

## 1. General information

| Location Plan:                                                                                                                                                                                                                                                                               | <b>Avalanche East Sea Wall</b><br>Assessment Date: 20/04/2021 |                                                                          |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------|--------------------------------------------------------------------------|
|                                                                                                                                                                                                                                                                                              | CARRS Exam ID:                                                | <b>13251866</b>                                                          |
|                                                                                                                                                                                                                                                                                              | Exam Type:                                                    | <b>Detailed</b>                                                          |
|                                                                                                                                                                                                                                                                                              | Complete Survey:                                              | Yes                                                                      |
|                                                                                                                                                                                                                                                                                              | Network Rail ELR:                                             | <b>CNH3</b>                                                              |
|                                                                                                                                                                                                                                                                                              | Structure Reference:                                          | <b>W2291320</b>                                                          |
|                                                                                                                                                                                                                                                                                              | Mileage:                                                      | <b>229m 1320yds 60chs</b>                                                |
|                                                                                                                                                                                                                                                                                              | OS Ref:                                                       | 270460 , 376250                                                          |
|                                                                                                                                                                                                                                                                                              | Operational Area:                                             | North Wales                                                              |
| NOTE: This document has been prepared as an Asset Condition Survey Report for Network Rail. JBA Consulting accepts no responsibility or liability for any use that is made of this document other than by the Client for the purposes for which it was originally commissioned and prepared. |                                                               |                                                                          |
| Governing SMP2:                                                                                                                                                                                                                                                                              |                                                               | 20 – Garizim to the Great                                                |
| SMP2 Policy Unit:                                                                                                                                                                                                                                                                            |                                                               | 20.1- Garizim                                                            |
| SMP2 Policy:                                                                                                                                                                                                                                                                                 |                                                               | 2025 = hold the line;<br>2055 = hold the line;<br>2105 = hold the line;. |

### 1.1. Type of structure and general description (to include key components and materials)

Avalanche East Sea Wall is located alongside the Crewe North to Holyhead line, between Penmaenmawr (270,460; 376,250m) and Llanfairfechan stations (270,103; 376,253m). The start of the defence is adjacent to a local authority coastal defence that extends to the east, while the end of the defence ties into the Pen-y-Cip headland.

- Avalanche East Sea Wall – it comprises of a near vertical wall section masonry (stone/blocks with mortar) of differing incline, with a masonry parapet and a concrete apron on a short part and a number of drainage outlets through the structure.
- The height of the wall ranges from 9m to 10m and the parapet varies from 2m to 3m according to information obtained from previous reports. The increase in height of the parapet is mainly to support the roof/deck of the viaduct shelter located immediately east of Penmaenmawr Tunnel.

The wall was examined on foot from the beach level at low tide.

### 1.2. Summary of condition and critical defects

There has been no major change in condition since 2016 and the defence remains in fair condition. Repairs have been addressed such as filling in mortar joints on the capping wall. However, a number of localised defects have been identified that could undermine the integrity of the structure. The following works are recommended:

- Further investigation to establish the source of the flow through the wall section, whether it is washing out material from behind the wall or it has been designed as a drain through the wall or it is a defect, in one lower section of the wall, a visible flowing seepage point is now showing. In 2021 inspection there is a large amount of undermining of the wall.

## 1.3. Access considerations

|                                                 |                                                                                                                                                                                |
|-------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Network Rail access requirement:                | No COSS                                                                                                                                                                        |
| Third party/adjacent landowner permissions:     | Not required                                                                                                                                                                   |
| Nearest public highway:                         | A55                                                                                                                                                                            |
| Local guidance:                                 | The defence can be accessed from the esplanade car park that is off the A55 Expressway via Conway Road/Bangor Road, Penmaenmawr. The defence can only be accessed at low tide. |
| Tide state during survey:                       | Neap (Not defined)                                                                                                                                                             |
| Equipment required for access and examinations: | No COSS required                                                                                                                                                               |

## 2. Structure information

| CERD Hierarchy | Asset Type | Major Elements | Minor Elements  | Attributes |
|----------------|------------|----------------|-----------------|------------|
| Section A      | Defence    | Wall           | Wall section    | Masonry    |
|                | Defence    | Wall           | Wall Apron      | Concrete   |
|                | Defence    | Wall           | Parapet/Capping | Masonry    |
| Section B      | Defence    | Wall           | Wall section    | Masonry    |
|                | Defence    | Wall           | Wall Armour     | N/A        |

|                                                                     |                                                                                                                                                                                                                                                       |     |                 |
|---------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|-----------------|
| General Description of Structure:                                   |                                                                                                                                                                                                                                                       |     |                 |
| Approx. defence length (m):                                         | 360m                                                                                                                                                                                                                                                  |     |                 |
| Approx. co-ordinates from:                                          | 270466 , 376267                                                                                                                                                                                                                                       | to: | 270101 , 376256 |
| As built drawing available:                                         | No                                                                                                                                                                                                                                                    |     |                 |
| Linked to other Asset Types:                                        | None                                                                                                                                                                                                                                                  |     |                 |
| NR Infrastructure protected:                                        | 360 m of CNH3 situated 2m from the structure crest.                                                                                                                                                                                                   |     |                 |
| Assets type and ownership that the defence ties into at either end: | The start of the defence is adjacent to a local authority defence (wall, masonry) whose condition should be monitored as it still shows cracks and there are indications of erosion at the toe. The end of the defence abuts the Pen-y-Clip headland. |     |                 |

### 2.1. Topographic level information

|                                        | Defence (Section B) | Defence (Section A) |
|----------------------------------------|---------------------|---------------------|
| Track level (mAOD)                     | N/A                 | 10.0 (LIDAR)        |
| Crest level of primary defence (mAOD)  | N/A                 | 11.6 (GPS)          |
| Toe level of primary defence (mAOD)    | N/A                 | N/A                 |
| Approx. defence height above beach (m) | N/A                 | 12.8 (GPS)          |
| Upper beach level (mAOD)               | N/A                 | N/A                 |
| Lower beach level (mAOD)               | N/A                 | N/A                 |
| Approx. total beach height (m)         | N/A                 | N/A                 |
| Beach crest width (m)                  | N/A                 | N/A                 |
| Approx. beach gradient (1in ...)       | N/A                 | N/A                 |
| Upper beach composition                | N/A                 | Sand                |
| Lower beach composition                | N/A                 | N/A                 |

### 2.2. Extreme sea level information

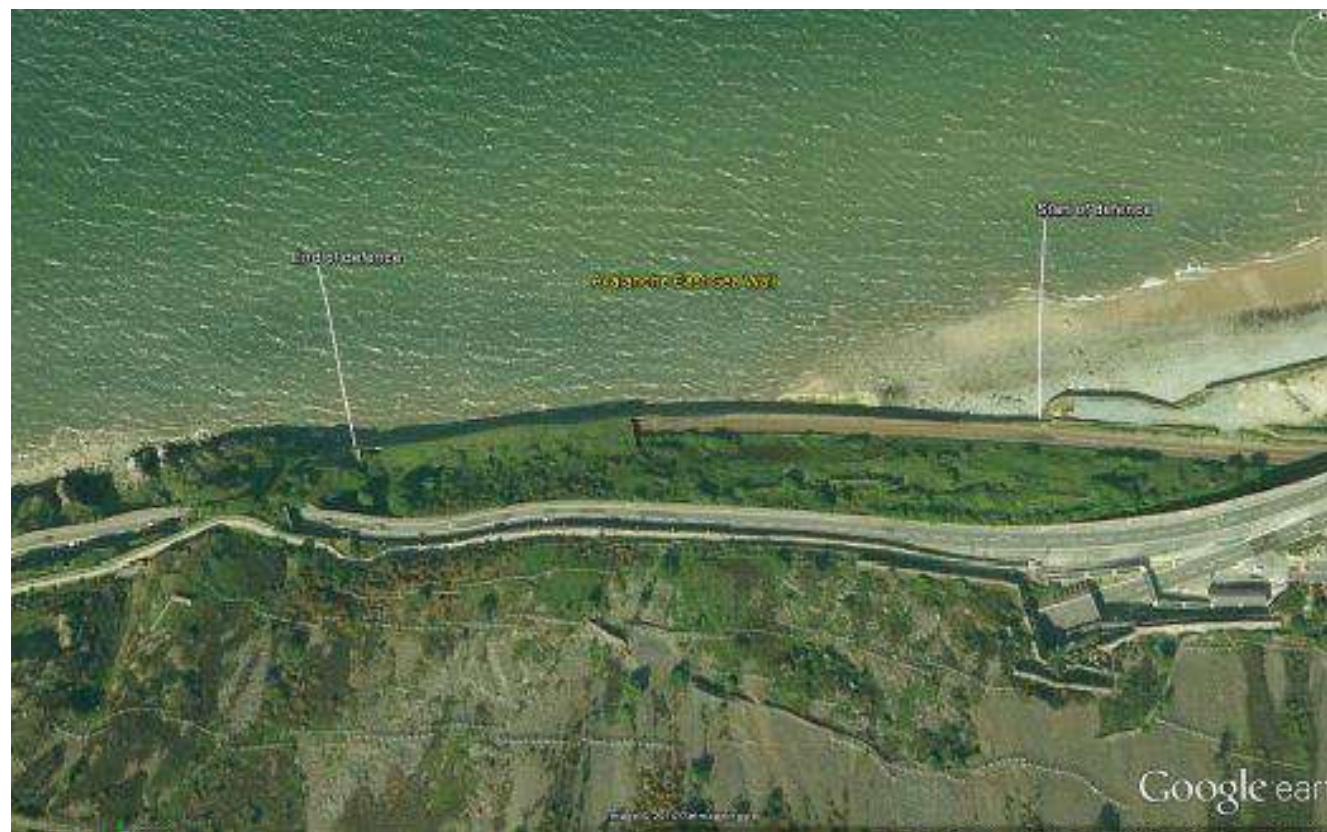
# COASTAL ASSET CONDITION SURVEY REPORT



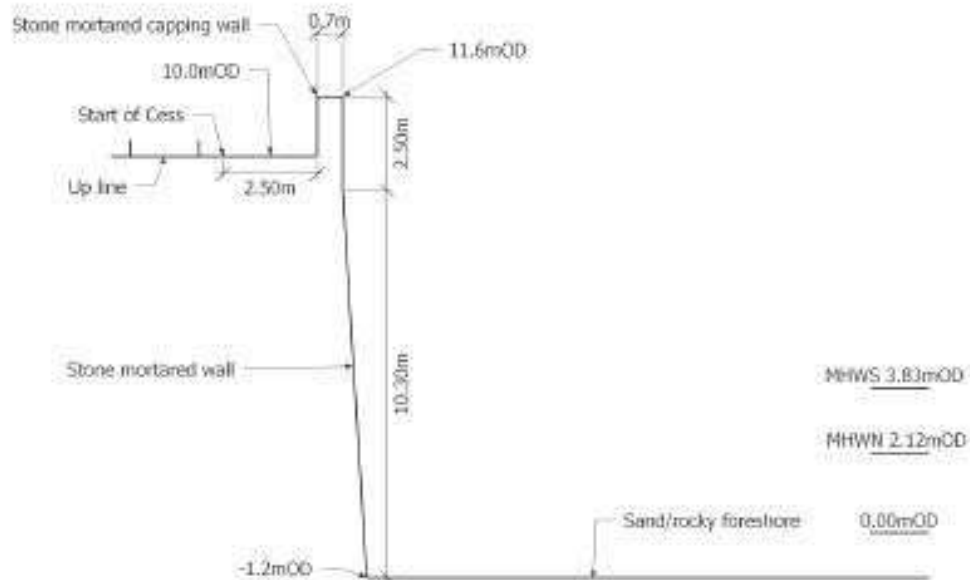
| Return Period | Extreme sea level (mAOD) | Extreme sea level + climate change (mAOD) |
|---------------|--------------------------|-------------------------------------------|
| 1             | 4.67 (2016)              | 5.37 (2115)                               |
| 5             | 4.86 (2016)              | 5.56 (2115)                               |
| 10            | 4.94 (2016)              | 5.64 (2115)                               |
| 20            | 5.02 (2016)              | 5.72 (2115)                               |
| 50            | 5.13 (2016)              | 5.83 (2115)                               |
| 100           | 5.21 (2016)              | 5.91 (2115)                               |
| 200           | 5.30 (2016)              | 6.00 (2115)                               |

## 3. Asset site sketch

### Plan



## Sketch



## 4. Visual Condition Survey

### Visual Condition Survey (Defence - Section A) Major Element - Wall

| Minor Elements             | Photo No.                                                                                                                                    | Attributes and General Notes                                                                                                                                                                                            | Condition Grade | Weighting (1-9) | Overall (CG x W) |
|----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|-----------------|------------------|
| Wall section               | 41                                                                                                                                           | Masonry (Masonry (stone blocks with mortar) (open joints at the toe, seepage at the toe/base of the wall, stone blocks exposed) ).                                                                                      | 3               | 7               | 21               |
| Wall Apron                 | 40                                                                                                                                           | Concrete (Concrete (apron placed on a small section that probably was due to exposure of the toe, concrete is missing in some areas and blocks are exposed, poor finishing of the concrete and repairs in some areas)). | 3               | 7               | 21               |
| Parapet/Capping            |                                                                                                                                              | Masonry (Masonry (stone blocks with mortar) (open joints/loss of mortar at same location as identified in previous Amey report. ).                                                                                      | 3               | 7               | 21               |
|                            |                                                                                                                                              |                                                                                                                                                                                                                         |                 |                 |                  |
| Sum (W)                    |                                                                                                                                              |                                                                                                                                                                                                                         |                 | 21              |                  |
| Sum (CG x W)               |                                                                                                                                              |                                                                                                                                                                                                                         |                 |                 | 63               |
| <b>Overall Asset Grade</b> | <b>Sum of (Weight x Condition Grades) divided by sum of weightings. Unless weighting of 9 for any element, then condition grade is used.</b> |                                                                                                                                                                                                                         | <b>3</b>        |                 |                  |

