



Whitsunday Regional Council

Stormwater Fact Sheets



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WHITSUNDAY REGIONAL COUNCIL

STORMWATER FACT SHEET

OVERLAND FLOODING & URBAN DRAINAGE

This fact sheet provides information about:

- Overland Flow
- Urban Drainage Features and Functions

OVERLAND FLOW

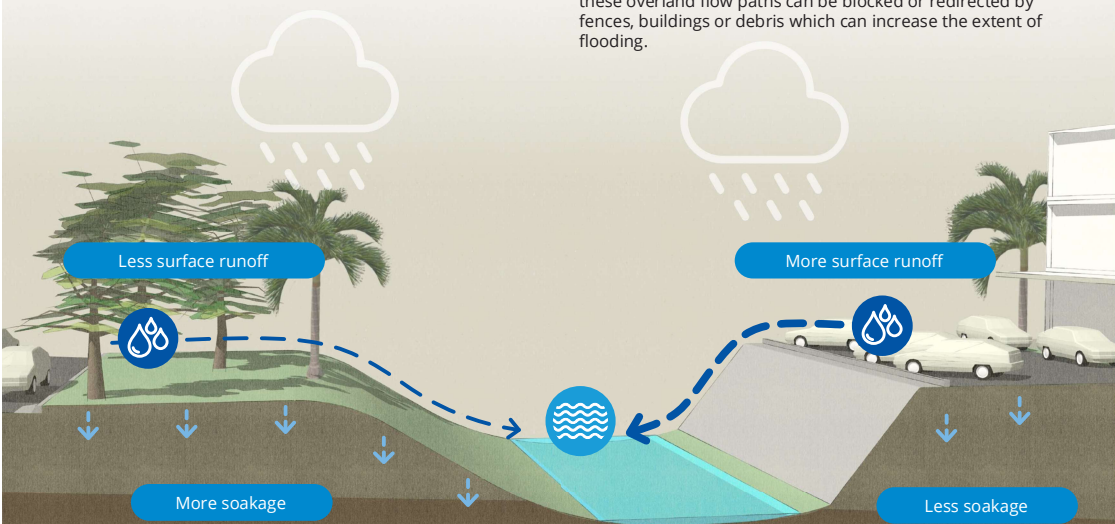
Surface runoff (overland flow) occurs when rainfall cannot soak into the ground. This occurs when the ground is already saturated from previous rain or the rain falls on impervious surfaces that do not allow water to soak into the ground (eg. concrete, roads and building roof tops).

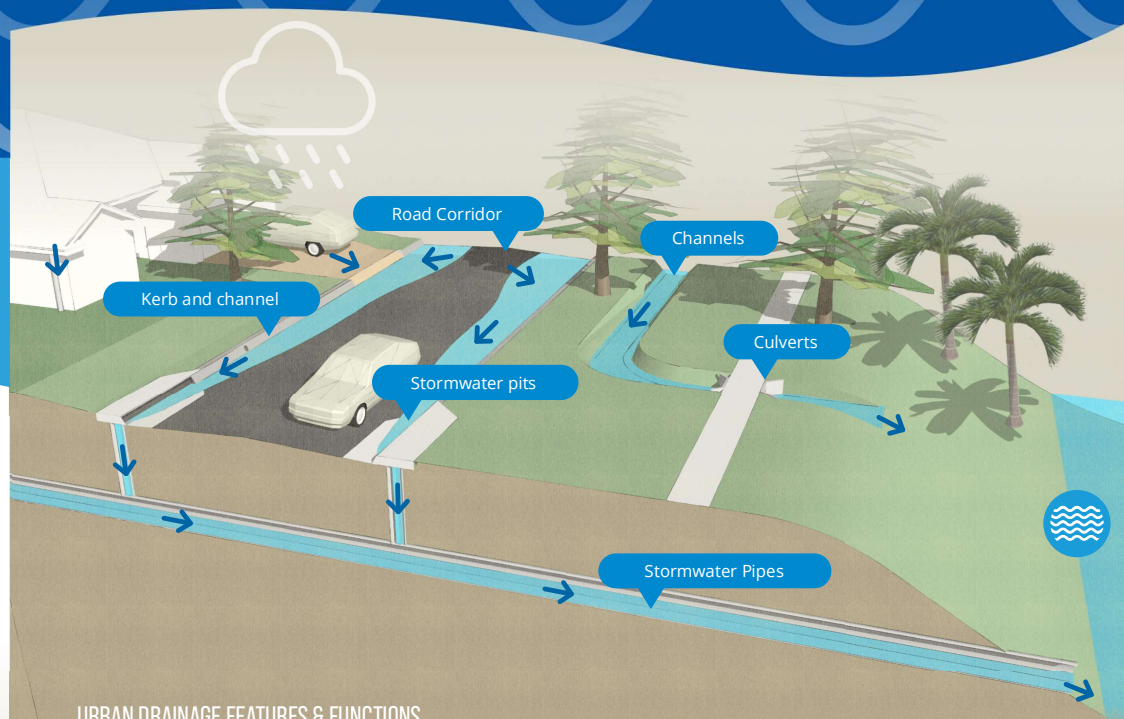
As runoff gathers above the ground, it will seek to follow natural or man-made depressions in the landscape. Eventually, this runoff will reach the nearest creek or river and flow into the ocean. In urban or rural areas, overland flow is often directed into stormwater infrastructure, such as stormwater pits, pipes and channels.

