

## 1.5 SAMPLE SITE PLANS

In this section, all information presented in Section 1.4, “Erosion and Sediment Control Plan Preparation,” will be put to use in the development of an erosion and sediment control plan for a proposed construction project. Since this is an exercise, the development of the sample plan will be brief; however, it is important that all issues be addressed.

### Plan Development

The erosion and sediment control plan for this project was developed according to the step-by-step procedure outlined in Section 1.4. For training purposes, each step is discussed separately with corresponding maps to illustrate what was done. This plan consists of four maps, shown in Figures 1.2 through 1.5, though information on Figures 1.2 and 1.3 could have been combined on one map. However, planners may choose the method they wish to present the information.

#### Step 1: Data Collection (Figure 1.2)

The topographic information was obtained by aerial survey and shown on the map in Figure 1.2 at a scale of 1 in. = 200 ft, with 2 ft contours.

From an on-site inspection, as shown on the topographic map, the site has three watersheds, each drained by a distinct swale. Land use and slopes of adjacent upstream properties must also be identified to analyze the potential overland control needs.

The soils information is available from the SWCD office. This site has slopes that range from a 2% to a 25% grade. Each soil type is identified by a symbol. The first two numbers identify the soil name; the letter B, C, or D indicates the degree of slope, from gently sloping to moderately steep. The final number, 2 or 3, indicates whether the soil is currently in an eroded or severely eroded condition. The lack of a final number indicates slight to no erosion.

An on-site investigation was made to determine the existing vegetation. Tree lines are shown on the top of the map along with the type of grass cover on the site.

The land use of the adjacent properties is indicated on each side of the proposed development tract.

#### Step 2: Data Analysis (Figure 1.3)

In terms of topography, the site consists of a series of ridges and valleys running from west to east. The areas that have the steep (10% to 20%) slopes should be avoided if possible.

The three major drainage areas identified as areas I, II, and III on Figure 1.2 have approximately 35 acres, 20 acres, and 28 acres, respectively. Each area is drained by a well-defined swale. These swales should continue to be used. Extreme care should be exercised to control any erosion that might occur during construction.

Information about the major soil types should be related in the narrative. Soils that have a high degree of erodibility should be noted on the map.

Ground cover conditions should be noted, and the growth that should be saved should be identified in the field and on the development plans.

The adjacent areas downstream must be protected from large flows of sediment during construction. The flow intensity across the site should be managed to retain sediment on site and prevent downstream erosion. Adequate erosion and sediment control measures must be in place before construction begins. The two highways should be protected from the possibility of construction traffic tracking mud on them.

### **Step 3: Site Plan Development (Figure 1.4)**

Figures 1.2 and 1.3 were used to determine the most suitable areas for development and the most critical areas from an erosion control standpoint. Erosion potential is a factor to be considered in locating the many features of the plan.

The final site plan, shown in Figure 4, was developed through a balanced evaluation of such factors as convenience, drainage, maintenance, costs, aesthetics, and erosion potential during construction and stormwater runoff after construction.

Access roads were located to follow the existing topography as nearly as possible so that grading could be minimized.

The two major buildings were located on either side of the swale in Drainage Area II with a connecting walkway to minimize disturbance within the swale.

The parking areas were clustered around the buildings for convenience and to centralize land disturbance in one major area.

The existing drainage swales were preserved to continue draining the site. A storm sewer was located along the swale in Drainage Area I to follow the existing grade and minimize land disturbance.

The tennis courts and ball fields were located to take advantage of the flattest areas on the site. Although the ball field is located over a highly erosive soil, the flat grade should minimize erosion.

Development is basically confined to Drainage Areas I and II. There will be no increase in erosion potential in Drainage Area III during construction. There should be no potential for damage to adjacent areas on the southern border of the site, and flow intensity changes should be minimized. Care should be taken to reduce the velocity and volume of runoff during and immediately after a rainfall event.

