

Stormwater Drainage and Coastal Development Policy and Guidelines

Approved by Executive Council on September 13th, 2001

Important Note:

Developers are expected to undertake their own study of the required stormwater management system for the site/proposal. Whilst this leaflet sets out the minimum details required to be submitted with a planning application it is a **Guide only** and it is the responsibility of developers and landowners to adequately plan for and manage stormwater on their land.

1.0 Introduction

Stormwater can result in damage to property, loss of income and, loss of life. It can be a serious threat. It needs careful planning at the earliest stage to minimize its impact. This leaflet is for developers, landowners, businesses and the public.

2.0 Background

In November 1999 Anguilla suffered from two Hurricanes (Jose and Lenny), which caused damage, estimated to be US\$62 Million. This damage resulted from a combination of substantial rainfall, stormwater, storm surge, wave action and winds. Whilst no lives were lost many were endangered.

3.0 Why The Polices are Important

All coastal areas are of value to Anguilla. They have remarkable marine natural heritage and provide rich resources for both work and play. These areas are also particularly sensitive to development. Stormwater is one of many issues that must be planed for in these areas. Failure to provide adequate drainage for stormwater can result in damage to:

- buildings and property
- surrounding infrastructure including access roads and
- to our natural environment.

4.0 Special Considerations for Coastal Developments

Coastal developments have a number of special considerations that must be taken into account when planning a stormwater management system.

4.1 Sea Levels:

The developer must recognize and plan for the potential risk of increased sea levels and waves at times of 'depression', tropical storm and hurricane. These events may overwhelm a system designed for rainwater alone.

4.2 Coastal Changes

Due to these coastal changes no stormwater outfalls or similar structures will be allowed on beaches, Anguilla's coastline changes in shape, appearance and structure throughout the year. Sand erosion and deposition occurs at all times but it can be seen at it's most dramatic at times of 'depression', tropical storm and hurricane.

A separate guidance leaflet is being prepared to cover the issue of Anguilla's cliffs, which are mainly on the northern coast.

Modifying the coastline to significantly affect the natural processes of erosion and deposition through development can cause significant problems and must be very carefully considered. Such developments would include:

- sea walls, groynes, and similar 'hard' structures
- land reclamation works
- modification and removal of sand dunes
- cutting back and removal of sand vegetation
- beach profiling work.

5.0 Guidelines to be used for all major coastal developments

These guidelines cover hotels (and their associated facilities i.e. car parks, leisure and sport facilities, restaurants etc.) and schemes of familiar nature and/or size and/or impact.

1. Each site will have a unique set of circumstances that will need careful study by the developer.
2. There are four key issues that need to be considered for all schemes:
 - Surface water runoff
 - Temporary storage
 - Infiltration
 - Water Quality

5.1 Surface Water Runoff

A surface water collection system **must** be provided where large areas around the building have been paved (or given a hard impermeable surface) such as car parks etc. The run-off coefficient will be assumed to be 1.0. The system must be either pipes and/or open channels and designed to a storm return period of not less than 2 years. All open channels must be lined to prevent erosion and shallow enough to prevent hydraulic jumps. Culverts must be designed to operate without surcharging under design conditions.

Runoff from outside the development site (which would ordinarily run across the site) should be planned for and not diverted in such a way at or within the site perimeter as to result in erosion or other environmental damage.

Gabion mattresses or similar measures are required at outfall structures to prevent erosion.

5.2 Temporary Storage

Temporary storage areas are very effective in preventing damage by stormwater. Normally there is no detrimental impact of a well-planned storage system especially if the location of the overflow pipe is carefully sited.

Storage of rainwater from building roofs (which is a large amount of the total impermeable area of a development site) etc. can be directed to water supply cisterns either in the basement or beneath structures such as tennis courts. Overflow from such a system should be planned for by either a surface outflow preferably into a soakaway from the buildings or preferably piped into a grey-water tank.

These facilities can also provide valuable storage for surface water runoff. Discharge of runoff into local ponds can also be a suitable method of providing alternative temporary storage.

5.3 Infiltration

Infiltration provides another valuable way of disposing of surface water. The surface where the water falls often requires different treatment:

Car Parks

Permeable macadam or cellular blocks are recommended. Where impermeable surfaces are used stone filled infiltration trenches (soakaway) will be required around the areas *perimeter* (this will also be included on tennis courts).

