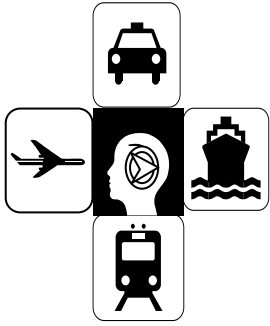


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Tech Brief

Laboratory Information Management System (LIMS)

FHWA-NJ-2004-010

April 2008

SUMMARY

Currently, most material test results at NJDOT are applied on a micro scale and paper-filed. To integrate the operational functionality of material data filing, processing, and transfer, a computerized local/remote Intranet network management system was developed. The NJDOT LIMS (Laboratory Information Management System) is an integrated material laboratory testing result report system. A pilot scale intranet-based information management system was developed, installed, tested, and is currently being evaluated by NJDOT. This system consists of three major components: (a) database; (b) administrative management interface; and (c) database-driven web application. These three parts comprise an Intranet web application with which users can create reports, store testing results, and retrieve, display, and transfer information among the NJDOT Materials Bureau in Trenton and regional and field offices through the NJDOT network. LIMS standardizes data entry procedures, defines performance evaluation measures, certifies material test data, analyzes the relationships between test data and actual material performance, streamlines the project closeout process, and generates summary reports. The LIMS System is an efficient, effective, and user-friendly one.

SQL Database

The SQL database provides all administrative information about projects, contractors, suppliers, material mix designs, personnel, laboratories, and field offices. The system administrator of NJDOT LIMS uses the Administrative Management Interface to input all administrative information. The Administrative Management Interface is a Microsoft Access 2000 application, named 'Lims_2000_Admin.mdb'. This application has functional data entry/retrieval forms linked to the SQL database. Using these forms at the supervisor level, the system administrator can initialize specific records on projects, contractors, and suppliers; enter material mix design data; and enter User ID for authorized users. The SQL database also stores test results for concrete, soils, and asphalt samples.

Administrative Management Interface

The Main Menu of the Administrative Management Interface provides access to the administrative program functions that allow updating of system information. . Figure 1 shows this main menu. Clicking on any of the option buttons will take the user to the corresponding function.

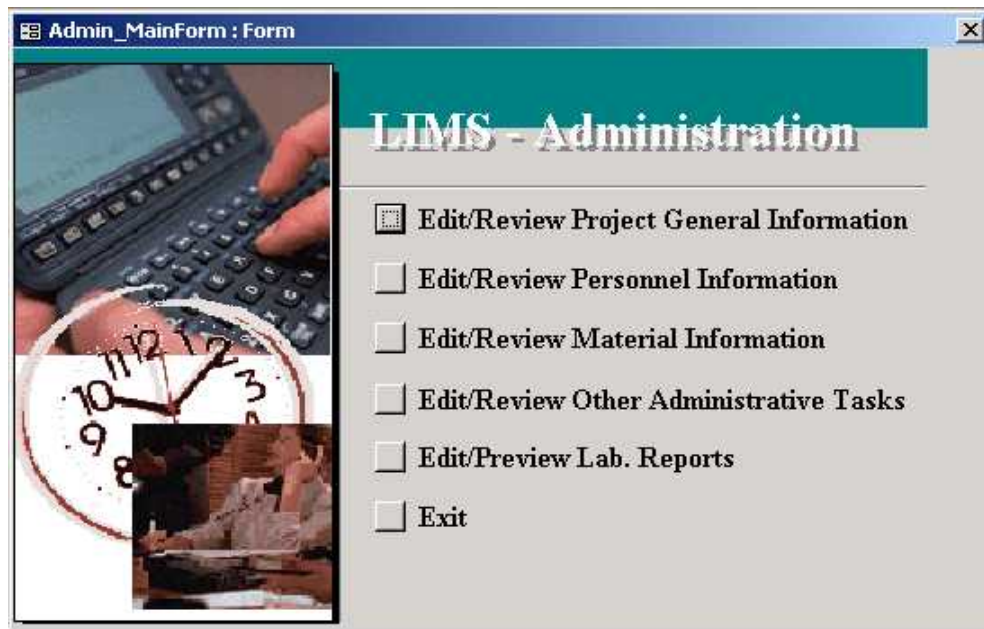


Figure 1. Main Menu of LIMS Administration Management Interface

LIMS Intranet Application

By LIMS design, the data entry can be done manually (basic information initialization), automatically (calculated and transferred results), or be triggered (data downloading) by another device. Each sampling process has its own logical life from beginning to end. All data entry forms in LIMS were created according to their sampling logic, and data fields and form layout were standardized. Figure 2 shows a sample web page of the LB201-CY General Information form for concrete cylinder material. Figure 3 shows the related Trenton Central Lab test data form, and Figure 4 displays a sample of the LB201-CY Full Report.

