1.0 CLEARING, GRUBBING AND EXCAVATION.

Key Points

- Before any construction the roadway must be cleared of all vegetation and trees including their roots removed.
- Cross sections should be taken prior to any excavation works.
- All construction works must be carried out in as safe a manner as possible.
- Excavated suitable materials should be used when possible in the works.
- Provision has to be made for drainage of the temporary and permanent works.
- Soil containing vegetable matter is not suitable as fill material.
- Borrow pits should not affect the stability of the road, or any other structure.

1.1 Clearing and Grubbing (Specification 2.1)

Before any construction starts the roadway must be cleared of debris. Unless there are specific reasons, agreed to by the Engineer in writing, all materials including trees, grass, crops and structures, which fall within the road alignment must be removed.

Also all major stumps and roots need to be removed (grubbed out) and the holes left must be filled with compacted suitable fill material.

Figure 1 shows an example of the clearing and grubbing which is required.
Figure 1. Clearing and grubbing of roadway
1.2 **Excavation (Specification 2.2, 2.3, 2.4, 2.5 and 2.9)**

1.2.1 **General**

Before any excavation, including the removal of any areas of unsuitable materials, cross-sections should be taken of the undisturbed ground. From this information, and the cross sections taken of the completed road, earthwork quantities can be calculated.

No existing material, which will remain in the completed works, should be loosened unnecessarily during excavation.

Excavation works, along with all construction activities, must be undertaken in as safe a manner as possible to minimise the dangers to road users and the contractors personnel.

1.2.2 **Excavated Material**

Excavated materials need assessing as suitable or unsuitable. Suitable materials should be used when possible in the works. The excavated materials can be temporarily stockpiled, but must cause no damage to roads, services or property and not prevent water draining from the road or from the surrounding land.

Any excess suitable material, which is not required for the construction of the Works or any material classified as unsuitable is the property of RHD. The Contractor should stockpile these materials separately, as directed, or place the material in an approved location on site. To be suitable as fill material the soil must not contain any vegetable matter. To be suitable as road pavement the requirements for sub base or base materials must be met. Materials excavated from existing road pavements may meet the necessary requirements directly, or after breaking and mixing with other materials.
1.2.3 Drainage and Channel Excavation

During construction, ditches are required to be maintained to ensure proper drainage at all times. Any necessary ditches and channels should be constructed and maintained to ensure there is no damage to the roadway section. All existing ditches, or drainage channels, which the road crosses, need to be closed at the edge of the embankment, unless pipes or structures are to be constructed and, where necessary, alternative outfalls are to be provided.

Any canals and channels which are located within the embankment area need to be cleaned up and then back filled with sand. The sand fill should reach a level of 500 mm above the water level, but thereafter earthworks (as described in Embankments below) can be placed.

1.2.4 Borrow Pits

The borrow pits should be kept as drained as possible. Borrow pits should not be constructed where they might:-

a) Affect the stability or safety of the highway, see Figure 2, or any railway or other structures, which may be present.
b) Prevent natural or artificial drainage or irrigation.
c) Damage adjacent property or future expansion plans for the highway.

As materials are only paid for when included in the embankment, there is no need to measure the volume of material removed from any borrow pits.
Figure 2. Borrow pits locations