

6. HULVERSTONE DRIVE STOP-BANK

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The purpose of this report is to make a recommendation to the Board on the construction of a stop-bank along Hulverstone Drive.

BACKGROUND

On 3 March and 30 June 2003 the Board considered reports about a proposed stop-bank along Hulverstone Drive between Avondale and Wainoni Roads. The stop-bank is to protect against street flooding and rare house flooding. One house has a floor level below a 2% annual risk ("50 year return period") event. Three houses are subject to flooding in a 1% annual risk ("100 year return period") event. Street flooding has a 4 to 5% annual risk of occurring.

Service Centre staff consulted with Avondale residents to ascertain their views on whether a stop-bank construction should proceed. The results of consultation are discussed below.

The cost of the stop-bank is estimated to be between \$145,000 and \$440,000, depending on the option chosen. Previous economic analyses indicated that the benefits from the proposed stop-bank would be less than the cost of construction and from an economic standpoint one would not proceed with construction. Revised economic analysis results alter the recommendation.

CONSULTATION PROCESS

Information packs were posted in April to 680 Avondale households; generally those whose addresses appeared on the Parks and Waterways Unit database of lower lying properties. Recipients included all households on Hulverstone Drive. All properties known to have floor levels lower than the proposed stop-bank were advised of this fact separately, with floor level information. Residents distant from the river and on higher ground did not receive the information.

Two stop-bank options were outlined in the information pack which has been circulated separately to Board members.

Option 1 is a mostly grass bank from Avondale Road to Wainoni Road. In some places where the river berm is narrower it incorporates a low concrete wall disguised by ground-cover plants. The cost is estimated to be \$210,000.

Option 2 is a wider, predominantly earth bank from Avondale Road to Wainoni Road. It minimises the use of concrete, increases the width of the river berm and maximises the opportunity for tree planting. The greater width of this bank would be accommodated by narrowing Hulverstone Drive by 1.5 metres. The cost is estimated to be \$440,000.

As advised in the information pack pegs and tape were placed along the line of the stop-bank on 8 and 9 April to indicate the proposed stopbank height.

Residents were invited to meet staff at the Shirley Service Centre between 7.00 and 9.00 pm on 17 April. Seventeen people came to ask questions and share opinions about the project. Written comments from the night are recorded in Annex A.

Responses

One hundred and forty-nine responses have been received. The response rate is 22%.

Respondents were placed into three locality groups which could be expected to have distinct views about the project.

Response Area 1: Numbers 23-181 Hulverstone Drive which would view the stop-bank across the road.

Response Area 2: Numbers 2-18 Hulverstone Drive which back onto the river bank and would have the stop-bank outside their rear boundary.

Response Area 3: All other residents.

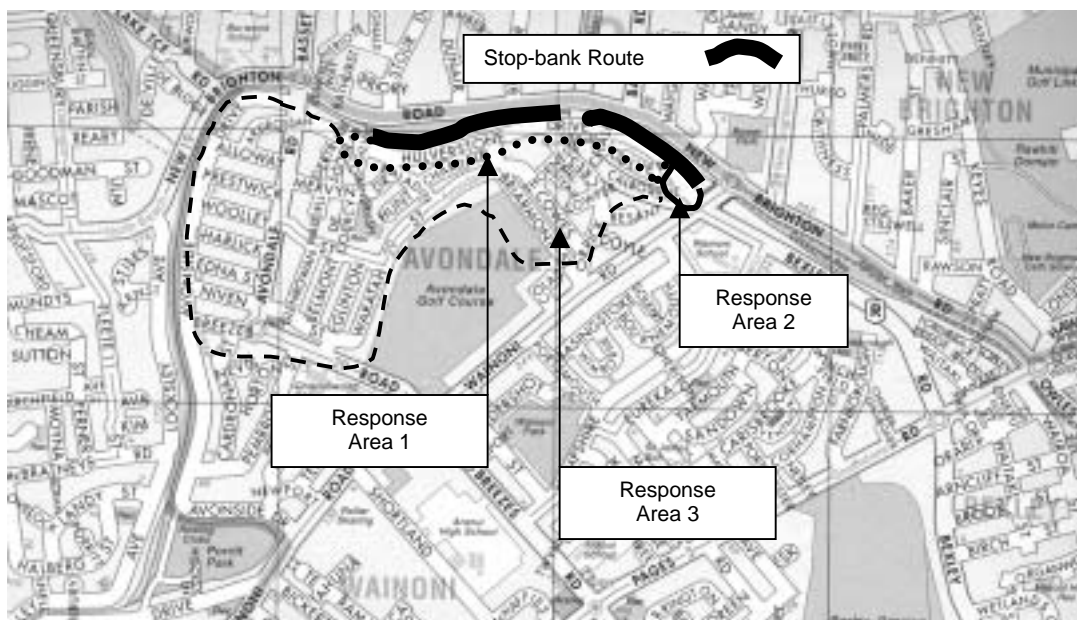


Figure 1: Area covered by information mail-out. Division into special interest “Response Areas”

Table 1: Brief summary of responses to information mailout and questionnaire.

