

EAST AYRSHIRE COUNCIL

ROADS & TRANSPORTATION DIVISION

SUBJECT: Summary Report on Study for Flood Prevention Measures to the A713 Dalmellington to Ayr and B741 Dalmellington to Straiton Routes.

1.0 Introduction

- 1.1 Flooding of the B741 Dalmellington to Straiton (adjacent Sillyhole Moss) from east of Muck Bridge to west of River Doon Bridge, approximately 1.0km, has occurred on numerous occasions. Flooding has also occurred, to a lesser extent, on the A713 Dalmellington to Ayr road from north of the junction A713/B741 for approximately 1.06km.
- 1.2 East Ayrshire Council Roads & Transportation Division commissioned Halcrow, Consulting Engineers, to investigate the depth and extent of flooding for a 1 in 100 year return period. The Council's Roads & Transportation Division prepared outline schemes to raise both routes above the flood levels.

2.0 Scheme A713 Dalmellington to Ayr

- 2.1 This Scheme was designed with a finished road level +300mm above the 100 year flood event with a road width of 7.3m and no hard strip. In addition no form of direct drainage was allowed.
- 2.2 The construction cost for this Scheme is estimated at approximately £1.47m. No allowance has been made for final design, contract preparation, any service diversions/protection, supervision of construction, land acquisition or compensation etc. associated with the proposed scheme. If the works were to be progressed to the detailed stage, some savings on construction costs may be identified.

3.0 Scheme B741 Dalmellington to Straiton

- 3.1 This Scheme was designed with a finished road level +300mm above the 100 year flood event with a road width of 6.0m and no hard strip. In addition no form of direct drainage was allowed.
- 3.2 The construction cost for this Scheme is estimated at approximately £1.80m. The estimate includes for replacement of Mucks Bridge with twin box culverts. No allowance has been made for final design, contract preparation, any service diversions/protection, temporary access, supervision of construction, land acquisition or compensation etc. associated with the proposed scheme. If the works were to be progressed to the detailed stage, some savings on construction costs may be identified

4.0 Conclusions

- 4.1 For both schemes the construction costs alone, £1.47m and £1.80m, are such that the Council is unable to fund direct.
- 4.2 Submitting the schemes as Flood Prevention Schemes to the Scottish Executive is unlikely to attract funding given the probable outcome of benefits v costs.

EAST AYRSHIRE COUNCIL

ROADS & TRANSPORTATION DIVISION

SUBJECT: Summary Report on Feasibility Study for Flood Protection to Dalrymple adjacent Primpton Burn.

0.0 Introduction

- 1.1 Flooding was experienced on the 11 September 2000, in the Dalrymple area adjacent to the Primpton Burn. Water escaped from the Burn flooding areas around properties in Burnton Road, Weir Terrace, Seath Drive and Forglan Road etc.
- 1.3 East Ayrshire Council Roads & Transportation Division commissioned Halcrow, Consulting Engineers, to investigate the flooding and identify possible flood protection measures that may be required.
- 1.4 In order to protect the areas from flooding, two options have been considered initially for protection against a 100 year flood. They are described as follows.

1.0 Scheme Option 1

- 2.3 This option considers the upgrade of Barbieston and Primpton Bridges and constriction of flood waters into the main channel by constructing walls and embankments along the Primpton Burn. The Scheme is as follows:
- 2.4 Replace Barbieston and Primpton bridges by new enlarged bridges:
 - Existing Barbieston Bridge is 2m x 1.04m arch culvert + twin pipe culvert 600mm diameter. Replace with a new 3.3m x 1.2m box culvert;
 - Existing Primpton Bridge is a 3.2m x 0.9m box culvert. Replace with a new 4m x 1m culvert.
- 2.5 Raise new embankment on left bank between section 1b and 2 (approx. 50m long x 0.5m high).
- 2.6 Raise new wall on left bank between sections 2 and Primpton Bridge (approx. 310m long x 0.5 to 1m high).
- 2.7 Raise new wall downstream of Primpton Bridge (approx. 30m long x 0.75m high).
- 2.8 Raise new embankment along field downstream of Primpton Bridge (approx. 650m long x 0.5 to 1m high).
- 2.9 It is noted that no protections are required on the right bank of Primpton Burn because ground levels are generally above the predicted water levels. However, more detailed investigation would be required at some locations on the right bank.

2.0 Scheme Option 2

- 2.1 This option considers providing flood protection in Dalrymple without carrying potentially disruptive works in the town. It is proposed to divert the Primpton Burn approximately 150m upstream of Barbieston Bridge to the River Doon. The Scheme is as follows:
- 2.2 Construction of a dam 5m high and approx. 150m long.
- 2.3 Construction of a channel diversion between the existing Primpton Burn and the River Doon.
- 2.4 Inclusion of a 750mm pipe through the dam in order to maintain flows in the Primpton Burn in normal circumstances.
- 2.5 Modification of the access road located next to the dam, and landscaping of the area.
- 2.6 Construction of an embankment approx. 500m long and 0.3 to 0.8m high as protection to the Forglen Road area from the Purclewan Burn.

