

GENERAL REQUIREMENTS FOR DRAWING PREPARATION

1. SCOPE

1.1 Intent. This specification establishes requirements for the uniform preparation of working drawings and "as-built" drawings using various referenced standards. Drawing preparation may include revision of existing drawings and complete drafting of new drawings (including completely new drawings that didn't previously exist and new drawings that are redrawn from existing drawings).

2. REFERENCES

COAST GUARD DRAWINGS

None.

COAST GUARD PUBLICATIONS

Coast Guard Commandant Instruction (COMDTINST) M9085.1B, Oct 2004, Naval Engineering Computer Aided Design Standards

OTHER REFERENCES

American Society of Mechanical Engineers (ASME) Y14.1, 2005; Drawing Sheet Size and Format

American Society of Mechanical Engineers (ASME) Y14.2, 2008; Line Conventions and Lettering

American Society of Mechanical Engineers (ASME) Y14.3, 2003; Multi and Sectional View Drawings

American Society of Mechanical Engineers (ASME) Y14.38, 2007; Abbreviations and Acronyms

American Society of Mechanical Engineers (ASME) Y14.5, 2009; Dimensioning and Tolerancing

American Welding Society (AWS) A2.4, 2007; Standard Symbols for Welding, Brazing and Nondestructive Testing

MIL-D-23140, April 1992; Drawings, Installation Control for Shipboard Electronics Equipment

MIL-PRF-5480, July 1998; Data, Engineering and Technical, Reproduction

MIL-STD-22, Mar 1991; Welded Joint Design

MIL-STD-25, Dec 1990; Ship Structural Symbols for Use on Ship Drawings

MIL-T-31000, July 2004; Technical Data Packages, Specifications For

NAVSEA Drawing No. 53711-803-5001049, July 1989; Piping System Symbols and Abbreviations

NAVSEA Publication S0300-AT-GTP-010/ESL, 1988; Standard Electrical Symbol List Ships

3. REQUIREMENTS

3.1 Types of drawing preparation. The Contractor shall be aware that the Coast Guard will provide the Contractor direction in the tasking document. Generally, tasks will fall into the following categories:

3.1.1 New drawings. All new drawings shall be prepared in CAD format, in accordance with COMDINST M9085.1 and all of the above cited references that apply to a particular drawing. The following additions/exemptions to COMDINST M9085.1 are made:

3.1.1.1 Drawings may be prepared in CAD software, but the completed drawings must be submitted, one sheet per file, in the latest AutoCAD .dwg format, along with copies of all files used in the preparation of the drawing sheets, including any product models.

3.1.1.2 Paragraph 3.2.1 (Revision of Master Drawings only) of this standard specification shall govern drawing sheet size.

3.1.1.3 Drawings prepared by Contractors shall use the example title block Figure 3-11 of COMDINST M9085.1 to develop their title blocks for use on USCG drawings.

3.1.1.4 Single drawings associated with a single cutter may be hand drawn if specifically authorized by the tasking document.

3.1.2 Revisions to existing drawings. Revisions may be completed on U.S. Coast Guard supplied master mylar drawings, tracings, or sepias, or, in cases where drawings exist in CAD format, an AutoCAD file will be provided and "revision" shall be completed in accordance with COMDINST M9085.1, with further guidance provided by this standard specification.

3.2 Standard revision practices. The following standard drawing revision practices shall be observed. These practices are generally in accordance with MIL-T-31000. Additional information may be found in those documents or commercially prepared compilations of those documents for industry use. Graphite pencils shall not be used to revise or correct an inked or photographically reproduced drawing on polyester film. Plastic pencils of the type designed for use on polyester film, or similar film base drafting material, may be used for making revisions on the film. Revisions made to selected record drawings shall be in black drawing ink.

3.2.1 Revision to Master Drawings only. Revising a reproducible copy results in the generation of a duplicate drawing and often leads to confusion. Master Drawings shall be stamped in red ink with the following note: THIS DRAWING IS THE MASTER DRAWING ONLY IF THIS NOTE IS IN RED INK (not all master drawings in the Coast Guard's files have been stamped yet). If this stamp is not in red ink, or if a stamp is present saying "FILE COPY", or "SFLC COPY", do not revise without specific direction from SFLC. A DRAFT revision to a drawing may be prepared on a reproducible copy (or on a print copy) only if that copy's title block is hatch-marked out and a large-lettered flag stating: "UNOFFICIAL DRAWING: FOR DRAFT REVISION PURPOSES ONLY" is prominently displayed immediately adjacent to the hatched-out title block.

