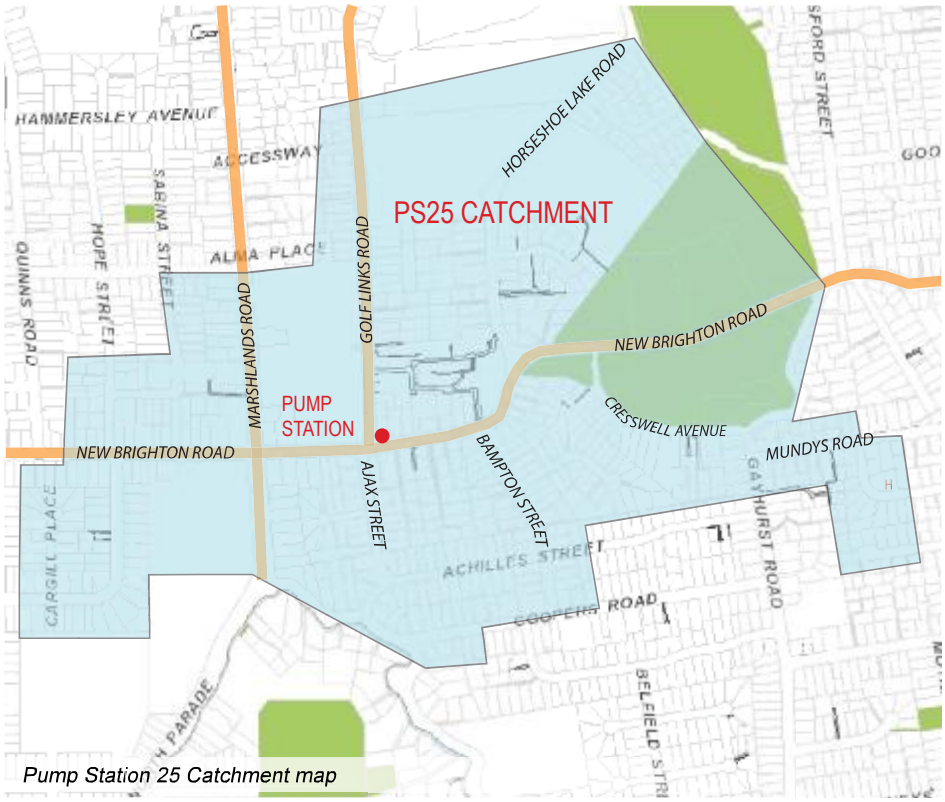
SCIRT
Rebuilding Infrastructure

18 October 2012

Wastewater rebuild – Shirley/Dallington Catchment

The earthquakes caused significant damage to the wastewater network in the Shirley/Dallington catchment and a new vacuum wastewater system is proposed for this area. This flier provides information on the vacuum system, including a proposed pump station on the corner of Golf Links Road and New Brighton Road.



Pump Station 25 Catchment map

The wastewater network

Wastewater (sewage) is generated by homes and businesses from toilets, sinks, and baths etc. The wastewater network collects and conveys the wastewater to the treatment plant in Bromley. The wastewater network is separate from the stormwater network, which collects the flow from rainwater drains, gutters etc.

Before the earthquakes, Christchurch's wastewater network relied on a gravity wastewater system. Gravity wastewater pipelines are laid at a gradient to make the wastewater flow downhill. In some areas of the city the gravity system has performed well and will be repaired.

In other areas however the earthquakes have challenged us to find smarter ways of dealing with our wastewater. Our new wastewater systems need to be able to withstand future earthquake activity and be easier to repair if they are damaged. We are now using three types of wastewater systems in the city:

Enhanced gravity - steeper grades, shallower pipework and more pump stations. Enhanced gravity works well in areas that are not prone to lateral spread or liquefaction.

