TECHNICAL NOTE

DATE:	15 March 2024	**CONFIDENTIALITY:**	Public
SUBJECT:	Site Monitoring Report – February 2024		
PROJECT:	Swanage Town Council – Shore Road	**AUTHOR:**	Ben Ward
REVIEWER:	Sam Rhodes	**APPROVER:**	David Roy

1 INTRODUCTION

1.1 WSP UK Ltd (WSP) was commissioned by Swanage Town Council (STC), 'the Client', to produce a supplementary technical note detailing the findings of a follow up defect walkover survey undertaken in February 2024. Areas of ground and retaining wall instability have been identified across the site over a number of years. It is not known when these defects were first identified by STC.

1.2 An initial defect survey was undertaken in June 2023, with a subsequent site monitoring report issued, providing a baseline list of defects identified across the site [1]. These risks were assigned a risk rating using a qualitative risk assessment methodology.

1.3 A description of the site locale and references to existing geotechnical information are presented within Section 1 of the Ground Stabilisation Feasibility Study [2].

1.4 References to supplementary information relating to buried services, UXO risk and topographical surveys are provided in Table 1 of the Ground Stabilisation Options Refinement Technical Note [3].

2 DEFECT WALKOVER SURVEY

2.1 The latest defect walkover survey was undertaken on the 16th February 2024, by a WSP Geotechnical Engineer. Weather conditions were mostly dry and clear, with intermittent light rain showers.

2.2 The purpose of the walkover was to record the updated condition of defects identified during the initial defect survey in June 2023 [1], an interim inspection in October 2023 [4], and the latest survey in completed in February 2024. Information on any new defects which may have developed in the interim period shall also be captured.

2.3 Photos and measurements of each defect were taken and compared to the previous survey in order to determine the rate of deterioration of assets across the site. This would inform the revised risk rating assigned to each defect within the defect schedule.

2.4 The walkover survey comprised inspection of the following areas:

- The Spa;
- The Spa Beach Huts;
- Weather Station Field; and
- Sandpit Field.

2.5 Defect areas were categorised by location with the Spa and Spa Beach Hut areas denoted "A", Weather Station Field denoted "B", and Sandpit Field denoted "C", in the defect schedule. The defect schedule is presented as Appendix A of this technical note.

2.6 A total of 42no. defects were identified during the site walkover. These typically related to, but were not limited to the following:

- Retaining walls with vertical and/or horizontal cracking, bulging or bowing, partial failure in bearing/overturning etc.;
- Hummocky areas where surface distress was identified in grassed areas and footways;
- Tension cracking forming in oversteep vegetated slopes;
- Footway and stairway distress in the form of tension cracking, structural cracking, pavement settlement and heave; and
- Dilapidated surface drainage and retaining wall weepholes, blocked or semi-blocked by debris and siltation.

2.7 Of the 42no. defects observed during the walkover survey, 35no. related to retaining walls, four related to pavements and footways, two related to earthwork slopes, and one related to drainage systems.

2.8 Where identified, a characteristic image of each defect has been included within the defect schedule. A link to a repository of images captured during the inspection shall be made available on request.

2.9 An updated defect risk rating has been assigned to each of the defects based on the February 2024 site walkover, presented in the defect schedule (see Appendix A). These values have been assigned based on a qualitative risk assessment (QRA), to give an approximation of risk levels at the time of the survey.

2.10 The QRA methodology used to derive defect risk ratings is presented as Appendix B.

2.11 The following defects were surveyed and observed to have shown more signifcant degradation in condition compared to the previous survey undertaken in October 2023: B4, B11, C9, C12. Further information on these defects are presented within the defect schedule. The risk level from the previous surveys has been presented within the Defect Schedule to highlight changes in asset condition over time.

2.12 Tension cracking was noted along the extents of the embankment adjacent to defect C12.

2.13 Recommendations on defects which require additional intervention measures are detailed within Section 4.

3 MONITORING DATA

PREVIOUS SURVEYS AND INTERPRETATION (JUNE 2021 – MAY 2023)

3.1 Initial ground monitoring data from site was provided within the Ground Investigation Report (GIR) produced by South West Geotechnical Ltd (SWG), in June 2021 [4]. An interpretation of this monitoring data was provided in the Ground Stabilisation Feasibility Report produced by WSP in September 2022 [2].

3.2 Ground monitoring data has been made available for the site, with the latest readings taken in September 2023. The monitoring regime at the site comprises, eight inclinometers and eight diver piezometers, with results presented as Appendix C.

3.3 During the previous survey period (up to June 2023), spikes in groundwater (GW) were identified in all boreholes from November 2022 to January 2023, consistent with periods of high rainfall, and recharging of groundwater tables underlying the site. The inclinometer data mirrored the results of the high GW readings, with significant near surface movement identified in four of the monitoring locations. However, from March to May 2023, no significant change in the groundwater regime was observed at the site.

