Petroleum Development Oman L.L.C.

Specification for Transportable Accommodation Units

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i Document Authorisation

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ii Revision History

The following is a brief summary of the most recent revisions to this document. Details of all revisions prior to these are held on file by the issuing department.

Version No.	Date	Author	Scope / Remarks
Revision 0	March '87		First Issue as PDO-ERD-92-02
Revision 1	April '94	TTH/4	Completely revised & updated.
Version 1.0	December '04	Ali Nasser Al Jahadhamy, TTO/2 (UEC)	Converted to Specification as per PDO policy and minor changes to the text
Version 2.0	December '09	Ali Nasser Al Jahadhamy, UIB/4 (UEC)	Revised to include check lists and revisions to reference standards
Version 3.0	June '17	Hilal Said Ahmed Al Aghbari UEP1C (UEB)	Completely revised & updated.
Version 4.0	January '21	Hilal Al Aghbari UEV Mohammed Al Rumhi UEV7 Abdulrahman Al Oraimi UEFV12	Revised and updated to Latest International Codes & Standards (see section 1.2)
Version 5.0	Feb. '24	Khalid Al- Mantheri, UEV Hamid Kindi, UEV6	Revised and updated to Latest International Codes & PDO Standards. Minor changes to the text

iii Related Business Processes

Code	Business Process (EPBM 4.0)

iv Related Corporate Management System (CMS) Portal

The related CMS Documents can be retrieved from the Corporate Business Control Documentation Register *CMS*.

TABLE OF CONTENTS

1 Introduction

1.1 Purpose

The purpose of this document is to specify the minimum requirements for design, fabrication, transportation and installation of re-locatable and transportable accommodation units for use in Temporary Camps, e.g., Residential and Industrial Construction and Service Camps, and Mobile Camps, e.g., Rig and Seismic Camps

This specification is intended for use by PDO and its nominated Consultants and Contractors for the development and operation of Company facilities.

1.2 User Guidelines

This Specification supersedes **Version 4.0 "Specification for Transportable Accommodation Units".** Other than the conversion or formatting, the following are the main changes to this document.

- Reference to international standard is provided to ensure alignment with the industry requirements.

The document should be read in conjunction with the Contract Documents for each project.

For all HSE requirements, the User should refer the CP-122 'Code of Practice for Health, Safety and Environmental Protection' and other documents referenced therein.

1.3 Changes to the Specification

Custodian of this document is the Corporate Functional Discipline Head (CFDH) of Civil Engineering. Any User of this document, who encounters an inaccuracy or ambiguity, is requested to notify the CFDH using the SP-user-comment form provided in Appendix-D or using the digital technical query form available at UEV webpage

Reviews and modifications or changes to the specification will normally be made by the CFDH every three years or earlier when justified.

1.4 Applicable Standards, Specifications and Codes

This Specification shall be used in conjunction with the latest revisions of the following Standards Specifications and Codes.

1.4.1 **PDO Standards**

SP-1075	:	HSE Specification- Fire & Explosion Risk Management.
GU-920	:	Electrical Installation Guideline
SP-1103	:	Specification for Electrical Engineering Design
SP-1109	:	Specification for Earthing & Bonding
SP-1110	:	Specification for Electrical Supplies for Mobile Camps.
SP-1232	:	HSE Specification – Public Health

SP-1275	:	Specification and Criteria for design of Civil & Buildings Works
SP-1279	:	Specification for Civil Construction Works
SP-1282	:	Specification for Concrete Production & Construction
SP-1284	:	Specification for Signs and Sign boards –Standard Signs Catalogue
SP-1285	:	Heating, Ventilation and Air-Conditioning (HVAC) Specification
SP-2155	:	Building Services Specification
CP-122	:	Code of Practice for Health, Safety and Environmental Protection
SP-2275	:	Specification for Lifting and Hoisting Equipment Inspection and Testing Requirements
SP-2277	:	Specification for Civil & Structures – Asset Registration, Inspection & Maintenance Works
SP-2320		Telecoms Infrastructure and Facilities Specification Part C – Cabling Systems
SP-2200	:	Standard Meteorological Data Set for PDO Projects

1.4.2 **Omani Standards**

Royal Oman Police	:	Limits of Vehicle Sizes & Weights in the Sultanate of Oman
HDS	:	Oman Highway Design Standards