Rainfall patterns change over the year, with more rain generally falling in October through May in the Whitsunday region.

Stormwater that is unable to enter the urban drainage system will find its natural way to the nearest watercourse via overland flow paths. These overland flow paths are typically natural depressions (that often occur through private property), open channels, roadways and the like.

The extents of flooding from runoff varies with the amount of rainfall and efficiency of flow paths. Runoff within these overland flow paths can be blocked or redirected by fences, buildings or debris which can increase the extent of flooding.





URBAN DRAINAGE FEATURES & FUNCTIONS

An urban drainage system is a network of infrastructure that is used to collect stormwater from properties, parks, roads and other environments. Urban drainage is also used to facilitate development by more efficiently capturing and redirecting overland flow. The type and extent of urban drainage infrastructure may vary depending on when the land was developed. Regardless, it usually involves a similar combination of surface and underground infrastructure. Urban drainage is often constructed to convey a 5% AEP (1 in 20 years).

It is also important to recognise that the natural terrain of parts of our region may limit what can be done, and that installation of hard infrastructure (such as concrete pits and pipes) is not always the right solution.

CHANNELS

Channels are a type of waterway designed to carry stormwater runoff. Channels can be used to carry large volumes of runoff to creeks and may be lined with vegetation or rock to protect the surface from eroding. Vegetated channels also have the added ability to remove pollutants from stormwater before it enters natural creeks and rivers.

STORMWATER PITS

Stormwater pits are used to capture runoff and direct flows into stormwater pipes.

STORMWATER PIPES

Stormwater pipes carry the runoff captured by stormwater pits to nearby channels or creeks. Stormwater pipes are typically only large enough to carry runoff from minor storm events.

KERB AND CHANNEL

Kerb and channel allows runoff to flow towards stormwater pits within the road. Kerb and channel also provides a connection point for roof downpipes to allow runoff from roofs to flow towards stormwater pits.

CULVERTS

Culverts are used as 'cross-drainage' to pass flow from one side of a road to the other. Driveway culverts and maintenance is also the responsibility of the property owner. An exception may apply where Council will only maintain private culverts if: gravel/crushed rock from Council's roads have caused the culvert to block, or the culverts non-function causes damage to Council's Assets

ROAD CORRIDOR

The road corridor is commonly used as a drainage flow path to control flooding in heavy (higher intensity) rainfall events.

WHITSUNDAY REGIONAL COUNCIL STORMWATER FACT SHEET

MINOR & MAJOR FLOODING

This fact sheet covers:

- Size and Frequency of Floods
- General Advice
- Council's Role

SIZE AND FREQUENCY OF FLOODS

The size and frequency of flooding can vary as a result of several factors:

- The duration and intensity (heaviness) of rainfall. This is generally the biggest factor driving the severity of flooding.
- Ground conditions, whether it is dry or already saturated.
- The number of impervious surfaces (e.g. roads, concrete, rooftops).
- Any blockages within the urban drainage system or overland flow paths.
- Land characteristics.