	Response Area 1	Response Area 2	Response Area 3
Respondents' position For or Against the stop-bank proposal	Hulverstone Drive 23 – 179	Hulverstone Drive 2 - 18	Avondale Remainder
For	24 (69%)	4	98 (92%)
Against	10 (28%)	3	9 (8%)
No Opinion	1 (3%)	0	0
Total	35	7	107

The responses indicate majority approval. Opinions were fairly evenly distributed among respondents from the three groups. The main reasons given for opposing the stop-bank were:

- The stop-bank will affect views of the river channel (17)
- The stop-bank will affect views of the river bank (15)
- Concerns that the additional landscaping would look scruffy if not properly maintained
- Plants will obscure views of the river
- Cost (12)

A more detailed summary of responses is in Annex B.

Two households from the 2-18 Hulverstone Drive area strongly oppose location of the stop-bank close to their property boundaries because it will alter or displace landscaping done by themselves on Council land. These two households received verbal support from their neighbours at the 17 April meeting at the Shirley Service Centre.

The views of residents from the 2-18 Hulverstone Drive area are presented in more detail in Annex C.

This information was presented to the 30 June Board meeting. There was discussion about the need for stop-banking. The 2-18 Hulverstone Drive area was represented by a deputation at the meeting. The deputation felt that their area was not at risk from flooding and that a stop-bank would be unnecessary. In subsequent discussion it was suggested that the Anzac Drive embankment might create a natural break in the stop-bank such that stop-banking to the west could be considered as a separate option. The Board requested more information about this possibility, and in particular about the costs and benefits of the separate western and eastern sections.

STOP BANK OPTIONS

Consideration of the stop-bank in two parts creates a third option. The three stop-bank options are:

Option 1: A mostly grass bank from Avondale Road to Wainoni Road at an estimated cost of \$210,000.

- Option 2: A wider, predominantly earth bank from Avondale Road to Wainoni Road (including narrowing Hulverstone Drive by 1.5 metres) at an estimated cost of \$440,000.
- Option 3: A truncated version of Option 1, from Avondale Road to Anzac Drive at an estimated cost of \$145,000.

The proposed stop-banking is to protect against the risk of street flooding and rare house flooding. One house has a floor level below a 2% annual risk ("50 year return period") event. Three houses are subject to flooding in a 1% annual risk ("100 year return period") event. Street flooding has a 4 to 5% likelihood of occurring annually.

The stop-bank would nominally protect against a 1% annual risk flood. This is the stop-bank standard for the lower Avon River.

Properties most at risk are to the west of Anzac Drive. The area east of Anzac Drive is higher and a good proportion of the residential land is at stop-bank level. The section of stop-bank west of Anzac Drive would give protection to the majority of Hulverstone Drive properties and to the somewhat lower lying land to the south. The section of stop-bank east of Anzac Drive would have only minor benefits.

The environmental benefit of Option 2 (the minimum environmental impact option) is greatest west of Anzac Drive. Widening the river berm in this area would avoid the use of concrete walls. The river berm east of Anzac Drive is generally wider and in this area the differences between options 1 and 2 are not great. Nine Hulverstone Drive Group 1 residents (and three Group 3 residents) disliked Option 2 because of the perceived danger from speeding cars on the narrowed road. However, 36 respondents (including nine from Group 1) supported this option.

Option 2 was put forward to test the demand for a low environmental impact alternative to Option 1. The demand did not appear to be significant. Although staff view Option 2 as more desirable than Option 1 it will be difficult for the Parks and Waterways Unit to implement because its cost exceeds the available budget of \$195,000.

Considering Option 3 - Is A Stop Bank Needed East Of Anzac Drive?

About 80 properties in Chale Lane, Calbourne Lane, Culver Place and numbers 2-47 Hulverstone Drive are situated in the area north-east of Anzac Drive and west of Wainoni Road (indicated in Figure 2). This area would be protected by the section of the stop-bank east of Anzac Drive at an estimated cost of \$75,000.

Land levels in this area vary between 11.0 and 11.2 metres (mean sea level being 9.04 metres to CDB datum). Much of it is around 11.2 metres, which is stop-bank level. There is no indication that any house floors are lower than 11.2 metres. Thus the proposed stop-bank would provide no protection to houses and little protection to land in this area. The loop of Anzac Drive and Wainoni Road between the two bridges is high enough to stop flood water from moving further afield and invading the lower lying Bexley area.

Option 3 gives almost all of the benefits of Option 1 but at a reduced cost. It would satisfy the objections of the 2-18 Hulverstone Drive residents' group. Six of the nine households see "little perceived need for a stop-bank" [separate, signed letter - copied at Annex D]. There is some ambiguity in the responses from this area as four of the six "think that the benefits of flood protection outweigh the impact of a stop-bank along the river edge" [a questionnaire tick box response]. Taken in conjunction with verbal responses this appears to indicate opposition to the stop-bank for mainly amenity reasons.

