



Meeting: Harbour Committee

Date: 22nd September 2014


Wards Affected: All wards in Torbay

Report Title: Haldon and Princess Piers Structural Repairs

Executive Lead Contact Details: Non-Executive Function

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Tor Bay Harbour Master**

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1. Purpose

- 1.1 Following detailed structural surveys of both Princess and Haldon Piers major structural defects have been identified within each structure. At present these structures have been assessed as having a limited useful life expectancy unless further remedial works are undertaken. The main structural defects identified include: widespread scour below sea level, many voids within the piers below sea level, incomplete rock armour and voids within the central core of the piers.
- 1.2 Both of these piers make up an important part of Torbay's coast protection infrastructure and as part of our built environment they are well used by residents and visitors alike. However, the structural assessment that has recently been undertaken indicates that the structures are in poor condition in many places.
- 1.3 This report seeks to highlight the issues to the Harbour Committee and propose a recommended course of action to a meeting of the full Council.

2. Proposed Decision

- 2.1 **That the Harbour Committee notes the serious structural condition of both Haldon and Princess Piers and the level of investment required to address the issues identified in the Report.**
- 2.2 **That the Council is asked to consider making an allocation of £4.6m within the capital programme, as a matter of urgency, to allow repair work to proceed on both Piers.**

- 2.3 That, given the strategic importance of Haldon and Princess Piers, the Mayor should be formally advised of the need for urgent repairs to both structures.**
- 2.4 That, the Harbour Committee makes representations to the Heart of the SW Local Enterprise Partnership and the relevant Minister, regarding the need for urgent repairs to both structures.**
- 2.5 That officers are requested to investigate other sources of funding, in addition to the Environment Agency, to help fund the Capital programme.**

3. Action Needed

- 3.1 The Council need to consider whether an allocation of £4.6m can be made within the Council's future capital programme for 2016/17 and 2017/18, or earlier if possible.
- 3.2 That should funding be made available that officers submit an application to the Environment Agency for the maximum grant in aid funding of approximately £1.1m.

4. Summary

- 4.1 A report was presented to the Council in December 2007 regarding the first phase of the structural repair works to both Haldon and Princess Piers at Torquay harbour. As a result of that report the Council approved a capital budget of £2,050,000 to enable the most critical repair works to be undertaken. In addition a further report was requested in the future to identify the required budget to undertake the remainder of the repair works.
- 4.2 Following approval of the budget in 2007 the first phase of the repair works to Haldon Pier has been completed.
- 4.3 The overall estimated cost of the structural repair works to Haldon and Princess Piers was in the sum of £8.7m. In February 2011 Torbay Council submitted a project appraisal report to the Environment Agency in support of an application for flood and coastal defence grant in aid funding for the entire repair works to Haldon and Princess Piers. This application was partially successful and secured approximately £1.3m of grant in aid funding however before any further funding can be approved a detailed economic appraisal was required in line with the revised Environment Agency partnership funding/outcome measures calculator.
- 4.4 This report outlines the works that have been undertaken at Haldon Pier and the remaining works that are required to be undertaken which have an estimated cost in the sum of £5.7m. Based on the Environment Agency partnership funding/outcome measures calculator the likely funding available from grant in aid

for the remaining repairs is in the sum of £1.1m which will leave a shortfall of £4.6m.

- 4.5 In line with their Terms of Reference the Harbour Committee is required to provide strategic direction in respect of those assets within Tor Bay Harbour and the harbour estate that are managed by Tor Bay Harbour Authority. Following advice from the Harbour Asset Review Working Party the Executive Head of Tor Bay Harbour Authority considered it necessary to highlight the current condition of Haldon and Princess Piers to the Harbour Committee.
- 4.6 The Harbour Committee last received a formal report on the condition of Haldon and Princess Piers in December 2007. As a result of the 2007 report the Council agreed that the Harbour Authority could borrow £1.2m towards the cost of Phase 1 and this loan remains ongoing and is serviced through the revenue budget.
- 4.7 It should be noted that this report relates only to the flood defence element of the piers. It does not include the repairs required to the boardwalk or steelwork support to the boardwalk at Princess Pier which are already included in the Council's capital program. Although the boardwalk and steelwork repairs are already in the capital program the Council's engineers have advised that repair work to the main structure should be completed first.

