



Ministry of Fisheries, Marine Resources, and Agriculture
Male', Republic of Maldives

Technical description and specification of the ice plant

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Seawater flake-ice complete unit with the capacity to produce 25 tons ice per day shall be supplied.

1. General requirement:

Detail	Requirement	Proposed
Seawater flake ice	Evaporator (Ice drum) ice blade, reducer, water pump, water tank compressor (Hanbell/Bitzer), low pressure gauge, high/low pressure control, high pressure gauge, oil pressure gauge, water –cool condenser liquid supply pipe, condenser pump (vertical type), cut-off valve (Danfoss), filter (ALCO/D&F), liquid sight glass (ALCO), solenoid valve (Danfoss), expansion valve (DANFOSS) suction pipe, accumulator, liquid receiver, refrigeration lubricant, electrical control system	
Ice store with polyurethane panels	Minimum 50 ton and refrigeration system of ice storage with Bitzer/HANBEL SCREW compressor unit to be supplied	

2. Designed condition:

Detail	Requirement	Proposed
Ambient Temperature	+36 °C	
Refrigerant system	Direct expansion for Ice store	
Seawater temperature	+30 °C	
Main current	400 Volts, 50 Hz, 3 phases	
Pilot current	230 Volt, 50 Hz, 1 phase	
Make up water	seawater 30 °C	

3. Requirement:

Detail	Requirement	Proposed
Flake Ice maker x 1 set	Flake Ice maker x 1 set	
Capacity	25 tons/24hr	
	Ice store with polyurethane panels capacity of minimum 50 ton	

4. Refrigeration Equipment

- Set Screw / Compressor for flake ice maker with screw compressor accessories
- Shell and tube condenser (cupronickel)
- Liquid receiver
- Economizer
- Pre-chiller
- Control panel for refrigeration unit.
- Ice store cooling system.

5. Ice Machine:

Detail	Requirement	Proposed
Flake ice thickness 1.6 to 2 mm	Flake ice thickness 1.6 to 2 mm	
Capacity	25 tons/24 hours (the machine shall be manufactured to use for seawater	
Product water	Sea water 30 degree Celsius	
Desired water temperature may be reduced with pre-chiller arrangement	Desired water temperature may be reduced with pre-chiller arrangement	

6. Ice store:

Detail	Requirement	Proposed
Walls and ceiling prefabricated insulation panel	minimum requirement: SS304 inside panel(1.2mm), Outside panel (0.8mm)	
Floor under insulation on top reinforced concrete floor	Floor under insulation on top reinforced concrete floor	
Storage Capacity	minimum 50 tons	
Room temperature:	-10~-15 degree Celsius	
The ice store cooling system shall be independent from the ice making system.	The ice store cooling system shall be independent from the ice making system.	

7. Operational requirement:

- All energy used on the ice plant should come from the plants own diesel generator.
- Cummins diesel generator approx. 250KVA with direct injection air cooled conforming to ISO 3046 /BS 5514 shall be included
 - o Alternator: Stanford brushless AC alternator.
 - o Separately excited, self-regulated
 - o Class 'H' insulation
 - o Automatic voltage regulator

8. The plant comprises with the following items:

- Ice plant prefabricated building
- Ice store 50 tons.
- Flake ice machine capable of producing sea water flake ice 25 metric tons/24hours. Compressor Condenser Receiver and all other necessary equipment.
- Sea water intake to supply sea water to condenser.
- Sea water supply and filtering system for ice production.

9. Ice plant building:

- Steel structure self-supporting with frame column beam and trusses roof purlin prefabricated for bolt assembling on site, heat resistance metal sheet for roof and siding. All equipment shall be housed in the same building.
- A boundary wall (height 3ft) for the ice plant site shall be built by the contractor.
- Concept drawing for the prefab building and ice plant site shall be provided by the applicant.

10. Duration

- The Ice plant should be handed over to the Ministry of Fisheries, Marine Resources and Agriculture within 180 days of signing the agreement and after the completion of the construction.

11. Other provisions

- Import duty for following items imported for the ice plant work will be exempted by the ministry.
 - o The equipment and machinery which are included in the Ice Plant
 - o The Machinery and equipment required for the production of Ice
 - o Cold Storage (Storage of Ice)
 - o Machinery Room (e.g.: - generator set)
 - o Spare Parts Room
 - o Office
 - o Boundary wall
 - o Concept drawings to be attached with the proposal (layout/side/ground view)
 - o Should provide with quotation, parameters, diagram and drawing of all machines and equipment's of ice plant.

