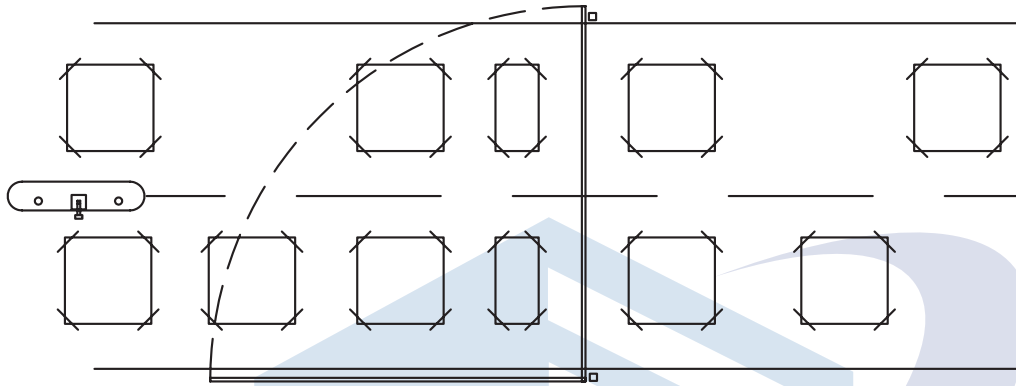


Vehicle Detection Loops: Automating Your Access Control Point



This white paper examines different types of presence detection loop applications typically found in access control points.

Introduction

Detection loops are typically installed in roadways with security barriers or traffic gates to detect the presence of a vehicle to provide indication as to a vehicle's presence within the barrier area. This indication is to help prevent the barrier or gate from closing while a vehicle is present. Some loops also provide information to control the barrier's movement. The type of barrier (wedge barrier, bollards, rising beam, drop arms, swing gates, sliding or track gates, traffic arms) and its intended use, should determine which loop function should be used and where they should be located. All loop functions should be a part of an overall traffic flow theory of operation for the particular access point, to ensure proper operations.

NOTE: Detection loops **DO NOT** provide safety regarding pedestrians.

In general, the following are types of loop functions used with security barriers and traffic gates:

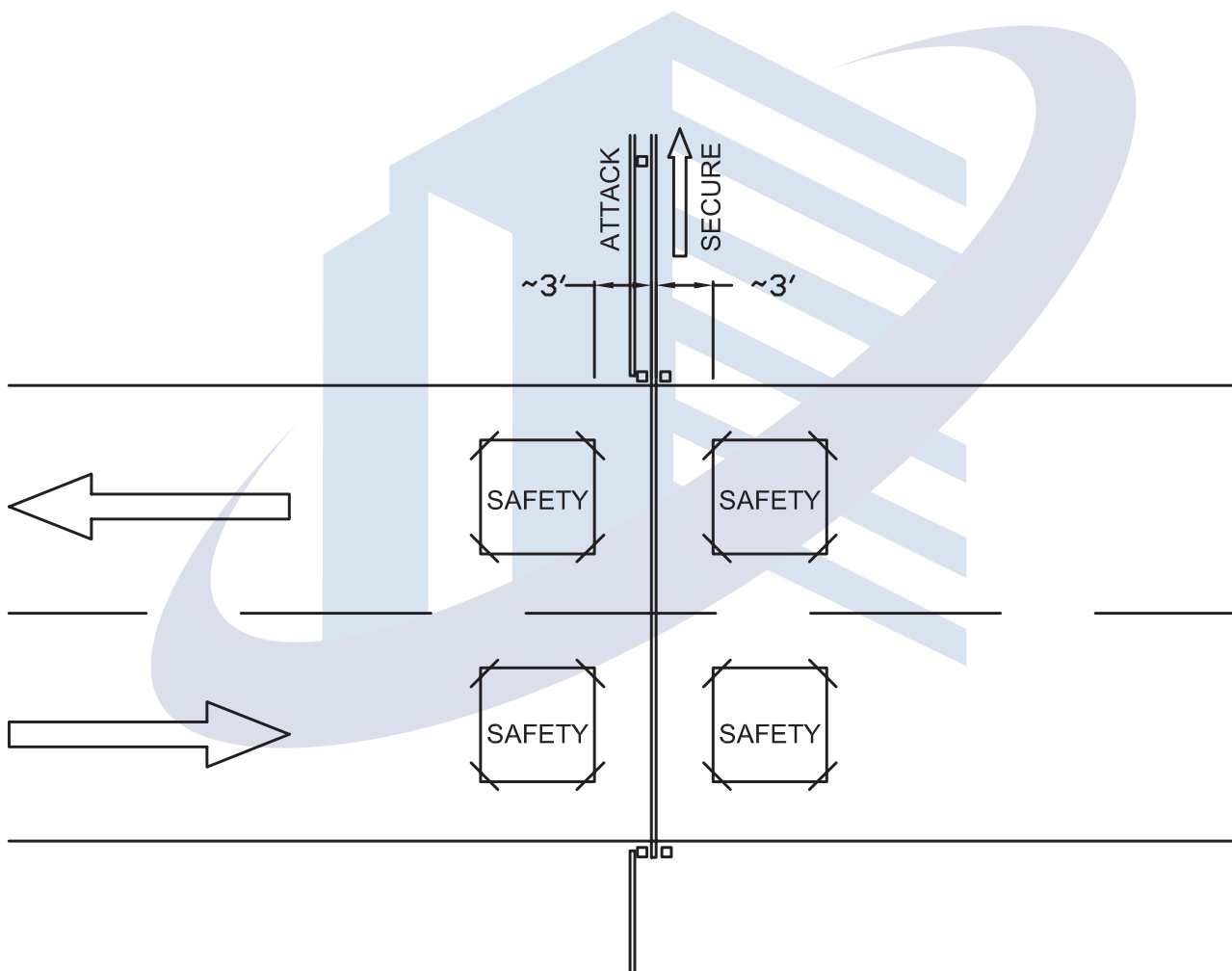
- Safety Loops
- Presence Loops for Card Readers
- Close on Exit Loops
- Free Exit Loops
- Shadow Loops

