

GENERAL SPECIFICATION

CONCEPTION AND SAFETY ENGINEERING

GS EP ICS 001

2D CAD Layouts

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1. Scope

1.1 Purpose

This specification defines the minimal requirements to be applied for the general organisation and configuration of Layout drawings created by means of Computer Aided Drawing (CAD) software.

The purpose of this specification is to achieve uniformity and productivity through consistent use of frame sheets, layers, text, dimensions, line types, colours & layouts.

This specification aims to obtain standardized CAD documents, through all the project phases, allowing simplified exchange and rational use of CAD documents between the Contractors and the Company.

1.2 Applicability

This specification is **not** retroactive.

This specification shall apply to all 2D CAD Layouts drawings deliverables produced by the Contractors, its sub-Contractors and Vendors during project definition phases (preliminary, conceptual, pre-project) and unless otherwise stipulated during project execution phases (Basic/FEED and detailed engineering stages) and field operation phases.

This specification shall apply to onshore and offshore Greenfield and Brownfield projects.

2. Reference documents

The reference documents listed below form an integral part of this General Specification.

External Documents

Unless otherwise stipulated, the applicable version of these documents, including relevant appendices and addendums, is the latest revision published at the effective date of this document.

Reference	Title
ISO 128-20	Technical Drawings – General principles of presentation
ISO 7200	Technical product documentation - Data fields in title blocks and document headers
ISO 3098-0	Technical Product Documentation - Lettering - Part 0: General Requirements
ISO 5457	Technical product documentation - Sizes and layout of drawing sheets
ISO 5455	Technical Drawings - Scales
ISO 129-1	Technical drawings - Indication of dimensions and tolerances

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Unless otherwise stipulated, the applicable version of these documents, including relevant appendices and addendums, is the latest revision published.

Reference	Title
GS EP DEV 001	Asset Objects Tagging
GS EP ICS 002	2D CAD Process Schematics
GS EP ICS 004	3D CAD Models
GS EP ICS 005	3D CAD Model Administration & Catalogues
GS EP PJC 701	Documents identification & numbering at project execution and field operations phases
GS EP PJC 702	Documents requirement at project execution and field operations phases

3. Terminology

3.1 Definitions

There are five types of **statements** in this specification, the “shall”, “should”, “may”, “can” and “must” statements. They are to be understood as follows:

Shall	Is to be understood as mandatory. Deviating from a “shall” statement requires derogation approved by Company.
Should	Is to be understood as strongly recommended to comply with the requirements of the specification. Alternatives shall provide the same level of protection or performance and this shall be documented.
May	Is to be understood as permission.
Can	Is to be understood as a physical possibility.
Must	Expresses a regulatory obligation

Note that “will” is not to be understood as a statement.

The following terms as defined below have been used throughout this specification.

Company	TOTAL S.A.
Contractor	Entity that enters into a contract with the Company
Document	Pieces of information gathered for a specific goal on a support identified by a unique reference. It comprises the information and its support. A document may include one or more electronic files. A document itself may include one or more documents (e.g. a Study with appendices)

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Drawing	All graphical representation with a technical purpose and applicability issued during a project
Facility	Onshore Process Plants, Offshore Production platform, Semi-submersibles, Floating units (FPSO, FPU, etc.) operated by Company
File Format	Form in which information is coded in an electronic file. Format is determined by the software used to create it and usually indicated by the file extension: *.dwg, *.plt, etc.
Layout Drawing	A layout drawing depicts design development requirements by presenting pictorial, notational, or dimensional data to the extent necessary to convey the design solution used in preparing other engineering drawings such as conceptual design layout (to present one or more solution for meeting the basic design parameters and to provide a basis for evaluation and selection of an optimum design approach), design approval layout (to present sufficient detail of the design approach for cost estimating and design approval) or detailed design layout (depicting the final development of the design in sufficient detail to facilitate preparation of detail and assembly drawings)
Symbol	All conventional sign used in writing, drawing or printing to represent equipment of facilities or infrastructures on PFDs, P&IDs, etc.
Title Block	A box shown on a document or a drawing relating to ownership, identification and numbering of said document / drawing
3D CAD System	Software used for 3D modelling and further automatic production of 2D drawings.

