



Exploration & Production

GENERAL SPECIFICATION

Medical

GS EP MED 062

Hygiene in bases and living quarters

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02	10/2006	Addition of the standard ISO 22000 reference, table § 4.4.4 modification
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1. Scope

The aim of this General Specification is to define the necessary requirements in terms of health, safety and hygiene for the construction, layout and operation of bases and living quarters.

2. Reference documents

The reference documents listed below form an integral part of this General Specification. Unless otherwise stipulated, the applicable version of these documents, including relevant appendices and supplements, is the latest revision published at the EFFECTIVE DATE of the CONTRACT.

Standards

Reference	Title
ISO 22000:2005	Food safety management systems – Requirements for any organisation in the food chain

Professional Documents

Reference	Title
CAC/RCP 8 - 1973	Codex Alimentarius – Recommended international code of practice for the processing and handling of quick frozen foods, FAO-WHO, and subsequent amendments Codex Alimentarius – Code of hygienic practice for precooked and cooked food in mass catering , FAO-WHO, and subsequent amendments Managing health for field operations in oil & gas activities, OGP, May 2003 Guidelines for environmental health for offshore installations, UKOOA, January 2007
CAC/RCP 39 - 1993	
Report N° 343	
Report EHS23	

Regulations

Reference	Title
Code du travail français (édition 2008) (French legislation)	Titre I: Obligations du maître d'ouvrage pour la conception des lieux de travail (article R 4211 et suivants) Titre II: Obligations de l'employeur pour l'installation des lieux de travail. Chapitre 1 ^{er} : Dispositions générales (article R 4221)
Copenhagen Protocol	Amendment to the Montreal Protocol on substances that deplete the ozone layer (Copenhagen, 23-25 November 1992)
Montreal Protocol	The Montreal Protocol on substances that deplete the ozone layer, September 1987 and subsequent amendments
SI 1976/1019	The offshore installations (operational safety, health and welfare) Regulations 1976 (amendment of regulations 4&5, 14&15, schedule 1, schedule 4 in SI 1998/2306)
SI 1999/3242	The management of health and safety at work Regulations 1999 (amendment of regulation 22 in SI 2006/438)

Codes

Reference	Title
Not applicable	

Other documents

Reference	Title
FDA OBM 0910-0578	Managing Food Safety : A Manual for the Voluntary Use of HACCP principles for Operators of Food Service and Retail Establishments, April 2006 and subsequent amendments
ISBN 9789241547611	Guidelines for drinking-water quality, 3 rd edition incorporating the 1 st and 2 nd adenda, Vol. 1, Recommendations – WHO

**Total General Specifications**

Reference	Title
GS EP CIV 403	Temporary construction camps and associated facilities (onshore)
GS EP ENV 001	Environmental requirements for projects design and E&P activities
GS EP ENV 421	Landfill design and operation for E&P sites
GS EP HVA 100	Basis of design
GS EP HVA 202	Air Handling Unit(s) (AHU)
GS EP HVA 211	Electrical heaters
GS EP MED 060	Onsite medical structures
GS EP MED 061	Medical support for E&P sites
GS EP MED 063	Specific risks : Clinical and therapeutic elements
GS EP SAF 221	Safety rules for buildings

3. Health, safety and hygiene on bases and in living quarters – procedure

This section explains the practices to be implemented in terms of hygiene on bases and in living quarters.

The person in charge of catering and hygiene in living quarters onsite is called the Camp Boss.

3.1 Collective catering: the complete food chain

An important reference document is the [Report EHS23](#). Although dedicated to offshore installations, this report reiterates the essential principles applicable to all types of installations, notably the “Hazard Analysis and Critical Control Points” (HACCP) principle.

The Camp Boss is responsible for implementing and continuously monitoring the HACCP procedure.

From production to consumption and waste management, a complete food chain is formed. The essential points are:

- Production / Purchasing
- Storage / Packaging / Transport onsite
- Reception
- Dry / refrigerated / frozen storage
- Hot / cold preparation
- Cooking
- Keeping food hot
- Refrigeration



- Reheating
- Serving
- Washing-up
- Waste management

Each one of these points is the source of a potential incident which could affect the quality of foodstuffs and lead to a health problem.

The workflow for this chain is shown below:

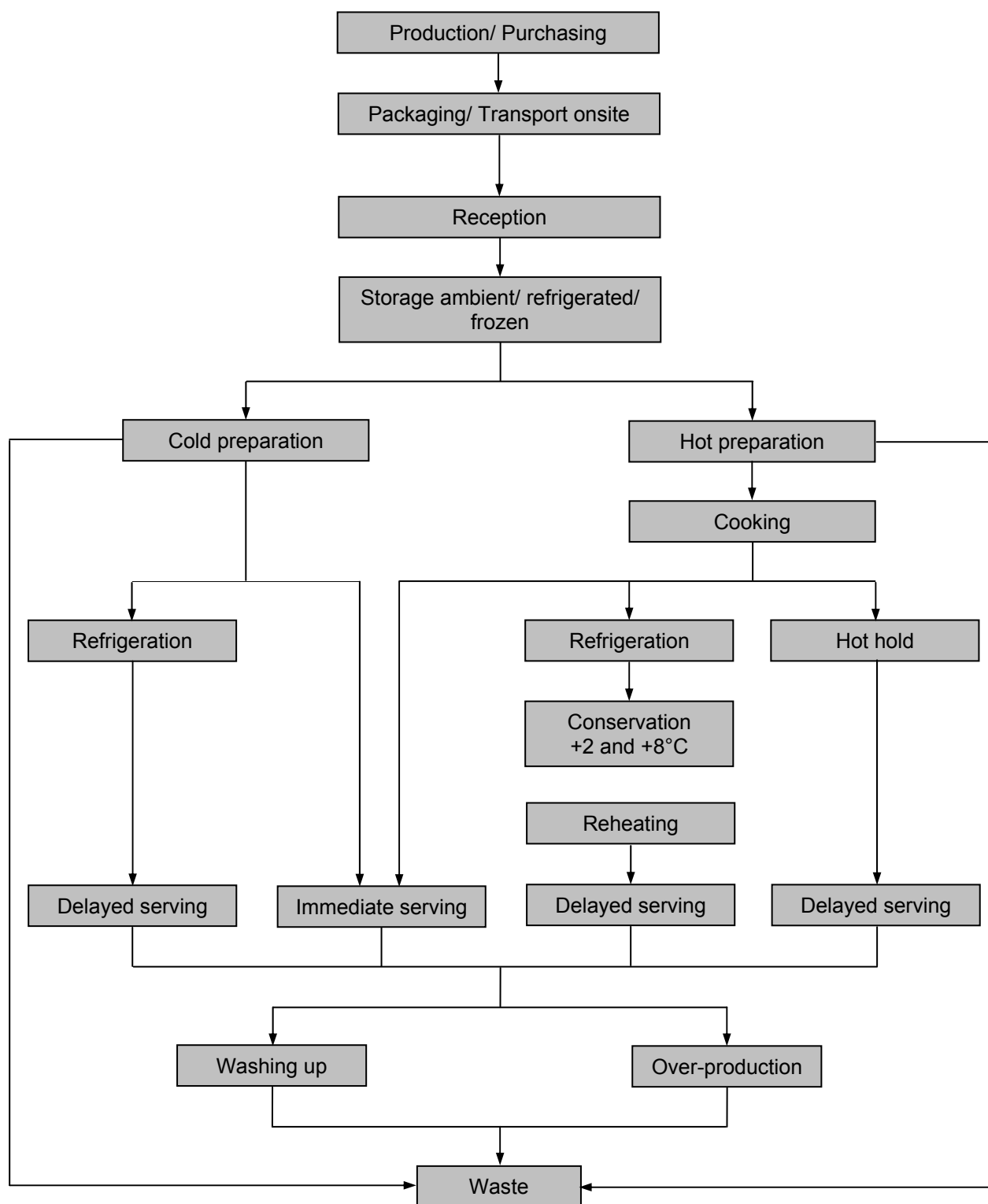


Fig. 1: complete food chain



3.1.1 Production/ Purchasing

The Camp Boss shall order from suppliers recognised by a competent authority. This is usually the local health authority. If the latter does not provide sufficient guarantees, the affiliate health officer can instigate a verification of the suppliers' premises and work methods.

3.1.2 Packaging/ Transport on site

All containers and packaging for foodstuffs shall protect the contents from any contamination or deterioration during storage and transport for the normal expected delivery times on site. Containers and packaging shall be labelled "FOOD" so that they can be identified and handled first when unloading. They shall be meticulously cleaned after usage before being sent back to the warehouse.

Refrigerated containers shall keep foodstuffs at a temperature less than +5°C for refrigerated foodstuffs and less than – 18°C for frozen foodstuffs. To do so, they shall:

- include insulating materials;
- be painted in a light colour to reduce absorption of heat from the sun;
- include eutectic plates;
- have been loaded according to the logic plan: frozen foodstuffs at the rear, piled up to 10 cm from the roof, then the same procedure for refrigerated foodstuffs, then the foodstuffs stored at ambient temperature. This should be done in such a way that there is as little empty space as possible. The only large empty space should be next to the doors. The best type of refrigerated container is the container with 3 separate compartments (frozen/ refrigerated/ ambient temperature);
- have been loaded as quickly as possible, only opening the doors when loading;
- be fitted with a panel which protects the foodstuffs in case the door-closing system fails;
- be fitted with a refrigeration system which can be supplied with electricity during transportation (lorry/train/boat) and a system for recording the interior temperature, but which is visible from the exterior (mini-maxi thermometer or continuous recording).

These containers shall be loaded in premises where the temperature is controlled.

Foodstuffs stored at ambient temperature shall be protected from contamination during handling and transportation operations. This is particularly critical when chemical products are being transported in the same container.

Fruit and vegetables are extremely fragile; they should be carefully packed and processed separately.

3.1.3 Reception

When the delivery arrives onsite, the medical personnel and the Camp Boss shall carry out periodic inspections to detect any signs of deterioration or contamination. Any foodstuffs deemed unfit for human consumption shall be withdrawn and a report submitted to the RSES who decides on the measures to be taken. A sample of the damaged foodstuffs may be taken as proof or be sent to the local health authorities.



The main aspects to be inspected are:

- Meats and poultry: fresh appearance and colour, consistency and odour; temperature less than +5° C.
- Eggs: date should not exceed more than 2 weeks after the date they were laid; temperature less than +5° C.
- Fish and shellfish: temperature between 0°C and +5°C. Packaged in refrigerant packaging; gills red and moist; weak odour.
- Frozen foodstuffs: no signs of re-freezing (ice crystals, sheets of ice). Temperature less than – 18°C
- Refrigerated prepared meals: temperature less than +3°C.
- Foodstuffs at ambient temperature: dry and undamaged.
- Canned food: absence of rust, leakage, cans should not be swollen or blown.

