

Industrial Area Crossing Signal System

The Industrial Area Crossing Signal System is designed to offer full railroad crossing signaling for single or multiple crossings at a plant or complex. The systems are factory built, fully tested, then shipped mostly assembled on pallets, such that on site installation time is minimized.

Two or more signals placed at each crossing are normally solar powered and synchronized so that each turn on and off at the same time. Activators detect the approaching train and turn on the lights and bell. These activators may be on the signal mast, or located conveniently along and near the track, with their activation commands transmitted wirelessly to the signal mast. Several activator types are available, using microwave, magnetic coil, infrared, and remote control. Two or more activator types may be used at a single crossing, depending on location conditions.

System Components

Signals

- Standard 4 Light Solar Powered
- Gated 4 Light Solar Powered

Activators

- Microwave
- Track Circuits
- Remote Control
- Microwave and Remote Control
- IR
- Truck Avoidance IR
- Remote Microwave Sensor
- Presence Detector



Industrial Area Crossing Signal System

Industrial Area Crossing Signal System

Signals

4 Light Solar Powered Signals

Each signal is a standard grade crossing 4 light mast with a bell. The train detection sensor may be on the signal mast, or located elsewhere along the tracks for better train detection. Solar power systems are pre-wired and integrated before shipment.

Standard features include 12" energy saving high intensity LED lights, "Stop On Red Signal" sign and a 48" railroad crossing sign. Each signal is shipped assembled, ready for mounting on a foundation, modularized to facilitate maintenance, and built to MUTCD standards.

Standard Components per Crossing

- 1 wireless synchronizer data link per crossing
- 100 watt solar power system on master mast with 110 A hr deep cycle battery
- 80 watt solar power system on slave mast with 110 A hr deep cycle battery
- 4 – 12" flashing red LED lights per mast
- Manual override key switch on each mast
- 2 x 15' x 4" aluminum mast with 9.5" bolt spacing base clamp
- "Stop on Red Signal" sign on each mast
- "Railroad Crossing" sign, MUTCD standard on each mast
- Electronic bell on each mast



*Industrial Area Crossing Signal
with 4 Lights*

Industrial Area Crossing Signal System

Signals

4 Light Solar Powered Signals

| | |
|--------------------------|---|
| Specifications | 4 Light Signals |
| Solar System | 100 Watt solar power system on master, 80 Watt on slave, each with 110 A hr. deep cycle solar battery. The solar panel meets Class 1 Division 2 and shock resistant requirements, with 24 hours operation without sunlight. |
| Control Box | The weatherproof metal control box houses the battery, circuit breakers, terminal strips, microprocessor flasher assembly, and 3 position key switch (OFF-MANUAL-AUTO). |
| Lights | 4 x 12" (30 cm) bright red LED's in standard housings on arms, MUTCD standard railroad crossing signal. The flashing rate is the industry standard 0.5 seconds on, 0.5seconds off. |
| Synchronizer | One 2.4 GHz peer to peer data link module per pole synchronizes signals at a crossing to activate and deactivate simultaneously. The range is 100 m (300 ft.). |
| Signs | 1.2 m (48") MUTCD standard RAILROAD CROSSING sign and 61 cm (24") STOP ON RED SIGNAL sign. |
| Mast | 15' 6" x 4" (4.73 m x 10 cm) aluminum pole with 9.5" (24 cm) bolt spacing base clamp, ready for mounting on customer supplied industry standard foundations. |
| Bell | Standard electronic bell on top of pole with 80-95 dbA at 10 feet (3 m), adjustable sound level output. |
| Wiring Harness | Internal wiring harness with 16 gauge copper wiring and soldered bayonet terminals on each wire. Wiring is fully connected to each component and tested before shipment. |
| Country of Origin | USA |
| System | The Industrial Area Crossing Signal is solar powered and is delivered assembled. |

Industrial Area Crossing Signal System

O'CONNER
ENGINEERING Inc.



