

# **Appendix C**

## **Bathymetric and Surficial Geology**



## **Appendix C – Bathymetric and Surficial Geology**

This appendix contains maps of the seafloor of the study corridor from the United States-Canadian border south to the Port Angeles Harbor in Washington.

In July 2005, Sea Breeze conducted an evaluation of existing seafloor conditions and potential surface and sub-surface hazards along the study corridor. The field survey collected data using a number of industry standard survey systems installed on a locally chartered survey vessel:

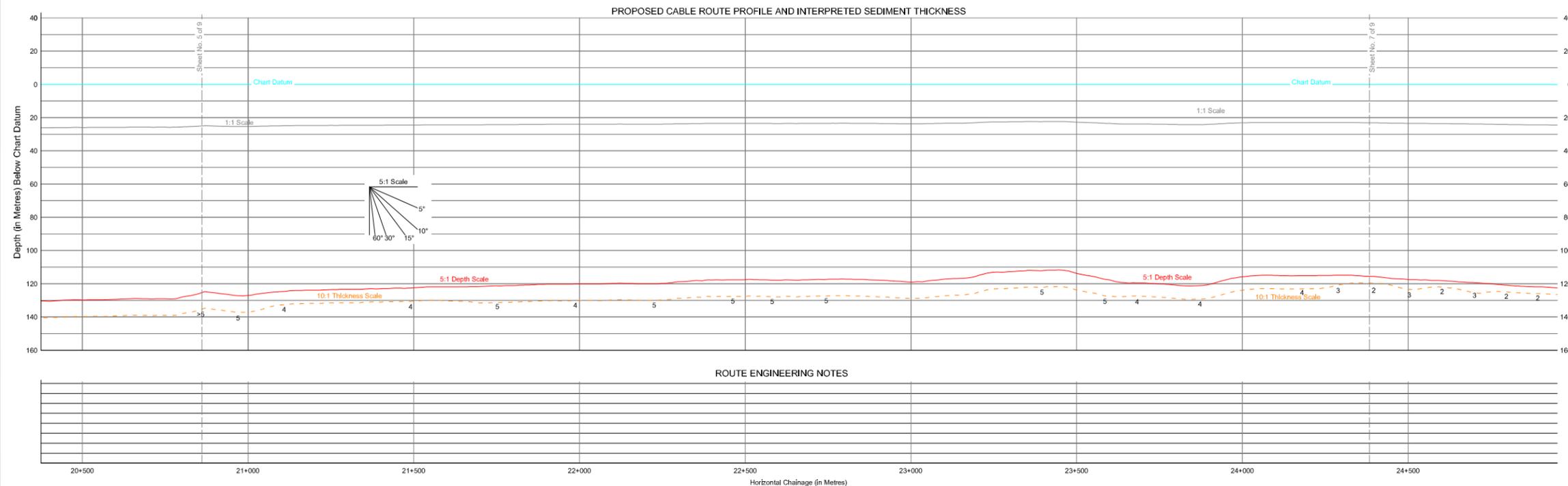
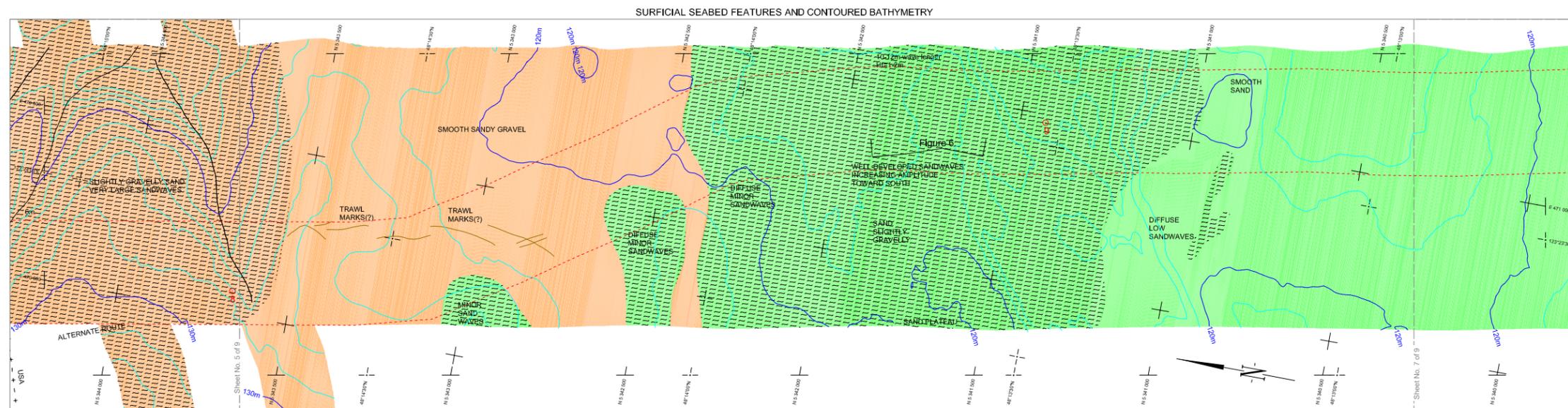
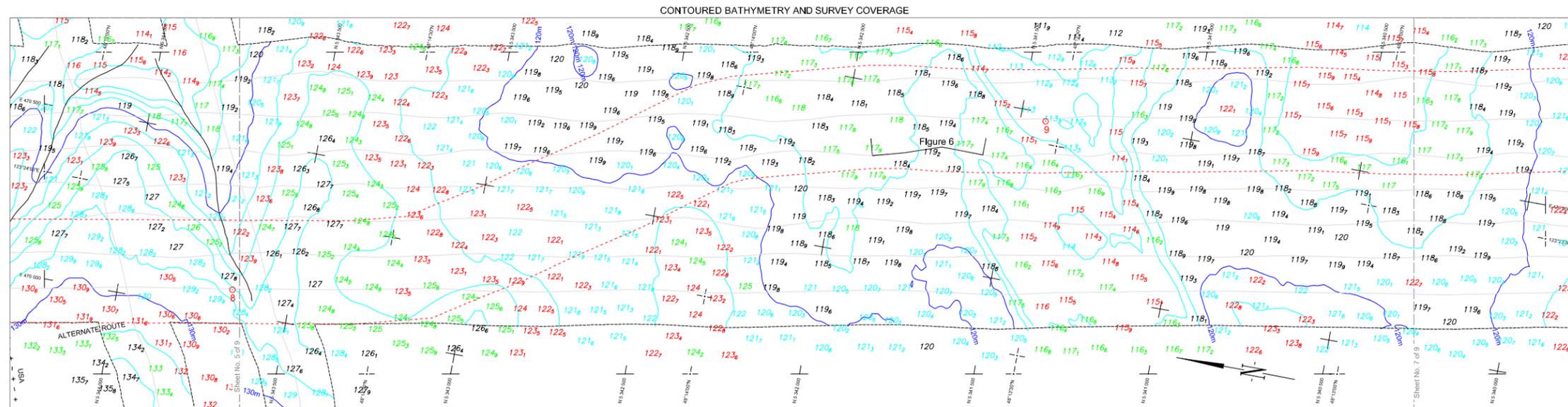
- Survey Navigation and Positioning
- Multibeam Bathymetry
- Sub-bottom Profiling
- Side Scan Sonar Imagery

