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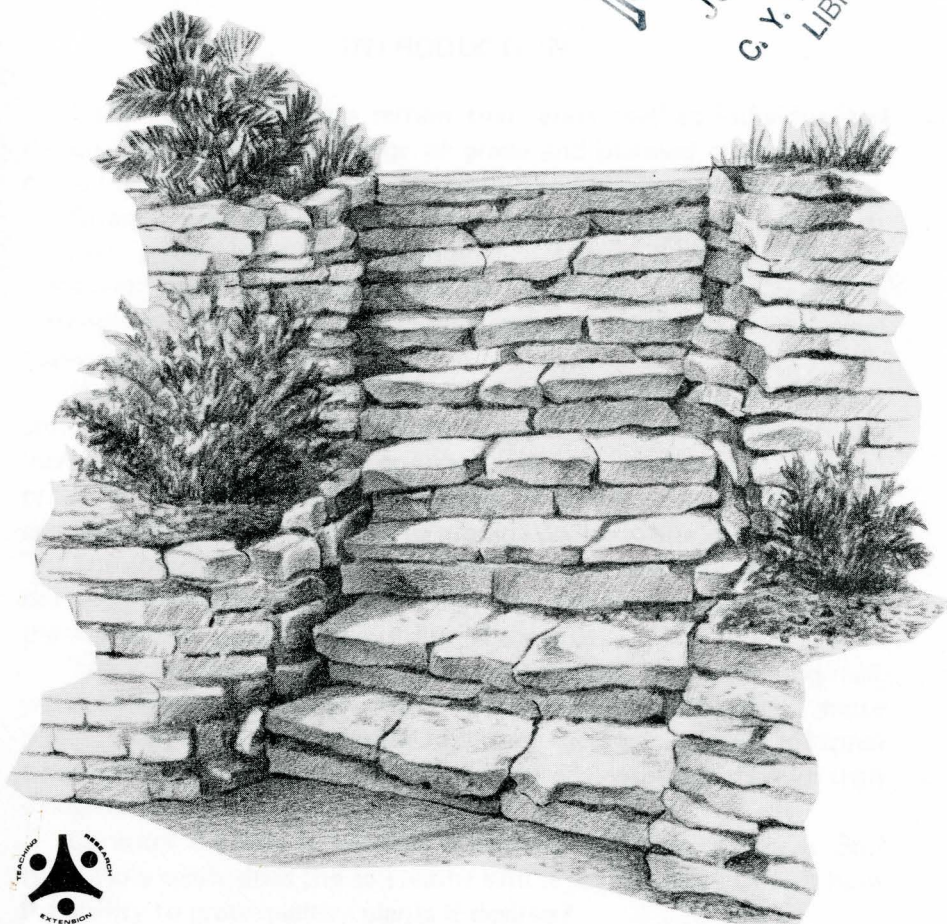
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Rock RETAINING WALL CONSTRUCTION.

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U. S. Department of Agriculture and the College of Home Economics
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ROCK Retaining Wall Construction

By Clark Jensen
Agricultural Extension Agent, Douglas County

INTRODUCTION

Each building site has terrain that lends itself to individualized design. Natural slopes, change of grade and planned changes in the overall terrain may lead to an interesting and pleasing landscape.

Straight lines or lines lending themselves to square, rectangular or circular areas tend to develop into a formal landscape. Curved, sweeping lines lend themselves to a more informal, relaxing atmosphere. Most home landscaping attempts to develop an informal appearance.

Retaining walls of rock are often designed to develop the primary style of landscaping that will be followed. An uneven terrain can increase the beauty and appearance of the landscape if handled properly. It may be used to advantage to divide utility, recreational and gardening areas, as well as to provide proper water diversion.

