



TESORO AVON MOTEMS STRUCTURAL AND SAFETY COMPONENTS

September 27, 2016

PROJECT OVERVIEW



- MOTEMS - Standards were developed to ensure that California Marine Oil Terminals meet the highest levels of safe operation and protection of the environment
- The project consists of upgrading the existing Avon Marine Terminal to current MOTEMS Standards
- Project will be completed by June 2017

MARTINEZ REFINERY MARINE TERMINALS



AVON WHARF BEFORE THE START OF MOTEMS UPGRADES



STATE OF ART PROJECT DESIGN



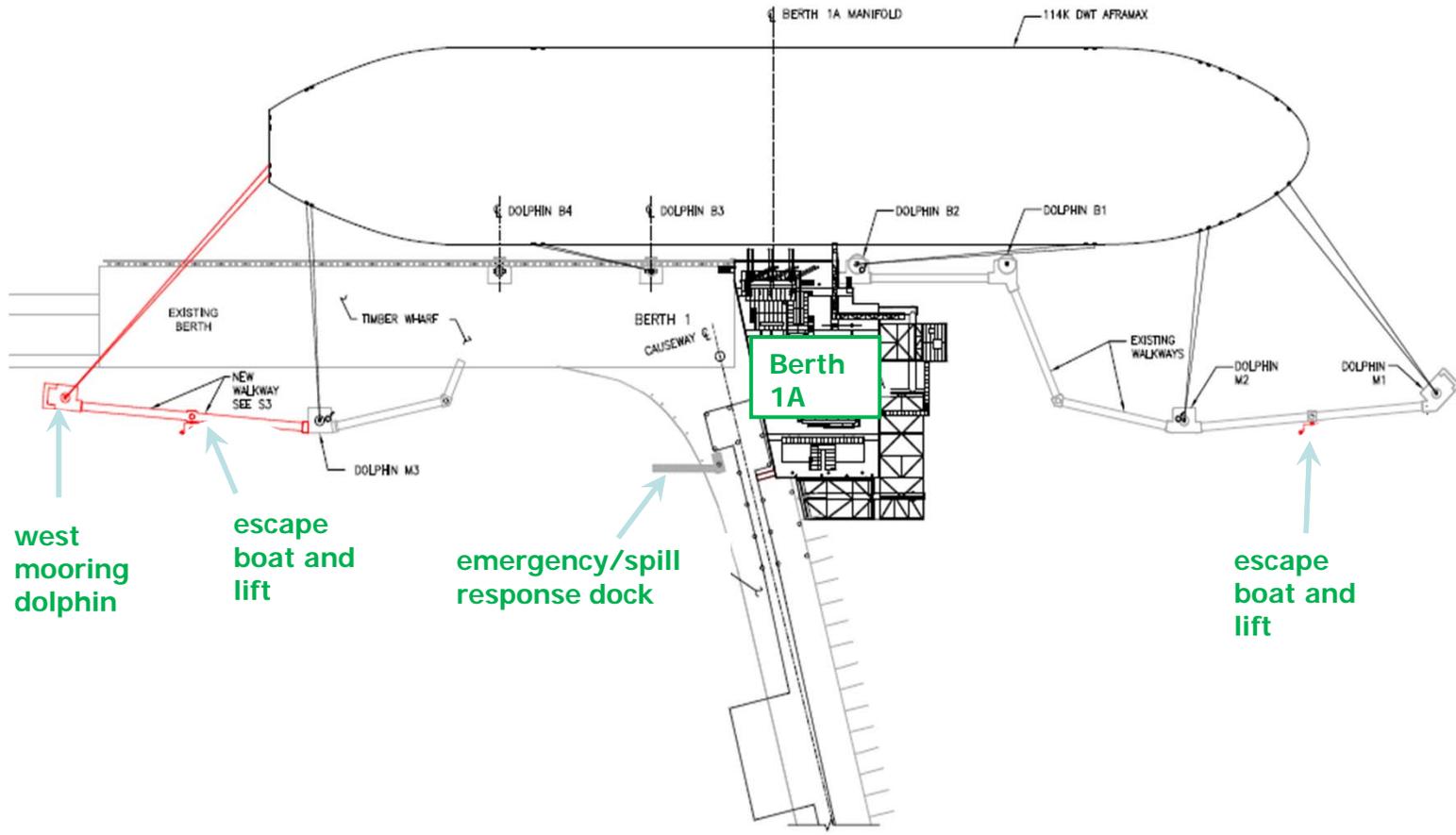
- Designed by Marine Terminal Engineering Experts
 - Anvil – Electrical & Piping
 - Ben C. Gerwick / COWI – Structural
 - Langan Treadwell Rollo – Geotechnical
- Utilized three dimensional Computer Aided Design (CAD)
- Extensive Design Quality Assurance (QA) by multiple engineering specialists
- Design, drawings and calculations evaluated by CSLC and the BCDC Engineering Criteria Review Board