### Visual Condition Survey (Defence - Section B) Major Element - Wall

| Minor Elements             | Photo No.                                                                                                                                    | Attributes and General Notes                                                                                                       | Condition Grade | Weighting (1-9) | Overall (CG x W) |
|----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|-----------------|-----------------|------------------|
| Wall section               | 39                                                                                                                                           | Masonry (Masonry (stone blocks with mortar) (open joints at the toe, seepage at the toe/base of the wall, stone blocks exposed) ). | 3               | 7               | 21               |
| Wall Armour                |                                                                                                                                              |                                                                                                                                    | 3               | 6               | 18               |
|                            |                                                                                                                                              |                                                                                                                                    |                 |                 |                  |
| Sum (W)                    |                                                                                                                                              |                                                                                                                                    |                 | 13              |                  |
| Sum (CG x W)               |                                                                                                                                              |                                                                                                                                    |                 |                 | 39               |
| <b>Overall Asset Grade</b> | <b>Sum of (Weight x Condition Grades) divided by sum of weightings. Unless weighting of 9 for any element, then condition grade is used.</b> |                                                                                                                                    | <b>3</b>        |                 |                  |

## 4.1. Asset condition grade summary

|                                  | Defence (Section B) | Defence (Section A) |
|----------------------------------|---------------------|---------------------|
| Target condition grade           | 2                   | 1                   |
| Overall surveyed condition grade | 3                   | 3                   |
| Total time taken to reach CG1    | N/A                 | N/A                 |
| Total time taken to reach CG2    | N/A                 | N/A                 |
| Total time taken to reach CG3    | N/A                 | N/A                 |
| Total time taken to reach CG4    | 10                  | 20                  |
| Total time taken to reach CG5    | 20                  | 30                  |

## 4.2. Additional information

|                                                                                         |                                                                                                                                                                                                                                                                                                                                                       |
|-----------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| General description and effect of any coastal erosion noted:                            | Signs of erosion/scour at the toe of the structure in the defence adjacent to the structure which indicated that erosion processes are happening. However, they are not visible in the defence being surveyed as it might have a deeper toe than the adjacent one. Minor indication of abrasion visible in the rounding of blocks. No further change. |
| General description and effect of any wave overtopping noted:                           | Not clearly evident during the asset inspection.                                                                                                                                                                                                                                                                                                      |
| General description and effect of any longshore / cross-shore sediment transport noted: | No visible signs during inspection.                                                                                                                                                                                                                                                                                                                   |

# COASTAL ASSET CONDITION SURVEY REPORT



## 5. Identification of defects and recommendations

| Defect Ref No. | Defect Location (NGR)       | Major Element | Minor Element | Photo Ref        | Severity | Probability | Risk Score | Below MHWS | Defect Group | Defect Description                                                                                                                                                                     | Recommendations                                                                               | Defect Priority |
|----------------|-----------------------------|---------------|---------------|------------------|----------|-------------|------------|------------|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|-----------------|
| D1             | N/A                         | Wall          | Wall section  | 104, 102, 42, 80 | 2        | 4           | 8          | True       | N/A          | Open joints. 600mm deep near the repair. Between the 2020 and 2021 examinations, no change to defects. Open joints are still present with some minor loss of blocks                    | Re-point open joints                                                                          | 6               |
|                | N/A                         | Wall          | Wall section  | 71, 72, 82       | 2        | 4           | 8          | True       | N/A          | Open joints. Between the 2020 and 2021 examinations, there is no change.                                                                                                               | Re-point open joints                                                                          | 6               |
| D2             | 270129, 376247 CNH3 229.167 | Wall          | Wall section  | 76, 77, 83       | 2        | 4           | 8          | N/A        | N/A          | There are Missing blocks around the outfall. Between the 2016 and 2020 examinations, all the outfalls have missing blocks. Between the 2020 and 2021 examinations, there is no change. | Replace missing blocks, and further investigation of the services and source of water seepage | 4               |

# COASTAL ASSET CONDITION SURVEY REPORT



| Defect Ref No. | Defect Location (NGR)       | Major Element | Minor Element | Photo Ref                         | Severity | Probability | Risk Score | Below MHWS | Defect Group | Defect Description                                                                                             | Recommendations                                                                               | Defect Priority |
|----------------|-----------------------------|---------------|---------------|-----------------------------------|----------|-------------|------------|------------|--------------|----------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|-----------------|
|                | 270563, 376305 CNH3 229.125 | Wall          | Wall section  | 103                               | 2        | 4           | 8          | True       | N/A          | Missing blocks around the outfall                                                                              | Replace missing blocks, and further investigation of the services and source of water seepage | 4               |
| D3             | 270571, 376306 CNH3 229.124 | Wall          | Wall section  | 105, 45, 52                       | 1        | 2           | 2          | False      | N/A          | There is mineral seepage. Between the 2016 and 2020, and 2020 and 2021 examinations, there has been no change. | Further investigation of the source of mineral seepage                                        | 8               |
|                | 270139, 376249 CNH3 229.166 | Wall          | Wall section  | 61, 84                            | 1        | 2           | 2          | N/A        | N/A          | Mineral seepage. Between the 2016 and 2020, and 2020 and 2021 examinations, there has been no change.          | Further investigation of the source of mineral seepage                                        | 9               |
| D4             | N/A                         | Wall          | Wall section  | 107, 106, 108, 63, 64, 65, 73, 85 | 4        | 2           | 8          | True       | N/A          | Seepage through the wall. Between the 2020 and 2021 inspections, there has been no change.                     | Further investigation of the source of mineral seepage                                        | 4               |

# COASTAL ASSET CONDITION SURVEY REPORT



| Defect Ref No. | Defect Location (NGR)       | Major Element | Minor Element | Photo Ref                                                                    | Severity | Probability | Risk Score | Below MHWS | Defect Group | Defect Description                                                                                                                                                                                                                  | Recommendations               | Defect Priority |
|----------------|-----------------------------|---------------|---------------|------------------------------------------------------------------------------|----------|-------------|------------|------------|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|-----------------|
| D5             | 270127, 376253 CNH3 229.168 | Wall          | Wall section  | 109, 110, 123, 124, 125, 126, 135, 131, 133, 132, 134, 136, 138, 137, 58, 86 | 2        | 3           | 6          | True       | N/A          | Open joints. There have been some new joint pointing undertaken, however open joints at the toe were not able to be found due to probable burial from shingle material. Between the 2020 and 2021 examinations, there is no change. | Repoint open joints           | 3               |
| D6             | 270138, 376255 CNH3 229.166 | Wall          | Wall section  | 111, 112, 122, 130, 129, 150, 149, 55, 66, 81                                | 2        | 4           | 8          | True       | N/A          | Old corroded access ladder. Between the 2020 and 2021 examinations, there has been no change all the ladder points are corroded along with the extent of the asset.                                                                 | Consider replacing the ladder | 1               |
| D7             | 270151, 376256 CNH3 229.165 | Wall          | Wall section  | 113, 114, 115, 62, 74, 75, 87                                                | 2        | 4           | 8          | False      | N/A          | Vegetation growth on top of the wall. Between the 2020 and 2021 examinations, there is no change.                                                                                                                                   | Remove vegetation             | 10              |

# COASTAL ASSET CONDITION SURVEY REPORT



| Defect Ref No. | Defect Location (NGR)      | Major Element | Minor Element | Photo Ref                            | Severity | Probability | Risk Score | Below MHWS | Defect Group | Defect Description                                                                                                                                                                                                                      | Recommendations                              | Defect Priority |
|----------------|----------------------------|---------------|---------------|--------------------------------------|----------|-------------|------------|------------|--------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|-----------------|
| D8             | N/A                        | Wall          | Wall section  | 117, 116, 119, 118, 120, 121, 78, 88 | 2        | 3           | 6          | True       | N/A          | There are Voids at the toe of the blockwork 300mm deep. The defect is unidentifiable or has been repaired. Between the 2020 and 2021 examinations, original photograph defect was not located but voids were noted in similar location. | Re-point open joints in parapet wall         | 7               |
| D9             | 270198, 376267 CNH3 229.16 | Wall          | Wall section  | 127, 128, 67, 70, 89, 90             | 2        | 4           | 8          | True       | N/A          | Mineral seepage. Between the 2020 and 2021 examinations, there is no change.                                                                                                                                                            | Monitor for signs of further mineral seepage | 5               |
| D10            | N/A                        | Wall          | Wall section  | 144, 143, 145, 146, 142, 56, 91, 92  | 2        | 3           | 6          | True       | N/A          | There is a large open joint with seepage. The joint has been filled. Between the 2020 and 2021 examinations, additional large open joints were visible due to reduced wall toe protection.                                              | Fill in the open joints                      | 6               |

# COASTAL ASSET CONDITION SURVEY REPORT



| Defect Ref No. | Defect Location (NGR)       | Major Element | Minor Element   | Photo Ref                  | Severity | Probability | Risk Score | Below MHWS | Defect Group | Defect Description                                                                                                                                                                                           | Recommendations                              | Defect Priority |
|----------------|-----------------------------|---------------|-----------------|----------------------------|----------|-------------|------------|------------|--------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------|-----------------|
| D11            | N/A                         | Wall          | Parapet/Capping | 148, 147, 57               | 1        | 1           | 1          | False      | N/A          | There are Large open joints present. Between the 2016 and 2020 examinations, the defect has been repaired.                                                                                                   | Close out defect                             | 10              |
| D12            | 270459, 376255 CNH3 229.132 | Wall          | Wall section    | 152, 151, 53, 54, 93, 94   | 2        | 4           | 8          | True       | N/A          | There is a Poorer condition of the adjacent connecting sea wall. Fractures have been formed, mineral washout, and seepage. Between the 2020 and 2021 examinations, fracture appears to have widened slightly | Consider repairing the fractures             | 5               |
| D13            | N/A                         | Wall          | Wall section    | 43, 44, 47, 48, 49, 50, 51 | 3        | 1           | 3          | True       | N/A          | 4* Large fracture in the wall from the bottom up approx. 3m with missing blocks and voids at the bottom in the adjacent wall.                                                                                | Inform the adjacent landowner of the defect. | 10              |
| D14            | N/A                         | Wall          | Wall section    | 46                         | 2        | 1           | 2          | True       | N/A          | Mortar washed out in between the joints approx. 300mm deep.                                                                                                                                                  | Inform adjacent landowner of defect.         | 10              |

# COASTAL ASSET CONDITION SURVEY REPORT



| Defect Ref No. | Defect Location (NGR)       | Major Element | Minor Element | Photo Ref             | Severity | Probability | Risk Score | Below MHWS | Defect Group | Defect Description                                                                                                                                            | Recommendations                                   | Defect Priority |
|----------------|-----------------------------|---------------|---------------|-----------------------|----------|-------------|------------|------------|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------|-----------------|
| D15            | N/A                         | Wall          | Wall section  | 59, 60, 96            | 2        | 3           | 6          | True       | N/A          | Undermining with pooling water approx 150mm deep. Defect not found in 2021 potentially buried in shingle                                                      | grout the toe of the wall to prevent undermining. | 2               |
| D16            | N/A                         | Wall          | Wall section  | 68, 69                | 3        | 4           | 12         | True       | N/A          | During the 2020 inspection, there is a critical and visible seepage point in the toe of the wall. Between the 2020 and 2021 examinations, there is no change. | Fill in the seepage point with concrete repair.   | 5               |
| D17            | 270359, 376260 CNH3 229.143 | Wall          | Wall Apron    | 141, 140, 139, 79, 95 | 2        | 3           | 6          | True       | N/A          | Minor spalling across the concrete apron. Between the 2020 and 2021 examinations, there is no change.                                                         | Consider repairing the apron                      | 9               |
| D18            | N/A                         | Wall          | Wall section  | 97, 98                | 2        | 3           | 6          | True       | N/A          | Open joints and voids in the face of the wall                                                                                                                 | Fill in joints and voids                          | 6               |

# COASTAL ASSET CONDITION SURVEY REPORT



| Defect Ref No. | Defect Location (NGR) | Major Element | Minor Element | Photo Ref    | Severity | Probability | Risk Score | Below MHWS | Defect Group | Defect Description                                                                                                                                                                                                                          | Recommendations          | Defect Priority |
|----------------|-----------------------|---------------|---------------|--------------|----------|-------------|------------|------------|--------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|-----------------|
| D19            | N/A                   | Wall          | Wall section  | 99, 100, 101 | 4        | 3           | 12         | True       | N/A          | Deep undermining of the wall at the start of the asset adjacent to the steps. The concrete abutment has been scoured and undermined back to the wall level. The wall has also been scoured and undermined. The extent of undermining is 15m | Repair concrete abutment | 1               |

## 6. Health and safety check

### Health and Safety Check (Defence - Section A)

|                                              |    | Photos and Notes |
|----------------------------------------------|----|------------------|
| <b>Handrails</b>                             |    |                  |
| Are handrails necessary?                     | No |                  |
| Are handrails present?                       | No |                  |
| Are handrails secured?                       | -  |                  |
| Handrail construction material               | -  |                  |
| Are handrails corroded?                      | -  |                  |
| Is handrail paint in good condition?         | -  |                  |
| <b>Ladders / Steps</b>                       |    |                  |
| Are ladders / steps necessary for access?    | No |                  |
| Are ladder / steps present?                  | No |                  |
| Steps construction material                  | -  |                  |
| Are steps in good condition?                 | -  |                  |
| Are steps free of algae growth?              | -  |                  |
| Are ladders secured?                         | -  |                  |
| Are ladders corroded?                        | -  |                  |
| Is ladder paint in good condition?           | -  |                  |
| <b>Ramps and walkways</b>                    |    |                  |
| Are ramps and walkways necessary for access? | No |                  |
| Are ramps and walkways present?              | No |                  |
| Ramp construction material                   | -  |                  |
| Are ramps in good condition?                 | -  |                  |
| Are ramps free of algae growth?              | -  |                  |
| <b>Safety Harness Attachments</b>            |    |                  |
| Are attachments necessary for inspection?    | No |                  |
| Are attachments present?                     | No |                  |
| Are attachments in good condition?           | -  |                  |
|                                              |    |                  |

#### Summary of health and safety items

The access is taken via steps on the east side of the asset leading down from the carpark. These steps should be taken with caution as are very slippery. The asset involves moving across lots of rock which can be difficult to navigate in wet conditions. At the toe of the section is a weathered concrete apron, however as this is below the MHWS this has high amounts of algae growth therefore must be taken with caution due to high risk of slips/trips.