The basic functionality of each of these common applications will be explored below.

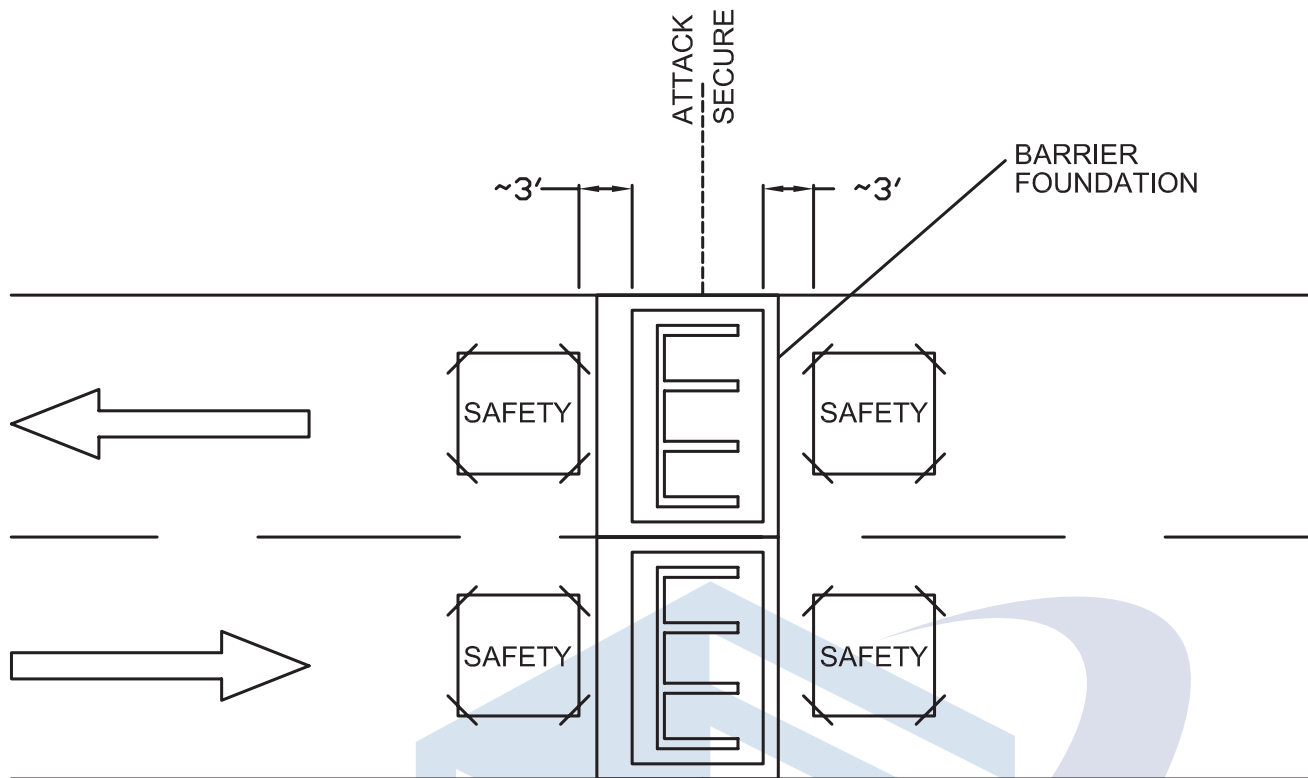
Common Configurations

1) Safety Loops

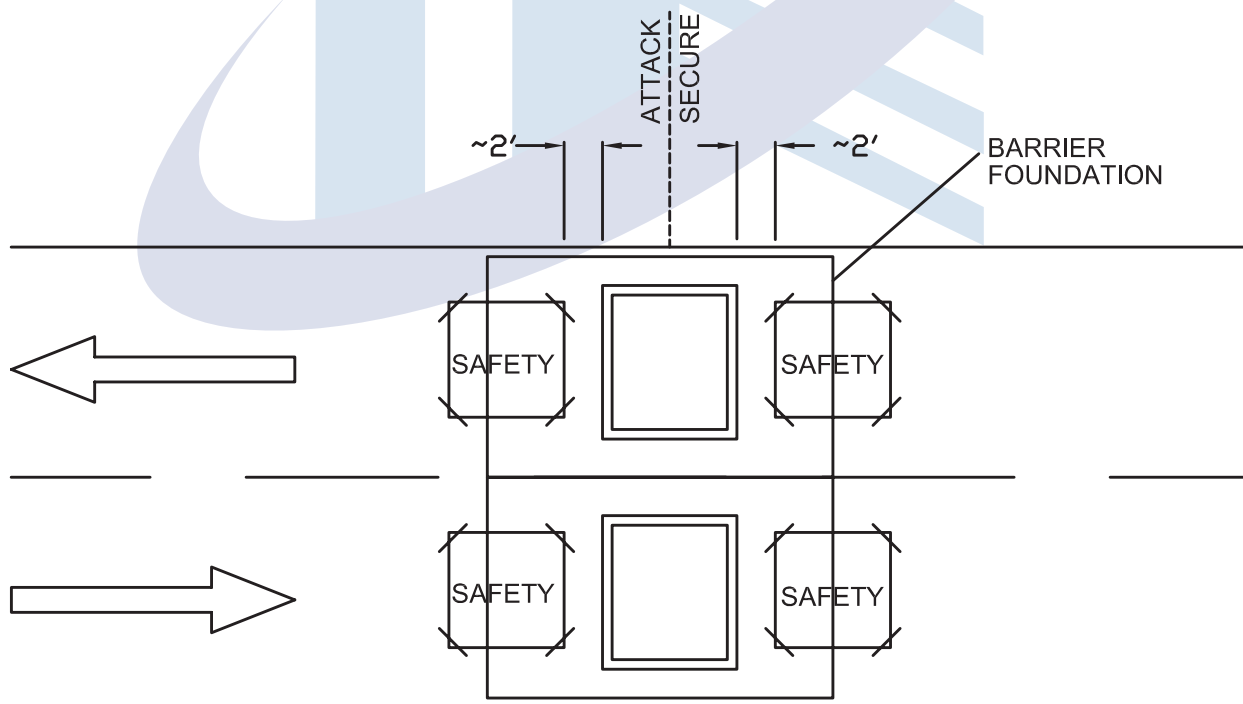
Induction loops used for safety are to help prevent a barrier from raising or lowering on a vehicle. If a barrier closure command is initiated with a vehicle over the safety loop, the loop will signal the barrier to not operate. Only when a vehicle is no longer over the loop, would the barrier operate. Some barrier configurations can have an Emergency Fast Operation (EFO) button, that when pressed, can ignore any safety loop signal regardless of a vehicle's presence over the safety loop. Safety loops should be located directly under any drop arm, and on both the secure and non-secure side of wedge barriers, bollards and sliding gates. They should be placed such that they are not affected by the barrier's movement or by cross talk from adjacent loops (typically 2'-3').



