



Exploration & Production

GENERAL SPECIFICATION

PIPING VALVES VESSELS

GS PVV 113

Block models

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1. Scope

This specification lays down rules for the design, construction, and use of block models for the petroleum units.

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.

The model shall be built in accordance with all drawings issued in connection with the preliminary project, in particular with the following documents:

- Preliminary plot plan drawing of the installation
- Process flow diagrams
- List of equipment
- Preliminary layouts of the main elements of structures, piping, cable routing, etc.
- Equipment data sheets
- General structural drawings (main elements only)
- Layout drawings for escape ways and rescue equipment.

Standards

Reference	Title
Not applicable	

Professional Documents

Reference	Title
Not applicable	

Regulations

Reference	Title
Not applicable	

Codes

Reference	Title
Not applicable	



Other documents

Reference	Title
Not applicable	

Total General Specifications

Reference	Title
Not applicable	

3. Definition of block models

The block model is a three-dimensional tool made in the context of a preliminary design or preliminary project with the purpose of defining the layout of the main items of equipment in accordance with erection, operating, maintenance and safety requirements.

Block models may be built in the following cases:

- Onshore installations:
 - Production units
- Offshore installations:
 - Production platforms
 - Utility platform
 - Living-quarter platforms.

4. Presentation of the model

4.1 Scale

The block model shall be built to 1/50 scale. The use of any other scale must be approved in advance by the COMPANY. This scale shall be represented by at least three mobile models of people supplied with the block model. A scale rule shall be supplied for each block board table.

4.2 Division into plot boards

A drawings showing the installations into plot boards and indicating the numbers and identifications of the plot board tables, shall be prepared from the plot plan drawing so as to meet the following criteria:

- To facilitate handling, the dimensions of a plot board table must not exceed 750 x 1500 mm
- In so far as possible, the equipment constituting a package should be located on the same plot board table
- The limits of the plot board table must not run under an item of equipment or under the centre line of a structural column.

4.3 Plot-board tables

4.3.1 Manufacture

Plot-board tables shall be constructed of 16 mm thick chip-board faced with a smooth mat white plastic.

A frame 80 mm high and 19 mm thick, made of the same material as the plot board tables, shall be provided under each table so as to prevent deformation. This frame shall be mounted 18 mm from the edges of the table to provide finger space for lifting boards. Braces shall be added under the tables if necessary.

Each board table shall be constructed with four removable metal legs adjustable to give a floor to top surface height of 800 mm. The legs shall consist of 25 mm diameter tube painted black. They may also have a square cross-section of equivalent dimensions, and be chrome-plated or made of stainless steel rather than being painted.

4.3.2 Identification and miscellaneous markings

4.3.2.1 On at least one corner board table

- Scale of the model
- Key to the main colours used
- A title block giving the main project information: name of the COMPANY, name of the Engineering Company(ies), the type of unit or installation, and the location of the installation.

4.3.2.2 On each board table

- The identification number of the board table
- North (at the top right of each board table)
- The elevation
- The coordinates of each side.

5. Execution of the model

5.1 Equipment

(Pressure vessels, columns, rotating machines, etc.).

5.1.1 Fabrication

The equipment and vessels shall be fabricated from wood or opaque plastic. Cylindrical equipment shall be modelled from plastic tube in the commercially available size closest to the desired dimensions (insulation is not included). Pumps, compressors, exchangers, etc. shall be modelled in block form representing their external shapes.

Vessel nozzles to the main piping listed in paragraph 5.4 shall be made in simplified form.



5.1.2 Mounting

Large items of equipment shall be solidly attached to the plot board tables by screws or bolts. Medium-size or small items of equipment may be glued directly to the plot board table.

5.1.3 Tagging

5.1.3.1 Alphanumeric identification

Equipment identification numbers shall be shown in letters and digits 6 mm high on labels that shall be glued to the top of equipment in the case of exchangers and to the easiest-to-read side in the case of other equipment.

5.1.3.2 Colours

Equipment shall be dark gray. Furnaces shall be light blue.

5.1.3.3 Other markings

The layout coordinates of the equipment shall be indicated.

5.2 Civil engineering

5.2.1 Buildings

Buildings containing operating equipment (compressors, water treatment, pumping units, etc.) shall be fabricated in cutaway form. Other buildings (control rooms, analysers, power sub-stations, etc.) shall be fabricated in block form with only doors and windows indicated.

Steel portions of buildings shall be dark gray, and concrete ones light gray.

5.2.2 Foundation blocks

The foundation blocks of equipment, structures, platforms, etc. are fabricated in block form of PVC or Plexiglas. The stairways and ladders and the small foundations supporting piping shall not be shown.