### **Step 4: Erosion & Sediment Control Plan Preparation (Figure 1.5)**

The limits of grading are outlined on the site plan (in Figure 1.4) so the areas requiring erosion and sediment control practices can be determined. Because construction will take place in two separate drainage areas, the erosion and sediment control plans were considered for each drainage area as follows:

### Drainage Area I

Land disturbance in this area consists of grading access roads, a parking area, tennis courts and a baseball field. The objective is to keep sediment from entering the natural drainage swale leading to Courthouse Creek. This will be done by a combination of management and vegetative methods to minimize erosion potential and structural measures to retain sediment that is unavoidably generated.

### Drainage Area II

The major portion of the construction will take place in this area. This includes grading for three buildings, three parking lots and access roads, and future buildings and parking. A storm sewer system is also planned to be built along the swale.

It is likely that a considerable amount of sediment and an increased level of runoff flow will enter the drainage swale during construction. The objective will be to reduce flow velocities and minimize erosion by using vegetative controls and management methods to trap sediment before it enters the creek.

### Structural Controls, Area I

1. A system of temporary diversion structures and sediment traps below the graded areas will be used to trap and filter sediment before it enters the drainage swale.
2. A temporary construction entrance will allow muddy tires to be cleaned before entering the highway.
3. The potential exists for erosion at the outlets of drainage pipes. Thus, riprap is planned at the outlets to dissipate energy and prevent erosion.
4. Not shown in the example are measures required to control the flow from upstream properties and along the perimeter at the outlet of each drainage area. Control measures placed to intercept adjacent property runoff must consider land use vegetation changes over the time of construction. Perimeter measures must consider the potential for failure or overload of the on-site erosion control measures.

### Structural Controls, Area II

1. Drainage Area II is completely drained by a single swale. A sediment basin constructed across the swale below all construction is the most effective method to remove sediment from runoff before it enters the creek.
2. Sediment-laden water will be filtered before entering the storm drain system during construction. The type of inlet protection being used should be clearly identified.
3. A cluster of trees and other vegetation should be protected from sediment deposition during construction. A silt fence will provide the necessary protection.

### Vegetative Measures, Areas I and II

1. Topsoil will be stripped, stockpiled, and spread at a later time. Stockpiles should be located in a safe area and protected by seeding and mulching.
2. Temporary seeding will be done on graded areas where further work will be delayed three weeks. Diversion structures and the sediment basin embankment will also be seeded with temporary seeding.
3. Permanent seeding will be applied in accordance with the overall landscape plan for the site.

4. An excelsior mat will be used as a temporary liner in all the drainage ditches and as an aid in grass establishment

**Management, Areas I and II**

1. Construction traffic will be limited to access roads and areas to be graded. All traffic will be prohibited from crossing drainage swales and streams, except where necessary.
2. The sediment basin, diversion structures, and sediment traps will be installed as a first step in grading.
3. As soon as the major grading is done, temporary or permanent seeding will be applied in the respective areas.
4. Responsibility for implementing the plan should be transferred to the construction superintendent. The superintendent should make all workers aware of the provisions of the plan.
5. All erosion and sediment control measures should be checked continuously and after each significant storm to locate and repair damages and conduct maintenance operations.

**Step 5. Prepare the Plan**

In Steps 1–4, all of the information necessary for preparing an erosion and sediment control plan was developed. In this final step, the actual plan is to be prepared containing all of the pertinent information in a logical format. The checklist at the end of Section 1.4 was used as a basis for developing the erosion and sediment control plan as shown in Figures 1.2–1.5.