The results are presented in the following maps.

### **Reading the Maps**

This appendix contains the maps of the proposed corridor under U.S. jurisdiction (maps 6 through 9). Each map sheet represents a given segment of the marine cable route, indicated by the red solid line, with kilometer posts (KP) every 500 meters (1640 feet). A kilometer post is a particular point along the total project length (in kilometers). For example, sheet 6 of 9 represents the segment from KP 20+500 (20500 m from the beginning of proposed cable route) to KP 24+500.

Each map sheet shows three panels that each present a different aspect for the given route segment. The top and middle panels are a “plan view” of the proposed cable corridor. The top panel shows the depth contours, in meters, and the middle panel presents the seabed features (topography) and shallow geology, including sediment types. The bottom panel is a “profile view” (cross-section) of the proposed cable route. The information presented in the map sheets was gathered from the field survey and other sources listed on the map legend.



#### ROUTE ENGINEERING NOTES

No.	Revision	Date	Drawn	Checked	Approved
1	Final	18 May 06	MR,JA	HO	MW
0	Draft	28 Nov 05	BB,JA,MR	HO	MW

### LEGEND

**CARTOGRAPHIC SYMBOLS**

- Proposed cable route (dashed in HDD sections), with kilometre post (KP)
- TRSI vessel track line
- Archipelago SIMS survey area
- Adjacent drawing limit
- Submarine pipeline
- Submarine telecommunication cables (in service)
- Submarine telecommunication cables (out of service/abandoned)
- Coastline
- Local seabed slope in degrees
- Bathymetric contours, 2m Interval, Indexed at every 5th contour

**SEABED FEATURES AND SHALLOW GEOLOGY**

- Fine sediment (predominantly MUD/SILT)
- Coarse sediment (predominantly SAND/GRAVEL)
- Very coarse sediment (GRAVEL to BOULDERS)
- Subcropping rock/coarse material (sed. thickness <1m)
- Rock outcrop
- Possible spoil dumping
- Area of sandwaves with height in metres
- Seabed scar or trawl mark
- Sediment or feature boundary
- Uncertain sediment or feature boundary
- \* Individual large target
- + Individual boulder/rock
- + Scarp with height (m) above ambient seafloor (hachures on down side)
- + Possible wreck or wreck debris
- + Large seabed ridge axis (with height in metres)

**SHALLOW GEOLOGY PROFILE**

- Seabed profile (with 5x vertical exaggeration)
- Seabed profile (true scale)
- Most significant shallowest seismic reflector
- Interpreted top of bedrock

**GENERAL NOTES**

**Equipment**  
 Survey vessel: R/V Richardson Point  
 Surface Positioning Systems: CSI DGPS Max Rr  
 Navigation and Acquisition Software: NavDip (TRSI)  
 Stratigraphy: EG&G Uniboom Profiler  
 Bathymetry: Knudsen 320M 200kHz, Reson 8124 200kHz Multibeam  
 Sonar/Seismic Workstation: Triton ISIS  
 Morphology and Stratigraphy: Edgetech 260 Sonar 100kHz  
 Multibeam Processing Parameters  
 Depths in metres and decimetres, reduced to LLWLT using observed tide data from the CHS tide gauge in Victoria Harbour  
 Multibeam data set gridded to 5cm for contouring.  
 Geodesic Parameters  
 UTM Zone 10 NAD83  
 Central Meridian=123°W; Scale Factor at CM=0.9996; FE=500000; FN=0  
 Side Scan Sonar Montage  
 The relative level of acoustic reflectivity of seafloor sediments and objects is directly proportional to the Image shading. Acoustic shadows are white (absence of signal).  
**Coastline and Improvements**  
 Foreshore limits and constructed objects on land and water were supplied by the client from sources including CHS, NOAA, and Corporation of Port Angeles.

**SCALE**  
 HORIZONTAL SCALE 1:5000  
 SCALE IN METRES

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Survey Date: 22-27 July 2005

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**Project**  
 JUAN DE FUCA STRAIT CABLE ROUTE SURVEY