# COASTAL ASSET CONDITION SURVEY REPORT



| Health and Safety Check (Defence - Section B) |    |                  |
|-----------------------------------------------|----|------------------|
|                                               |    | Photos and Notes |
| <b>Handrails</b>                              |    |                  |
| Are handrails necessary?                      | No |                  |
| Are handrails present?                        | No |                  |
| Are handrails secured?                        | -  |                  |
| Handrail construction material                | -  |                  |
| Are handrails corroded?                       | -  |                  |
| Is handrail paint in good condition?          | -  |                  |
| <b>Ladders / Steps</b>                        |    |                  |
| Are ladders / steps necessary for access?     | No |                  |
| Are ladder / steps present?                   | No |                  |
| Steps construction material                   | -  |                  |
| Are steps in good condition?                  | -  |                  |
| Are steps free of algae growth?               | -  |                  |
| Are ladders secured?                          | -  |                  |
| Are ladders corroded?                         | -  |                  |
| Is ladder paint in good condition?            | -  |                  |
| <b>Ramps and walkways</b>                     |    |                  |
| Are ramps and walkways necessary for access?  | No |                  |
| Are ramps and walkways present?               | No |                  |
| Ramp construction material                    | -  |                  |
| Are ramps in good condition?                  | -  |                  |
| Are ramps free of algae growth?               | -  |                  |
| <b>Safety Harness Attachments</b>             |    |                  |
| Are attachments necessary for inspection?     | No |                  |
| Are attachments present?                      | No |                  |
| Are attachments in good condition?            | -  |                  |
|                                               |    |                  |
| <b>Summary of health and safety items</b>     |    |                  |

## 7. Asset Assessment

### 7.1. Recommended works

**Band A: Emergency works** (Defect posing an immediate safety hazard. Immediate action required.)

| Defect Ref No. | Works Category          | Recommendations                                        | Recommended Closure Date | Latest Status            |
|----------------|-------------------------|--------------------------------------------------------|--------------------------|--------------------------|
| D4             | Brickwork/Stone Repairs | Further investigation of the source of mineral seepage |                          | Active Defect (Approved) |

**Band B: Short-term remedial works** (Defect posing a potential safety hazard. Work recommended within 12 month period.)

| Defect Ref No. | Works Category          | Recommendations                                                                               | Recommended Closure Date | Latest Status            |
|----------------|-------------------------|-----------------------------------------------------------------------------------------------|--------------------------|--------------------------|
| D2             | Brickwork/Stone Repairs | Replace missing blocks, and further investigation of the services and source of water seepage |                          | Active Defect (Approved) |
| D2             |                         | Replace missing blocks, and further investigation of the services and source of water seepage |                          | Active Defect (Approved) |
| D6             | Metalwork Repairs       | Consider replacing the ladder                                                                 |                          | Active Defect (Approved) |
| D16            | Concrete Repairs        | Fill in the seepage point with concrete repair.                                               |                          | Active Defect            |

**Band C: Medium-term remedial works** (Defect posing a potential safety hazard. Work recommended within 12 to 30 month period.)

| Defect Ref No. | Works Category          | Recommendations                                   | Recommended Closure Date | Latest Status            |
|----------------|-------------------------|---------------------------------------------------|--------------------------|--------------------------|
| D1             |                         | Re-point open joints                              |                          | Active Defect (Approved) |
| D1             | Brickwork/Stone Repairs | Re-point open joints                              |                          | Active Defect (Approved) |
| D8             | Brickwork/Stone Repairs | Re-point open joints in parapet wall              |                          | Active Defect (Approved) |
| D9             | Other                   | Monitor for signs of further mineral seepage      |                          | Active Defect (Approved) |
| D15            | Concrete Repairs        | grout the toe of the wall to prevent undermining. |                          | Active Defect            |
| D17            | Concrete Repairs        | Consider repairing the apron                      |                          | Active Defect (Approved) |
| D18            | Brickwork/Stone Repairs | Fill in joints and voids                          |                          | Active Defect            |
| D19            | Concrete Repairs        | Repair concrete abutment                          |                          | Active Defect            |

**Band D: Long-term maintenance works** (Defect resulting in long-term deterioration of structure or affecting performance. Work recommended within 30 to 48 month period.)

| Defect Ref No. | Works Category          | Recommendations                                        | Recommended Closure Date | Latest Status            |
|----------------|-------------------------|--------------------------------------------------------|--------------------------|--------------------------|
| D3             | Brickwork/Stone Repairs | Further investigation of the source of mineral seepage |                          | Active Defect (Approved) |

# COASTAL ASSET CONDITION SURVEY REPORT



|     |                           |                                                        |  |                          |
|-----|---------------------------|--------------------------------------------------------|--|--------------------------|
| D3  | Other                     | Further investigation of the source of mineral seepage |  | Active Defect (Approved) |
| D5  | Brickwork/Stone Repairs   | Repoint open joints                                    |  | Active Defect (Approved) |
| D7  | Vegetation                | Remove vegetation                                      |  | Active Defect (Approved) |
| D10 | Brickwork/Stone Repairs   | Fill in the open joints                                |  | Active Defect (Approved) |
| D11 | Brickwork/Stone Repairs   | Close out defect                                       |  | Active Defect (Approved) |
| D12 | Brickwork/Stone Repairs   | Consider repairing the fractures                       |  | Active Defect (Approved) |
| D13 | Brickwork/Stone Repairs   | Inform the adjacent landowner of the defect.           |  | Active Defect            |
| D14 | Bridge Strike Ancillaries | Inform adjacent landowner of defect.                   |  | Active Defect            |

