I-10 Dust Detection and Warning System Sunshine Blvd to Picacho Peak Rd

Project Update

February 27, 2018

Project Background

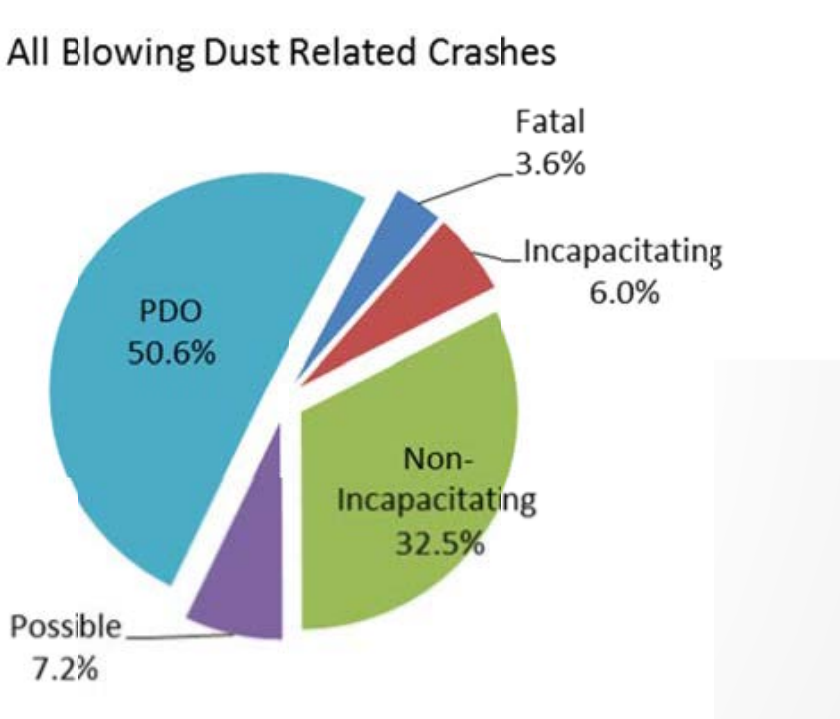
- October 2013 – dust storm related crash on I-10, kills three people
- Since 2000, dust has contributed to 1,207 collisions resulting in 40 fatalities and 1,136 injuries.

- The 'Season' for dust storms in Pinal County is usually associated with the summer monsoons, but has been extending into the fall

Project Background

Aug 2010 to Aug 2015

- 3 Fatal
- 5 Incapacitating
- 27 Non-Incapacitating
- 6 Possible
- 42 Property Damage Only



83 Crashes in 5 years

Project Infrastructure Overview

- Conduit, Pull Boxes and Fiber
- CCTV Cameras
- DMS
- Mainline Detection
- Spot Detection
- Long Range Detection
- Variable Speed Limit Signs
- Communications

MP 209-219

Project Infrastructure Overview

Existing Technology used by ADOT

Project Infrastructure Overview

Conduit, Pull Boxes and Fiber

- Urban type of design because of many devices
- Considered direct bury fiber
- 2-3” conduits on one side of I-10

a. 144 SMFO cable in one conduit
b. 2nd conduit for power conductors or spare

Project Infrastructure Overview

Conduit, Pull Boxes and Fiber

- No. 9 Pull Boxes along trunkline

- No. 7 Pull Boxes
  a. Near cabinets (where required)
  b. At sawcut loop locations

Project Infrastructure Overview

CCTV Cameras

- One CCTV every 2 miles
- Provide confirmation of road conditions in the corridor
- ADOT Standard Camera
- Will be one of 3 listed in Specs
  a. Cohu
  b. Bosch
  c. WTI

Project Infrastructure Overview

CCTV Cameras

- Mounted on 55’ tall pole w/lowering device
- Provide coverage of I-10 and have view of DMS

- Additional CCTV camera on TS pole at SR 87 TI
- Will use existing CCTV camera at WB I-10 MP 217