1.4.3 **International Design & Construction Standards**

BS 5234-1	:	Partitions
BS 5306	:	Fire protection installations and equipment on premises
BS 6767-1	:	Transportable Accommodation Units- Part 1: Recommendations for Design and construction of the basic unit
BS 6767-2	:	Transportable Accommodation Units- Part 2: Recommendations for design and installation of services and fittings with guidance on transportation, siting and aspects relating to habitation
BS 9999, EN 12101	:	Code of practice for fire safety in the design, management and use of buildings
BS EN 1949 2002	:	Code of Practice for Domestic Butane and Propane Gas-Burning Installation in Caravans & Non-Permanent Dwellings.
BS EN 1995-1	:	Design of timber structures

BS EN 1999-1	:	Design of aluminium structures
EN 1993-1	:	Design of steel structures
EN 12207	:	Windows and Doors - Air permeability Classification.
EN 12208	:	Windows and Doors - Water tightness classification
NFPA 58	:	Storage & Handling of Liquefied Petroleum Gases.
NFPA 501A	:	Manufactured Home Installations.
NFPA 1192	:	Recreational Vehicles.
BS 476	:	Fire Tests in Building Materials & Structures.
BS 1945	:	Fire Guards for Heating Appliances.
BS 8417 + A1	:	Preservation of wood - Code of practice

1.5 Compliance with Standards

In the event compliance with the entire specification is considered inappropriate for a particular project, then step out approval shall be obtained from the document owner who is the CFDH for Civil Engineering.

For any deviations from the ”shall” requirements in this specification, variances shall be obtained in accordance with PR-2066 Managing Variances from Technical Standards.

2 Scope

2.1 Units of Measurement

Dimensions in metres and millimetres	:	m, mm.
Temperature in degree Celsius	:	^{o}C
Weight in kilo Newtons	:	KN
Pressure in Pascals	:	Pa
Electrical voltage, phase and frequency	:	V/Ph/Hz
Electrical power in kilowatts	:	KW
Thermal transmittance (U) in	:	W/m^2 ^{o}K (watts per metre squared Kelvin)

2.2 Unit Design & Fabrication

2.2.1 **General**

2.2.1.1 **Classification**

For the purposes of this document, transportable accommodation units are classified as follows.

Relocateable Units	:	Units for use in semi-permanent locations, i.e. Temporary Camps for Service Contractors. Such units should be sized and designed for normal transportation on an occasional basis (without ROP classification as a 'Special Wide Vehicle') and the utilities and services should be installed to meet normal requirements. Units may be individually skid-mounted.
Transportable Units	:	Skid-mounted units (more than one unit may be mounted on a set of skids) for use in short-term locations, such as rig and seismic camps. Such units move on a frequent basis and are often so configured that special transportation (may require escort as a special wide load) arrangements are required. The utility and service installation requirements reflect the difference in use compared with semi-permanently located units.
Mobile Units	:	Units similar to Transportable Units, but permanently mounted on trailers.

2.2.1.2 **Size Limitations**

Generally, for normal transportation, unit sizes are based on those of a standard container and the transportation requirements of the ROP, resulting in the following.

Clear floor to ceiling height	:	2.1 m minimum
Transportation height	:	4.2 m maximum, including vehicle
Length	:	12 m maximum including skid
Width	:	3.6 m maximum

Normally vehicles sized over 4.2 m high x 2.6 m wide, including load, are classified by the ROP as Special Wide Vehicles' and require transportation escort. However, at present, the ROP allow the Company a vehicle width, including load, of 3.6 m without such classification.

2.2.2 **Structure**

2.2.2.1 **General Requirements**

Design and fabrication should be for a minimum useful life of 15 years.

Structural use of materials should be as recommended in the following or equal and approved by the Company.

Aluminium	BS EN 1999-1-3
Timber	BS EN 1995-1-1
Steel	EN 1993-1

Refer to BS EN 1991-1-1 for design loads and follow the recommendation and for wind load refer to SP-2200 “Standard Meteorological Data Set for PDO Projects”.

For structure specification, refer to BS 6767 part 1.

For linking of units, refer to BS 6767 part 2.

2.2.3 **External Construction**

2.2.3.1 **General Requirements**

Iron and steel components shall be protectively coated against rusting in accordance with SP-1246.

Glazing in doors and windows shall be manufactured and installed in accordance with SP-1279.