SURVEY PERIOD (JUNE – SEPTEMBER 2023)

3.4 In the period leading up to the current defect survey (June – September 2023), groundwater levels remained consistent or saw a slight reduction throughout the period. It should be noted that significant rainfall had occurred the week prior and the day of the defect survey. This period of wet weather would

likely have caused a spike in groundwater levels, with a mirrored response in the inclinometer data anticipated. However, the latest monitoring data available at the point of issue of this report is from September 2023, therefore the resultant effects of these weather events can only be speculated at this point.

3.5 No significant change in inclinometer data was observed during this period. Monitoring locations which observed large movements within 2m of surface level (i.e. BH03, BH07, BH10), indicate deflections have remained consistent or having decreased from previous maximums. This is expected during the summer period where weather conditions are more favourable, resulting in lower groundwater levels and a subsequent reduced effect on slope stability across the site.

3.6 Large displacements were observed in the latest readings taken from BH12, with the deflections in the Face A orientation increasing from -2mm to -8mm in a one-month period. The BH12 inclinometer is located at the crest of the slope, therefore a movement away from the toe is not expected. This could be symptomatic of a larger rotation slip occurring within the slope. This is considered unlikely, however previous inclinometer data at this location indicated a translational movement of the top 1.5m of superficial soils down slope, consistent with the depth of Made Ground observed during the intrusive investigation works. It is assumed that the reading is erroneous, however this trend should be reviewed with the following months monitoring results.

3.7 Based on the observations made from the previous monitoring data during the winter period, further asset degradation is more likely to occur during prolonged periods of wet weather and high groundwater levels. It is recommended that groundwater and inclinometer monitoring is continued throughout the winter period alongside periodic site walkovers to ensure that site defects are appropriately risk managed, and areas cordoned off as necessary.

SURVEY PERIOD (OCTOBER 2023 – FEBRUARY 2024)

3.8 Groundwater conditions have generally been noted to have responded to increased rainfall events in the winter period, with a corresponding increase in ground water levels. In particular BH13 which has indicated groundwater at ground level. Groundwater levels were noted to have peaked in November 2023 and gradually reduced into 2024, with a slight increase in in February 2024.

3.9 It is noted that BH02 is ‘blocked’ and BH08 ‘buried’. These descriptions should be clarified with the monitoring contractor, and methods of recommissioning explored.

3.10 Inclinometer readings from BH03 continue to show an increasing trend of slope movement (up to 12mm) with a potential shear surface at depth approximately 2m bgl. These trends are also reflected in BH07 (10mm) with a potential shear surface at 3m bgl. BH10 has shown an increase following the September visit (6mm) but has remained generally constant in all subsequent visits.

3.11 The BH12 inclinometer continues to show a variation in readings which make assessment of potential movement difficult. Further monitoring is recommended to establish is these readings have stabilised or show an increasing trend.

3.12 The inclinometer in BH14 was noted to have erroneous readings in October 2023. It should be noted that subsequent readings do not indicate any significant movements.

3.13 BH16 inclinometer shows a uncharacteristic change between January and February 2024. This should be reviewed in subsequent visits to establish if this is an increasing movement trend or an anomaly.

3.14 It is recommended that groundwater and inclinometer monitoring is continued throughout the winter and spring periods alongside periodic site walkovers to ensure that site defects are appropriately risk managed, and areas cordoned off as necessary.

4 RECOMMENDATIONS

4.1 Following review of the latest defect survey and the monitoring information, the following general recommendations are given:

- Ongoing walkover surveys should be undertaken at regular intervals (i.e. two to three monthly), to assess the condition of defects identified, and any new defects which have since developed;
- After periods of heavy and prolonged rainfall, an inspection of listed defects should be undertaken by a suitability qualified person on behalf of the Client, to ensure all areas are still sufficiently safe to be opened to members of the public;
- Monthly groundwater and surface monitoring locations should continue, with BH02 and BH08 investigated and where possible commissioned; and
- Areas identified as having high risk (risk rating equal to or greater than 9), should be visually inspected weekly, or after periods of heavy and prolonged rainfall, to ensure no rapid deterioration in the asset has occurred.

4.2 Based on the revised defect risk ratings, recommendations for defect specific mitigation measures are presented in Table 1. It should be noted that the mitigation measures recommended below should be considered supplementary to those stated in previous reports.

Table 1 – Recommended Defect Mitigation Measures

Defect Ref.	Defect Location	Defect Photo	Recommended Mitigation Measure
B11	Weather Station Field		• Continue to monitor regularly. • Further deterioration may require foot path diversion.
C9	Sandpit Field		• Consider removal and light regrade of toe
C12	Sandpit Field	 	Remove remaining bench and infill. • Continue to monitor propagation of tension cracks.

REFERENCES

[1] WSP UK Ltd, “Site Monitoring Report - Shore Road (June 2023),” WSP, Bristol, UK, 2023.

[2] WSP UK Ltd, “Swanage Seafront - Ground Stabilisation Feasibility Study (Report No. 70094760-GEO-REV001),” WSP UK Ltd, Bristol, UK, 2022.

[3] WSP UK Ltd, “Swanage TC - Shore Road - Ground Stabilisation Options Refinement Technical Note – Hybrid Option,” WSP, Bristol, UK, 2023.

[4] South West Geotechnical Ltd, “Swanage Seafront - Geotechnical Assessment (Report No. 12660),” South West Geotechnical, Devon, UK, 2021.

