

PS/3AA/101

DEFENSE MAPPING AGENCY
PRODUCT SPECIFICATIONS
FOR
1:50,000 SCALE TOPOGRAPHIC MAPS OF FOREIGN AREAS



FIRST EDITION

July 1980

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**DEFENSE MAPPING AGENCY
PRODUCT SPECIFICATIONS
FOR
1:50,000 SCALE TOPOGRAPHIC MAPS OF FOREIGN AREAS**

**FIRST EDITION
JULY 1980**

**Prepared by
DEFENSE MAPPING AGENCY
HYDROGRAPHIC/TOPOGRAPHIC CENTER
WASHINGTON, D.C. 20315**

RECORD OF CHANGES AND AMENDMENTS

AMENDMENT OR CHANGE NO.	DATE	IMPLEMENTATION DATE	REMARKS

FOREWORD

1. AUTHORITY

This document is issued under the authority of DoD Directive 5105.40, Defense Mapping Agency (DMA), 10 August 1978.

2. PURPOSE AND SCOPE

a. These specifications are basic instructions for the compilation, color separation, and reproduction of the 1:50,000 scale map for foreign areas.

b. Certain portions of these specifications apply to 1:50,000 scale mapping for domestic areas. These portions are addressed only under specific direction by project assignment memoranda.

c. Certain map identification items, specified in Chapter 3-Margin Data, are derived from identification systems that include all scales and map products. The specifications of how these items are formulated for 1:50,000 scale maps must necessarily include an explanation of the complete systems.

d. These specifications incorporate the basic provisions of the following North Atlantic Treaty Organization (NATO) Standardization Agreements (STANAG):

- 2201 MC Standard Unit of Vertical Measure to be Shown on Land Maps, MAS (AIR) (70) 33
- 2211 MC Geodetic Datums, Spheroids, Grids and Grid References, MAS (ARMY) (69) 257
- 2215 MC Evaluation of Land Maps, MAS (AIR) (70) 74
- 3671 MC Edition Designation System for Land Maps, Aeronautical Charts, and Military Geographic Documentation, MAS (AIR) (72) 252
- 3675 MC Symbols on Land Maps, Aeronautical Charts and Special Naval Charts, MAS (AIR) (74) 115
- 3676 MC Marginal Information on Land Maps and Aeronautical Charts, MAS (AIR) (72) 132
- 3677 MC Standard Scales for Land Maps and Aeronautical Charts, MAS (AIR) (76) 184
- 3689 MC Place Name Spelling on Maps and Charts, MAS (AIR) (73) 254

3690 MC Standard Printing Sizes for Maps of Various Scales, MAS (AIR)
(72) 129

3716 MC Map Series Numbering, MAS (AIR) (74) 154

3. APPLICABILITY

These specifications apply to the production of all new 1:50,000-scale topographic maps of foreign areas. These specifications also apply when revising 1:50,000-scale foreign topographic maps in areas which are designated as "Tactical Land Combat (TLC)" and "Tactical Air Operations (TAO)." Appendix II of these specifications is applicable in the preparation or revision of all domestic 1:50,000-scale topographic maps. Appendix II should be used in conjunction with either Defense Mapping Agency Hydrographic/Topographic Center Technical Manual S-1 (TM S-1) or USGS 1:50,000-scale specifications. TM S-1 will be used in preparation of all 1:50,000-scale topographic maps not otherwise specified above.

4. DISTRIBUTION

Distribution will be made in accordance with the Initial Distribution List of the Defense Mapping Agency Product Specifications for 1:50,000-Scale Topographic Maps of Foreign Areas that is maintained by the Defense Mapping Agency Office of Distribution Services, ATTN: Code IMA, Washington, D.C. 20315

5. CHANGE NOTICES AND AMENDMENTS

a. Revisions to the specifications will be issued in the form of change notices or amendments.

b. Change notices, which may cover one or more revisions, will remain in force until superseded by a subsequent change notice or amendment. Change notices require hand entry in the appropriate places in the specifications.

c. Amendments will be issued in the form of substitute pages when the quantity of change notices warrants consolidation to improve the readability of the specifications or to introduce major revisions. Asterisks in the left margin will indicate the amended lines. Recipients should replace the old pages with the amended pages.

d. Recipients should maintain the Record of Changes and Amendments to assure a complete record of all changes.

e. Recommended changes or comments should be keyed to the specific page, paragraph, and line of text. Reasons should be provided for item of comment to ensure understanding and complete evaluation. Comments should be forwarded directly to:

Director
Defense Mapping Agency Hydrographic/Topographic Center
ATTN: Code PPO
6500 Brookes Lane
Washington, D.C. 20315

6. SECURITY

These specifications are unclassified.

