

METRIC

MIL-STD-100E
NOTICE 2
4 SEPTEMBER 1992

MILITARY STANDARD
ENGINEERING DRAWING PRACTICES

TO ALL HOLDERS OF MIL-STD-100E:

1. Make the following pen and ink changes:

- a. Page xv, paragraph 606. Change title to "Reinstating a superseded (old drawing, differen number) drawing."
- b. Page xix, Appendix E, paragraph 40.4. Change to "Abbreviated distribution statements and export control warning notices."
- c. Page 16, paragraphs 3.9,3.9.1,3.9.2, and 3.9.3. Delete all four definitions.
- d. Page 17, paragraph 3.4, lines 3, 6 and 7. Change "CAGE code" to "CAGE: Code".
- e. Page 18, paragraphs 3.16 and 3.17. Delete both definitions.
- f. Page 22, paragraph 3.44, line 2. Change "CAGE code" to "CAGE Code".
- g. Page 24, paragraph 3.59, line 3. Change "CAGE code"" to "CAGE Code".
- h. Page 26, paragraph 3.70, line 2. Change "repairable" to "repair-able" and "MIL-STD-1388/1" to "MIL-STD-1388-1".
- i. Page 34, paragraph 6.4. Delete "Baseline" and changr "CAGE code" to "CAGE code".
- j. Page 100-1, " paragraph 101.1.1, line 3. Change the phrase "a component of a largcr unit" to "an element of a larger item. "
- k. Page 400-8," NOTE 1. Change "dash numbers" to "suffix identifiers".
- l. Page 400-9," paragraph 406.10, Note 2, first sentence. Change to read "Source control drawing numbers, along with applicable suffixes, establish PINs."
- m. Page 400-9, paragraph 406.10, NOTE 2. In line 3 delete "identified and", and in line 4 change "dash number" to "suffix identifier".

AMSC N/A

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- n. Page 400-10, paragraph 406.11.1, line 6, Change “dash numbers” to “suffix identifiers”.
- o. Page 500-8.” Delete Figure 500-2,”
- p. Page 500-9.” Delete Figure 500-3,”
- q. Page 600-3,” title of Figure 600.1. ” Change “Revision block” to “Revisions block”.
- r. Page 600-4,” paragraph 602.6, line 3. Change “revision block” to “revisions block”.
- s. Page 600-4,” title of Figure 600-2.” Change “Revision block” to “Revisions block”.
- t. Page 600-9,” paragraph 605.1. In line 6. change notations” to “history”, and in line 8 change “revision block” to “revisions block”.
- u. Page 700-8.” paragraph 709, line 2. Change “Revision Block” to “revisions block”.
- v. Page B-8, paragraph 40.1.8. In line 2 change “deleting” to “removing”, and in line 5 change “revision block” to “revisions block”.
- w. Page B-8, Figure B-7. Delete from Figure the notation “OLD CLASSIFICATION MAY BE LINED OUT OR REMOVED.”
- x. Page D-3, paragraph 40.5.1, line 1. Change to read: “Existing single-source, source control drawings shall...”
- y. Page D-9, paragraph 50.3.2, last sentence. Change to read: Each item of data and each sheet that contains data to be protected is to marked with above statement.

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2. THE FOLLOWING PAGES OF MIL-STD-100E HAVE BEEN REVISED AND SUPERSEDE THE PAGES LISTED:

NEW PAGE	DATE	SUPERSEDED PAGE	DATE
ix	30 September 1991	ix	REPRINTED WITHOUT CHANGE
x	4 September 1992	x	30 September 1991
xiii	4 September 1992	Xiii	30 September 1991
XIV	4 September 1992	xiv	30 September 1991
9	4 September 1992	9	30 September 1991
10	4 September 1992	10	30 September 1991
31	4 September 1992	31	30 September 1991
32	4 September 1992	32	30 September 1991
100-5	4 September 1992	100-5	30 March 1992
100-6	4 September 1992	100-6	30 March 1992
100-9	4 September 1992	100-9	30 March 1992
100-10	4 September 1992	100-10	30 March 1992
100-13	4 September 1992	100-13	30 September 1991
100-14	30 September 1991	100-14	REPRINTED WITHOUT CHANGE
200-1	4 September 1992	200-1	30 September 1991
200-2	4 September 1992	200-2	30 September 1991
200-3	4 September 1992	200-3	30 September 1991
200-4	4 September 1992	200-4	30 September 1991
200-5	4 September 1992	200-5	30 September 1991
200-6	4 September 1992	200-6	30 September 1991
200-7	4 September 1992	200-7	30 September 1991
200-8	4 September 1992	200-8	30 September 1991
400-1	4 September 1992	400-1	30 September 1991
400-2	4 September 1992	400-2	30 September 1991
400-3	4 September 1992	400-3	30 September 1991
400-4	30 September 1992	400-4	REPRINTED WITHOUT CHANGE
400-5	4 September 1992	400-5	30 September 1991
400-6	4 September 1992	400-6	30 September 1991
400-11	4 September 1992	400-11	30 September 1991
400-12	4 September 1992	400-12	REPRINTED WITHOUT CHANGE
400-13	4 September 1992	400-13	30 September 1991
400-14	4 September 1992	400-14	30 September 1991
500-1	4 September 1992	500-1	30 March 1992
500-2	4 September 1992	500-2	30 March 1992
500-3	4 September 1992	500-3	30 September 1991
500-4	4 September 1992	500-4	30 September 1991
500-5	30 September 1991	500-5	REPRINTED WITHOUT CHANGE
500-6	4 September 1992	500-6	30 September 1991
600-1	4 September 1992	600-1	30 September 1991

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600-2	4 September 1992	600-2	30 March 1992
600-5	4 September 1992	600-5	30 September 1991
600-6	4 September 1992	600-6	30 September 1991
600-7	4 September 1992	600-7	30 September 1991
600-8	4 September 1992	600-8	30 September 1991
600-11	4 September 1992	600-11	30 September 1991
600-12	4 September 1992	600-12	30 September 1991
600-13	4 September 1992	600-13	30 September 1991
600-14	30 September 1991	600-14	REPRINTED WITHOUT CHANGE
700-5	4 September 1992	700-5	30 September 1991
700-6	4 September 1992	700-6	30 September 1991
B-5	4 September 1992	B-5	30 March 1992
B-6	30 September 1991	B-6	REPRINTED WITHOUT CHANGE
E-1	4 September 1992	E-1	30 September 1991
E-2	4 September 1992	E-2	30 September 1991

3. RETAIN THIS NOTICE AND INSERT BEFORE TABLE OF CONTENTS

4. Holders of MIL-STD-100E will verify that page changes indicated above have been entered. This notice will be retained as a check sheet. This issuance, together with appended pages, is a separate publication. Each notice is to be retained by stocking points until the Military Standard is completely revised or cancelled.

5. Vertical lines are used in this Notice to denote changes (additions, modifications, corrections, deletions) from the basic standard. This was done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractor-s are cautioned to evaluate the requirements of this document based on the entire content irrespective of the marginal notations and relationship to the basic standard.

Custodians:

Army - AR
Navy - SA
Air Force -16

Preparing activity:

Army - AR
(Project DRPR-0328)

Review activities:

Army - AT, AV CE, CR, EA, ER, MI, SC, SM, TE
Navy - AS, CH, EC, MC, OS, SH, TD, YD
Air Force -11, 13, 14, 18, 19, 19, 79, 90, 99
DLA - CS, DH, ES, GS, IS
NSA - NS

User activities:

Army - GL, ME
Air Force -68, 70, 71, 80, 84

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ANSI Y32.4	Graphic Symbols for Plumbing Fixtures for Diagrams Used in Architecture and Building Construction
ANSI Y32.9	Graphic Symbols for Electric Wiring and Layout Diagrams Used in Architectural and Building Construction
ANSI Y32.10	Graphic Symbols for Fluid Power Diagrams
AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)	
ASTM E380	Standad for Metric Practice
AMERICAN WELDING SOCIETY (AWS)	
ANSI/AWS A2.4	Symbols for Welding and Nondestructive Testing
ANSI/AWS A3.0	Welding Terms and Definitions
INSTITUTE OF ELECTRICAL. AND ELECTRONIC ENGINEERS (IEEE)	
ANSI/IEEE Std 91	Graphic Symbols for Logic Functions
ANSI/IEEE Std 91a	Supplement to Graphic Symbols for Logic Functions
ANSI/IEEE Std 200	Reference Designations for Electrical and Electronic Parts and Equipment
ANSI/IEEE Std 260	Letter Symbols for Units of Measurement (SI Units, Customary inch-Pound Units and Certain Other Units)
ANSI/IEEE Std 280	letter Symbols for Quantities used in Electrical Science and Electrical Engineering (Same as ANSI Y10.5- 1985)

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IEEE Std 315	Graphic Symbols for Electrical and Electronic Diagrams
IEEE Std 315a	Supplement to Graphic Symbols for Electrical and Electronic Diagrams
ANSI/IEEE Std 991	Logic Circuit Diagrams

INSTITUTE FOR INTERCONNECTING AND PACKAGING
ELECTRONIC CIRCUITS (IPC)

ANSI/IPC-D-275	Design Standard for Rigid Printed Boards and Rigid Board Assemblies
ANSI/IPC-D-350	Printed Board Description in Digital Form
ANSI/IPC-T-50	Terms and Definitions for Interconnecting and Packaging Electronic Circuits

SOCIETY OF AUTOMOTIVE ENGINEERS (SAE)

SAE AS1290	Graphic Symbols for Aircraft Hydraulic and Pneumatic Systems
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Copies of DoD adopted non-Government Standards are available to Military activities through the DoD Single Stock Point, Standardization Documents Order Desk, Bldg 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094. Military activities may obtain copies of non-DoD adopted documents from the sponsoring Industry Association. Non-military activities may obtain copies of non-Government standards and publications from the sponsoring Industry organization as follows:

(ANSI) American National Standards Institute
1430 Broadway
New York, NY 10018

(ASME) American Society of Mechanical Engineers
22 Law Drive
Fairfield, NJ 07007-2300

(ASTM) American Society for Testing and Materials
1916 Race Street
Philadelphia, PA 19103

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6. NOTES

(This section contains information of a general or explanatory nature that may be helpful, but is not mandatory.)