APPENDIX A – DEFECTS SCHEDULE (FEBRUARY 2024)

Swanage Town Council - Shore Road - Asset Defect Schedule (October 2023)											October 2023 Risk Rating	February 2024 Risk Rating					
Defect Ref.	Defect Location	Easting (m)	Northing (m)	Link to Defect Images (June 2023)	Link to Defect Images (Oct 2023)	Link to Defect Images (Feb 2024)	Sample Photo of Defect	Initial Defect Description (June 2023)	Defect Description (Oct 2023)	Defect Description (Feb 2024)	Risk Level	Likelihood (Number)	Likelihood	Effect (Number)	Effect	Risk Level (Number)	Risk Level
A1	The Spa	403068	79415	A1	A1	A1		Vertical and horizontal cracking, bulging/horizontal sliding of failing wall section. Crack width 10 - 20mm. Bowing of wall face, up to 40mm. Loose blockwork, missing masonry, loss of mortar between blockwork. Crack length 1.2m wall height 1.2m Retained height 3.0m+.	Crack width increased to 25mm. Bowing of wall face up to 50mm. North facing wall completely sheared from east facing return. Additional bowing/shearing of masonary at bench level adjacent to return wall, with up to 70mm movement. Recommended that area is fenced/closed off. Return wall supports 3-5m of backfill. In the event of total failure, potential to cause significant harm to members of the public.	No significant change Note heras fencing present to separate area from public	High	3	Likely	3	High	9	High
A2	The Spa	403068	79423	A2	A2	A2		Retaining wall height: 1.3m Retained height: 1.3m Horizontal cracking, crack width up to 10mm. Cracking along failed mortar joint.	Max crack width increased 15mm. Otherwise no significant change (NSC) observed.	No significant change	Low	2	Unlikely	1	Very Low	2	Low
A3	The Spa	403061	79407	A3	A3	A3		Retaining wall height: 0.8m Retained height: 0.8m Vertical cracking and horizontal displacement of wall. Crack width, 40 - 60mm with loose and missing masonry. Evidence of previous repair attempt with cement mix.	Max crack width 80mm. Max translational movement of masonary (left and right hand side) 50mm. Otherwise no significant change, and low risk.	No significant change	Low	2	Unlikely	1	Very Low	2	Low

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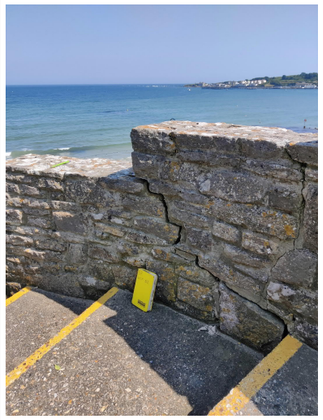
Defect Ref.	Defect Location	Easting (m)	Northing (m)	Link to Defect Images (June 2023)	Link to Defect Images (Oct 2023)	Link to Defect Images (Feb 2024)	Sample Photo of Defect	Initial Defect Description (June 2023)	Defect Description (Oct 2023)	Defect Description (Feb 2024)	Risk Level	Likelihood (Number)	Likelihood	Effect (Number)	Effect	Risk Level (Number)	Risk Level
A4	The Spa	403060	79395	A4	A4	A4		Retaining wall height: 1.0m Retained height: 1.0m Vertical cracking, width up to 30mm. No bowing/bulging of wall face observed. Pavement cracking at base of retaining wall mirroring cracking in retaining wall face.	Surveyed - No significant change.	Vertical cracking, width 40mm	Low	1	Negligible	1	Very Low	1	Low
A5	The Spa	403051	79400	A5	A5	A5		Retaining wall height: 0.9m Retained height: 0.2m Vertical and horizontal cracking, crack width up to 30mm. Appears lower section of wall has settled/rotated away from top section, causing failure of mortar joint and cracking in wall.	Surveyed - No significant change.	No significant change	Low	2	Unlikely	2	Low	4	Low
A6	The Spa	403060	79402	A6	A6	A6		Retaining wall height: 0.9m Retained height: 0.9m Vertical cracking, crack width up to 20mm. Horizontal displacement of right side of wall 10mm from left side. Evidence of previous mortar joint repair, which has since re-failed.	Horizontal displacement of right side of wall increased to 15mm. Otherwise, no significant change, and low risk.	No significant change	Low	2	Unlikely	1	Very Low	2	Low

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Defect Ref.	Defect Location	Easting (m)	Northing (m)	Link to Defect Images (June 2023)	Link to Defect Images (Oct 2023)	Link to Defect Images (Feb 2024)	Sample Photo of Defect	Initial Defect Description (June 2023)	Defect Description (Oct 2023)	Defect Description (Feb 2024)	Risk Level	Likelihood (Number)	Likelihood	Effect (Number)	Effect	Risk Level (Number)	Risk Level
A7	The Spa	403058	79400	A7	A7	A7		Pavement cracking and uneven ground. Differential settlement/transverse cracking in pavement with height up to 10mm. Longitudinal cracking, with width up to 2mm.	Surveyed - No significant change.	No significant change	Low	2	Unlikely	1	Very Low	2	Low
A8	The Spa	403052	79390	A8	A8	A8		Retaining wall height: 1.0m Retained height: 1.0m Vertical and horizontal cracking, cracking width 30 - 60mm. Length of defect 0.7m. Evidence of minor previous patch repairs with cement mix.	No bowing observed. Surveyed - No significant change.	No significant change At end of wall vertical cracking noted 10-20mm in width	Low	2	Unlikely	1	Very Low	2	Low

