

**ตารางแสดงวงเงินงบประมาณที่ได้รับจัดสรรและราคากลาง(ราคาอ้างอิง)  
ในการจัดซื้อจัดจ้างที่มีใ้ใช้งานก่อสร้าง**

๑. ชื่อโครงการ การจัดจ้างการออกแบบระบบปรับอากาศและระบายอากาศของเรือตรวจการณ์ไกลฝั่ง  
กิจกรรม จัดจ้างการออกแบบระบบปรับอากาศและระบายอากาศของเรือตรวจการณ์ไกลฝั่ง  
/หน่วยงานเจ้าของโครงการ สำนักโครงการเรือตรวจการณ์ไกลฝั่ง ลำที่ ๒ บริษัท อุ่กรุงเทพ จำกัด

๒. วงเงินงบประมาณที่ได้รับจัดสรร ๑,๒๐๐,๐๐๐ บาท (รวมภาษีมูลค่าเพิ่ม ๗%)

๓. วันที่กำหนดราคากลาง (ราคาอ้างอิง) วันที่ ๑๑ ธันวาคม ๒๕๕๘  
เป็น ๑,๐๕๒,๓๒๕.๕๒ บาท (รวมภาษีมูลค่าเพิ่ม ๗%)

๔. แหล่งที่มาของราคากลาง (ราคาอ้างอิง)

จากการสืบราคาปัจจุบัน จากท้องตลาด ๒ ราย ดังนี้

๔.๑ J & E Hall Internationa

๔.๒ Viking Airtech Pte Ltd.

๕. รายชื่อเจ้าหน้าที่ผู้กำหนดราคากลาง (ราคาอ้างอิง)

๕.๑ นางจันทร์ทิพย์ ชำศิริพงษ์ หัวหน้าแผนกบริหารงานพัสดุ

## **Term of Reference (TOR)**

### **Design of Heating, Ventilation and Air-Conditioning (HVAC) and Refrigeration Provision Systems for the Royal Thai Navy Offshore Patrol Project**

#### **1. Objective**

The Bangkok Dock Company (1957) Limited (BDC) wishes to announce this Term of Reference (TOR) for the Designs of Heating, Ventilation and Air-Conditioning (HVAC) and Refrigeration Provision Systems for the Royal Thai Navy Offshore Patrol Vessel (OPV 2).

#### **2. Requirement**

- 2.1 Design of sea water cooled chilled water type air conditioning system
- 2.2 Design of mechanical ventilation system
- 2.3 Design of refrigeration provision system

Technical requirements are given in ANNEX 1

#### **3. Condition of Bidding**

- 3.1 The bid price shall include all costs, expenses, fees (excluded Value Added Tax)
- 3.2 The enumeration of the bid price must be provided Grand Total Price.

#### **4. Qualification of Bidder**

- 4.1 Bidder must be a professional in naval HVAC and Refrigeration Provision System Design and has experience in designing the mentioned systems for naval vessel larger than 1200 tons for at least 5 vessels and also at least 5 marine vessels larger than 10,000 tons.
- 4.2 Bidder has never been on the blacklist of the Thai Government, or as a result of not receiving orders to another entity or person who is blacklisted by the Thai Government.
- 4.3 Bidder must act as principal for its own account and not as agent or broker. If any Bidder has a coordinator in Thailand, the name and contact details of such coordinator must be clearly specified in the proposal.
- 4.4 Bidder must have own bank account where receive/payment shall be made, except, if each payment is not over 30,000 Bath, the counter party may receive/paid by cash.

#### **5. Document for Consideration**

- 5.1 Bidder's Qualification Document (For foreign bidder)
  - 5.1.1 Copy of Company Registration/Affidavit1 and certified true copy.
  - 5.1.2 Letter of power of attorney, in case of the bidder is authorized the behalf to bid, sign in the bid, or in the other cases. The letter shall be affixed the duty and enclosed with the copy of the identity card or passport and/or household registration, which declare both of the authorizer and behalf.
- 5.2 Technical Specification Document
  - 5.2.1 The details of specification of design in this bid must meet BDC's requirements. The bidder must clearly identify its own profile and the origin country of service provider.
  - 5.2.2 Copy of document showing that the bidder had experiences in the designs as specified in (4.1) above.