MAJOR FLOODING

Very intense rainfall which can cause major flooding is less likely to occur than minor flooding. When it does occur, large amounts of runoff can rapidly accumulate and overwhelm urban drainage systems (like pits and pipes) or cause channels and creeks to break their banks.

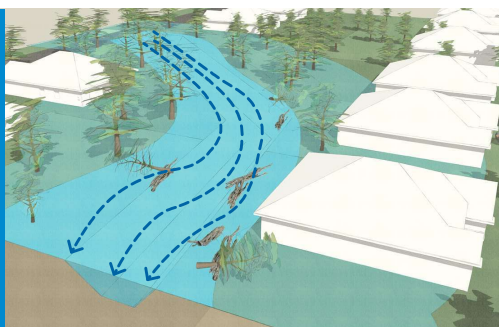
This type of flooding can be very fast moving and reach areas which may have not previously flooded. Major flooding can pose significant risk to life and property where development and associated stormwater infrastructure was designed to older standards and methods.

During major flooding, the community may see or experience:

- Flooded buildings.
- Very fast-moving water along overland flow paths, towards creeks.
- Water flowing within the full road corridor.
- Water rapidly flowing in channels and creeks.
- Water breaking out of channels and creeks.

Major flooding may result in high-risk flooding of buildings (sheds and houses), parked cars and highly hazardous flow (deep, fast moving water) in channels and creeks.

High Risk



MINOR FLOODING

Minor (gentle) rainfall events can still cause flooding to areas such as road corridors, backyards, channels and creeks. However, minor and more frequent rain is less likely to pose a risk to life and property.

During minor flooding, the community may see or experience:

- Ponded or slow-moving water in backyards or open areas (such as parks or fields).
- Water flowing along overland flow paths.
- Water passing along kerb and channel.
- Water flowing through channels and creeks.

Minor flooding may result in low-risk flooding of minor structures (such as garden sheds, carports etc.) or under high-set houses.

Low Risk



COUNCIL'S ROLE

To manage the risks and impacts of flooding Council currently:

- Maintains an extensive stormwater drainage network to manage minor flooding and allow urban development.
- Regulates new development through the Whitsunday Regional Council Planning Scheme.
- Manages community requests in relation to stormwater flooding and drainage.
- Undertakes flood mitigation projects aimed at reducing the risk associated with stormwater drainage.
- Council drainage is typically built to convey a 20% AEP rainfall event (1 in 5 year rainfall event).
- Annual Exceedance Probability (AEP) is used to explain the chance of a flood of a given size (or larger) occurring in any one year, usually expressed as a percentage. For example, the Bureau of Meteorology explains that for each and every year, there is a 1% chance (a 1 in 100 chance) that the defined event will be equalled or exceeded (once or more than once).

PERSONAL SAFETY

- Never drive through or enter flood water. Unlike riverine flooding, overland flooding will generally subside within a matter of hours.
- Secure pets and other animals away from low-lying areas, channels and creeks. Overland flooding can occur during storms, which may frighten pets and trigger unexpected behaviour.
- If possible, prevent water from ponding for more than 5-days to discourage mosquito breeding within private land.

POSSESSIONS AND PROPERTY

- Avoid building sheds and other external structures in low-lying areas or natural depressions. If in doubt, refer to Council's Planning Scheme flood risk mapping or ask neighbours about local flood behaviour.
- Remove rubbish and loose vegetation from overland flow paths.
- If safe, move parked cars away from channels and road edges where the kerb is high.
- Raise dangerous items (such as chemicals or electrical equipment) or valuable possessions above ground level in sheds.



GENERAL ADVICE

Report any instance of above-floor house flooding to Council on 1300 WRC QLD (1300 972 753) or via e-mail at info@whitsundayrc.qld.gov.au

DRAINAGE ASSETS, CONDITION & MAINTENANCE

This fact sheet covers:

- Overland Flow
- Urban Drainage Features and Functions

WHAT IS A DRAINAGE ASSET?