3.2 Abbreviations

CAD	Computer Aided Design
E3D2	Everything 3D (AVEVA)
FEED	Front End Engineering Design or Basic Engineering
FPSO	Floating Production Storage and Offloading
FPU	Floating Production Unit
HVAC	Heating, Ventilation and Air Conditioning
PDMS	Plant Design Management System (AVEVA)
PFD	Process Flow Diagram
P&ID	Piping & Instrumentation Diagram

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TMP	TOTAL Master Project (Catalogue project developed for AVEVA tools)
DEPT	AVEVA Administrative Elements Department for Drawing
REGI	AVEVA Administrative Elements Registry for Drawing

4. 2D CAD Software

The nominated CAD software authorized by the Company for the production of 2D CAD Layouts Drawings is defined in Table 1.

	2D CAD SOFTWARE	PERMISSIBLE VERSION	SUPPLIER	COMMENTS
2D Layout Engineering Drawings With available 3D CAD Model	DRAW module of E3D2	E3D2	AVEVA	The administration of E3D2 DRAW is further described in GS EP ICS 005 .
2D Layout Engineering Drawings Without available 3D CAD Model	AutoCAD	2014	AUTODESK	Higher version may be used by Contractor considering the requested handover version requested by Company

Table 1 – Authorized 2D CAD software

The use of AutoCAD for 2D Layout Drawings production is only authorized, upon Company's explicit request, during Brownfield project definition phase without available 3D CAD Model or Point Clouds. Otherwise 2D Layout Drawings shall always be produced from a 3D CAD system.

In the case 2D CAD layout deliverables are produced from a 3D CAD system, then the corresponding databases shall adhere to the requirements specified in **GS EP ICS 004** & **GS EP ICS 005**.

Whatever software used for production of 2D CAD layout drawings, AutoCAD native files shall be supplied to the Company in ***.dwg AutoCAD 2013 compatible format only**. Other native 2D CAD formats shall not be used without authorisation of the Company.

If the Contractor uses special modules of AutoCAD or E3D2 for deliverables, the names of such modules shall be specified and authorized by the Company and the corresponding database, configuration and specific files, if exist, shall be handed over to the Company.

In order to avoid loss of quality at handover, conversion between 2D CAD formats is not recommended. However, if conversion or redrafting is required and granted by the Company, which will be in this case on the Contractor's responsibility, the final hand over drawings shall adhere to all requirements of current specification regarding 2D CAD drafting.

The Contractor shall use licensed software only, the Company reserves right to require information regarding the licenses for the 2D CAD drafting software.

5. Layout Drawings Frame & Title Block

5.1 Generalities

All the 2D CAD Layout drawings issued to the Company shall comply with [ISO 5457](#) requirements accordingly to the template drawing frame and title block format defined in this section. The corresponding AutoCAD native *.dwt template file is embedded in **Appendix 1** and shall be used by Contractors for Layout drawings production using AutoCAD software.

The Layout Drawing Frame is defined as per Figure 1.

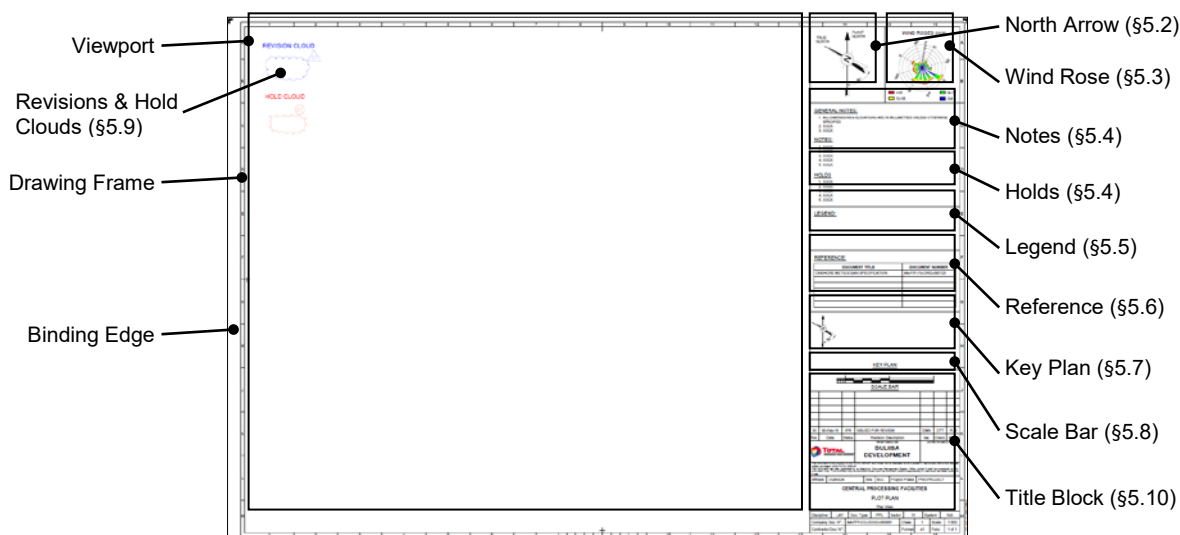


Figure 1 – Layout Template Frame

The arrangement and corresponding allocated space for information above the Title Block (**section 5.2 to section 5.8**) are provided in the Company's template for recommendations only. It is the Contractor's responsibility to adapt this drawing's area in accordance with drawing's specificities and project's needs.

