

## Filling Materials

The design of gabion retaining walls is based on the mass of the contained stone or rock being able to resist the disturbing forces due to soil and external loadings. The design does not consider that the gabion-mesh provides improvement to stability. The design code applicable to gabions is BS 8002 - The Code of Conduct for Earth Retaining Structures.

In the design of the retaining structure, the principles are the same for both woven and welded mesh gabions. Where walls are subject to possible settlements, woven mesh gabions have more flexibility and therefore may be best suited in these situations. Where a high quality of appearance is needed, welded gabions are superior providing that the correct selections of mesh wire combinations are chosen.

The selection of rock or stone fill is very important, as the performance of gabion structures is dependent upon the mass. Although the mass is the criteria for design, other factors to be considered are:

### Grading of fill

Gabion fill is normally a graded fill of between 100 to 200mm in diameter with a nominal fill smaller or larger.

The grading can be tightened to 80 to 150mm providing the control of the grading is tight. Stones smaller than the mesh will not be contained by it.

The grading is important to ensure that voids within the wall are minimised otherwise settlements can occur.

### Angularity of fill

The more angular the fill, the better interlock and the less deformation of the face occurs.

**Rounded stone** has little interlock and results in greater deformation of the face. To overcome the deformation, a heavier mesh of 4mm or 5mm wire should be used.

**Crushed concrete or gritstone**, although angular, tend to become rounded. They do have greater interlock than rounded stones and therefore 4mm or 5mm welded wire mesh should be specified.

**Quarried stone** which is normally angular is the preferable fill as the interlock is very good.

**Blocky stone or flat stone** when machined/fixed can result in large voids being present which can result in settlements. Care should be taken when machine filling to minimise large voids.

Ideally, all gabions should be fully faced (hand packed on the exposed faces). Where the cost of quarried rock fill is high, the gabions can be filled with 2 types of fill, a quarried rock or block stone for the exposed face with a cheaper stone fill behind. To assist in placing of differing fills, an additional cell can be incorporated normally at least 50mm from the face during gabion manufacture to assist in the construction.