

GENERAL REQUIREMENTS FOR DRAWING PREPARATION

1. SCOPE

1.1 Intent. This specification establishes requirements for the uniform preparation of working and "as-built" engineering drawings using various Coast Guard adopted industry specifications and standards. The scope of "Drawing Preparation" may include either the revision of existing drawings to reflect configuration changes or the development of new drawings to document new configuration information. New drawing development includes both new drawings that didn't previously exist as well as new drawings that are redrawn using the geometry from existing drawings.

1.2 Acronyms and term definitions. Below are definitions of various acronyms and terms that are used in this standard or may be encountered in work item specifications.

- **CAD**: Computer Aided Design
- **CG-LIMS**: Coast Guard Logistics Information Management System
- **EC/TCTO**: Engineering Change/Time Compliance Technical Order
- **ESD-TIMB**: Engineering Services Division, Technical Information Management Branch
- **SFLC**: Surface Forces Logistics Center
- **SRD**: Select Record Drawing
- **STIP**: Surface Technical Information Portal

2. REFERENCES

COAST GUARD DRAWINGS

None

COAST GUARD PUBLICATIONS

Coast Guard Commandant Instruction (COMDTINST) M9000.6 (series), Naval Engineering Manual, Chapter 085

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

OTHER REFERENCES

None

NOTE

In the event of a conflict between the information or options presented in any other drawing discipline specific reference typically used as an industry standard or cited within Coast Guard Commandant Instruction (COMDTINST) M9085.1(series), Naval Engineering Computer Aided Design Standards, SFLC Standard Specification 0850 must take precedence.

3. REQUIREMENTS

3.1 Drawing line items. The Coast Guard will provide the Contractor with direction and scope within the contractual documentation. Generally, tasks will fall into the following categories:

3.1.1 New drawings. All new drawing source files must be prepared in a CAD format. New drawings will be developed in accordance with SFLC Standard Specification 0850 and when necessary, utilize any of the additional references cited above that apply to a particular drawing.

3.1.2 Drawings may be prepared in any CAD software, but the completed drawings must be submitted, in single-file, multi-sheet format, and delivered in the AutoCAD “.dwg” file extension format, compatible with AutoCAD version 2016 or earlier. Submittals must include copies of all files used in the preparation of the drawing sheets, including any product models. Drawings may be distilled from a 3D model into the specified AutoCAD 2-Dimensional format if they meet these same provisions.

3.1.3 When in the design phase, all drawings must begin with a revision designation of “1”. Subsequent iterations or resubmissions must have the revision designation incremented numerically. All numeric revision write-up and triangles will remain until the drawing is completely approved by the CG. At that time, the drawing must have all revision indicators and entries in the revision block removed and the revision designation must become “-“ to indicate that this is the CG approved base line of the drawing. Once under CG control, future revisions will be annotated with alpha characters.

3.1.4 Hand drawn sketches or red-lined reproductions provided as part of a Condition Found Report or a Change Order Request are temporary drawings and are not considered a permanent part of the asset's planset.

3.1.5 Revisions to existing drawings: Revisions may be completed on U.S. Coast Guard supplied master AutoCAD files. In cases where legacy source drawings exist in non-CAD formats, revisions will be made on the Mylar drawings, tracings, or sepias provided. With approval from TIMB, PDF renditions of a document may be revised when an original source file is unavailable (See Section 3.31.1.4). All drawing revisions must be completed in accordance with this standard specification.

3.2 Drawing types. There are four CG drawing types: Hull, Mechanical & Electrical (HM&E); Procurement, Contract Guidance, and Bills of Materials. When creating a new drawing for any drawing type, a drawing number must be requested in CG-LIMS STIP before work on the drawing begins.

3.2.1 Hull, Mechanical & Electrical (HM&E). These drawings are a permanent representation of an asset that will be revised throughout the lifecycle of the asset.

3.2.1.1 Fleet Drawings are HM&E drawings that define a system or part that is used on more than one Platform Class.

3.2.2 Procurement. These drawings are not part of any asset's structure or systems. They are used to detail items and parts that are used aboard the asset or throughout the CG such as; Flags, eating utensils, awards folders, USCG medals, etc.

3.2.3 Contract guidance. These drawings are developed by or for the CG to provide general or detailed direction to a shipbuilder or contractor. Contract Guidance drawings should also be used to detail removal and installation of systems on an asset.

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3.2.3.1 When a drawing package is required for equipment or system installation, removal, or for general contract guidance, the necessary data from each Ships Work Breakdown Structure (SWBS) group should be packaged together to make an Installation/Removal/Guidance (IRG) drawing. The IRG must be a Contract Guidance drawing comprised of pertinent portions of existing baseline drawings, from any SWBS group, required to detail the change. If the IRG drawing contains data from only one SWBS, that SWBS can be used in the drawing number. If the IRG drawing contains data pulled from multiple SWBS, the drawing number will have an 802 SWBS. The IRG drawing must be utilized for the prototype installation/removal of a system, and must be redlined by the installation team with any deviations from the original design.

3.2.3.2 Once the redlined IRG drawing receives approval from the project manager and the appropriate product line, the data contained therein must be used to revise existing baseline drawing(s) within the appropriate SWBS group(s). New drawings must be created when the data to be presented involves a new system or equipment that cannot otherwise be integrated appropriately by revising an existing drawing. The IRG drawing itself must not be used to satisfy this requirement. The IRG must be canceled once the data has been disseminated into the appropriate baseline drawing(s) or made into new drawing(s) within the HM&E document type. IRG drawings must not be considered a final product detailing the change and will not be entered into CG-LIMS-STIP as part of an Active plan set. Non-SRD drawings must be updated at the project manager's or Product Line's discretion. A Contract Guidance drawing number must be requested from SFLC-ESD-TIMB thru CG-LIMS STIP for all IRGs.

