ENVIRONMENTAL MANAGEMENT SYSTEM
ISO 14001

PROCEDURE 4.4.6.2

STORMWATER MANAGEMENT

Tongaat Hulett DEVELOPMENTS

Registration No. 81/12378/07

Date	Authorised Person	Responsible Person	Proposed review date	Procedure revision no.	Page No.
August 2012	Rory Wilkinson	Bheki Shongwe	August 2013	2	Page 1 of 6

Use of Information

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1.0 AIM

To provide a Standard Operating Procedure (SOP) for management of stormwater on a development site both during and after construction. The guiding principle behind stormwater management is to keep post development runoff similar to pre development runoff. Best practice suggests a passive management approach to stormwater management whereby stormwater is retained on site for as long as possible released slowly, thus high velocity flow and peak water flow events that could cause erosion and damage property on site and in surrounding areas are avoided. Ecological engineering recognises that natural systems should be mimicked to accommodate biological systems.

This procedure must be subject to engineer approval for each project as it only investigates environmental implications, which may or may not be suitable from an engineering perspective.

2.0 RESPONSIBLE PERSON/S

The Environmental Consultants are responsible for using the SOP in the EMPs and updating it where applicable.
The Town Planner (Planning Manager) is responsible for ensuring that SOP's are updated.
The Engineer is responsible for consulting with the Environmental Consultant on environmental suitability of system.

3.0 METHODOLOGY

This SOP should be used as a guideline for preventing and managing soil erosion on site. This guideline should be used in conjunction with Procedure 4.4.6.3 on Erosion control.

4.0 ENVIRONMENTAL IMPACTS

In general, soils in the areas most used by Tongaat Hulett Developments primarily tend to be unconsolidated dune sands and / or Berea red sands which are highly susceptible to wind and water erosion which means that stormwater management during construction is of particular importance as uncovering these soils exposes them to these erosive elements. Wherever poorly managed stormwater results in erosion, there is usually the additional impact of increased siltation of water ways and related wetland areas and this impedes the flow of water and thus the functioning of these systems.

5.0 PROCEDURE

A stormwater management plan should be created to manage stormwater on site both during and after construction. An effective stormwater management plan should work towards maintaining post development stormwater runoff at the same level as pre development run off. Key elements are the reduction of flow velocity which could cause erosion problems on site and down stream, keeping stormwater on site for as long as possible, avoiding points of concentrated flow, promoting recharging of natural water bodies without exceeding these requirements and altering flow regimes and downstream timing i.e. assessing the catchment as a whole.

5.1 Promoting Infiltration and Reducing flow velocity

The permeability of soils and infiltration potential of an area will have an effect on run off and the infiltration of stormwater. However, with development, a greater proportion of the site will be covered by hardened surfaces areas, which will promote an increase in the volume and speed of surface run off. Therefore, in order to mitigate the effect of development and reduce flow velocity and speed, stormwater should be encouraged to remain on site for as long as possible. This can be achieved by keeping hardened surface areas to a minimum and encouraging stormwater infiltration through the creation of larger open vegetated areas so that stormwater can slowly soak away to recharge streams and water bodies.

5.1.1 Vegetated stormwater detention ponds

Vegetated stormwater detention ponds are often a useful way to reduce flow velocity and retain stormwater on site for as long as possible. These can also be developed into attractive water features. By choosing appropriate plants (see wetland species template 4.4.6.14) and selecting the appropriate area on a site, detention ponds can provide a similar function to that of a wetland. As such they may act as sponges, slowly releasing water to recharge surrounding water bodies, filtering

suspended and dissolved solids from the water and slowing the rate of flow. If provision is made for keystone species such as the water moss other species will be encouraged to use the area. However placement of these ponds should take into account that loose and unconsolidated soils may be susceptible to collapse when moisture is added and are therefore not suitable for the creation of detention ponds as instabilities may occur on steeper slopes.

Although seen as a positive tool for the management of stormwater, there is a possibility that the use of stormwater ponds may cause secondary environmental impacts. Possible negative impacts of stormwater ponds may be changes to downstream water temperature regimes, downstream dry weather water quality, downstream bedload movement, down-stream trophic shifts, upstream fish passage, upstream channel degradation, and destruction of riparian cover and wetlands. Very little research has been conducted on these possible negative impacts, most of which have been inferred from research on the effects of larger impoundments (dams) on large river systems and it is uncertain how this research may be applied to stormwater ponds. For example, it has been suggested that stratification of such water bodies (layering of temperatures and nutrients) may ultimately affect water temperatures down stream. However, as depth has an effect on the level of stratification that the water body experiences and shallow stormwater ponds are only likely to be weakly stratified as opposed to deeper impoundments that can exhibit very strong seasonal stratification, it is uncertain if such inferences are indeed applicable.

5.2 Accommodating sensitive systems

Sensitive systems need to be taken into account when managing stormwater. Water requirements of surrounding areas and water bodies within the same catchments area should also be determined and accounted for i.e. stormwater management needs to be approached in a holistic manner incorporating the impacts it could have on the wider area within which the site operates. Certain systems such as wetlands and other water bodies will have specific water requirements which must be met and exceeding or undersupplying water to these water sources could have an impact on how they function. Other sensitive systems such as grasslands and forests also need to be considered and should not be used as dissipation areas for stormwater without careful consideration of their water requirements and what impact over supply of water could have on these systems.

5.2.1 Wetland

In terms of managing stormwater in and around wetland areas, the “Interim Guidelines for development that may affect wetlands” produced by the DAEA should be followed (see also SOP 4.4.6.8 Management of Sensitive Systems section 5.8). Specific requirements relating to stormwater management are that hardened surfaces should be at least 15m outside of the outer boundary of the seasonal / permanent wetland zone. It also states that stormwater outflows should not directly enter a wetland and that a vegetated buffer of 20m should be included between the stormwater outflow and the outer boundary of the wetland with mechanisms for dissipating water energy and slowing water flow. In cases where a high biodiversity exists within the wetland, a specialist will need to determine buffer widths.

5.2.2 Discharging water into water bodies

Discharging stormwater into natural watercourses is only acceptable under certain conditions (requirements of the National Water Act should be followed at all times). Stormwater entering a natural water course must be of acceptable quality (as per DWAF requirements, see attached extract from old Water Act which is stil being used as a water quality guideline), no pollutants i.e. soaps, car washings, paints or any other domestic pollutants can be allowed to enter the natural system. Stormwater entering the system should not significantly alter the natural timing and flow of the stream as this could cause flooding and erosion further downstream. It may be advisable to slow and filter water prior to allowing it to enter the natural water course. Prior to discharging water to a water body, requirements for permits should be investigated.

References

Every effort has been made to reference all sources used, however, some of the information gathered was taken from our own reports and sources of information and have not been referenced here.

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