6.1 Intended use. The requirements contained herein apply to hardcopy drawings, digital data file(s), associated lists and textual data resulting from the contractual application of DOD-D- 1000, MIL-T-31000 or MIL-T-47500.

6.1.1 Applicability. The current document specifying engineering drawings as a technical data package element is MIL-T-31000. DOD-D-1000 and MIL-T-47500 are inactive for new design.

6.2 Acquisition requirements.

6.2.1 Issue of DODISS. When this standard is used in acquisition, the applicable issue of the DODISS must be cited in the solicitation (see 2.1.1, and 2.2).

6.2.2 Tailoring guidance. To ensure proper application of this Standard, invitations for bids, requests for proposals, and Contract Data Requirements Lists (CDRLs) must tailor the requirements in Chapters 100 through 700 to exclude unnecessary requirements. It is essential that the contractual applicability of the numerous referenced documents, as contained herein, especially Chapter 100, be as definitive as practicable. Although the manner and extent of such tailoring will vary in accordance with program or end-item requirements, the following is provided as a minimum for consideration in acquisition documents:

A. Media (See 101.16 and 704 including NOTE)

- (1) Hard Copy: originals reproductions
- (2) Digital Data: magnetic tape, IGES (type) transmission

B. Drawing Format (See ANSI Y 14.1)

- (1) Contractor
- (2) Government

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C. Application Data (See 101.1.1)

- (1) Whether required
- (2) On drawing
- (3) Separate document
- (4) Used on identity

D. Drawing Detail (See ASME Y14.24M)

- (1) Monodetail
- (2) Multidetail

E. Metric (See 101.4)

F. ANSI Y14.5M (Version) (See 101.21.6e)

G. Drawing Notes (See 101.21.5)

- (1) On drawing
- (2) Separate document

H. Quality Assurance Provisions - Location and Format (See 101.21.6h)

I. Types of Drawings (See ASME Y14.24M and Chapter 200)”

J. Multi-Sheet Drawings (Revisions) (See 604)

K. Redrawn Drawings (Practices) (See 605)

L. Special Items and Processes (See 501)

M Associated Lists: Parts Lists, Data Lists, Index Lists (See Chapter 700)

- (1) Manually prepared
- (2) Derived from digital data
- (3) PLs: Separate, integral or contractors option

N. Distribution Statements and Export Control Notices (See 504, 602.7 and Appendix E).

o . Software Master Media (See 204.2.6.1)

6.3 International agreements. Certain provisions of this Military Standard are the subject of International Standardization Agreements (see following listing). When revision or cancellation of this standard is proposed which will affect or violate the International Agreement concerned, the Preparing Activity will take appropriate reconciliation action through international standardization channels including departmental standardization offices, if required.

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101.14,20” Abbreviations. Abbreviations shall be in accordance with MIL-STD-12.

101.15 Diagrams.

101.15.1 Electrical and electronics diagrams. Electrical and electronics diagrams and interconnection diagrams shall be in accordance with ANSI Y14.15, Y14.15a and Y14.15b.

101.15 .1.1 Logic circuit diagrams. Logic circuit diagrams shall be in accordance with ANSI/IEEE Std 991.

101.15.2 Printed board drawings. Printed board drawings shall be in accordance with the requirements of MIL-STD-275, MIL-STD-2118, ANSI/IPC-T-50, and ANSI/IPC-D-275 as applicable.

101.15.3 Printed board description in digital form. When printed board descriptions are in digital form (defined either by metric or customary units) the description and form shall be in accordance with ANSI/IPC-D-350 or MIL-D-28000.

101.16 Media for drawings and associated lists.

101.16.1 Materials.

101.16 .1.1 Plastic sheet or roll. originals on plastic sheet shall be in accordance with L-P-519, type I or II, class 2. Undimensioned drawings, printed wiring artwork masters, production masters, and master pattern drawings shall be in accordance with MIL-D-8510. type 11 (per MIL-STD-275) or L-P-519, type I or II, class 1.

101.16 .1.2 Paper tracing. Tracing paper for dimensioned drawings shall be in accordance with UU-P-561, Type as specified.

101.16.1.3 Film, Diazotype. Copies on sensitized, diazotype film shall be in accordance with L- F-340, Type and Class as specified.

101.16.1.4 Paper, Diazotype. Copies on direct-positive, sensitized (diazotype) paper shall be in accordance with UU-P-221.

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101.16 .1.5 Preparation of duplicate original. Duplicate originals shall not be prepared for the purpose of maintaining duplicate records. Their application is limited to replacing missing original drawings.

101.16.1.6 Digital data.

101.16.1.6.1 Plotters. If originals are maintained as digital data, copies resulting from electrostatic plotters need not meet the material, erasure and aging requirements of L-P-519 or UU-P-561.

101.16.1.6.2 Maintenance. Unless otherwise specified, requirements for erasure, aging and paper do not apply to associated lists prepared by automatic data processing, or drawings prepared and maintained as digital data.

101.16.1.7 Associated lists, materials. Associated lists prepared from digital data need not meet the requirements of 101.16.1.1 or 101.16.1.2.

101.16.2 Digital product definition data.

101.16.2. Media. The physical media for delivery of digital product definition data shall conform to MIL-STD-1840.

101.16.2.2 Initial Graphics Exchange Specification (IGES). IGES engineering data files shall be Class II application data subsets in conformance to MIL-D-28000 and MIL-STD-1840.

101.16.2.3 Raster data files. Raster data files shall be in accordance with MIL-R-28002.

101.17 Scale. Drawings shall be drawn to a scale that depicts all details of the item clearly and accurately except as noted in 101.17.3.

101.17.1 Selection of scale. Drawings should show an object or assembly to full scale. When full scale is not practicable, drawings may be prepared to reduced or enlarged scale. It is desirable, whenever practicable, that detail drawings be prepared to the same scale as pertinent assembly drawings.

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101.21 Drawing notes. Drawing notes are used to provide information required to clarify the requirements for the item delineated. They may apply to a portion of the drawing or to the entire drawing, providing additional treatment, finish, protection, or other considerations. The notes area of a drawing shall be identified with the heading "NOTES".

101.21.1 Language style. Notes shall be short, concise statements, using the simplest words and phrases for conveying the intended meaning. Notes shall not include contractual requirements such as statements of costs, time and place of delivery, methods of payment, requirements for submission, approval or distribution of data, reports or plans.

101.21.2 Commonly used words and phrases. Certain words and phrases are frequently used on a drawing. The following rules shall be applied:

a. Reference documents shall be cited as follows:

- (1) "...pe"..."
- (2) "...conforming to..."
- (3) "... as specified in..."
- (4) "... in accordance with..." or "... IAW..."

b. "Unless otherwise specified" shall be used to indicate the generally applied requirements. This phrase shall come at the beginning of the note or denoted at the head of **the NOTES** column. This phrase shall be used only when it is possible to clarify its meaning by providing a reference to another document, or requirement on the drawing, that clearly specifies the exception(s).

101.21.3 Use of "shall", "will", "should" and "may".

a. "Shall". "Shall", the emphatic form of the verb, shall be used whenever a requirement is intended to express a provision that is contractually binding.

b. "Will". "Will" may be used to express a declaration of purpose on the part of the Design Activity. It may be necessary to use "will" in cases when simple futurity is required.

c. "Should" and "may". "Should" and "may" are used when it is necessary to express non-mandatory provisions.

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101.21.4 Indefinite terms. Indefinite terms such as “and/or”, “etc.”, “e.g.” and “i.e.” shall not be used. On drawings, definite, precise language is imperative.

101.21.5 Location of notes. Notes shall be located on sheet one or reference shall be included on sheet one indicating note location. When notes are continued beyond a given sheet, information to that effect shall be included, for example “NOTES CONTINUED ON SHEET 4”.

101.21.5.1 Drawings in book-form. For drawings in book-form, the notes or textual data may be prepared and grouped on continuation sheet(s) of the drawing.

101.21.6 Drawing notes, contents. Drawing notes are pertinent data given in word form and used to complement the delineation of other given data. Drawing notes shall be concise, grammatically correct statements. The arrangement of the notes shall not be interpreted as an order of precedence, or sequence in manufacturing or assembly unless so specified on the drawing. The following shall be applicable in the preparation or use of notes:

- a. General notes apply to the entire drawing or associated list.
- b. Local notes are notes which are located at the specific area or point of application. Requirements specified by local notes apply only to the areas or points indicated.
- c. Flagnotes are notes which are located with the general notes but apply only at specific areas or points on the drawing. A flagnote shall be identified with a flagnote symbol in accordance with 101.21.6f. The flagnote symbol including the note number shall be shown at each point of application.
- d. General notes and flagnotes shall be numbered consecutively as a single listing starting with Note 1. Filling in voids (open spaces) to accommodate deletions is not required. Note numbers of deleted notes shall not be reused unless the identical note content is reused.

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101.23 Drawing verification, approval and authorization systems. Unless otherwise specified, the Design Activity shall have an effective verification and approval, or authorization system (including electronic as applicable) for the detailed examination and review for technical accuracy of all engineering drawings, associated documents, databases, including microfilm or data transmission systems. The authorization system shall require the entry of the names or signatures of the responsible individuals in the appropriate blocks to indicate conformance of the engineering drawings, associated lists or digital databases with applicable requirements and contract provisions. See also Appendix A.

101.24 Dating drawings. The method of specifying dates on drawings shall be numerical by year-month-day for entry in the DATE block. For example, June 10, 1989 would be indicated as 89-06-10 or 890610 or 89/06/10.