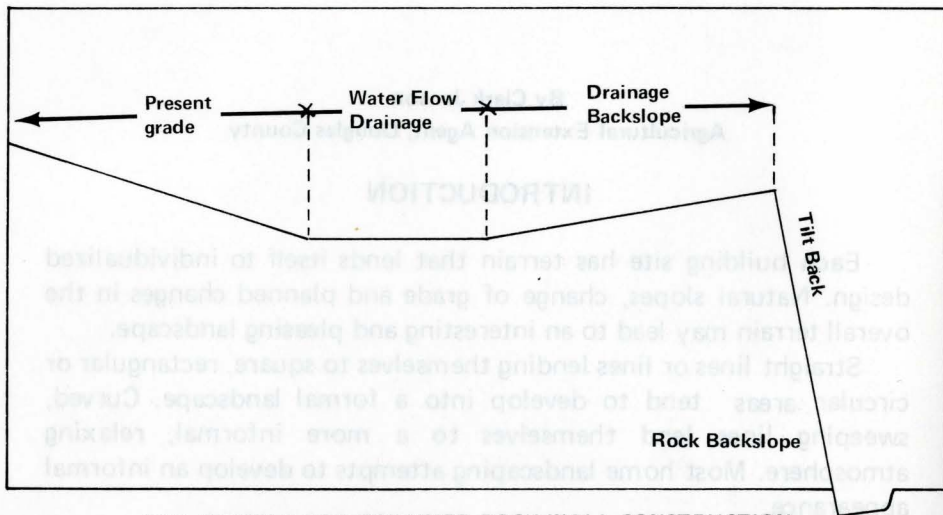
The color, size and amount of rock used can be incorporated into the overall landscape design. A rock wall can increase the beauty of the site as well as add to the utility of the area.

There are several things you should consider in constructing rock walls to reduce grade or slope. The wall will usually give a more pleasing appearance if developed into a gentle curve. In informal landscaping, curved lines tend to be more pleasing to the eye than straight lines.

Consider the site or location of the wall and such factors as: Soil type. How easily does the soil wash? Will it pack firmly? Does it have the ability to grow healthy plants if desired?

You must determine the drainage area and the rate of flow as well as the concentration points for water runoff.

Consider the need for water diversion around a rock wall when shaping the area for a wall. Allow water to move gradually to a lower level by a planned drop structure or by careful grading and construction practices. Never force water to run over the face of the rock retaining wall.

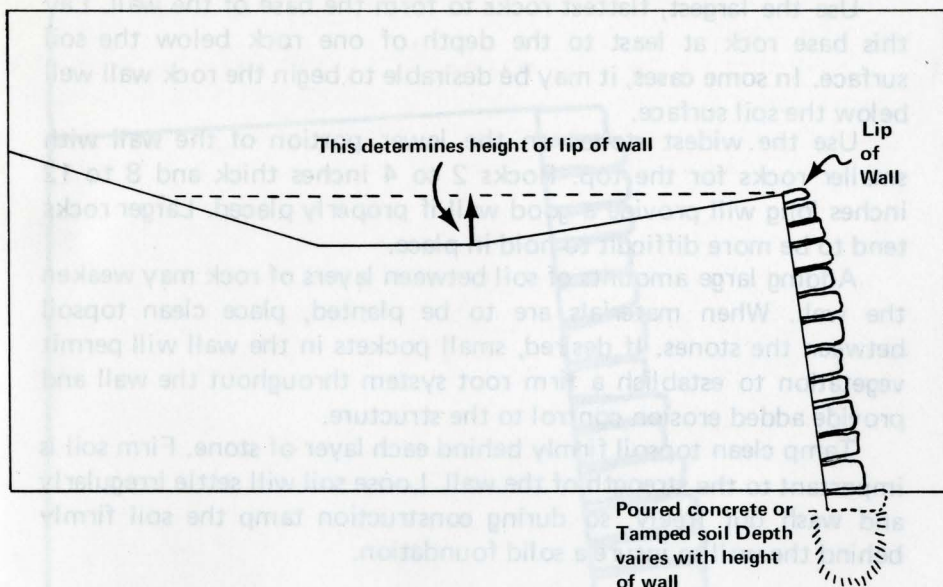


SOIL PROFILE FOR RETAINER ROCK WALL CONSTRUCTION

Keep the lip (top layer of rock) of the wall at least six inches higher than the adjoining ground. Increased lip height should be in proportion to the amount of water flow in the drainage area. This height should form a gradual backslope extending at least four to eight feet.

