

MINOS Far Detector Laboratory Outfitting

The MINOS Far Detector Laboratory, part of the Fermi National Accelerator Laboratory's NuMI project, is located adjacent to the Soudan 2 cavern, at the deepest level of the Soudan Underground Mine State Park in northeastern Minnesota. The Park is a historic underground iron ore mine now operated by the State of Minnesota Department of Natural Resources. More than 30,000 Park visitors tour the underground workings each summer.

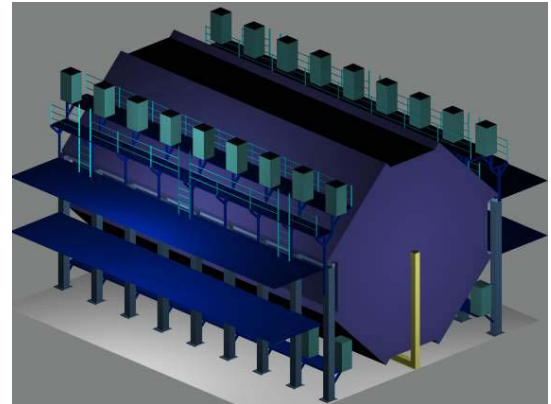


CNA was the prime consultant to the U of MN, with responsibility for feasibility study, site selection and investigation, space planning, design, and construction services for this large, underground physics laboratory. Other team members provided mechanical, electrical, and architectural services.



Cavern construction was completed in the fall of 2000, and cavern outfitting was completed in summer 2001. The photos above show transport of the first shipment of steel plates for the detector.

Cavern outfitting is in preparation for assembly of a 6,000-ton steel detector composed of alternating layers of steel and scintillator. One supermodule of the detector is illustrated in the rendering to the right. The octagonal cross section is 26.5 ft across. Other outfitting items include installation of a 25-ton bridge crane, steel structures, electrical systems, ventilation systems, a surface-to-underground chilled water loop for cooling, materials handling systems and concrete floors. CNA designed the steel structure that supports the detector supermodules and bridge crane hangers.



The detector will be assembled underground from components hoisted underground, stored until needed, then tested prior to assembly. The photo to the left shows the north end of the cavern, where assembly will occur on the floor of the cavern. The gantry cranes in the foreground are used to transport detector components to the assembly areas. Two planes of the detector may be assembled simultaneously. The bridge crane in the top of the photo serves the full length of the cavern.

Owner — University of Minnesota, School of Physics & Astronomy

Construction Cost — \$12 million

CNA
Consulting
Engineers

2800 University Ave. SE, #102
Minneapolis, MN 55414
Ph: (612) 379-8805
Fax: (612) 379-8160
E-mail: bkn@cnaengineers.com