

# JETTY REHABILITATION AT THE MOUTH OF THE COLUMBIA RIVER

Travis Davidson, P.E.  
Resident Engineer  
Vancouver Resident Office  
Portland District  
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US Army Corps  
of Engineers®



# PRESENTATION OVERVIEW

- Mouth of the Columbia River (MCR) Jetties
- Rehabilitation Schedule and Contract Data
- Jetty Repair Scope
- Construction Methodology
- Challenges and Lessons Learned
- Future Portland District Jetty Work





# MCR JETTIES





# REHABILITATION SCHEDULE/CONTRACT DATA



Project	Contractor	Contract Cost (approx)	Construction Period	Stone Quantity (approx)
South Jetty Dune Stabilization	NW Construction	\$ 1,700,000.00	2013	
North Jetty Lagoon Fill	Catworks	\$ 4,900,000.00	2015	
North Jetty Critical Repairs	J.E. McAmis	\$ 9,700,000.00	2015	52k tons
Jetty A Major Rehabilitation	Kiewit Infr. West	\$ 19,500,000.00	2016	82k tons
North Jetty Rehabilitation	J.E. McAmis	\$ 42,700,000.00	2018-2019	190k tons
South Jetty Rehabilitation	J.E. McAmis	\$ 140,800,000.00	2020-2025 (est)	425k tons
		<b>\$ 219,300,000.00</b>		