3.1.4 Storage methods

- The rotation principle for foodstuffs is: “first in – first out”. Expiry dates shall be regularly checked (by the catering manager and by medical personnel each time an inspection is performed).
- Fresh meats and dairy products shall be separated.
- Frozen meats, fish and shellfish shall be separated.
- All frozen foodstuffs shall be preserved in packaging, certified for foodstuffs. Plastic dustbin bags are not acceptable. Packaging shall be clearly labelled (indicating the contents) and dated.
- All refrigerated foodstuffs shall be:
 - o either preserved in suitable packaging, certified for foodstuffs, particularly for offal, fish and shellfish;
 - o or stored in a closed recipient.
- Packaging shall be clearly labelled (indicating the contents) and dated. A tray shall be put underneath the foodstuffs to catch any juices which may leak from them.
- Nothing shall be stored in direct contact with the ground (recipients for foodstuffs, cooking utensils, etc.).
- Foodstuffs delivered in bulk (rice, flour, sugar, beans etc.) shall be stored in a plastic recipient with a cover, as soon as their original packaging is opened.
- As specified above, raw foodstuffs shall be separated from cooked, refrigerated foods. Never store raw foodstuffs (to be cooked) and foodstuffs ready for consumption in the same recipient. If exceptionally, these two types of foodstuffs are in the same cold store, the raw food shall be stored underneath the cooked food.
- Ice creams shall not be exposed to temperatures above – 2.2° C. If they have been, they shall be destroyed. At this temperature, they can only be stored for a limited period (one to two days) in a freezer or in a machine specially adapted for storing ice creams. For longer storage periods of up to one week, the recommended temperature is less than – 12°C.

For very long storage periods, the temperature shall be less than – 18° C as for any other frozen foods.

- Ice creams reconstituted from powder or pasteurised liquids, shall be frozen within an hour after preparation. Ice-cream machines shall be given particular attention, notably when rinsing and cleaning after use.
- Ice cubes shall be made with drinking water.
- Cleaning products shall be stored in a room apart from that (those) where foodstuffs are stored.
- Foodstuffs shall not be stored anywhere else other than in the areas designated for this purpose.
- Storerooms shall be clean and firmly closed to avoid any animal intrusions.

3.1.5 Defrosting

The defrosting temperature shall be less than +5°C. There are four acceptable ways of defrosting:

- The refrigerator: this is the most acceptable method.
- The rapid defrosting chamber: expensive and cumbersome, this requires considerable maintenance and permanent temperature monitoring.
- The microwave: limited volume, this is only acceptable for foodstuffs which are to be cooked immediately after defrosting.
- Running water (+21°C or less) is acceptable except if the water is not drinkable. This method is prohibited in isolated camps.

Certain preparations can be cooked direct from frozen. The manufacturers' instructions on the packaging shall be followed.

3.1.6 Cold preparation

The different stages of preparation shall be monitored by the Camp Boss. Frequent hand-washing (see § 3.3.2) is required, especially between each stage.

3.1.7 Cooking – Hot and cold preservation– Refrigeration – Reheating – Serving

All foodstuffs which are meat, fish, shellfish, rice, egg, milk or cream-based shall be preserved until used, at a temperature either above +63°C or below + 5°C. This does not apply to:

- Breads, biscuits, patisseries.
- Bacon, sausages, smoked ham.
- Un-opened canned foods.
- Hard cheeses.
- Dehydrated preparations (soups, purees, etc.).

Foodstuffs shall be refrigerated as quickly as possible after preparation (less than 4 hours).

Recommended minimum cooking temperatures, hot preservation and reheating are shown in the table below.

Table1: minimum temperatures for cooking, hot hold and reheating

	Cooking	Hot hold	Reheating
Beef/ Veal/ Lamb	+63°C (+145°F)	+63°C (+145°F)	+82°C (+180°F)
Pork/ Minced beef	+71°C (+160°F)	+63°C (+145°F)	+82°C (+180°F)
Poultry : whole and thighs	+82°C (+180°F)	+63°C (+145° F)	+82°C (+180°F)
Poultry: white meat	+77°C (+170°F)	+63°C (+145°F)	+82°C (+180°F)
Seafood	+63°C (+145°F)	+63°C (+145°F)	+82°C (+180°F)
Fish	+68°C (+155°F)	+63°C (+145°F)	+82°C (+180°F)

3.2 Collective catering: essential practices

- A record of the menus served shall be kept for 3 months.
- The control meals are small samples of each dish served (cooked dish, patisserie etc.), packaged in small, airtight boxes, labelled with the date and the mealtime and cold stored (less than +5°C). They shall be preserved and made available to medical personnel for 48 hours after each dish has been served.
- All work surfaces shall be cleaned and disinfected after each preparation session with a chlorine-based product (or equivalent) and then rinsed.
- Floors and surfaces in the dining room shall be cleaned after each period of service.
- Cooker hoods shall be regularly cleaned and degreased, depending on their use. If a lot of fatty foods are cooked, the hoods should be cleaned daily to prevent a layer of grease from forming.
- There shall be an adequate number of wash hand basins provided for the number of members of kitchen staff. Antiseptic soap and a hot/cold water supply should be provided. The taps shall be controlled with a foot pedal, a knee lever or a photoelectric device so that the taps are not touched with the hands. Hands shall be dried using disposable paper towels. Hot air hand driers are only acceptable in areas outside the food preparation area. Nailbrushes shall also be provided.
- Chopping boards: the rule is: One chopping board = One use. There is a different chopping board for each different food category:
 - o raw vegetables

