

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: South West Regional Coastal Monitoring Programme

Scheme Number: 1364

Employer's Address: Teignbridge District Council, Forde House, Brunel Road, Newton Abbot, Devon. TQ12 4XX

Nominated Employer's Representative: Mr Simon Humphry

Survey Title: Provision of topographic data for:

Work Package TSW01 – Portland Bill to Start Point

Work Package TSW02 – Gribbin Head to Land's End

Work Package TSW03 – Land's End to Hartland Point

Work Package TSW04 – Hartland Point to Beachley

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: Teignbridge District Council is unaware of any special hazards other than those normally associated with beach 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 Consultant. Data layers identifying conservation designations are freely available from the Natural England website:

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

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 Consultant during the contract period. If the Consultant 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 Consultant 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 Consultant shall comply with all relevant legislation and bylaws when carrying out the Survey. Equipment and survey personnel provided by the Consultant for work in connection with the contract shall be the Consultant'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 Consultant's risk throughout. All risks of data acquisition, including equipment hire and demurrage will be borne by the Consultant.

2.2 LOCATION AND EXTENT OF SURVEY

The SW coastline is divided into a series of Work Packages, each sub-divided into a number of Survey Units. For each Work Package, the location of cross-shore Survey Unit boundaries are given in the appropriate *SUboundaries.xls files, with the extent of the surveys defined in the corresponding bounding shapefiles, as detailed in Table 2.1.

File name	File contents
TSW01 – Portland Bill to Start Point	
TSW01_SUboundaries.xls	Spreadsheet and shape files with start/end co-ordinates of Survey Units
TSW01_SUboundaries.shp	
TSW01_BaselineCoverage.shp	Extent of survey area for Year 2 baseline surveys
TSW01_RepeatBaselineCoverage.shp	Extent of survey area for repeat baseline surveys

File name	File contents
TSW01_ProfileLines.xls	Spreadsheet and shape file of Start of Line/End of Line co-ordinates of profiles
TSW01_ProfileLines.shp	
TSW01_Control.xls	Spreadsheet and shape file of survey control points
TSW01_Control.shp	
TSW02 – Gribbin Head to Land’s End	
TSW02_SUboundaries.xls	Spreadsheet and shape files with start/end co-ordinates of Survey Units
TSW02_SUboundaries.shp	
TSW02_BaselineCoverage.shp	Extent of survey area for Year 2 baseline surveys
TSW02_RepeatBaselineCoverage.shp	Extent of survey area for repeat baseline surveys
TSW02_ProfileLines.xls	Spreadsheet and shape file of Start of Line/End of Line co-ordinates of profiles
TSW02_ProfileLines.shp	
TSW02_Control.xls	Spreadsheet and shape file of survey control points
TSW02_Control.shp	
TSW03 – Land’s End to Hartland Point	
TSW03_SUboundaries.xls	Spreadsheet and shape files with start/end co-ordinates of Survey Units
TSW03_SUboundaries.shp	
TSW03_BaselineCoverage.shp	Extent of survey area for Year 2 baseline surveys
TSW03_RepeatBaselineCoverage.shp	Extent of survey area for repeat baseline surveys
TSW03_ProfileLines.xls	Spreadsheet and shape file of Start of Line/End of Line co-ordinates of profiles
TSW03_ProfileLines.shp	
TSW03_Control.xls	Spreadsheet and shape file of survey control points
TSW03_Control.shp	
TSW04 – Hartland Point to Beachley	
TSW04_SUboundaries.xls	Spreadsheet and shape files with start/end co-ordinates of Survey Units
TSW04_SUboundaries.shp	
TSW04_BaselineCoverage.shp	Extent of survey area for Year 2 baseline surveys
TSW04_RepeatBaselineCoverage.shp	Extent of survey area for repeat baseline surveys
TSW04_ProfileLines.xls	Spreadsheet and shape file of Start of Line/End of Line co-ordinates of profiles
TSW04_ProfileLines.shp	
TSW04_Control.xls	Spreadsheet and shape file of survey control points
TSW04_Control.shp	

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

Note that the *Baselinecoverage and *RepeatBaselineCoverage shapefiles indicate the lateral (alongshore) boundaries of the survey; the seaward and landward boundaries are as defined below.

2.2.1 Location of Survey Lines

Survey profile lines have been defined at 50 metre intervals along the entire South West coastline. The start and end co-ordinates and bearings of these lines are given in the accompanying spreadsheet and GIS files e.g. TSW02_ProfileLines.xls/shp (see Table 2.1).

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 which profiles are to be surveyed for each survey type e.g. topographic baseline survey, topographic interim profile survey, topographic post-storm profile survey, topographic repeat baseline survey.

