

OVERVIEW

General

In 1993, the Federal Highway Administration (FHWA) initiated a national program to implement the use of high performance concrete (HPC) in bridges. The program included the construction of demonstration bridges in each of the FHWA regions and dissemination of the technology and results at showcase workshops. Eighteen bridges in 13 States were included in the national program. In addition to the joint State-FHWA HPC initiative, other States have implemented the use of HPC in various bridge elements.

The bridges are located in different climatic regions of the United States and use different types of superstructures. The bridges demonstrate practical application of high performance concretes. In addition, construction of these bridges provided opportunities to learn more about the placement and actual behavior of HPC in bridges. Consequently, many of the bridges were instrumented to monitor their short- and long-term performance. In addition, concrete material properties were measured for most of the bridges.

Information about the HPC bridges is located in numerous published and unpublished technical reports, papers in technical journals and symposium proceedings, and student theses. The purpose of this CD is to present a compilation of the data from the HPC bridges. Data from 19 bridges are included.

The information is presented in two formats:

- An individual compilation for each bridge
- Ten summary tables

Individual Bridge Compilations

The individual compilations may be accessed by clicking on "Bridges" on the opening screen and then moving the mouse over the light blue states. A drop-down menu will appear. Click on an individual bridge. Alternatively, click on the "Text List" button and select an individual bridge from the next screen.

To return to the opening screen or main menu, click on the FHWA logo in the top left corner.

Each compilation is divided into the following sections:

1. **DESCRIPTION.** This section contains a summary of the overall bridge features.
2. **BENEFITS OF HPC AND COSTS.** Highlights why HPC was used in the bridge and provides total cost, cost per sq ft, cost per ft, or any other information that was obtained.
3. **STRUCTURAL DESIGN.** Essential features about the structural design of the bridge.

4. **SPECIFIED ITEMS.** This section includes only items that were required by the HPC special provisions. If items were not identified as being specified, the line is left blank.
5. **CONCRETE MATERIALS.** This section lists information obtained before actual construction of the bridges. It represents the information that would normally be submitted for approval of concrete mix proportions plus additional data that were available because of the research component.
6. **CONCRETE MATERIAL PROPERTIES.** This section contains information obtained during the actual construction. It is separated into sections on material properties from quality control (QC) tests and material properties from research tests. Separate sections are provided for each HPC element used in the bridge such as girders and deck.
7. **OTHER RESEARCH DATA.** This section contains research data specifically related to the construction of the showcase bridge. The information varies considerably between compilations depending on the approach and interests of the researchers.
8. **OTHER RELATED RESEARCH.** This section contains other research information that was usually obtained prior to construction of the bridge.
9. **SOURCES OF DATA.** References of documents used for the compilation are listed. Some of the data were obtained directly from the States and do not appear in the published data. The names of individuals who supplied the data are listed.
10. **DRAWINGS.** This section contains miscellaneous details to clarify the written information.
11. **HPC SPECIFICATIONS.** When available, the special provisions for HPC in the bridge are included.

To go directly between the different sections, click on "Index" and select a topic.

The compiled information from each bridge is available as a Word file from which hard copy can be printed. Click on "Open Word Document." For some of the data shown as graphs, the data are available in Excel files. Click on "Open Excel file to access data." For execution of these options, it is necessary to have Word or Excel available on the computer being used to view the CD. Otherwise, all other software is contained on the CD.

Summary Tables

The summary tables may be accessed by clicking on "Summary Tables" on the opening screen or in the top navigation bar throughout the presentation, then selecting a table

from the pop-up menu accessed by clicking the "Index" button at the bottom of the screen.

Information in the summary tables is not as detailed as the information in the individual bridge compilations. The ten summary tables provide a means to compare data from different states and different bridges. The tables are arranged as follows:

Tables 1a and 1b provide a description of the major features of the girders and decks, respectively.

Table 2a provides information about structural design considerations.

Tables 3a and 3b list the specified properties for the prestressed concrete girders and cast-in-place concrete decks, respectively.