3.2.4 Bill of Material (BM). BMs are a legacy drawing that identified all parts associated with an asset for all major systems. While BM's are no longer developed for new CG acquisitions, they are still maintained for legacy assets.

3.2.5 Other file types that can be considered a drawing. Excel, Word, and Access, can be accepted at the CG's discretion. Sheet 1-2 templates are located on the CG Portal Page. All non-CAD drawings must abide by the requirements set forth in this standard where applicable.

3.2.6 If another file type is to be accepted by the CG, it must at a minimum, have the following:

- Signature block
- Revision history block
- Distribution statement
- An assigned drawing number
- Applicability block

3.3 Format. All new drawings and revisions to existing drawings must be delivered to SFLC-ESD-TIMB in AutoCAD™ 2016 compatible (.dwg) file format and in accordance with Naval Engineering Manual M9000.6 (series).

3.3.1 2D Drawings extracted from a 3D Product Model must be fully compatible with AutoCAD™ (latest USCG agreed to version) without the use of any add on or viewer programs. External References (X-Refs), proxy graphics or non-editable block or graphics must not be used.

3.3.2 Drawings prepared in data processing systems (text and graphics processing). If data processing systems other than AutoCAD are used to prepare drawings, text and graphics must be imported and embedded into the AutoCAD file and must follow standards in accordance with M9085.1. Text and graphic files must be readable and allow for modification and editing within AutoCAD™ or the Microsoft™ Office Suite without the use of additional software.

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3.3.3 Drawings may be prepared in discipline specific software or other applications that are in an AutoCAD™ 2016 compatible (.dwg) file format and must be capable of being viewed, printed and modified without the use of the original generating program or any Object Enabler plug-in.

3.3.4 All drawings developed by or specifically for the USCG must utilize the USCG drawing border templates. The USCG will provide these templates to any contractor doing work for the CG.

3.3.5 Sheet Subtitles and Layout/Sheet Tabs.

3.3.5.1 In each Title Block, Subtitles must be used to identify all sheets. The Subtitle should generally identify the data on that sheet. Subtitles are required for each sheet in the Index block.

3.3.5.2 Layout Tabs must be named with the drawing sheet number only (e.g. 1, 2, 3, 3A, etc.) and must be sequential from left to right.

3.3.6 Paper space. The border templates containing the standard attributable blocks required by this Manual must be utilized and are created in paper space at 1:1 scale. The actual physical components depicted must be at full scale (1:1) in model space and scaled viewports utilized. Viewports must be on layer "0-Viewport." Viewport scale must coincide with the scale bar (Imperial or Metric scale) on the sheet and be identified in the scale Callout.

3.3.6.1 For Metric drawings, border templates must be scaled up by a factor of 25.4. Plot Scale must be set to "1:1" with 1 mm = 1 units for plotting the drawing to actual paper size.

3.3.6.2 Existing model space drawings undergoing revision need not be converted to paper space unless specifically stated in the contract or statement of work.

3.3.7 Drawing layering convention. Layer naming systems must be used and based on the specific usage of the drawing information. Layer naming systems must be used to distinguish system types, component sizes and/or materials, manufacturing data, geometric location or orientation, type of drawing entity, or other uses specific to the needs of the user. The following general guidance must be applied to all drawings:

3.3.7.1 No entities may be drawn on layer "0" (zero) except elements of blocks. Blocks with internal layering may be inserted on layer "0" (zero).

3.3.7.2 At a minimum, layering systems must provide at least one separate layer for each of the following elements and contain at least one descriptive word such as provided in all CG border Templates:

- Notes and other text not part of dimensions.
- Dimensions.
- Reference or construction lines that do not represent actual material or structure, such as baselines, centerlines, lines of frames, perpendiculars, etc.
- Systems, structure or components used as background, not ordered or modified by the drawing.
- Specialized information such as weight data.
- Drawing features such as section or detail cut lines, break lines, and similar non-physical entities.

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3.3.7.3 Revision entities outside of the revision history block such as revision triangles, hashing and revision clouds must be on a separate layer for each revision. Note that this does not require that the drawing elements inserted at a revision be on a separate layer, (though this is not prohibited either).

3.3.7.4 Layer “No-Plot” and “0-Viewport” may be used for any information that should be visible on the drawing but not be plotted. Layers used within a standard Coast Guard drawing template may be copied, modified, renamed, or deleted as required.

3.3.8 Blocks and shapes. No blocks subject to copyright or other licensing restrictions may be used in any drawing.

3.3.8.1 All block and shape files used, including those automatically produced by proprietary software, must be provided to the Coast Guard with no license restrictions controlling use, modification of, or distribution of the drawings containing these blocks or shapes. Proprietary software, which does not comply with this requirement, must not be used for developing Coast Guard drawings.

3.4 Drawing zone requirements. All drawing sheets, except A and B size drawings, must include vertical (alphabetical) and horizontal (numerical) zones for reference purposes (Figure 1).

3.4.1 The alphabetical (vertical) lettering must start at “A”. Addendum sheets must have alphabetic (vertical) zone designators continuing the lettering scheme of the sheet it is inserted after (e.g. if sheet 2 of a D-size border is zoned 9-A through 16-D, sheet 2A must be zoned 9-E through 16-H).

