



# Platform Holly Sub Sea Power Cable Replacement

October 8, 2014

# Platform Holly Cable Replacement

## Platform Holly Cable

- Installed in 1966 as part of original Platform
- Power Cable de-rated over years
- At times Cable has limited production
- Bundled communication cables had already failed
- Cable pre-dated modern design and codes
- Cable and Power Supply Reliability in question





# Platform Holly Cable Replacement

## Project Goals

- As Built Replacement of Power Cable
- Restore power supply to original load capability
- Update communications cable to fiber optics
- Minimize Environmental Impact
- No platform down time due to cable replacement project
- Complete during routine platform maintenance shutdown in 2014
- KEEP THE LIGHTS ON !



# Platform Holly Cable Replacement

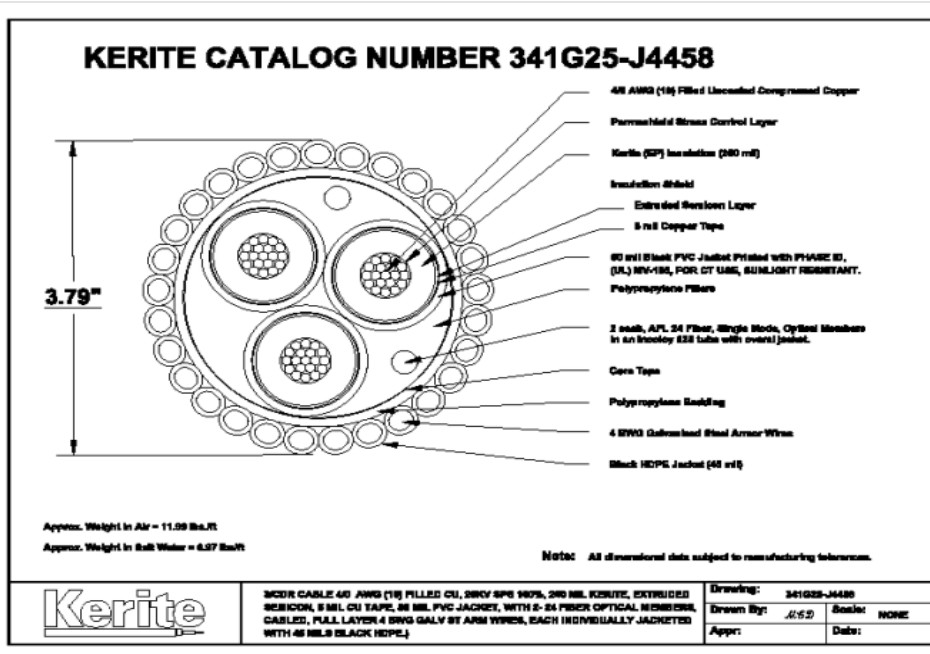
## Project Phases:

- Preliminary Cable Routing
- Cable Design / Specification
- Order the Cable
- Finalize Design
- Permitting
- HDD bore
- Platform I-tube and routing
- Pipeline Crossing
- Construction
- Testing
- Power Cut Over





- Cable Selected:



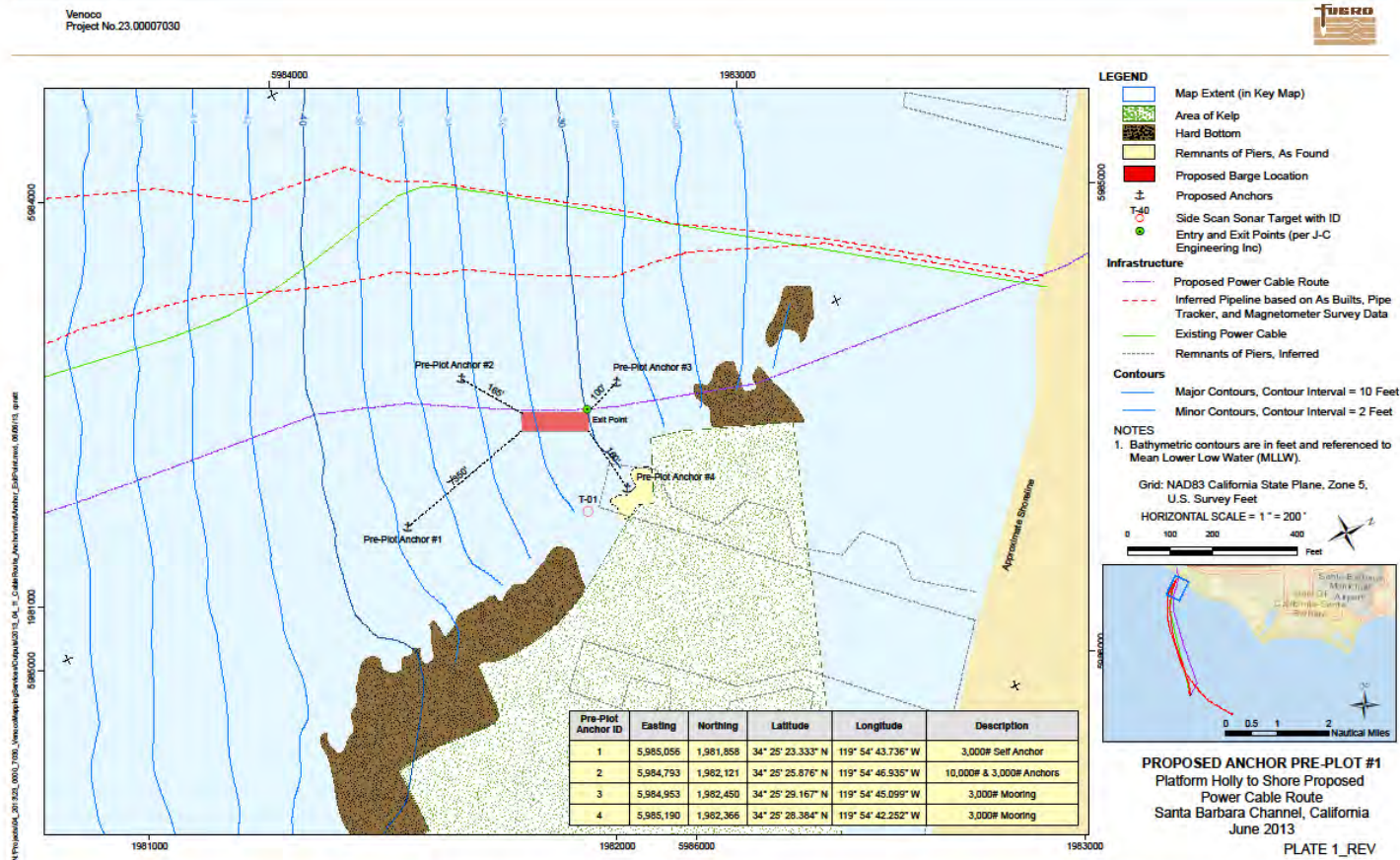


## Final HDD Bore Design – Bennett Trenchless Engineers



# Platform Holly Cable Replacement

## Final HDD Bore Design – New Exit Point







# Platform Holly Cable Replacement

## Permitting

- California State Lands Commission – Lead Agency
- California Coastal Commission
- California Regional Water Quality Control Board
- Department of the Army – Corps of Engineers
- City of Goleta
- Santa Barbara County Air Pollution Control District
  
- Hundreds of Pages / Scores of Conditions
- Months to Obtain





# Platform Holly Cable Replacement





# Platform Holly Cable Replacement

**HDD Bore + Regulatory Monitoring - Every Operation – Every Day – Every Site**



**5 Monitors for 3 -4 ft Entry Hole  
3 = EQAP Monitors in Blue Hats  
1 = Cultural Resources in White Hat  
1 = Native American Monitor in White**





# Platform Holly Cable Replacement

**Contingency Dive Team – Ready on Standby All Day**







# Platform Holly Cable Replacement Rhodamine Dye Requirement





# Platform Holly Cable Replacement

- Inadvertent Surface Release of Drilling Mud
  - Material detected in water, no dye detected
- New Plan
  - Drill and Ream the last 300' with Water Only (No Drilling Mud)