Industrial Area Crossing Signal

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Industrial Area Crossing Signal System

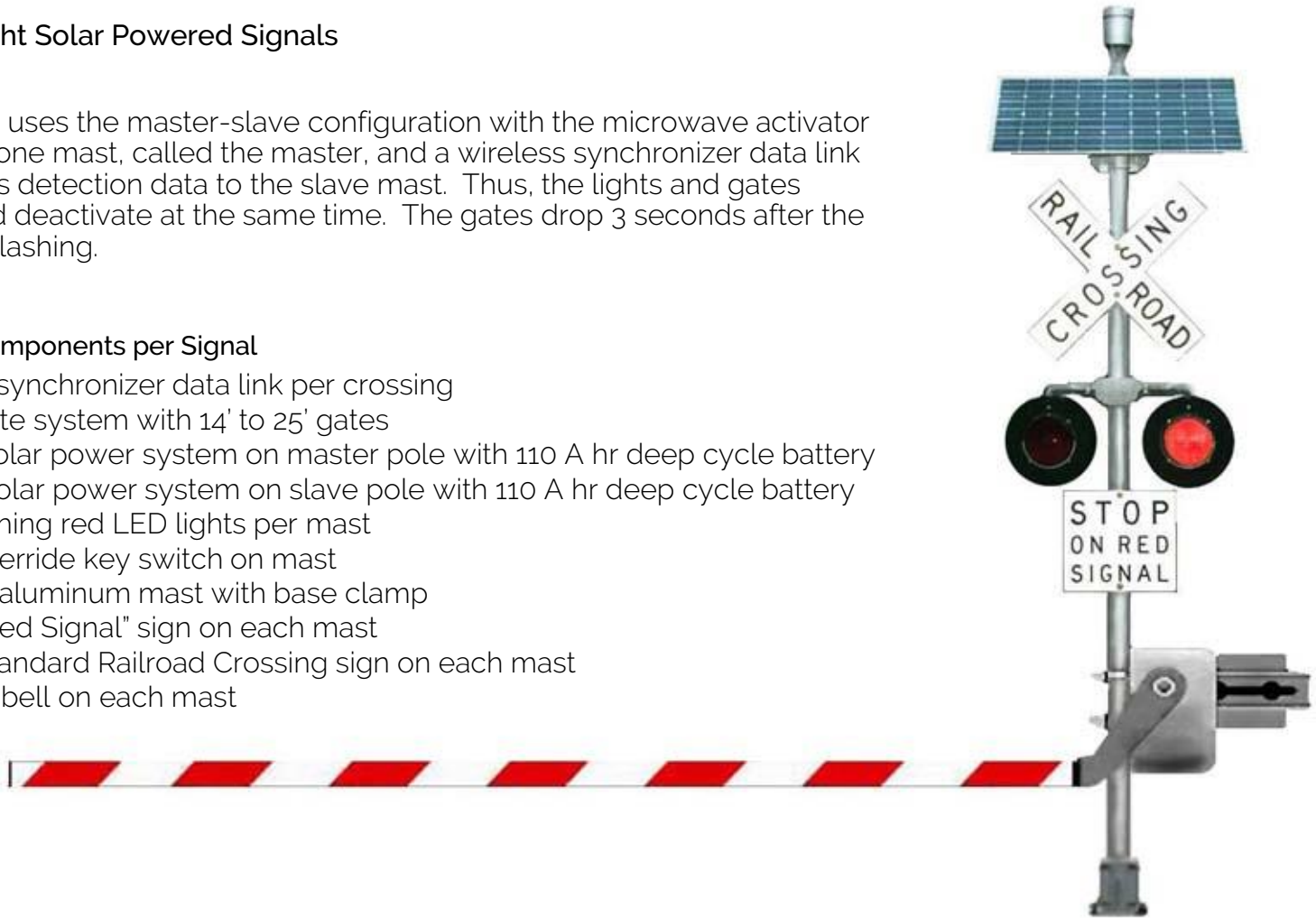
Signals

Gated 4 Light Solar Powered Signals

The system uses the master-slave configuration with the microwave activator located on one mast, called the master, and a wireless synchronizer data link which sends detection data to the slave mast. Thus, the lights and gates activate and deactivate at the same time. The gates drop 3 seconds after the lights start flashing.

