

herrington

CONSULTING LIMITED



Client: Dover District Council
Review of Coastal Change Management
Areas in Dover District

June 2018

Herrington Consulting Limited
Unit 6 & 7 – Barham Business Park
Elham Valley Road
Barham
Canterbury
Kent, CT4 6DQ
Tel/Fax +44 (0)1227 833855

www.herringtonconsulting.co.uk

This report has been prepared by Herrington Consulting Ltd in accordance with the instructions of their client, **Dover District Council**, for their sole and specific use. Any other persons who use any information contained herein do so at their own risk.

Client: Dover District Council

Review of Coastal Change Management Areas in Dover District

Contents Amendment Record

This report has been issued and amended as follows:

| Issue | Revision | Description | Date |
|-------|----------|---|-----------------|
| 1 | 0 | Draft report for comment | 19 January 2018 |
| 2 | 1 | Minor amendments to report and added section 6 and appendix A.4. Draft report re-issued. | 24 April 2018 |
| 3 | 2 | Minor amendments to main report and adaptation of Appendix A.4 to meet Local Plan policy needs. | 18 June 2018 |
| 4 | 3 | Minor changes regarding the SMP management policy at Folkstone Warren. Document issued as final report. | 29 June 2018 |

Document Verification

| Issue | Revision | Date: | 19 January 2018 |
|-------|----------|--------------------|---------------------|
| 1 | 0 | Author(s): | Nigel West |
| | | First Check By: | Simon Maiden-Brooks |
| | | Amendments Agreed: | Nigel West |
| | | Second Check By: | Rosie Brown |
| | | Amendments Agreed: | Kirsty Thomas |
| | | Director Sign Off: | Simon Maiden Brooks |

| Issue | Revision | Date: | 24 April 2018 |
|-------|----------|--------------------|---------------------|
| 2 | 1 | Author(s): | Nigel West |
| | | First Check By: | Simon Maiden-Brooks |
| | | Amendments Agreed: | Nigel West |
| | | Second Check By: | Rosie Brown |
| | | Director Sign Off: | Simon Maiden-Brooks |

| Issue | Revision | Date: | 18 June 2018 |
|-------|----------|--------------------|---------------------|
| 3 | 2 | Author(s): | Nigel West |
| | | First Check By: | Simon Maiden-Brooks |
| | | Amendments Agreed: | Nigel West |
| | | Second Check By: | Simon Maiden-Brooks |
| | | Director Sign Off: | Simon Maiden-Brooks |

| Issue | Revision | Date: | 29 June 2018 |
|-------|----------|--------------------|---------------------|
| 4 | 3 | Author(s): | Nigel West |
| | | First Check By: | Kirsty Thomas |
| | | Amendments Agreed: | Nigel West |
| | | Second Check By: | Simon Maiden-Brooks |
| | | Director Sign Off: | Simon Maiden-Brooks |

Contents Page

| | | |
|----------|--|-----------|
| 1 | Background and Context | 1 |
| 1.1 | CCMA and Integrated Coastal Zone Management | 1 |
| 1.2 | Dover District's Coastal Change Management Areas | 1 |
| 2 | Overview of Coastal Processes | 2 |
| 2.1 | Background | 2 |
| 2.2 | Historic Evolution | 3 |
| 2.3 | Contemporary Coastal Change Trends | 3 |
| 3 | Methodology | 4 |
| 3.1 | Key Objective | 4 |
| 3.2 | What is new since 2010? | 4 |
| 3.3 | Defining the Coastal Change Zones | 8 |
| 3.4 | CCMA End Areas | 8 |
| 3.5 | Cliff Fall Observation Imagery | 8 |
| 4 | CCMA Maps | 9 |
| 4.1 | Mapping Format | 9 |
| 4.2 | Cliff Fall Observations | 9 |
| 5 | Observations | 10 |
| 6 | CCMAs and Recommended Guidance | 12 |
| 6.1 | Provisions for development and infrastructure relocation away from CCMAs | 12 |
| 7 | Conclusions | 14 |
| 8 | References | 15 |
| 9 | Appendices | |

1 Background and Context

The concept of Coastal Change Management Areas (CCMAs) is central to the United Kingdom Government's current, March 2012, National Planning Policy Framework (NPPF) and the Integrated Coastal Zone Management (ICZM) process outlined in the National Planning Practice Guidance (NPPG). The policy and guidance aspire to reduce the risk to people from coastal change. Section 10 of the NPPF, paragraphs 105 to 108¹, refers specifically to the management of change in coastal areas (copied verbatim, for reference, in Appendix A.3). Additional guidance for a coastal Local Planning Authority (LPA), relating to coastal change, is found in the NPPG section on Flood Risk and Coastal Change². The NPPG states that CCMAs will be identified in an LPA's Local Plans.

The purpose of defining CCMAs is to identify where, along a district's coastline, that a risk may exist due to coastal change. LPAs must manage development in these CCMAs by considering how appropriate development will be at such locations, whilst also considering its vulnerability classification. The execution of permitted development in CCMAs must also be managed by the LPA, as well as ensuring neighbourhood plans and neighbourhood development/community right-to-build orders account for coastal change.

This document is intended to provide the background information in relation to the coastal processes influencing Dover District's coastal cliff lines which are at risk of erosion and to define the CCMAs. This document will enable an informed approach to the ICZM process in Dover District, directly relating to the policies set out in the NPPF and NPPG. Appendix A.4 provides the draft text which may be used as the basis for Dover District's policy for CCMAs.

1.1 CCMA and Integrated Coastal Zone Management

The ICZM process encourages an informed long-term approach to coastal management, which is both holistic (considering the coastline in its entirety) and inclusive (involves all relevant administrative bodies). In the case of coastal districts, the Marine Management Organisation (MMO) can coordinate the implementation of policy at the land-sea boundary.

1.2 Dover District's Coastal Change Management Areas

In Dover District, the CCMAs were first defined by Herrington Consulting Ltd. (2010). These used digitised cliff lines and data from the Shoreline Management Plans (SMP) for South Foreland to Beachy Head SMP, 2006³, and Isle of Grain to South Foreland SMP, 2007⁴. These were published on Dover District Council's Policy Maps.

This document reviews the data that has become available since 2010 and subsequently details the recommended changes to the CCMA and the associated policy.

¹ <https://www.gov.uk/guidance/national-planning-policy-framework/10-meeting-the-challenge-of-climate-change-flooding-and-coastal-change> accessed December 2017.