## Appendix 1 – Photographs

### Asset Structure Photos

Photo number: 1



Photo number: 3



Photo number: 2



## Section Photos

Section A  
Photo number: 21



Section A  
Photo number: 22



Section A  
Photo number: 24



Section A  
Photo number: 25



Section A  
Photo number: 23



Section A  
Photo number: 28



Section A  
Photo number: 27



Section A  
Photo number: 26



Section A  
Photo number: 29



Section A  
Photo number: 30



Section A  
Photo number: 31



Section A  
Photo number: 35



Section A  
Photo number: 33



Section A  
Photo number: 34



**Section A**  
**Photo number: 36**



**Section A**  
**Photo number: 37**



Section A  
Photo number: 38



Section A  
Photo number: 32



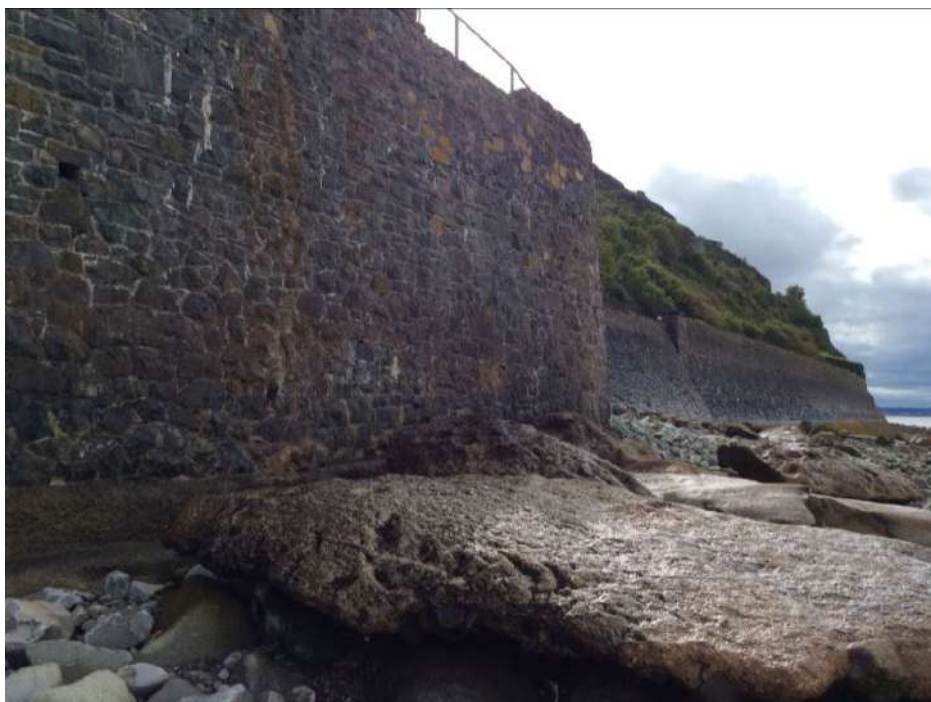
**Section A**  
**Photo number: 8**

**Date Taken:**  
19/08/2020 16:36



**Section A**  
**Photo number: 9**

**Date Taken:**  
19/08/2020 16:36



**Section A**  
**Photo number: 10**

**Date Taken:**  
19/08/2020 16:54



**Section A**  
**Photo number: 11**

**Date Taken:**  
19/08/2020 16:54



**Section A**  
**Photo number: 12**

**Date Taken:**  
19/08/2020 17:10



**Section A**  
**Photo number: 13**

**Date Taken:**  
20/04/2021 10:36



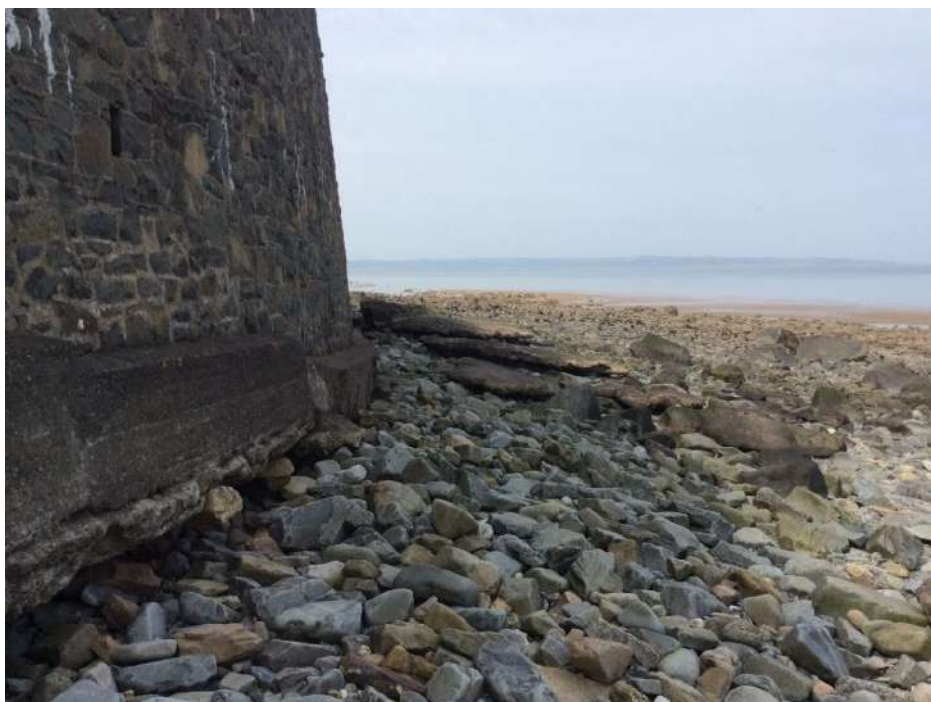
**Section A**  
**Photo number: 14**

**Date Taken:**  
20/04/2021 10:36



**Section A**  
**Photo number: 15**

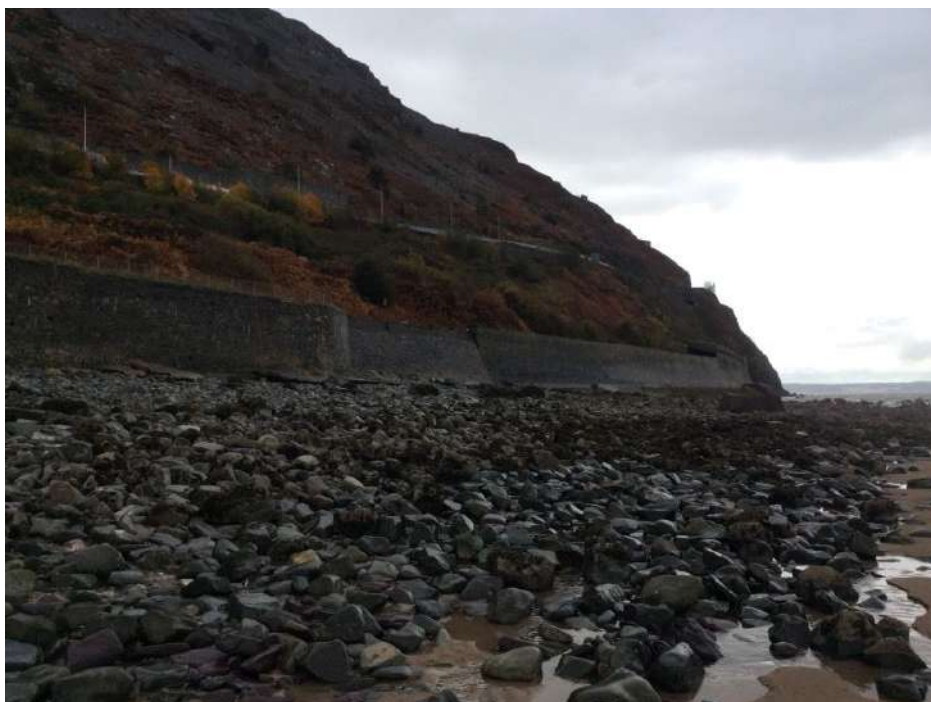
**Date Taken:**  
20/04/2021 11:28



Section B  
Photo number: 18



Section B  
Photo number: 19



Section B  
Photo number: 16



Section B  
Photo number: 17



Section B  
Photo number: 20



Section B  
Photo number: 4

Date Taken:  
19/08/2020 16:14



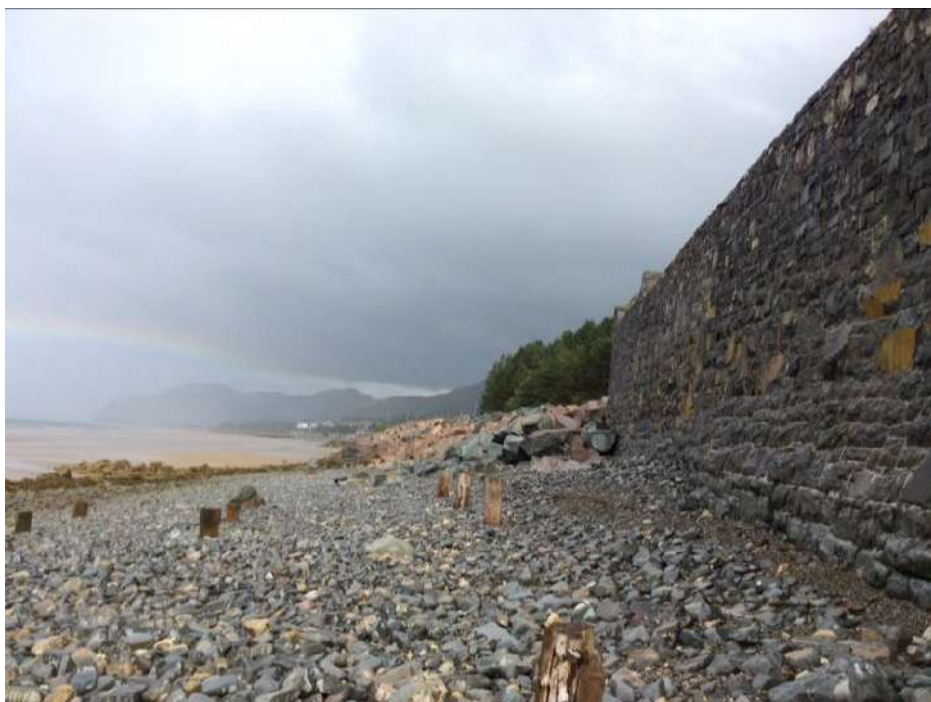
**Section B**  
**Photo number: 5**

**Date Taken:**  
19/08/2020 16:15



**Section B**  
**Photo number: 6**

**Date Taken:**  
19/08/2020 16:19



**Section B**  
**Photo number: 7**

**Date Taken:**  
19/08/2020 16:25



## Element Survey Photos

**Section A**  
**Wall Apron**  
**Photo number: 40**

**Date Taken:**  
19/08/2020 17:23

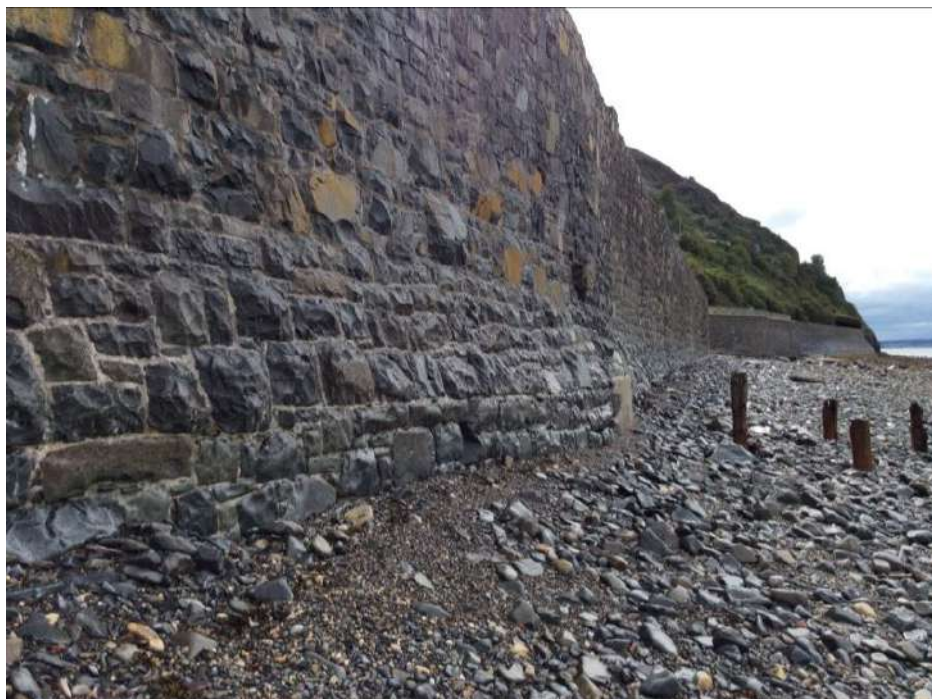


**Section A**  
**Wall section**  
**Photo number: 41**



Section B  
Wall section  
Photo number: 39

Date Taken:  
19/08/2020 16:25



## Defect Photos

**Section A**  
**Wall section**  
**Defect Ref: D1**  
**Description:** Open joints. Between the 2020 and 2021 examinations, there is no change.

**Photo number: 71**

**Date Taken:**  
19/08/2020 17:08



**Section A**  
**Wall section**  
**Defect Ref: D1**  
**Description:** Open joints. Between the 2020 and 2021 examinations, there is no change.

**Photo number: 72**

**Date Taken:**  
19/08/2020 17:09



**Section A**  
**Wall section**  
**Defect Ref: D1**  
**Description:** Open joints. Between the 2020 and 2021 examinations, there is no change.

**Photo number: 82**

**Date Taken:**  
20/04/2021 10:45



**Section B**  
**Wall section**  
**Defect Ref: D1**  
**Description:** Open joints. 600mm deep near the repair. Between the 2020 and 2021 examinations, no change to defects. Open joints are still present with some minor loss of blocks  
**Photo number: 104**



## Section B

### Wall section

#### Defect Ref: D1

**Description:** Open joints. 600mm deep near the repair. Between the 2020 and 2021

examinations, no change to defects. Open joints are still present with some minor loss of blocks

**Photo number: 102**



## Section B

### Wall section

#### Defect Ref: D1

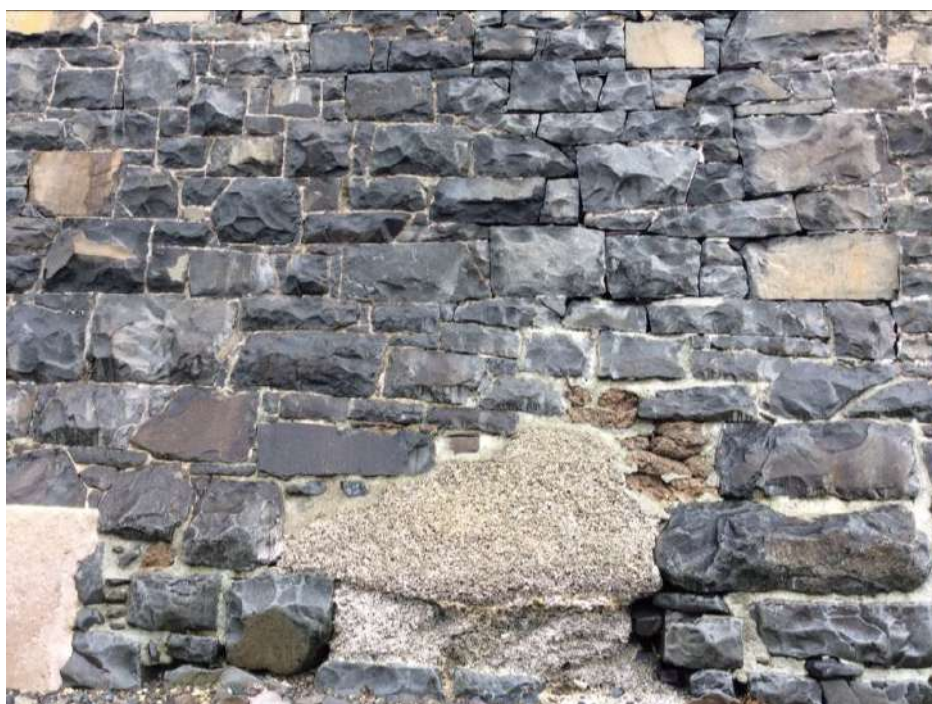
**Description:** Open joints. 600mm deep near the repair. Between the 2020 and 2021

examinations, no change to defects. Open joints are still present with some minor loss of blocks

**Photo number: 42**

#### Date Taken:

19/08/2020 16:20



## Section B

### Wall section

#### Defect Ref: D1

**Description:** Open joints. 600mm deep near the repair. Between the 2020 and 2021

examinations, no change to defects. Open joints are still present with some minor loss of blocks

**Photo number: 80**

#### Date Taken:

20/04/2021 10:39



## Section A

### Wall section

#### Defect Ref: D2

**Description:** There are Missing blocks around the outfall. Between the 2016 and 2020 examinations, all the outfalls have missing blocks. Between the 2020 and 2021 examinations, there is no change.

**Photo number: 76**

#### Date Taken:

19/08/2020 17:14



## Section A

### Wall section

#### Defect Ref: D2

**Description:** There are Missing blocks around the outfall. Between the 2016 and 2020 examinations, all the outfalls have missing blocks. Between the 2020 and 2021 examinations, there is no change.

**Photo number: 77**

**Date Taken:**

19/08/2020 17:16



## Section A

### Wall section

#### Defect Ref: D2

**Description:** There are Missing blocks around the outfall. Between the 2016 and 2020 examinations, all the outfalls have missing blocks. Between the 2020 and 2021 examinations, there is no change.

**Photo number: 83**

**Date Taken:**

20/04/2021 10:49



**Section B**  
**Wall section**  
**Defect Ref: D2**  
**Description:** Missing  
blocks around the  
outfall  
**Photo number: 103**



**Section A**  
**Wall section**  
**Defect Ref: D3**  
**Description:** Mineral  
seepage. Between  
the 2016 and 2020,  
and 2020 and 2021  
examinations, there  
has been no change.

**Photo number: 61**

**Date Taken:**  
19/08/2020 16:56



**Section A**  
**Wall section**  
**Defect Ref: D3**  
**Description:** Mineral seepage. Between the 2016 and 2020, and 2020 and 2021 examinations, there has been no change.

**Photo number: 84**

**Date Taken:**  
20/04/2021 10:50



**Section B**  
**Wall section**  
**Defect Ref: D3**  
**Description:** There is mineral seepage. Between the 2016 and 2020, and 2020 and 2021 examinations, there has been no change.

**Photo number: 105**



## Section B

### Wall section

#### Defect Ref: D3

**Description:** There is mineral seepage. Between the 2016 and 2020, and 2020 and 2021 examinations, there has been no change.

**Photo number: 45**

**Date Taken:**

19/08/2020 16:24



## Section B

### Wall section

#### Defect Ref: D3

**Description:** There is mineral seepage. Between the 2016 and 2020, and 2020 and 2021 examinations, there has been no change.

**Photo number: 52**

**Date Taken:**

19/08/2020 16:35



## Section A

### Wall section

**Defect Ref: D4**

#### Description:

Seepage through the wall. Between the 2020 and 2021 inspections, there has been no change.

**Photo number: 107**



## Section A

### Wall section

**Defect Ref: D4**

#### Description:

Seepage through the wall. Between the 2020 and 2021 inspections, there has been no change.

**Photo number: 106**



**Section A**  
**Wall section**  
**Defect Ref: D4**  
**Description:**  
Seepage through the wall. Between the 2020 and 2021 inspections, there has been no change.  
**Photo number: 108**



**Section A**  
**Wall section**  
**Defect Ref: D4**  
**Description:**  
Seepage through the wall. Between the 2020 and 2021 inspections, there has been no change.  
**Photo number: 63**

**Date Taken:**  
19/08/2020 16:59



**Section A**  
**Wall section**  
**Defect Ref: D4**  
**Description:**  
Seepage through the wall. Between the 2020 and 2021 inspections, there has been no change.  
**Photo number: 64**

**Date Taken:**  
19/08/2020 16:59



**Section A**  
**Wall section**  
**Defect Ref: D4**  
**Description:**  
Seepage through the wall. Between the 2020 and 2021 inspections, there has been no change.  
**Photo number: 65**

**Date Taken:**  
19/08/2020 17:01



**Section A**  
**Wall section**  
**Defect Ref: D4**  
**Description:**  
Seepage through the wall. Between the 2020 and 2021 inspections, there has been no change.  
**Photo number: 73**

**Date Taken:**  
19/08/2020 17:09



**Section A**  
**Wall section**  
**Defect Ref: D4**  
**Description:**  
Seepage through the wall. Between the 2020 and 2021 inspections, there has been no change.  
**Photo number: 85**

**Date Taken:**  
20/04/2021 10:51



## Section A

### Wall section

#### Defect Ref: D5

**Description:** Open joints. There have been some new joint pointing undertaken, however open joints at the toe were not able to be found due to probable burial from shingle material. Between the 2020 and 2021 examinations, there is no change.

**Photo number: 109**



## Section A

### Wall section

#### Defect Ref: D5

**Description:** Open joints. There have been some new joint pointing undertaken, however open joints at the toe were not able to be found due to probable burial from shingle material. Between the 2020 and 2021 examinations, there is no change.

**Photo number: 110**



## Section A

### Wall section

#### Defect Ref: D5

**Description:** Open joints. There have been some new joint pointing undertaken, however open joints at the toe were not able to be found due to probable burial from shingle material. Between the 2020 and 2021 examinations, there is no change.

**Photo number: 123**



## Section A

### Wall section

#### Defect Ref: D5

**Description:** Open joints. There have been some new joint pointing undertaken, however open joints at the toe were not able to be found due to probable burial from shingle material. Between the 2020 and 2021 examinations, there is no change.

**Photo number: 124**



## Section A

### Wall section

#### Defect Ref: D5

**Description:** Open joints. There have been some new joint pointing undertaken, however open joints at the toe were not able to be found due to probable burial from shingle material. Between the 2020 and 2021 examinations, there is no change.

**Photo number: 125**



## Section A

### Wall section

#### Defect Ref: D5

**Description:** Open joints. There have been some new joint pointing undertaken, however open joints at the toe were not able to be found due to probable burial from shingle material. Between the 2020 and 2021 examinations, there is no change.

**Photo number: 126**



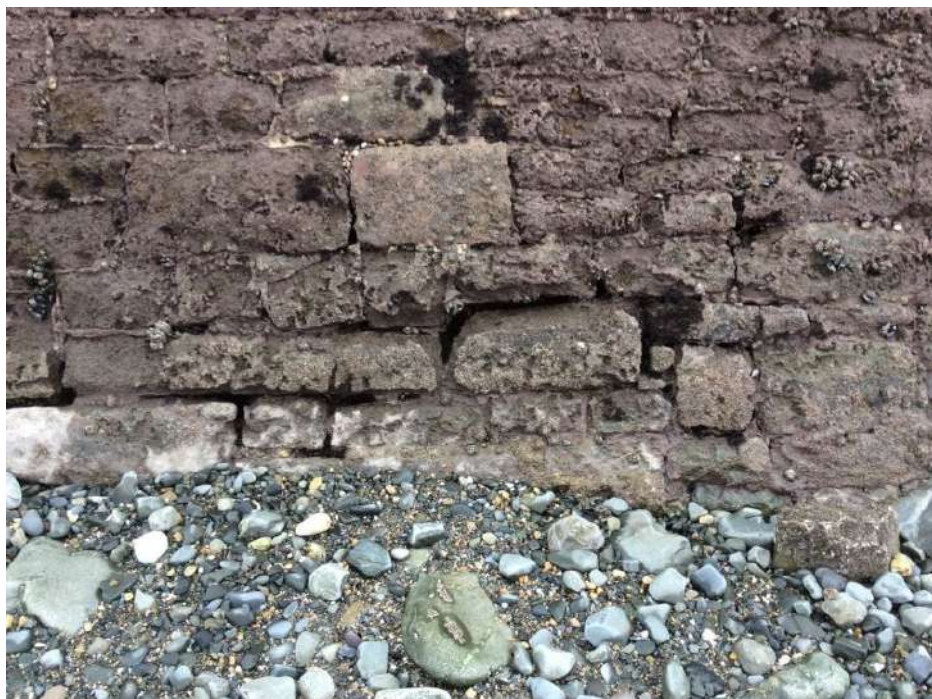
## Section A

### Wall section

#### Defect Ref: D5

**Description:** Open joints. There have been some new joint pointing undertaken, however open joints at the toe were not able to be found due to probable burial from shingle material. Between the 2020 and 2021 examinations, there is no change.