101.25 Reference identifiers. A reference identifier may be used to provide supplementary identification of an item that has been identified previously on the drawing or on a subordinate assembly. The use of reference identifiers shall be limited to instances that add substantially to drawing clarity. In order to differentiate from the item identification callouts, the following format shall be used:

a. Reference identifier shall be either the basic name or the basic name preceded by modifier(s) or part number as necessary (in instances where there are more than one part with the same basic name such as "PLATE" or "SCREW").

b. Reference identifier shall be followed by the word "REF".

Examples: "TRANSMISSION - REF"
"FRONT BUMPER - REF"
"12345678-REF"

101.26 Parenthetical information. Design activity identifying numbers may be referenced parenthetically to identify in-house peculiar identities. Engineering drawings and PIs using parenthetical identification shall carry a note thereon indicating parenthetical identities are for reference only. Parenthetical information contained on a drawing is for reference only. Documents identified as parenthetical information are not considered as referenced documents as defined in 3.69.

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101.27 Use of Government and non-Government standardization documents. When the requirements in applicable standardization documents do not completely fulfill the design requirements of the item, engineering drawings may specify the requirements of the standardization document and the variations necessary to fulfill the design requirements of the item, in lieu of preparing new documentation.

101.28 Code Identification, FSCM and CAGE Code. Terms such as “FSCM” or “Code Identification” on existing documents or pre-prepared formats in stock need not be updated to “CAGE Code” or “CAGEC”.

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CHAPTER 200

TYPES OF ENGINEERING DRAWINGS

200. General. This chapter defines and illustrates the types of engineering drawings normally prepared by or for Departments and Agencies of the Department of Defense.

201. Associated lists. See Chapter 700.

202. Methods and styles.

202.1 Tabulation. Tabulation is the depiction on a drawing of a group of items having certain common characteristics and some variable features. Any type of drawing may be "tabulated" in order to delineate such variations. Tabulation precludes the preparation of individual drawings for each item depicted. Each item included in the tabulation shall have a PIN assigned in accordance with 406.6. See Figure 200-1.

202.1.1 Tabulation requirements. The difference (variables) between the items on a given drawing shall be tabulated. The fixed (common) characteristics shall be depicted or stated once. Each item shall be uniquely identified. Normally, a pictorial representation of a single item is shown, with variable characteristics coded by means of letters used as headings for columns in the tabulation. The variables are entered in the table under the appropriate headings and on the same line as the unique identifier for the specific item. Alternate methods may be used to correlate the variations in characteristics to the individual items. The description for each tabulated item shall be as complete as that of an individual item described on the specific drawing type.

202.2 Drawings in book-form. Where it is advantageous to provide a given drawing type in the form of numerous small sheets, suitable for binding, and so doing meets with the approval of the design or procuring activity, drawings in book-form format may be used. The format shall be in accordance with ANSI Y14.1 and structured as illustrated in Figures 200-2a and 2b. Drawings in book-form shall not be used as a means of avoiding the development of formal standardization documents, such as military or federal specifications. The specifying of products in specification format should be in accordance with MIL-STD-490 or MIL-STD-961, as applicable.

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202.2.1 Book-form requirements and limitations. Drawings in book-form shall use A, B, C, and G size sheets, and may include graphic delineations, textual data, tables and tabulations. A, B, and G size sheets may be intermingled in a single drawing. However, C size sheets shall not be intermingled with other sheet sizes. See 604 for revision procedures. Drawings in book-form shall not be prepared to circumvent the requirements for furnishing the types of drawings normally required for the delineation of an item or system.

202.3 Combination of drawing types. The characteristics of more than one drawing type may be combined into a single drawing provided that the resulting combination includes the data required by the individual drawing types.

202.3.1 Application. Normally several types of engineering drawings and associated lists are required to completely define the end-product requirements of an item. As a minimum, a combination of detail and assembly drawings may suffice to define these requirements. However, as the complexity of the item increases, specialized engineering drawings may be required to provide for full engineering description. As a rule, combinations of detail, assembly, control, installation and diagrammatic drawings will provide the necessary engineering description. In certain cases, ancillary drawings (see 204.1) may be required for management control, logistic purposes, configuration management, manufacturing aids, and other unique functions as might be required by a design or procuring activity.

203. Pictorial drawing. When three dimensional depiction is specified instead of or as a supplement to multiview orthographic drawings, the required pictorial drawing shall be in accordance with ASME Y14.4M.

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204. Drawing types.

204.1 Industry standard. The following drawing types shall be in accordance with ASME Y14.24M (See Appendix F.)

- Ancillary drawings (See Note 1)
- Layout drawing
- Detailed drawings: monodetail and multidetail
- Assembly drawing
- Modifying drawings: altered item and selected item and modification drawings (see Note a .
- Arrangement drawing
- Installation drawing
- Control drawings: vendor item drawing (formerly specification control drawing), source control drawing, interface control drawing, and identification cross reference drawing (see Notes 4, 5, 6, 7, 8 and 9).
- Mechanical schematic diagram
- Electrical/electronic diagrams: functional block diagram , single line diagram, schematic or circuit diagram, connection or wiring diagram, interconnection diagram, wiring list, and logic circuit diagram
- Special application drawings: wiring harness drawing, cable assembly drawing. printed board drawing sets - assembly drawing. master drawing, and artwork master, undimensioned drawing, tube bend drawings – pictorial and tabular delineation. matched set drawing, kit drawing, and cutaway definition drawing (see Note 10).

NOTE 1: Ancillary drawings are other than end-product drawings used to supplement end-product requirements. Ancillary drawings do not establish item identification. These kinds of engineering drawings may be required for management control, logistic purposes, configuration management, manufacturing aids, and other function unique to a design activity or manufacturer. Drawings of a general nature that describe unique data, processes, methods, heat treatment, protective finishes or special painting, shall be prepared as a general requirements drawing in either book-form or other format. See also 202.2.

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NOTE 2: Engineering data shall be submitted along with altered or selected item drawings, unless the item, prior to alteration or selection, is described in a military or non-Government standardization document. Military and non-Government standardization documents need not accompany submissions of altered or selected item drawings. If existing engineering data completely describing the item prior to alteration or selection is not available, then the delineation of the item on the altered or selected item drawing shall be of such detail as necessary to completely define the item requirements prior to alteration or selection.

NOTE 3: (NOTE DELETED BY NOTICE 2)

NOTE 4: A control drawing is a drawing disclosing engineering form, fit, function, and performance requirements for the acquisition of interchangeable purchased items of existing designs, or of items specially developed by vendors to the control drawing requirements.

Control drawings permit the acquisition of vendor developed items from specialized segments of industry without disclosing details of designs or divulging proprietary vendor data. A Standardized Military Drawing is a Government peculiar control drawing. See 204.2.3.

NOTE 5: Vendor item drawings shall not be used to depict microcircuits (Federal Supply Class 5962) which comply with MIL-STD-883. Microcircuits compliant with MIL-STD-883 shall be depicted on Standardized Military Drawings (SMDs). See 204.2.3.

NOTE 6: A vendor item drawing depicts an existing commercial item or vendor developed item advertised or catalogued as available on an unrestricted basis as an "off-the-shelf" item or an item, while not commercially available, is procurable from a specialized segment of industry. The manufacturer's (vendor's) part number shall be the PIN. See 406.10d and 406.10, Note 1.

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NOTE 7: Under certain contracts or purchase orders, Government design or procuring activity approval may be required for the preparation of Source Control Drawings. See Appendix D for Qualification Provisions as applied to Source Control Drawings where the Government Activity (Army, Navy, Air Force) is identified by CAGEC and Name in the title block or indicated as "CURRENT DESIGN ACTIVITY".

NOTE 8: A source control drawing provides an engineering description, qualification requirements, and acceptance criteria for a vendor item that exclusively provides the performance, installation, and interchangeability characteristics required for specific critical applications. Included on the drawing is a listing of approved sources of supply, their addresses, CAGE Code, and item identification for vendor items that have been qualified and approved for use in a specific application. The source control drawing number and applicable suffix identifiers establish the PIN. See 406.10, Note 2.

NOTE 9: Unless otherwise specified, the listing of manufacturing sources of supply on a source control drawing by a Government design activity is performed in accordance with Appendix D.

I NOTE 10: See also 101.15.2 and 101.15.3 on Printed Board Drawing.

204.2 Government peculiar. The following drawing types (or variations thereof) describe program or Government peculiar requirements for drawing types. See also Appendix F.

204.2.1 Inseparable assembly drawing. An inseparable assembly drawing delineates items (pieces) which are separately fabricated and are permanently joined together (as in welded, brazed, riveted, sewed, glued or other processes) to form an integral unit (part) not normally capable of being disassembled for replacement or repair of the individual pieces. An inseparable assembly drawing may be prepared in lieu of individual monodetail drawings for inseparable (welded, brazed, bonded, riveted, sewn, glued or other processes) assemblies intended to be procured and replaced as a unit. Example: A welded or riveted bracket, a wood, metal or plastic chest, or a canvas case may be covered by an inseparable assembly drawing without separate detail drawings. See Figure 200-3. (See ASME Y14.24M, Assembly Drawing)

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204.2.1.1 Inseparable assembly drawing requirements. An inseparable assembly drawing shall fully define the end-product as assembled. Pieces of the inseparable assembly may be detailed either on separate detail drawings or on the inseparable assembly drawing itself.

204.2.2 Envelope drawing. An envelope drawing depicts an item in a development (privately or Government) or pre-production stage. Accordingly, features not shown on the drawing are left to the ingenuity of the producer in meeting the performance, design and, installation requirements that are indicated. Envelope drawings do not establish item identification. When item development is completed, envelope drawings shall evolve into detail drawings, specifications, or vendor item or source control drawings, as applicable. The notation "ENVELOPE DRAWING" shall be placed above the title block. See Figure 200-4.

204.2.3 Standardized military drawing. An SMD is a control drawing, and shall disclose the applicable configuration, envelope dimensions, mounting and mating dimensions, interface dimensional characteristics, specified performance requirements, nuclear effects, and inspection and acceptance test requirements for microcircuits in a military application. Guidance concerning SMDs is contained in MIL-HDBK-780. See Figure 200-5.