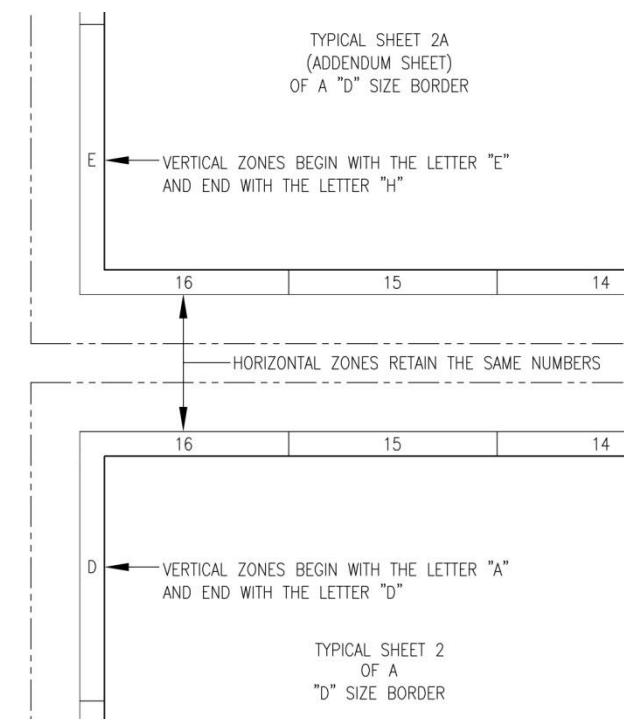


FIGURE 1: DRAWING ZONES FOR ADDENDUM SHEETS (NOT TO SCALE – FOR ILLUSTRATION PURPOSES ONLY)

3.4.2 The numerical (horizontal) entries must start with “1” on the first sheet lower right corner and continue with consecutive numbering throughout the drawing (e.g. on an H-8 size drawing, sheet one will start with 1 and go to 8, sheet two 9 to 16, sheet three 17 to 24, etc.).

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3.5 External references. The current Coast Guard drawing management system does not allow for the tracking and control of external reference files (XREFs). Therefore, all XREFs must be bound or inserted into the drawing file before delivery to SFLC-ESD-TIMB.

3.6 3D Models. All 3D Technical Data Packages (TDP) must be developed in accordance with MIL-STD-31000. The 3D Product Model must be in an ISO 10303 STEP compliant format.

3.6.1 Tessellation lines may appear on drawings if desired. Hidden line removal, if required, must be set. Proper drawing plotting must not require the user to set hide options prior to plotting.

3.6.2 Three dimensional models, (solids, wire frames, or surfaces) are acceptable.

3.6.3 Shading or rendering, while permitted must not be required to view or plot a drawing, and drawings must be clear and understandable without the use of shading or rendering.

3.6.4 Dimensions. All dimensions must be in paper space layout with a DIMASSOC value of 2. All DIMSTYLES must adhere to the following:

- Dimensions must be associative and must not be exploded.
- Dimension styles preloaded within the border template must be used, and modified for scale purposes only when necessary.
- Dimension style STANDARD must not be used. Fractional dimension must be “Not Stacked”.
- Dimension appearance (1/8" closed arrows, 'CG_ROMANS' text style, 1/8" text height, 'Not Stacked' fractions, etc.) must remain consistent with all present and new dimstyles.
- Fractional unit (CG-FRAC) dimstyles add an inch mark (") to the dimension as a suffix and must not be used for angular dimensions. These dimstyles are generally used for objects measuring up to 72".
- Architectural unit (CG-ARCH) dimstyles are generally used for objects measuring 6'-0" and over.
- Millimeter with inch unit (CG-MMIN) dimstyles are used when the border template geometry and associated blocks have been scaled up by a factor of 25.4.
- Paper space (PS) dimstyles automatically scale to the viewport when the variable 'DIMASSOC' is set to two (2).
- Scale factor (SF) dimstyles are used in paper space but have a 'measurement scale factor' (DIMLFAC) assigned. Note that these ‘SF’ styles must have the variable 'dimassoc' set to one (1) to work properly. These dimstyles may be copied and renamed to accommodate additional scales if the 'DIMLFAC' is changed to match the scale factor.

3.7 Text styles. Text height must not be set any smaller than 0.1 inches, and must be in accordance with ANSI-Y14.2. Text not used for special purposes such as illustration of actual labels, must be "Romans.shx" font. Text width must be .8 but may be set as required for the text style. All text must be in Paper space and on layer “Text” or “Dimensions” unless the text is embedded in the block geometry.

3.8 Line types. Only the line types supplied with AutoCAD™ 2016 must be used.

3.9 Color usage. All drawings created or revised in AutoCAD must have the background set to Black. All drawings must be created using colors visible both in the electronic .dwg file as well as on plotted drawings. The list of CG authorized colors for plotting are embedded in each CG Border template.

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3.10 Line weights. Each USCG Drawing template has a predefined line weights set up. These line weights should not be altered by a contractor without consent from the USCG.

3.11 Revision symbol block. An attributable block, triangle style revision symbol (Rev Triangle) must be used to identify changes made during a revision to a drawing. The Rev Triangle must have the appropriate Rev letter inside the triangle and the revision number in superscript at the top right outside the triangle (see REVTRIBLK on any standard template). Other attributes embedded on the Rev Triangle block are for amplifying information but are not required.