Field Office Forms | Centra Lab. Forms | Full Report Preview | Main Selection Board

LB-201-CY 8/98 NEW JERSEY DEPARTMENT OF TRANSPORTATION Bureau of Materials, Trenton
 Construction Maintenance dc
PORTLAND CEMENT CONCRETE CYLINDER - INSPECTION/TESTING 10/10/2001 5:22:39 PM

Project	Route 4 Section 2AE & Route 17 sections 2P & 3G		Region	North Region
Project IDs	DP Number	11111111	UPC Number	Federal No. STP-NH-56(145)
Contractor	ANSELM&DECICCO, 23 Hill Street, Newark, NJ			
Supplier	BLUE CIRCLE MATERIALS INC	Location	ALL PLANTS	
Dates Made	Cyts.	9/29/2001	Rpt.	10/10/2000 (+)
Proposed Use (Type of Constr.)			Type of Mixing	AS PREVIOUS
Total C.M. Placed			Age to Be Tested	28
Class of Concrete	A SLG70/	A (+)	Lot No.	12 (+) Item No.
Cement Source and Type	AS APPROVED/NEWCEM 70/30 CL A		Pay Item Qty.	
Fine Agg. Source/Location	AMBOY AGGREGATES, SOUTH AMBOY, NJ		LIMS Mix ID:	49
Coarse Agg. Source/Location	BLUE CIRCLE, HAMBURG, NJ			
Exact Location of Pour				

(+) Field entry required!
 Units: Metric

Tester(s) Business data entry (First Middle LastName)

Current Report: (Original)

Save
 Delete
 Reset

Figure 2. LB201-CY General Information Form

It is the integrated design of the sampling cycles that makes LIMS a flexible and reliable information management system. The pilot scale LIMS currently contains all the forms for three major construction materials (concrete, soil, and asphalt concrete) plus the closeout forms required by FHWA.

All of the required forms for the purpose of closeout have been incorporated into the LIMS System. This feature will help users to process closeouts of projects effectively and efficiently. Figure 5 shows a close out form (Form LB96) that is used to prepare a computer generated closeout letter sent to FHWA. Figure 6 shows an Exceptions of Failures Report which is attached to the close out letter to FHWA.

Close Out Forms | [Exceptions Failures](#) | [Print Version](#)

LB-96

James Weinstein
COMMISSIONER

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840 Bear Tavern Road
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West Trenton, NJ 08628

This is to certify that:

The results of the tests on acceptance samples for the referenced project indicate that the materials incorporated in the construction work and the construction operations controlled by sampling and testing were in conformity with the approved plans and specifications, and that such results compare favorably with the results of the independent assurance sampling and testing.

Exceptions to the plans and specifications concerning materials are explained on the back hereof.

IN REPLY PLEASE REFER TO:

Project: Route 4 Section 2AE & Route 17 sections 2P & 3G
FP#: STP-NH-56(145)
County:
Region: North Region
Date:

Chief, Bureau of Materials
Engineering and Testing

Figure 5. LB96 Close-out Form

EXCEPTIONS OR FAILURES

(Attachment to LB-96 Close Out Letter)

The following materials (items) failed to comply with NJDOT Plans and Specifications.
Corrective action was taken by the Resident Engineer and /or Resident Materials Engineer

<u>Item No.</u>	<u>Lot No.</u>	<u>Description</u>	<u>Comments</u>
101	15	wall (BM)	Penalized as per Spec.
		No More Records Exist!	

Figure 6. LB96 Exceptions or Failures Report

WHAT ARE THE BENIFITS OF LIMS?

LIMS can significantly reduce paper-work and provides the capability to store relevant materials data and retrieve it rapidly. It also shortens the time between project completion and final closeout as mandated by the Federal Highway Administration for federally funded projects. LIMS and its concept have a great potential to be adopted by other transportation agencies for management of materials and laboratory test data.

FOR MORE INFORMATION CONTACT:

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A final report is available online at: <http://www.state.nj.us/transportation/refdata/research/>

If you would like a copy of the full report, please FAX the NJDOT, Bureau of Research, Technology Transfer Group at (609) 530-3722 or send an email to Research.Bureau@dot.state.nj.us and ask for:

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