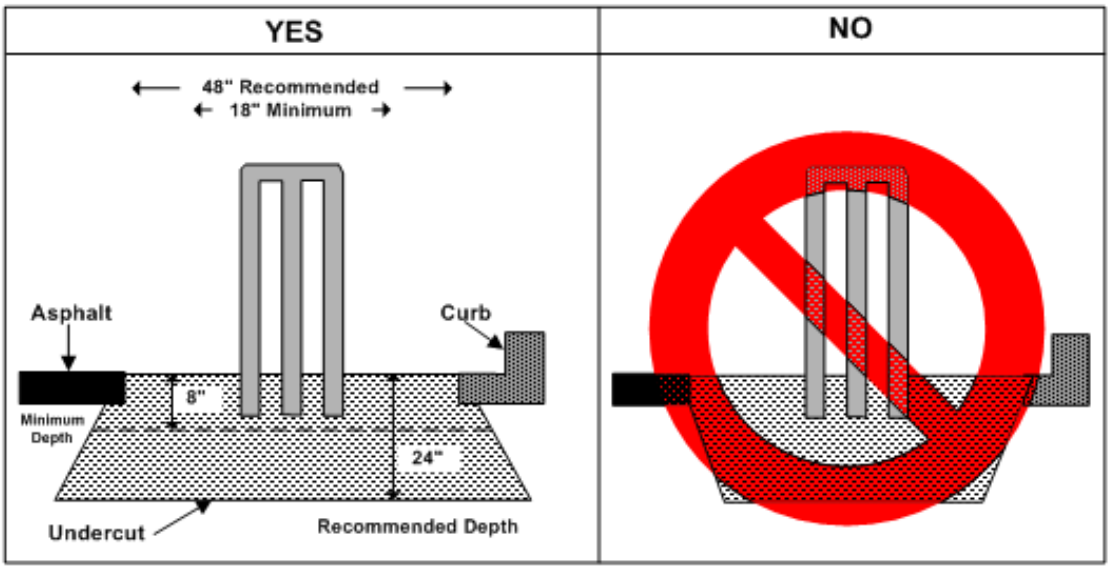


Figure 7. Concrete Pad Dimensions

If you are pouring a new slab, you will be able to simply immerse the frame into the freshly poured concrete, make sure it is level, and allow it to set with the frame in place at the proper depth.

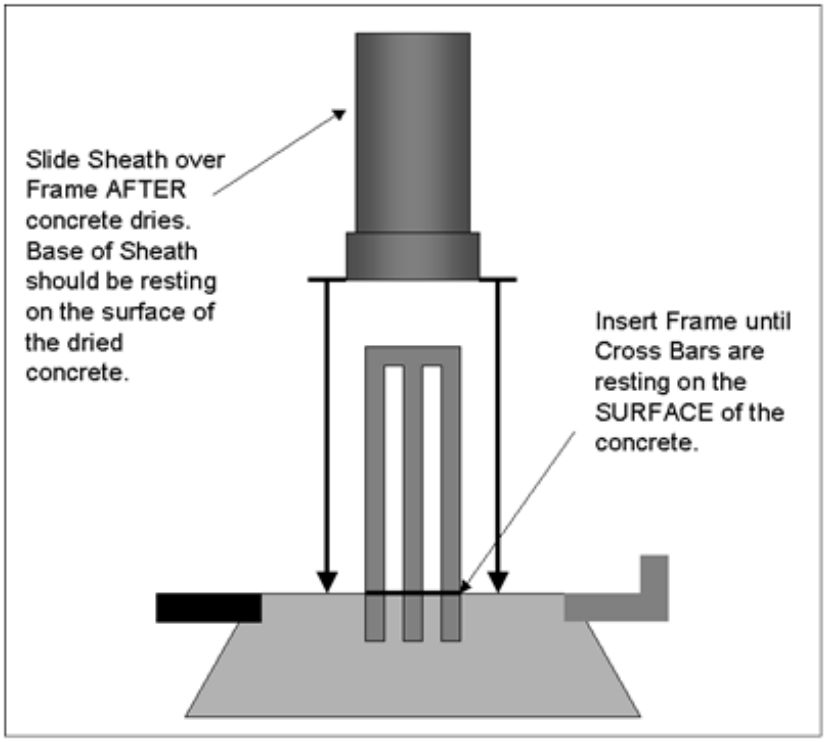


Figure 8. Frame and Sheath Installation

If you already have a slab that meets the dimensional requirements, you may drill into the concrete, fill the holes with epoxy or cement, and immerse the frame into the wet epoxy or cement. The following procedures walk you through each scenario.

3.1.1.1 New Slab

1. Verify that each conduit is properly located according to the holes and cutout in the base frame according to Figure 6.
2. Pour a slab 48" by 48" with a minimum depth of 8" (24" depth recommended), making sure you leave a minimum of 3" of conduit above the surface to keep standing water from getting into the conduit.
3. Position the XPT base frame so that the frame centerline is 18" away from the edge of the curb. **Note:** In some areas, such as California, this distance may vary. Refer to local building code for specific requirements.

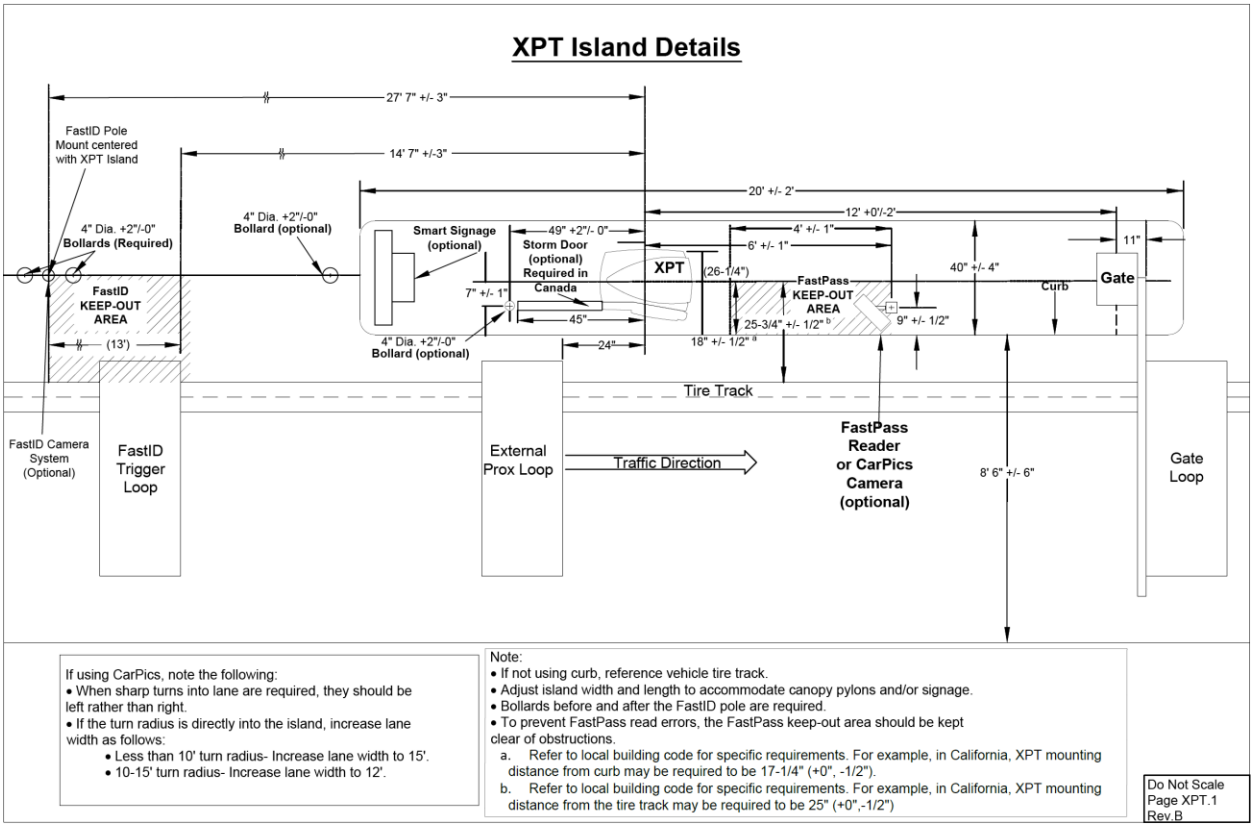


Figure 9. Positioning the Frame on a New Slab

4. Immerse the standard or curb-height base frame into the freshly poured concrete to a depth of 6". The reinforcement crosspieces are welded 6" above the bottom of the frame, and should be resting on the surface of the concrete when you have inserted the frame.
5. Ensure the frame is level by resting a dual-plane level across the top of the frame. Do not let the concrete dry with the frame unleveled. If the frame is not level, make the necessary adjustments before the concrete sets.

3.1.1.2 Pre-existing Slab

1. Position the XPT base frame so that the frame centerline is 18" away from the edge of the curb. **Note:** In some areas, such as California, this distance may vary. Refer to local building code for specific requirements.

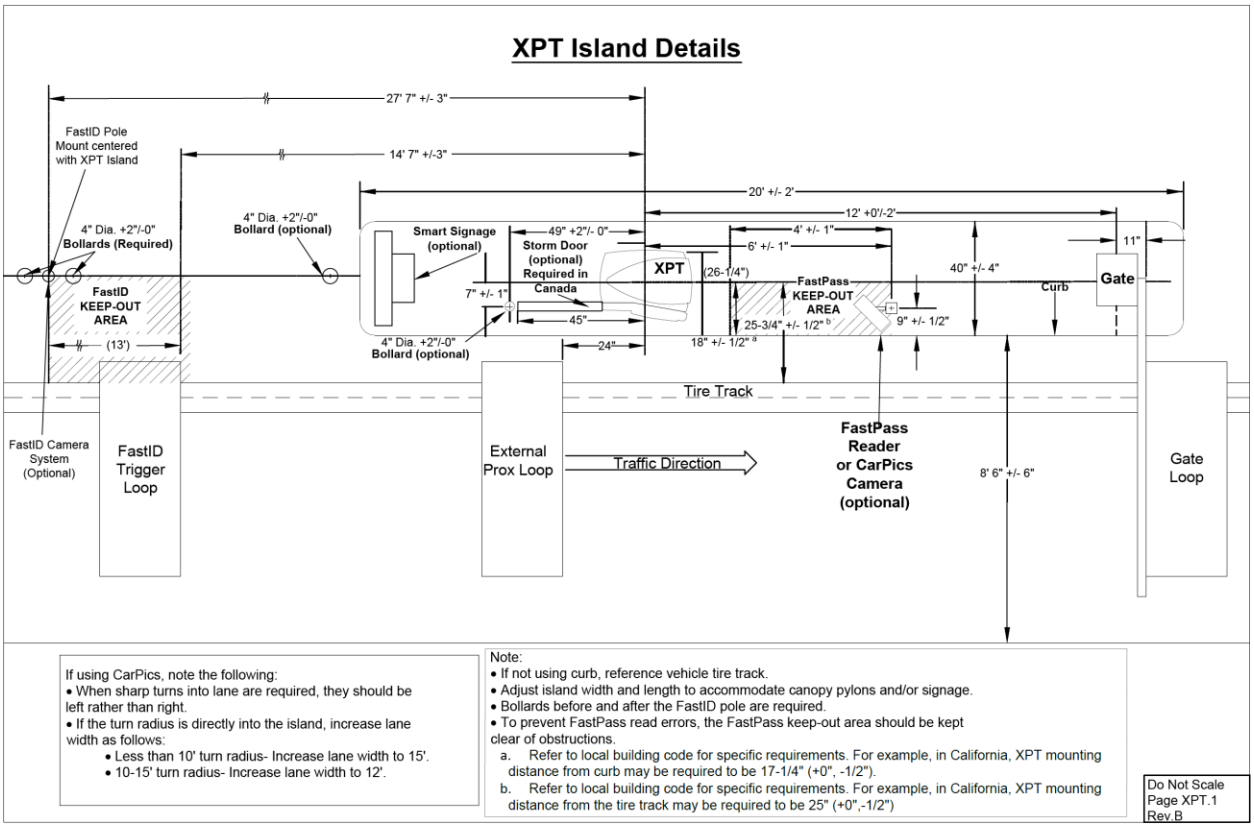


Figure 10. Positioning the Frame on a Pre-Existing Slab

2. Mark on the cement where the six legs of the stand will be inserted into the slab.
3. Using a hammer drill with a minimum 2.5" bit, drill the six holes where you marked them. The holes should be drilled 6" deep.
4. Fill each of the holes with either an epoxy solution or wet cement.
5. Insert the steel frame into the drilled and filled holes. The reinforcement crosspieces should be resting on the surface of the concrete slab.
6. Ensure the frame is level by placing a dual-plane level across the top of the frame.

3.1.2 Molded Polyethylene Sheath

When the concrete or epoxy solution has dried completely, slide the molded polyethylene sheath over the steel frame. The base of the sheath should be flush with the top of the concrete, and the top should be flush with the top of the frame.

3.1.3 Additional Security

At this stage you have the option of adding an extra level of security to the XPT by filling the base with concrete.

1. Extend the conduits, ensuring they will be aligned with the service entry port in the bottom of the XPT.
2. Tie a rope midway around the plastic sheath to prevent it from bowing out when filled with concrete.
3. Fill the sheath with concrete.
4. When the concrete dries, remove the rope.

3.1.4 Mount Unit to Frame

1. Locate the three large washers.
2. Slide the unit down over the mounting bolts while feeding the wire runs up through the service entrance port and out the door of the unit. If the correct lengths of wire were pulled, you should have approximately 3' of wire hanging down in front of the unit. Due to the weight and size of the unit, we recommend using 2-3 people to lift and seat the unit on the frame.
3. Place one large washer on each of the (2) mounting bolts on the right side of the case, and hand-tighten the mounting nuts.

   Warning!: Verify the nuts are secure before tilting the bill dispenser forward in the next step. Failure to do so could cause the XPT to tip forward!
4. Unlock and open the vault door, then tilt the bill dispenser forward to gain access to the third mounting bolt.
5. Place a large washer and nut on the third mounting bolt, and then hand tighten the nut.
6. Verify the unit's final position. Use the dual-plane level to verify the unit is level. Make adjustments if necessary.
7. Fasten the 3 nuts with the socket wrench. Once you have done so, there should be no movement of the case whatsoever.

3.2 Bricking in the XPT

For security reasons, we strongly recommend bricking in XPTs located at unattended sites or in high crime areas. You have two mounting options when installing a bricked-in base:

- **Brick-in adapter plate -** Build the brick enclosure, fill it with concrete, sink the adaptor plate with anchor bolts into the wet concrete, let the concrete cure, mount the XPT, and then finish bricking in the unit. Ensure that a 1½" air gap is left between the bottom, rear, and top of the XPT case and brickwork.
- **Brick-in Adapter Plate + Standard or Curb-Height Base Frame -** Install the curb or standard height steel frame, attach the adaptor plate, build the brick enclosure around the frame, mount the XPT unit, and finish bricking in the unit. This option allows the XPT to be installed prior to the brick enclosure being built.

	Note:	Do not install a metal cap on the brick-in enclosure. Doing so can interfere with FastPass reader operation.

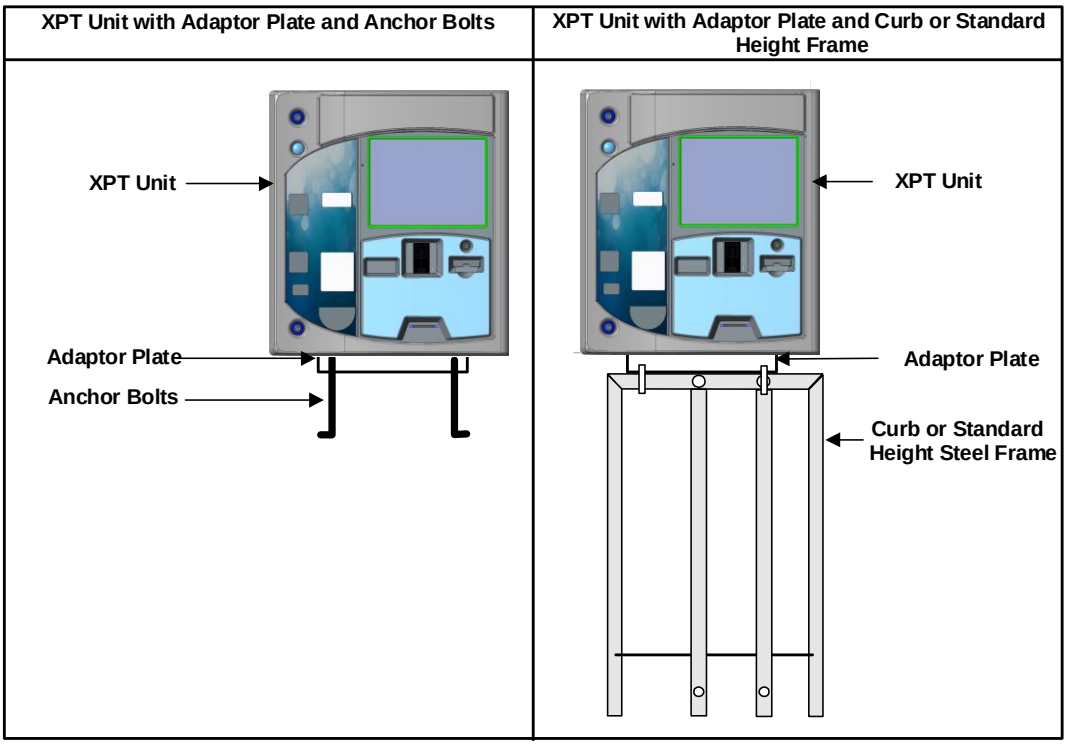


Figure 11. Bricked-In Base Options

In addition to two mounting options, there are two available mounting positions – recessed and flush mount. See Figure 12 for an example of each. **It is important to determine which mounting position will be used, as this will determine how far back the brick enclosure should be built from the edge of the curb** (as shown in Figure 13).

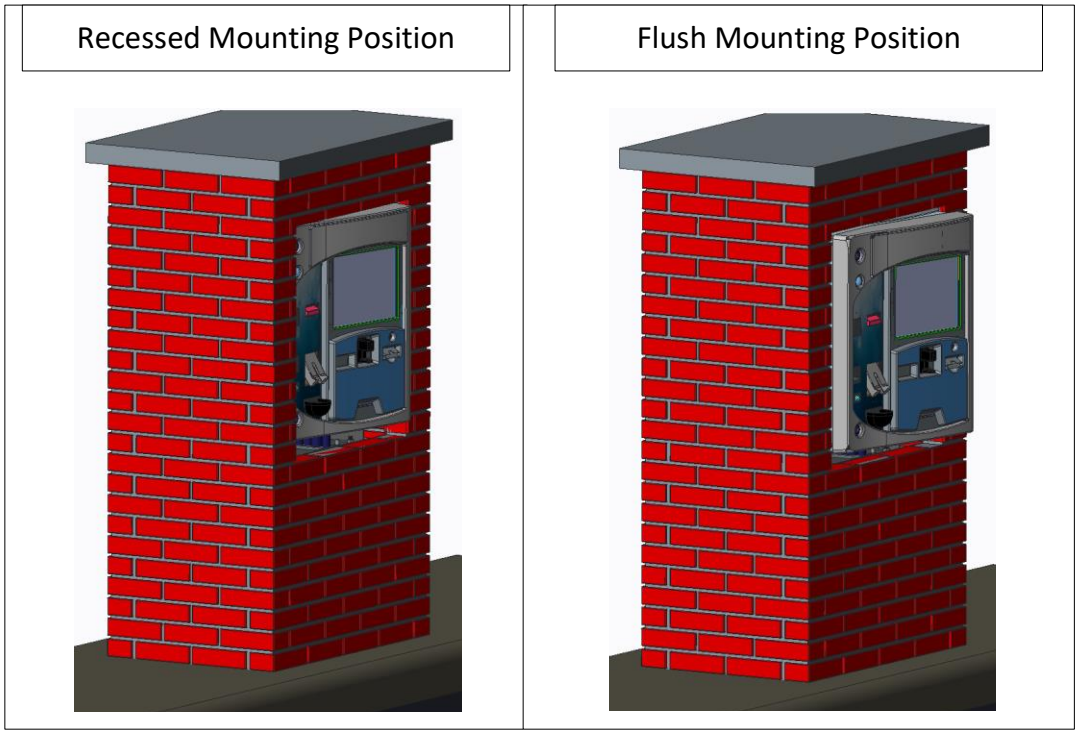


Figure 12. Brick-In Mounting Positions

3.2.1 Pouring the Slab

- The bottom of the XPT unit should be 35" from the road surface. Make appropriate adjustments to accommodate curb height, if necessary. **Note**: In some areas, such as California, the required height may vary. Refer to local building code for specific requirements.
- The center of the brick enclosure should be located 12' from the center of the gate.
- Conduit should be placed to align with the rectangular cutout in the brick-in adapter plate, as shown in Figure 17. Figure 14 also provides a low-detail footprint of the bottom of the XPT.
- Depending on whether the XPT will be mounted in recessed or flush mount position, the brick enclosures should be sized and positioned relative to the curb as shown in Figure 13. The recessed mounting position will require the brick enclosure be made deeper than if using the flush mounting position.

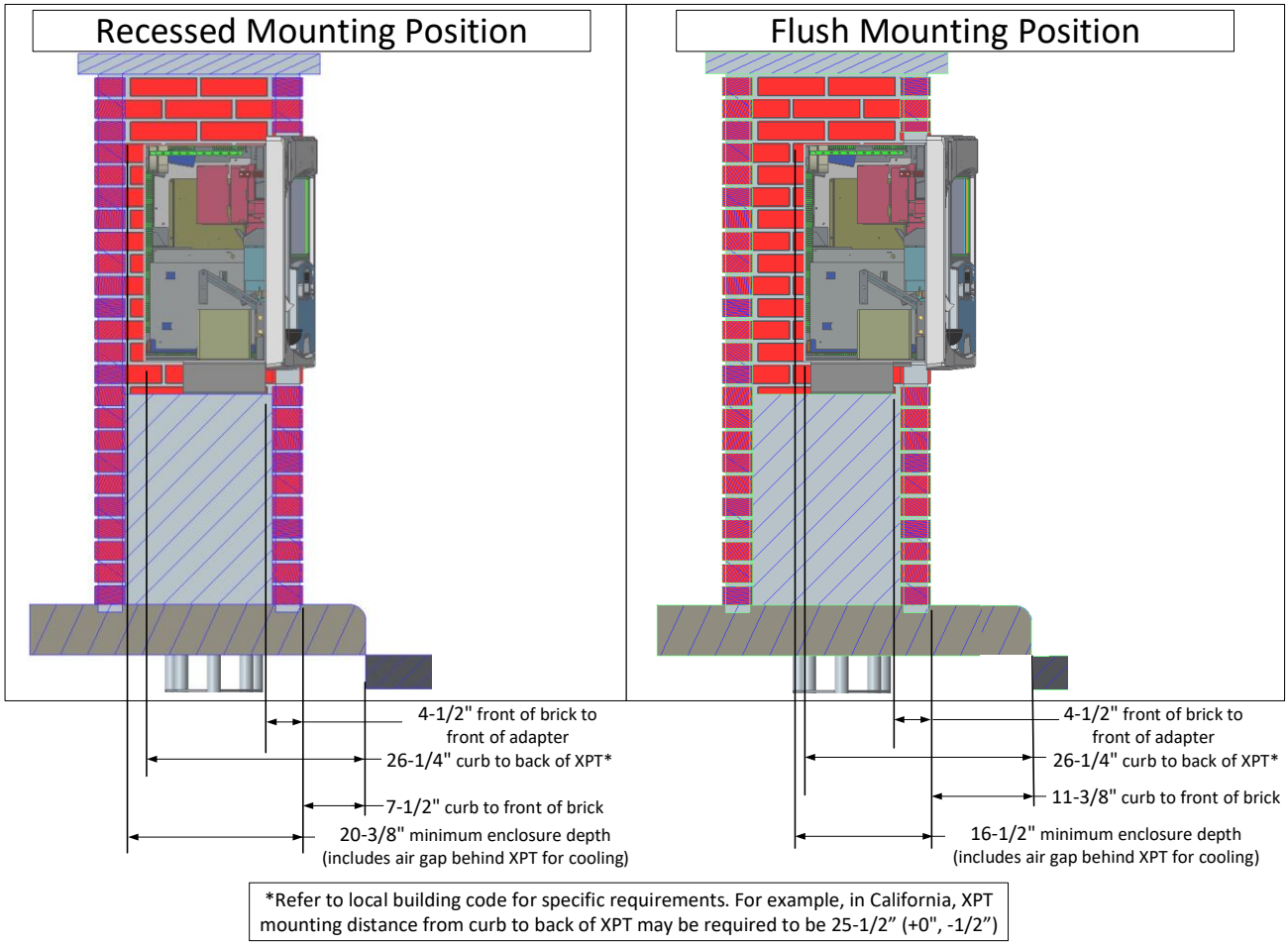


Figure 13. Mounting Position vs. Enclosure Placement and Size

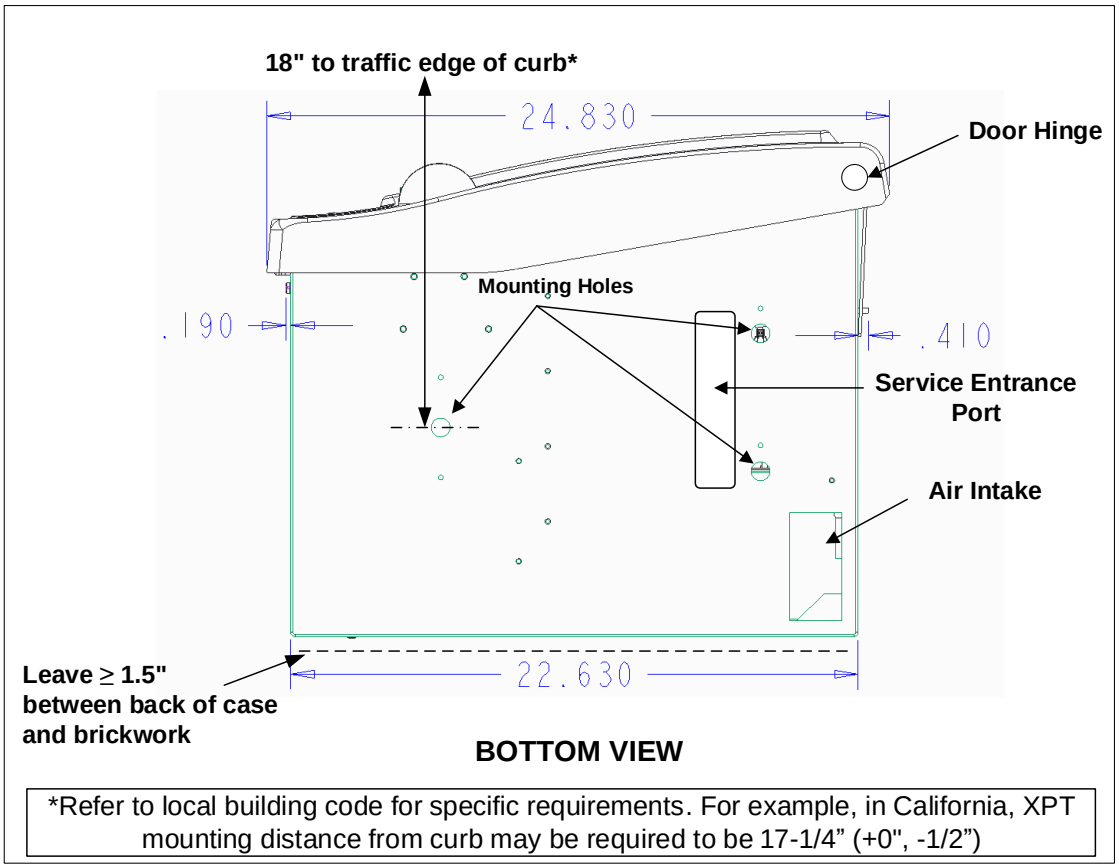


Figure 14. Bottom View of XPT

- After the brick enclosure depth has been calculated according to Figure 13, the enclosure should be sized to allow a minimum 26-3/4" wide by 30-1/4" high opening for the XPT, as shown in Figure 15. These dimensions allow the correct minimum gap around all sides of the XPT to allow the main door and vault doors to fully open without contacting the brickwork. The proper gap underneath the front of the XPT becomes even more critical if the XPT includes the coin dispensing option, because the coin cup protrudes downward approximately 2-7/8" below the bottom of the XPT case, when the vault door is open (as shown in Figure 16. Clearance Required for Coin Cup).