All stairs and platforms and their ancillaries shall be designed and located to meet the requirements of the following codes:

BS 9991 : Fire safety in the design, management and use of residential buildings – Code of practice

BS 9999 : Fire safety in the design, management and use of buildings – Code of practice

DS EN 16585 : Railway applications

BS 4592 : Industrial type flooring and stair treads

BS 8300 : Design of an accessible and inclusive built environment

2.2.3.2 Thermal Insulation

Refer to BS 6767 part 1 for the requirements of thermal insulation.

2.2.4 Internal Finishes

2.2.4.1 General Requirements

Refer to BS 6767 part 1 for the requirements of internal finishes.

2.2.5 Units Used for Storage

2.2.5.1 General Requirements

Units designed solely forstorage should be air conditioned and thermally insulated as required. Refer to BS6767 part 2

2.2.6 Documentation

2.2.6.1 Drawings

Prior to commencing the Works, the following complete sets of drawings shall be submitted by the supplier to the Contractor for approval.

Manufacturers Shop Drawings

Shop drawings shall include, but not be limited to:

- Layout drawings.
- Structural fabrication details together with the structural basis of design.
- Details of all finishing's, furnishings and equipment.
- Details of all connections, fittings, openings and lifting arrangements.

Working Drawings

Working drawings shall include, but not be limited to :

- Site layout drawings.
- Electrical installation single line diagram.
- Power earthing diagram.
- Services drawings as detailed in Section 2.4 of this document.

2.2.6.2 Manufacturer's Certificate

Certification shall be provided to the Company which shall include:

General

- Name and address of Manufacturer.
- Model, type, serial number and grade.
- Ex-works mass and maximum permissible mass for lifting.
- Internal length, width and height.
- Degree of corrosion protection.
- Suitability for stacking.

Structural

- Maximum distributed floor loads.
- Roof loads.
- Wind loads.
- Allowances for wind uplifts on roof and floor.
- Allowances for horizontal forces induced at lifting points.
- Foundation design calculations and anchoring System.

Fire Resistance

- External wall, internal wall and ceiling spread of flame.
- Roofing fire resistance.

In addition, certification and test reports shall be provided as detailed in Section 2.7 of this document.

2.2.6.3 Marking

Each unit shall be marked externally with:

- Name and address of the Manufacturer.
- Type, serial number and grade.
- Maximum permissible distributed floor load.
- Maximum external sizes.
- Ex-works mass.
- Maximum mass of the unit for lifting.
- Maximum gross mass for moving on skids.
- Position of lifting and anchor points.
- Suitability for stacking.
- Maximum demand (kW), nominal voltage, phases, frequency and Earthing system.

2.3 Fire Protection

2.3.1 **Fire Protection Generally**

The criteria for protection against fire are given below.

Fire Resistance

The minimum material fire resistance shall be for 15 minutes.

Fire Detection & Alarm

Fire detection and alarm provisions and procedures shall be such as to ensure the safe evacuation of all personnel at risk.

Fire Breaks

Separation between units, or linked units, shall be such as to limit the spread of fire.

Fire Fighting

Fire extinguishers, appropriate to the type of fire, shall be generally available within 30 m of any location and immediately available at hazardous locations.

Fuels

Fuels for combustion (i.e., oil, gas) shall be rendered harmless in the event of a fire.

2.3.2 **Separation Between Units**

Table 1 gives the minimum unit separations required as fire breaks, based on the recommendations given in PDO HSE Manual, NFPA 501A, NFPA 1192 , and Section 2.3.6.1 of this document.

Table 1 - Minimum Separation between Units

	Type & Configuration	Minimum Separation
1.	**Normal Construction (15 FR/ 30 FR)**	
	(15/ 30 minutes fire resistance with windows, doors etc)	
	Side to Side	6m
	End to End	6m
	End to Side	6m
2.	**Enhanced Construction (60 FR)**	
	(Both exposed walls and roofs of 60 minutes fire resistance, with no openings on exposed faces)	
	Between rows	6m
	Side to Side	6m
	End to End	6m
	End to Side	6m

3.	Utilities	
	Generator (including fuel tank)	15m
	On line gas bottles	6m
	(unless separated by a heat radiation shield)	
	Off line and empty gas bottles	20m

Walls may be used as fire breaks in lieu of separation provided:

- The wall fire resistance is for a minimum of 60 minutes.
- The wall height is at least equal to that of adjacent units.
- A minimum clearance of 1 m is maintained each side of the wall for access and escape purposes.

