

Somerset West and Taunton Council Executive – 22 January 2020

East Quay Wall, Watchet - Maintenance

Report of Localities Manager – Chris Hall

(This matter is the responsibility of Executive Councillor Marcus Kravis)

1. Executive Summary

This report sets out the current situation with the East Quay wall, Watchet and the options that the Council have to maintain this asset into the future. It does not seek approval of a permanent solution for the repair at Splash Point, this will be dealt with separately once possible design options have been established, but does request financial approval of the design work for this permanent repair.

For the East Quay wall survey works have identified that the wall is not at imminent risk of failure but would benefit from maintenance with some reinforcing in the central and northern sections to ensure that operations can continue here into the future, and that a programme of monitoring be put in place for the entire length of the wall. The report challenges the economic advantage of undertaking the reinforcing work to the northern section and proposes alternative options.

The East Quay wall serves as part of the structure to create the marina, protects Watchet as a sea defence, and stabilises the East Quay itself. This area is used for boat storage, as a lifting facility for the marina, and a tourism offering.

The timing of this report is unrelated to the granting of the lease to the Onion Collective as the report identifies that this development has a negligible impact on the wall structure and no works to the wall are required to enable the development.

The report identifies a budget need for design work and a maintenance solution, therefore a budget request is made for £740k to design a permanent solution to the Splash Point failure and reinforce the central section of the East Quay wall with the associated professional costs.

2. Recommendations

- 2.1 It is recommended that the Executive request Full Council approve the following additions to the Capital Programme, which will be funded through borrowing:
- i) Add the following to the Capital Programme for 2019/20
 - a. The sum of £100k be allocated to the wall design works at Splash Point and
 - b. The sum of £100k be allocated to the wall design works at East Quay

- ii) Add the following to the Capital Programme for 2020/21
 - a. The sum of £500k be allocated to reinforce the East Quay wall in the central section and
 - b. The sum of £40k for project management resource to deliver this project to its conclusion.

3. Risk Assessment

Risk Matrix

Description	Likelihood	Impact	Overall
Risk: Failing to maintain the East Quay in a timely fashion could result in deterioration with greater costs at a later date	Possible (3)	Moderate (3)	Medium (9)
<i>Mitigation: Investigations and proposals presented in this report seek approval to undertake improvement works in the central section with limited restrictions to operations in the northern section.</i>	Unlikely (2)	Moderate (3)	Low (6)
Risk: The wall fails unexpectedly resulting in a risk to public and greater costs in reacting to this as an emergency.	Possible (3)	Moderate (3)	Medium (9)
<i>Mitigation: Survey and modelling identify a theoretical risk area in the central section, the construction type here would likely lead to a bend in the structure rather than a collapse. Recommendation is to reinforce this section.</i>	Unlikely (2)	Moderate (3)	Low (6)
Risk: Failing to maintain the asset to meet the terms of the lease to the Marina Operator. Breach of these terms could place the council at risk of challenge, or at least place further strain on the relationship	Possible (3)	Moderate (3)	Medium (9)
<i>Mitigation: The Marina operator has been provided with report on condition and offered a meeting to discuss its content. We do not consider any of the restriction options to have a negative impact on their operation.</i>	Unlikely (2)	Moderate (3)	Medium (6)
Risk: Reinforcing the wall will remove a small amount of space from the Marina and increase, by that same amount the side of the East Quay, this additional land will increase the cost of the roadway surfacing which is a responsibility of the OC development. If there is an identifiable increase in cost we would anticipate the OC seeking a contribution from the council for this.	Possible (3)	Minor (2)	Low (6)

<i>Mitigation: Whilst there may be an increased area for surfacing there may be less sub base construction works needed in creating the roadway reducing the costs. Council officers will negotiate the cost changes and seek to offset OC savings on the roadway against any increased cost for surfacing.</i>	Unlikely (2)	Minor (2)	Low (4)
Risk: In order to expedite delivery of the works Members are being asked to approve a project based on estimates of costs, there is a risk that these could be incorrect once put to market	Moderate (3)	Possible (3)	Medium (9)
Mitigation: Member approval would allow the project team to undertake the design works and go to market with a tender, this will only then be converted into a contract where the overall costs of the project fall within the estimates. Should they not then a revised report will be provided for Members to reconsider.	Moderate (3)	Possible (3)	Medium (9)

4. Project Governance

- 4.1 The Project was initially being managed under the Commercial Investment functional area but with such close links to Localities, the operations of the Marina, and the Onion Collective, the Localities Manager is now overseeing this with initial project management support being provided through Localities.
- 4.2 The Project Team is made up of internal and external contributors. The internal Project Manager is Steve Hughes, with a range of others providing their technical support as required. Pick Everard and Crouch Waterfall have been providing specialist survey works and modelling.
- 4.3 The likely scale of spend and complexity of the works means that we will continue to need engineering expertise to design and potentially support the procurement process.

