

California Incline Project



By: City of Santa Monica

To: Western Bridge Engineering Seminar



Agenda

California Incline Project

Project Background

Design

Construction

Q&A

California Incline Bridge Replacement



California Incline Bridge Replacement

Project History

- Original road built in 1896, called Linda Vista Dr
- Original bridge structure was built in 1930

Project Need

- Caltrans/LA County determined CA Incline bridge was structurally deficient.
- Replacement more cost effective than rehabilitation and retrofitting
- Pedestrian/bicycle safety improvement
- Traffic Signal Enhancement
- Slope Stabilization

California Incline Bridge Replacement

Project Background

- Planning, design began in 1992 and FHWA HBP funds were programmed
- 1994 Northridge EQ derailed the funding and project
- EIR preparation began January 2003
- EIR was approved July 2012
- Design completed July 2014
- Bid posted October 2014
- City used A+B bidding format
- Contract awarded January 2015
- Construction began April 2015

California Incline Bridge Replacement

1910s CA Incline



1915 CA Incline



1930s CA Incline



1984 Olympic Torch

Credit: LA Public Library

California Incline Bridge Replacement

Original CA Incline Roadway

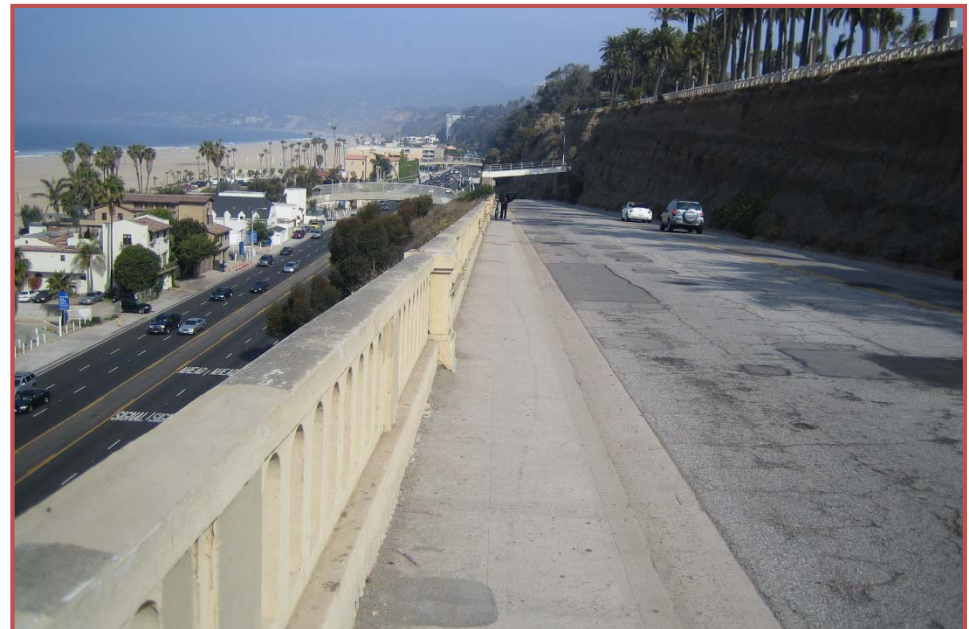
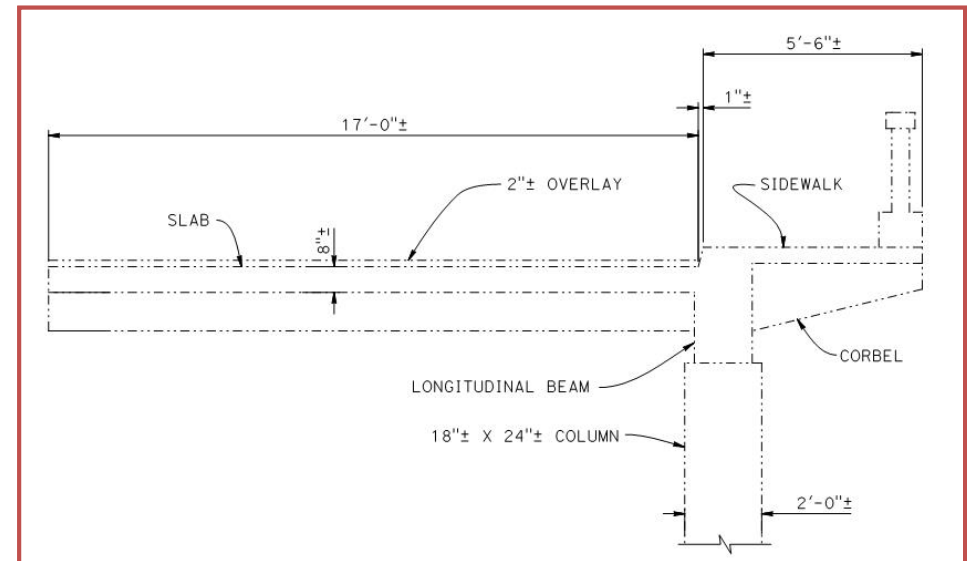
- Length: ~1,400 linear feet (0.27 miles)
- Width: 46 feet
- Northbound Lanes: 1
- Southbound Lanes: 1 with left turn pocket
- Pedestrian Access: 4½-foot wide walk, west side only