Parking shall be remote from units and allow access for fire fighting.

2.3.3 **Means of Escape**

Refer to BS 6767 part 1 and BS 6767 part 2 for means of escape requirements.

2.3.4 **Highly Flammable Materials**

Units used for special purposes such as; storage of highly flammable material or, laboratories shall be subject to specific design and are not covered by this document.

2.3.5 **Fire Detection & Alarm**

2.3.5.1 **General Alarm**

A facility for general alarm, audible in all areas at risk, shall be provided.

In large semi permanent camps, the alarm system should be in the form of bells, automatically initiated by manual call points (break glasses). Such installations shall comply with SP-2155.

In smaller, frequently relocated camps, the general alarm may be in the form of manually operated sirens.

2.3.5.2 **Kitchens**

In cases where the fire alarm system is automatic, heat detection, set at 185^{o}C, shall be provided within kitchen hoods. Activation shall:

- Shut down the kitchen hood exhaust fan (and supply fan, if any).
- Shut off the gas, or electrical, supply to appliances.
- Initiate an audible alarm.

In addition, manual fire alarm call points shall be located at each escape way and initiation shall cause the same activation as heat detection. Alarms shall be clearly audible in every part of the area at risk.

In cases where there is a serving hatch between kitchen and dining areas, the hatch shall include an automatic fire shutter of 15 minutes minimum fire resistance.

Doors between kitchens and other internal areas shall have door closers.

2.3.5.3 Office, Dining & Recreation Units

In cases where the fire alarm system is automatic, manual fire alarm call points shall be located on emergency escape routes, staircase landings and at exits to the open air. Alarms, initiated by manual call points, shall be clearly audible in every part of the area at risk.

2.3.5.4 Accommodation Units

The provision of self contained smoke detector alarms is recommended.

2.3.6 Gas Supply

2.3.6.1 Re-locatable Units

For semi permanent Camps, on line gas bottles shall be located outside and, if closer than 6 m from a unit, shall be separated by a reinforced block work wall to provide a heat radiation shield.

Storage of spare and empty gas bottles shall be separated in a secure, ventilated enclosure located at least 20 m from combustible materials. Requirements are normally satisfied by the provision of a cage of tubular frame, chain-link fencing and roof sheeting with an internal separation.

An emergency, dead weight, shut-off fire valve shall be provided in the main supply line, located outside the unit immediately after the manually operated rotary ball valve, upstream of the main high pressure regulator. The ESD shall be located at the kitchen main exit and shall be coloured yellow to differentiate from fire alarms. The system may be cable or electrically operated. In cases where systems are electrically operated, actuators shall be suitable for Zone 1 hazard and fail safe, i.e. normally energised.

Gas installations shall comply with SP-2155, BS 5482 and NFPA 58.

2.3.6.2 Transportable & Mobile Units

In cases where gas fuel is used, the requirements of Section 2.3.6.1 shall apply.

In addition, gas bottles may be mounted directly on the skids provided:

- Bottles shall be protected from units by a radiation heat shield enclosure, of 1 h fire resistance, that is well ventilated to avoid the accumulation of gas.
- Bottle sizes shall be less than 0.5m³ water capacity.
- No more than 2 bottles per enclosure shall be installed and shall be secured by rack and chains.
- The pressure relief discharge shall be at least 1m horizontally from any unit opening below the level of discharge and not less than 1.5 m from any source of ignition.
- A dry powder fire extinguisher shall be provided at each enclosure location.

2.3.7 **Fire Extinguishers**

The requirements for the types, sizes and locations of fire extinguishers are given in SP-1075 and BS 5306.

To summarise:

- **Accommodation Areas**

  3 No. 9 litre Foam extinguishers, located a minimum of 5 m from the unit, shall be available within a maximum travel distance of 30 m.

- **Offices, Dining & Recreation Areas**

  1 No. 9 litre Foam extinguisher shall be located at each emergency exit, entrances and dead ends. In all cases travel distances shall not exceed 30 m.

- **Main Kitchen Areas**

  1 No. 5 kg CO_2 fire extinguisher and 1 No. fire blanket shall be provided within kitchen areas, together with 1 No. 12 kg dry powder fire extinguisher located outside the main exit.