Standard Components per Signal

- 1 wireless synchronizer data link per crossing
- 2 x 12 V gate system with 14' to 25' gates
- 130 watt solar power system on master pole with 110 A hr deep cycle battery
- 100 watt solar power system on slave pole with 110 A hr deep cycle battery
- 4 – 12" flashing red LED lights per mast
- Manual override key switch on mast
- 2 x 15" x 5" aluminum mast with base clamp
- "Stop on Red Signal" sign on each mast
- MUTCD standard Railroad Crossing sign on each mast
- Electronic bell on each mast



Industrial Area Crossing Signal System

Signals

Gated 4 Light Solar Powered Signals

| Specifications | Gated 4 Light Solar Powered Signal |
|-------------------------|--|
| Solar System | 120 Watt solar power system on master, 100 Watt on slave, each with 110 A hr. deep cycle solar battery. The solar panel meets Class 1 Division 2 and shock resistant requirements, with 24 hours operation without sunlight. |
| Crossing Gate Mechanism | 12 V dc system with counterweights and crossing gates (14' to 25'). Longer gates and 4" LED lights on gates available |
| Control Box | The weatherproof metal control box houses the battery, circuit breakers, terminal strips, microprocessor flasher assembly, and 3 position key switch (OFF-MANUAL-AUTO). |
| Lights | 4 x 12" (30 cm) bright red LED's in standard housings on arms, MUTCD standard railroad crossing signal. The flashing rate is the industry standard 0.5 seconds on, 0.5seconds off. |
| Synchronizer | One 2.4 GHz peer to peer data link module per pole synchronizes signals at a crossing to activate and deactivate simultaneously. The range is 100 m (300 ft.). |
| Signs | 1.2 m (48") MUTCD standard RAILROAD CROSSING sign and 61 cm (24") STOP ON RED SIGNAL sign. |
| Mast | 15' 6" x 5" (4.73 m x 125 mm) aluminum pole with bolt base clamp, ready for mounting on customer supplied industry standard foundations. |
| Bell | Standard electronic bell on top of pole with 80-95 dbA at 10 feet (3 m), adjustable sound level output. |
| Wiring Harness | Internal wiring harness with 16 gauge copper wiring and soldered bayonet terminals on each wire. Wiring is fully connected to each component and tested before shipment. |
| Country of Origin | USA |
| System | The Industrial Area Crossing Signal System with Gates is solar powered and is delivered mostly assembled. |

Industrial Area Crossing Signal System

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Gated Signal

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Industrial Area Crossing Signal System

Activators

Microwave Activator

Solar powered microwave sensors to detect approaching trains between 1mph and 35 mph. Installed on a signal mast, the lights start flashing 15 to 20 seconds before the train reaches the crossing, flash as long as the train is moving through the beam and continue to flash until the train has left the crossing. If the train stops, the lights will flash for up to 15 minutes then turn off.

Standard features include interference suppression and prediction software, drivers for up to four 30 cm high intensity LED lights, driver for electronic bell and override circuits.



*Microwave Activator
Mounted on Signal*

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*Industrial Area Crossing Signal
with 4 Lights*

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Industrial Area Crossing Signal System

Activators

Microwave Activator

| Specifications | Microwave Activator System | |
|---|----------------------------|--|
| Microwave Activator (for Industrial Area Crossing Signal master) | Type | 2 x 24 GHz Stereo Doppler |
| | Range | 500 m nominal for trains (line of sight) |
| | Beamwidth | 10° at far range, 30° at near range |
| | Min-Max Speed | 1 – 60 km/h (0.5 - 35 mph), higher and lower speeds available on request |
| | Power Output | 3.75 milliwatts (FCC Part 15b approved, safe at any distance) |
| | Power Required | 10 to 18 V dc, 0.3 Amps (power supplied by solar system) |
| | Size / Weight | 36 cm w x 41 cm h x 18 cm d / 8 kg |
| | Output activation | Darlington drivers for LED flashing lights, electronic bell, and if applicable, gate |
| Country of Origin | USA | |

