

**Boulder Fill Shoreline Embankment  
Honoapiilani Highway at Olowalu, Maui**

	<b>Design—Boulder Fill</b>	<b>Design (new)</b>
Project description	<p>Large boulders will be placed along the eroding shoreline in Olowalu to repair damage to the shoulder of Honoapiilani Hwy. Boulders (2.3-3.8 tons) will be used to stabilize the shoreline slope. Plan calls for geotextile fabric to be installed first, followed by the boulders. Smaller rocks will be installed under the large boulders to stabilize the ground. In preparation for the boulder fill, the underlying area will be excavated to remove loose material and provide a stable surface.</p> <p>An existing 24-inch drain line outlet will be extended to accommodate the shoreline improvements and a new headwall will be installed at the outlet.</p> <p>Jersey barriers placed along the edge of the boulder slope during construction may remain in place to mitigate damage to the highway from overtopping waves.</p>	<p>Large boulders will be placed along the eroding shoreline in Olowalu to repair damage to the shoulder of Honoapiilani Hwy. Boulders (1.5-3 tons) will be used to stabilize the shoreline slope. Plan calls for geotextile fabric to be installed first, followed by the smaller rocks and then boulders. The smaller rocks will be installed under the large boulders to stabilize the ground. In preparation for the boulder fill, the underlying area will be excavated to remove loose material and provide a stable surface.</p> <p>An existing 24-inch drain line outlet will be extended to accommodate the shoreline improvements and a new headwall will be installed at the outlet.</p> <p>Jersey barriers placed along the edge of the boulder slope during construction will be removed and replaced with metal guardrails.</p>
Project area	900 feet of shoreline	Project area spans from State mile post 15.7 to 15.9. Length of boulder fill is approximately 900 feet.
Footprint	Boulders may extend 40 feet into nearshore tidal waters	Boulders may extend to up to 35 feet from the State right-of-way. For extents of boulder fill in relation to MHHW, see cross sections.

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Composition and quantity of fill material	Geotextile fabric (2,800 SY) 6-20 inch stone underlayer (1,880 CY) 2.3-3.8 ton boulders (5,550 CY)	<b>ABOVE MHHW:</b> Geotextile fabric (1,600 SY) 6”-12” quarry run (1,125 CY) 1.5-3 ton boulders (3’ nominal diameter) (2,875 CY)	<b>BELOW MHHW:</b> Geotextile fabric (1,200 SY) 6”-12” quarry run (1,105 CY) 1.5-3 ton boulders (3’ nominal diameter) (2,350 CY)
Excavated material	Loose bottom material underlying the new revetment (fill) area (1,680 CY) Incidental loose material underlying the drainline to be removed (10.4 CY)	<b>ABOVE MHHW:</b> Loose bottom material underlying new revetment (1,085 CY) Incidental loose material underlying the drainline to be removed (10.7 CY)	<b>BELOW MHHW:</b> Loose bottom material underlying new revetment (3,400 CY) Incidental loose material underlying the drainline to be removed (1.5 CY)
Height of revetment	8 feet MSL, or about the same elevation as the edge of the highway pavement. Low crest elevation intended to minimize the horizontal footprint of the boulder fill.	Crest elevation is at 10.5 M.S.L., about the same elevation as the new guardrail.	
Construction method	To the extent possible, excavation and construction work will be carried out using equipment stationed on landside platforms. Jersey barriers will be placed along the edge of the boulder slope to define the outer edge of a 15-foot shoulder—this widened shoulder will be used for construction and staging. (Minor filling between the existing edge of pavement and the jersey barriers to consist of non-	To the extent possible, excavation and construction work will be carried out using equipment stationed on landside platforms. During construction, the existing roadway will be shifted inland to allow for a small construction and staging area at the existing shoulder. For technical and safety reasons, the Contractor may find it necessary to place construction equipment in coastal waters.	

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	expansive, well-graded material.) For technical and safety reasons, the Contractor may find it necessary to place construction equipment in coastal waters.	
Length of construction	Duration of 10 weeks (401 WQC application)	Duration of 32 weeks (401 WQC application)
BMPs	<p>Oil spill response plan</p> <p>Gravel bag diversion to be used as temporary site-specific BMP during removal of the exiting drainline and construction of the new, extended drainline</p> <p>Floating turbidity barrier during excavation for, and construction of the shoreline revetment</p>	<p>Oil spill response plan</p> <p>Temporary stabilized construction entrance</p> <p>Silt fence at top of bank</p> <p>Gravel bag barrier (to be installed in phases)</p> <p>Inlet protection device for existing drainage structures</p> <p>Gravel bag diversion for drainline work.</p>