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Living quarters area

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Foreword

NORSOK C-001:2022 was adopted as NORSOK Standard 2022-03-21.

NORSOK C-001:2022 supersedes NORSOK C-001 Rev. 4, March 2015.

NORSOK is an acronym for the competitive position of the Norwegian continental shelf and comprise petroleum industry standards in Norway. The collaboration initiative in 1993 between the authorities and the petroleum industry initiated the development of NORSOK standards.

Reducing the project execution time and developing and operating cost for petroleum installations on the Norwegian shelf was the target.

The intention for the Petroleum industry is to develop and use standards providing good technical and cost effective solutions to ensure that the petroleum resources are exploited and managed in the best possible way by the industry and the authorities. The industry will actively contribute to the development and use of international standards in the global market.

The NORSOK standards shall:

- bridge the gap based on experiences from the Norwegian continental shelf where the international standards are unsatisfactorily;
- replace oil company specifications where possible;
- be available as references for the authorities' regulations;
- be cost effective; and
- promote the Norwegian sector as an attractive area for investments and activities.

Developing new NORSOK standards and regular maintenance of existing standards shall contribute to maintain the competitiveness both nationally and internationally for the Norwegian petroleum industry.

The NORSOK standards are developed by experts from the Norwegian petroleum industry and approved according to the consensus principles as laid down by the guidelines given in NORSOK A-001 directive.

The NORSOK standards are owned by the Norwegian Oil and Gas Association, the Federation of Norwegian Industries and the Norwegian Shipowners' Association. They are managed and published by Standards Norway.

This NORSOK standard has been written and revised by the NORSOK committee EG C.

Annex A, B and C are normative.

Main changes from fourth edition to fifth edition are in summary:

- general reformatting;
- inclusion of hygienic measures;
- inclusion of operational experience feedback from recent offshore projects;
- revised section related to scope;
- revised section related to cabin area;

- revised sections related to administration area and control centers;
- “operations room” deleted;
- revised section related to helicopter hangar;
- revised section related to technical shafts;
- deleted requirement for central vacuum cleaning system;
- deleted requirement for solarium and sauna;
- deleted requirement for internet café;
- new [Annex B.2](#): periodically manned LQ;
- new [Annex B.3](#): shelter and temporary refuge area;
- new [Annex C](#): ergonomic requirements for furniture and work stations.

Introduction

This NORSOK standard is based on practical experiences accumulated from the offshore petroleum industry, and sets the framework for the architectural design and development of the living quarters area on offshore installations.

The bibliography lists standards, norms, laws, regulations and other literature that may be relevant to the use of this document.

Normative text contains the requirements of the standard. Informative text is only guidance to the reader. All text in foreword, introduction and notes is informative text. Note to entries in clause 3 and annexes to the document may be either normative or informative.

Living quarters area

1 Scope

This NORSOK standard defines the requirements for the architectural design, engineering and development of the LQ area (as defined in [6](#)) on offshore installations in the petroleum industry.

This NORSOK standard is primarily applicable to fixed installations.

The standard can also be used for mobile installations for which, however, other requirements may be applicable.

2 Normative references

The following referenced documents contain text which fully or in part is part of the requirements in the document. For dated references, only the edition cited applies. For undated references, the latest edition of the cited document applies (including amendments).

[NORSOK C-002](#), *Architectural components and equipment*

[NORSOK C-004](#), *Helicopter deck on offshore installations*

[NORSOK E-001](#), *Electrical systems*

[NORSOK H-003](#), *Heating, ventilation and air conditioning (HVAC) and sanitary systems*

[NORSOK I-002](#), *Industrial automation and control systems*

[NORSOK N-004](#), *Design of steel structures*

[NORSOK R-002](#), *Lifting equipment*

[NORSOK S-001](#), *Technical safety*

[NORSOK S-002](#), *Working environment*

[NORSOK T-101](#), *Telecom systems*

[NS-INSTA 800-1](#), *Cleaning quality - Part 1: System for establishing and assessing cleaning quality*

[NS-EN ISO 11064 \(all parts\)](#), *Ergonomic design of control centres*

[NS-EN ISO 16283-1](#), *Acoustics – Field measurement of sound insulation in buildings and of building elements – Part 1: Airborne sound insulation*

[DNV-ST-E406](#), *Design of free fall lifeboats*

3 Terms and definitions

In this document, the following terms and definitions apply.