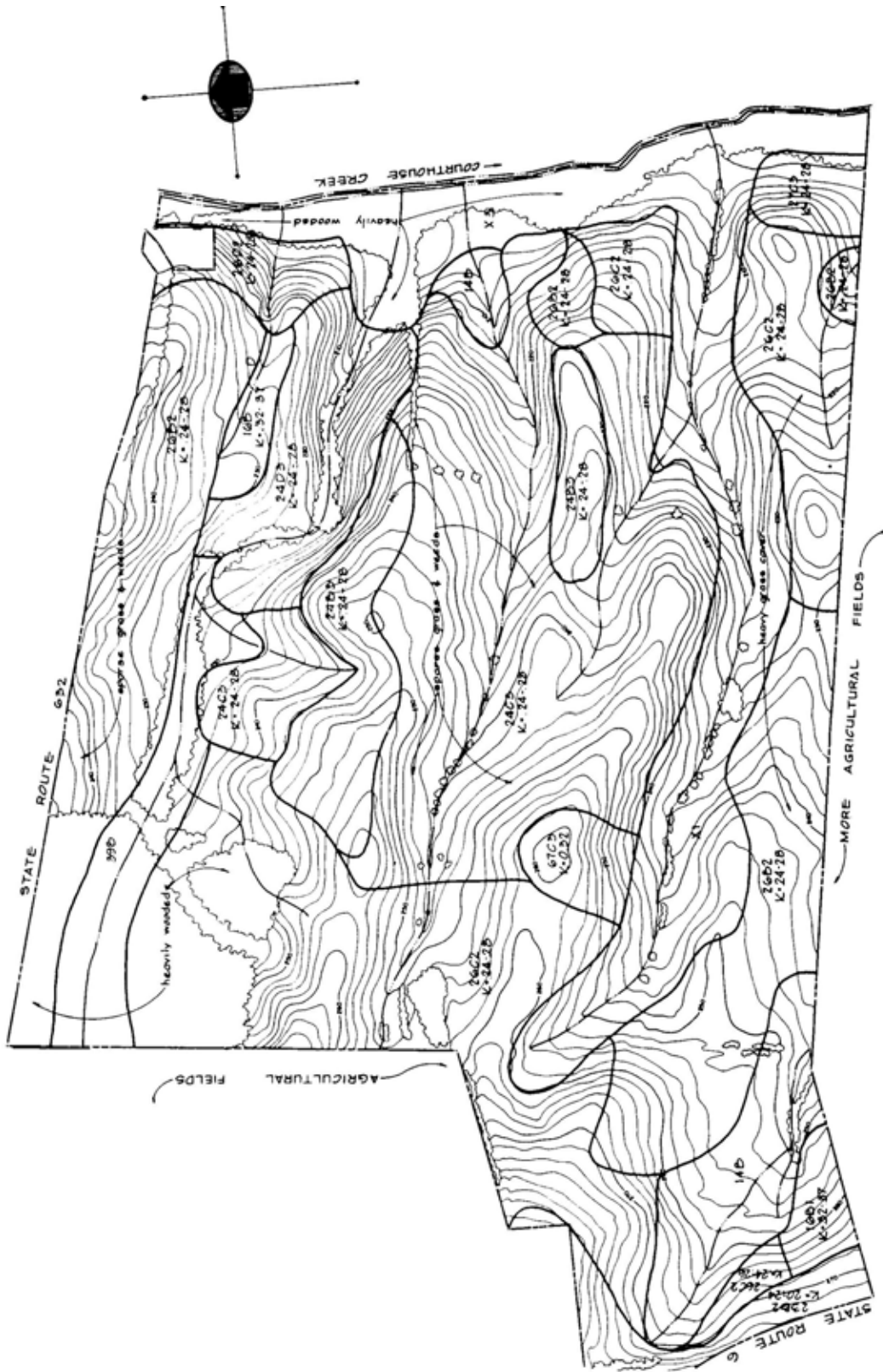


Figure 1.2. Data collection worksheet

