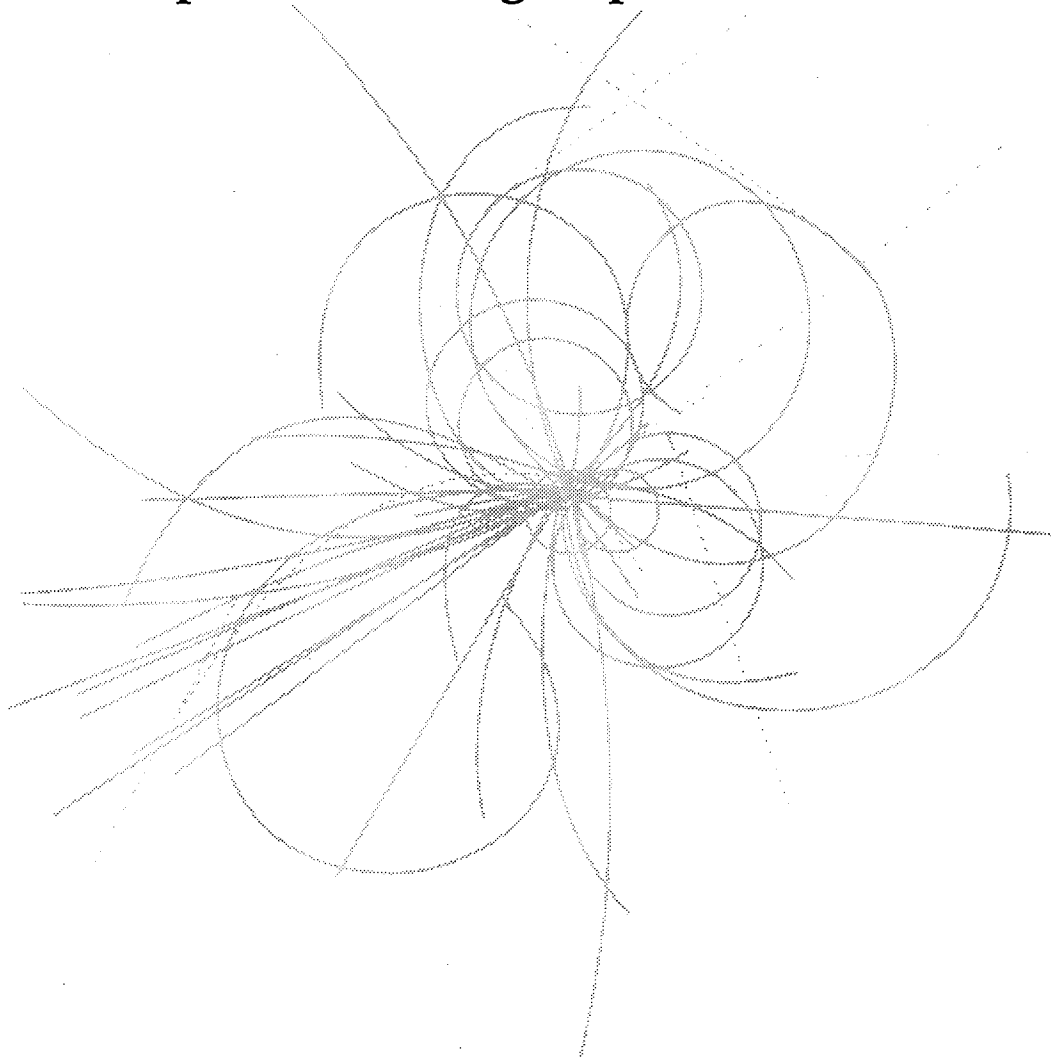


Superconducting Super Collider Laboratory



Highlights of the SSC Site Development Plan

James R. Sanford

October 1991

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Highlights of the SSC Site Development Plan

James R. Sanford

Superconducting Super Collider Laboratory, Dallas, TX 75237

This paper summarizes highlights of the Site Development Plan for the Superconducting Super Collider Laboratory. The Plan, sometimes called a Master Plan, was prepared by the architectural and engineering firm for the Laboratory: Parsons Brinckerhoff/Morrison Knudsen (PB/MK) working in association with CRSS. Their task was to interpret the SSC project needs in the context of the Ellis County, Texas site. The team effort was under the direction of Lewis May from CRSS, guided by Robert Sims from the SSC Laboratory.

After examining the physical features of the many individual sites around the 54-mile ring as well as the technical requirements for the project as described in the Site-specific Conceptual Design Report, the CRSS team held a series of meetings with people at the Laboratory. One was the Community Group set up by the Director and the other, the Citizens Advisory Committee from Ellis County. In addition to guidance from laboratory personnel, each group provided advice and site-specific information to the CRSS planning team.

One of the first tasks was to place the SSC in the context of the Dallas - Fort Worth metropolitan area as well as within Ellis County (Figures 1 and 2). Here the objective was to study the access to the site via major and minor highways with particular emphasis on the roads to the DFW airport. Within the county, the ability to connect from the west to east land complexes of the project was of vital concern.

From the information about the technical needs of the SSC and the site surveys, CRSS prepared a land use analysis. This was a documented report that described the surface and infrastructure features of the land and services available on the west and east sides of the Collider ring, as well as at the remote service areas. From this beginning, it was possible to overlay the major scientific components of the accelerators and experimental areas. Figure 3 illustrates the results of this analysis for the 7355 acres on the west complex; a similar analysis was undertaken for the east complex and will be described later in this paper.

Within the overall boundaries of the two main and sixteen secondary sites, the planners were able to evaluate the land features including topography, soils types, access, etc. This led to a plan that zoned the various pieces of land according to their primary Laboratory purpose (Figure 4). From such a study, the planners were able to identify the zones (Figure 5) within the west complex that are favored for surface facilities development. A similar analysis was done for the east complex.

In conjunction with the land use study the infrastructure capabilities were documented and analyzed. As an example, Figure 6 indicates the sources of raw and processed water that overlay the various SSC sites. Similar diagrams were created for electrical power, natural gas, and other utilities. An examination of the overall pattern of utility sources and

distribution systems was undertaken. This study was done in conjunction with the technical areas where the services are needed in order to minimize the costs for the new distribution systems. These studies led to the determination of two utility corridors for bringing services into and through the west complex site. These are shown in Figure 7.

With the technical and infrastructure requirements satisfied, attention turned to the campus facilities. In the process of siting the central Laboratory facilities, the road network was examined. Attention was given to the needs of the surrounding populace as well as those of Laboratory personnel. These considerations led to the designation of some roads as primary offsite for general purpose use and others for onsite traffic and maintenance purposes (see Figure 8). Primary access to the west Laboratory site would be from Rt. 66 initially, but later from FM 1493. To enhance access to the site during the research phase of the project, a north/south road connecting with US 287, as shown in Figure 9, is recommended.

In parallel with the previously described considerations, the natural features of the land were catalogued and mapped. As shown in Figure 10, an examination of the land suggested that designated areas be maintained as open prairie and for preservation of the any significant, man-made features. A listing of the various Laboratory features for the west complex are summarized on Figure 11. Attention should be given to the special opportunity and campus areas shown in the illustration. The campus is designed to support the core activities of the Laboratory including the operation, maintenance, and improvement of the accelerators and experimental areas. Activities that support and enhance the broader functions of the Laboratory are found in the special opportunity areas.

The campus and special opportunity areas are shown in Figure 12 in a representative manner only. The essential features of the campus are shown in four (later six) buildings enclosing 420,800 square feet of interior space. The campus buildings are placed in close proximity to the injector accelerators, two of the experimental areas, and the test beam facilities. Near to the campus are found the buildings that are in the special opportunity region on the west complex. These support the education, visitor, and research user needs at the laboratory. The buildings are clustered in a region somewhat separate from the campus, yet close enough to facilitate close interaction of the people involved.

The east complex, consisting of 1861 acres, is located near I 45, nearly 16 miles from the west complex. This area, like the west area, has the potential for four experimental areas with some greater growth possibilities due to the utility region on the lower part of the east side. Figure 13 illustrates the scientific features and constraints on the east side, leading to the development regions displayed in Figure 14. When zoned, the overall land use is illustrated in Figure 15, with the acreage tabulated on the Figure. The east/west and north/south utility corridors are diagrammed in Figure 16 where the pathways are adjusted to take advantage of the source and distribution networks on the east side.

There are many fewer roads on the east side. FM 878 touches the north boundary of the site, while FM 879 is near the southern portion. Only FM878 connects to I 45 for the movement to and from the east complex. It is fortunate that the east experimental areas are near to this access road. As shown in Figure 17, new, or improved north/south roads will

be needed to connect the research zones in the area. With such roads, access to the area can be achieved from either of the primary roads, as can be seen in Figure 18. Because of the smaller surface area, there are fewer natural features on the east side (Figure 19), yet care will be taken to preserve natural and historic features. The specific laboratory features of the area are identified in Figure 20.

Considerable attention was given to the sixteen remote sites that are the service areas around the collider ring. Figure 21 shows the location of the areas and the access roads that have been designated for entry. Studies concentrated on each area with respect to land forms, soils analyses, slopes, interference with man-made features, etc. Figure 22 illustrates the results from one such study site. The Site Development Plan documented the conclusions for all the N and S sites and guided the shape and acquisition of the land by the Texas National Research Laboratory Commission. Six potential large shaft locations for the delivery of magnets to the underground tunnel were identified in the study, as illustrated in Figure 23. Those sites were examined in the same manner as the service areas and the results used in the land procurement.

The initial objectives of the Master Plan were realized through the working out of detailed studies for each site. The overall placing and configuration of the SSC Laboratory facilities have been considered. There is much more work to be done before this project can be considered complete. The next steps require advancing the design definition of the accelerator and experimental facilities by PB/MK as part of the Title I and II design process. It is then hoped that the Master Plan can be updated with more definite and current information.

