5.3 Site Engineering Study

By this point the development task force (working in concert with the community leaders and residents) has decided the appropriate type(s) of site for the community and narrowed the potential locations to a few attractive alternatives. The resources necessary to move the project ahead have been the time and effort of interested individuals, groups and community officials. Of course there also have been financial expenditures for materials, information distribution, travel and meetings. Hopefully, most if not all of these costs have been covered by in-kind contributions from those organizations and political bodies involved in the effort. But now comes the time to expend some funds for consulting assistance. Engineering assistance is needed to determine the best site and to prepare information that a potential firm will need to decide the appropriateness of the site for its project. Professional engineers bring the ability to view the project from an objective universal image. They should have experience working in other communities in the region and can help the local community understand the basic requirements regarding utility and layout issues to be competitive in the search for tenants. Consultants also bring the ability of a specialist to present alternatives that will meet the overall objectives of the project. These alternatives may not have been thought out by those who daily operate local facilities. For example, the local water department staff, while it may do a fine job caring for the efficient safety and delivery of services to the community, usually does not have the opportunity to gain detailed understanding of alternatives. Therefore, the contracting for the services of an engineering consultant will actually lead to the savings of cost for the project since there are few if any site-development efforts that do not have deficiencies that need to be addressed.

A community in southwest Ohio can serve as an example of this principle. For years the community had promoted a site owned by a local land speculator. Finally, in the mid-1980s, the site attracted the attention of an industrial prospect. It was located on a national highway, close to utility lines and near the existing industrial park at the eastern edge of the town. In addition, it was rectangular, with level topography of sizeable acreage. The community had not invested any funds in completing engineering studies but was fortunate enough to have a manufacturing firm interested in locating in the community. Local officials were excited that after years of waiting they at last were working with an industrial firm that had included its community on the list of the final three communities. Before selecting the final location, the firm wanted additional technical information, specifically soil-test borings on all the final sites, to be delivered within ten days. The community found $3,500 and a soil sample company that could give a report within the allotted schedule. The results narrowed down the options of sites that would fit the needs of the manufacturing firm. Unlike land used for growing crops, a manufacturer has heavy equipment that requires a solid foundation, such as clay. Though topsoil is great for increased harvests, it is something that needs to be removed to get to the clay base for a manufacturer. In addition, water on a site is great for the root systems of crops but does not lead to a stable foundation for machinery. The results of the soil test borings found that the community’s site had an extremely high water table, so high that if those who farmed the land over the years had not invested in a tiling system, water would have been standing on the site. All the time and effort invested to promote this site for industrial use was wasted. To this date the location is being used for agricultural purposes. Luckily for this community there was an alternative location at the opposite end of town. This location had just been discovered and had the same characteristics as the other location, except that it was located out of the corporate limits. In addition, the soil borings revealed no water and easy access to clay surfaces. Happily, the township and city joined together to make this alternative site work for the firm. Today the firm has made its third expansion and is one of the larger employers in the community. The point of this example is not to have an alternative site just in case your primary site doesn’t work. Instead, the idea is to be prepared in the first place by doing the technical work necessary to select the community’s best location. A community’s level of preparation will make a large statement about its understanding of business (see marketing section of this document for further discussion regarding this point).

Contents of an Engineering Study

This phase of the process relates a particular location to its environmental and land-use characteristics. The development task force and community are trying to discover information that will lead to the selection of the best location from all the potential sites. Even though the community may know the
answers to some of the items listed below, it is wise to have the consultant review the information. Through the review of existing information, the consultant’s regional expertise can be beneficial to the task force. Zoning regulations provide a case in point. The community may already know the location of zoned light manufacturing. However, a consultant will review the standards of what the zoning classification means within that particular community. From this detailed review the consultant may offer some additional standards or suggest the removal of some standards which could be more in keeping with regional standards.

The following is a list of items the community will want to consider including in an engineering study.

**Zoning:** A quick review of zoning maps and regulations to make sure that the location is properly zoned for intended use. Consultants should also review adjacent property zoning classifications to identify any potential conflict with existing or future usage.

**Road Considerations:** The consultant should review access to major highways and secondary streets, internal and external circulation patterns, improvements needed to the road directly serving the site. The consultant should suggest appropriate entrance layout to the site (Waterhouse 1996, 114).

**Land Uses:** Is the proposed use the best alternative for this location? What special features need to be addressed? How does the classification and intended use of this site affect future community development? How can natural features be optimized? If the site is to be used as a park layout intended for more than one user, then a plan should be developed and mapped for the site (Waterhouse 1996, 114).

**Topography:** A review of vegetation at the site should be included. Drainage patterns, storm water management, and soil-boring tests should be completed.

**Environmental Issues:** The site should be studied for wetland characteristics, hydrogeology reports, floodplain review, any potential archeological significance, and finally, potential contamination. The contamination review is usually accomplished by a Phase I Environmental Audit. This audit is primarily a review of historical use of the site and evaluates the existing condition of the site. If any evidence of potential contamination is discovered, a Phase II Audit is necessary.

**Utilities:** Utility standards are determined by the intended use of the site (industrial, retail or commercial), the size of the site, and the proximity to utility supplies. Information should be gathered for water, wastewater, and electric and natural gas service. A review should be prepared including the available capacity and size of the main, plus the rate for each service. If service must be upgraded, a plan should be developed including cost of improvements and estimated time of construction. A review should also be included regarding the appropriate routing of each utility service.

The final report from the engineering consultant should include planning drawings and a supporting narrative describing the following:

- The key features of the development
- The transportation and utility network
- Any appropriate subdivision of the site
- A recommended phasing of needed improvements
- Detailed copies of reports on items such as soil borings, environmental audit, archeological reviews, wetland review

The completion of the consultant review should provide information to help the development task force and community determine the best location or locations for meeting their objective of creating a development site. By completing the review, the development office will also have detailed reports and
information that potential tenants of the site will need to make their location decisions. At this point of the site-development process the community should have invested financial resources only into the cost of consultant fees, engineering studies, and report creation. No investments should be made in actual improvements to the site until a market study is completed.