3.12 Computer Oriented Wiring Diagram (COED's). All COED's must adhere to the following two part formatting constraints:

3.12.1 Cover sheets. The cover sheet(s) must consist of one, multi-sheet file on standard horizontal A sized borders. At a minimum these sheets should include:

- Sheet one must have: Coast Guard Title, Drawing Number Block, USCG Approval Block, Command or Contractor Block, Revision History Table, Applicability Table, Sheet Revision Status Table, Special Notations Table and Reference Plans Table.
- The COED DATABASE LINK section is reserved for SFLC, ESD, Technical Information Management Branch use and should not be moved or altered.

3.12.1.1 Sheet 2 is meant as a continuation of sheet one for information and or data that does not fit on in the blocks on sheet 1. If needed, the Materials List Table should go on sheet 2.

3.12.2 Cable database. The Cable Database must be in Access format, utilizing the standard Coast Guard COED Template. The database report will consist of two or three separate reports generated from the Access Database COED Template. These reports are located in the reports section of the database and are as follows:

3.12.2.1 Cable Run Report (Mandatory). Contains origin and destination information for cables, also includes length and cable type

3.12.2.2 Final Report (Mandatory). Contains origin and destination information for cables as well as special instructions, point-to-point information for all conductors of the cables, connectors and revision notation

3.12.2.3 Sleeving Report (Optional). Generates a report for the label designations for all individual conductors

3.12.3 COED cover sheets and database templates can be found on the SFLC website.

3.13 Proofing and performing preliminary drawing check-off. The Contractor must purge the drawings of unused block definitions, layers, line types, etc. (except for special layers which may be required for assignment drawings in supplemental CAD policies) to keep file size to a minimum.

- Remove any extraneous data in Model Space and outside the drawing borders in Paper Space.
- If the drawings were associated with a sheet set, the association to the sheet set must be purged from each drawing prior to submission, to avoid the lost set association error. To remove the association, open the drawing in the absence of the sheet set file, and select remove on the Lost Set Association dialog, and save.
- Delete any unused layout tabs.

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- Delete any unattached XREF paths & bind any XREF.
- ZOOM to EXTENTS and save drawing.
- Save in format compatible with AutoCAD 2016 drawing format.
- Delete any geometry present in Model Space that is not depicted in any Layout unless needed for design development.
- Drawing Signature Authority.

3.14 Authorized signature authorities. Newly created drawings and revisions to existing drawings require the signature of a designated Coast Guard authority to become part of the official Coast Guard drawing planset. Authorized signature authorities for new and revised drawings are listed below:

3.14.1 Major acquisitions:

- Project Resident Office or Commandant (CG-9) Program Office

3.14.2 Non-Major acquisitions:

- Commandant (CG-9) Program Office
- Commandant (CG-7) Capability Office
- Commandant (CG-45) Office of Naval Engineering

3.14.3 Hull, Mechanical and Electrical for sustainment of Surface Assets

- SFLC-ESD-Naval Architecture & Marine Engineering Branch (NAME)
 - Naval Architecture Section Chief
 - Main Propulsion Machinery Section Chief
 - Auxiliary Machinery Section Chief
 - Electrical Systems Section Chief
- SFLC-ESD-Technical Information Management Branch (TIMB)
 - Branch Chief (Non-engineering changes)
- USCG Yard Engineering
 - Electrical/Electronic Section Chief
 - Mechanical Section Chief
 - Hull Section Chief
- Product Lines
 - Product Line Manager
 - Product Line Engineer
- Command, Control, Communications, Computers and IT drawings (C4IT)
 - C4ITSC and Project Resident Office (PRO)
 - Command Appointed Engineering Authority

3.14.4 For new drawings, signature approval in the Title Block on sheet one of a multi-sheet drawing constitutes approval of all sheets of that drawing. Approval signatures are not required on subsequent sheets of the same drawing.

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3.14.5 For drawing revisions, signature approval is only required in the Revision Block with the latest revision write up. Both the draftsman completing the revision and the approval authority must date, add his/her first initial, full last name and organization of the approving official in the revision history block. The approval signatures in the revision history block constitute approval of all portions of that revision.

3.14.6 For AutoCAD™ drawings, both new and revised, printed names (i.e. text) with the suffix designator "/s/" must represent drawing approval signatures.

3.15 Drawing numbers and title block numbering convention. All drawings relating to cutters, boats, and installations thereon must be assigned a Coast Guard drawing number issued by Surface Forces Logistics Center, Engineering Services Division, Technical Information Management Branch (SFLC-ESD-TIMB) in accordance with the Naval Engineering Manual, COMDTINST M9000.6 (series).

3.15.1 The Coast Guard drawing number is the key component for drawing identification and management. Drawing numbers must be shown in all title blocks and will be structured as follows:

PLATFORM CLASS NUMBER CONSISTING OF:				
Platform Length	Platform Sub-Class	Platform Class	Ship Work Breakdown Structure (SWBS)	Serial Number
110	B	WPB	521	001
DRAWING NUMBER: 110B-WPB-521-001				

3.15.2 Older platform classes may utilize a 4 digit SWBS structure. When revising a drawing with a 4 digit SWBS, it should not be converted to a 3 digit SWBS. All new drawings, for new or legacy assets, must conform to a 3 digit SWBS convention.

3.15.3 Different numbering system(s) for shore based Platform Classes are employed. All drawings must follow the numbering schema developed for that Platform Class.

3.16 Electronic file naming convention for drawing files. There are six fields needed to define an electronic drawing file to allow easy recognition of file content. The notes below provide examples:

Note 4
Note 5
Note 6
Note 7
Note 8

<platform class>_<SWBS>_<serial>_<sheet>_<addendum sheet>_<revision> .dwg

Examples DRAWING SHEET	ELECTRONIC FILE NAME
378-FRAM-E-085-002, Sheet 5A, Rev. D	378-FRAM-E_85_2_5_A_D.dwg
160-WLIC-1205-003, Sheet 1, Rev. -A (Old 4-digit SWBS Numbering System)	160-WLIC_1205_3_1_-_A.dwg

Note 1: All fields are mandatory.