5.2 Orientation

The orientation of all Layout plan view drawings shall be shown by means of a North Arrow indicating Plant/Platform North direction against True North.

The North arrow shall be positioned preferably in the upper right corner of drawings on the right side of the viewport.

In some cases, in order to increase the usable space on the right of the viewport (for Current Roses, Notes, Holds, etc.) it is allowed to place the North Arrow in the upper left corner of the viewport.

All plan views on a single drawing, or group of drawings shall be orientated coincidentally.

All layout drawings shall be drawn with Plant/Platform North orientated vertically upwards.

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5.3 Wind and Current Roses

The Wind Roses and when applicable the Current Roses shall obligatorily appear on any plan view layout drawings. The Wind and Current Roses shall be positioned in the upper right corner, on the right side of the viewport.

The Wind and Current Roses shall precisely indicate all speed, frequency and direction information. The indication of prevailing wind and/or current direction by the mean of a single arrow is not tolerated.

The Wind and Current Roses shall be orientated in accordance with True North direction with regard to Plant/Platform North direction.

5.4 Notes & Holds

Drawing notes shall be positioned in a column at the right hand side of the drawing viewport above the title block and above any holds.

Holds shall be positioned in a column at the right hand side of the drawing viewport immediately below the notes.

Notes & Holds shall be numbered sequentially and should, as far as possible, refer to specific numbered details on the drawing.

5.5 Legend

When applicable the meaning of line types and hatching used in the drawing shall be specified in a dedicated Legend area positioned on the right hand side of the viewport below Notes and Holds.

5.6 Reference Drawings

Reference drawings shall be tabulated in a dedicated Reference Drawing section on the right hand side of the drawing's viewport. Tabulation shall be from the bottom upwards and shall include drawing numbers, titles and revisions.

5.7 Key Plan

The Key Plan shall be located at the right hand side of the drawing's viewport.

The Key plan shall be shown as a block (or for AutoCAD case as a special viewport with only required layers turned ON) and be as light as possible in order not to overload the drawing size.

For the Layout drawings generated from a 3D CAD system, it is appreciated to add an isometric view of the overall asset that can either replace the plan view key plan or be added in the upper right corner of the viewport.

5.8 Scale Bar

A Scale Bar shall obligatorily appear on any layout drawing, positioned just above the Title Block.

The breakdown of the scale bar shall be relevant to the drawing scale and length indication shall be integer values.

The Scale Bar shall be shown as a block, and it is authorized for AutoCAD to have it displayed from the **Model Space** instead of having it in the **Paper Space**.

5.9 Revisions & Hold Clouds

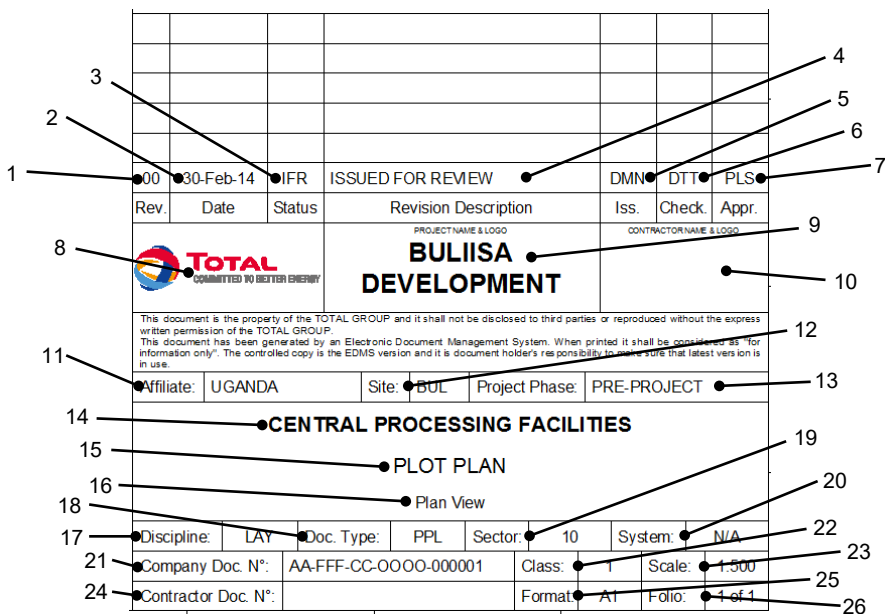
All revisions to the drawings which have been previously and officially issued shall be shown with a Revision Cloud around the changed area and a revision triangle symbol in accordance with [ISO 128-20](#). Examples of revision cloud and triangle are given on drawing templates attached to this specification.

