How to build a Retaining Wall

You will need:

Wall Rock	Landscape fabric
¾ chip Aggregate	Brick hammer
Masonry chisels	Shovel
Heavy work gloves	Safety goggles

Building the wall

While handling the stones remember to wear heavy work gloves to protect your hands. If you need to cut or shape the stones, wear safety goggles to protect your eyes.

1. **Excavate the Wall Bed.**
   Cut the angle of the embankment back 30 – 45 degrees from plumb to give you room to place the stones and the gravel for drainage behind the wall rock. Loose or sandy soils tend to collapse, so cut the angle more sharply. In soil that drains well, excavate a 9-inch deep by 18-inch wide trench along the length of the wall. Remove all grass, sod, roots and large rocks. Put drainage fabric in the trench and drape up the excavated wall leaving enough to fold back over. The fabric will allow moisture and air to penetrate but will prevent the soil from settling into the aggregate bed. Overlap adjoining sections of fabric by 4 inches. Then put 3 to 6 inches of crushed aggregate for the base and compact (tamp) it. Put the first course of stones directly on the aggregate base in the excavated trench. (Fig. 1)

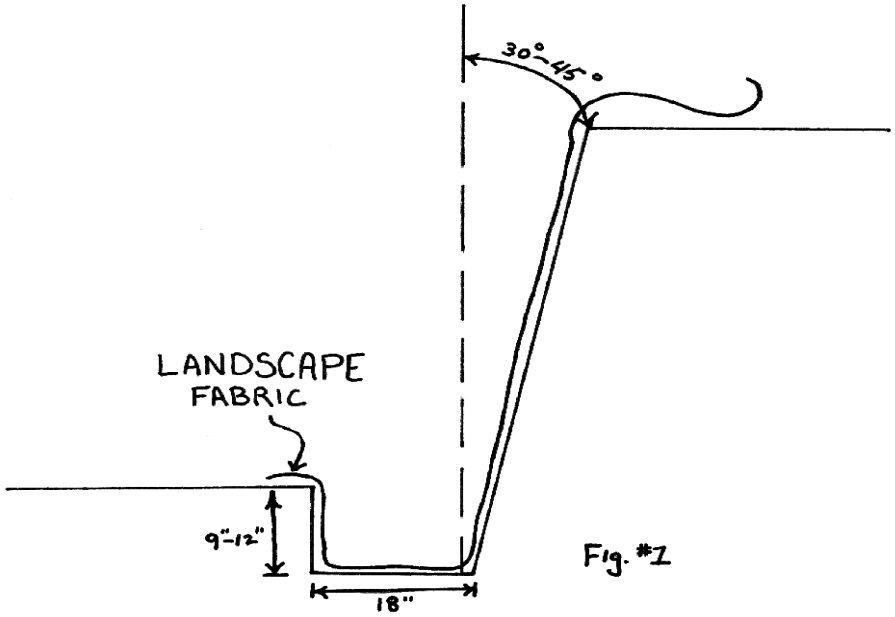

Fig. #1

In dense or clay soils or in areas that do not drain well, excavate 10 to 12 inches deep and add 4 to 6 inch deep crushed aggregate. You should use an aggregate with good drainage quality as well as structural support. Directly behind the wall at the base install a drainage-perforated pipe wrapped with a drainage fabric with at least 3 inches of drainage rock all around it. (Fig. 2) Level the drainage bed with a rake and tamp the aggregate to compact it.

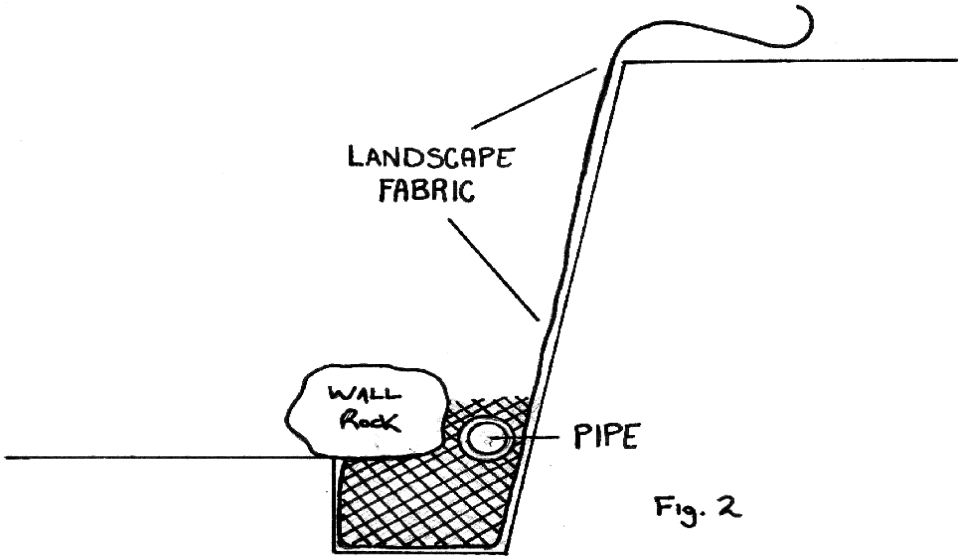

Fig. 2

2. **Lay the first course of stones.**
   Starting at one end of the wall, carefully fit each stone, seating it firmly in the aggregate bed. Use your largest stone for the first course, not only to create a good base, but also to avoid having to lift and adjust these heavy pieces at higher levels. Dig out under the stone and fill in any void spaces with aggregate, if necessary, to get the stone to sit firmly without wobbling. Pack the spaces between stones in the first course to give the wall a stable base.

3. **Set the next courses.**
   Set the next few courses of stone on top of the first, keeping in mind that you want the inside of the wall to slant back at least 2 inches for every foot of height. As mentioned, the front of the wall can be plumb or it can follow the slope. Lay stone in successive courses so that they overlap the stone above and below. Avoid creating continuous, straight vertical joints. The overlapping pattern will produce a stronger wall giving it the stability it needs to resist pressure from the soil. Install long stone that extend into the back fill about every 4 feet horizontally in each course. These are called bond stones or dead-man stone. And they help tie the wall into the hillside. Offset the bond stones in each course.

4. **Fill in backfill material.**
   Make sure you are filling in behind the wall with the aggregate and try to keep the aggregate layer at least 6" inches thick.

5. **Set the remaining courses**
   Set the remaining courses of stone in the same manner. Remember to let each course of the inside wall jut in an inch or so farther toward the embankment so that the inside face will slant about 2 inches per foot.

   When building up the wall, carefully select each stone for the best fit and check its fit as you lay each course. If a stone wobbles on a point or sharp corner, use a brick hammer and a point or pitching chisel to shape it so it will sit more securely. You also can use small pieces of stone as shims to make the stones fit more tightly together; although for the best looking wall, you will want to minimize shims. If you do use shims, insert them from the outside of the wall.

   All the stones should be slightly inclined toward the soil embankment so that the weight of the wall leans into the hill. While stones should fit snugly together in a retaining wall, don't worry about filling every little void between stones. You want to leave plenty of natural drain holes to allow ground water to pass through.

6. **Cap the top of the Wall**
   You have some design options here. One approach is to stop building 6 – 8" inches before you reach the top of the slope. Pack dirt between the top course of stones and then cover the wall with soil to bring it up to the tip grade. Then you can plant a ground cover above the wall. The plant's root network will help prevent erosion and help hold the wall together. This method looks very nice in a casual country garden. Another approach is to leave the top of the wall exposed as you would for any freestanding stonewall. You can mortar the stone of the top course in place or cap the tip course with mortar.