Drainage assets (or stormwater infrastructure) are used to capture and carry stormwater runoff to nearby creeks and rivers. Examples of drainage assets include:

ROAD DRAINAGE:
Kerb and Channel

OPEN CHANNELS:
Vegetated or lined channels

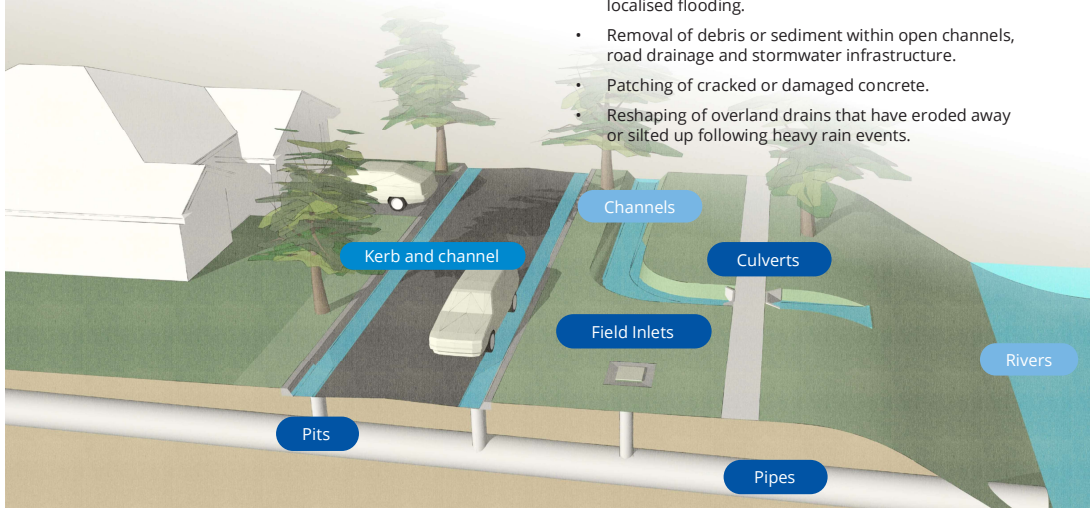
PIPES AND PITS:
Pipes, pits and culverts

ASSET CONDITION AND MAINTENANCE

Understanding the condition of drainage assets helps inform Council's maintenance and replacement program. Council conducts a proactive Drainage Asset Condition Assessment program. This is a process within which road drainage, open channels and underground pipes are inspected, assessed and flagged for maintenance or replacement. Council will generally replace drainage assets that are no longer performing their intended function. Council will not replace drainage assets due to poor aesthetics.

Common examples of annual maintenance regularly undertaken by Council include the following:

- Trimming / removal of excess vegetation. Overgrown drainage assets can limit their capacity and cause localised flooding.
- Removal of debris or sediment within open channels, road drainage and stormwater infrastructure.
- Patching of cracked or damaged concrete.
- Reshaping of overland drains that have eroded away or silted up following heavy rain events.



WHITSUNDAY REGIONAL COUNCIL STORMWATER FACT SHEET

COUNCIL & PROPERTY OWNER RESPONSIBILITIES

Disputes over stormwater and drainage issues can occur between private property owners. This fact sheet covers:

- Council and Property Owner Responsibilities
- Civil Disputes
- Dispute Resolution

COUNCIL RESPONSIBILITY

Council provides and maintains stormwater drainage infrastructure (such as roads, pipes and open drains) on public land to collect and convey stormwater to creeks and rivers.

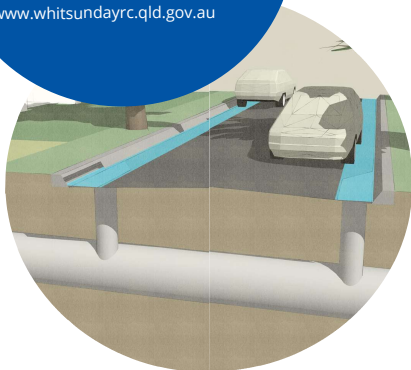
Council also provides and maintains some stormwater drainage infrastructure on private property (often within a designated drainage easement) if it is part of Council's stormwater drainage network.