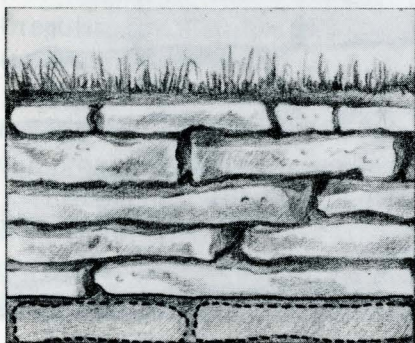
A stone retaining wall will be made stable and thus more permanent if a concrete footing is provided. However, retaining walls can normally be laid safely up to three or four feet in height without concrete footings. If fill soil is the wall foundation, a tamped soil surface 12 to 18 inches deep will generally provide a stable base for walls up to four feet high. Undisturbed, firmly settled soils may not require a tamped base.

If walls must be more than four feet high, a solid footing is required. Construct the footing of concrete 18 to 30 inches below

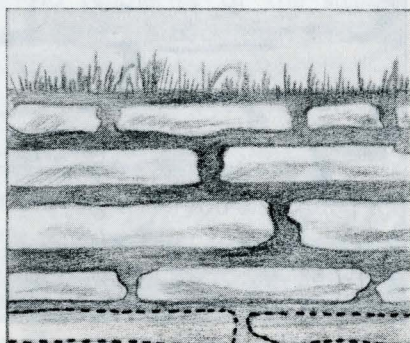


ground level. Footing width should be one-fifth the wall height and should be centered under the base rock.

Type and quality of stone are important. Some stones are very hard and resist severe weather, while other stones have materials embedded in soft shale that will crumble from the parent stone. Materials that may be used for wall construction include: native stone, ledge rock, brick, tile, broken concrete, concrete blocks and railroad ties.