7. SUPERSESSION

These specifications supersede the TM S-1, "Specifications for Military Maps," for the applicable situations described in paragraph 3 above. TM S-1 will, however, be retained as the applicable specifications for the revision of all 1:50,000-scale topographic map sheets in foreign areas which are not designated as TLC or TAO areas.

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CHAPTER 1-GENERAL
SECTION 100-INTRODUCTION

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101. General

A. These specifications provide general guidance and the basic requirements for the design and contents of worldwide topographic mapping at the 1:50,000 scale.

B. It is not possible to address the varying aspects of topography and culture for the entire world in these specifications. Therefore, it may be necessary to introduce unique treatments as supplementary specifications in attendant project memoranda assignments.

C. The terms used herein are in conformance with definitions appearing in the *Department of Defense Glossary of Mapping, Charting, and Geodetic Terms*.

D. The numbers in the margin of the text are the numbers assigned to the symbols that appear in Appendix I - Symbols.

102. Units of Measure

Specification measurements are given at reproduction scale in dual form, i.e., International (Metric) and U.S Customary.

103. Map Accuracy

Horizontal and vertical accuracies are commensurate with those required for 1:50,000 scale topographic maps as designated in Defense Mapping Agency Instruction 8570.1A, Defense Mapping Agency (DMA) Product Maintenance System (PMS). Deviations from minimum accuracy requirements listed in PMS are contained in supplementary instructions.

104. Security Classification

The 1:50,000 scale topographic maps prepared under these specifications are classified in accordance with existing security regulations.

105. Maintenance

The Defense Mapping Agency Hydrographic/Topographic Center is responsible for the technical maintenance of these specifications.

CHAPTER 1-GENERAL

SECTION 200-FORMAT

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201. General

A. Sheet lines are the means by which a geographic area is divided to establish the limits of individual sheets. Sheet lines are generally formed by parallels of latitude and meridians of longitude. The sheet lines of individual maps are also referred to as neatlines.

B. Work limits define the area available for printing. Dimensions are expressed in linear units of measure. Maximum work limits are 558.80 mm by 723.90 mm (22.0 in by 28.5 in) except for areas falling between 4° N and 4° S where the EW maximum limit is increased to 559.80 mm (22.04 in).

C. Trim size pertains to the overall dimensions to which a map is cut after printing. Trim size is 571.50 mm by 736.60 mm (22.5 in by 29.0 in). On maps produced for use in NATO areas of interest, the maximum work limits are 549.25 mm by 733.40 mm (21.625 in by 28.875 in) and the trim limits are 558.80 mm by 736.60 mm (22.0 in by 29.0 in). At the prerogative of the reproduction element, the 736.60 mm (29.0 in) trim limit for non-NATO maps may be increased, but not to exceed 762.00 mm (30.0 in). Refer to project specifications for applicable work limits and trim size.

D. Figure 200-1 illustrates sheet lines, work limits, and trim size pictorially.

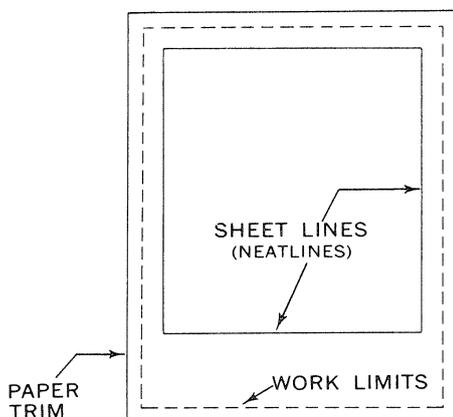


Figure 200-1.

202. Standard Sheet Lines

A. The 1:50,000-scale sheet lines are based on an established 1:100,000-scale format which was designed to incorporate pertinent worldwide map series (map sheets collectively identified and having the same scale and cartographic specifications). A quartered 1:100,000-scale map forms four 1:50,000-scale maps, e.g.: the 1:100,000-scale map sheet 4141 of series L672 quarters into the 1:50,000-scale sheets 4141 I, 4141 II, 4141 III, and 4141 IV of series L772. The establishment of sheet lines is based on the following principles:

1. Sheet lines are developed on a series or project basis.
2. Sheet lines are designed to provide map coverage of an area with the minimum number of sheets without unduly impairing the continuity of adjoining sheets.
3. Sheet lines are so positioned that they coincide with grid, spheroid, and datum junctions wherever possible.