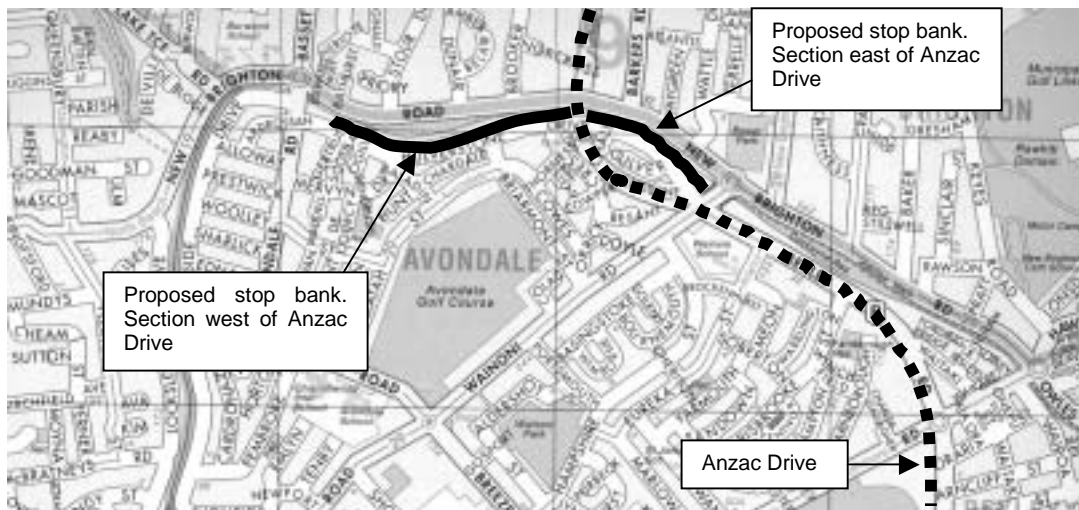


Figure 2: Stop-bank divided by Anzac Drive.

COSTS VERSUS BENEFITS

The benefits of building the stop-bank have been reassessed since previous reports (Harris, 2003¹). Information is taken from a recently completed study of the impacts of sea level rise on the Avon River flood plain. The new estimate of benefits has increased to a present-day value of \$600,000 and significantly exceeds the costs for all options.

There are three reasons for the increase in assessed benefits over earlier estimates:

1. The Council's estimate of sea level rise has been increased to 0.15 metre in 50 years (previously 0.1 metre) and 0.4 metre in 100 years (previously 0.3 metres). Under this scenario the stop-bank will be protecting against higher water levels sooner. This increases the discounted value of benefits.
2. The stop-bank is deemed to give protection against floods larger than the design event (that is, to all floods which have peak levels lower than stop-bank crest level.)
3. Saved flood damages in years 2050 to 2100 have been included and are the major component of benefits.

These findings indicate that it is worthwhile to build the stop-bank; however, they also indicate that it would be acceptable to defer building the stop-bank until sea level rise occurs.

BUDGET AVAILABLE

The budget available for this work is in Utilities New Assets: Avon River Stopbank - CFWD \$195,000.

CONCLUSIONS

Three stop-bank options have been proposed for the length of Hulverstone Drive from Avondale Road to Wainoni Road. All options nominally protect against a 1% annual risk ("100 year return period") flood.

Of the three options presented, Option 3, a shortened stop-bank from Avondale Road to Anzac Drive has the least cost, and meets the majority of feedback opinion while achieving a level of protection equivalent to other stop-banked areas. At an estimated cost of \$145,000 it can be constructed within the available budget.

¹ Assessment of the impacts of sea level rise on floodplain management planning for the Lower Avon River (Harris Consulting, July 2003).

NATURAL + PEOPLE + ECONOMIC STEP ASSESSMENT

#	CONDITION:	Meets condition ✓✓0*	HOW IT HELPS MEET CONDITION:
The Natural Step			
N1	Reduce non-renewable resource use	*	Flood avoidance is preferable
N2	Eliminate emission of harmful substances	0	Unable to compare between stop-bank construction and alternative house raising or relocation.
N3	Protect and restore biodiversity and ecosystems	0	
N4	People needs met fairly and efficiently	NA	NA - See People Step + Economic Step
The People Step			
P1	Basic needs met	0	
P2	Full potential developed	0	
P3	Social capital enhanced	0	
P4	Culture and identity protected	0	
P5	Governance and participatory democracy strengthened	✓	Outcomes of consultation followed
The Economic Step			
E1	Effective and efficient use of all resources	✓	Economic analysis favourable
E2	Job rich local economy	✓	Construction by local contractor probable
E3	Financial sustainability	✓	Economic analysis favourable

Staff

Recommendation: That the Council proceed with construction of the Option 3 Hulverstone Drive stop-bank from Avondale Road to Anzac Drive.

Chairperson's

Recommendation: For discussion.