² <https://www.gov.uk/guidance/flood-risk-and-coastal-change> accessed December 2017

³ http://www.se-coastalgroup.org.uk/wp-content/uploads/2012/02/SF2BH-SMP_Main-Doc.pdf

⁴ <http://www.se-coastalgroup.org.uk/wp-content/uploads/2012/02/IGSF-SMP-Report.pdf>

2 Overview of Coastal Processes

2.1 Background

The coastal frontage of the Dover District faces due east and southeast into the English Channel and lies within the larger coastal process behavioural system that is defined by the Isle of Grain to South Foreland and the South Foreland to Beachy Head Shoreline Management Plan boundaries. The following description of the coastal behaviour system has been summarised from Futurecoast (Halcrow 2002).

The English Channel has been subject to many periods of changing sea levels and bed exposure over the last 2 million years. Past geological evolution has been controlled primarily by fluctuations in sea levels associated with several intervals of climatic warming and cooling. During warm, high sea level intervals, wave action extended to the toe of the South Downs and cut the shore platform that forms the West Sussex coastal plain. During the last period of sea level fall, significant quantities of sediment were left stranded along the coastal plain, creating raised beach deposits.

Much of the present shoreline of the English Channel has been shaped by sea level rise during the Holocene, i.e. following the last glaciation. Flooding of the English Channel commenced from the west as sea levels rose, and by approximately 10,000 years ago had reached Beachy Head. By c.8,000 years ago the entire English Channel and Dover Straits was inundated, although shallow land still separated this water body from the North Sea. This was subsequently breached, initiating a strong eastward transport in the eastern channel.

In the early stages of this period, the onshore migration of significant quantities of sediment led to major episodes of coarse sediment accumulation resulting in the formation of shingle barriers, that have rolled back to form the present shoreline with spits and bars across low-lying bays. Such processes ultimately resulted in the closing of former inlets and estuaries by barriers (comprising sand bases with overlying shingle) and subsequently led to relatively rapid deposition of river sediment (alluvium) to landward. Under contemporary conditions there is a limited addition of new sediment from sea cliff recession and shore platform lowering. This implies that as sea level continues to rise, existing beach volumes will diminish.

The Goodwin Sands, a sand bank system offshore from the east-facing Kent coast, is a remnant of a former tidal delta associated with tidal flows through the Dover Straits and southern North Sea. This delta was present during early stages of the Holocene but, as sea levels rose, it became modified by tidal flows that were deflected around North Foreland. The Sands have been, and remain, an important large-scale control on the development of Sandwich and Pegwell Bays, supplying sand to the foreshore and protecting the shoreline against direct incident wave attack.

2.2 Historic Evolution

Current beach material, primarily shingle, drifting northwards from South Foreland was first deposited in areas of lower wave energy during the Holocene period. However, the natural alongshore supply of sediment to this frontage from the south was terminated when the harbour was constructed at Dover some 150 years ago. Before this time a shingle beach existed along the base of the cliffs between Dover and Kingsdown and the beach at Oldstairs Bay was over 150m wide. The construction of the Folkestone Harbour in 1809 had a similar impact on sediment transport, resulting in a significant reduction in the supply of shingle onto the beaches at the toe of the cliffs north of Folkestone Harbour.

2.3 Contemporary Coastal Change Trends

In more recent history the anecdotal evidence and recorded beach profile surveys have shown that there has been a significant redistribution of material along the District's frontage. Beaches at Oldstairs Bay have eroded by up to 100m since the 1930s; however, this erosion has been matched by a corresponding accretion along the Walmer beaches, approximately 2km to the north. There has also been a significant overall reduction in the volume of shingle along the toe of the cliffs between Oldstairs Bay and Caple-le-Ferne, which has exposed the toe of the unprotected cliffs to wave action and subsequent erosion.

Whilst there are areas of accretion along the Dover District shoreline, particularly at Deal and Walmer, the lengths of coastline that are covered by CCMA's are all frontages where the predominant trend is one of erosion. Since the dramatic redistribution of shingle along the frontage in the early part of the 20th century, the rate of change has slowed as the mean high water line has become coincident with the toe of the cliffs.

The mode of failure of the chalk cliffs is fairly spasmodic, with short sections of the cliff failing as a result of the toe being undercut by wave action. This episodic mode of failure means that erosion is not consistent over time, although, when considered over a 100 year period this does correlate well with measured erosion rates. The predicted rate of erosion of the chalk cliffs along the frontage is not consistent and does vary considerably. This is due in part to the differences in the geological formation of the cliffs, but is also related to the degree of wave exposure and the wave climate at the base of the cliff.

3 Methodology

3.1 Key Objective

The main objective of this study is to update the CCMA definitions within Dover District which were first specified in the Herrington Consulting report (2010). The updated CCMA's are mapped so that they can be used to inform future planning policy.

Additionally, observed cliff falls are logged for the years 2001 through to 2016. These are not meant to provide any verification of the CCMA's but are instead provided so that a qualitative overview of cliff fall frequency, or infrequency, and the varying modes of cliff failure can be gained.

3.2 What is new since 2010?

Since the first CCMA definitions were undertaken by Herrington Consulting in 2010, the Environment Agency (EA) has published potential erosion predictions for each SMP policy unit, where relevant, around the United Kingdom coastline⁵. For policy units which have a potential for erosion the erosion predictions, in metres, are published in three epochs⁶:

- 2006 to 2025 (10 years);
- 2025 to 2055 (50 years); and
- 2055 to 2105 (100 years).

The mapping of the CCMA's in this study begins with a digitised cliff line (the cliff top as per year 2010). The erosion distance predicted for the 100 year epoch is then used to estimate the potential position of the cliff top for the year 2105. The area between the 2010 cliff top and the predicted 100 year cliff top forms the CCMA. This approach is considered to be conservative, because some locations have land at the foot of the cliff which will initially prevent cliff erosion. In such cases, predicted erosion may apply to these lands rather than the cliff itself. However, no distinction is made in this study and the predicted erosion has been applied directly to the cliff.

The way in which the CCMA's are defined in this study is very specific (with respect to spatial extent). However, emphasis is placed on the fact that these extents are best estimates at the time of publication. The actual erosion which could potentially occur may have either a lesser or greater extent than predicted in this study. Therefore, it is recommended that the CCMA's are viewed as 'core' zones of risk and that the areas directly adjacent to these areas are considered within local policy, albeit perhaps with a lower level of perceived risk.