204.2.3.1 SMD requirement. SMDs shall depict Government requirements for existing commercial items in terms of performance, screening, and testing for military application.

204.2.3.2 SMD limitation. SMDs shall be prepared in lieu of source control and vendor item drawings for microcircuits compliant to MIL-STD-883. The use of source control drawings in lieu of SMDs is subject to the review and approval of the procuring activity.

204.2.4 Combination of adopted items drawing. A combination of adopted items drawing depicts the items constituting a combination of items and assigns a unique identification number to the combination. The drawing serves as the basic document for assignment of a stock number to the combination. See Figure 200-6.

204.2.4.1 Combination of adopted items drawing requirements. Entries on the drawing shall be in accordance with lettering requirements of 101.2. Entries in each column shall be as follows:

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a. **NATIONAL STOCK NUMBER (NSN):** Self Explanatory. If no NSN exists, enter "NONE". If an NSN exists but does not apply enter "NOT APPLICABLE".

b. **COMBINATION OF ADOPTED ITEMS:** The necessary description of the combination of adopted items represented by the drawing shall be entered in the "Combination of Adopted Items" column. The first and main entry shall be the necessary description of the combination of adopted items for which the drawing is prepared. The words "COMPOSED OF:" shall be entered below the first entry. The items contained in the combination described in the first entry shall then be listed by complete nomenclature. The quantity of each item, listed below the words "COMPOSED OF:" necessary to complete one unit of the combination shall precede the description of each item.

c. **CAGE CODE:** The CAGE Code of the design activity whose PIN is assigned to the item(s) listed. If the CAGE Code is the same as that in the drawing title block, it may be omitted.

d. **PIN:** The PIN(s) of the item(s) listed. If no PIN exists, enter "NONE".

204.2.5 Package content drawing. A package content drawing is a drawing prepared to provide a package PIN and appropriate package nomenclature for stock identification of military materiel packaged for convenience of handling, storage, issue, or functional selectivity in logistic support operations. Package content drawings are prepared for that packaging which constitutes a synthetic grouping or combination of items, which in themselves do not constitute a functioning, engineering, or production assembly. Representative examples of such groupings are engine and container units. See Figure 200-7.

204.2.5.1 Package content drawing requirements. Entries on the drawing shall be in accordance with the lettering requirements of 101.2. Entries shall be as follows:

a. **PACKAGE STOCK NO.:** The National Stock Number assigned to the package.

b. **PACKAGE NOMENCLATURE:** The nomenclature of the package.

c. **THIS PACKAGE PERTAINS TO:** The nomenclature and model number or, if model number does not apply, the part number of the system/subsystem to which the package applies.

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d. QTY: The quantity of each item which is necessary to make up one unit of the package.

e. NAME OF ITEM: Nomenclature of each item contained in the package.

f. DWG NO.: The drawing number of each item listed.

g. CAGE CODE: The CAGE Code assigned to the drawing for- the items listed. If the CAGE Code is the same as that in the drawing title block it may be omitted here.

h. PIN: The PIN of each item listed.

i. STOCK NUMBER: The National Stock Number of each item listed. If no Stock Number exists, leave blank.

j. TITLE BLOCK: The nomenclature of the package contents drawing.

204.2.6 Software and firmware data. Drawings defining software that will be or are intended as resident in a firmware device shall be prepared as Software Drawings for the master media and Altered Item Drawings for the firmware.

204.2.6.1 Software drawing. A software drawing describes the characteristics of the software and its master media, used for programming each applicable device or assembly. Software programs will not be defined as truth tables but rather identified as to be supplied as a duplicate of the master media in digital form.

204.2 .6.1.1 software drawing requirements. The drawing shall specify the type of media (for example, magnetic tape or disk), media PIN. and version identification of the software. In addition, the media characteristics (for example, type, number of tracks, density and size) and the characteristics and formats of the information stored on the media shall be fully described. Any other information necessary to completely describe how the master media is to be used shall also be included. The PIN of the master media shall be shown as a suffixed identifier of the software drawing. If more than one version of the software is to be installed or used, the drawing shall provide separate suffixes for each version. The notation SOFTWARE DRAWING shall be placed above the title block. See Figure 200-8."

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CHAPTER 400

NUMBERING, CODING AND IDENTIFICATION

400. General. This chapter establishes numbering, coding, and identification procedures for engineering drawings, associated lists, and documents referenced thereon. It also provides identification direction for parts, materials, processes, and treatments specified on these engineering drawings and associated lists.

401. Commercial and Government Entity Code (CAGE Code). The CAGE Code is a five-position code, or numeric or alpha numeric character-s, applicable to activities which have designed, produced or are producing or supplying items used by the Government. It also applies to Government activities which control design, or are responsible for the development of certain specifications, drawings or standards which control the design of items. These codes are assigned in conformance with CAGE Cataloging Handbook, H4/H8. Activities not assigned a CAGE Code shall request such identification in conformance with the CAGE Cataloging Handbooks. Organizations which neither manufacture nor control design, such as dealers, agents or vendors of items produced by others, are assigned type "F" CAGE Codes and shall not be included as a design activity on a drawing. Type "A" CAGE Codes, for manufacturers, are applicable for use on drawings. CAGE Codes shall be entered in the appropriate block of the drawing or associated list format and shall be preceded by the phrase "CAGE CODE". If necessary, because of space limitations, the phrase "CAGE" may be used.

402. Document identification number. The document identification number consists of numbers of combinations of letters, numbers, and dashes. This number, in addition to the titles and CAGE Code, is assigned to a document for identification purposes.

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403. Drawing number. The drawing number consists of letters, numbers or combination of letters and numbers, which may or may not be separated by dashes. The number assigned to a particular drawing and the CAGE Code provide a unique drawing identification. The drawing number shall be assigned from numbers controlled by the design activity whose CAGE Code is assigned to the drawing.

404. Part or identifying number The Part or Identifying Number (PIN) shall consist of letters, numbers or combinations of letters and numbers, which may or may not be separated by dashes or slashes that are assigned to uniquely identify a specific item. The PIN shall be or shall include the design activity drawing number, and may include a suffix identifier (if applicable). (See 406.6.) The PIN assigned to a specific item and the CAGE Code assigned to the drawing of the item provide a unique item identification.

405. Find number A find number may be assigned to an item for the purpose of cross-referencing an item identified in a parts list or table on the drawing to the location of the item in the field of the drawing, in lieu of using the PIN in the field of the drawing. Item identifications for- parts or assemblies that are assigned a find number shall be itemized in the integral *or* separate parts list or in a table on the drawing. Items identified as substitutes shall be assigned the same find number as the items for which they may be substituted. Find numbers are for cross-referencing purposes only within the drawing and associated lists, and shall not be used for procurement or marked on the items they represent or the assemblies containing the items. Reference designations in accordance with ANSI/IEEE STD 200 and IEEE STD 315 may be used as find numbers. See ANSI Y14.34M.

406. Identification requirements. All drawings, associated lists and items shall be assigned identifications as follows:

406.1 New drawings and associated lists. New drawings and associated lists shall be assigned a CAGE Code in accordance with 401 find 406.4: drawing number-s in accordance with 403 and 406.5. Items shall be assigned PINs in accordance with 404, 406.6 and 406.10.

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406.2 Existing drawings and associated lists. Existing drawings and associated lists which do not contain a CAGE Code, FSCM or Code Identification shall be assigned a CAGE Code (see 602.7) in accordance with 401. The CAGE Code shall be placed as near as possible to the drawing or associated list number. The CAGE Code shall be preceded by the phrase "CAGE CODE" or "CAGEC".

406.3 Referenced documents. All documents, other than Government or non-Government standardization documents referenced on drawings, shall be assigned a document identification number, and a CAGE Code. Reference documents shall be identified on drawings in accordance with 406.11.2. The contractor design activity is responsible for assigning or obtaining document numbers and the CAGE Code for documents used with drawings. Technical orders, pamphlets and recordings are not considered referenced documents, and, therefore, shall not be referenced on engineering drawings without Government design or procuring activity approval.

406.4 CAGE Code. The CAGE Code shall be the CAGE Code of the design activity whose drawing number is assigned to the drawing and shall be entered on the drawing in the appropriate block, as shown in Figure 400-1. CAGE Code assignment shall establish a relationship between the assigned Code and the design activity name and address (appearing on the drawing), at the time of assignment. (Notice of change in design activity name or address are subject to review by the Government and are forwarded to: Defense Logistics Services Center, Defense Logistics Agency, Battle Creek, Michigan 49016.) See also 406.9.

406.5 Drawing number structure. The drawing number shall not exceed 15 characters. These characters may include numbers, letters, and dashes with the following limitations: (See 406.6).

a. Letters "I", "O", "Q", "S", "X" and "Z" shall not be used; however, letters "S" and "Z" may be used only if they are a part of the existing drawing numbering system. They shall not be used in the development of new drawing numbering systems.

b. Letters shall be uppercase (capital letters). Numbers shall be Arabic numerals. Fractions, decimals and roman numerals shall not be used.

