

PROJECT BRIEF

Amendment

FALMOUTH CRUISE PORT

EAST BERTH

Maintenance & Capital Dredging

FEBRUARY 2018

PROJECT BRIEF - AMENDMENT

MAINTENANCE & CAPITAL DREDGING FALMOUTH CRUISE PORT (East Berth)

BACKGROUND

The Historic Falmouth Cruise Port is located in the town of Falmouth, Trelawny on the north coast of Jamaica and consists of a finger pier constructed in late 2009 with the capability of accommodating two megaliner cruise vessels.

The Port Authority of Jamaica (PAJ) is seeking to undertake dredging of the Historic Falmouth Cruise Port East Berth to widen the berth pocket and a section of the access channel. Capital and Maintenance Dredging works will be carried out to enable the port to accommodate the next generation class of cruise vessels at both the East and West berths simultaneously. Previous dredge works saw the basin having a depth of 12m with the berth pockets being 11.6m to the west and 10.6m to the east berth. In compliance with the Beach Licence condition stipulated by the National Environment and Planning Agency (NEPA) a public sensitization was held 2017 June 01.

Due to the presence of high value natural resources such as the Martha Brae river in the area of interest, the PAJ engaged the services of environmental consultant company Smith Warner International Limited (SWIL) to analyze the impacts from dredging at the Falmouth Cruise Port East Berth. Analyses consisted of bathymetric and benthic surveys as well as physicochemical and biological data collection including water quality and sediment.

Of important note is **that the proposed dredge footprint is situated in an area previously altered and impacted by dredging works**. Recommendations were proposed for minor realignment of the ship channel widening to permit exclusion of sensitive resources such as hard corals found in the northern section (Exhibit 1). The National Environment and Planning Agency (NEPA) approved the Works with the issuance of a Beach Licence #L3637 and Permit No. 2017-07017-BL00066.

METHODOLOGY AND EQUIPMENT

The dredging works will be carried out by a Trailing Hopper Suction Dredger with an expected hopper capacity of approximately 3,700 m³. Additional dredging equipment such as Backhoe and Split-Hopper barges will be employed as determined by the contractor.

The dredger will operate 24 hours per day and seven (7) days a week including all local and other holidays. Dredging operations will be conducted in repeated cycles with the following activities comprising one cycle: dredging; sailing loaded; discharging; sailing empty.

- Dredging – dredged material will be placed into the hopper using a sectional dredging arm.
- Sailing loaded – once hopper is full, vessel will sail to disposal site
- Discharging – unloading of dredged material at the disposal site by opening hopper

- Sailing empty – vessel will return empty to dredge area to commence dredging again.

VOLUME ESTIMATES

An estimated one hundred and forty thousand cubic metres (140,000 m³) of material will be removed from the seafloor at the location shown on the attached Exhibit 2 which illustrates the proposed dredge slope represented by purple hatched markings.

The breakdown of estimated volume is as follows:

<u>LOCATION</u>	<u>VOLUME</u>
East Berth	140,000 m ³ (maintenance & capital) dredge to 11.6m

LOCATION OF DISPOSAL SITE

The proposed disposal site for the dredge spoil is the area approved by NEPA in previous capital dredging works located at least 2.5 nautical miles offshore and not closer than the coordinates 18° 31'58.04"N and 77° 38'46.22"W (see attached Exhibit 3)

TYPE OF MATERIAL

Material composition of the dredge spoil is expected to be a mixture of high sand and significant silt and clay content. The presence of solid waste and other land-based source material is also expected.

BENTHOS

A benthic survey was conducted by SWIL to identify species which could face potential negative impacts from dredging works and results indicate low ecological value of the proposed dredge footprint. Limited living significant marine resources - such as corals and fish - are located in the proposed dredge area presumably due to modification from previous activities as evidenced by the SWIL Impact Analysis October 2016 Report.