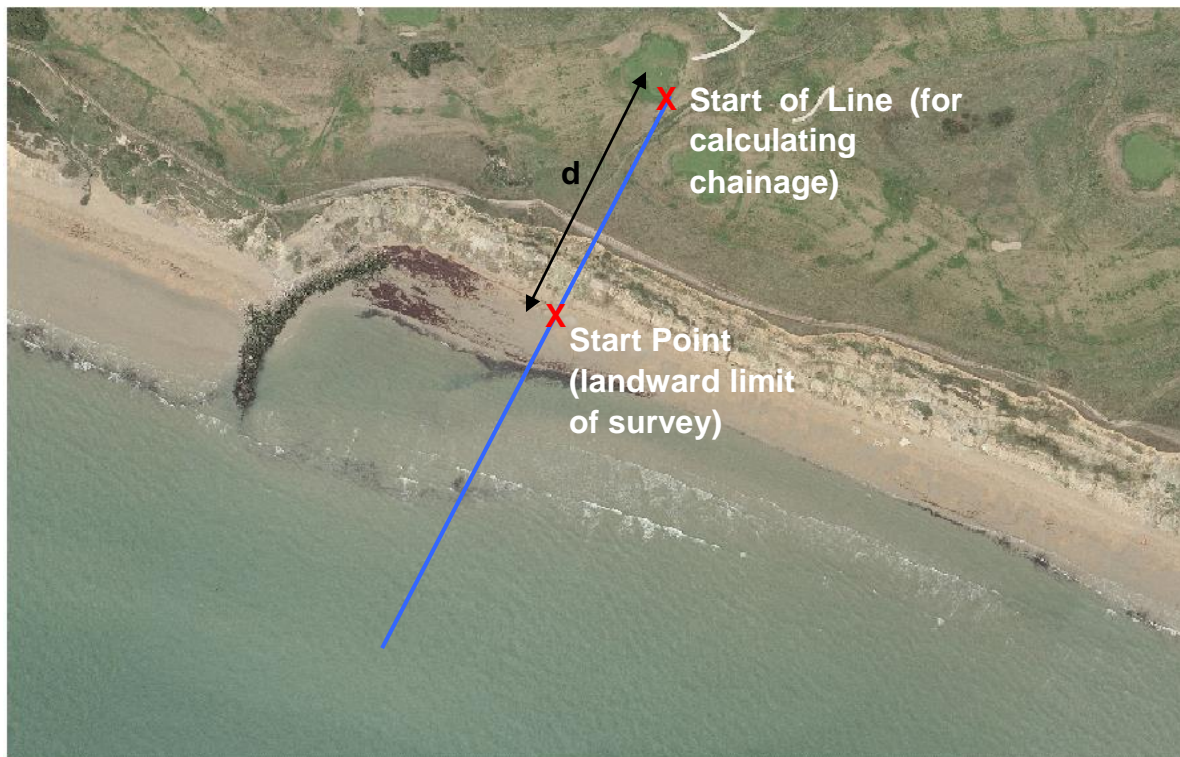


Figure 2.1 Definition of terms for topographic survey

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

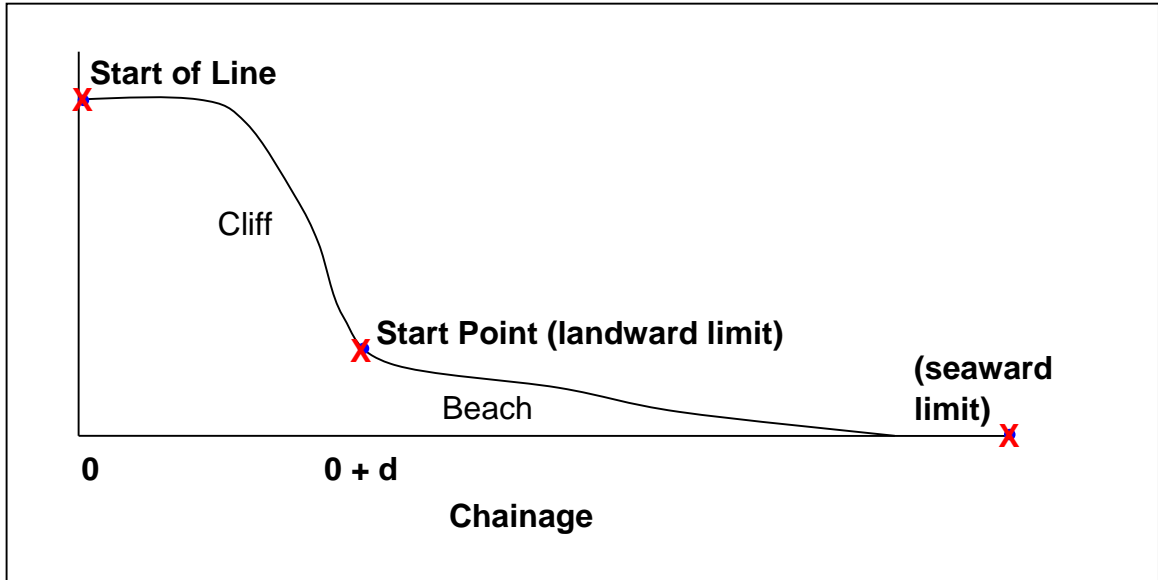


Figure 2.2 Start Point at cliff toe

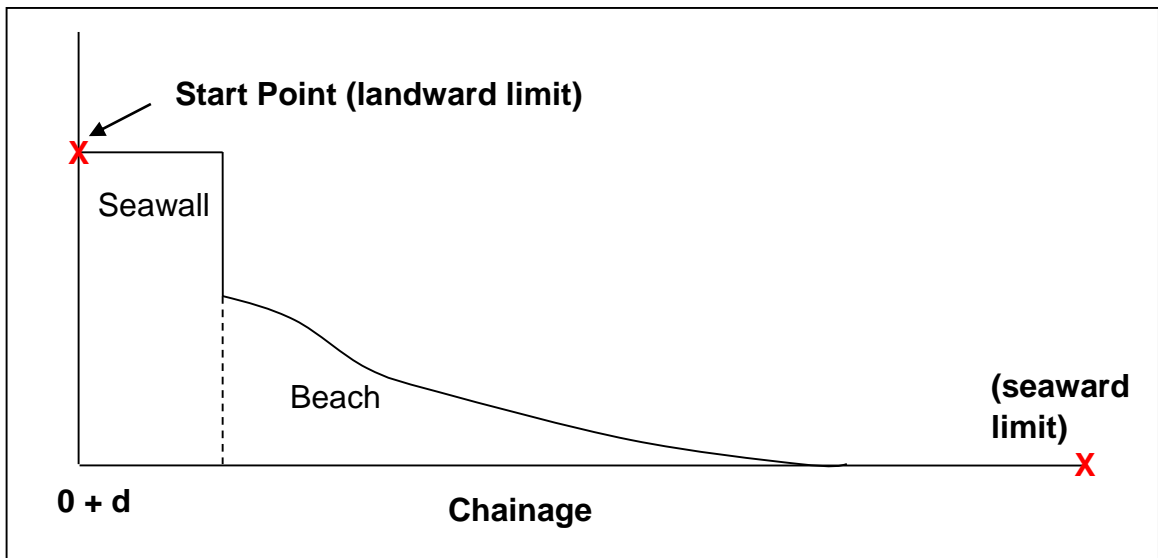


Figure 2.3 Start Point for a fixed structure

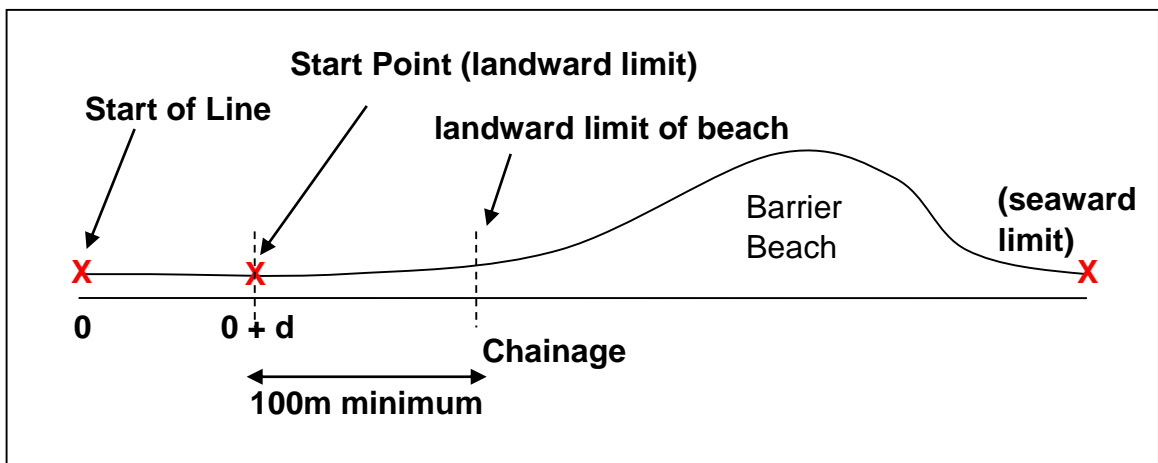


Figure 2.4 Start Point for barrier beaches

2.2.3 End Point for the Survey (the Seaward Boundary)

The seaward boundary is the elevation of Mean Low Water Spring tides (MLWS), as defined for each Survey Unit in Table 2.2.

Survey Unit	Start unit	End unit	MLWS (CD)	MLWS (OD)
TSW01 – Portland Bill to Start Point				
6aSU2	West Weare	Osprey Quay (Northern End)	0.8	-1.30
6aSU3-2	Abbotsbury	Cogden Beach	0.6	-1.65
6aSU3-3	East of Hive Beach	West of Hive Beach		
6aSU3-5	East of Burton Freshwater	West of Burton Freshwater		
6aSU4	East of West Bay	West of West Bay		
6aSU5-2	East of Seatown	West of Seatown		
6aSU5-4	East of Charmouth	West of Charmouth	0.6	-1.75
6aSU6-1	East Cliff (Lyme Regis)	Broad Ledge (Lyme Regis)		
6aSU6-2	Broad Ledge	The Cobb		
6aSU7-1	The Cobb	Devonshire Head		
6aSU8-1	East of Seaton	Beer		
6aSU10	River Sid	West of Sidmouth	0.5	-1.94
6aSU12	Otterton Ledge	East of Budleigh Salterton		
6aSU13	East of Budleigh Salterton	West of Budleigh Salterton		
6aSU16-1	Orcombe Rocks	Exmouth Marina		
6bSU16-3	Dawlish Warren Headland	Langstone Rock		
6bSU17	Langstone Rock	The Parson and Clerk	0.7	-1.95
6bSU18-1	The Parson and Clerk	Teign Estuary	0.9	-1.67
6bSU18-2	Teign Estuary	The Ness		
6bSU20-1	Petit Tor Point	East of Babbacombe Beach	0.7	-2.10
6bSU21-2	West of Kilmorie	East of Daddyhole Cove		
6bSU21-4	Torquay Marina	nr Livermead		
6bSU21-5	nr Livermead	Paignton Harbour		
6bSU21-6	South of Paignton Harbour	North of Broadsands		
6bSU21-8	Broadsands	Broadsands	0.6	-2.02
6bSU25-2	East of Blackpool Sands	West of Blackpool Sands		
6bSU26-1	Pilchard Cove	Limpet Rocks		
6bSU26-2	Limpet Rocks	South of Beesands		
6bSU26-3	South of Beesands	Start Point		
TSW02 – Gribbin Head to Land's End				
6d6D2-4	Par Sands	Par Sands	0.6	-2.45
6d6D2-7	Fishing Point	West of Crinnis Beach		
6d6D2-13	Pentewan Beach	Port Giskey	0.7	-2.35
6d6D2-15	Portmellon Beach	Portmellon Beach		
6d6D2-17	Gorran Haven		0.8	-2.11
6d6D3-2	Hemmick Beach			
6d6D3-4	Porthluney Cove			
6d6D3-6	Portholland			
6d6D3-10	Carne Beach	Pendower Beach		
6d6D3-12	Portscatho			
6d6D5-2	Swanpool			