Supporting Information

5. Position

- 5.1 Following detailed structural surveys of both Princess and Haldon Piers major structural defects have been identified within each structure. At present these structures have been assessed as having a limited useful life expectancy unless further remedial works are undertaken. The main structural defects identified include: widespread scour below sea level, many voids within the piers below sea level, incomplete rock armour and voids within the central core of the piers.
- 5.2 Both of these piers make up an important part of Torbay's coast protection infrastructure and as part of our built environment they are well used by residents and visitors alike. However, the structural assessment that has recently been undertaken indicates that the structures are in poor condition in many places.
- 5.3 Phase 1 of the repair works addressed the rock armouring and structural damage to the seaward face of Haldon Pier. In addition a number of sections on the inner face of the pier that have suffered excessive scour have been repaired.

- 5.4 A summary of the remaining structural defects located at each pier are identified below:

Princess Pier

1. Underwater defects to the original pier structure including widespread scour at the seabed to approximately 1.5m high on both sides of the pier. In addition many voids above and below the low tide level have been located with a few as large as 2m wide x 2m high x 2m deep.
2. Following recent storm damage the two sections of seaward stone steps are in a very dangerous condition.
3. The top surface of the old pier has numerous cracks and is in need of repair and the existing balustrade is in a poor condition.

Haldon Pier

- 1.
2. An underwater survey of the pier has identified widespread scour of the harbour face of the old section of pier, which has resulted in partial washout of the core material behind the wall.
3. Boreholes have been sunk into the central core of the pier and these have identified general voids within the fill material due to wash out and storm damage. In addition voids have been identified below the concrete slabs forming the pier hard standing. As a result a weight limit has been implemented for large plant on the pier.

- 5.5 The estimated capital cost of the remaining structural repair works to both Haldon and Princess Piers is in the sum of £5.7m.

- 5.6 Torbay Council has undertaken detailed hydraulic modelling of the harbour in order to assess the impacts of flooding should one or both of the piers be breached. The results of this modelling have been used to assess the likely funding that will be available through flood and coastal defence grant in aid from the Environment Agency. Using the Environment Agency's partnership funding/outcome measures calculator the maximum grant in aid funding for this scheme would be in the sum of £1,116,000. The remainder of the funding, some £4.6m would have to be sourced through partnership funding. This would be through the Council's capital programme, and could be funded from the following sources:-

- Existing capital funding – this will require a substantial redesign of the existing capital programme and remove funding from other areas to carry out these repair works.
- Prudential Borrowing – the cost to repay the borrowing which will be funded from the Council’s revenue budget would be £312,941 per annum over the next 25 years.
- S106 – it is unlikely that there would be individual developments around the harbour that are likely to take place within the next 3 to 5 years that would provide sufficient funding to pay for these repairs. The Council could choose to implement a local planning policy where by all developments across the Bay would contribute to the project with this being used to re-pay prudential borrowing. This would require reprioritisation of the use of S106 income.
- Local Business Rates Levy – Other coastal authorities have introduced a local business rates levy on properties that are protected by these works which will again fund the cost of prudential borrowing.
- Other sources – Officers are actively seeking other opportunities for further grants/external funding.

5.7 On the basis of the very high benefit to cost ratio the Council submitted a grant application to the Government via the Local Enterprise Partnership. This was in response to the Government making more funding available for flood defence following the winter floods in 2013/14. Although the Council’s application was extremely strong and substantiated by the sort of cost- benefit ratios that are few and far between, the Council was unsuccessful.

5.8 In August 2014 grant aid of £295,000 was awarded to the Council following a successful application made by Tor Bay Harbour Authority into the Department for Transport’s Small Ports Recovery Fund. The fund was set up to help repair small ports and harbours across England damaged by the winter storms. Approximately £200k will be available for repairs to Princess Pier.

6. Possibilities and Options

6.1 The following options have been considered:-

- Do nothing.
- Do something and make a clear recommendation to the Council that the Capital Plan be reprioritised.

