SECTION 26 – DESIGN OF CUTTINGS

0608. The side slopes of cuttings must not be steeper than the angle of repose of the local soil and they may have to be cut back further to ensure stability (see Figure4.2). Trial pits should be dug to determine requirements.

Figure 6.1 shows typical cross-sections of:-

a. Through cut.
b. Side-hill cut.
c. Through cut

0609. Drainage.

a. Width at the bottom of the cut must be sufficient to allow far side drains and berks.

b. The road through a cutting should have a gentle gradient (minimum 1 in 150) to clear surface water from the cutting.

c. Catch water drains may be necessary above the banks.

d. Subsoil drains may be required on the banks.

0610. Benching. In deep cuttings and in bad ground the bank should be benched (see Figure 6.1 (a). This reduces the likelihood of slips and decrease the flow of water down the slops during storms.

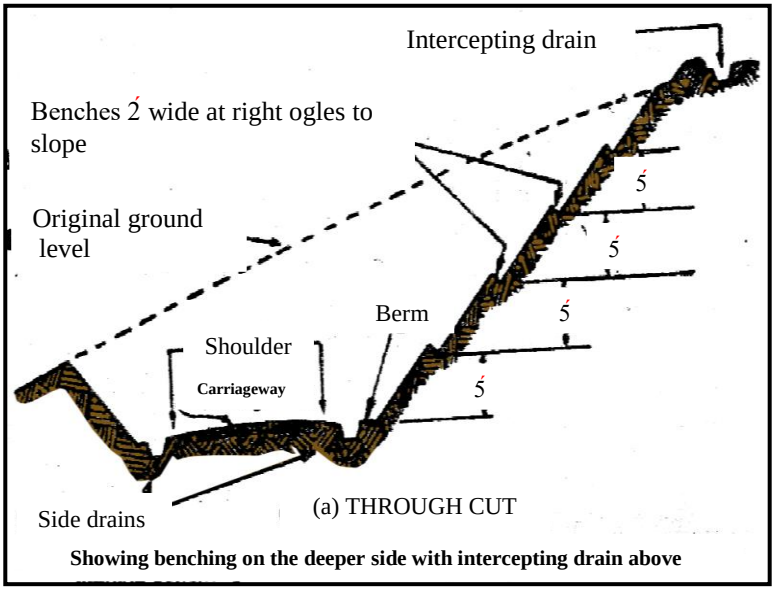

Figure 6-1 (a): Types of Cutting

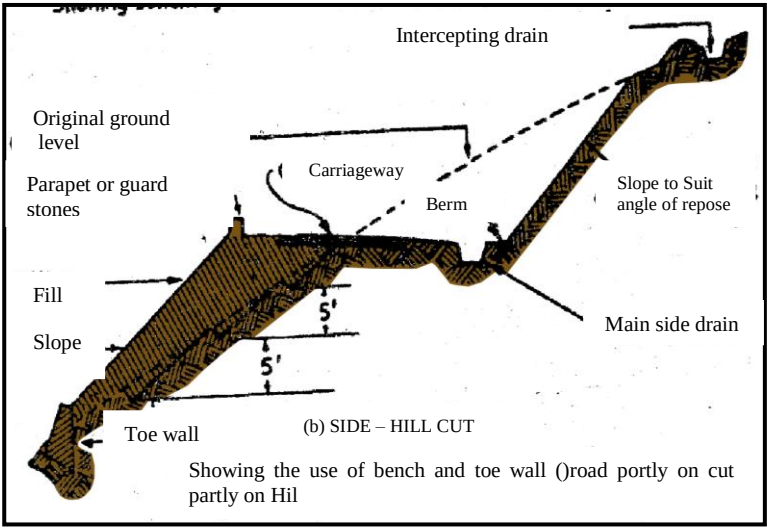

Figure 6-1 (b): Types of Cutting

0611. Curves. Curves are very under able in cuttings. If used, their radius must be large. It may also be necessary to cut back the inner bank to improve the line of sight.

0612. Disposal of Spoil. Use excavated material for adjacent fills if possible. If it must be run to water, dump it in spoil banks on low ground never above the side slopes of the cutting.

Side Hill Cut

0613. General Method. Normal practice is to carry part of the road on cut and part, cut and fill being balanced to minimize earthwork. On steep side slopes the embanked portion would tend to slip, and it would then be sounder and sometimes more economical, to carry the road on full cut. No bank slope must exceed the natural angle of repose.

0614. Retention of fill material:

a. On moderate side-hill slopes the fill material should be keyed into the surface by benching (see Figure 6.1(b)).

b. On steep slopes toe walls may also be necessary to prevent sliding.

c. Pile or picket bents driven into the natural surface may also help to prevent slip.

d. Retaining walls can be used only when skilled labor is available and when suitable stone exists near the site (see section 122). They are desirable when the natural side-hill slope approximates to the angle of repose or when space is limited. They may be more economical in time and effort than large scale excavation in rock.

0615. Drainage.

a. The main drainage ditch should be along the inner side of the road, discharging through culverts under the road at intervals.

b. The drainage ditch must have a sufficient longitudinal gradient to clear the collected water quickly.

c. On steep side hill slopes catchwater drains are usuallyrequired above the road.

0616. Curves. The increase of carriage-way width on curves (see Para 47) is especially important when the road is in side hill cut. On sharp bends round spurs the inner bank may also have to be cut back to improve the line of sight.