Survey Unit	Start unit	End unit	MLWS (CD)	MLWS (OD)
6d6D5-4	Maenporth			
6d6D5-10	Porthallow			
6d6D5-11	Porthoustock			
6d6D5-12	North Corner	Dolor Point		
6d6D5-14	Easterly part of Kernack Sands		0.6	-2.30
6d6D5-15	Westerly part of Kernack Sands			
6d6D5-17	Cadgwith			
6eSU3-2	Mullion Cove	Mullion Cove		
6eSU3-4	Poldhu Cove	Poldhu Cove	0.6	-2.30
6eSU3-6	Church Cove	Church Cove		
6eSU4-3	Gunwalloe fishing cove	Loe bar		
6eSU4-4	Loe bar	Loe bar		
6eSU4-5	Porthleven Sands	Porthleven Sands	0.8	-2.19
6eSU4-6	Porthleven	Porthleven		
6eSU6-2	Rinsey head	Sydney Cove		
6eSU6-3	Sydney Cove	Sydney Cove		
6eSU8-2	Perran Sands	Perran Sands		
6eSU9-2	Little London	Little London		
6eSU10-1	St Michael's Mount	St Michael's Mount	0.8	-2.25
6eSU10-2	West of Marazion	Penzance Harbour		
6eSU11	Penzance Harbour	Penzance Harbour		
TSW03 – Land's End to Hartland Point				
7a7A1-2	Sennen Cove	Aire Point	0.8	-2.25
7a7A2-2	Porthmeor Beach			
7a7A2-3	Porth Gwidden	St Ives		
7a7A2-4	St Ives			
7a7A2-5	South of St Ives	West of Porth Kidney Sands	0.8	-2.6
7a7A2-6	Hayle Estuary	Hayle Estuary		
7a7A2-7	East of Halye Estuary	Godrevy Point		
7a7A3-2	Portreath	Portreath		
7a7A3-4	Porth Towan			
7a7A3-8	Perranporth	Perranporth	0.8	-2.8
7a7A3-9	Perran Beach	Perran Beach		
7a7A3-13	Vugga Cove	Pentire Point East		
7a7A3-15	Fistral Beach	Little Fistral Beach		
7a7A3-17	Newquay	Trevelgue Head		
7a7A3-18	Trevelgue Head	Berryl's Point	0.6	-3
7a7A3-19	Trenance	Trenance		
7a7A3-21	Porthcothan	Porthcothan		
7a7A3-23	Treyarnon	North of Constantine Bay		
7b7B1-2	Harlyn Bay	Harlyn Bay	0.8	-3
7b7B1-8	Hayle Bay			
7b7B2-4	Port Isaac	Port Gaverne	0.9	-2.9
7b7B3-1	Widemouth Bay	South of Widemouth Sand		
7b7B3-2	Widemouth Sand		0.9	-2.9
7b7B3-4	Bude	Crooklets		
TSW04 – Hartland Point to Beachley				
7cWEST2	Westward Ho!	Skern	1.6	-2.98
7cSAUN1	Crow Point	Airy Point		
7dPORL1	Gore Point	Porlock Weir	0.9	-4.3

Survey Unit	Start unit	End unit	MLWS (CD)	MLWS (OD)
7dPORL2	Porlock Weir	Porlockford		
7dPORL3	Porlockford	Hurlstone Point		
7dMINE1	North of Minehead			
7dMINE2	Minehead			
7dMINE3	The Warren			
7dMINE4	Dunster Beach Holiday Park		1	-4.4
7dMINE5	Ker Moor			
7dMINE6	Blue Anchor			
7dLILS2	Lilstock		1.1	-4.7
7dPARR2	Hinkley Point	Stolford		
7dPARR3	Stolford	Stert Point		
7dBURN2	Burnham-on-sea			
7dBURN3	Berrow Dunes		-0.1	-5.23
7dBURN4-A	North of Brean Village	South of Brean Farm		
7dBURN4-B	South of Brean Farm	Brean Down		
7eWSM1	River Axe	Southern end of Promenade		
7eWSM2	Weston Bay north		0.8	-5.2
7eSANB1	Sand Bay			
7eSU17-5	Wain's Hill	Ladye Point		
7eSU17-2	Kilkenny Bay	Battery Point		
7eSU15-4	Portishead Pier	Portbury Pier		
7eSU15-2	Michell's Salt Rhine	Severnside Works	1	-5.5
7eSU15-1	Severnside Works	New Passage		
7eSU7-4	Old Passage	Aust Cliff	0.7	-5.4

Table 2.2 Elevation of MLWS

2.3 SURVEY SCHEDULE

2.3.1 Year 2 Baseline Survey (Section VIII Part One)

- A single baseline survey of beach topography will be required for each Survey Unit (Table 2.3). The baseline survey will comprise staked-out profile lines (defined in *ProfileLines.xls), plus alongshore (continuous) lines and a detailed structures survey as defined in Section VIII part 1 of the Specification, including surveying a continuous line as close as possible to the base of a seawall (if present). Surveys will be completed (continuous data together with accompanying profiles) in blocks not exceeding a shoreline length of 1km, before proceeding to a new block.
- The alongshore extent of the Year 2 baseline survey is defined in *BaselineCoverage.shp (note that this is indicative and that the landward and seaward boundaries are as defined in paragraphs 2.2.2 and 2.2.3 above). The approximate accessible frontage length indicated in Table 2.3.

Survey Unit	Start unit	End unit	Approximate Accessible frontage length (m)
TSW01 – Portland Bill to Start Point			
6aSU2	West Weare	Osprey Quay (Northern End)	4300
6aSU3-3	East of Hive Beach	West of Hive Beach	400
6aSU3-5	East of Burton Freshwater	West of Burton Freshwater	600
6aSU4	East of West Bay	West of West Bay	650
6aSU5-2	East of Seatown	West of Seatown	210
6aSU5-4	East of Charmouth	West of Charmouth	250
6aSU6-1	East Cliff (Lyme Regis)	Broad Ledge (Lyme Regis)	400
6aSU6-2	Broad Ledge (Lyme Regis)	The Cobb	950
6aSU7-1	The Cobb	Devonshire Head	680
6aSU8-1	East of Seaton	Beer	2200
6aSU10	River Sid	West of Sidmouth	1300
6aSU12	Otterton Ledge	East of Budleigh Salterton	600
6aSU13	East of Budleigh Salterton	West of Budleigh Salterton	1900
6aSU16-1	Orcombe Rocks	Exmouth Marina	2650
6bSU16-3	Dawlish Warren Headland	Langstone Rock	3500
6bSU17	Langstone Rock	The Parson and Clerk	2850
6bSU18-1	The Parson and Clerk	Teign Estuary	3150
6bSU18-2	Teign Estuary	The Ness	1600
6bSU20-1	Petit Tor Point	East of Babbacombe Beach	600
6bSU21-2	West of Kilmoreie	East of Daddyhole Cove	900
6bSU21-4	Torquay Marina	nr Livermead	1400
6bSU21-5	nr Livermead	Paignton Harbour	2000
6bSU21-6	South of Paignton Harbour	North of Broadsands	950
6bSU21-8	Broadsands	Broadsands	600
6bSU25-2	East of Blackpool Sands	West of Blackpool Sands	750
6bSU26-1	Pilchard Cove	Limpet Rocks	5500
6bSU26-2	Limpet Rocks	South of Beesands	1650
6bSU26-3	South of Beesands	Start Point	300
TSW02 – Gribbin Head to Land's End			
6d6D2-4	Par Sands	Par Sands	950
6d6D2-7	Fishing Point	West of Crinnis Beach	1350
6d6D2-13	Pentewan Beach	Port Giskey	1000
6d6D2-15	Portmellon Beach	Portmellon Beach	150
6d6D2-17	Gorran Haven		300
6d6D3-2	Hemmick Beach		200
6d6D3-4	Porthluney Cove		350
6d6D3-6	Portholland		400
6d6D3-10	Carne Beach	Pendower Beach	1250
6d6D3-12	Portscatho		900