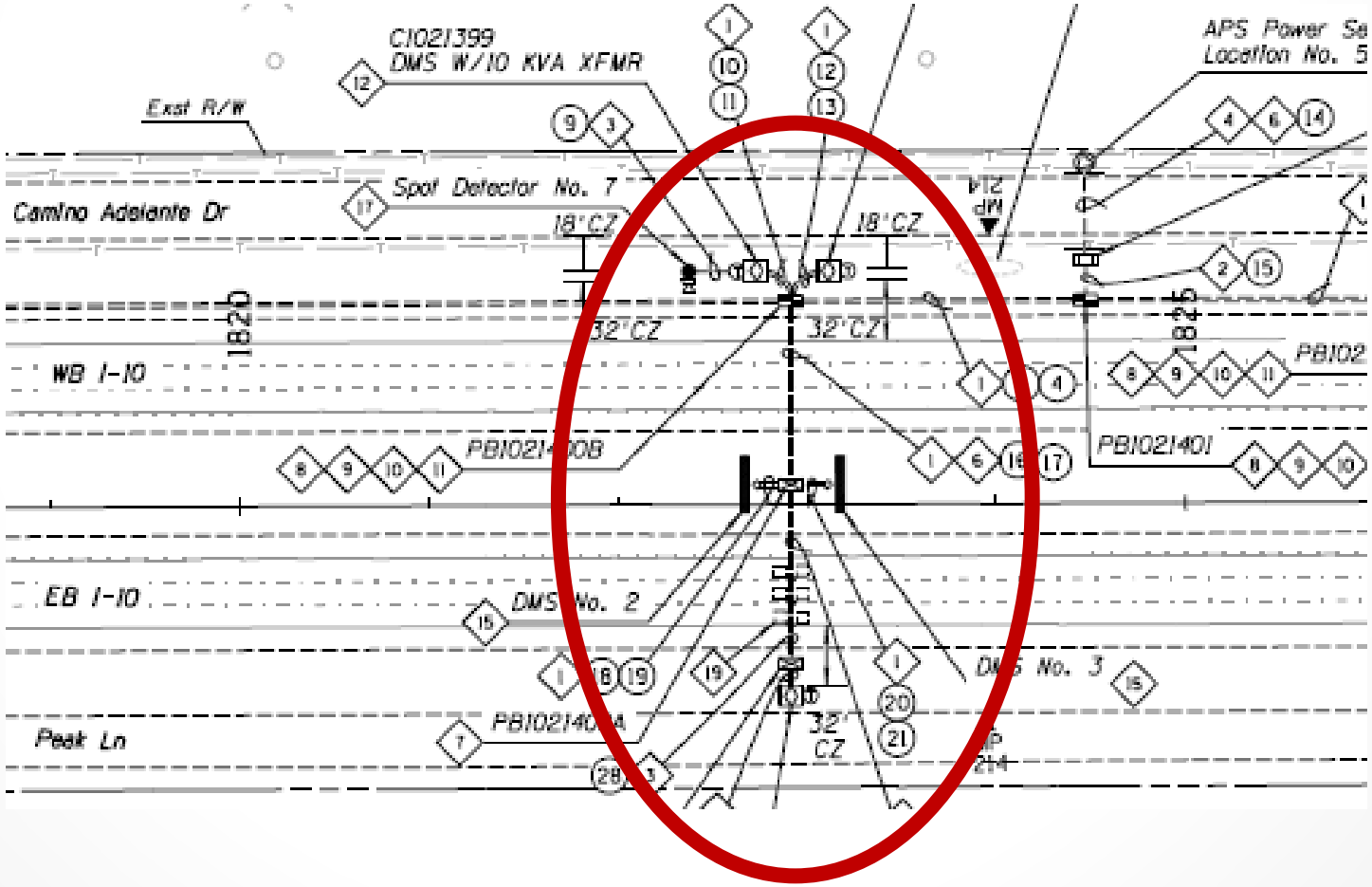
Project Infrastructure Overview

DMS

- Procured off existing ADOT on-call contract (Daktronics)
- Walk-in DMS, Cabinet, DMS controller, and power/communications cabling installed by contractor
- Mounted on ADOT Standard 'T' structures
- Will use existing DMS at WB I-10 MP 217

Project Infrastructure Overview

DMS



Project Infrastructure Overview

Mainline Detection

- Sawcut loops per ADOT Standard Details
- 3 EB and 3 WB Stations
- Measures Volume, Speed, Occupancy
- Confirm conditions in the corridor
- Model 2070 controller furnished and installed by the contractor at each location

