**Video: HDL-VLT\_9-1-In-Situ Scour Testing Device.mp4**

**YouTube Information:**

Title: Virtual Hydraulics Lab Tour – In-Situ Scour Testing Device (ISTD)

Description: An introduction to the In-Situ Scour Testing Device (ISTD) which is used to measure the erosion resistance of cohesive soils in the field. FHWA demonstrated ISTD technology for 19 State DOTs across the country over a 2-year period.

Video: mp4

Captions: attached

Thumbnail file: attached

Public Listing Type: Unlisted (we only want people to discover this video through our website and the virtual tour.)

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Video: The entire video is FHWA-owned.

Music: Getaway by Oliver Michael. Licensed from Artlist. See attached PDF: Getaway\_License\_719099 - 2020-2021.pdf

**Script:**

The FHWA has developed the In-situ Scour Testing Device to measure the erosion resistance of cohesive soils in the field. The ISTD has inherent advantages attributed to its direct application and in-place testing of undisturbed soils to obtain soil erosion resistance values, which minimizes error associated with sample disturbance during transportation for laboratory testing. The FHWA has demonstrated the ISTD for 19 State Departments of Transportation across the U.S. from June 2018 to March 2020. The ISTD features an innovative erosion head that, when inserted into an ordinary Shelby tube, circulates water to produce a high-speed horizontal radial flow to erode the soil surface. A drill crew uses a conventional drill rig to auger to the desired testing depth, then a Shelby tube is mounted to a series of casing segments which are lowered into the borehole. After assembling the remaining ISTD components the erosion head is lowered into the casing to the soil surface. As the soil erodes an algorithm lowers the erosion head to maintain a constant gap, which is later converted into an erosion rate for the soil.

**508 Caption Description:**

The video starts with an aerial view of an ISTD test being conducted on a bridge carrying a straight, two-lane road in a flat, rural section of Nevada. There are mountains visible in the far distance. A drill rig faces the camera, and behind it are the ISTD equipment, including a large pump and a moving truck to transport the equipment. The test location is on the shoulder on top of the abutment. Traffic cones are set up to block a lane of traffic. The camera rises slowly then changes to a direct overhead view of the testing site, where the water tank, hoses, and lab staff conducting the experiment are clearly visible. The aerial shot then switches to the camera flying in a large circle around the test site which gives a view of some farmland adjacent to the river. A second video is overlaid in the upper right-hand corner which shows a closer view of the linear drive and a PVC pipe which extends from the device to the water tank. In the background of this video a train runs on a track parallel to the road. The test site footage fades out and on the left side a computer model appears of a drill rig where the subsurface layers of the soil are visible and a hollow stem auger drills downward to reach the lower layer. On the right side a photo of the bottom of the erosion head appears, which show the distance sensors that measure the clay surface. The computer model on the left is replaced by a close-up animation of the auger reaching the soil testing depth. On the right, a photo appears of 4 Shelby tubes resting in a metal carrying case. On the left, the auger reaches the desired depth and the auger is sliced open to show the Shelby tube and casings being lowered down to the soil layer. The photo on the right changes to another photo of the test set-up in the field, with the linear drive mounted on the casings in front of the drill rig, with a hose connected on top and the PVC pipe running back to the tank. On the left, the Shelby reaches the soil and is pushed down into the clay. The erosion head is lowered into the casing until it reaches the soil surface. The right side changes to a larger view of a computer model of the erosion head, where the inner chambers that direct the water are visible. When the water begins to flow, arrows move which show the flow direction around the erosion head. Text appears which reads “Erosion Head, Water Inflow, Water and Soil Outflow.” On the left side the erosion head moves downward through the soil until it reaches the bottom of the Shelby tube.