- **Electrical Switchboards**

  Main distribution switchboards shall have 2 No. fire extinguishers, and sub distribution switchboards shall have 1 No. fire extinguisher, suitably located. Fire extinguishers shall be 5 kg CO_2 in air-conditioned spaces and 12 kg dry powder in non-air-conditioned spaces.

2.3.8 **Fire Fighting Water**

In the case of Temporary Camps, i.e., where units are moved only occasionally, existing firewater mains, if any, should be extended. Where firewater is not available, connection should be made to the domestic water supply if pressure requirements allow.

Criteria for the design of fire fighting water installations, if provided, are given in SP-2155.

2.4 Services

2.4.1 **Services Generally**

Provision for unit services and their connection, should be made during manufacturing. Service installations should include the following.

- Structural framework and foundations shall be avoided.
- Penetrations shall be adequately sleeved and sealed.
- Services, connections and mountings shall be capable of withstanding impact and vibration during transportation and use.
- Unit service connections shall have local isolation at points of entry, labelled accordingly.
- Proper access for maintenance shall be provided.
- Exposed services shall take account of the limitations of transport requirements.
- Services installed by the manufacturer shall be factory tested and certified.

2.4.2 **Electricity**

The rated voltage and frequency shall be:

415V/3Ph/50Hz, 240V/1Ph/50Hz.

Electrical installations shall comply with SP-1103 and SP-1109. However, in certain aspects of the electrical installations for Transportable and Mobile Camps, in particular cables and earthing, deviations are allowed as given in SP-1110.

Attention is drawn to the testing and certification requirements of these documents.

2.4.3 **Heating, Ventilation & Air conditioning**

2.4.3.1 **General Requirements**

For All HVAC requirements, refer to SP-1285.

2.4.4 **Water and Drainage**

Potable, hot &cold water and drainage installations shall comply with SP-2155.

2.4.5 **Telecom Installations**

Telecom installations shall comply with SP-2320 part C. Safety Signs & First Aid Boxes

2.4.6 **Safety Signs**

Signs, labels, nameplates, instruction and warning plates necessary for identification and safe operation shall be provided.

Details of specific sign requirements are given in the relevant discipline specifications.

Signs and signboards, and their procurement, shall comply with the requirements of SP-1284.

2.4.7 **First Aid Boxes**

A minimum of 1 No. First Aid Box, with contents as listed in the Medical Conditions of Contract shall be provided and, preferably, located in the Dining/Recreation area.

2.5 Transportation

2.5.1 **Transport Vehicle Size & Weight**

Vehicle size limitations are given in Section 2.2.1.2 of this document.

The following are the maximum axle loads allowed by the ROP Regulations for roads and shall not be exceeded without Company approval.

Single Axle Load	13 tonnes.
Tandem Axle Loads (total of both axles)	given in Table 2.

Table 2 - Maximum Tandem Axle Loads

Spacing Between Twin Axles (m)	Maximum Allowable Total Load on Twin Axles (Tonnes)
0.90, 1.00, 1.10, 1.20, 1.30	16.0, 17.0, 18.9, 20.3
1.35 - 2.50 & Greater than 2.50	21.0 Considered as single axles

2.5.2 **Transport & Handling**

The form of transport shall be appropriate to the type, size, mass and safe handling of the unit and shall comply with the ROP Regulations. Units shall be securely fixed to transportation vehicles by anchor ties.

Lifting equipment shall be in accordance with SP-2275. Units shall be lifted and positioned in strict accordance with the Manufacturer's instructions, with spreader beams used as required. Exposed services shall be protected against damage.

The route to be taken shall be agreed with the Company. Prior to transportation, the route shall be surveyed for possible obstructions, e.g. overhead or underground services, and vehicle manoeuvrability. Total loads on service crossings shall be established and protective measures taken as required.

2.6 Siting

2.6.1 **Weather Exposure**

For weather considerations, refer to BS-6767 part 2.

2.6.2 **Environmental Impact**

Temporary Camps shall comply with the regulations of the Environmental Authority. The Company Environmental Advisor (MSE2) is the focal point for liaison with the Ministry.

Temporary Camps that move only occasionally may require an Environmental Impact Statement, Camps that move frequently may not. In any case, the Company Environmental Advisor should be consulted.

