

1. THE SPECIFICATION FOR TOPOGRAPHIC SURVEYS

The Specification for the topographic surveys is the Environment Agency National Standard Contract and Specification for Surveying, Standard Technical Specifications (Version 3.1).

2. THE SURVEY BRIEF

This Survey Brief amplifies and amends the Environment Agency National Standard Contract and Specification for Surveying, Standard Technical Specifications (Version 3.1) and must be read in conjunction with these specifications.

Scheme Title: North East Regional Coastal Monitoring Programme

Scheme Number: SCB105

Employer's Address: Scarborough Borough Council, Town Hall, St Nicholas Street, Scarborough, YO11 2HG

Nominated Employer's Representative: Mr Robin Siddle

Survey Title: Provision of topographic data for:

Work Package TNE01 – Northumberland Frontage

Work Package TNE02 – North Tyneside Frontage

Work Package TNE03 – South Tyneside Frontage

Work Package TNE04 – Sunderland Frontage

Work Package TNE05 – County Durham Frontage

Work Package TNE06 – Hartlepool Frontage

Work Package TNE07 – Redcar & Cleveland Frontage

Work Package TNE08 – Scarborough Frontage

The Sections of the Standard Technical Specifications which shall apply to this Contract:

Section II, Section III, Section VIII

Purpose of Survey:

- The surveys are to be used as part of a long-term programme of coastal monitoring, to analyse coastal processes and provide data for operational and strategic shoreline management.
- Many of the surveys will be repeated on a regular basis; repeatability is therefore a key requirement.

Delivery Schedule: to be in accordance with table 2.5 and section 2.6

Tender Submission Date: See the “Pro Contract System”

Contract Completion Date: 31 March 2021

Known Hazards: Scarborough Borough Council is unaware of any special hazards other than those normally associated with beach and cliff surveying. The surveyor shall carry out a full Risk Assessment before each survey and shall prepare a Safe System of Working based on the Assessment. A copy shall be forwarded to the Employer's Representative. The surveyor's attention is drawn to the desirability, among other

things, of monitoring the tidal cycle and the weather forecast and of notifying the Coast Guard of the survey activities.

Site Conditions/Restrictions, Access and Public Relations:

Contact details for any areas requiring specific permission for access will be supplied to the Contractor. Data layers identifying conservation designations are freely available from the Natural England website:

http://www.gis.naturalengland.org.uk/pubs/gis/GIS_register.asp.

Due to the sensitivity of over-wintering birds, Natural England prohibit quad bikes from accessing the following areas during November:

- Hartlepool North Beach
- Hartlepool North Gare
- Redcar Beach.

All surveyors shall carry with them an identification card bearing their photograph and authorisation, which should be presented as a matter of course and without it being demanded, at all meetings with landowners or the public.

2.1 GENERAL

2.1.1 Performance Monitoring Arrangements

An annual review will be undertaken by the Employer to examine the performance of the Contractor during the contract period. If the Contractor is shown to be failing in his obligations to comply with the terms of the Contract, Specification or Brief, the Employer may exercise his rights under clause 90 of the Conditions of Contract to terminate the contract.

2.1.2 Quality Control of Data

The Contractor is responsible for undertaking quality control of the topographic data to ensure that the data meets the standards and requirements of the Specification and the Brief. The Employer will undertake QC checks on the processed data within 2 weeks of delivery of each Survey Unit. If data rejected by the Employer requires re-processing, the re-processed data will be supplied within 1 week of notification of failure. Survey Units which are rejected due to the survey extent not being complete (or any other failure to meet the Specification which cannot be corrected by re-processing) must be re-surveyed within 4 weeks of notification or during the next suitable tide/weather window. In such cases, in order to maintain data integrity, the entire Survey Unit must be re-surveyed.

2.1.3 Health & Safety

The Contractor shall comply with all relevant legislation and bylaws when carrying out the Survey. Equipment and survey personnel provided by the Contractor for work in

connection with the contract shall be the Contractor's responsibility at all times. The said equipment and survey personnel and any loss, injury or damage suffered or caused by them shall be at the Contractor's risk throughout. All risks of data acquisition, including equipment hire and demurrage will be borne by the Contractor.

2.2 LOCATION AND EXTENT OF SURVEY

The NE coastline is divided into a series of Work Packages, each sub-divided into a number of Survey Zones. The location of cross-shore survey profiles, topographic surveys and cliff monitoring locations are provided in the shapefiles detailed in Table 2.1.

Table 2.1 Accompanying files defining survey extent and other co-ordinates

File name	File contents
Cell1_cellone_zones_Aug2015.lyr	Shapefile and layer file delineating Survey Unit boundaries
Cell1_cellone_zones_Aug2015.shp	
Cell1_topographic_surveys_Aug2015.xlsx	Spreadsheet and shapefile of topographic survey areas. Indicates frequency, extent and locations of required surveys.
Cell1_topographic_surveys_Aug2015.shp	
Cell1_topographic_profiles_start_end_Aug2015.xlsx	Spreadsheet and shapefile of Start of Line/End of Line co-ordinates of profiles
Cell1_topographic_profiles_start_end_Aug2015.shp	
Cell1_cliff_top_points_locations_Aug2015.xlsx	Spreadsheet and shapefile virtual monitoring points (VMPs) for cliff top monitoring
Cell1_cliff_top_points_locations_Aug2015.shp	
Cell1_topographic_line_surveys_Aug2015.xlsx	Spreadsheet and shapefile of linear (alongshore) cliff top and edge of sand surveys.
Cell1_topographic_line_surveys_Aug2015.shp	

2.2.1 Location of Survey Lines

Survey profile lines have been defined at varying intervals along the entire North East coastline. The start and indicative end co-ordinates together with bearings of these lines are given in the accompanying spreadsheet and GIS files (see Table 2.1, data provided in Annex A). The Start-of-Line co-ordinates of these profiles is considered as zero chainage (see Figure 2.1) for all surveys so that profiles obtained from all survey types (topographic, bathymetric and LiDAR) can be compared. The spreadsheet also details the timing and frequency of surveys.

2.2.2 Start Point for Survey (the Landward Boundary)

For topographic surveys, the landward boundary to be surveyed (the 'Start Point') is defined as appropriate, by either:

- The cliff toe (Figure 2.2)
- The landward limit of fixed coastal structure e.g. seawall, embankment (Figure 2.3)
- 100m inshore from the landward toe of the back barrier toe on a barrier beach (Figure 2.4)
- *either* 200 metres to landward of the seaward face of a dune system *or* to the back of the dune system if the dunes are less than 200m wide
- At agreed locations for any further categories which are identified.