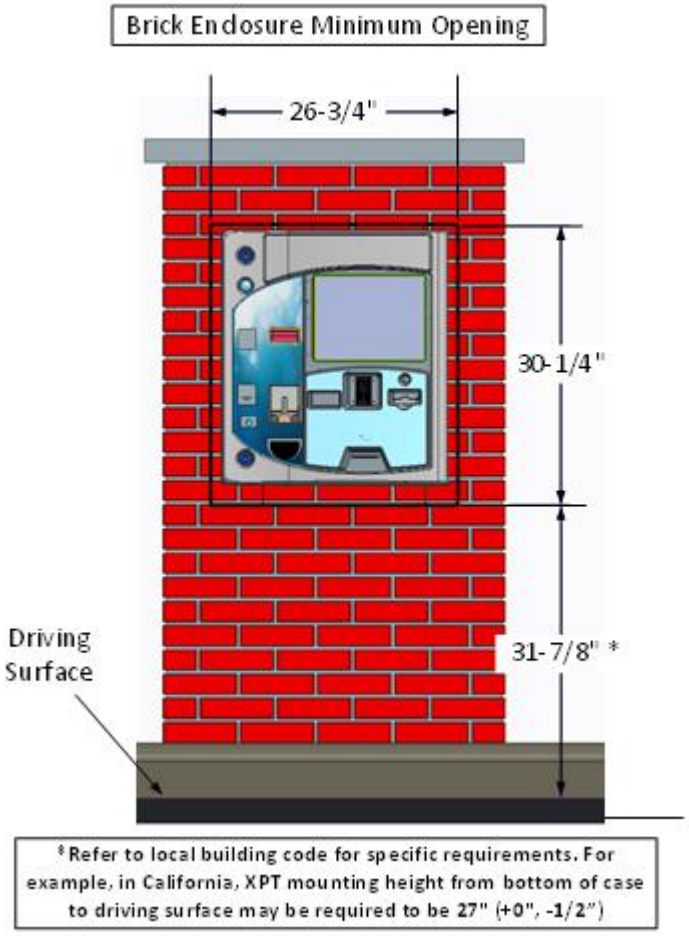


Figure 15. Brick Enclosure Minimum Opening

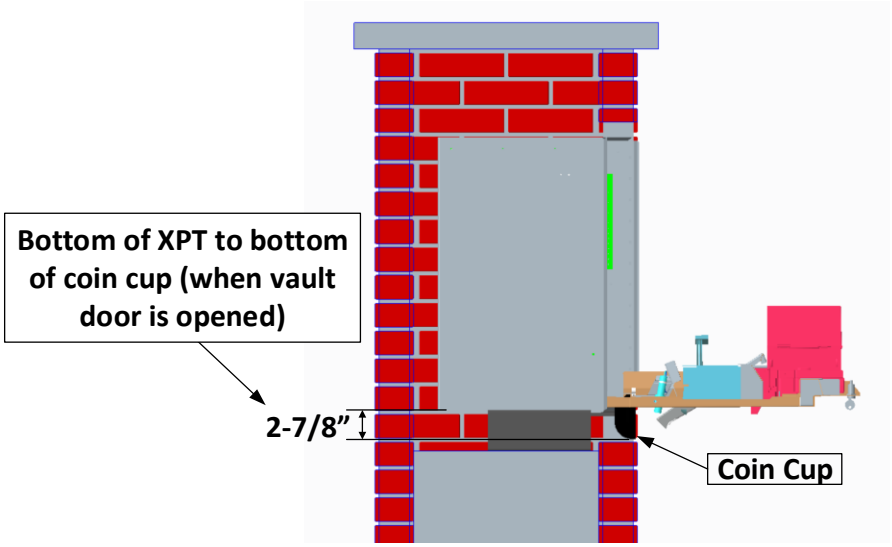


Figure 16. Clearance Required for Coin Cup

3.2.2 Adaptor Plate and Anchor Bolts

A brick-in adaptor plate is used to secure the XPT and provide proper air circulation required for the heat exchanger air intake and exhaust. It also offers the option of mounting the XPT with the back edge of the door flush with the front edge of the brick or recessed in the brick enclosure. The following diagrams illustrate the XPT bricked in using the adaptor plate and anchor bolts.

Note: The brick-in adapter does not share the same centerline with the XPT. Refer to Figure 17 to determine the installed XPT centerline relative to the brick-in adapter.

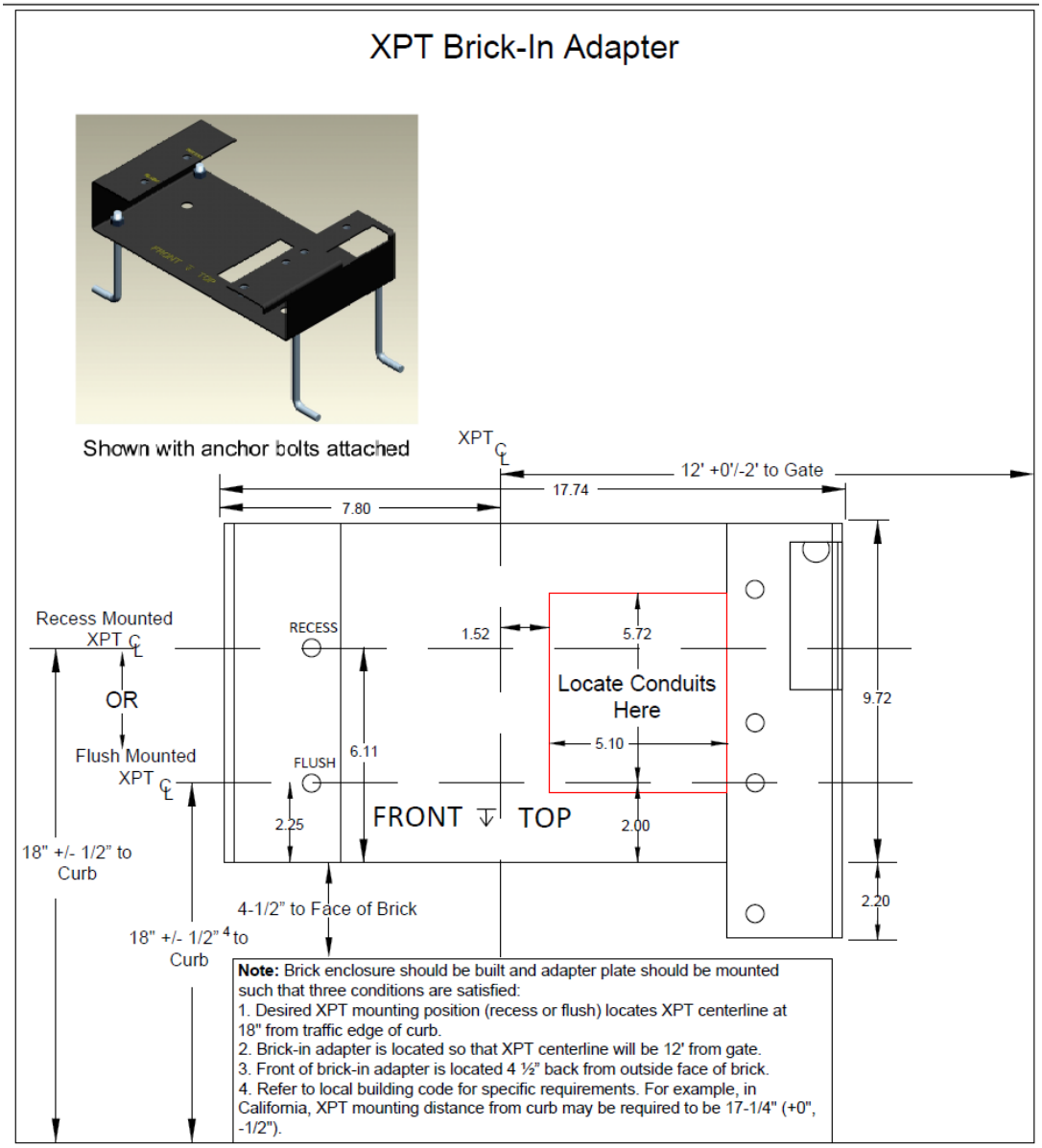


Figure 17. Brick-In Adapter

Use the following procedures when bricking in the unit using the adaptor plate and anchor bolts:

1. Make a mark on the adapter plate with a permanent marker, 10" in from the right edge of adapter. This mark indicates the XPT centerline, and should be aligned with the center of the brick enclosure.
2. Build the brick enclosure up to 33" high, measured from the road surface.
3. Verify conduits are properly located according to the cutout in the brick-in adapter, as shown in Figure 17.
4. Fill the enclosure with 31" of concrete, measured from the road surface.
5. Sink the adaptor plate with anchor bolts into the wet concrete, until the top of the adapter plate is 35" from the road surface. Position the adaptor plate 4½" back from the front edge of the brick, and center the mark on the adapter plate created in step 1 above with the inside of the brick enclosure, as shown in Figure 19. Level the adaptor plate while the concrete is still wet.
   - **Note**: In some areas, such as California, the required height may vary. Refer to local building code for specific requirements.

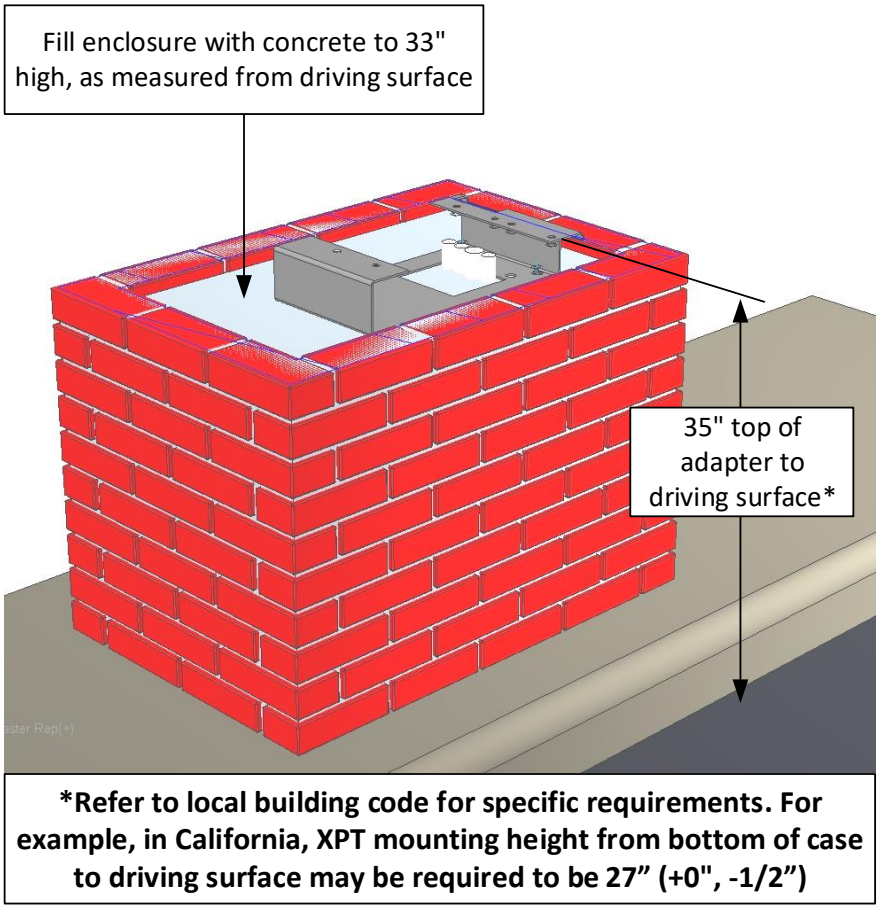


Figure 18. Fill Brick Enclosure with Concrete

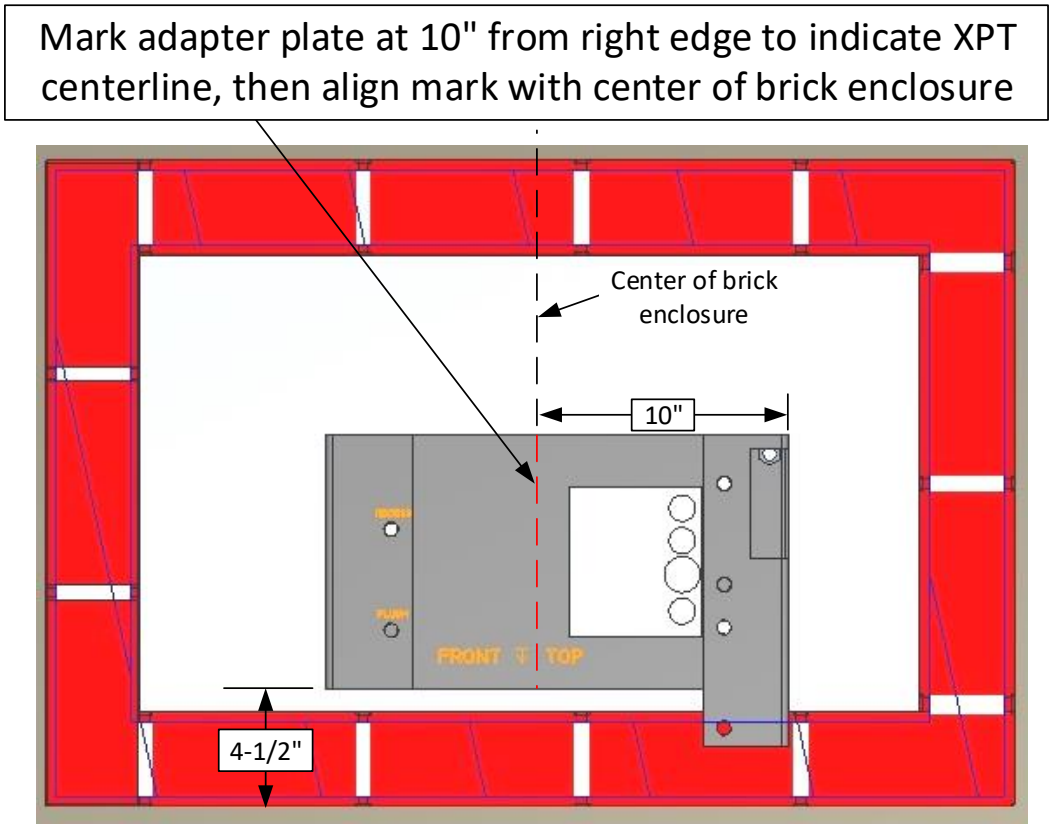


Figure 19. Positioning the Adaptor Plate

6. Allow the concrete to cure for a minimum of 24 hours.
7. Mount the XPT unit to the adaptor plate by inserting and tightening two bolts through mounting holes on the right side of the XPT case, for either a flush or recessed door configuration (see Figure 20 below).
8. **Warning! Verify the bolts are secure before proceeding to the next step to tilt the bill dispenser forward. Failure to do so could cause the XPT to tip forward and cause bodily harm.**

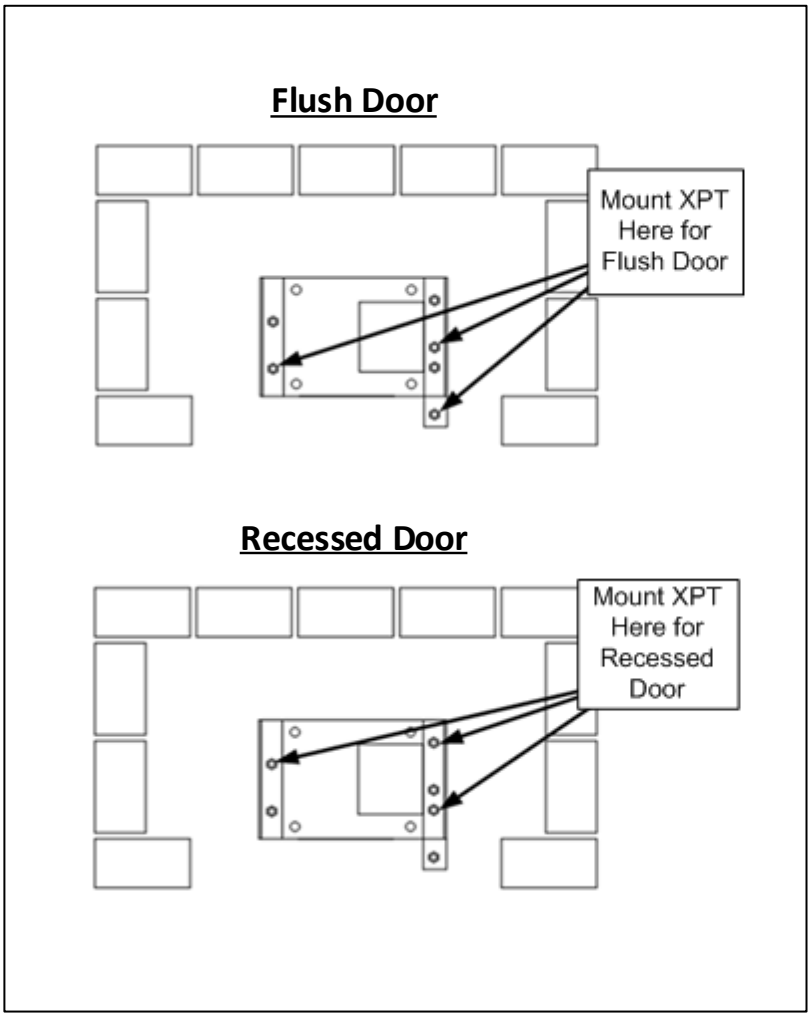


Figure 20. Flush Door and Recessed Door Mounting Options

9. Unlock and open the vault door, then tilt the bill dispenser forward to gain access to the third mounting hole.
10. Place a bolt through the third mounting hole, and then hand tighten.
11. If mounting in the recessed door position, insert bolts and tighten halfway, then pull the XPT toward the front of the bracket and finish tightening the bolts.
12. Finish bricking in the unit and verify an air gap exists between the top of the XPT and the top of the brick opening to allow the "chimney effect" to exhaust heat from the brick enclosure.

3.2.3 Adaptor Plate with Curb or Standard Height Steel Frame

When using this configuration, the curb or standard height steel frame will need to be sunk in the concrete 4" deeper than normal, to compensate for the height of the adaptor plate. The following diagram illustrates the XPT bricked in using the adaptor plate and the curb or standard height steel frame:

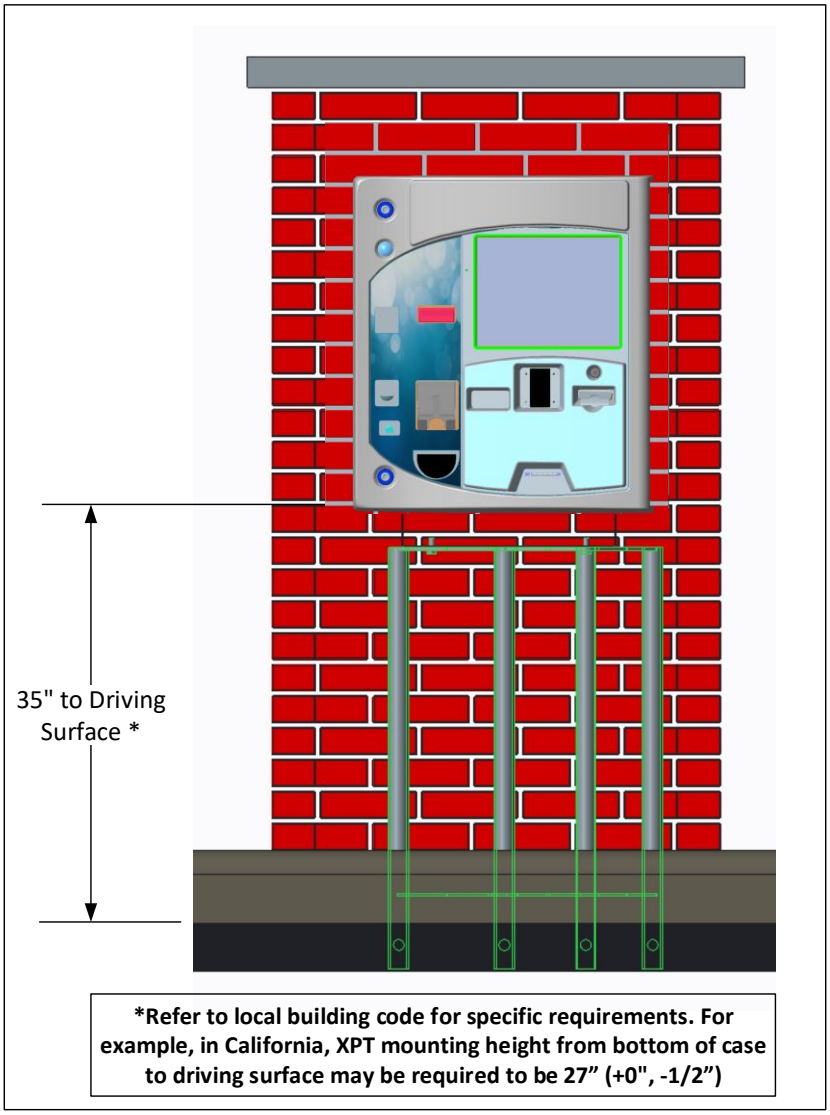


Figure 21. Bricked-In XPT with Adaptor Plate and Standard Base Frame

Use the following procedures when bricking in the XPT using the adaptor plate and the curb or standard height steel frame:

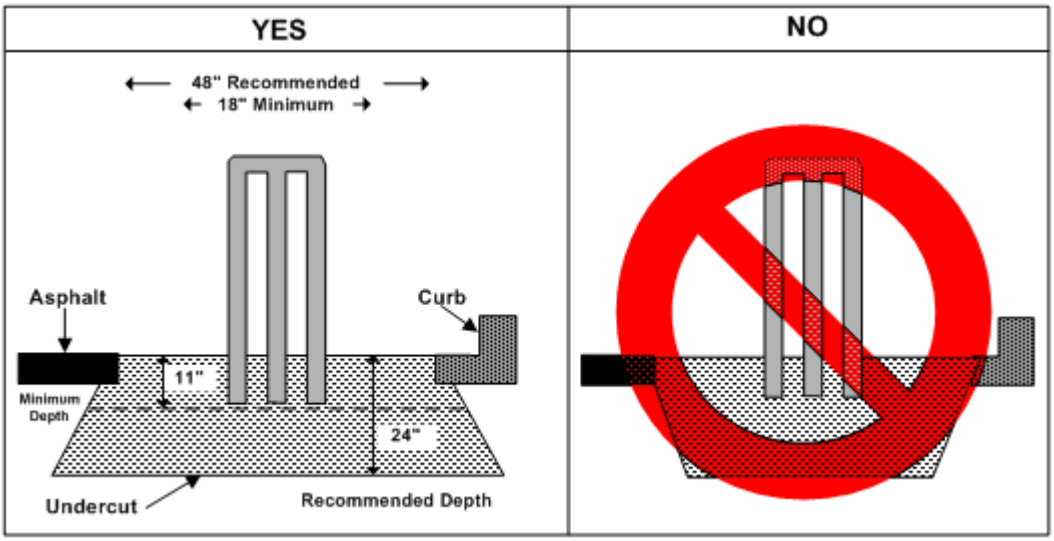


Figure 22. Concrete Slab Dimensions

When installing the base, you will first sink the steel frame 10" into concrete. We recommend the slab be 48" by 48", with a minimum depth of 11", and a recommended depth of 24". Since a brick-in adapter plate is being added between the steel frame and the XPT, the steel frame will need to be sunk into the concrete past the reinforcement cross pieces to achieve a mounting height of 35" from the road surface to the bottom of the XPT. **Note**: In some areas, such as California, the required height may vary. Refer to local building code for specific requirements.

3.2.3.1 Concrete Slab

1. Pour a slab 48" by 48" with a minimum depth of 11" (24" depth recommended), making sure you leave a minimum of 3" of conduit above the surface to keep standing water from getting into the conduit.
2. Verify that each conduit is properly located according to the holes and cutout in the base frame according to Figure 6.
3. Position the XPT base frame so that the centerline of the frame is 18" away from the edge of the curb. If a curb is not used, reference the edge of the tire track. **Note:** In some areas, such as California, this distance may vary. Refer to local building code for specific requirements.

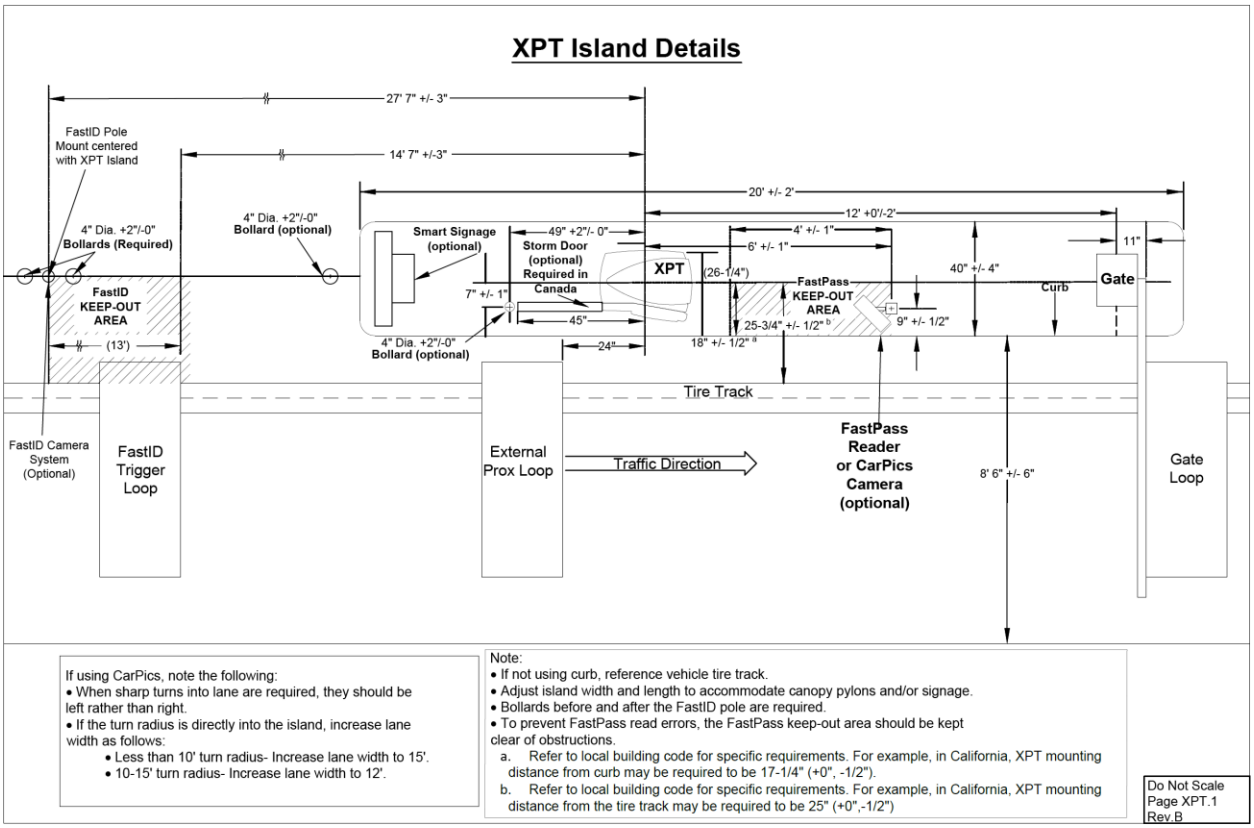


Figure 23. Positioning the Frame

Note: For additional security, rebar can be inserted into the holes in the bottom of the frame prior to inserting it into the concrete.