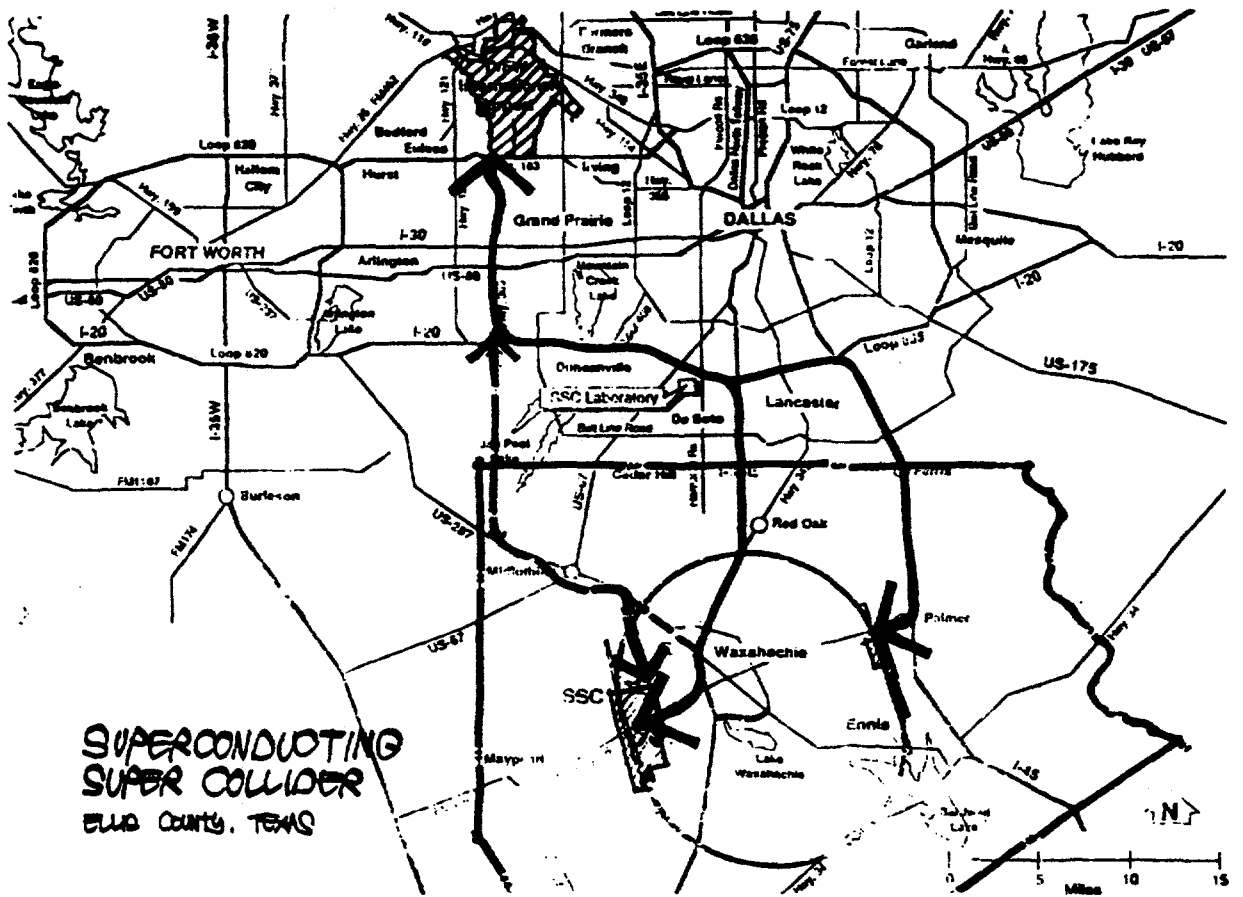


Figure 1 Regional Transportation Network

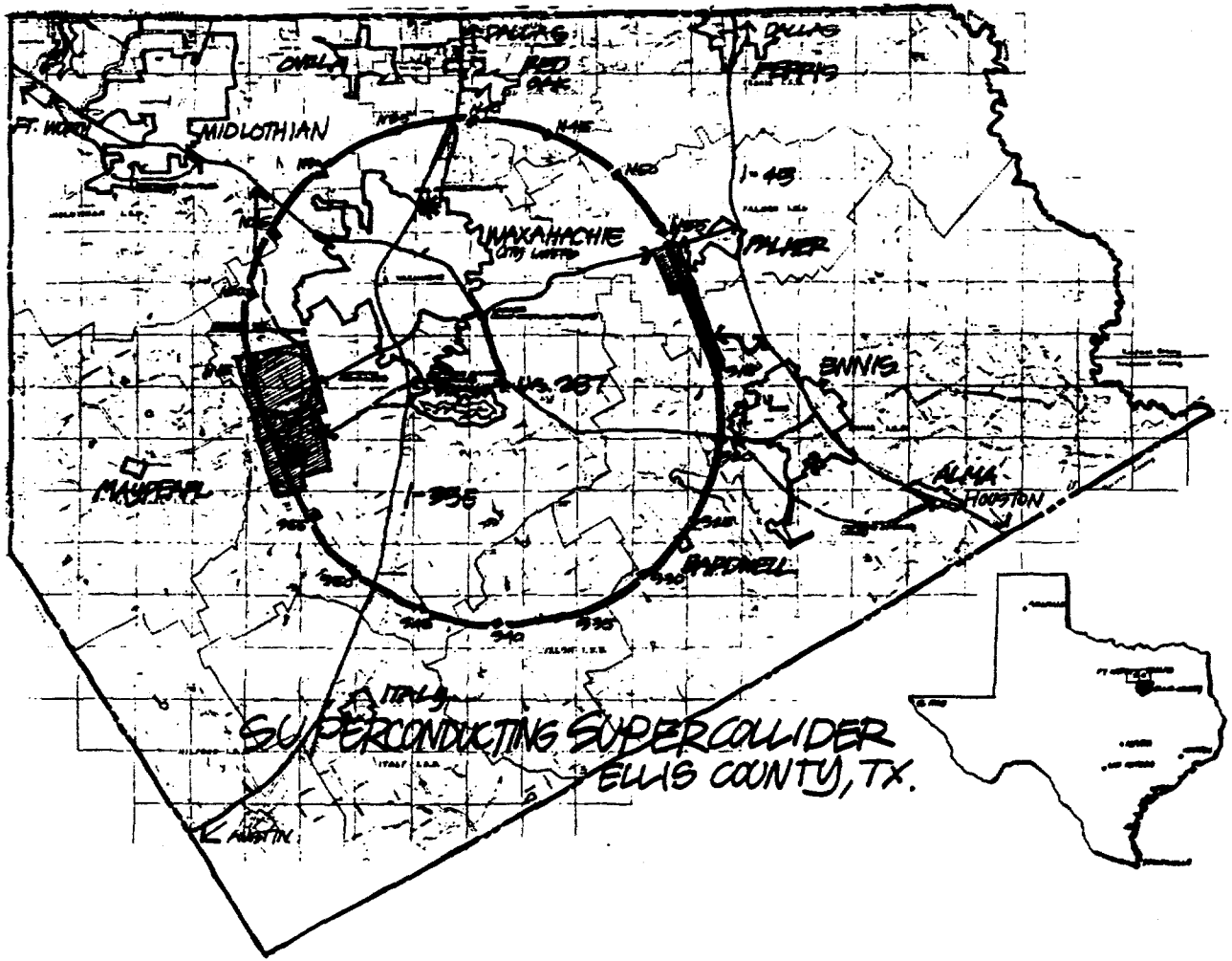


Figure 2 Ellis County Regional Map

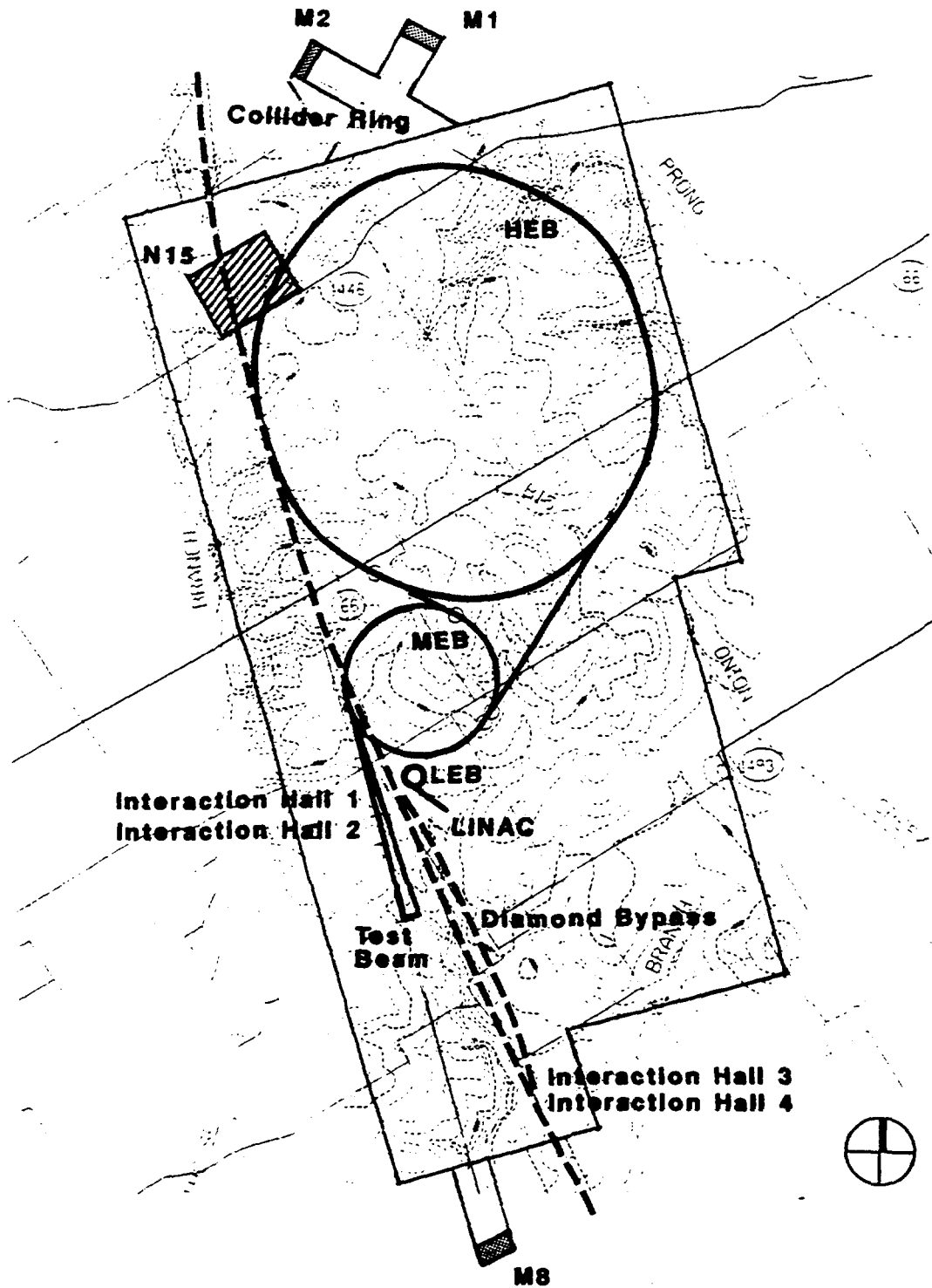


Figure 3 West Complex Site-Specific Scientific Components

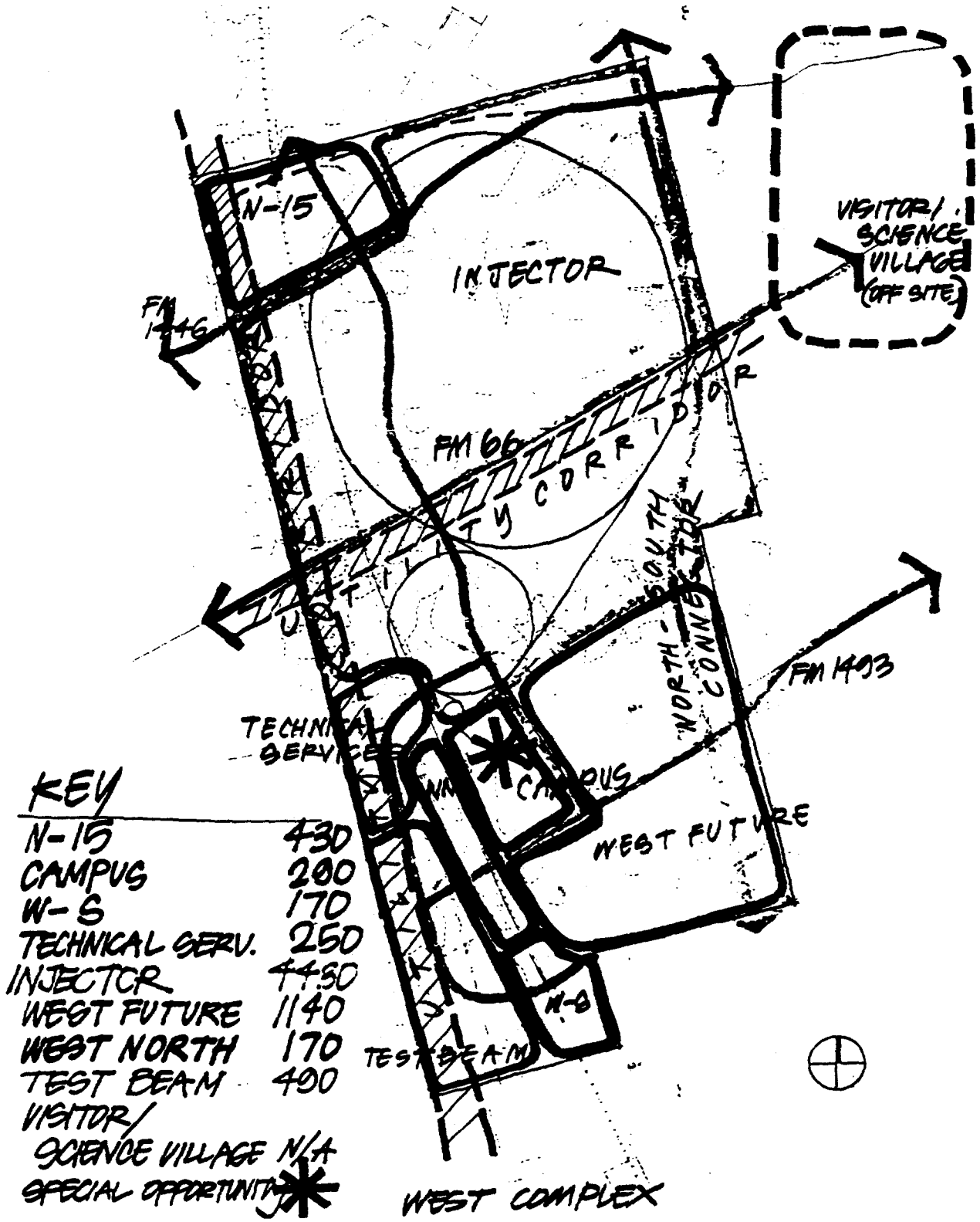


