

14. WOOLSTON/BURWOOD EXPRESSWAY

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The purpose of this report is to provide the Board with an update on the Woolston/Burwood Expressway, including the background to the design of the bridge underpasses and the solutions that will help to reduce the effects of the flooding, as requested by the Board.

STAGE 1

Road Corridor

Stage 1b from New Brighton Road to Eureka Street has been in use since September last year. As reported to the Board earlier in the year the initial landscaping outcome was less than desirable. Additional landscaping was recently undertaken to improve the appearance of the road corridor. This involved the replacement of dead plants, bulking up of existing beds, the creation of new plant beds and the enhancement of the Cedarwood Reserve boundary.

There were reports of vehicles leaving the expressway on the southern side of the bridge and shortcutting down the embankment to Hulverstone Drive West. This is not considered a safe manoeuvre. A series of bollards have been installed to restrict this movement.

There is a network of shared pedestrian/cyclist paths that may appear confusing for new users. Directional signs to guide users are to be installed shortly.

Bridge Underpasses

As reported to the Board in March flooding of the underpasses has occurred more frequently than anticipated. Rather than install path closure gates for these occurrences as was initially suggested, efforts are being made to maintain a higher level of service for users. A short explanation of the decision to build the underpass walls at their current height (10.7m) follows.

In the early stages of design, discussion between the City Streets and City Water and Waste Units identified the following objectives and constraints for the underpasses:

- The bridge could not be built too high to minimize cost and maximize aesthetics.
- Light entry was to be maximised and a people friendly space provided.
- A headroom of 2.4m was needed to allow use by both pedestrians and cyclists.
- Flooding levels were to be considered to allow a defined level of service.

The height of the walls therefore needed to be kept as low as possible. The level of the walls was determined using an analysis of historical tides and flooding levels from the Horseshoe Lake Outfall Pump Station at Kerrs Reach. The analysis showed the following:

- The normal tidal range was between 8.2m and 10.2m.
- Tides above 10.5m occurred eight times a year.
- Tides above 10.6m occurred twice a year.
- Tides above 10.8m occurred once every four years.

The height of 10.7m was chosen given the indication that flooding was expected to occur not more than twice a year. This was considered acceptable as reducing the occurrence rate was costly and had a large impact on the project.

Possible reasons that the flooding is occurring more often than predicted include:

- There may have been more atmospheric lows this year causing a rise in tide levels. The rainwater associated with these events runs off the embankments and also adds to the tidal water.
- There may be a benchmark error such that "10.7m" at the recorded water level means something different from "10.7m" at the expressway. This is being checked.
- There are indications that incoming tidal waves sometimes peak slightly higher near the river mouth than at the recorder site at Horseshoe Lake.

Whatever the reason we need to ensure that the effects of the flooding can be reduced. The first step was to determine why the north side was flooding more frequently when the south and north walls have been built at exactly the same height (10.7m). Initially this was thought to be due to the mulch from the planting in this area blocking the sumps which contain the pumps.

However an inspection by the Contractor who maintains other underpass pumps throughout the City found that the north pump was installed incorrectly and therefore not allowing it to reach full pumping capacity. Alterations have been made to the arrangement so the pump should be able to cope with clearing the total inundation over several hours. The pumps will be checked by this contractor on a regular basis when they are attending the Council pump station on Hulverstone Drive.

The next step is to observe the underpasses during the next exceptionally high tides. There are some predicted for early September. This will help determine, firstly whether both sides are being flooded and secondly whether the pumps are operating to specification and how long is it taking to clear the water. If it is found that the underpasses are not being cleared quickly enough there are several other measures that will be investigated. These include revisiting a manual valve option and/or upsizing the pumps to allow greater pumping capacity and hence faster clearance time.

There are alternative routes available for path users. However these add significant travel distance to the users' trip. The alternatives on the north side involve the crossing of several of the roundabout approaches which also detracts from the recreational experience. Opportunities to shorten these alternatives are being investigated.

Eliminating the problem, that is ensuring the underpasses are dry 100% of the time, is difficult without raising the wall height. It is not just the walls in the underpasses that would require raising but the path/footbridges each side for some distance. This is not a preferred option at this stage due to potentially high costs and an adverse effect on the walking experience in the underpasses. However, if the results of the pump alterations or the above measures are not satisfactory this may need revisiting.