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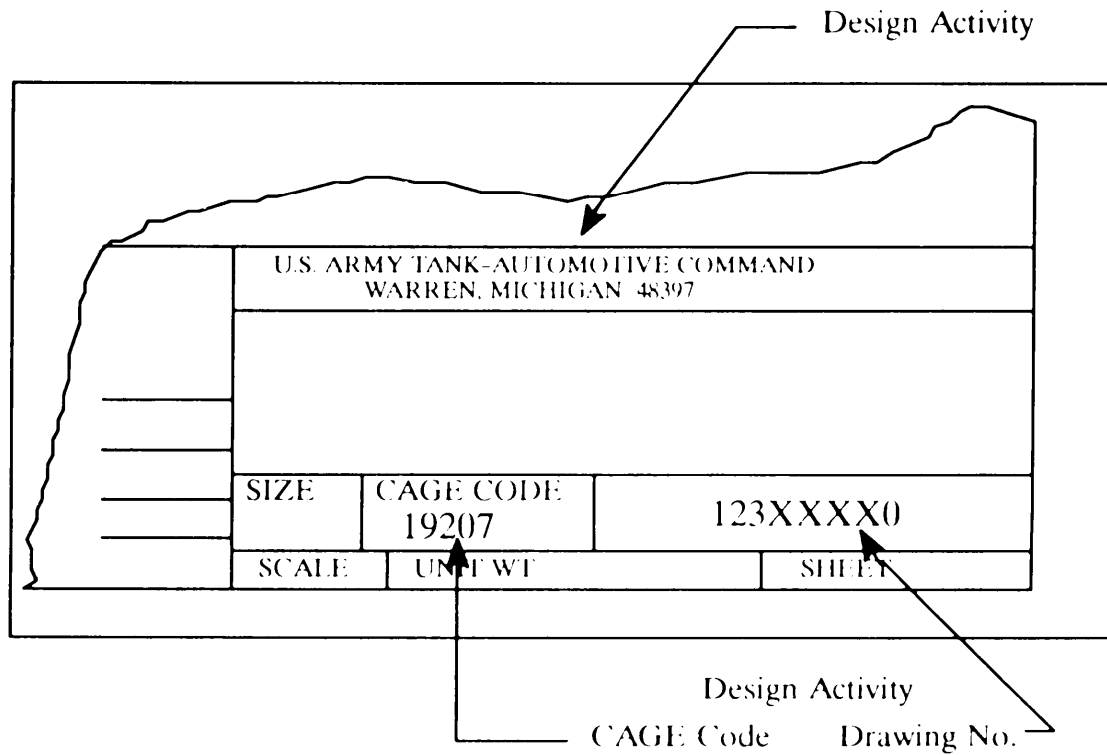


Figure 400-1. Example of CAGE Code, drawing no, design activity relationship as originally specified.

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c. Blank spaces are not permitted.

d. Symbols such as: parentheses (), asterisks*, degree °, plus +, shall not be used, except when referencing the Government or non-Government standardization document whose identification contains such a symbol.

e. The CAGE Code, drawing format size letter, and drawing revision letter (see 602.3) are not considered part of the drawing number.

f. Drawing numbering systems shall preclude duplication of assigned numbers. Numbering systems may be based on either non-significant numbers or significant numbers.

406.6 PIN length and applicat PIN's shall not exceed 15 characters. This number shall be or shall include the drawing number on which the item is described. Where more than one item is described on a drawing, unique identification shall be provided by the addition of a suffix identifier, with the following limitations: (For bulk materials see 406.15.4).

a. The total length of the PIN including the suffix identifier shall not exceed 15 characters.

b. The suffix identifier shall have the same characteristics as drawing numbers and may be composed of numbers, letters or any combination thereof.

c. Suffix identifiers may be used even if only one item is described on a drawing.

d. PIN's shall not include the drawing revision (see 400.5.e).

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NOTE: Contractor–manufacturer part and drawing numbering systems. Contractors and manufacturers are encouraged to forward to the Commander, Defense Logistics Services Center, ATTN: DLSC–FBA, Federal Center, Battle Creek, Michigan 49016, an explanation of their part and drawing numbering systems to be included in Cataloging Handbook H7, Manufacturers Part and Drawing Numbering Systems for Use in the Federal Cataloging System.

406.7 Records. A complete and accurate record of drawing numbers shall be maintained by the design activity allocating or assigning the numbers. Duplicate drawing number assignment shall be avoided.

406.8 Associated lists. Associated lists shall be assigned the same identifying numbers as the parent drawing to which it pertains. This identifier shall be prefixed by the letters “PI”, “DI”, or “II” as applicable. This prefix becomes an integral part of the list identifier. When no parent drawing exists, associated lists shall be assigned a drawing number with the associated prefix “PI”, “DI”, or “II”. The fifteen–character PIN limit shall not apply in those instances where the applicable associated list prefix plus the drawing number exceeds fifteen characters.

406.9 Transferring design responsibility to another activity. When the design responsibility for engineering drawings is transferred from one design activity to another, the drawing number(s) and PINs shall be transferred to the new design activity for administration. The new assignee shall add his CAGE Code, name, and address on the drawing by revision action to identify change in design responsibility. In no case will the original drawing identity be changed or relocated to indicate a new CAGE Code. Figure 400–2 illustrates an example of drawing notations indicating a transfer of design responsibility.

NOTE: In addition, the CAGE Code of the original design activity specified in the item identification marking requirement shall not be changed.

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406.12 Numbering of related parts. Numbers to identify special relationships between parts shall be assigned as follows:

406.12.1 Matched part designation. Matched parts shall be marked with the word "SET" next to the PIN assigned to identify the matched set or pair of parts. See also ASME Y14.24M.

406.12.2 Symmetrically opposite (mirrored) parts. Symmetrically opposite parts, if not described by separate drawings, shall be described using one of the following methods:

a. Detail each part in a separate view. Each part shall be identified by the suffix identifier system. See 406.6. Do not specify "SHOWN" and "OPPOSITE".

b. Detail one of the parts in a view and identify each part by the suffix identifier system. See 406.6. For example, include on the drawing under the view the designation "765432-1 SHOWN" and "765432-2 OPPOSITE" or "-1 SHOWN" and "-2 OPPOSITE". The use of odd suffix identifiers for the parts shown and even suffix identifiers for the opposite parts is preferred. This method is useful if the view is clear enough to distinguish the opposite part.

c. Truly identical parts which can be "reversed" in any position shall carry only one PIN.

406.12.3 Inseparable assembly. When two or more pieces are permanently fastened together by welding, riveting, brazing, cementing, bonding, or other processes to form an inseparable assembly, the assembly shall be assigned an identifying number. The individual pieces may be assigned PINs as described in 406.10 and called out on the inseparable assembly.

406.13 Change requiring new identification. The design or procuring activity shall assign new PINs when a part or item is changed in such a manner that any of the following conditions occur:

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Condition 1. Performance or durability is affected to such an extent that superseded items must be discarded or modified for reasons of safety or malfunction.

Condition 2. Parts, subassemblies, or complete articles are changed to such an extent that the superseded and superseding items are not interchangeable.

Condition 3. When superseded parts are limited to use in specific articles or models of articles and the superseding parts are not so limited to use.

Condition 4. When an item has been altered, selected, or is a source control item (see Chapter 200 and ASME Y14.24M).

Condition 5. When a repair part within an item is changed so that it is no longer interchangeable with its previous version, it shall be assigned a new PIN. A new PIN shall also be assigned to the next higher assembly for the changed repair part and to all subsequent higher assemblies up to and including the level at which interchangeability is re-established.

406.13.1 Computer program. When an item is changed in such a way that it necessitates a corresponding change to a computer- program for operation. self test or maintenance test, the PIN of the item and its next assembly and all progressively higher assemblies shall be changed up to and including the assembly where computer programs are affected.

406.14 Changes not requiring new identification. When a part or assembly is changed in such a manner that conditions of 406.13 do not occur, the PIN shall not be changed. Under no condition shall the PIN be changed only because a new application is found for an existing part. When an item has been furnished to the Government. the applicable PIN shall not be changed unless conditions in 406.13 apply. However, when a design activity desires to create a tabulated listing or a standard because of a multiple application of an item, the aforementioned need not apply. The superseded drawing shall identify the document which superseded it. The superseding document shall identify the PINs replaced and provide a complete cross-reference of superseded PINs to replacement PINs.

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406.15 Identification of materials, processes and protective treatment. Materials, processes and protective treatment necessary to meet the design requirements of an item shall be identified on the drawing or PL by reference to the item identification, identification cross reference, or to the applicable specifications or standards, including type, grade, class, or condition as applicable. Revision or amendment symbol of the specification or standard shall not be indicated unless it can be established that a particular revision level or existing amendment has a critical relationship to drawing interpretation or item function. Additional reference to other equivalent specifications is permitted. If necessary these items may be reidentified in accordance with 406.10.1.

406.15.1 Group identification. A set of requirements common to items delineated on different drawings may be consolidated into a single document and referred to by a single document identifier. This document shall be part of the drawing set but does not replace the documents detailing the requirements that would otherwise be referenced on the item drawings.

406.15.2 Other identification. When parts, materials, processes and protective treatments are used which cannot be identified adequately in accordance with 406.10, a separate drawing or specification (if applicable) shall be prepared. See 406.10.1. The document or PIN shall be specified on applicable drawings.

406.15.3 Formulation identification. Formulation (such as chemical constituents of explosives, propellants, pyrotechnics or fillers) shall be considered and treated as a part and identified in accordance with 406.6 (PINs) or 406.10a and 406.10b (specification or standard based identifications).

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406.15.4 Bulk items identification Bulk items shall be identified by a discrete identifier in accordance with 406.10 or 406.15. Where practicable, the quantity or measurement of material shall be included. Separate engineering drawings shall not be prepared for specific quantities of bulk items, unless the conditions specified in 406.15.4.1 apply.

406.15.4.1 Drawings for bulk items Any bulk item, requiring assignment of National Stock Number and not having an associated PIN system, shall require a drawing and PIN if no supporting documentation exists (military specification or standard, or non-Government standard). Bulk items, which have a finite shape, such as wire, tubing, cable, chain, tape and hose, and are required for logistics support, shall be identified as a component an assembly or installation drawings through a discrete PIN consisting of a document number and suffix identifiers, as applicable to identify each size, length or quantity used in the assembly or installation. Accordingly, the absence of controlling documentation and PIN system shall require a separate drawing. Separate drawings shall not be prepared for bulk items covered by existing specifications or standards except where there is a support requirement and an absence of a PIN system.

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CHAPTER 500

MARKINGS ON ENGINEERING DRAWINGS

500. General. This chapter establishes requirements for application of markings on engineering drawings and associated lists. These markings are used in support of and in addition to graphics and text to convey information about the drawing, the list or items depicted thereon. The intent of this chapter is to standardize marking nomenclature, control graphics of symbology, and indicate minimum requirements for management data that is currently mandatory for drawing and associated list maintenance and application by Government design or procuring activities.