3.1**shall (requirement)**

expression in the content of a document conveying objectively verifiable criteria to be fulfilled and from which no deviation is permitted if compliance with the document is to be claimed

Note 1 to entry: Requirements are expressed using the verbal forms specified in ISO/IEC Directives, Part 2 clause 7.2 Table 3.

3.2**should (recommendations)**

expression the content of a document conveying a suggested possible choice or course of action deemed to be particularly suitable without necessarily mentioning or excluding others

Note 1 to entry: Recommendations are expressed using the verbal forms specified in ISO/IEC Directives, Part 2 clause 7.3 Table 4.

Note 2 to entry: In the negative form, a recommendation is the expression that a suggested possible choice or course of action is not preferred but it is not prohibited. (permission)

3.3**may (permission)**

expression in the content of a document conveying consent or liberty (or opportunity) to do something

Note 1 to entry: Permissions are expressed using the verbal forms specified in ISO/IEC Directives Part 2 clause 7.4 Table 5.

3.4**can (possibility and capability)**

1. expression in the content of a document conveying expected or conceivable material, physical or causal outcome

2. expression in the content of a document conveying the ability, fitness, or quality necessary to do or achieve a specified thing

Note 1 to entry: Possibility and capability is expressed using the verbal forms specified in in ISO/IEC Directives, Part 2 clause 7.5 Table 6.

3.5**“clean” area**

area inside LQ with high level of cleanness, where use of protective clothing is normally not permitted

Note 1 to entry: Areas requiring shoe covers to be worn shall be defined together with operator/company.

EXAMPLE Protective clothing includes hard hats, coveralls and work shoes.

3.6**“dirty” area**

area where use of protective clothing is permitted

EXAMPLE Protective clothing includes hard hats, coveralls and work shoes.

3.7**early stage of engineering**

activities prior to LQ contract award

3.8**LQ manning capacity**

total number of persons the LQ is dimensioned for, based on the total number of beds

3.9

personnel on board

POB

total number of persons on board at any time, including any day visitors

Note 1 to entry: The POB shall not exceed the number of lifeboat seats available.

4 Abbreviations

For this document, the following abbreviations apply.

CAP	critical alarm panel
CCR	central control room
CER	central equipment room
CDB	clean and dry building
DIFFS	deck integrated firefighting system
EIT	electrical, instrumentation and telecommunication
ERR	emergency response room
FEBS	field emergency center (feltberedskapssenter)
FEED	front end engineering development
HF	human factors
HTCC	helicopter traffic control center
HVAC	heating, ventilation and air conditioning
HLO	helicopter deck landing officer
HSE	health, safety and environment
LAN	local area network
LED	light emitting diode
LSD	large screen display
LQ	living quarters
MCT	multi cable transit
MOB	man over-board
OPS	operation support
PA	public address
PSA	Petroleum Safety Authority Norway (Petroleumstilsynet)
RAF	raised access floor
RH	relative humidity
SAR	search and rescue
SAS	safety automation system
STIPA	speech transmission index for public address systems
SWL	safe working load
TER	telecom equipment room
TTR	telecommunication transmitter room
TV	television
UHF	ultra high frequency
UPS	uninterrupted power supply
VDU	visual display unit
VHF	very high frequency

5 General requirements

This NORSOK standard shall be read in conjunction with [NORSOK C-002](#), where more detailed information is specified with respect to materials, finishes, furniture, and equipment.

Functional quality level defined in this standard shall also apply to manned non-LQ areas, unless defined otherwise by operator/company. Ease of cleaning and housekeeping shall be to LQ standard.

Periodically manned LQ or shelter areas shall also be arranged to a LQ standard of functionality as described in [Annex B](#).

Engineering design approach shall ensure timely incorporation of relevant operational experience at an early stage, to avoid later re-work and costly modifications, resulting from engineering of insufficient maturity.

Constructability experience shall be incorporated at an early stage of engineering.

Other discipline requirements related to the LQ are covered in the respective NORSOK standards and shall be integrated with the architectural design development to achieve a co-ordinated and optimal solution for the LQ area. The architectural discipline is the leading discipline responsible for the LQ layout development.

Incorporation of operational experience shall be ensured to avoid cost-driving late modifications and disruptions. This shall be established at start of project engineering and be a planned process until model design freeze.

The purpose of user involvement is to ensure room and area functionality. Operator/ company should ensure availability and continuity of relevant personnel for user involvement. Contractor and engineering responsible party shall ensure adequate maturity of relevant room layout proposals, to provide adequate information to user representatives.

NOTE See relevant parts of PSA Framework regulations [\[1\]](#).