SAFETY LOOP FOR CANTILEVER GATE



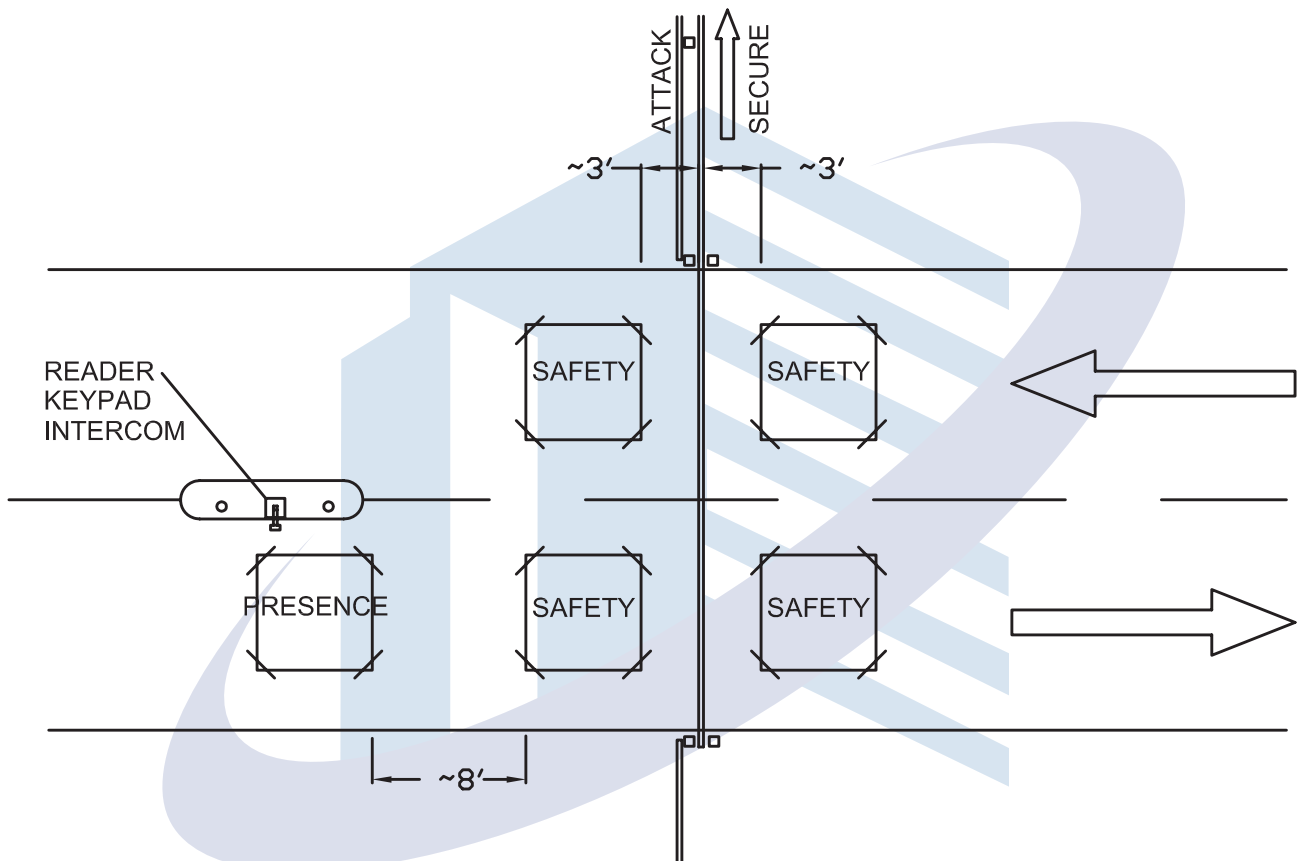
SAFETY LOOPS FOR BARRIER WITH SMALLER FOUNDATION



SAFETY LOOPS FOR BARRIER WITH LARGER FOUNDATION

2) Presence Loops for Card Readers

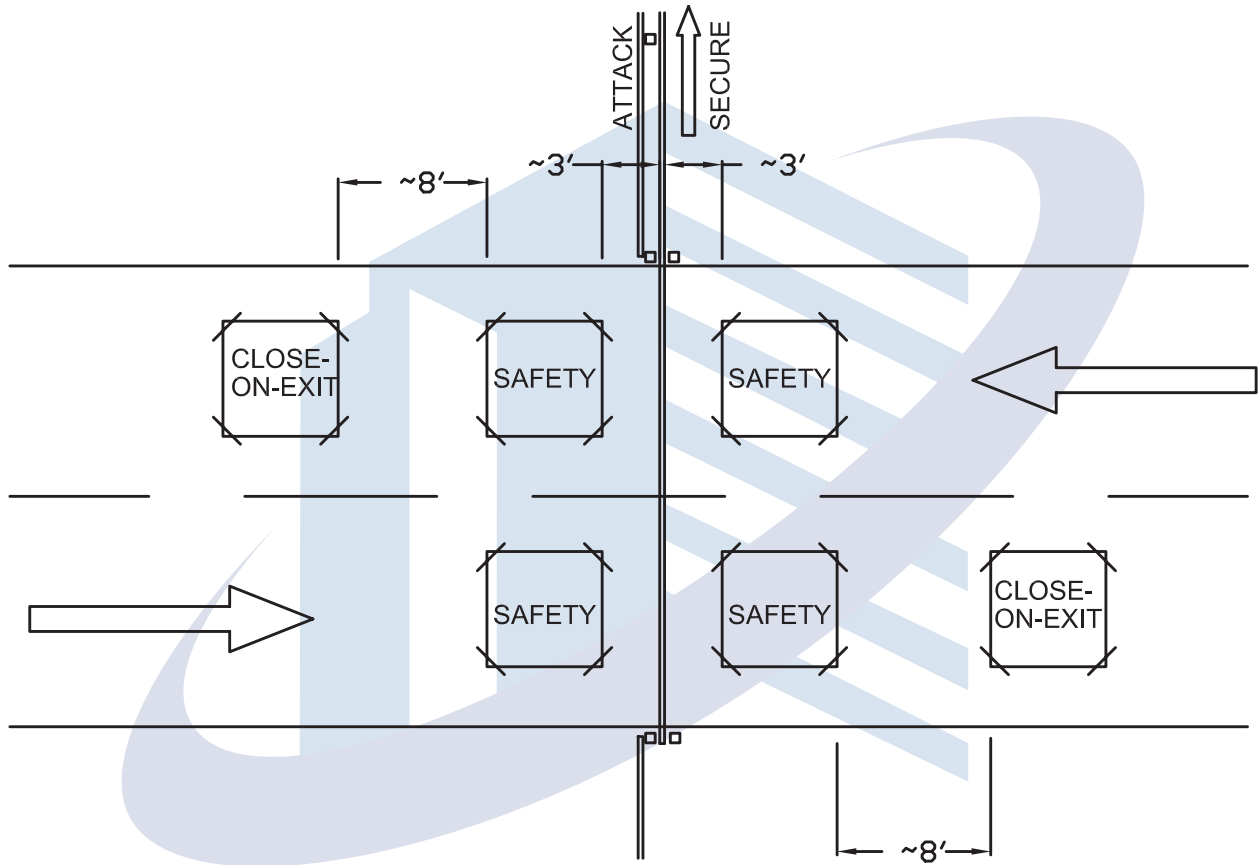
Presence loops are used to indicate a vehicle is at a card reader, keypad, or intercom device. Based on the control system configuration, if this loop detects a vehicle, the reader will allow personnel to swipe a card to open the secured traffic lane. Some facilities may use this detection to notify security personnel to activate an open command, or initiate a conversation with personnel in the vehicle. Presence loops should be located adjacent to the reader or keypad device so that the vehicle is detected while stopped at the reader. The reader and its associated loop should be located far enough away (8') from any barrier safety loop so that the vehicle is not detected by the safety loop while stopped at the reader.



