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Department of Transportation



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SUMMARY REPORT

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South Carolina
Department of Transportation
955 Park Street
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Establishment of a Resident Engineer Academy

Final Summary of Research Project No. 639 July 2005
For the South Carolina Department of Transportation

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Overview: The Resident Construction Engineer (RCE) and the Resident Maintenance Engineer (RME) play important roles in the South Carolina Department of Transportation (SCDoT). The engineers in these positions are responsible for SCDoT projects from pre-construction activities through final plans and maintenance activities. To keep these engineers up-to-date in the varied activities related to their positions, a technology transfer program was organized for the following four topics (modules):

- I. Office Administration
- II. Environmental
- III. Materials
- IV. Safety

It was determined that the SCDoT would establish the fourth module (Safety) in-house due to the number of related programs that they have already developed. The other three modules were developed and piloted twice at the University of South Carolina (USC). The results of the final pilot of the three modules developed at USC are:

I: Administrative: The final recommended pilot module consists of 1.5 days of presentations followed by a short examination. The agenda items are:

- Project Initiation Prior to Pre-Construction (Day 1)
- Project Initiation During Construction (Day 1)
- Project Initiation Ending Construction (Day 1)
- Miscellaneous Reports (Day 1)
- Maintenance (Day 1)
- DBE/EEO (Day 1)
- Public Relations (Day 1)
- Website Presentation (SiteManager) (Day 1)
- Purchasing/Procurement (Day 2)
- STARS Payroll (Day 2)
- Review and Examination (Day 2)

The manual consists of handouts for all items except Public Relations and Examination.

II: Environmental: The final recommended pilot module consists of 1.5 days of presentations followed by a short test. It follows the Administrative module (after a lunch break) on Day 2 to ease travel requirements for the participants. The agenda items are:

- Federal and State Laws, Regulations & Guidances: Overview (Day 2)
- 404 Permit (33 USC 1344)(33 CFR Part 330) (Day 2)
- Highway & Site Management: Hazardous Materials, Razing Structures, Debris Disposal, Waste Management (Day 2)
- OCRM Permit, Wetlands, Endangered Species, Archeological Sites (Day 2)
- Inspections & Audits :DHEC&EPA, Self Auditing(Compliance Mgmt), Reporting/Records (Haz Waste & Generation) (Day 3)
- USTs, Spills, Non-haz Materials/Wastes, Housekeeping (Day 3)
- SPCC Plans (Day 3)
- Introduction to ISO 14000 (Day 3)
- Roadside Vegetative Management (Day 3)
- Stormwater Quality Management: Intro., Federal & State Requirements, Permitting, Management & Planning, MS-4, SWP-3 (Day 3)
- Examination

The manual includes sections with handouts for all items except Examination.

III: Materials: The final recommended pilot module consists of 1.5 days of presentations and discussion followed by a short test and then a subsequent 3-day laboratory section in small groups conducted by SCDOT lab personnel at the SCDOT Materials Research Lab. The presentation portion consists of:

- Structural Steel (Day 1)
- Structural Materials Testing (Day 1)
- Prestressed Concrete Plant Inspection (Day 1)
- Precast Drainage Inspection (Day 1)
- Reinforced Concrete Pipe Inspection (Day 1)
- Ready-mixed Concrete Plant Inspection (Day 1)
- Soils Testing (Day 1)
- Subsurface Investigation (Day 1)
- Pavement Design/Evaluation (Day 1)
- Cement Physical Unit (Day 2)
- Cement Chemical Unit (Day 2)
- Asphalt (Day 2)
- Quality Assurance (Day 2)
- Matlab (Day 2)
- Examination (Day 2)

The manual includes sections with handouts for all items except Examination.

Conclusions. In general, the participants in both series of pilot modules found the sessions and manuals to be helpful and informative. The second set of pilot courses proved useful in further refining the information and the time frames appropriate for each subsection of the programs, and for testing the modules on less experienced engineering personnel. The project title was changed from Resident Construction Engineer (RCE) Academy to Resident Engineer Academy (REA) to include both construction and maintenance engineers. Overall, final comments and suggestions were positive. It is recommended that the Resident Engineer Academy (REA) continue in the same format as the second set of pilots using the presentations, testing procedure and manuals as developed. In future sessions of the Resident Engineer Academy updated forms and supplemental information may be added to the presentations and manuals, as procedures and technology change.

This research project was conducted at the University of South Carolina by M. Hanif Chaudhry, Erik I. Anderson, and Liv M. Haselbach. For further information, contact Terry Swygert at SCDOT: (803) 737 6652; swygerttl@dot.state.sc.us