6 Living quarters area

Any of the following functions shall be designed and built as LQ area and is covered by the NORSOK C-standards:

- LQ complete with cabins, kitchen, provision stores, dining room, lounges, coffee bars, exercise rooms, laundry, administration area, changing rooms, medical center, sky lobby, technical rooms, lay-down deck(s), etc., with all support functions as described in this standard;
- helicopter deck;
- helicopter hangar;
- mustering area with life boats and safety equipment;
- MOB-boat with associated equipment;
- central control room (CCR);
- central equipment room (CER);
- telecom equipment room (TER);
- workshop areas (inclusive specialized workshops and laboratories);
- local control rooms and driller's cabin;
- local equipment rooms;
- offices areas outside LQ;
- workers' coffee bars;
- any other fully outfitted indoor area.

Room finishes schedule [CDS-102](#) shall be used to identify finishes standard at an early stage (i.e. FEED), including for internal non-LQ areas, this is found in [Annex A](#).

Concealed EIT and plumbing services shall be arranged, in areas requiring frequent cleaning and housekeeping.

7 Living quarters area room programme

The LQ area room programme is a project specific document listing all rooms/areas within the defined LQ area with associated area calculations and other key data.

The LQ area room programme shall be developed for the LQ area early in the concept phase, based on relevant field- and operational information. It shall be continuously updated throughout all project phases, inclusive final as built stage. The following information shall be available prior to the development of the LQ room programme:

- type of installation;
- personnel capacity;
- manning philosophy for all main operational phases;
- catering philosophy;
- CCR philosophy (if applicable);
- environmental data on location;
- design life;
- helicopter type(s) and operational philosophy;
- main evacuation philosophy;
- lifeboat capacity and number;
- workshop area requirements (if applicable);
- waste handling philosophy;
- housekeeping (cleaning) philosophy.

The room programme schedule in [Annex A](#) shall be used, where all relevant room information shall be included. Gross room areas in square meters including ceiling heights should be entered prior to detail design, for material quantity calculations and input to HVAC discipline ventilation calculations.

8 Arrangement of main facilities in the living quarters

8.1 General requirements

8.1.1 General

The LQ shall offer personnel protection and shelter, and shall be located in the safest place on the installation. It shall be protected from hazardous areas by external walls and roofs, which are fire and blast resistant in accordance with results of risk and emergency preparedness analyses.

There shall be at least two exits to escape routes leading in different directions from each level in the LQ with at least one internal stairway linking all levels.

All rooms exceeding 20 m² shall have a minimum of two escape ways mutually located at opposite sides of the room. Doors to this room category shall open outwards from the room. Technical rooms may have escape hatches, but only if doors are considered unsuitable.

The LQ area shall be arranged with a clear and logical segregation between “clean” and “dirty” areas. Access to “clean” area shall not be through “dirty” area. Doors, windows and other penetrations should be limited on the side of the LQ exposed to production and drilling areas.

Steam piping, exhaust pipes or similar shall not be routed through personnel accommodation or in the corridors leading to such rooms, except where these are enclosed in appropriate fully welded casings. Steam piping, water pipes, tanks or similar shall be insulated against heat or cold in accordance with recognized standards.

Areas with “stressed skin” construction shall be given special attention at an early stage of engineering with respect to limiting cut outs in high stressed areas for doors, windows and penetrations.

Standardisation of architectural materials, components and equipment shall be accomplished as far as possible throughout the LQ and the installation as a whole in close cooperation with operator/company and any other involved parties. Details shall be clarified with operator/company.

Floating installations where movement must be expected shall have ships type detailing with storm edges etc, unless agreed otherwise with operator/company.

8.1.2 Manning

The LQ shall be dimensioned, designed and equipped to accommodate and cater for the maximum number of personnel required at any time during the field’s various operational phases, defined as the LQ’s manning capacity. This includes start-up, drilling, production, as well as periods of planned production shutdown for modifications and maintenance, etc.

The field’s operator shall give the subject due attention by performing comprehensive manning analyses for the field as a whole, inclusive considerations for fields requiring more than one installation. The required manning level shall be verified prior to commencement of the conceptual phase.

NOTE The difference between the terms LQ manning capacity and POB are defined in [3.8](#) and [3.9](#).

The LQ shall be furnished and equipped for persons of all genders, with separate rooms as needed.