- o raw red meats
 - o cooked red meats
 - o raw fish
 - o cooked fish
 - o raw poultry
 - o cooked poultry
- These boards shall be labelled or identifiable by a code according to what they are used for.
- They shall be placed once a month for a workforce of 400 people and once every two months for a workforce of 800 people.
- They shall be washed after each use.
- They shall be brushed and disinfected once a week with a chlorine-based product or equivalent and then rinsed.
- A warning sign shall indicate the specific use of each wash hand basin and work surface, e.g.:
 - o “For hand washing only”
 - o “For food preparation only”
 - o “Not for food preparation”
- The entire collective catering area (kitchen, dining room, storage areas, etc.) is a non-smoking area. Access is restricted to authorised personnel.
- The dishwasher shall carry out its wash cycle at a temperature between 55°C and 65°C. The temperature of the final rinse shall be at least 82°C. If there is no washing machine, the washing-up shall be done in hot water using a detergent and then a bactericidal agent for the final rinse.
- No waste recipients shall be used for the preparation or storage of foodstuffs, or even washed or disinfected.
- Dustbins located in the kitchen shall be covered after each preparation session (see above) and emptied as quickly as possible. They shall never be overfilled. Ideally, the dustbin should be a pedal bin.
- The bins for preparation waste shall be positioned next to the work tables. They are the first element in the dirty circuit.
- Waste bins and other waste recipients shall be clearly labelled WASTE.
- A waste compactor is useful for dry waste.
- All utensils shall be washed, dried and put away after each preparation session. The utensil storage areas shall be set apart from food storage areas at ambient temperature.
- Anti-vector measures (rats, insects, etc.) are specified in the **GS EP MED 063**.



3.3 Collective catering: personnel

3.3.1 Medical fitness-for-work

All catering personnel shall undergo a medical examination to verify their fitness-for-work:

- prior to starting their contract,
- then once annually.

This applies to all personnel likely to handle foodstuffs, including waiters/ waitresses. The Camp Boss and medical personnel on site are responsible for ensuring that these medical examinations are up-to-date and that personnel are constantly made aware of the risk of transmitting diseases.

The medical examination shall include at least:

- A clinical examination to detect any transmissible diseases, particularly skin, lung, urinary and digestive diseases.
- An examination of stools for Cysts, Eggs, Parasites (CEP).
- The following biological examinations:
 - o Platelet Count;
 - o Transaminases;
 - o Serology of hepatitis A, B and C.
- A pulmonary x-ray and a Tuberculin skin test.

An additional parasitological examination of stools shall be performed each time contamination is suspected or a gastro-intestinal illness has been detected in the patient, before s/he is declared fit to work again in collective catering.

Catering personnel shall be encouraged to flag up any health problem they encounter, particularly if one of the following is suspected:

- Pyogenic dermatitis (furuncle, whitlow).
- Gastroenteritis.
- Close contact (e.g. with family during an off duty period) with a person suffering from gastroenteritis.
- Coloured or hemoptysic expectorations from themselves or a member of their family.

A member of the catering staff shall be immediately declared unfit for work as soon as one of the following is detected:

- An infectious disease which can be transmitted through water, food or by touch (human contact).
- Pyogenic dermatitis, a wound to the hands (even minor) until it is fully healed, if it cannot be covered by a waterproof plaster, an infected wound, wherever it may be located, or an acute infection of the airways.

S/he shall only be allowed to return to work after having been examined and given a clean bill of health by a member of the onsite medical personnel. If the latter is not a doctor, the Health Plan shall specify whether s/he can take the decision him/herself or whether s/he shall refer the



decision to the affiliate health officer.

When periodical kitchen inspections are conducted (see end of this section), the hands of all catering personnel shall be inspected for wounds which have not been declared.

3.3.2 Personal hygiene and training practices

3.3.2.1 Hand washing

All catering personnel shall wash their hands regularly according to the principle: “before every clean action, after every dirty action”. Particularly:

- before starting or recommencing work;
- before beginning a preparation session (cutting meat, vegetables, preparing bread, etc.);
- after touching an uncovered part of the body (hair, etc.);
- after blowing the nose or after having coughed;
- after going to the toilet (+++);
- after cleaning, washing-up;
- after handling raw food;
- after handling waste.

3.3.2.2 General hygiene

All catering personnel shall:

- Shower and wash their hair at least once a day.
- Wear clean clothing at work (cotton overalls designed for this type of work), a close-fitting cap for the hair, closed shoes (no sandals in the kitchen), disposable gloves (to be changed regularly) for serving and handling foodstuffs.
- If responsible for cutting meat, be provided with the required safety equipment according to regulations: metallic gauntlet, protective apron.
- Have short, clean nails.
- Not smoke while working.
- Not wear any jewellery (one ring is permissible).

3.3.2.3 Continuous training

The Camp Boss and medical personnel shall work together to establish a continuous training programme to include at least the following points:

- Personal hygiene
- Cleaning and disinfecting the premises
- Storing foodstuffs
- Preparing and serving foodstuffs
- Waste cycle



- Anti-vector measures (rats, insects, etc.)
- Cleaning washing equipment

3.4 General hygiene in living quarters

- Eating in bedrooms shall be forbidden.
- Living quarters shall be cleaned regularly.
- Work shoes shall always be removed before entering the living quarters.
- Sanitary installations, showers and wash hand basins shall be cleaned and disinfected every day using a chlorine-based product or equivalent.
- The regular cleaning of the sanitary installations shall include the showerhead. Given that they produce a spray of hot water, they are a fertile breeding ground for Legionella bacteria.
- Bed linen shall be regularly cleaned and changed.
- Each room shall have a wastepaper bin which shall be regularly emptied.
- The laundry shall be clean at all times. Tumble dryer filters shall be daily cleaned.
- All linen worn, including underwear, shall be handed in to the laundry.