Figure 4 West Complex Functional Zoning

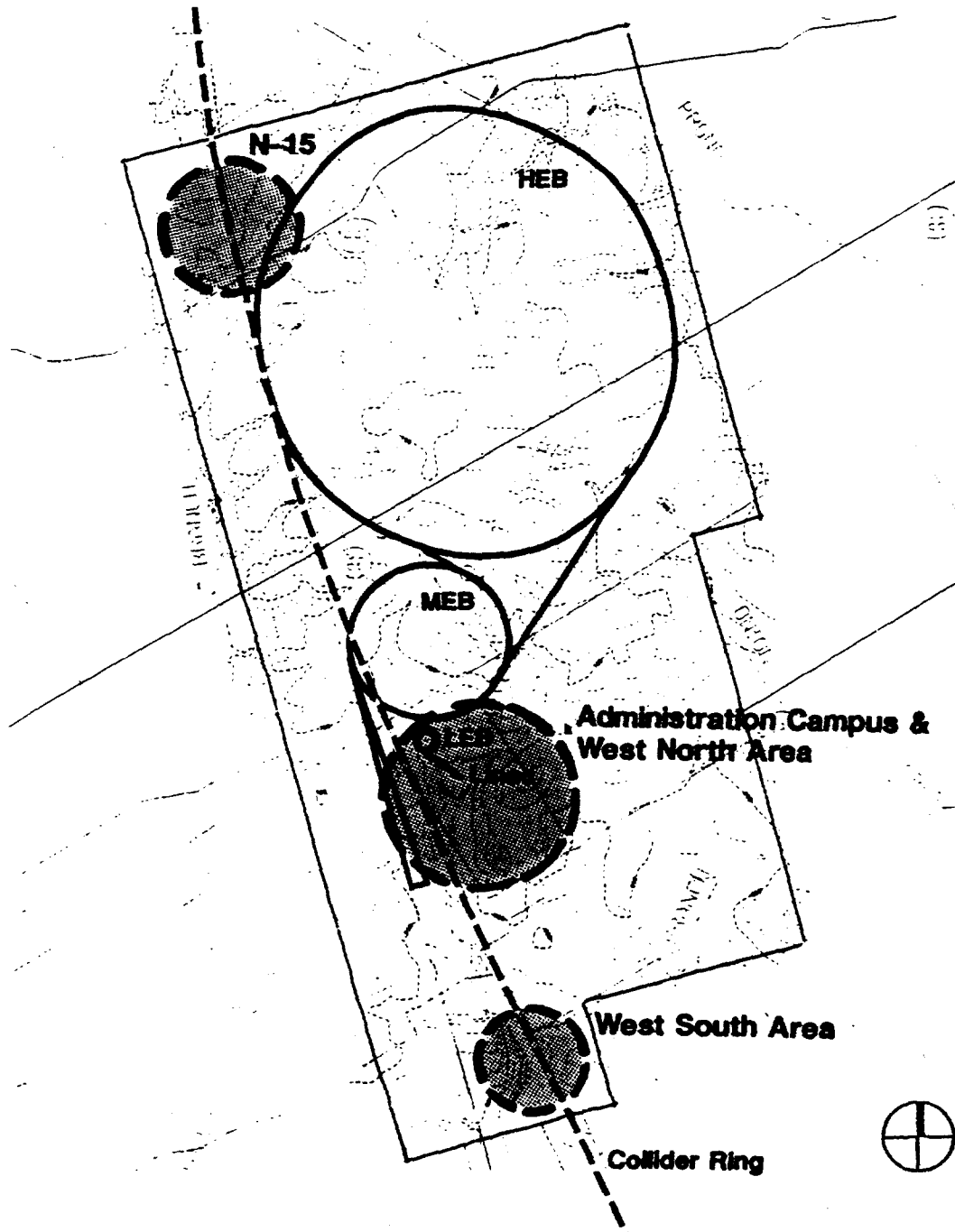
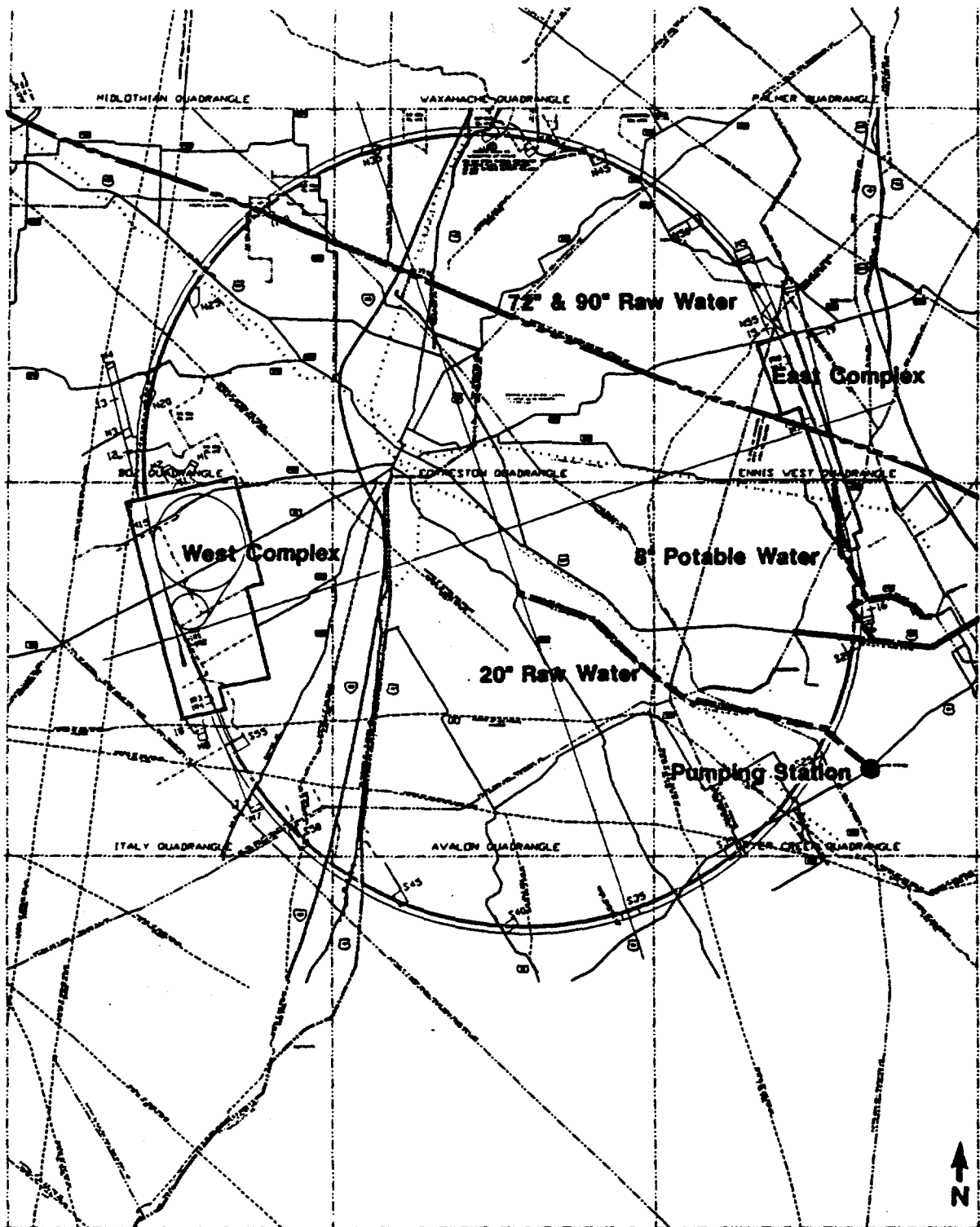


Figure 5 West Complex Development Zones






-  Tarrant County Water Control and Improvement District No. 1 Pipeline
-  Ellis County Water Control and Improvement District No. 1 Pipeline
-  City of Ennis Pipeline