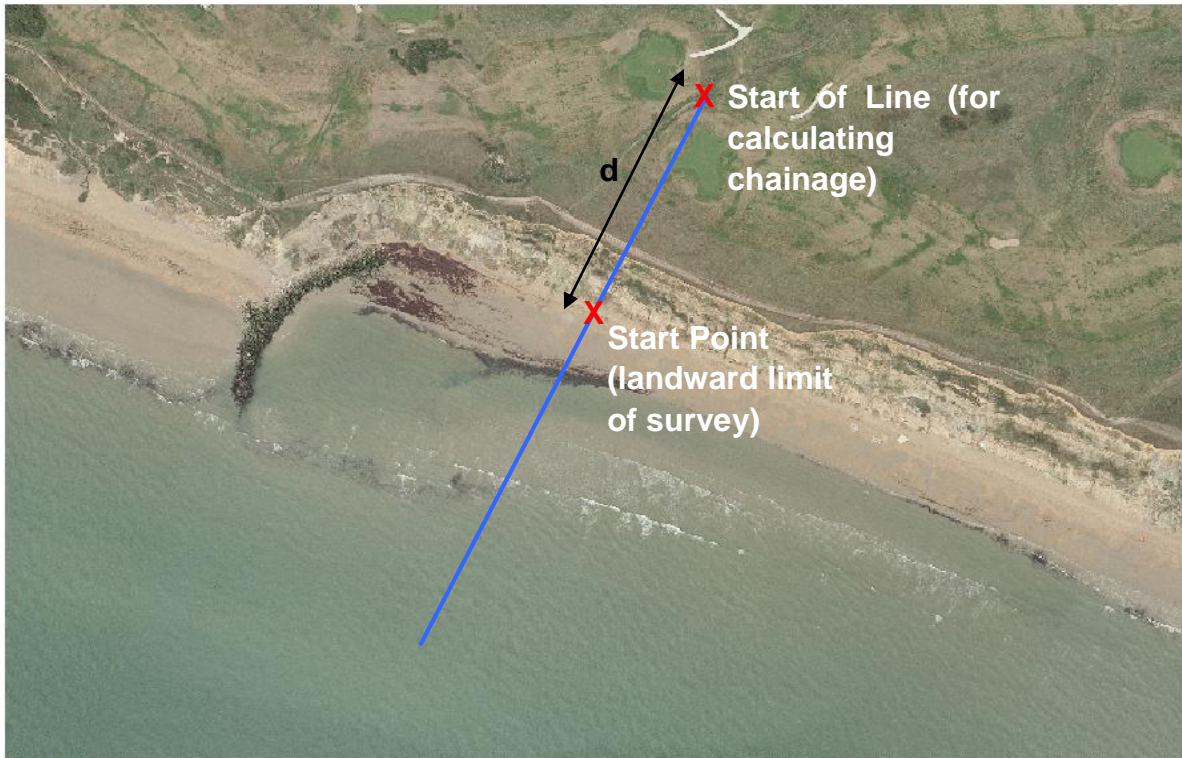


Figure 2.1 Definition of terms for topographic survey

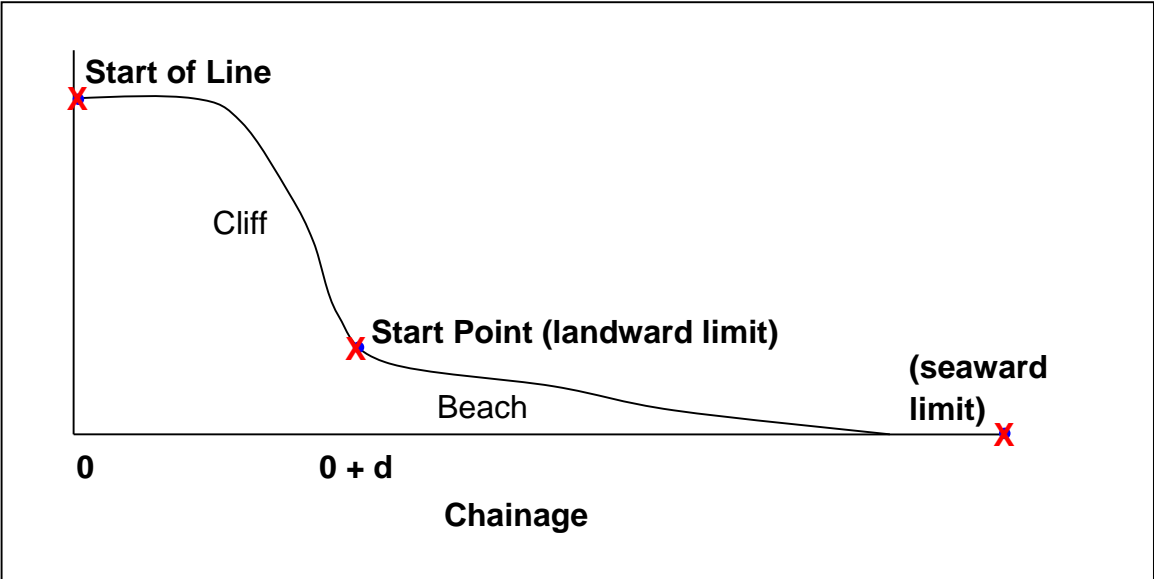


Figure 2.2 Start Point at cliff toe

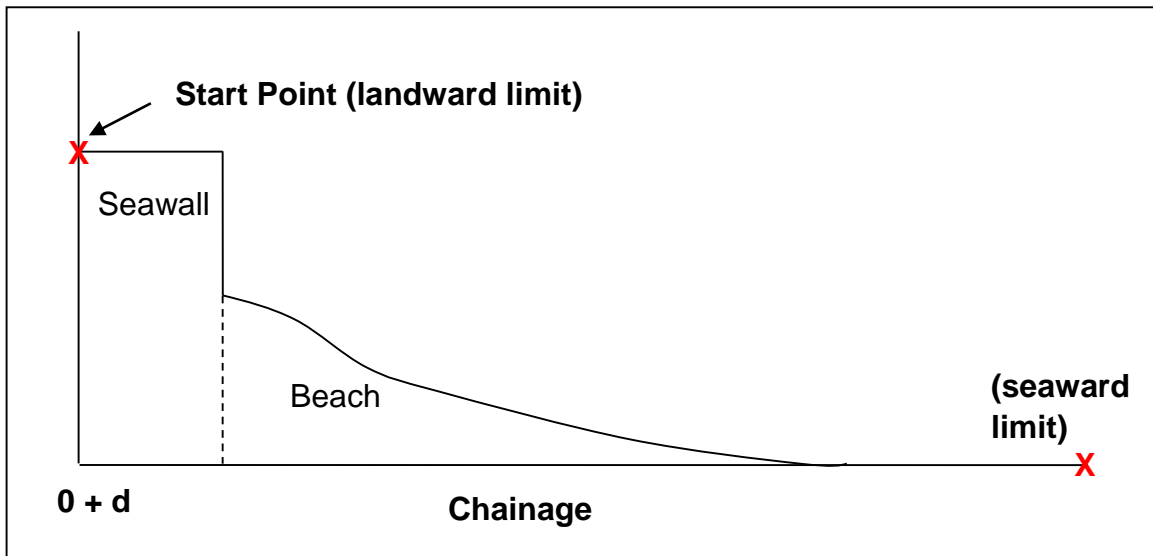


Figure 2.3 Start Point for a fixed structure

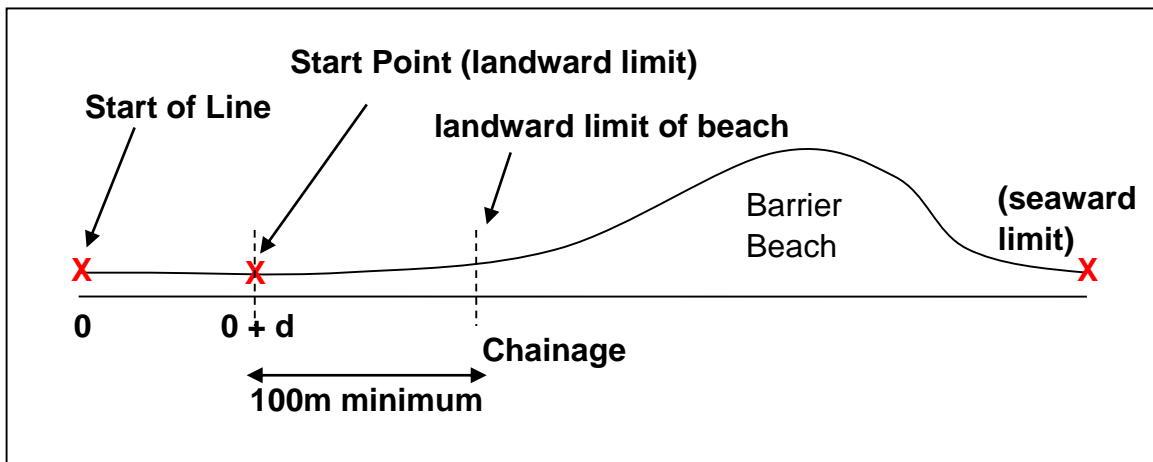


Figure 2.4 Start Point for barrier beaches

2.2.3 End Point for the Survey (the Seaward Boundary)

The seaward boundary will be dictated by the tidal conditions at the time of the survey. In as far as is practicable, survey programmes should be scheduled to achieve the greatest possible extent of foreshore coverage. Ideally, this will be to reach the level of Mean Low Water Spring tides (MLWS), as defined in Table 2.2. However, it is recognised that this will not always be practicable across the whole of the North East coast and therefore survey programming should aim to achieve coverage to the level of Mean Low Water (MLW) or lower, as defined for each Survey Unit by the Admiralty tide data (Table 2.2). If coverage to MLW cannot be achieved in a particular Survey Unit, the Consultant shall discuss with the Employer the extent of coverage that is possible based on his survey programming for that season's campaign and agree a way forward, but in all circumstances coverage to a minimum level of that reached by Mean Low Water Neap (MLWN) tides will be expected.

Location	MLWN m ODN	MLW (approx.) m ODN	MLWS m ODN
Berwick upon Tweed	-1.2	-1.6	-1.9
Holy Island	-0.9	-1.4	-1.8
North Sunderland	-0.8	-1.3	-1.7
Amble	-0.8	-1.3	-1.9
Blyth	-0.7	-1.3	-1.8
River Tyne	1.0	-0.1	-1.2
Sunderland	-0.7	-1.3	-1.8
Seaham	-0.7	-1.4	-2.0
Hartlepool	-0.9	-1.4	-1.9
River Tees	-0.8	-1.4	-2.1
Whitby	-0.8	-1.4	-2.0
Scarborough	-1.0	-1.7	-2.4
Filey	-0.9	-1.6	-2.3
Bridlington	-1.1	-1.7	-2.3

Table 2.2 Tidal Elevations (m ODN)

2.2.4 Location of clifftop surveys