B. Sheet lines may vary within a map series. The following table lists the standard sheet line sizes and the latitudes at which they occur:

LATITUDE	SHEET SIZES	
	1:50,000	
	N-S	E-W
*0° to 36°	15'	15'
36° to 44°	15'	18'
44° to 50°	15'	20'
50° to 61°	15'	22'30"
61° to 67°	15'	30'
67° to 72°	15'	36'
72° and above	**	

*See style sheet for guidance for treatment of margin data between 14°S and 14°N.

**As specified in instructions for the assignment

203. Departures from Standard Sheet Lines

A. Certain departures from the standard sheet lines may be required to avoid making unnecessary sheets, thereby reducing the number of map sheets in a project. However, these departures shall be kept at a minimum and based on careful consideration of their impact on the overall requirement of continuity of standard sheet lines. Departures from standard sheet lines occur most often in coastal areas, long narrow islands, and large islands with varying widths.

B. Base considerations when addressing the introduction of departures from standard sheet lines should include the following principles and options.

1. Adherence to specified maximum work limits.
2. Extent of land topography and the need to show landmark hydrographic features.
3. The placement of margin data in open water areas.
4. Existence of grid, spheroid, and datum junctions.
5. Adjustment of sheet lines to avoid decimal parts of second-of-arc.

C. The following, with combinations as necessary, are examples of the departures from standard sheet lines.

1. A border break permits a gap in a sheet neatline to accommodate small points of land or islands of an adjoining area (Figures 200-2 and 200-3). When there is a choice of sheets which may contain a border break, the sheet which requires the least rearrangement of margin data is selected (Figure 200-3). The neatline is not shown through the protruding land mass.



Figure 200-2.

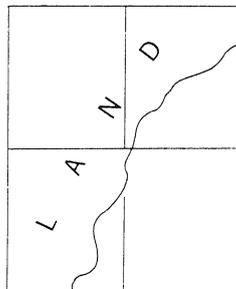


Figure 200-3.

2. An extension is the enlargement of a sheet by moving one or more sheet lines to include adjoining land areas (Figure 200-4).

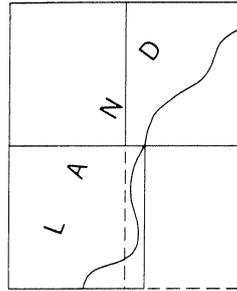


Figure 200-4.

3. A shift is a change in continuity of sheet lines to accommodate a land mass (Figures 200-5, 200-6, and 200-7). Sheets that are shifted usually retain the defined sheet dimensions for the area. A shift may involve more than one sheet. Overlapping sheets are to be avoided if the overlapped area contains land (Figure 200-7).

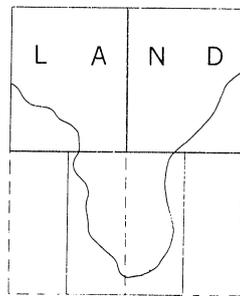


Figure 200-5.

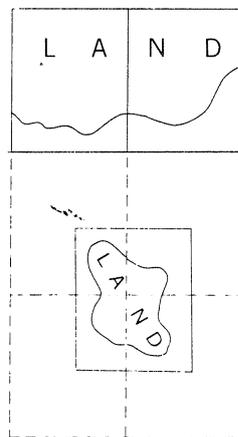


Figure 200-6.

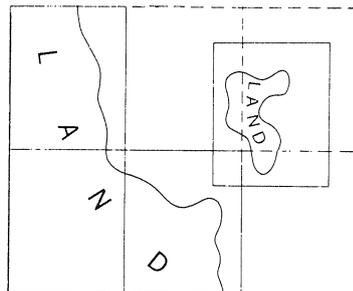


Figure 200-7.

4. Reproportionment permits the adjustment of the latitudinal and longitudinal limits of the defined sheet lines (Figure 200-8).

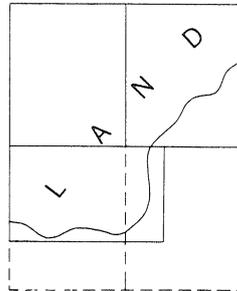


Figure 200-8.

5. An inset is a shift of a portion of a sheet covering an island(s) to relocate it within the open water area of another sheet (Figure 200-9). The inset is relocated on the nearest sheet and preferably along the same line of latitude or longitude.