SAFETY ASPECTS



- Rigorous seismic design criteria required by MOTEMS (that exceed normal local earthquake building codes)
- Rapid pipeline shut-off valves to significantly decrease response time for operators
- Enhanced emergency response capabilities
 - Additional fire fighting and spill response equipment
 - Automated / elevated monitors with remote operation capability
 - New response boat dock
 - Two emergency escape boat lifts
 - Fire detection and alarm system
- New state-of-the-art Operations Control Building

NEW TERMINAL PROJECT ELEMENTS



west mooring dolphin

escape boat and lift

emergency/spill response dock

escape boat and lift

MODULE CONSTRUCTION BEGINS



SETTING OF NEW CONTROL BUILDING



BERTH 1A LAYOUT / PROGRESS

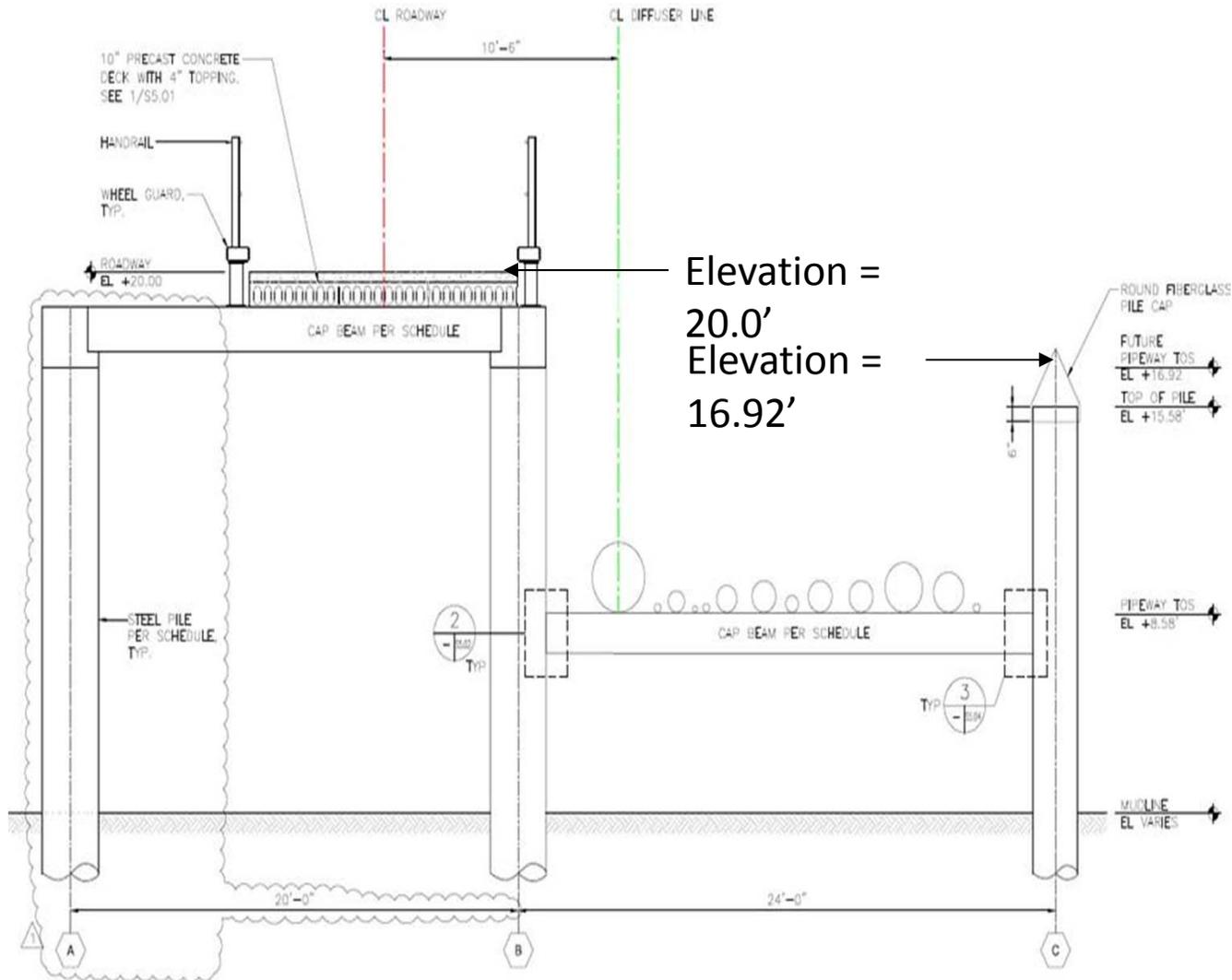


COMPLIANCE WITH BCDC PLANS & POLICIES



- New Berth 1A, terminal approach road and pipeway supports designed to accommodate future sea level rise per BCDC San Francisco Bay Plan
- Installation of five seismic accelerometers on the new Berth 1A and approach road