Project Infrastructure Overview

New Technology for ADOT

Project Infrastructure Overview

Spot Detection

- Forward scatter technology
- Measures visibility at a “spot” location
- Very accurate up to 1 mile

Project Infrastructure Overview

Spot Detection

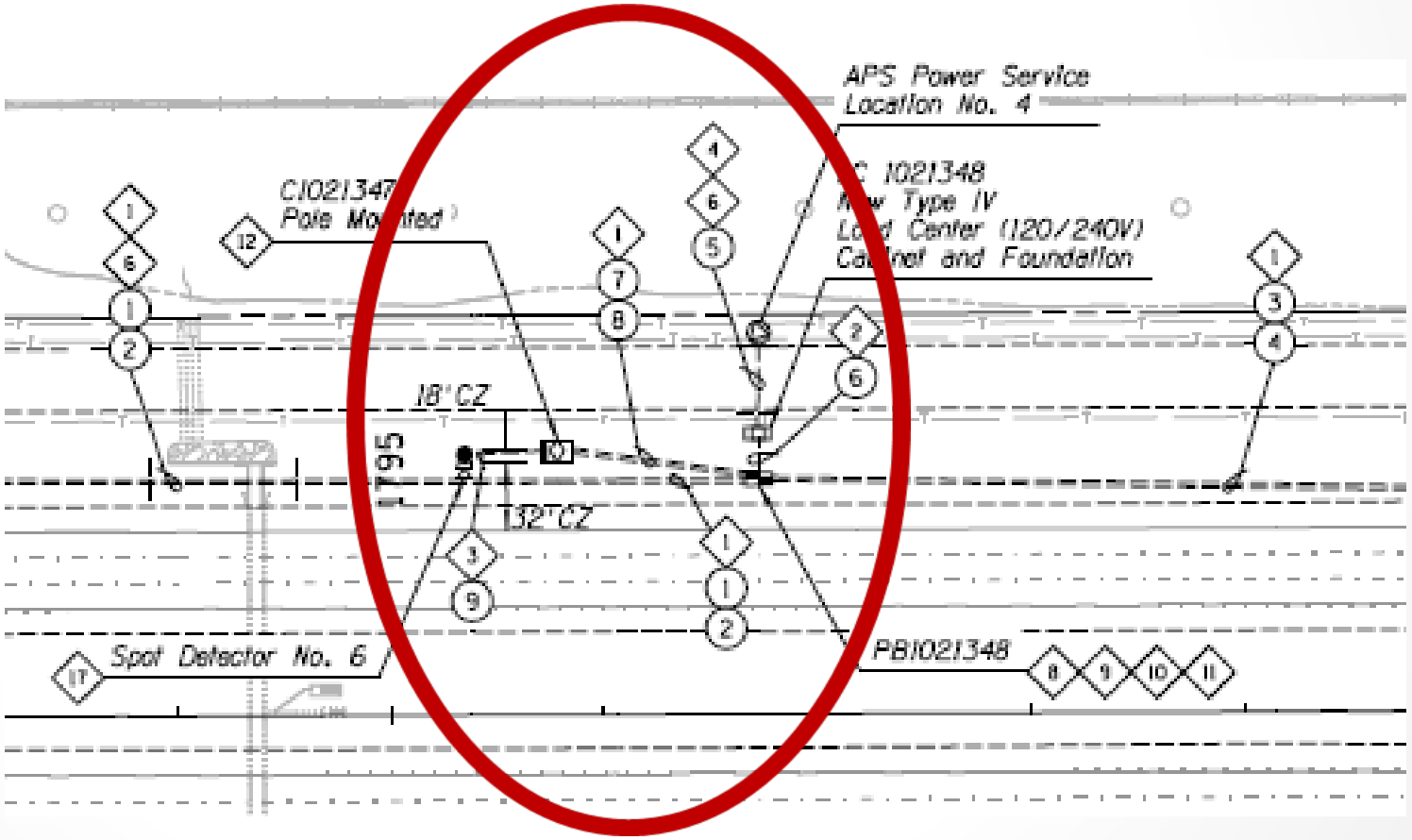
- 1 installation per mile
- 1 installation per ½ mile MP 212-214
- 13 total installations
- Each sensor mounted on a pole
- Shares a cabinet with other device at most locations

