

BUILDING TO THE TOP

The Facilities Engineering Services Section's mission is to establish and maintain a dependable base from which high energy physics and other Fermilab programs can be accomplished without interruption. As part of the proud heritage of supporting high energy physics, FESS and its predecessor organizations were integral in the planning, design, construction and operation of significant components of the Fermilab accelerator complex that contributed to the discovery of the Top Quark.



● To produce antiprotons, physicists collide proton beams with a metal target. The collisions produce a wide range of secondary particles including many antiprotons. The antiprotons are captured, focused and stored. After accumulating a sufficient number of antiprotons, beam operators send them to the Main Injector for acceleration and injection into the Tevatron.



● CDF is one of two detectors that physicists use in the Tevatron tunnel to observe collisions between protons and antiprotons. As large as a three-story house, each detector contains many detection subsystems that identify the different types of particles emerging from collisions at almost the speed of light. Analyzing the "debris," scientists explore the structure of matter, space and time.

CDF



● More than two million times a second, proton-antiproton collisions create showers of new particles at the center of both CDF and DZero detectors, which record each particle's flight path, energy and electric charge. Working in shifts, physicists monitor the proper functioning of the detectors 24 hours a day. In 1995, physicists from both experiments observed the first top quarks ever produced by accelerators.

DZERO

FESS continues to support the Fermi mission of advancing the understanding of the fundamental nature of matter and energy by providing leadership and resources for qualified researchers to conduct basic research at the frontiers of high energy physics and related disciplines.