If Ponding is experienced within council owned or managed land, Council will investigate the issue and consider intervention where the water ponding is:

- Not caused by driveways
- Above the intervention level of 100mm; and
- remains for at least 5 days

To get in touch with Council regarding maintenance requests you can:

Call 1300 WRC QLD (1300 972 753)
Email info@whitsundayrc.qld.gov.au
Or lodge a Customer Feedback Form via Council's Website
www.whitsundayrc.qld.gov.au



PROPERTY OWNER RESPONSIBILITY

Property owners are responsible for the effective management of stormwater drainage and surface water on their property by maintaining privately owned stormwater pipes, gutters, downpipes, gully pits and other components, which will minimise the possibility of stormwater entering their home. If there is a drainage easement and overland flow path on the property, it must be maintained and kept clear of debris or other materials to allow the natural overland flow of stormwater.

Property owners are required to accept natural overland flow from adjoining properties or public land. When constructing hard surfaced areas (such as driveways, concrete and paved areas), landscaping and any other impervious surfaces or drains, property owners must manage the stormwater to prevent increased or concentrated flows onto an adjacent property.

Property owners generally need to ensure that roof water is drained to a lawful point of discharge. Draining to the following locations ensures a lawful point of discharge:

- Kerb and channel
- An inter-allotment stormwater drainage pipe system.
- Council controlled drainage easement or drainage reserve. These locations require approval by Council.

Property owners need to be aware that fences and landscaping can change the way stormwater flows.

Property owners should be aware that in significant rainfall events stormwater may cause temporary inundation of their property.

Land owners can determine if their property is at risk of inundation by viewing council's flood hazard mapping online.

CIVIL DISPUTES

Problems with overland stormwater flow between private properties are a civil matter to be resolved between the respective owners. Council has limited powers to intervene.

Property owners are encouraged to talk to their neighbours about the problem and seek a mutually suitable solution. If this is not possible without a third party, the services of a mediator may be sought through the Department of Justice and Attorney General.

DISPUTE RESOLUTION

All property owners have the right to live in a peaceful neighbourhood. Therefore, disputes or disagreements between neighbours should be resolved as quickly as possible. However, if talking with your neighbour hasn't worked or things have deteriorated too far, mediation might help.

The Mackay - Whitsundays Dispute Resolution Centre offer free mediation services to help you manage your neighbourhood disputes without going to court.

The mediators act as an impartial third party to guide you through a structured mediation process. They help you decide what you want to achieve and keep the discussion on track, ensuring everyone is heard. Mediation for neighbourhood disputes is free and completely confidential.



For more information on disputes resolution, please refer to 'Settling Disputes Out of Court' on the Queensland Government website or contact the Mackay - Whitsundays Dispute Resolution Centre via phone at (07) 4889 8402 or via email at drc.mkymwhit@justice.qld.gov.au.

WHITSUNDAY REGIONAL COUNCIL STORMWATER FACT SHEET

INTER-ALLOTMENT DRAINAGE & EASEMENTS

This fact sheet covers:

- Inter-Allotment Drainage Systems
- Drainage Easements and Maintenance
- Council and Owner Roles and Responsibilities