Note 2: Do not use leading zeros in any field (i.e. SWBS 0243 = 243).

Note 3: All fields will be separated by an underscore.

Note 4: <platform class> consists of Platform Length, Platform Sub-Class and Platform Class.

Note 5: Multi-sheet drawings in a single data file must have "1" assignment for sheet number field.

Note 6: If the sheet is not an addendum sheet (e.g. sheet 5A), use a dash in the addendum sheet field.

Note 7: Use dashes in the revision field to indicate an original, non-revised sheet.

Note 8: ".dwg" indicates file extension for an AutoCAD™ drawing.

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3.17 Storage and transmission media for electronic files. The CG Logistics Information Management System (CG-LIMS), Surface Technical Information Portal (STIP) will be used for the management of all Naval Engineering drawings. Check-In and Check-Out of drawings must continue to follow established internal procedures set by SFLC-ESD-TIMB.

3.17.1 For commands and commercial entities not authorized direct access to the drawing management features of CG-LIMS STIP, a CD-ROM or DVD is the preferred medium of temporary storage and transmission of electronic files in accordance with ISO/IEC 10149. Other methods are acceptable upon concurrence between the CG and the vendor.

3.17.2 File encryption must not be used. If encryption is required for security reasons, an approved method of encryption will be designated by SFLC-ESD-TIMB.

3.18 Drawing format and sizes. The format of all drawings must be in accordance with instructions as specified herein and are generally in accordance with ASME Y14.1.

3.18.1 Drawings must be produced from AutoCAD™ templates provided by the SFLC-ESD-TIMB.

3.18.2 For A, B, C, D & H-8 size drawings, all sheets must be the same size. For H-10, 12, 16 and 24, for sheets 2 and higher, it is permissible to use a smaller H sized sheet.

3.18.3 Multiple sheet drawings must have all sheets contained within one AutoCAD file. Each sheet must be on a different layout tab. Use of script files to turn on and off layers is prohibited.

3.18.4 Addendum Sheets can be used when the information to be added fits logically after an existing sheet rather than at the end of a drawing. Addendum sheets must not be used on new drawings.

3.19 Standardized border templates. Multiple sheet drawing border template files, with all mandatory and conditional blocks, have been developed in AutoCAD™. These templates must be used for all drawings and are available from SFLC-ESD-TIMB. The template file is intended to provide a consistent drawing format for technical information management.

3.19.1 Templates can be downloaded from the Surface Forces Logistics Center, Engineering Services Division Intranet site.

3.20 Mandatory and conditional blocks or tables. Mandatory blocks or tables can be found within the CG standard drawing border templates. The following blocks must start on Sheet one and can be continued on subsequent sheets as needed:

- (1) Coast Guard Title Block
- (2) Drawing Number Block
- (3) USCG Approval Block
- (4) Command or Contractor Block (except as noted)
- (5) Scientific Technical Information (STINFO) Block
- (6) Revision History Table
- (7) Applicability Table
- (8) Sheet Revision Status and Title Index Table
- (9) Special Notations Table
- (10) Weight Control Table (if applicable)

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- (11) Reference Plans Table
- (12) General Notes Block
- (13) Materials List Table (except A and B size drawings)

3.20.1 Scale Bar dynamic blocks are mandatory for each viewport with scalable geometry. Only one scale is needed for a sheet containing multiple viewports of the same scale. The block is not required for geometry drawn at a scale of 1:1.

3.20.2 All lists must utilize AutoCAD Tables verses multiline text.

3.20.3 For new drawings, all tables may be continued onto sheet 2, then sheet 3 and so on as needed. For revisions to existing drawings, the tables can be continued on an addendum sheet to the last sheet that has the table on it.

3.20.4 Mandatory attributable blocks must not be modified with the exception of Command or Contractor Approval Signature Block (CCBLK).

3.20.5 For new drawings, the Materials List Table may be continued on sheet 2 as needed. For Revisions to drawings, if additional space is needed for the Materials Table, it must continue onto an addendum sheet to the last sheet that had a Materials List Table on it. All material identified on the drawing must be listed in one Materials List table. Additional columns may be added to the Material List Table for amplifying information as needed.

3.20.6 Materials list exception. Due to the rapid pace of cyber-IT component advances, and their virtual obsolescence upon installation, all routers, servers, switches managed by the C4IT community will be identified as such in a materials list, however these items will be treated as generic parts that do not require supporting logistic details (i.e., Part Number, CAGE Code, Manufacturer ID, etc.) within the Parts List block. These generic components, when replaced, will not trigger a revision of Selected Record Drawings impacted.

3.21 Standard revision practices. The following standard drawing revision practices must be observed. These practices are generally in accordance with MIL-STD-31000 Technical Data Packages and ANSI-Y14.100. Additional information may be found in those documents or commercially prepared compilations of those documents for industry use. For specific questions and assistance, contact SFLC-ESD-TIMB. All drawings must be checked out of CG-LIMS STIP before beginning the revision. When requesting Hard Copy drawings, once the check-out process has been initiated in CG-LIMS STIP, Hard Copy drawings can be acquired by contacting SFLC-ESD-TIMB.