Survey Unit	Start unit	End unit	Approximate Accessible frontage length (m)
6d6D5-2	Swanpool		550
6d6D5-4	Maenporth		200
6d6D5-10	Porthallow		175
6d6D5-11	Porthoustock		210
6d6D5-12	North Corner	Dolor Point	600
6d6D5-14	Easterly part of Kernack Sands		350
6d6D5-15	Westerly part of Kernack Sands		550
6d6D5-17	Cadgwith		120
6eSU3-2	Mullion Cove	Mullion Cove	50
6eSU3-4	Poldhu Cove	Poldhu Cove	150
6eSU3-6	Church Cove	Church Cove	175
6eSU4-3	Gunwalloe fishing cove	Loe bar	1750
6eSU4-4	Loe bar	Loe bar	700
6eSU4-5	Porthleven Sands	Porthleven Sands	1250
6eSU4-6	Porthleven	Porthleven	550
6eSU6-2	Rinsey head	Sydney Cove	1700
6eSU8-2	Perran Sands	Perran Sands	400
6eSU9-2	Little London	Little London	950
6eSU10-1	St Michael's Mount	St Michael's Mount	700
6eSU10-2	West of Marazion	Penzance Harbour	3800
6eSU11	Penzance Harbour	Penzance Harbour	1600
TSW03 – Land's End to Hartland Point			
7a7A1-2	Sennen Cove	Aire Point	2000
7a7A2-2	Porthmeor Beach		600
7a7A2-3	Porth Gwidden	St Ives	110
7a7A2-4	St Ives		1300
7a7A2-5	South of St Ives	West of Porth Kidney Sands	700
7a7A2-6	Hayle Estuary	Hayle Estuary	3000
7a7A2-7	East of Halye Estuary	Godrevy Point	4850
7a7A3-2	Portreath	Portreath	400
7a7A3-4	Porth Towan		450
7a7A3-8	Perranporth	Perranporth	800
7a7A3-9	Perran Beach	Perran Beach	2600
7a7A3-13	Vugga Cove	Pentire Point East	1300
7a7A3-15	Fistral Beach	Little Fistral Beach	700
7a7A3-17	Newquay	Trevelgue Head	2200
7a7A3-18	Trevelgue Head	Berryl's Point	3350
7a7A3-19	Trenance	Trenance	700
7a7A3-21	Porthcothan	Porthcothan	150
7a7A3-23	Treyarnon	North of Constantine Bay	850

Survey Unit	Start unit	End unit	Approximate Accessible frontage length (m)
7b7B1-2	Harlyn Bay	Harlyn Bay	750
7b7B1-8	Hayle Bay		700
7b7B2-4	Port Isaac	Port Gaverne	200
7b7B3-1	Widemouth Bay	South of Widemouth Sand	350
7b7B3-2	Widemouth Sand		1200
7b7B3-4	Bude	Crooklets	800
TSW04 – Hartland Point to Beachley			
7cWEST2	Westward Ho!	Skern	4850
7cSAUN1	Crow Point	Airy Point	3300
7dPORL1	Gore Point	Porlock Weir	800
7dPORL2	Porlock Weir	Porlockford	600
7dPORL3	Porlockford	Hurlstone Point	3700
7dMINE1	North of Minehead		850
7dMINE2	Minehead		1850
7dMINE3	The Warren		1900
7dMINE4	Dunster Beach Holiday Park		1300
7dMINE5	Ker Moor		1950
7dMINE6	Blue Anchor		1250
7dLILS2	Lilstock		650
7dPARR2	Hinkley Point	Stolford	1750
7dPARR3	Stolford	Stert Point	6550
7dBURN2	Burnham-on-sea		2700
7dBURN3	Berrow Dunes		5900
7dBURN4-A	North of Brean Village	South of Brean Farm	1050
7dBURN4-B	South of Brean Farm	Brean Down	1500
7eWSM1	River Axe	Southern end of Promenade	1800
7eWSM2	Weston Bay north		2000
7eSANB1	Sand Bay		2850
7eSU17-5	Wain's Hill	Ladye Point	350
7eSU17-2	Kilkenny Bay	Battery Point	850
7eSU15-4	Portishead Pier	Portbury Pier	2150
7eSU15-2	Michell's Salt Rhine	Sevenside Works	2300
7eSU15-1	Sevenside Works	New Passage	700
7eSU7-4	Old Passage	Aust Cliff	400

Table 2.3 Year 2 Baseline surveys

2.3.2 Repeat Baseline Surveys

Annual baseline surveys will be required for Survey Units denoted as repeat baseline survey sites (Table 2.4). The surveys will comprise staked-out survey of the profiles defined as "Repeat Baseline" in *ProfileLines.xls, plus alongshore (continuous) lines. The specification

for the repeat baseline surveys is the same as for the Year 2 baseline survey, but without the structures survey.

Survey Unit	Start of unit	End of unit	Approximate frontage length (m)	Alongshore extent of repeat baseline survey (incl.)		Number of profile lines
				From Profile No.	To Profile No.	
TSW01 – Portland Bill to Start Point						
6aSU3-5	East of Burton Freshwater	West of Burton Freshwater	600	6a00648	6a00660	12
6aSU4	East of West Bay	West of West Bay	650	6a00682 A	6a00706	19
6aSU6-2	Broad Ledge (Lyme Regis)	The Cobb	950	6a00955	6a00974A	19
6aSU10	River Sid	West of Sidmouth	1300	6a01440	6a01464	26
6aSU16-1	Orcombe Rocks	Exmouth Marina	2650	6a01765	6a01821	57
6bSU16-3	Dawlish Warren Headland	Langstone Rock	3500	6b00001	6b00060	61
6bSU26-1	Pilchard Cove	Limpet Rocks	5500	6b01218	6b01325	109
6bSU26-2	Limpet Rocks	South of Beesands	1650	6b01328	6b01358	31
6bSU26-3	South of Beesands	Start Point	300	6b01359	6b01391	27
TSW02 – Gribbin Head to Land's End						
6d6D2-7	Fishing Point	West of Crinnis Beach	1350	6d01002	6d01028	27
6eSU4-4	Loe bar	Loe bar	700	6e00349	6e00361	13
6eSU6-2	Rinsey head	Sydney Cove	1700	6e00506	6e00538	33
TSW03 – Land's End to Hartland Point						
7a7A2-6	Hayle Estuary	Hayle Estuary	2200	7a00773	7a00826	54
TSW04 – Hartland Point to Beachley						
7cWEST2	Westward Ho!	Skern	4850	7c00498 A	7c00610F	86
7cSAUN1	Crow Point	Airy Point	3300	7c00637 A	7c00689C	47

Table 2.4 Repeat Baseline Surveys

2.3.3 Interim Beach Profile Surveys

Profile surveys of the interim profile lines (defined as "interim" in *ProfileLines.xls) will be conducted, according to Table 2.5. Surveys will be completed in blocks not exceeding a shoreline length of 1km, before proceeding to a new block.

