

RNZAF BASE AUCKLAND – A STRATEGIC APPROACH TO STORMWATER MANAGEMENT

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ABSTRACT

The New Zealand Defence Force is embarking on a regeneration programme at the RNZAF Base Auckland. The regeneration programme is seeking to redevelop the Base out to 2030 including construction of buildings, and infrastructure that is compatible with a modern defence force. Due to the large number of projects proposed with each project comprising a separate project team and previous challenges with previous projects being consented separately, NZDF has undertaken a strategic approach to stormwater management at the Base.

This paper discusses the challenges associated with each project being designed and consented. The paper then outlines the approach taken to develop a Base-wide strategic plan for stormwater management that allows for a large number of discrete projects to be managed and designed by different parties over a long timescale while achieving a consistent result that meets the specific needs of an operating airbase and can be managed under a single consent.

The status quo approach

Historically, development and consenting of new infrastructure at the Base has been undertaken on a project by project basis. While the projects and designs meet the relevant regulatory requirements, this has resulted in variety of stormwater treatment devices being installed and multiple consents and con-going conditions. While previous projects met the requirements under the relevant regional plan, the design has been based on the stormwater engineer making a call on what they consider is the most appropriate design approach, without necessarily have any broader guidance on site specific constraints or drivers.

NZDF were keen to develop an approach which minimised the number of consents and compliance obligations, and ensuring future stormwater infrastructure is consistent and meets the specific needs of an operating airbase, while allowing each project to be managed and designed by different parties.

Overview of strategic approach

The proposed regeneration at Base Auckland has been the driver for a more strategic approach to both consenting and stormwater management. The proposed developments are planned to occur over an extended period of time, with each project to be managed, designed and constructed by a project team involving different consultants and contractors. The purpose of the strategy was to provide overarching guidance and direction on the stormwater management

requirements associated with new builds, and the selection and design of stormwater management devices suitable for the Base.

The development of the strategy was based on a staged approach with involvement of NZDF staff, Council staff and external project managers working on the regeneration programme.

The stages included:

- understanding the requirements and constraints at the Base;
- preparation of a Base wide strategy;
- development of a Base specific stormwater management plan which sets out the minimum requirements for each individual project and provides guidance on how this can be met;
- a long term management process to review and track projects as they are developed.

Stage 1: Review of requirements and constraints

The requirements and constraints were split into three categories, including:

- Regulatory requirements – what does the strategy need to achieve;
- Site specific requirements – what constraints exist at the site; and
- Maintenance requirements and contracts and NZDF experience.

The regulatory requirements were controlled by the Auckland Unitary Plan Operative in Part and include requirements for stormwater treatment for high contaminant generating parking areas, stormwater retention and stormwater detention.

The site specific requirements were due to the site being an operational airbase. The most significant constraint that impacts on both stormwater and earthworks is the risk associated with bird strikes. The risk from bird strikes is greatest during aircraft take-off and landing. To identify the constraints associated with risk from bird strikes, a workshop was held with key personnel to understand the issues in relation to birdstrike, the methods used to manage wildlife, and the types of stormwater systems that may attract birds to the Base.

The workshop identified the following features should be avoided were possible for air safety reasons:

- permanent ponding water;
- intermittent ponded water;
- dense ground habitat suitable for nesting;
- plant species that are known to attract specific bird species including pukeko, ducks and geese; and
- mixed flowering plant species that flower at different times through the year.

NZDF have a number of different stormwater management devices across their assets and have experience with the performance and maintenance of these systems. The experience of NZDF staff helped inform the development of the strategy. Some of the key issues identified were:

- The costs associated with maintaining and servicing proprietary devices can be high;
- Maintenance of proprietary devices can often be limited to only a small number of suppliers, which can conflict with existing and future maintenance contracts at the Base;
- Base Auckland has a large number of mature deciduous trees which can result in clogging of drains and stormwater devices;
- A large variety of devices makes effective training of maintenance staff difficult as a large number of different maintenance plans and methods need to be understood.

Furthermore, additional drivers within NZDF were identified for consideration as part of the development of the strategy including:

- A desire for new projects to identify and consider opportunities for capturing and re-using water;
- Where there are opportunities to retrofit existing buildings with rain tanks, to use these gains to off-set a proportion of new developments where such opportunities may not exist;
- Individual projects to look at providing the required hydrological mitigation requirements within the project footprint where possible; and
- Provide stormwater treatment for all areas by using permeable paving for small parking areas (less than 30 parks) and low volume trafficked areas where possible.

Stage 2: Development of strategy

The final stormwater management strategy was developed based on the following aspects:

- NZDF seeking to identify and investigate possible retrofit/ offset opportunities on existing facilities where these are practicable and achieve longer term benefits;
- Require each individual project to consider the best stormwater management outcomes for the project subject to meeting the requirements of the site stormwater management strategy as well as looking for opportunities to provide additional benefits beyond the project; and
- NZDF to maintain an overall register of all changes to the stormwater infrastructure including retrofit/ offsets and new projects to track the overall change in imperviousness and flows from the site and to provide flexibility for the projects.

These aspects were used to develop the Base wide approach to managing stormwater for the Base associated with the regeneration programme.

Stage 3: Stormwater management plan

The stormwater management plan was developed for use by the project teams to ensure they understood the stormwater requirements at the site, and to avoid inappropriate stormwater management measures.

The stormwater management plan includes the requirements for each project, and site specific design guidance in cases where the Council's standard design guidance needs to be modified for use at the Base. An example is raingardens, which typically incorporate a hollowed surface to provide for temporary detention. The need to minimise ponded water on the Base requires design changes to avoid the potential for ponded water. This can be achieved by providing a rock media with a large void space on the surface of the rain garden so that water can be held to infiltrate through the device while not showing visible ponded water.

The stormwater management plan includes a standard checklist and worksheet to ensure to be completed and provided to NZDF to review against the requirements.

Stage 4: Long term management process

The development of the Base wide stormwater strategy and management plan now sets out clear guidance on the requirements for the site, to ensure the measures incorporated into each project are suitable for the Base and are consistent with NZDF's longer term strategy.

While, the guidance has been developed, there is still the chance that alternative solutions are proposed or put forward by the project team that does not specifically meet the requirements of the plan, or circumstances may exist where there are challenges in meeting the requirements of the plan.

To manage this process, NZDF have established a review and tracking system which has two functions. Firstly, by requiring each project team to provide a summary of the proposed development and the extent of any changes in imperviousness, NZDF can ensure the requirements for the project are identified early in the process. The second function, is to allow NZDF to keep a record and track the overall changes in imperviousness at the site.

Conclusion

Previously stormwater works associated with development at the RNZAF Base Auckland were undertaken on a project specific basis. This has resulted in a costly process and a number of separate stormwater consents that need to be managed and have ongoing costs.

A stormwater management strategy has been developed for the Base to provide a strategic review of management options and to assist in the development of a Base wide stormwater management plan for use by each project team.

This ensures each project team is clear about the stormwater requirements for the site, and minimises the risk of new infrastructure designed and constructed which is not suitable for the site.