⁵ http://maps.environment-agency.gov.uk/wiyby/wiybyController?topic=coastal_erosion&ep=map&scale=7&lang=e&layerGroups=default&layerGroupToQuery=1&x=637762.32175&y=145001.5079000005&textonly=off#x=624840&y=147583&lq=1.10.&scale=5 accessed December 2017

⁶ 'epoch' is a period in time; this terminology used in the shoreline management plans

The study area is shown in Figure 3.1, which also delineates the SMP policy units within the Dover District. Attention is drawn to policy unit 4b24, which is separated by different erosion characteristics in its northern and southern halves. For the purposes of this study 4b24 is split into two sections, which are identified by '4b24_1' and '4b24_2'. This naming convention may not appear anywhere else in the SMP or policy documentation.

The NPPG states that CCMA's need only be defined for areas where shoreline change is 'significant' and the management policy is not to 'hold the line' or 'advance the line'. However, 'significant' is not defined in the NPPG and consequently, this study only distinguishing criteria for defining CCMA's where the Environment Agency publish the predicted erosion for the 100 year epoch.

Attention must be drawn to Folkstone Warren where the 100 year epoch management policy switches from 'hold the line' for the short and medium term policy to 'hold the line or no active intervention' in the long-term policy. Two policies are applied in this location for the long-term epoch because of the anticipated relocation of the existing railway line, for which the anticipated timescale is uncertain. The railway line will continue to be defended along Folkstone Warren until coastal erosion in the neighbouring policy unit, Abbots Cliff, makes relocation of the track necessary. Upon relocation of the track the policy will switch from 'hold the line' to 'no active intervention'. Therefore, whilst the current 'hold the line' policy would not normally require a CCMA to be defined, one has been outlined within this report due to the potential for long-term policy to become 'no active intervention' in the future.

For the purposes of this document and the NPPF policy, coastal change means physical change to the shoreline which may include erosion, coastal landslip, permanent inundation and coastal accretion.

Table 3.1 summarises the management policy and sources of risk for the SMP policy units in Dover District. In reviewing this information, Table 3.2 identifies six policy units to warrant the definition of an associated CCMA, where possible.

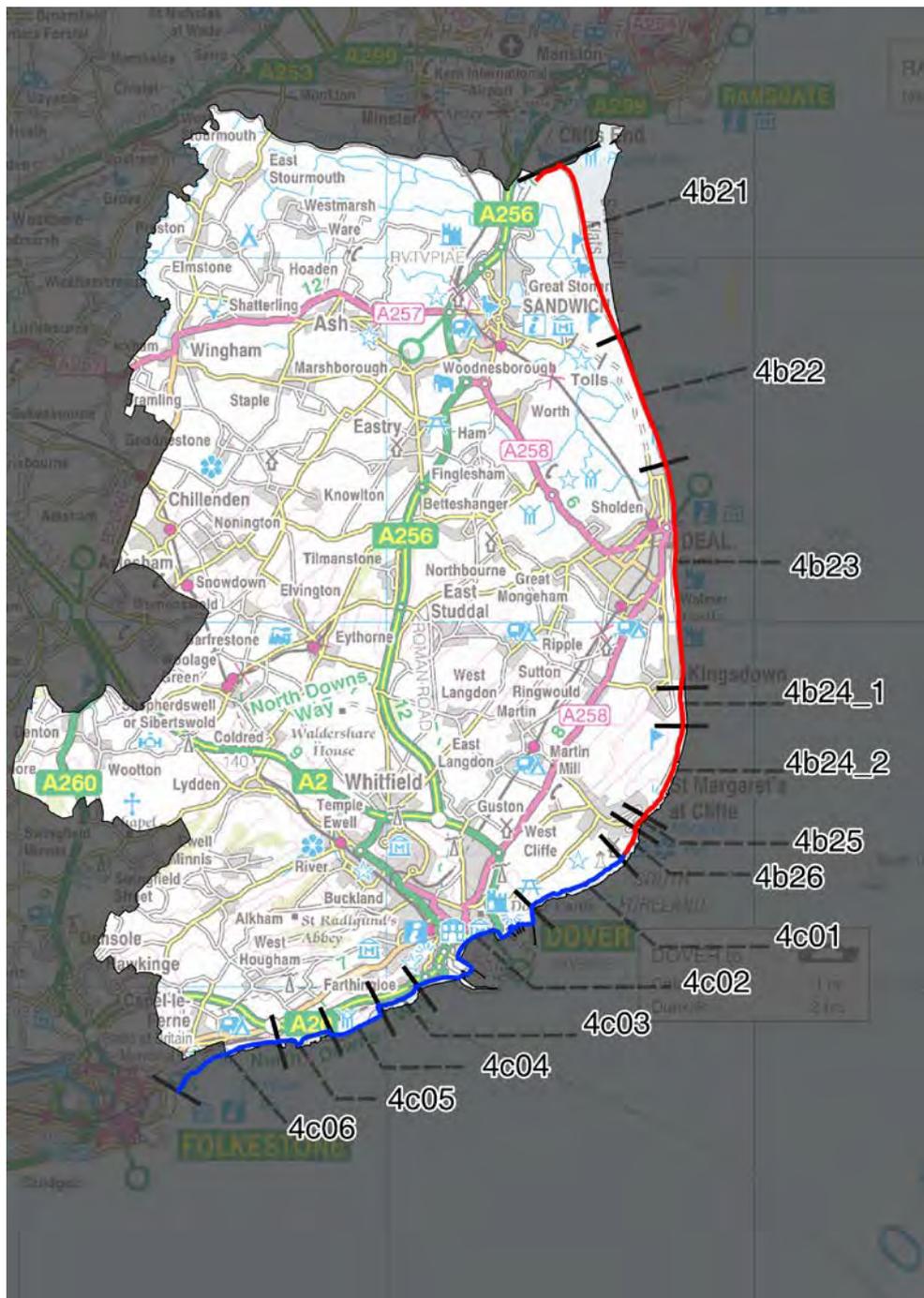


Figure 3.1 – Overview of the study area and the SMP policy units along the Dover District coastline.