STAGE 2

Progress

The contract for construction of this final stage has been awarded to Isaac Construction Ltd and work commenced in early July. The work will be undertaken in two stages, the first being the section north of Pages Road towards Eureka Street and the second south of Pages Road towards Birch Street. The construction will take approximately 11-13 months to complete.

The City Streets Unit intends to continue with newsletters and media releases updating the community on the progress. Local residents' groups are being briefed on the project details and the contractor's programme. These briefings will continue throughout the construction.

See Appendix A for the latest plan of the expressway.

Riverbank Path

As discussed in the March update report the project includes the creation of a park like area on the river side of the new expressway between Eureka Street and Carisbrooke Street. This part of the project was initiated by the Parks and Waterways Unit and that Unit is also providing the funding. The existing riverbank which has a harsh vertical profile will be regraded to slope gently to the water's edge providing a more natural look and also an informal beach.

The existing riverbank is higher than the adjacent ground and acts as a flood stopbank. The existing path/cycleway sits on the crest of the stopbank, at a level of approximately 11.20m, and therefore well above the water level. In line with safe design practice, the new road is banked up around the sweeping bend along the river. This gives a level of approximately 11.30m around the outside of the bend, the road effectively becoming the new stopbank. The path/cycleway will be re-routed a little towards the river and down-slope at a lower level of approximately 10.74-10.80m (that is, lower than existing).

Since completing the design last year, the tide levels experienced at the underpasses have been reviewed. It appears that at least half the width of the path is likely to be under water at exceptionally high tides - although slightly less frequently than the occurrence at the underpasses. It is estimated that the path will be wet 30-40 hours each year, a very small percentage of the time.

The situation differs from that of the underpasses in several ways. Firstly, the water will not be contained and will fall freely with the receding tide. Secondly there is an alternative route available by crossing the road to the west side of the expressway using the refuge islands at Eureka Street and Carisbrooke Street, adding very little distance to the trip length. Thirdly, the situation will be quite obvious and without the perception of danger.

Raising the path to avoid any flooding will compromise the design philosophy, which was to allow users to walk in proximity to the river in surroundings as natural as possible. It would also bring the users closer to the outside lane of a fast and busy road and destroy the recreational enjoyment of using the riverside path. On the basis of the above discussion there is no proposal to amend the design. It was felt that the Board should be aware of this decision in light of the issues at the underpasses.

Road Closures

The closures of Eureka Street, Carisbrooke Street, Bexley Road (north and south), Brook Street and Birch Street at the Expressway have all been processed and legally approved as part of the project. The contractor will ensure that advance notice of the physical closures is given to residents and other road users.

The City Streets Unit is committed to monitoring the effects of the closures in both the Aranui and Bexley areas. This will be undertaken by gathering as much 'before closure' data in the form of traffic volumes, speed surveys and delay counts at intersections. 'After closure' data will also be gathered to allow comparisons to determine the actual effects.

Any works required to counteract adverse effects will need to be funded from the City Streets Neighbourhood Improvements budget. As part of the recent Annual Plan process \$80,000 has been allocated to the 2003/04 budget for works in Hampshire Street. The collected data will be used in the development of this project.

Property Issues

Several areas of land were initially considered to be surplus to the project and would become available for revenue recovery. Those that became landlocked, that is could not be accessed once the expressway was in place, have been landscaped as part of the project. The future of five remaining areas present potential land use problems that the Board should be aware of. These areas are shown on the plan in Appendix A and numbered 1 to 5.

Several of these blocks of land are very low lying (the lowest being approximately 10.30m) and within the Bexley storm water pumping station catchments. The current minimum floor level for new buildings in this area is 10.90m and minimum lot level is 10.21m.

In the Bexley area the main issue is extreme tidal events and sea level rise. In an attempt to reduce further flood damage in this potentially hazardous area a variation to the City Plan on flooding issues is currently being processed. The variation proposes to increase the minimum floor level for new buildings to 11.80m, which would generally be achieved by filling the building platform. Under the current minimum lot size of about 450m², filling to this extent in the Bexley area would create recession plane and drainage effects on neighbouring properties. Therefore, as well as minimum floor levels it is also proposed to restrict further subdivision potential to minimum 600m² lots for this area. This proposal will also reduce future flood damage potential. The variation will restrict the disposal of surplus land for housing development.