A specific attention must be given to cloud drawing so that the extent of the revision is clearly shown and that the cloud does not include portions of the drawing which have not been revised. Previous revision symbols and clouds shall be removed and only clouds associated with the current revision shall be shown when the drawing is reissued.

Similarly, all graphical and text information which is currently considered "ON HOLD" at the time of the drawing issue should be shown in Hold Cloud together with hold circle. Examples of hold cloud and hold circle are given on the drawing templates attached to this specification.

5.10 Title Block

The Title Block to be used for 2D CAD Layout drawing shall comply with [ISO 7200](#) requirements and shall follow the arrangement defined in Figure 2.



1	00	30-Feb-14	IFR	ISSUED FOR REVIEW	DMN	DTT	PLS
2	Rev.	Date	Status	Revision Description	Iss.	Check.	Appr.
3	PROJECT NAME & LOGO			CONTRACTOR NAME & LOGO			
4	BULIISA DEVELOPMENT						
5	This document is the property of the TOTAL GROUP and it shall not be disclosed to third parties or reproduced without the express written permission of the TOTAL GROUP. This document has been generated by an Electronic Document Management System. When printed it shall be considered as "for information only". The controlled copy is the EDMS version and it is document holder's responsibility to ensure that latest version is in use.						
6	Affiliate:	UGANDA	Site:	BUL	Project Phase:	PRE-PROJECT	
7	CENTRAL PROCESSING FACILITIES						
8	PLOT PLAN						
9	Plan View						
10	Discipline:	LAY	Doc. Type:	PPL	Sector:	10	System:
11	Company Doc. N°:	AA-FFF-CC-0000-000001	Class:	1	Scale:	1:500	
12	Contractor Doc. N°:		Format:	A1	Folio:	1 of 1	

Figure 2 – Title Block

The content of the Title Block is defined in the Table 2.

	DESCRIPTION	AutoCAD LABEL	E3D2 Element	E3D2 ATTRIBUTE or UDA	FORMAT	COMMENT
1	Revision	REV_X*	REVI (i)	Rvsnumber	2 digits	In accordance with §6.2 of this

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	DESCRIPTION	AutoCAD LABEL	E3D2 Element	E3D2 ATTRIBUTE or UDA	FORMAT	COMMENT
	Number		of sheet			specification at Project definition phase and GS EP PJC 702 at Project execution phase.
2	Revision Date	DATE_X*	REVI (i) of sheet	Revdate	dd-Mmm-yy	Eg. 30-Feb-14
3	Status Code	STAT_X*	REVI (i) of sheet	:TMPRevStatus	3 characters	In accordance with §6.2 of this specification at Project definition phase and GS EP PJC 702 at Project execution phase.
4	Revision Description	REV_MEMO_X*	REVI (i) of sheet	Stext	25 characters	Eg. ISSUED FOR REVIEW 1 (IFR1)
5	Issuer Trigram	ISSUE_X*	REVI (i) of sheet	Rvauthor	3 characters	Generally first letter of the name, then first and last letter of the surname
6	Checker Trigram	CHECK_X*	REVI (i) of sheet	Checker	3 characters	Generally first letter of the name, then first and last letter of the surname. Checker shall be different from Issuer
7	Approver Trigram	APPROV_X*	REVI (i) of sheet	Approver	3 characters	Generally first letter of the name, then first and last letter of the surname. Approver shall be different from Checker and Issuer
8	Company Name & Logo					Provided in the AutoCAD template of this specification
9	Project Name & Logo	PROJECT_TITLE	DRWG	:TMPProject Title	30 characters on 2 lines maximum	Provided by Company. This attribute shall always be filled even if a logo is used. In this case the attribute may be hidden to not overlap with the logo.
10	Contractor Name & Logo	CTR_NAME	DRWG	:TMPCTRName	15 characters	Preferably as a vector graphic. This attribute shall always be filled even if a logo is used. In this case the attribute may be hidden to not overlap with the logo.
11	Affiliate Name	AFFILIATE_NAME	DRWG	:TMPAffiliate Name	15 characters	Provided by Company
12	Site Code	SITE	DRWG	:TMPSite	3 characters	Provided by Company
13	Project Phase	PROJECT_PHASE	DRWG	:TMPProject PhaseName	15 characters	Eg. PRELIMINARY, SCREENING, CONCEPTUAL, PRE-PROJECT, BASIC, FEED, DETAIL DESIGN, DEBOTTLENECKING, etc.
14	Drawing Title 1	DOC_TITL	DRWG	Title	35	Generally indication of the drafted