| Location | Policy Unit Reference | SMP Policy | | | Source of Risk | CCMA? |
|---|-----------------------|------------------------|------------------------|---|----------------|----------|
| | | 2006 to 2025 | 2025 to 2055 | 2055 to 2105 | | |
| South of River Stour to Sandwich Bay Estate | 4b 21 | No active intervention | No active intervention | No active intervention | Flooding | x |
| Sandwich Bay Estate to Sandown Castle | 4b 22 | Hold the line | Hold the line | Hold the line | Coastal change | x |
| Sandown Castle to Oldstairs Bay | 4b 23 | Hold the line | Hold the line | Hold the line | Flooding | x |
| Oldstairs Bay to St Margret's Bay | 4b 24 | No active intervention | No active intervention | No active intervention | Coastal change | ✓ |
| St Margaret's Bay | 4b 25 | Hold the line | Hold the line | Hold the line | Coastal change | x |
| South Foreland | 4b 26 | No active intervention | No active intervention | No active intervention | Coastal change | ✓ |
| South Foreland to Dover | 4c 01 | No active intervention | No active intervention | No active intervention | Coastal change | ✓ |
| Dover | 4c 02 | Hold the line | Hold the line | Hold the line | Coastal change | x |
| Shakespeare Cliff | 4c 03 | No active intervention | No active intervention | No active intervention | Coastal change | ✓ |
| Samphire Hoe | 4c 04 | Hold the line | Hold the line | Hold the line | Coastal change | x |
| Abbots Cliff | 4c 05 | No active intervention | No active intervention | No active intervention | Coastal change | ✓ |
| Folkestone Warren | 4c 06 | Hold the line | Hold the line | Hold the line or No active intervention | Coastal change | ✓ |

Table 3.1 – Summary of SMP policy and risk source for policy units in Dover District.

| Location | Policy Unit Reference | Predicted Erosion | | |
|--|-----------------------|-------------------|---------------|---------------|
| | | 2006 to 2025 | 2025 to 2055 | 2055 to 2105 |
| Oldstairs Bay to St Margret's Bay (Rifle Range frontage) | 4b 24 | 0.4 – 1.2 m | 1.7 – 3.3 m | 3.4 – 6.6 m |
| Oldstairs Bay to St Margret's Bay (south of Rifle Range) | | 4.0 – 8.0 m | 10.0 – 20.0 m | 20.0 – 40.0 m |
| South Foreland | 4b 26 | 4.0 – 8.0 m | 10.0 – 20.0 m | 20.0 – 40.0 m |
| South Foreland to Dover | 4c 01 | 4.0 – 8.0 m | 10.0 – 20.0 m | 20.0 – 40.0 m |
| Shakespeare Cliff | 4c 03 | 10.6 – 19.4 m | 26.5 – 48.5 m | 53.0 – 97.0 m |
| Abbots Cliff | 4c 05 | 10.6 – 19.4 m | 26.5 – 48.5 m | 53.0 – 97.0 m |
| Folkestone Warren | 4c 06 | Undetermined* | Undetermined* | Undetermined* |

**The causes of cliff instability are complex here because the structure of underlying rock formations and its interactions with groundwater. This makes a reliable prediction very difficult.*

Table 3.2 – Predicted erosion at the six policy units where coastal change is anticipated.

3.3 Defining the Coastal Change Zones

The landward extent of the CCMA has been defined by offsetting the line of the existing (2010) cliff top by the cumulative erosion distance shown in Table 3.2 for the 100 year appraisal period. The seaward extent of the CCMA is not mapped and should be considered, for practical applications, to include the area between the cliff top line and the sea

3.4 CCMA End Areas

The ends of each discrete CCMA are expanded along the coast by the erosion distance for that zone. This is to account for the fact that natural erosion processes are highly unlikely to follow policy area boundaries. This approach is intended to be conservative and is an estimate only.

3.5 Cliff Fall Observation Imagery

Cliff fall observations have been made from the Channel Coastal Observatory (CCO) repository of aerial imagery. High resolution images are available for years 2001, 2005, 2008, 2013 and 2016. However, sometimes the cliff face is obscured by the oblique angle of capture and therefore, some cliff falls may have been obscured from view, preventing their inclusion in the records in this study.

4 CCMA Maps

4.1 Mapping Format

The CCMA maps are presented in Appendix A.1. These maps also show specific SMP policy units and locations of observed cliff falls for the years 2001 to 2016, which are colour-coded by the year in which they appear in the aerial imagery. Cliff falls are numbered so that they can be related to the database of images shown in Appendix A.2.

The CCMA maps contain the following information:

- 2010 cliff top position;
- SMP policy unit boundaries;
- Coastal Change Management Areas;
- Locations of observed cliff falls; and
- Background mapping from Ordnance Survey (Vector Map Local).

The CCMA map is divided into three coloured panes (red, green and blue) for presentation purposes only.

4.2 Cliff Fall Observations

The images in Appendix A.2 present the aerial imagery, grouped by year, in which the cliff fall observations can be seen. Each of the numbered cliff falls in Appendix A.1 can be related to this database of imagery. The information is presented in this way so that the size of each recorded fall can be viewed in context, with respect to local geology, as well as near-by property and assets. The size of each observed fall cannot be quantified from the existing available data.

5 Observations

The Coastal Change Management Areas in the Dover District have been defined by using the erosion distances published by the Environment Agency. These erosion distances vary by location on the coastline, meaning that the CCMA's comprise different widths at different locations along the District's coastline.

The CCMA's defined in this study are presented in Appendix A.1. In addition to the CCMA's, the observed cliff falls since 2001 are summaries in Appendix A.2. The cliff fall drawings are provided for quick access to the District coastline's aerial imagery and enable a high-level assessment of the property, infrastructure and assets which may potentially be at risk.

Summary observations include the following:

- Erosion distances, in the 100 year epoch, in the Dover District vary between 6.6 m and 97.0 m at Oldstairs Bay and Abbots Cliff, respectively;
- Ground conditions at Folkestone Warren, below Capel-le-Ferne, prevent the prediction of erosion distances for any of the three time epochs considered in the SMPs, meaning that it is not possible in this study to define an exact CCMA for policy area 4c06 (Figure 3.1);
- The cliff fall observations show that falls have occurred in the Folkestone Warren cliff area, meaning that this region should be considered with care, even if a discrete CCMA is very difficult to define;
- The Folkestone Warren area currently benefits from coastal defences, which help lessen change/erosion, although these formal defences are anticipated to not be maintained in the long term;
- The risks at Folkestone Warren may thought to be less than other locations of change along the District coastline, but they should not be ignored;
- Numerous observations of cliff falls can be seen for the years 2001 to 2016 near St Margaret's at Cliffe; and
- Policy units 4b24_2 and 4b26 (Figure 3.1), adjacent to St Margaret's at Cliffe, have erosion distances of 40.0 m for the 100 year epoch, meaning the CCMA in that area directly intersects property and buildings in the village.

Policy unit 4b24_1 (Figure 3.1) affords some protection from existing, but unmaintained, sea defences associated with the low-lying rifle range, which accounts for its erosion distance of 6.6 m. This erosion distance is applied, conservatively, to the cliff at the rear of the rifle range rather than to the flat land directly behind the sea defences. Therefore, the erosion distance can be considered an overestimate for this unit. However, once the rifle range has eroded the rate of erosion of the cliff

is likely to accelerate due to an increased exposure to wave action. The timescale of this change is uncertain.

