

The Superconducting Super Collider Expanding the Role of the Survey Office

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The Superconducting Super Collider (SSC) will be the most advanced particle accelerator in the world. It will provide the United States with the preeminent facility for the study of high energy physics.

Located in Ellis County, Texas, the SSC is constructed within a racetrack-shaped tunnel, 54 miles in circumference and 14 feet in cross section diameter. The required right of way is 1,000 feet wide, an average of 100 feet below ground and approximately 100 feet in vertical dimension.

Within the tunnel, 10,000 superconducting magnets will focus and guide two beams of protons in opposite directions, approaching the speed of light. These beams will be made to collide head-on with the energy of 40 trillion electron volts. The particles

emanating from these collisions will be studied and generate basic research information which will help scientists better understand the complexities of the universe.

In May of 1990, Universal Field Services was hired to acquire the 1,360 parcels of land required for the project. The land acquisition program consisted of four different property types:

Eleven survey consultant firms were employed to perform the boundary surveys and to establish horizontal control on existing monuments.

1. Two administrative campuses consisting of 9,500 acres.
2. Sixteen 50-acre sites around the ring for the construction of magnet delivery shafts, the removal of fill

and the construction of cooling ponds.

3. Nine sites for the construction of monitoring wells.
4. Six thousand, three hundred acres of subsurface fee for the construction of the tunnel.
5. The total land area being acquired consisted of 16,700 acres.

PROJECT OVERVIEW

The greatest challenge Universal faced was to explain the nature of the project and overcome the property owners' concerns about radioactive particles circulating at high speeds beneath their property, and then being brought together in a collision. Questions about ground water con-

tamination, radiation, the impact on the value of their remainders, and how the tunnel construction might impact adjoining land all had to be addressed.



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The Superconducting Super Collider

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DCA Coordinate Geometry and Digital Terrain Modeling Package, and the Lewis and Lewis Coordinate Geometry Package. Universal developed in-house software programs for vertical modeling and horizontal/vertical intersections. We also developed in-house programs to process quality assurance checks on all incoming/outgoing plats and descriptions.

Certified boundary plats were required on each parcel. In addition, a surface contour model was developed for the entire project. Three-dimensional horizontal and vertical models of the project ring were made using the location criteria provided by the Superconducting Super Collider Laboratory (SSCL). These models were used in developing three-dimensional intersections required for the completion of a legal description.

General land office original field note and patent maps on the 168 original surveys covered by the project limits were used. These patents were mapped, analyzed and plotted on aerial photography to determine if any state ownership (vacancies) existed, and a complete report of the findings was developed.

This information provided the support for three primary reference sources:

- "All" Drawing: Through the use of the coordinate system each parcel surveyed was inserted as a unique entity into a CADD "All" drawing which became the basis for many project drawings. Universal used this drawing to piece the parcels together like parts of a puzzle into a project base map in NAD 83. Errors, omissions, gaps and overlaps could readily be identi-

fied from this drawing.

- Parcel Booklets: These booklets provided a breakdown of the project limits on legal size paper, thereby allowing us to illustrate parcels in a given project area.
- Baseline Parcel Map: This map was continuously updated to show the total taking and parcel parent tract polylines. (see Figure 1)

The information that was developed from these reference sources was tailored for five primary user groups: the appraisers, agents, eminent domain attorneys, project administrators and title.

APPRAISERS

The appraisers were provided detailed parcel information to help them in performing the appraisal(s). The plat and legal description provided to the appraiser showed and described the whole property acreage and included all adjoining ownerships. Aerial photography covering all appraised areas was provided, and access corridors were defined on existing maps and special exhibits.

Property sketches were prepared illustrating the relationship of the tunnel to the surface. These drawings provided the appraiser with the distance and elevation information that was required to assess damages that might result from the acquisition.

An index of parcel survey and location maps, road maps, ownership maps and subdivision maps were developed to assist the appraisers. Drawings showing the contours of the property, lakes, drainage corridors, access corridors, and flood zones were also made available to the appraisers, as well as comparable sales maps.

AGENTS

The property sketches were used by the agents to explain to the property owners exactly how the project was affecting their property. The sketches showed the depth and thick-

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FIGURE 2 SUBSURFACE CORRIDOR