Industrial Area Crossing Signal System

Activators

Track Circuit

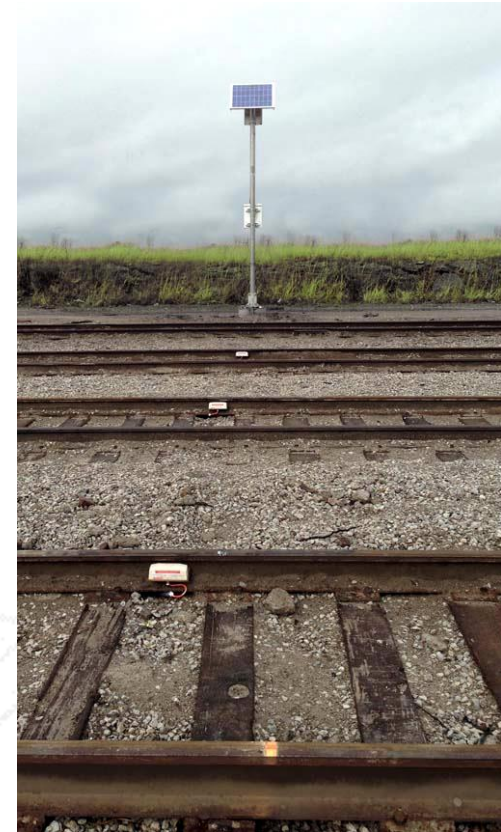
Magnetic coil wheel detector sensors attached to the track up to 1,200 feet from the crossing detect approaching trains, then wirelessly activate the crossing signals. The system is entirely solar powered with wireless data links, thus they use no long cables, or external wiring.

The lights start flashing as soon as the train passes over the approaching track detector and continue until the last car has passed over the exit detector.

Signals from the track detectors are wirelessly linked to the master signal at the crossing. A wireless data link synchronizes the slave signal to the master signal.



*Industrial Area Crossing
Signal
Wheel Detector*



Track Circuit 4 Tracks

Industrial Area Crossing Signal System

Activators

Track Circuit

| Specifications | Track Circuit System |
|------------------------------------|---|
| In-Track Detector | Type Double wheel detector Activation Wheel flange Pulse Length >3 ms Power Required 10 to 18 V dc, 50 mA (power supplied by solar system) Size / Weight 15 cm w x 10 cm h x 7 cm d / 2 kg Output Induction pulse |
| Track to Signal Wireless Data Link | Type 2.4 GHz wireless synchronized link Range up to 1,200 feet (line of sight) Power Required 10 to 18 V dc, 25 to 175 mA at activation, 50 mA sleep (power supplied by solar system) Size / Weight 36 cm w x 41 cm h x 18 cm d / 8 kg Output Darlington drivers for LED flashing lights, electronic bell, and if applicable, gate activation |
| Track Detector Solar System | 30 to 80 Watt solar power system with 8 to 20 A hr. deep cycle solar battery. The solar panel meets Class 1 Division 2 and shock resistant requirements. The system is rated for 24 hours continuous operation without sunlight. |
| Mast | 10' x 3" galvanized steel with poured concrete foundation or 15' 6" x 4.5" aluminum pole with 9.5" (24 cm) bolt spacing base clamp, ready for mounting on customer supplied industry standard foundations. |
| Wiring Harness | Internal wiring harness with 16 gauge copper wiring and soldered bayonet terminals on each wire. Wiring is fully connected to each component and tested before shipment. |
| System | The Industrial Area Crossing Signal is solar powered. |
| Country of Origin | USA |

Industrial Area Crossing Signal System

Activators

Remote Control

The signal is turned on and off by wireless hand held remote control transmitters. Multiple signals may be separately activated by one transmitter. Units shipped assembled, ready for mounting on foundation. Each system includes both transmitters and signals. Each signal is normally installed on finished foundations in about 3 hours.

The system operates on the master-slave concept. The master signal contains the receiver for the remote control. The master then sends a wireless signal to the slave for synchronization.

The system is expandable to 10 crossings on individual channels using one transmitter.



Single Crossing Transmitter



Two Crossings Transmitter



Remote Control Signal

Industrial Area Crossing Signal System

Activators

Remote Control

| Specifications | |
|----------------|---|
| Remote Control | Transmitters: 2 x handheld transmitters, 2,000 feet range. Receivers: 1 Remote Control, 2.4 GHz or 960 MHz Receiver on master. |
| Synchronizer | One 2.4 GHz peer to peer wireless data link module per pole synchronizes signals at a crossing to activate and deactivate simultaneously. The range is 100 m (300 ft.). |
| Solar System | 80 Watt solar power system with 110 A hr. deep cycle solar batter. The solar panel meets Class 1 Division 2 and shock resistant requirements. The system is rated for 24 hours continuous operation without sunlight, with lights and bell activated 10% of the time. |
| Control Box | The weatherproof metal control box houses the battery, circuit breakers, terminal strips, microprocessor flasher assembly, and 3 position key switch (OFF-MANUAL-AUTO). |
| Lights | 4 x 12" (30 cm) bright red LED's in standard housings on arms, MUTCD standard railroad crossing signal. The flashing rate is the industry standard 0.5 seconds on, 0.5 seconds off. |
| Bell | electronic bell 85 dBa at 10 feet, adjustable |