Clifftop surveys have been defined at specific locations along the North East coastline. The purpose of this survey, when repeated over time, is to determine rates of change along eroding sections of cliff. The clifftop surveys take two forms:

- (i) continuous surveys along the line of the cliff edge (clifftop survey – lines)
- (ii) offset measurements from a fixed Virtual Monitoring Point (VMP) to the cliff edge along a defined bearing (Clifftop survey – points)

Clifftop survey lines are undertaken at four locations in Northumberland and Scarborough Borough to define the position of the cliff top:

- Church Point Caravan Park near Newbiggin,
- Sandy Bay Caravan Park near Cambois
- Cambois Bay
- Scalby Ness, Scarborough North Bay.

The Start of Line co-ordinates and End of Line co-ordinates are given in the accompanying spreadsheet “Cell1_topographic_line_surveys_Aug2015.xls” under the worksheet tab ‘clifftop lines’ (see Table 2.1). Please see Annex A.

Clifftop survey using Virtual Monitoring Points (VMPs) are recorded at a series of locations, namely:

- Trow Point, South Tyneside
- Hendon to Ryhope, Sunderland
- Dawdon (near Seaham), County Durham
- Staithes, Redcar & Cleveland

- Robin Hood's Bay, Scarborough Borough
- Scarborough South Bay, Scarborough Borough
- Cayton Bay, Scarborough Borough
- Filey Bay, Scarborough Borough.

Virtual Monitoring Points (VMPs) have been established close to, but set back from, the edge of cliffs at these locations. A series of offset measurements from these VMPs to the cliff edge will be undertaken along a pre-determined bearing. The Easting and Northing of the VMPs and the bearing along which the offset measurement to the cliff edge will be undertaken are given in the accompanying spreadsheet "Cell1_cliff_top_point_locations_Aug2015.xls" under the worksheet tab 'clifftop points' (see Table 2.1). Please see Annex A.