7. Preferred Solution/Option

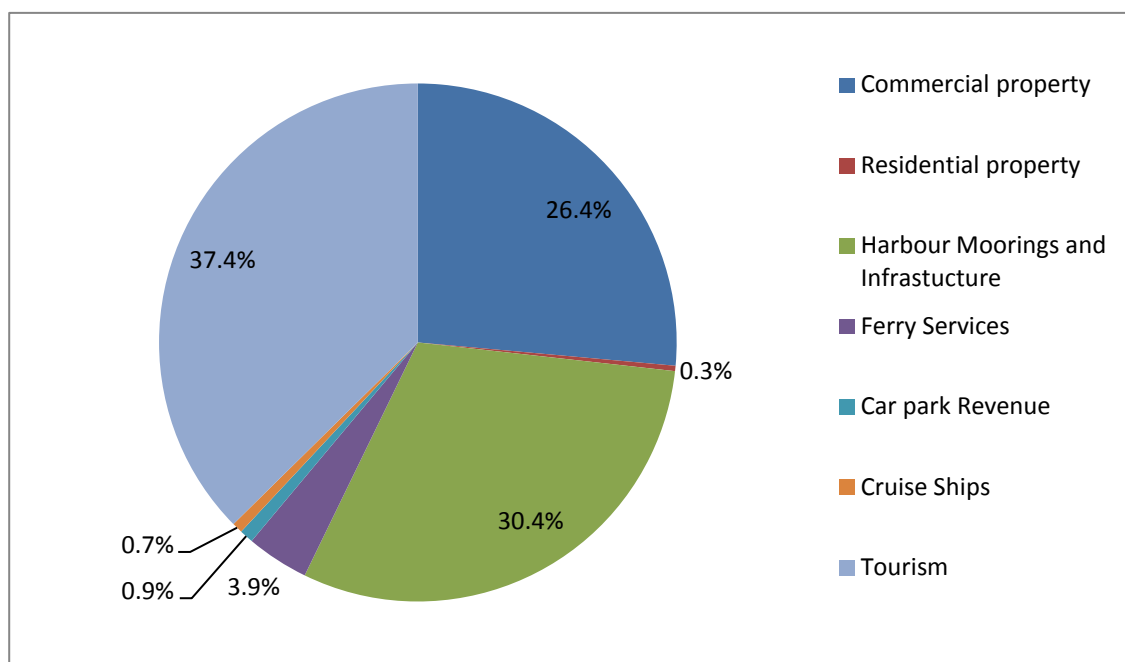
7.1 The economic assessment that is undertaken in support of the Environment Agency grant in aid application is based on national economic impacts (losses to the Nation) associated with the do nothing option. Under this option it is assumed

that either one or both of the piers will be breached within 5 to 10 years if no works are undertaken. This assessment identifies a whole life benefit cost for this scheme of just over £20m and hence the benefit cost ratio of the scheme is 3.5 to 1. The local economic impacts on Torbay cannot be included within this assessment.

7.2 In order to assess the local economic impact of these piers, Torbay Council commissioned Royal Haskoning to undertake a detailed local economic assessment. This assessment investigated impacts on the following seven economic sectors:

- Commercial property
- Residential property
- Harbour moorings and infrastructure
- Ferry services
- Car parks
- Cruise ships
- Tourism

The analysis comprises both a quantitative and qualitative assessment of potential benefits. Using conservative assumptions the total present value benefit cost for all seven sectors of benefits (potential losses avoided) amounts to £159.3m. Some 94% of benefits relate to securing the commercial sector, the harbour and holiday based tourism. The benefit cost ratio for the scheme to the local economy, even with conservative assumptions, can therefore be seen to be over 27 to 1. The local economic benefits derived from maintaining the harbour infrastructure and securing mooring revenues would alone give an 8.4 to 1 benefit cost ratio. A breakdown of the benefit costs associated with each sector is identified below.



- 7.3 The harbour and marina are at the core of Torquay's tourist industry offering and providing major prospects for economic growth and regeneration and for restoring the competitive edge of Torquay and the English Riviera in general so that the English Riviera is repositioned as a leading UK destination. However, these prospects are all dependent – dependent to some extent – some totally dependent and most significantly dependent – upon the continued protection of Torquay harbour from storms creating erosion and flooding since such events may breach one or more of the piers leading to the effective loss of the marina and harbour as a serviceable facility. The direct knock-on consequences of such a loss on the local economies of Torquay on the one hand and Torbay and the English Riviera on the other, when these economies are already recognised as being in a fragile condition are likely to be very serious. They could cause a vicious downward spiral in the economic fortunes of Torquay and Torbay; it is likely that these local economies would take decades to recover and they could be irreversibly damaged.
- 7.4 Based on the local economic assessment, the benefits to Torbay in maintaining both the Haldon and Princess Piers have clearly been demonstrated. As a result it is essential the partnership funding in the sum of £4.6m be secured in order that the structural repair works to both Haldon and Princess Piers can be completed.
- 7.5 Due to the excessive costs of these repairs a phased approach over the next three years has been proposed. By undertaking the repairs using this phased approach a level of pedestrian access can be maintained to both piers during the remedial works. Following completion of the works both piers would have a minimum life expectancy of 50 years.