5. Background

- 5.1 This report does not attempt to resolve the issues that have recently been encountered with the wall at Splash Point, there are a range of options at that location that require further consideration before a design can be put to market. Therefore a budget is requested to undertake the design works at Splash Point. The design options for East Quay are less variable with the likely solution being a sheet piled front to reinforce the existing wall. However to meet our obligations under the Construction Design and Management Regulations 2015 a principle

designer still needs to be appointed and a solution drawn up by competent engineers.

- 5.2 The Authority has responsibility for the East Quay wall which has been repaired in different places at a different times over its life. There have been concerns raised about the structural integrity and the lifecycle for maintenance. In response the council commissioned a range of surveys from specialists in the industry.
- 5.3 The survey response from Pick Everard was presented to the Asset Management Group of West Somerset Council back in 2018. It was clear at this point that whilst there was no immediate risk to the public from the wall its maintenance needs to be planned for and its current condition better understood.
- 5.4 The council had previously undertaken a procurement activity to seek a contractor to deliver a maintenance scheme in advance of the OC development. The rationale for this was to complete any work necessary and be off site prior to the OC work starting, it was felt that this would minimise complexity. In reality contractors considered that this posed increased challenges in the timeframe available. It was also apparent that contractors needed additional information on the wall construction which was not available at that time.
- 5.5 Officers commissioned surveys to establish the condition of the wall ties and finite material analysis. Both of these would support the design of the maintenance scheme required as well as provide a greater understanding of the current factor of safety. These surveys were undertaken and the outcomes of these provide the most up to date information available, further reducing concerns over the East Quay wall structure.
- 5.6 The British Standard minimum factor of safety is 1.25. This means meeting the basic requirements for the wall for pedestrians, vehicles movements, and crane operations with a safety factor of 0.25 or 25%. Therefore any score below 1.25 is a fail.
- 5.7 A quay wall would normally be built to take activities with a loading of 10 kilopascals (kpa), kilopascals being a common measure of pressure. Due to the lease with the marina operator and their known use of the crane this has been increased to 20 kpa to ensure that our factor of safety relates to the known activities on site.
- 5.8 The Onion Collective's project does not include maintenance of the wall but it is clear that we will need to work with the OC and Watchet Harbour Marina Ltd to ensure that each parties operational needs are met when works are underway. Undertaking the work after the development may result in damaging the new surfaces put down by them, this could invalidate any warranties that they have for the buildings. This could also impact on warranties for the provision of the roadway which is being provided at OC's cost but will remain an asset of the council, their warranty for this is therefore to the benefit of SWaT. Reputational damage could also occur for the council where newly laid surfaces need to be lifted (or are damaged) for the wall maintenance.

- 5.9 Information that is pertinent to the OC's development has been shared with their engineers, to help inform their design and working practices. Their contractors are required to consider this information and undertake their own assessment to inform their design. The assessment of the OC engineers have been provided to the council.
- 5.10 As a point of clarity the council are not undertaking these repairs to enable the Onion Collectives development, the wall is the responsibility of the council and it serves as a structure that not only creates the East Quay, which is also part leased by the Marina Operator, but is also a sea defence for Watchet.
- 5.11 There has been no historical programme of monitoring or maintenance in place and only reactive works have been undertaken. Regardless of any recommendations to make repairs or reinforce sections a monitoring and maintenance programme must be put in place.