2.6.3 **Foundations & Anchoring**

For foundations and anchoring requirements, refer to BS 6767 part 2.

2.7 Testing, Inspection, Operation & Maintenance

2.7.1 **Spares, As-Builts & Manuals**

2.7.1.1 **Maintenance Tools**

Any special maintenance tools including but not limited to keys shall be supplied prior to the issue of the Substantial Completion Certificate.

2.7.1.2 **As Built Drawings**

Where as indicated in contract document As Built Drawings to be submitted to the company' such drawings shall comply with SP 2099 'Engineering 2D Design & Drafting Specification' and SP-2065 'Document Management in Engineering and Operations'

2.7.1.3 **Operation & Maintenance Manuals**

Operation & Maintenance Manuals shall be prepared, coordinated and submitted to the Company for approval prior to the issue of the Substantial Completion Certificate.

Operation & Maintenance Manuals shall include, but not be limited to:

- An index.
- A full description of the Works.
- Illustrations describing operational routeing together with line diagrams showing the location and function of controls and valves.
- Maintenance routines and details of spare parts.
- Manufacturers details of all equipment with maintenance and operating instructions.
- Emergency measures and telephone numbers of Vendors, Installers, Manufacturer, etc.
- Safety Procedures necessary for the proper operation and maintenance of the installation and equipment.
- As Built Drawings.
- Commissioning and Testing Records and Reports.

Operation & Maintenance Manuals shall comprise 3 securely bound copies of each.

2.7.2 **Commissioning & Testing**

2.7.2.1 **Certification**

The following certification shall be submitted to the Company for approval prior to the issue of the Substantial Completion Certificate.

Civil & Structural

As given in Section 2.2.6.2 of this document.

Electrical

As given in Section 2.4.2 of this document.

2.7.2.2 Testing

The following Test Reports shall be submitted the Company for approval prior to the issue of the Substantial Completion Certificate.

Electrical: As given in Section 2.4.2 of this document.

Air conditioning: As given in SP-1285

Water & Drainage: As given in SP-2155.

Fire Protection: As given in SP-2155.

2.7.3 Inspection & Maintenance

Pre-startup inspection shall be carried out in accordance with SP-1232.

Regular inspection and maintenance shall be carried out in accordance with manufacturer's recommendations as follows.

- at least twice a year for units that are frequently relocated.
- at least once a year for units that are not frequently relocated.
- both before and after installation or relocation of a unit.

Maintenance inspections shall include, but not be limited to:

- external cladding..
- external finishes.
- structure and substructure for corrosion and termite attack.
- skids for corrosion and damage.
- services and equipment, for which defects shall be rectified immediately.
- floors, for which damage shall be replaced and/or repaired immediately.
- a repeat of the electrical tests given in Section 2.7.2.2 of this document.
- a repeat of the fire protection tests given in Section 2.7.2.2 of this document.

Units shall be regularly cleaned both inside and out.

3 Appendices

Appendix A: Definitions

Appendix B: Checklist for HAZID

Appendix C: Checklist for Pre-start up Audit

Appendix D: SP-User-Comment Form

Appendix A : Definitions

A.1 General

For the purposes of this document, the following definitions shall apply.

Shall	:	The word 'shall' indicates a requirement.
Should	:	The word 'should' indicates a recommendation.
the Company	:	Petroleum Development Oman LLC.
the Contractor	:	The party with which the Company has entered into a Contract.
Manufacturer/Supplier	:	A Company supplying goods, materials or product related services to be used during the fabrication of a facility.
Works	:	All work to be executed and all services to be rendered by a Contractor under the terms of a Contract.

A.2 Abbreviations

ESD	:	Emergency Shutdown Device
FR	:	Fire Resistance
PDO	:	Petroleum Development Oman
ROP	:	Royal Oman Police
UDL	:	Uniformly Distributed Load
UV	:	Ultra Violet