3.0 Scheme Options 1 & 2 - Cost Estimates

4.1	Flood defence embankments	£325,000
	Flood defence walls	£400,000
	<u>Bridges upgrading/replacing</u>	<u>£150,000</u>
	<u>TOTAL</u>	<u>£875,000</u>

	Earth Dam	£500,000
	Diversion channel	£170,000
	Road access and landscaping	£100,000
	<u>Embankment</u>	<u>£185,000</u>
	<u>TOTAL</u>	<u>£955,000</u>

Please note that no allowance has been made for the cost of final design, preparation of contracts, service diversions/protection, supervision of construction, land acquisition or compensation etc. associated with the proposed schemes. If the works were to be progressed to the detailed stage, some savings on construction costs may be identified.

4.0 Recommendation

- 5.1 Notwithstanding finance implications etc, Option 2 would be recommended, as it would provide better protection against flooding along the Primpton Burn than Option 1. It would also be substantially less disruptive to the local populace.

5.0 Conclusions

- 6.1 For both Scheme Options 1 and 2, the construction costs alone, £875,000 and £955,000, are such that the Council is unable to fund direct.
- 6.2 Submitting the Schemes as Flood Prevention Schemes to the Scottish Executive is unlikely to attract funding given the probable outcome of benefits v costs.

EAST AYRSHIRE COUNCIL

ROADS & TRANSPORTATION DIVISION

SUBJECT: Summary Report on Study for Flood Prevention Measures to Patna adjacent Doonbank Crescent.

1.0 Introduction

- 1.1 Flooding due to a culvert surcharging, adjacent Doonbank Crescent, Patna, was experienced on several occasions, in particular on 11 September 2000 and 6 December 1999. Overflow spilling at the chamber between the railway culvert and the 90m culvert ran into the street and local gardens and crossed the A713 road to discharge into the field south of the A713.
- 1.5 East Ayrshire Council Roads & Transportation Division commissioned Halcrow, Consulting Engineers, to investigate the flooding due to the culvert surcharging and identify possible flood mitigation measures that may be required.
- 1.6 In order to raise the level of service of the culvert up to a 100 year return period, four options were considered for the protection to properties at Doonbank Crescent. The options took into account the three main results of the site and modelling investigations:
- The culvert is prone to blockages mainly because of the inadequate screen at the manhole adjacent the railway embankment;
 - The existing 750mm diameter culvert pipe is undersized;
 - There are further restrictions of flows at the downstream end of the culvert when it changes to an old stone arch culvert under the A713, with old steel bars constricting the culvert and silt deposition.

2.10 Scheme Option 1

- 2.11 Scheme Option 1 is a minimum option to enhance the present conditions. The Scheme is as follows:
- 2.12 This option considers clearing the culvert, removing debris, silt and the existing metal bars and screen that are partly blocking the culvert and providing a new screen upstream of the railway culvert. These works will provide a level of service equivalent to a 6 year return period.
- 2.13 Scheme Option 1 will improve the existing conditions, however is not considered an overall flood mitigation scheme as it will not provide flood protection for significant return period events.

3.0 Scheme Option 2

- 3.1 Scheme Option 2 is to provide protection against a 1 in 100 year flood event. The Scheme is as follows:

- 3.2 Replacing the existing culvert from the manhole downstream of the railway to the downstream end of the culvert south of the A713 with a new 1.0 x 1.2m wide culvert and providing a new screen at the inlet of the railway culvert.

4.0 Scheme Option 3

- 4.1 Scheme Option 3 considered maintaining the present culvert but trying to confine water overflowing from the manhole, adjacent the railway, on the road, and protecting the properties in Doonbank Crescent by raising flood walls and embankments. This option was assessed during site inspection and did not appear to be feasible because it would increase the risk of flooding of one house on the west side of Doonbank Crescent (the access to the house is lower than the road). Furthermore, such an option would not protect the A713 from flooding. Therefore, this option was not retained as feasible.

5.0 Scheme Option 4

- 5.1 Scheme Option 4 considered upstream storage to attenuate peak flows at the inlet of the culvert. This was not possible due to the steep nature of the catchment area. Therefore, this option was not retained as feasible.

6.0 Scheme Options 1 & 2 - Cost Estimates

6.1	Clearing Culvert	£2,000
	New Screen	£8,000
	TOTAL	£10,000

	Service Diversions/Protection	Not available
	New Screen	£8,000
	Replacing Culvert	£75,000
	TOTAL	£83,000

Please note that no allowance has been made for the cost of final design, preparation of contracts, any service diversions/protection, supervision of construction, land acquisition or compensation etc. associated with the proposed schemes. If the works were to be progressed to the detailed stage, some savings on construction costs may be identified.

7.0 Recommendation

- 7.1 Notwithstanding finance implications etc, Option 2 would be recommended, as it would provide better protection against a 1 in 100 year flood event.

8.0 Conclusions

- 8.1 Option 2 construction cost alone, £83,000, is such that the Council is unable to fund direct.
- 8.2 The scheme is not substantial enough to promote a Flood Prevention Scheme through the Scottish Executive in order to attract funding.

AGENDA