The CCMA's are defined in this study with clear boundaries for the erosion reasonably anticipated for the 100 year epoch. However, the erosion distances for the CCMA's are estimates and the timescales over which such erosion may occur has the potential to vary greatly, both longer and shorter. Therefore, a cautious approach is recommended such that local policies developed for the CCMA's are considered, either wholly or in part, for adjacent areas also.

6 CCMA's and Recommended Guidance

Dover District Council's existing guidance relating to CCMA's is detailed in Annex 1 of the Land Allocations Local Plan, January 2015 (LALP), paragraphs 1.17 to 1.20. The LALP 2015 provides guidance only with respect to CCMA's.

Dover District's CCMA's consist mainly of cliffs, where coastal change and erosion includes the risk of cliff falls. Cliff falls represent a risk to life, and therefore a specific policy for the CCMA's is recommended.

Appendix 4 provides suggested updates for the guidance documentation as well as a suggested CCMA policy.

6.1 Provisions for development and infrastructure relocation away from CCMA's

The NPPG recommends that in some instances it may be appropriate to formally allocate land for the relocation of development and habitat affected by coastal change. Settlements that appear to most likely be affected by coastal change during the 100 year epoch include St Margaret's at Cliffe and Capel-le-Ferne. The CCMA are defined using the 100 year epoch predicted erosion from the SMP. However, this timescale should not be relied upon for planning purposes of land allocation. It is recognised that the rate of erosion can potentially accelerate and pose risk to life earlier than the 100 year epoch. Therefore, the monitoring of actual cliff erosion rates is recommended, so that appropriate action can be taken in a timely manner.

To accommodate relocations, it may be necessary to make provisional allocations which conflict with other policies, such as those governing rural development. Where such allocations need to be made and planning permissions would normally be refused, Dover District Council should make clear that the circumstances are exceptional.

Capel-le-Ferne is located where the exact extent of the CCMA zone is very difficult to define (the SMP is unable to estimate erosion due to the complexity of the geology). Therefore, regular monitoring is recommended of Capel-le-Ferne and Folkestone Warren (noting that Folkestone Warren falls outside of Dover's District boundary). There are numerous properties, a caravan park and the cliff-top café, located along the cliff at Capel-le-Ferne which could all be directly affected by coastal erosion. Additionally, Old Dover Road runs directly along, or very close to, the cliff top at Capel-le-Ferne. Coastal erosion could affect the road making it impassable. However, there is a sufficient number of roads connecting to Old Dover Road which will continue to provide access to either side of a break in the road.

St Margaret's Bay is flanked by two CCMA. The 100 year epoch CCMA overlaps the boundaries of a number of properties near the cliff in St Margaret's at Cliffe. Properties at risk include houses, gardens and outbuildings on top of the cliff. To the south west of the Bay some of these outbuildings are at the cliff edge itself. Below the cliff there are beach huts, a public house, a kiosk, public toilets and a car park. As many as 25 cliff falls have been observed, in the aerial imagery, near St Margaret's

Bay since 2001. Eighteen of these observed falls are located adjacent to Granville Road and The Leas (on the north-eastern side of the bay). Regular monitoring of the cliffs flanking St Margaret's Bay is recommended.

The CCMA at Shakespeare Cliff runs very close to the A20 dual carriageway (Archcliffe Road). At its north eastern end, the Shakespeare Cliff CCMA covers the A20 carriageway and reaches the residential roads of Aycliff. This CCMA demarcation should be treated with caution as there is likely to be sufficient sea defences and other infrastructure to prevent this extent from being realised. This is not fully appreciated in the demarcation of the SMP policy unit boundary (the basis of the CCMA definition) and is positioned so that the unit includes some 50 m of the defences.

The CCMA zones at Shakespeare Cliff and Abbot's Cliff also encompasses the railway tunnels. At Shakespeare Cliff the access tunnel for Samphire Hoe and the Channel Tunnel Ventilation Facility also fall within the CCMA.

South of Kingsdown and Oldstairs Bay there are many properties positioned between the Golf Links and the clifftop. These properties range between approximately 0.5 to 1.9 ha with the dwellings generally set to the opposite side of each site from the cliff. The 100 year epoch erosion here may see some of the seaward boundaries of those properties affected by coastal erosion while the buildings themselves are sufficiently far from the cliff to fall outside of the current 100 year epoch CCMA. However, the access road (The Leas) to these properties runs along the cliff top and will be affected before the properties themselves. The Leas (USRN. 11301673) identifies as a private street in Kent County Council's List of Streets⁷. Private or public, this access route is likely to require relocation during the 100 year epoch.

⁷ Gazetteer Report https://www.kent.gov.uk/_data/assets/pdf_file/0014/10850/Gazetteer-report.pdf

7 Conclusions

The primary focus of this study is to define a detailed set of CCMA maps for the Dover District. Coastal change and its impact on the natural and built environment is a material planning consideration and current planning guidance states that LPAs need to define CCMA's and consider the local policy within them. Therefore, new planning policy on development and coastal change requires coastal change to be considered at all stages of the planning process, to avoid inappropriate development.

The role of the CCMA mapping is to identify areas in which the vulnerability of development proposals can be tested, to ensure that only appropriate development that requires a coastal location and provides substantial economic and social benefits is permitted in these areas. This will involve determining whether the development will be safe through its planned lifetime, or perhaps setting a time limit for development.

There is also potential for the CCMA maps to be used to mitigate the impact and reduce the risk facing coastal communities already experiencing coastal change. By putting in place plans to manage the future development of coastal communities through adaptation, for example, by improving their resilience or by relocation, the impacts can be reduced.

8 References

Herrington Consulting Ltd. (2010) Coastal Change Management Area Mapping Study. Report prepared for Dover District Council, October 2010.

9 Appendices

Appendix A.1 – Coastal Change Management Areas (CCMA)

Appendix A.2 – Observations of Cliff Falls

Appendix A.3 – Excerpt from Section 10 of the NPPF

Appendix A.4 – Suggested CCMA Guidance and Policy

Appendix A.1 – Coastal Change Management Areas (CCMA)

Coastal Change Management Areas

**Dover District Council
Strategic Flood Risk Assessment**



Cliff Fall Observations

- 2001
- 2005
- 2008
- 2013
- 2016
- Policy Units
- Change Areas
- Dover District Boundary

The 'change areas' presented are based on the cliff position in 2010 and the predicted erosion rates for the years 2005 to 2105 presented in the Shoreline Management Plans (SMP) covering Dover District. These maps are intended as indicators of general risk of erosion to enable strategic planning. They are not intended to indicate specific risk to any existing property or asset. It is recommended that any potential risks to existing property are investigated on an individual basis, as required, so that they may include an appropriate level of detail.

