

Architectural Design Premises/Criteria

CO₂ Capture Facility

Kårstø, Norway

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Architectural Design Premises/Criteria

1.0 INTRODUCTION

The architectural design is based on the requirements provided by GASSNOVA in Exhibit E6.1. General Requirements Civil, Structure and Architectural for CO₂ capture facilities at the Karsto Plant.

2.0 GOVERNING CODES AND STANDARDS

2.1

All occupied buildings and/or building areas (including access to and from such locations, e.g., control room and administration area) shall be designed in accordance with the requirements of International Building Code (IBC) 2006, NFPA 59A, Norsok standard C-0002 Architectural Components and equipments (Edition 3, June 2006) and all applicable Norwegian laws and Local codes, standards and regulations listed in exhibit 'E', appendix 'E1.2'..

2.2

All other plant areas will be designed and configured to meet OSHA requirements contained in Part 1910 of the U.S. Code of Federal Regulations.

3.0 FACILITY DESCRIPTION

3.1 PLANT LAYOUT

3.1.1

The Facility will be laid out to accommodate the spaces required for access of the equipment and to maintain and operate the plant. Access aisles and clearances will be provided to accommodate operations and maintenance and equipment removal. The facility will include paved road to access the buildings. Roof access to equipment will be provided for maintenance purposes only.

3.1.2

Provisions will also be made for personnel walkways to equipment (for routine maintenance only), doors, stairs/fixed ladder and other access points. Vertical access hatches will be located to facilitate moving equipment and materials.

3.1.3

Fire separation walls and floors will be provided in accordance with code requirements.

3.1.4

Plant security and life safety features will also be considered in the plant layout.

3.2 BUILDINGS

The various buildings on CO₂ capture plant consist of followings.

- Machinery Buildings includes Flue Gas Bower and CO₂ Compressor Building.
- Chemical Storage Buildings/Rooms (Not required)
- Control Building includes Workshop and Store Building
- Electrical Switchgear Building

- Emergency Diesel Generator Building
- Workshop and Store Building (Part of Control Building)

3.2.1 Machinery Buildings including Flue Gas Blowers and CO₂ Compressor Building

The machinery buildings will be steel frame construction with insulated metal siding and inside liner panel. The roofing will be insulated metal roof panel with insulation and vapor barrier. The floor finish will be troweled finish reinforced concrete slab.

3.2.2 Control Building includes Workshop and Store Building

Exhibit E6.1 indicates that the Control Building and Workshop and Store Building are separate buildings. After reviewing the requirements, we recommend/propose that the building will be better served if both the buildings are combined in one single building. Control, Workshop and Store will be housed under a single building. The building will include administrative office area for operational and maintenance personnel. Also, the building is equipped with services and support listed under exhibit E6.1, item 2.14. which include CCR furniture and equipment, office furniture and equipment, high speed data network, telephone cabling, laboratory furniture, test equipment for instrumentation/electrical, workshop machine and tools, hoist lifts, first aid kits and Kitchen and Social room furniture and equipment.

- The Control, Workshop and Store building will be single story steel frame construction with explosion resistant wall and roof panel. For wall and roof, concrete panels can be used. Windows and exterior doors will be explosion resistant. Insulation and vapor barrier will be used as required. The building will be supported on reinforced concrete spread footings. The building will be designed to withstand accidental loads from explosion and earthquake.
- The building contains control/admin area, workshop and store area. The control/admin area includes main control room area, conference room, offices, general administration and reception area, dining (canteen) room with kitchen facilities and toilet/locker (changing room) /shower facilities for 30 persons.
- Interior walls of the control/admin area will be metal stud construction with gypsum wallboard finish. This area will have suspended acoustical ceiling. Floor finishes will be carpet for all offices, ceramic tiles for toilet/locker/shower areas, access floor system with carpet tile or vinyl dissipated tile finish for the main control room area, and vinyl composition tile for all other areas.
- The floor will be troweled finish reinforced concrete slab and finish with oil resistant floor finish where required. Floor drains will be provided in the locker, rest room areas and workshop and storage area.

3.2.3 Electrical Switchgear Building

The Electrical switchgear building will be steel frame construction with insulated metal siding and inside liner panel. The roofing will be insulated metal panel with vapor barrier. The floor finish will be troweled finish reinforced concrete slab.

3.2.4 Emergency Diesel Generator Enclosure

The emergency Diesel Generator enclosure will have insulated metal siding with inside liner panel. The roofing will be insulated metal panel with vapor barrier.