4. Immerse the base frame into the freshly poured concrete to a depth of 10". The reinforcement crosspieces are welded 6" above the bottom of the frame. They should be approximately 4" below the surface of the concrete after you have inserted the frame.
5. Ensure the frame is level by resting a dual-plane level across the top of the frame. Do not let the concrete dry with the frame unleveled. If the frame is not level, make the necessary adjustments before the concrete sets.

3.2.4 Mounting the XPT

The exact mounting procedures will vary depending on the design of your enclosure. The following guidelines will remain consistent regardless of your design.

- **Warning!** Secure the XPT to the base frame with two nuts on the right side of the XPT case before tilting the bill dispenser to access the third fastener. Failure to perform these steps in order could cause the XPT to tip forward.
- Make sure the conduit positioning allows the wiring to enter the XPT through the service entrance port.
- Pull all wires through conduits before mounting the unit. See **Electrical Planning** for wiring requirements.
- Bear in mind that the conduit run should protrude at least 3" to prevent standing water from accumulating in the conduit.
- Feed the wires up through the service entrance port and out the front of the unit while mounting the unit to the adaptor plate or base.
- Allow 6’ of wire (measured from the ground level) to extend through the conduit.
- The bottom of the XPT should be 35" from the road surface. Make adjustments as necessary, to achieve this mounting height. **Note**: In some areas, such as California, the required height may vary. Refer to local building code for specific requirements.
- Level the unit using washers, bolts, or shims prior to tightening the mounting bolts.

3.2.5 Weather Door for Canada

XPTs sold into Canada must include the Weather Door (or equivalent third-party structure) to regulate the internal temperature in extreme cold weather and prevent ice forming in and around the cash devices when the wash is closed during inclement weather.

Once open, the door can be lifted off the hinges and stored elsewhere.

Figure 24. Canadian XPT 5+ Weather Door

4 Electrical Installation

After completing the mechanical installation, you will wire any external hardware to the control module, connect the external prox loop, connect the AC power, and connect the network cable.

4.1 Wiring External Hardware to the Control Module

Note: Follow local electrical code when wiring the XPT.

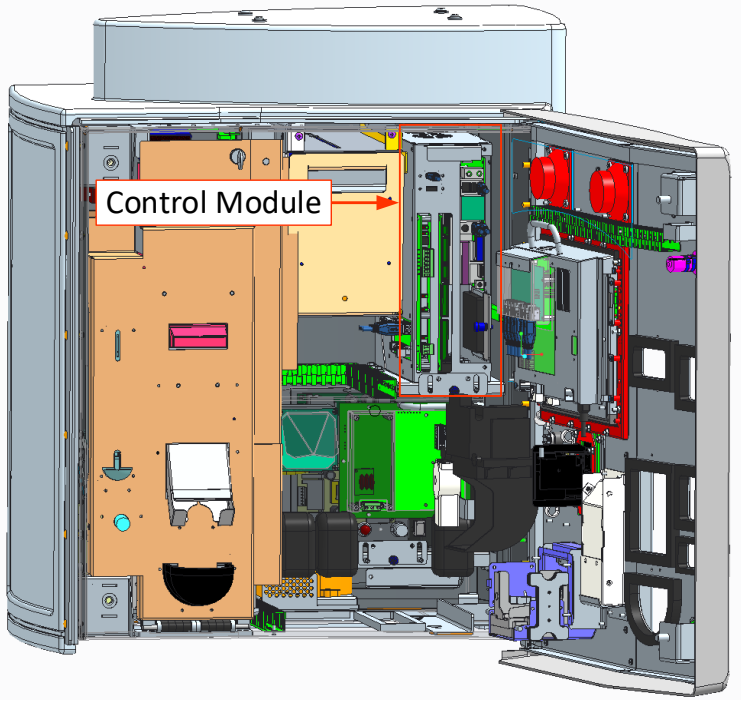


Figure 25. Control Module Location

The control module is located inside the XPT case on the right wall, above the power module.

Some examples of external hardware that can be wired to the control module inputs and outputs are:

- A gate (if using non-Ethernet controlled gate) (Appendix C)
- A lane available light (Appendix F)
- An In-Bay Automatic wash controller (Appendix G)
- Other third-party devices

⚠	**Warning:**	Carwash equipment wiring can carry 20-120 VDC or 20-120 VAC. Disconnect the power from ALL carwash equipment before wiring to the control module.

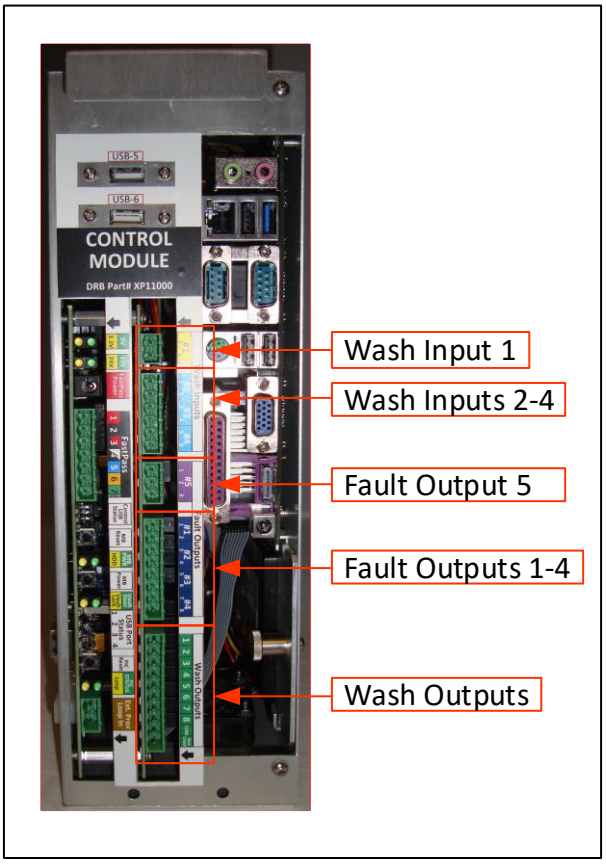


Figure 26. Control Module Input/Output Connectors

Input Ratings (all optically isolated and require external power source): 12V - 120V AC or DC; 1.25mA at 12V, 25mA at 120V

Output Ratings (all dry contacts): 1A max for Fault Outputs 1 – 4, 500mA max for Fault Output 5, 1A max combined for Wash Outputs 1-8, 120VAC or DC.

1. You will need a thin-tipped, flat head screwdriver to open and tighten the relay connections of the Phoenix connector.
2. Phoenix connectors are shipped already inserted in the appropriate sockets on the control module.
3. Remove the appropriate Phoenix connector to make the connections described for each step, making sure there is enough slack in the wire to allow the connector to be replaced on the board and for the cable to be routed through the wire duct on the right wall of the XPT.

4. Make the necessary connections between the control module and the gate (Appendix C), lane available light (Appendix F), or in-bay automatic wash controller (**Error! Reference source not found.**).
    - When all of the connections have been made, they can be tested by pressing the Phoenix connectors back into their positions on the board.

4.2 Wiring and Configuring the External Prox Loop Detector

1. When controlling the Magnetic gate through an Ethernet connection (preferred), the external prox loop should be wired to the control unit on the Magnetic gate.
    a. When controlling the Magnetic gate or SKIDATA gate through the discrete I/O connections, the optional external prox hardware will need to be purchased for the XPT, and the loop should be run to the XPT. Contact DRB Systems to order this optional hardware.
2. Verify the external prox loop has been installed in the pavement according to the diagram below. Installing the proximity loop too early or too late in the lane will result in poor photos. Refer to Appendix C section H for further information on loop wire specifications.

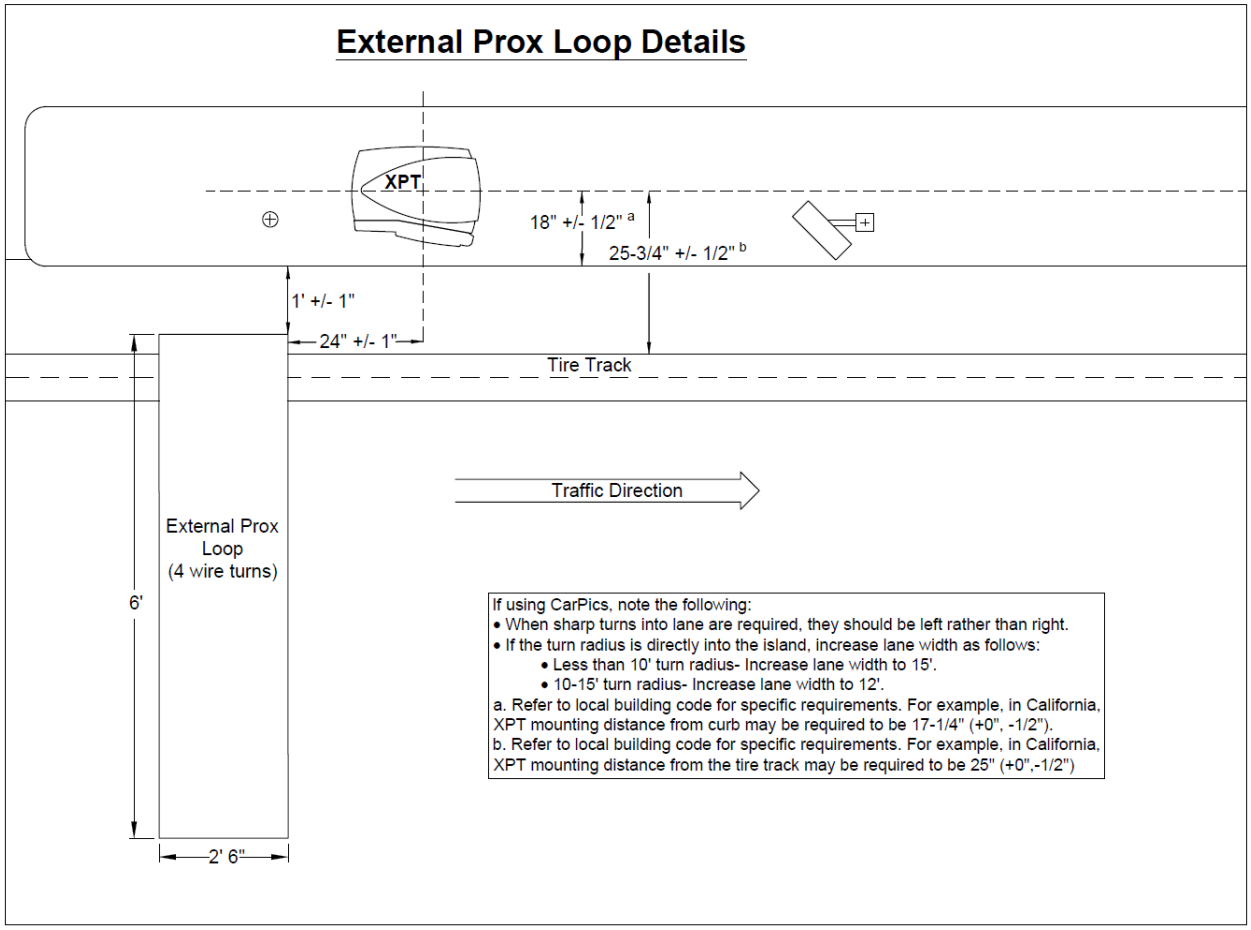


Figure 27. External Prox Loop Details

3. Wiring an external prox loop to the Magnetic gate controlled by an Ethernet connection.
    a. Verify the loop lead in wires have been twisted at least 6 turns per foot from the edge of the loop to the connections on the Magnetic gate control unit.
        i. Connect the external prox loop to the loop B connections on the Magnetic gate control unit.

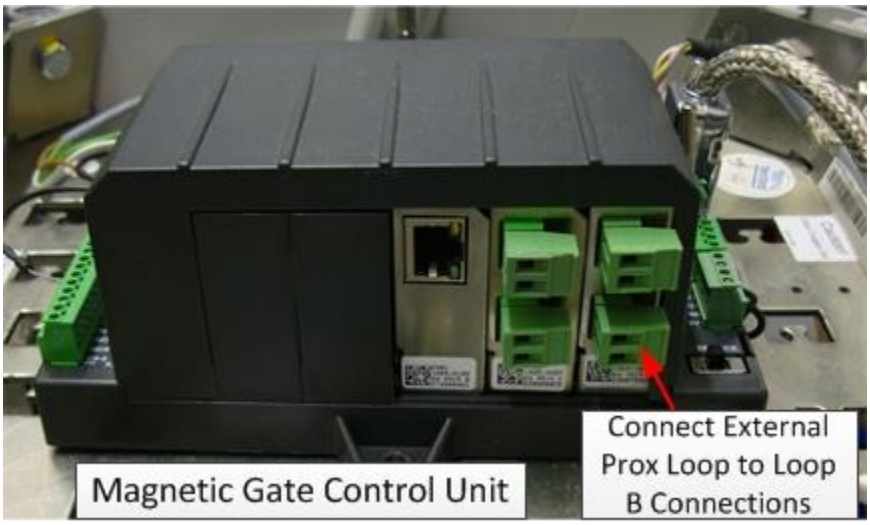


Figure 28. Magnetic Gate Control Unit

4. If using the optional external prox hardware in the XPT, follow the instructions below.

Warning:	The loop detector used for the external prox loop is not compatible with those used in SKIDATA gates or other equipment. Using this loop detector in other equipment can cause permanent damage.

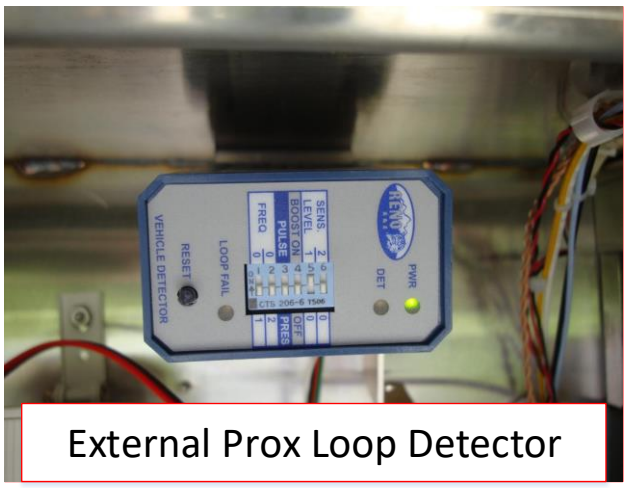


Figure 29. Optional External Prox Loop Detector

    a. Verify the loop lead-in wires have been twisted at least 6 turns per foot from the edge of the loop to the front of the control module inside the XPT.

b. Verify the XPT power is turned off at the main power switch.

c. Terminate the loop lead-in wires to the two pin Phoenix block labeled Ext. Prox Loop In.

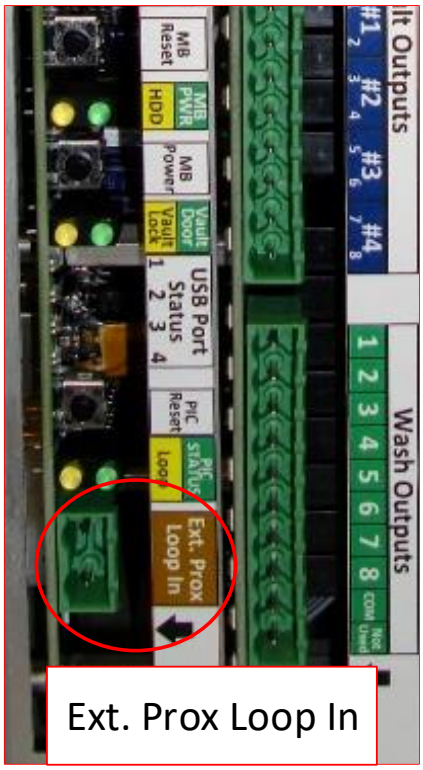


Figure 30. External Prox Loop Lead-In Connections

d. Verify the loop detector DIP switches, which are located on the front of the loop detector, are configured for the default settings:

Table 3. External Prox Loop Detector Settings

External Prox Loop Detector - DIP Switch Settings		
DIP Switch	**Function**	**Default Setting**
1	Frequency	OFF
2		OFF
3	Pulse/Presence	OFF
4	Sensitivity Boost	OFF
5	Sensitivity	ON
6		OFF

Switches 5 and 6: These two switches determine the sensitivity of the loop. There are four sensitivity settings: Low, Medium Low (Default), Medium High, and High. A higher sensitivity level is needed if the loop is consistently not detecting a vehicle. A lower sensitivity is needed if the loop is consistently detecting a vehicle when none is actually present. The combinations of settings for these two switches are shown below.

Table 4. External Prox Loop Detector Sensitivity Settings

Sensitivity DIP Switch (5 and 6) Settings	
Low	5 OFF, 6 OFF
Med Low	5 ON, 6 OFF (Default)
Med High	5 OFF, 6 ON
High	5 ON, 6 OFF

4.3 Wiring the Main Power

Warning: Disconnect 115 VAC-120 VAC power from the main power lines at the panel box before continuing.

1. Locate the main power wires. There will be three 12-16 AWG environmentally rated wires (black, white, and green).
2. Route the main power wires to the XPT power module and remove excess wire length, leaving sufficient length to reach the AC power inlet connector.
3. Remove the 3-pin Phoenix block from the power module by loosening the two security screws on the sides of the connector. Secure the Line (black), Neutral (white) and Ground (green) wires to the appropriate terminal screws. (See Figure 31.)
4. Re-insert the 3-pin Phoenix block back into the power module. Tighten the two security screws on either side of the Phoenix block.

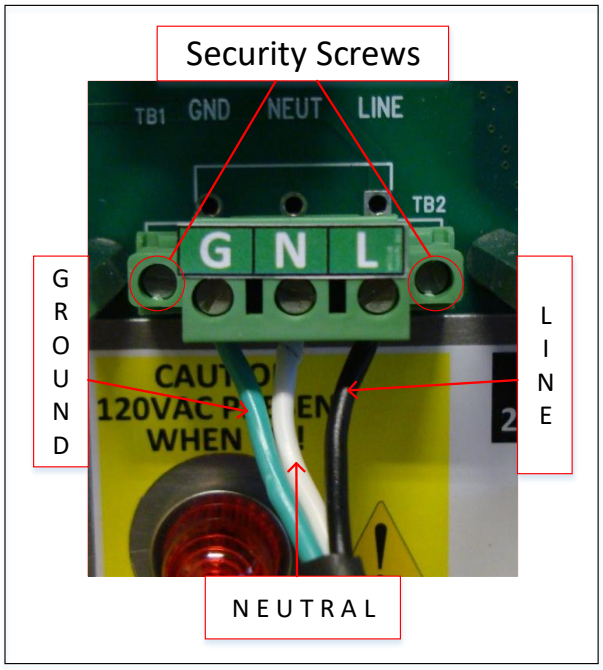


Figure 31. Line - Neutral - Ground Connections

4.4 Wiring the Intercom

The installation of an intercom is highly recommended to provide two-way communications between customers at the XPT and staff elsewhere on site. Without an intercom, the system can send a notification to staff when a customer presses the **Help** button, but the staff must walk to the terminal in order to respond to the customer.

The intercom is wired to the display module on the back of the main door. Jumpers and adjustments to control its operation are also located on that board. 2, 3, and 4-wire intercoms are supported. A digital intercom is recommended if the intercom wiring is sharing conduit with other communications wiring, but not required.

4.4.1 Intercom Connections

The intercom has two connectors which control the way in which the intercom is wired and the mode of operation. The connector labeled Intercom on the left side of the display module is the interface and connects to the customer's intercom unit. The jumpers below the intercom connector are used to select mode of operation (2, 3, or 4-wire intercom systems). Twisted pair/fully shielded cable is recommended for optimum performance.

4.4.2 Intercom Adjustments

The XPT intercom system has the ability to sense when voice band audio signals are present, and allows the speakers in the XPT to be used as an intercom. When in intercom mode, the volume control on the site-provided intercom base station adjusts the speaker volume in the XPT; the XPT volume control will have no effect on intercom volume levels.

The sensitivity and time delay of intercom mode should be adjusted (turn clockwise to increase) according to the local acoustical characteristics, such as background noise, in order for both intercom and XPT normal audio to work properly.

- **Note:** It is necessary to disconnect any USB cables from USB ports 3 and 4 in order to access the intercom adjustments and view the D19 LED.
- **Sensitivity Adjustment**: The potentiometer labeled SENS is used to adjust the sensitivity of this circuit. The D19 LED, labeled Sensitivity, is located directly above the potentiometer, and will aid in the sensitivity adjustment.
- **Time-Out Delay Adjustment**: The potentiometer labeled DELAY is used to adjust the time-out delay after which the XPT will revert back to the normal audio mode. The D18 LED, to the right of the display module, labeled Audio Present, will aid in the time-out delay adjustment. Adjust the potentiometer to the desired delay after the last audio has been detected. Thirty seconds is normal.

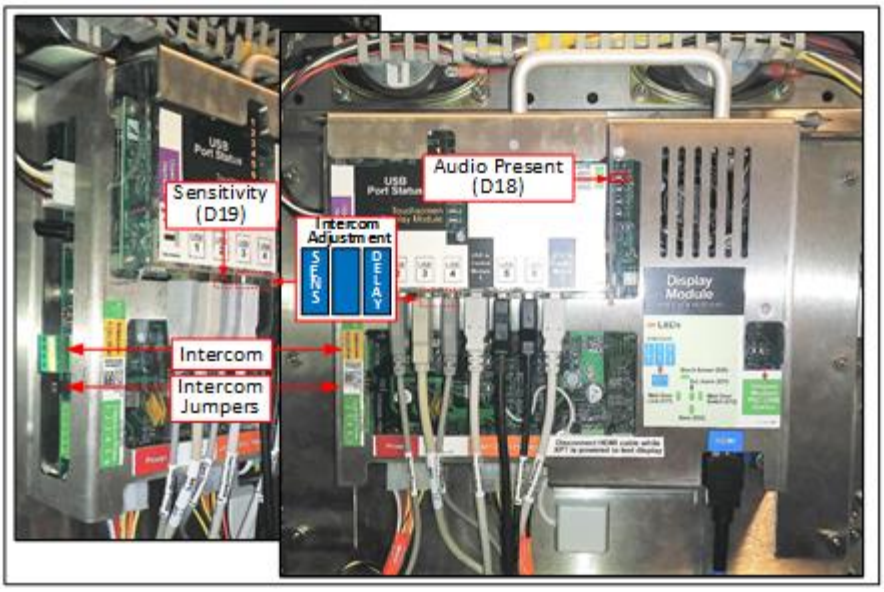


Figure 32. Intercom Component Locations on the Display Module

4.4.3 Connection Overview

Call Function: A view of the diagram below shows J34 and J35. The unit will initiate a call function by closing the contacts on an internal relay. By default, the intercom connector Pin 1 (H1) and Pin 2 (H2) will always reflect the contact closure of the internal relay. This is the default for the four-wire mode when both the call function and audio are completely separated. More detailed instructions on this follow.

Audio: When the XPT intercom mode is active, the audio section is floating and is not relative to ground. By default, the intercom connector Pin 3 (SP+) and Pin 4 (SP-) will always be connected to the audio section.

Four-Wire Intercom Configuration: Two separate pairs (four wires) are used for both the call function and audio in the four-wire configuration. In this mode, no intercom jumpers are installed. This is shown below.

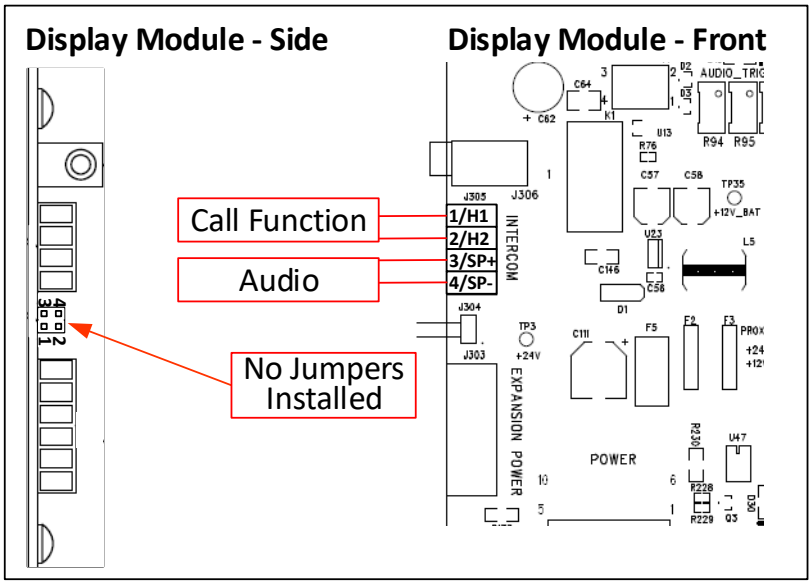


Figure 33. Four-Wire Intercom Configuration

Three-Wire Intercom Configuration: This mode requires two conductors for audio and one additional conductor for the call function. This mode uses a common ground for both audio and the call function (SP-). Jumper pins 3&4 and connect H1, SP+, and SP- as shown below.

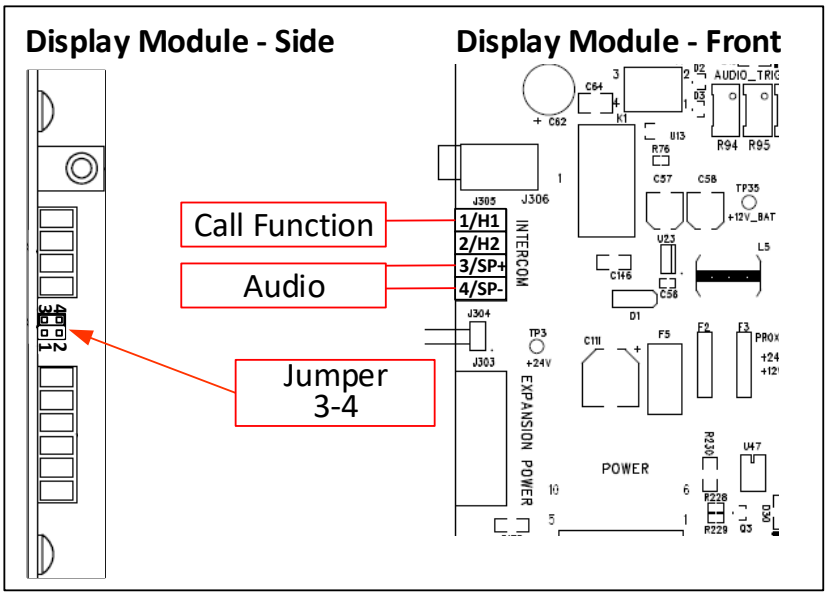


Figure 34. Three-Wire Intercom Configuration

Two-Wire Intercom Configuration: This type of intercom system has both the call function and audio sharing the two conductors. Jumper pins 3 and 4 as well as pins 1 and 2 and then connect the two conductors to SP+ and SP- as shown below.

