



# STORMWATER MANAGEMENT SOLUTIONS

#### Keeping it pure and simple!

Lowe Environmental Impact are specialists at providing stormwater treatment, detention, reticulation and discharge design solutions for residential, industrial and commercial environments. We can take any project from the initial investigation stage, deal with all local and regional council resource consent requirements, and provide tailored stormwater solutions to meet the requirements of any site.

# LEI EXPERTISE AND SERVICES

LEI is a specialist science and engineering company that can design your stormwater system and bridge the gap between individual property owners/developers, local or regional councils and civil engineers. We provide a well-rounded and easy to deal with organisation for all your stormwater needs.

Specific stormwater expertise provided includes:

- > Residential, commercial and industrial design solutions.
- > Pre and post development stormwater runoff modelling.
- Stormwater treatment and detention design solutions.
- Discharge designs (soakage pit/trench or surface water discharges).
- Construction water treatment and discharge design solutions.
- > Erosion and sediment control management plans.
- Resource consent and assessment of environment effects.
- > Compliance applications.
- Contaminated land stormwater solutions.
- > Truck wash treatment and discharge design solutions.
- > Site supervision and CPEng sign-off for drainage systems.

The following provides a brief overview of stormwater system requirements.



#### **REGULATORY REQUIREMENTS**

Property owners and developers need to be aware of both the local and regional council regulatory rules and site specific requirements. Is a building consent enough or do you also require a resource consent from the regional council? Do you require operational and construction water discharge consents? Do you require a land use consent? Is the site listed on the HAIL register? Do you need an earthworks consent?

It is important to have a good understanding of all consent requirements and be aware that in some cases more than one consent may be needed.

### STORMWATER TREATMENT

There is a vast range of stormwater treatment technologies available and before selecting a device the following needs to be considered:

- Council approval.
- Cost (capital, operational and maintenance).
- Maintenance requirements.
- Site activity.
- Site restrictions (e.g. high groundwater, contamination).
- Council infrastructure (e.g. road side pipe inverts)
- Consent requirements.
- Development contributions (onsite treatment and detention could potentially reduce development contribution costs).
- Visual aesthetics and landscaping.

Always consider the site landscaping requirements; garden or lawn areas are ideal for the siting of rain gardens, swales, infiltration basins and many other natural treatment systems that look good, are preferred by Councils and provide excellent treatment guality.

When selecting a treatment system do not forget ongoing operational and maintenance requirements and costs. Many off-the-shelf physical barriers have low to mid-range capital expenditure (some have high) but require the ongoing need for filter replacement and sediment removal. Green systems require the same maintenance as any landscaped area...keep it clean and the vegetation maintained.

## **STORMWATER DETENTION**

Increased urban growth is placing more pressure on drainage infrastructure capacities and in some cases the increased discharge volumes entering waterways can result in downstream flooding.

Councils are requiring onsite detention of stormwater in many catchments. However, there is no set guideline, with each catchment being assessed on its own merit. A typical requirement is that post development run off should not exceed that of the pre development.

Stormwater detention can be by way of storage tanks, grassed or vegetated basins, soakage pits or trenches, or via any other methodologies that will ensure the capture and slow release of stormwater discharges up to a set rain fall event and duration.

Determining the detention requirement must be carried out by a skilled professional who has the knowledge of rainfall patterns, pre and post development modelling and understands Council expectations. Do not just rely on the Council to define the detention volume, it is wise to have the volume calculated by an experienced engineer.

#### OVERLOOKED STORMWATER ISSUES

Many sites have characteristics that are overlooked in the initial design stages but are picked up by local or regional councils. Not taking into account all site characteristics will cost time and potentially lead to a redesign. Always consider the following:

- > Is the site contaminated from a past activity?
- Is there a truck wash?
- Has enough land area been put aside for stormwater treatment and detention facilities?
- Site restrictions (e.g. groundwater)?
- Construction water discharges?
- What contaminants are of concern?

There are many types of resource consents that can be triggered via a stormwater design submission, therefore, review the full site development and gauge any potential consent issues before they arise. Clear communication with both local and regional councils is important.

#### Contact us to scope what is required and provide you with a proposal for your project





Examples of stormwater systems LEI staff have been involved in