New CA Incline Roadway

- Length: ~1,400
- Width: 51 feet 8 inches
- Northbound Lanes: 1 with PCH Turn Pocket
- Southbound Lanes: 1 – with Ocean Av Turn Pocket
- Pedestrian Access: 16-foot wide bicycle and pedestrian walkway; both physically separated from traffic

California Incline Original Bridge

- Series of sidehill viaducts
- Partial width across roadway
- Transverse beams on grade
- 8" conc. deck with AC overlay
- Edge beam with columns
- Cantilevered sidewalk
- Balustrade railing
- Spanned erosion rills (gullies)
- Posted for 3 ton limit
- Deteriorated concrete



California Incline Original Bridge



California Incline Original Bridge

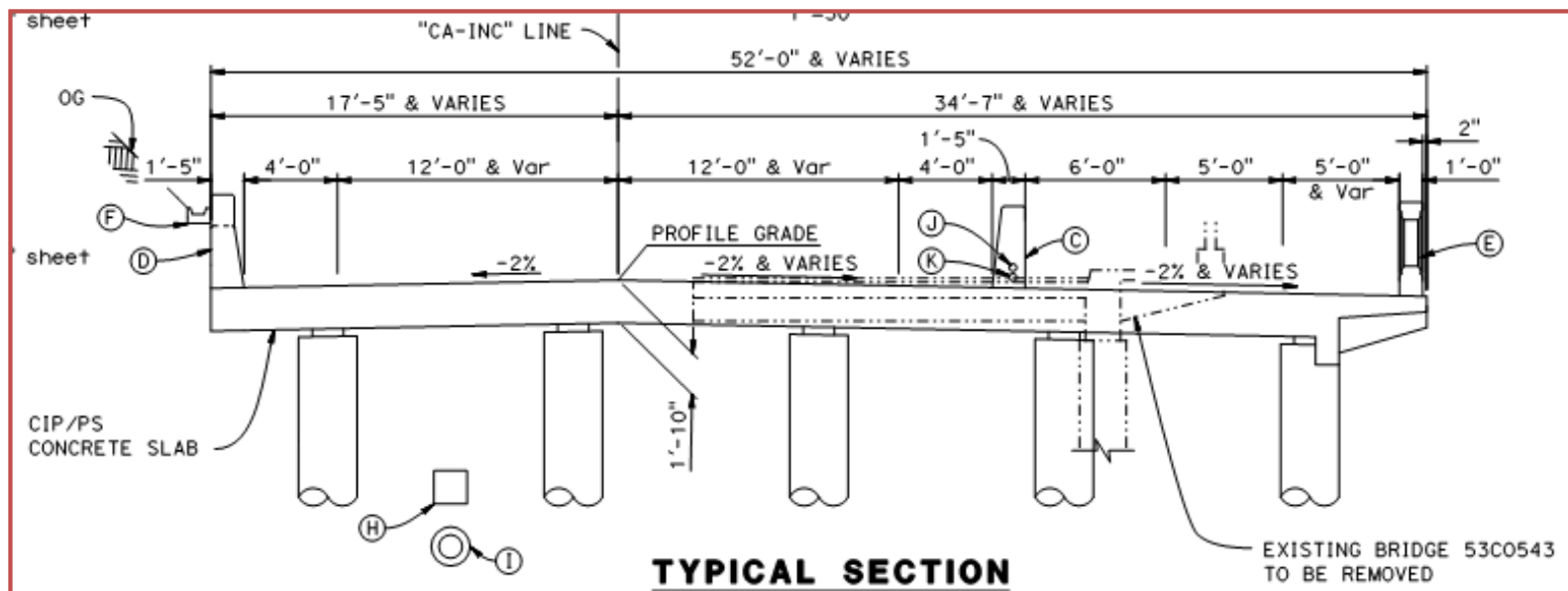


California Incline Original Bridge



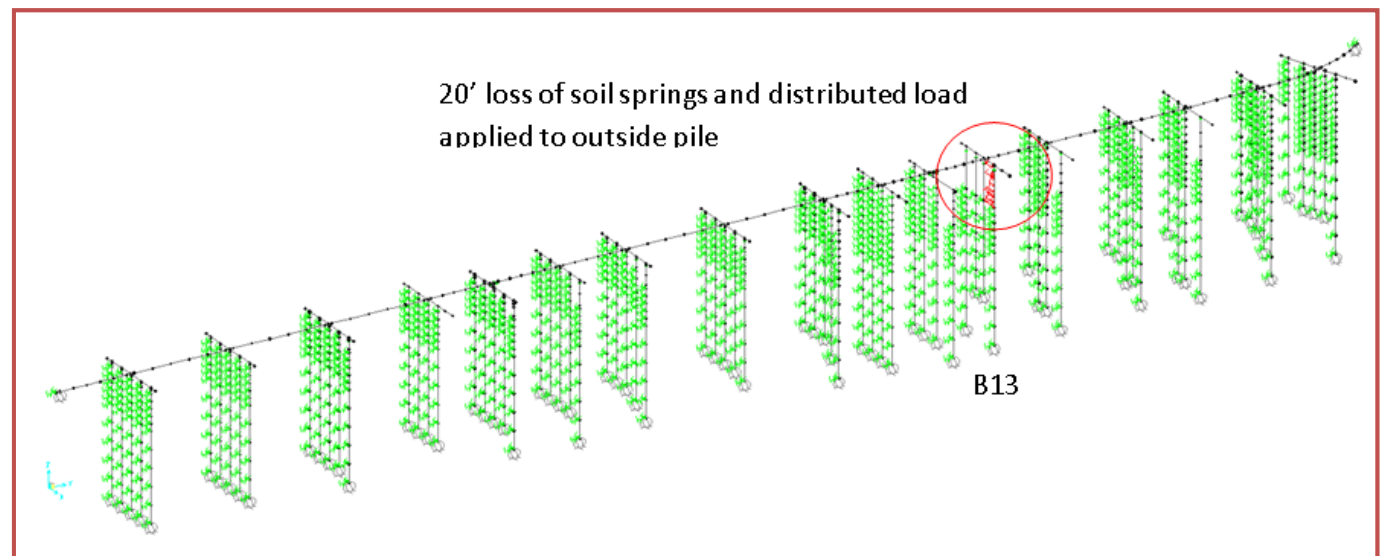
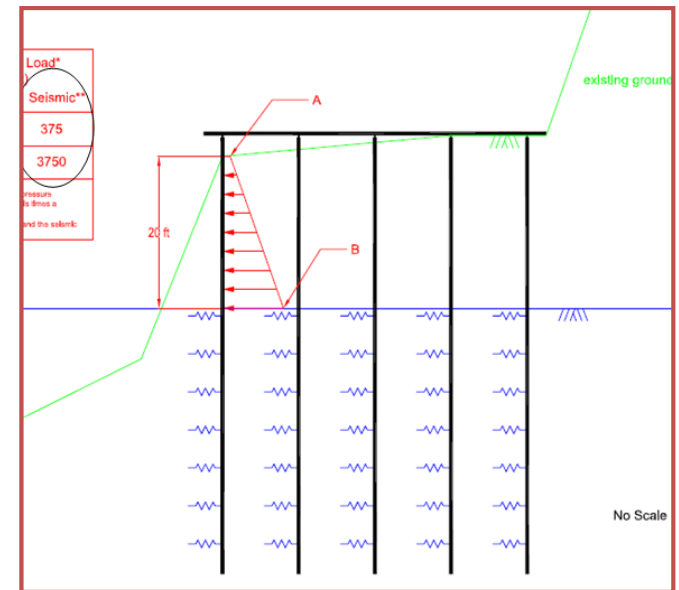
California Incline New Bridge

- Year long type selection process
- Full width bridge across roadway
- 750-ft long CIP/PS Slab
- 3 Frames ~ 250' long
- 89 – 30" CIDH Piles
- Cast on original ground and falsework



California Incline New Bridge

- High seismic, $PGA = 0.6g$
- Local bluff failure loading
- Designed for 20' of erosion
- Corrosive soil
- Replicated balustrade railing (Texas barrier) and sidewalk