12. Land Area of the Ice Plants

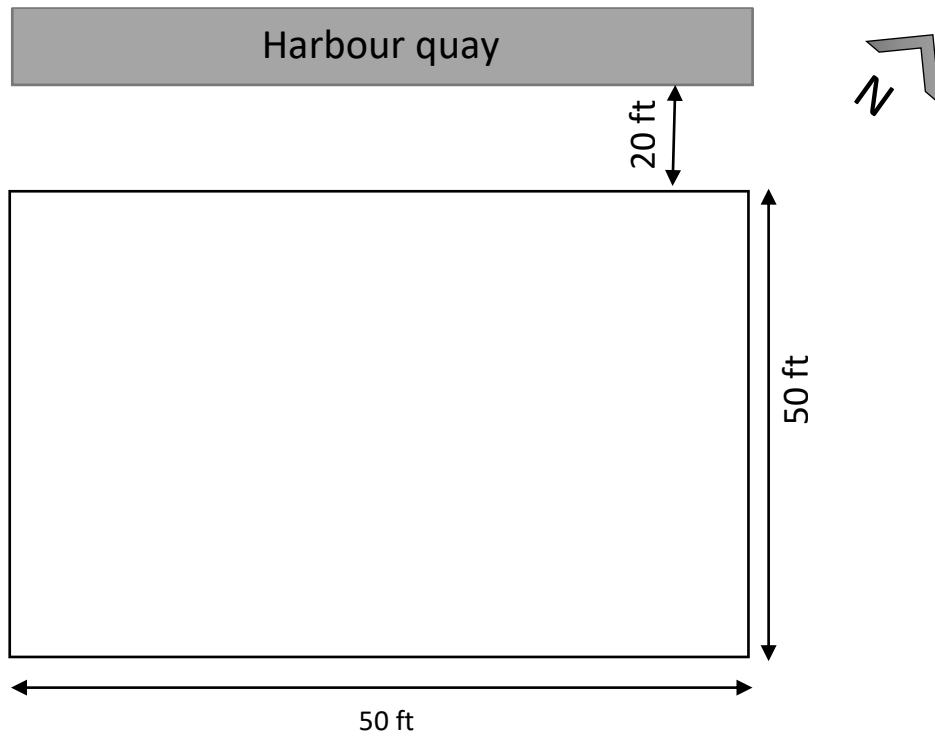
- Near harbour area, 3000 sqft (see attached drawings)
- Ice Plant and Cold Storage (Storage of Ice)
- Machinery room (eg:- generator set) 240 sqft
- Spare Parts Room/Godown: 60 sqft
- Office: 120 sqft
- Toilet: 30 sqft

13. Environment Impact Assessment (EIA)

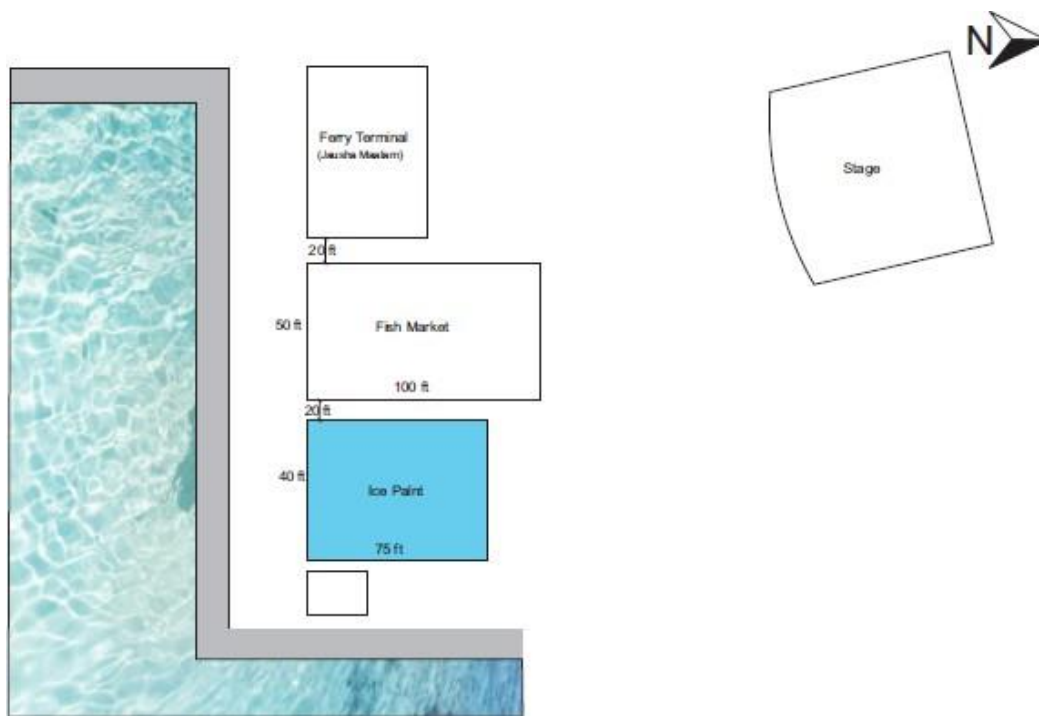
- The Environment Protection and Preservation Law of the Maldives (Law No. 4/93) requires a comprehensive Environmental Impact Assessment (EIA) to be undertaken prior to the commencement of the project.
- EIA costs should be borne by the contractor. It is also responsibility of the contractor to complete the EIA work as per the rules and regulations of Environment Protection Agency (EPA).