6. Survey works

- 6.1 A range of surveys have been undertaken over a period of time, these include but are not limited to core hole sampling, wall tie condition, location of dead man's anchors, and finite materials analysis. The Surveyors have also looked at wall construction and repairs, and life expectancy of the materials. These have all provided information for the modelling assessments.
- 6.2 The modelling has considered the likely means of failure of the wall and provided a factor of safety (fos) on each of these. These include bend moments, wall slip from the toe and overturning of the head. All results in table 1 are represented as the lowest factors of safety from any of this analysis, i.e. worst case scenarios.
- 6.3 The surveys undertook a range of modelling based on a sectional analysis of the wall. These sections were derived by the construction type and therefore the loadings required to achieve failure. This is then converted into a factor of safety with fos of 1.25 being the minimum needed for the activities and loading that are undertaken. Crane operations have the greatest weight impact on the wall exerting 20 kpa in close proximity to the wall. All outcomes assume the greatest weight loading unless stated otherwise.
- 6.4 A key message from the survey works, and one of the reasons the council were comfortable in signing off the lease to the Onion Collective, is that the surveys identify a negligible impact of the development on the wall. Therefore development, or no development, the factor of safety for the wall is unaffected. This is due to the distance of the development from the wall edge.
- 6.5 The wall for the purposes of the report is considered in the three sections. The southernmost section which adjoins The Esplanade, the central section which is the steel piled area, and the northernmost section beyond the steel piles but before the pier. These can be seen in appendix A, a diagram of the East Quay
- 6.6 In all scenarios modelled by the consultants the **southernmost** section **exceeds** the minimum factor of safety of 1.25. This may come as a surprise as visually it

looks to be in the worst condition, however due to its lower height, and a number of other factors, the wall here is stable and has the highest factor of safety rating of the three sections.

- 6.7 At high tide the **central** section of the wall **exceeds** the minimum factor of safety of 1.25. However at low tide the wall **fails** to meet the minimum requirements, this means that in theory the wall should fail but in practice it has shown no signs of doing so. Due to the construction of this section failure would most likely be seen by a bending of the sheet piles rather than a collapse. The modelling gave a range of factors of safety based on assumptions about the sheet pile types and their embedment into the bedrock. The table below takes the worst case scenario and it is therefore possible that the assumptions are predicting a situation that is worse than reality. It is nevertheless recommended to Members that this section is reinforced.
- 6.8 It is clear from the site investigation works that the central part of the structure is nearing the end of its life and were there to be no maintenance then it will inevitably fail at some point in the future.
- 6.9 With the current mud and silt level the **northern** section of the wall **exceeds** the minimum factor of safety of 1.25 at high and low tide for pedestrian and vehicle traffic, but **fails** for crane operations at **low tide only**. Officers will be advising the marina operator of this however in practice with the current marina mud levels crane operations would not occur at low tide anyway.
- 6.10 The council have a choice to reinforce this section of wall, or place a restriction on crane operations at low tide, or restrict any future dredging operation within this immediate area. The cost of including the northernmost section in the procurement is estimated to be in excess of £400k it is therefore economical to look at alternatives. It is recommended that this is excluded from the reinforcing programme and officers are instructed to work with the marina operator to limit the impact of this decision.
- 6.11 Results of the modelling shown in Table 1 below differ between low and high tide. This is caused by the volume of water at high tide placing a positive pressure on the wall front and increasing the factor of safety.

Table 1: Factor of Safety Outcomes.

No	Surcharge	kpa loading	Northern section		Central section		Southern section	
			Low Tide	High Tide	Low Tide	High Tide	Low Tide	High Tide
1	Current	10 kpa	1.3 (1.1 with silt removed)	4.0	0.7	2.7	1.8	10+
2	Current inc. crane	20 kpa	1.06	2.5	0.7	2.7	1.4	4.0
3	Current + OC	60 kpa	Outside of OC development area		Negligible effect of OC development so not modelled		1.8	10+
4	Crane + OC	70 kpa					1.4	4.0

- 6.12 As part of the analysis we sought to understand if water that entered into the structure of the East Quay at high tide washed out material as the tide fell. This finite element modelling identified no loss of fine material being washed out from the rear of the wall. In terms of the wall integrity this is a good result as it reduces the opportunity for voids to be created behind the wall.

7. The Maintenance options

- 7.1 From the survey information provided it is clear that the southern section requires no substantial maintenance works, however a plan for monitoring is required.
- 7.2 It is recommended that the central section is reinforced to allow for vehicle movements into the boat storage area and crane operations which are a condition of the lease to the marina operator. These can continue at high tide but advice will be provided to the marina operator and Onion Collective concerning low tide. Undertaking this work will also provide for longer term stability for the operation of the marina.
- 7.3 It is recommended that the northern section is excluded from the reinforcing programme and officers are instructed to work with the marina operator to limit the impact of this decision.