Project Infrastructure Overview

- **Spot Detection**
- Spot Detector, Cabinet, controller, and power/comm cabling furnished and installed by contractor
- Specific Model manufactured by Vaisala

Project Infrastructure Overview

Spot Detection



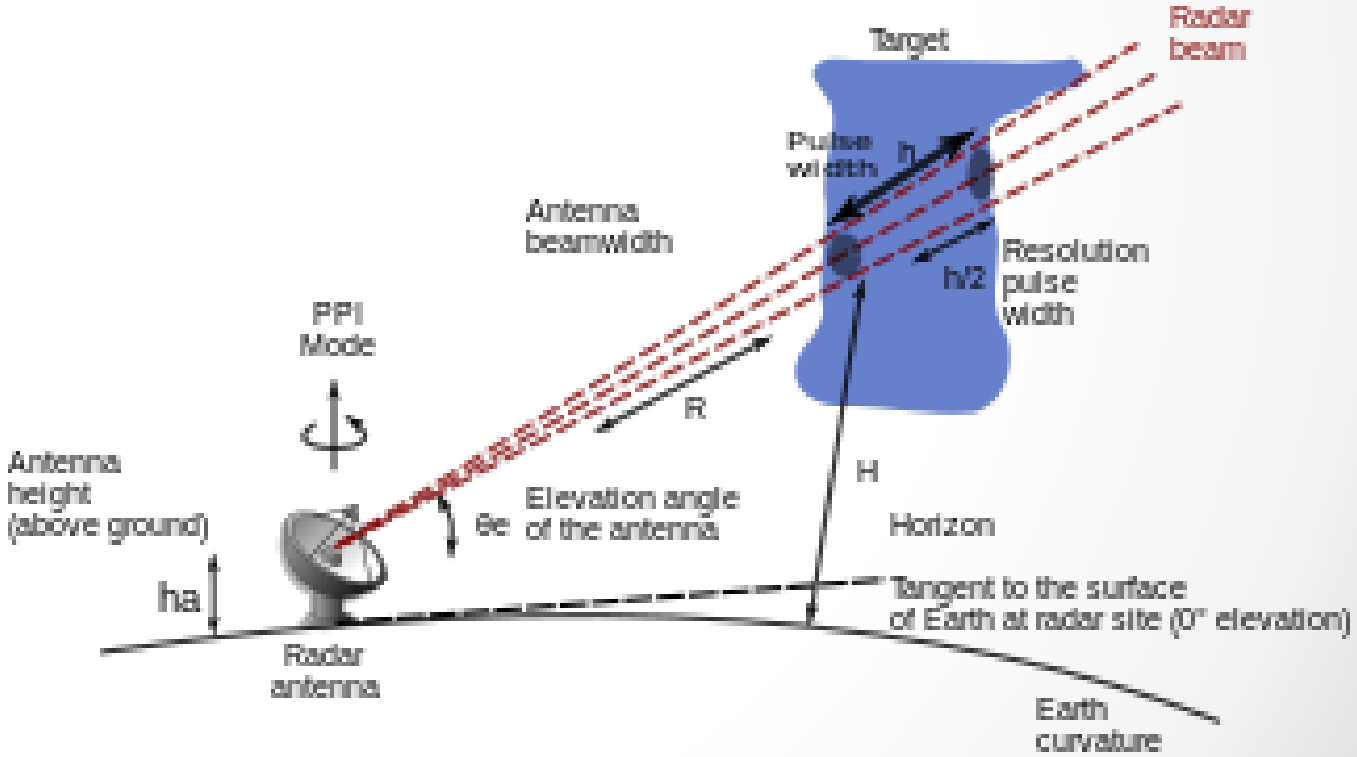
Project Infrastructure Overview

Long Range Detection

- X-band radar technology
- 1 installation for the entire project
- Looks for low visibility conditions outside the corridor
- Located at the north end of the corridor because of the mountains to the south
- Range of 40 miles