2.3 SURVEY SCHEDULE

Surveys are scheduled to be undertaken twice in each year, once in spring and once in autumn, nominally separated by 6 months.

The autumn works are referred to as Full Measures Surveys and include a full set of activities, including all beach profile surveys, beach topographic surveys, clifftop lines and clifftop points.

The spring works are referred to as Partial Measures Surveys and include a repeat of a sub-set of surveys, comprising a selection of beach profiles and beach topographic surveys and all clifftop lines and clifftop points.

The Full Measures Surveys Contract will comprise a repeat of all of the existing (pre-established) surveys identified as being undertaken at an annual frequency (Table 2.3). It is expected that these will usually be undertaken between September and November in each year. The first Full Measures Survey under the Contract will be in autumn 2016 and the last will be in autumn 2020, meaning there will five sets of surveys in total.

Note that due to the sensitivity of over-wintering birds, quad bikes are prohibited from accessing the following areas during November and therefore surveys should be completed between September and October:

- Hartlepool North Beach
- Hartlepool North Gare
- Redcar Beach.

The Partial Measures Surveys in each year of the Contract will comprise a repeat of all of the existing (pre-established) surveys identified in Table 2.3. It is expected that these will usually be undertaken between March and April in each year. The first Partial Measures Survey under the Contract will be in spring 2017 and the last will be in spring 2021, meaning there will five sets of surveys in total.

There are additional survey requirements at Hartlepool and Spittal Carrs in Newbiggin Bay:

- Once every five years, the beach topographic survey at Hartlepool north is extended across a wider frontage, as shown in the GIS polygons provided in the shape file "Cell1_topographic_surveys_Aug2015.shp". One extended survey will be required at Hartlepool North Sands/Hartlepool Headland as part of this contract. This is required to be incorporated into the Full Measures survey in autumn 2018
- The edge of sand is to be surveyed at Spittal Carrs in Newbiggin Bay as part of the pre-established Newbiggin Bay topographic survey in each Full Measures Survey and in each Partial Measures Survey. This is intended to monitoring any adverse impacts of a nearby beach management scheme on intertidal habitats.

The work to be completed under Full and Partial Measures Surveys over the period of the Contract is summarised in Table 2.3 below.

Table 2.3 Summary of Survey Activities

Work Package	Survey Unit	Full Measures (Autumn)			Partial Measures (Spring)		
		Number of Beach Profiles	Number of Topo Surveys	Number of cliff Monitoring Locations	Number of Beach Profiles	Number of Topo Surveys	Number of Cliff Monitoring Locations
TNE01 Northumberland	Sandstell Point (Spittal A)	10	1	-	4	1	-
	Spittal (Spittal B)	4	-	-	2	-	-
	Goswick Sands	6	-	-	2	-	-
	Holy Island	8	1 ¹	-	2	-	-
	Bamburgh	1	-	-	-	-	-
	Beadnell Village	2	-	-	1	-	-
	Beadnell Bay	9	-	-	5	-	-
	Embleton Bay	2	-	-	-	-	-
	Boulmer	2	-	-	2	-	-
	Alnmouth Bay	10	1	-	3	1	-
	High Hauxley and Druridge Bay	9	-	-	8	-	-
	Lynemouth Bay	7	-	1 Topo Line	2	-	1 Topo Line
	Newbiggin Bay ²	30	1	-	30	1	-
	Cambois Bay	7	-	1 Topo Line	-	-	1 Topo Line Survey
Blyth South Beach	6	-	-	6	-	-	
<i>SUB-TOTAL for Northumberland</i>		<i>113</i>	<i>4</i>	<i>2 Topo Lines</i>	<i>67</i>	<i>3</i>	<i>2 Topo Lines</i>
TNE02 North Tyneside	Whitley Bay	5	1	-	5	-	-
	Cullercoats Bay	1	-	-	1	-	-

¹ Survey of causeway and flanks

² Also includes a bespoke 'Edge of Sand' survey at both Full and Partial Measures

Work Package	Survey Unit	Full Measures (Autumn)			Partial Measures (Spring)		
		Number of Beach Profiles	Number of Topo Surveys	Number of cliff Monitoring Locations	Number of Beach Profiles	Number of Topo Surveys	Number of Cliff Monitoring Locations
	Tynemouth Longsands	3	1	-	3	1	-
	King Edward's Bay	1	-	-	1	-	-
<i>SUB-TOTAL for North Tyneside</i>		10	2	-	10	1	-
TNE03 South Tyneside	Littlehaven Beach	4	1	-	4	1	-
	Herd Sands	5	1	-	3	-	-
	Trow Quarry (Including Frenchman's Bay)	4		6 VMPs	4	-	6 VMPs
	Marsden Bay	4	-	-	2	-	-
<i>SUB-TOTAL for South Tyneside</i>		17	2	6 VMPs	13	1	6 VMPs
TNE04 Sunderland	Whitburn Bay	11	1	-	3	-	-
	Sunderland Harbour and Docks	11	-	-	-	-	-
	Hendon to Ryhope (including Halliwell Banks)	36	1	35 VMPs	13	-	35 VMPs
<i>SUB-TOTAL for Sunderland</i>		58	2	35 VMPs	16	-	35 VMPs
TNE05 County Durham	Featherbed Rocks	1	-	-	1	-	-
	Dawdon and Seaham	1	-	3 VMPs	1	-	3 VMPs
	Blast Beach	3	-	-	3	-	-
	Hawthorn Hive	1	-	-	1	-	-
	Blackhall Colliery	3	-	-	-	-	-
<i>SUB-TOTAL for County Durham</i>		9	-	3 VMPs	6	-	3 VMPs
TNE06 Hartlepool	North Sands and Headland	7 ³	1 ⁴	-	7	-	-
	Middleton	1	1	-	1	-	-
	Hartlepool Bay	4	1	-	4	-	-
	North Gare	-	1	-	-	-	-
<i>SUB-TOTAL for Hartlepool</i>		12	4	-	12	-	-
TNE07 Redcar and Cleveland	Coatham Sands	3	1	-	3	-	-
	Redcar Sands	4		-	4	1	-
	Marske Sands	1		-	1	-	-
	Saltburn Sands	1		-	1	1	-
	Cattersty Sands (Skinningrove)	-	1	-	-	1	-

³ 1cHN1 is in County Durham, but is reported under Hartlepool.