**Photo number: 135**



## Section A

### Wall section

#### Defect Ref: D5

**Description:** Open joints. There have been some new joint pointing undertaken, however open joints at the toe were not able to be found due to probable burial from shingle material. Between the 2020 and 2021 examinations, there is no change.

**Photo number: 131**



## Section A

### Wall section

#### Defect Ref: D5

**Description:** Open joints. There have been some new joint pointing undertaken, however open joints at the toe were not able to be found due to probable burial from shingle material. Between the 2020 and 2021 examinations, there is no change.

**Photo number: 133**



## Section A

### Wall section

#### Defect Ref: D5

**Description:** Open joints. There have been some new joint pointing undertaken, however open joints at the toe were not able to be found due to probable burial from shingle material. Between the 2020 and 2021 examinations, there is no change.

**Photo number: 132**



**Section A****Wall section****Defect Ref: D5**

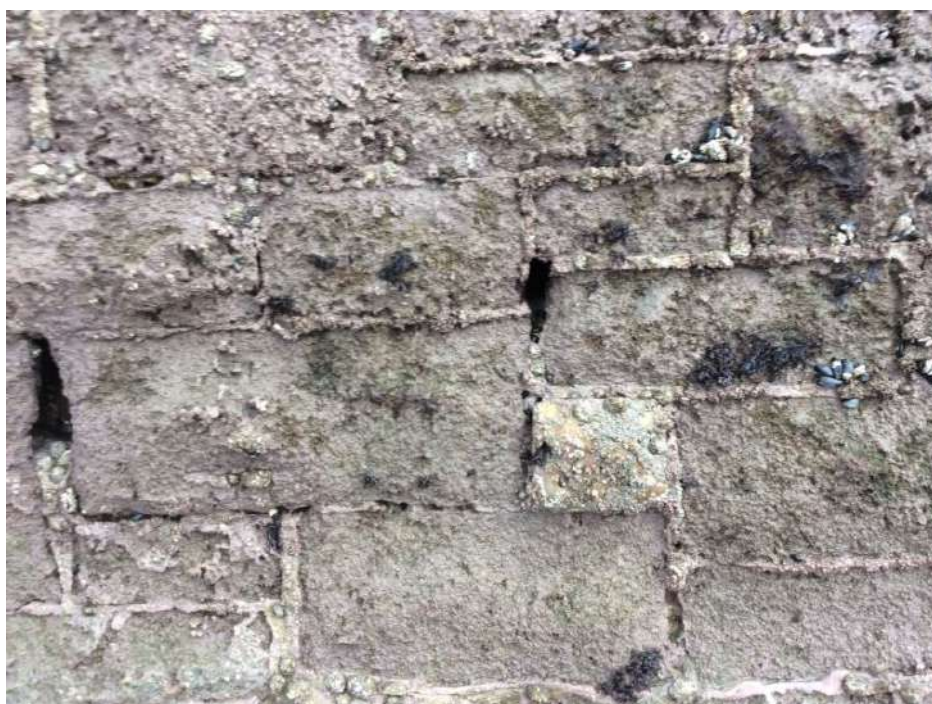
**Description:** Open joints. There have been some new joint pointing undertaken, however open joints at the toe were not able to be found due to probable burial from shingle material. Between the 2020 and 2021 examinations, there is no change.

**Photo number: 134**

**Section A****Wall section****Defect Ref: D5**

**Description:** Open joints. There have been some new joint pointing undertaken, however open joints at the toe were not able to be found due to probable burial from shingle material. Between the 2020 and 2021 examinations, there is no change.

**Photo number: 136**



## Section A

### Wall section

#### Defect Ref: D5

**Description:** Open joints. There have been some new joint pointing undertaken, however open joints at the toe were not able to be found due to probable burial from shingle material. Between the 2020 and 2021 examinations, there is no change.

**Photo number: 138**



## Section A

### Wall section

#### Defect Ref: D5

**Description:** Open joints. There have been some new joint pointing undertaken, however open joints at the toe were not able to be found due to probable burial from shingle material. Between the 2020 and 2021 examinations, there is no change.

**Photo number: 137**



## Section A

### Wall section

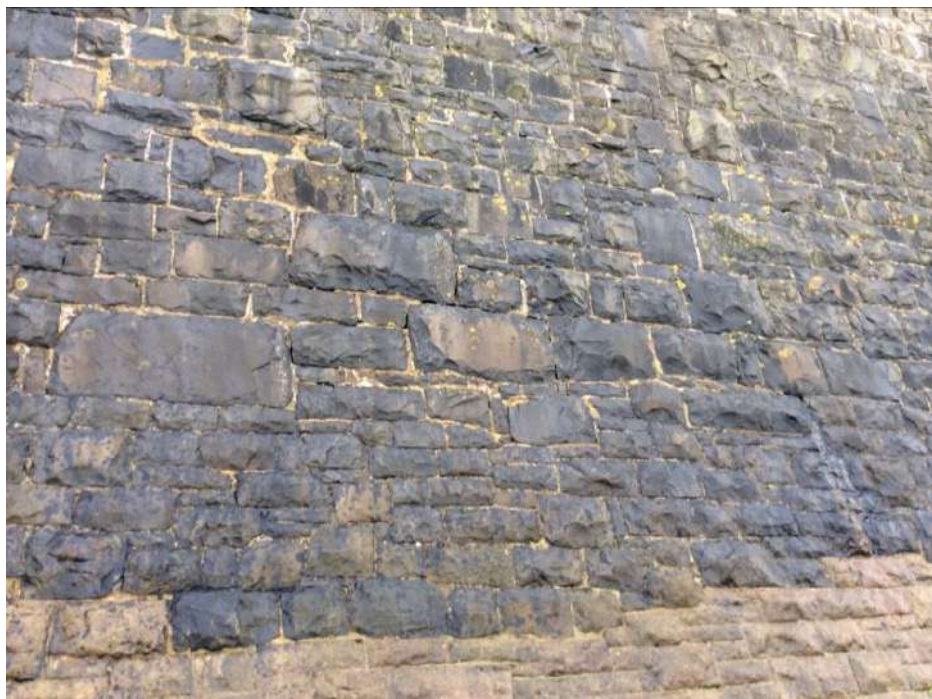
#### Defect Ref: D5

**Description:** Open joints. There have been some new joint pointing undertaken, however open joints at the toe were not able to be found due to probable burial from shingle material. Between the 2020 and 2021 examinations, there is no change.

**Photo number: 58**

#### Date Taken:

19/08/2020 16:48



## Section A

### Wall section

#### Defect Ref: D5

**Description:** Open joints. There have been some new joint pointing undertaken, however open joints at the toe were not able to be found due to probable burial from shingle material. Between the 2020 and 2021 examinations, there is no change.

**Photo number: 86**

#### Date Taken:

20/04/2021 10:52



**Section A**  
**Wall section**  
**Defect Ref: D6**  
**Description:** Old corroded access ladder. Between the 2020 and 2021 examinations, there has been no change all the ladder points are corroded along with the extent of the asset.  
**Photo number: 111**



**Section A**  
**Wall section**  
**Defect Ref: D6**  
**Description:** Old corroded access ladder. Between the 2020 and 2021 examinations, there has been no change all the ladder points are corroded along with the extent of the asset.  
**Photo number: 112**



**Section A**  
**Wall section**  
**Defect Ref: D6**  
**Description:** Old corroded access ladder. Between the 2020 and 2021 examinations, there has been no change all the ladder points are corroded along with the extent of the asset.  
**Photo number: 122**



**Section A**  
**Wall section**  
**Defect Ref: D6**  
**Description:** Old corroded access ladder. Between the 2020 and 2021 examinations, there has been no change all the ladder points are corroded along with the extent of the asset.  
**Photo number: 130**



**Section A**  
**Wall section**  
**Defect Ref: D6**  
**Description:** Old corroded access ladder. Between the 2020 and 2021 examinations, there has been no change all the ladder points are corroded along with the extent of the asset.  
**Photo number: 129**



**Section A**  
**Wall section**  
**Defect Ref: D6**  
**Description:** Old corroded access ladder. Between the 2020 and 2021 examinations, there has been no change all the ladder points are corroded along with the extent of the asset.  
**Photo number: 150**



## Section A

### Wall section

#### Defect Ref: D6

**Description:** Old corroded access ladder. Between the 2020 and 2021 examinations, there has been no change all the ladder points are corroded along with the extent of the asset.

**Photo number: 149**



## Section A

### Wall section

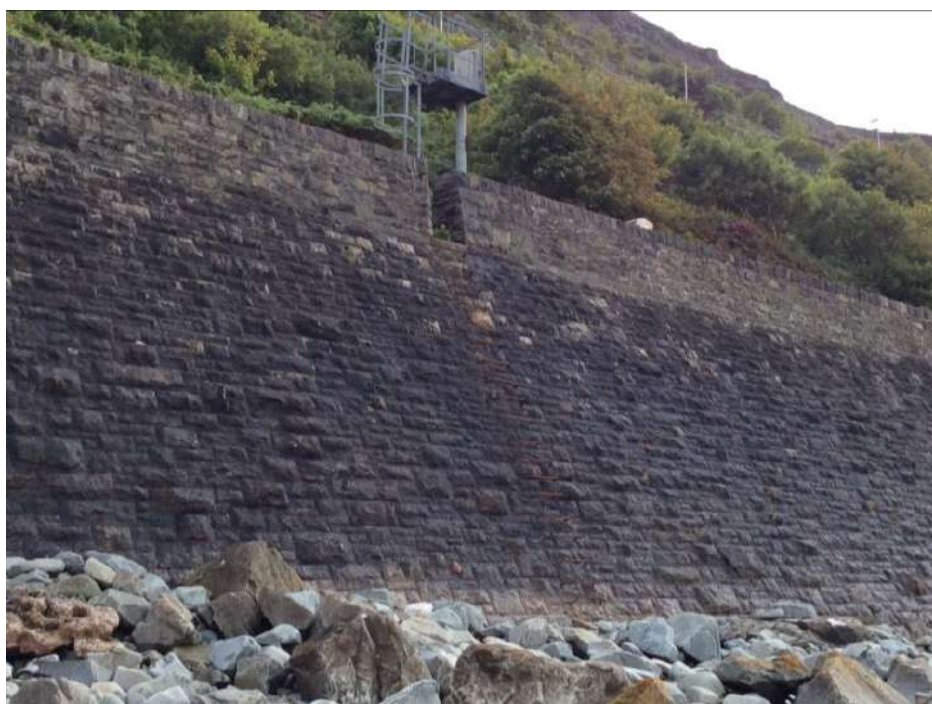
#### Defect Ref: D6

**Description:** Old corroded access ladder. Between the 2020 and 2021 examinations, there has been no change all the ladder points are corroded along with the extent of the asset.

**Photo number: 55**

**Date Taken:**

19/08/2020 16:39



## Section A

### Wall section

#### Defect Ref: D6

**Description:** Old corroded access ladder. Between the 2020 and 2021 examinations, there has been no change all the ladder points are corroded along with the extent of the asset.

**Photo number: 66**

**Date Taken:**

19/08/2020 17:01



## Section A

### Wall section

#### Defect Ref: D6

**Description:** Old corroded access ladder. Between the 2020 and 2021 examinations, there has been no change all the ladder points are corroded along with the extent of the asset.

**Photo number: 81**

**Date Taken:**

20/04/2021 10:43



## Section A

### Wall section

**Defect Ref: D7**

#### Description:

Vegetation growth on top of the wall.  
Between the 2020 and 2021 examinations, there is no change.

**Photo number: 113**



## Section A

### Wall section

**Defect Ref: D7**

#### Description:

Vegetation growth on top of the wall.  
Between the 2020 and 2021 examinations, there is no change.

**Photo number: 114**

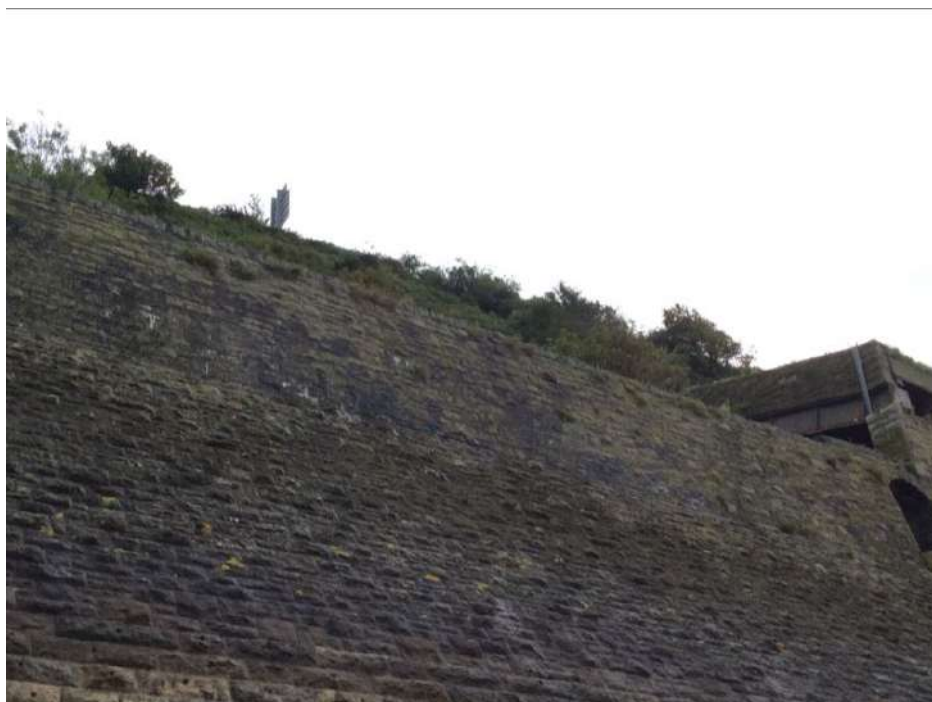


**Section A**  
**Wall section**  
**Defect Ref: D7**  
**Description:**  
Vegetation growth on  
top of the wall.  
Between the 2020  
and 2021  
examinations, there is  
no change.  
**Photo number: 115**



**Section A**  
**Wall section**  
**Defect Ref: D7**  
**Description:**  
Vegetation growth on  
top of the wall.  
Between the 2020  
and 2021  
examinations, there is  
no change.  
**Photo number: 62**

**Date Taken:**  
19/08/2020 16:58



**Section A**  
**Wall section**  
**Defect Ref: D7**  
**Description:**  
Vegetation growth on  
top of the wall.  
Between the 2020  
and 2021  
examinations, there is  
no change.  
**Photo number: 74**

**Date Taken:**  
19/08/2020 17:12



**Section A**  
**Wall section**  
**Defect Ref: D7**  
**Description:**  
Vegetation growth on  
top of the wall.  
Between the 2020  
and 2021  
examinations, there is  
no change.  
**Photo number: 75**

**Date Taken:**  
19/08/2020 17:13



## Section A

### Wall section

#### Defect Ref: D7

#### Description:

Vegetation growth on top of the wall.  
Between the 2020 and 2021 examinations, there is no change.