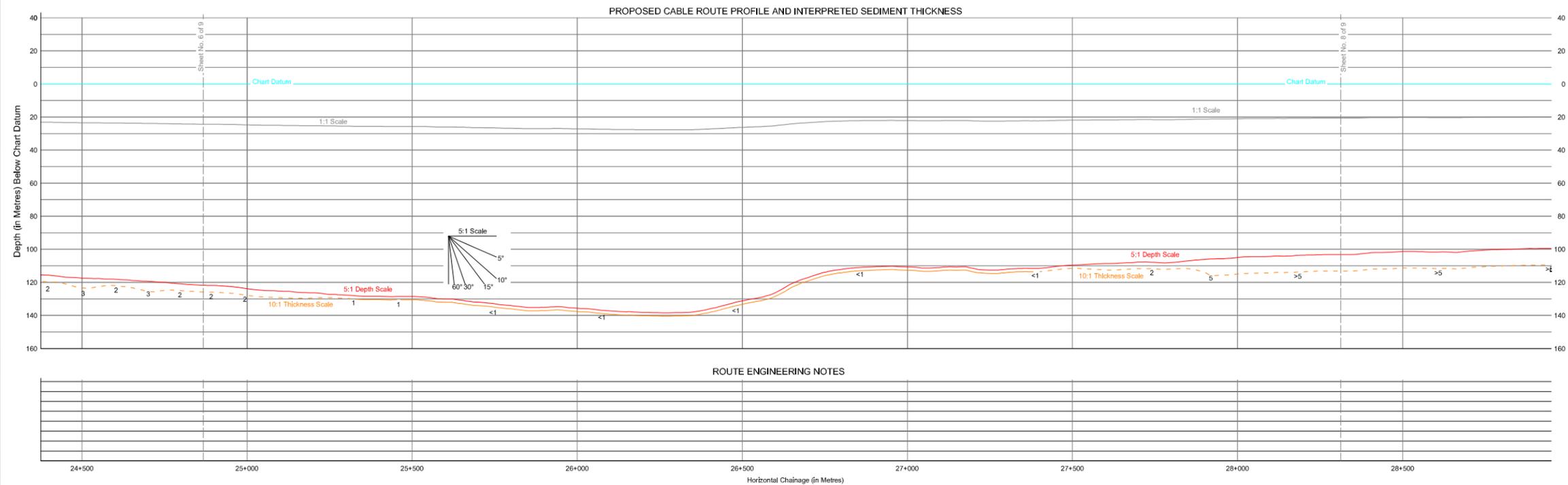
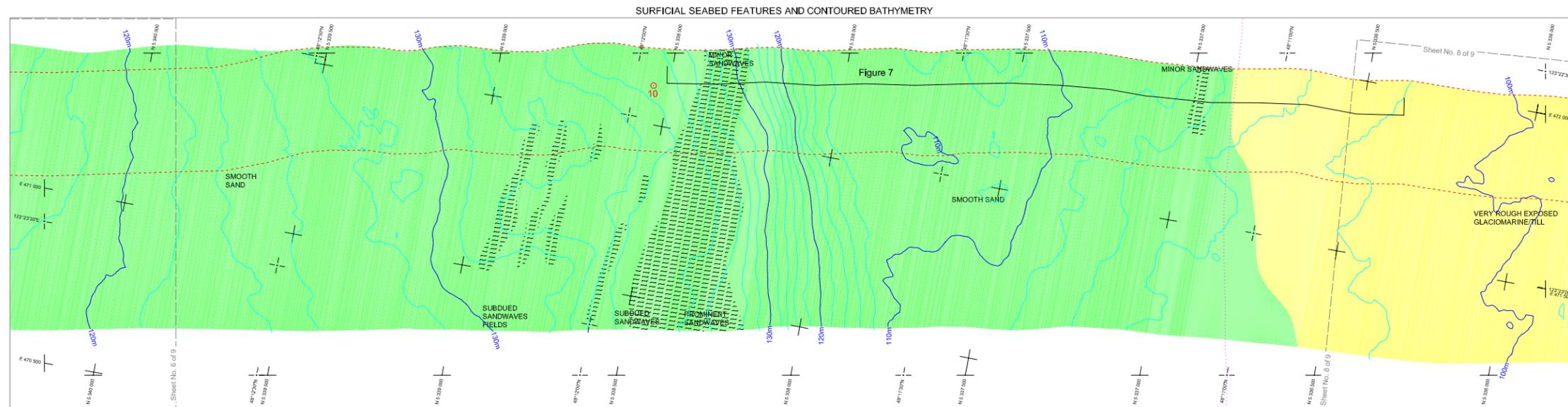
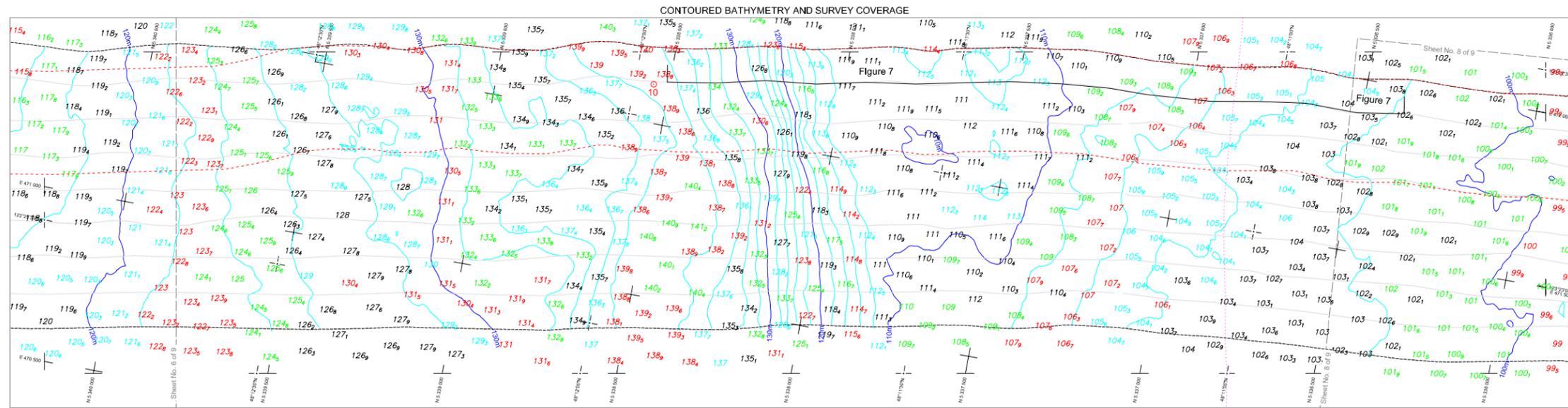
**Document Title**  
 PROPOSED ROUTE PLAN AND PROFILE ALIGNMENT  
 BATHYMETRY AND SURFICIAL GEOLOGY