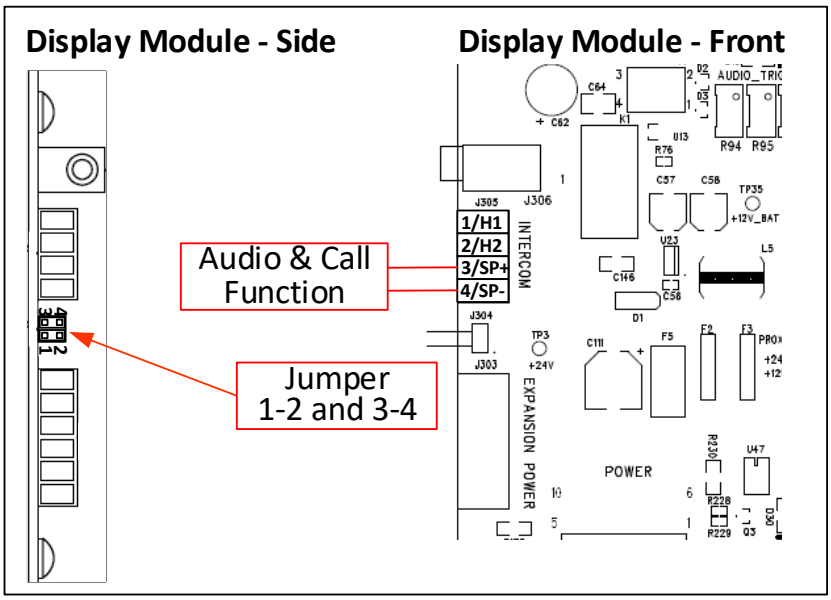


Figure 35. Two-Wire Intercom Configuration

4.5 Network Installation

The XPT needs two Ethernet network connections back to the SiteWatch Server before beginning customer operations. The only network component installed at this point is the wiring between the XPT and the router.

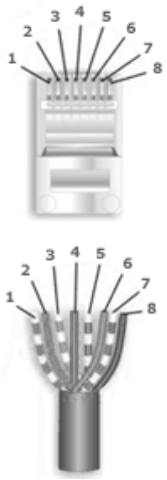
To install the cable, you will connect the RJ-45 modular connectors to the Ethernet cables (which should have been pulled along with the other wiring) using the RJ-45 crimp tool.

4.5.1 Connecting the Network cable

1. Terminate each Cat-6 wires to an RJ45 connector using a crimp tool. Refer to the following chart for wiring:

Table 5. CAT-6 Wire Termination Chart

Wire	Pin #
White/Orange	1
Orange	2
White/Green	3
Blue	4
White/Blue	5
Green	6
White/Brown	7
Brown	8



Note: The locking tab on the RJ45 connector should be facing downward when referring to the diagram above for wire terminations.

2. The first network cable, dedicated to the SiteWatch CDE Network, needs connected to the bottom of the Ethernet surge suppressor.

Figure 36. PoE Pass-Thru Switch and Ethernet Surge Suppressor

3. The second network cable, dedicated to the Non-CDE network, should connect to port 9 on the BVTech network switch.

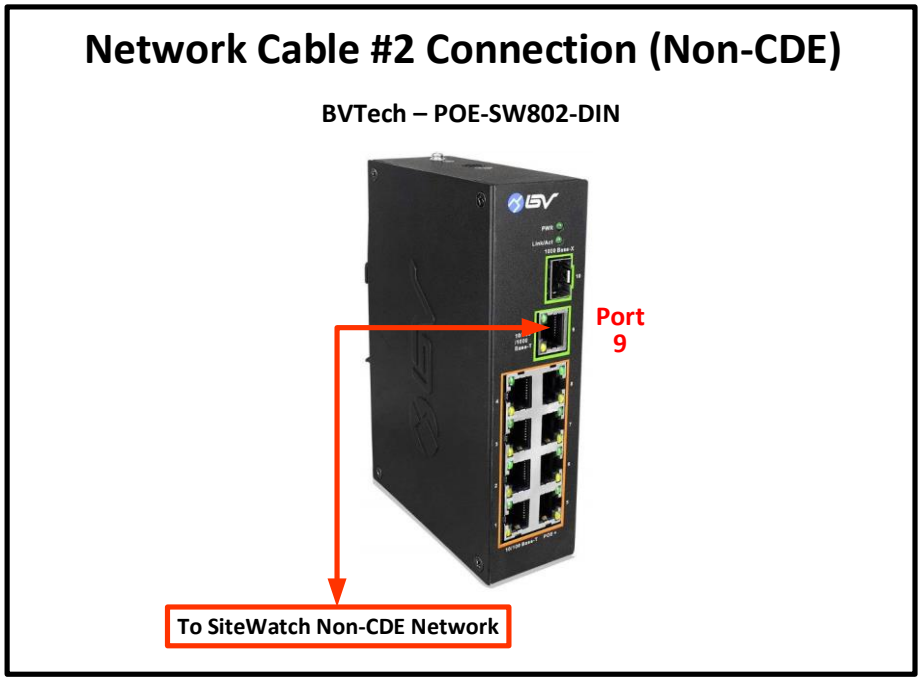


Figure 37. Network Cable #2/Non-CDE Connection

4. The other end of each cable will be connected to the network switches that are installed as part of the SiteWatch network.

4.6 Wiring the External Alarm

The XPT contains an internal alarm to attract attention in the event of an attempted break-in or vandalism. An external alarm system can also be connected through the power module for added security. The external alarm relay output will activate and deactivate in parallel with the internal alarm.

4.6.1 External Alarm Connections

The external alarm relay connection, J30, uses a removable Phoenix connector and can be found on the power module.

The connection can be wired as either a normally open or normally closed output, depending on the configuration of the customer's alarm system. The table below indicates the function of each pin on the external alarm connector:

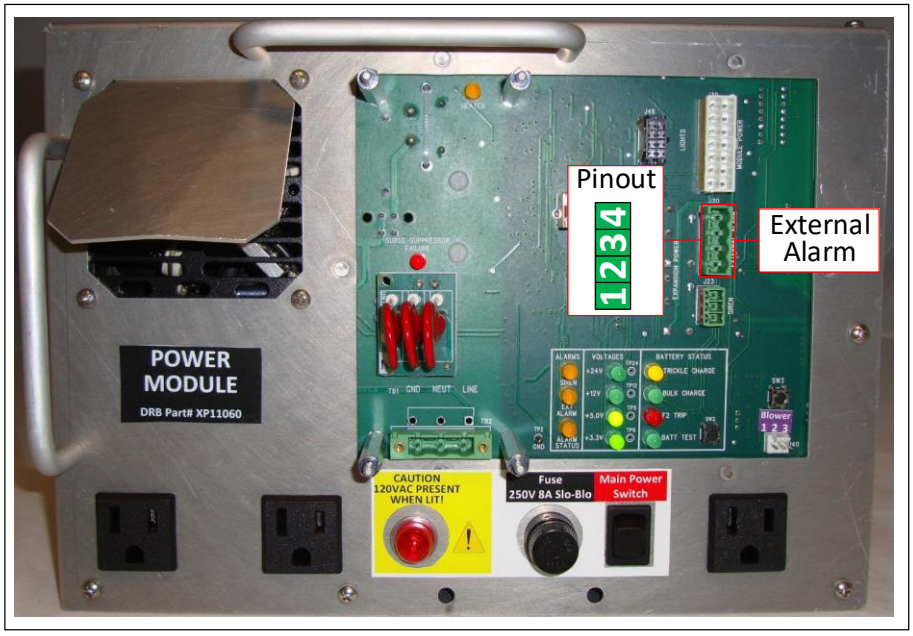


Figure 38. Power Module External Alarm Connection

Table 6. External Alarm Output Pin # Chart

External Alarm Output	
Pin #	**Function**
1	Common
2	Normally Closed
3	Normally Open
4	Not Used

Chapter 5

5 System Setup and Configuration

Most of the software configuration needed to sell wash services to customers at XPTs is done in the point of sale software. The DRB Systems Implementation staff will do this after the XPT has been installed and is operational.

However, there is some configuration needed in the XPT software to adapt it to the specific hardware configuration being used. Those steps are required before testing of the hardware is possible, and are detailed below.

5.1 Coin Acceptor

Depending on the model of XPT purchased, the coin acceptor comes from the factory programmed to accept either U.S. coins (quarters and dollar coins) or Canadian coins (quarters, Loonies, and Toonies). If the site is accepting tokens, the coin acceptor must also be programmed to accept them. See the section in the *XPT Hardware Service Manual* on programming the coin acceptor for detailed instructions.

Note that tokens accepted or dispensed should be between .80" and 1.18” diameter.

5.2 Coin Dispensers

The XPT can be ordered with or without the coin dispenser assembly. This assembly contains two cube hoppers, allowing two coin denominations to be dispensed. By default, both of the cube hoppers are configured to dispenser dollar coins in the USA, or Loonies in Canada. Each cube hopper is able to hold 400 U.S. dollar coins or 500 U.S. quarters, providing a total hopper assembly capacity of up to 1,000 coins.

If other coins or tokens will be dispensed, the coin dispensing wheel and guide arm must be changed as instructed in the *XPT Hardware Service Manual*. Note that tokens accepted or dispensed should be between .80" and 1.18" diameter, and between .059" and .126" thick, for reliable operation.

5.3 Bill Dispenser

The dual denomination bill dispenser can be loaded with up to 500 new U.S. or Canadian bills in each cassette, for a total of 1,000 bills. Bill quality and proper bill loading are extremely important for reliable operation. Refer to the *XPT Hardware Service Manual* for periodic bill dispenser maintenance.

5.3.1 Bill Quality

The bills used for dispensing should be in good condition and not have excessive wear or folded corners, tape, or other quality issues that could prevent reliable dispensing. If using new bills, fan the edge of the stack to prevent bills from sticking together.

5.3.2 Bill Loading

It is very important that bills be in good condition and loaded correctly in order to be dispensed reliably. Many bill dispenser errors occur because of poor bill quality or improper loading. See *XPT Hardware Service Manual* for instructions on proper bill loading.

5.4 Adjusting the Volume

The audio amplifier has a volume knob on the left side of the display module. Turning the knob counterclockwise (when viewing the left side of the display module) turns the volume down; clockwise turns it up.

5.5 Optional Card Dispenser

The optional card dispenser can be loaded with up to 50 cards. If the cards include barcodes printed according to the specs provided by DRB Systems, the device is also capable of automatically reading the barcode data while the card is dispensing. Refer to the "XPT Hardware Service Manual" information on card specs and how to load them.

Warning: Only load new, clean, unbent cards to avoid maintenance and reliability issues.

To load the card dispenser:

1. Remove the weight from the top of the card stack and set aside.
2. Load a stack of cards with barcodes facing up and toward the main door, until the maximum fill line is reached.
3. Place the weight on top of the card stack.

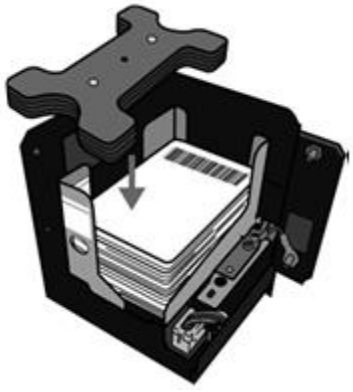


Figure 39. Card Dispenser Loading

Chapter 6

6 Testing Field-Wired Devices

Before testing the XPT, verify and complete the following procedures:

- Wiring is completed for terminal and any attached hardware.
- 120 VAC power is available to the hardware at the machine room circuit breakers.
- Power is on at each of the units (terminal, gate, etc.).
- The XPT software is running as indicated by an "Out of Service" screen on the terminal.

6.1 Testing the Unit

You will use the XPT maintenance software to test the operation of the terminal and its peripherals. To do so, follow these instructions:

1. Unlock the top lock on the main door to activate the login screen.
2. Log in using **98** as the **Employee #** and **98** as the **Password**.
3. Press the **Enable & Test Hardware** button to open the **Enable & Test Hardware** screen.
4. Follow the instructions below to test each of the options on the **Enable & Test Hardware** screen.

If there are unexpected status messages or behavior in the test process, contact DRB Knowledge Center at (330) 645-3299 to resolve the problem.

6.1.1 Gate & Merge Zone Inputs

If using a non-Ethernet controlled gate, this testing is used to synchronize the maintenance software with the actual operation of the gate and merge zone inputs. To do this, follow these steps:

1. From the **Enable & Test Hardware** screen, press the button labeled **Inputs & Outputs**. An **Inputs & Outputs** screen opens.
2. On the **Inputs & Outputs** screen, press the button labeled **Miscellaneous (Wash) Inputs**. A **Miscellaneous (Wash) Inputs** screen opens.
3. Because you can attach the wiring to any of the 4 inputs, you need to determine which ones are being used. Manually open the gate (see the gate manual for instructions) and watch to see which input changes status from **Now Off** to **Now On**, or vice versa. Usually it is wired to the input labeled **Input 1 (Spare)**.
4. When you have determined which input is the gate, check to see if the status is **Now On** when the gate is open. If it is, move on to the next step. If not, press the **Normally Open (press to change)** button beside the input; the status should change to **Now On**.

5. If there is a merge loop, drive a car over the merge zone, and then watch to see which input changes status. Usually it is wired to **Input 4 (WC)**.
6. When you have determined which input is used by the merge loop, check to see if the status is **Now On** when a vehicle is detected (check status lights on loop controller to verify the vehicle is being detected), and **Now Off** when there is none. If this is backwards, press the **Normally Open (press to change)** button beside that input to correct it.

6.1.2 Miscellaneous Inputs

If the site is queuing cars to keep them in order from the gates to the tunnel entrance, the gate control logic in SiteWatch will only open a gate if all gates are closed, and there is no car in the merge zone. For non-Ethernet controlled gates, this is done by checking the status of the wash inputs on the control module. If any of these inputs are on, the gate won't open. So it is important to be sure that the inputs are working correctly.

The inputs in this screen monitor the following connections on the control module.

- Input 1 = Wash Input 1 connector, pins 1 and 2
- Input 2 = Wash Inputs 2 - 4 connector, pins 1 and 2
- Input 3 = Wash Inputs 2 - 4 connector, pins 3 and 4
- Input 4 = Wash Inputs 2 - 4 connector, pins 5 and 6

In most cases you will not use all of the inputs.

Follow these steps to test the inputs:

1. Press the **Inputs & Outputs** button on the **Enable & Test Hardware** screen. The status should be **OK**.
2. Press the **Miscellaneous (Wash) Inputs** button on the **Inputs & Outputs** screen.
3. If there is a non-Ethernet controlled gate attached to the XPT terminal, manually open the gate.
    - The status of the input to which the gate is wired (Input 1) should change from **Now Off** to **Now On** when the gate is opened.
    - The status should stay at **Now On** as long as the gate is open.
    - The status should return to **Now Off** when the gate is closed.

	**Note:**	If the status of Input 1 is **Now Off** when the gate is **open** and **Now On** when the gate is **closed**, press the button to the right of the input status information to change the polarity of the input.

4. If a non-Ethernet controlled gate is used, and the external prox loop is connected to the control module, drive a vehicle over the loop to activate the input.
    - The status of the Proximity Input should change from **Now Off** to **Now On** when the vehicle is at the XPT.
    - The status should stay **Now On** as long as the vehicle remains at the XPT.
    - The status should change to **Now Off** when the vehicle pulls away from the XPT.

5. If there is a wash controller with a wash in use input wired to the XPT, activate the wash in use output at the wash controller.
    - The status of the wash in use input (input 2) should change from **Now Off** to **Now On** when the wash is busy.
    - The status should stay **Now On** as long as the wash in use signal is active.
    - The status should change to **Now Off** when the wash in use signal goes off after the vehicle has left the wash.
6. If there is a wash controller with a wash fault input (input 3) wired to the XPT, activate the wash fault output at the wash controller.
    - The status of the wash fault input should change from **Now Off** to **Now On** when the signal is being sent to indicate there is a problem with the wash.
    - The status should stay **Now On** as long as the wash fault signal is active because the problem still exists.
    - The status should change to **Now Off** when the wash fault signal is turned off by the controller to indicate it is once again able to accept cars.
7. If there is a merge loop connected to a non-Ethernet controlled gate and the terminal, activate the loop (drive a car into the area just beyond the gate).
    - The status of the loop input (input 4) should change from **Now Off** to **Now On** when the car is being detected.
    - The status should stay at **Now On** as long as the car is detected.
    - The status should return to **Now Off** when the car is no longer detected.
8. Press the **EXIT** button to return to the **Inputs & Outputs** screen.

6.1.3 Miscellaneous Outputs

The outputs on this screen control the following connections on the control module.

- Output 1 = Fault Outputs 1 - 4 connector Outputs, pins 1 and 2
- Output 2 = Fault Outputs 1 - 4 connector, pins 3 and 4
- Output 3 = Fault Outputs 1 - 4 connector, pins 5 and 6
- Output 4 = Fault Outputs 1 - 4 connector, pins 7 and 8
- Output 5 = Fault Output 5 connector, pins 1, 2, and 3

1. Press the **Miscellaneous (Fault) Outputs** button on the **Inputs & Outputs** screen.
2. Press the **Output 4 (press on/off)** button (gate control output). If a non-Ethernet gate is connected, the gate should open and stay open.
3. Press the **Output 4 (press on/off)** button again to turn the output off before attempting to close the gate. Close the gate by driving a car over the gate loop, or using a piece of metal to simulate a car passing through the gate.
4. If there is a lane available light attached to the XPT, press the button to the left of the output controlling it (usually output 3). The lane available light should come on and stay on until you press the button again to turn the output off.
5. Press the **EXIT** button to return to the **Inputs & Outputs** screen.

6.1.4 Wash (Relay) Outputs

The outputs on this screen control the following connections on the control module.

- Output 1 = Wash Outputs connector, pins 1 and 9
- Output 2 = Wash Outputs connector, pins 2 and 9
- Output 3 = Wash Outputs connector, pins 3 and 9
- Output 4 = Wash Outputs connector, pins 4 and 9
- Output 5 = Wash Outputs connector, pins 5 and 9
- Output 6 = Wash Outputs connector, pins 6 and 9
- Output 7 = Wash Outputs connector, pins 7 and 9
- Output 8 = Wash Outputs connector, pins 8 and 9

1. Press the **Wash (Relay) Outputs** button on the **Inputs & Outputs** screen.
   - The status for each of the outputs should be **Now Off**.
   - If the XPT has already connected to SiteWatch, and services have been configured for the outputs, those service names are shown above the status for the output.
2. Press the button beside any output that has been wired to the in-bay automatic wash controller.
   - The status for that output should change to **Now On**.
   - The appropriate wash or service should be activated on the wash controller.
   - Press the button beside the output again to turn it back off.
3. Repeat the test for each output that is wired to the wash controller.
4. Press the **EXIT** button to go back to the **Inputs & Outputs** screen.
5. Press the **EXIT** button on the **Inputs & Outputs** screen to return to the **Enable & Test Hardware** screen.

6.1.5 External Alarm

1. Press the **Security Devices** button on the **Enable & Test Hardware** screen.
2. If you have wired the site alarm system to the external alarm output on the XPT, you can test it by pressing the **Ext. Alarm Off (press to turn on)** button. Press the button again to turn the external alarm back off.
3. Press the **Exit** button to return to the **Enable & Test Hardware** screen.
4. Press the **Exit** button again to return to the **Main Status Screen**.
5. Lock the top lock on the XPT to exit maintenance mode.

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Appendix A. Dimensional Schematic of the XPT

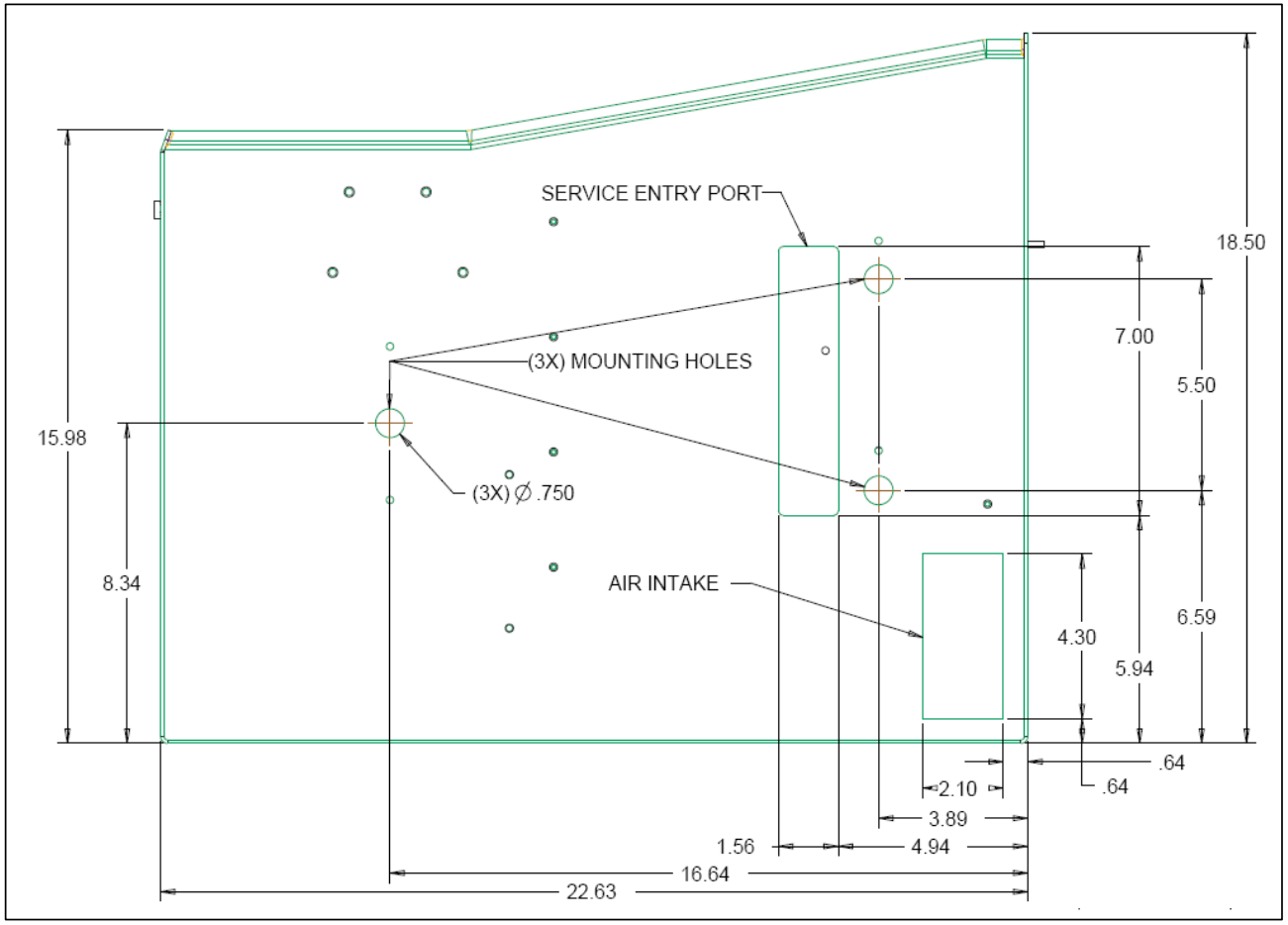

Figure 40. Bottom View of the XPT (case only)

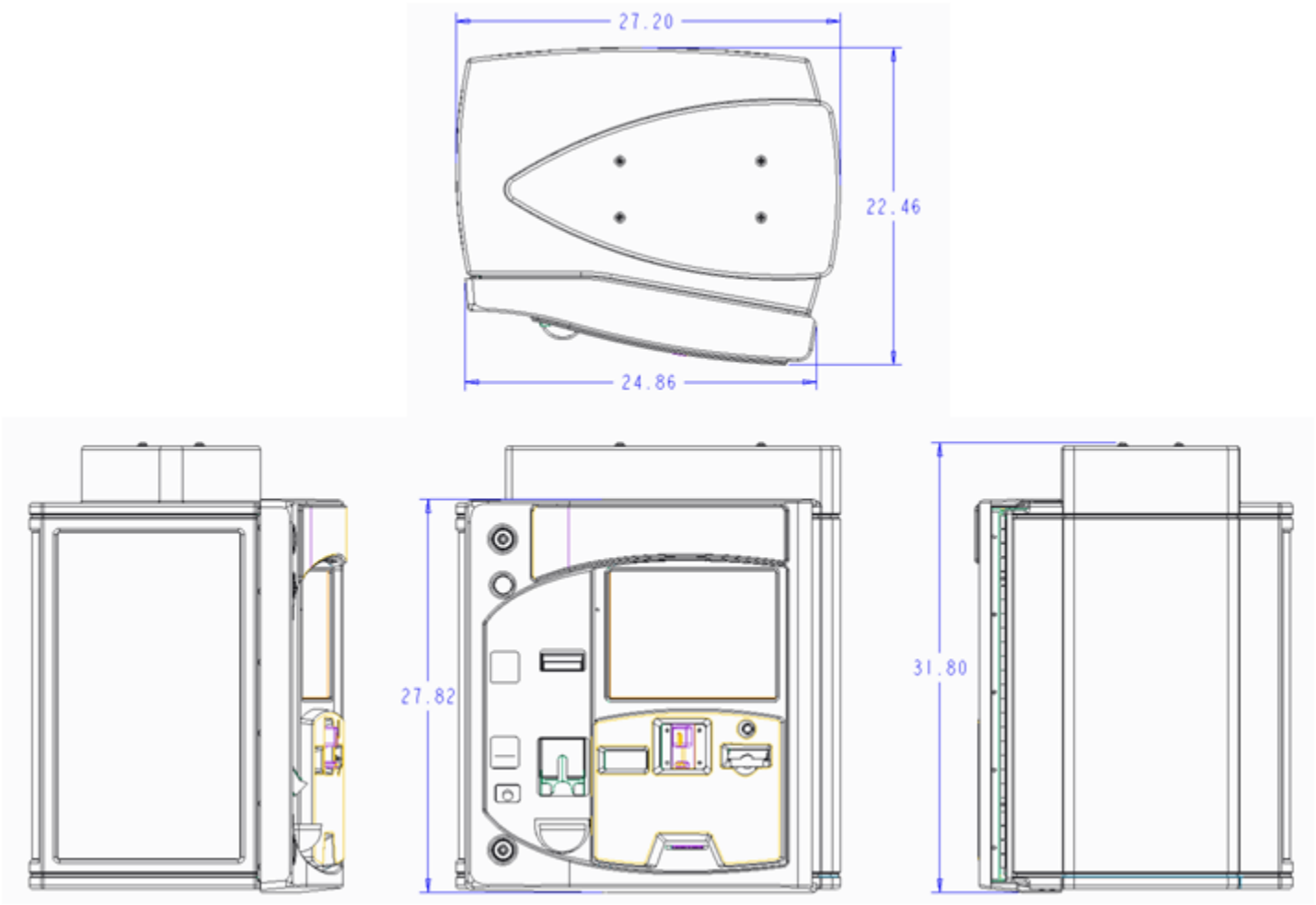

Figure 41. Standard USA XPT 5+ w/MSR, USA XPT 5+ w/CardConnect EMV, or Canadian XPT 5+