3.21.1 Revision to Master Drawings only. All revisions must be completed on the master file, paper or CAD files. All drawing master files are maintained in the SFLC-ESD-TIMB drawing repository. Master Drawings in hardcopy format must 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.

3.21.2 Drawings should be revised when the extent of drawing changes are minor relative to the amount of data that will be retained in the drawing.

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3.21.3 Hard copy drawings. The old portions can be hashed out and new details should be created on additional sheets in AutoCAD. Revisions to text can be erased or hashed out and new information can be hand drawn on the hard copy or added to an additional AutoCAD sheet. If a sheet is deleted, the title block of the deleted sheet must be hashed out. A revision triangle block must be placed next to the hashed out title block indicating the revision that deleted that sheet. The words "THIS SHEET DELETED BY REVISION xx" should also appear next to the title block utilizing the largest practical font size.

3.21.4 Bills of Material in Hard Copy format. When an item identified in a Bill of Material needs to be revised, the item must be lined out on the Hard Copy (except for the Item and Piece Number), and the replacement item must be added via an AutoCAD sheet. The Item Number will be the next sequential number for the entire BoM, and the piece number must be carried forward to the new item number. A revision triangle must be placed next to the lined out item on the Hard Copy BoM and the revision write-up must detail the change to the new Item Number.

3.21.5 CAD files. Old geometry, details and text must be hatched out or lined out and new data added on existing sheets, or on additional CAD sheets. Exceptions: if a change can be fully defined in the revision write-up, it is permissible to delete the geometry, details and text that are being revised.

3.21.6 Retaining Historical Data. Revisions should be detailed in the Revision block with as much clarification as practical. 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. It is not necessary to hatch out deleted geometry and data. All historical versions of a drawing are maintained by SFLC-ESD-TIMB. Additionally, all original drawings and prior revisions can be viewed and downloaded via CG-LIMS-STIP to ascertain previous configurations.

3.22.4 If a revision needs to be made to an original hard-copy drawing and the revised data will be created using AutoCAD, all sheets of that drawing must be converted to AutoCAD for uniformity when possible.

3.21.7 Give Reason for Revision. Each revision write-up should begin with a brief description documenting the reason for the revision, such as "TO SUIT ENGINEERING CHANGE (number): REPLACE BEARING MATERIAL". The description should provide what project, EC, or documentation that initiated the change. In the event multiple ECs are incorporated in the revision, the revision write up must clearly delineate the changes corresponding to each EC. Additional cross-reference information supporting the reason for revision (Contract, CLIN, Activity, Project #, Service Bulletin, etc), is encouraged to also be entered in revision history.

3.22 Revision status. Sheet one of all drawings must always contain the highest revision designator in the Title block of the drawing, while each remaining sheet must carry the revision designator associated with the latest revision affecting that individual sheet. Sheet one must have a Sheet Revision Status and Title Index table, which must indicate the revision designator of each sheet of the drawing.

3.22.1 Each time a drawing is revised a revision symbol is added to each sheet where changes are made. In cases where there are multiple revisions to a complex detail, it is permissible to add just one revision triangle next to the "Call-out" of the detail.

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3.22.2 The Revision History Table must be updated accordingly. A revision triangle is not to be placed next to the Revision History Table to indicate the change to the table, nor should this change be documented in the revision write-up.

3.22.3 The revision designator for a drawing must be identified by an upper case letter or letters (except in Conceptual/Prototype drawings). Each new drawing created must begin with the “tack” symbol (-) in the Title block. The first revision must then be identified by "A". Successive changes must use the next sequential letter, except that the letters "I", "O", "Q", "S", "X", and "Z" must not be used. Upon exhaustion of the alphabet, sequential revisions must be "AA", "AB", etc., and then "BA", "BB", etc.

3.22.4 On legacy drawings where numbers have been used instead of letters for revision designators, the use of numbers must be continued in the spirit of an authorized deviation for current convention.

3.23 Revision history block. All revision notes must be placed in a revision history block beginning on sheet one and continued on a 2A addendum sheet as needed.

3.23.1 A triangular revision identifier must be placed adjacent to all revised areas, except where the entire sheet has been added by revision. Where multiple items are being revised under the same revision, each item or group of items must be identified with a superscript number outside the revision symbol that relates to the revision notes in the Revision History Table. The CG approved Rev Triangle block (REVTRIBLK) can be found on all CG border templates.

3.24 Revision Procedure for Special Situations.

3.24.1 Master drawing not yet available. This situation arises when master engineering drawings have not yet been accepted from the shipbuilder, and changes need to be made to a system(s). In this instance, a new engineering drawing must be created for the purpose of documenting needed changes. The new master engineering drawing will be retained by SFLC-ESD and will be available for documenting changes until the complete master engineering drawings are received from the shipyard.

3.24.2 For drawings that will be based from the shipbuilder’s drawings, the drawing number and title of the new master engineering drawing must be the same as the shipbuilders drawing except for the series number, and have the shipbuilders drawing number in parenthesis added to the end of the title. The serial number must be changed sufficiently to identify that it is a modification to an un-released OEM drawing (typically beginning with series number 500).

3.24.3 For drawings created by entities other than the asset’s original builder, a new drawing number will be established with the appropriate SWBS and the title must be unique to the system being depicted. All efforts should be made to ensure this title is not a duplicate of any of the shipbuilder’s original drawing titles.

3.24.4 When the only copy of a drawing is in PDF format, every effort should be made to convert the PDF to an AutoCAD file. With permission from TIMB, a PDF can be revised via raster or overlay of the PDF into an AutoCAD file. The needed changes should be done via AutoCAD, and then Save to PDF. The newly created PDF would then be the master file for that revision. A hard copy can be plotted from the PDF if needed.