Project Infrastructure Overview

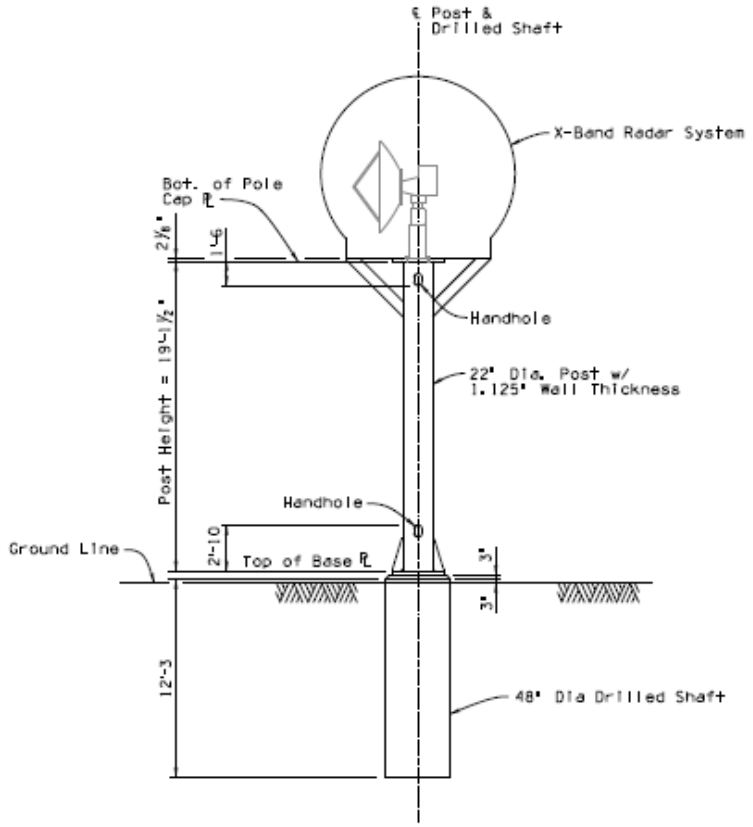
Long Range Detection



Project Infrastructure Overview

Long Range Detection

- Mounted on a 20’ tall monotube structure
- Inside a radome



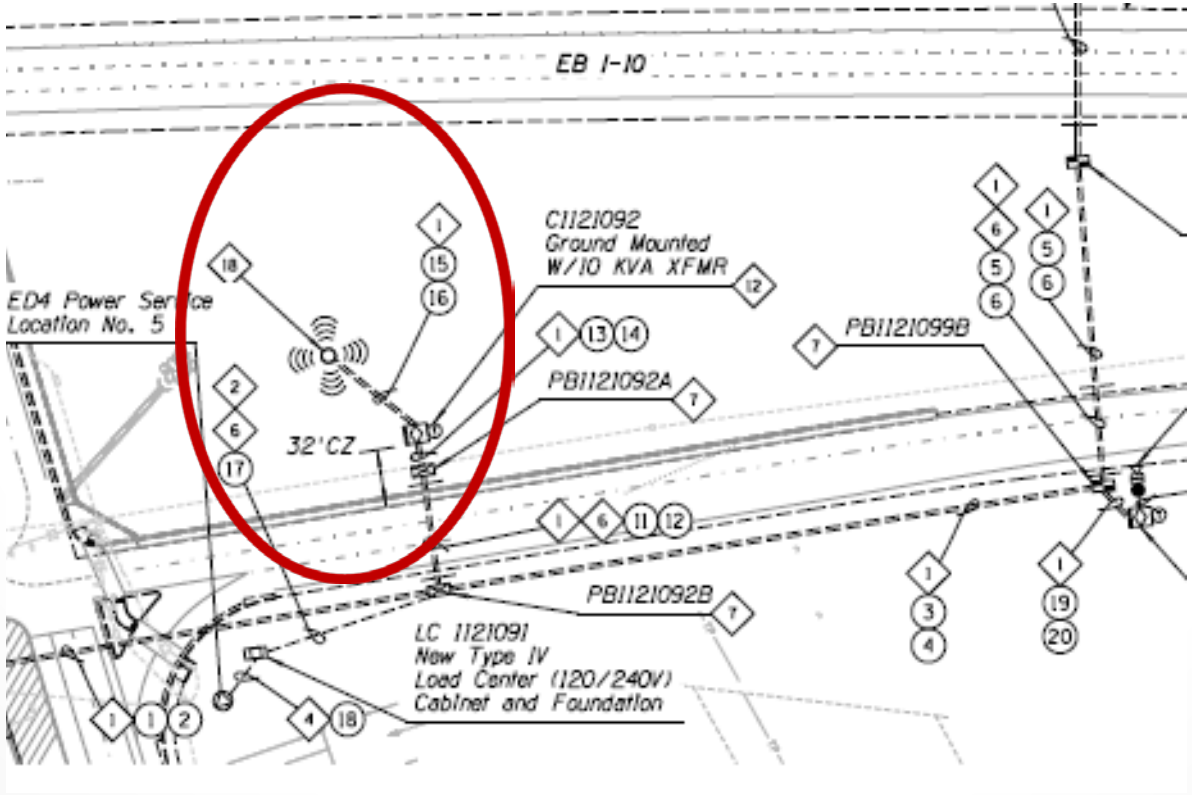
Project Infrastructure Overview

Long Range Detection

- Detector, Cabinet, controller, and power/comm cabling furnished and installed by contractor
- Specific Model manufactured by EEC

Project Infrastructure Overview

Long Range Detection



Project Infrastructure Overview

Variable Speed Limit Signs

- Hybrid Type VSL
  a. Static MUTCD compliant speed limit sign
  b. Digital display of speed limit digits
  c. NOT Full Matrix
- 4 VSL spaced 1000’ apart at entrance to the corridor
- Procured off existing ADOT on-call contract (Daktronics)
- Remove existing static signs