Survey Unit	Start of unit	End of unit	Approximate Accessible frontage length (m)	No. of profiles	Frequency of interim profiles (per year)
TSW01 – Portland Bill to Start Point					
6aSU2	West Weare	Osprey Quay (Northern End)	4300	26	2
6aSU3-2	Abbotsbury	Cogden Beach	800	4	2
6aSU3-3	East of Hive Beach	West of Hive Beach	400	3	2
6aSU3-5	East of Burton Freshwater	West of Burton Freshwater	600	3	2
6aSU4	East of West Bay	West of West Bay	650	9	2
6aSU5-2	East of Seatown	West of Seatown	210	2	2

Survey Unit	Start of unit	End of unit	Approximate Accessible frontage length (m)	No. of profiles	Frequency of interim profiles (per year)
6aSU5-4	East of Charmouth	West of Charmouth	250	3	2
6aSU6-1	East Cliff (Lyme Regis)	Broad Ledge (Lyme Regis)	400	3	1
6aSU6-2	Broad Ledge	The Cobb	950	8	2
6aSU7-1	The Cobb	Devonshire Head	680	4	2
6aSU8-1	East of Seaton	Beer	2200	11	2
6aSU10	River Sid	West of Sidmouth	1300	6	2
6aSU12	Otterton Ledge	East of Budleigh Salterton	600	4	2
6aSU13	East of Budleigh Salterton	West of Budleigh Salterton	1900	10	2
6aSU16-1	Orcombe Rocks	Exmouth Marina	2650	14	2
6bSU16-3	Dawlish Warren Headland	Langstone Rock	3500	22	2
6bSU17	Langstone Rock	The Parson and Clerk	2850	16	2
6bSU18-1	The Parson and Clerk	Teign Estuary	3150	16	2
6bSU18-2	Teign Estuary	The Ness	1600	10	1
6bSU20-1	Petit Tor Point	East of Babbacombe Beach	600	4	2
6bSU21-2	West of Kilmorie	East of Daddyhole Cove	900	4	2
6bSU21-4	Torquay Marina	nr Livermead	1400	6	2
6bSU21-5	nr Livermead	Paignton Harbour	2000	9	2
6bSU21-6	South of Paignton Harbour	North of Broadsands	950	5	2
6bSU21-8	Broadsands	Broadsands	600	3	2
6bSU25-2	East of Blackpool Sands	West of Blackpool Sands	750	4	2
6bSU26-1	Pilchard Cove	Limpet Rocks	5500	25	2
6bSU26-2	Limpet Rocks	South of Beesands	1650	7	2
6bSU26-3	South of Beesands	Start Point	300	4	2
TSW02 – Gribbin Head to Land's End					
6d6D2-4	Par Sands	Par Sands	950	4	2
6d6D2-7	Fishing Point	West of Crinnis Beach	1350	6	2
6d6D2-13	Pentewan Beach	Port Giskey	1000	6	2
6d6D2-15	Portmellon Beach	Portmellon Beach	150	1	2
6d6D2-17	Gorran Haven		300	2	2
6d6D3-2	Hemmick Beach		200	1	2
6d6D3-4	Porthluney Cove		350	2	2
6d6D3-6	Portholland		400	2	2
6d6D3-10	Carne Beach	Pendower Beach	1250	6	2
6d6D3-12	Portscatho		900	2	2
6d6D5-2	Swanpool		550	2	2
6d6D5-4	Maenporth		200	1	2
6d6D5-10	Porthallow		175	2	2
6d6D5-11	Porthoustock		210	1	2
6d6D5-12	North Corner	Dolor Point	600	2	2
6d6D5-14	Easterly part of Kernack Sands		350	1	2

Survey Unit	Start of unit	End of unit	Approximate Accessible frontage length (m)	No. of profiles	Frequency of interim profiles (per year)
6d6D5-15	Westerly part of Kernack Sands		550	3	2
6d6D5-17	Cadgwith		120	2	2
6eSU3-2	Mullion Cove	Mullion Cove	50	1	2
6eSU3-4	Poldhu Cove	Poldhu Cove	150	3	2
6eSU3-6	Church Cove	Church Cove	175	2	2
6eSU4-3	Gunwalloe fishing cove	Loe bar	1750	4	2
6eSU4-4	Loe bar	Loe bar	700	6	2
6eSU4-5	Porthleven Sands	Porthleven Sands	1250	3	2
6eSU4-6	Porthleven	Porthleven	550	3	2
6eSU6-2	Rinsey head	Sydney Cove	1700	11	2
6eSU8-2	Perran Sands	Perran Sands	400	2	2
6eSU9-2	Little London	Little London	950	3	2
6eSU10-1	St Michael's Mount	St Michael's Mount	700	4	2
6eSU10-2	West of Marazion	Penzance Harbour	3800	18	2
6eSU11	Penzance Harbour	Penzance Harbour	1600	6	2
TSW03 – Land's End to Hartland Point					
7a7A1-2	Sennen Cove	Aire Point	2000	5	2
7a7A2-2	Porthmeor Beach		600	4	2
7a7A2-3	Porth Gwidden	St Ives	110	2	2
7a7A2-4	St Ives		1300	7	2
7a7A2-5	South of St Ives	West of Porth Kidney Sands	700	4	2
7a7A2-6	Hayle Estuary	Hayle Estuary	3000	15	2
7a7A2-7	East of Halye Estuary	Godrevy Point	4850	11	1
7a7A3-2	Portreath	Portreath	400	2	2
7a7A3-4	Porth Towan		450	2	2
7a7A3-8	Perranporth	Perranporth	800	5	2
7a7A3-9	Perran Beach	Perran Beach	2600	5	1
7a7A3-13	Vugga Cove	Pentire Point East	1300	3	1
7a7A3-15	Fistral Beach	Little Fistral Beach	700	4	2
7a7A3-17	Newquay	Trevelgue Head	2200	12	2
7a7A3-18	Trevelgue Head	Berryl's Point	3350	17	1
7a7A3-19	Trenance	Trenance	700	3	2
7a7A3-21	Porthcothan	Porthcothan	150	3	2
7a7A3-23	Treyarnon	North of Constantine Bay	850	5	2
7b7B1-2	Harlyn Bay	Harlyn Bay	750	4	2
7b7B1-8	Hayle Bay		700	5	2
7b7B2-4	Port Isaac	Port Gaverne	200	2	1
7b7B3-1	Widemouth Bay	South of Widemouth Sand	350	1	1
7b7B3-2	Widemouth Sand		1200	5	2
7b7B3-4	Bude	Crooklets	800	3	2
TSW04 – Hartland Point to Beachley					
7cWEST2	Westward Ho!	Skern	4850	27	2
7cSAUN1	Crow Point	Airy Point	3300	24	2
7dPORL1	Gore Point	Porlock Weir	800	5	2
7dPORL2	Porlock Weir	Porlockford	600	5	2

Survey Unit	Start of unit	End of unit	Approximate Accessible frontage length (m)	No. of profiles	Frequency of interim profiles (per year)
7dPORL3	Porlockford	Hurlstone Point	3700	18	2
7dMINE1	North of Minehead		850	5	2
7dMINE2	Minehead		1850	12	2
7dMINE3	The Warren		1900	9	2
7dMINE4	Dunster Beach Holiday Park		1300	7	2
7dMINE5	Ker Moor		1950	11	2
7dMINE6	Blue Anchor		1250	8	2
7dLILS2	Lilstock		650	4	2
7dPARR2	Hinkley Point	Stolford	1750	9	2
7dPARR3	Stolford	Stert Point	6550	13	2
7dBURN2	Burnham-on-sea		2700	14	2
7dBURN3	Berrow Dunes		5900	13	2
7dBURN4-A	North of Brean Village	South of Brean Farm	1050	2	2
7dBURN4-B	South of Brean Farm	Brean Down	1500	4	2
7eWSM1	River Axe	Southern end of Promenade	1800	11	2
7eWSM2	Southern end of Promenade	Knightstone	2000	14	2
7eSANB1	Sand Bay		2850	12	2
7eSU17-5	Wain's Hill	Ladye Point	350	5	1
7eSU17-2	Kilkenny Bay	Battery Point	850	4	1
7eSU15-2	Michell's Salt Rhine	Sevenside Works	2300	7	1
7eSU15-1	Sevenside Works	New Passage	700	3	1

Table 2.5 Interim profile surveys

2.3.4 Post-Storm Surveys

Post-storm surveys will be conducted following storm events of a defined severity. Provision has been made within the Programme budget to allow for surveys of 50% of the Interim profile survey lines (defined as "Post-Storm" in *ProfileLines.xls) on average once per year. The Employer will determine the storm-event threshold and the Consultant's survey team is required to mobilise to site within 24 hours of 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 Coastal.Observatory@plymouth.ac.uk on the day of survey (where possible).

2.4 DELIVERY SCHEDULE

The delivery schedule for the 5 year Programme is given in Table 2.6. (Note that the "Year 2 Baseline" survey is actually scheduled for Jan-Aug 2017, where it replaces one of the Profile surveys. Post-storm surveys shall be conducted as required by the Employer (paragraph 2.3.4).

All surveys shall be completed in 1km blocks (see section 2.3.1), each block to be completed within 3 (daylight) tides for baseline surveys and within 2 (daylight) tides for interim and post-storm surveys.