Pressure – individual pressure pump systems on private property. Pressure wastewater systems work well in areas most prone to lateral spread and/or liquefaction. Pressure systems are also used in areas where the ground levels have significantly changed so that it is difficult for wastewater to flow in the right direction under gravity

Vacuum – a central pump station. Vacuum systems work well in large catchments that have experienced some lateral spread and/or liquefaction, and some changes in land levels.

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The Shirley/Dallington catchment

For the Shirley/Dallington area the existing gravity wastewater system suffered significant damage from the earthquakes. The pipes were damaged to a point where replacement of the entire system is required.

Each area of the city is unique, and the best solution for the wastewater system varies from location to location. When designing a new wastewater system for this catchment gravity, pressure and vacuum systems were all considered. In the Shirley/Dallington catchment the vacuum system is the best method for managing wastewater because it will have greater resilience in case of further earthquake activity, it can be more easily repaired than the current gravity system, and is cost effective for a large catchment. The table below compares each of the wastewater systems, against a traditional gravity system, and shows how we chose the vacuum system for the Shirley/Dallington catchment.

	Wastewater systems		
	Gravity	**Pressure**	**Vacuum**
Resilience to future earthquakes (in liquefiable ground)	✗	✓✓	✓
Ease of construction	✗	✓	✓✓
Ease of repair after earthquakes	✗	✓	✓
Ongoing Maintenance	✓	✓	✓
Cost	✗	✓	✓

A review of the wastewater repair options for this catchment identified a vacuum wastewater system as the best option. This decision was based on the following factors:

- Ground conditions that are prone to liquefaction.
- Construction takes place in the road and on the road berm (rather than in private property as is the case for a pressure wastewater system).
- The vacuum system will have greater resilience in case of further earthquake activity and it can be more easily repaired than the current gravity system. This is because the pipes are plastic and are welded together, and are laid at a shallower depth.
- The vacuum system has lower installation and operational costs, compared to a conventional gravity wastewater system. A vacuum system is also more cost effective in a larger catchment area.

The wastewater network

What is a vacuum wastewater system?

A vacuum wastewater system uses air pressure (a vacuum) to transport wastewater through the pipes from houses to the wastewater treatment plant. The wastewater is sucked from collection chambers, located in the road berm, through to vacuum pipes (mains) in the street. Each collection chamber in the berm serves up to four properties. From the mains, the wastewater is transported to a vacuum pump station, and then on to the Christchurch Wastewater Treatment plant at Bromley.

The vacuum wastewater system is generally located in the road and road berm. The Christchurch City Council covers the cost of installing and operating the system, and there is no additional costs to residents.

How does the vacuum wastewater system work?

You will not notice any difference in the way your wastewater system functions at your home. The wastewater will leave your property via the private lateral and collect in the vacuum collection chamber located in the road berm

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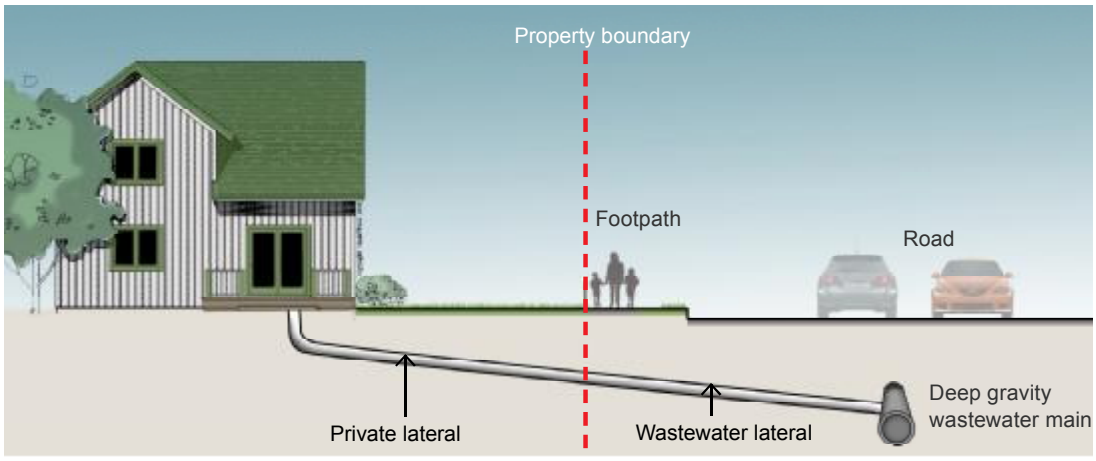
Once the wastewater reaches a certain level in the chamber a valve will open and the wastewater will sucked to the vacuum pump station. There will be one pump station within this catchment (see page 4 for details)