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	DESCRIPTION	AutoCAD LABEL	E3D2 Element	E3D2 ATTRIBUTE or UDA	FORMAT	COMMENT
		E_ENG_1			characters	element (eg. Wellpad, Cellar Deck, Liquefaction Module, etc.)
15	Drawing Title 2	DOC_TITL E_ENG_2	SHEET	Title (before “-“)	45 characters	Generally the type of drawing (eg. Overall Plot Plan, Unit Layout, etc.)
16	Drawing Title 3	DOC_TITL E_ENG_3	SHEET	Title (after “- “)	45 characters	Optional, generally indicates view type or information of studied cases during conceptual study
17	Discipline Code	DISC	DRWG	:TMPDiscCo de	3 characters	In accordance with GS EP PJC 701
18	Document Type	TYPE	DRWG	:TMPDocTyp e	3 characters	In accordance with GS EP PJC 701
19	Sector Code	SECTOR	DRWG	:TMPFacility Sector	2 digits	In accordance with GS EP DEV 001
20	System Code	SYS	DRWG	:TMPSystem	1 digits	To be featured when relevant, in accordance with GS EP DEV 001
21	Company Document Number	CPY_DOC _REF	DRWG	:TMPCountry Name :TMPSite :TMPFacility Sector :TMPOriginat orCode :TMPCPYSe qNum	21 characters (including 6 digits)	In accordance with GS EP PJC 701
22	Document Acceptance Class	CLASS	DRWG	:TMPClassN um	1 digit	In accordance with GS EP PJC 702
23	Drawing Scale	SCALE	VIEW		6 digits	Eg. 1:2500 Automatically filled for E3D2 with the scale of the first view of the sheet
24	Contractor Document Number	CTR_DOC _REF	DRWG	:TMPCTRDo cNum	25 characters and/or digits	Defined by Contractor
25	Drawing paper format	FORMAT			1 character & 1 digit	Imposed to A1 for Layout drawings
26	Folio Number	SHEET			8 characters	Eg. 1 of 3 Automatically filled for E3D2 with the rank of the sheet in the drawing
27	ICS Document Number	ICS_DOC_ REF	DRWG	:TMPCountry Name :TMPICSFiel dCode :TMPICSStu dyNum :TMPICSDw	20 characters (including 11 digits)	For Company Internal use.

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DESCRIPTION	AutoCAD LABEL	E3D2 Element	E3D2 ATTRIBUTE or UDA	FORMAT	COMMENT
			gType :TMPICSSeq Num		

X*: X varies from 0 to 9, allowing up to 10 revisions of the drawing

Table 2 – Title Block Content

6. General Requirements for 2D CAD Layouts

6.1 Drawings Execution General Guidelines

The limits of a drawing depend on the size and the scale of the drawing. Details shall be represented within one drawing when possible following the enlargement or reduction scale ratio proposed in **Appendix 3**. If a layout needs to be split into several drawings because it cannot fit into one drawing, it shall be done in several sheets within a single document. It should be avoided to create different documents when different sheets could be used (e.g. deck layouts of a module). This requirement aims to reduce amount of comments, which in this case would be done only once in a single document.

6.2 Revision cycle

The following section is only applicable during project definition phases (preliminary, conceptual, pre-project) as the revision cycle for project execution phases (Basic/FEED and detailed engineering stages) is already defined in **GS EP PJC 702**.

The revision cycle flowchart presented in Figure 3 can be divided into three (3) stages:

- A start-up phase allowing the Company to prepare a start-up package of documents and information necessary to conduct the drafting activities
- A convergence phase allowing the Company to ensure conformity of the drawing with regard to initial requirements through internal revisions
- An issue phase allowing official issue of the drawing to the Company

The internal revision (IDC: Internal Disciplines Check) during the convergence phase shall use an alphanumeric revision number:

- AA→BB→CC→etc. for new drawings
- 0A→0B→0C→etc. for drawing previously officially issued

The official revision shall only use a numeric revision number:

- 00 for new drawings (IFR: Issued For Review)
- 01, 02, 03, etc. for drawing already officially issued (IFR1, IFR2, IFQR: Issued For QR, AFS: Approved For Study, etc.)