CAPABILITY STATEMENT

Stormwater and Flood Management

WHO WE ARE

GWE Consulting Engineers is highly experienced in stormwater management, drinking water, wastewater, geotechnical, environmental and civil infrastructure engineering, with a wealth of development experience from large, multi-lot greenfield subdivisions to small scale, inner city brownfield developments. We work closely with architects, project managers, planners, surveyors, owners and developers to provide the technical capability required to design and deliver successful projects.

GWE capabilities incorporates understanding client and community needs, evaluating flood risk, assessing environmental sensitivities and the effects of stormwater discharges, developing sustainable environmental outcomes.

Our delivery is grounded in our LIFT values: we Listen to understand stakeholders, context and constraints; Innovate to identify practical, cost-effective solutions; Follow Through with rigorous documentation and verification; and Team Up with clients and project partners to keep projects moving and outcomes defensible.

Our brand promise is clear: when others stall, we solve, bringing calm, clarity and rigour to complex projects and sites and challenging consenting pathways. We do the hard work, so your project doesn't get harder.

WHAT WE DO

GWE Consulting Engineers has built a solid reputation in Stormwater Engineering and Flood Management with a range of projects successfully completed across New Zealand. We help clients manage the effects of stormwater runoff from urban areas and modified rural catchments to streams and rivers. Our solutions are aesthetically designed and meet regulatory standards for water quality and flow control.

We undertake the following Stormwater Engineering and Flood Management related work:

- Flood Impact and/or flood risk Assessments
- Stormwater Management Plans
- Water Sensitive Design
- Stormwater Networks Design
- Erosion and Sediment Control Plans
- Associated earthworks design with cut & fill balannce
- Resource consent applications

VALUE DELIVERED

- Compliant, aesthetically designed stormwater solutions that manage runoff effects, meeting regulatory standards for water quality and flow control.
- Robust planning and design informed by hydrologic and hydraulic modelling, balancing conventional infrastructure, Water Sensitive Design devices and enhanced natural systems (including for greenfield/brownfield sites and stormwater neutrality).
- Erosion and sediment control planning that meets local Council standards and helps prevent sediment entering natural waterways.

Low Flow Channel within a Managed Floodplain

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OUR SERVICES

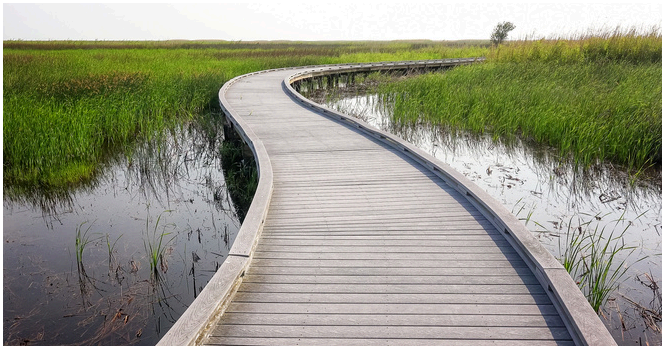
Flood Impact and/or Flood Risk Assessments

Flooding is a common hazard for many developments in urban and rural environments. The magnitude and frequency of these events are related to numerous factors including site topography, rainfall intensity/duration and soil conditions. GWE undertakes hydrologic and hydraulic modelling of sites that are prone to flooding. We identify the extent of overland flow paths and flood plains and advise our clients on what the risks are and how to mitigate the effects on their developments and downstream properties.

Stormwater Management

GWE's approach to stormwater management incorporates identifying client and community needs, evaluating flood and stormwater discharge effects on the environment and developing Water Sensitive Design (WSD) solutions to manage those effects. Site specific, sustainable outcomes are achieved through stormwater mitigation (retention and/or detention) and a balanced use of conventional stormwater infrastructure, WSD devices and enhanced natural systems.

GWE has extensive experience with the hydraulic modelling and design of open channels and stormwater pipelines for greenfield and brownfield developments. We also design stormwater management devices for the retention and detention of stormwater to minimize the effects on downstream catchments and the erosion and scour of stream environments.