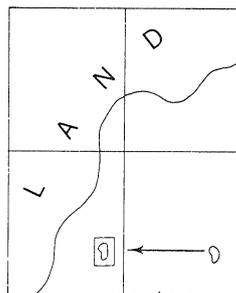


Figure 200-9.

a. The presentation of the military grid information within an inset requires special treatment. When the grid or grid zone for the inset area differs from that of the map proper, the appropriate grid note is shown with the inset. (See Appendix VI - Style Sheet.)

b. When the 100,000 unit identification letters of the inset area differ from those of the map proper, a miniature representation of the inset and its identification letters are indicated in the grid reference box and a grid convergence note for the center of the inset is shown. Example:

GRID CONVERGENCE FOR THE CENTER OF
THE INSET IS 2° 36' (40 MILS) WESTERLY

CHAPTER 1-GENERAL

SECTION 300-SPHEROIDS, PROJECTIONS, AND GRIDS

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302. Spheroids, Projections, and Grids	9

301. General

A. The scope of the subject matter on spheroids, projections, and grids is such that it would be impractical to present these data herein. The major source of this type of information for DMA mapping is Department of the Army Technical Manual (DA TM) 5-241-1, "Grids and Grid Reference." This reference contains complete explanatory data and specifications, including:

1. Descriptive data and parameters for worldwide application of spheroids, projections, and grids.
2. Explanations on the usage of the Military Grid Reference System, British Grid Reference Systems, and Geographic Coordinate Reference Systems.
3. Definitions, specifications, and illustrations of treatments of grids and graticule for the map interior and map margin of the 1:50,000 scale and larger.
4. Treatment of grid and spheroid junctions.
5. Treatment of attendant declination diagrams.
6. Appendixes with definitive illustrations delimiting worldwide coverage of geodetic datums, spheroids, and grids.
7. A listing of related references, particularly those required in geodetic computations and projection plotting, for the major spheroids in use.

B. Paragraphs that follow in this section provide only the very basic information to establish a continuity on the subject matter of these specifications.

302. Spheroids, Projections, and Grids

A. A *spheroid* is a mathematical figure which differs but little from a sphere. As a surface of reference for surveying and mapping, a spheroid is usually defined as an ellipse of revolution which closely approximates the geoid (or equipotential surface of the Earth) in size and shape. The spheroid is normally defined by the length of the Semi-axes (a, b) or by the length of one of the semi-axes, most commonly the semi-major or equatorial semi-axes and the flattening (ellipticity) of the ellipse. Ten different spheroids are currently specified for DMA mapping areas of the world, and they are defined in DA TM 5-241-1.

B. A *map projection* is a system of lines drawn on a plane surface to represent parallels of latitude and meridians of longitude (the graticule) for a portion of the Earth. All DMA maps show the graticule in conventional sexagesimal units (degrees, minutes, and seconds-of-arc) with Greenwich as the meridian of reference. Different projections have unique characteristics and serve differing purposes. The projection is represented on the 1:50,000-scale map by limiting sheet lines (neatlines) and a series of evenly-spaced projection intersections in the map interior at 5 minutes of arc intervals. The sheet lines of standard 1:50,000-scale maps show the meridians (lines of longitude) as straight lines, and parallels (lines of latitude) which effect curvature through the connection of straight line segments between successive-intermediate projection intersections.

C. A *grid* is a network of uniformly spaced straight lines intersecting at right angles. A military grid, constructed on a specific projection and referenced to a specific datum and spheroid, is used for referencing and measuring the location of a point. The grid interval on 1:50,000-scale maps is normally 1,000 meters in northing and easting. With the exception of certain areas specified in DA TM 5-241-1, where foreign grids are still in use, the Universal Transverse Mercator (UTM) grid is used for DMA mapping in most areas of the world.

D. The positioning and plotting accuracies of the projection and grid are critical phases of the map preparation.

1. The intersections of the parallels and meridians of the projection must be plotted with 0.15 mm (0.005 in) of the computed position.

2. The grid is constructed on a given sheet so that the distances between adjacent grid lines do not vary more than 0.15 mm (0.005 in) from the computed grid interval; and the overall distances between the first full grid lines, complementing those of adjoining sheets, do not vary more than 0.15 mm (0.005 in) from their computed measurements.