8.1.3 Hygienic measures

The following shall be allowed for within arrangement of LQ internal areas:

- Landscape arrangement of offices shall be acceptable if agreed with operator/company. Adequate spacing and physical barriers to be provided.
- Physical contamination points of contact shall be kept to a minimum, i.e. frequently used doors and all common handwash basins shall be automatic.
- Contact surfaces like handrails and door handles shall be of a finish that allow frequent disinfection.
- Increased use of detergent or antiseptic resistant surface materials, see [8.1.7](#).

8.1.4 Noise considerations

The internal areas shall provide possibilities for work, recreation, relaxation, sleep and privacy. Areas requiring quietness shall be particularly protected from noise and vibrations.

Special attention shall be given to the location of the helicopter deck relative to the LQ cabin areas with regard to potential noise from helicopters during take-off, landing and hovering.

Noisy and vibrating equipment and machinery shall not be located in close proximity to the LQ cabins and administration areas.

The noise reduction properties and requirements of the whole LQ construction, including window and door assemblies, shall be evaluated during the engineering phase.

The maximum sound level inside the accommodation areas shall follow [NORSOK S-002](#).

The noise reduction rating of window and door assemblies shall be tested and documented. The documentation shall be submitted to the operator/company for acceptance prior to placement of order.

8.1.5 Windows

The LQ shall provide natural light through windows in cabins, public and working areas. As a minimum, windows shall be provided in dining rooms, main recreation room(s), work places that will be in use for more than 6 hours per working day, and the majority of cabins. Windows in cabins shall have a minimum glazed area of 0,5 m². Windows in offices and other work places shall have a minimum glazed area of 0,9 m², where possible. Large windows should be provided in the lounge areas (type "floor to ceiling"). Inner frame of windows shall have detailing that reduces the effort and need for cleaning and housekeeping.

Windows in manned LQ areas shall be "self-cleaning" type (nano-treatment or similar).

Requirements for windows are further covered in [NORSOK C-002](#).

8.1.6 Doors

All doors shall be dimensioned and equipped for the intended use, inclusive material handling.

Doors should normally open in the escape direction without blocking corridors and other escape routes.

Doors exposed to weather and strong winds shall be robust sliding doors. Hinged doors may be used externally, but only when recessed or shielded from weather exposure.

Floating and FPSO type installations, which have an identified accidental heel scenario, shall at an early stage of engineering clarify need for door automatic opening assistance in tilt situations, to keep complexity of door arrangements to a minimum. This shall be clarified with technical safety personnel.

Doors to common areas in frequent use shall have knee or elbow activated opening devices, alternatively sensor activation where very high frequency of use is expected. A preliminary door schedule shall be developed as part of the conceptual design phase. It shall be continuously updated throughout the various project phases, until all required information is specified prior to procurement of doors.

Heat tracing of doors should be considered at locations with sub-zero conditions and frequent snow and ice in close cooperation with operator/company.

Requirements for doors are further covered in [NORSOK C-002](#).

8.1.7 Selection of materials and arrangement

Selection of layout arrangements, materials, components and detailing shall be based on noise and recognised principles, providing robust solutions and effective cleaning and maintenance. Selection of material surfaces shall where relevant allow frequent disinfection without degrading.

8.1.8 Wet room floor finish

The wet room floor finish shall be of a non-slip easy to clean type, e.g. tiles or grout on screed, all with a proven offshore wet room track record. Alternative may be a composite floor system with a long term proven track record from offshore wet rooms.

8.2 Cabin area

8.2.1 Cabins

The minimum area for a single cabin, inclusive bathroom, should be 7,5 m², but shall not be less than 7,0 m². Single cabins with bathroom shall be designed and equipped for single occupancy and use.

NOTE Exempted is use/arrangement for special situations as specified in the PSA Activities regulations section 19 [\[1\]](#).

The minimum area for a double cabin, inclusive bathroom, shall be 12 m².

Double cabins with bathroom shall be designed and equipped for a maximum of two persons, but not for simultaneous co-sleeping.

The above areas shall be measured from the center line of the dividing partition between the cabins, and the internal face of the other perimeter partitions/linings. The areas shall include the bathroom and cabin service shaft. Where two cabins share a service shaft, half of the service shaft area shall be included in each of the cabin areas. Where two cabins share a common entry lobby, half of the entry lobby area shall be included in each of the cabin areas.

Each cabin shall be arranged to provide an environment for undisturbed sleep, restitution and rest, with opportunities for reading, writing, use of laptop PC and TV watching. The cabins shall be furnished with a hanging storage arrangement for survival suit(s) in an open niche, a wardrobe for each person, two drawers under each bed, bed lamp, and a small seating arrangement. One of the private drawers (or wardrobe) shall be lockable. The size and form of the cabin desk shall not impede bed linen change.