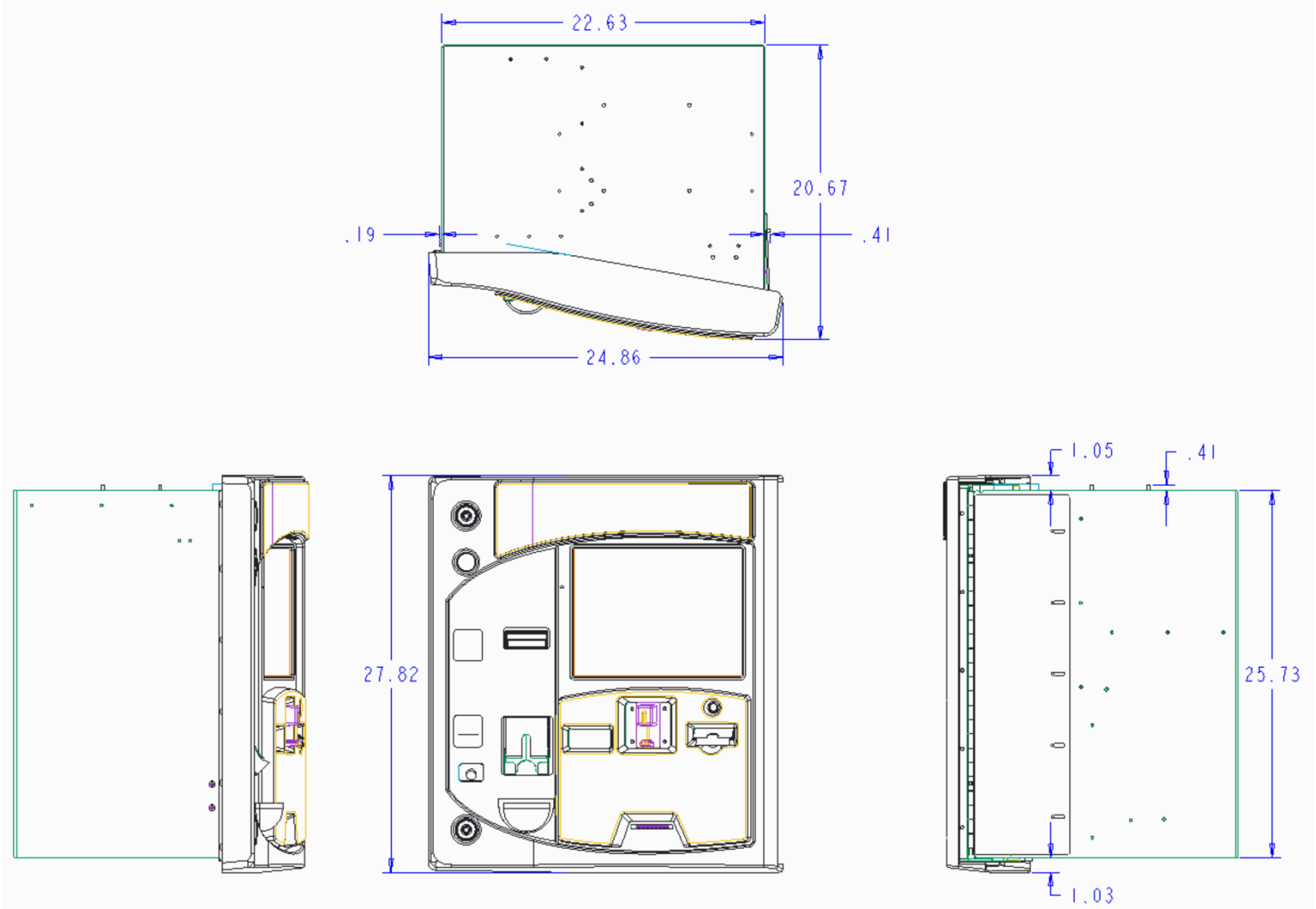

Figure 42. Brick-In USA XPT 5+ w/MSR, USA XPT 5+ w/CardConnect EMV, or Canadian XPT 5+

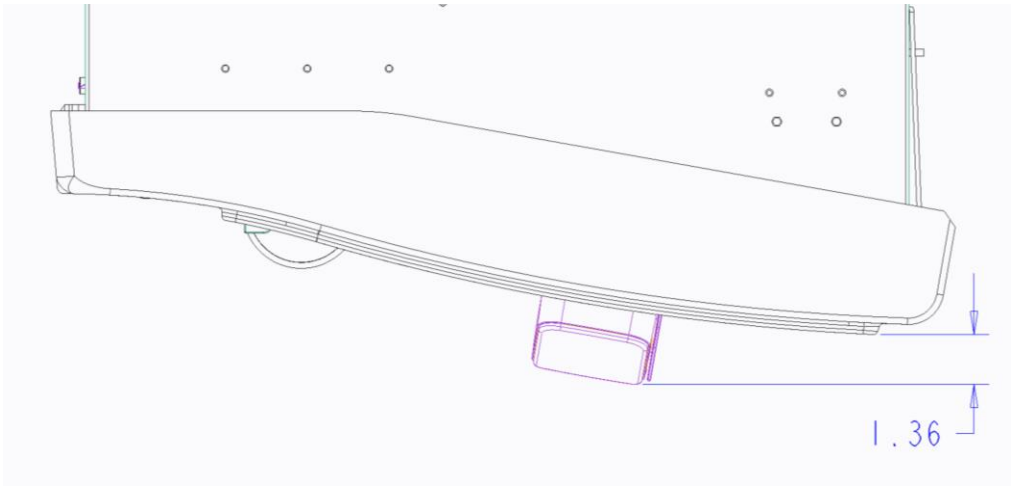

Figure 43. Additional Door Depth of USA XPT 5+ w/Vantiv EMV

Appendix B. XPT Technical Specs & Guidelines

Rough Dimensions:

Standard XPT with plastic shroud: 32" H x 27.5" W x 22.5"D

Brick-In XPT without plastic shroud: 28" H x 25" W x 21" D

Standard height base: 35" H x 23" W x 12" D

Curb height base: 28.5" H x 23" W x 12" D

Operating Temperature:

USA models -20°F to 115°F

Canadian models -40°F to 115°F

Shipping Weight:

XPT with all options: 230 lbs

Power Requirements:

120VAC, 8 Amps "computer grade power" with dedicated ground and dedicated circuit breaker.

Hardware Capacities:

Bill Dispenser: 1,000 New US Bills

Bill Acceptor: 1,000 Bills

Coin Dispenser Hopper: 1,000 US Quarters

Coin Acceptor: 500 US Quarters

Receipt Printer: 60mm (2.36") x 4" Diameter Thermal Transfer Paper

Appendix C. Magnetic Gate Installation

A. Physical Installation of the Gate

The following information applies only to the Magnetic Parking Pro gate. Most of the details of the gate installation are available in the documentation that comes with the gate. An overview of the issues to consider is given below.

The following tools are needed for the installation of the gate:

- Diagonal cutters
- Wire strippers
- Small, thin blade, flat-tip screwdriver
- Phillips screwdriver
- Slotted screwdriver
- Torque wrench with Torx T40 bit
    - Capable of 11.8lb ft tightening torque
- Torque wrench with 10 AF hexagon socket
    - Capable of 55.318lb ft tightening torque
- 3mm Allen wrench
- 3/4" deep well socket (or sized according to ground flange anchor size)
- Torx bit, size 20

Steps for installing the gate:

The gate should be installed 12’ beyond the XPT in line with the terminal. Use the parameters below to determine how many conduits will be required for the gate installation.

1. A 3/4" conduit between the gate and the XPT to carry Cat-6 cable from the XPT to the gate.
2. A 1" conduit bringing in the 120 VAC power for the gate. **Note**: The gate is rated or 5 amps. In order to meet local electrical code, each gate may require a dedicated power circuit. This conduit should be positioned far enough away from the gate loop to prevent electromagnetic interference (minimum 12").
3. A 3/4” conduit between the gate and the FastID camera enclosure to carry 2-conductor cable from the FastID camera to the gate, if connecting the FastID trigger signal to the gate..
4. A 1/2" PVC conduit to carry the gate loop leads to the gate.
5. A 1/2" PVC conduit to carry the merge loop leads to the gate, if installed.
6. A 1/2" PVC conduit to carry the external prox loop leads to the gate.
7. A 1/2” PVC conduit to carry the FastID trigger loop leads to the gate, if installed.
8. All conduits should be routed into the center point of where the gate is to be mounted to ensure the conduit will fit inside the gate. See the "Anchor bolt positioning" section below.

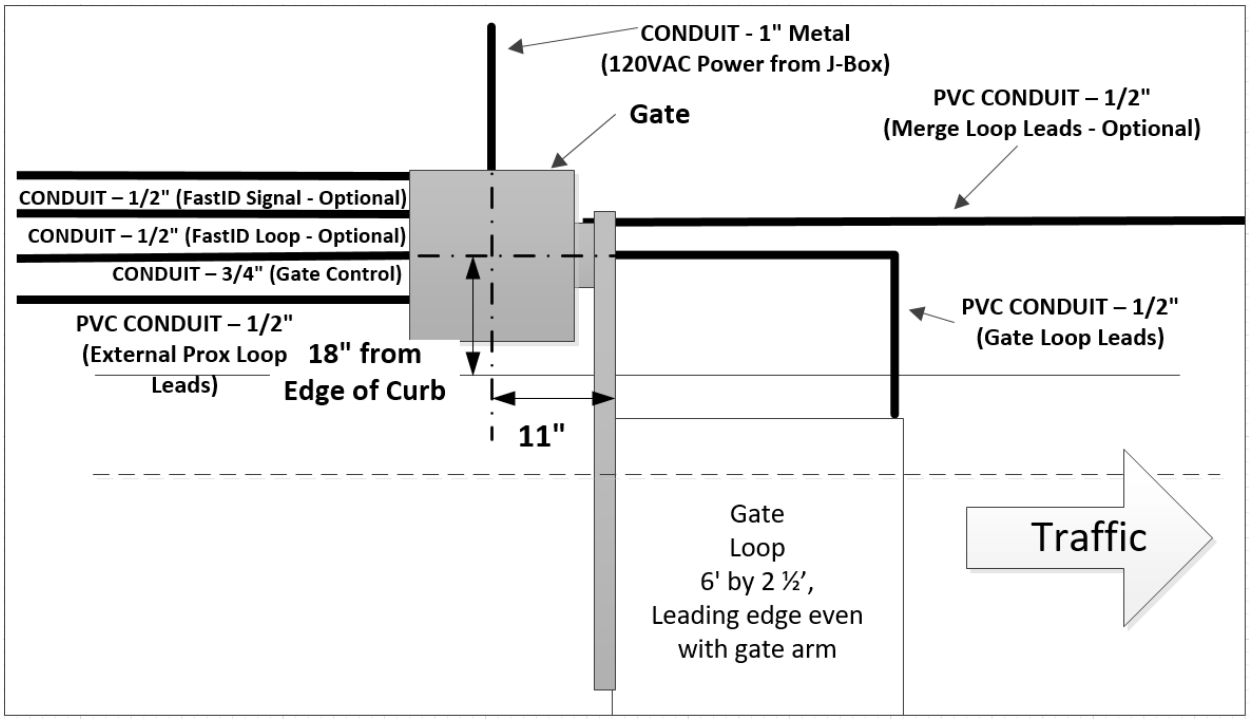

Figure 44. Magnetic Gate Conduit Requirements

Concrete Base

The gate should be anchored to a trowel-finished concrete foundation. The foundation should be at least 31.5" deep and 17.7" as measured parallel to the lane by 23.6" as measured perpendicular to the lane. Four holes should be drilled in the concrete and 3/8" fasteners/anchors should be used to secure the gate.

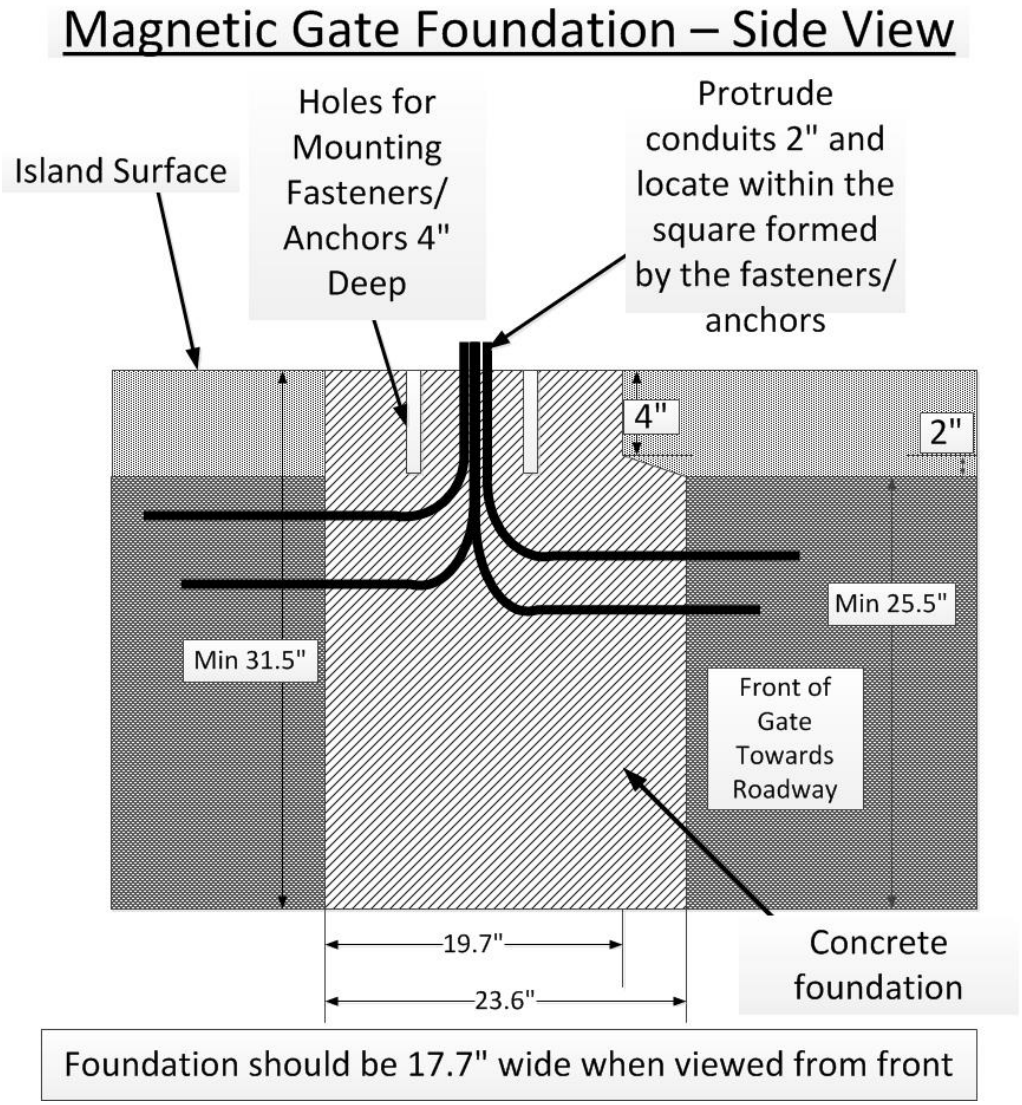

Figure 45. Magnetic Base Side View

Anchor Bolt Positioning

The gate may be secured to the concrete by using the existing securing holes on the bottom of the gate housing or using the (2) mounting plates included with the gate. To secure the gate using the securing holes on the bottom of the gate, the gate base template (included in gate packing material) should be used as a guide when installing the anchor bolts. To secure the gate using the mounting plates, the (4) anchor bolts should be installed in a 7.09" square alignment, centered to the base of the gate as shown below.

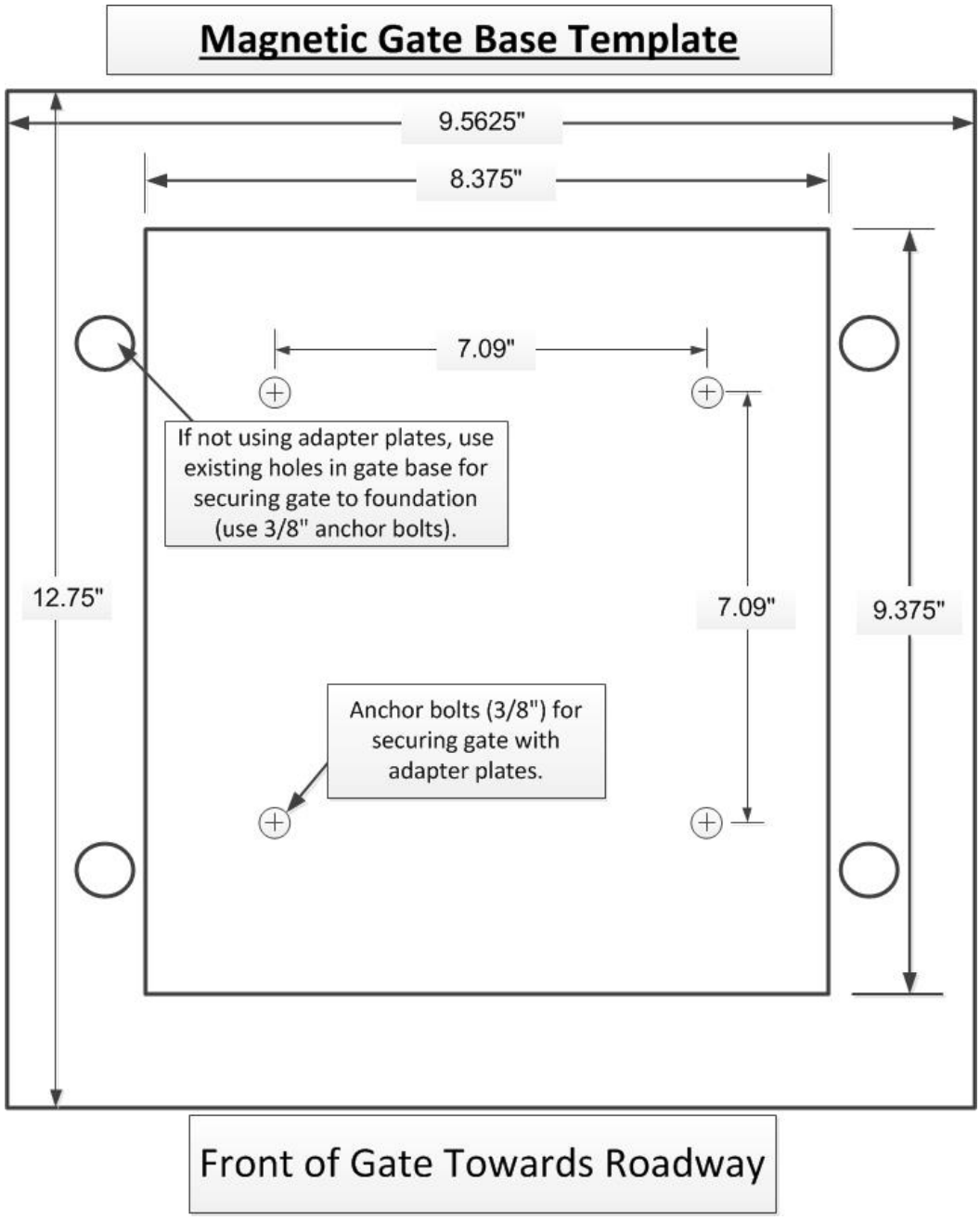

Figure 46. Magnetic Gate Base Template

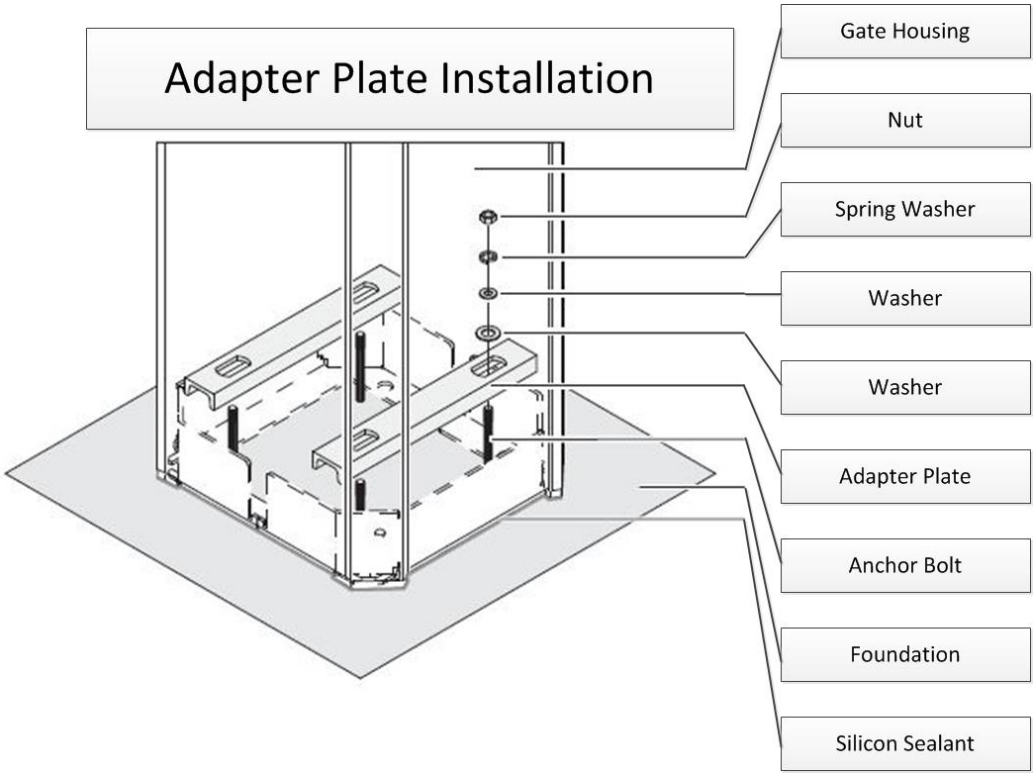

Figure 47. Adapter Plate Installation

Gate Power Wiring

Each gate is rated for 5 amps at 115 VAC and may require a dedicated circuit, depending on local code requirements. The 115 VAC site power must be wired into the bottom terminal clamps of the power distribution block as shown below.

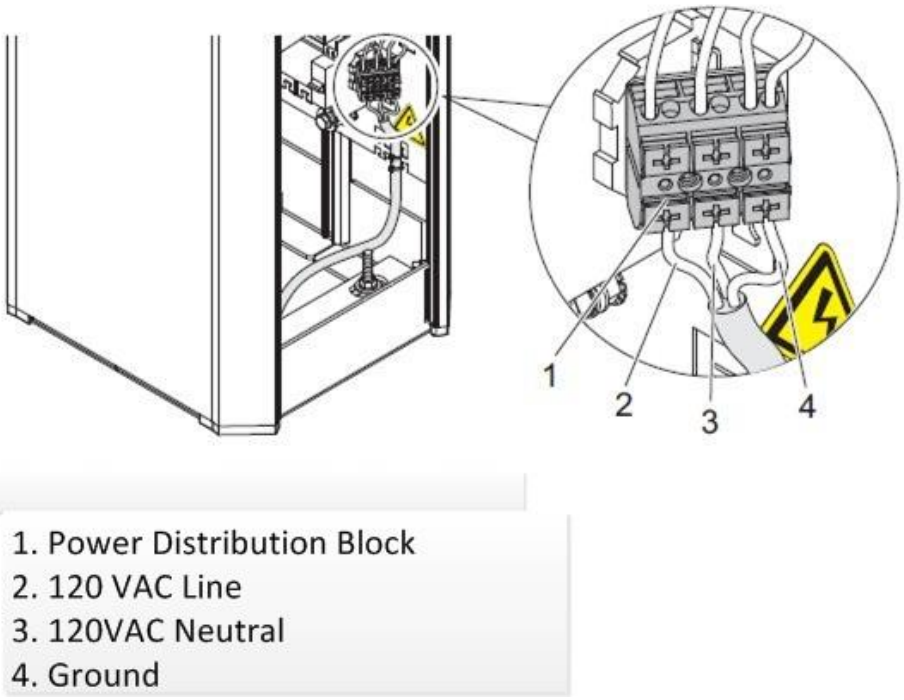

Figure 48. Gate Power Wiring

B. Gate Loop Installation

A loop should be placed in the pavement below the gate. This loop is used to detect the presence of a vehicle, keep the gate from closing on cars, and tell the gate to close after the car is beyond it.

- The loop should be 2.5 feet long by 6 feet wide to cover the car lane under the gate arm. The leading edge of the loop should be even with the gate arm, and the trailing edge of the loop should be 2.5 feet beyond the gate arm. The loop wire should make 5 turns around the pavement saw-cut, to provide correct inductance needed for detecting automobiles.
- The loop leads should be twisted 6 turns per foot, from the edge of the loop to the loop A connections on the control unit. These twists are necessary to minimize interference and prevent false loop detection.
- If multiple gates are installed, the loop frequency setting on both channels of each loop detector should be different for adjacent gates. There are two frequency settings for each loop detector channel: high and low. For example, Gate 1 loop detector channels A and B should be set to High frequency, gate 2 loop detector channels A and B should be set to Low frequency, gate 3 loop detector channels A and B should be set to High frequency, etc.
- Refer to section H of this appendix for further information on loop specifications.
- The loop leads come into the gate and connect to A1 and A2 on the right side of the control unit as shown below.

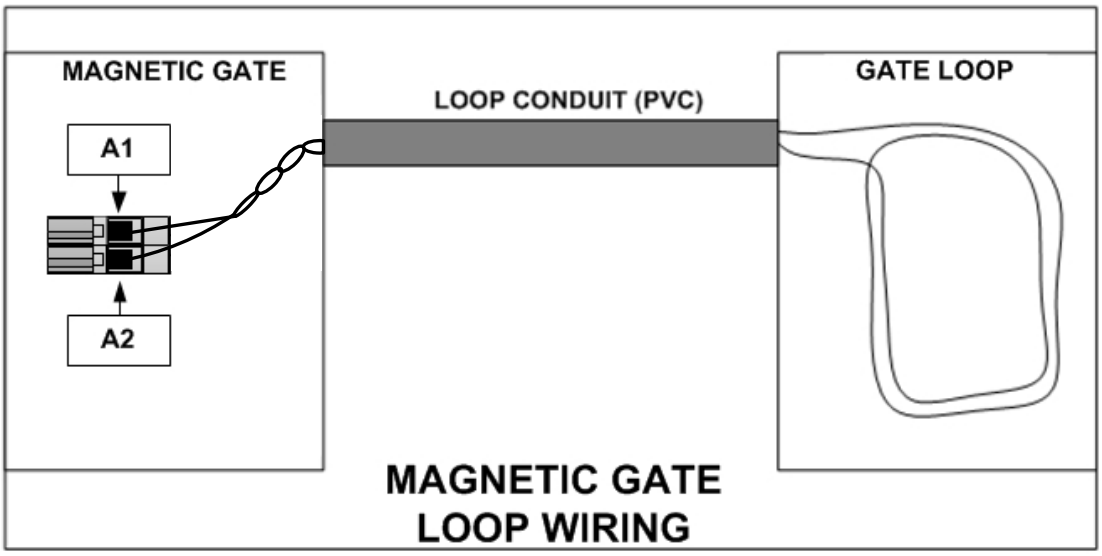

Figure 49. Magnetic Gate Loop Wiring

C. Wiring the Gate Control and Monitoring Circuits

There are two methods of controlling Magnetic gates: Ethernet and discrete I/O. The Ethernet control is the preferred method, and the Magnetic gate must contain an Ethernet module in order to use this method.

Preparation

- Make sure all power is disconnected from the gate and XPT prior to beginning this procedure.
- You will need a thin tipped, flat head screwdriver to open and tighten the relay connections on the XPT and gate.
- Locate the Wash Input 1, Wash Inputs 2-4, and Fault Outputs 4 connectors on the XPT control module. Remove those connectors to attach wires on the XPT side and then replace them when the wiring is completed.

Ethernet control: A Cat-6 cable needs to be pulled from the gate control unit, through the conduit, and into the XPT.