3.2.2 Retention of historical data. Revisions shall be prepared so as to retain as much of the previously-shown data as possible. Ideally, it should be possible to reconstruct the previous version of the drawing simply by undoing the changes described in the revision column. Thus the revision column itself should detail every change made, using wording that describes the change as accurately as possible, such as "ADDED DETAIL 9-F", "DELETED REF 16", or "RV-7 SET PRESS WAS 60 PSI". Note in the last case that it would be redundant to say "CHANGED RV-7 SET PRESS FROM 60 TO 75 PSI", because the body of the drawing already shows the set pressure as 75 psi. Data should be hatched-out (not erased, unless the revision column will document the previous data) and redrawn in another place. It is important to retain the previously-shown data because it may be years before a ShipAlt is actually accomplished aboard a cutter, and the operators and maintenance commands must have information that depicts their actual shipboard configuration in the meantime.

3.2.3 Reason for revision. The revision column shall begin by documenting the reason for the revision, such as "TO SUIT SHIPALT (number if known) TO REPLACE BEARING MATERIAL."

3.2.4 Additional sheets. An effective way to revise a drawing is to add one (or more) new sheets. This approach is especially effective when large portions of a drawing must be redrawn. The old portions are simply hatched out, and the new sheet(s) can then be drawn in AutoCAD. This approach also retains the old data for historical purposes.

3.2.5 Revision status.

3.2.5.1 On drawings that consist of more than one sheet, it is common practice for each sheet to carry its own revision designator, i.e. all sheets of the drawing do not necessarily carry the same revision, so that only the affected sheets need to be issued when revised. Sheet 1 always carries the last revision letter, while each remaining sheet carries the revision letter associated with the last revision that happened to affect that particular sheet. The revision letter on any sheet (except sheet 1) can therefore skip letters, such as from D to G.

3.2.5.2 Accordingly, the first sheet of a multi-sheet drawing shall have a Revision Status Table, which shall indicate the revision letter of each sheet of the drawing. A Revision Status Table shall be added if needed to all multi-sheet drawings whenever the drawing is revised for other reasons. With each revision to any part of the drawing, the revision status of sheet 1 shall be updated to the next sequential letter. Likewise, the revision letter of each affected sheet shall be updated to the same letter as sheet 1, and finally the Revision Status Table shall be updated. The revision letter of unaffected sheets shall not be changed.

3.2.5.3 The revision designator for a drawing shall be identified by an upper case letter or letters. The first revision shall be identified by "A", the second revision by "B", and so forth. Successive changes shall use the next sequential letter, except that the letters "I", "O", "Q", "S", "X", and "Z" shall not be used. Upon exhaustion of the alphabet, the next sequential revisions shall be "AA", "AB", etc., and then "BA", "BB", etc.

3.2.5.4 Where numbers have been used instead of letters for revision designators, the use of numbers shall be continued.

3.2.6 Revision block.

3.2.6.1 All revision notes for a multi-sheet drawing shall be placed in one revision block or column, beginning on Sheet 1 and continuing to other sheet(s) as needed for space. In addition to revision details, the revision note shall identify the sheet number and applicable panel. However, if existing revisions to a drawing have been noted on the individual sheets, that practice may continue as long as a bold print note on Sheet 1 identifies that "REVISION NOTES ARE DETAILED ON INDIVIDUAL SHEETS". This latter practice shall not be used for revisions to new or previously-unrevised drawings.

3.2.6.2 A triangular revision symbol or identifier shall be placed adjacent to all revised areas, except where the entire sheet has been added by revision. The triangular symbol shall contain the appropriate revision letter. Where multiple items are being revised under the same revision, each item or group of items shall be identified with a superscript number outside the revision symbol that relates to the revision notes in the revision block.

3.2.7 Multi-cutter drawing applicability. Drawings applicable to more than a single cutter may be revised only if changes made do not result in the loss of information describing other cutters. Drawings may include alternative details applicable to different cutters if the applicability is clearly indicated and no alternative detail applicable to any other cutter is erased or crossed out.

3.3 When to revise, supersede, or create new drawing.

3.3.1 Revise an existing drawing if extent of drawing changes are minor and the old data can be easily retained as explained in paragraph 3.2.2 Adding additional sheets to a drawing (see 3.2.4) also applies here.

3.3.2 Supersede an existing drawing if extensive revisions are required, if the quality of the existing Master Drawing is poor (torn, faded, smeared, etc.), or if conversion (digitalization) of the drawing to AutoCAD is in order. The following steps shall be followed:

3.3.2.1 The (old) superseded Master Drawing shall have its title block hatched out, and a bold flag near the title block shall state: THIS DRAWING IS SUPERSEDED BY USCG DWG(S) XYZ. Increase this drawing's revision letter by one letter.

3.3.2.2 The (new) superseding Master Drawing shall carry a new USCG drawing number as assigned by USCG SFLC-ESD-TECH INFO, and provided to the Contractor by the requiring office. The superseded drawing title, approval names (text format) and approval dates shall be carried over to the new drawing. The new drawing shall be a "clean" drawing; i.e. revision symbols, cross-outs, and the revision block from the old superseded drawing shall not be reconstructed on the new superseding drawing. The following bold face note shall be placed immediately adjacent to the title block: THIS DRAWING SUPERSEDES USCG DWG XXX. The original issue of this drawing shall be REV A, and the revision column shall begin as follows: THIS DRAWING WAS CREATED BECAUSE (give reason). If redrawn with substantive change from what was shown on the superseded drawing, describe the change and the reason for the change in the revision column as per normal revision practices. The revision approval date shall be the current date.