501. Items and processes, special notations. When items or processes require special notations on the drawing, relevant drawings shall identify such items, processes, or both, as applicable, with specific markings, notations, or both. Acronyms, descriptions, and relevant references, are indicated in Table 1.

501.1 Marking for special items and processes. When it is required to identify special consideration item(s), process(es), or combination of item(s) and process(es), the appropriate symbol(s), such as shown in Figure 500-1, shall be prominently displayed near the title block and shall use the same size letters as the drawing title. The appropriate symbol shall also be placed at the line entry of the applicable item(s) or process(es) in the parts list and shall use the same size lettering as the parts list entries. Exceptions are as noted in 501.4.

501.2 Feature identification. When a specific feature of a drawing is the cause for special item or process status, that feature shall be identified with the appropriate symbol. The symbol shall be placed adjacent to the note or dimension(s) defining the characteristic. For tabulated dimensions or features, the table shall contain an entry for the applicable symbol.

501.3 Notes. For drawing notes associated with special items and processes, refer to 101.21.6. If, on an assembly drawing, the special item or process is the assembly method(s) procedure(s), this shall be reflected in the drawing notes. If the special item or process is itself a note, the symbol shall be placed as follows:

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Preferred: 5. CSI HEAT TREAT PER

Alternate: 5. HEAT TREAT PER *CSI*

501.3.1 Specialized note. The following note shall be used for hardness critical items or processes:

“THIS (enter the word DRAWING or PARTS LIST, as appropriate)
DEPICTS HARDNESS CRITICAL ITEMS (HCT's) AND (OR)
HARDNESS CRITICAL PROCESSES (HCP's). ALL CHANGES
TO OR PROPOSED SUBSTITUTIONS OF THESE HCT's OR
HCP's SHALL BE EVALUATED BY (Enter the engineering
activity responsible for nuclear survivability.)”

501.4 Exceptions. For systems which cannot produce the boxed symbols, and for standard text, alternate symbols such as *HCT*, -OCP-, -CSI-, or *INT*, in applicable note and text size, may be used. The same symbology structure shall be used throughout the drawing or list. However, for the ESD symbol shown in Figure 500-1, only that symbol shall be used in non-text applications.

502. Item replacement notations.

502.1 Interchangeable items. When an item is replaced by another item, which is physically and functionally interchangeable and intended for stocking as a fielded replacement, the notation “PIN 9876 . . . INACTIVE FOR NEW DESIGN, USE INTERCHANGEABLE PIN 1234 . . .”, shall be entered on the drawing. The new item will replace the old in all present and future applications. The addition of the note constitutes a change; therefore, an applicable entry in the revisions block in accordance with Chapter 600 is required.

502.2 Noninterchangeable items. When an item is to be replaced by another existing or new item but is not interchangeable, and intended for stocking as a fielded replacement, the notation “PIN 9876 . . . INACTIVE FOR NEW DESIGN, USE NONINTERCHANGEABLE PIN 1234 . . .”, shall be applied over, or as near as practicable to, the title block of the drawing for the replaced item as shown in Figure 500-3 and in accordance with 502.5. The new item will replace the old item only in new design work. The old item will continue to

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be used in all its applications. The addition of the note constitutes a change: therefore, an applicable entry in the revisions block in accordance with Chapter 600” is required.

502.3 Drawings of multiple items. When not all of the items on a drawing are replaced, the notation information cited in 502.1 and 502.2 shall be contained in a drawing flagnote or table for each affected item.

502.4 Superseded drawing When a drawing is redrawn (new original with the same drawing number), and the superseded drawing is to be retained, the word “SUPERSEDED” shall be added to the old original above the title block as shown in Figure 500-4 and in accordance with 502.5. Revisions block entries shall be in accordance with Chapter 600.”

502.5 Notation size. Notation cited in 502.4 shall be stamped or printed in characters the same size as the lettering height of the drawing title.

503. Identifying substitute parts. Drawings and PLs show parts, materials, or methods as substitute to permit establishment of alternate sources of supply, permit production of parts by alternate methods of manufacture or permit fabrication of items with substitute parts or materials. If parts are identified on the field of the drawing by part number callout, substitute parts or assemblies shall be identified directly or by reference, on assembly or installation drawings as follows (See 406):

127XXXX1 - PREFERRED

128XXXX3 - SUBSTITUTE

or

128XXXX3 - ALTERNATE

504. Distribution Statements. Distribution Statements and associated Export Control Warning Notices shall be in accordance with MIL-STD-1806 and located on engineering drawings and associated lists in accordance with Appendix E. Distribution Statements shall be as specified by the Government design or procuring activity.

505. Security classification and notation. Security classification and notations shall be in accordance with Appendix B.

506. Proprietary legends on drawings. Proprietary (limited rights) claims shall be marked on applicable sheets of drawings with the appropriate approved legend as required by applicable Defense Federal Acquisition Regulation (DFAR).

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507. Duplicate original. (The following requirement applies to manually prepared drawings. For CAD drawings refer to 509.) When a drawing is replaced by the "DUPLICATE ORIGINAL" process, that is, field of drawing has not been touched-up or reconstructed, the words "DUPLICATE ORIGINAL" shall be added to the drawing in the lower right hand margin, near the title block, with lettering size the same size as the drawing title. See Figure 500-5. The revision level shall not be raised. If reconstruction or touch-up is required, the drawing shall be considered "REDRAWN WITHOUT CHANGE" (see 605). If additional changes are required, the drawing shall be considered "REDRAWN WITH CHANGE" (see 605.)

508. Duplicate production master (stable base artwork). One production master drawing (master pattern) shall be prepared as an original master. Duplicates of the production master, made from the original stable base artwork or CAD system shall be marked "DUPLICATE PRODUCTION MASTER. DO NOT REVISE" in the revisions block area as shown in Figure 500-6 or above the title block. Marking may be accomplished by addition of a label, lettering applied directly on drawing, or other suitable means.

509. CAD reproductions. Reproductions of drawings that are CAD data base controlled shall be marked in accordance with 510 (see also 608). Design activities may add additional information to this note to identify in-house peculiar requirements.

510. Reproductions from digitally maintained data. Copies derived from data that is stored and maintained digitally, shall include a note similar to the following beneath the last entry of the revisions block area (see Figure 500-7), or above the title block.

CAD MAINTAINED. CHANGES SHALL BE
INCORPORATED BY THE DESIGN ACTIVITY.

511. Drawing copies derived from exchanged digital data. When digital data is exchanged between dissimilar digital systems, the exchange format (such as IGES or STEP) shall be included on the drawing copy. This information shall follow the note required by 510. See the following example.


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Insert IGES version,
example : (3.0)



IGES - ()

512. Chemical agent resistant coating. Items coated with Chemical Agent Resistant Coating ((AR(') shall have the word "CARC" and data applied near the data plate or name plate of the item. The word "CARC" shall be in contrasting color, black or green, in block letters, 7.5 mm high minimum. The marking may be applied directly or by label or decal. Drawings shall specify the exact method of applying and locating of the word "CARC".

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TABLE I. Acronyms for special items and processes

ACRONYM	DESCRIPTION	REFERENCE
CSI	Critical Safety Item	MIL-STD-882
CSP	Critical Safety Process	MIL-STD-882
ENI	Environmental Impact	
ESD	Electrostatic discharge Sensitive Devices	MIL-STD-1686/ DOD-HDBK-263
ESS	Environmental Stress Screening	MIL-STD-2164
HAZ	HAZardous conditions, processes, or materials	
HCI	Hardness Critical Item	
HCP	Hardness Critical Process	
I/R	Interchangeability /Replaceability	MIL-I-8500
INT	INTerface control	
OCI	Observable Critical Item	
OCP	Observable Critical Process	

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CHAPTER 600

REVISION OF ENGINEERING DRAWINGS

600 General. This chapter covers methods for revising engineering drawings and for identifying and recording revisions on original drawings.

601 Revision methods. Revisions shall be made by erasure, crossing out, addition of information or by redrawing.

601.1 Change in dimensions. In general, any change in a dimension of a part should also be made to scale on the affected portion of the delineation. However, for manually maintained drawings, it is permissible to leave the delineation unchanged when the new proportion of the part is not noticeably different from the original one. If change to scale is not made, the practice outlined in ANSI Y 14.5M (for out-of-scale dimensions) shall be followed. If the drawing is redrawn, delineation shall be made to scale. Where the product definition is on an interactive computer graphics system the scale of the feature and dimension shall be maintained.

601.2 Crossing out. When the crossing-out method is used, a series of parallel lines shall be placed on the face of the drawing. The superseding data, if any, or reference to its location shall be placed near the portion crossed out and shall be indicated by a revision letter. The crossing-out method is applicable to manually prepared drawings only.

601.3 Drawing practices. When revising an existing engineering drawing, the graphic symbols, designations, lettering style and size, material (lead/ink) and method of application and drawing practices (such as line width) used in creating the original drawing format shall be followed unless otherwise directed by the design or procuring activity. When a drawing is being revised and does not reference the dimensioning and tolerancing standard or applicable issue, a determination of the applicable standard or issue shall be made (the matrix depicted in Appendix C may be used as a guide), and the proper standard then specified on the drawing. This action shall be recorded as a change in the revisions block or in the applicable change authorization document.

602 Identifying revisions on drawings.

602.1 Identifying revision locations. Except as noted in 602.6, the revision locations on the drawing shall be identified by one of the following methods:

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- a. Description in the revisions block
- b. Zone in the zone column within the revisions block.
- c. Revision authorization document referenced in the revisions block.
- d. Revision symbols on the field of the drawing.
- e. Combinations of (a), (b), (c) and (d) as required for clarity.

602.2 Revision symbols. Revision symbols shall not be used on drawings in book-form, artwork master of undimensioned drawings and schematic or wiring diagrams where the use of such symbols may conflict with other symbols as used on these kinds of drawings.