→

The wastewater from the vacuum pump station is collected in a vacuum vessel (collection tank) and pumped to the treatment plant.

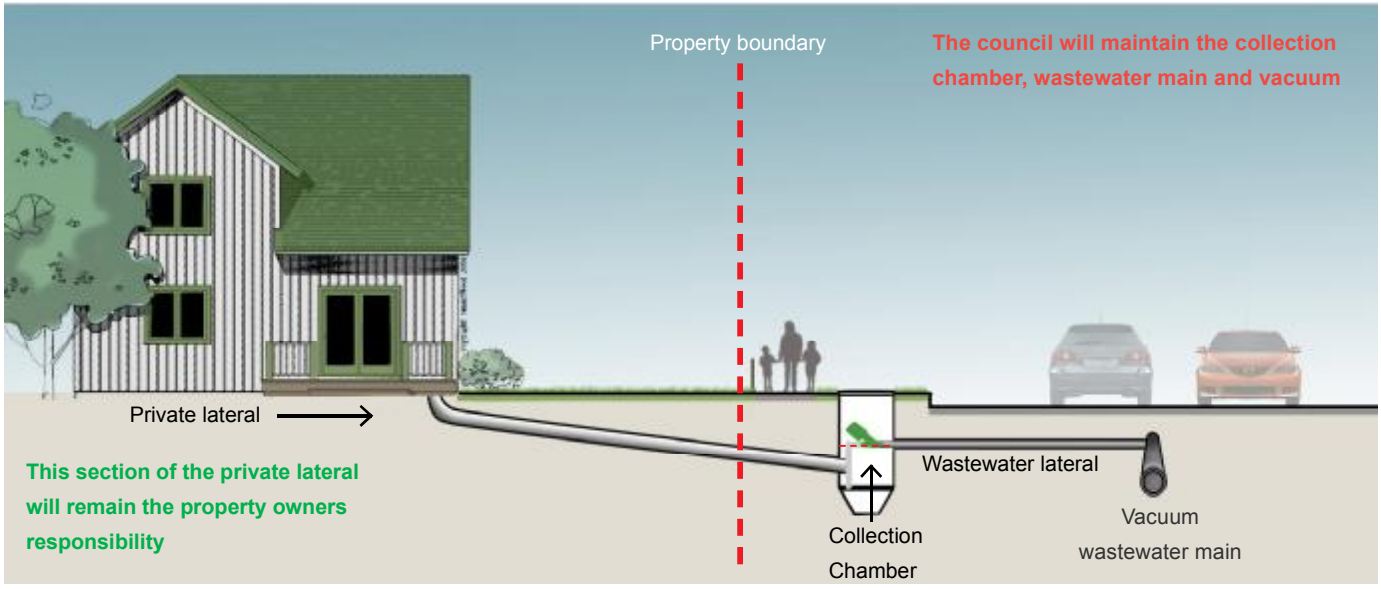
Although you will not notice a difference in the way your wastewater system works, you need to be aware that a vacuum system does not have as much tolerance as a gravity system to inappropriate items flushed down the toilet or sink. There are a number of items that should not be disposed of through any wastewater system, and these include glass, metal, gravel or sand, clothes, sanitary produces, including flushable wipes (these do not break down the same way that regular toilet paper does), kitty litter, strong chemicals and lubricating oil or grease. Should one of these items accidentally make its way down the system the vacuum system should cope, but occasionally a blockage maybe caused which could affect you and your neighbours.