Figure 6 Water

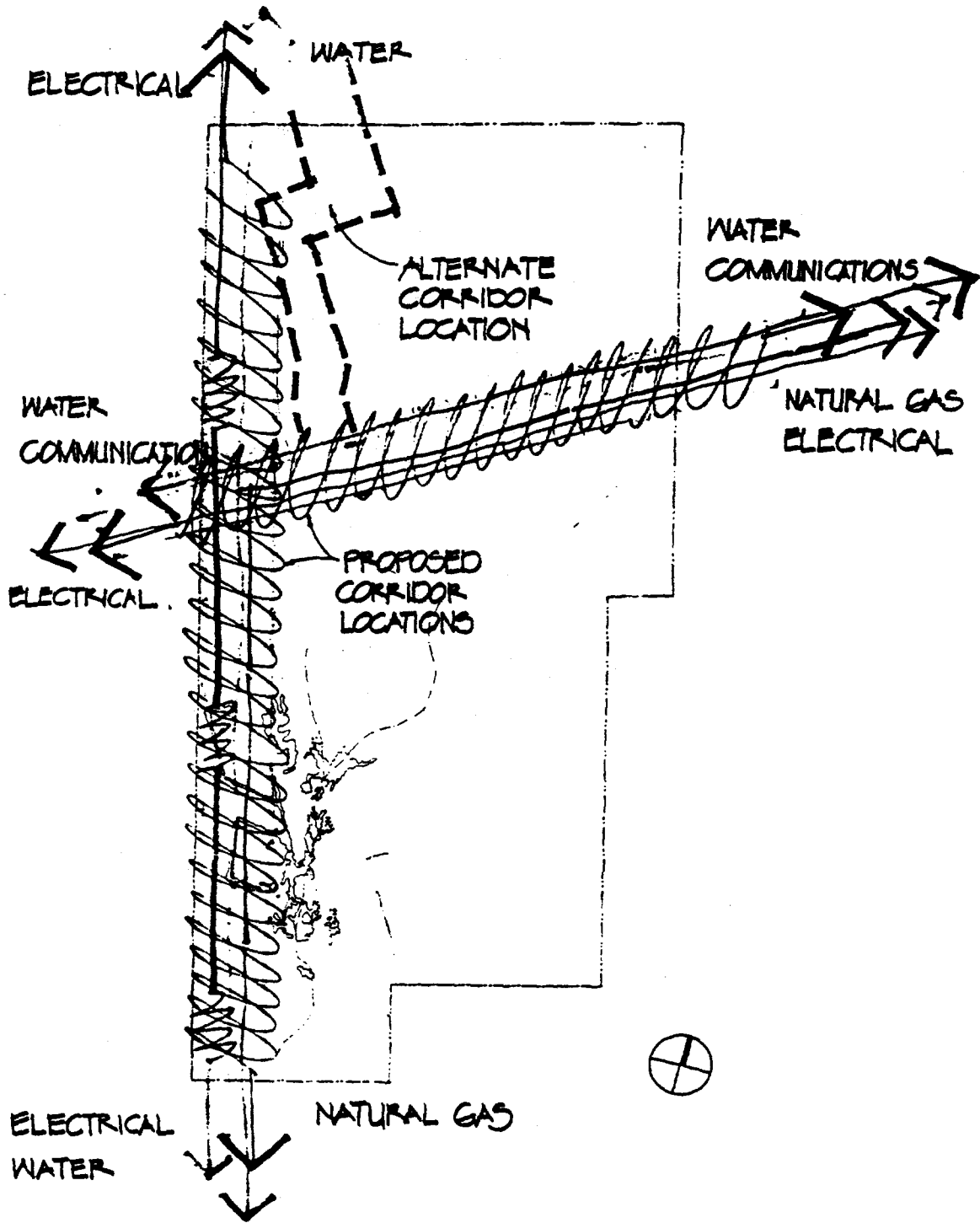


Figure 7 West Complex Utility Corridor Plan

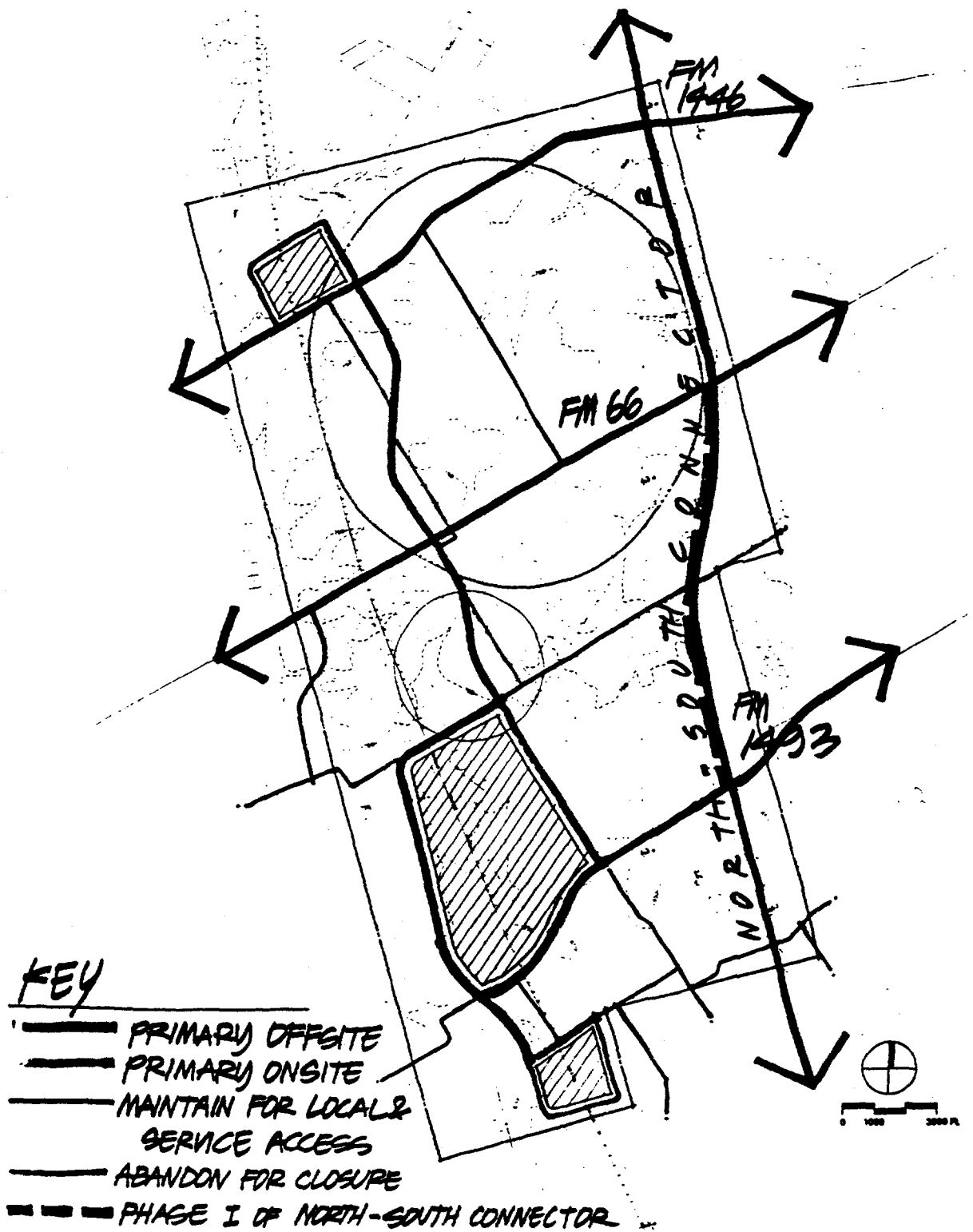


Figure 8 West Complex Long Range Transportation Plan

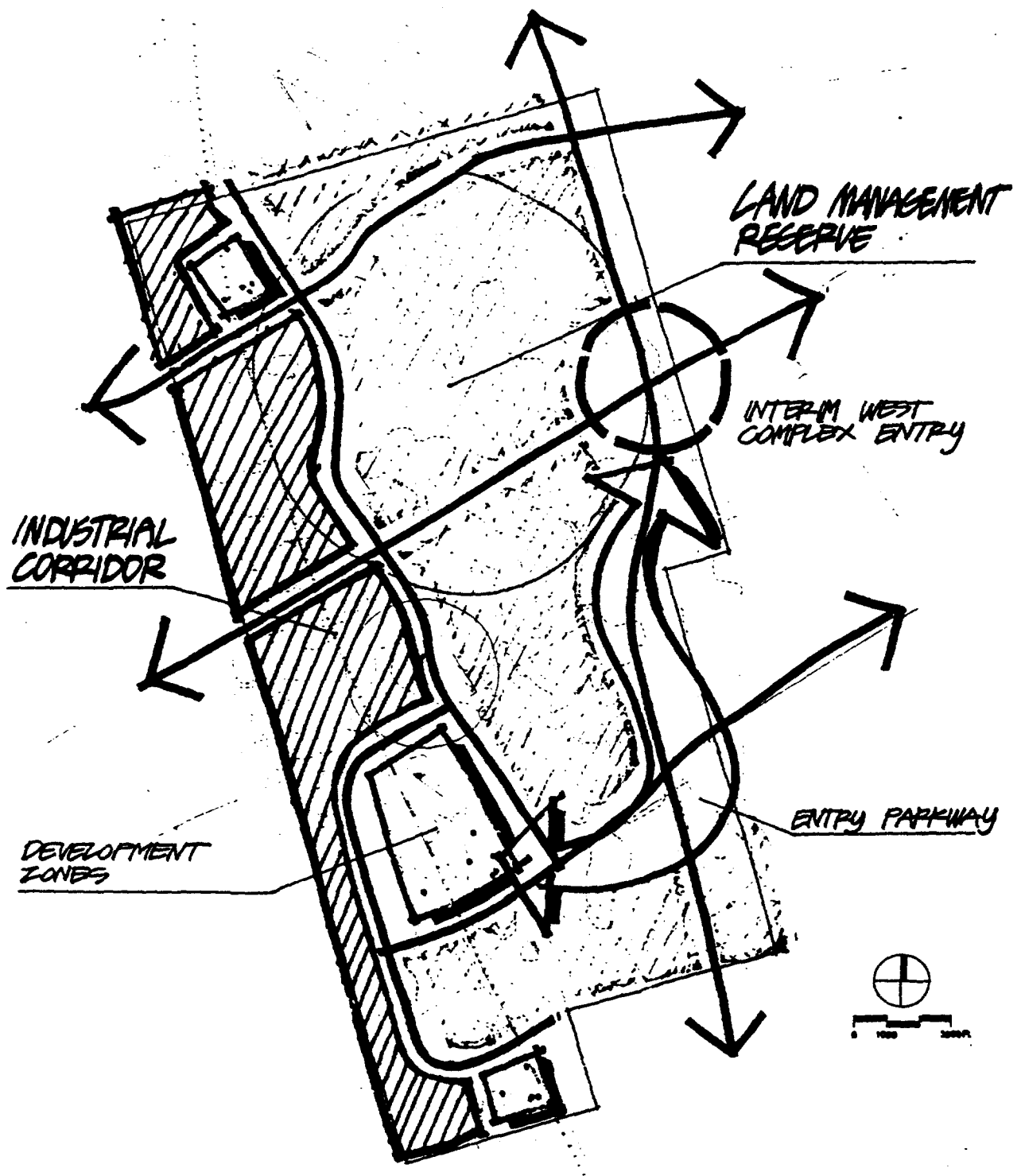