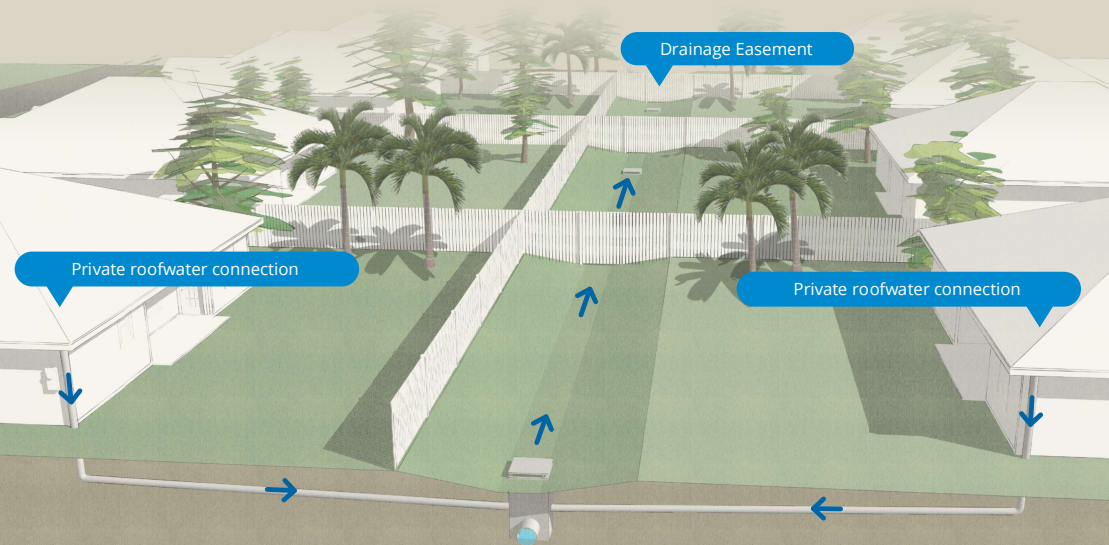
INTER-ALLOTMENT DRAINAGE SYSTEMS

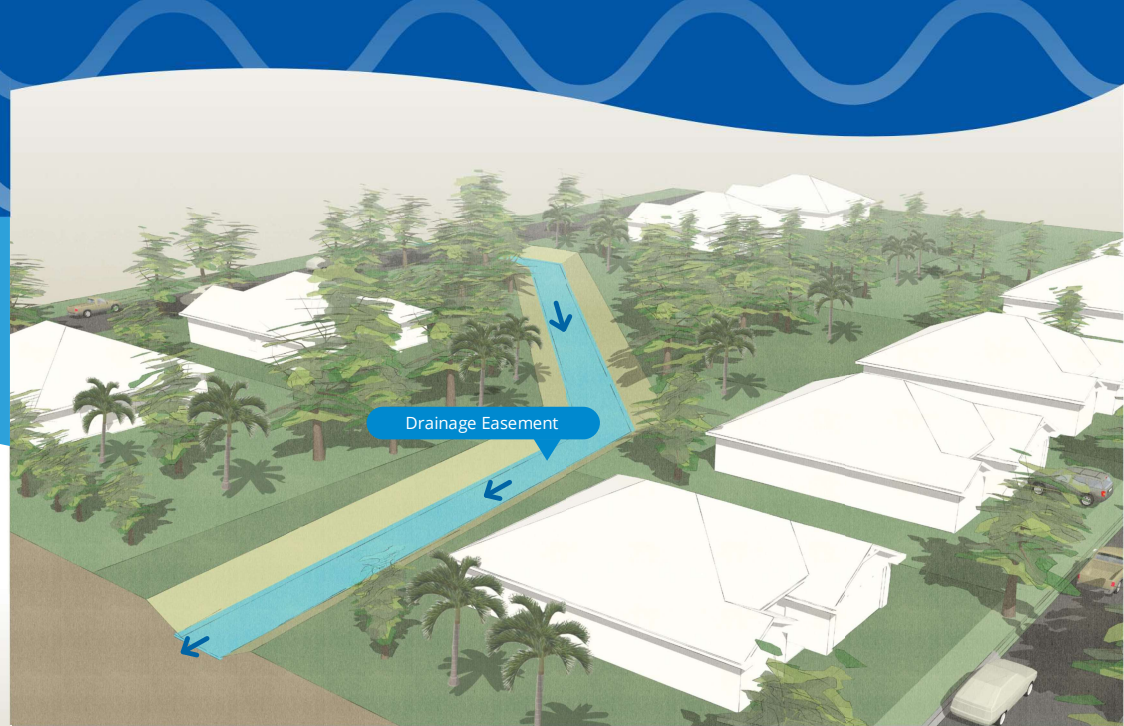
Inter-allotment drainage systems, where present, are used to drain roof water and ground runoff from one or more private properties that are unable to drain directly to the street.

Inter-allotment drainage is generally located within a dedicated easement and consists of pits, pipes or channels to carry runoff to a nearby pipe network, channel or creek. Building approvals specify how stormwater runoff is to be managed on a particular site. This may include connecting to an inter-allotment drainage system.

If your property is below street level or slopes downwards away from the street, you may have an inter-allotment drainage system for your roof water and/or overland flow. However, in some areas where an inter-allotment drainage system doesn't exist, it is likely conveyed via natural overland flow path/s.

Council is responsible for inter-allotment drainage systems that are part of Council's stormwater drainage network. The relevant property owners are responsible for any privately owned inter-allotment drainage systems. Council can assist with identifying who is responsible for an inter-allotment drainage system.