3.25 Superseding a drawing. Drawings should be superseded if extensive revisions are required or if the quality of the existing hard copy master engineering drawing is poor (e.g. torn, faded, smeared, etc.). If a drawing is superseded, the following steps must be followed:

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3.25.1 Superseded Drawing.

- The act of superseding a drawing constitutes a revision to that drawing. Thus the following revisions should be made:
- Hatch out the title block on all sheets, except for the revision letter.
- As a result of the drawing being superseded, the revision letter must be increased.
- Add (in bold characters) immediately adjacent to the title block of sheet 1: "THIS DRAWING HAS BEEN SUPERSEDED BY USCG DWG XXX."
- The Revision History block should be annotated with a brief description as to why the drawing was superseded. I.E. "THIS DRAWING WAS SUPERSEDED DUE TO EXTENSIVE CHANGES IN THE --- SYSTEM."

3.25.2 Superseding Drawing.

- The new superseding master engineering drawing must be in AutoCAD and carry a new USCG drawing number.
- The new drawing must be a "clean" drawing. All revision symbols, cross-outs, entries in the Revision History block, etc..., from the superseded drawing must not be reconstructed on the superseding drawing.
- The original issue of the superseding drawing must be REV "-", and the revision column must be annotated as follows "THIS DRAWING WAS CREATED BECAUSE (brief description)."
- The superseding drawing will have new Design, Drawn, Checked and Approval signatures.

3.26 Canceling a drawing. If a drawing no longer contains useful or applicable information, the drawing must be canceled. If a drawing is cancelled, the following steps must be followed:

- Hatch out the title block on all sheets, except for the Revision letter.
- As a result of the drawing being canceled, the revision letter must be increased.
- Add (in bold characters) immediately adjacent to the title block "THIS DRAWING HAS BEEN CANCELED."
- The Revision History block should be annotated with a brief description as to why the drawing was canceled. I.E. "THIS DRAWING WAS CANCELED IN ACCORDANCE WITH ENGINEERING CHANGE # XXXX. (Brief explanation such as: THIS SYSTEM HAS BEEN REMOVED WITH NO REPLACEMENT.)"

3.27 Revisions when Master Select Record Drawing (SRD) is unavailable. This situation arises for example when Master SRD Drawings have not yet been received from the shipbuilder and changes need to be made to certain systems, the following actions should be taken:

3.27.1 A single, new Master Drawing for each appropriate set of drawings must be created, which may be based from current, but un-editable vendor drawings, for the purpose of documenting needed changes. This drawing will have a special branching drawing number, issued by TIMB, that identifies it as an addendum to the original vendor's master drawing. This new Master Drawing will be available for depicting various needed changes until the complete Master Drawings are received from the shipyard. At such time, the two drawings must be incorporated back into one class SRD drawing.

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3.27.2 The title of this new Master Drawing must be "CHANGES TO (Original Title)", and the following note must be displayed prominently on sheet one near the title block: "THIS DRAWING WAS CREATED FOR THE PURPOSE OF DOCUMENTING CHANGES WHEN THE ORIGINAL MASTER DRAWINGS WERE NOT AVAILABLE FOR REVISION."

3.27.3 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.

3.27.4 When the (previously-absent) Master SRD Drawing becomes available, it is mandatory to revise the vendor's master class drawing with the addendum drawing. The applicable Product Line will be responsible to fund the maintenance/repair contractor to modify the SRD drawing if it becomes available during the availability timeframe. However, once the maintenance/repair contract is complete, the PL will be responsible to incorporate the changes, to contract work to outside vendors qualified to perform the work, or to initiate and negotiate activities with SFLC-ESD-NAME to perform the required engineering/CAD services.

3.28 Drawing views. All drawing views must be identified with a "Callout". The Callout is generally placed below and in the middle of the view. The zone of the Callout must have the horizontal numerical zone followed by a "dash" and then the vertical alpha character. The views zone number and letter for the title must come from where the center of the Callout block is located in the body of the drawing (e.g. "PLAN VIEW 5-A" has the callout block located in horizontal zone "5" and vertical zone "A"). This pertains to all views, even if the view expands into multiple zones of the drawing sheet.

3.28.1 Cross-section views must be identified by the zone number where the cross-section is detailed. The cross-section leaders on the source object must be identified by the Callout location of the detail. See Figure 2.

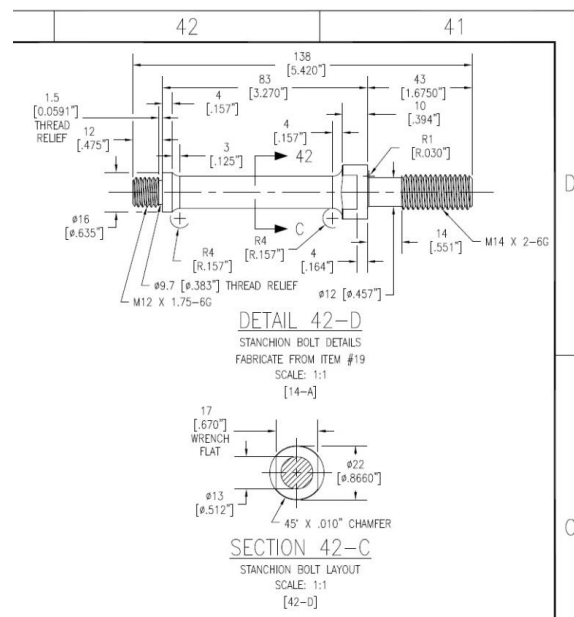


FIGURE 2: CALLOUT IDENTIFICATION FOR CROSS-SECTIONAL VIEWS (NOT TO SCALE – FOR ILLUSTRATION PURPOSES ONLY)

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3.29 Plotting instructions. Plotting must be in accordance with USCG Color-Dependent Plot Style Table as shown on all CG drawing templates.