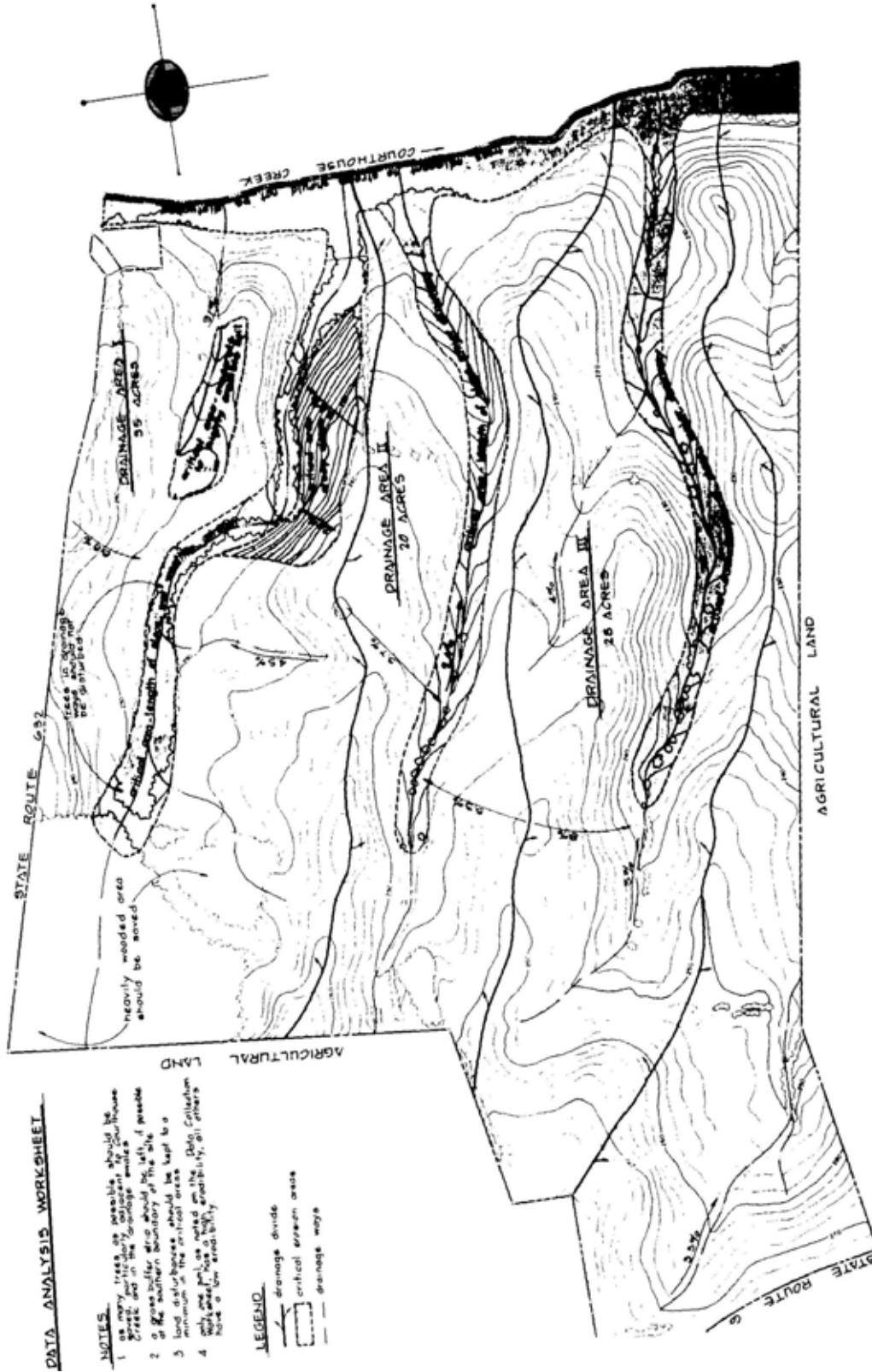


Figure 1.3. Data analysis worksheet