3.3.2.3 If the superseding drawing is a re-draw of a vendor-furnished drawing, retain as much of the original title block as possible, including the vendor's original drawing number, all rights legends and any corporate information. Revisions by the vendor shall be kept separate from revisions by the Coast Guard.

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3.3.3 Create a new drawing with a new USCG drawing number if the data to be presented involves an entirely new system, new equipment or cannot otherwise be appropriately integrated (by revision or by being superseded) into the existing drawing set. For drawings applicable to an entire class, add the note "This is a Class Drawing developed from a shipcheck of _____ <name cutter>. Intended applicability to other cutters must be verified."

3.4 Cancellation of drawings. If a drawing no longer contains any currently useful or applicable information, such as an entire system being removed from a cutter, the Coast Guard may authorize cancellation of the drawing. Hatch mark out the title block and place the following bold face note immediately adjacent to the title block: **THIS DRAWING HAS BEEN CANCELLED**. Increase the revision letter by one letter, and give the reason for the drawing cancellation in the revision column.

3.5 Revisions when Master Drawing is unavailable. This situation arises for example when Master Drawings have not yet been received from the shipbuilder, and changes need to be made to certain systems.

3.5.1 A single, new Master Drawing for each appropriate set of drawings shall be created for the purpose of documenting needed changes. This new Master Drawing will be available for depicting various needed changes until the complete Master Drawings are received from the shipyard.

3.5.2 The title of this new Master Drawing shall be "CHANGES TO VARIOUS DRAWINGS", and the following note shall be displayed prominently on it's face: "THIS DRAWING WAS CREATED FOR THE PURPOSE OF DOCUMENTING CHANGES TO VARIOUS SYSTEMS AND EQUIPMENT WHICH WERE DETERMINED TO BE NECESSARY WHEN THE ORIGINAL MASTER DRAWINGS WERE NOT AVAILABLE FOR REVISION." The USCG drawing number for this new Master Tracing shall be (Cutter Class Number) WXXX 085-100.

3.5.3 This new Master Drawing (which may grow to many sheets) shall be used to depict changes to any and all systems and equipment regardless of the SWBS grouping of the system or equipment being changed. The drawing will serve as a single "place" where all such needed changes can be documented.

3.5.4 This Master Drawing shall be used to depict the needed changes in the most practical manner, by recreating only as much of the (absent) system drawing as necessary to understand the modification(s) that is to be made.

3.5.5 It is mandatory that this new Master Drawing make reference (by drawing number in a List of References on Sheet 1) to the (absent) system drawing. The List of References will be used as a "tickler" to update the absent Master Drawings when received. In addition, a note shall state: "This change was developed based on information shown at Revision "X" of reference (Y)."

3.5.6 When the (previously-absent) Master Drawings become available, it will only be necessary to pull the affected drawings and revise them as follows: Place the following note immediately adjacent to the title block: "FOR CERTAIN REVISIONS TO THIS DRAWING, SEE USCG DWG WXXX 085- 100." If time permits and it is feasible, the changes can actually be incorporated by revision, in which case the related portions of WXXX 085-100 should be hatched out to minimize confusion.

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3.6 General drawing practices.

3.6.1 Drawing sheet size. Drawing sheet sizes shall be Size "A", "B", "C", "D", and roll type "H" as indicated in Table 1 which is extracted from ANSI Y14.1.

TABLE 1 – STANDARD DRAWING SHEET SIZES

SIZE DESIGNATION	WIDTH (IN)	LENGTH (IN)*	MARGIN (IN)*	
			Hor.	Vert
A	11.0	8.5	0.25	0.38
B	11.0	17.0	0.38	0.62
C	17.0	22.0	0.75	0.50
D	22.0	34.0	0.50	1.00
H	28.0	44.0(min)/88.0 (max)*	0.50	0.50

* Not including added protective margins (See paragraph. 3.2.3.2)

⊗ Roll type "H" drawings (28-inch high) shall have a maximum length of 88 inches. Exception: Lines Drawings and Booklet of Plans, which cannot meet this requirement, shall have a maximum length of 132-inches

* All existing drawings, including those that are to be renumbered and resubmitted, are exempt from the length requirements, except for existing Roll Type "G" (11-inches high) - material on these drawings shall be redrawn in conformance with the new specified drawing requirements

3.6.2 Prints of drawing and reproduction. Prints of drawings shall be folded to a size of 11-inches vertical by 8-inches horizontal, with the title block exposed in the lower right-hand corner, unless otherwise directed. Reproduction shall be in accordance with MIL-D-5480.