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Defect Ref.	Defect Location	Easting (m)	Northing (m)	Link to Defect Images (June 2023)	Link to Defect Images (Oct 2023)	Link to Defect Images (Feb 2024)	Sample Photo of Defect	Initial Defect Description (June 2023)	Defect Description (Oct 2023)	Defect Description (Feb 2024)	Risk Level	Likelihood (Number)	Likelihood	Effect (Number)	Effect	Risk Level (Number)	Risk Level
A9	Spa Beach Huts	403028	79367	A9	A9	A9		Retaining wall height: 0.9m Retained height: 0.9m Minor vertical cracking, missing masonry blocks and silted up and damaged back of wall drainage. Damage potentially due to running services through wall, post wall construction.	Surveyed - No significant change.	No significant change	Low	2	Unlikely	1	Very Low	2	Low
A10	Spa Beach Huts	403054	79358	A10	A10	A10		Retaining wall height: 1.25m Retained height: 1.25m Vertical cracking, crack height 0.9m, crack width up to 30mm. Damaged weephole / void at the base of the wall (see left of survey book).	Surveyed - No significant change.	No significant change	Low	2	Unlikely	2	Low	4	Low

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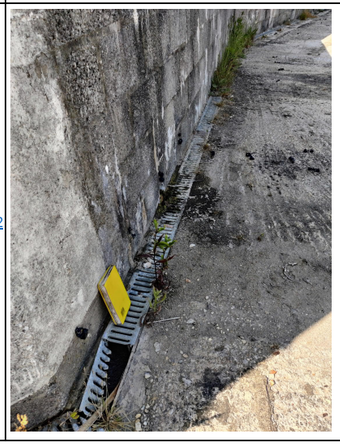
Defect Ref.	Defect Location	Easting (m)	Northing (m)	Link to Defect Images (June 2023)	Link to Defect Images (Oct 2023)	Link to Defect Images (Feb 2024)	Sample Photo of Defect	Initial Defect Description (June 2023)	Defect Description (Oct 2023)	Defect Description (Feb 2024)	Risk Level	Likelihood (Number)	Likelihood	Effect (Number)	Effect	Risk Level (Number)	Risk Level
A11	Spa Beach Huts	403042	79361	A11	A11	A11		Retaining wall height: 2.15m Retained height 2.15m Hairline vertical cracking full height of the wall, crack width ~1mm. Weephole silted up and 2/3 blocked by additional concrete pours, potentiall from previous remedial works.	Could not survey due to lack of access to mid-terrace. From visual inspection in accessible location, no significant change observed.	No significant change	Low	1	Negligible	3	High	3	Low
A12	Spa Beach Huts	403050	79369	A12	A12	A12		Delapidated aco surface water drainage system. Drainage gratings broken, and invert fully silted up for the full length of the retaining wall.	Could not survey due to lack of access to mid-terrace. From visual inspection in accessible location, no significant change observed.	No significant change	Low	3	Likely	1	Very Low	3	Low

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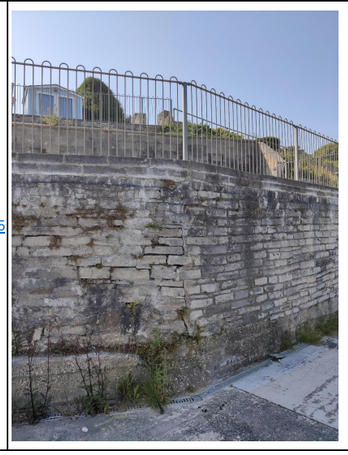
A13	Spa Beach Huts	403055	79380	A13	A13	A13		Retaining wall height: 2.15m Retained height: 2.5m Horizontal hairline cracking, crack width 1mm. Cracking located 1.85m from existing ground level. Slight bulging/bowing at the mid span/mid height of retaining wall. Defect length: 8m.	Could not survey due to lack of access to mid-terrace. From visual inspection in accessible location, no significant change observed.	No significant change	Low	2	Unlikely	1	Very Low	2	Low
A14	Spa Beach Huts	403062	79353	A14	A14	A14		Retaining wall height: 1.2m Retained height: 0m Vertical and horizontal cracking. Crack length 1.1m, crack width up to 3mm. No loose masonry or missing blockwork. No bulging or bowing of the wall structure.	Surveyed - No significant change.	No significant change	Low	2	Unlikely	1	Very Low	2	Low
A15	Spa Beach Huts	403060	79377	A15	A15	A15		Retaining wall height: 2.55m Retained height: 2.55m Vertical cracking, crack length 1.3m, typical crack width between 3 - 10mm. Bulging/bowing at corner section of masonry wall. Loss of mortar between blockwork.	Horizontal crack width 20mm max. Vertical crack width 20mm max. Otherwise no significant change.	No significant change	Low	2	Unlikely	2	Low	4	Low