602.3 Revision letters. Upper case letters shall be used in alphabetical sequence. The letters "I", "O", "Q", "S", "X" and "Z" shall not be used. When revisions are numerous enough to exhaust the alphabet, the revision following "Y" shall be "AA", and the next "AB", then "AC". etc. Should "AA" to "AY" be exhausted, the next sequence shall be "BA", "BB". Revision letters shall not exceed two characters. Release (initial issue) of a drawing does not constitute need for a revision letter and may be indicated by the use of a dash (-). See Figure 500-6."

602.4 Multiple Change. All changes to a drawing authorized by a given revision authorization document shall be incorporated at the same time. All changes to a drawing incorporated at one time shall be identified by the same revision letter if the revision letter is assigned at the time the changes are incorporated. The changes may be numbered sequentially to permit ready identification of a specific change. In this case the appropriate sequence number will appear as a suffix to the revision letter in the field of the drawing. Revision authorization documents that are assigned individual revision letters shall be incorporated individually as separate revisions (in proper sequence) to the drawing.

602.5 Additions. When a multi-sheet drawing is revised to add a new sheet(s), the note. "THIS SHEET ADDED", shall be placed in the revisions block of the new sheet(s), in addition to other notations. See FIGURE 600-1". If a revisions block is not included on the new sheet, the indication that a new sheet was added to the drawing shall be recorded on sheet 1. See 604.2.

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602.7 Required revisions. Any change to a drawing or associated list, except as noted in 602.7.1 and 605, requires advancing the revision level. When security classification is changed on a drawing, this will constitute a revision to the drawing. However, addition of CAGE Code (see 401) or initial inclusion of Distribution Statement (see 504 and Appendix E) may be accomplished concurrent with needed drawing revision but need not be described in the revisions block or revision authorization documents. Subsequent changes to an indicated Distribution Statement shall require a change in the drawing revision level and an entry in the revision block or described in a revision authorization document.

603. Recording revisions on drawing level advance. A Distribution Statement and delivery contract numbers (see 504 and Appendix E) may be added to copies of contract~r's drawings upon release for delivery to the Government without revision action.

603. Recording revisions on drawing.

603.1 Revision block. Unless other-wise specified, revisions block format shall conform to ANSI Y14.1. Each revision shall be recorded in the revisions block in accordance with Figures 600-"1, 600-2," and the following:

603.1.1 Letter. The identifying letter pertaining to the particular revision being recorded shun be entered in the "REV" column.

603.1.2 Description. A brief description of the change (see also) 602.6), or reference to the identity of the revision authorization document describing the charge, shall be entered in the description column.

603.1.3 Approval. The date of revision approval shall be entered in the "DATE" column, and signature or name entered in the "APPROVED" column. See 101.23.

603.1.4 Zoning. When changes are recorded by zoning, the zone in which each change is made shall be entered in the "ZONE" column on the same line as the description of change. When the "ZONE" column is too small to identify all zones revised, the zones may be defined in the "DESCRIPTION" column and cross referenced to the zone column by symbol.

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603.1.5 Revision date. The date sequence shown in the revisions block shall be the same as specified in 101.24.

603.1.6 Continuing the recording of revisions. Recording of revisions may be on an additional supplementary revisions block or on another sheet when additional room is needed. When the revision block is continued on another sheet, a reference to its location shall be made. If new sheets are added, see 604.2.

604. Revision of multi-sheet and drawings in book-form.

604.1 Procedure.

a. Concurrent changes to any or all sheets of a multiple-sheet or drawing in book-form shall be identified on each sheet so revised by the same revision letter. If a revisions block is included on each sheet the revision or revision authority shall be described in the revisions block of that sheet. Where the revisions block is not included on all sheets, revisions shall be identified in the revisions block of sheet 1. Each revision affecting any or all sheets shall be identified on the revision status of sheets block on sheet 1, and the revision letter shall appear in the revision symbol block of each changed sheet. If the revision status of sheets is not on sheet one, the location thereof shall be indicated on sheet one. See FIGURE 600-3. Revision letters should be recorded on each continuation sheet in the supplementary revision block (if included on the drawing format) shown adjacent to the drawing number. See ANSI Y14.1.

b. The revision status of each sheet comprising a drawing shall be indicated in a revision status of sheets block with the exception of the procedures indicated in 604.1.1. For all sheets that have never been revised, a dash shall be entered in appropriate box.

c. A revision to any sheet requires raising the revision level of that sheet. See 604.1.1.

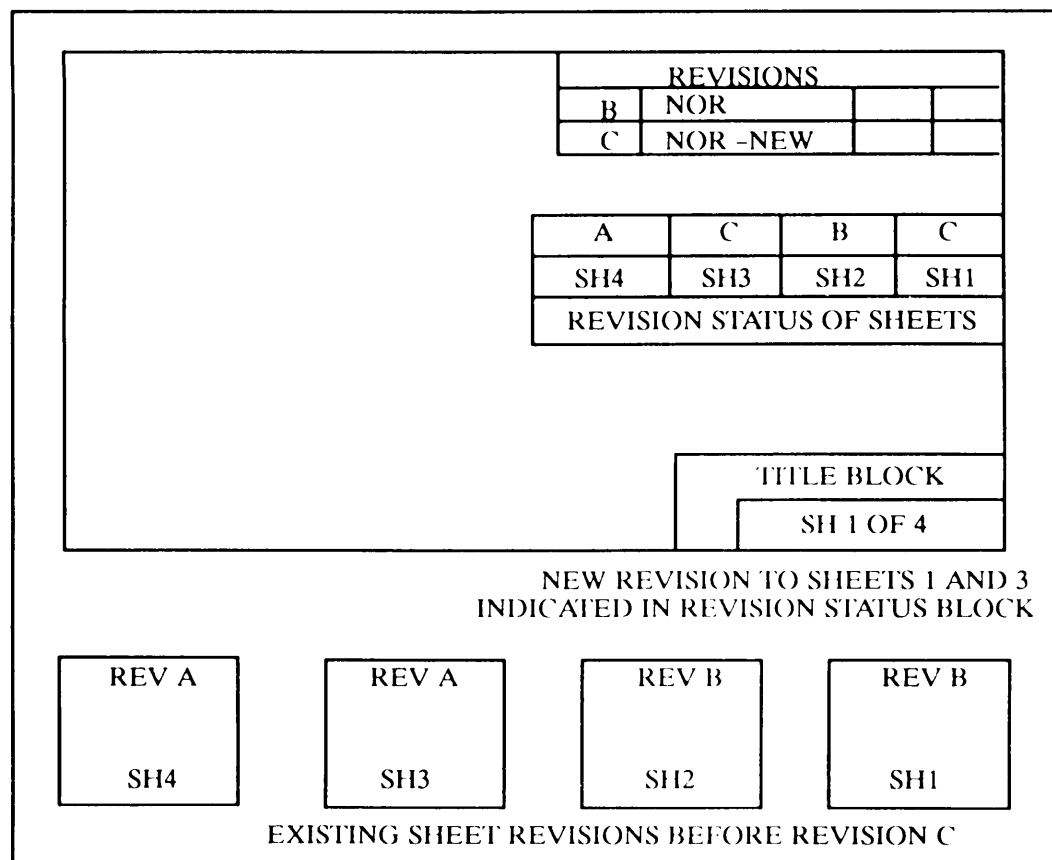
d. An entry in the revision status block requires that the revision level of Sheet 1 be raised. Sheet 1 is revised whenever any sheet is revised; therefore, the revision of Sheet 1 represents the revision level of the entire document.

e. Unchanged sheets retain their revision levels and are carried forward on the revision status block. See FIGURE 600-3.

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604.1.1 Alternate Procedure. All sheets may be identified by the same revision letter without regard to the specific sheet(s) to which the revision applies. The revision status of sheets block may be replaced by a note stating that the revision status of all sheets are the same, such as: "ALL SHEETS ARE THE SAME REVISION STATUS". However, when this method is used and sheets are added or deleted drawing sheets shall be numbered in accordance with 604.2.1 or 604.2.2.



The above figure is informational only and complete to the degree necessary to illustrate a sample format. Actual for-mat and drawing shall conform to the textual requirements set forth in this standard.

FIGURE 600-3. Revision status to existing drawing sheets.

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604.2 Adding and deleting sheets, multi-sheet and drawings in book-form.

604.2.1 Adding sheets. Added sheets constitute a change to the drawing and shall be entered at the revision level next in sequence for sheet 1. This revision shall be entered on the revision status block on sheet 1. Additional sheets inserted between existing sheets shall require one of the following procedures:

- a. Sheets shall be renumbered using consecutive whole numbers.
- b. Added sheets shall be numbered in a decimal-number sequence; for example, three sheets added between sheets 4 and 5 would be numbered 4.1, 4.2, and 4.3.
- c. Added sheets shall be numbered in a numeric-alpha sequence; for example, three sheets added between sheets 4 and 5 would be numbered 4A, 4B, and 4C.

Procedures "b" and "c" above shall not be intermixed on the same drawing.

604.2.2 Deleting sheets. When sheets are deleted, the revision level of sheet 1 shall be advanced to the appropriate revision level, and the action shall be explained, or reference made to the revision authorization document, in the revisions block. One of the following procedures will apply:

- a. Remaining sheets shall be renumbered to maintain a consecutive whole numbered sequence. The revision status of sheets block and total number of sheets shall be updated accordingly.
- b. Remaining sheets shall not be renumbered. The revision status of sheets block shall be updated by crossing out the revision letter entries of the deleted sheets or replacing the revision letter with the notation "DEL". The total number of sheets is updated accordingly.

(NOTE: Any cross references between sheets in the field of the drawing shall be updated when sheets are renumbered.)