PRESENCE LOOP FOR CARD READER

3) Close on Exit Loops

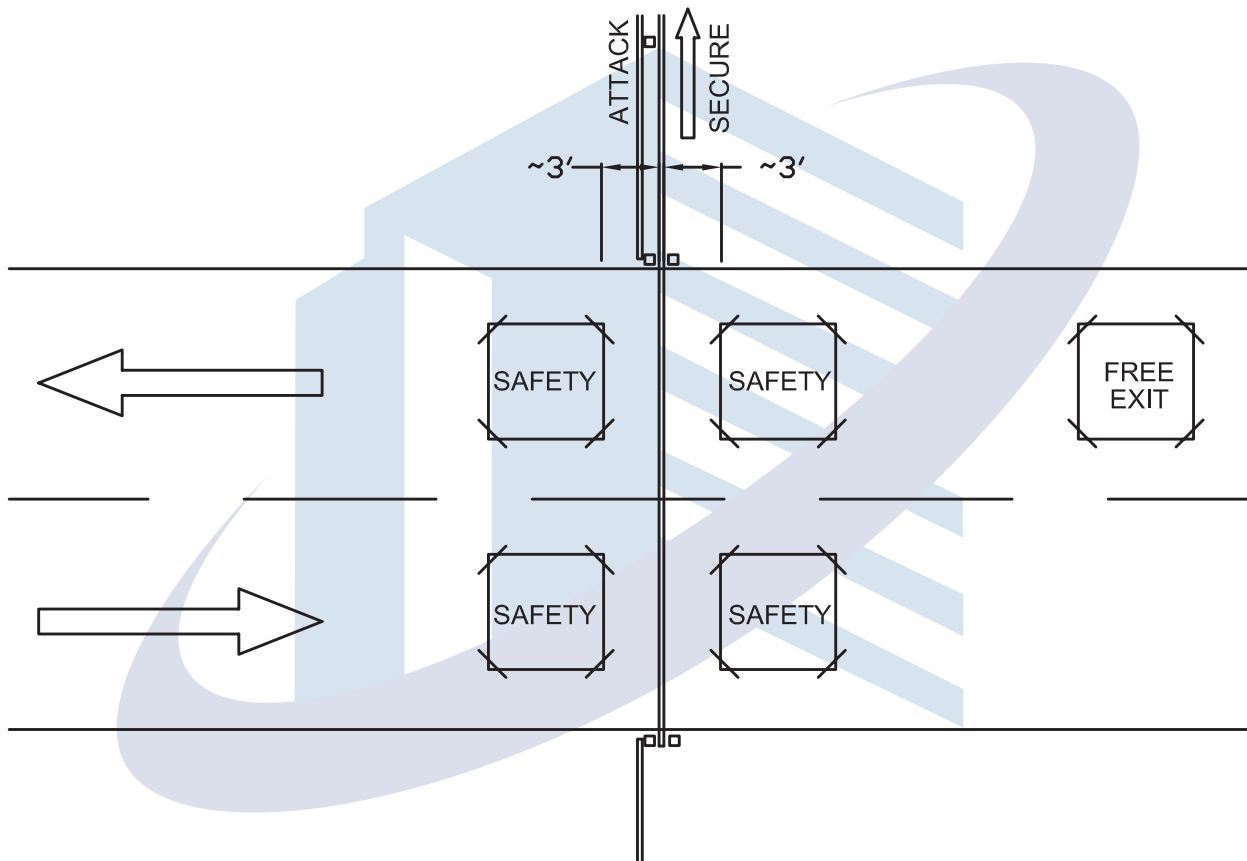
Induction loops used as a close on exit function are installed to secure the traffic lane after a vehicle passes through the barrier. The loop configuration is no different from other loops, but is typically placed at a distance from the barrier sufficient enough to ensure the vehicle is completely clear of the barrier. The loop detector associated with this loop is configured to issue a pulse when the vehicle clears the loop, and this pulse is tied to the barrier close function. Close on exit loops can be a separate loop, or in some cases, a dual relay loop detector can use the safety loop to also perform this function. However; this is not recommended as the detection of a high bed vehicle may be lost by the loop prior to the vehicle actually clearing the barrier.