# Platform Holly Cable Replacement







# Platform Holly Cable Replacement





# Platform Holly Cable Replacement

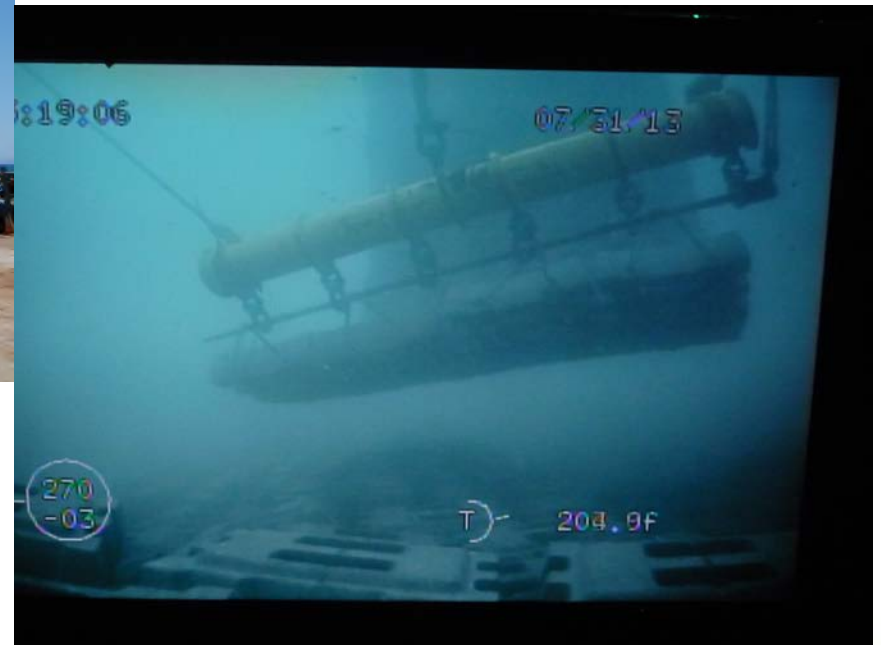






# Platform Holly Cable Replacement

## Pipeline Crossing Mats







# Platform Holly Cable Replacement





# Platform Holly Cable Replacement







# Platform Holly Cable Replacement

Lay the Cable – First Pull Cable Into Ellwood Onshore Facility





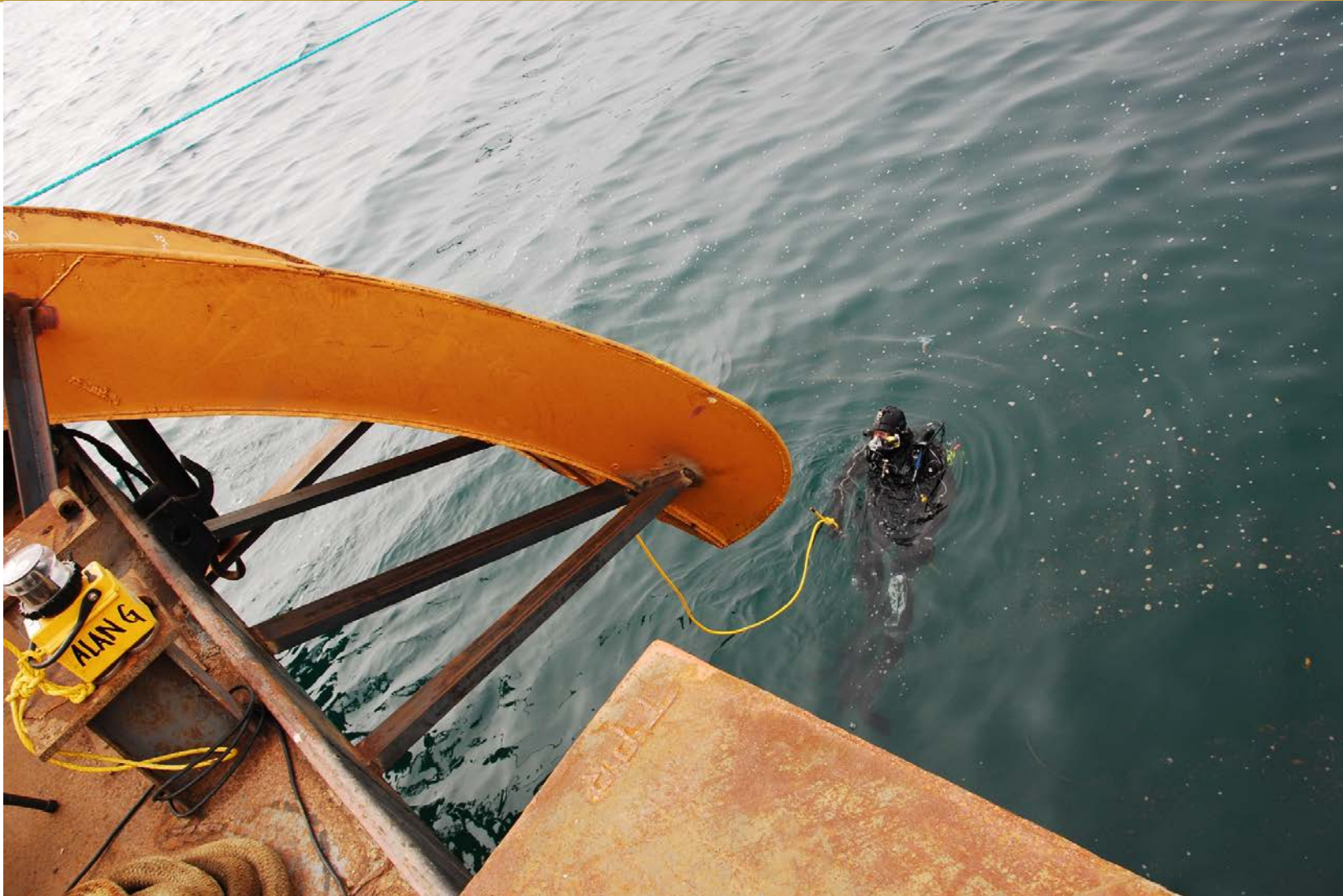


# Platform Holly Cable Replacement





# Platform Holly Cable Replacement







# Platform Holly Cable Replacement







# Platform Holly Cable Replacement

Lay the Cable – Now to Holly – Tight Work Space Constraints





# Platform Holly Cable Replacement







# Platform Holly Cable Replacement







# Platform Holly Cable Replacement

## OOPS !





# Platform Holly Cable Replacement

## It Gets Worse - Twisted

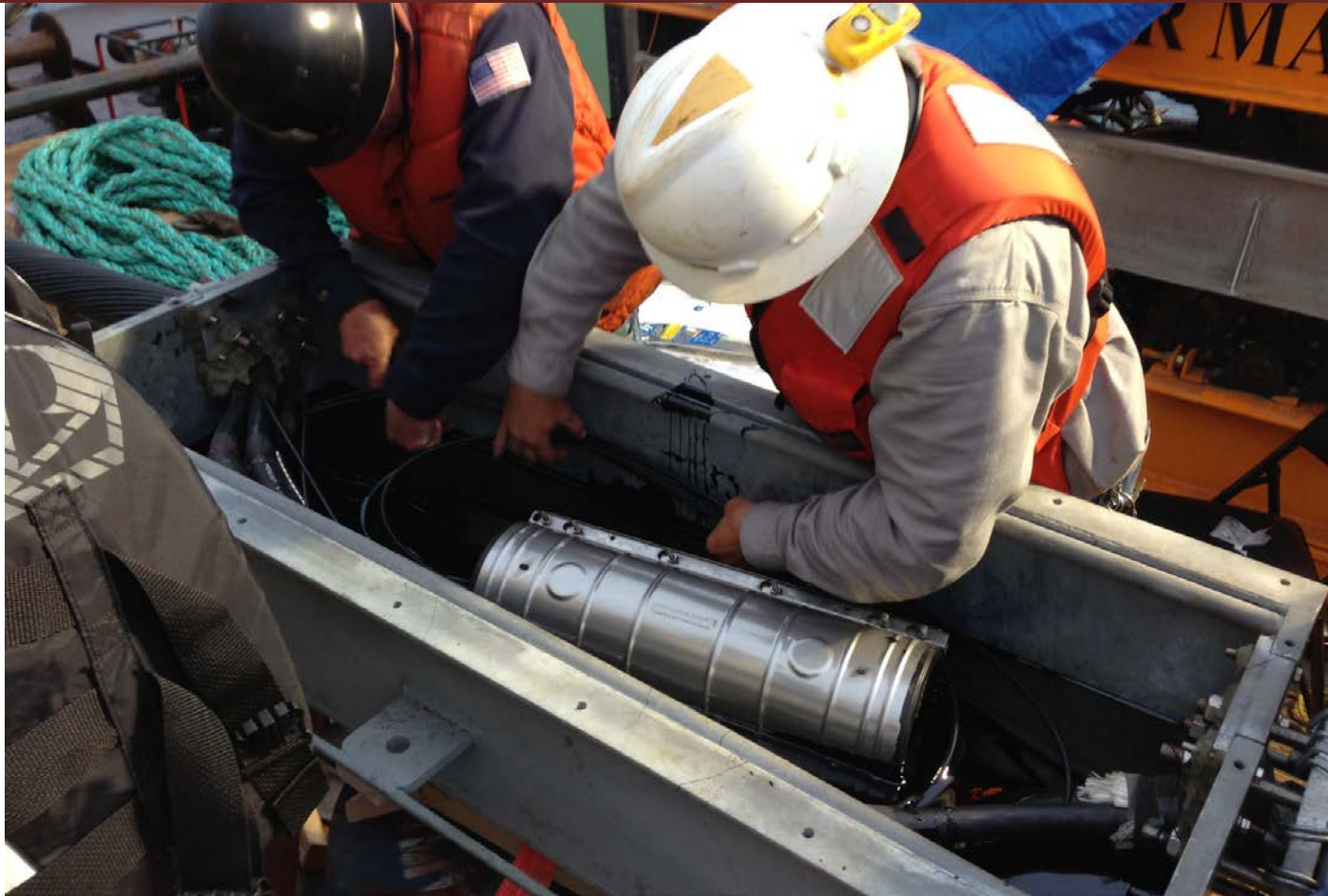