Irrigated Grassed Areas

Swales with low check dams will be required. Careful landscaping can enhance the appearance of swales.

Soakaways can also be used to drain paved surface areas. These are commonly used to tackle large volumes of water within a small plan area. They can be built as rock filled trenches incorporating a large diameter perforated pipe or open structures with blockwork walls or precast concrete rings. No soakaways should be located within 10m of building foundations. The soakaways must be built of a minimum of 1

cubic metre for every 17-20m² of area to be drained. It is recommended that the soakaways be built of a rectangular design and as wide as possible.

Important:

During and after construction it is important to ensure that soakaways are protected from the influx of large quantities of sediment as this may lead to 'clogging' of ground so that the soakaway falls to work properly or at all. Forms of soakaway protection include silt traps, which are regularly maintained.

5.4 Water Quality

This is of vital importance for all living, working and visiting Anguilla now and in the future. Developers, land-owners and business operators have a key responsibility not only for the:

- Quantity of the water generated from their sites but also its quality.

There are three key actions, which must be taken.

a) Sediment Control

Silt traps must be constructed at the earliest opportunity during the site construction work. The traps can either be a simple concrete tank or unlined basin formed by an earth impoundment. They must be designed:

- to remove 90% of sediment particles greater than 0.3mm in diameter.
- with the velocity of water flow not exceeding 0.3m/s.

b) Floating waste (litter and debris including oil).

Where large deliveries of oil non-soluble chemicals are expected oil/chemical interceptors must be incorporated into the stormwater system. Trash (litter) screens must be installed at all inlet structures.

c) Dissolved contaminants and chemical spillage.

A detailed *Action Plan* of measures to be taken to prevent and respond to spillage to protect the environment including areas

of water must be submitted with the planning application for approval.

Of Vital Importance

To ensure continuous high quality of water regular maintenance including clearing and cleaning (and all other necessary remedial work) **must** be undertaken to ensure proper functioning of equipment.

6.0 Your Planning Application Check List

If you are applying for Planning Permission for a major coastal development (including a hotel) you must clearly demonstrate in your application that you have given full consideration to the issue of stormwater management contained in this leaflet.

Where an application fails to show adequate management of stormwater a decision will be deferred until satisfactory details have been submitted for approval.

The details to be submitted **must always include the following** (the precise content and extent of works will depend upon the particular site and development proposed):

- ✓ Approach to how stormwater on the site will be managed. This must include a plan showing proposals for storm drains, pipe networks, soakaways, swales and outfalls and all other related structures/features.
- ✓ Environmental Protection Management Plan (covering the construction period and after construction)
This must highlight which works are proposed as temporary and permanent measures. The measures, which may be appropriate, could include silt traps, oil and litter interceptors, and erosion control measures. This is in addition to the requirement for an Environmental Impact Assessment.

The Physical Planning Department may also require you to submit the following (you may also find them of use in developing your Stormwater Management systems).

➤ Studies conducted on the site/neighbouring or comparable sites.

These might include:

- Flood studies
- Infiltration tests
- Investigations of the water table height
- Coastal stability and beach processes

7.0 Glossary of Terms – Simple explanations

Gabion Mattresses

Wire mesh box/cage filled with rocks. They limit erosion and can be used in a variety of locations. They can aid sand dune reconstruction and shore protection.

Soakaways

They can be built as rock filled trenches incorporating a large diameter perforated pipe or open structures with blockwork walls or precast concrete rings.

Silt traps

These devices reduce the water velocity and result in particles (sand, soil etc.) setting out. They are invaluable at construction stage of developments when the potential for sediment-laden water is often greatest. They can have a variety of designs including wire mesh or natural.

Groyne

Shore protection structure built perpendicular to the shore; designed to trap sediment.

Seawall

Massive structure built along the shore to prevent erosion and damage by wave action.

Beach profile

Side view of a beach extending from the top of the dune line into the sea.

Dune

Accumulations of wind-blown sand in ridges or mounds that lie landward of the beach and usually parallel to the shoreline.

8.0 Acknowledgements

Thanks go to the support of Halcrow Water, part of the Halcrow Group Limited who produced the Anguilla Drainage Study August 2000 on behalf of the Government of Anguilla.

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