# JETTY REPAIR SCOPE



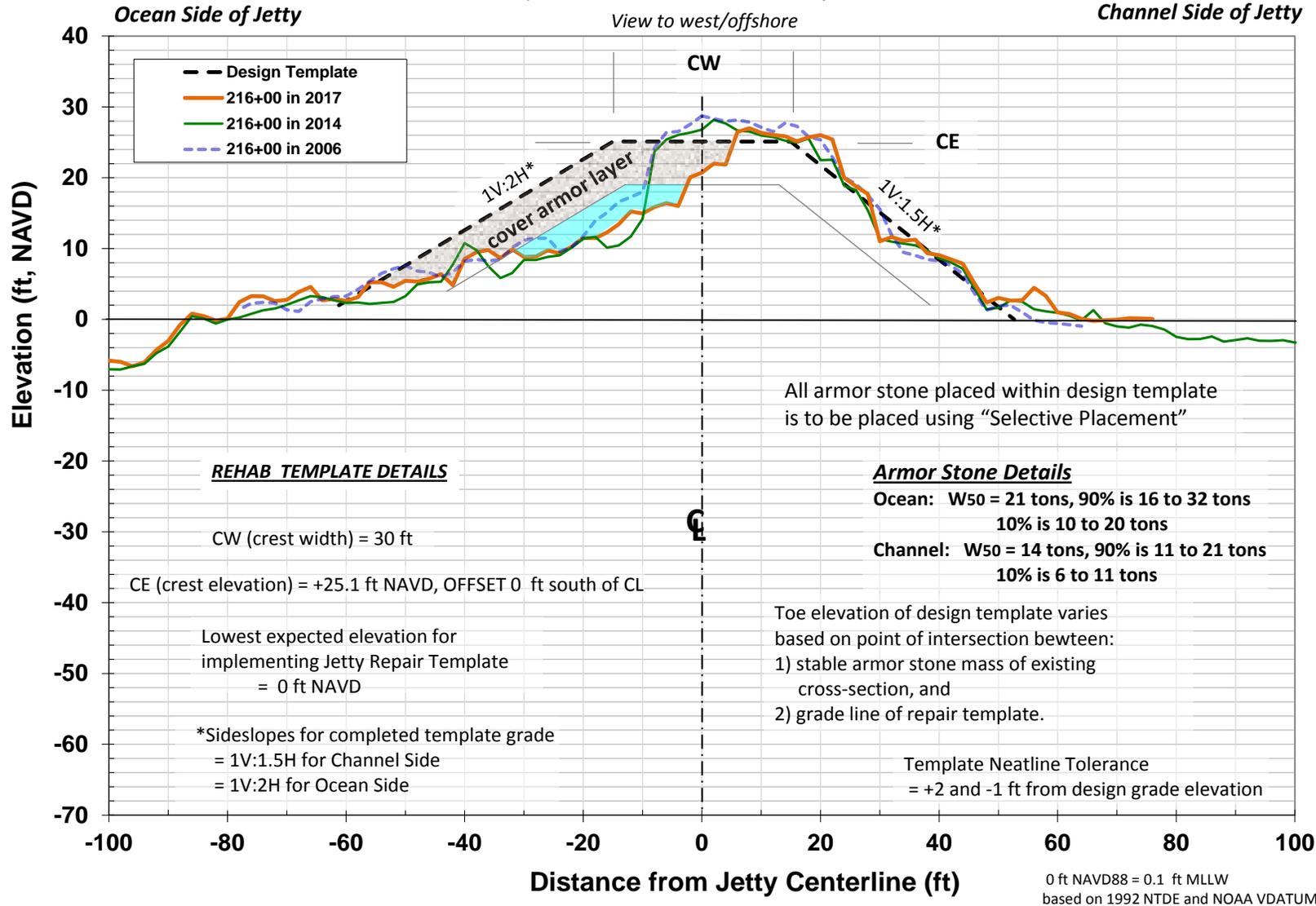


# TYPICAL REPAIR SECTION



## Design Template for South Jetty Rehabilitation: STA 216+00

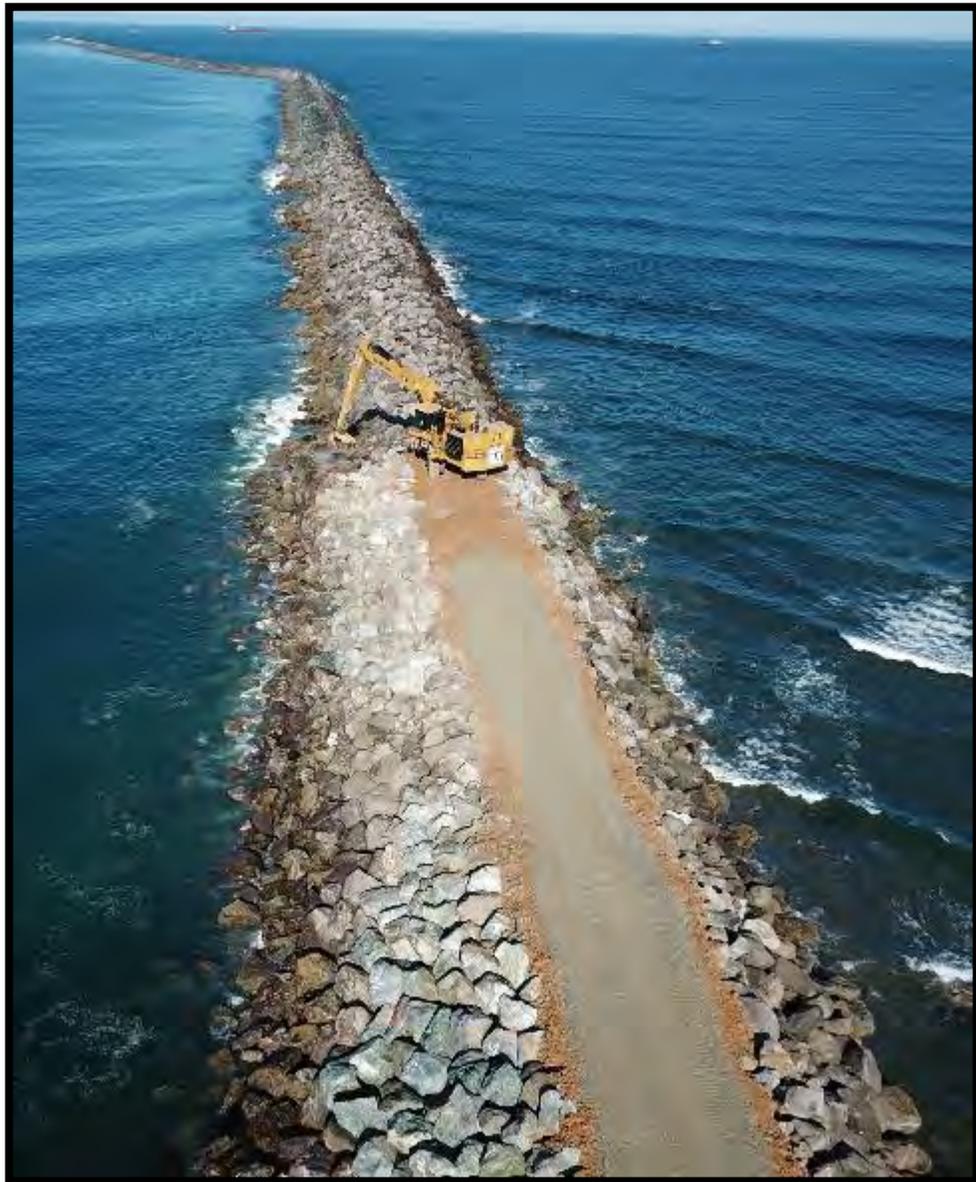
Compared to 2006, 2014, and 2017 Survey Data



- Template optimized to minimize stone quantity
- Larger wave heights/more energy on the ocean side
- Armor stone size is 10-32 tons on ocean side