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REVISIONS				
ZONE	REV	DESCRIPTION	DATE(YR-MO-DY)	APPROVED
		<p><i>Do NOT enter revision letter or date or signature</i></p> <p>REPLACED WITH CHANGE BY REV</p> <p><i>Enter next sequential revision letter</i></p> <p><i>or if applicable, enter notation</i></p> <p>REPLACED WITHOUT CHANGE BY REV</p> <p><i>Enter next sequential revision symbol (if applicable)</i></p>		<p><i>Enter notation</i></p>

FIGURE 600-5. Superseded (old) drawing notations redrawn with same number

605.1.2 Superseded (old) drawing, same number. Notation such as shown in FIGURE 600-5 are entered in the revisions block of the superseded drawing. The word "SUPERSEDED" shall be added just above the title block as shown in FIGURE 500-4. See 502.4.

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REVISIONS				
ZONE	REV	DESCRIPTION	DATE(YR-MO-DY)	APPROVED
<i>Enter notation</i>		<i>Enter replacing (new) drawing number</i> REPLACED WITH CHANGE BY DRAWING 123XXXX8 REV _____ or DATED _____		
		<i>Enter replacing drawing revision letter.</i> <i>If no revisions, enter original date.</i> <i>Enter description of change or reference</i> <i>to the change authorization document.</i>		
				<i>Enter next sequential revision letter and date and approval signature</i>

FIGURE 600-7. Superseded (old) drawing notations replaced by drawing with different number

605.2.2 Superseded (old) drawing, different number. Where the superseded drawing is to be retained, notations such as shown in Figure 600-7 are entered in the revisions block of the superseded drawing.

606. Reinstating a superseded (old drawing, different number) drawing. The applicable notation (See FIGURE 500-4.) shall be removed from the drawing. This action constitutes change; therefore, revisions block entries are required. The next sequential revision letter shall be entered.

607. Associated list(s) revisions. Associated Lists shall be revised as necessary and for compatibility with related drawing changes. Changes shall be identified by reference to the authorization document or described in the DESCRIPTION column if such is included in the list format. See Figure 700-3. However, a drawing or associated list need not be revised for the sole purpose of maintaining common revision levels between drawing and list.

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608. Revisions to production master drawings. Revisions to production master drawings (reproduction of the artworks master) shall be made to the original artwork master drawing or CAD file only. New duplicate production masters shall be reproduced from the revised original artwork master or CAD system and shall be marked in accordance with 508.

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Example:

Find <u>PIN</u>	Qty	<u>No.</u>	Document <u>or Description</u>	Nomenclature	No	Req.
15	8	MS9321-16	MS9321	WASHER, FLAT - AMS 6350		
15 SUBST		MS9320-16	MS9320	WASHER, FLAT - AMS 5510		

705.4.2 Column 10, quantity required (mandatory). Enter the quantity for each item required to produce a single assembly to which the list pertains. The abbreviation AR (As Required) or the quantity required, if known, (including the unit of measure when no optional unit of measure column is used) shall be used for bulk items. If nonstandard symbols or abbreviations are used, they will be explained in the parts list or in a referenced document.

705.4.3 Column 11, CAGE Code (mandatory). Enter the appropriate CAGE Code assigned to the design activity whose PIN appears in column 12 or whose document number appears in the drawing document number column (See 705.4.5). When the CAGE Code for an item or document is identical to that entered for the list (block 2), it is not necessary to repeat the code in column 11. Whenever Government or Industry standards or specifications are the basis for entries in the list, a CAGE Code need not be listed.

705.4.4 Column 12, part or identifying number (PIN) (mandatory).

a. Enter the PIN including the suffix identifier (when applicable) for parts and bulk items.

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b. The PIN will be repeated for each suffix identified item. When several items from the same tabulated drawing are used, the drawing number is required for the first and last entries. A line, arrow or ditto marks may be used between the identical portion of the first and last entries. For items delineated on the drawing to which the list applies, only the suffix identifier associated with the item need be entered.

c. Enter MS or AN number and suffix identifier in this column for parts so identified.

d. When an item is controlled by a military specification and is individually identified by a PIN (such as RNC55H1001FS, 20101BAC), make this entry accordingly.

e. When type, grade, class or condition are required for identification, such information shall be entered. If this information exceeds the identification limit of 15 characters, it may be entered in the Nomenclature or Description column, or the item may be reidentified. See 406.10.1.

f. This column may also be used to list referenced documents.

705.4.5 Drawing or (procurement) document number column (optional). When this column is used the following applies:

a. The document number applicable to the material from which a listed part delineated on the corresponding drawing is fabricated.

b. The document number applicable to a listed item for which a designation as to type, class condition, or grade has been entered in the PIN column.

c. The drawing number applicable to a listed item in the PIN column.

d. This column may also be used to list referenced documents.

e. The size column may be included to indicate the document size. Omit if not used.

705.4.6 Supplemental list column (optional). A supplemental list column may be included in which "X" entries are made to indicate each item (assembly) that has its own associated list.

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40.16. Location of security markings on associated lists. Security classification shall be at the top and bottom of the list as illustrated in Figures B-4 and B-5.

CLASSIFICATION											
PARTS LIST		1. DESIGN ACTIVITY				2. CAGE CODE CURRENT ORIGINAL		3. ORIG DATE (YR-MO-DY)		4. PL	
5. LIST TITLE						6. AUTHENTICATION		7. SHEET OF SHEETS			
								8. DWG NO.			
9. FIND NO.	10. QTY REQD	11. CAGE CODE	12. PART OR IDENTIFYING NO.	DRAWING/DOCUMENT		15. NOMENCLATURE OR DESCRIPTION		16. SUPPL LIST	17. NOTES		
				13. SIZE	14. NUMBER						
SECURITY NOTATIONS											
18. LTR	DESCRIPTION	DATE (YR-MO-DY)	APPD	18. LTR	DESCRIPTION	DATE (YR-MO-DY)	APPD	18. LTR	DESCRIPTION	DATE (YR-MO-DY)	APPD

CLASSIFICATION

FIGURE B-4 Location of security marking on associated lists.

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<div style="border: 1px dashed black; display: inline-block; padding: 5px 20px;">CLASSIFICATION</div>							
<p>U.S. ARMY</p> <p>ARMAMENT RESEARCH, DEVELOPMENT AND ENGINEERING CENTER</p> <p>PICATINNY ARSENAL, NJ 07806-5000</p> <p>CURRENT CAGE CODE 19200 - ORIGINAL CAGE CODE 19207</p>							
<p>PARTS LIST PL-10513599</p> <p>DOCUMENT/PART LIST F 10513599</p> <p>BODY ASSEMBLY</p> <p>CHANGE CONTROL NUMBER A5H2521 AUTHENTICATION</p>				<p>REV DATE 730131</p> <p>REVISION LETTER P</p> <p style="text-align: center;">SHEET 1</p> <p>ORIG DATE 640630</p>			
FIND NO.	QTY REQ	UNIT MEAS	CAGE CODE	PART OR IDENTIFYING NO	DRAWING DOCUMENT SIZE NUMBER	NOMENCLATURE OR DOCUMENT TITLE	SUPPL LIST
	1			7649178	B 7649178	PLUG	
	2			7649181	B 7649181	WASHER	
	1			7649182	A 7649182	WASHER	
	2			7688718	C 7688718	LENS, OBJECTIVE	
<div style="border: 1px solid black; width: 100%; height: 100%; display: flex; flex-direction: column; justify-content: center; align-items: center;"> <p>SECURITY</p> <p>NOTATIONS</p> </div>							
<div style="border: 1px dashed black; display: inline-block; padding: 5px 20px;">CLASSIFICATION</div>							

FIGURE B-5. Location of security markings on digital data generated associated lists.

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APPENDIX E

DISTRIBUTION STATEMENTS

10. General.

10.1 Scope. This Appendix pertains to the content of Distribution Statements, criteria for application and guidance for physical location on drawings. This Appendix is a mandatory part of this standard. The information contained herein is intended for compliance.

20. Applicable documents.

20.1 Government documents. The following documents form a part of this Appendix to the extent specified:

MILITARY STANDARDS

MIL-STD-1806	Marking Technical Data Prepared by or for the Department of Defense.
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(Copies of federal and military specifications, standards, and handbooks are available from the Standardization Documents Order Desk, Bldg 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094. For specific acquisition functions, these documents should be obtained from the contracting activity or as directed by the contractin activity.)

30. Definitions.

30.1 Definitions used in this appendix. For purposes of this appendix the definitions of MIL-STD- 1806 shall apply.

40. General requirement

40.1. Distribution statement and associated notices. Distribution statements and associated export control warning notices, including abbreviated notices, shall be in accordance with MIL-STD-1806 (see 504) and the following:

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40.2 Assigning statements and notices. Assignment of distribution statements and notices to engineering drawings and associated lists denote the extent to which they are available for distribution, release and dissemination without additional approvals or authorization. Marking of associated lists shall be based on the content of the list and not the classification of the drawing.

40.3 Applicability. Distribution statements shall be included on all drawings and associated lists. For multi-sheet drawings except drawings in book-form, distribution statements shall be included on all sheets. For drawings in book-form and multi-sheet associated lists, inclusion of distribution statements on sheet one shall suffice.

40.4 Abbreviated distribution statements and export control warning notices. When space limitations prohibit the use of entire notices or distribution statements, abbreviated notices or distribution statements may be used and shall be in accordance with MIL-STD-1806.

40.5 Method of application. Statements and notices may be generated from digital data, applied by decals, rubber stamp or by direct lettering on the drawing. Lettering shall meet the reproduction requirements of the engineering drawing and associated lists.

40.6 Size of lettering. Lettering shall be equal to or larger than the size of the largest note lettering on the drawing or associated list.

40.7 Color of lettering. All lettering and notations shall be black.

40.8 Location on drawings and associated lists. Graphics and textual data permitting, Distribution Statements shall be located on drawings and lists in accordance with Figures E-1 through E-6. Otherwise the required statements and associated notices are to be located in similarly prominent areas.

40.8.1 Location of associated notices. Export control warning notices required in association with Distribution Statements shall be located in the same general area as the Distribution Statement