Dredging in a coral reef environment is likely to have a number of negative impacts, however it is important to note that **the proposed dredge footprint is located in an area previously altered and impacted by dredge work.** The subsequent dredge impacts will be dependent on duration of the dredging operations, the equipment and proposed technique to be used.

Subsequent detailed analyses by the Consultant indicated that over 600 corals, inclusive of contingency estimate, will now require relocation. However, the vast majority of corals within the area will be avoided due to the ship channel realignment previously proposed. The coral species composition of dredge footprint is detailed in the attached Coral Relocation Plan.

The proposed dredge slope and basin consisted mainly of non-living substrate, particularly silt with macroalgae being the dominant living substrate type. Fish diversity and abundance were low and no seagrass species were found in the proposed dredge area.

MITIGATION MEASURES

Given the proximity of the existing reef to the proposed dredge area, mitigation measures have been proposed including relocation of some corals and invertebrates.

Recommendations from the SWIL October 2016 report include the use of the coral relocation site from the previous capital dredge work of 2009 for any hard coral relocation provided that the site possesses complementary features (regarding space and species competition) and is exempt from potential harmful impacts such as ship groundings and sedimentation. Discussions with NEPA highlighted that the eastern section of the previous coral relocation site (from the 2009 dredging) showed better conditions and as such the coral relocation site being proposed will be located on the eastern side as seen in the revised Coral Relocation Plan dated February 02 2018 attached.

Minimization of sediment plume during dredging operations will be effected by the use of turbidity barriers to help protect the existing marine community. Suspension of dredging activities will be carried out in cases of adverse sea conditions and abnormal ocean parameters to further diminish the impact of sediment suspension on marine resources in close proximity to the dredging site.

DURATION

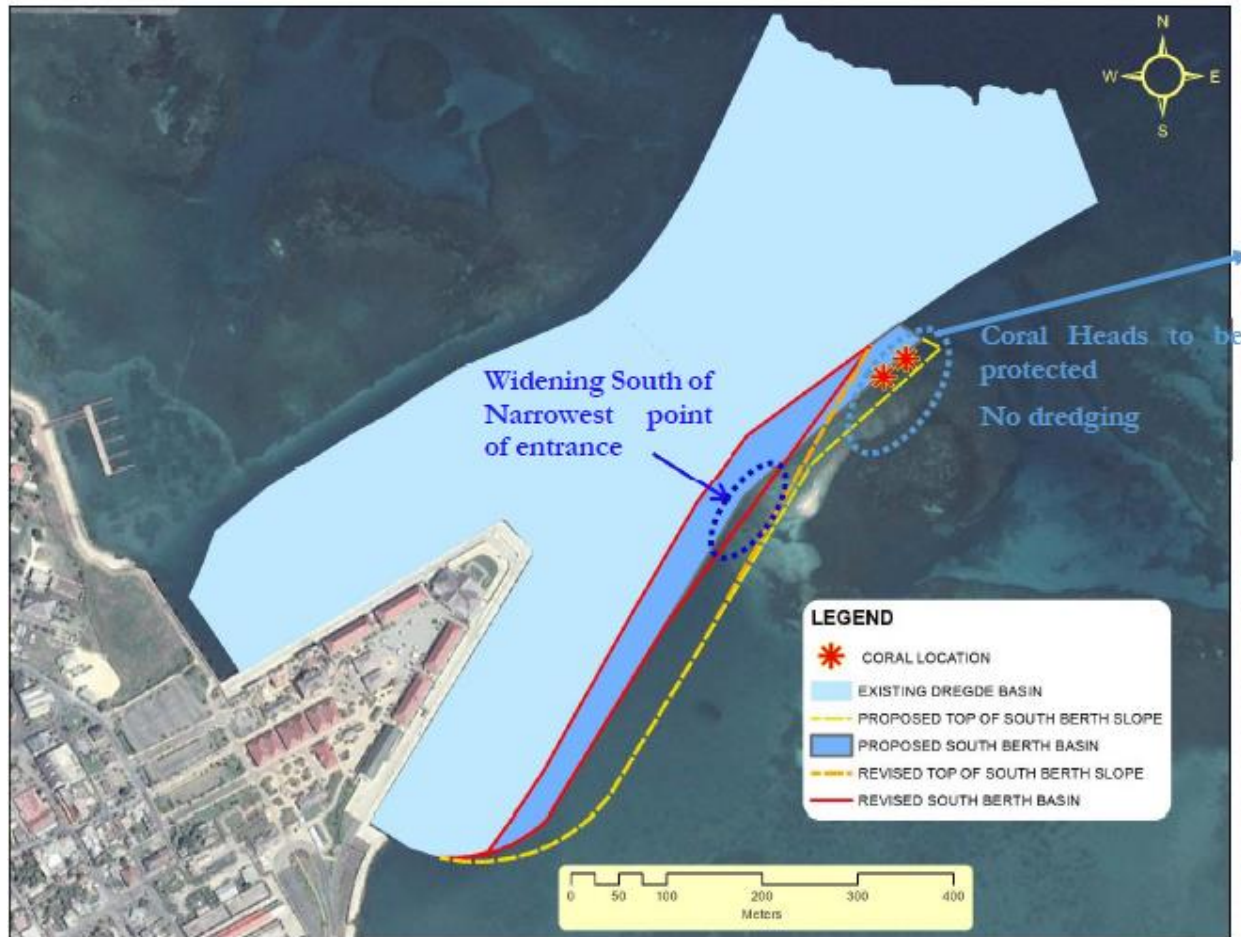
Work is projected to occur over a period of two and a half weeks.