In double cabins, one of the beds may be of a sofa-bed type, provided it is to be used during shorter peak manning intervals only. In this case special attention shall be given to comfort, bed linen change and mechanical function. Each bed shall be placed on the floor to allow for safe use and bed linen change. The beds shall be labelled "A" and "B", inclusive personal wardrobes and items for personal use. Turnable beds may be accepted in agreement with operator/company but area shall be increased to allow minimum double storage capacity including space for survival suits.

The cabin layout and the furniture arrangement shall be of an ergonomic design, simplifying fabrication, use, cleaning and maintenance. Dust-collecting edges and surfaces should be avoided. Voids below beds shall be closed.

A minimum of 750 mm free space should be provided in front of beds, with the exception of any bed side table or cabin desk. The mattress dimensions shall be minimum 800 mm x 2100 mm. The top of the mattress should be 600 mm to 650 mm above the floor. A small clearance shall be provided between the mattress and the bed side panels to allow for easy hand/finger access. Changing of bed linen and turning of mattress shall not be obstructed by objects such as TV, bed light, bed rest, etc. The bed front panel and any exposed side panels shall have a 30 mm diameter rounded hardwood top profile to avoid discomfort from sitting on the edge of the bed. Bedfront base shall minimum be recessed 100 mm to ease change of bed linen.

Each cabin type shall be standardised. Prefabricated cabins with bathrooms are strongly recommended since industrial mass production will allow for better accuracy, control and compliance with strict noise reduction requirements. The principle also allows for fast cabin installation and system "plug-in" in a clean and tidy setting. The cabin design (room layout) and installation arrangement shall be settled early in the design development, (FEED phase), in order to avoid problems with installation method and tolerances in the detail engineering and installation phase.

Care shall be taken to avoid impact noise transmission through walls between cabins. Similarly, care shall be taken in the design, dimensioning and construction of the external bulkheads to prevent excessive noise beyond the maximum allowable noise level limits in cabins and other areas, caused by helicopter operations or other external noise sources.

Direct access from corridor to cabin should be through one door only. The cabin doors shall be non-lockable in the operational phase for safety reasons. The lock shall be covered by a “blind” escutcheon plate or blind cylinder.

The cabins should be grouped together on dedicated floor levels or in separate corridors (private domain) away from traffic areas and noisy activities (communal domain). Each cabin domain should be organised in such a manner that it can be locked up whenever required.

All cabins shall have unobstructed access to a corridor leading to a minimum of two independent emergency exits.

8.2.2 Bathroom unit

All bathroom units shall be standardised and prefabricated.

The size of the bathroom and the shower area shall comply with recognised standards. The shower area shall be minimum 0,65 m², and clearly separated from the rest of the bathroom area by means of hinged, glazed shower panels, curtains, or similar, with detailing and surfaces that allows easy cleaning and elimination of dirt traps. The minimum width through the center of the shower area shall be 700 mm.

Sufficient space shall be provided in front of the toilet and washbasin.

The washbasin shall be arranged as large as possible, minimum width 350 mm. It shall be possible to bend the head over the washbasin without knocking the head against wall mounted accessories or equipment. A mirror shall be installed above the wash basin and may be combined with a wall mounted cupboard.

Electrical socket(s) shall be of an earth-leakage circuit-breaker type.

Bathroom piping shall be concealed inside the bathroom unit to provide easy access for repair/maintenance and leakage detection. All piping shall be directed to the cabin service shaft. The bathroom floor tray, floor drain(s) and drain piping shall be fabricated as one joint-less unit for direct connection to the vertical soil pipe in the service shaft. For new buildings, the bathroom unit with walls and floors shall be of a completely seamless construction. Where mastic is used as a primary moisture barrier at walls or floor, life expectancy of this mastic shall be documented. Concealed piping in walls or voids between bathroom units are not acceptable.

Selection of material for piping/plumbing in bathroom unit should minimize galvanic corrosion issues, i.e. by use of cross-linked polyethylene (PEX) or similar materials.

A folding bathroom door (type airline door, or similar) may be considered to minimize the door radius. Bathroom door threshold detailing shall be inclined inwards to eliminate water from shower into cabin.

Bathrooms for double cabins shall be labelled “A” and “B” for storage/hanging of personal items.

Further requirements for prefabricated bathroom units are given in [NORSOK C-002](#).