In most cases, Interim profile surveys will be carried out in both the spring and the autumn. Where only one Interim profile survey is required per year, it will be conducted in the spring. Where two Interim profiles are required each year, at least 3 months shall elapse between Interim profile surveys. For Survey Units where a repeat baseline survey is required, at least 2 months shall elapse between baseline and profile surveys.

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.

Survey Delivery Schedule															
Survey Unit	Year 1 (2016/17)			Year 2 (2017/18)			Year 3 (2018/19)			Year 4 (2019/20)			Year 5 (2020/21)		
	Apr - Aug	Sep - Dec	Jan - Mar	Apr - Aug	Sep - Dec	Jan - Mar	Apr - Aug	Sep - Dec	Jan - Mar	Apr - Aug	Sep - Dec	Jan - Mar	Apr - Aug	Sep - Dec	Jan - Mar
TSW01 – Portland Bill to Start Point															
6aSU2		Profile	Baseline	Profile	Profile		Profile	Profile		Profile	Profile		Profile	Profile	
6aSU3-2		Profile	Baseline	Profile	Profile		Profile	Profile		Profile	Profile		Profile	Profile	
6aSU3-3		Profile	Baseline	Profile	Profile		Profile	Profile		Profile	Profile		Profile	Profile	
6aSU3-5	Baseline	Profile	Baseline	Profile	Profile	Baseline	Profile	Profile	Baseline	Profile	Profile	Baseline	Profile	Profile	
6aSU4	Baseline	Profile	Baseline	Profile	Profile	Baseline	Profile	Profile	Baseline	Profile	Profile	Baseline	Profile	Profile	
6aSU5-2		Profile	Baseline	Profile	Profile		Profile	Profile		Profile	Profile		Profile	Profile	
6aSU5-4		Profile	Baseline	Profile	Profile		Profile	Profile		Profile	Profile		Profile	Profile	
6aSU6-1		Profile	Baseline		Profile			Profile			Profile			Profile	
6aSU6-2	Baseline	Profile	Baseline	Profile	Profile	Baseline	Profile	Profile	Baseline	Profile	Profile	Baseline	Profile	Profile	
6aSU7-1		Profile	Baseline	Profile	Profile		Profile	Profile		Profile	Profile		Profile	Profile	
6aSU8-1		Profile	Baseline	Profile	Profile		Profile	Profile		Profile	Profile		Profile	Profile	
6aSU10	Baseline	Profile	Baseline	Profile	Profile	Baseline	Profile	Profile	Baseline	Profile	Profile	Baseline	Profile	Profile	
6aSU12		Profile	Baseline	Profile	Profile		Profile	Profile		Profile	Profile		Profile	Profile	
6aSU13		Profile	Baseline	Profile	Profile		Profile	Profile		Profile	Profile		Profile	Profile	
6aSU16-1	Baseline	Profile	Baseline	Profile	Profile	Baseline	Profile	Profile	Baseline	Profile	Profile	Baseline	Profile	Profile	
6bSU16-3	Baseline	Profile	Baseline	Profile	Profile	Baseline	Profile	Profile	Baseline	Profile	Profile	Baseline	Profile	Profile	
6bSU17		Profile	Baseline	Profile	Profile		Profile	Profile		Profile	Profile		Profile	Profile	
6bSU18-1		Profile	Baseline	Profile	Profile		Profile	Profile		Profile	Profile		Profile	Profile	
6bSU18-2		Profile	Baseline		Profile			Profile			Profile			Profile	
6bSU20-1		Profile	Baseline	Profile	Profile		Profile	Profile		Profile	Profile		Profile	Profile	
6bSU21-2		Profile	Baseline	Profile	Profile		Profile	Profile		Profile	Profile		Profile	Profile	
6bSU21-4		Profile	Baseline	Profile	Profile		Profile	Profile		Profile	Profile		Profile	Profile	

6bSU21-5		Profile	Baseline	Profile	Profile		Profile	Profile		Profile	Profile		Profile	Profile
6bSU21-6		Profile	Baseline	Profile	Profile		Profile	Profile		Profile	Profile		Profile	Profile
6bSU21-8		Profile	Baseline	Profile	Profile		Profile	Profile		Profile	Profile		Profile	Profile
6bSU25-2		Profile	Baseline	Profile	Profile		Profile	Profile		Profile	Profile		Profile	Profile
6bSU26-1	Baseline	Profile	Baseline	Profile	Profile	Baseline	Profile	Profile	Baseline	Profile	Profile	Baseline	Profile	Profile
6bSU26-2	Baseline	Profile	Baseline	Profile	Profile	Baseline	Profile	Profile	Baseline	Profile	Profile	Baseline	Profile	Profile
6bSU26-3	Baseline	Profile	Baseline	Profile	Profile	Baseline	Profile	Profile	Baseline	Profile	Profile	Baseline	Profile	Profile
TSW02 – Gribbin Head to Land’s End														
6d6D2-4		Profile	Baseline	Profile	Profile		Profile	Profile		Profile	Profile		Profile	Profile
6d6D2-7	Baseline	Profile	Baseline	Profile	Profile	Baseline	Profile	Profile	Baseline	Profile	Profile	Baseline	Profile	Profile
6d6D2-13		Profile	Baseline	Profile	Profile		Profile	Profile		Profile	Profile		Profile	Profile
6d6D2-15		Profile	Baseline	Profile	Profile		Profile	Profile		Profile	Profile		Profile	Profile
6d6D2-17		Profile	Baseline	Profile	Profile		Profile	Profile		Profile	Profile		Profile	Profile
6d6D3-2		Profile	Baseline	Profile	Profile		Profile	Profile		Profile	Profile		Profile	Profile
6d6D3-4		Profile	Baseline	Profile	Profile		Profile	Profile		Profile	Profile		Profile	Profile
6d6D3-6		Profile	Baseline	Profile	Profile		Profile	Profile		Profile	Profile		Profile	Profile
6d6D3-10		Profile	Baseline	Profile	Profile		Profile	Profile		Profile	Profile		Profile	Profile
6d6D3-12		Profile	Baseline	Profile	Profile		Profile	Profile		Profile	Profile		Profile	Profile
6d6D5-2		Profile	Baseline	Profile	Profile		Profile	Profile		Profile	Profile		Profile	Profile
6d6D5-4		Profile	Baseline	Profile	Profile		Profile	Profile		Profile	Profile		Profile	Profile
6d6D5-10		Profile	Baseline	Profile	Profile		Profile	Profile		Profile	Profile		Profile	Profile
6d6D5-11		Profile	Baseline	Profile	Profile		Profile	Profile		Profile	Profile		Profile	Profile
6d6D5-12		Profile	Baseline	Profile	Profile		Profile	Profile		Profile	Profile		Profile	Profile
6d6D5-14		Profile	Baseline	Profile	Profile		Profile	Profile		Profile	Profile		Profile	Profile
6d6D5-15		Profile	Baseline	Profile	Profile		Profile	Profile		Profile	Profile		Profile	Profile
6d6D5-17		Profile	Baseline	Profile	Profile		Profile	Profile		Profile	Profile		Profile	Profile
6eSU3-2		Profile	Baseline	Profile	Profile		Profile	Profile		Profile	Profile		Profile	Profile
6eSU3-4		Profile	Baseline	Profile	Profile		Profile	Profile		Profile	Profile		Profile	Profile