**Projection and Datum**  
 UTM Zone 10 NAD83

Sheet No.	6 of 9
Revision	1

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TRSI Project No.: 05J-1109M



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- Fine sediment (predominantly MUD/SILT)
- Coarse sediment (predominantly SAND/GRAVEL)
- Very coarse sediment (GRAVEL to BOULDERS)
- Subbottom rock/coarse material (sed. thickness <1m)
- Rock outcrop
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**GENERAL NOTES**

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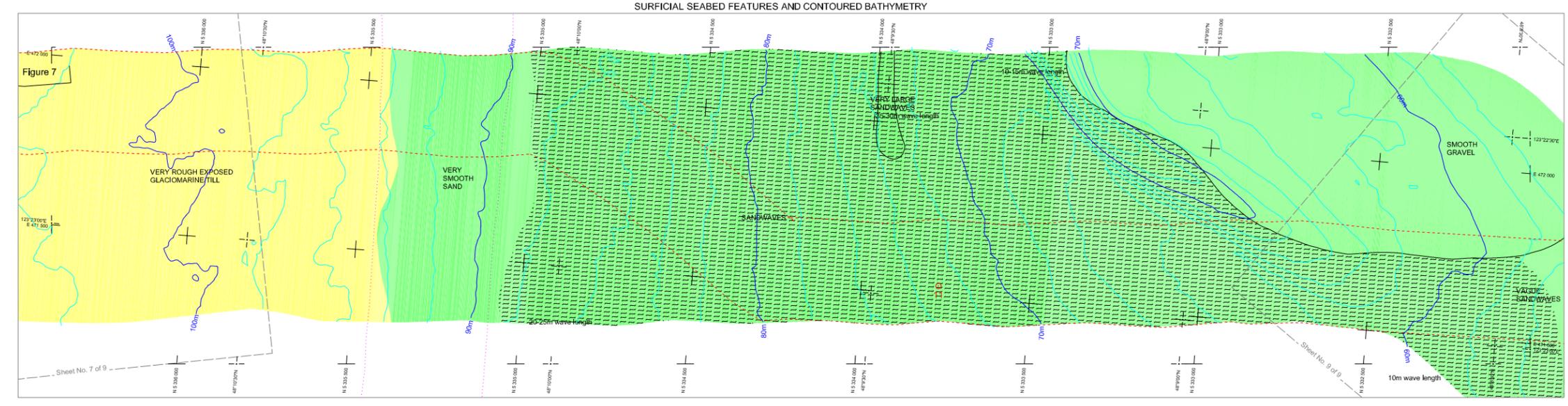
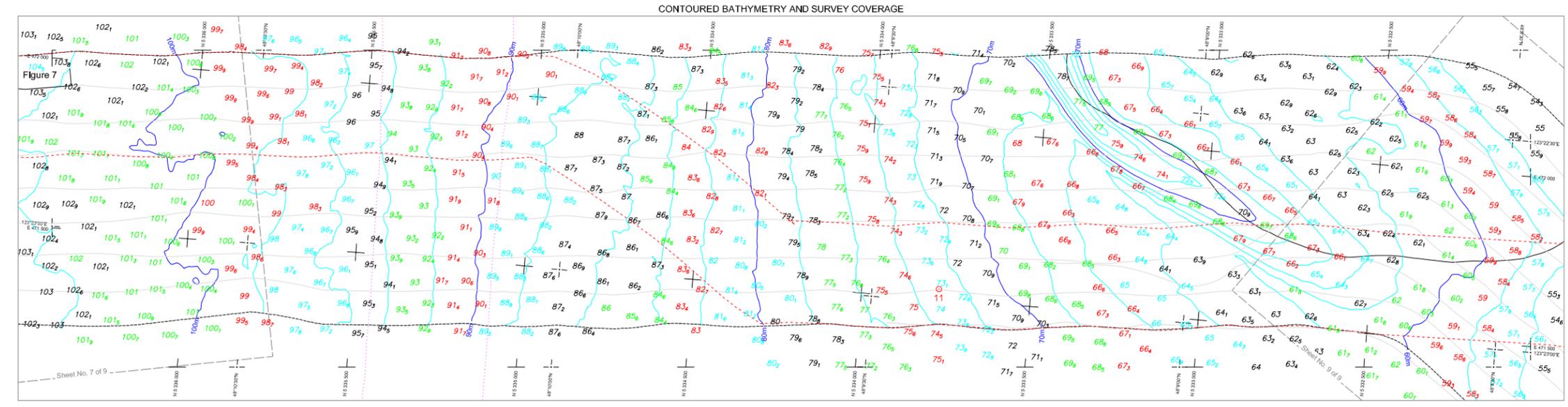
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  - Fine sediment (predominantly MUD/SILT)
  - Coarse sediment (predominantly SAND/GRAVEL)
  - Very coarse sediment (GRAVEL TO BOULDERS)
- Rock:
  - Subcropping rock/coarse material (sed. thickness <1m)
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HORIZONTAL SCALE 1:5000      SCALE IN METRES