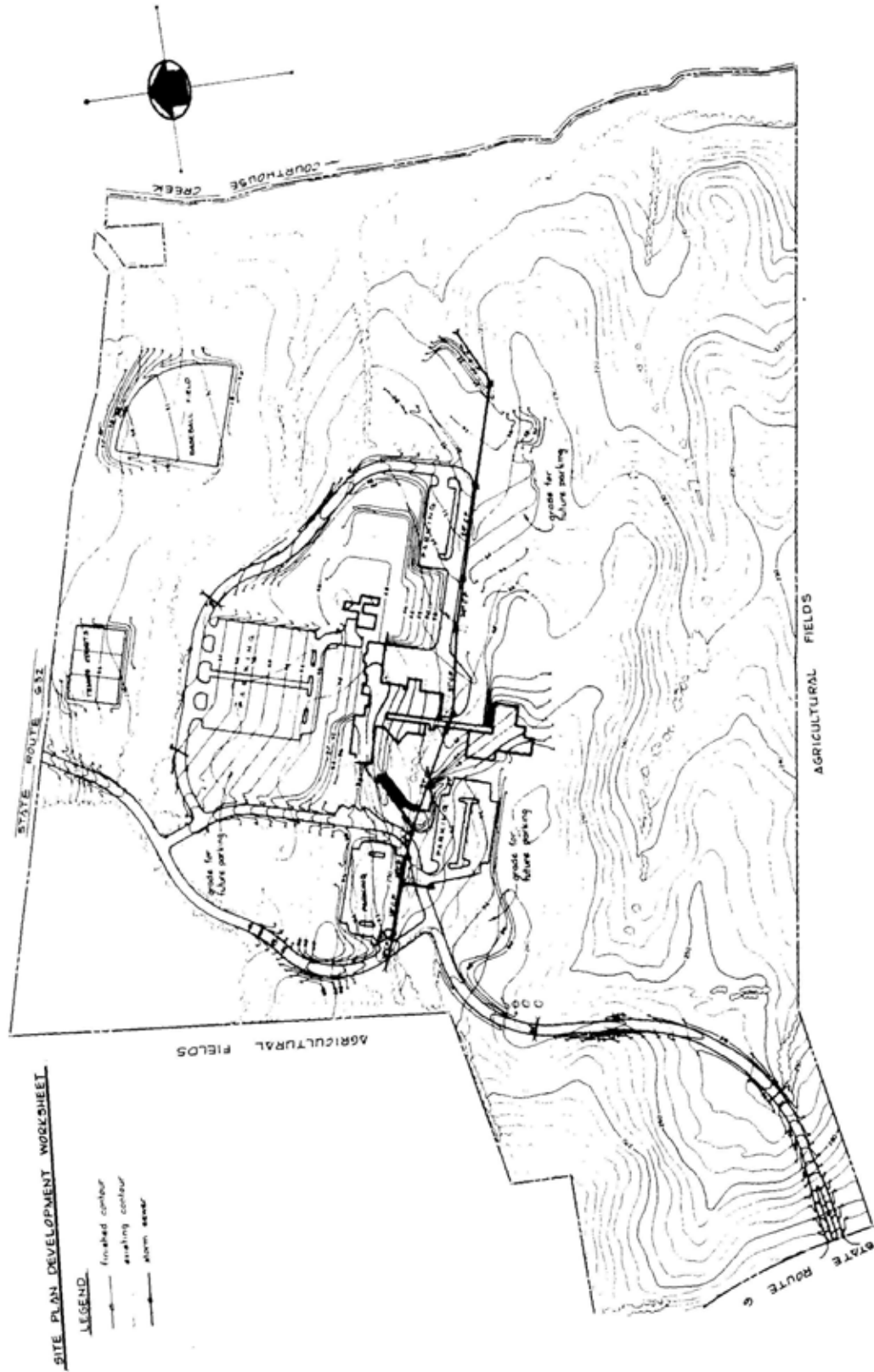


Figure 1.4. Site plan development worksheet

