Solar Powered TS1000 Crosswalk Warning Light System

Trench & Fill Type Installation

City of Vallejo, CA – December 2009

The Basics

- **Prior to the installation a complete a site survey should be conducted to evaluate system requirements:**
  - Excessive Crowning or Steep Down Hill Slope, Uneven Road Surfaces, Curves in the Road
  - Conditions Affecting Drainage – Road Depressions, Soil Conditions
  - Shading of Solar Panel – Check for potential sources of shadows between 9am and 3 pm
- **The system should be configured and designed for the conditions at the site.**
- **Consult engineering plans for correct location of the in-pavement fixtures.**
- **When installing the fixture base cans make sure that they are positioned flush with the surface of the road, and aligned approximately with the flow of traffic.**
- **Provide support at the bottom of base cans to avoid settling while the concrete cures.**
- **Verify that drainage system functions as expected before pouring concrete.**
- **Pay attention to the polarity of the fixture cabling:**
  - White Fixture Conductor (+12 Volts DC) to Red Street Cabling
  - Black Fixture Conductor (Return) to Black Street Cabling
- **When installing a solar powered system make sure that the solar panels are facing *True South.***
- **Before connecting the street wiring to the controller terminal block, check the street wiring to make sure that there are no short circuits.**

Attention to basics makes for a problem free installation!

Pre-installation

1. Main system components arrive on one or more pallets.

2. Optional pole kit shipped separately.

3. Crosswalk site before system installation.

Site Preparation

4. L-Bolts and electrical conduit are installed and a concrete foundation is poured at each pole base location.

5. Site prepared and ready for trenching to begin.

Trenching Operation

6. An outline of the trench is first sprayed onto the pavement.

7. A dry cut is then made to cut along the outline of the trench.

Trenching Operation

8. Next, a jack hammer is used to break-up the existing pavement within the trench.

9. A trench digger is then used to remove pavement pieces and dig the trench.

Trenching Operation

10. The final phase of the trenching is completed with the use of a trench shovel.

11. Trench is now completed and ready for Installing the Base Cans and Conduit.

Base Can and Drainage System Installation

12. Base cans are fitted with a mounting jig (used to hold base can flush with road surface), and the conduit fittings attached to the bottom of the base can.

13. Drain and electrical conduit is then positioned for installation.

Base Can and Drainage System Installation

14. Drain conduit (PVC) is then installed between the base cans, and between base cans and the storm drain.

15. Drain conduit is positioned directly below the drain hole of each base can.

Base Can and Drainage System Installation

16. Base cans are then attached to drain conduit using the PVC fittings.

17. Base cans are then lowered into the trench.

Base Can and Electrical Conduit Installation

18. Dobie blocks are positioned under the conduit to prevent the base can from sinking after the mounting jig has been removed.

19. Electrical conduit is then installed above the drain conduit and connects with all base cans.

Preparations for the Fill Operation

20. Wood stakes are put in place and attached to the electrical conduit with wire to support the conduit during the pouring of concrete.

21. With all base cans, mounting jigs, drain and electrical conduit, and supports in place the concrete is poured and leveled.

Fill Operation

22. Quick dry concrete is generally used around the base cans; Standard concrete mix is used everywhere else.

23. The mounting jig is removed, base can cleaned, and the protective plywood cover bolted onto the base can.

Pole Base Installation

24. The treads of the L-Bolts are cleaned in preparation for mounting the pole base.

25. Pole base shown with access door positioned towards the side walk.

Pole Assembly Preparation

26. Access holes are cut into the pole at various locations to provide access for Electrical cabling between system components.

27. Waterproof Electrical Fittings are attached to the Pole for Flashing LED Sign Cabling.

Solar Panel Assembly

28. Pole mounting hardware is attached to the solar panel.

29. Solar panel is then attached to the pole.

Solar Panel Assembly

30. Using a steel tape, cabling is pulled through the inside of the pole and positioned to electrically connect system components.

31. Waterproof fittings are installed on pole cap and cabling attached to the terminals inside the solar panel J-Box.

Pole and Sign Installation

32. Pole and base are installed onto base foundation (base shown with access door open).

33. Flashing LED signs are installed using saddle brackets and metal straps.

Activation Device Installation and Field Cabling

34. Cabling is attached to the terminals at the back of the pushbutton, and the pushbutton attached to the pole.

35. Infrastructure (street cabling) for fixtures, signs, and pushbuttons are measured and prepared for placement into the electrical conduit.

Field Cabling Operation

36. The process of passing the cabling through the base cans, to the pushbuttons and signs, and to the control system begins at the pole base.

37. All cabling passes through the base cans. Fixtures are wired in parallel using water proof splices (white-to-red and black-to-black).

Trench Fill and Leveling Process

38. After all street cabling has been completed; asphalt is shoveled into the trench and leveled with a rake.

39. An asphalt compactor is used to finish the leveling and smoothing of the asphalt.

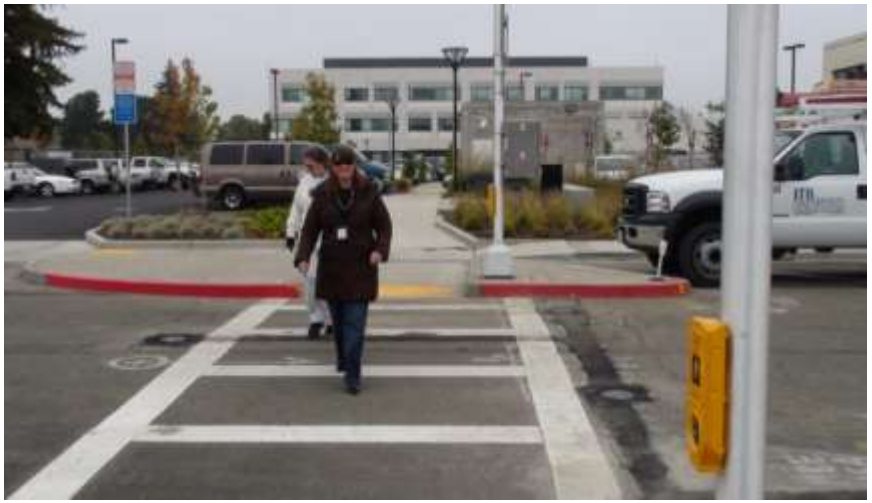
Fixture Installation

40. In-Pavement installation completed and ready for fixtures to be plugged into their connectors.

41. The plywood covers are then removed and replaced with fixtures. The fixtures are bolted to the base can. Silicon sealant is then placed into the space between the base can and fixture, providing a water proof seal.

Final System Set-up and Testing

42. Final wiring is then made to the terminal block in the rear of the enclosure; the controller back panel is reinstalled, load and power cables connected, and the system's operating parameters set-up.



43. The solar powered TS1000 Crosswalk Warning Light System is now ready for testing.

Completed Installation

44. View of crosswalk looking towards the main parking area and Solano County building complex.

45. View of crosswalk looking towards the secondary parking area.

Completed Installation and Site Photo

46. View of crosswalk from the driver's perspective (one way, single lane road).

47. Solano County Justice Building.

Site Photos

48. Solano County Health Service Building·

49. Solano County Social Service Building·

Completed Installation

50. View of pole assembly showing the solar panel facing *True South*, flashing LED pedestrian sign, crosswalk arrow sign, and TS1000 system enclosure.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