8.2.3 Cabin technical installations

All technical installations, switches, sockets etc. shall be neatly designed and installed as functionally appropriate. Technical penetrations in adjoining cabin walls should be kept to a minimum to avoid weakening the noise insulation properties of the walls.

Inspection hatches in cabin ceilings should be minimized by locating required inspection points within reach from the corridor or cabin lobby ceiling, when possible. Cable penetrations and MCTs should be avoided above cabins.

Each cabin should be equipped with sockets for telephone, computer and hotel type flat screen TV with integrated radio, entertainment equipment, alarm clock, etc. A solid, flexible support bracket shall be provided for the TV. If the cabin does not have a wireless system a telecom connection point shall be

integrated in a panel adjacent to the cabin table. Safe simultaneous charging of a laptop and mobile phone shall be arranged to reduce fire risk.

LED lighting is recommended wherever appropriate. Main light in ceiling shall be connected to a dimmer that allows for required illumination during cabin cleaning. The cabin bed lamp/desk lamp shall have a low surface temperature, which cannot ignite or burn textiles. Arrangement for cabin emergency lighting / battery backup shall be provided.

An accessible PA loud speaker shall be recessed above the wardrobe cabinet, (as an integrated part), or be integrated in the ceiling.

A low surface temperature type thermostat controlled heater shall be installed in each cabin, unless specified otherwise by operator/company.

Heating cables in the bathroom floor shall be replaceable from the cabin service shaft.

Access shall be provided for cleaning of the supply air chamber at the bottom of cupboards by easy removal of the ventilation grill, (displacement ventilation system).

8.2.4 Cabin service shaft

The service shafts are normally shared by two cabins. The shafts shall be sufficiently dimensioned for easy access, inspection and maintenance, inclusive cisterns, pipes, rodding eyes, junction boxes, replacement of bathroom heating cables, etc. All equipment and piping shall be neatly and logically displayed. Any maintenance related to one cabin shall not affect the functioning of the other. The layout arrangement and accessibility shall be verified during cabin mock-up review and testing.

A simple, battery powered, audible alarm moisture detection device shall be included at floor of shaft.

8.2.5 Cabin corridors

Cabin corridors shall have a minimum net width of 1 200 to 1 500 mm, in accordance with safety and evacuation study requirements. Space for two standard laundry trollies, one for dirty bed linen and one for towels, shall be included. Self-service area adjacent to corridor for dispenser soap and toilet paper shall also be provided in agreement with operator/company.

All EIT distribution cables should be accessible above the corridor ceiling to enable easy inspection, maintenance and installation of additional cables when required. A suspended ceiling system containing both fixed panels and hinged panels should be provided, unless specified otherwise. The hinged panels shall be safe and easy to handle by use of a secure locking mechanism. The fixed panels should be arranged as appropriate, for inclusion of fixed services such as light fittings, PA speakers, detectors, etc.

Fire divisions, fire cabinets, etc. shall be in accordance with requirements in [8.28](#).

8.2.6 Mock-up cabin

A full size mock-up cabin arrangement shall be fabricated as early as possible in the detail engineering phase, unless approved test documents from an equal cabin construction and setting are available and endorsed by operator/company.

Two full sized single cabins (left and right type), or two full size double cabins (when specified by operator/company), shall be provided complete with windows, doors, furniture, bathrooms, service shaft and full width section of the adjacent corridor. All materials, components, equipment and detailing shall be equal to those to be installed on board. The corridor section shall include integration of a fire hose cabinet and fire door / smoke door, when required on board.

The cabin set-up shall be mounted inside an appropriate insulated structural module with bulkheads and decks equal to the real LQ structure.

A detailed test procedure shall be developed prior to commencement of the following testing activities:

- sound reduction index through external wall/bulkhead (helicopter noise);
- sound reduction index between cabins;
- sound reduction index between cabin and corridor;
- impact sound insulation between cabins;
- impact sound insulation between cabin and corridor;
- PA speaker STIPA test;
- illumination test;
- displacement ventilation, air changes and air velocities;
- verification of HVAC duct-heater access for maintenance and inspection of fire and safety thermostats if applicable;
- test of operation of HVAC duct-heater within specified minimum and maximum air-volumes if applicable;
- smoke test for location of smoke detectors;
- door functionality and dynamic opening pressure test;
- visual and functional inspection of design, ergonomics, workmanship, interior detailing, surfaces, finishes, elements, ceilings, accessories, systems, interfaces, etc. in cabins, bathrooms, service shaft and corridor;
- serviceability and functionality of all technical installations in the cabin service shaft, inclusive leakage detection test with “drainage” to corridor for early detection of any piping leakages.