PROPERLY CONSTRUCTED ROCK WALL



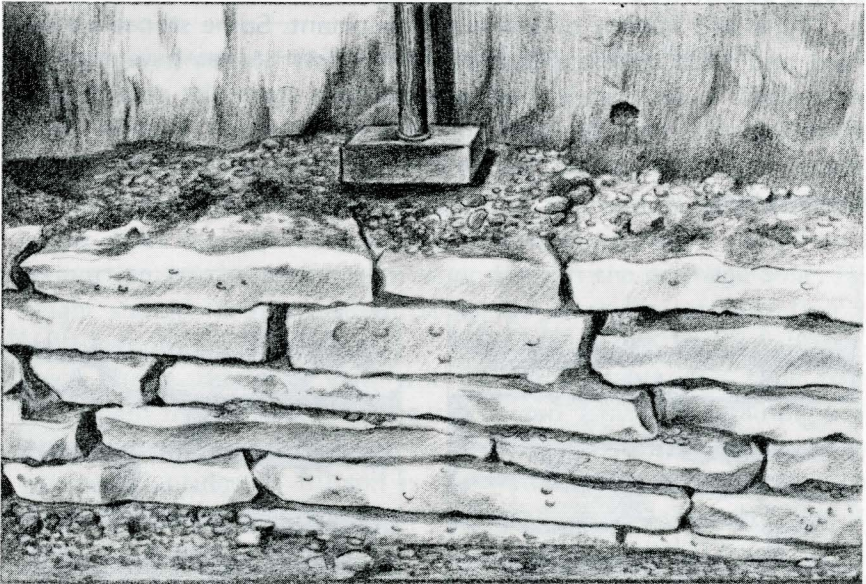
TOO MUCH SOIL BETWEEN ROCKS

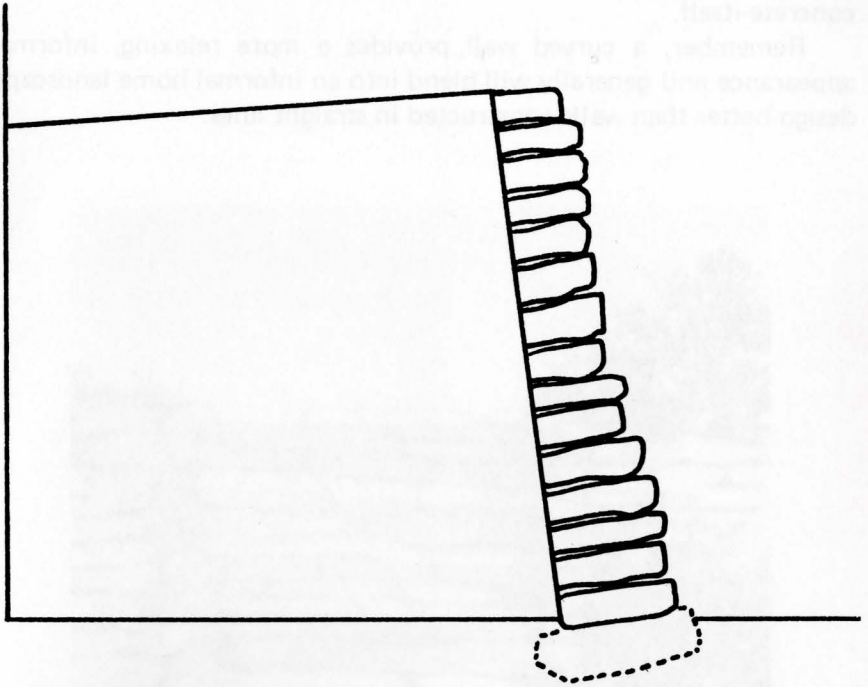
Use the largest, flattest rocks to form the base of the wall. Lay this base rock at least to the depth of one rock below the soil surface. In some cases, it may be desirable to begin the rock wall well below the soil surface.

Use the widest stones on the lower portion of the wall with smaller rocks for the top. Rocks 2 to 4 inches thick and 8 to 12 inches long will provide a good wall if properly placed. Larger rocks tend to be more difficult to hold in place.

Adding large amounts of soil between layers of rock may weaken the wall. When materials are to be planted, place clean topsoil between the stones. If desired, small pockets in the wall will permit vegetation to establish a firm root system throughout the wall and provide added erosion control to the structure.

Tamp clean topsoil firmly behind each layer of stone. Firm soil is important to the strength of the wall. Loose soil will settle irregularly and wash out freely, so during construction tamp the soil firmly behind the wall to insure a solid foundation.





The secret of designing a solid retaining wall is in laying each stone firmly in place. The quantity of rock used in the wall will generally reflect the amount of soil placed between each stone. Using less rock is usually false economy.

Tilt-back (the vertical angle from the base to the top of the wall) will vary with the thickness, size and regularity of the stones. Irregular, small stones will require a greater tilt-back than smooth, large, uniform rocks.

Plan at least two to three inches of tilt-back per foot of wall height. Greater tilt-back will help compensate for irregular stones and will provide pockets into which material may be planted.

Stone chips will help firm uneven stones while you are laying the wall. Another useful item will be a chipping hammer to settle restless rocks. Lay all stones with the flattest side horizontal to the wall. Use a sledge hammer to divide rocks too large to fit into the wall.

Steps may be set without the use of concrete. They will be more solid though if the larger stepping stones are set in a bed of mortar.

This will make the footing solid without the appearance of the concrete itself.

Remember, a curved wall provides a more relaxing, informal appearance and generally will blend into an informal home landscape design better than walls constructed in straight lines.