CLOSE-ON-EXIT LOOP FOR CANTILEVER GATE

4) Free Exit Loop

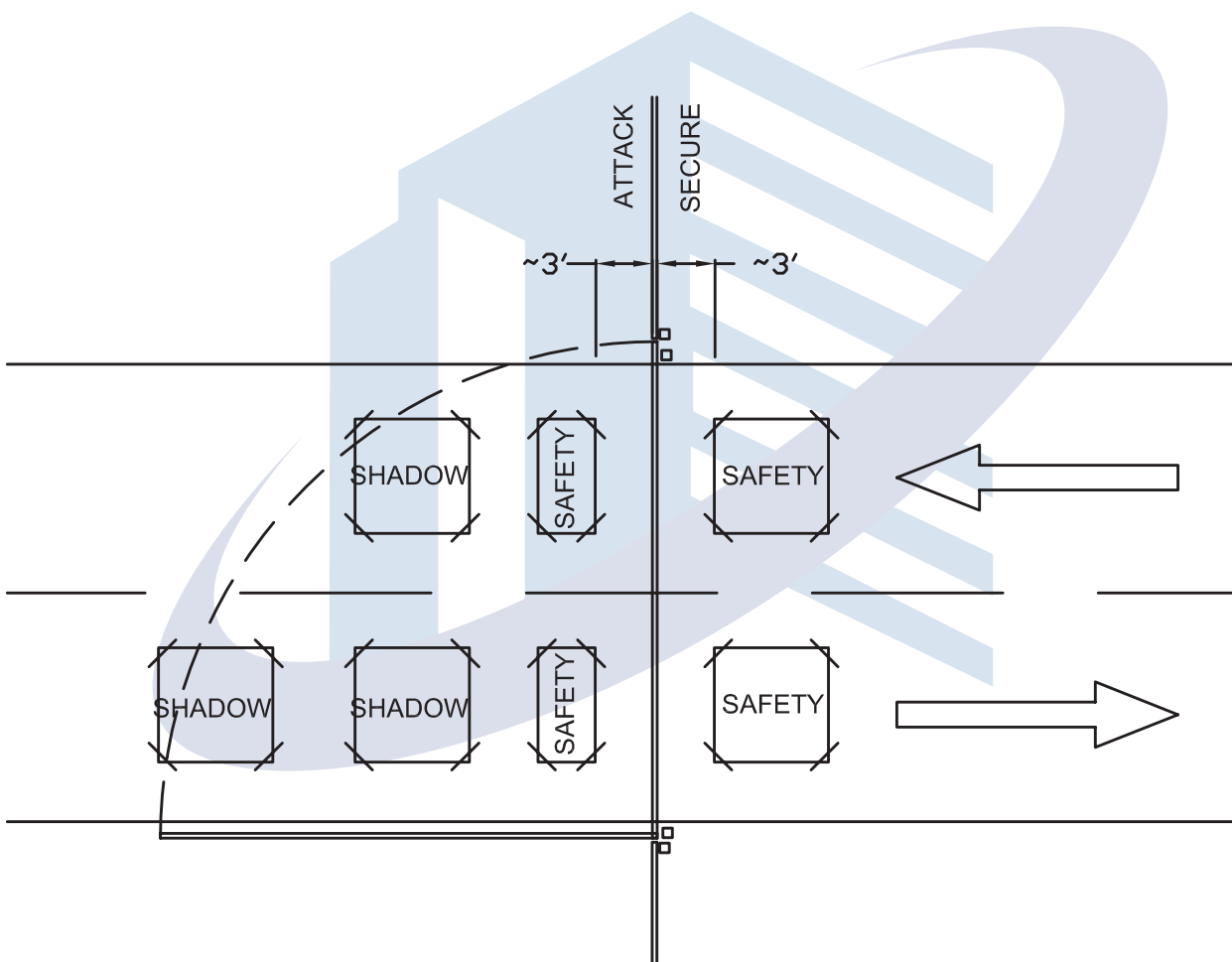
Induction loops used as free exit loops, are installed to allow free exit from a secured location. The loop is configured so that when it first detects a vehicle over the loop, it will issue a pulse to open the traffic lane. Located on the "secure" side of the barrier, the loop is typically set back enough to prevent the vehicle from being detected by other loops in the system. These loops are typically used to allow free exit of a non-controlled traffic lane. Therefore; once the vehicle clears the barrier, a close on exit loop or timer should be used to re-secure the lane to traffic.



FREE-EXIT LOOP FOR CANTILEVER GATE

5) Shadow Loop

Induction loops used as shadow loops, are typically used with swing gates and are located within the swing path of the gate. This means there is a large area under the swing path of the gate which is unprotected. Since the swinging gate moves over the shadow loop when opening, the system ignores the signal of the shadow loop that the gate itself is causing. However, when the swinging gate begins to close, the system does not ignore the shadow loop signal. If a vehicle is detected by the shadow loop(s) when signaled to close, the gate should not close. Once the loop is clear, the gate begins to close and the shadow loop will ignore any further signals caused by the gate closing across the loop. This means that vehicles that tailgate, or enter the shadow loop after the gate begins to close, will not prevent the gate from closing, possibly causing damage to the vehicle. Some control functions are programmable, so careful analysis of the traffic control theory of operation should be done to ensure proper functionality. The control configuration for swing gates must be engineered and installed correctly for the shadow loop to perform its function.



SHADOW LOOP(S) FOR SWING GATE