The mock-up testing program shall be specified in the project schedule, allowing sufficient time for testing, adjustments and modifications. The upgraded version shall be a real reference in every respect to the cabins to be installed on board.

The cabin noise reduction requirement shall be based on the highest sound pressure level anticipated on the actual walls/decks by helicopter operations and other noisy installation activities, all seen in conjunction with the maximum permissible cabin noise level requirements.

Care shall be taken to reduce impact noise transmitted between cabins via walls, see [NS-EN ISO 16283-1](#). Due allowance shall be given to compensate for inaccuracy when using [NS-EN ISO 16283-1](#) for small rooms.

NOTE For check lists, see [Annex A](#), data sheet [CDS-103](#).

8.2.7 Linen store

Clean linen store(s) shall be provided on all cabin levels, suitably sized for storage of standard linen trolleys and towel trolleys (length x width x height = 1 000 mm x 600 mm x 1700 mm). Each linen trolley normally contains 60 bed sets for bed change once a week. Similarly each towel trolley normally contains 200 towels, where the use of two towels per day per person is common. In view of this the total number of trolleys should be based on approximately one trolley per 10 beds on board, unless specified otherwise by operator/company. The number needs to be seen in relation to the frequency of supplies in each case.

The weight of a fully loaded linen trolley is about 180 kg. The fully loaded towel trolley weighs about 142 kg. For floating/ moving installations, arrangement to secure trolleys shall be included in conjunction with wall protection bumper arrangement. Quick release fixings shall be provided.

Additional shelves may be installed if required by operator/company. Shelves shall be of stainless steel with height adjustability, and shall be mounted along one of the walls. The shelf depth shall be approximately 500 mm with a load bearing capacity of minimum 1500 N per running meter shelf. The shelf system shall be supported by the floor and fixed to the wall to prevent overturning.

The linen stores should be arranged to minimize disturbances to cabin occupants from trolley movements.

A dedicated space shall be provided at each cabin level for temporary storage of dirty linen trolleys in transit to the linen lay-down deck, or the laundry, as applicable.

Lift(s) shall be available for vertical transport of linen trolleys.

8.2.8 Cleaning store

A cleaning store shall be provided on all cabin levels within easy reach of areas to be served. The room shall contain space for vacuum cleaning equipment, slop sink, storage shelves and space for cleaning trolleys. For further details, see [8.14](#).

8.2.9 Leave lockers

A minimum of three lockable leave lockers for storage of private articles during the onshore period shall be provided for each bed on the installation, unless specified otherwise by operator/company. The leave lockers should be located in dedicated rooms or areas adjacent to the cabin area. Leave lockers in cabin corridors should be avoided to prevent unwanted traffic and noise, but if installed, shall be securely fixed and recessed in corridor walls. The front shall be mounted flush with the surrounding walls without any dust traps above. Locker doors shall be provided with a soft closing device.

8.2.10 Personal work lockers

Personal work lockers (for working clothes, special tool kits, etc.) shall be provided in accordance with operator/company requirements. The lockers should be located in a dedicated room/area close to the changing room(s).

Further requirements to lockers are specified in [NORSOK C-002](#).

8.3 Recreation area

8.3.1 General

The total recreation area should not be less than 2,0 m² per bed. A sufficient number of recreation rooms shall be provided to satisfy the personnel's need for recreation, rest and social and physical activities. The atmosphere shall be attractive, promoting social relationships and human comfort in a psychosocial environment.

NOTE Smoking room in [8.4](#) and "clean" coffee bar in [8.5.2](#) are part of the recreation areas specified in this clause.

Recreation areas should, where appropriate, be grouped together to reduce isolation in periods with low manning. Glazed partitions and doors should be used, where relevant, to promote transparency.

The rooms and areas shall be provided with elements and finishes of high aesthetic and durable quality that are easy to clean. Polished chrome detailing, requiring extra cleaning effort, should be avoided.

At an early stage of detail engineering acoustic absorbents shall be arranged for, preferably in wall and ceiling panels to meet room acoustic requirements.

Loose furniture shall be light in weight and easy to handle and clean, and accessible for dust cleaning underneath. Loose furniture is recommended for flexibility and future furniture replacement. Additional furniture requirements are given in [NORSOK C-002](#) and in [Annex C](#).

Loose furniture should be securely fixed on floating installations, unless specified otherwise by operator/company.