**Photo number: 87**

#### Date Taken:

20/04/2021 10:53



## Section A

### Wall section

#### Defect Ref: D8

**Description:** There are Voids at the toe of the blockwork 300mm deep. The defect is unidentifiable or has been repaired.  
Between the 2020 and 2021 examinations, original photograph defect was not located but voids were noted in similar location.

**Photo number: 117**



**Section A**  
**Wall section**  
**Defect Ref: D8**  
**Description:** There are Voids at the toe of the blockwork 300mm deep. The defect is unidentifiable or has been repaired. Between the 2020 and 2021 examinations, original photograph defect was not located but voids were noted in similar location.  
**Photo number: 116**



**Section A**  
**Wall section**  
**Defect Ref: D8**  
**Description:** There are Voids at the toe of the blockwork 300mm deep. The defect is unidentifiable or has been repaired. Between the 2020 and 2021 examinations, original photograph defect was not located but voids were noted in similar location.  
**Photo number: 119**



## Section A

### Wall section

#### Defect Ref: D8

**Description:** There are Voids at the toe of the blockwork 300mm deep. The defect is unidentifiable or has been repaired. Between the 2020 and 2021 examinations, original photograph defect was not located but voids were noted in similar location.

**Photo number: 118**



## Section A

### Wall section

#### Defect Ref: D8

**Description:** There are Voids at the toe of the blockwork 300mm deep. The defect is unidentifiable or has been repaired. Between the 2020 and 2021 examinations, original photograph defect was not located but voids were noted in similar location.

**Photo number: 120**



## Section A

### Wall section

#### Defect Ref: D8

**Description:** There are Voids at the toe of the blockwork 300mm deep. The defect is unidentifiable or has been repaired. Between the 2020 and 2021 examinations, original photograph defect was not located but voids were noted in similar location.

**Photo number: 121**



## Section A

### Wall section

#### Defect Ref: D8

**Description:** There are Voids at the toe of the blockwork 300mm deep. The defect is unidentifiable or has been repaired. Between the 2020 and 2021 examinations, original photograph defect was not located but voids were noted in similar location.

**Photo number: 78**

#### Date Taken:

19/08/2020 17:18



## Section A

### Wall section

#### Defect Ref: D8

**Description:** There are Voids at the toe of the blockwork 300mm deep. The defect is unidentifiable or has been repaired. Between the 2020 and 2021 examinations, original photograph defect was not located but voids were noted in similar location.

**Photo number: 88**

#### Date Taken:

20/04/2021 10:56



## Section A

### Wall section

#### Defect Ref: D9

**Description:** Mineral seepage. Between the 2020 and 2021 examinations, there is no change.

**Photo number: 127**



**Section A**  
**Wall section**  
**Defect Ref: D9**  
**Description:** Mineral seepage. Between the 2020 and 2021 examinations, there is no change.  
**Photo number: 128**



**Section A**  
**Wall section**  
**Defect Ref: D9**  
**Description:** Mineral seepage. Between the 2020 and 2021 examinations, there is no change.  
**Photo number: 67**

**Date Taken:**  
19/08/2020 17:02



**Section A**  
**Wall section**  
**Defect Ref: D9**  
**Description:** Mineral seepage. Between the 2020 and 2021 examinations, there is no change.  
**Photo number: 70**

**Date Taken:**  
19/08/2020 17:07



**Section A**  
**Wall section**  
**Defect Ref: D9**  
**Description:** Mineral seepage. Between the 2020 and 2021 examinations, there is no change.  
**Photo number: 89**

**Date Taken:**  
20/04/2021 10:56

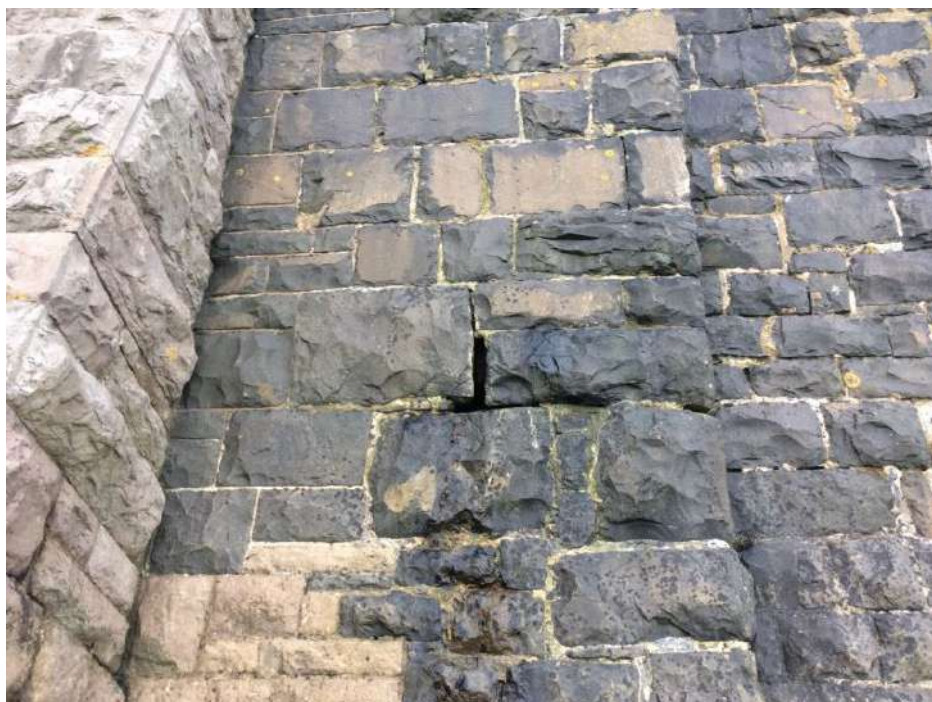


**Section A**  
**Wall section**  
**Defect Ref: D9**  
**Description:** Mineral seepage. Between the 2020 and 2021 examinations, there is no change.  
**Photo number: 90**

**Date Taken:**  
20/04/2021 10:57



**Section A**  
**Wall section**  
**Defect Ref: D10**  
**Description:** There is a large open joint with seepage. The joint has been filled. Between the 2020 and 2021 examinations, additional large open joints were visible due to reduced wall toe protection.  
**Photo number: 144**



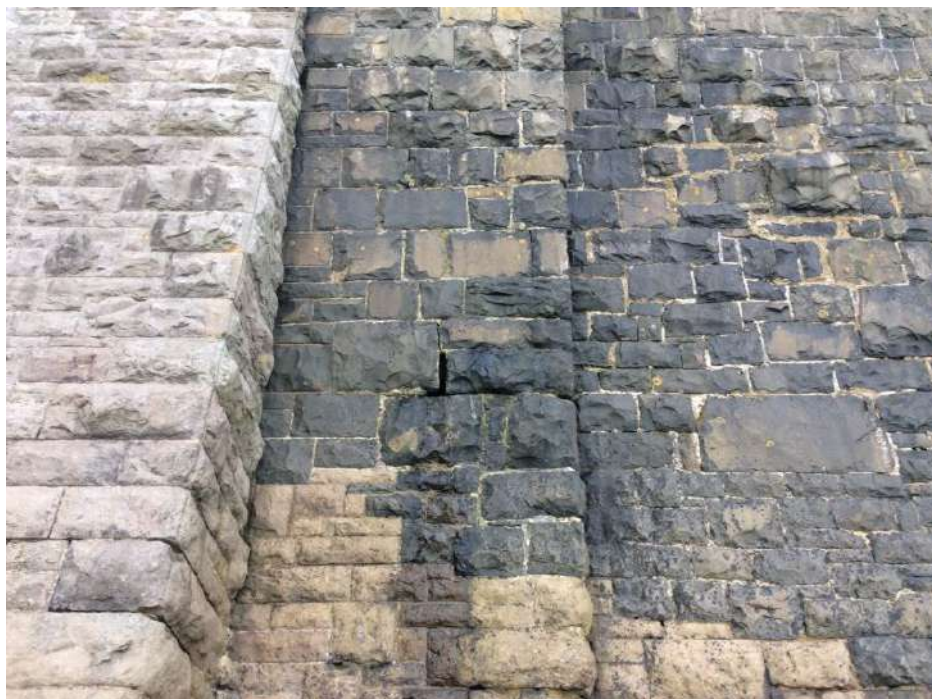
## Section A

### Wall section

#### Defect Ref: D10

**Description:** There is a large open joint with seepage. The joint has been filled. Between the 2020 and 2021 examinations, additional large open joints were visible due to reduced wall toe protection.

**Photo number: 143**



## Section A

### Wall section

#### Defect Ref: D10

**Description:** There is a large open joint with seepage. The joint has been filled. Between the 2020 and 2021 examinations, additional large open joints were visible due to reduced wall toe protection.

**Photo number: 145**



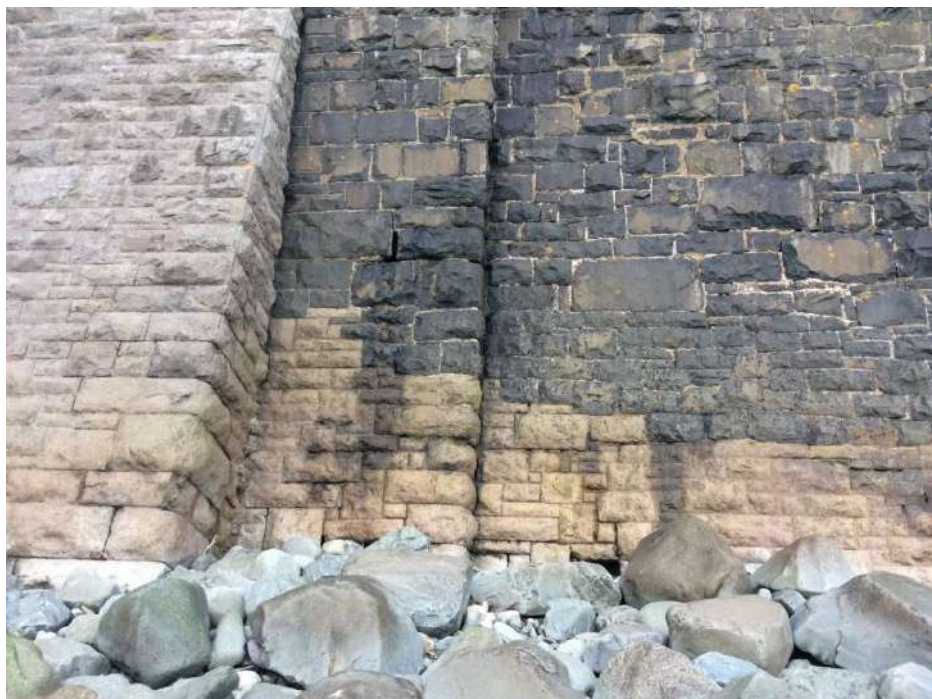
## Section A

### Wall section

#### Defect Ref: D10

**Description:** There is a large open joint with seepage. The joint has been filled. Between the 2020 and 2021 examinations, additional large open joints were visible due to reduced wall toe protection.

**Photo number: 146**



## Section A

### Wall section

#### Defect Ref: D10

**Description:** There is a large open joint with seepage. The joint has been filled. Between the 2020 and 2021 examinations, additional large open joints were visible due to reduced wall toe protection.

**Photo number: 142**



## Section A

### Wall section

#### Defect Ref: D10

**Description:** There is a large open joint with seepage. The joint has been filled. Between the 2020 and 2021 examinations, additional large open joints were visible due to reduced wall toe protection.

**Photo number: 56**

**Date Taken:**

19/08/2020 16:44



## Section A

### Wall section

#### Defect Ref: D10

**Description:** There is a large open joint with seepage. The joint has been filled. Between the 2020 and 2021 examinations, additional large open joints were visible due to reduced wall toe protection.