SCHEDULE/ TIMELINE

Dredging operations are expected to commence at a date to be agreed during the first quarter of 2018 for completion after two and a half weeks.

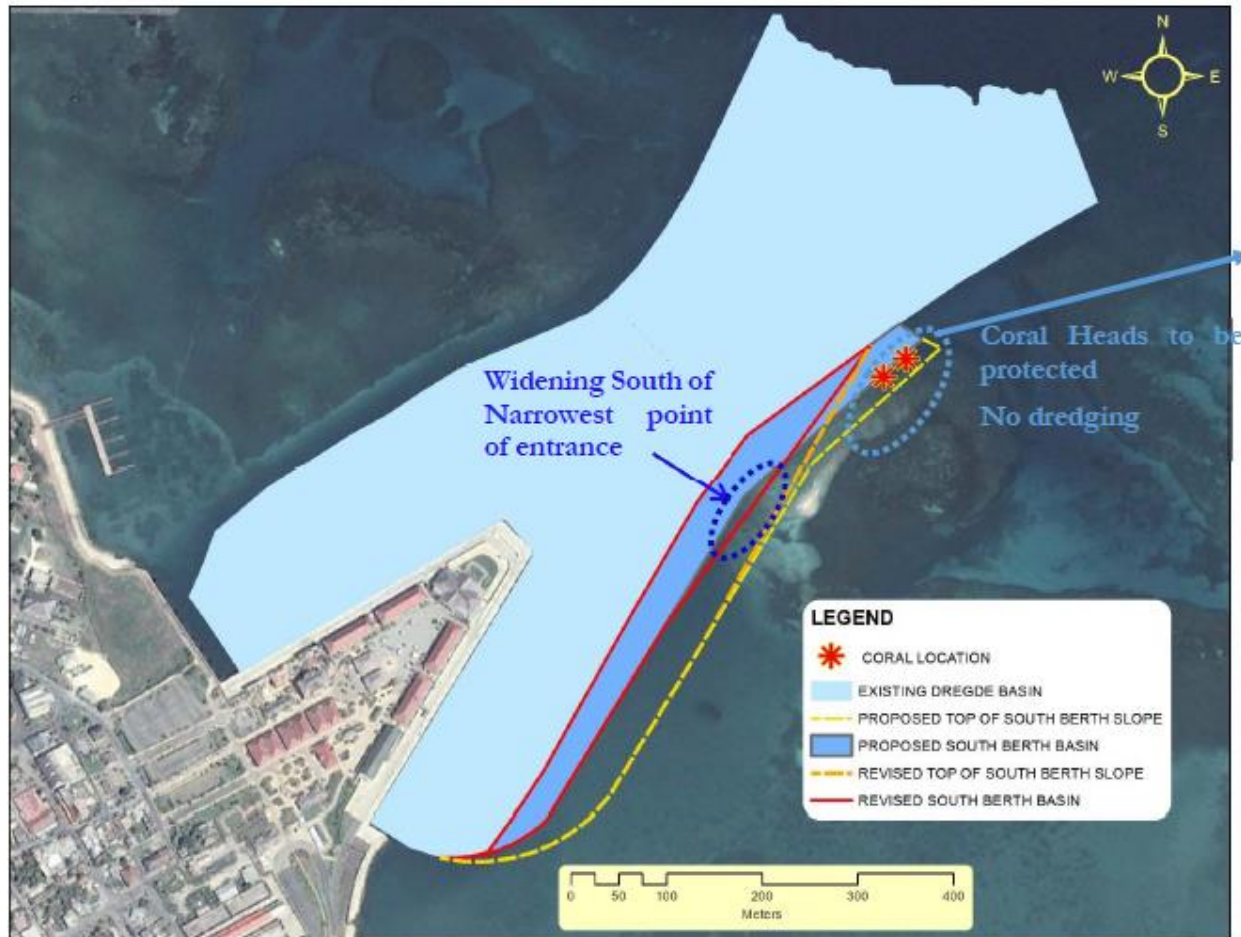
The Port Authority of Jamaica - February 2018