Discrete I/O control: At least 5 wires need to be pulled through the conduit to the XPT. If you are installing a merge loop, you must pull 1 additional wire through the conduit to the XPT. The master connection diagram for a single gate connected to a single XPT is shown in Figure 51. This diagram also illustrates the merge loop redundancy connection, for sites with 3 or more XPTs, as explained further in section H of this appendix. Note that all wires should be 18-22 gauge.

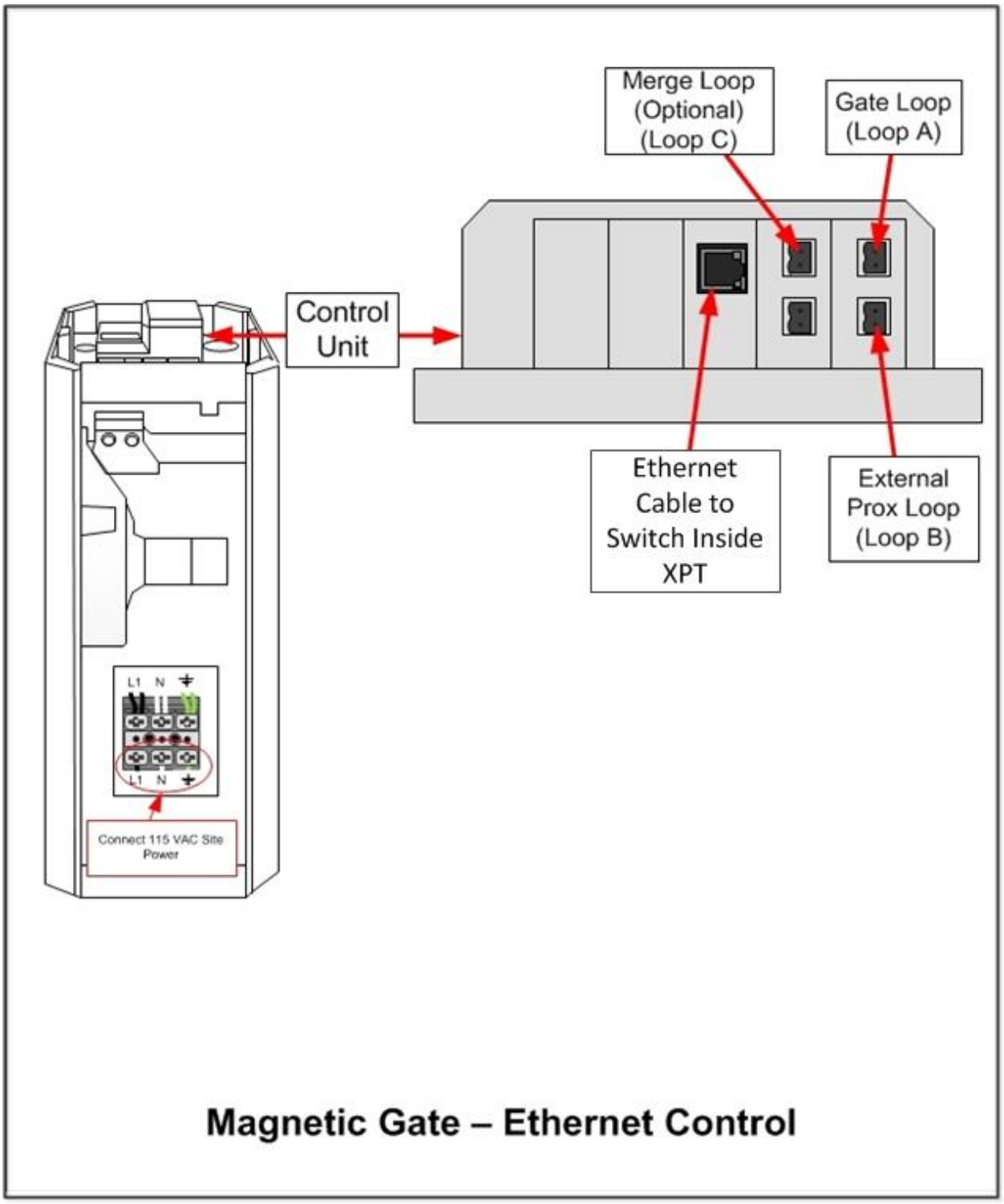

Figure 50. Magnetic Gate – Ethernet Control

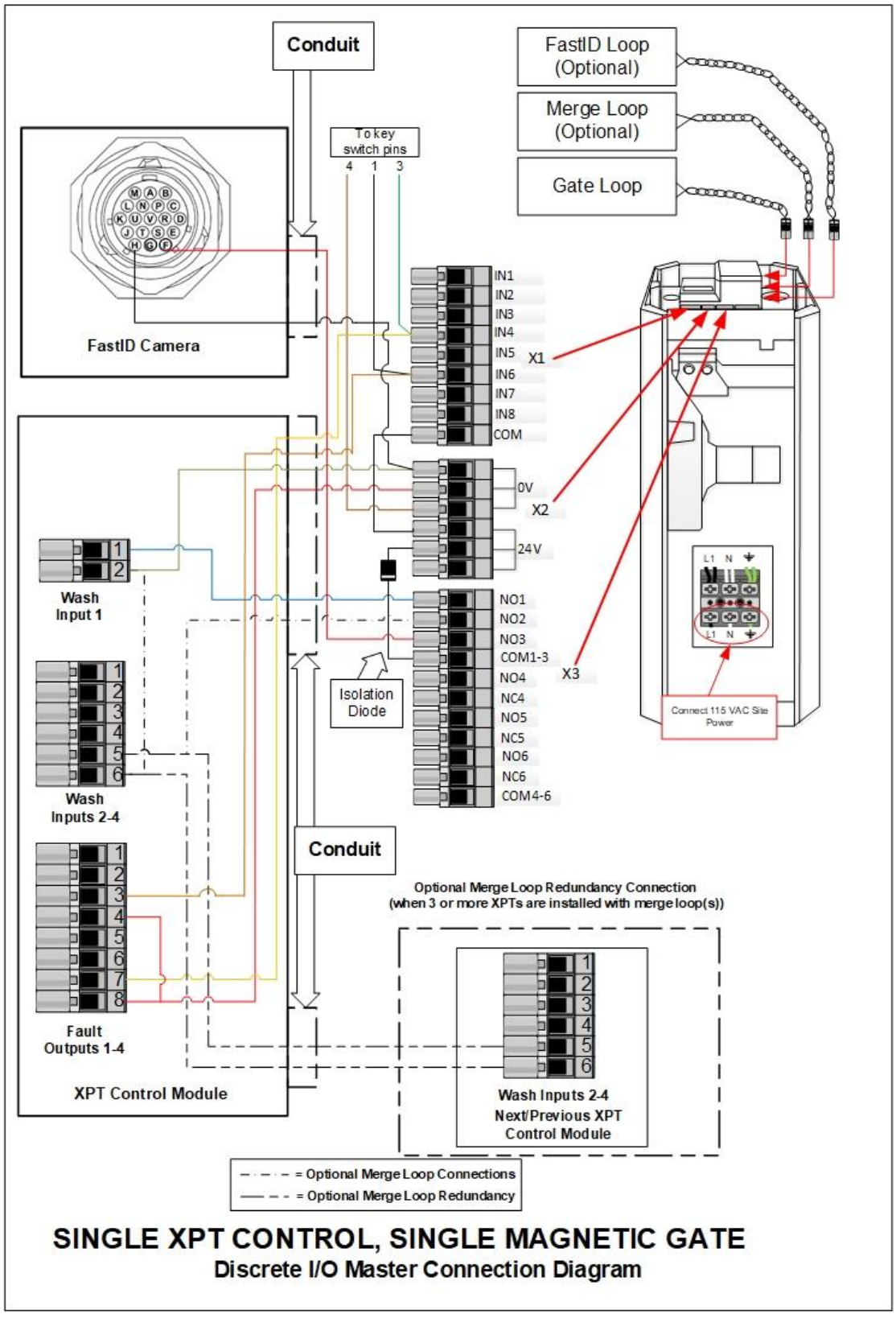

Figure 51. Single XPT Control, Single Magnetic Gate

D. Magnetic Gate Merge Loop Installation

When queuing (stacking) cars from the XPTs to the tunnel entrance, it is possible for cars to get out of order in the "merge zone" area between the terminal gates and the place where the tunnel entry area narrows to a single lane. To prevent this, merge loops are installed in the merge area to keep gates from opening until the previous car is into the choke point, where it cannot be passed by other cars. The merge loops must be placed so that a car is detected before it has completely left the gate loop, to prevent the car from becoming "lost" between the two loops. To accomplish this, the leading edge of the merge loops should be placed no farther than 12' past the trailing edge of the gate loops, so that even the shortest car remains continuously detected from the time it enters the gate loop until it leaves the merge zone. If the wash is capable of washing cars of less than 12' length (Smart Car, etc.), consider placing the merge loops even closer to the trailing edge of the gate loops. The trailing edge of the merge loops must also be spaced a minimum of 1 car length beyond the trailing edge of the gate loops, so that when SiteWatch opens the next gate, the next car is able to pull all the way through to the choke point.

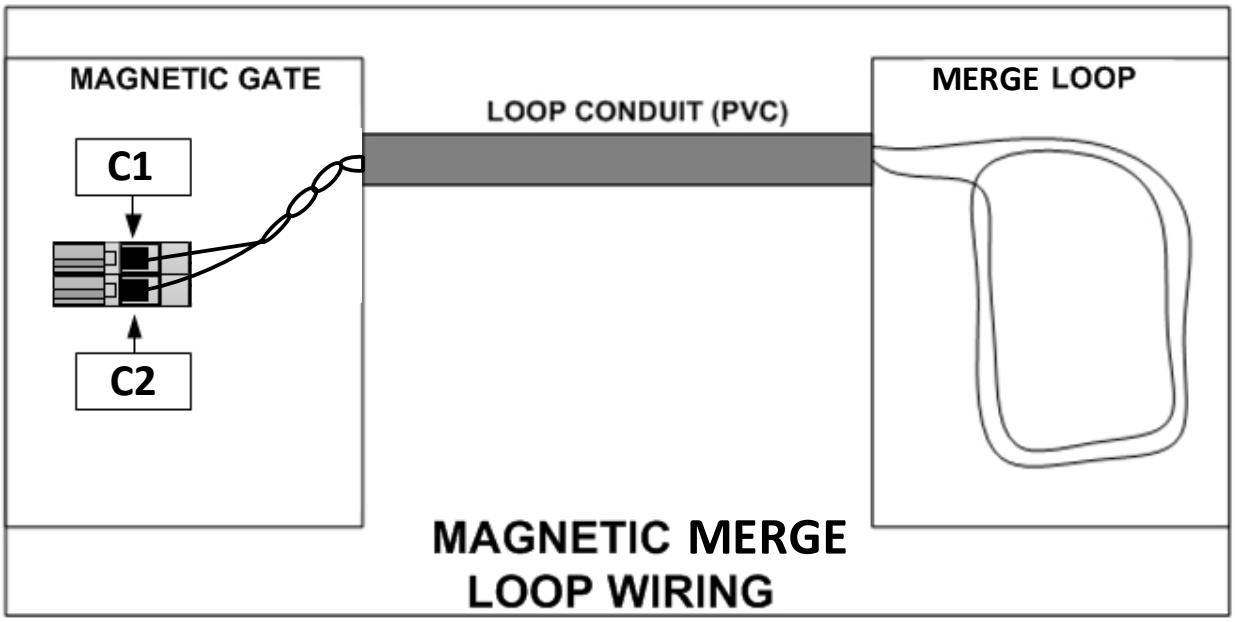

Figure 52. Magnetic Merge Loop Wiring

E. Installation of the Merge Zone Loops

DRB Systems recommends one pre-formed merge loop per gate, sized at 4' x 10', but in special circumstances, the customer can order bulk loop wire and create a custom sized merge loop. The sensitivity and size of each custom loop must be such that a vehicle can't stop in the middle of the loop area and be undetected. The size of a single merge loop should not be larger than 200 square feet, and the shortest sides should not be less than 2.5', for reliable vehicle detection. The detection height of the loop is approximately 2/3 the shortest side, so a 2 1/2' wide loop will detect metal that is approximately 1.7' off the ground. To recap, there are four important criteria that should be met when laying out a custom merge loop:

1. The leading edge of the merge loop should be no farther than 12' past the trailing edge of the gate loop.
2. The trailing edge of the merge loop should be a minimum of 1 car length beyond the trailing edge of the gate loop.
3. The shortest side of the merge loop should not be smaller than 2 1/2'.
4. The area of a single merge loop should be less than 200 square feet.

The lane layout shown in Figure 53 uses three merge loops to cover three XPT lanes. In this example, cars will remain detected by either the gate or merge loop until they've reached a choke point at which they cannot get out of order by passing each other.

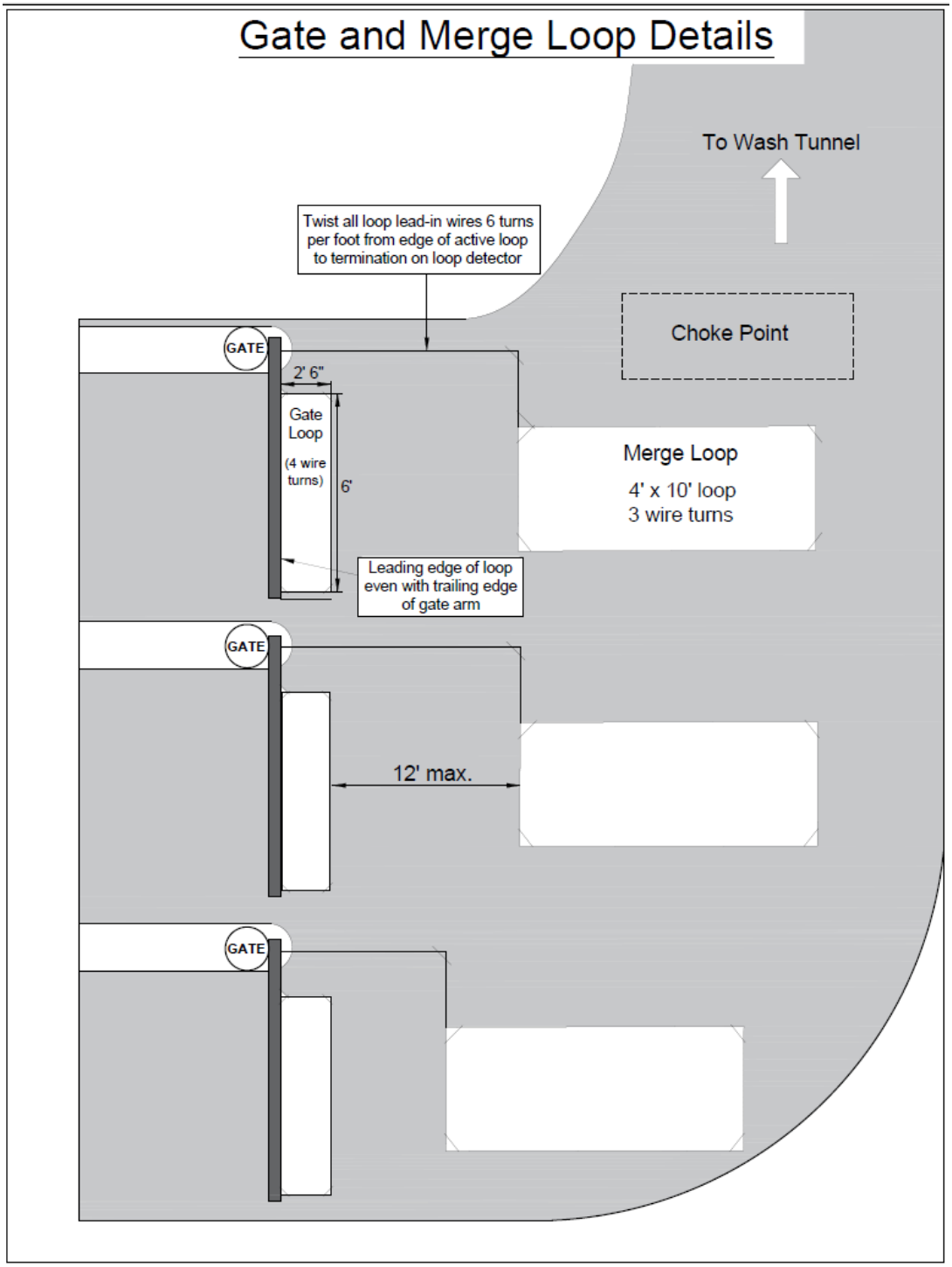

Figure 53. Three XPT Lanes with Three Merge Loops

When multiple merge loops are used, ensure that each merge loop is spaced a minimum of 3 feet, or the length of the longest short side, whichever is greater, to prevent interference. In the example shown below, one merge loop is 24' by 6' and the other is 18' by 7', so the loops would need to be spaced 7' apart. When using the recommended 4' by 10' merge loops, the minimum spacing between loops would be 4'.

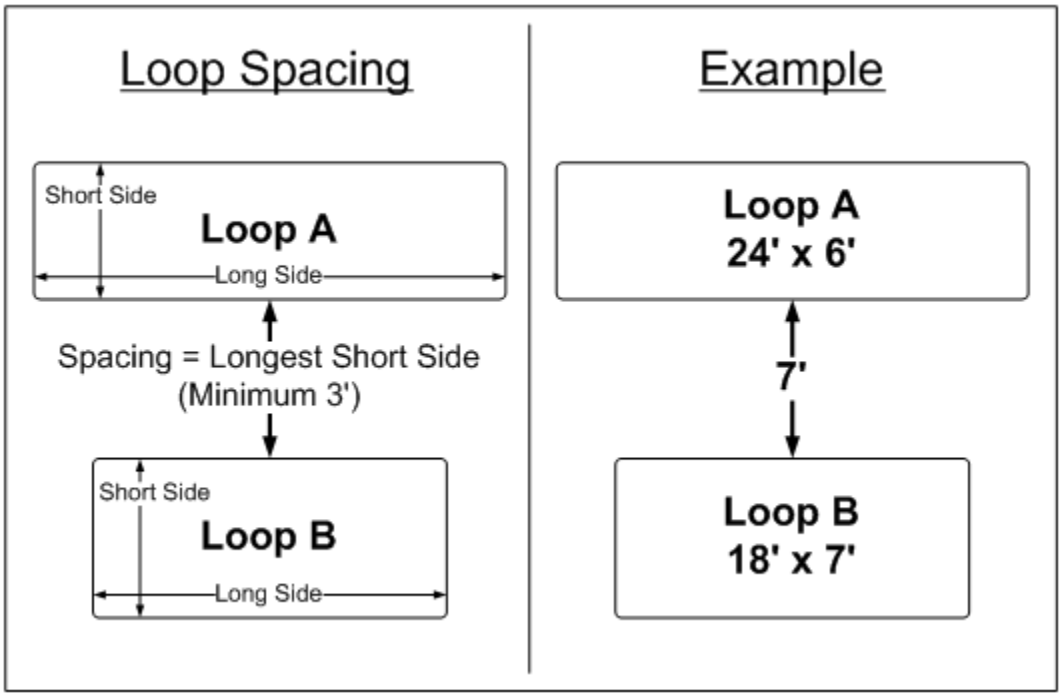

Figure 54. Merge Loop Separation

F. Magnetic Gate FastID Loop Installation

A loop should be placed in the pavement in front of the XPT. This loop is used to detect where the rear of the vehicle is, so the FastID camera knows when to capture an image of the license plate.

- The loop should be 2.5 feet wide by 6 feet wide to cover the car lane under the gate arm. The trailing edge of the loop should be 14’7” from the center line of the XPT.
- The loop leads should be twisted 6 turns per foot, from the edge of the loop to the loop D connections on the control unit. These twists are necessary to minimize interference and prevent false loop detection.
- If multiple gates are installed, the loop frequency setting on both channels of each loop detector should be different for adjacent gates. There are two frequency settings for each loop detector channel: high and low. For example, Gate 1 loop detector channels A, B, C, and D should be set to High frequency, gate 2 loop detector channels A,B,C, and D should be set to Low frequency, gate 3 loop detector channels A, B, C, and D should be set to High frequency, etc.
- Refer to section H of this appendix for further information on loop specifications.
- The loop leads come into the gate and connect to D1 and D2 on the right side of the control unit as shown below.

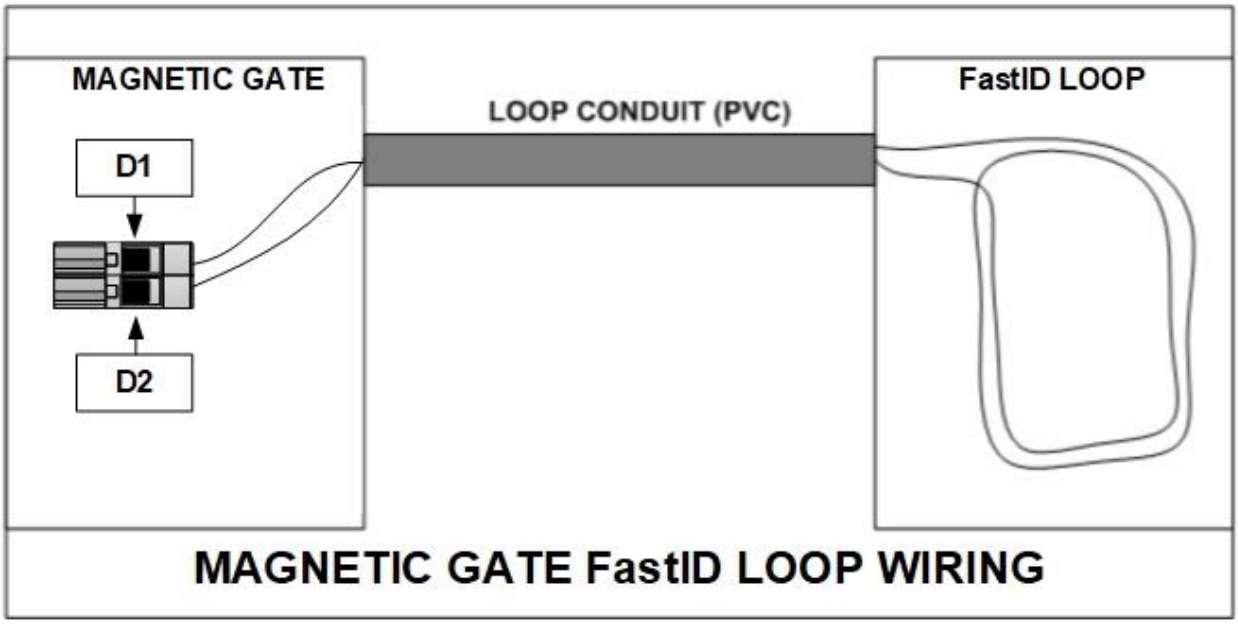

Figure 55. FastID Loop Wiring

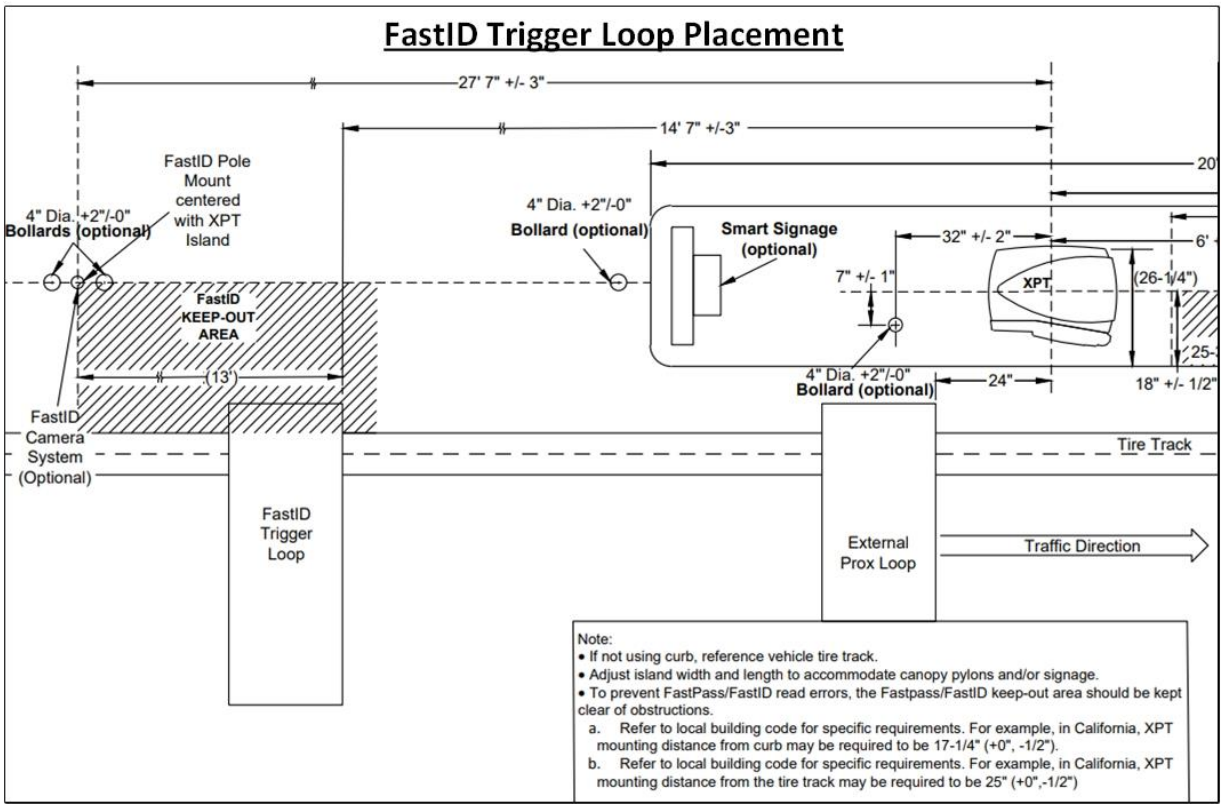

Figure 56. FastID Trigger Loop Placement

G. FastID Trigger Signal Cable Installation

The FastID trigger signal cable runs from the FastID camera's IO connector to relay output 3 and 0V on the Magnetic gate. The cable is used to signal the camera to capture the image of the license plate.

Connect the red wire to pin 3 on the X3 terminal strip of the Magnetic gate. Connect the black wire to pin 1 on the X2 terminal strip of the Magnetic gate.

Connect the other end of the cable (end with the circular connector) to the FastID camera's IO connector.

