

# Department of Transportation



## I-495 Bridge Update

June 18, 2014

# Facts About the Bridge

- ▶ Bridge 1-813
- ▶ Built in 1974
- ▶ Concrete deck on steel beams
- ▶ 4,800 feet long with 38 spans
- ▶ Last inspected in October 2012
  - Showed no deficiencies
  - No stockpile of dirt
- ▶ Christiana Avenue is not a state-maintained road

# Potential Cause

- ▶ 50,000 tons of dirt removed from the site
  - Soil tested and confirmed by DNREC to be clean
- ▶ Structural and subsurface inspection findings
  - Lateral displacement of soil
- ▶ Federal Highway Administration findings (letter)
- ▶ Geotechnical expert and legal counsel retained
  - Golder Associates, Inc. and Ober/Kaler
- ▶ Pursuing all legal options

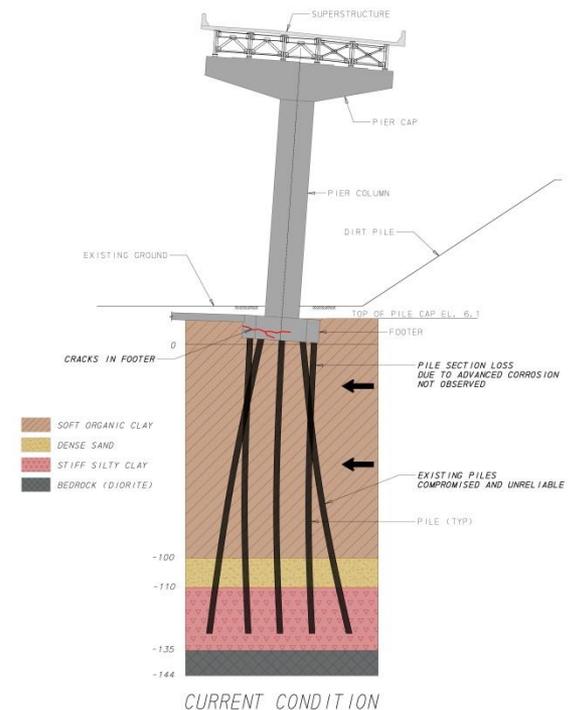
# June 2, 2014 Closure

- ▶ Bridge and Maintenance crews inspected the superstructure and the ground
- ▶ Notification to the Secretary at 2:00PM
- ▶ Notification to the Governor's Office
- ▶ Commenced closure procedure as quickly and safely as possible
  - Between Terminal Avenue and 12<sup>th</sup> Street



# Condition of the Bridge

- ▶ Tilt sensors installed
- ▶ 4 of the 37 support columns were tilted as much as four percent out of vertical alignment
- ▶ Inspection of affected piers and subsurface
  - No corrosion
  - Cracks found in footers
    - Lateral displacement of soil
- ▶ No damage to other piers
- ▶ Inclinometers installed
- ▶ Convened team of experts to assess options



# Design and Construction

- ▶ AECOM and JD Eckman (design and construction)
  - Stabilize and re-align a 400-foot section of the bridge
  - New concrete-filled shafts down to bedrock beneath the columns create a stable surface above the underlying unstable soil
  - Concrete shafts will be tied together with a reinforced concrete grade beam
  - Temporary jacking towers to be erected on the grade beam to restore the bridge's superstructure to its original position, and allow reopening
  - Permanent new concrete columns will be erected taking the place of the jacking towers

# Work to Date

- ▶ Work taking place 24/7
- ▶ 50,000 tons of dirt removed
- ▶ Existing concrete piers tied together
- ▶ Drilling has begun for the new foundation
- ▶ Equipment and materials have arrived from across the country
  - Steel cages from the Tappan Zee Bridge project
  - Casings from Oklahoma and Washington State
  - Drilling rigs from New Jersey and Texas



# Crews at Work



# Timeline and Cost

- ▶ Southbound lanes open by Labor Day
- ▶ First phase to re-open the bridge - \$20 million
- ▶ Eligible for Federal Emergency Relief Funding
  - \$2 million received to date
  - First 180 days & temporary repair 100% reimbursable
  - Post 180 days or permanent repair 90/10 Split

# Traffic Mitigation

- ▶ Detour routes in place
- ▶ Adjusted signal timing
- ▶ Hired Wilmington Police Officers to direct traffic during peak hours
- ▶ Temporary signal installed at Terminal Avenue
- ▶ Re-striped I-95 to create three lanes southbound from Wilmington

# Review of Other Bridges

- ▶ Reviewed entire inventory for similar design in similar soil conditions
- ▶ Reviewed all bridges for similar stockpiling uses
  - Field inspected 29 bridges over 500 ft.
  - Field inspected 33 bridges 200 ft. to 500 ft.
- ▶ Updated bridge inspection protocols
- ▶ Use of remote sensing technology

# Questions & Comments