Figure 9 West Access

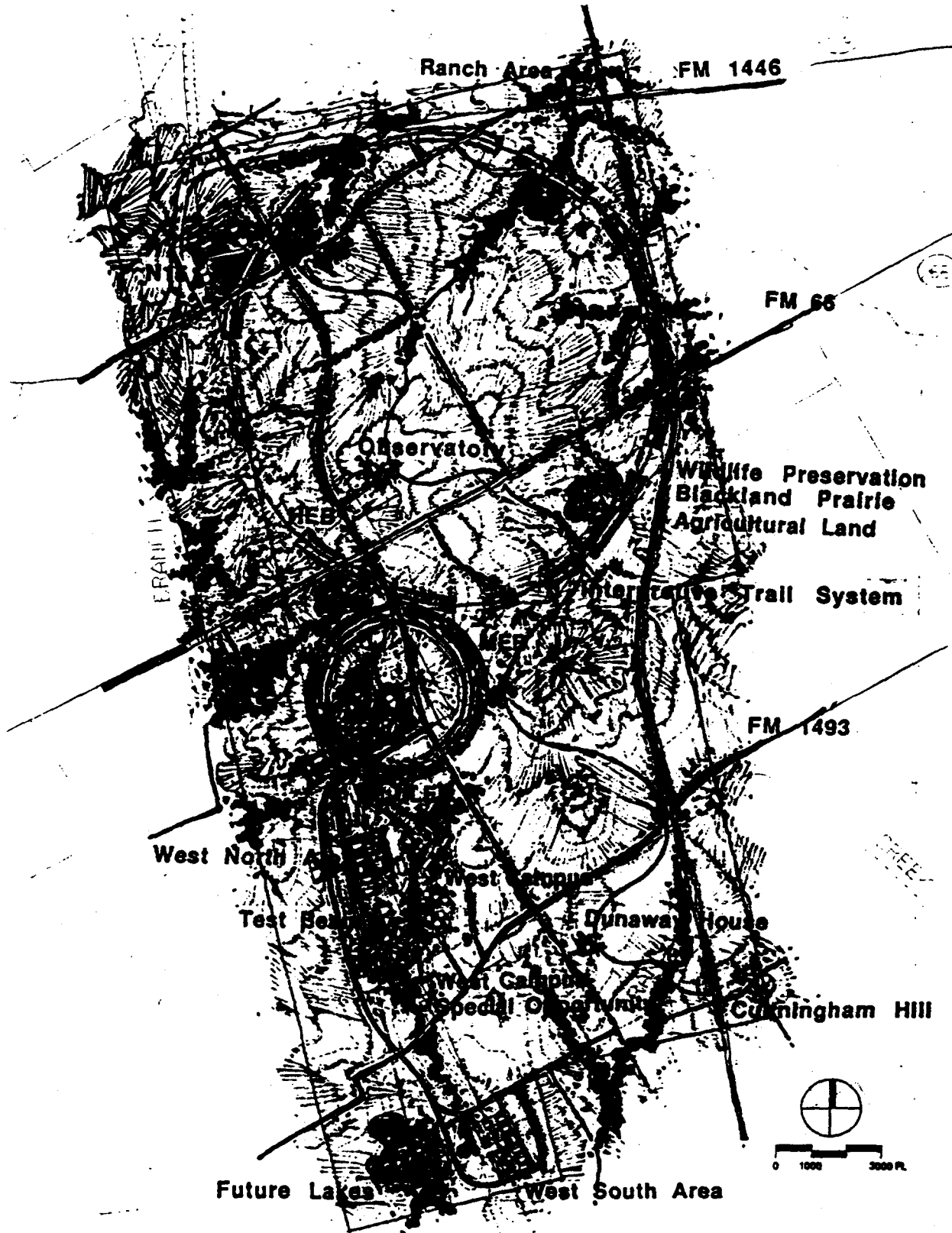


Figure 10 West Complex Illustrative Master Plan

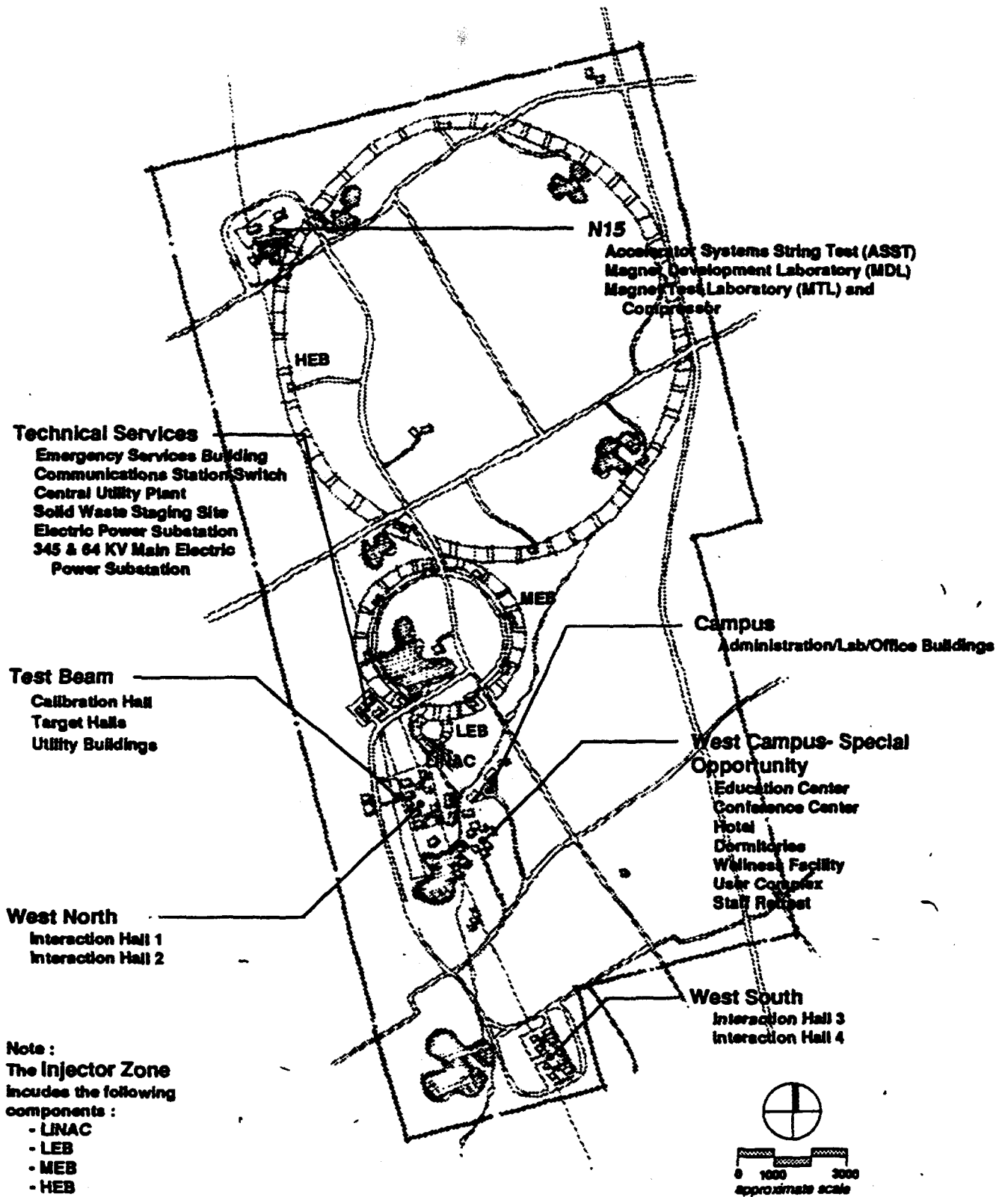


Figure 11 West Complex Long Range Master Plan

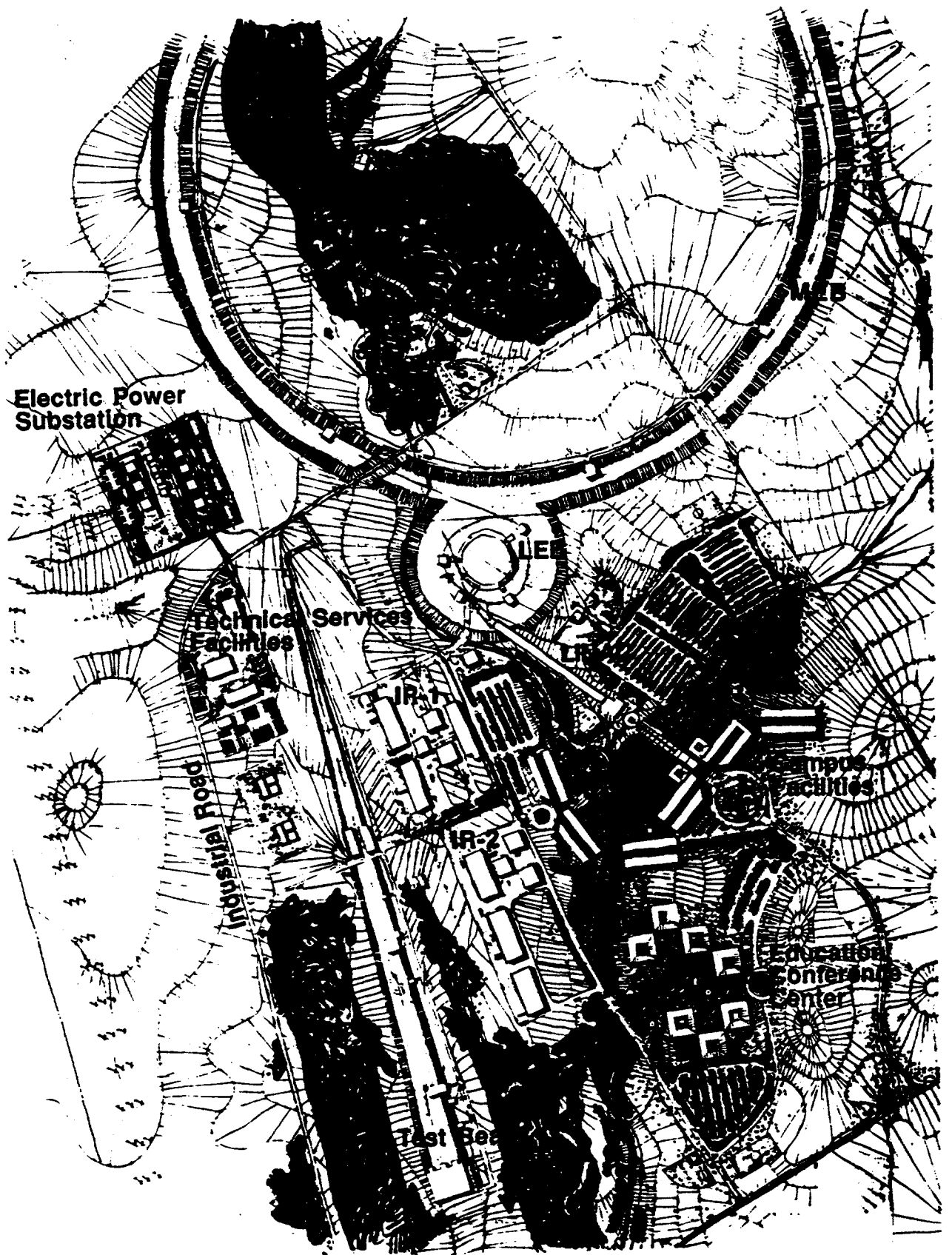