Tables 4a and 4b list the concrete mix proportions for the prestressed concrete girders and cast-in-place concrete decks, respectively.

Tables 5a and 5b contain a summary of the measured structural concrete properties for the prestressed concrete girders and cast-in-place concrete decks, respectively.

Table 5c contains a summary of the measured durability properties for both the prestressed concrete girders and cast-in-place concrete decks.

The tables have been compiled using a combination of properties measured in the QC programs and measured as part of the associated research projects.

For comparison purposes, data originally supplied in SI units have been converted to English units for use in the tables. The user should go to the individual bridge compilations for the SI values.

Search

Information on a specific topic can be obtained by using the search option.

General Information

The information contained on this CD was compiled under FHWA Contract No. DTFH61-00-C-00009 entitled "Compilation and Evaluation of Results from High Performance Concrete Bridge Projects."

Contractor: Henry G. Russell, Inc.

FHWA Contracting Officer: Arlan E. Finfrock

FHWA Contracting Officer Technical Representative: Joseph L. Hartmann

Contact Person for Questions:
Jerry L. Potter
(202) 366-4596
jerry.potter@fhwa.dot.gov

Acknowledgements

The Contractor acknowledges the cooperation of the State Departments of Transportation and their researchers for providing the information used to compile the CD. These include the following:

- Alabama: William F. Conway, Alabama Department of Transportation
J. Michael Stallings, Auburn University

- Colorado: Mark A. Leonard, Colorado Department of Transportation
P. Benson Shing, University of Colorado

- Georgia: Paul V. Liles, Georgia Department of Transportation
Lawrence F. Kahn, Georgia Institute of Technology

- Louisiana: Paul Fossier, Louisiana Department of Transportation and
Development

- Nebraska: Michael W. Beacham, Nebraska Department of Roads
Maher K. Tadros, Tadros Associates, LLC.
Sharon Huo, Tennessee Technological Institute

- New Hampshire: Mark D. Whittemore, New Hampshire Department of
Transportation
Christopher M. Waszczuk, New Hampshire Department of
Transportation
Raymond A. Cook, University of New Hampshire
Vincent Sampo, The Louis Berger Group, Inc.

- New Mexico Sherman R. Peterson, New Mexico State Highway and
Transportation Department
Bryce P. Simons, New Mexico State Highway and
Transportation Department

- North Carolina: Azam Azimi, State of North Carolina Department of
Transportation
Tom Koch, State of North Carolina Department of
Transportation
Paul Zia, North Carolina State University

- Ohio: Richard A. Miller, University of Cincinnati

- South Dakota: Hadly G. Eisenbeisz, South Dakota Department of Transportation
Daniel Strand, South Dakota Department of Transportation
- Tennessee: Mark Holloran, Tennessee Department of Transportation
- Texas: Mary Lou Ralls, Texas Department of Transportation
Kevin R. Pruski, Texas Department of Transportation
Shawn P. Gross, Villanova University
John J. Myers, University of Missouri-Rolla
- Virginia: H. Celik Ozyildirim, Virginia Transportation Research Council
- Washington: M. Myint Lwin, Federal Highway Administration
Bijan Khaleghi, Washington State Department of Transportation

Disclaimer

In the process of collecting the information for this CD, some inconsistencies in the data were noted. The Contractor has attempted to resolve as many of these inconsistencies as possible. Nevertheless, some inconsistencies still remain. The State Specifications included in this compilation have been reproduced from the original documents.

The FHWA and the Contractor disclaim any and all responsibility and liability for the accuracy and the application of the information contained on this CD to the full extent permitted by law.

Limited Warranty and Limitations of Remedies

This product is provided as-is, without warranty of any kind—either expressed or implied (but not limited to the implied warranties of merchantability and fitness for a particular purpose). The FHWA and the distributor do not warrant that the functions contained in the software will meet the end-users' requirements or that operation of the software will be uninterrupted and error-free. Under no circumstances will the FHWA, Distributor, or Contractor be liable to the end-user for any damages rising out of the use or liability to use the software (even if these organizations have been advised of the possibility of such damages), or for any claim by any other party.