6eSU3-6		Profile	Baseline	Profile	Profile		Profile	Profile		Profile	Profile		Profile	Profile
6eSU4-3		Profile	Baseline	Profile	Profile		Profile	Profile		Profile	Profile		Profile	Profile
6eSU4-4	Baseline	Profile	Baseline	Profile	Profile	Baseline	Profile	Profile	Baseline	Profile	Profile	Baseline	Profile	Profile
6eSU4-5		Profile	Baseline	Profile	Profile		Profile	Profile		Profile	Profile		Profile	Profile
6eSU4-6		Profile	Baseline	Profile	Profile		Profile	Profile		Profile	Profile		Profile	Profile
6eSU6-2	Baseline	Profile	Baseline	Profile	Profile	Baseline	Profile	Profile	Baseline	Profile	Profile	Baseline	Profile	Profile
6eSU8-2		Profile	Baseline	Profile	Profile		Profile	Profile		Profile	Profile		Profile	Profile
6eSU9-2		Profile	Baseline	Profile	Profile		Profile	Profile		Profile	Profile		Profile	Profile
6eSU10-1		Profile	Baseline	Profile	Profile		Profile	Profile		Profile	Profile		Profile	Profile
6eSU10-2		Profile	Baseline	Profile	Profile		Profile	Profile		Profile	Profile		Profile	Profile
6eSU11		Profile	Baseline	Profile	Profile		Profile	Profile		Profile	Profile		Profile	Profile
TSW03 – Land’s End to Hartland Point														
7a7A1-2		Profile	Baseline	Profile	Profile		Profile	Profile		Profile	Profile		Profile	Profile
7a7A2-2		Profile	Baseline	Profile	Profile		Profile	Profile		Profile	Profile		Profile	Profile
7a7A2-3		Profile	Baseline	Profile	Profile		Profile	Profile		Profile	Profile		Profile	Profile
7a7A2-4		Profile	Baseline	Profile	Profile		Profile	Profile		Profile	Profile		Profile	Profile
7a7A2-5		Profile	Baseline	Profile	Profile		Profile	Profile		Profile	Profile		Profile	Profile
7a7A2-6	Baseline	Profile	Baseline	Profile	Profile	Baseline	Profile	Profile	Baseline	Profile	Profile	Baseline	Profile	Profile
7a7A2-7		Profile	Baseline	Profile	Profile			Profile			Profile			Profile
7a7A3-2		Profile	Baseline	Profile	Profile		Profile	Profile		Profile	Profile		Profile	Profile
7a7A3-4		Profile	Baseline	Profile	Profile		Profile	Profile		Profile	Profile		Profile	Profile
7a7A3-8		Profile	Baseline	Profile	Profile		Profile	Profile		Profile	Profile		Profile	Profile
7a7A3-9		Profile	Baseline	Profile	Profile			Profile			Profile			Profile
7a7A3-13		Profile	Baseline	Profile	Profile			Profile			Profile			Profile
7a7A3-15		Profile	Baseline	Profile	Profile		Profile	Profile		Profile	Profile		Profile	Profile
7a7A3-17		Profile	Baseline	Profile	Profile		Profile	Profile		Profile	Profile		Profile	Profile
7a7A3-18		Profile	Baseline	Profile	Profile			Profile			Profile			Profile
7a7A3-19		Profile	Baseline	Profile	Profile		Profile	Profile		Profile	Profile		Profile	Profile

7a7A3-21		Profile	Baseline	Profile	Profile		Profile	Profile		Profile	Profile		Profile	Profile
7a7A3-23		Profile	Baseline	Profile	Profile		Profile	Profile		Profile	Profile		Profile	Profile
7b7B1-2		Profile	Baseline	Profile	Profile		Profile	Profile		Profile	Profile		Profile	Profile
7b7B1-8		Profile	Baseline	Profile	Profile		Profile	Profile		Profile	Profile		Profile	Profile
7b7B2-4		Profile	Baseline	Profile	Profile			Profile			Profile			Profile
7b7B3-1		Profile	Baseline	Profile	Profile			Profile			Profile			Profile
7b7B3-2		Profile	Baseline	Profile	Profile		Profile	Profile		Profile	Profile		Profile	Profile
7b7B3-4		Profile	Baseline	Profile	Profile		Profile	Profile		Profile	Profile		Profile	Profile
TSW04 – Hartland Point to Beachley														
7cWEST2	Baseline	Profile	Baseline	Profile	Profile	Baseline	Profile	Profile	Baseline	Profile	Profile	Baseline	Profile	Profile
7cSAUN1	Baseline	Profile	Baseline	Profile	Profile	Baseline	Profile	Profile	Baseline	Profile	Profile	Baseline	Profile	Profile
7dPORL1		Profile	Baseline	Profile	Profile		Profile	Profile		Profile	Profile		Profile	Profile
7dPORL2		Profile	Baseline	Profile	Profile		Profile	Profile		Profile	Profile		Profile	Profile
7dPORL3		Profile	Baseline	Profile	Profile		Profile	Profile		Profile	Profile		Profile	Profile
7dMINE1		Profile	Baseline	Profile	Profile		Profile	Profile		Profile	Profile		Profile	Profile
7dMINE2		Profile	Baseline	Profile	Profile		Profile	Profile		Profile	Profile		Profile	Profile
7dMINE3		Profile	Baseline	Profile	Profile		Profile	Profile		Profile	Profile		Profile	Profile
7dMINE4		Profile	Baseline	Profile	Profile		Profile	Profile		Profile	Profile		Profile	Profile
7dMINE5		Profile	Baseline	Profile	Profile		Profile	Profile		Profile	Profile		Profile	Profile
7dMINE6		Profile	Baseline	Profile	Profile		Profile	Profile		Profile	Profile		Profile	Profile
7dLILS2		Profile	Baseline	Profile	Profile		Profile	Profile		Profile	Profile		Profile	Profile
7dPARR2		Profile	Baseline	Profile	Profile		Profile	Profile		Profile	Profile		Profile	Profile
7dPARR3		Profile	Baseline	Profile	Profile		Profile	Profile		Profile	Profile		Profile	Profile
7dBURN2		Profile	Baseline	Profile	Profile		Profile	Profile		Profile	Profile		Profile	Profile
7dBURN3		Profile	Baseline	Profile	Profile		Profile	Profile		Profile	Profile		Profile	Profile
7dBURN4-A		Profile	Baseline	Profile	Profile		Profile	Profile		Profile	Profile		Profile	Profile
7dBURN4-B		Profile	Baseline	Profile	Profile		Profile	Profile		Profile	Profile		Profile	Profile

7eWSM1		Profile	Baseline	Profile	Profile		Profile	Profile		Profile	Profile		Profile	Profile
7eWSM2		Profile	Baseline	Profile	Profile		Profile	Profile		Profile	Profile		Profile	Profile
7eSANB1		Profile	Baseline	Profile	Profile		Profile	Profile		Profile	Profile		Profile	Profile
7eSU17-5		Profile	Baseline	Profile	Profile			Profile			Profile			Profile
7eSU17-2		Profile	Baseline	Profile	Profile			Profile			Profile			Profile
7eSU15-2		Profile	Baseline	Profile	Profile			Profile			Profile			Profile
7eSU15-1		Profile	Baseline	Profile	Profile			Profile			Profile			Profile

Table 2.6 Survey delivery schedule.

Note that Call-off post-storm surveys are in addition to the scheduled surveys shown in this table. Please also note that year 2 baseline surveys must be conducted 8 weeks after the previous interim survey. These dates will be provided, once available, by the Employer.

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.