The existing Gravity system



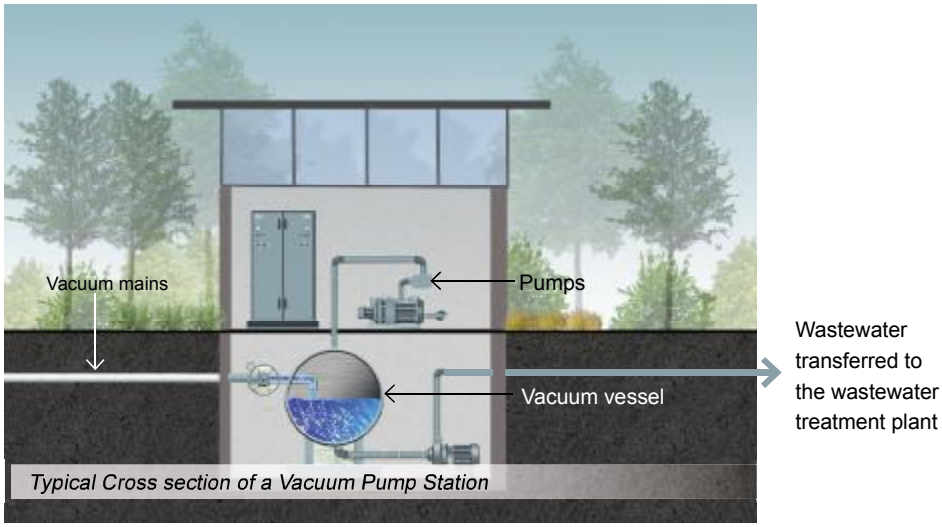
Owner's responsibility **Council's responsibility**

