



Drainage Behind and Through Levees

Summary

This floodplain risk management (FRM) guideline addresses the funding eligibility for the components drainage systems behind and through levees under the State Government's Floodplain Management Program.

Introduction

Flood levees prevent riverine flooding from inundating the protected area. However, in doing so they prevent runoff from the catchment behind the levee from draining to the river. Local runoff ponds at low points behind the levee in an uncontrolled fashion unless appropriate gravity and/or pumped drainage systems are provided to discharge water through or over the levee, with the latter option overcoming potential seepage problems associated with culvert barrels.

Drainage Infrastructure Behind and Through Levees

Drainage systems behind levees can be separated into: infrastructure associated with discharge through or over the levee; and drainage systems that deliver the water to the discharge system. Section 1 discusses typical descriptions of these, and provides a discussion of the breakdown of the latter into major and local drainage problems in accordance with the 2005 Floodplain Development Manual, 2005.

Funding Eligibility Issues

Funding eligibility is summarised below with additional detail given in Section 2.

Eligibility for funding in the levee investigation phase is limited to:

- works essential to effective storage and discharge of flow through or over the levee;
- alteration to drainage systems where conduits and overland flowpaths are disrupted by the levee; and
- major drainage problems as outlined in Section 1.

Design and construction funding is limited to eligible items identified in the management plan, which may include:

- infrastructure essential to gravity and pumped systems discharging through or over the levee;
- alteration to either conduits and overland flow systems disrupted by the levee construction or associated works; and
- management measures to address major drainage problems (as defined in the Manual).

General improvements to local drainage, as defined in the Manual, are not eligible for funding.

Recommendations

Funding eligibility is limited as outlined above and in Section 2. Where funding eligibility remains unclear clarification should be sought from DECC Floodplain Risk Management staff.



Section 1 Drainage Systems Behind/Through Levees

Section 1.1 Typical Drainage System Components

The drainage system through a levee typically comprises both:

- Pumped drainage systems, to discharge water into the river when river water levels are higher than the water level behind the levee. This generally involves a ponding area to collect runoff behind the levee, and associated pumps, pressure main and auxiliary equipment. The pump equipment can be omitted if there is sufficient volume available in the ponding area to temporarily store stormwater until it can be discharged by gravity through the levee when river levels fall.
- A gravity drainage system, to discharge water to the river when the river level is below the water level behind the levee. This typically involves pipes under the levee, and a gated outlet structure, to prevent back flow when the river level is high.

The remaining drainage areas on the town side of the levee can be classified as either major or local drainage problem areas, in accordance with the Manual. Local and major problem areas comprise flow conduits and formal or informal overland flowpaths.

Section 1.2 Major Drainage Problems

Major drainage problems are within the scope of the Manual. They typically involve:

- the floodplains of original watercourses or trunk drainage systems (which may now be piped or channelised or diverted), or sloping areas where overland flows occur along alternative paths once system capacity is exceeded; and/or

- water depths generally in excess of 0.3m (in the system design storm used to derive the flood planning level). These conditions may result in danger to personal safety and damage to property (both premises and vehicles); and
- major overland flowpaths through developed areas outside of defined drainage reserves; and/or
- the potential to flood a number of buildings along the major flow path.

Section 1.3 Local Drainage Problems

Local drainage problems occur randomly throughout urban areas and fall outside the definition of major drainage problem areas, above. They are outside the scope of the Manual and therefore not eligible for funding.

They can generally be minimised by adoption of general urban building controls requiring a minimum difference between finished floor and finished ground levels (to cope with shallow water depths) and adequate site drainage. Areas without these controls may have damage potential but the level of damages is generally relatively small. Therefore, benefits of remediation cannot be justified on economic cost alone.

Section 1.4 Consideration of Drainage in Levee Investigations and Designs

The construction of a levee can affect major and local drainage problems with significant impacts for flooding at low points in the vicinity of the levee. This is an essential consideration in the investigation and design of a levee and therefore should form an integral part of any associated brief.



Section 2 Funding Eligibility

Section 2.1 Investigations

Eligibility for funding in the investigation phase is limited to:

- works essential to effective storage and discharge of flow through or over the levee. This involves determining peak flows, volumes, and examining the feasibility of establishing appropriate systems to discharge flows through or over the levee.
- alteration to drainage systems, where they are likely to be disrupted by the levee, as outlined below.
- resolution of major drainage problems that would be brought about or significantly exacerbated by the construction of the levee; and
- design of local drainage disrupted by the levee scheme and requiring realignment or reconstruction. Improvements to local drainage are not eligible for funding.
- major drainage problems, as outlined in Section 1.

Councils are to be encouraged to investigate major drainage problems in accordance with the Manual.

Section 2.2 Design and Construction

Funding for construction is limited to eligible items identified in the management plan:

- infrastructure essential to gravity and pumped systems discharging through the levee, as described in Section 1.
- alteration to drainage disrupted by the levee construction or associated works, as described above; and
- management measures to address major drainage problems.

Improvements to local drainage are not eligible for funding.