Industrial Area Crossing Signal System

Activators

Truck Avoidance IR

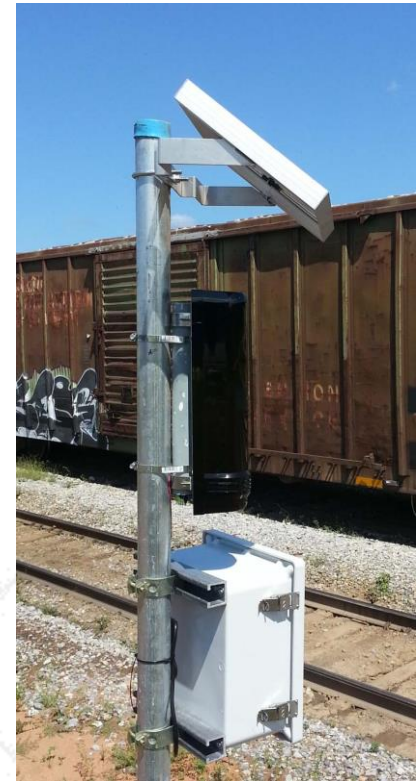
IR transmitters are strategically placed on each side of the road at the crossing such that trucks stopped within the crossing perimeter, or moving through the crossing when the lights activate, will keep the gates from coming down on the truck.

As long as a truck is not at the entrance or exit to the crossing, the gates come down 5 seconds after the lights are activated.

This system is intended for use at any crossing where gates are used.

Components

- 2 IR transmitters per crossing
- 2 IR receivers per crossing located on the masts
- 2 x 30 watt solar power system with 17 A hr deep cycle battery
- 2 x 10' x 2" metal mast with concrete foundation



*Truck Avoidance
IR Link Interrupt Transmitter*

Industrial Area Crossing Signal System

Activators

IR

Two Infrared (IR) transmitters are strategically placed on each side of the crossing up to 50 feet from the track such that the train interrupts the IR beam to IR receivers located on the crossing masts.

As a train approaches or stops at the crossing, the beams are interrupted and the signals flash.

This system is intended for both single and multiple track crossing, up to 6 tracks, and may be stand alone, or as an add on to other activators.

Components

- 2 x IR transmitters per crossing
- 2 x IR receivers per crossing
- 2 x 30 watt solar power system with 17 A hr deep cycle battery
- 2 x 10' x 2" metal mast with concrete foundation



IR Link Interrupt Transmitter

Industrial Area Crossing Signal System

Activators

Remote Sensor

Using microwave sensors, the Remote Sensor detects trains approaching and passing at either 1 - 35 mph for industrial areas or 2 - 100 mph for rural areas. The Sensor can be solar powered and needs no track circuits to send control signals to a crossing signal located up to 5 miles away.

The Remote Sensor may be used instead of track detector circuits to activate a crossing.

The Remote Sensor is also used where there are 3 or more tracks. The internal microwave sensors are aimed to detect trains approaching the crossing that might be blinded by another train.

Components

- 1 train microwave activator per mast
- 1 wireless synchronizer data link
- 80 watt solar power system with 110 A hr deep cycle battery
- 15' x 4" aluminum mast with 9.5" bolt spacing base clamp



Remote Sensor

Industrial Area Crossing Signal System

Activators

Remote Sensor

| Specifications | Remote Sensor |
|---|---|
| Remote Microwave Activator with Data Link | Type 2 x 24 GHz Stereo Doppler, (FCC Part 15b approved) Range adjustable up to 200 m in industrial areas, up to 500 m in rural areas (line of sight) Beamwidth 10° at far range, 30° at near range Min-Max Speed 1 - 55 km/h (0.5 - 35 mph) or 3 - 160 km/h (2 - 100 mph) Power Output 3.75 milliwatts Power Required 10 to 18 V dc, 0.3 Amps (power supplied by solar system) Size / Weight 36 cm w x 41 cm h x 18 cm d / 8 kg Output Darlington drivers for Data Link |
| Data Link | Transmitter: One 960 MHz or 2.4 GHz peer to peer data link module synchronizes data between the Remote Microwave Activator and the crossing or remote signs. Range: short range version, 1,200 feet, long range version up to 5 miles. |
| Solar System | 80 Watt solar power system with 110 A hr. deep cycle solar battery. The solar panel meets Class 1 Division 2 and shock resistant requirements. The system is rated for 24 hours continuous use without sunlight. |
| Control Box | The weatherproof metal control box houses the battery, circuit breakers, terminal strips. |
| Mast | 15' 6" x 4" (4.73 m x 10 cm) MUTCD standard aluminum pole with 9.5" (24 cm) bolt spacing base clamp, ready for mounting on customer supplied industry standard foundations. |
| Wiring Harness | Internal wiring harness with 16 gauge copper wiring and soldered bayonet terminals on each wire. Wiring is fully connected to each component and tested before shipment. |
| Country of Origin | USA |
| System | The Remote Sensor is solar powered and is delivered assembled. |