DRAINAGE EASEMENTS AND MAINTENANCE

A stormwater drainage easement is an area within a private property where Council has legal rights relating to the usage of the land for stormwater purposes. The owner can use the land but cannot do anything that would block or redirect the drainage. A drainage easement does not guarantee there is any drainage infrastructure. It means that drainage infrastructure could be constructed on the easement in the future, at Council's discretion.

Generally, no structures or improvements (such as dwellings, extensions and sheds) are permitted within the easement boundaries. For more information on what can and cannot be done within an easement, please refer to the easement agreement for the easement of interest.

If the easement area includes a natural creek, it is likely that natural processes will occur including ponding, meandering (changes in the creek flow direction), erosion, siltation and vegetation growth.

COUNCIL ROLES & RESPONSIBILITIES

Council will maintain Council owned infrastructure that has been designed and installed as part of the drainage network. For example, pipes and concrete headwalls.

Council will not maintain infrastructure related to drainage of the property itself, like roof water pipes or subsoil drains.

OWNER ROLES & RESPONSIBILITIES

The property owner is responsible for maintaining an easement on private property and the driveway culvert where present. This includes vegetation maintenance such as clearing weeds, trees and overgrown vegetation.

While the primary responsibility rests with the property owner, there may be occasions when Council undertakes some maintenance work to ensure the efficient operation of the stormwater drainage infrastructure.

Landowners can improve drainage easement amenity or make it easier to maintain but must seek approval from Council first. A reasonable request is likely to be approved if it does not destabilise the area or is subject to environmental or planning and development constraints.

STORMWATER QUALITY

This fact sheet covers:

- What is Water Sensitive Urban Design (WSUD)?
- Managing Stormwater Quality
- Private Property Owners Stormwater Quality Checklist
- Stormwater Quality Checklist

WHAT IS WATER SENSITIVE URBAN DESIGN (WSUD)?

Water Sensitive Urban Design aims to improve the quality of stormwater runoff from urban areas through removal of pollutants which can be harmful to the natural environment. These pollutants may include:



Gross pollutants
(eg. plastic bottles,
food packaging)



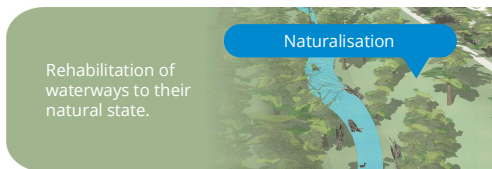
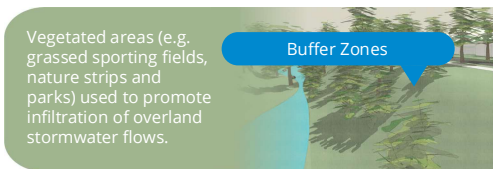
Natural pollutants
(eg. eroded soils, grass/
leaf matter)



Chemical Pollutants
(eg. oil, fertilisers)

MANAGING STORMWATER QUALITY

Council takes an active approach towards managing and treating stormwater runoff. Some WSUD examples include:



PRIVATE PROPERTY OWNERS STORMWATER QUALITY CHECKLIST

While Council implements stormwater treatment measures within the catchment to manage stormwater pollution, it is vital that all private property owners take active steps to improve the quality of stormwater runoff discharging from their property. Private property owners are encouraged to refer to the following stormwater quality checklist. The checklist will help private property owners to improve and maintain the quality of stormwater runoff as it leaves their property.

STORMWATER QUALITY CHECKLIST

ISSUE	CAUSES	CHECKLIST	
Animal and Human Waste	Leaking septic tanks, animal droppings	Inspect septic tanks systems for leaks and pick up animal droppings before rain events.	
High Runoff Rates	Heavy urbanisation, impervious surfaces (e.g. paved and concreted areas)	Minimise paved and concreted areas within your property. Grassed or vegetated areas encourage infiltration of stormwater and provide treatment of pollutants via absorption into leaves and roots. Planting native trees, plants and grasses is recommended.	
Gross Pollutants	Poor storage of garbage and garbage bins	Ensure your property is kept rubbish free and that garbage bins are properly stored before storm and rainfall events. Inspect your property for any objects that may be washed away by stormwater before rain events.	
Chemical Pollutants	Oil and chemical spills, fertilisers, pesticides	Ensure all oils and chemicals are properly stored and all spills are completely removed prior to rain events. Ensure environmentally friendly fertilisers and pesticides are used. Do not apply chemicals to lawns/garden/crops immediately prior to rain events.	
Natural pollutants	Erosion, decaying vegetation	Check your property for soil erosion after each rain event. Planting vegetation is the best way to minimise the risk of further erosion. Clean up grass and garden clippings from your property prior to rain events.	