TYPICAL NEW TRESTLE "BENT"

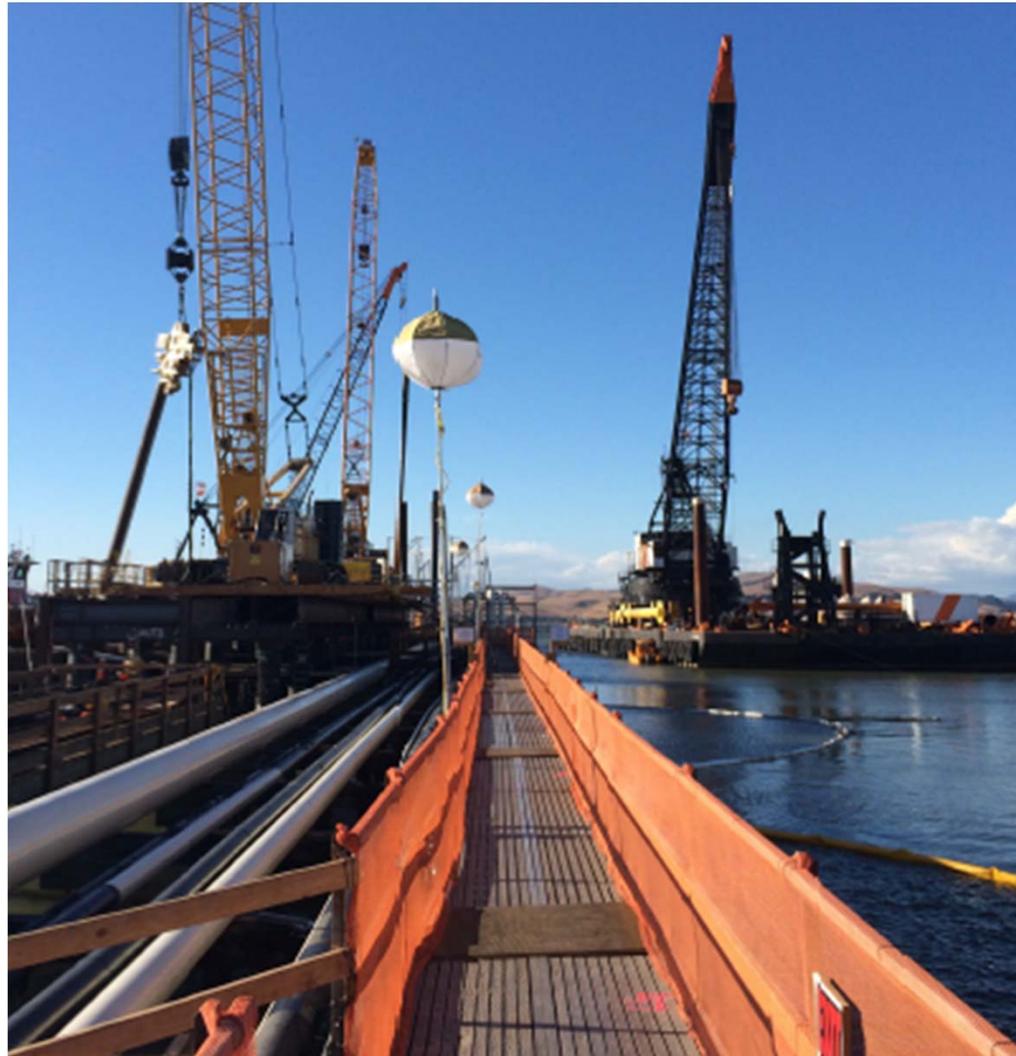


Elevation =
20.0'
Elevation =
16.92'

C2 TYPICAL SECTION
3/8"=1'-0"

NEW TRESTLE - AREA C
AREA C - SHOWN: BENT 75A

OLD TRESTLE AND PIPE SUPPORTS



NEW TRESTLE AND PIPE SUPPORTS



NEW BERTH 1A PIPING CONNECTION TIE IN LOCATION



INTERESTING CRANE LIFT