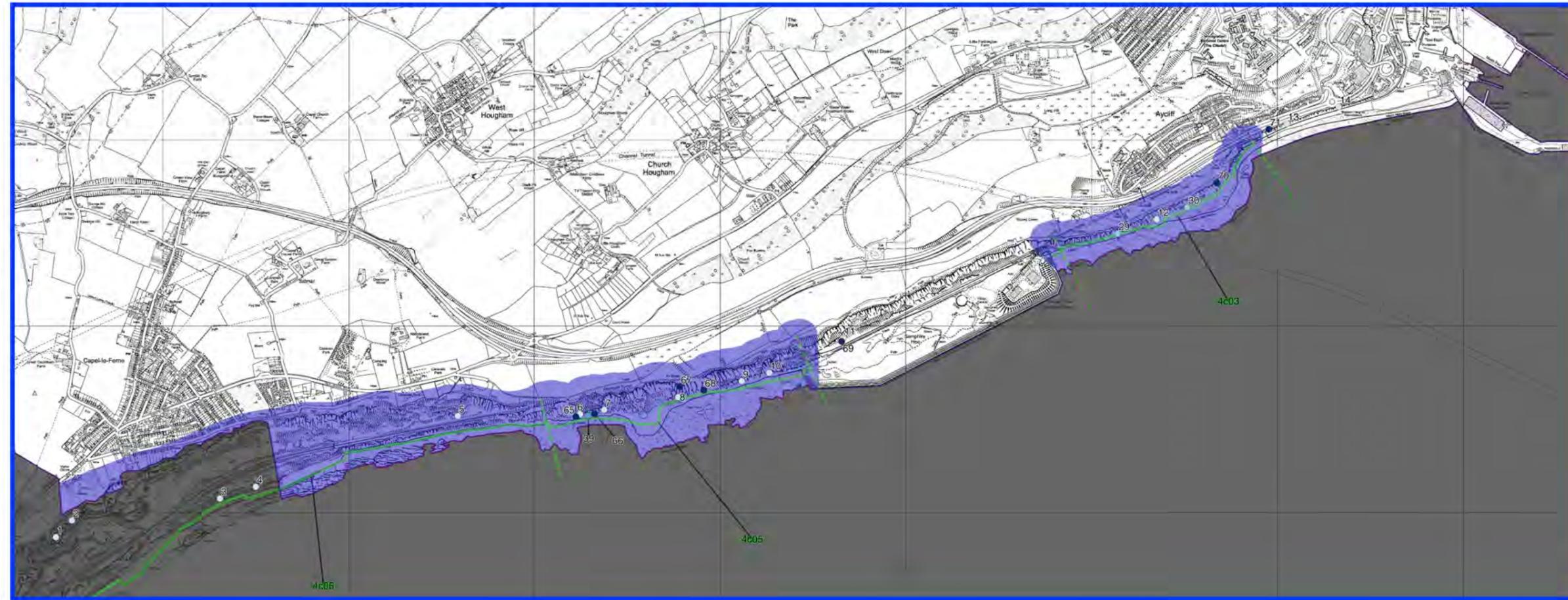
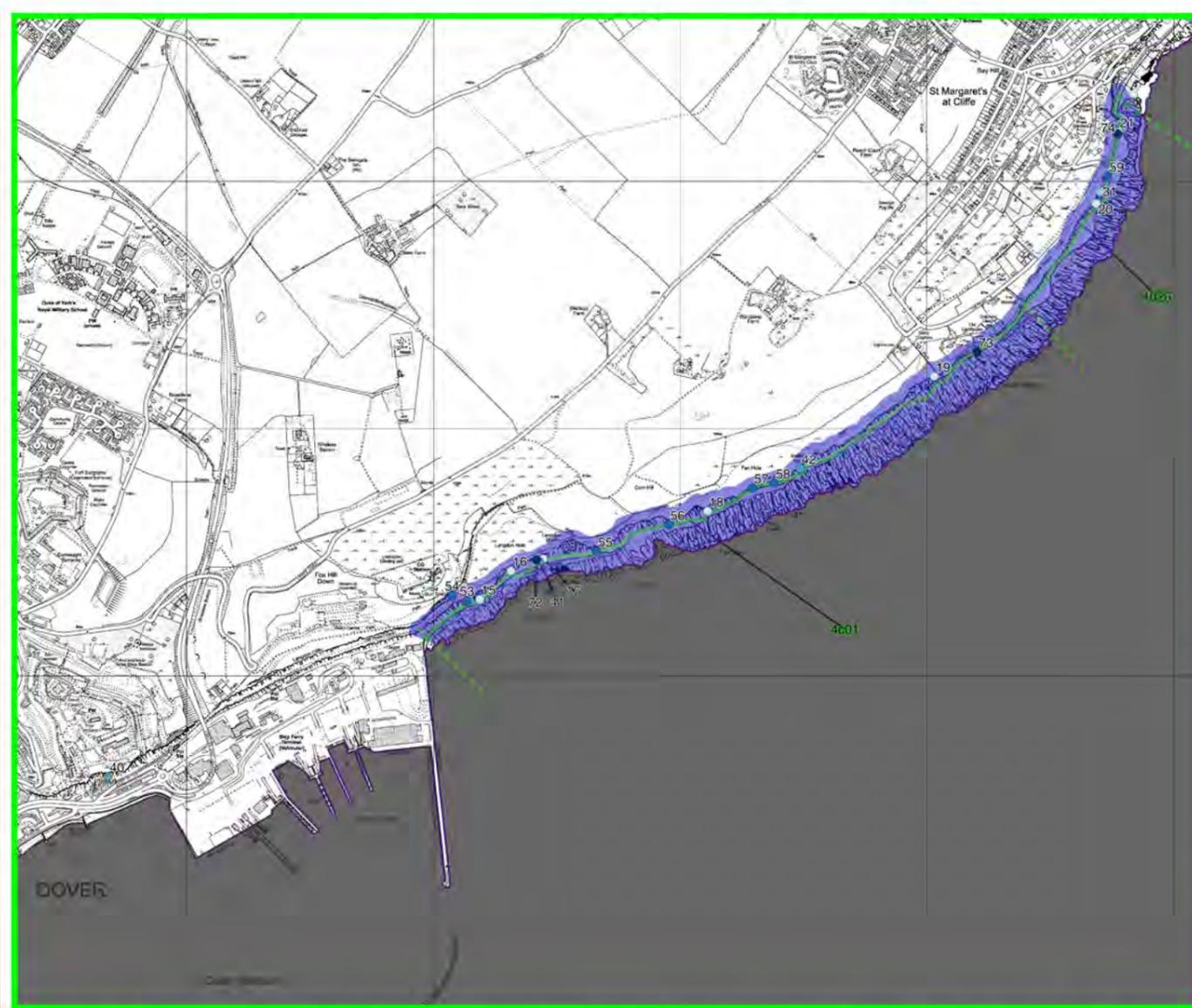
This map is reproduced from Ordnance Survey material with the permission of Ordnance Survey on behalf of the Controller of Her Majesty's Stationery Office © Crown copyright. Unauthorised reproduction infringes Crown copyright and may lead to prosecution or civil proceedings. Dover District Council, 100019780 (2018).

