



# 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

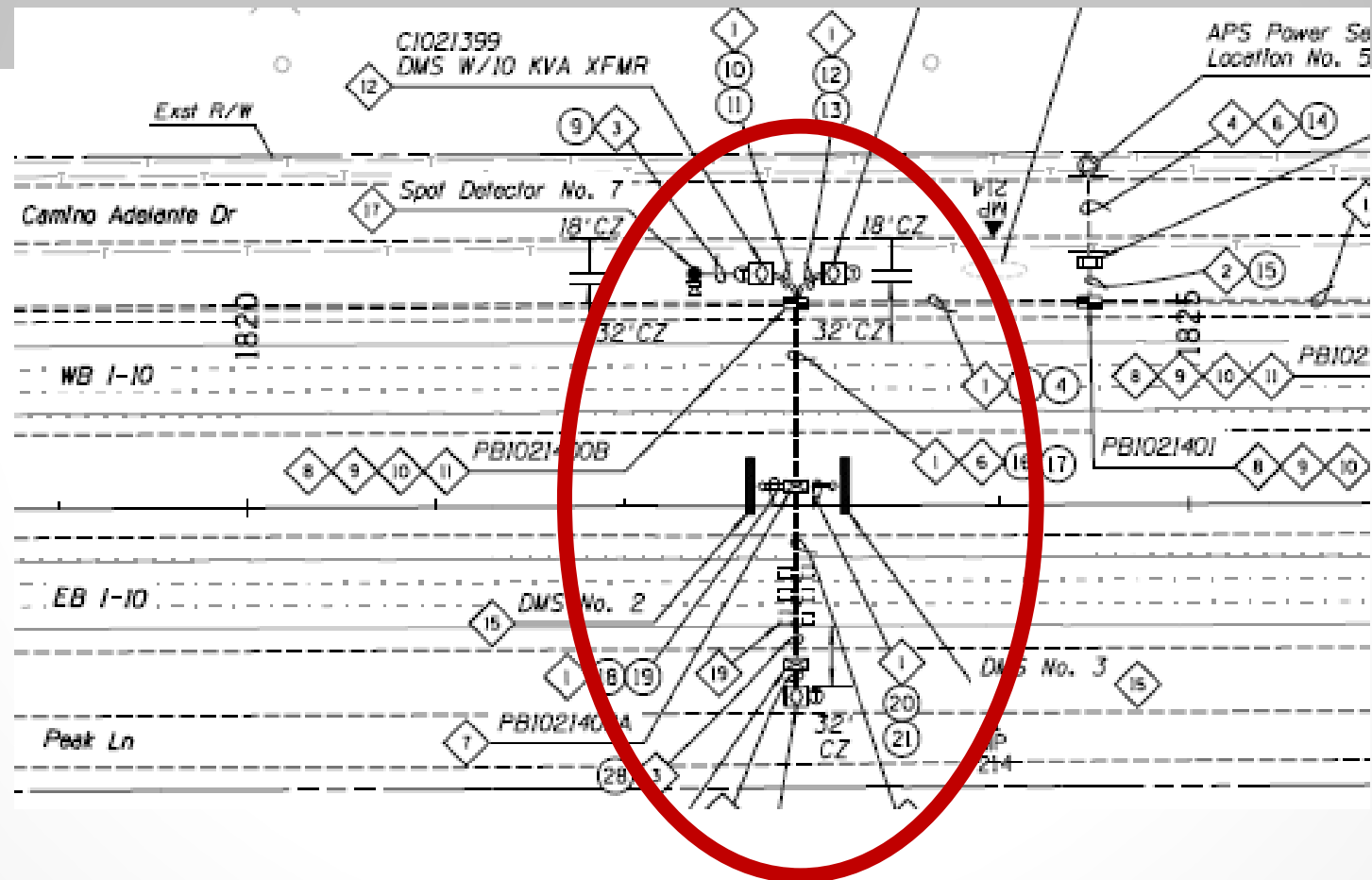


# I-10, Sunshine Blvd to Picacho Peak Rd

CONSTRUCT WEATHER  
DETECTION SYSTEM

## 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

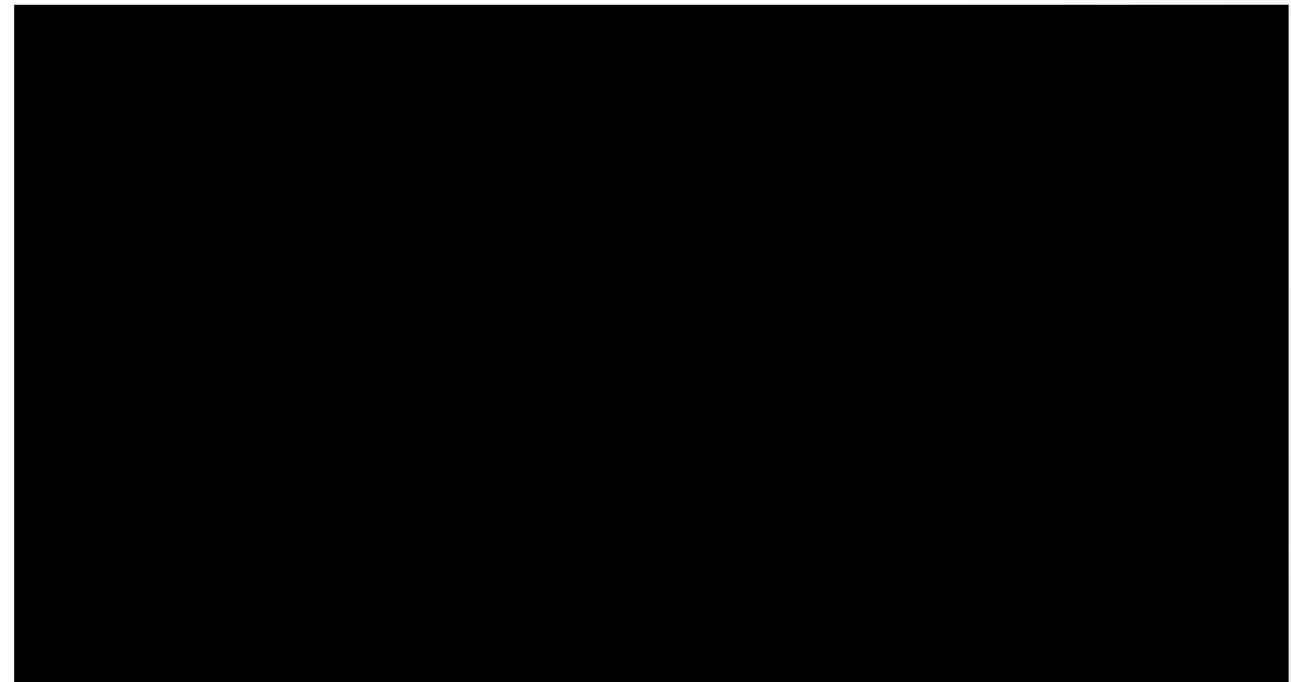
## New Technology for ADOT



# 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



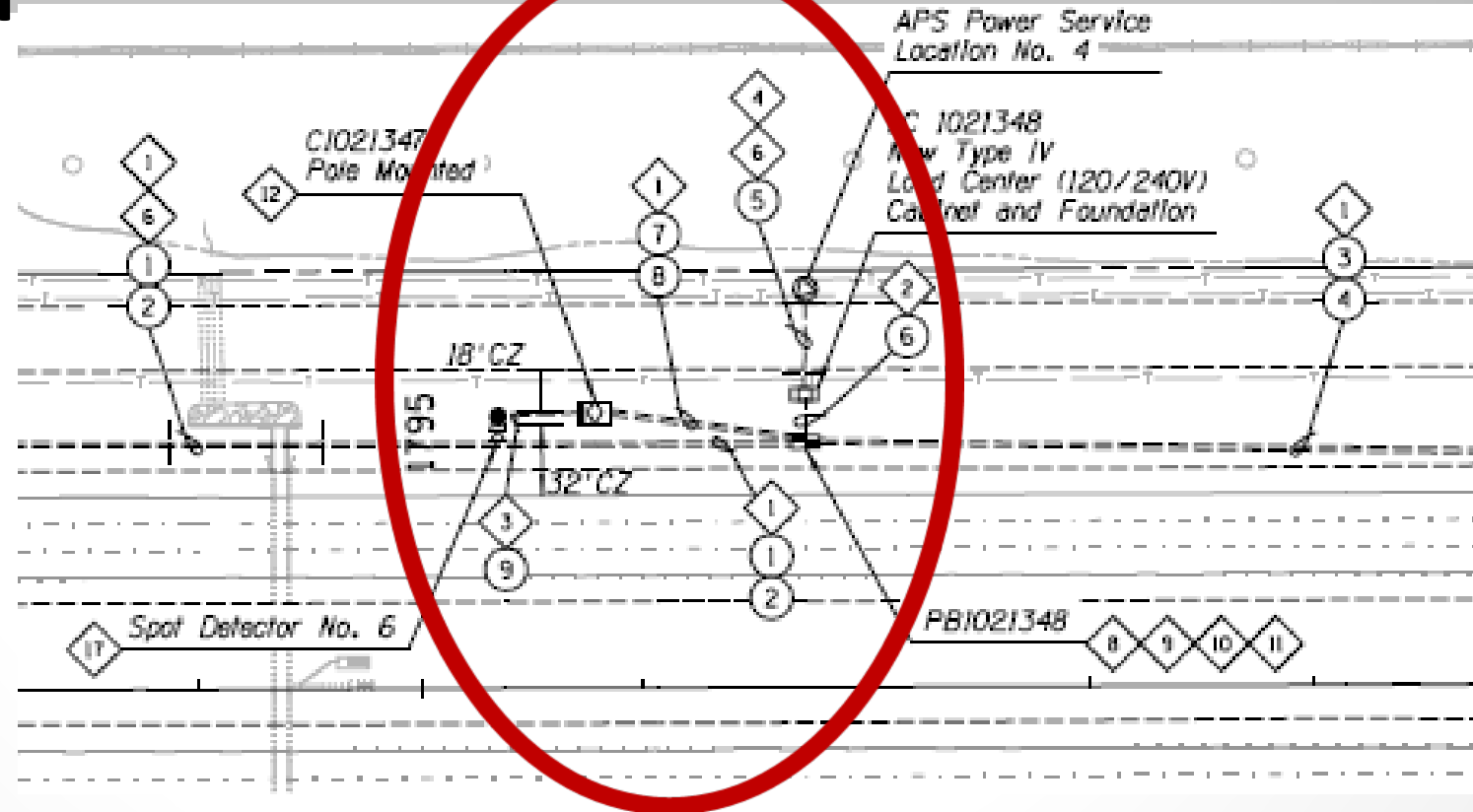


# I-10, Sunshine Blvd to Picacho Peak Rd

CONSTRUCT WEATHER  
DETECTION SYSTEM

# Project Infrastructure Overview

## Spot Detection





# Project Infrastructure Overview

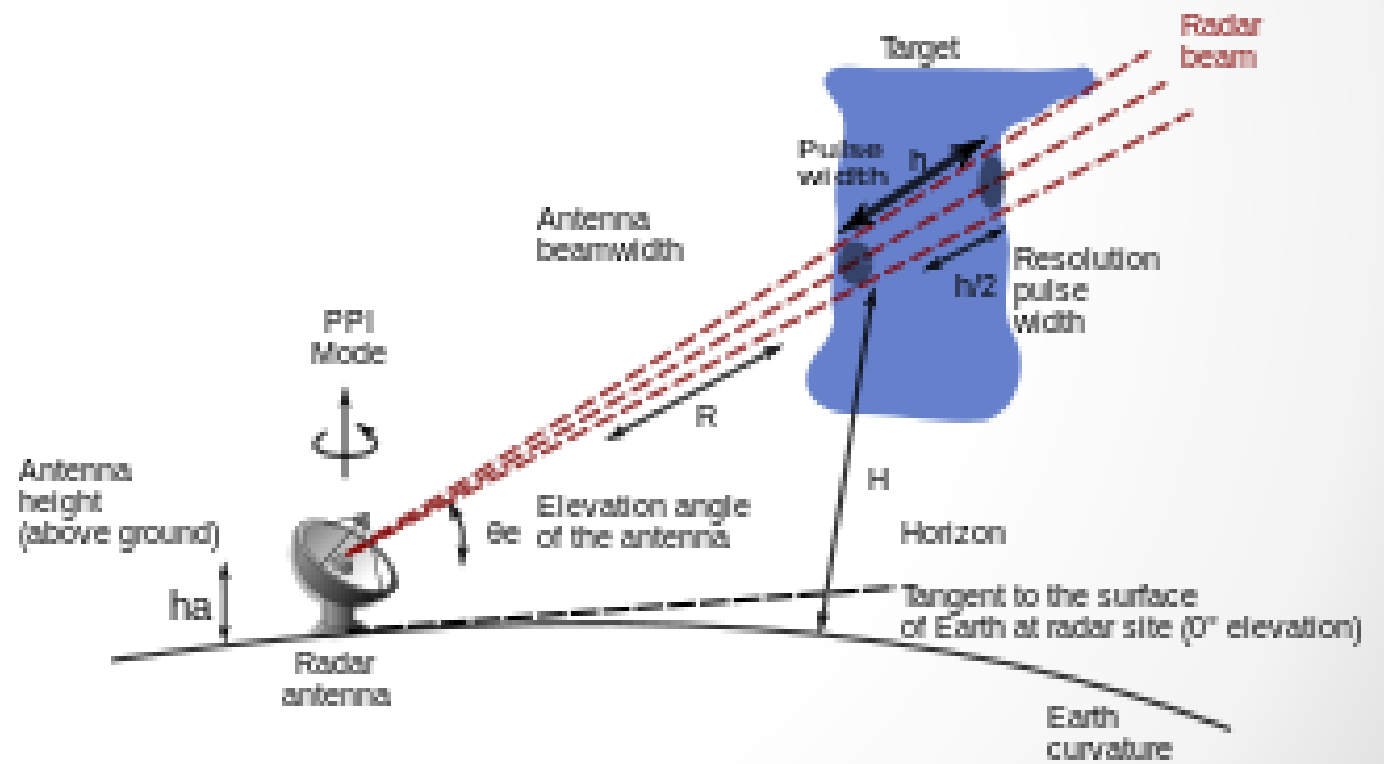
## Long Range Detection

- 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

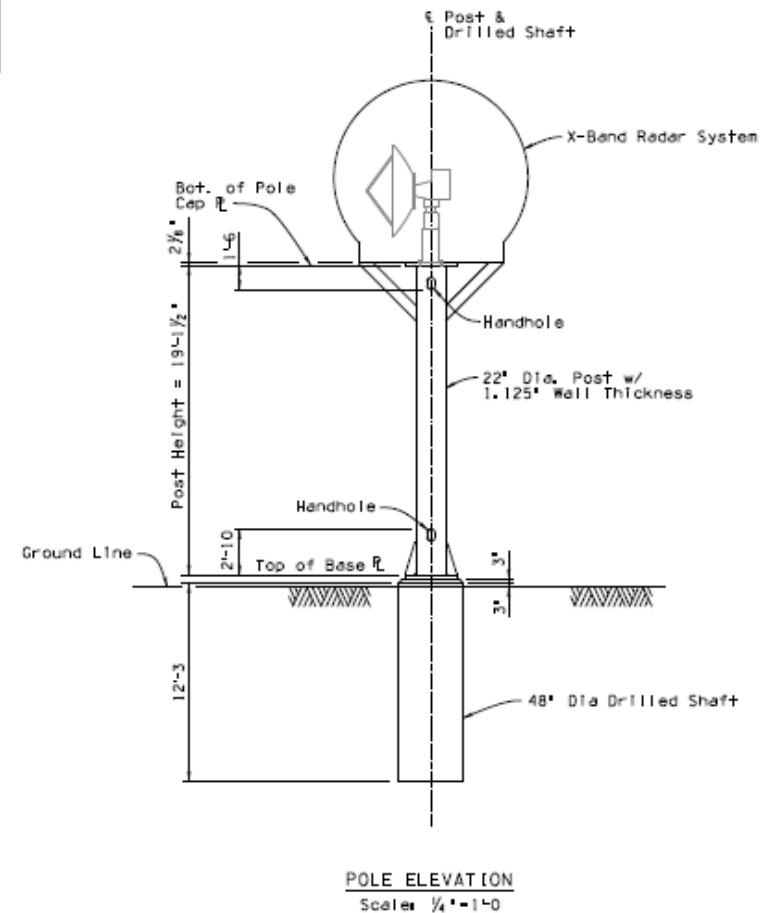




# Project Infrastructure Overview

## Long Range Detection

- Mounted on a 20' tall monotube structure
- Inside a **radome**





# Project Infrastructure Overview

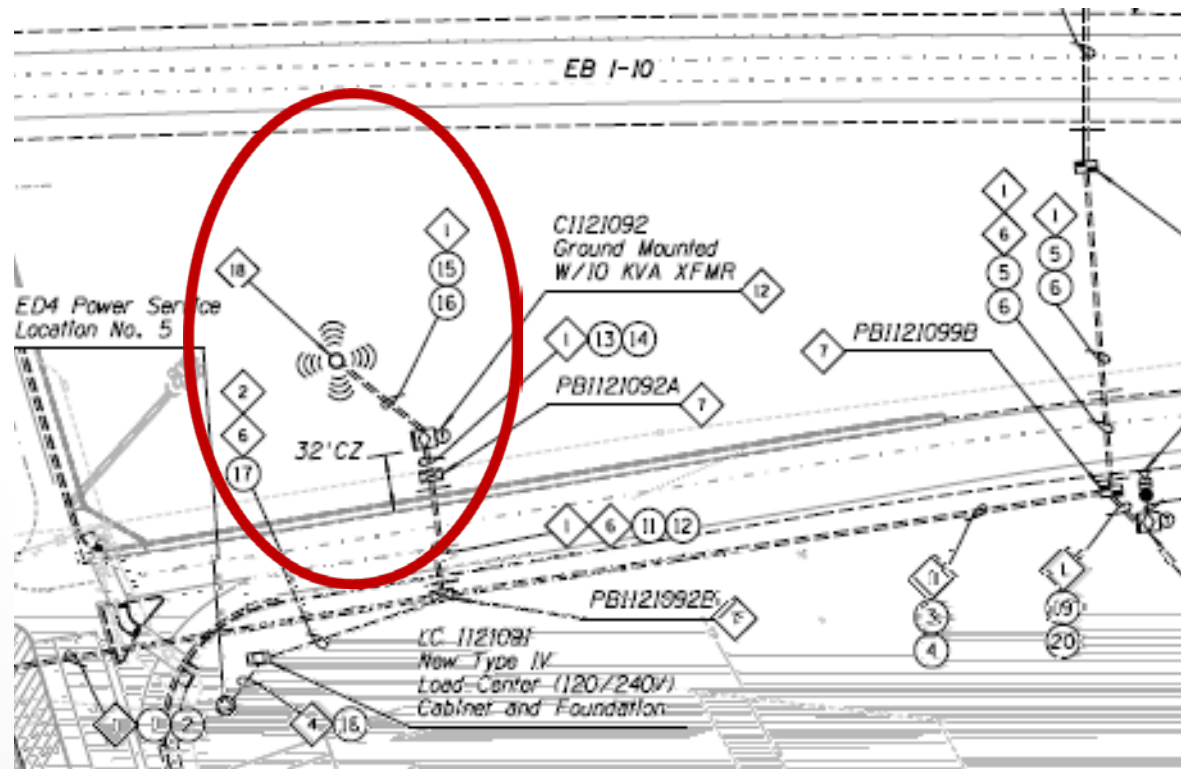
## Long Range Detection

- 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



**I-10, Sunshine Blvd to Picacho Peak Rd**

**CONSTRUCT WEATHER  
DETECTION SYSTEM**

# Project Infrastructure Overview

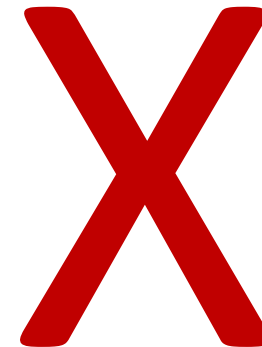
## Variable Speed Limit Signs





# Project Infrastructure Overview

## Variable Speed Limit Signs





# Project Infrastructure Overview

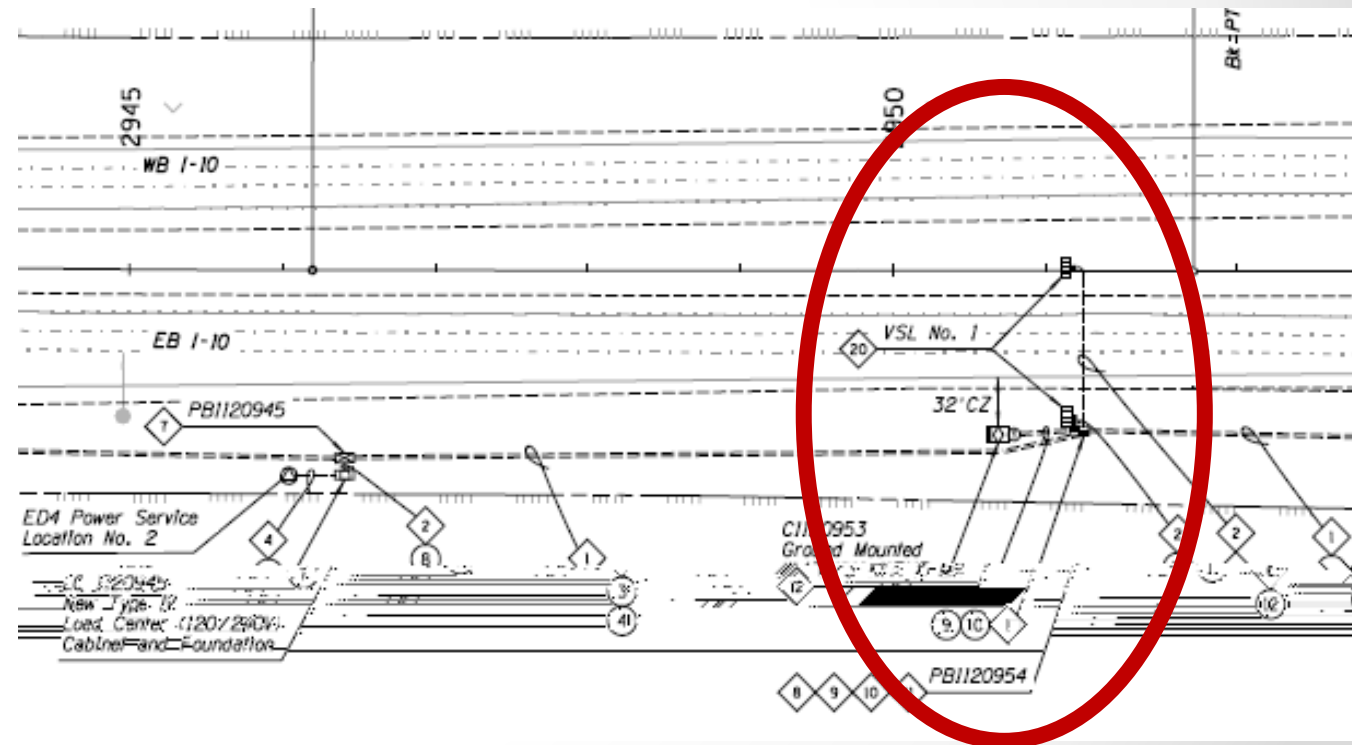
Variable Speed Limit Signs **Example**



# 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 furnished and installed 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



**I-10, Sunshine Blvd to Picacho Peak Rd**

**CONSTRUCT WEATHER  
DETECTION SYSTEM**

# Everything Works Together!