⁴ Extended survey area once every five years. Next in 2018 – see GIS database

Work Package	Survey Unit	Full Measures (Autumn)			Partial Measures (Spring)		
		Number of Beach Profiles	Number of Topo Surveys	Number of cliff Monitoring Locations	Number of Beach Profiles	Number of Topo Surveys	Number of Cliff Monitoring Locations
	Staithes ⁵	-	-	12 VMPs	-	-	12 VMPs
<i>SUB-TOTAL for Redcar and Cleveland</i>		9	2	12 VMPs	9	3	12 VMPs
TNE08 Scarborough	Staithes ⁶	-	-	8 VMPs	-	-	8 VMPs
	Runswick Bay	-	1	-	-	1	-
	Sandsend, Uppang and Whitby	3	1	-	3	-	-
	Robin Hoods Bay	-	1	13 VMPs	-	1	13 VMPs
	Scarborough North Bay	5	1	1 Topo Line	5	-	1 Topo Line
	Scarborough South Bay	4	1	13 VMPs	4	-	13 VMPs
	Cayton Bay	4	1	8 VMPs	4	-	8 VMPs
	Filey Bay	5	1	28 VMPs	5	1	28 VMPs
<i>SUB-TOTAL for Scarborough</i>		21	7	70 VMPs 1 Topo Line	21	3	70 VMPs 1 Topo Line
GRAND TOTAL		249	23	126 VMPs 3 Topo Line	154	11	126 VMPs 3 Topo Line

2.3.4 Post-Storm Surveys

Post-storm surveys will be conducted following storm events of a defined severity. The Employer will determine the storm-event threshold and the Contractor's survey team is required to mobilise to site within 24 hours of a request by the Employer.

For post-storm surveys, it is expected that the survey will be timed to be undertaken around Low Water, but the seaward boundary is defined as "as far seaward as can be surveyed safely". Other specifications may exceptionally be relaxed according to weather conditions at the site following mobilisation; the Employer will agree these in advance. Photos of significant storm damage to structures / general beach damage to be taken and emailed to robin.siddle@scarborough.gov.uk on the day of survey (where possible).

2.4 DELIVERY SCHEDULE

The delivery schedule for the 5 year Programme is given in Table 2.4. Post-storm surveys shall be conducted as required by the Employer (paragraph 2.3.4).

⁵ Site straddles R&C and Scarborough

⁶ Site straddles R&C and Scarborough.

Table 2.4. Delivery schedule of surveys.

Survey type	Frequency	Working window	Completion blocks	Years	Total surveys
Full Measures	Autumn	September – November*	Completion of each 1km block within 2 (daylight) tides	2016 – 2020	5
Partial Measures	Spring	March - April	Completion of each 1km block within 2 (daylight) tides	2017 - 2012	5
Hartlepool North Extended	Autumn	September – November*	Completion of each 1km block within 2 (daylight) tides	2018	1
Post-storm	As required	As required	On-site within 24 hours of request. Completion within 2 (daylight) tides	2012-2016	As required

* note access restrictions due to over-wintering birds at certain beaches.

All Full Measures and Partial Measures surveys shall be completed in 1km blocks (see section 2.3.1), each block to be completed within 2 (daylight) tides. Post-storm surveys must start within 24 hours of a request by the Client and must be completed within 2 (daylight) tides.

2.5 TECHNICAL REQUIREMENTS

2.5.1 General Requirements Applicable To All Surveys

Surveys will be required over low water spring tide periods in order to achieve the required seaward limit of surveys. Surveys will be programmed to ensure that the required seaward limit can be achieved.

Any survey marks used to identify the first point to be surveyed on each profile line will be maintained; these will be surveyed on the occasion of each survey and used to check the results of the survey. The type of markers to be used shall be approved by the Employer. Wherever possible, markers should be grouted into concrete or other permanent structures.

All software to be used for survey processing will be agreed in advance. The surveyor shall provide details of all software packages and survey equipment to be used in the Method Statement required as part of the tender.

When Kinematic GNSS data collectors are used for profile measurement they will be set to a horizontal precision of 15mm and a vertical precision of 20mm (Section III, 7.0 Standard Technical Specifications). For alongshore (continuous) data collection, horizontal precision may be reduced to 50mm and vertical precision to 50mm.

2.5.2 Method of survey

The technical details given in this section represent the minimum that shall be achieved in terms of data coverage and are based on the assumption of RTK GPS as the survey method. Other methods of survey may be used e.g. laser scanning, ATV etc., in accordance with the Specification, providing that the minimum requirements are met. Details shall be provided in the Method Statement to demonstrate that the Consultant's proposed instrumentation and method of survey can fulfil the minimum technical requirements.

2.5.2.1 Cross-shore Profiles

Lines will be staked out using navigation software. Staked points will lie within +/- 0.1m of the pre-defined profile. Points will be surveyed at each change in slope with intervals not exceeding 5m between points. Maximum spacing of measurement points may be increased to 10m, plus breaks of slope, at a distance of 50m seaward of the toe of a shingle beach. Maximum spacing of measurement points may be increased to 20m, plus breaks of slope, at a distance of 100m seaward of the toe of a shingle beach, or more than 100m onto the low tide terrace of a sand beach (see Figure 2.5). Maximum spacing of measurement points may be increased to 50m, plus breaks of slope, at distances in excess of 200m onto the low tide terrace of a sand beach until the seaward boundary is reached. Where a seawall is present, the profile shall include at least one fixed point on the seawall and extend to the landward limit of the structure.