Unit 6 & 7 Berham Business Park,
Eham Valley Road
Canterbury,
Kent
CT8 4DG
www.herringtonconsulting.co.uk
+44 (0)1227 833555
enquiries@herringtonconsulting.co.uk



| | | |
|---------------|------------------|-----------------|
| Drawn: BW/NW | Date: 31/05/2018 | Scale: 1:25,000 |
| Checked: KT | Date: 31/05/2018 | Original: A3 |
| Approved: SMB | Date: 31/05/2018 | Sheet: 1 of 1 |

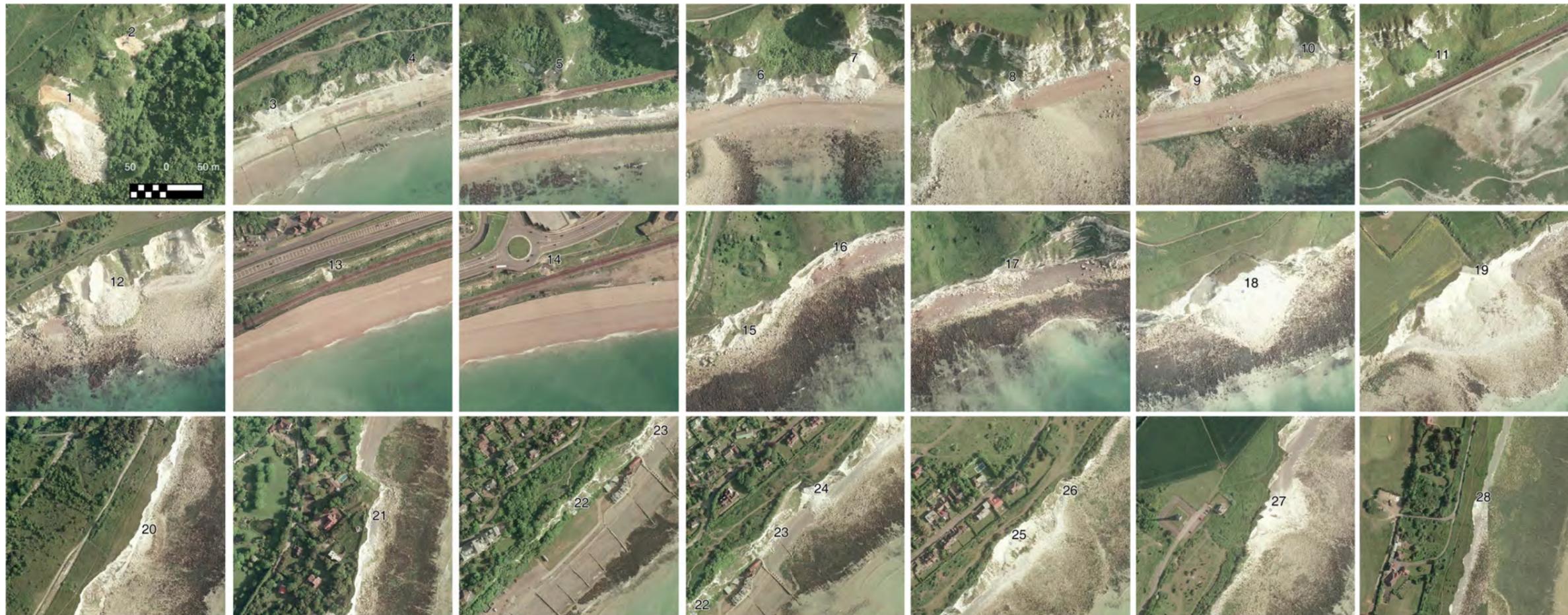
| | | |
|-------------------|--------------|---------|
| Drawing Number: | Revision No: | Status: |
| CCMA Appendix A.1 | 1 | FINAL |



Appendix A.2 – Observations of Cliff Falls

These images are produced using satellite imagery obtained from the Channel Coast Observatory.

2001



2005



Unit 6 & 7 Barham Business Park,
Eham Valley Road,
Canterbury,
Kent,
CT6 4DQ
www.herringtonconsulting.co.uk
+44 (0)1227 833855
enquiries@herringtonconsulting.co.uk



Council Offices, Whitfield (Head Office)
White Cliffs Business Park
Whitfield
Dover
Kent
CT16 3PJ

| | | |
|---------------|------------------|----------------|
| Drawn: NW | Date: 03/01/2018 | Scale: 1:6,433 |
| Checked: KT | Date: 17/01/2018 | Original: A3 |
| Approved: SMB | Date: 17/01/2018 | Sheet: 1 of 2 |

| | | |
|-------------------------------------|----------------|---------------|
| Drawing Number: CCMA Appendix A.2-1 | Revision No: 0 | Status: FINAL |
|-------------------------------------|----------------|---------------|

2008



2013



2016



Observed Cliff Falls: 2008 to 2016

Dover District Council
Strategic Flood Risk Assessment

These images are produced using satellite imagery obtained from the Channel Coast Observatory.

herrington
CONSULTING LIMITED
Unit 6 & 7 Barham Business Park,
Eham Valley Road,
Canterbury,
Kent,
CT16 4DQ
www.herringtonconsulting.co.uk
+44 (0)1227 833855
enquiries@herringtonconsulting.co.uk



Council Offices, Whitfield (Head Office)
White Cliffs Business Park
Whitfield
Dover
Kent
CT16 3PJ

| | | |
|---------------|------------------|----------------|
| Drawn: NW | Date: 03/01/2018 | Scale: 1:6,433 |
| Checked: KT | Date: 17/01/2018 | Original: A3 |
| Approved: SMB | Date: 17/01/2018 | Sheet: 2 of 2 |

| | | |
|---------------------|--------------|---------|
| Drawing Number: | Revision No: | Status: |
| CCMA Appendix A.2-2 | 0 | FINAL |

Appendix A.3 – Excerpt from Section 10 of the NPPF

The following paragraphs are reproduced from Section 10 of the NPPF. They are included here for reference in anticipation of future amendments of the online versions or their web addresses.