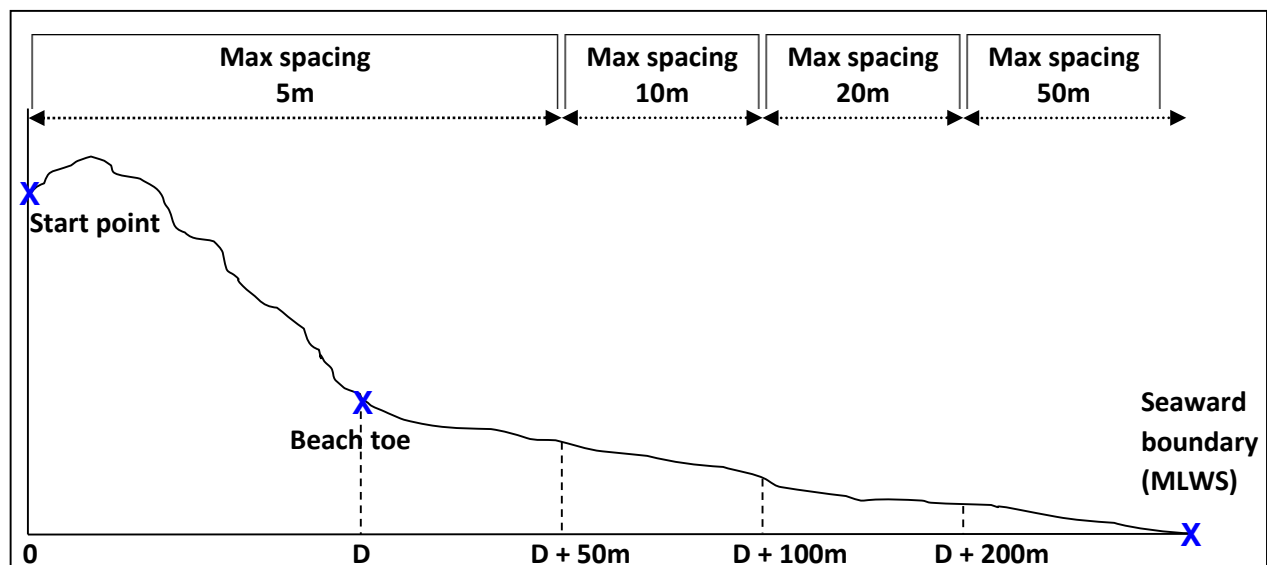


Figure 2.5 Spacing of measurement points for profile survey

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. Spot heights along all alongshore lines will be surveyed at a point spacing not exceeding 5m and including all features of beach topography. Alongshore lines will be surveyed at a maximum cross-shore spacing of 5m (plus breaks of slope), following the features alongshore. Maximum cross-shore spacing of the alongshore lines may be increased to 10m, plus breaks of slope, when the seaward boundary lies between 50 - 100m seaward of the toe of a shingle beach, or more than 50m onto the low tide terrace of a sand beach. At a distance of 100m from the beach toe/low tide terrace, shore parallel lines may be spaced at 20m, plus breaks of slope. At a distance of 200m from the beach toe/low tide terrace, shore parallel lines may be spaced at 50m, plus breaks of slope, until the seaward boundary is reached (Figure 2.6).

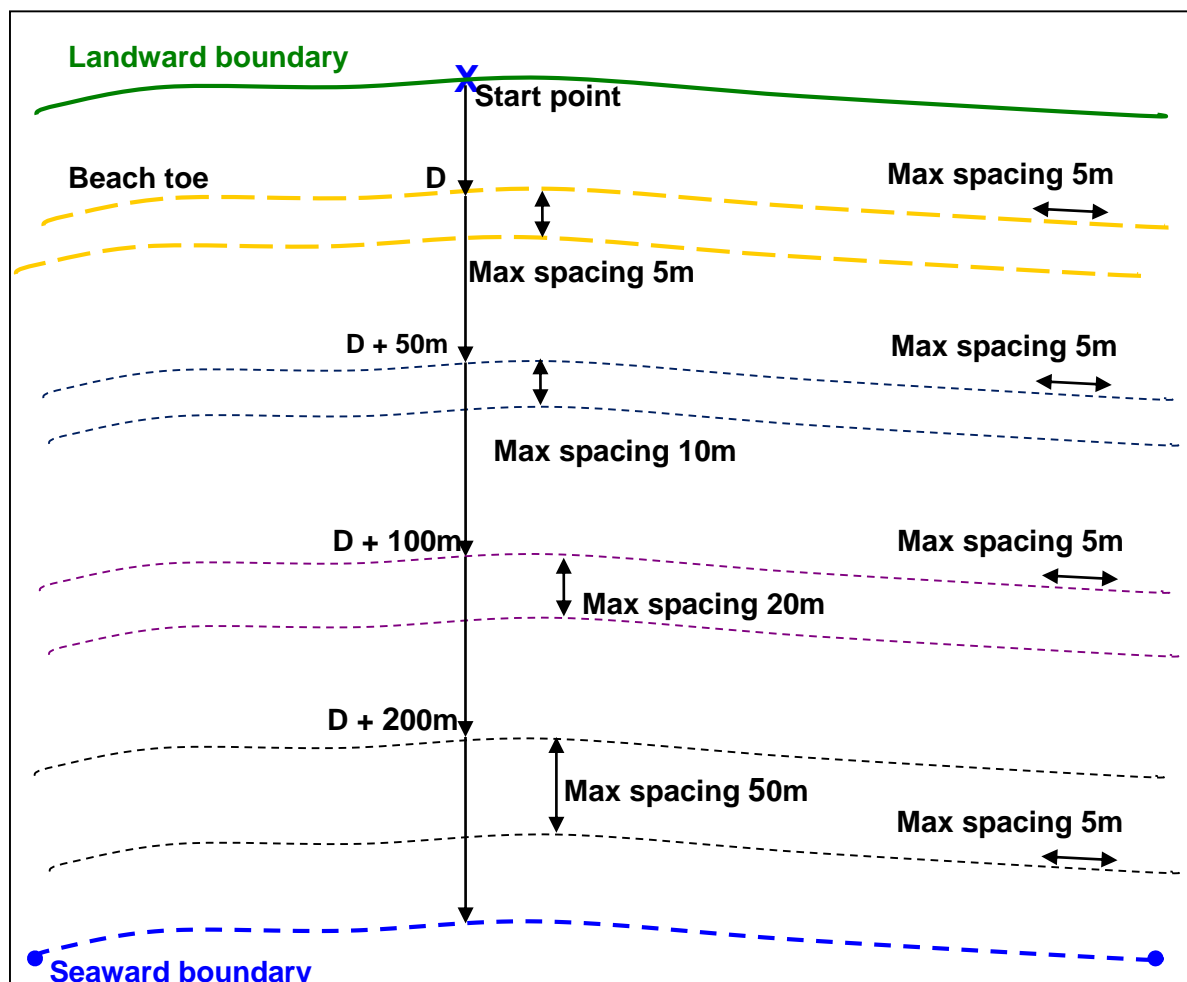


Figure 2.6 Continuous survey spacing of measurement points (plan view)

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 2.7. 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.

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

Table 2.7 Surface Sediment Type Feature Codes

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 1). Witness diagrams will be supplied to the Consultant 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.

Note that at least two observations shall be taken at the start and end of all surveys on each kit used. 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.

2.5.4 Photography

All photography will be taken using a digital camera and will be digitally labelled with camera grid reference, direction of view, date and time. Each profile will be photographed from a point mid-way along the profile. Photographs will be taken looking landwards along the profile, seawards along the profile and to the left and right of the profile. General photographs, taken from the back of the beach, will be taken at approximately 500m intervals. Where obstructions or beach conditions cause gaps in the survey, these will be documented with photographs which will also 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 spread over completely different dates, 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*

- Barrier beach photographs (portrait format)

[6e00356_YYYYMMDD_CrestUp.jpg](#) *photo taken from beach crest, looking landward*

[6e00356_YYYYMMDD_CrestDwn.jpg](#) *photo taken from beach crest, looking seaward*

- Alongshore photographs (landscape format), *either:*

[6b00021_YYYYMMDD_N.jpg](#) *photo taken from beach toe, looking broadly north*

[6b00021_YYYYMMDD_S.jpg](#) *photo taken from beach toe, looking broadly south*

or:

[6e00356_YYYYMMDD_E.jpg](#) *photo taken from beach toe, looking broadly east*

[6e00356_YYYYMMDD_W.jpg](#) *photo taken from beach toe, looking broadly 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_Consultant_YYYYMMDD.xls

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

Example: [Meta_Topo_Consultant_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 Consultant 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 Consultant 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 Consultant 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
 Consultant
 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
 Consultant is the name of company undertaking the survey work

Example: Topographic survey
 Dawlish Warren
 6bSU16-3,
 20110305
 CD 1 of 1
 Consultant
 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 2.6). 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 Plymouth Coastal Observatory, Plymouth University, Drake Circus, Plymouth PL4 8AA

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 Consultant 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"

3. ACTIVITY SCHEDULE

The total area to be surveyed is split into 4 Work Packages (TSW01, TSW02, TSW03 & TSW04), covering the coastline from Portland Bill to Beachley. Tenderers may price for any or all of the Work Packages. The council reserves the right to limit the number of work packages awarded based on the Consultant's available resource and work packages already awarded/to be awarded.

Note that a post-storm survey is a call-off item. There is no guarantee that all/any post storm surveys will be requested. The frequency and number of surveys will be dependent on the storm events experienced and site risk. Some sites may therefore not be requested whereas others may be called more frequently.

The lump sum prices to be paid for the whole of the services provided in accordance with this contract are:

See spread sheets:

Activity_Schedule_TSW01

Activity_Schedule_TSW02

Activity_Schedule_TSW03

Activity_Schedule_TSW04