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William W. Hay Railroad Engineering Collection

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Summary

The Association of American Railroads' (AAR) Technology Outreach Program (formerly known as the Technology Scanning Program) mission is to review and adapt promising technologies to railway industry applications. The Affiliated Laboratories program engages leading technological universities to assist in this mission. The Affiliated Laboratory at the University of Illinois was selected as the repository for railroad engineering texts. This *Technology Digest* (TD) describes the program's capabilities to assist railways in using the library's resources to conduct railway engineering searches. As such, it is a reference tool available to AAR members.

William W. Hay Railroad Engineering Collection contains a wealth of railroad engineering materials that is accessible online to the public. This TD provides an overview of the website and directions for using the search interface successfully. The website and searchable database it uses were created by the University of Illinois at Urbana-Champaign (UIUC) Grainger Engineering Library Information Center.

In 2001, Grainger Engineering Library at UIUC received a gift collection of railroad engineering related texts from the AAR's Transportation Technology Center, Inc. (TTCI) and the Federal Railroad Administration (FRA). The collection contains over 5,500 technical reports, books, and journal issues in the areas of railroad engineering, railroad technology, and railroad history that were originally part of several AAR technical libraries and approximately 1,500 items originally owned by FRA. The American Railway Engineering and Maintenance of Way Association (AREMA) has also designated the UIUC library as the repository for its publications. These collections have been added to the extensive collection of railroad materials already owned by the UIUC Library, some of which date back to the 1700s. The Grainger Engineering Library serves as home to the majority of these materials.

The combined collection of railway engineering library materials was named in honor of Dr. William W. Hay, former professor of railway and transportation engineering at UIUC, in recognition of his lifelong commitment and contribution to railway engineering education, research, and practice.

In succeeding years, the collection has expanded as AAR/TTCI, FRA, and AREMA continue to send their publications. Grainger Engineering Library has actively collected a wide range of resources in the subject area including publisher, electronic journal, and book collections. This combination has made the UIUC collection the largest, most comprehensive set of materials on the subject of railway engineering in North America.

To enhance the value of the Hay Railroad Engineering Collection to users, both on and off campus, a website was created to facilitate access to more than 22,500 titles pertinent to railroad transportation. These include the UIUC online catalog holdings as well as the AAR/TTCI and FRA gift collection. All the old and new materials have been cataloged to develop a comprehensive database that can be searched by visitors to the website. It provides access by author, organization, title, and subject. Grant funding from the Rail Transportation and Engineering Center at UIUC has helped support the ongoing task of maintaining and updating the website and the database it uses.



INTRODUCTION

In 2002, Grainger Engineering Library’s acquisition from AAR/TTCI of over 5,500 technical reports, books, and journal issues in the areas of railroad engineering, railroad technology, and railroad history expanded its coverage of railroad literature, but it also posed new challenges. The need to process this much material as quickly as possible, add it into the library’s collection, and make it available for use, meant that many of the technical reports were initially listed by report type and report number only. Finding this type of material without a report number became an extensive process. In addition, AAR/TTCI gifted this collection to UIUC Library with the agreement that their personnel would still have access to it.

To make the database more accessible and facilitate search capabilities, Grainger librarians determined to add a more complete description of the AAR/TTCI material to the database. Further, they wanted users to be aware of resources in both the UIUC collection and in other transportation databases. The experienced Grainger librarians created the Grainger Railroad Database, which contains descriptions and locations of the AAR/TTCI and FRA materials. In 2002, they completed a website with a search interface for the Hay Railroad Engineering Collection, which is available both on and off campus.

Content of Target Sources

Initially, the Hay Railroad Engineering Collection search interface searched only the local database. Over time its capability has been expanded. Currently, searches completed from this interface retrieve information from the Grainger Railroad Database as well as from several other resources relevant to railroad engineering and transportation. These include the UIUC Library Online Catalog, Illinois Digital Environment for Access to Learning and Scholarship (IDEALS), Google Books, and the Transportation Research Board database, Transport Research International Documentation (TRID). These target sources contain the following items:

- Grainger Railroad Database contains primarily technical reports generated by AAR/TTCI and government transportation agencies.
- UIUC Library Online Catalog contains books, technical reports, government documents, CD-ROMs, and some e-books owned or licensed by UIUC University Library (currently 14 million items).
- IDEALS is a digital repository that contains reports, papers, and dissertations produced by faculty, staff, and students at UIUC. Some full-text documents are available.
- Google Books is an online electronic library with a wide range of digitized material, some of which is open access full text. However, if the material is still covered by copyright, it must be purchased or borrowed.¹

- TRID was launched by the Transportation Research Board, the Joint Transport Research Centre of the Organisation for Economic Co-operation and Development, and the International Transport. Through TRID, users have access to one database to locate transportation research from around the world.² Coverage includes free access to 940,000 records with some full text.³

Begin Search

Access to the Hay Railroad Engineering Collection search interface can be found at the following URL: <http://search.grainger.illinois.edu/whay/>. It may be used both on campus at UIUC or off campus. The initial page contains a brief description and acknowledgements. Click on “Go to Search Page” to link to the search interface page (Figure 1). Enter at least one term in one of the search boxes and press the Search button to retrieve results from the database. Click “Search Tips” (upper-left area) for help in searching.

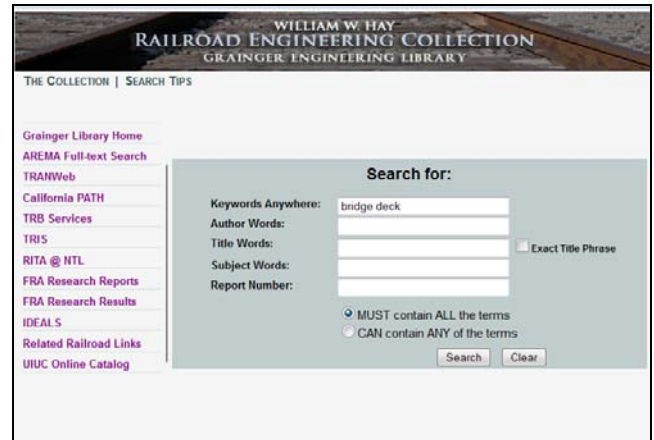


Figure 1. Search Interface

Ways to Search

- **Keywords Anywhere:** This is the broadest and most general search. Results from a keyword search will include any item record that contains the search words in any location. There is no need to use connecting words or article words, the database will automatically search all the keywords entered.
 - Specific information may be used to perform other searches. These searches will access only particular fields or lines of the item records for the terms entered. They include:
- **Author Words:** For best results, use the author's last name only. Most authors are entered in the database with last name and first initial. A problem for this search is that the funding agency may be considered the author instead of the researchers who wrote the report.
- **Title Words:** Title terms can either be searched as terms that are not necessarily adjacent to one another or as an exact phrase. For the latter, choose the checkbox “Exact Title Phrase,” and enter the phrase as published with articles and conjunctions included.

- **Subject Words:** Subject term searches will usually return results that are more precise than keyword searches. However, subject terms are often based on a specialized vocabulary and require some familiarity with the subject matter to perform accurate searches.
- **Report Number:** This is a very specific search. Enter the number with appropriate punctuation. If there are multiple parts to the report and searching with the part on the report number yields no results, try with just the report number, but no part designation.

Search Characteristics

- Keyword searching is used, not exact-phrase matching. For example, a search on the term “wide” will return results with the word “widening” and “Widell.” Further, a search on the terms “wide gap” will return records where the two terms are not necessarily adjacent.
- Truncation of search terms is the use of a shortened form of the term. The search term “rail” will match on “railroad,” “railway,” and “railroads,” etc. This is useful if spelling or phrasing is not known.
- Avoid using punctuation when entering search terms, except in the case of report number searching.
- Do not enter “and” or “or” between search terms. Instead, select the search method preferred.
- Choose “CAN contain ANY of the terms” to find results that include any of the terms entered. This is a broad search and will return records that contain at least one of the search terms.
- Choose “MUST contain ALL of the terms” to find results that include all of the terms entered. This is a narrower search. All of the words must appear somewhere in the item record, although not necessarily together.

Search Results

Figure 2 shows the search results for the keywords “bridge deck.” The initial results page contains the search term as entered and the number of matches found in each of the target resources.