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Defect Ref.	Defect Location	Easting (m)	Northing (m)	Link to Defect Images (June 2023)	Link to Defect Images (Oct 2023)	Link to Defect Images (Feb 2024)	Sample Photo of Defect	Initial Defect Description (June 2023)	Defect Description (Oct 2023)	Defect Description (Feb 2024)	Risk Level	Likelihood (Number)	Likelihood	Effect (Number)	Effect	Risk Level (Number)	Risk Level
A16	Spa Beach Huts	403060	79381	A16	A16	A16		Retaining wall height: 2.55m Retained height: 2.55m Horizontal and vertical cracking. Crack length 1.6m. Typical crack width 3 - 10mm. Bulging/bowing at the mid span of masonry wall.	Surveyed - No significant change.	No significant change	Low	1	Negligible	2	Low	2	Low
A17	Spa Beach Huts	403062	79383	A17	A17	A17		Retaining wall height: up to 2.2m Retained height: up to 2.5m. Horizontal cracking. Crack length 1.8m. Crack width 3 - 12mm. Horizontal movement of return wall causing cracking, potentially due to bulging/bowing from the main span.	Surveyed - No significant change.	No significant change	Low	1	Negligible	1	Very Low	1	Low
B1	Weather Station Field	403050	79339	B1	B1	B1		Pavement tension cracking, surface deformation and partial collapse. 2no. continuous cracks observed, 3.6m and 11m in length respectively. Multiple patch repairs with asphalt and cement/concrete mix. Ground uneven and with numerous cracks. Crack depths ranging between 5 - 10mm where repairs have not been completed.	Surveyed - No significant change. Slip/trip/fall hazard for members of the public (similar to defect ref. C7). Consider closing off access to footpath, or removing entirely.	Footpath now removed and replaced with grass	Medium	1	Negligible	1	Very Low	1	Low

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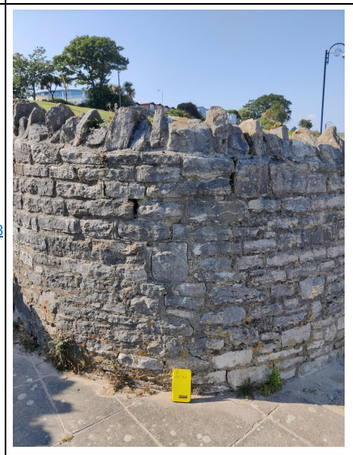
B2	Weather Station Field	403042	79330	B2	B2	B2		In the field area to the east of weather station, hummocky ground observed, with tension cracking in slope, bulging of surface.	Surveyed - No significant change.	No significant change	Medium	3	Likely	2	Low	6	Medium
B3	Weather Station Field	403059	79309	B3	B3	B3		Retaining wall height: 1.8m Retained height: 1.8m Vertical and horizontal cracking, crack width between 2 - 20mm, occuring at apex of wall curvature. No bulging or bowing of the wall observed.	Unable to survey position of maximum crack width due to information signage location. Otherwise no significant change observed.	No significant change	Low	2	Unlikely	2	Low	4	Low
B4	Weather Station Field	403055	79305	B4	B4	B4		Retaining wall height: 1.8m Retained height: 1.8m Curved wall with 3no. sets of vertical cracking. From south face of retaining wall, cracks are at chainage CH 0, 2.0, and 5.5m. Total length of defect: 5.5m. CH 0m Defect: Vertical cracking, crack width typically 30 - 50mm. Missing blockwork at the head of the wall, with significant voids behind mid span of wall (potentially lost mortar or block work following movement). CH 2.0m Defect: Vertical cracking, max crack width typically 90 - 130mm, increasing with height of wall. Missing blockwork at top of wall. CH 5.5m Defect: Vertical cracking, crack width up to 10mm. Blockwork intact.	Survey of crack dimensions hampered by heras fencing panels, which could not be moved. Could not be surveyed accurately. No significant change in structure compared with previous survey. Maintain heras fencing panel around defect. Continue to monitor regularly.	Heras fencing forming exclusion zone. No direct measurements made, however general observations indicate further movement. Continue to monitor and maintain exclusion.	High	3	Likely	3	High	9	High