Exhibit 1 – Proposed Realignment of ship channel in Falmouth showing hard coral locations.

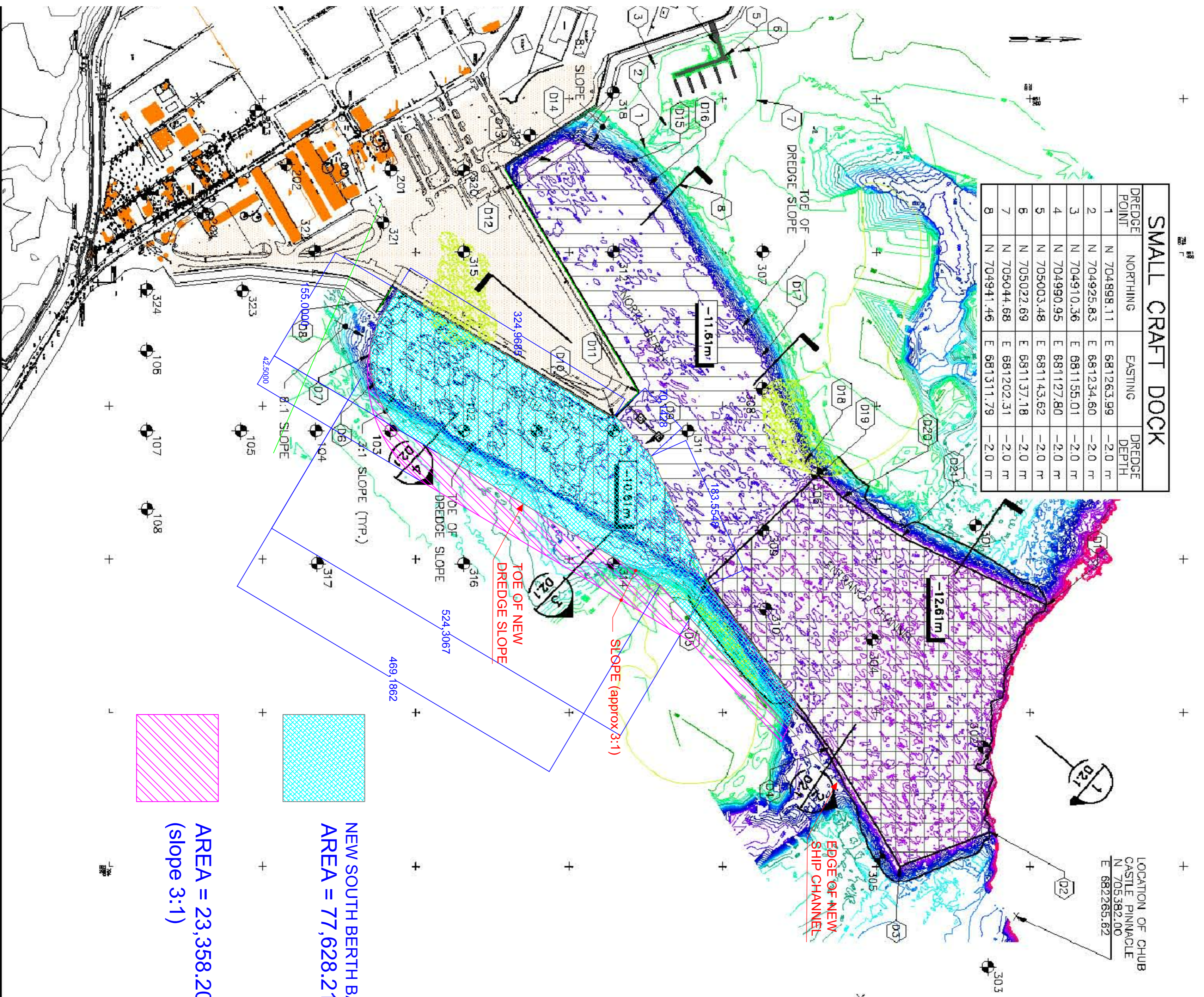


Proposed realignment

Exhibit 1 – Proposed Realignment of ship channel in Falmouth showing hard coral locations.



Proposed realignment



SMALL CRAFT DOCK

DREDGE POINT	NORTHING	EASTING	DREDGE DEPTH
1	N 704898.11	E 681263.99	-2.0 m
2	N 704925.83	E 681234.60	-2.0 m
3	N 704910.36	E 681155.01	-2.0 m
4	N 704990.95	E 681127.80	-2.0 m
5	N 705003.48	E 681143.62	-2.0 m
6	N 705022.69	E 681137.18	-2.0 m
7	N 705044.68	E 681202.31	-2.0 m
8	N 704941.46	E 681311.78	-2.0 m

LOCATION OF CHUB CASTLE PINNACLE
N 705382.00
E 682285.82

DREDGING COORDINATES

DREDGE POINT	NORTHING	EASTING	DREDGE DEPTH	DREDGE POINT	NORTHING	EASTING	DREDGE DEPTH
* D1	N 705421.90	E 681860.46	-12.61 m	D11	N 704890.77	E 681582.54	-11.61 m
* D2	N 705346.78	E 682194.73	-12.61 m	D12	N 704729.15	E 681310.74	-11.61 m
D3	N 705230.92	E 682199.76	-12.61 m	D13	N 704775.68	E 681280.13	-11.61 m
D4	N 705138.60	E 682045.55	-12.61 m	D14	N 704831.45	E 681255.30	-11.61 m
D5	N 704979.33	E 681827.83	-12.61 m	D15	N 704875.68	E 681283.38	-11.61 m
D6	N 704547.98	E 681568.92	-10.61 m	D16	N 704903.86	E 681311.83	-11.61 m
D7	N 704539.75	E 681534.57	-10.61 m	D17	N 705050.24	E 681535.71	-11.61 m
D8	N 704589.36	E 681456.40	-10.61 m	D18	N 705106.95	E 681672.54	-11.61 m
D9	N 704898.68	E 681649.27	-11.61 m	D19	N 705124.44	E 681689.55	-12.61 m
D10	N 704858.75	E 681615.85	-11.61 m	D20	N 705155.18	E 681719.44	-12.61 m
				D21	N 705232.63	E 681770.93	-12.61 m

* APPROXIMATE LOCATIONS, THESE POINTS MAY VARY DEPENDING ON ACTUAL DEPTH.