# Platform Holly Cable Replacement

## Cut & Splice it Together







# Platform Holly Cable Replacement

## Splice Again, Rinse & Repeat





# Platform Holly Cable Replacement







# Platform Holly Cable Replacement





# Platform Holly Cable Replacement







# Platform Holly Cable Replacement







# Platform Holly Cable Replacement







# Platform Holly Cable Replacement

## Up Through the I-Tube





# Platform Holly Cable Replacement







# Platform Holly Cable Replacement

## Testing the Cable and Fiber Optics





# Platform Holly Cable Replacement

## Pipeline Crossing – Cable Cover







# Platform Holly Cable Replacement





# Platform Holly Power Cable Replacement

Resident Inspectors Ecstatically signed off project








# Platform Holly Power Cable Replacement

## What did this all cost?

- |                                            |           |
|--------------------------------------------|-----------|
| ➤ Planning, Engineering                    | \$ 357K   |
| ➤ Permitting, Monitoring                   | \$ 571K   |
| ➤ Cable Purchase                           | \$1,587K  |
| ➤ Installation                             | \$5,802K  |
| ➤ Total                                    | \$ 8,317K |
| ➤ <u>Not a single accident of any kind</u> |           |

The background of the slide is a photograph of an offshore oil platform at sunset. The sky is a deep orange and yellow, with the sun low on the horizon, creating a bright glow and lens flare. The platform's steel structure is silhouetted against the bright sky. In the foreground, there are some industrial structures and containers on a barge or pier. Overlaid on the left side of the image is a semi-transparent map of California, with a purple line tracing a path along the coast and into the ocean, likely representing the location of the power cable.

# Platform Holly Sub Sea Power Cable Replacement

Prevention First

October 8, 2014