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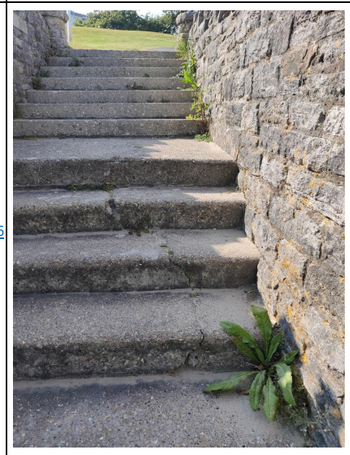
B5	Weather Station Field	403054	79310	B5	B5	B5		Vertical cracking on footpath/stepped access. Crack length 3m, typical crack width 1 - 2mm.	Additional cracking observed at bottom left stairs area. Crack widths similar to previous survey.	No significant change	Low	2	Unlikely	1	Very Low	2	Low
B6	Weather Station Field	403045	79304	B6	B6	B6		Retaining wall height: 1.0m. Retained height: 1.5m Vertical and horizontal cracking, crack length 0.8m. Typical crack width 40 - 60mm. Minor bowing of the wall at mid height.	Previously identified "minor bowing" appears more akin to shearing of top row of finishing stones of wall span, from the wall below. No significant change in crack widths from previous survey.	No significant change in crack widths Noted to be very wet with water issuing from between cracks	Low	1	Negligible	1	Very Low	1	Low
B7	Weather Station Field	403034	79304	B7	B7	B7		Retaining wall height: 0.9m Retained height: 1.0m. Vertical cracking, from base to top of wall (i.e. 0.9m), crack width between 20 - 40mm.	Surveyed - No significant change.	No significant change	Low	1	Negligible	1	Very Low	1	Low

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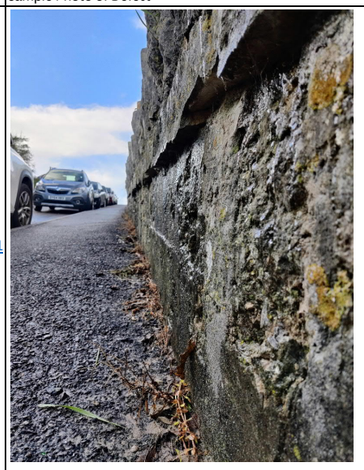
B8	Weather Station Field	403026	79304	B8	B8	B8		Retaining wall height: 0.85m Retained height: 1m + Vertical and horizontal cracking, the full height of the wall (0.85m), with typical crack width of 20mm. Lower right side (east) of wall translational movement relative to rest of wall.	Max crack width increased to up to 40mm. Otherwise no significant change - low risk.	No significant change	Low	1	Negligible	1	Very Low	1	Low
B9	Weather Station Field	403017	79304	B9	B9	B9		Retaining wall height: 1.0m Retained height: 1.0m Vertical cracking, running full height of the wall. Right of the crack (east side of the wall), 30mm translational movement of the wall relative to the west side. Pavement cracking adjacent to retaining wall observed from base of retaining wall.	Surveyed - No significant change.	No significant change	Low	1	Negligible	1	Very Low	1	Low
B10	Weather Station Field	403040	79304	N/A	B10	B10		N/A	Retaining wall height: 0.9m Retained height: 1.0m. Vertical cracking, from base to top of wall (i.e. 0.9m), crack width up to 10mm.	No significant change	Low	2	Unlikely	1	Very Low	2	Low

Swanage Town Council - Shore Road - Asset Defect Schedule (October 2023)											October 2023 Risk Rating	February 2024 Risk Rating					
Defect Ref.	Defect Location	Easting (m)	Northing (m)	Link to Defect Images (June 2023)	Link to Defect Images (Oct 2023)	Link to Defect Images (Feb 2024)	Sample Photo of Defect	Initial Defect Description (June 2023)	Defect Description (Oct 2023)	Defect Description (Feb 2024)	Risk Level	Likelihood (Number)	Likelihood	Effect (Number)	Effect	Risk Level (Number)	Risk Level
B11	Weather Station Field	403040	79304	N/A	B11	B11		N/A	7.5m length of wall, between defect ref. B6 and B7: Shearing of top span of masonry from base of wall, up to 50mm. Movement in superficial material on retained side of weather station field seperating wall at weak/mortar joint location. Risk of collapse over time, and damage to pavement, members of the public, and cars parked on road adjacent to wall. Advise to continue monitoring regularly.	Shearing of top span of masonry from base of wall, increased to 70mm. Evidence of seepage through wall, along extents. Advise to continue monitoring regularly. Further deterioration may required foot path diversion.	Medium	2	Unlikely	3	High	6	Medium
C1	Sandpit Field	403000	79294	C1	C1	C1		Retaining wall height: 1.0m. Retained height: 1.0m Vertical cracking, full height of wall, typical crack width 5 - 30mm. Large bushes overhanging back of retaining wall, likely the cause of distress observed in the structure.	Displacement of east side of wall relative to the west up to 30mm. Otherwise no significant change - low risk.	No significant change	Low	2	Unlikely	1	Very Low	2	Low
C2	Sandpit Field	403009	79294	C2	C2	C2		Retaining wall height: 0.8m Retained height: 0.8m Vertical cracking full height of wall, typical crack width 5 - 20mm. Evidence of historic patch repair made previously.	Surveyed - No significant change.	No significant change	Low	1	Negligible	1	Very Low	1	Low