4. Hygiene on bases and living quarters – construction and layout

The Health Plan affects the construction and layout of bases and living-quarters. Only non-medical premises are dealt with here.

4.1 Living quarters (offshore) – Dwellings (onshore)

4.1.1 Layout

Personnel working night shifts shall have a bedroom in an area protected from noise and vibrations. This is particularly important on offshore platforms.

A designated clean area comprises those rooms in which the wearing of work clothes is prohibited (mainly: common rooms and bedrooms). Access to these two areas shall be gained through changing rooms.

The recommended volumes for bedrooms, their fittings and sanitary installations vary according to whether the installation is offshore or onshore. The reference specifications are appendix 1 of this document, [GS EP CIV 403](#) and [GS EP SAF 221](#).

Even if space is limited, it is recommended that at least one wardrobe per person be provided.

4.1.2 The laundry

The laundry shall have the necessary provisions required to wash, dry, iron and store the bed linen, bathroom linen and personal linen (work clothes and underwear).

The expected volume is 5 kgs of washing per person per week.

Special care shall be taken to ensure that this premise is properly ventilated.

4.2 Collective catering: layout and equipping premises

4.2.1 Layout

There are three basic principles to follow:

- Definition of work areas specific to each activity organised logically and linked by circulation areas, separating a clean circuit from a dirty circuit.
- Short circulation routes to reduce and facilitate the movement of personnel.
- The hazard analysis flowchart: from delivery to consumption, foodstuffs shall follow the clean circuit without going back a stage or meeting the dirty circuit.

Operational layout scheme according to the hazard analysis process:

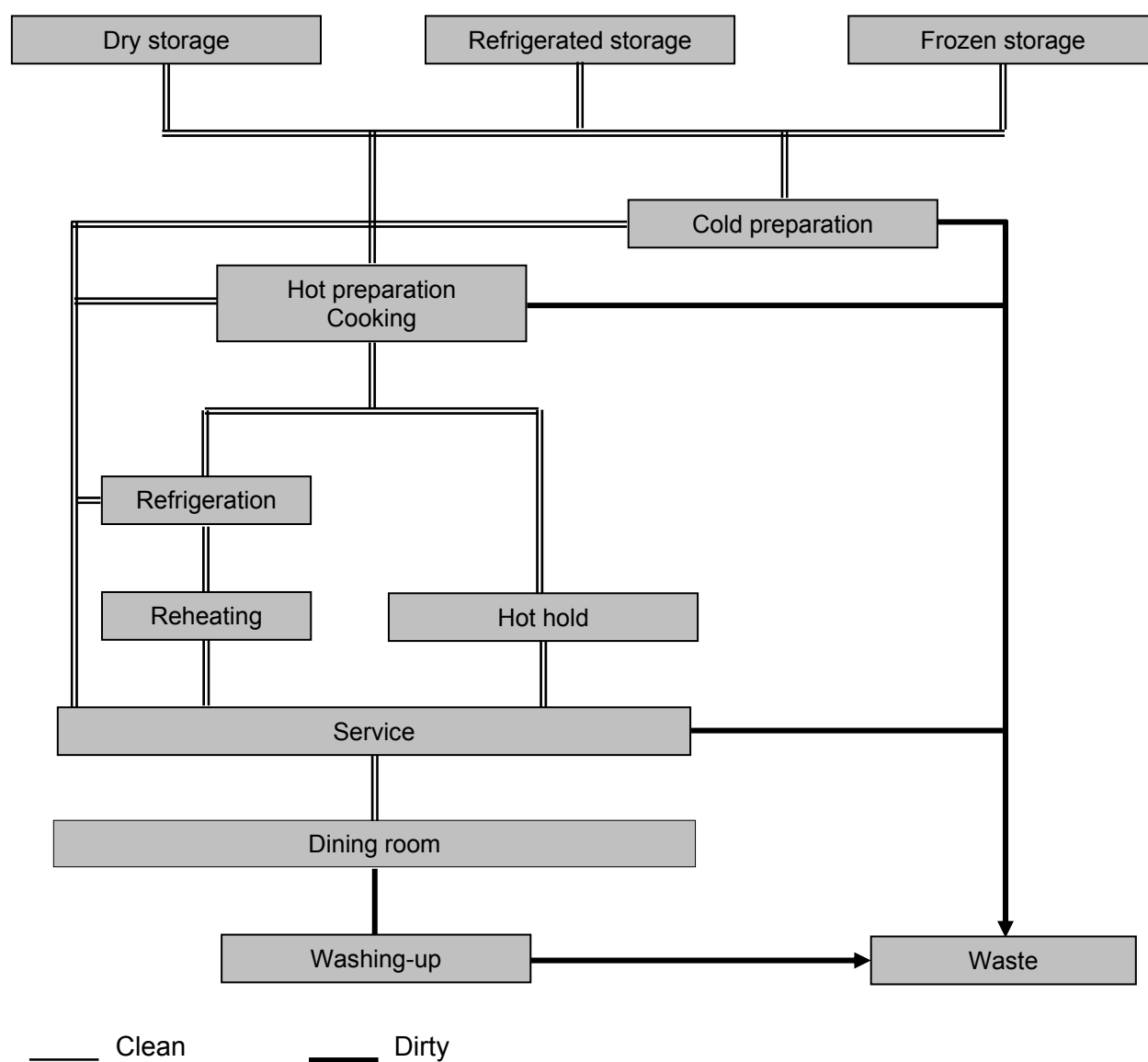


Fig. 2: operational layout scheme

4.2.2 Storage

Three separate storage rooms (ambient temperature, refrigerated, frozen) shall be located near the kitchen and be easily accessible from it, protected from any deterioration due to climatic conditions or installation activities.