3.29.1 Normal layer line width and visibility. All layers will normally be on. Layer “no-plot” must have plotting turned off. Drawings requiring other plotting instructions must have the special plotting instructions prominently visible on layer “No Plot”.

3.29.2 Special plotting instructions. All special plotting preferences will be noted in the USCG Color-Dependent Plot Style Table in the upper right-hand corner of the drawing template.

APPENDIX A INSTRUCTIONS FOR COMPLETING ATTRIBUTE BLOCKS

A1. SCOPE

A1.1 Intent. This appendix establishes requirements for the attribute blocks.

A2. REQUIREMENTS

A2.1 Coast Guard Title with USCG Approval Block.

1. LENGTH: Enter the length of the vessel or standard boat in feet and annotated with “FT”. Example: “418 FT”. For Fleet drawings the length should be left blank.
2. CLASS: Enter the class designator of the vessel or standard boat such as “WMEC” or “BUSL”. For Fleet drawings, use “FLEET”.
3. DRAWING TITLE LINE 1: Enter line one of the drawing title. This is a Text Field. Use command DWGPROPS to enter TITLE1.”
4. DRAWING TITLE LINE 2: Enter line two of the drawing title.
5. SUBTITLE_LINE3 and 4: Sub-titles are mandatory and describe the data depicted on that sheet.
6. DRAWING NO: Enter the Coast Guard assigned drawing number.
7. REVISION: Enter the drawing revision character. Note that the first sheet of a drawing must contain the highest revision character of the drawing.
8. DRAWING SCALE: Enter the drawing scale, AS NOTED or NONE.
9. SHEET NO: Enter the sheet number of the drawing if not already filled out by the use of the dynamic block on each CG drawing template.
10. TOTAL NO. OF SHEETS: Enter the total number of sheets in the drawing set. If the drawing includes addendum sheets (i.e. sheet 5A), include this in the total number of sheets (i.e. if a drawing consists of sheets 1, 2, 2A & 3, the total number of sheets would be 4). NOTE: The total number of sheets is only on the Title sheet of the drawing.
11. APPROVAL SIGNATURE: Enter the full first and last name of the signer. Enter “/s/” to indicate electronic signature.
12. APPROVAL AUTHORITY: Enter the full first and last name of the USCG approving official.
13. APPROVAL DATE: Enter the date the drawing was approved by the Coast Guard.

A2.2 Supplemental Drawing Number Block.

1. DRAWING NO: Enter the Coast Guard assigned drawing number.
2. SHEET NO: Enter the sheet number of the drawing.
3. REVISION LETTER: Enter the sheet revision character. Note that the first sheet of a drawing must always contain the highest revision character of the drawing.

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A2.3 Coast Guard Title Block, Continuation Sheet

1. LENGTH: Enter the length of the vessel or standard boat in feet and annotated with "FT".
Example: "418 FT". For Fleet drawings the length should be left blank.
2. CLASS: Enter the class designator of the vessel or standard boat such as WMEC or BUSL.
3. TOP DRAWING TITLE: Enter line one of the drawing title.
4. CENTER DRAWING TITLE: Enter line two of the drawing title.
5. SUB-TITLE_LINE-3 and 4: If sub-titles are used, enter one or two lines of the drawing sub-title.
6. DRAWING NO: Enter the Coast Guard assigned drawing number.
7. REVISION: Enter the drawing revision character. Note that the first sheet of a drawing must contain the highest revision character of the drawing.
8. DRAWING SCALE: Enter the drawing scale, AS NOTED or NONE.
9. SHEET NO: Enter the sheet number of the drawing.

A2.4 Command or Contractor Approval Signature Block.

1. CONTRACTOR/COMMAND NAME: Enter contractor or command name.
2. ADDRESS LINE-1: Enter line one of the contractor or command address.
3. ADDRESS LINE-2: Enter line two of the contractor or command address.
4. ADDRESS LINE-3: Enter line three of the contractor or command address.
5. ADDRESS LINE-4: Enter line four of the contractor or command address.
6. PHONE NO: Enter the contractor or command phone number. Include the area code in parentheses.
7. CONTRACT/PO NO: Enter the contract, purchase, project, or job order number.
8. SIGNATURE: Enter the name of the preparer. Include "/s/" to indicate electronic signature.
9. DATE: Enter the design date.
10. SIGNATURE: Enter the name of the individual who checked the drawing. Include "/s/" to indicate electronic signature.
11. DATE: Enter the date the drawing was checked.
12. SIGNATURE: Enter the name of the lead engineer with contractor or command approval authority. Include "/s/" to indicate electronic signature.
13. DATE: Enter the date of approval.

A2.5 Revision Triangle Block

1. REVISION LETTER: Enter the appropriate revision character.
2. REVISION ITEM #: Enter the item number from the revision history block.
3. ZONE: Enter the zone designator the item is located in.
4. ITEM DESCRIPTION: Enter a brief description of the item.
5. DATE OF REVISION: Enter the date of the appropriate revision from the revision history block.
6. REVISED BY: Enter the initials of the person making the revision.
7. APPLICABILITY: Enter the hull number(s) of the platform revision application. Use "ALL" if the revision applies to the entire platform class.