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Defect Ref.	Defect Location	Easting (m)	Northing (m)	Link to Defect Images (June 2023)	Link to Defect Images (Oct 2023)	Link to Defect Images (Feb 2024)	Sample Photo of Defect	Initial Defect Description (June 2023)	Defect Description (Oct 2023)	Defect Description (Feb 2024)	Risk Level	Likelihood (Number)	Likelihood	Effect (Number)	Effect	Risk Level (Number)	Risk Level
C3	Sandpit Field	403024	79295	C3	C3	C3		Retaining wall height: 0.95m Retained height 1.0m Vertical cracking, full height of wall, crack width between 1 - 3mm.	Surveyed - No significant change.	No significant change	Low	1	Negligible	1	Very Low	1	Low
C4	Sandpit Field	403035	79295	C4	C4	C4		Retaining wall height: 1.0m Retained height: 1.2m Vertical cracking, full height of wall. Crack width 20 - 40mm.	Small void at base of wall due to loss of mortar/masonry. Likely lost from translational movement of the wall. Otherwise no significant change.	No significant change	Low	1	Negligible	1	Very Low	1	Low
C5	Sandpit Field	403058	79290	C5	C5	C5		Retaining wall height: 1.25m Retained height 1.25m Vertical and horizontal cracking, typical crack width 20 - 30mm. Transverse movement of the wall, mortar joint failure from masonry blockwork moving apart.	Vertical and horizontal cracking increased from 20-30mm to 40-50mm. Otherwise health of asset unchanged. Low risk.	No significant change	Low	2	Unlikely	2	Low	4	Low

Swanage Town Council - Shore Road - Asset Defect Schedule (October 2023)											October 2023 Risk Rating	February 2024 Risk Rating					
Defect Ref.	Defect Location	Easting (m)	Northing (m)	Link to Defect Images (June 2023)	Link to Defect Images (Oct 2023)	Link to Defect Images (Feb 2024)	Sample Photo of Defect	Initial Defect Description (June 2023)	Defect Description (Oct 2023)	Defect Description (Feb 2024)	Risk Level	Likelihood (Number)	Likelihood	Effect (Number)	Effect	Risk Level (Number)	Risk Level
C6	Sandpit Field	403054	79280	C6	C6	C6		Retaining wall height: 0.6m Retained height: 1.5m+ Vertical cracking full height of the wall. Typical crack width between 10 - 15mm. Overgrown bushes and vegetation acting on the back of the wall the likely cause of deterioration of the retaining structure.	Typical crack width increased to 15-25mm. Otherwise no significant change - low risk.	No significant change	Low	2	Unlikely	2	Low	4	Low
C7	Sandpit Field	403057	79248	C7	C7	C7		Multiple areas of pavement cracking and surface deformation (one example shown face left). Distress in asphalt behind lower slope retaining walls observed where rotation of lower wall was seen (see defect C13). Additional areas of distress in pavement seen where up slope area is oversteepened and not effectively restrained by retaining structure or otherwise, see defect C12.	Defect has been repaired, asphalt has been re-laid in area following slip/trip/fall incident. Bench removed from area. Area to be checked in follow up surveys to ensure defect does not reoccur.	No significant change	Low	1	Negligible	1	Very Low	1	Low
C8	Sandpit Field	403056	79252	C8	C8	C8		Retaining wall height: 1.3m Retained height 3.0m + 6 l.m of terraced masonry blocks which were observed to be overturning with over steepened slope behind. Blocks likely installed to prevent shallow slip failure of material above, however global stability of slope borderline.	Blocks further overturned. Further ravelling of slope material. A 1 m section of toe has a paving stone/blockwork missing. Unsupported toe area has an increased risk of slip/localised slope failure. Regular inspection of area recommended to inspect condition. Consider replacing stone/blockwork to provide support to the face.	No significant change	Medium	2	Unlikely	3	High	6	Medium

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Defect Ref.	Defect Location	Easting (m)	Northing (m)	Link to Defect Images (June 2023)	Link to Defect Images (Oct 2023)	Link to Defect Images (Feb 2024)	Sample Photo of Defect	Initial Defect Description (June 2023)	Defect Description (Oct 2023)	Defect Description (Feb 2024)	Risk Level	Likelihood (Number)	Likelihood	Effect (Number)	Effect	Risk Level (Number)	Risk Level
C9	Sandpit Field	403056	79246	C9	C9	C9		Retaining wall height: 0.6m Retained height: 3m + 7.5 l.m of retaining wall blocks partially overturned at toe of retaining wall. Insufficient embedment of blocks at toe, and oversteepened slope behind overloading wall.	Surveyed - No significant change.	Slabs appear to have rotated further outward, consider removal or replacement	Low	3	Likely	2	Low	6	Medium
C10	Sandpit Field	403052	79239	C10	C10	C10		3 l.m of tension cracking observed in oversteep section of slope. Width of tension crack approx 200mm, and 250mm depth in areas.	Tension crack width Otherwise no significant change. Continue to monitor on ongoing basis.	No significant change	Medium	3	Likely	2	Low	6	Medium
C11	Sandpit Field	403055	79235	C11	C11	C11		Retaining wall height: 0.3m Retained height: 3m+ 2 lm section of retaining wall at the rear of benches, has overturned by 30 degrees from vertical. Large overgrown vegetation acting immediately behind the rear of wall, likely cause of issue.	Overturning of retaining wall increased to 45 degrees from vertical. Low risk, however continue to monitor. Risk of causing hazards related to slips/trip/falls, particularly adjacent to bench + pedestrian walkway.	Evidence of increased tilt - continue to monitor.	Low	2	Unlikely	1	Very Low	2	Low