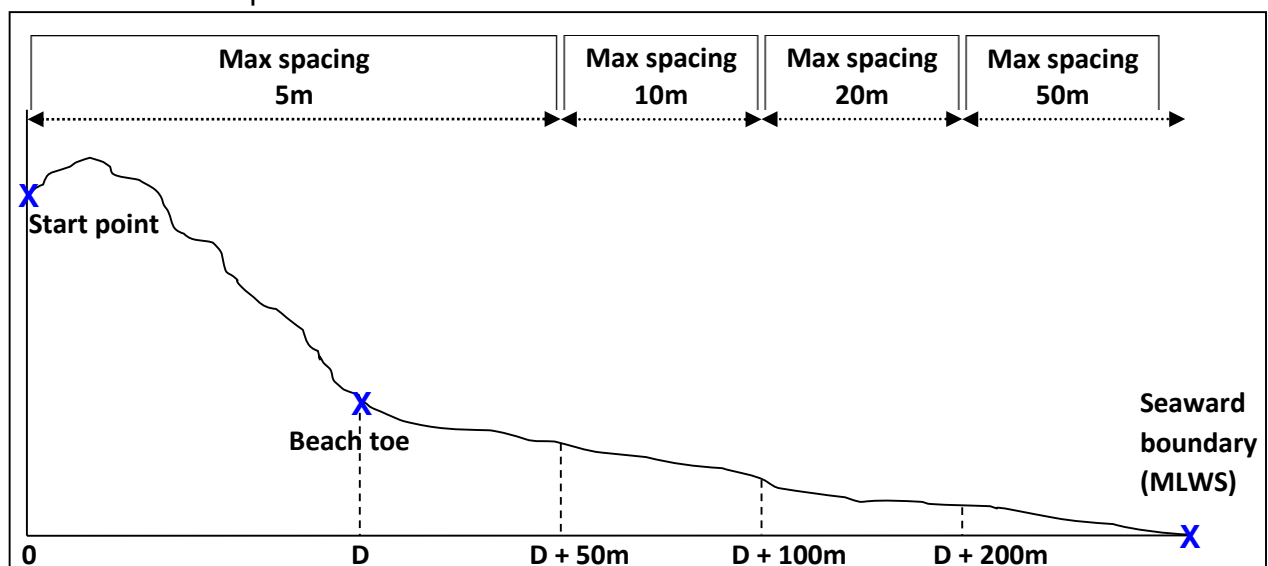


Figure 2.5 Spacing of measurement points for profile survey

2.5.2.2 Alongshore (continuous) Lines

Spot height (baseline) surveys will generate sufficient data to enable contours to be plotted at an interval of 0.25m and 5m resolution digital elevation model to be produced. Spot heights along all alongshore lines will be surveyed at a point spacing not exceeding 20m. Alongshore lines will be surveyed at a maximum cross-shore spacing of 20m. In addition to this grid of spot heights, the surveyor should pay particular attention to recording the location of beach topography features including ridges, runnels and other breaks of slope that may be present (Figure 2.6).

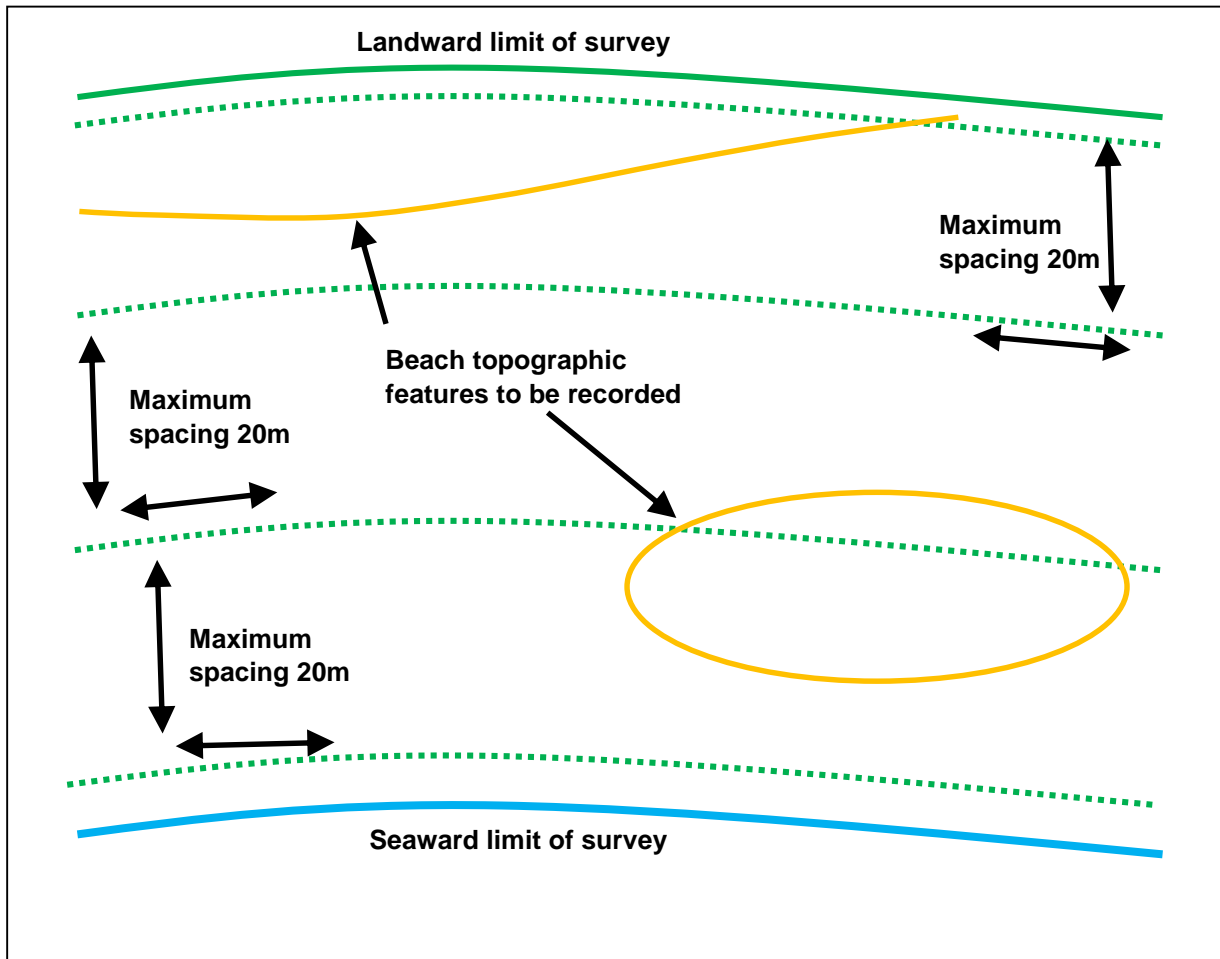


Figure 2.6 Continuous survey spacing of measurement points (plan view)

2.5.2.3 Post-storm Profile Surveys

In addition to the profile survey requirements, where a seawall is present in the Survey Unit to be surveyed, a continuous line will be surveyed as close as possible to the base of seawall. Where a sand dune is present in the Survey Unit to be surveyed, a continuous line will be surveyed along the toe of the sand dune.