They shall be located in an area consistent with the unloading area and handling possibilities. Storage of foodstuffs is the first link in the global catering process, which shall follow the hazard analysis procedure.

Volume and temperature:

The total volume of stored foodstuffs including cold storage is 1.4 m³/ POB + 2 to 5 l water / POB / day, for a minimum autonomy of 7 days. Storage includes:

- Storage at ambient temperature.
- Refrigerated storage: in at least two separate units (+3°C and + 5°C). The unit at + 5°C is the largest, designed to store all foodstuffs to be refrigerated until they are used. The unit at +3°C is designed to store cooked foods, refrigerated and waiting to be reheated and then served. It is recommended that there be a separate unit for fresh vegetables. A large refrigerated storage capacity is recommended since this is also the ideal means of defrosting foodstuffs.
- Frozen storage: - 18°C or less.

All cold storage units and freezers shall be fitted with thermometers showing the internal temperature, but this reading shall be visible outside the unit. The temperatures of the different units shall be monitored by mini-maxi thermometers if there is no permanent temperature recording system. Several temperature readings shall be taken on a daily basis and be made available to the onsite medical personnel. These readings shall be kept for 3 months. If the thermometers need to be recalibrated regularly, the readings from recalibrations shall also be kept for 3 months.

Cold storage units shall have an independent supply of electricity.

Refrigeration fluids shall correspond to the standards dictated by the [Copenhagen Protocol](#) and the [Montreal Protocol](#) (Hydro Chloro Fluoro Carbons – HCFC are prohibited and must be replaced by the fluids R 134 A or R 407 C or an equivalent).

The dining room shall have a surface area of 0.90 to 1.40 m²/ person (not including the “self service” counter). For offshore installations, a small surface area is permissible, but onshore installations should aim at a surface area closer to the upper limit. For installations accommodating more than 500 people, there should be a dining room for each category of personnel. The length of the tables shall allow at least 0.60 m per person.

Construction materials for the kitchen – dining room shall:

- be easily washable and disinfectable: hard, smooth surfaces; easily washable walls, floors, and ceilings, of a light, but not blinding, colour;
- not encourage the build-up of condensation, dust and moulds (particularly for doors and windows);
- be rust-resistant.



The kitchen equipment shall conform to the standards for collective catering equipment, notably by excluding any aluminium utensils. A list of such equipment is set out in **GS EP CIV 403** and appendix 2 of the present document dealing with onshore and offshore installations respectively.

An area for making bread and pastries is always included in the kitchen space.

All metallic equipment shall be fixed to the ground, including fridges and freezers. The standard differences between electrical sockets and water points shall be respected as well as the standards for electrical sockets in a moist environment.

Chopping boards shall be made of plastic, not wood. The rule is: "one chopping board = one use". There is a different chopping board for each different food category:

- raw vegetables,
- raw red meats,
- cooked red meats,
- raw fish,
- cooked fish,
- raw poultry,
- cooked poultry.

These boards shall be labelled or identifiable by a code according to what they are used for.

They shall be replaced once a month for a workforce of 400 people and once every two months for a workforce of 800 people.

The floor shall be covered with a non-slip, washable material. The joints between walls and floors shall be watertight. Floor drains are not recommended.

The kitchen shall have the capacity to allow meals to be prepared for at least half the maximum number of personnel onsite in one sitting.

Changing rooms – toilets reserved for kitchen staff shall be located outside the clean area and have an independent ventilation system. The number of toilets/ changing rooms shall conform to appendix 3 of the present document.

Toilets for diners are located close to the dining room.

None of the areas in which foodstuffs are handled (storage, preparation, consumption) shall be directly linked to the toilets, a utility room or a dwelling.

The washing-up area shall be fitted with three separate sinks for washing, disinfecting and rinsing, all with a hot/cold water supply.

There shall be an adequate number of wash hand basins provided for the number of members of kitchen staff. Antiseptic soap and a hot/cold water supply shall be provided. The taps shall be controlled with a foot pedal, a knee lever or a photoelectric device so that the taps are not touched with the hands. Hands shall be dried using disposable paper towels. Hot air hand driers are only acceptable in areas outside the food preparation area. Nailbrushes shall also be provided.

The entire collective catering area (kitchen, dining room, storage areas, etc.) is a non-smoking area. Access is restricted to authorised personnel.

Lighting shall conform to the specifications set down in appendix 4 of the present document.

Acoustic performances shall respect the specifications set down in appendix 5 of the present document.

The dishwasher shall carry out its wash cycle at a temperature between 55° C and 65° C. The temperature of the final rinse shall be at least 82° C. If there is no washing machine, the washing-up shall be done in hot water using a detergent and then a bactericidal agent for the final rinse.

No waste recipients shall be used for the preparation or storage of foodstuffs, or even washed or disinfected. Waste bins and other waste recipients shall be clearly labelled WASTE.

A waste compactor is useful for dry waste. The bins for preparation waste shall be positioned next to the work tables. They shall be covered after each preparation session.

They are the first element in the dirty circuit.

A warning sign shall indicate the specific use of each wash hand basin and work surface, e.g.:

- “For hand washing only”
- “For food preparation only”
- “Not for food preparation”

4.3 Air Quality

The specifications regarding air quality are defined in **GS EP HVA 100**, **GS EP HVA 202** and **GS EP HVA 211**.

The ventilation systems for the infirmary, kitchens, toilets, etc. shall run on separate circuits.

When air is recirculated, anti-bacterial filters shall be installed in the circuit and checked regularly.