Industrial Area Crossing Signal System

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Remote Sensor

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Industrial Area Crossing Signal System

Activators

Presence Detector

This all weather microwave remote sensor measures the distance to rail cars in its narrow 10° beam. Cars within a programmable window of 3 m to 25 m are detected. It is normally mounted on the signal pole with its beam perpendicular to the track.

Multiple outputs are available for indication the presence, distance, and time a car is within the range window.

The sensor may be powered by 12 V dc, 110-240 V ac, or solar.



Specifications

| | |
|-------------------|--|
| Type | 24 GHz FMCW |
| Range Window | 3 m to 25 m (internally programmable window) |
| Beam width | 10° |
| Distance Accuracy | 1 m |
| Power Output | 1 milliwatt |
| Power Required | 10 to 18 V dc, 110-240 V ac, or solar, 5 Watts |
| Size/Weight | 10 x 11 x 29 cm / 1.5 kg |
| Temperature | -20°C to +60°C |
| Outputs | 1) Contact closure when train is within range window, or 2) RS232 or RS422 Signal over cable with distance to train, sensor id, time target in widow, or 3) 2.4 GHz wireless |



Train Presence Detector

Industrial Area Crossing Signal System

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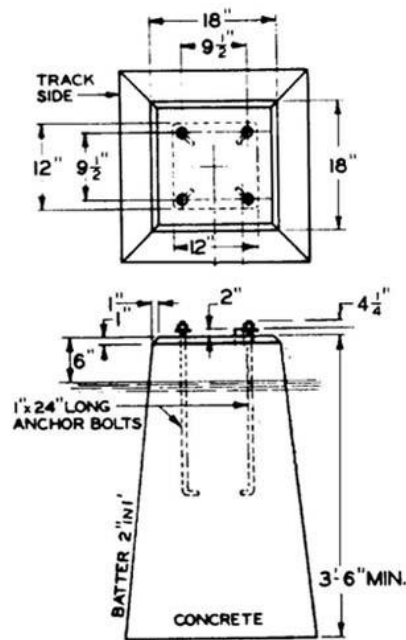
Industrial Area Crossing Signal System with Remote Control and Track Circuits

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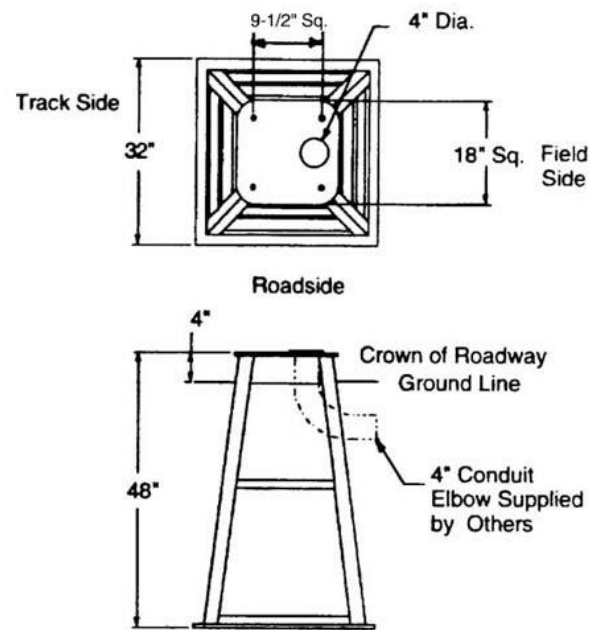
Industrial Area Crossing Signal System

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Suggested Foundations for O'Conner Signals



Concrete Foundation



Galvanized Steel Foundation

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