Figure 12 Special Opportunity Areas

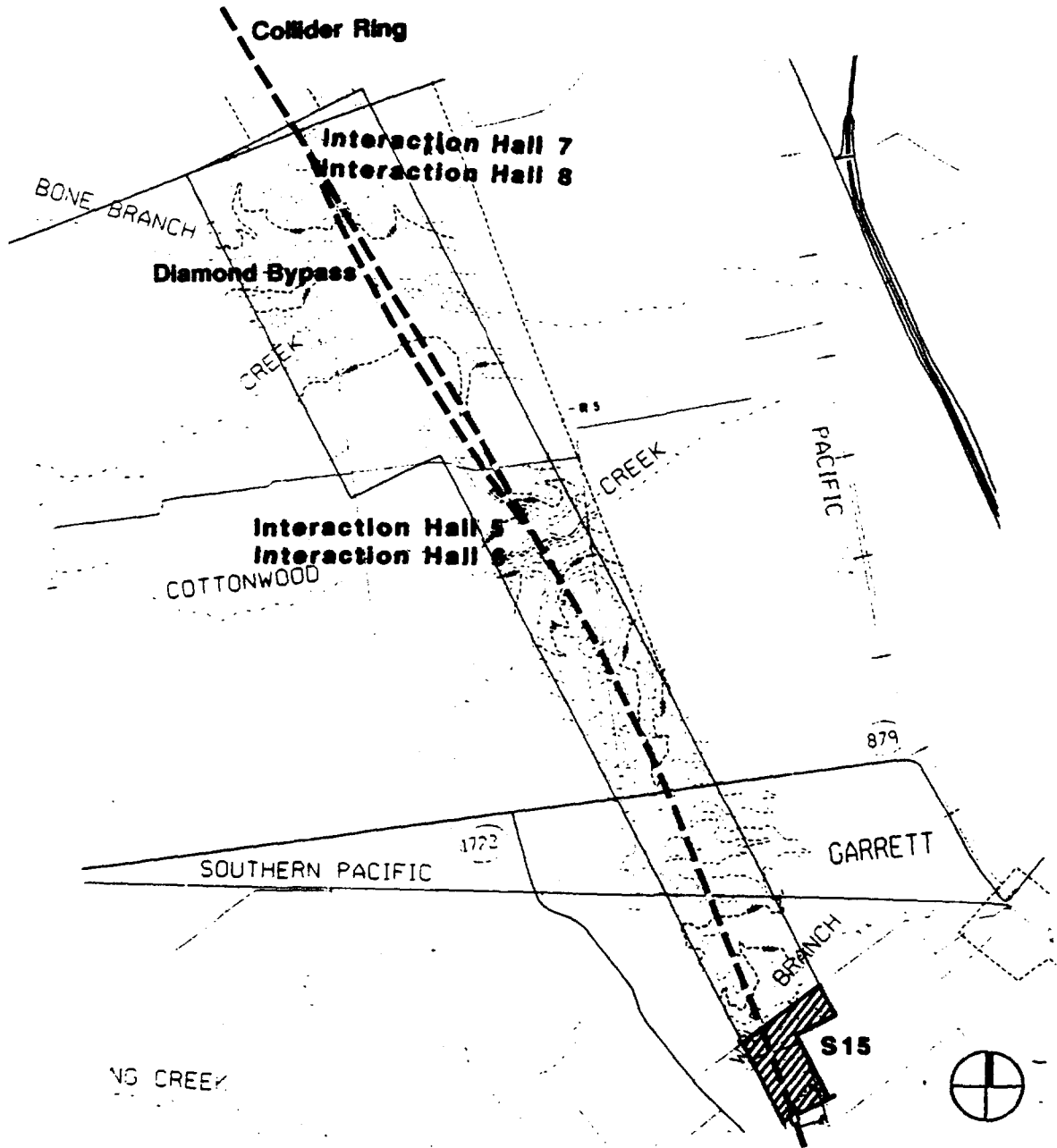


Figure 13 East Complex Site-Specific Scientific Components

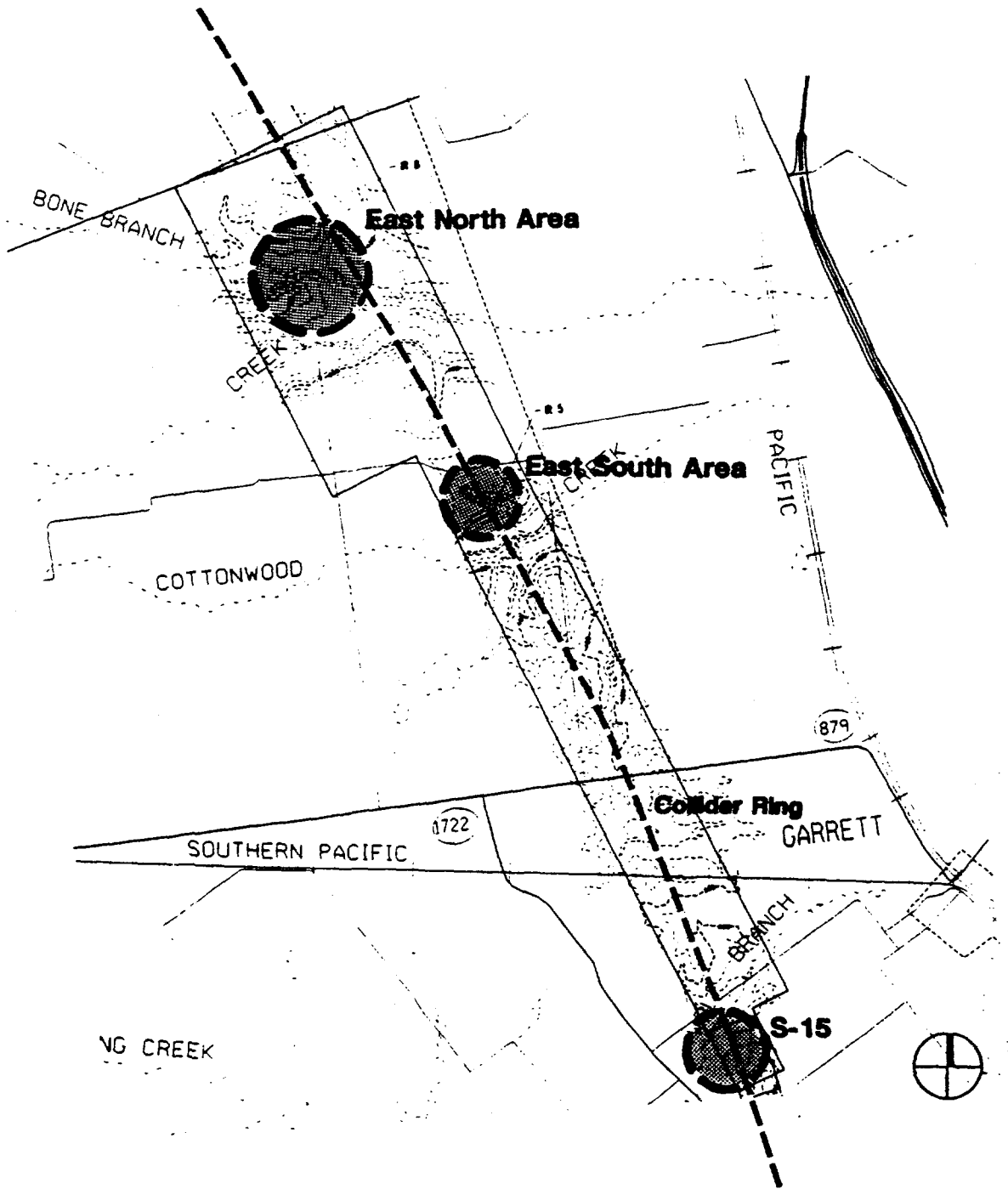
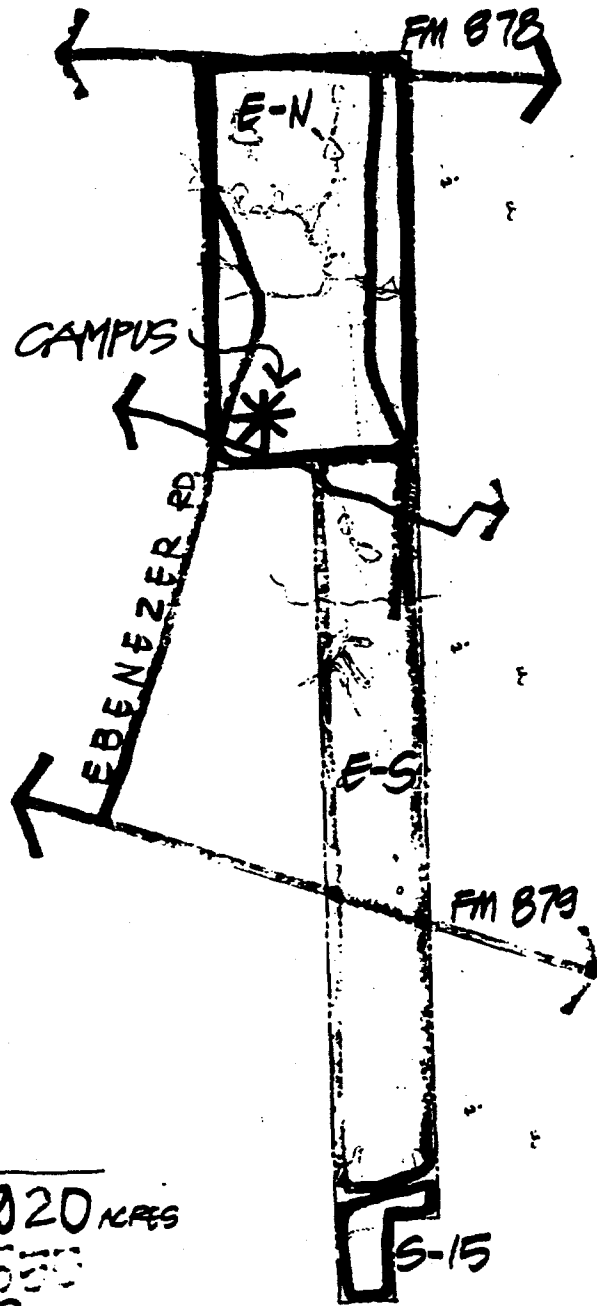