**Photo number: 91**

**Date Taken:**

20/04/2021 11:10



## Section A

### Wall section

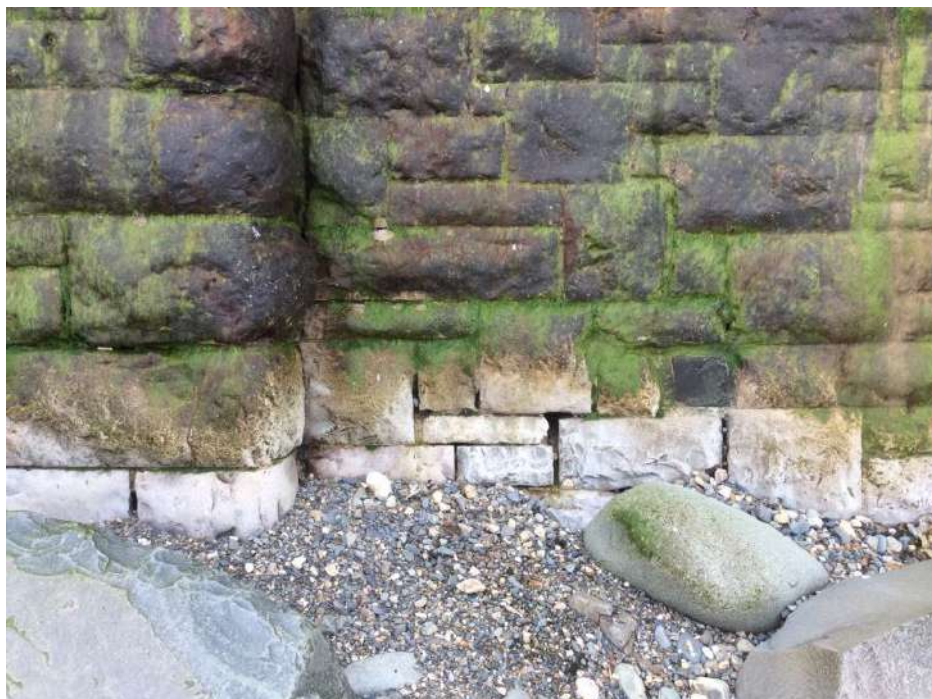
#### Defect Ref: D10

**Description:** There is a large open joint with seepage. The joint has been filled. Between the 2020 and 2021 examinations, additional large open joints were visible due to reduced wall toe protection.

**Photo number: 92**

**Date Taken:**

20/04/2021 11:10



## Section A

### Parapet/Capping

#### Defect Ref: D11

**Description:** There are Large open joints present. Between the 2016 and 2020 examinations, the defect has been repaired.

**Photo number: 148**



**Section A**  
**Parapet/Capping**  
**Defect Ref: D11**  
**Description:** There are Large open joints present. Between the 2016 and 2020 examinations, the defect has been repaired.  
**Photo number: 147**



**Section A**  
**Parapet/Capping**  
**Defect Ref: D11**  
**Description:** There are Large open joints present. Between the 2016 and 2020 examinations, the defect has been repaired.  
**Photo number: 57**

**Date Taken:**  
19/08/2020 16:47



## Section A

### Wall section

#### Defect Ref: D12

**Description:** There is a Poorer condition of the adjacent connecting sea wall. Fractures have been formed, mineral washout, and seepage. Between the 2020 and 2021 examinations, fracture appears to have widened slightly  
**Photo number: 152**



## Section A

### Wall section

#### Defect Ref: D12

**Description:** There is a Poorer condition of the adjacent connecting sea wall. Fractures have been formed, mineral washout, and seepage. Between the 2020 and 2021 examinations, fracture appears to have widened slightly  
**Photo number: 151**



## Section A

### Wall section

#### Defect Ref: D12

**Description:** There is a Poorer condition of the adjacent connecting sea wall. Fractures have been formed, mineral washout, and seepage. Between the 2020 and 2021 examinations, fracture appears to have widened slightly

**Photo number: 53**

**Date Taken:**

19/08/2020 16:38



## Section A

### Wall section

#### Defect Ref: D12

**Description:** There is a Poorer condition of the adjacent connecting sea wall. Fractures have been formed, mineral washout, and seepage. Between the 2020 and 2021 examinations, fracture appears to have widened slightly

**Photo number: 54**

**Date Taken:**

19/08/2020 16:38



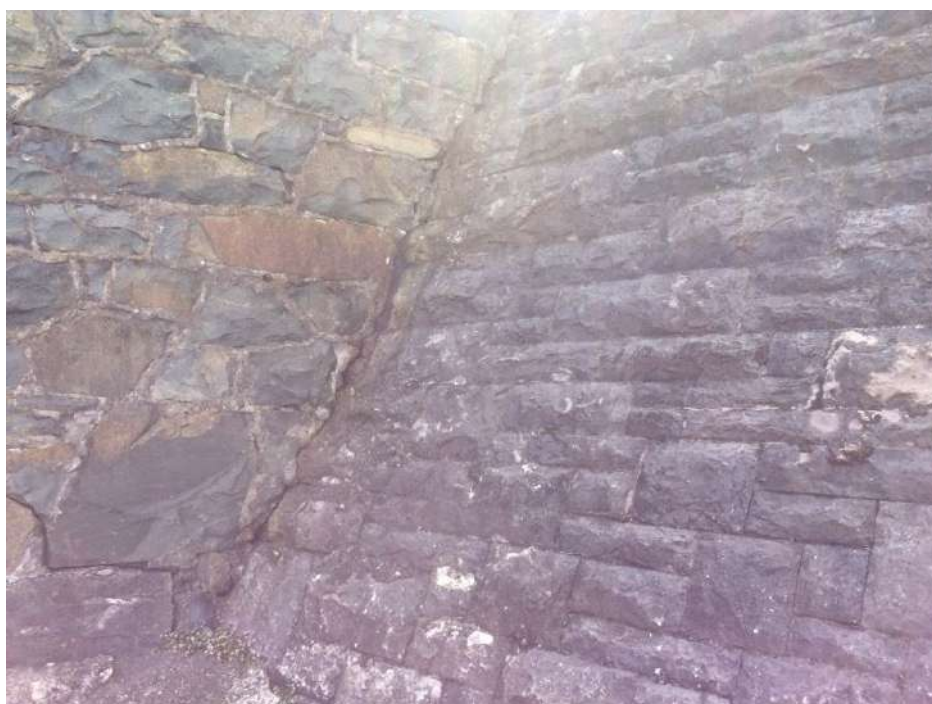
**Section A**  
**Wall section**  
**Defect Ref: D12**  
**Description:** There is a Poorer condition of the adjacent connecting sea wall. Fractures have been formed, mineral washout, and seepage. Between the 2020 and 2021 examinations, fracture appears to have widened slightly  
**Photo number: 93**

**Date Taken:**  
20/04/2021 11:13



**Section A**  
**Wall section**  
**Defect Ref: D12**  
**Description:** There is a Poorer condition of the adjacent connecting sea wall. Fractures have been formed, mineral washout, and seepage. Between the 2020 and 2021 examinations, fracture appears to have widened slightly  
**Photo number: 94**

**Date Taken:**  
20/04/2021 11:14



## Section B

### Wall section

**Defect Ref: D13**

**Description: 4\***

Large fracture in the wall from the bottom up approx. 3m with missing blocks and voids at the bottom in the adjacent wall.

**Photo number: 43**

**Date Taken:**

19/08/2020 16:23



## Section B

### Wall section

**Defect Ref: D13**

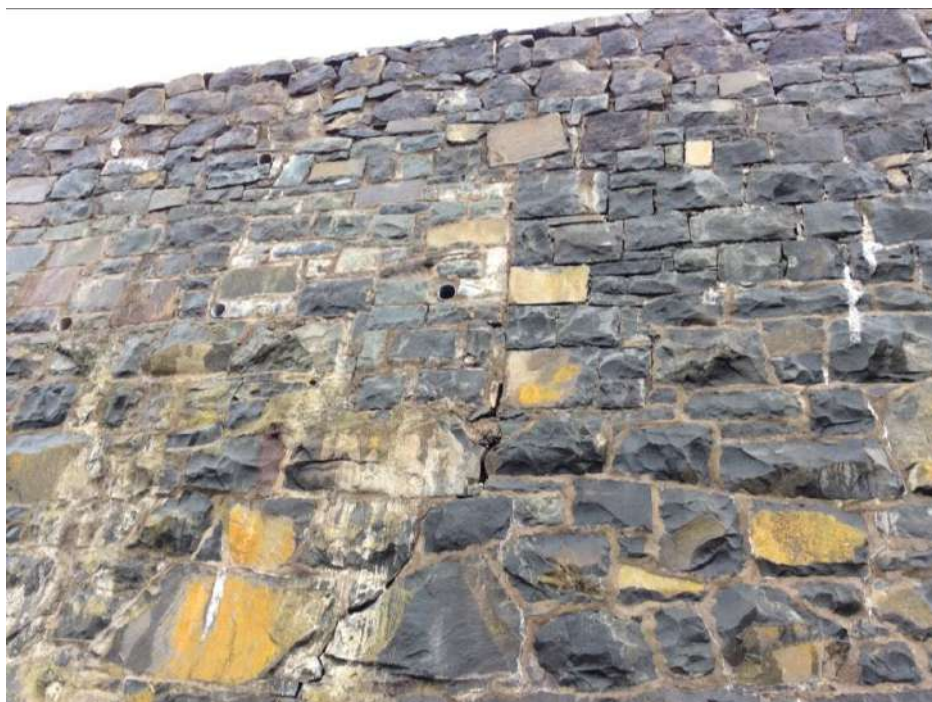
**Description: 4\***

Large fracture in the wall from the bottom up approx. 3m with missing blocks and voids at the bottom in the adjacent wall.

**Photo number: 44**

**Date Taken:**

19/08/2020 16:24



## Section B

### Wall section

**Defect Ref: D13**

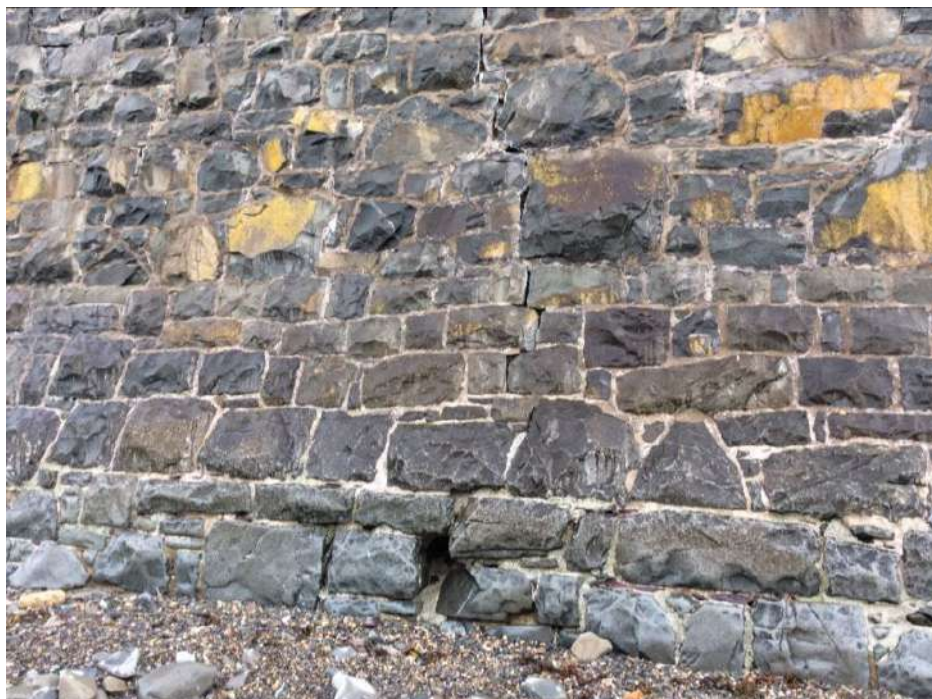
**Description: 4\***

Large fracture in the wall from the bottom up approx. 3m with missing blocks and voids at the bottom in the adjacent wall.

**Photo number: 47**

**Date Taken:**

19/08/2020 16:27



## Section B

### Wall section

**Defect Ref: D13**

**Description: 4\***

Large fracture in the wall from the bottom up approx. 3m with missing blocks and voids at the bottom in the adjacent wall.

**Photo number: 48**

**Date Taken:**

19/08/2020 16:28



## Section B

### Wall section

**Defect Ref: D13**

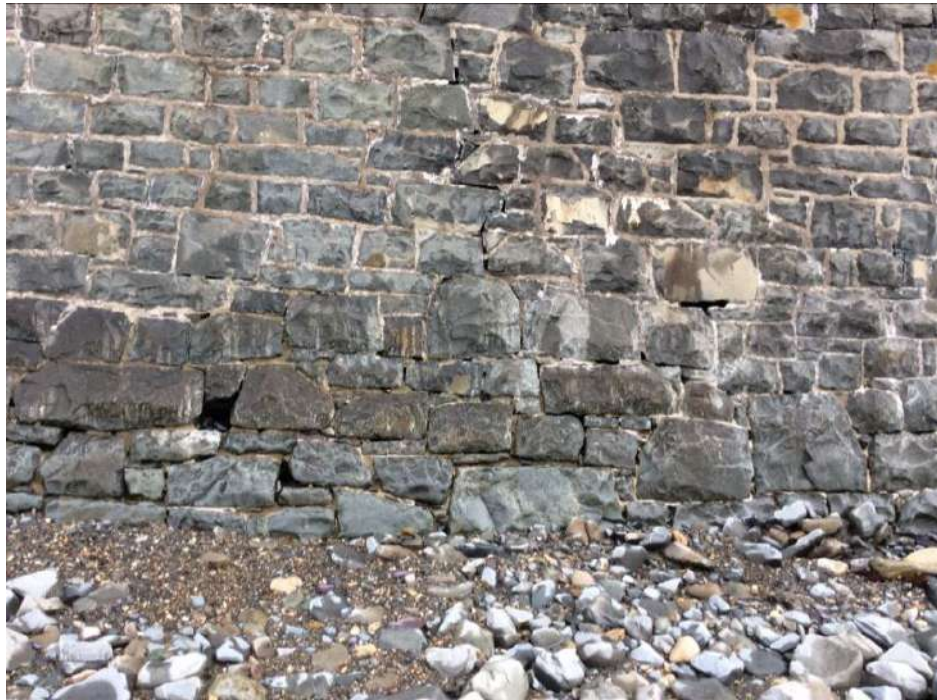
**Description: 4\***

Large fracture in the wall from the bottom up approx. 3m with missing blocks and voids at the bottom in the adjacent wall.

**Photo number: 49**

**Date Taken:**

19/08/2020 16:30



## Section B

### Wall section

**Defect Ref: D13**

**Description: 4\***

Large fracture in the wall from the bottom up approx. 3m with missing blocks and voids at the bottom in the adjacent wall.

**Photo number: 50**

**Date Taken:**

19/08/2020 16:30



## Section B

### Wall section

**Defect Ref: D13**

**Description: 4\***

Large fracture in the wall from the bottom up approx. 3m with missing blocks and voids at the bottom in the adjacent wall.