5.2.3 Access roads

Access roads shall be shown on the plot board table by solid strips of black adhesive tape.

5.2.4 Underground networks

Underground networks (piping electrical cables, instrumentation tubing, etc.) shall not be shown.

5.3 Structures

5.3.1 Fabrication

Structures shall be fabricated from wooden or plastic parts. Fire-proofed steel structures shall be modelled like concrete beams or columns. To facilitate modelling piping or taking photographs, some structures must be made so that they can be separated, preferably at floor level.



The following elements shall be shown:

- The main platforms, slabs, and floors serving for:
 - Access to vessels
 - Emergency evacuation of personnel (escape ways)
 - Overseeing and operating the main items of equipment
 - Dismantling and maintenance of major equipment (exchangers, compressors, turbines, etc.).

These elements shall be modelled by transparent plastic. Dismantling and servicing areas and areas set aside for future extensions shall be indicated by a black line on the corresponding platform or on the plot board tables themselves. Slabs and floors shall be at least 3 mm thick and platforms at least 2 mm thick.

- Main structural elements: columns and beams (except for stiffening elements)
- The ladders and stairways of the platforms listed above shall be shown in simplified block form (without guard rails, handrails, or safety cages)
- Fixed handling equipment (cranes, monorails, crane runways, etc.).

5.3.2 Mounting

All structures shall be solidly attached to the plot board table by screws or bolts. Small platforms shall be stuck directly to the plot board table.

5.3.3 Colour code

The following colour code shall be used:

- Light gray: Concrete (or fire-proofed) parts
- Dark gray: Steel parts
- Transparent: Platforms, slabs, and floors

5.4 Piping, fittings and valves

5.4.1 Principles of execution

All piping half as large as the maximum diameter of the lines of the installation and larger shall be modelled to scale; other piping shall not be shown in principle.

Repetitive systems of piping (such as several identical modules) shall be shown in full detail only once; the other equipment of the same type shall then be shown in symbolic form (to indicate the outside dimensions).

The tracing and insulation of lines shall not be shown.

All valves and fittings (couplings, flanges, etc.) of the lines to be shown shall be modelled. The orientations of valve hand wheels and actuators shall also be shown. Commercially-available components shall be used for the valves and fittings; when no standard material can be used, parts shall be made to scale.

5.4.2 Mounting

All piping elements shall be assembled by sticking. For sticking to painted parts, the paint shall be scraped away before sticking.

When piping is cut by a division into boards, transparent plastic racks shall be installed to support the lines. Dummy supports made of transparent plastic shall be provided to assure the adequate rigidity of the piping installed on the models.

5.4.3 Tagging

5.4.3.1 Identification

All lines shall be identified by their numbers, which shall be marked on self-adhesive labels affixed to the corresponding piping. Horizontal labels shall be grouped and shall be perpendicular to the nearest edge of the board; vertical labels shall be grouped so that they can be read from bottom to top.

The arrow-shape of the labels shall be used to indicate the direction of fluid flow.

5.4.3.2 Colour code

The following colours shall be used:

- Red: Fire piping
- Yellow: Process piping
- Blue: Utility piping
- Black: Existing piping
- Silver: Future piping
- Gray: All valves (except for instrumentation)
- White: Hook-up piping between the various modules to be installed on the platform

5.5 Electricity

Electrical equipment is shown in the form of plastic blocks representing their external shapes. The above-ground routing of large bundles of cables shall be shown by batch-colored Plexiglas; the individual cables shall not be shown.

The following equipment must be installed:

- Transformers
- Major electrical panels located outside
- The local control panels of major equipment.

The colour used shall be **green**.

5.6 Instrumentation

Instrumentation buildings (analysers or others), panels and cabinets shall be represented by blocks of plastic to scale.

The above-ground routing of bundles of instrumentation cables shall be shown by batch-colored Plexiglas; the individual cables shall not be shown.



Measurement instruments that require a special layout study because of their dimensions must be shown.

The air-instrument and process connections of the instruments shall not be shown.

The colour used shall be **pink**.

6. Approval

Approval of the block model shall cover the following points:

- Confirmation of the relative positions of the main items of equipment and structures
- Accessibility and ease of operation
- Ease of erection (hoisting problems)
- Safety (special access roads)
- Maintenance
- Radius of action of the hoisting apparatus mounted on the platforms
- The possibility of grouping various sets of equipment into modules (compressors, turbines, separators, manifolds, etc.)
- Hook-ups to be made on the platform after erection of the modules.

After the final comments, the model shall be fully updated to take account of all changes approved by the COMPANY.

Colour photographs of each plot board and overall views of plot boards together shall be taken after each review.