Attachment (drawings)

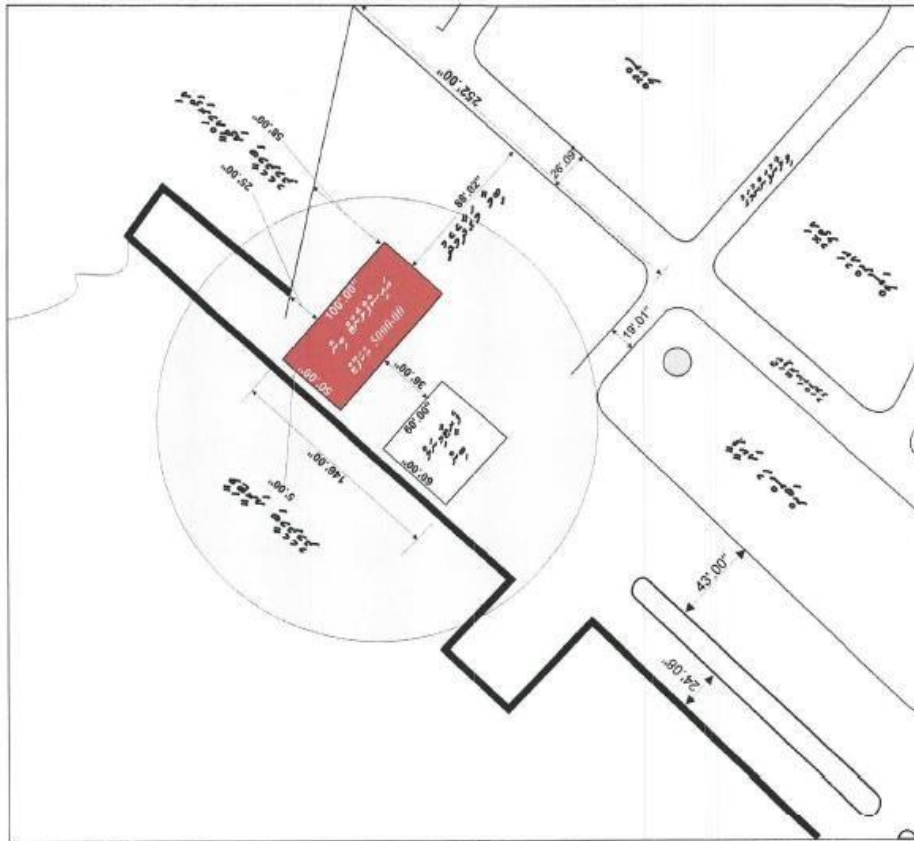
Drawing 1 – Gdh. Rathafandhoo (50 x 50ft)



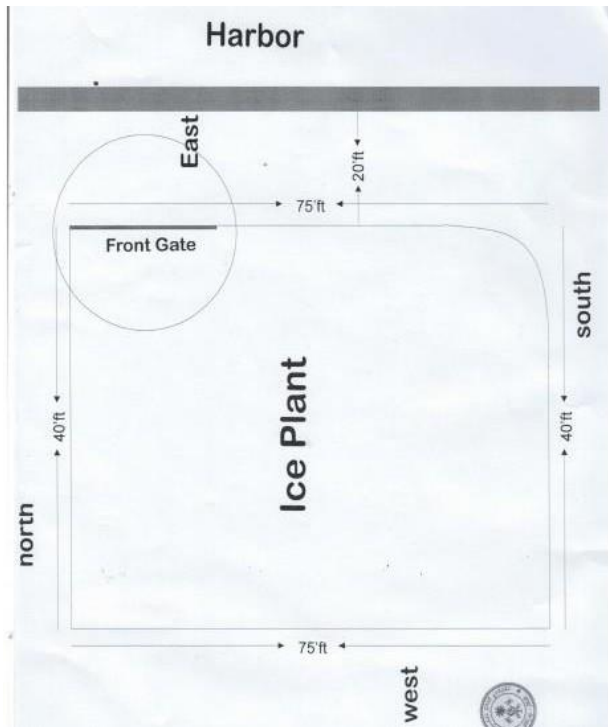
Drawing 2 – Ha. Dhidhdhoo (40ft X 75ft)



Drawing 3 – Aa. Rasdhoo (50ft X 100ft)



Drawing 4 – L. Maamendhoo (40ft X 75ft)



Drawing 5 – Dh. Meedhoo (50ft X 60ft)