8. Consultation

- 8.1 As part of the preparation works for the first phase of the repair works to Haldon and Princess Piers various avenues of consultation were undertaken regarding the structural damage to both piers. This consultation was undertaken with both internal and external organisations and included the following :-
- Torbay Council – Full Council
 - Torbay Council – Harbour Committee
 - Torbay Council – Flood Steering Group
 - Torbay Council – Planning Department
 - Environment Agency
 - Torquay & Paignton Harbour Liaison Forum
 - Marine Management Organisation
 - Natural England
 - English Heritage

8.2 Following completion of the first phase of the works further consultation has been undertaken with a number of organisations in the production of the proposals for the second phase of the structural repairs. In addition to the organisations identified above consultation has been undertaken with :-

- Torbay Development Agency
- English Riviera Tourism Company
- Torbay Business Forum
- Harbour Asset Review Working Party

9. Risks

9.1 The consequences of the do nothing option are that the structural condition of both piers will continue to deteriorate and the risk of a breach failure to one or both of the piers will increase. The recent reports on the structural condition of these piers has identified that if no works are undertaken to repair these piers a breach failure is likely to occur within 5 to 10 years. Delays to the repair works would result in the continued deterioration of these structures, along with a disproportionate increase in the cost of repairs to such an extent that any future repair works may well become economically impossible. Providing the repair works are completed within the next five years the risk of severe deterioration in the structure has been assessed at the intermediate level as shown on the table below:

Risk Table – Repairs completed within 5 years

Likelihood	6	6	12	18	24
	5	5	10	15	20
	4	4	8	12	16
	3	3	6	9X	12
	2	2	4	6	8
	1	1	2	3	4
		1	2	3	4

Low risk
 Intermediate risk
 High risk

The "x" in the above matrix denotes where the author has assessed the level of final risk to fall

9.2 Should a breach failure occur to one or both of these piers flooding to over 200 properties around Torquay harbour would be experienced due to overtopping of the harbour walls as a result of increased wave action within the harbour during high tides and storm conditions. Should repair works not be undertaken, further sections of the piers would be breached resulting in properties being flooded on a more regular basis.

- 9.3 Following a breach failure of the piers there are likely to be impacts as a result of erosion to the inner and outer harbours. Due to the effects of increased wave action, tidal conditions and severe storms it has been estimated that the old harbour walls around Torquay harbour would fail in 20 to 50 years following the breach, allowing erosion to take place. This would result in the loss of harbour walls, promenade, roads and both residential and commercial buildings.
- 9.4 Although detailed surveys have been undertaken on both Princess and Haldon Piers to identify the repair works required there is a risk with works of this nature that whilst repair works are being carried out further deterioration of the structure may be encountered. This may be as a result of further scour to the walls below sea level. Similarly, additional voids may be located within the wall, which would result in additional works having to be undertaken. The estimated cost for the repair works has been prepared following detailed discussions with various contractors and suppliers who have undertaken similar repair works. In addition a 15% contingency has been included within the estimate to cover the risk of additional works being required due to hidden defects. As a result of the detailed estimates and the inclusion of the contingency element the financial risk has been assessed as 6 in the table below.

Financial Risk Table

Likelihood	6	6	12	18	24
	5	5	10	15	20
	4	4	8	12	16
	3	3	6X	9	12
	2	2	4	6	8
	1	1	2	3	4
		1	2	3	4

Low risk
 Intermediate risk
 High risk

The "x" in the above matrix denotes where the author has assessed the level of final risk to fall

- 9.5 Following completion of the works the piers will have a minimum life expectancy of 50 years. However, there will always be a risk of damage to the piers due to severe storm events together with the risk of accidental damage as a result of impact from coastal vessels. The risk of storm damage following the repair works is initially minimal however these risks will increase over time. The risk of damage due to impact from vessels is again minimal however should this occur emergency repair works would have to be carried out and the cost for these repairs would normally be recoverable from the vessels underwriter.

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Services

Appendices

None

Documents available in members' rooms

None

Background Papers:

The following documents/files were used to compile this report:

Haldon and Princess Piers Structural Repairs – Project Appraisal Report – February 2011

Torquay Harbour Flood Risk Modelling – February 2011

Haldon and Princess Piers Structural Assessment – April 2012

The Local Impact of the Do Nothing Scenario for Torquay Harbour – January 2014