105. In coastal areas, local planning authorities should take account of the UK Marine Policy Statement and marine plans and apply Integrated Coastal Zone Management across local authority and land/sea boundaries, ensuring integration of the terrestrial and marine planning regimes.

106. Local planning authorities should reduce risk from coastal change by avoiding inappropriate development in vulnerable areas or adding to the impacts of physical changes to the coast. They should identify as a Coastal Change Management Area any area likely to be affected by physical changes to the coast, and:

- be clear as to what development will be appropriate in such areas and in what circumstances*
- make provision for development and infrastructure that needs to be relocated away from Coastal Change Management Areas*

107. When assessing applications, authorities should consider development in a Coastal Change Management Area appropriate where it is demonstrated that:

- it will be safe over its planned lifetime and will not have an unacceptable impact on coastal change*
- the character of the coast including designations is not compromised*
- the development provides wider sustainability benefits*
- the development does not hinder the creation and maintenance of a continuous signed and managed route around the coast [NPPF reference to footnote 8*]*

108. Local planning authorities should also ensure appropriate development in a Coastal Change Management Area is not impacted by coastal change by limiting the planned life-time of the proposed development through temporary permission and restoration conditions where necessary to reduce the risk to people and the development.

*footnote 8 in Section 10 of the NPPF directs the reader to the Marine and Coastal Access Act 2009 (<http://www.legislation.gov.uk/ukpga/2009/23/contents>)

Appendix A.4 – Draft CCMA Policy for the Local Plan

The CCMA's are identified on the Policy Map. Dover District's CCMA are strongly associated with undefended coastal cliffs. The purpose of the following policy is to manage the risks within these CCMA.

Within Coastal Change Management Areas:

- Permanent new development will not be permitted;
- Permitted development rights are revoked and will instead require planning permission (this includes alterations and extensions);
- Temporary development may be granted time-limited planning permissions so long as:
 - It is necessary, absolutely requires a clifftop/coastal location, or is considered as essential infrastructure, such as Ministry of Defence installations;
 - Demonstrated to be safe and does not increase the risk to life during its planned lifetime;
 - Does not exacerbate rates of coastal change anywhere on the coastline;
 - Financial and logistical provision is made for the removal of the development at the end of its lifetime, or when the risk to the development from coastal change has been deemed to increase unexpectedly;
- The management of surface water using infiltration/soakaways is unlikely to be permitted;
- Ponds, swimming pools and septic tanks are not permitted;
- All proposed development in CCMA's will require both:
 - A coastal change vulnerability assessment; and
 - A geotechnical appraisal.

Further information

New permanent development is not generally considered appropriate in an area which of known risk which will only increase into the future and is not likely to be approved in any of Dover District's CCMA's.

The Planning Authority exercise their powers⁸ to revoke permitted development within the Dover District's CCMA's. Therefore, domestic alterations and extensions (including outbuildings) must seek planning permission. This is necessary as developments may pose an increased risk to its occupants or increase the number of occupants at risk.

Extensions and outbuildings at existing dwellings in CCMA's may be permitted so long as they demonstrate that they satisfy the overall criteria required of development in a CCMA.

Temporary time-limited development may be appropriate and permissible under certain circumstances. All developments in CCMA's will need to demonstrate that its size and location is

⁸ Article 4 of the Town and Country Planning (General Permitted Development) (England) (Order) 2015

necessary and that its construction and removal can be safely executed in advance of it being affected by coastal erosion. Temporary developments will need to demonstrate that appropriate and secure financial provisions are in place for their management in advance of them being affected by coastal erosion. The expectation is for developments to be removed while it is still safe to do so.

It may be appropriate to caveat time-limited planning consents with time-frames for re-appraisal to enable the extension or curtailment of consent periods.

To achieve consent, a temporary development will need to demonstrate that it:

- has no detrimental effect on coastal processes nor would it increase the likelihood or rate of coastal change;
- will not result in increased risk to life or property;
- will not impede relocation or adaptation to coastal change;
- will not impede adaptation to climate change by communities or the natural environment; and
- will not require new or improved coastal defences to sustain it.

Some types of essential infrastructure and Ministry of Defence infrastructure may be permitted.

Considering the sensitivity of coastal change to groundwater, the following will not be permitted:

- Infiltration as a mechanism of managing surface water runoff, such as soakaways, filter strips and infiltration basins;
- Ponds & swimming pools;
- Septic tanks or sewage treatment plants;
- Above or below ground water storage devices with a capacity greater than 1 m³; and
- The uncontrolled discharge or disposal of water onto or into the ground.

This is due to the risk that these water-retaining structures pose should they leak, either slowly or catastrophically, as this has the potential to accelerate the cliff failure.

Permeable surfacing may still be permitted for isolated areas of hardstanding such as driveways & patios. However, this will only be the case where runoff from other hardstanding does not drain to this permeable surfacing.

In addition to satisfying all other relevant planning requirements, proposals for development in CCMA's will need to be accompanied by:

- A Coastal Change Vulnerability Assessment; and
- A Geotechnical Appraisal.

Both the Vulnerability Assessment and Geotechnical Appraisal must be completed by qualified professional persons⁹.

The Vulnerability Assessment is recommended so that a development can demonstrate its exposure to risk from coastal erosion. This must consider the changes in risk over the planned lifetime of the development.

The purpose of the Geotechnical Appraisal is for a development to demonstrate that it will not detrimentally affect ground stability nor exacerbate/accelerate coastal erosion, with respect to itself, its neighbours or any surrounding infrastructure or property, neither during nor after its construction. The Geotechnical Appraisal can be commensurate in scope to the size and scale of the development as well as the development's vulnerability, following the Vulnerability Assessment,

The Geotechnical Appraisal may include:

- a review of historical changes in ground stability near the development;
- a review of the existing ground conditions;
- demonstrable evidence of appropriate site investigations; and
- an evaluation of the anticipated future stability.

The Geotechnical Appraisal ought to conclude whether the development is expected to remain safe during its planned lifetime. Recommendations should include how potential changes to the level of risk over the planned lifetime be monitored and managed.

⁹ A registered member of a relevant professional body, who has suitable professional indemnity insurance for undertaking geotechnical investigations.