**Photo number: 51**

**Date Taken:**

19/08/2020 16:31



## Section B

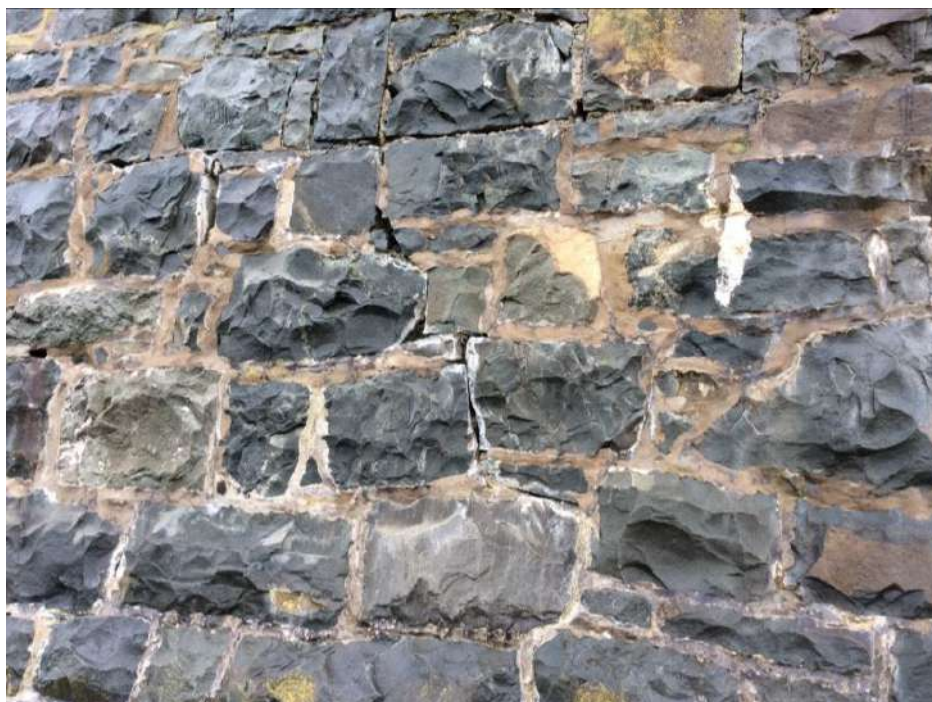
### Wall section

**Defect Ref: D14**

**Description:** Mortar washed out in between the joints approx. 300mm deep.  
**Photo number: 46**

**Date Taken:**

19/08/2020 16:26



**Section A**  
**Wall section**  
**Defect Ref: D15**  
**Description:**  
Undermining with  
pooling water approx  
150mm deep.  
Defect not found in  
2021 potentially  
buried in shingle  
**Photo number: 59**

**Date Taken:**  
19/08/2020 16:52



**Section A**  
**Wall section**  
**Defect Ref: D15**  
**Description:**  
Undermining with  
pooling water approx  
150mm deep.  
Defect not found in  
2021 potentially  
buried in shingle  
**Photo number: 60**

**Date Taken:**  
19/08/2020 16:52



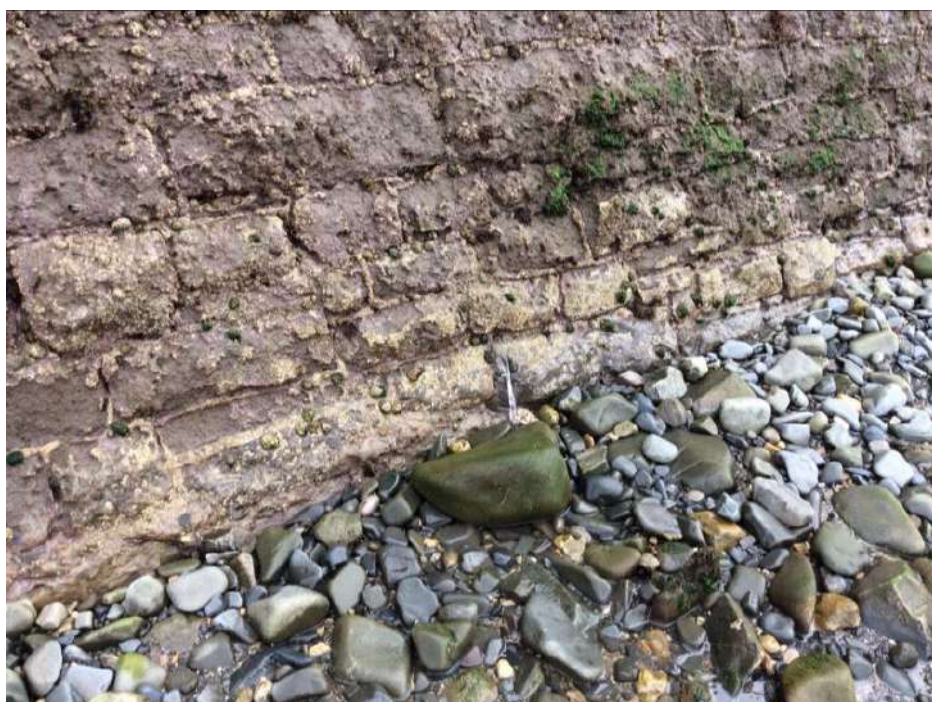
**Section A**  
**Wall section**  
**Defect Ref: D15**  
**Description:**  
Undermining with  
pooling water approx  
150mm deep.  
Defect not found in  
2021 potentially  
buried in shingle  
**Photo number: 96**

**Date Taken:**  
20/04/2021 11:21



**Section A**  
**Wall section**  
**Defect Ref: D16**  
**Description:** During  
the 2020 inspection,  
there is a critical and  
visible seepage point  
in the toe of the wall.  
Between the 2020  
and 2021  
examinations, there is  
no change.  
**Photo number: 68**

**Date Taken:**  
19/08/2020 17:04



## Section A

### Wall section

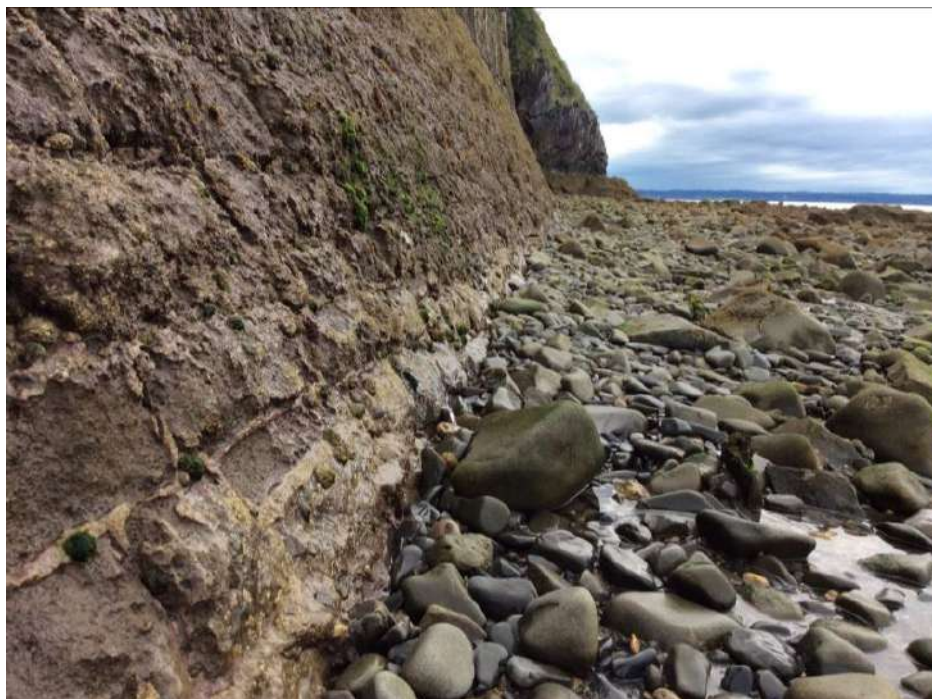
#### Defect Ref: D16

**Description:** During the 2020 inspection, there is a critical and visible seepage point in the toe of the wall. Between the 2020 and 2021 examinations, there is no change.

**Photo number: 69**

**Date Taken:**

19/08/2020 17:05



## Section A

### Wall Apron

#### Defect Ref: D17

**Description:** Minor spalling across the concrete apron. Between the 2020 and 2021 examinations, there is no change.

**Photo number: 141**



**Section A**  
**Wall Apron**  
**Defect Ref: D17**  
**Description:** Minor spalling across the concrete apron. Between the 2020 and 2021 examinations, there is no change.  
**Photo number: 140**



**Section A**  
**Wall Apron**  
**Defect Ref: D17**  
**Description:** Minor spalling across the concrete apron. Between the 2020 and 2021 examinations, there is no change.  
**Photo number: 139**



## Section A

### Wall Apron

#### Defect Ref: D17

**Description:** Minor spalling across the concrete apron. Between the 2020 and 2021 examinations, there is no change.

**Photo number: 79**

**Date Taken:**

19/08/2020 17:22



## Section A

### Wall Apron

#### Defect Ref: D17

**Description:** Minor spalling across the concrete apron. Between the 2020 and 2021 examinations, there is no change.

**Photo number: 95**

**Date Taken:**

20/04/2021 11:16



**Section A**  
**Wall section**  
**Defect Ref: D18**  
**Description:** Open joints and voids in the face of the wall  
**Photo number: 97**

**Date Taken:**  
20/04/2021 11:24



**Section A**  
**Wall section**  
**Defect Ref: D18**  
**Description:** Open joints and voids in the face of the wall  
**Photo number: 98**

**Date Taken:**  
20/04/2021 11:24



## Section A

### Wall section

#### Defect Ref: D19

**Description:** Deep undermining of the wall at the start of the asset adjacent to the steps. The concrete abutment has been scoured and undermined back to the wall level. The wall has also been scoured and undermined. The extent of undermining is 15m

**Photo number: 99**

**Date Taken:**

20/04/2021 11:27



## Section A

### Wall section

#### Defect Ref: D19

**Description:** Deep undermining of the wall at the start of the asset adjacent to the steps. The concrete abutment has been scoured and undermined back to the wall level. The wall has also been scoured and undermined. The extent of undermining is 15m

**Photo number: 100**

**Date Taken:**

20/04/2021 11:28



## Section A

### Wall section

#### Defect Ref: D19

**Description:** Deep undermining of the wall at the start of the asset adjacent to the steps. The concrete abutment has been scoured and undermined back to the wall level. The wall has also been scoured and undermined. The extent of undermining is 15m

**Photo number: 101**

#### Date Taken:

20/04/2021 11:28



## Appendix 2 – Asset descriptors

| Asset Type      | Major Element    | Minor Elements             | Attributes                                                         |
|-----------------|------------------|----------------------------|--------------------------------------------------------------------|
| Defence         | Embankment       | Apron                      | Stone, concrete, masonry                                           |
|                 |                  | Capping Wall               | Stone, concrete, masonry                                           |
|                 |                  | Modular Blocks             | Concrete                                                           |
|                 |                  | Drainage                   | Pipe, masonry, Concrete Headline                                   |
|                 |                  | Gabions                    | Gabions                                                            |
|                 |                  | Natural                    | Vegetated, un-vegetated                                            |
|                 |                  | Pitching                   | Stone, Concrete, Masonry                                           |
|                 |                  | Armour                     | Rock, concrete                                                     |
|                 |                  | Toe                        | As above                                                           |
| Defence         | Wall             | Apron                      | Stone, concrete, masonry                                           |
|                 |                  | Parapet / Capping          | Stone, concrete, masonry, timber                                   |
|                 |                  | Wall section               | Stone, concrete, masonry, timber, sheet piles                      |
|                 |                  | Armour                     | Rock, concrete                                                     |
|                 |                  | Drainage                   |                                                                    |
|                 |                  | Toe                        | Concrete, natural, rock                                            |
| Defence         | Cliff / Slope    | Drainage                   |                                                                    |
|                 |                  | Face protection            | Netting, pinning, other                                            |
|                 |                  | Infill                     | Stone, concrete, masonry                                           |
|                 |                  | Natural                    | Vegetated, un-vegetated                                            |
|                 |                  | Toe                        |                                                                    |
| Beach Structure | Groyne           | Capping Beam               | Concrete, timber (whaling)                                         |
|                 |                  | Piles                      | Steel, timber                                                      |
|                 |                  | Groyne main section        | Rock, stone, masonry, timber (planking), concrete                  |
|                 |                  | Groyne landward connection | Rock, stone, masonry, timber (planking), concrete                  |
|                 |                  | Groyne – seaward roundhead | Rock, stone, masonry, timber (planking), concrete                  |
|                 |                  | Sheet piling               | Steel                                                              |
| Beach Structure | Breakwater       | Capping Beam               | Concrete                                                           |
|                 |                  | Breakwater Section         | Stone, masonry, concrete                                           |
| Land            | Salt Marsh       | Salt marsh edge            | Vegetation (loss or growth), reduction in area                     |
|                 |                  | Channel / creeks           | Channels or creeks becoming wider, loss of vegetation on edge etc. |
| Land            | Tidal Flats      | Mudflats                   | Reduction in area                                                  |
|                 |                  | Channel                    | Channels becoming wider, changing course etc.                      |
| Land            | Sand Dune        | Crest                      | sand                                                               |
|                 |                  | Front face                 | sand                                                               |
| Land            | Beach            | Crest                      | Shingle, sand, cobbles, mixed                                      |
|                 |                  | Front face                 | Shingle, sand, cobbles, mixed                                      |
| Structure       | Outfall (>0.45m) | Outfall pipe               |                                                                    |
|                 |                  | Upstream headwall          |                                                                    |
|                 |                  | Downstream headwall        |                                                                    |
|                 |                  | Apron                      |                                                                    |
|                 |                  | Frame                      |                                                                    |
|                 |                  | Screen                     |                                                                    |
|                 |                  | Penstock                   |                                                                    |
|                 |                  | Flap valve                 |                                                                    |

## Appendix 3 – EA Condition Grades

10 Environment Agency Condition Assessment Manual

### 2.0 Visual inspection condition grades

The condition grading and descriptions given below are the standards adopted by the Environment Agency. The five condition grades, ranging from ‘very good’ to ‘very poor’, remain as before. However, the descriptions have been redefined, compared to the previous versions of the Condition Assessment Manual, to reflect condition according to flood defence performance.

#### 2.1 General assessment

| Grade | Rating    | Description                                                                                        |
|-------|-----------|----------------------------------------------------------------------------------------------------|
| 1     | Very Good | Cosmetic defects that will have no effect on performance                                           |
| 2     | Good      | Minor defects that will not reduce the overall performance of the asset                            |
| 3     | Fair      | Defects that could reduce performance of the asset                                                 |
| 4     | Poor      | Defects that would significantly reduce the performance of the asset. Further investigation needed |
| 5     | Very Poor | Severe defects resulting in complete performance failure                                           |