2.5.2.4 Feature Codes

Each measured data point shall be tagged with a Feature Code which represents the sediment surface type. The only permissible Feature Codes are given in Table 2.5. Note that the High Water Mark (HW) should only be tagged where the surveyor is reasonably certain that the High Water Mark represents the maximum run-up elevation of the previous High Water. Nevertheless, it is a particularly useful measurement for research into beach behaviour and every effort should be made to identify the High Water Mark whenever possible, particularly on post-storm surveys. "X" should only be used for sediment mixtures which cannot be described by GS, MS or GM

2.5.3 Survey Control

The survey data shall be supplied to OSGB36 National Grid using OSTN02/OSGM02 transformations. Surveys will be conducted using the control supplied. Locations of the control stations are given in the accompanying spreadsheet and GIS files e.g. "TSW02_Control.xls/shp" (see Table 2.1). Witness diagrams will be supplied to the Contractor on award of contract. Additional control may be added at the surveyor's convenience. RTK base station sites will be surveyed to E2 standards and a witness diagram produced and supplied to the Employer with a sketch of the control station with at least 3 tie dimensions shown. Also to be included are a photograph of the control station, Easting, Northing and Elevation (ODN) to 3 decimal places, ETRS89 co-ordinates, logging duration, and E1/E2 control stations used to establish the new station.

At least two observations shall be taken at the start and end of all surveys. All check point observations should lie within +/- 30 mm of the co-ordinates stated. Additional measurements should be taken on other accessible control points where possible. The results of these check point observations will be supplied in the survey report.

Table 2.5 Surface Sediment Type Feature Codes

Feature Code	Sediment type
S	Sand
M	Mud
G	Gravel
GS	Gravel & Sand
MS	Mud & Sand
B	Boulders
R	Rock
SD	Sea Defence
SM	Saltmarsh
W	Water body
GM	Gravel & Mud
GR	Grass
D	Dune (non-vegetated)
DV	Dune (vegetated)
F	Forested
X	Mixture
FB	Obstruction
CT	Cliff Top
CE	Cliff Edge
CF	Cliff Face
SH	Shell
ZZ	Unknown
HW	High Water Mark

2.5.4 Photography

All photography will be taken using a GPS-enabled digital camera to record the location of the image. JPEG files will be digitally labelled with Profile code, date and time. Each profile will be photographed from a point mid-way along the profile. Photographs should be taken looking landwards and seawards along the profile.

Where obstructions or beach conditions cause gaps in the beach or cliff survey, these will be documented with photographs that shall be included in the survey report.

2.6 DATA MANAGEMENT

Data files will contain all measured data points (control points must be removed). Survey data shall be in metres, to 3 decimal places. Elevations shall be reference to Ordnance Datum.

2.6.1 File Names

Filenames shall not contain spaces. Filenames shall include the date of survey:

YYYY is the year of survey (4 digits)
MM is the month of the survey (2 digits)
DD is the day of the survey (2 digits).

Note that if a survey for one Survey Unit spanned two or three consecutive days, the file date should be the last survey day. However, if the survey of one Survey Unit was completed in stages with a gap of several days, separate files should be made.

Profile data

Each profile data file shall contain data from one Survey Unit only and be given the filename:

CCUUU_YYYYMMDDxx.txt

where CC is the Coastal Process Sub-Cell (2 digits) e.g. 6b
UUU is the Survey Unit (variable number of characters) e.g. SU16-3
xx indicates the type of survey (see below)

Example: Survey Unit 6bSU16-3, surveyed on 23/24 Sep and 01/02 Oct. The data should be saved in two files:

[6bSU16-3_20100924xx.txt](#) and [6bSU16-3_20101002xx.txt](#)

Baseline (spot height) data

Baseline data shall be split into OS 1km tiles with the filename:

OSOSOS_YYYYMMDDxx.txt

where: OSOSOS is the Ordnance Survey 1km tile name

Example: [SY4567_20101002xx.txt](#)

Photographs

Photographs shall be named using the regional profile name and the photo orientation:

Cross-shore photographs (portrait format)

[6b00021_YYYYMMDD_Up.jpg](#) *photo taken seaward of beach toe, looking landward*

[6b00021_YYYYMMDD_Dwn.jpg](#) *photo taken from landward end of profile, looking seaward*

If alongshore photographs are taken they should have the following format (landscape format), *either*:

[6b00021_YYYYMMDD_N/S/E/W.jpg](#) *photo taken from beach toe, looking broadly north / south / east / west*

Raw data

Raw files and unedited data collector files shall be zipped into one file and named:

CCUUUU_YYYYMMDDyy.zip

where yy represents, as appropriate:

tri Trimble project
lei Leica project
ski Ski-pro project
ts Total Station

Example: [6bSU16-3_20100924tri.zip](#)

Report of Survey

Survey reports shall be named according to the Survey Unit e.g.

Report_Topo_CCUUU_YYYYMMDD.pdf

Example: [Report_Topo_6bSU16-3_20101002.pdf](#)

Metadata

Accompanying metadata files shall be named:

Meta_Topo_Contractor_YYYYMMDD.xls

Where YYYYMMDD refers to the last survey encompassed by the metadata form.

Example: [Meta_Topo_Contractor_20101002.xls](#)

2.6.2 File Formats and Contents

Profile data files

Data files shall be tab-delimited text files, with the file extension *.txt. Add “tp” to the filename for profiles surveyed as part of baseline surveys (representing *topographic profile*). Add “tip” to the filename for interim profiles (representing *topographic interim profile*). Data must be in columns, with headers:

Easting Northing Elevation_OD Chainage FC Profile Reg_ID

Example: 6bSU16-3_20101002tp.txt
6bSU16-3_20101108tip.txt

Easting	Northing	Elevation_OD	Chainage	FC	Profile	Reg_ID
298140.726	78450.091	-1.937	187.549	S	CS1	6b00051
298142.436	78447.610	-2.017	190.563	S	CS1	6b00051
298448.213	78951.988	6.595	161.766	D	N/A	6b00040
298448.680	78951.443	5.832	162.483	DV	N/A	6b00040

The chainage is calculated as distance from the Start-of-Line co-ordinates (as given in *_ProfileLines.xls). Chainage can be positive or negative depending on which side of the Start-of-Line co-ordinate the surveyed points lie; landward of the Start-of-Line co-ordinate is negative and seaward of the Start-of-Line co-ordinate is positive.

Profile is the local name for the profile, Reg_ID is the regional profile name; both are provided by the Employer with the Start-of-Line co-ordinates. FC is the Feature Code *i.e.* sediment type. FC shall be in capital letters.

Post-storm profile data files

As for profile data files, but replacing the suffix "tp" with "tpsp", representing *topographic post-storm profiles*.

For the continuous line, surveyed as close as possible to the base of seawall, these data files must be tab-delimited text files, with the file extension *.txt. File format is as for baseline data (below), but with the suffix "tstrps" to the filename, representing *topographic structure post-storm*.