Figure 14 East Complex Development Zones



KEY	
EN	920 ACRES
S-15	85

Figure 15 East Complex Functional Zoning

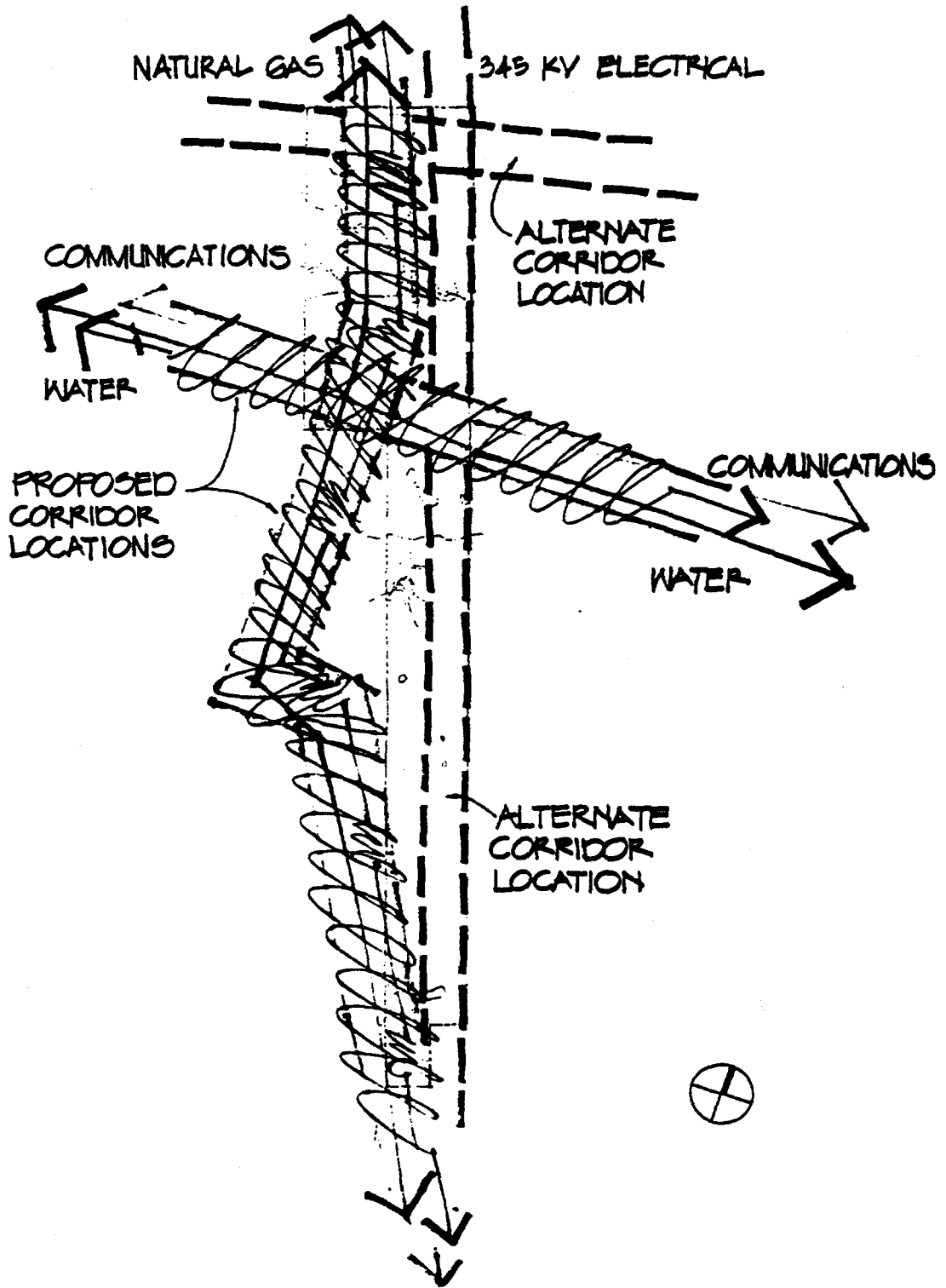


Figure 16 East Complex Utility Corridor Plan

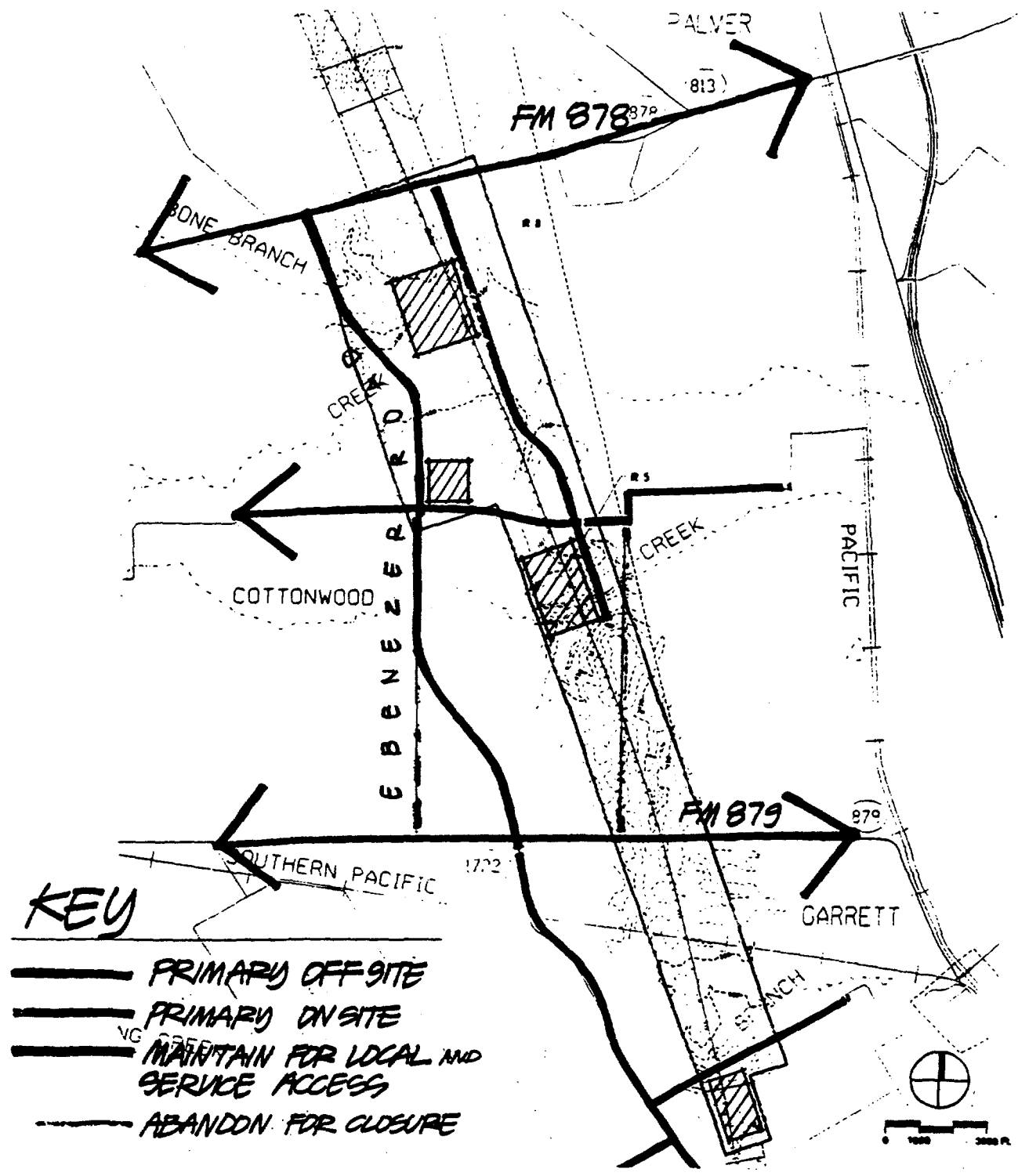


Figure 17 East Complex Long Range Transportation Plan

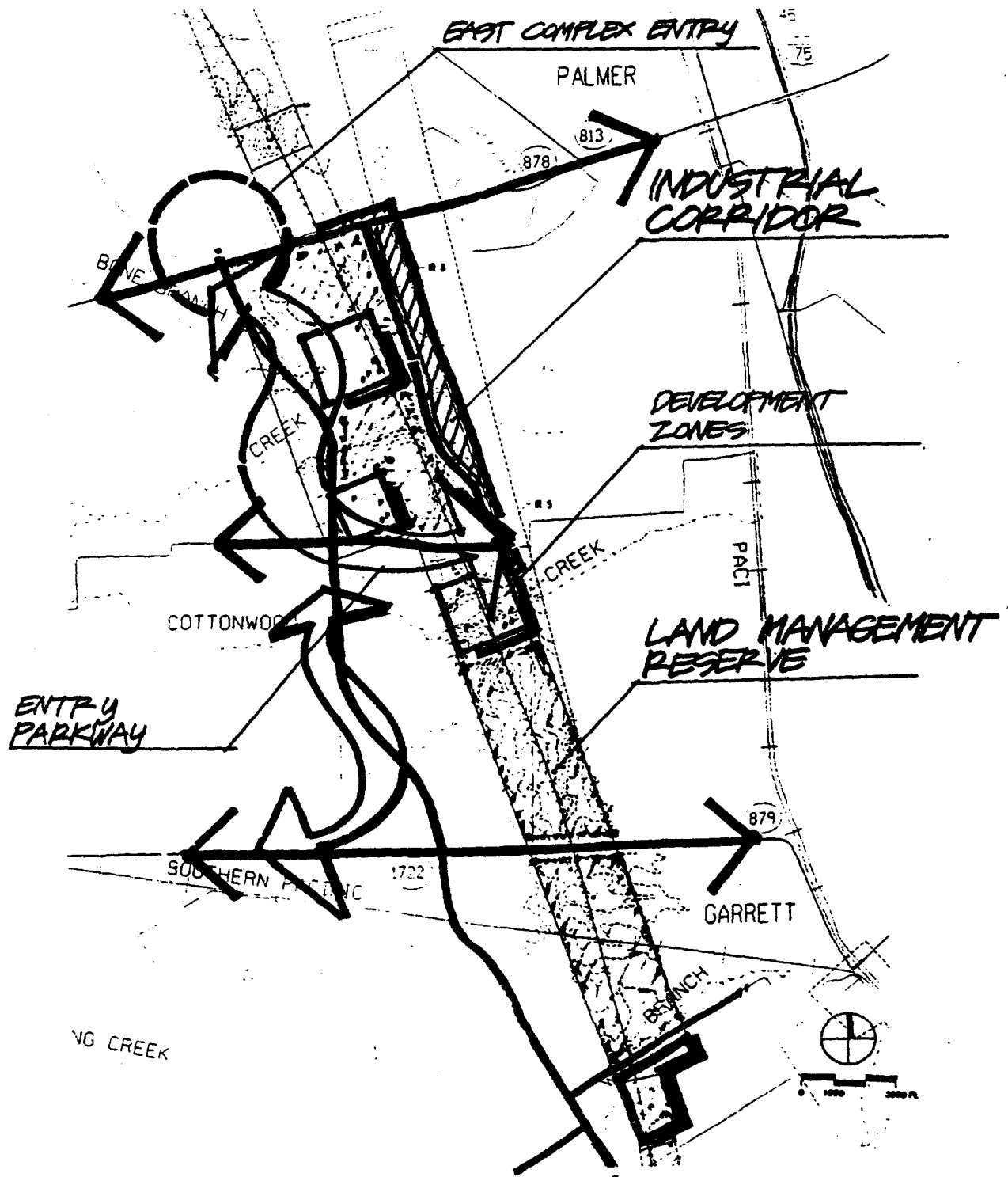


Figure 18 East Access

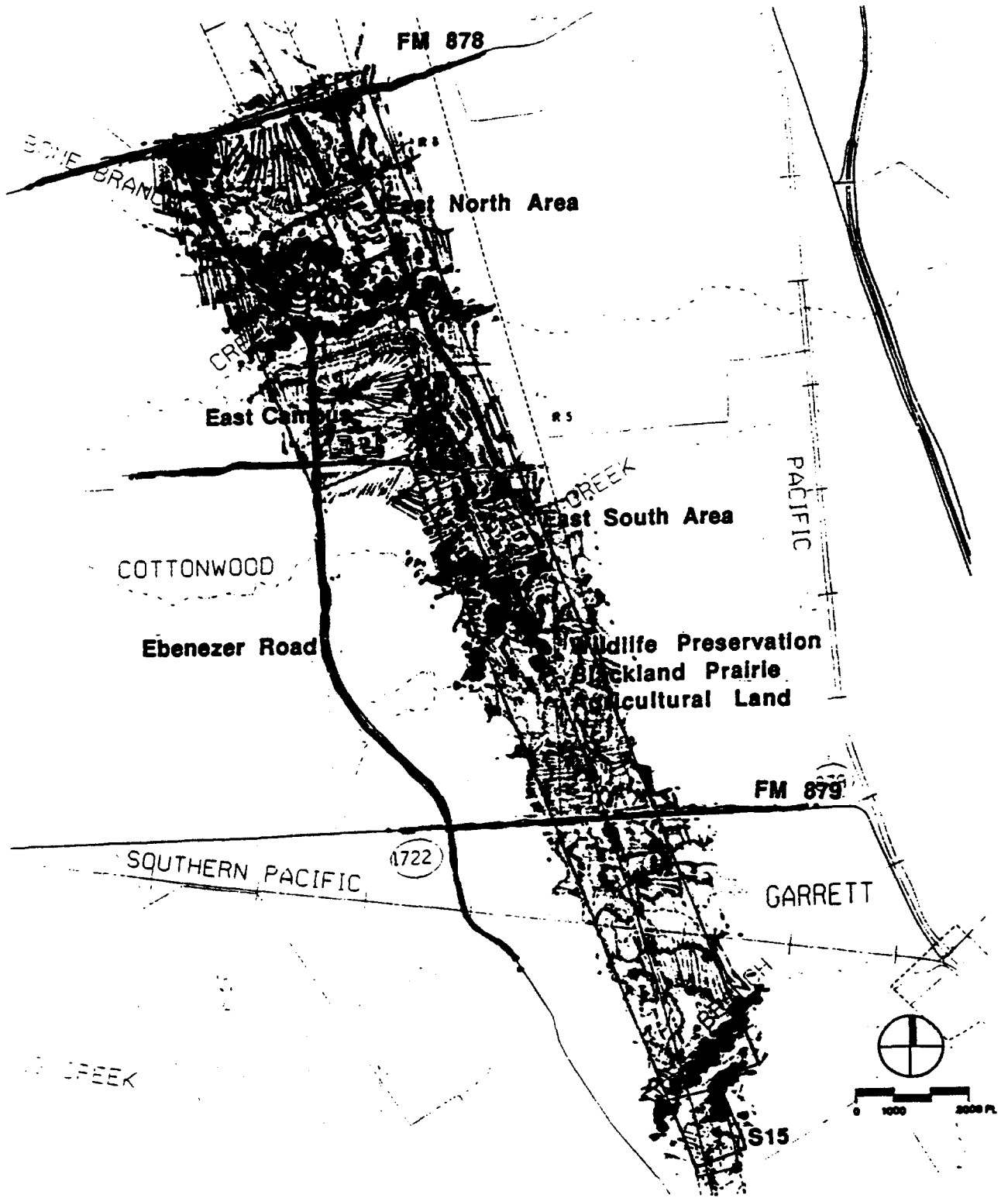


Figure 19 East Complex Illustrative Master Plan

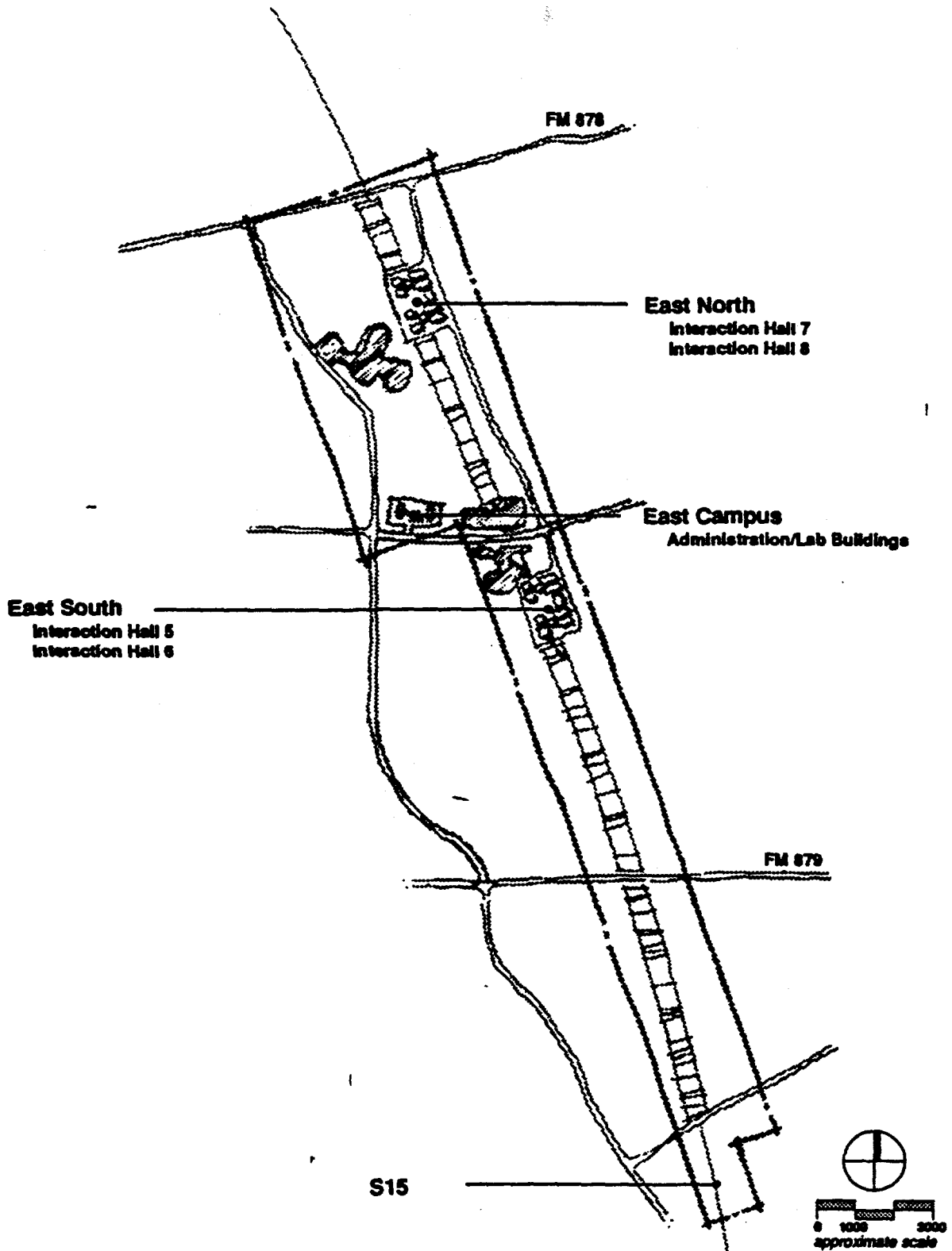


Figure 20 East Complex Long-Range Master Plan

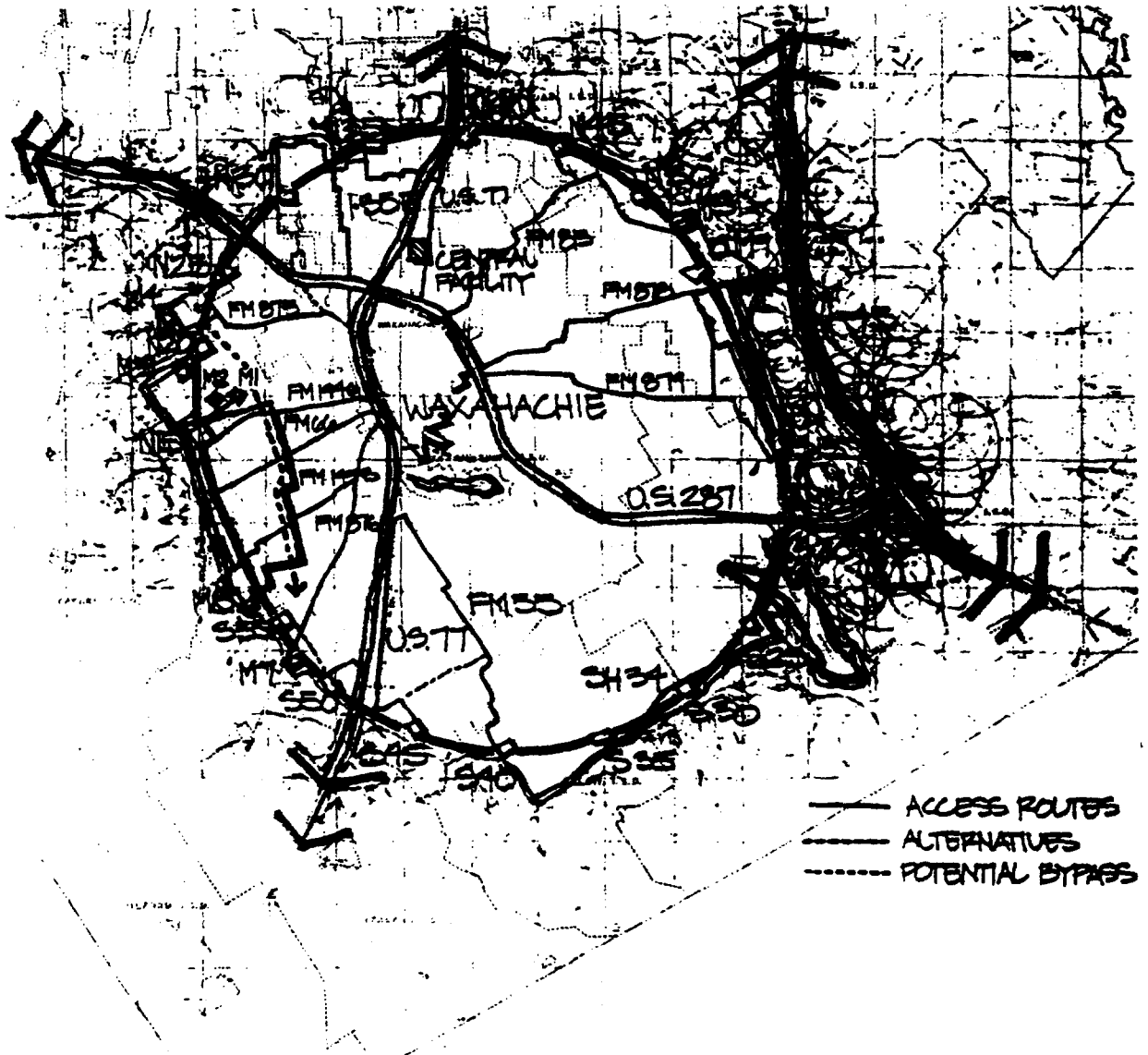


Figure 21 N, S, and M Site Access Routes

SITE PIPE ALTERNATIVE 'B'
LOCATED IN SENSITIVE AREA
REQUIRES BRIDGING EXISTING
CREEK.

25' DIA. PERSONNEL SHAFT
LOCATED 50' INSIDE
LATTICE ALIGNMENT.

22' DIA. UTILITY SHAFT
LOCATED 50' INSIDE
LATTICE ALIGNMENT.

EXISTING RAVINE
PERROUTED TO
ACCOMMODATE SHAFT
LOCATION.

SITE PIPE
ALTERNATIVE 'A'
LOCATED IN 100 YR.
FLOODPLAIN.

ENVIRONMENTALLY
SENSITIVE RAVINE WOODS
AREA REQUIRING MITIGATION
DURING SITE DEVELOPMENT.
I.E. TREE PROTECTION,
EROSION CONTROL FROM
DISTURBED AREAS.

ACCESS ROAD RESPONDING
TO EXISTING CONTOURS.

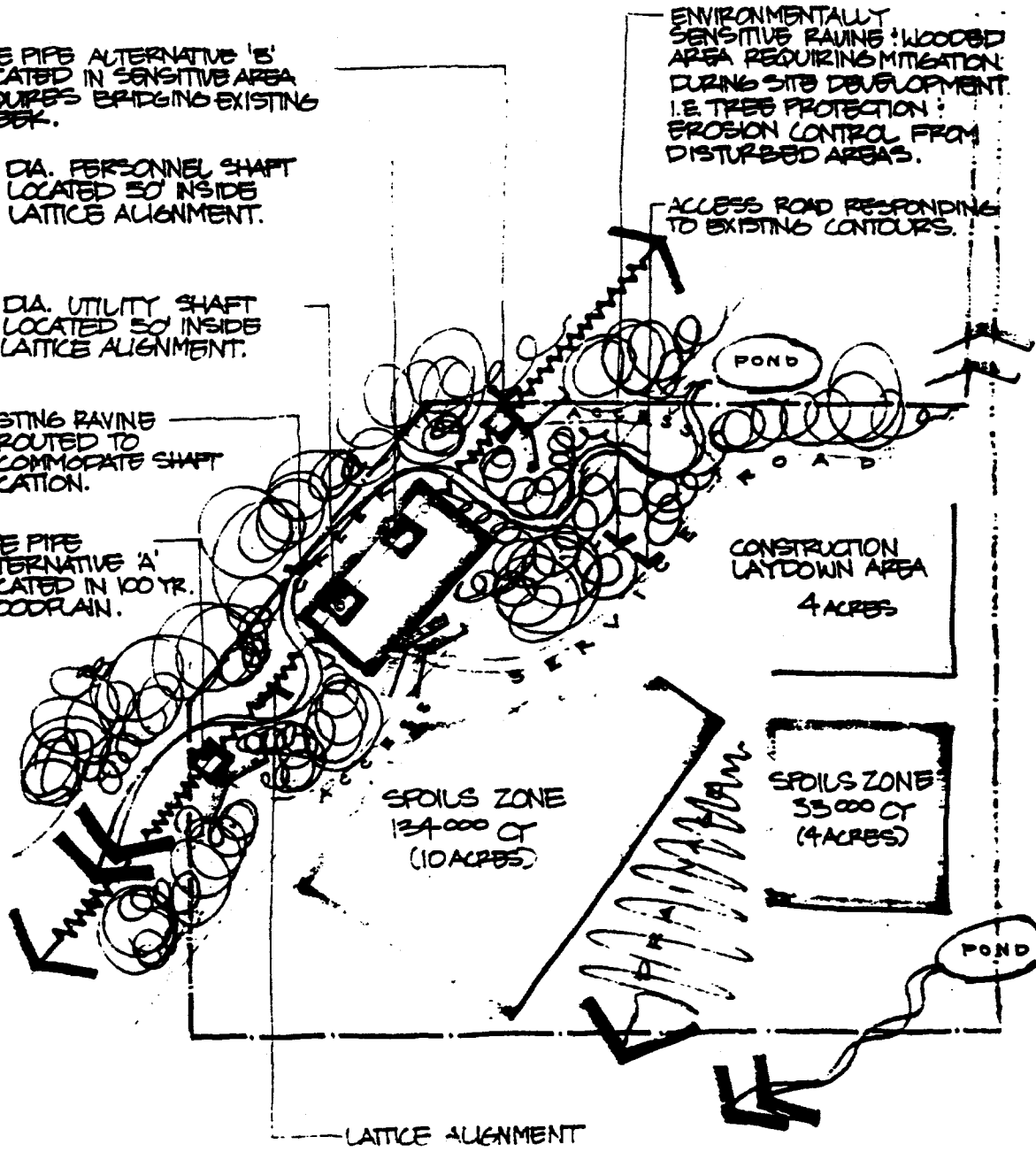


Figure 22 Collider Ring Service Areas - Typical "F" Sites

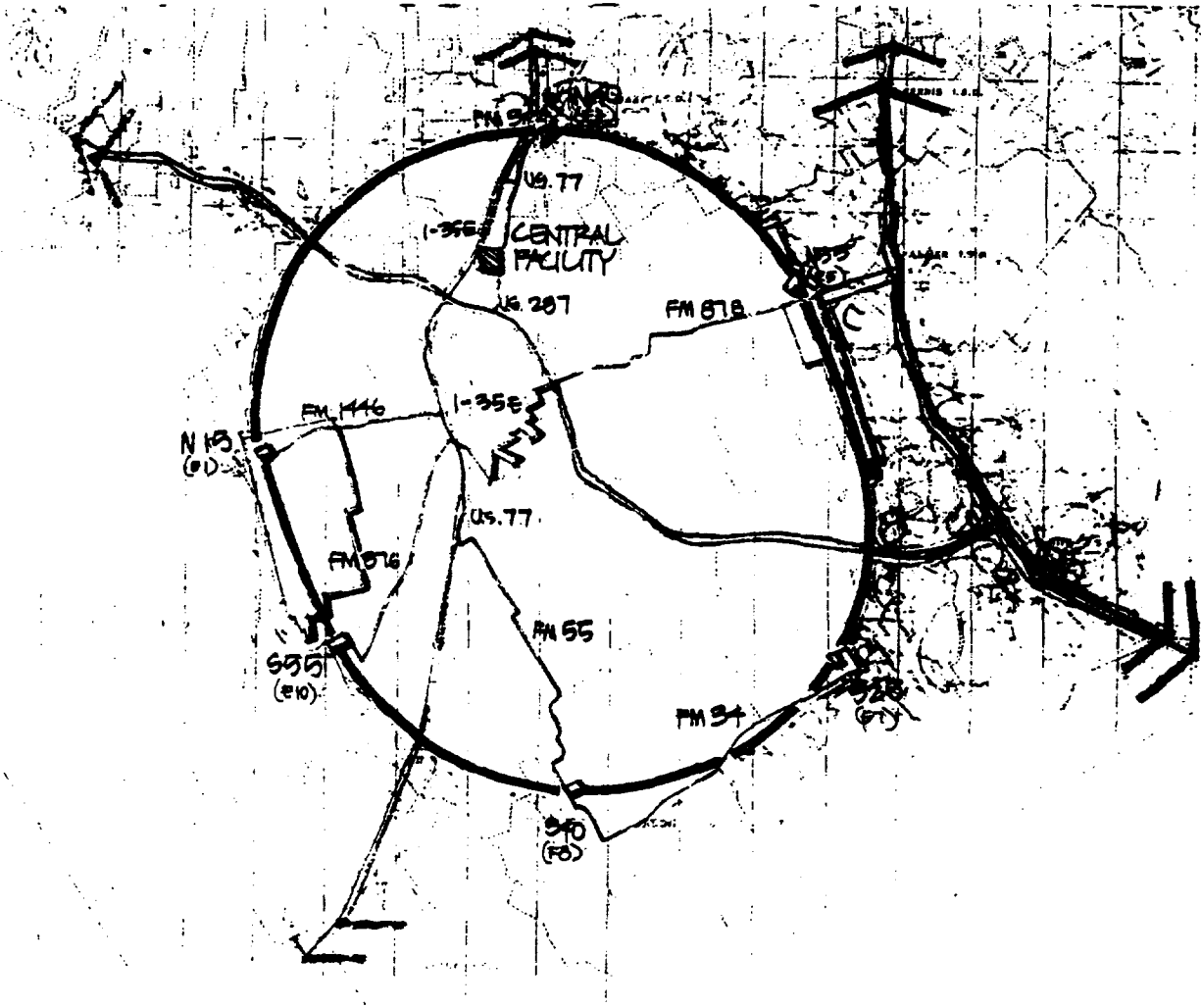


Figure 23 Magnet Delivery Routes for Discussion