

HORIZONTAL SWIFTGATE HSG-18CW

1. Description

Furnish and install the SwiftGate as shown in the plans. The SwiftGate is a secure remotely controlled warning gate system used in designated locations for traffic control measures such as automated highway lane closures, access ramp control, median crossover management, on-ramp and off-ramp traffic control, temporary work zone lane closures, tunnel emergency closures, tollbooth lane management and many other roadway applications.

The system consists of automated warning gates and communication hardware. Automated warning gates Type HSG-18CW are horizontal swing gates used to create a continuous obstacle line that acts as a vehicle deterrent. When multiple gates are used at a specific location, they may be activated individually, in sequence, in groups, or as part of an overall solution that brings together various devices. The communication hardware offers different communication options to allow gates to be operated, monitored, sequenced, etc. The horizontal gate allows for manual, local, and remote operations.

2. Material

The SwiftGate shall be designed and built for highway traffic operations. The SwiftGate shall consist of one or many warning gate(s), and communication hardware. Specialized accessories and customer-specific customizations including longer gates should be made available through coordination with the SwiftGate manufacturer.

2.1. Warning Gate

A Warning Gate shall typically consist of the following assemblies:

- Arm Assembly
- Swing Arm
- Base Support Frame
- Gate Mechanism
- Power and Communication Cabinet Components
- Power Source Assembly

2.1.1. Arm Assembly

The warning gate arm shall be available in lengths ranging from 2 to 18 feet. The arm shall consist of easily replaceable high-density polyethylene modular sections. Guy wires shall be furnished as appropriate for gate length.

The gate arm shall provide maximum visibility and reflectivity. The gate arm shall be covered on the front side (facing traffic) with high-intensity reflective sheeting such as Type 3 or 4 or equivalent. The minimum reflective sheeting surface shall be 80 in² per linear foot. The reflective sheeting color shall be alternating red and white at 16-inch intervals measured horizontally, and angled at 45 degrees or as specified by the project requirements.

As shown on the plans and where required, the gate arm shall include a chevron panel installed at the end of the gate arm. The chevron panel surface shall be at least 390 in². The chevron panel shall be made of polycarbonate and be covered with Type 4 high-intensity reflective sheeting or equivalent on the front side (facing traffic). The chevron panel reflective sheeting color shall be red with a white arrow.

A red flashing gate LED arrow shall be mounted on the chevron panel for increased visibility. The gate LED shall be battery-powered and shall continue working for a few days in the event of main power loss.

Other types of chevrons or signs (e.g. 'No Entry' or 'Tunnel Closed') shall be made available through coordination with the warning gate manufacturer.

2.1.2. Swing Arm

The horizontal mechanical swing arm shall include a shear pin mechanism to allow the arm to swing out in the event of an impact and minimize damage to the gate. In such case, a safety latch shall lock the gate arm and prevent the arm from swinging back. The latch shall not interfere with arm movement in any normal operating condition.

2.1.3. Base Support Frame

The gate base support frame shall be a galvanized steel structure with a built-in anchoring plate. The dimensions of that anchoring plate shall be within 10 inches wide per 15 inches long, and be pre-drilled with four 9/16 inch holes. The mounting structure must be suitable, as specified by the project engineer.

2.1.4. Gate Mechanism

The warning gate shall be driven by a weatherproof electrical linear actuator. The electrical actuator shall be connected to the swing arm. The electrical actuator shall be a removable, easily replaceable single unit. The electrical actuator shall be equipped with end-of-travel limit switches to indicate whether the gate is deployed or retracted. The electrical actuator shall include a mechanical overload protection, such as slip clutch or other means. The electrical actuator shall be self-locking to provide an integrated brake.

The electrical actuator shall have a hand crank manual override to allow for manual operation of the automated gate during emergencies.

2.1.5. Power and Communication Cabinet Components

The warning gate Power and Communication Cabinet shall include the following electrical components and functionalities:

- Electrical burn-out protection
- Valve-regulated lead–acid battery (sealed/maintenance-free battery) with adequate charger
- Power control circuit for actuator operation
- Gate light power management and flashing logic
- Communication interface

2.1.6. Power Source Assembly

The warning gate shall be capable of operating from its own internal power source. The assembly shall recharge its internal power source from a solar panel or an external power source. The external power source shall be typically between 90V AC to 260V AC and other options shall be available. The current consumption shall be typically 0.6 A at 120V AC or 0.3 A at 230V AC. In case of external power source failure, the warning gate shall continue working for a certain amount of time. This amount of time is dependent on the selected communication solution and selected battery size. When the selected external power source is a solar panel, the power source assembly shall include a solar panel sub-assembly. This solar panel sub-assembly shall be lightweight and mounted on an adjustable bracket allowing tilt and rotation to provide optimum sunlight exposure.

2.2. Communication Hardware

The communication hardware components shall be coordinated with the gate manufacturer. The communication hardware shall offer various options for control and monitoring such as National Transportation Communications for ITS Protocol (NTCIP), Radio Frequency, wired solution, or manual push buttons. It shall be possible to combine communication options for increased operational flexibility as some options may offer more control and monitoring possibilities than others.

The warning gate shall offer remote control and monitoring via NTCIP using the warning gate manufacturer's programmable sequencer controller hardware.

The warning gate shall offer remote control and monitoring by Radio Frequency over the frequency range 902 to 928 MHz (US 915-MHz ISM band) using the warning gate manufacturer's RF handheld remote hardware.

2.3. Crashworthiness

The warning gate shall be successfully crash tested according to the requirements of MASH 2016 (Tests # 3-71 and 3-72).

2.4. List of Available Options

Various options and customizations are available through coordination with the manufacturer, including but not limited to:

- Gate Arm color
- Reflective Sheeting type and color
- Gate Arm lighting
- Gate Arm signs (such as No Entry)
- Anchoring adaptor plates

3. Installation Requirements

The installation of the SwiftGate shall be as shown on the plans. Install the SwiftGate according to the manufacturer's recommendations. Use the furnished equipment and materials and follow the installation procedure as documented with the SwiftGate. Use the size and type of power cables as required by the local electrical code. Power and communication cables (when required) must be placed in conduit. Restore any areas impacted by the installation of the SwiftGate to its original condition unless otherwise shown in the plans.

4. Warranty

Ensure the SwiftGate and its related equipment have a manufacturer's warranty covering defective material and components for one year from the date of delivery. Ensure the warranty includes providing replacements within 30 calendar days of notification for defective parts and equipment during the warranty period at no cost to the Department.