For the continuous line, surveyed along the toe of a sand dune, these data files must be tab-delimited text files, with the file extension *.txt. File format is as for baseline data (below), but with the suffix "tdps" to the filename, representing *topographic dune post-storm*.

Baseline (spot height) data files

The files shall be tab-delimited text files, with the file extension *.txt. Add "tb" to the filename, representing *topographic baseline*. Data must be in columns, with headers:

Easting Northing Elevation_OD FC

Example: SY4567_20101002tb.txt

Easting	Northing	Elevation_OD	FC
298105.738	78501.381	5.775	SD
298107.340	78499.041	5.841	SD
298115.831	78486.579	0.361	B

298117.378	78484.325	-0.138	GS
298119.279	78481.531	-0.376	S

FC is the Feature Code *i.e.* sediment type. FC shall be in capital letters.

Structure survey data files

As for Baseline data files, but with the suffix “tstr” to the filename, representing *topographic structure*.

Profile photographs

Photographs of relevant profiles shall be supplied in jpg format. The minimum digital photo size will be 800 x 600 pixels for landscape images and 600 x 800 pixels for portrait images. Where barrier beaches occur, photographs will also be taken from the highest point of the beach crest looking landward and seaward.

RAW DATA FILES

The Raw Data files shall contain any or all of the following:

- Control Station descriptions (*.pdf)
- Logged GPS files (system specific)
- Vector files (system specific)
- Network adjustment & Survey software output files (system specific)
- IGS Ephemeris files
- Rinex Files for survey period
- Processing software statistical reports (system specific)
- Raw unedited data collection files (system specific)

Report of survey

A report of survey shall be supplied for each survey, in pdf format. The report shall contain, as a minimum:

- Survey diary
- Survey area
- Survey type
- Survey contractor and personnel
- Survey control used
- RTK and/or Total Station check observations
- Wind speed and direction (estimated, Beaufort Force and compass points *e.g.* SW F3)
- Sea state
- Times of Low Water (GMT)
- Any additional information pertinent to the survey or for data processing

If surveys of several Survey Units are carried out within a few days, the Contractor has the option of supplying only one Survey Report, providing it contains all required information for all surveys. The Report, however, should be copied and renamed appropriately:

Example: Report_Topo_6bSU16-4_20101002.pdf
 Report_Topo_6bSU16-5_20101002.pdf
 Report_Topo_6bSU16-6_20101002.pdf

These Survey Report files are identical and contain information for all 3 surveys.

Metadata files

The following metadata shall be supplied with the data files. A template metadata *.xls will be supplied by the Employer. Only one metadata form is required per set of surveys, providing the information is appropriate for all survey files submitted.

METADATA FORM FOR TOPOGRAPHIC SURVEY		
General Information		
Survey Instrumentation Manufacturer & Type		
Survey Instrumentation Model		
Quality Information		
Estimated accuracy of dataset (m)	positional +/-	
	elevational +/-	
Explanation of accuracy estimate		
Name of survey report:		*.pdf
Metadata Information		
Data has been collected by		<i>Company</i>
Comments:		

2.6.3 Method of Data Delivery

The Contractor may set up an FTP site to deliver data. Alternatively, data shall be delivered via CD/DVD or hard drive and labelled as follows:

Label: Topographic Survey
 SurveyAreaName
 Survey Units
 YYYYMMDD
 No. of medium
 Contractor
 Delivery reference no.

Where: SurveyAreaName is the name of the area surveyed
 Survey Units e.g. SU16-3, SU16-4
Date shall be the last survey date included on the suite of DVD/CDs being submitted
 No. of medium is number of e.g. DVDs making up this particular delivery
 Contractor is the name of company undertaking the survey work.

Example: Topographic survey
Dawlish Warren
6bSU16-3,
20110305
CD 1 of 1
Contractor
Delivery Ref. no. 12345

2.7 DELIVERABLES

Processed, quality-controlled survey data shall be delivered within 14 days of completion of survey of a Survey Unit and in accordance with the survey delivery schedule (Table 2.4). Final deliverables are (per Survey Unit):

Baseline survey

- Profile files (*.tp.txt)
- Baseline files (*.tb.txt)
- Structure files (*.tstr.txt)
- Photographs (*.jpg)
- Survey Report (*.pdf)
- Raw data files (*.zip)
- Metadata (*.xls)

Repeat Baseline survey

- Profile files (*.tp.txt)
- Baseline files (*.tb.txt)
- Photographs (*.jpg)
- Survey Report (*.pdf)
- Raw data files (*.zip)
- Metadata (*.xls)

Interim profile survey

- Profile files (*.tip.txt)
- Photographs (*.jpg)
- Survey Report (*.pdf)
- Raw data files (*.zip)
- Metadata (*.xls)

Post-storm profile survey

- Profile files (*.tpsp.txt)
- Structure files (*.tstrps.txt)
- Continuous data file (*.tdps.txt)
- Photographs (*.jpg)
- Survey Report (*.pdf)
- Raw data files (*.zip)
- Metadata (*.xls)

Deliverables shall be sent to Robin Siddle, Scarborough Borough Council, St Nicholas Street, Scarborough YO11 2HG.

2.8 PAYMENT SCHEDULE

Per Survey Unit

100% on acceptance of data by Employer.

2.9 TENDER INFORMATION

As part of the Method Statement, the Contractor will provide full details to show that the technical requirements of the Specification and Brief can be met. The Method Statement shall make reference to:

- Health and Safety
- Instrumentation to be used
- Methodology for survey planning, including how to meet seaward boundaries
- Data processing procedures
- Quality control procedures
- Outline programme for achieving survey within given time frame

2.10 Variations to Standard Technical Specifications

Section	Clause	Variation
Section II	3.2	Delete
Section II	3.3.5	Delete
Section II	3.3.8	Delete
Section III		Only sections 6.0 to 8.3 apply to this contract
Section VIII	1.0	Delete
Section VIII	4.0	Ignore beach topography diagram, replace by Figure 2.6 of Survey Brief
Section VIII	6.1	Positions are precise not indicative. If a new cross-shore structure is built where a predefined profile exists, then the profile should be moved 10m to one side of the structure, whichever is deemed most appropriate
Section VIII	6.2	Does not exist in Specification
Section VIII	9.0	Data shall be provided as per section 5.6.2 of Brief
Section VIII	11.0	Delete – replace with Table 2.7 of Survey Brief
Section VIII	12.1	Should read "The GNSS antenna is to be mounted vertically over a front wheel"