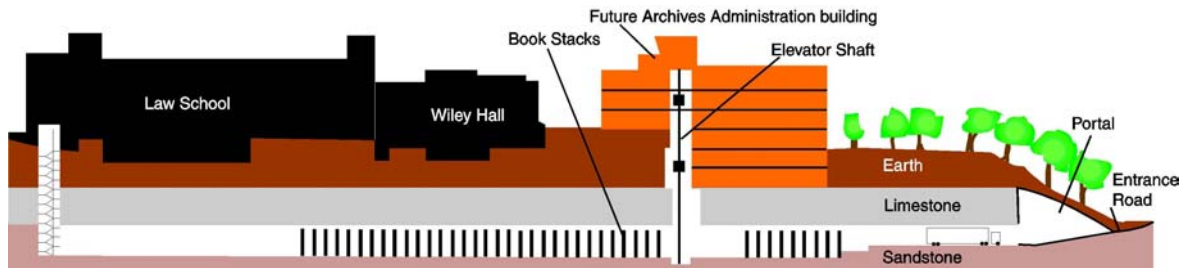


Elmer L. Andersen Library, University of Minnesota

Grand opening of the Andersen Library, including the four-story aboveground building, was in April 2000. The Library has two components—storage of archives collections and overflow storage. The Archives Collection contains precious, one-of-a-kind collections from around the country. Overflow storage will compliment the existing University Library system by providing space for infrequently accessed but important materials. This University of Minnesota project consists of two storage caverns, a 4-story conventional surface building, two vertical shafts, and a mined portal entrance. The photograph above and to the right illustrates the surface and underground nature of the project, and the urban density of the site. The mined caverns and tunnels have a footprint of 106,000 square feet and an excavated volume of 95,000 cubic yards. Each cavern is 600-feet long, 25-feet high, and 70-feet wide. The shafts provide vertical circulation between the surface and mined space, as well as emergency egress. The 50 foot high mined portal provides a drive-in entrance for vehicles as large as semi-trailer trucks. CNA designed the portal, which is a shell structure that retains more than 40 feet of soil. The graphic to the left illustrates some of the structural analysis output.



The caverns are constructed in the easily excavated St. Peter sandstone and Glenwood shale. The cavern roof is at the bottom of the Platteville limestone, which is rockbolt reinforced. Blasting through the Platteville limestone for shaft construction was tightly controlled on this dense urban site.



CNA provided the following services for the Library mined space, shafts, and portal structure: feasibility study, preliminary and final design, construction engineering and administration.

Owner — University of Minnesota

Completion Date— 2000

Construction Cost — \$9 million underground construction of the \$40 m total

CNA
Consulting
Engineers

2800 University Ave. SE
Minneapolis, MN 55414
Ph: (612) 379-8805
Fax: (612) 379-8160
E-mail: bkn@cnaengineers.com