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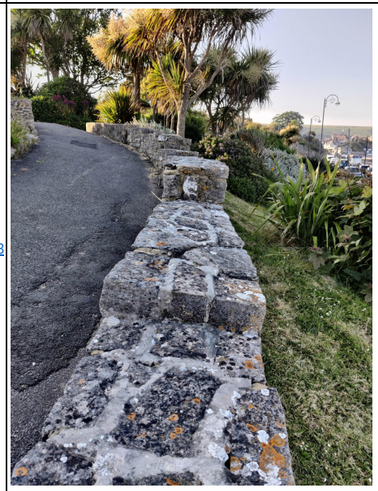
Defect Ref.	Defect Location	Easting (m)	Northing (m)	Link to Defect Images (June 2023)	Link to Defect Images (Oct 2023)	Link to Defect Images (Feb 2024)	Sample Photo of Defect	Initial Defect Description (June 2023)	Defect Description (Oct 2023)	Defect Description (Feb 2024)	Risk Level	Likelihood (Number)	Likelihood	Effect (Number)	Effect	Risk Level (Number)	Risk Level
C12	Sandpit Field	403055	79202	C12	C12	C12		3no. Failed retaining wall which use to house benches. Retaining wall height: 0.6m Retained height 2.5 - 3.5m + Masonry wall fully overturned and collapse of the main wall span. Partial collapse of the return walls either side of each retaining wall. Bulging and hummocking of stone slab at ground level, and signs of distress in adjacent asphalt where retaining walls have failed, indicating greater/deeper global failure occuring.	2nd/Middle retaining wall: - Increased ravelling of shallow material observed. -Shallow slip developing above overturned masonry. Considering heras fencing, cordoning off. Retaining Walls 1 + 3: Surveyed - No significant change observed.	Infilled with sleeps and planting - tension cracking noted above this section and above adjacent retaining walls. Continue to monitor. It is advised that the remaining bench is removed in this section.	Medium	3	Likely	2	Low	6	Medium
C13	Sandpit Field	403057	79207	C13	C13	C13		Retaining wall height: 1.0m Retained height: 0.3m Minor tilt/overturning observed in section of masonry wall. Area of overturning matches asphalt repairs and scarring work indicating link between the two. Defect length 22 lm.	Surveyed - No significant change.	No significant change. Footway resurfaced.	Low	2	Unlikely	2	Low	4	Low
C14	Sandpit Field	403039	79146	C14	C14	C14		Retaining wall height: 1.25m Retained height: 1.25m Lack of mortar joints connecting this section of wall, therefore potential reconstruction of wall section with dry stone wall technique. Mid height bulging/bowing of the wall likely due to large bushes/trees directly overhanging the back of the wall. Defect length approx 6 lm.	Significant bow in the wall, due to large bushes/trees directly overhanging back of the wall. Bow/overturn measured as 7 degrees to the vertical. Recommended that trees are coppiced, to remove load from back of the wall, and limit damage to wall without killing tree. Killing or removing the tree would cause the decay/rotting of root system, which is likely providing some intergrity to the wall structure.	No significant change.	Medium	3	Likely	2	Low	6	Medium

APPENDIX B – QUALITATIVE RISK ASSESSMENT METHODOLOGY

QUALITATIVE RISK ASSESSMENT (QRA) METHODOLOGY

Qualitative risk assessments are a method of measuring relative risk, based on ranking or descriptive categories. It is an industry standard means of determining a level of risk and is therefore considered appropriate and sufficient for use at this site.

LIKELIHOOD OF FAILURE

The likelihood of failure for each defect shall be assessed with consideration to findings defect and walkover surveys, and results from any previous Ground Investigation Reports.

Table 1 – Qualitative Risk Assessment; Likelihood

Score	Likelihood	Chance of occurrence (%)
5	Almost certain	>70
4	Probable	50-70
3	Likely	30-50
2	Unlikely	10-30
1	Negligible	<10

EFFECT OF FAILURE

The effect should a failure occur within a defect has been considered with reference to:

- Wall or slope geometry;
- Volume of failed material;
- Proximity to roads and pedestrian footways; and
- Potential to cause damage to infrastructure or harm to members of the public, within the site boundary.

Effect is commonly categorised based on the impact to cost or time, including damage to property and personnel injury.

Table 2 - Risk Assessment; Effect

Score	Effect	Cost or Time
4	Very High	Multiple fatalities and/or unserviceable damage to property
3	High	Fatality or injury to people or major damage to property
2	Low	Minor injury to people or minor damage to property
1	Very Low	Negligible damage
0	None	No effect

RISK LEVEL

A Risk Rating can subsequently be calculated using the adopted principle of Risk = Likelihood x Effect. Each risk rating corresponds to the respective Risk Level, ranging from low to very high risk.

Table 3 - Risk Assessment; Risk Level

Score	Risk Level
13-20	Very High
9-12	High
5-8	Medium
0-4	Low

APPENDIX C – MONITORING RESULTS (FEBRUARY 2024)