5.2.3 If the Technical Specification documents do not comply with item 5.2.1 - 5.2.2, BDC reserves the right not to consider the bidder.

## **6. Delivery and Acceptance**

- 6.1 The bidder must declare document and/or evidence of delivered designs that meet the specification and standard which specified in Contract or purchase order (PO) as stated in all respects.
- 6.2 If the delivered designs from bidder do not meet the requirements, BDC reserves the right to reject those designs. And in this case, the bidder must immediately take the right to correct immediately.
- 6.3 Designs shall be delivered to the BDC not more than 60 days after receiving Purchasing Order (PO) or Contract Effective Date (CED)

## **7. Penalty**

If the bidder cannot deliver on time as agreed scheduled, bidder must pay on a daily rate penalty of 0.05 percent of the Contract or purchase order (PO) values that are not delivered from the date of delivery until the date that the bidder has fulfilled the conditions in the contract or PO. However, the total amount of penalty shall not exceed 5% of the total contract value.

## **8. Condition of Payment**

- 8.1 BDC agrees to pay the design cost to the bidder when BDC has received the services completely according to the agreed payment terms.
- 8.2 Payment by this condition, BDC will transfer directly into the bank account of the bidder. The bidder and BDC shall agree on the responsibility for any other charges related to the transfer of the bank levy, and consent to such deductions from the amount transferred in that period.
- 8.3 The bank must be registered in Thailand.

## **9. Annex**

Annex 1 Technical Requirement

## ANNEX 1

### Technical Requirement

#### 1. Engineering Design and Document

The following Engineering Design & Document shall be submitted and reviewed for approval.

Item	Item Description
	<b>Main Air Conditioning System – Design Philosophy</b>
1	HVAC Basic Design Philosophy
2	HVAC System Description and Control Philosophy
3	Fire Damper Design Philosophy
	<b>Main Air Conditioning System – Calculation</b>
4	Cooling and Heating Load Calculation
5	Psychometric Charts Analysis
6	HVAC and Mechanical Ventilation System Duct Sizing – Single Line Diagram
7	HVAC Chilled Water Pump Sizing
8	HVAC Tanks Sizing
	<b>Main Air Conditioning System – Sizing</b>
9	Chiller Datasheets
10	Piping System Accessories Datasheets
11	Air Handling Unit Sizing
12	Fan Coil Unit Sizing
13	Galley Hood Sizing
14	Fire Damper Sizing
15	Shut-Off Damper Sizing
16	Mechanical Ventilation Fan Sizing
17	MSOD, PRD, NRD and VCD Sizing
18	Air Terminal Sizing
19	Ventilator Sizing
20	Fan or Duct Silencer Sizing
21	Typical Drawing for Penetration Pieces, Duct Supports, External Air Terminals (Louvers, Mushroom Ventilators, & Gooseneck Ventilators)
22	Instrument List
	<b>Main Air Conditioning System – Drawings</b>
23	HVAC Single Line Drawing
24	P & ID Chilled Water Unit Refrigeration System
25	P & ID Chilled Water Piping System
	<b>Provision Refrigeration System – Design Philosophy</b>
26	Cold Room Design Philosophy
	<b>Provision Refrigeration System – Calculation</b>
27	Refrigeration Load Calculation
	<b>Provision Refrigeration System – Datasheets</b>
28	Seawater Condensing Unit Sizing
29	Freezer Fan Coil Unit Sizing
30	Cooler Fan Coil Unit Sizing

2. Engineering Design & Document mentioned in (1) shall be in detail and adequate so that they are ready for BDC to submit for Class Approval.
3. Bill of materials and equipment specifications shall be provided so that they are ready for BDC to use for procurement.
4. Design Criteria shall refer to ISO 7547, ISO 8862, ISO 8863, ISO 8864 and ASHRAE where appropriate. Below conditions shall apply;

<b>Summer Season</b>	<b>Dry Bulb Temp</b>	<b>Relative Humidity</b>
Outside condition	+35°C	85%
Inside condition	+25°C	45% to 55%

Sea water temperature 32°C

5. Vessel General Arrangement and necessary information for the design shall be provided by BDC at appropriate time.