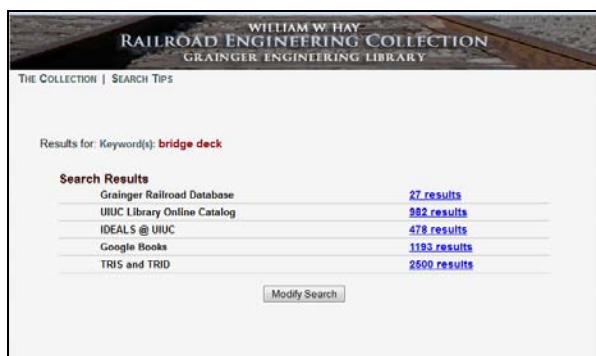


Figure 2. Search Results

Click on one of the blue hyperlinks to see the brief list display results for the selected target resource, which usually contains title, author, and sometimes source or location. Figure 3 shows an example of the brief list display results for the Grainger Railroad Database.

| Call# | Title | Author(s) | Subject |
|---------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------|---------|
| 625As73r | 1962 condition report on asphalt treatment of ballast and bridge decks | | |
| full-text, 625As73r | Analytical investigation of the longitudinal loads in an open-deck through-plate-girder bridge | Foutch, D.A., Tobias, D.H., Otter, D.E. | |
| full-text, 625As73r | Continuous Welded Rail Restraints on an Open-Deck Girder Bridge | Richard Joy, David Read, and Duane Otter | |
| 625As73r | Corrosion of bridge deck plates by brine (final report after fifteen years of exposure) | Kobnetz, J., Stone, DH | |
| 625T255RP | Details of strain gauge measurements on ballasted and direct fastening reinforced and prestressed concrete deck bridges (Question D 193 - Stresses and strength of reinforced and prestressed concrete decks on railway bridges) | | |
| full-text, 625As73r | Effects of Continuous Welded Rail on Open-Deck Steel Bridges | Joy, Richard; read, David; Otter, Duane | |
| 625As73r | Experimental and analytical investigation of the longitudinal loads in open-deck plate girder railway bridge | Otter, DE, LoPresti, J, Uppal, S, Foutch, DA, Tobias, DH | |
| 625T255RP | Fatigue calculations for the orthotropic decks of steel railway bridges (Question D 154.1 - Stresses and strength of orthotropic decks) | | |
| 625T255RP | Fatigue life of an orthotropic deck with open ribs of rolled steel. Fatigue strength of railway bridges with orthotropic decks stiffened by open ribs. Final report. | ERRI D 191 Specialists' Committee | |
| 625As73r | Field testing of two-open deck timber railroad bridges | Wipf, T. Wood, D., Ritter, M., Otter, D., Rogers, P., Uppal, AS | |
| 625T255RP | Final report (Question D 123 - Investigation of bridge decks with concrete encased girders) | | |
| full-text, 625As73r | Investigation of a Ballasted Deck Steel Plate Girder Railway Bridge | Foutch, DA; Choros, J, Tobias, DH | |
| full-text, 625As73r | Investigation of an open deck through-bruss railway bridge: Revenue traffic tests. | Tobias, D.H.; Foutch, D.A.; Choros, J. | |
| full-text, 625As73r | Investigation of an open deck through-bruss railway bridge: work train tests | Tobias, DH; Foutch, DA; Choros, J | |
| full-text, 625As73r | Logitudinal Forces in a Single-Span, Ballasted-Deck, Plate-Girder Bridge | Richard Joy, Joseph A. LoPresti, Duane E. Otter | |

Figure 3. Grainger Railroad Database Brief List Results Using Keyword Search

Click on the title in any of the brief lists to get more complete information about the item in an item record. Figure 4 shows an example of an item record in the Grainger Railroad Database.



Figure 4. Item Record

Request Material

Click on the Request Material button at the bottom of the item record page and complete the request form to place a request for material found in the Grainger Railroad Database. Requests from individuals affiliated with UIUC or TTCI may be filled directly by Grainger Engineering Library. Due to copyright restrictions, all others will be directed to request the material through the Interlibrary Loan service at their home library.

Other Target Source Search Results

Display results from other target sources contain similar information as the Grainger Railroad Database interface page results, but in different display formats. Figures 5-8 show results interface pages from UIUC Library Online Catalog, IDEALS, Google Books, and TRID for the keywords search on “bridge deck.”

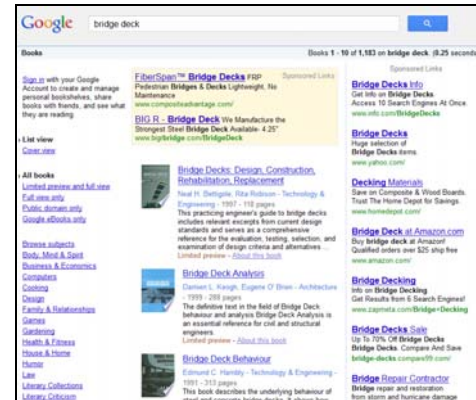


Figure 7. Google Books Search Interface Page

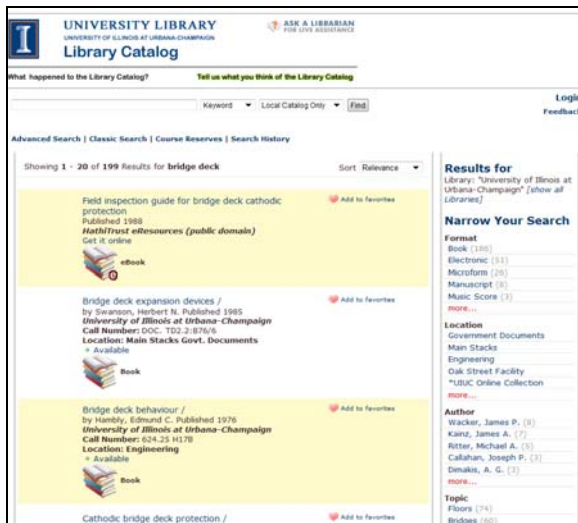


Figure 5. UIUC Library Online Catalog Interface Page

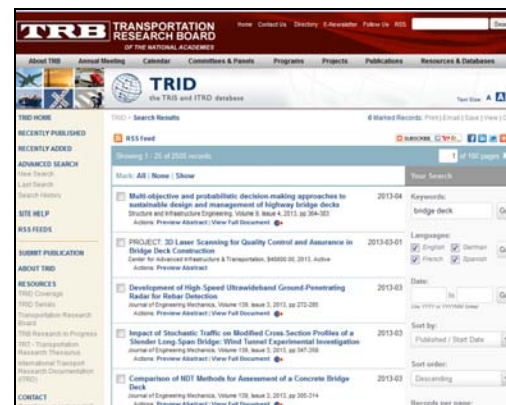


Figure 8. TRID Search Results Interface Page

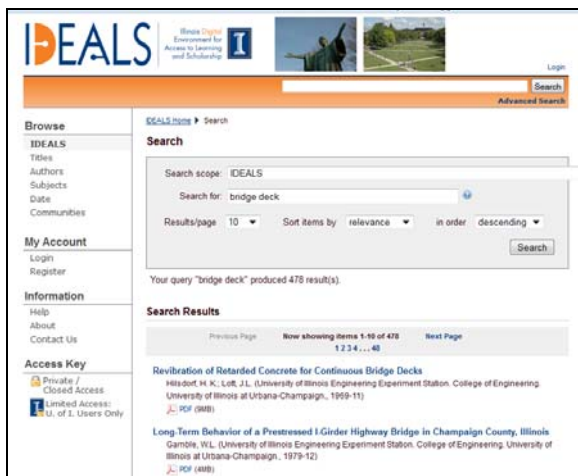


Figure 6. IDEALS Database Search Interface Page

Links to Other Railroad Transportation Websites

The search interface page (Figure 1) also contains links to several other railroad and transportation websites. Some full-text documents are available through these websites, but any database that is not a target source will require a separate search on its interface. Some of the transportation databases cover all modes of transportation. To get railroad-specific results, include the words “rail” or “railroad” in the search terms.

CONCLUSION

Web access to the Hay Railroad Engineering Collection search interface, both on and off campus, further enhances the usability of an exceptional and growing collection of documents relating to railroad engineering, railroad technology, and railroad history. The website was created to provide students, faculty, and other researchers with straightforward access to numerous titles important to railroad transportation engineering.

REFERENCES

1. Google. 11/15/2012. “About Google Books.” <http://books.google.com/intl/en/googlebooks/about.html>
2. Transportation Research Board. 11/20/2012. “TRID Home.” <http://www.trb.org/main/blurbs/164753.aspx>
3. Transportation Research Board. 11/15/2012. “TRID Home.” <http://trid.trb.org/>

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