Appendix B : Check List for HAZID

Exposure		Risk Level Ref Group RAM	Comment
1	HSE: Heat radiation		Has heat radiation been considered, e.g. too close proximity of units?
2	HSE: Escape routes		Are escape routes designed in line with the standards?
3	Extreme Wind		Including Sandstorms
4	Extreme Rain/Flooding – Run-off		Is the location in or near an area at risk of flooding and/or extreme current, e.g. a wadi?
5	Lightning		Assess risk of lightning against risks of lightning pole erection activities.
6	Slope/Soil Stability of camp area		Also: Land slides, Subsidence, Rock falls, due to extreme rainfall water run-off
7	Security		
8	Stacked units		Integrity of stacked units to be addressed
9	Loose items in camp		Risk of round flying items during storm (particularly in case of tents)
10	Roads to camp		Civil design of the roads to be discussed (type of road and duty)
11	Fire		Proximity of kitchen and cooking gas cylinders
12	Anchoring of units to foundations		
13	Seismic/earthquake		
14			

Appendix C : Check List for Pre-start up Audit

Issue	Question	Action
HSE aspects	Have all HSE aspects been considered: fire, explosion and dangerous gases, proximity of major construction operations and lifts?	Confirm HSE aspects have been addressed in the overall HSE management of the camp.
Camp Proximity to Wells	Is the camp location close to wells and thus risk of fire radiation and explosions?	A typical safe distance to a drilling site is 300 m, with the camp upwind of the drilling site.
Heat radiation	Is there a risk of fire and heat radiation close to the camp?	Confirm HSE aspects have been addressed in the overall HSE management of the camp.
Dangerous gases	Are there potential sources of dangerous gases in the vicinity of the camp (e.g. a H_2S well, H_2S processing facility, cooking gas)?	Confirm HSE aspects have been addressed in the overall HSE management of the camp.
Escape routes	Are escape routes out of the camp identified?	Confirm HSE aspects have been addressed in the overall HSE management of the camp.
Location camp	Has all information regarding environmental data and site conditions been gathered?	Confirm environmental aspects have been addressed. Consult a meteorological specialist.

Issue	Question	Action
Potentially hazardous natural phenomena (environmental conditions)		**It is advised to consult the local meteorological office or a meteorological engineer to evaluate the risk these phenomena pose for the camp.**
Wind	Has the extreme wind velocity and direction been established and considered in the design of the camp and specifically the stability of the accommodation units and containers?	Establish 100-year return period environmental design criteria (ref. Section 3) and evaluate the stability of accommodation units and containers (ref. Section 4).
Rain	Has the extreme rainfall been established and considered in the design of the camp?	Determine effects of rainfall.
Flooding	Is the camp location prone to (frequent) flooding?	If prone to flooding, consider moving the camp or raising the camp level above the design flooding level.
Lightning	Is the location prone to frequent thunderstorms?	If prone to lightning, consider risks and placing lightning conductors. Address risks of erecting lightning poles.
Slope stability, land slides	Is the camp terrain sloping and, if so, is slope stability a concern?	Maximum slope in camp depends on soil. Terrain slope shall not exceed 1 in 10.
Camp Layout and orientation	What camp layout is being considered?	Evaluate the layout and orientation for prevailing and extreme wind directions.
Bund wall around camp	Is a bund wall around the camp planned, e.g. for logistics and access control or in the desert protection against sand ingress?	Evaluate the need for a bund wall.

Issue	Question	Action
Roads	What traffic is planned to and from the camp, have the roads been designed for the traffic intensity? What is the heaviest vehicle to use the roads regularly?	Design roads for the expected traffic intensity. Oman Highway Design Manual may be used as guidance. Choose between off plot heavy duty, off plot light duty, patrol or maintenance track.
Accommodation units	Does the contractor have certificates for the accommodation units?	Obtain certificates for the accommodation units from the contractor.
Sea-containers	Does the contractor have certificates for the sea container units?	Obtain certificates for the containers from the contractor.
Furniture	Has the furniture and beds been fastened in the accommodation unit?	Consider fastening of the furniture.
Tools	Are tools planned to be placed in the accommodation units?	Do not place tools in the accommodation units.
Water storage	Is water storage planned at the camp?	Plan any water storage preferably at ground level, thus avoiding a water tower.

Appendix D : SP-User - Comment Form

	SP-1277 – Specification for Transportable Accommodation Units		
	Any user who identifies an inaccuracy, error or ambiguity is requested to notify the custodian so that appropriate action can be taken. The user is requested to return this page fully completed, indicating precisely the amendment(s) recommended. Elsewise, end user can provide feedback to this SP electronically via SPs feedback form at UEV webpage under informative links.		
Name:			
Ref ID		**Date:**	
Page Ref:	**Brief Description of Change Required and Reasons**		