Vertical Scale: 5:1 Depth Scale, 10:1 Thickness Scale

**Client**

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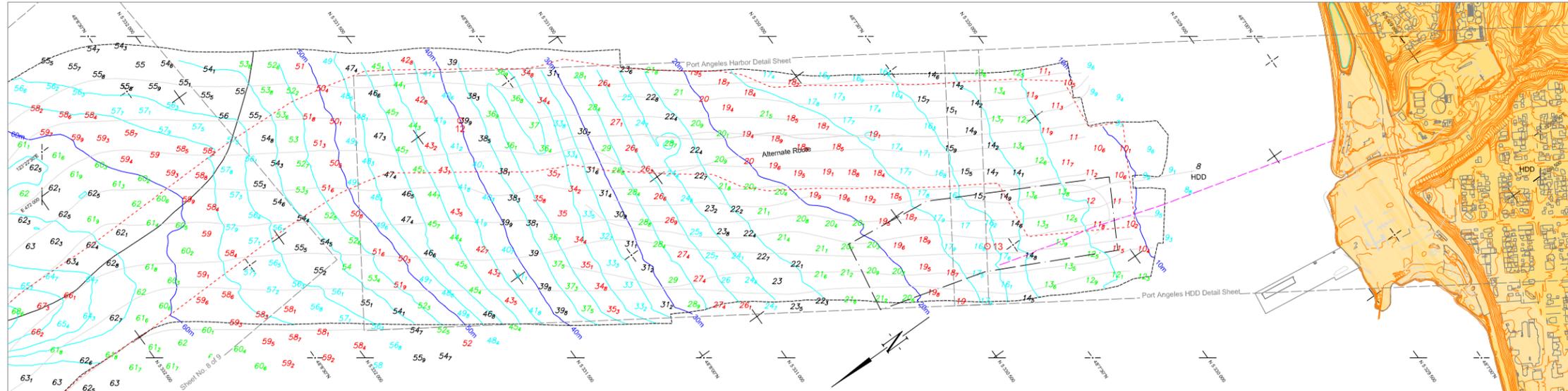
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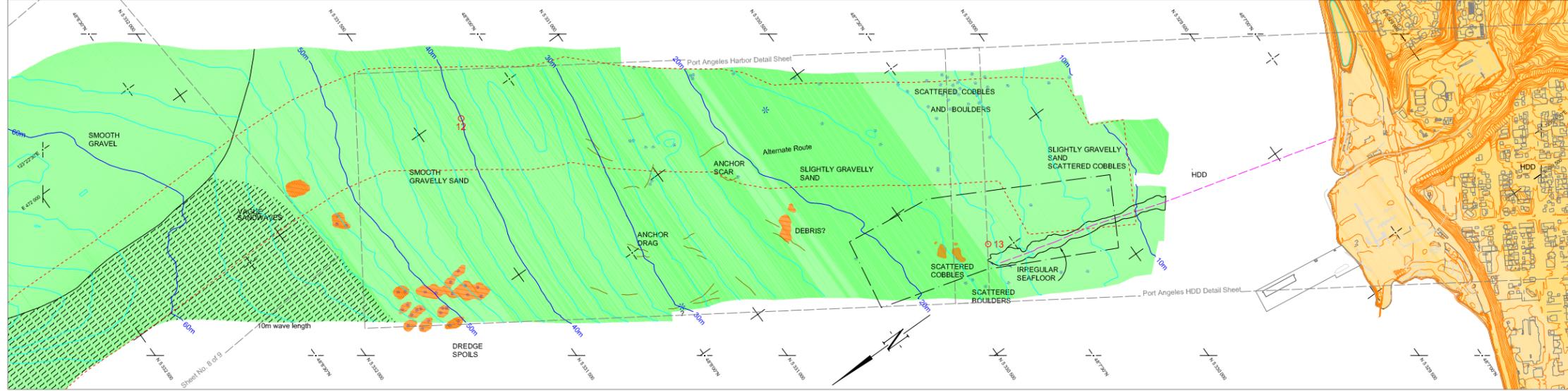
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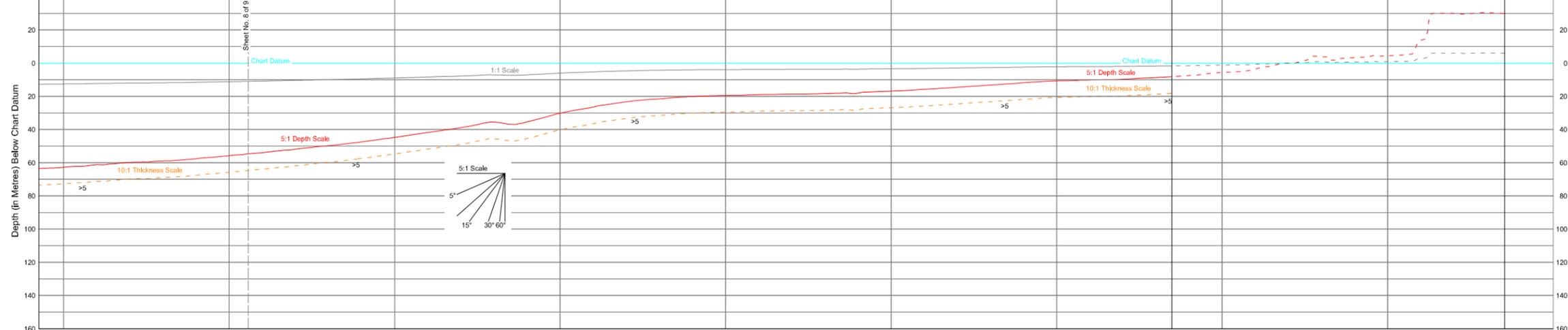