# JETTY REPAIR SCOPE





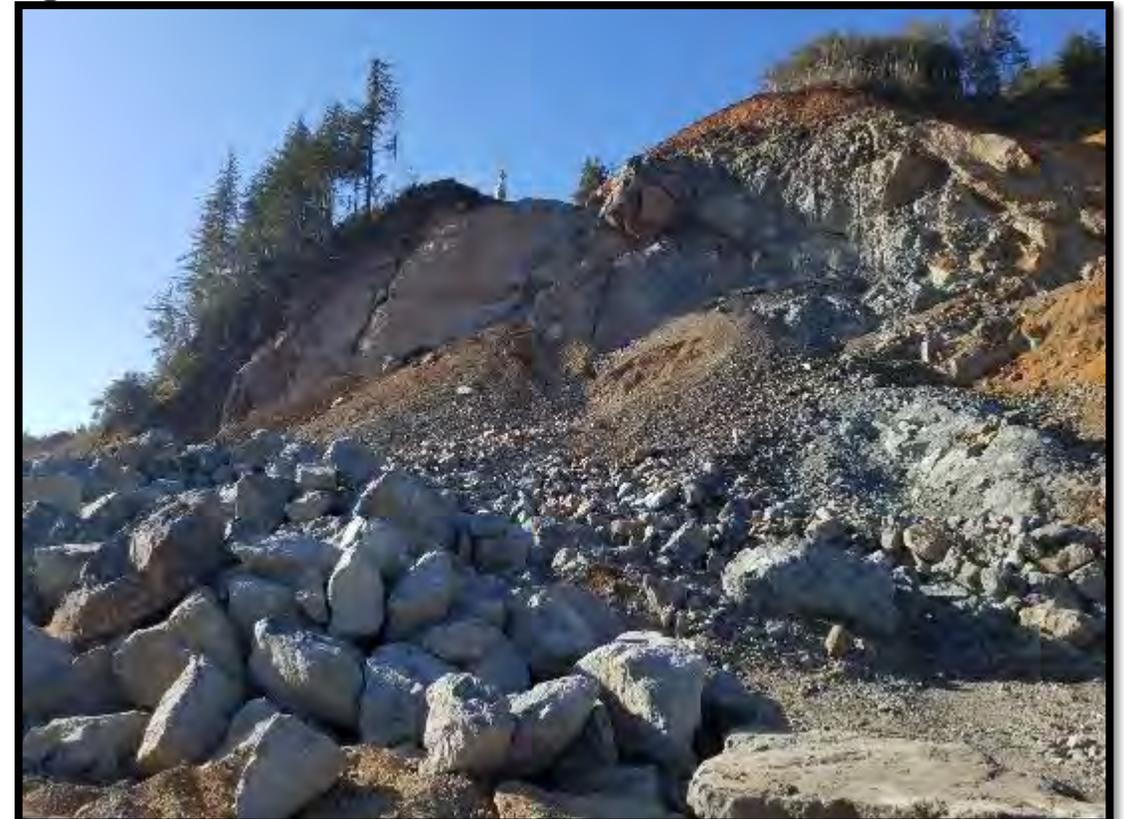
# JETTY STONE REQUIREMENTS AND SOURCES



- South Jetty requirements:
  - 10 different jetty stone sizes/types with individual gradations
  - Minimum stone density 167 PCF for trunk and root
  - Minimum stone density 180 PCF near and at head
  - At minimum density, stone sizes range from 0.6 tons to 44 tons
  - Must pass a battery of tests (abrasion/absorption/freeze-thaw/wetting and drying/etc)
- Multiple stone sources across Oregon and Washington
  - Beaver Lake (Mt. Vernon, WA)
  - Foster Quarry (Langlois, OR)
  - Drake Quarry (Astoria, OR)
  - Central Oregon Basalt (Madras, OR)
  - Baker Creek Quarry (Powers, OR)



37 ton stone





# STONE TRANSPORTATION AND DELIVERY





# JETTY STONE INSTALLATION



- Placement with crane and/or excavator
- Specific orientation (long axis perpendicular to jetty core)
- High stone to stone contact
- Minimal voids
- No point loading/solid bearing surface





# JETTY STONE INSTALLATION





# CHALLENGES/LESSONS LEARNED

- Dynamic coastal environment/weather
- Inspecting installed stone safely
- Stone tracking for payment
- Jetty stone quantity estimates





# UPCOMING PORTLAND DISTRICT JETTY WORK



- MCR South Jetty Rehab (present to 2025)
- Tillamook North Jetty Repair (J.E. McAmis, \$9 mil)
- Coos Bay North Jetty Repair (pending award)
- Tillamook South Jetty Repair (design phase)



Tillamook NJ Root



Coos Bay NJ Head



# QUESTIONS?