The new vacuum wastewater system



Owner's responsibility **Council's responsibility**

The new vacuum pump station



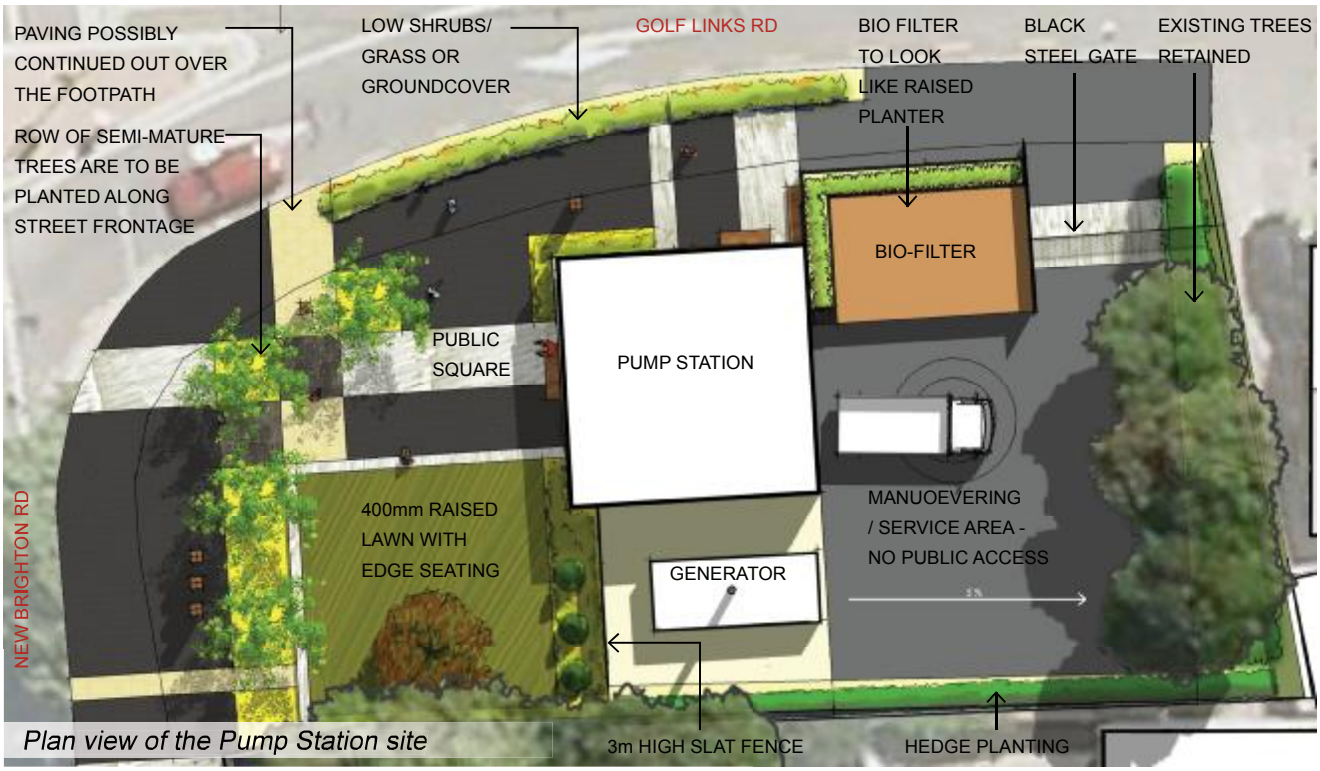
The Vacuum Pump Station

The project requires the construction of a new vacuum pump station. The new pump station will be in the same location as the existing gravity pump station on the corner of New Brighton Road and Golf Links Road.

The pump station site requires:

- A new pump station building to house the pumps and vacuum vessel (collection tank).
- A generator to provide back-up power to the vacuum system in the event of a power failure.
- A biofilter to vent air from the vacuum system. The biofilter is designed to eliminate any discernible smell from the site.

Construction of the new pump station also creates the opportunity for a new public space on the corner of New Brighton Road and Golf Links Road. This space includes a public square, planted gardens, a raised lawn area and trees. The pump station and landscaping (such as the timber detailing on the building, paving seating and gardens) has been designed to fit in with the local neighbourhood. The existing Orion substation will remain on the pump station site.



Plan view of the Pump Station site

The design was prepared by landscape architects and urban designers.

To construct the new pump station some of the existing trees on the site will need to be removed. More trees will be planted when the site is landscaped.


View from New Brighton Road


View from traffic island on Golf Links Road

What do you think?

You can have your say on some aspects of the pump station landscaping. Please see the back page for how you can provide your feedback.

CCTV Investigation

All wastewater systems are vulnerable to infiltration (of water) and debris (soil, stones, broken pipe pieces etc.) that result from private 'lateral' wastewater pipes that are in poor condition. High levels of groundwater infiltration can result in high energy and maintenance costs. Debris in the system can also cause the vacuum system to malfunction, requiring maintenance and repair.

Some private lateral wastewater pipes may have been damaged in the earthquakes. Property owners may not be aware of this damage. In order to make the new vacuum system successful, and to assist property owners with identifying any damage, we will be undertaking a programme of video inspections (CCTV) of private lateral wastewater pipes.

CCTV snapshot of a damaged gravity main

We will advise property owners of the outcome of the investigations. There will be no charge to the property owner for this inspection. In most cases the survey will be undertaken by pushing a camera down the gully trap located beside your house. The CCTV investigations are planned to be carried out over the next few months, starting within the next two weeks. We will advise you by letter when we come to investigate in your street.

In the event that the private wastewater lateral is found to be damaged, the Christchurch City Council will follow up with the property owner to confirm that the damage is being repaired and will provide guidance and assistance where possible. The repair may be covered under the property owner's insurance or EQC repair claim. The investigation and the repair of private laterals are essential for the correct functioning of the vacuum wastewater system and the wastewater treatment plant at Bromley.