Further information in relation to stormwater quality and ecosystem health is provided on the Queensland Government Department of Environment and Science website.

WHITSUNDAY REGIONAL COUNCIL STORMWATER FACT SHEET

EROSION & SEDIMENT CONTROL (ESC)

This fact sheet covers:

- What is ESC
- Council's Approach to ESC
- Owner Roles & Responsibilities
- Implications of Poor ESC

WHAT IS ESC?

ESC can be described as measures taken to prevent or reduce soil erosion caused by overland runoff. Proper management of ESC is vital on construction sites where exposed soil is open to the environment.

Soil erosion, sediment and litter from building sites can be major sources of stormwater pollution and can cause significant harm to our sensitive marine environments like the Great Barrier Reef.

COUNCIL'S APPROACH TO ESC

Council's Planning Scheme Policy for Development Works mandates ESC measures must be designed and implemented by developers in accordance with the following regulations:

- Environment Protection Agency's (EPA)
 - EPA Best Practice Urban Stormwater Management Guidelines
- International Erosion Control Association's (IECA)
 - Best Practice Erosion & Sediment Control
 - Queensland Urban Drainage Manual (QUDM).

Council have developed 10 ESC fact sheets with practical tools and best management practices to minimise stormwater pollution from building sites. They are designed to help people involved in the building industry comply with their statutory environmental duties and avoid large fines.

By following the advice from these fact sheets, you will be doing your part to ensure that our sensitive marine environments like the Great Barrier Reef and other waterways are protected from stormwater pollution.

The factsheets are available from Council's website
www.whitsundayrc.qld.gov.au



STORMWATER IS NOT WASTEWATER

Stormwater flows untreated into the waterways. It is your responsibility to help keep stormwater pollution-free.

Stormwater containing pollutants can enter our local creeks, rivers and marine systems, causing harm to native animals, plants, fish breeding habitats and recreational areas.

Soil erosion, sediment and litter from building sites can be major sources of stormwater pollution.

ESC ON BUILDING SITES

Soil erosion on building sites can be a major source of sediment pollution in our waterways. A single building block can lose up to four truckloads of soil in one storm.

Sediment washed from building sites into gutters and stormwater drains, can cause flooding and affects the water quality and fish stocks in our freshwater and marine environments.

EROSION AND SEDIMENT CONTROL PLANS (ESCP)

An Erosion and Sediment Control Plan (ESCP) must be prepared by the applicant and approved before any approved work or activities begin. These plans need to be communicated to all involved – subcontractors, private certifiers, home owners and regulators – how stormwater pollution is to be controlled on the site and who is responsible for its control.

Where appropriate, ESCP's should include, but not be limited to, the following information:

- property boundaries
- general soil description
- existing and final contours – including location of cut and fill banks
- existing and final overland flow drainage paths
- limits of clearing where applicable e.g. on large properties
- location of vegetated buffer strips
- stabilised entry/exit point (rumble pad)
- location of soil and sand stockpiles
- location of all proposed temporary drainage control measures
- location of all proposed erosion control measures (alternatively, use notes to describe locations) including installation sequence and maintenance requirements
- permanent site stabilisation measures
- a statement of who is responsible for establishing and maintaining all erosion and sediment measures.

OWNER ROLES AND RESPONSIBILITIES

Property owners are responsible for preventing/reducing soil erosion on their property that may impact downstream drainage infrastructure, road reserves, neighbouring properties or sensitive downstream ecosystems.

Council officers regularly visit new and existing home-sites to ensure adequate stormwater pollution controls are in place. Always take precautions to prevent polluted stormwater run-off from leaving your property.

IMPLICATIONS OF POOR ESC

Poor management of ESC on construction and development sites can result in severe damage to the environment and several negative outcomes such as:



