About Severn Library
- Severn Library is an off-site, high-density storage facility at the University of Maryland College Park.
- It was built in a former Washington Post printing facility in 2015-2016.
- The off-site storage collection was stored at Johns Hopkins University's Library Services Center from 2005-2016. The collection was moved into Severn Library in June 2016. Severn Library staff began circulating books in October 2016.

About High-Density Library Storage
- Began at Harvard University Library in 1968
- Preserves materials and increases density, which ultimately saves money and space in circulating libraries.
- Includes:
  - Storage of materials by size
  - Use of acid-free trays to store materials
  - Items are accessed by barcode
  - Use of an inventory control system to store material metadata and control operations
- Use an order picker to access 30 foot high shelving
- Controlled climate of 50°-60°F and 35%-50% relative humidity (RH)

Warehousing Books: A High-Density Storage Library in Action

Margaret Loebe ● Coordinator, Collection Maintenance and Retrieval ● University of Maryland College Park Libraries

Introduction

Severn Library: By the Numbers
- 56,587 books
- 1.25M books / 40k boxes
- 10.5 miles of shelving
- 30 foot high shelving
- $3.40/book savings
- 50.8˚F / 32% RH
- 2.5 staff

Severn Library: Design

- Books are stored, shelved, and retrieved in the book storage area
- In the library services area, books may be accessed, checked in and out for circulation, or scanned for electronic delivery

Severn Library: Circulation, Retrieval, and Shelving

Best Practices in Warehouses: Design

<table>
<thead>
<tr>
<th>Design Name</th>
<th>Type of Facility</th>
<th>Description</th>
<th>Layout Drawing</th>
</tr>
</thead>
<tbody>
<tr>
<td>U-Shaped warehouse</td>
<td>The processing and storing of the flow of items</td>
<td><img src="image_url" alt="U-Shaped warehouse diagram" /></td>
<td></td>
</tr>
<tr>
<td>Straight-Thru warehouse</td>
<td>The layout models the sequences of the flow of items</td>
<td><img src="image_url" alt="Straight-Thru warehouse diagram" /></td>
<td></td>
</tr>
</tbody>
</table>

McKeldin Library Circulating Library

- Library services are centralized and located separately from book storage

Severn Library: High Density Storage Library

- Library services are centralized and located separately from book storage
- Shelving and processing areas were set up with an efficient flow

Best Practices in Warehouses: Storage

<table>
<thead>
<tr>
<th>Consideration</th>
<th>Warehouse Best Practices</th>
<th>Severn Practice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scale</td>
<td>Keeps an order grouped as the largest possible (e.g., by the local library)</td>
<td>Staff receive individual items and then sort them into bundles in the upper shelves</td>
</tr>
<tr>
<td>Density</td>
<td>Materials should be located to maximize storage efficiency</td>
<td>Shelves and boxes are stacked on the ceiling, which are then grouped on shelves</td>
</tr>
<tr>
<td>Productivity</td>
<td>Materials should be located to maximize operating productivity</td>
<td>The heaviest materials are at the top of the modules</td>
</tr>
</tbody>
</table>

Best Practices in Warehouses: Shelving and Retrieval

- Automated Storage/Retrieval Systems
  - Use robotic shelving where the materials will come to the operator rather than the operator going to the shelf to get the material

- Batch retrieval and shelving
  - Materials should be retrieved and returned to their various locations at one time, rather than one order at a time

- Sequenced retrieval and shelving (WMS order)
  - Materials should be sorted from the retrieval and shelving locations to ensure that the collection is organized in the correct order

- Effective storage methods
  - Having the “dirty” space for vacuuming incoming materials, equipment storage space, and receiving space to all available space

Conclusions

Severn Library is generally a very efficient warehousing operation, when compared to the operations laid out by Fradella:
- **Design**
  - The design is not very efficient. Having one centralized library services area requires extra sets and is not made up to the design more similar to a circulating library than a warehouse.

- **Storage**
  - Severn Library’s storage principles generally follow the guidelines set out for warehousing, making them very efficient.

- **High-density storage by its very nature turns the warehouse’s fundamental rule for efficiency in storage on its head. Instead of keeping materials at the largest scale possible, we store individual items together in trays, which is why off-site storage is more efficient storage at its foundation than storage at a circulating library.

- **Severn Library**
  - In order to further improve operational efficiency, we could store the least-used items at top-most shelves.
  - We sequence shelving and retrieving by RMST order.

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References and Credits

[1] Loebe, Margaret. "Warehousing Books: A High-Density Storage Library in Action." [Source]. [Date]. (Note: Replace with actual bibliographic information)