Boardwalk through a Stormwater Management Area

Stormwater Management Plans

GWE has a long track record in preparing Stormwater Management Plans for our clients. Our methodology is to consider a variety of management options (treatment train approach) for the development and through an options analysis framework select the best practicable solution, taking into consideration the existing site features. The plan will present the proposed development layout and the water sensitive design applications. Ultimately, the plan will be used to inform future development at the site for the developer and the consenting process.

Raingardens in a New Housing Area

Water Sensitive Design

Water Sensitive Design (WSD) is a contemporary and regulated approach to freshwater management. It is applied to land use planning and development at regional, catchment and site scales. Water sensitive design protects and enhances natural freshwater systems, sustainably manages water resources and mimics natural processes to achieve enhanced outcomes for ecosystems and communities.

GWE's approach is to reduce 'effective' imperviousness within a development by directing stormwater runoff to pervious mitigation areas in order to retain/detain and treat stormwater prior to entering reticulated networks or the environment. This alleviates the potential downstream environmental effects from stormwater volumes, peak flows and contaminants and reduces requirements for lower catchment stormwater infrastructure to manage these effects.

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Stormwater Networks Design

We assist our clients with the design of stormwater urban drainage systems comprising pipe networks, open channels and overland flow paths. Our team of engineers are highly experienced in network modelling, reticulation layouts, culvert design and construction techniques for stormwater networks that are eventually vested in Council or privately owned and operated by industry or body corporates.

Good drainage design must strive to maintain compatibility and minimise interference with existing drainage patterns; control flooding of property, structures and roadways for design flood events; and minimise potential environmental impacts from stormwater runoff. Stormwater collection systems must be designed to provide adequate surface drainage while at the same time meeting other stormwater management goals such as water quality, streambank channel protection, habitat protection and groundwater recharge.

Grassed Swale Drain

Converting a Former Sediment Retention Pond

Erosion and Sediment Control Plans

There are a number of fundamental principles that provide best practice guidance for Erosion and Sediment Control (ESC). These principles can minimise the adverse effects of erosion and sediment transport on the environment through the planning, design, construction and maintenance phases of a project.

When preparing and implementing an ESC Plan GWE Engineers consider the following aspects of the development; minimising disturbance, staging construction, protecting slopes, protecting receiving environments, rapidly stabilising exposed areas, installing perimeter controls and diversions, employing sediment retention devices and adjusting the ESC Plan, as needed.

ESC measures should link to form the treatment train as each measure has a specific role. This approach can be a combination of structural (e.g. sediment retention ponds, perimeter controls) and non-structural (earthwork season, staging) practices. This treatment train approach should be considered during the project's early planning phases and followed through to project completion.

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RELEVANT PROJECT EXPERIENCE

Omaru Creek Stormwater Management Plan

The Tamaki Housing Regeneration Area sits within the Tamaki North stormwater catchment which includes the Omaru Creek. The Stormwater Management Plan addresses stormwater management issues in the Omaru catchment and was designed to deliver an inter-disciplinary design approach, which considers stormwater management interweaved with ecology, urban design, amenity, recreation, safety, community and cultural values in particular Te Aranga Design principles.

Firth Concrete, New Batch Plant, Manukau

Design of the stormwater treatment system for the new batching plant site including separate systems for clean stormwater and for run-off from operational areas and dirty areas of the site

Hingaia 2 Precinct SHA, Hayfield Way

Preparation of the stormwater management plan and the hydrologic and hydraulic design for this 57ha development in accordance with the stormwater attenuation and treatment requirements of the Unitary Plan. The stormwater concepts include the restoration/daylighting of a network of intermittent and permanent streams. WSD designs were based on GD01 and included permeable pavements, raingardens, tree pits and vegetative swales.

Huapai Triangle SHA, Huapai

Preparation of the hydrologic, hydraulic and WSD design for the 65ha residential development. Concept and preliminary designs include at source retention and CAPABILITY STATEMENT Stormwater and Flood Management detention according to the SMAF 1 requirements of the Unitary Plan. Treatment devices were designed for the main tree lined boulevard and included raingardens, tree pits and vegetative swales.

Cultivated Stream Crossing in A Subdivision

KEY PEOPLE

Gareth Williams, Director

Gareth is a process engineer and specialises in wastewater treatment facilities for small communities. Gareth has commercial oversight of all our projects and actively engages in client relationship management.

Johan Smit, Principal - Civil & Land Development

Johan manages GWE's Civil & Stormwater team.