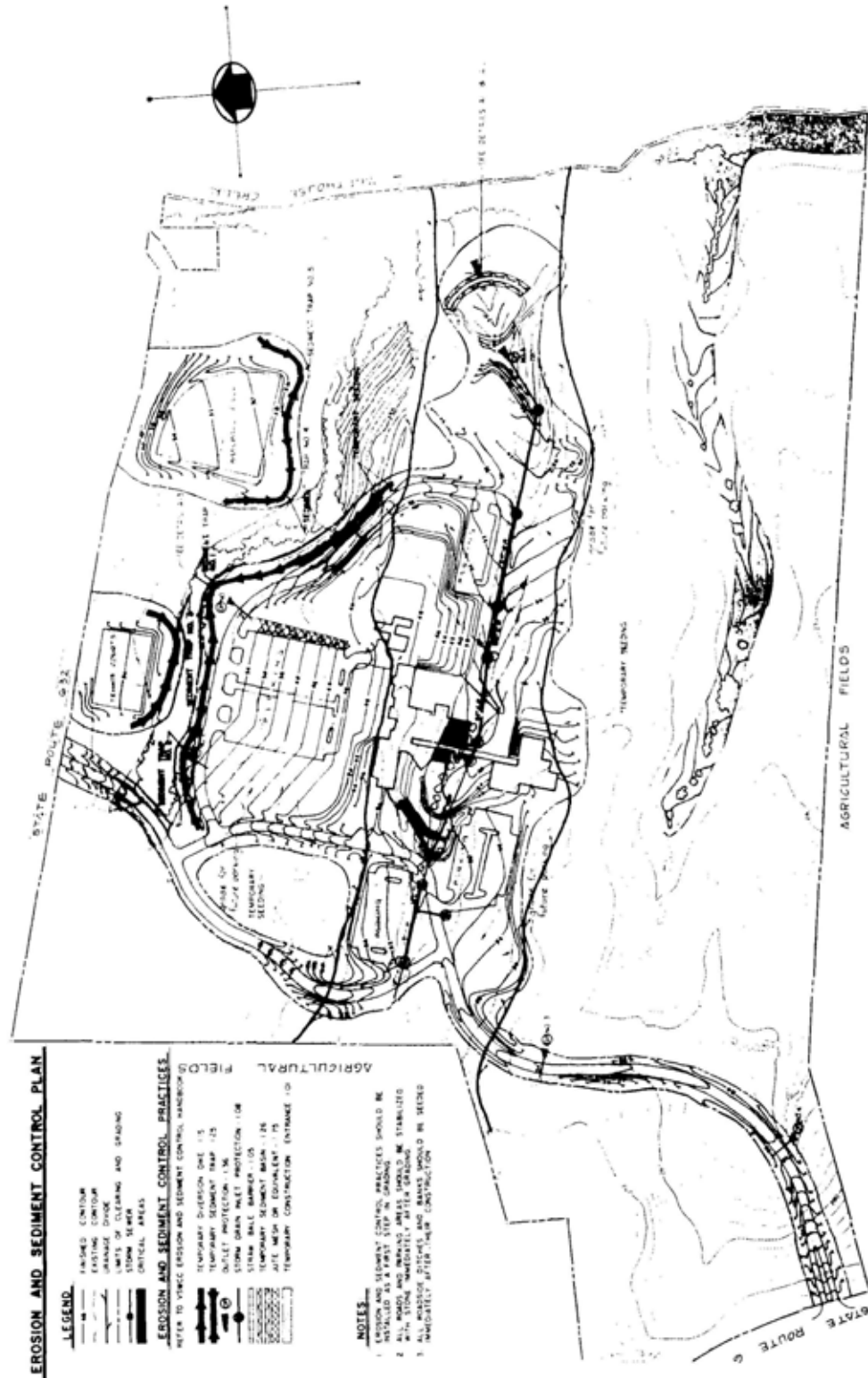


Figure 1.5. Erosion and sediment control plan