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G86-823 Rock Retaining Wall Construction

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Rock Retaining Wall Construction

Things to consider when constructing a rock retaining wall.

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Each building site has terrain that lends itself to individualized design. Natural slopes, with changes of grade or planned changes in the overall grade may lead to more interesting and pleasing landscapes.

Straight lines or lines lending themselves to square, rectangular, or circular areas tend to develop into a formal landscape. Curved, sweeping lines are less formal and more relaxed. Home landscaping often attempts to develop an informal appearance.

A rock wall can increase the beauty of the site as well as add to the area's utility. Uneven terrain can add visual interest and variety in the landscape if handled properly. Changes in grade may be used to delineate utility, recreational and gardening areas, as well as to provide proper surface drainage. Color and shape of rock used should be carefully incorporated to unify a design with the overall landscape.

There are several things you should consider in constructing rock walls to reduce grade or slope. The wall will usually be more stable if developed into a gentle curve. In informal landscaping, curved lines tend to be more pleasing to the eye than straight lines, while straight walls may need to be bolstered with columns or jogs to improve stability.

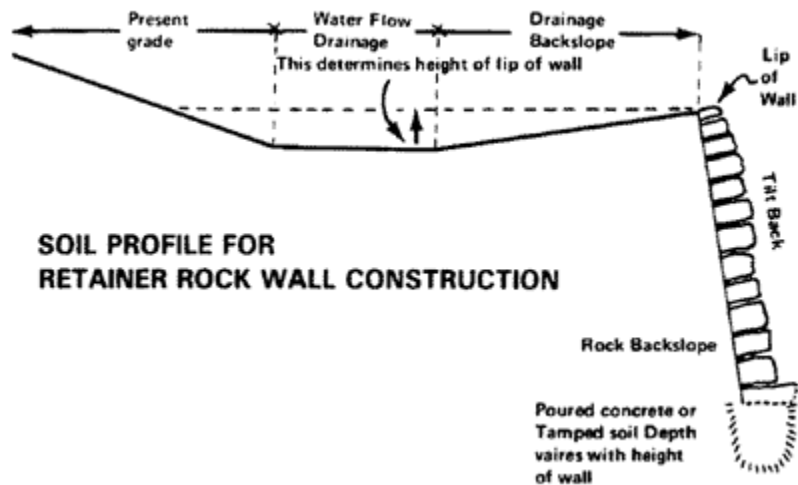
Consider the site or location of the wall and factors such as:

- Soil type.
- How easily does the soil wash?
- Will soil pack firmly?
- Does soil have the ability to grow healthy plants?

You should determine drainage and rate of flow as well as the concentration points of water runoff to protect a wall from erosion or undercutting. It may be necessary to consider 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.

Keep the lip (top layer of rock) of the wall at least six inches higher than the adjoining ground. The 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 last longer 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 soil is used as the wall foundation, tamp it to a depth of 12 to 18 inches. This will generally provide a stable base for walls up to four feet high.



Soil profile for retainer rock wall construction.

If walls must be more than four feet high, a solid footing is required. Construct the footing of concrete 24 to 36 inches below ground level. Footing width should be one-fifth the wall height and should be centered under the base rock. Terrace walls over 5-6 feet high to create walls more in scale with humans.

Type and quality of stone are important. Some stones are very hard and resist weathering, while others such as shale are soft and will crumble. Materials you can use for wall construction include: native stone, ledge rock, brick, tile, broken concrete, concrete blocks and railroad ties.

Use the largest, flattest rocks to form the wall's base. Lay this base rock at least to the depth of one rock below the soil surface. In some cases, it is 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 are more difficult to hold in place.

Adding large amounts of soil between layers of rock will weaken the wall. When plant materials are to be used in the wall, 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. However, large woody plants are not desirable.

Tamp clean topsoil firmly behind each layer of stone. Firm soil is important to the strength of the wall. An alternative method is to tamp and back fill with gravel or stone chips to help drainage behind



Properly constructed rock wall.



Too much soil between rocks.

the wall. Remember, 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 false economy. The top layer should be a larger, heavier capstone. For greater stability it should extend back over the lip of existing soil.

Tilt-back or batter (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 batter 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 rocks or clip uneven lumps. Lay all stones horizontally with the straightest edge toward the slope. Bridge joints on each successive layer. Do not allow long vertical joints. 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 a solid footing without an appearance of the concrete itself.

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