Ventilation systems have been identified as a source of spreading the Legionella bacteria. This is true if the air circulation network allows water to stagnate and if this same water is contaminated by the Legionella bacteria (coming from the water circuit). Preventative measures against the spreading of this bacteria mainly concern:

- The design of air circuits to avoid areas in which water can stagnate.
- Controlling the temperature of the water circuits.

Individual gas heating appliances are prohibited.

4.4 Water quality for domestic use

4.4.1 Volumes and storage

Water used for drinking, cooking and washing (clothes, foodstuffs, etc.) shall be fit for drinking. Drinking water can be supplied separately, in bottles, or via the drinking water network in place.

The storage capacity shall be 200 l / POB/day.

The storage temperature shall be such that germs cannot multiply. One of the main targets of such preventative measures is the Legionella bacteria, which causes Legionnaire's disease. This bacteria develops at a temperature between 25°C and 50°C. Recommendations are as

follows:

- Maintain the network and the cold water storage tank at a temperature below 25°C (the standard is fixed at 20°C)
- Maintain the hot water network above 50°C (minimum temperature at the end of the circuit). At around 60°C the time taken to destroy the Legionella bacteria is very short (1 minute).

Reference: [ISBN 9789241547611](#).

Storage tanks shall be accessible for cleaning operations. They shall be able to be disinfected in an emergency in the event of contamination.

The design of the water network shall avoid sections of tubing in which water rarely circulates or circulates badly, encouraging the development of micro-organisms.

Any worn joints or flexible tubing shall be changed immediately.

4.4.2 Water sources

Water may come from a well, a fresh water pumping station, a saltwater pumping station or from an existing drinking water network. Except perhaps for the last source, the water from all other sources shall be treated before being stored on site.

In all cases, water shall be regularly checked.

If the water supply comes from a well or a surface pumping station, the minimum distances to be respected between the supply and a potential source of contamination are:

Table 2: minimum distance between the water supply source and the potential source of contamination

Contamination	Well	Surface pumping station
Septic tank - sewers	15 meters	15 meters*
Toilets not connected to a network	30 meters	30 meters*
Septic seepage or drainage	45 meters	30 meters*
Stables or gazing area	45 meters	45 meters*

* distance between the potential source of contamination and the edge of the area of water to be pumped.

4.4.3 Treatment

This involves a series of consecutive operations which ensure that the treatment is efficient. The design of the treatment plant shall be studied for each case, depending on the expected characteristics of the supply source. The operations include:

- Desalting
- Pre-treatment, generally by chlorination as well as by specific treatment according to the composition of the water (e.g. removal of iron)
- Storage of pre-treated water

- UV sterilisation

4.4.4 Quality

The complete table of drinking water characteristics is presented in the **GS EP SAF 221**. The main concentration levels to be monitored are:

Table 3: specifications for drinking water

Parameter	Threshold values
pH	$6.5 \leq \text{pH} \leq 8$
Chloride	$\leq 250 \text{ mg/l}$
Nitrates	$\leq 50 \text{ mg/l}$
Benzene	$\leq 1 \text{ } \mu\text{g/l}$
Total coliform	0
Total bacteria (Heterotrophic Plate Count ou HPC)	$\leq 0.1 \text{ cfu/l}^*$

* cfu = colony forming units

4.4.5 Verifications

Verifications shall be conducted monthly and shall be done based on the criteria given in the table above.

Samples are taken by the medical personnel on site. The sampling points are chosen depending on the particular risks identified, or at random from among the water points in the kitchens, living quarters, etc. changing the sampling point every month. Ideally, samples shall be collected in sterile recipients of 250 to 400 ml. If no sterile recipients are available, a good technique for identifying bacteria is to take an untouched bottle of drinking water, empty it, rinse it several times with the water from the source to be tested, and then take the sample according to the standard sanitary procedure for this operation.

The analyses can be carried out in a local laboratory or onsite using the analysis kits currently available on the market. Such kits include a mini incubator and a supply of disposable cartridges providing results which can be read immediately.

When possible (if access to a specialist laboratory is available) specific samples taken to detect the legionella bacteria are carried out at the request of the affiliate medical officer.

4.5 Waste management

There shall be a plan for waste management which includes:

- Treatment and discharge of dirty water and waste water.
- Treatment of solid waste.

The characteristics of onshore and offshore waste management installations are described in **GS EP CIV 403**, **GS EP ENV 001**, **GS EP ENV 421**, **GS EP SAF 221** and in appendix 6 of the present document.



Appendix 1 Layout characteristics of living quarters (offshore) and dwellings (onshore)

Bedrooms

The cabins shall be grouped together on dedicated floor levels or in separate corridors away from traffic areas and noisy activities.

The minimum dimensions of the bedrooms shall depend on the National Labour Code of the country of installation. Failing this, the following minimum areas (toilets included) are recommended:

- 10 m² floor area for a bedroom with one standard bed (1 person)
- 14m² for a bedrooms with two standard beds (2 people)

These surfaces areas may be altered according to intended use (management, VIP, etc.).

The minimum clear height in the bedrooms shall be 2.4 ± 0.1 m.

The number of standard beds (excluding medical rooms) shall be at least equal to the permanent personnel, as appropriate.

Fold-away beds may be provided to accommodate contingency workers (bedroom 1 + 1 person or bedroom 2 +1 people).

In bedrooms, the beds shall not be arranged side by side.

In the best way, provide a window for each bedroom. Each window shall be cleaned on both sides.

When they are arranged one on the top of the other:

- the distance between the bottom of the bottom mattress and the floor shall be in accordance with the recommended minimum of 0.3 m,
- the distance between the bottoms of the bottom and top mattresses shall be in accordance with the recommended minimum of 1.00 m,
- the distance between the bottom of the top mattress and the ceiling shall be in accordance with the recommended minimum of 1.00 m.