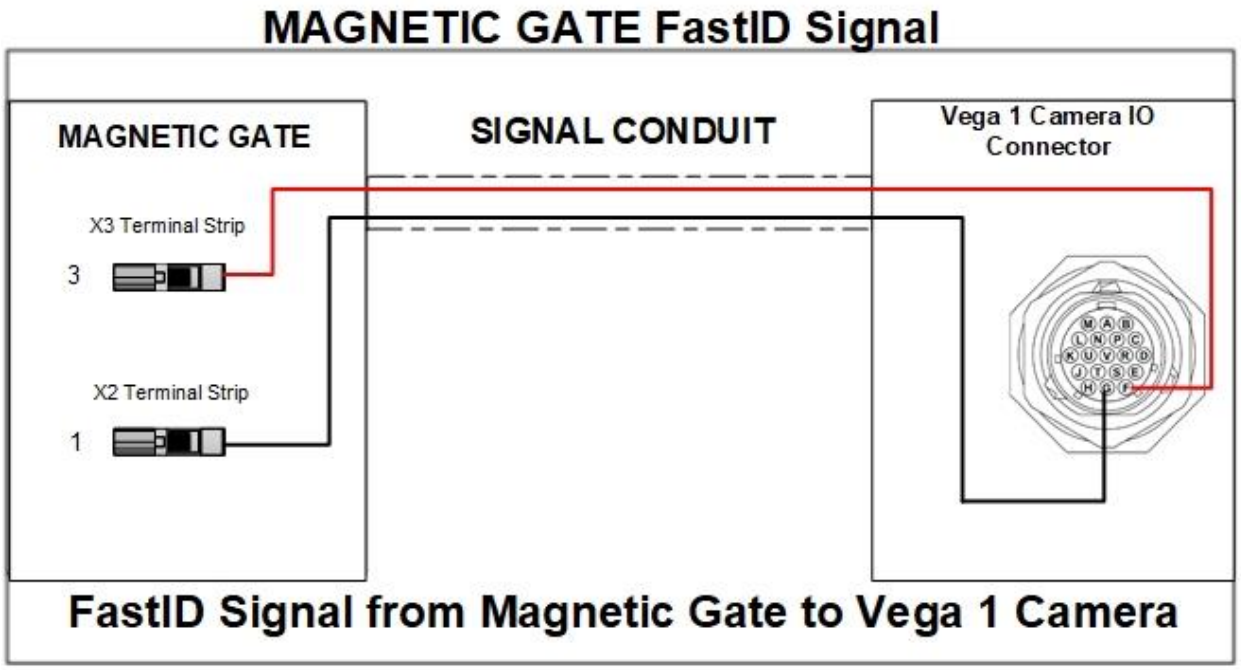

Figure 57. FastID Signal Wiring

H. Loop Installation Tips

If sourcing your own merge loops, the loop wire should be 16 or 18 gauge stranded tinned copper wire with cross-linked polyethylene (XLPE) insulation rated for 600V. **Note**: FastID trigger loops connected to the Magnetic gate must be 14 or 16 gauge. This wire has many superior characteristics that are needed in loop detector applications:

1. The large wire gauge keeps the serial resistance of the loop low.
2. The wire is flexible enough to bend to follow the saw cut, minimizing insulation damage.
3. The XLPE insulation has excellent moisture and solvent resistance, and ages well.

The loops can be installed in a saw cut or paved over. If using pave-over loops, it is recommended that a preformed pave-over style loop be installed. This type of loop generally encloses the wiring in non-metallic liquid tight conduit.

Table 7. Loop Turns Table

Loop Perimeter (2Length + 2Width)	Number of turns
Smaller than 10 feet	6
10 feet - 13 feet	5
13 feet - 20 feet	4 or 5
20 feet - 40 feet	3
Larger than 40 feet	2

Note: Do not use general-purpose building wire, which was designed for conduit applications. It often has a very thin sheathing of nylon, which protects it from moisture, but it is easily damaged during wire installation in the saw cut.

Sealant: Use a commercial loop sealant designed for traffic loops. Paving sealers, tar, and other products may work for a short time, but weather thermal cycles and vehicle pressure will invariably cause problems over time.

Backer Rod: Merge loops, which are much larger than the gate loop, may need backer rods. Use a backer rod to reduce the necessary amount of sealant, and to ensure that the wires are in place and do not vibrate. Any vibration or wire movement can cause a false detection.

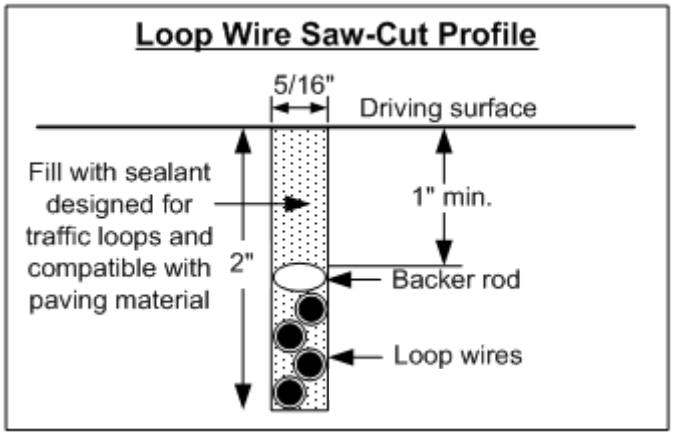

Figure 58. Loop Profile

LOOP WIRE INSTALLATION

A properly installed loop coil will provide reliable detection for a very long time with no attention or maintenance. To ensure proper installation, conform to the following guidelines:

1. Take care not to damage the loop wire insulation. Scratches on the wire insulation, sharp edges or small stones in the saw cut, and sharp tools used during the installation can damage the wire, causing false detections and detector lockup.

2. Avoid splices in loop wires, and if they must be made, they must be soldered and insulated with heat shrink tubing. The loop wire continuity (or serial resistance) will be low and constant. The current in the loop wire is too low to overcome the long-term oxidation that is inevitable with a wire nut connection.
3. The loop wire must not move or vibrate in the pavement. Any vibration of the loop wires or movement of steel rebar (if it is used) will cause false detection. Inspect the pavement before loop installation. If you see large cracks in the pavement and evidence of pavement movement, there is a potential problem. Pavement movement after you have installed the loop can damage the wire, or cause false detection. If necessary, use a backer rod to make sure that the wire is held firm in the saw cut.
4. Keep AC power at least 12" away from the loop. The loop wire **must not** be subjected to electrical noise. AC power running under the loop can cause false detection. The loop detector detects the changes in electrical currents as if they were cars.

Pave-over Loop Guidelines

Concrete Installation

Protect the loop lead-in wires with additional 1/2" flexible or rigid non-metallic conduit. Do not lay the loop directly on top of rebar or wire mesh. The loop must be at least 3" from rebar, wire mesh, or any other metal. The loop should be 3" below the road surface to provide optimal vehicle detection and maintain concrete strength over the loop. If this is not possible, the loop may be installed to an absolute minimum of 2" below the surface of the concrete. Non-metallic stakes or similar can be used to keep the loop the desired distance above the metal reinforcement.

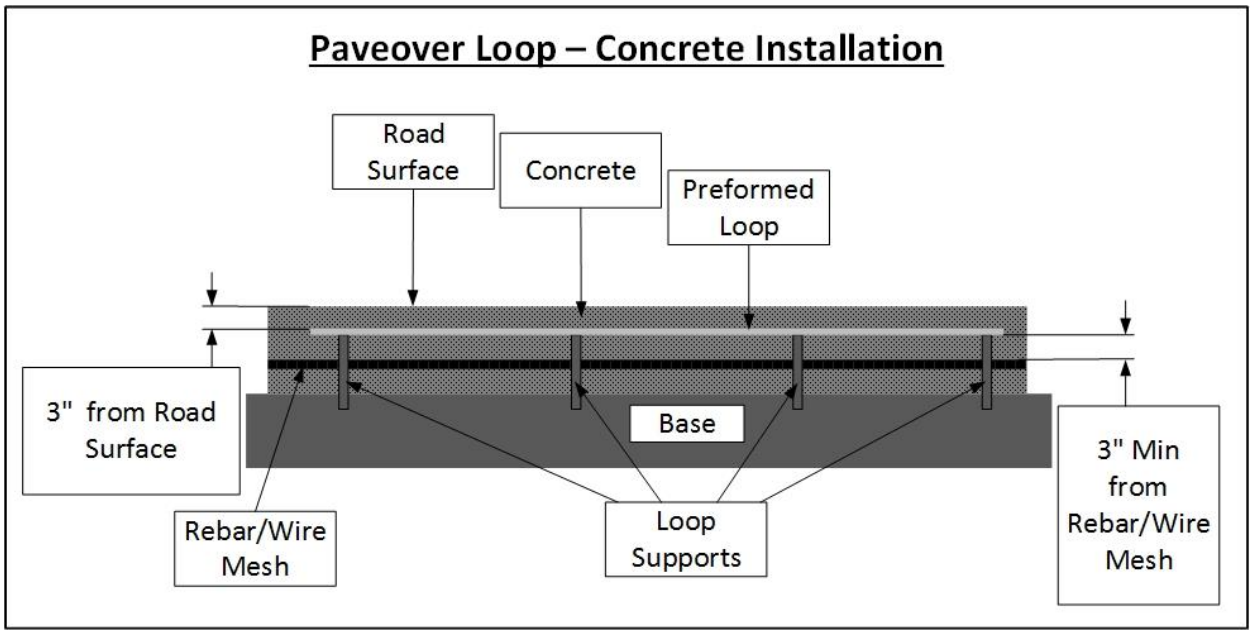

Figure 59. Pave-over Loop - Concrete Installation

Asphalt Installation

Protect the loop lead-in wires with additional 1/2" flexible or rigid non-metallic conduit. Ensure a high-temperature pave-over loop is used when installing in asphalt. The loop may be placed directly on the base surface before pouring the concrete. Use fiberglass backed mastic tape (included with high temperature preformed loops sold by Lead-In Systems) to hold the loop into position as the asphalt is being poured.

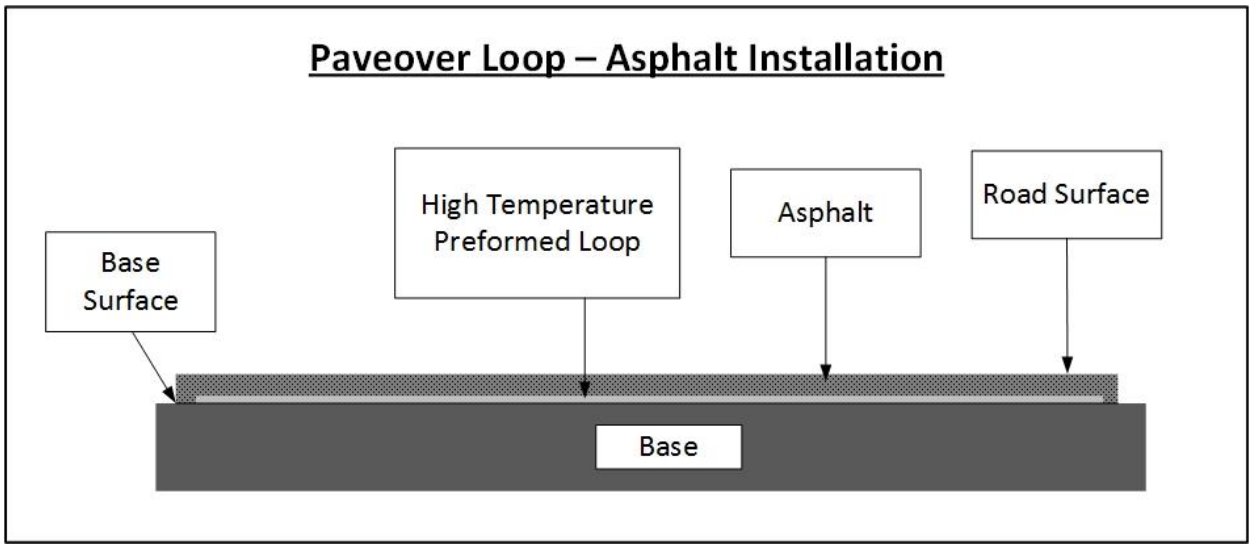

Figure 60. Pave-over Loop - Asphalt Installation

OTHER USEFUL INFORMATION

The following factors can reduce the loop detector sensitivity:

1. Underground steel reinforcing – make the loop saw cut shallow in existing concrete pavement with steel bar reinforcement (approximately 1") or use fiberglass mesh when installing new concrete pavement. If possible, the loop should be at least 3" from any steel reinforcing bars. Note that it may not be possible with pave-over loops to maintain at least 3" distance between the rebar or wire mesh. In such cases, the loop may be installed an absolute minimum of 2" below the surface of the concrete. If the thickness of the concrete will not allow for 3" separation between the steel reinforcing and the loop, fiberglass mesh must be used, or the steel reinforcing must be cut out below the loop.
2. More than one merge loop connected to one detector – connect each merge loop to a separate loop detector.
3. Loop buried too deep - the loop detector may have problems recognizing tall vehicles if it is buried more than 3" below the road surface. The detection height of the loop is calculated by multiplying the shortest leg of the loop by 2/3. For example, the detection height of a 6'x2.5' loop is 20" from the loop, not 20" from the road surface. If the loop is installed 3" below road surface, the detection height from the road surface is 17". (20" detection height) - (3" loop depth) = 17".

The following factors can cause detector lock up or intermittent detection:

1. Cross-talk between adjacent loops due to both having the same operating frequency – use a different operating frequency for each loop detector.
2. Loop wire vibration in the saw cut – use a backer rod.
3. Splices in loop wire – solder all splices.
4. Lead-in wires not twisted – twist lead-in wire at least six turns per foot.
5. Power lines close to the loop – keep the loop at least six feet away from power lines.

Merge Loop Detection Redundancy

Whenever 3 or more XPTs are installed at a site, and the gates are controlled by the discrete I/O method, a merge loop redundancy connection is necessary. This connection ensures that if one of the XPTs needs to be shut down, you can detect the merge loop wired to it on the XPTs that are still running. To do this, you need signal conduits (don't use the power conduit) between the XPTs and the connections shown in Figure 51.

I. Assemble Gate Arm Edge Protection

The edge protection is included in the gate arm packaging. It consists of two pieces of 2-meter length foam. To install the edge protection, perform the following steps:

1. Shorten the edge protection to the length of the gate arm.
2. With water, moisten the groove in the barrier arm onto which the edge protection will be pushed through.
3. Slide the edge protection into the barrier arm groove.
4. Slide further edge protection into the intended groove until the edge protection ends flush with the barrier arm.

J. Assembling the Flange and Gate Arm

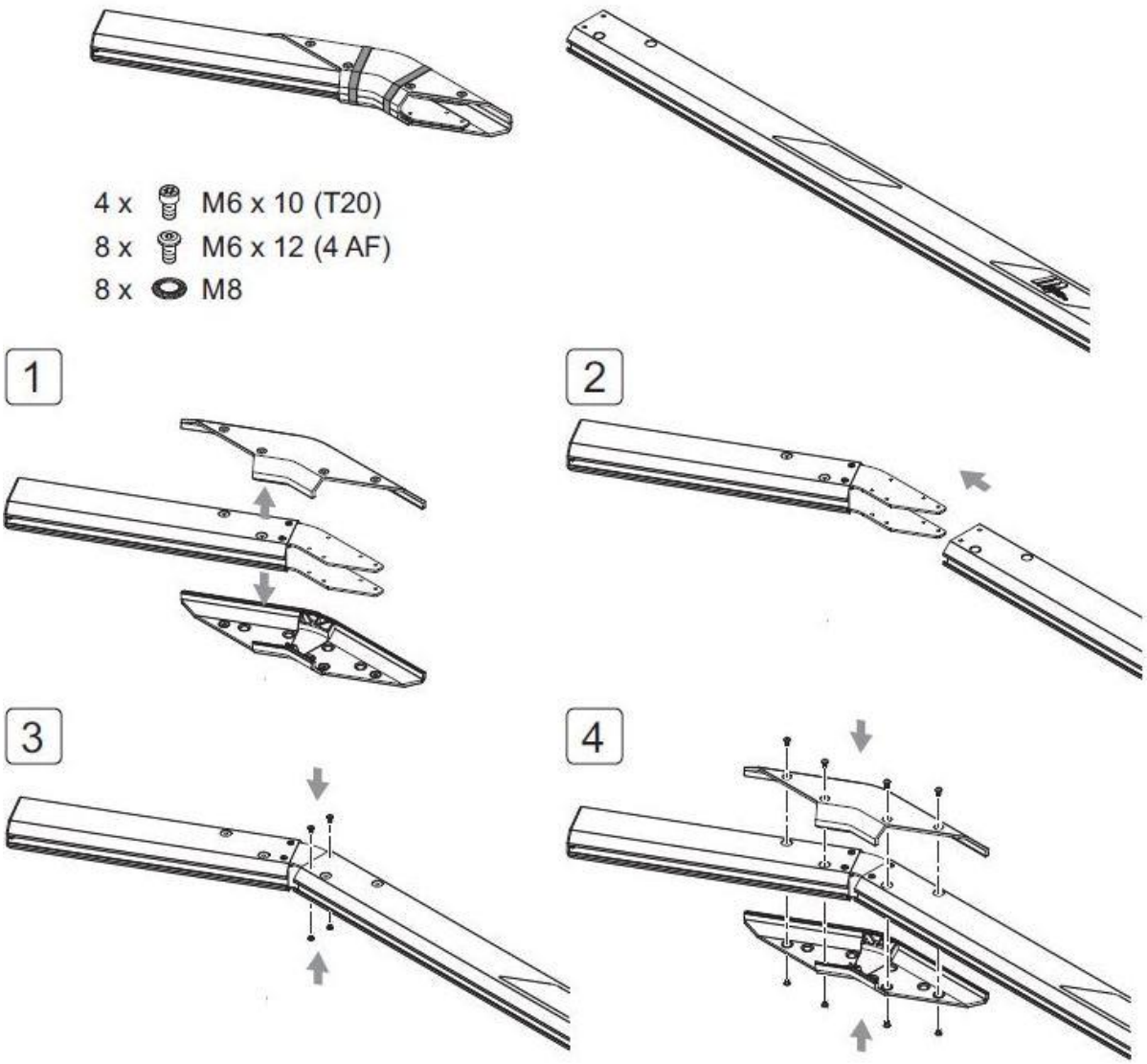

Figure 61. Assembling the Gate Arm

1. Remove rubber bands and disassemble the two half-shells from the short gate arm.
2. Slide the long gate arm over the two connection plates.
3. Attach the long gate arm to the connection plates with the 4 Torx screws. The larger holes must remain free.
4. Attach the two half-shells with the washers and the hexagon socket screws.

K. Attaching the Gate Arm to the Gate

1. Place the gate in the open position.

   Warning: Ensure the gate power is off and the balancing springs in the gate are relaxed (gate is at "top-most" or "open" position). Failure to do so may result in serious injury.

   If the gate is not in the "open" position, place it there by following these steps.
   Warning: Ensure the area near the balancing springs is clear. Failure to do so can result in serious injury.

   a. Press a tool straight into the upper tool bore. The lever arm is pressed from its dead point.

   b. Verify that the balancing springs are relaxed (gate open).

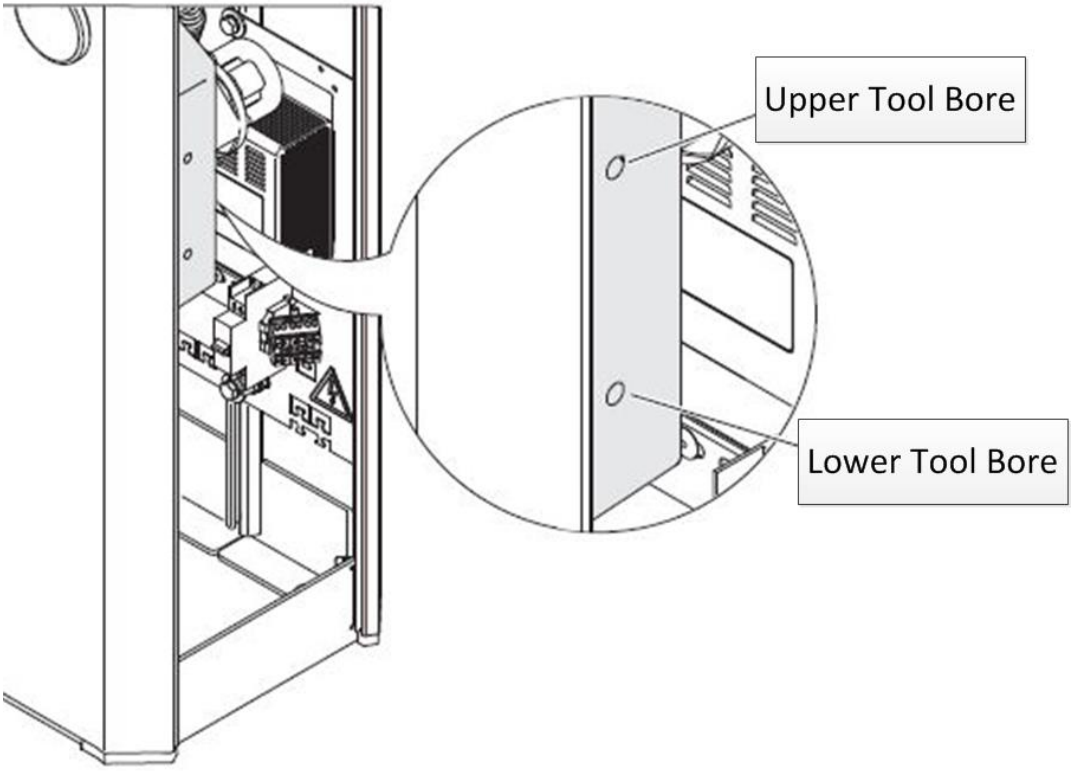

Figure 62. Open Gate Using Upper Tool Bore

2. Attach gate arm to the gate.
    a. Remove end cap from gate arm using a Phillips screw driver.

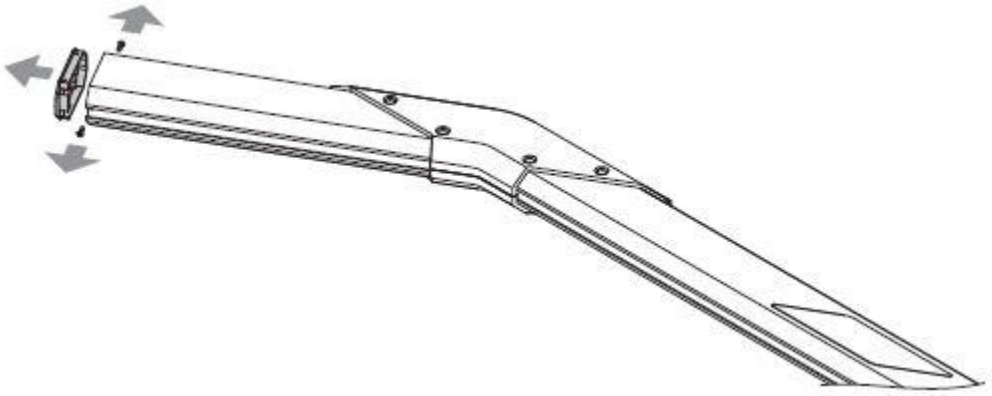

Figure 63. Remove End Cap

    b. Slide the shorter slot nut (1) and the additional sheet (2) into the groove on the underside of the gate arm. Slide the longer slot nut (3) on the upper side of the gate arm.

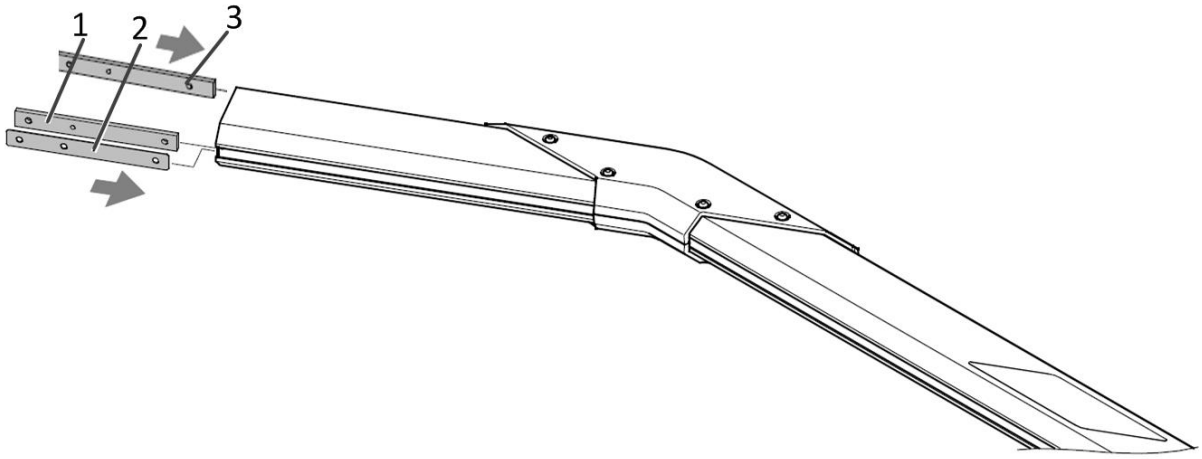

Figure 64. Install Slot Nuts

c. Attach the flange with the 4 Torx socket screws and the two slot nuts to the barrier arm. The shorter protrusion of the flange must point away from the gate arm. Tighten the screws to 11.8lb ft using a torque wrench with a Torx T40 bit. **Note**: If the screws are tightened below 11.8lb ft, the risk of the gate arm falling off the bracket increases. If the screws are tightened above 11.8lb ft, the risk of damage to the gate increases if the arm is hit by a vehicle.

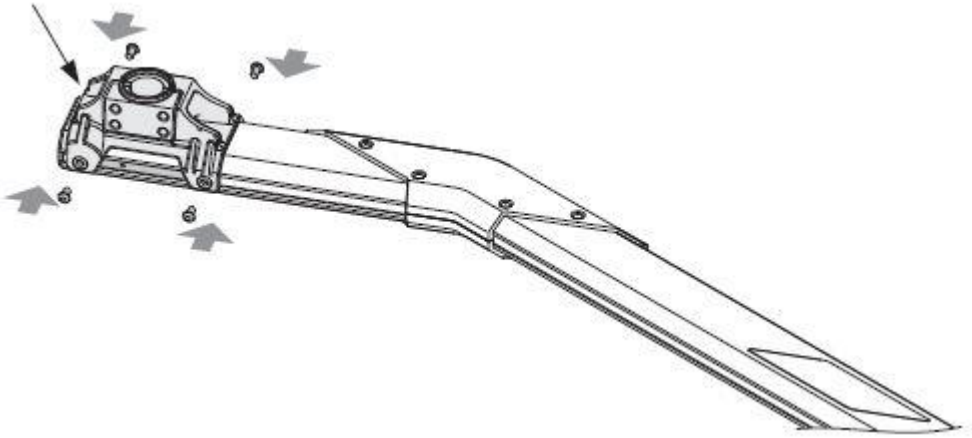

Figure 65. Attach Flange to Gate Arm

d. Reinstall the end cap to the gate arm.

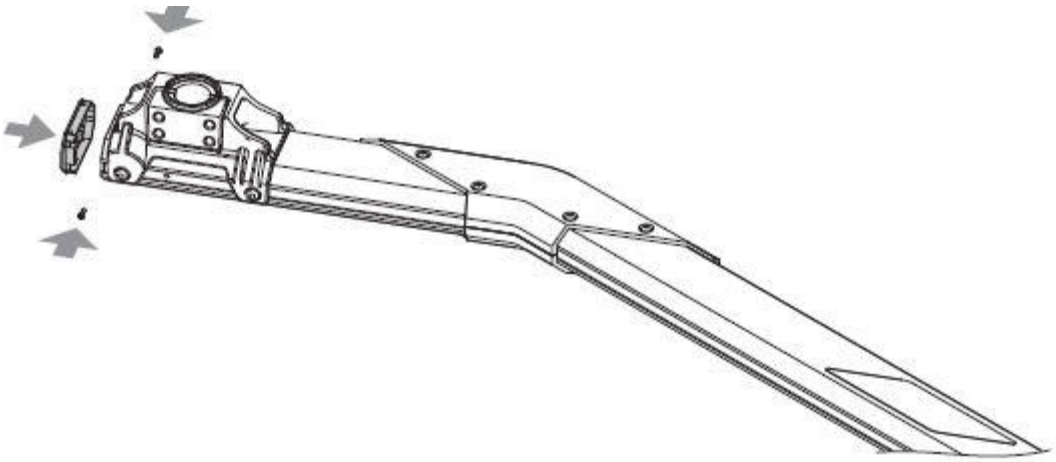

Figure 66. Reinstall End Cap to Gate Arm

e. Push gate arm with pre-assembled flange onto the flange shaft.