LEGEND

	ENTRANCE CHANNEL (-12.61m)		DREDGE BASIN (-10.61m)
	DREDGE BASIN (-11.61m)		REEF
	DREDGE LOCATION AND NUMBER		EXISTING CONTOURS MSL
	BORING LOCATION AND NUMBER		DESIGN DREDGE DEPTH

NOTES:

1. HYDROGRAPHIC AND SHORELINE SURVEY PROVIDED BY GEORGE F. YOUNG, INC. FIELD DATE: 2/18/2009, JOB NO. 0913030700
2. GEOTECHNICAL REPORT ENTITLED FALMOUTH CRUISE SHIP TERMINAL BY HILL-BETTY ENGINEERS LTD., DECEMBER, 2007.
3. GRID SYSTEM IS IN METERS RELATIVE TO JAD 2001
4. CHART DATUM (CD) RELATIVE TO MSL
MSL 0.0
CD -0.11 (AS DEFINED BY THE PORT AUTHORITY)
5. ALL ELEVATIONS ARE IN METERS AND REFER TO MEAN SEA LEVEL UNLESS NOTED OTHERWISE.
6. DREDGING COORDINATES REPRESENT TOE OF SLOPE.
7. AVERAGE SIDE SLOPE 3 HORIZONTAL TO 1 VERTICAL TO BE ACHIEVED BY STEPPED CUTS, AS SPECIFIED.
8. DREDGING TOLERANCES:
VERTICAL TOLERANCE: 0.00m ABOVE DESIGN DREDGE DEPTH, 0.30m BELOW DESIGN DREDGE DEPTH HORIZONTAL TOLERANCE: +3.0m TO -1.0m FROM THEORETICAL DREDGE BOUNDARY
9. UPLAND SURVEY PROVIDED BY LEMELYN ALLEN & ASSOCIATES, Commissioned Land Surveyors DATE OF SURVEY: Bet. 19th and 30th Nov., 2007 JOB NUMBER: LA/10-23/07 FIELD BOOK NUMBER: LA/167

NEW SOUTH BERTH BASIN
AREA = 77,628.21 sqm

AREA = 23,358.20 sqm
(slope 3:1)



AS-BUILT SET

Mark	Description	Date	By

AT FULL SIZE BAR IS ONE INCH

FALMOUTH CRUISE TERMINAL
FOR
E. Pihl & Son A.S.
**DREDGING
SITE PLAN**

PREPARED BY:
Halcrow
Halcrow Inc
1101 Channellside Drive, Suite 400 N
Tampa, FL 33602 (813) 986-1990
Certificate of Authorization Number: 28480

PREPARED FOR:
The Port Authority

DESIGNED BY: C. SCHNEIDER
DRAWN BY: R. AMLIN
CHECKED BY: C. CURTIS
APPROVED BY: C. SCHNEIDER
PE NAME: G. SCHNEIDER
ID: 33257

JULY 5, 2011

Project Name and Address
PAL FAST SOUTH BERTH PROPOSED DREDGING
Falmouth Cruise Ship Terminal
Trelawny, Jamaica



No.	Revision/Issue	Date

Project: PAL_FAST_SB_DREDGE_01
Date: 2015-01-07
Scale: NTS

General Notes

Exhibit 3. Approach to Falmouth Harbour showing proposed dredge disposal site (red outline) located 2.5 nautical miles offshore in 1000m contour