The ideal option would be to landscape these areas as part of the expressway project to increase the buffer with residential areas. However at this stage the project budget can not cover the establishment costs. This would also create large areas to be maintained, a long term cost to the Council. If landscaping becomes the only option available the funding would require sourcing.

There are several more specific community uses that have been identified and could be considered. The Community Gardens Group had a garden site on Pages Road that is now redundant as it was located on expressway designated land. The group are interested in obtaining use of another site within the area. Several of the sites could be appropriate for this activity.

The Bexley Residents' Association has suggested the creation of a reserve in the vicinity of the riverbank opposite Carisbrooke Street. They have suggested a reserve be named after a local war veteran. His family and the RSA support this idea. They also prepared to organize and fund a commemorative plaque in conjunction with the RSA. There is an empty section (70 Bexley Road) adjacent to the riverbank works that could be suitable for this purpose. The idea is being explored by the City Streets and Parks and Waterways Units, who will identify the best use of the land and undertake planning as necessary.

This table describes each site and outlines potential options for use and recommends a preferred option. The Board is asked to consider the options and add any input that may assist.

Site	Description	Options for use
No 1	Location: 124 Eureka Street. Approx Area:	<ul style="list-style-type: none"> • Offer to adjacent land owner. • Landscape the site.

Site	Description	Options for use
	<p>Existing ground level: 11.50m. Zoning: Living 1. Previous use: Residential. Comments: The shape of this section may restrict development as a separate lot.</p>	<ul style="list-style-type: none"> • Site for Community Gardens Group (probably too small and exposed). <p>Preferred Option: Offer to adjacent land owner. If they are not interested landscape the site (subject to funding).</p>
No 2	<p>Location: Next to 70 Bexley Road. Approx Area: 968m² Existing ground level: 10.78m (needs 1m of fill to bring up to the proposed level). Zoning: Living 1. Previous use: Empty land as part of corridor. Comments: Disposing of this lot with the new restrictions may be an issue.</p>	<ul style="list-style-type: none"> • Site for reserve development as part of the enhanced riverbank. • Site for Community Gardens Group. <p>Preferred Option: Explore the possibility of a reserve development as part of the enhanced riverbank.</p>
No 3	<p>Location: 616 and 618 Pages Road. Approx Area: 640m² Existing ground level: 10.50m (needs 1.3m of fill to bring up to the proposed level). Zoning: Living 1. Previous use: Residential. Comments: This area encompasses the residual land from two properties and now forms one lot.</p>	<ul style="list-style-type: none"> • Sell as one lot for development. • Site for Community Gardens Group. • Landscape the site. <p>Preferred Option: Attempt to sell as one lot for development. If not successful revisit other options.</p>
No 4	<p>Location: Adjacent to 614 Pages Road. Approx Area: 1,900m² Existing ground level: 10.30m (needs 1.5m of fill to bring up to the proposed level). Zoning: Living 1. Previous use: Leased for grazing. Comments: Triangular block of land which would be accessed from Bexley Road. Very low lying piece of land with limited access. As part of the negotiations with the owners of 614 Pages Road residential development has been ruled out.</p>	<ul style="list-style-type: none"> • Landscape to increase expressway corridor. • Site for Community Gardens Group. <p>Preferred Option: Landscape as part of expressway project.</p>
No 5	<p>Location: Adjacent to 154 Bexley Road. Approx Area: 1,200m² Existing ground level: 10.50m. Zoning: Open Space 2. Previous use: Grassed area outside reserve. Comments: This is a triangular block that has now become separated from the reserve area by the expressway. The zoning restricts development for residential purposes.</p>	<ul style="list-style-type: none"> • Leave as grassed area in the meantime. On completion of the expressway look at the possibility of landscaping the area. <p>Preferred Option: Leave as a grassed area but look at planting trees in the future if funding can be found.</p>

The variation to the City Plan as discussed has not as yet been approved by the Council but it must be taken into account when deciding the future use of these areas. The City Streets Unit would ideally like to recover some of the costs on the areas purchased for the expressway as the budget includes allowance for revenue from land purchase. However we are also aware that development in this area must comply with the City Plan and that preparing complying sections could be cost restrictive.

Staff

- Recommendations:**
1. That the information be received.
 2. That the preferred options for the use of the surplus land be supported.

Chairperson's

- Recommendation:** That the abovementioned recommendations be adopted.