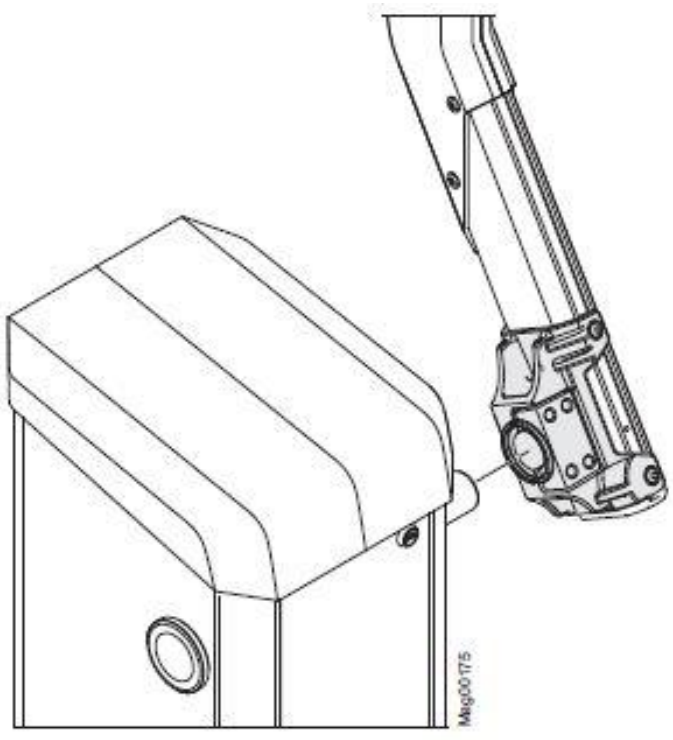

Figure 67. Install Flange onto the Flange Shaft

f. Align the gate arm vertically.

g. Install the flange on the flange shaft using the 4 hexagon socket screws.

h. Tighten the screws evenly to 55.3lb ft using a torque wrench with metric #10 hex socket.

L. Balance the Gate Arm

To maximize the life of the gate motor, the spring tension must be calibrated so that the gate arm is balanced at 30 degrees. For reference, 0 degrees is horizontal, 90 degrees is vertical.

1. Ensure the gate power is off.
2. Release the gate arm from either the horizontal or vertical position by using either the upper or lower tool bores as shown in the “Attaching the Gate Arm to the Gate” section above.
3. Manually place the gate arm at a 30 degree angle. Let go of the gate arm.
4. If the arm falls toward the horizontal position, then the spring tension is too weak.
5. If the arm rises toward the vertical position, the spring tension is too strong.
6. If needed, adjust the balancing spring tension.
    a. Remove the gate’s rear panel to gain access to the screws used to adjust the springs.

b. Loosen the lock nuts that are holding the spring adjustment screws in place.
c. If the gate arm rests below 30 degrees, rotate the spring adjustment screws clockwise until the gate arm balances at 30 degrees.
d. If the gate arm rests above 30 degrees, rotate the spring adjustment screws counter clockwise until the gate arm rests at 30 degrees.
e. Tighten the lock nuts when the gate arm is balanced.

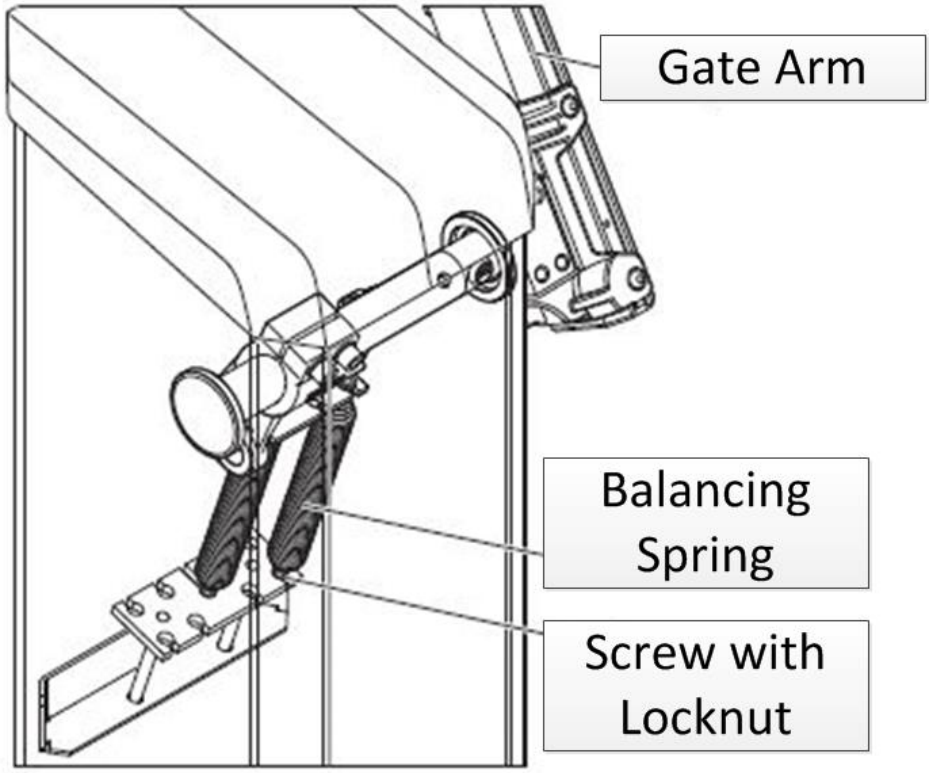

Figure 68. Balancing Springs

M. Testing the Gate Using the Key Switch

Once all wiring is complete, power can be turned on to the gate. Turn on the power supplying the gate at the source (circuit breaker) and at the gate power switch located in the bottom of the gate. Verify that the gate is operating properly by using the key switch on the left side of the gate to force the gate open and closed using the following steps. **Note**: These steps only verify that the gate is correctly wired to 115 VAC site power, and that all drive mechanisms are operating properly. These steps do not test XPT control of the gate.

1. Insert the key into the key switch located on the left side of the gate.
2. Turn the key to the right and verify the gate opens.
3. Turn the key to the left. The gate is now in the automatic position.
4. Turn the key to the left again and verify the gate closes.

Appendix D. Controlling Gates in Non-XPT Lanes

Some sites have a mixture of attended full service lanes and unattended self-serve lanes with XPTs. If using non-Ethernet controlled gates, each XPT is capable of controlling a gate in its lane, plus one attended lane.

	**Note:**	The following wiring diagrams are for two gates connected to a **single XPT**. If multiple XPTs are installed, connect each gate to each XPT individually.

A. Two Magnetic Gates Controlled by a Single XPT

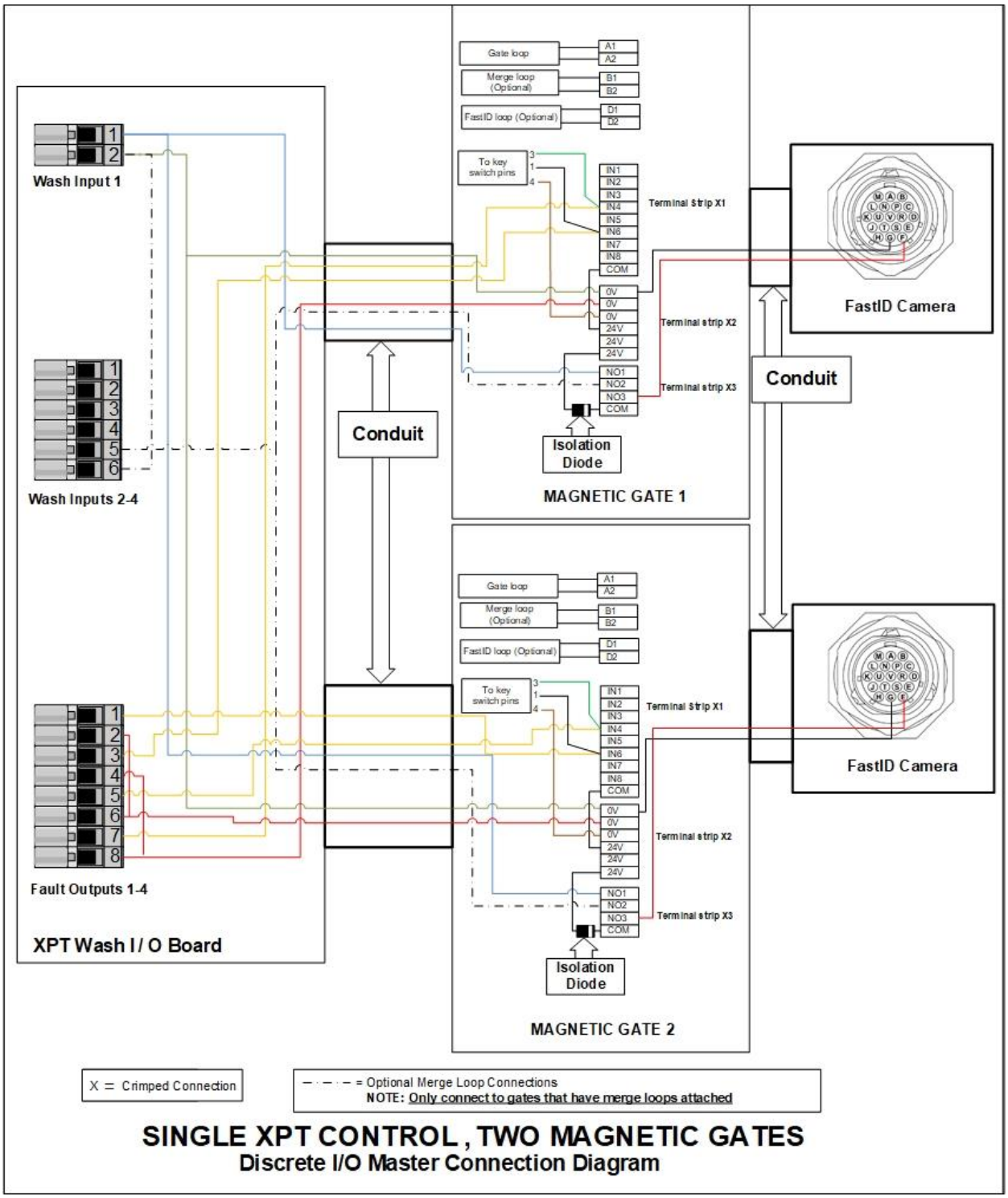

Figure 69. Two Magnetic Gates Controlled by a Single XPT - Master Connection Diagram

Appendix E. Shortening the Gate Arms

If gates are installed underneath a canopy, there must be a minimum amount of clearance from the gate mounting surface to the bottom of the canopy, to prevent the gate arm from colliding with the canopy when in the open position. The clearance required for a Magnetic gate requires 10'7". If there is not enough clearance, the gate arm can easily be shortened by cutting to the desired length. **Note:** If the Magnetic gate arm is shortened, the balancing springs **must** be recalibrated according to the "Balance the Gate Arm" section above. Failure to do so may result in damage to the gate.

A. Magnetic Gate

1. Remove the gate arm from the gate, and clamp to a stable surface for cutting.
2. Measure and mark the desired length on the gate arm, referencing from the end opposite the gate.
3. Remove the plastic cap from the end of the gate arm opposite the gate.
4. Use a power tool and blade designed for cutting aluminum, and cut the gate arm to the desired length.
5. Remove any burrs from the cut edge and reinstall the plastic cap on the end of the gate arm.
6. Reinstall the gate arm.

Appendix F. Lane Available Light Installation

Some operators have noted that customers often get in line rather than going to a terminal with an empty lane because they are concerned that the empty lane is closed or broken. The XPT lane available light feature allows you to install a Red/Green light that can be wired to turn green when the terminal is in normal operation mode, and turn red at all other times.

To take advantage of this feature, a light needs to be installed on the front side of the terminal or above the lane, and wired into the terminals fault output relays as described below.

A. Installing the Light

The XPT is capable of controlling a lane available light relay through a control module relay output. Any light or sign can be installed as long as it contains a relay wired to turn it green or on when the coil is activated, and red or off when there is no signal to the coil. There should be one light for each XPT installed in a location that clearly indicates to carwash customers which terminal is open when that light is green.

B. Wiring the Light

Each light needs 2 conduit runs, one to bring 120-volt power to the light and a second between the light and the XPT carries the wires to control the relay turning the light on and off.

The lane available control relay powers the light such that when the relay is pulled in the light is turned on or green, and when there is no power to the relay coil, the light is off or red.

Preparation

- Make sure all power is disconnected from the light prior to beginning this procedure.
- On the control module, locate the 8-pin Phoenix connector labeled Fault Outputs 1-4, and remove it before wiring. After connecting the wires, replace the connector.

Two wires must be connected to the XPT and run to the lane available light relay and relay power source:

1. A wire must be connected to an AC or DC source capable of producing 24V or less and to the XPT control module, Fault Outputs 1-4 connector, pin 5.
2. Another wire connects to the light relay coil. The other end is pulled to the XPT where it is connected to the Fault Outputs 1-4 connector, pin 6.

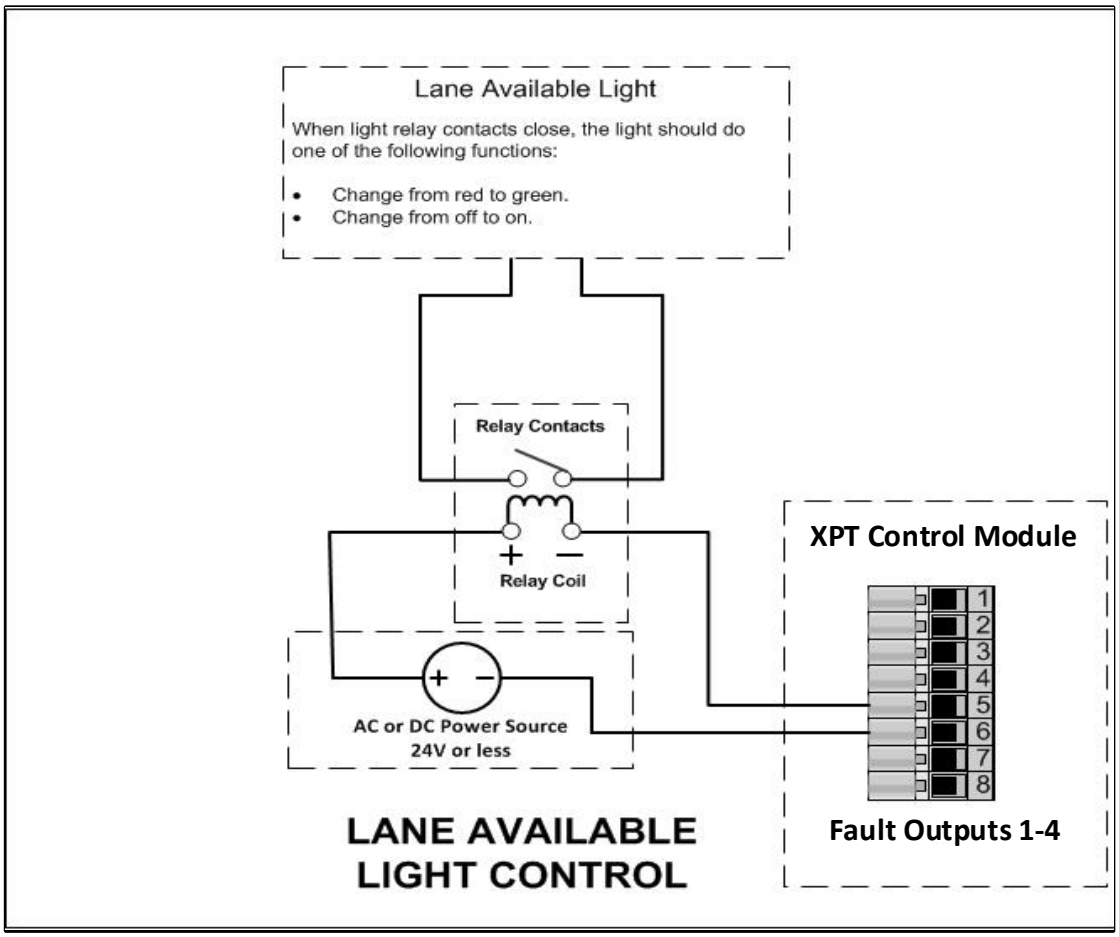

Figure 70. Lane Available Light Output Circuit

Appendix G. In-Bay Automatic Wash Controller Installation

There may be some sites with a tunnel and one or more automatic bays at the same site. There may also be instances in which the site may decide to connect their XPT directly to the tunnel controller rather than using the traditional SiteWatch connection from the SiteWatch Server to the controller through a Serial Relay Multiplexor Box (SRMB). **Note that this can only be done if it can be wired exactly as explained below.**

In either case, before the SiteWatch software can communicate to the wash controller through the XPT control module, the following wiring must be completed.

A. Connecting the Wash Relay Outputs

The XPT can support up to 8 wash services that can be programmed from the XPT to the wash controller. Most in-bay automatic wash controller manufacturers use a five-wire system to provide the arming signals for the selected wash packages. One common line and four arming input wires are connected between the wash's PLC and the XPT control module.

Each of the arming input wires signals the equipment to give only the designated wash options. When a customer purchases a wash package, the XPT sends a signal down the appropriate arming input wire through the control module.

Each wash manufacturer has its own color code system and wash relay pin-outs; therefore, it is important to review the appropriate wash documentation prior to beginning this portion of the installation. Then follow the instructions below to make the connections.

Preparation

- Make sure all power is disconnected from the XPT and the In Bay Automatic wash controller prior to beginning this procedure.
- On the XPT control module, locate the 10-pin Phoenix connector labeled Wash Outputs, and remove it before wiring. After connecting the wires, reconnect it to the control module.

The common and wash arming wires must be connected between the wash controller wash service input terminals and the Wash Outputs connector on the control module.

1. A wire must be connected between the wash relay common on the wash controller and pin 9 on the Wash Outputs connector.
2. Another wire connects to the input terminal to arm **Wash Service 1** (may be labeled differently on the controller). The other end is pulled to the XPT where it is connected to the Wash Outputs connector, pin 1.
3. Make similar connections for up to 8 wash service arming wires, with the wire for each wash service option (1, 2, 3…8) connected to the pin with the same number (1, 2, 3…8) on the Wash Outputs connector.
4. Please make a note of the wash service programmed by each wire that is connected. Pass this information to the SiteWatch installer who can then configure SiteWatch to sell the proper wash service for each one.

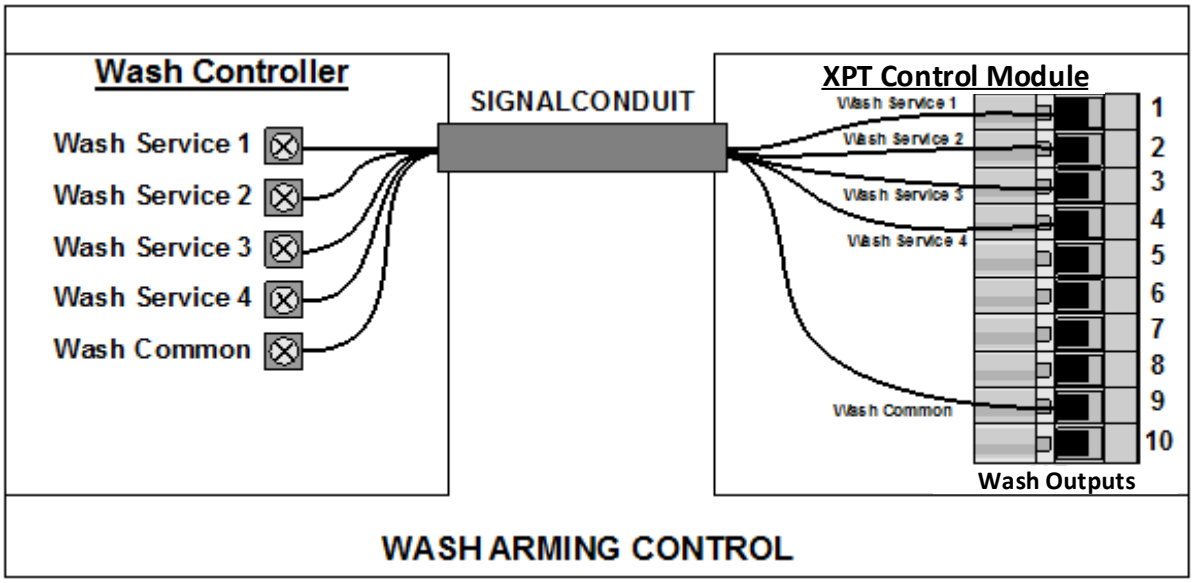

Figure 71. Wash Service Output Circuits

B. Connecting the Wash-In-Use Input

Most in-bay automatic washes provide a wash in use or "wash busy" signal to the entrance terminal to keep it from programming a wash while the wash is already busy. The XPT is able to process the next customer while the bay is busy, but will use the signal to instruct the customer to wait until the wash is clear before pulling forward.

In order for this to work, the wash in use output on the wash controller must be wired to inputs on the XPT as described below.

Preparation

- Make sure all power is disconnected from the XPT and the wash controller prior to beginning this procedure.
- On the XPT control module, locate the 8-pin Phoenix connector labeled Wash Inputs 2-4 and remove it before wiring. After connecting the wires, reconnect the connector to the control module.

To send the wash in use signal to the XPT, you need 2 wires through the conduit from the gate to the XPT. SiteWatch can be configured to use any of the input pairs on the Wash Inputs 2-4 connector, or even the Wash Input 1 connector for the wash in use signal, but normally the connection should be made as follows:

1. The HOT wash in use wire from the wash controller, goes to the XPT and attaches to the Wash Inputs 2-4 connector, pin 1, on the control module.
2. The NEUTRAL wash in use wire from the wash controller, goes to the XPT and attaches to the Wash Inputs 2-4 connector, pin 2, on the control module.
3. Inform the SiteWatch installer of the connections used for the wash in use input so they can configure SiteWatch to monitor the correct input on the control module.

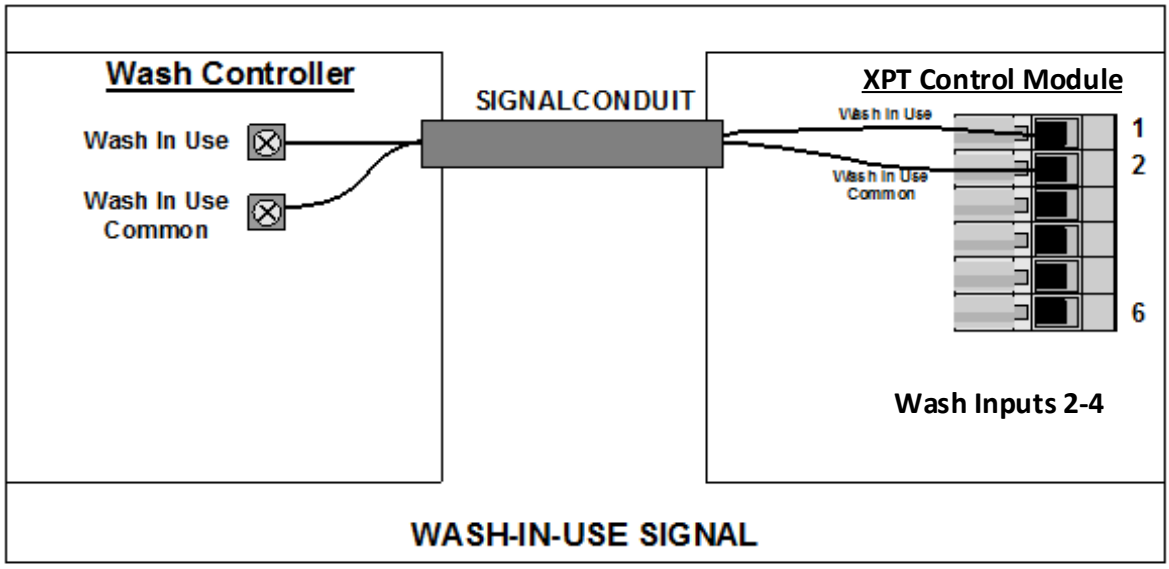

Figure 72. Wash in Use Circuit

C. Connecting the Wash Fault Input

Some wash controllers also provide a "wash fault" signal used to indicate a problem with the wash equipment that keeps it from washing cars. The XPT can use this signal to put the terminal "Out of Service" to prevent customers from purchasing a wash that cannot be delivered, and send a notification of a problem with that unit.

Some controllers send this signal through the wash in use wire, so they require no extra wiring. If this is the case, please inform the DRB Systems Installation staff so they can make the correct settings to look for the wash fault signal on the wash in use input.

For controllers that must have a separate wire to communicate wash problems to the entrance terminal, make the connections as described below.

Preparation

- Make sure all power is disconnected from the XPT and the wash controller prior to beginning this procedure.
- On the control module, locate the 8-pin Phoenix connector labeled Wash Inputs 2 - 4 and remove it before wiring. After connecting the wires, replace the connector on the board.

To communicate the wash fault signal to the XPT you need 2 wires through the conduit from the gate to the XPT. SiteWatch can be configured to use any of the Wash Inputs for the wash fault signal, but normally the connection should be made as follows:

1. The HOT wash fault wire from the wash controller goes to the XPT and attaches to the Wash Inputs 2 – 4 connector, pin 3, on the control module.
2. The NEUTRAL wash fault wire from the wash controller goes to the XPT and attaches to the Wash Inputs 2 – 4 connector, pin 4, on the control module.
3. Inform the SiteWatch installer of the connections used for the wash fault input so they can configure SiteWatch to monitor the correct input on the control module.

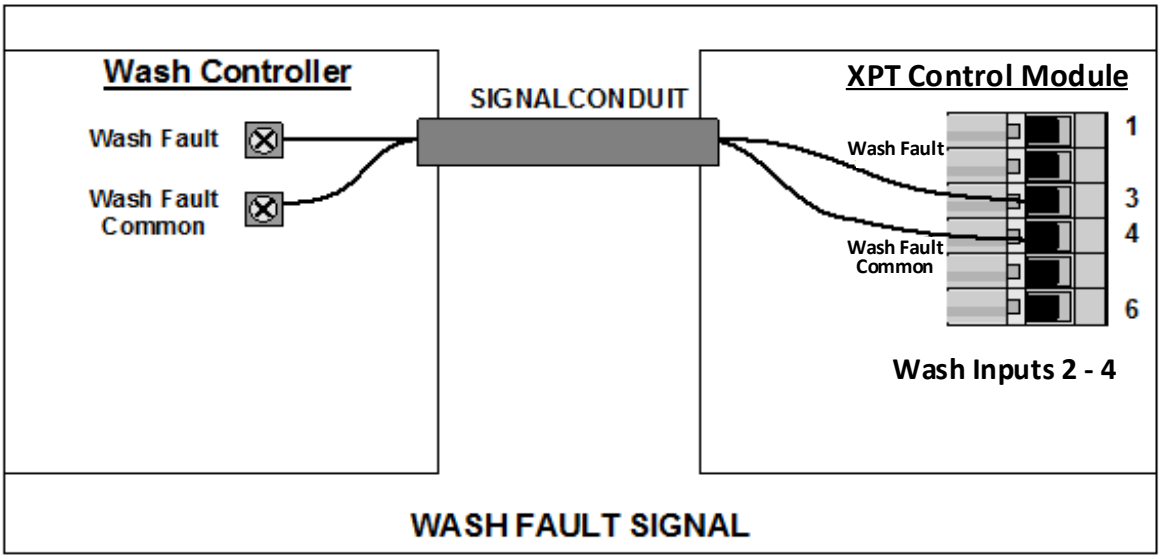

Figure 73. Wash Fault Circuit

Appendix H. Custom Overlays

The XPT is designed to accommodate custom overlays on the main door. These overlays are printed with site-specific graphics and advertisements. Please contact DRB Systems to request more information on the overlay options available.