8. Procurement process

- 8.1 The Authority will undertake a robust procurement activity to ensure that the best options and value are established. We recommend to Members that we further instruct specialists to create the necessary engineering designs for both Splash Point and the central section of East Quay.
- 8.2 We then recommend that the design is put to market with a minimum lifespan requirement. With this quality aspect already set we can then run a procurement activity weighted in favour of price.
- 8.3 Upon approval of the recommendations the design and procurement will begin, with works being undertaken on site in 2020 / 21, and completed to a timeline that avoids further disruption on site following the conclusion of the OC development.

9. Financial resource implications

- 9.1 The financial requests of this report are currently based on estimates and cannot therefore be considered as fixed, this creates a risk in terms of the known costs, however the councils responsibility for delivery are unchanged by the costs of the project. Any further changes to the costs will be reported through the budget monitoring process.
- 9.2 The total cost requested to be added to the Capital Programme is £740k, which will

be funded from borrowing, with a revenue cost of £44k per annum to be included in the budget from 2021/22 onwards.

10. Legal Implications

- 10.1 The council have a responsibility to maintain the assets at Splash Point and East Quay, any failure of the asset caused by the council's negligence would likely expose the council to challenge and financial risk.
- 10.2 Any failure of the asset caused by the negligence of others would expose that party to challenge and financial risk and the Council would take action against them to recover all associated costs.
- 10.3 Any restrictions imposed for the northern section of the wall are not considered to be unreasonable given the known operating restrictions caused by the marina's mud.

12. Environmental Impact

- 12.1 There are no detrimental implications associated with supporting the recommendations of this report. Environmental implications could exist where Members are unable to support the necessary maintenance of this asset. With no maintenance the asset could fail in time creating pollution within the Harbour.
- 12.2 It is anticipated that an Environmental Impact Assessment will be required making reference to the reinforcing solutions proposed by contractors.

13. Safeguarding and/or Community Safety Implications

- 13.1 There are no implications resulting from the recommendations of this report being approved.

14. Asset Management Implications

- 14.1 The Asset Management Team have been involved throughout the process and support the recommendations of this report. A programme of monitoring would fall to this team to manage.

15. Data Protection Implications

- 15.1 There are no identified implications of this report on data protection.

16. Consultation Implications

- 16.1 There has been and will continued to be a need for close working with the Onion

Collective and Watchet Harbour Marina Ltd, although there is no formal consultation process.

17. Equalities Impact

17.1 There are no detrimental impacts on any of the protected groups as a result of this report and its recommendations.

18. Partnership Implications

18.1 There are no formal partnerships impacted by the content of this report.

19. Climate Change implications

19.1 Climate change will impact on the sea levels in the coming years. This report does not evaluate the effects of rising sea levels but does seek to secure funding to maintain the integrity of the sea wall for the foreseeable future.

Democratic Path:

- **Executive – 22nd January 2020**
- **Full Council – 27th January Date 2020**

Reporting Frequency: One off

Appendices:

- A) Plan of the East Quay, Watchet**
- B) Site investigations report**

Contact Officer

Name	Chris Hall
Direct Dial	01823 356499
Email	c.hall@tauntondeane.gov.uk

Risk Scoring Matrix

Likelihood	5	Almost Certain	Low (5)	Medium (10)	High (15)	Very High (20)	Very High (25)
	4	Likely	Low (4)	Medium (8)	Medium (12)	High (16)	Very High (20)
	3	Possible	Low (3)	Low (6)	Medium (9)	Medium (12)	High (15)
	2	Unlikely	Low (2)	Low (4)	Low (6)	Medium (8)	Medium (10)
	1	Rare	Low (1)	Low (2)	Low (3)	Low (4)	Low (5)
			1	2	3	4	5
			Negligible	Minor	Moderate	Major	Catastrophic
Impact							

Likelihood of risk occurring	Indicator	Description (chance of occurrence)
1. Very Unlikely	May occur in exceptional circumstances	< 10%
2. Slight	Is unlikely to, but could occur at some time	10 – 25%
3. Feasible	Fairly likely to occur at same time	25 – 50%
4. Likely	Likely to occur within the next 1-2 years, or occurs occasionally	50 – 75%
5. Very Likely	Regular occurrence (daily / weekly / monthly)	> 75%