CONTOURED BATHYMETRY AND SURVEY COVERAGE



SURFICIAL SEABED FEATURES AND CONTOURED BATHYMETRY



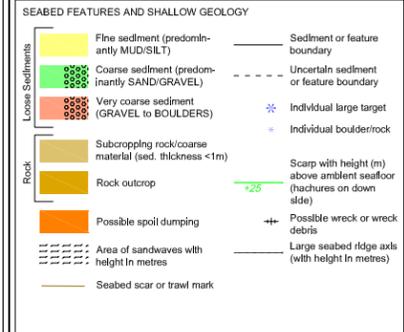
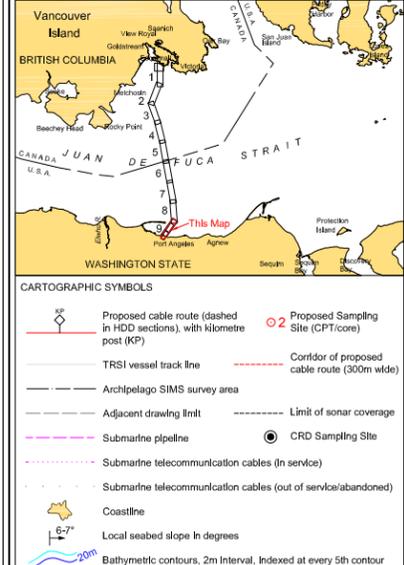
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ROUTE ENGINEERING NOTES

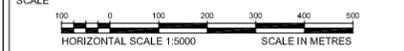
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