Project Infrastructure Overview

Variable Speed Limit Signs

Project Infrastructure Overview

Variable Speed Limit Signs

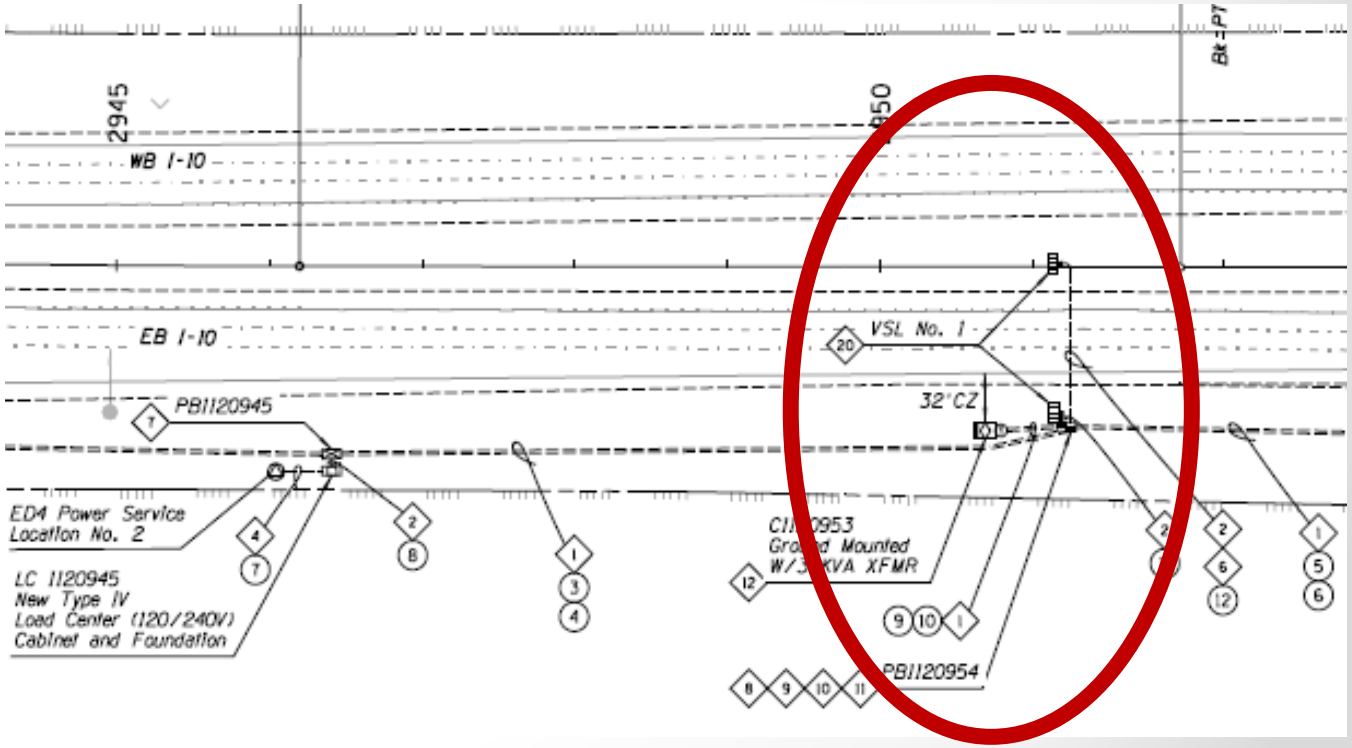
Project Infrastructure Overview

Variable Speed Limit Signs Example

Project Infrastructure Overview

Variable Speed Limit Signs

- VSL on each side of I-10 at each location
- One VSL controller at each location will control both VSL
- Mounted on 15’ Pole w/breakaway base



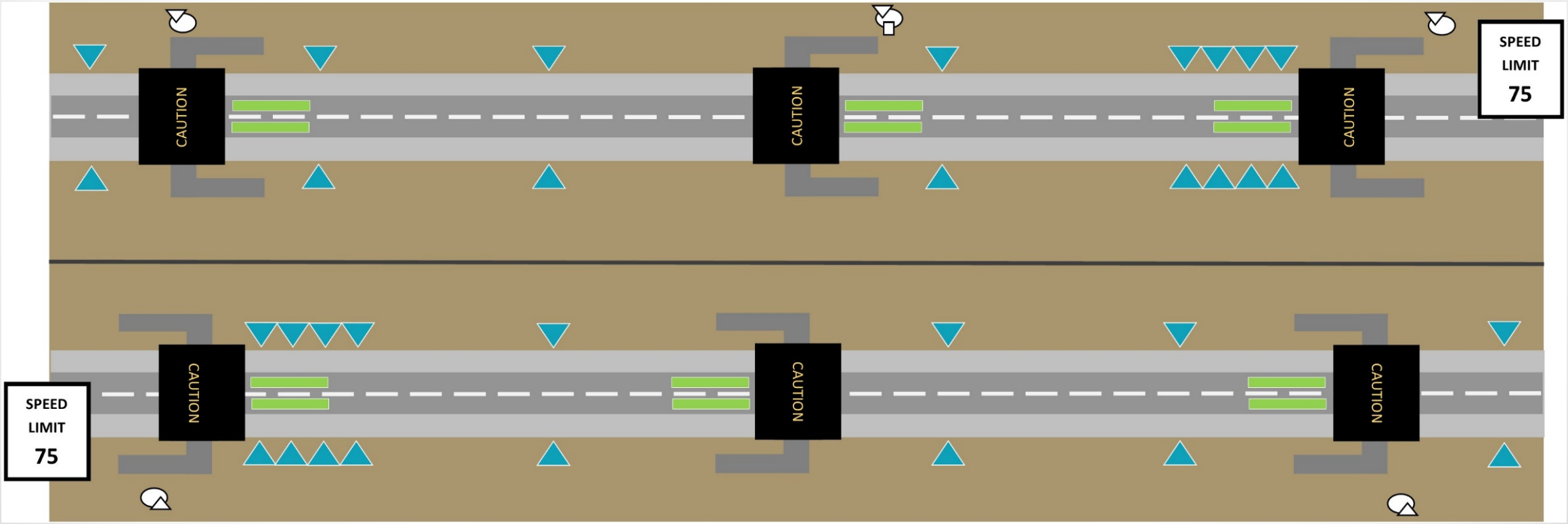
Project Infrastructure Overview

Speed Feedback Signs

- 1 per direction (EB and WB)
- Located after speed reduction sequence
- Speed Feedback Signs, controller, and power/comm cabling <u>furnished and installed</u> by contractor

Project Infrastructure Overview

Communications Equipment

- Ethernet communications at cabinet level
- Communications between corridor TOC via Internet connection
- A single network connection between one field cabinet and the Internet Service provider

Everything Works Together!