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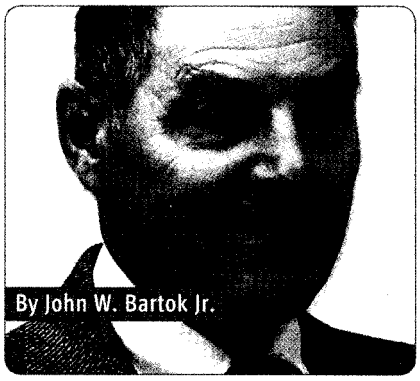
By John W. Bartok Jr.

Plan before you build a greenhouse

I'M SURE YOU'VE SEEN greenhouses that never should have been built where they are located, such as on a hillside, on poorly drained soil, on a very small parcel of land or in the middle of a wooded area.

A greenhouse represents a large capital cost with a normal useful life of at least 30 years. It's important to consider all aspects of locating and building a greenhouse before starting the project. Here are some considerations and procedures for developing a greenhouse site to make it more functional and efficient.

Contract for a property survey

A survey map of the parcel is needed to identify boundaries, topography, soil types, wetlands, structures and other features that could affect greenhouse placement. Particularly important is to have the contours delineated at 2-foot elevation intervals so that the amount of soil that may have to be moved to level the site can be determined. The contours will also help to establish where natural drainage occurs and how runoff from the greenhouses and parking areas can be handled.

Dig a few 4-foot-deep test pits to determine if there is any ledge or high water table in the area. Perk tests can also be made at this time to locate an area for a septic system. If problem areas turn up, you have not invested a lot of money at this point.

Develop a preliminary plan

Once the survey map is completed, it is time to start a preliminary plan showing the proposed location of the greenhouse, other buildings, outdoor growing areas, access roads, parking areas, storage and utilities. It is best to evaluate several layouts to see which might give the best arrangement. Be sure to allow for expansion of facilities and show these areas on the drawings.

If the land is not level, calculations should be made to determine the amount of earth moving that will be required. Although earth moving is expensive, it is usually best to plan to place the greenhouse on a level site.

Obtaining permits

At this point, it is probably best to start the procedure for getting the necessary permits. Contact the land use office to identify the permits and approvals required. Wetlands, zoning, economic development, health department, fire department, highway department and other approvals may be needed before the building inspector will give the go-ahead. This process can take from several months to a year so it is best to start as early as possible.

Usually a preliminary plan is all that is necessary to get the ball rolling. Final plans drawn by an engineer may be required before most approvals are made.

Although there are usually no restrictions on clearing the land of trees, it is best to wait until you have most of the approvals in place. If the site has large trees, the logs can be harvested and sold and the tops chipped. The stumps can be removed with a large bulldozer or excavator. Try to retain a buffer from adjoining property, especially if it is residential.

Preparing the site

Remove the topsoil for later use as a finish grading material. Areas around wetlands should be protected with a silt fence. Cut and fill material should be placed in maximum 6-inch layers that are compacted by a power roller before adding more layers.

A minimum 6-inch layer of gravel or stone should be placed under the greenhouse floor to facilitate drainage of subsurface water away from the greenhouse. Floor drains should be installed at this point.

Provide adequate drainage

On an ideal greenhouse site, water drains naturally away from the building. Keep the greenhouse higher than the surrounding site to allow proper drainage and reduce the possibility of a flooded floor during heavy rains.

Swales around the building can direct runoff to a stream, pond or wetlands. A good way to build a swale is to slope the soil in the shape of a "V" with the center 1-2 feet lower than the edges. The bottom of the swale should have a slope of 1 to 3 percent toward the stream, pond or wetlands. The swale can be lined with a weed barrier fabric and then covered with 1½ inches of stone. A perforated pipe could also be placed in the low part of the swale to aid runoff.

Runoff from hillsides or areas where large cuts have been made to level the site may have to be intercepted to prevent water from getting under the

greenhouse. Curtain drains are used for this purpose.

A curtain drain is constructed by digging a 3- to 4-inch-deep trench, placing a few inches of sand in the bottom, laying a 4-inch-diameter perforated drain pipe on the sand, covering the pipe with 2 feet of gravel or crushed stone and filling the remainder of the trench with soil. The pipe can be purchased with a filter fabric to keep soil from getting in and plugging it.

Provisions should be made to handle rainfall from large greenhouses or paved areas. A 1-inch rainfall on an acre roof will result in more than 27,000 gallons of water. Large amounts of water in a short period of time could cause flooding downstream. It is possible to dispose of this water through swales, but frequently a detention or retention basin may be needed to allow the water to collect and then run off slowly. These basins need to be sized for at least a 10-year storm.

Installing utilities

Electricity should be brought to the site to aid in constructing the greenhouse. Single-phase power is adequate for a small range but if available, three-phase power should be installed if the plan calls for several acres of growing area. The local electric utility should be contacted to help with sizing the service and locating the supply wires and service entrance.

Underground service is desirable to avoid problems with overhead lines that could be snagged by vehicles or brought down by an ice storm. Phone lines can usually be placed in the same trench.

If natural gas is available in the area, it is desirable to connect to this supply line. Natural gas prices are usually less expensive than either propane or fuel oil. A dual fuel heating system is sometimes installed to have the option of selecting the least expensive fuel. ❖

CONTACT INFORMATION

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