Contact surfaces of tables and chairs shall withstand repeated disinfection without deterioration.

Storage rooms shall be provided as required for each activity area.

8.3.2 Main lounge

The main lounge should preferably be located adjacent to the dining room with direct access between the two rooms when space permits. Such arrangement will facilitate combined use at certain occasions with associated catering benefits. The coffee bar shall be an integrated part of the lounge with a strategic position with respect to use and catering supply. Direct access to the lounge shall be provided from the main traffic area.

One area/room shall provide comfortable space for at least 50 % of the personnel for which the LQ is designed. This can be achieved by combining subdivided areas into one larger area. Where subdivisions of areas are required, glazed partitions and doors are encouraged to create an open, transparent atmosphere.

A strategically placed podium or small stage should be provided as a focal point for speeches, announcements, light entertainment, etc.

Heating of the lounge area shall be based on under-floor electrical heating cables, unless specified otherwise by operator/company. This shall be allowed for at an early stage of engineering, in agreement with HVAC and electrical discipline.

Care shall be taken in placement of low air speed ventilation grilles, (displacement ventilation system), for effective and comfortable ventilation.

Parts of the ceiling should be recess with concealed lighting to enhance the room quality and atmosphere, or to be arranged in other ways with geometric shapes, etc. to achieve similar effects.

The main lounge may be used as an internal muster area in accordance with [9.4](#).

8.3.3 TV-room, activity room, library, etc.

A separate TV-room/area shall be provided in the main lounge area for viewing of programs in a social setting.

Activity/hobby room(s) shall be provided for various leisure time activities. A bench with sink and hot/cold water shall be provided, as well as storage cabinets. The room(s)' working environment and facilities shall be consistent with the intended hobby activities. Lighting shall be dimmable.

Library, music room, games room, meditation room, etc. may be provided in accordance with operator/company requirements.

8.3.4 Shop/kiosk with store

A small shop for purchase of personal articles should be located near the main lounge. It shall be enclosed by a glazed partition front with a lockable sliding glazed door. A combination of displays and shelves should be provided to facilitate the principle of self service. A computer and pay station shall be included for the shop assistant. Appropriate lighting with dimming facilities shall enhance displays. Nicotine products shall be stored in closed cabinets in accordance with regulations. A small store with height adjustable shelves shall be provided for stocks.

8.3.5 Multipurpose room

A multipurpose room/area should be located in proximity of hospital and may be used for a wide range of activities, all in accordance with operator/company requirements, e.g.:

- lectures and briefings;
- films and videos;
- entertainment;
- games;
- group physical training sessions;
- emergency hospital (with suitable equipment).

If ball sports are required, a separate room should be provided for such purpose.

The multipurpose room/area may be combined with other rooms/areas.

A comfortable, safe and flexible/removable seating arrangement should be considered. A stage/podium may be provided with stage curtains, a white screen and adjustable spotlights. The room shall be provided with outlets for TV, audio-visual equipment and LAN. The main light fittings in the room shall have dimming facilities.

Selection and layout of flexible lighting solutions shall be carefully coordinated in order to satisfy the functional and aesthetical requirements for the various activities carried out in this room/area.

Special attention shall be paid to airborne and impact borne sound insulation in order to prevent noise transmission to adjoining rooms.

Suitable storage rooms shall be provided for loose chairs and other equipment needing storage space.

8.3.6 Exercise rooms

Physical exercise rooms shall be provided for a variety of sport activities including weight lifting, spinning and use of treadmills. Each room and area shall be designed, sized and outfitted in accordance with each room's intended function. The equipment shall be up-to-date, where the number of units shall reflect the likely demand and manning capacity on board. An overall assessment shall be made in close cooperation with operator/company at an early stage.

Large flat screen TVs and audio-visual equipment shall be provided in each room/area, as appropriate. The content and arrangement of these rooms shall be worked out in close cooperation with operator/company.

Special precaution shall be taken to prevent noise transmission to adjoining rooms. Perforated surfaces and sound absorbing elements should be provided as required. Shock-absorbing floor finishes should be installed wherever necessary. Wall and ceiling systems in exercise areas shall have suitable fixing and detailing to withstand physical impact, and to prevent injuries. Relevant parts of walls, ceilings and any windows shall be protected with suitable nets or mesh if the room is to be used for ball games. All major equipment shall be securely fixed.

8.4 Smoking rooms

The rooms shall be sized, arranged and outfitted for the sole purpose of short stays and smoking, and shall not be equipped for social activities and TV watching.