Standard bed size = 2050 mm x 850 mm.

Minimum standard furniture shall be as follows:

- 2 lockable drawers at lower bed;
- 1 lockable wardrobe per bed;
- 1 bedside drawer and/or 1 headboard;
- 1 desk with 2 drawers;
- 1 armchair;
- 1 safety cabinet for storage of life jacket and smoke hoods (1 equipment per bed);
- 1 individual lightening per bed.

Additional folding desk and 1 easy chair can be installed according to the available space.



A master key system shall be set for lockable furniture.

Bedroom facilities

Depending on the situation, the toilet facilities shall be:

- individual, per bedroom, with a minimum recommended area of 2.5 m²;
- shared between 2 bedrooms, with individual hand basins, and a minimum recommended area of 4.00 m².

Except if it's mentioned in the PTS, the toilet facilities shall be a pre-fabricated wet unit. These units shall be completely factory-finished and contain all systems required ready for connection to the LQ. services. They shall be equipped with lifting 'lugs' and adjustable legs for deck fixing.

The wet units shall be light weight and preferably of the fully insulated welded stainless steel panel type with walls and floor finished in gel coat polyester or similar.

The wet unit design shall incorporate space for all services to be accessed and connected to the LQ systems from the corridor without entering the wet unit from the cabin side.

The wet unit carcass shall be finished externally with the dry fix mineral fibre insulation batts, fixed using welded pins and speed-fix washers. The units shall form a complete waterproof system including and penetrations that may be required for service connections.

Each wet unit shall contain, as a minimum

- one wash hand basin in vanity unit with cupboard space under or approved alternative arrangement;
- one shower unit with thermostatically controlled mixer unit;
- one wall mounted cabinet with mirror door and vapour proof light fitting incorporating a shaver socket;
- one WC European type – with concealed or close coupled cistern;
- toilet extract system for connection to the installation HVAC system;
- ceiling mounted vapour proof light fit.

Toilet facilities

Separate toilet block shall be provided for accommodation area service personnel (hotel services, catering, etc.) and maintenance and operation personnel.

Toilets and washing facilities shall contain a minimum number of the following sanitary facilities: 1 water closet per 6 people, 1 basin per 9 people, 1 shower per 8 people.



Appendix 2 Canteen equipment

The list of equipment for the gallery is as follows:

Cooking island:

- electric range(s)
- convection & steam oven(s)
- tilting frying table(s)
- boiling pan(s)
- deep fat fryer
- salamander
- grill
- extract hood with fire extinguishing system's nozzles

Vegetable preparation

- vegetable peeler
- vegetable cutter
- potato chipper
- feed slicer
- cotter mixer
- sink with water boiler

Cold preparation area

- refrigerator(s)
- microwave(s)
- sink with water boiler

Hot preparation area

- shopping block(s)

Bakery

- planetary mixer
- sink

Washing area

- food waste disposer
- dishwasher and roller conveyers for pre wash (bleep basin and 1 pre-rinse spray unit) and for clean stationery
- extract hood
- large sink with pre-rinse spray unit for washing of pots and pans

Appendix 3 Catering personnel changing rooms and toilets

Table 4: characteristics of changing rooms and toilets for catering personnel

SPACE	EQUIPMENT
Catering Personnel	
This room shall be equipped with a number of 2-tier lockers corresponding to the number of catering personnel and with a dedicated toilet block with shower, toilet, urinal and washbasin. The minimum requirements shall apply: - changing rooms: 1m²/person; changing rooms for men (and separate changing rooms for women) with a minimum of 7m² - toilet blocks: the minimum area shall be 7m² for men's (and 7 m² for separated women's toilet block)	
Male changing room (N₃ people)	N ₃ double steel lockers N ₃ /10 shower N ₃ /5 wash basin N ₃ /10 water closet N ₃ /10 urinal
Female changing room (N₄ people)	N ₄ double steel lockers N ₄ /10 shower N ₄ /5 wash basin N ₄ /10 water closet

Appendix 4 Minimum requirements for lighting

Table 5: minimum requirements for lighting

Rooms	Lighting levels (lux)	Luminaire type	
Medical rooms			
Dispensary	540	Pale yellow fluorescent	Flush
Medical and dental treatment	810 to 1075		
Medical waiting area	540		
Laboratories	810		
All other medical and dental spaces	325		
Wards			
General lighting	100	Pale yellow fluorescent	Flush
Critical examination	810 to 1075		
Reading	540		
Sanitaries	150		
Clearing rooms	300		Surface Mounted
Mortuary	150		Surface Mounted

Note: lighting level measured to 0.8 m above floor, after luminary depreciation



Appendix 5 Minimum requirements for acoustic performances

Table 5: minimum requirements for acoustic performances

Rooms	Maximum sound level allowed [dB(A)]
Medical rooms	40
Clearing rooms	45
Mortuary	70



Appendix 6 Characteristics of waste management installations

Lighting requirements	Operating loads on structure	Maximum noise level [dB(A)]	Minimum requirement for the floor	Ambient conditions					
				Type of air	Cold climates		Hot climates		Presure (Pa)
150 lux	4.0 kN/m ²	60	UPEC Classification : U3.P2.E2.C2	MV AC*	T° C	% RH	T° C	% RH	30
White Fluorescent & Surface Mounted					15 ± 5	50 ± 20	15 ± 5	50 ± 20	

* MV : single or double-acting mechanical ventilation. AC: Air Conditioning: heating, cooling, controlled humidity treatment, with or without addition of new air.