Construction and timeframes

The construction of the vacuum wastewater system has a two stage approach. In the first stage, the mains are laid in the street, and the vacuum collection chambers are installed in the road berm. The private laterals are not connected to the new system at this time as the gravity system needs to be kept going until the new vacuum pump station is operational. In the second stage, once the new pump station is up and running, we will come back and connect the laterals to the mains. While it may seem extra work to come back to your street we cannot decommission the gravity system until the pump station is ready.

Construction will be carried out street by street across the catchment. Work is proposed to commence in the first streets (Horseshoe Lake Road and Cresswell Avenue) in November 2012. Construction methods will vary from street to street, however after CCTV investigations have been carried out, stages one to four will occur in each street.

CONSTRUCTION WORK AND TIMEFRAMES

Stage 1

- We will send a start work notice out to affected residents/businesses and landowners prior to work commencing, advising them of when the work will start, how long it will take and any changes to traffic and access conditions.

Stage 2

- The construction site area will be set up and traffic management put in place.

Stage 3

- The new wastewater vacuum pipe (main) will be laid within each street. Most streets will require trenches to be dug out at an average depth of 1.5 metres. The vacuum collection chamber will also be installed, usually in the road berm, At this stage we will temporarily reinstate the street. Once the new vacuum pump station is operational, we will come back to connect each private property lateral to the collection chamber.

Stage 4

- The road, footpath and berm will be reinstated, and the traffic management removed.
- Until the vacuum system is complete the existing gravity system will remain in operation. Once the vacuum system is activated the gravity system will be decommissioned. The gravity pipes in the road will be filled and left in place.

The time the work takes within each street will depend on a number of factors, including ground conditions, the type of construction methods required, the number of lateral connections, the length of the street etc. Each individual work notice will detail approximate timeframes.

Consultation

What are we consulting on?

We are seeking feedback on the landscaping of the proposed pump station on the corner of Golf Links Road and New Brighton Road.

The vacuum system is the wastewater system that the Council is providing for this catchment. The proposed vacuum pump station will replace the existing gravity pump station and this location is fixed. The location of the pump station on site is also fixed as it is dependent on linking with other infrastructure on and adjacent to the site.

As well as the well-designed pump station we want the site to be a useable and enjoyable public space for the community. As such we are seeking your feedback on the planting, seating areas, and open space features on the site.

How do I get involved?

To have your say simply complete the feedback form and free post it to us by folding the envelope on the back as per the instructions. Please have your feedback to us by **17 November 2012**. Alternatively you can scan the completed form and email it to Christchurch.comms@macdow.co.nz.

What happens next?

- We will be collect feedback on the landscaping proposal for the pump station site. After 17 November 2012, the feedback will be summarised and considered.
- The landscaping/open space design will be finalised, including the incorporation of any appropriate changes.
- A summary of the feedback along with the final design will be circulated to those participants who provide their contact details on the feedback form. The feedback and the final landscaping plan will be presented to the Burwood Pegasus Community Board.
- Further updates about the construction of the pump station will be provided to those participants who indicate on the feedback form that they would like to receive further updated.

Display Area

Information displays about the project will be located at The Palms (ground floor by Kmart) for you to view at any time until mid-November, when they will be moved to the Golf Links Road exit on the ground floor.

Please contact us with any queries on 0508 718 719 (freephone) between the hours of 8:30am and 5:00pm Monday to Friday.

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FEEDBACK FORM

We would welcome your feedback on the open space and landscaping design for the new vacuum pump station on the corner of New Brighton Road & Golf Links Road.

Question 1. What is your feedback on the design of the proposed public space at the new vacuum pump station on the corner of New Brighton Road and Golf Links Road?

Contact details (optional). Please complete if you would like to be provided with a summary of the feedback and final design.

Name: _____

Address: _____

_____

_____

Phone no. _____

Email: _____

Yes, I would like to receive further updates and information about the proposed vacuum wastewater system and pump station ☐ (please tick)

Freepost Authority No: 241200

SCIRT
Rebuilding Infrastructure

Free

McConnell Dowell Constructors Ltd

PO Box 16883

Hornby

Christchurch 8441

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