California Incline New Bridge



California Incline Soil Nails

- Stabilized upper bluffs for seismic stability
- Approximately 1000 soil nails - #10 bars Gr 75 – up to 75' long
- Colored grout to match slope



California Incline Closure (Detour Map)

CALIFORNIA INCLINE CLOSURE — Detour Map —




Beach House

Beach Access:

- Montana Ave Ped Bridge
- Moomat Ahiko

 CALIFORNIA INCLINE - (Closed in both directions for 12 - 14 months)

DETOUR ROUTES

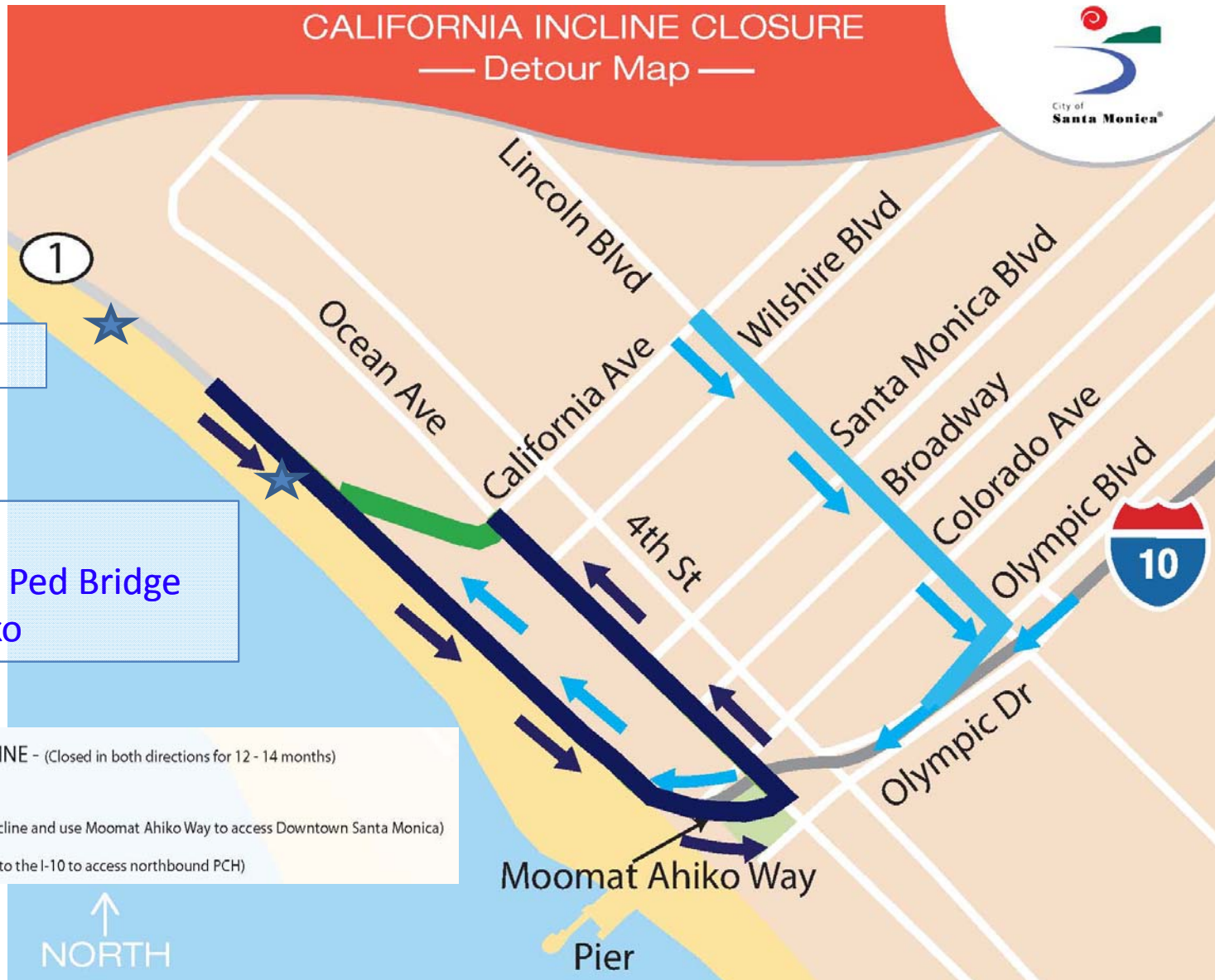
 INBOUND TRAFFIC (Continue past the incline and use Moomat Ahiko Way to access Downtown Santa Monica)

 OUTBOUND TRAFFIC (Use Lincoln Blvd. to the I-10 to access northbound PCH)

NORTH

Moomat Ahiko Way

Pier



California Incline Bridge Replacement

- Contract Time
- Incline Detour Closure
- Bluff Protection
 - Access
 - Sidehill Falsework
 - Bridge Demo
 - Soil Nails

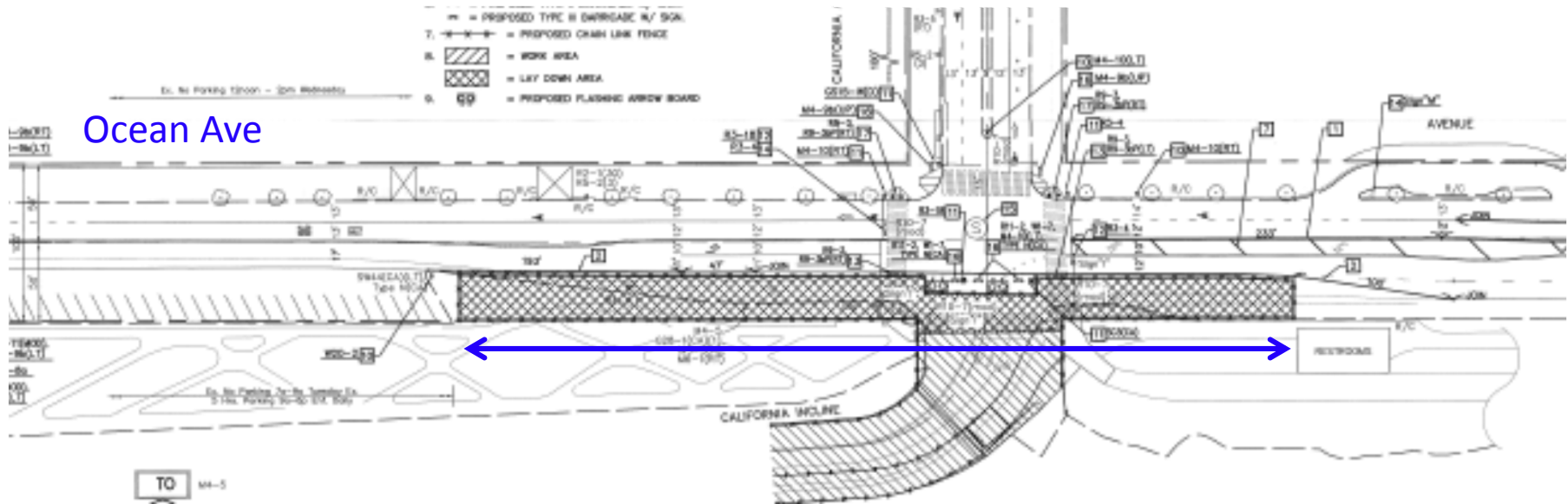
Construction Challenges



California Incline Closure Palisades Park

California Ave

Ocean Ave

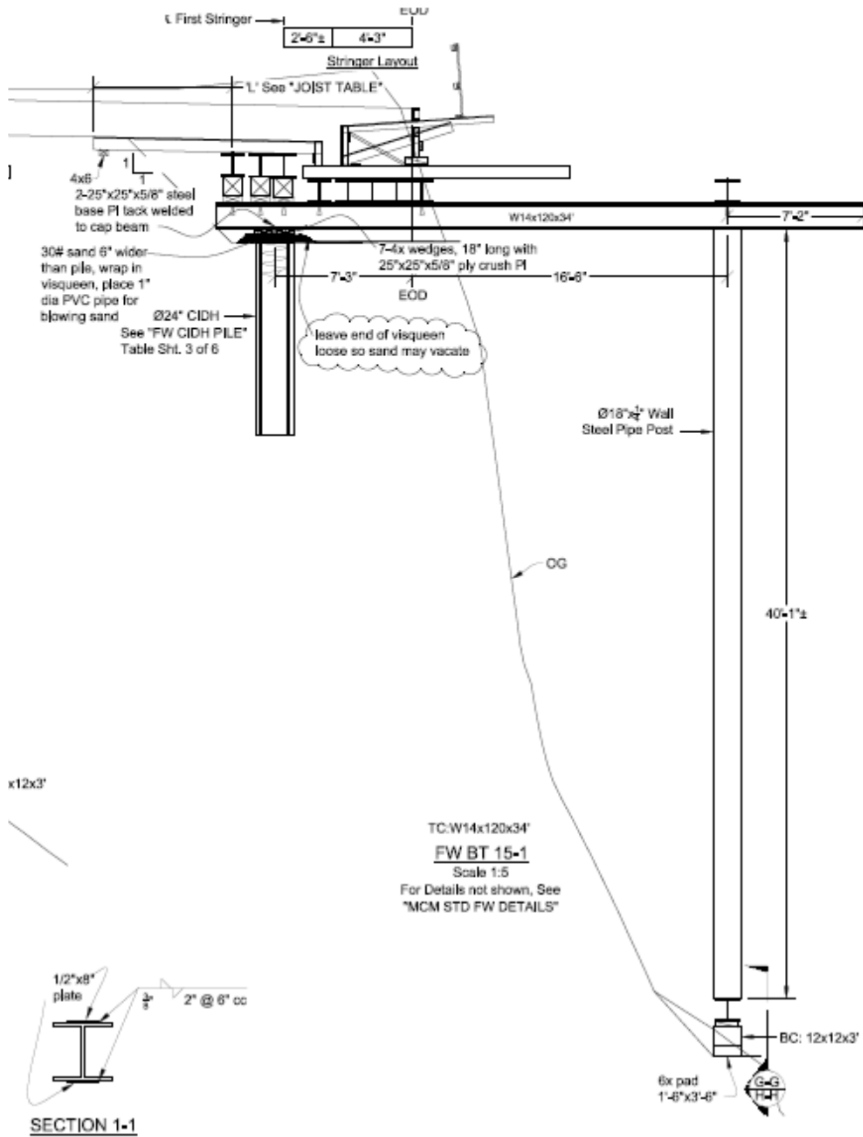


Contractor's Stage and Work Area on Ocean Ave.

California Incline - Access



California Incline - Falsework



F/W Interior CIDH Piles

- Caving Soils
- Heavy Bent Loads
- Access

Top Cap - Sand / Burritos Supports

- Load Tested
- Easier Cap Removal

Stability and Pour Sequence

- Settlement – F/W vs Slab on Grade

California Incline - Falsework

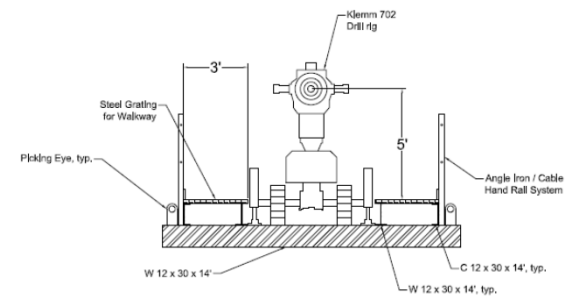


Burrito Wrap Sand Jack

California Incline – Upper Bluff Stabilization (Soil Nails)



- 250 Ton Crane
- 20' x 20' Drill Platform
- Klemm 702 Drill Rig
- Crane Safety
 - DL Test
 - Rigging Safety
 - Critical Pick and Platform Stabilization



California Incline – Upper Bluff Stabilization (Soil Nails)



California Incline – Upper Bluff Stabilization (Soil Nails)



California Incline – Upper Bluff Stabilization (Soil Nails)

- Proof Testing
- Testing and Reaction Assembly



- Drilled Hole Integrity
- Colored Grout

California Incline

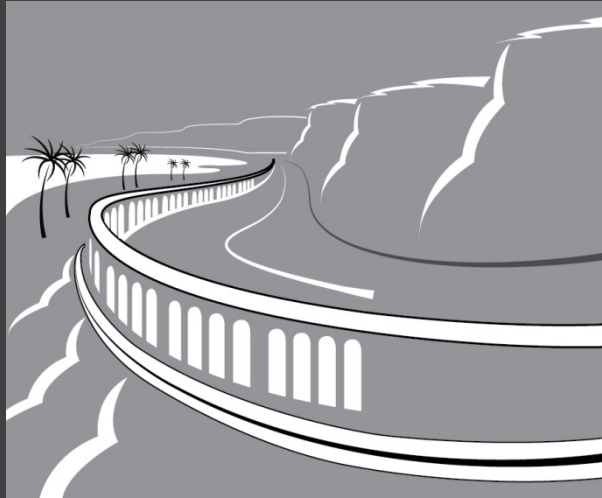
SOARIN' OVER

**CALIFORNIA INCLINE
PROJECT**

Presented
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City of Santa Monica



Q&A



California Incline

