

CIA TEAM

INFRASTRUCTURE

PRESERVATION

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EDC 1 – 4 Recap

Institutionalized:

EDC 1: Warm Mix Asphalt

EDC 1: Planning and Environmental Linkages (PEL)

EDC 1: Scope of Preliminary Design

EDC 1: In Lieu Fees and Mitigation Banking

EDC 1: Prefabricated Bridge Elements and Systems

EDC 1: Flexibilities in Right-of-Way (ROW)

EDC 3: Locally Administered Federal-Aid Projects: Stakeholder Partnering

EDC 3: e-Construction

EDC 3: Ultra-High Performance Concrete Connections for Prefabricated Bridge Elements

EDC 4: Pavement Preservation (When and Where)

EDC 4: Pavement Preservation (How)



EDC 1 – 4 Recap

Demonstration:

EDC 1: Programmatic Agreements

EDC 2: Locally Administered Projects: Certification Program

EDC 2: Locally Administered Projects: Consultant Services Flexibilities

EDC 4: Collaborative Hydraulics: Advancing Next Generation of Engineering (CHANGE)



Between Development and Demonstration:

EDC 4: e-Construction and Partnering: A Vision for the Future

Not Implementing:

EDC 4: Community Connections

EDC – 5

Collaborative Hydraulics: Advancing to the Next Generation of Engineering (CHANGE)

Next-generation hydraulic tools improve the understanding of complex interactions between river or coastal environments and transportation assets, enabling better design, enhanced communication, and more efficient project delivery.

Practicing engineers and designers have used one-dimensional (1D) hydraulic modeling tools routinely for nearly 60 years. Although user interfaces have greatly improved during this time, the underlying computational techniques have remained the same. These modeling techniques apply several simplifying assumptions that can lead to overly conservative, inadequate, or inaccurate results and are insufficient to meet many of today's project requirements.

For example, in recent years, resource agencies have increased their focus on assessment of environmental impacts associated with river crossings. As a result, hydraulic engineers have become responsible for demonstrating that impacts have been avoided or minimized to the extent possible. Traditional hydraulic tools do not effectively support these levels of inquiry and analysis.

Collaborative Hydraulics: Advancing to the Next Generation of Engineering (CHANGE)

Benefits

Improved Quality and Resiliency. 2D modeling results provide more accurate representations of flow conditions, including depths and velocities. Improved project quality may often be realized by using 2D modeling results to inform the location and size of structures, determine depths of bridge foundations, and analyze environmental impacts.

Enhanced Collaboration. 3D graphical visualizations derived from 2D modeling offer better tools for communicating the often complex interaction between waterways, the transportation infrastructure, and the surrounding environment.

Streamlined Delivery. Improved collaboration can help streamline project development, including environmental, regulatory, and engineering activities.

EDC – 5

Collaborative Hydraulics: Advancing to the Next Generation of Engineering (CHANGE)

Where are we now?:

- *Under EDC-4 CHANGE, completed 4 pilot projects using 2D hydraulic modeling.*

Where do we plan to be in two (2) years?:

- *Evaluated the use of 2D-informed 1D analysis for specific projects and presented the results to NJDEP as part of permit applications*
- *Training NJDEP on the use of the program*

How do we plan to get there?:

- *Assess what additional projects should be modeled using SRH-2D for floodplain analysis and scour*

EDC – 5

Advanced Geotechnical Exploration Methods

Mitigate risks and improve reliability by optimizing geotechnical site characterization with proven, effective exploration methods and practices.

Up to 50 percent of major infrastructure projects suffer impacts to schedule or cost due to geotechnical issues. Many of these issues relate to risks identified directly or indirectly to the scope and quality of site characterization work. Effective site characterization is critical for recognizing potential problems that may affect design and construction and for ensuring safe, well-performing, and cost-effective projects.

Advanced Geotechnical Exploration Methods

Benefits

Reduced Risk. Reducing uncertainties in subsurface conditions mitigates design and construction risks.

Improved Quality. Improving confidence in the geotechnical characterization reduces unnecessary conservatism in design and establishes a more reliable basis for design and construction of foundations and other geotechnical features impacting the highway system.

Accelerated Project Delivery. Since a significant number of construction delays can be attributed to inadequate knowledge of subsurface site conditions, well-scoped investigation programs improve decision-making and constructability, providing time and cost savings for transportation agencies.

Advanced Geotechnical Exploration Methods

Where are we now?:

- *NJDOT currently uses several AGEMs (Bathymetry Survey, Geophysical explorations, Lidar surveys, Tomography, and Microgravity survey , etc.)*

Where do we plan to be in two (2) years?:

- *Revised and enhanced NJDOT subsurface exploration program guidance*
- *included new innovative techniques in the subsurface exploration contract language*

How do we plan to get there?:

- *Geotechnical and Geology staff will consider on a project by project basis what new technologies can be implemented within the subsurface exploration program.*

EDC – 5

Project Bundling

Awarding a single contract for several preservation, rehabilitation, or replacement projects helps agencies reduce costs and achieve program goals.

Project bundling offers a comprehensive and accelerated delivery solution for addressing strategic program goals. It streamlines design, contracting, and construction; allows agencies to capitalize on economies of scale to increase efficiency; and supports greater collaboration during project delivery and construction.

EDC – 5

Project Bundling

Benefits

Expedited Project Delivery. Project bundling delivers strategic program solutions by streamlining various project delivery requirements such as environmental agreements and standardized designs.

Reduced Cost. Bundling projects with shared features leverages design expertise and achieves economies of scale.

Contracting Efficiency. Using a single contract award for several similar projects streamlines design and construction and saves procurement time.

EDC – 5

Project Bundling

Where are we now?:

- *Institutionalized. NJDOT has been doing project bundling (Batch Solicitation) for years. NJDOT routinely uses project bundling for the delivery of federally funded capital projects and for state-funded maintenance projects.*