CHAPTER 2-COMPILATION AND COLOR SEPARATION

SECTION 100-GENERAL

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101. Scope

This section provides basic principles and concepts for the compilation and color separation of map content. Detailed guidance for the compilation and color separation of specific features is contained in the appropriate sections of this chapter.

102. General Principles

A. Compilation is the process of extracting map detail from existing maps, new data, aerial photographs, and other sources for preparation of new or revised maps.

B. The compilation is the foundation of a map. The finished map can be no more accurate than its compilation, nor will it contain more information than is incorporated in the compilation. Extreme care must be exercised in the selection and positioning of map detail so that the finished map will not only meet standards of accuracy, but will also satisfy the purpose of the map. The compilation must be clear and legible and include every item to be shown on the finished map, properly delineated and correctly positioned.

C. A topographic map is a graphic representation of a portion of the Earth's surface which is systematically plotted to scale upon a plane surface to present the horizontal position and vertical relation of topographic and cultural features in measurable form. The ideal situation in compilation is realized when such features are shown true in shape, orientation, and scale. However, such representation is impossible. This is evident when, for example, a 1-kilometer square of the surface of the Earth at the scale of 1:50,000 must be condensed into a small square 20.0 mm by 20.0 mm (0.8 in by 0.8 in). An attempt to plot each feature true to scale would result in a map difficult to read. Many features would be delineated so minutely as to defy recognition. To be intelligible, many of these features are shown by conventional signs and symbols which must necessarily be exaggerated in size well beyond the actual ground limits of the features represented. For example, at the reproduction scale of 1:50,000, and using prescribed symbolizations: a small house

would cover an area on the ground equivalent to approximately 25 m by 25 m (83 ft by 83 ft); the width of a road would be approximately 29 m (95 ft); and the symbol for a single-track railroad would occupy a width equivalent to approximately 15 m (50 ft). The portrayal of many other features requires similar exaggeration. Therefore, at this scale, it is impossible to show each and every feature. Only the most important and most easily recognizable features should be shown, especially those required for the specific use of the map. The omission of unimportant features detracts little from the value of the map. Their inclusion would not only create dangerous exaggerations of position, but would also clutter the map with a multitude of unnecessary detail, which would make it difficult for the map user to readily identify the more important features.

D. Beyond basic compilation principles, the selection of map features involves experience and an appreciation of the intent of the map. Little difficulty is encountered in selecting roads, railroads, large streams, vegetation, landmark buildings, etc., which constitute the outstanding characteristics of an area. Problems are encountered in the selection of features of secondary importance. This selection should be important from a military standpoint. Where choice lies among several secondary features, the most prominent (landmark) features are preferable. In areas of moderate or dense culture, a particular feature could be unimportant and its omission would not necessarily detract from the use of the map. On the other hand, a similar feature in an area of sparse culture would be important as an aid in orientation.

E. The required accuracy standards are applied in the plotting of map detail. The center and orientation of a symbol correspond with the center and orientation of the feature represented. All line features such as roads, railroads, power lines, and streams are centered over their true positions wherever scale permits. Roads, railroads, streams, levees, and like features lying parallel and close to each other may require an exception to these criteria. A displacement of the symbols may be necessary to show these major features by their proper symbols. Taking all features collectively, the parallel features are displaced outwardly from their collective center at a minimum of 0.020 mm (0.008 in) between each succeeding feature. Where a double-line drainage feature or shoreline constitute the parallel features, the remaining symbols are displaced outwardly. Contours are adjusted to the displaced symbols.

F. When the plotted feature exceeds the minimum size prescribed for the symbol, it is delineated true to scale.

G. Reasonable effort is made to match a new compilation with adjoining sheets of existing maps at the same scale. In attempting to match sheet border features, displacements are not introduced into the new compilation that exceed the permissible limits of accuracy, nor are features arbitrarily added or extended to effect a tie with the adjoining sheet.

CHAPTER 2-COMPILATION AND COLOR SEPARATION
SECTION 200-ROADS, RAILROADS, AND RELATED DATA

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201. General

A. Consistent with map legibility and the density of cultural development, large scale topographic maps require maximum portrayal of road and railroad features in accordance with the specifications set forth herein.

B. To assure map readability, symbol sizes are usually larger than actual map scale size. The symbols, therefore, are always plotted so that their centers coincide with the true position centers of the represented features; deviations from this requirement are permissible where displacement is unavoidably necessary due to the close proximity of other plotted features. In such cases, displacement is held to the absolute minimum consistent with map legibility.

202. Road Categories

A. *Hard surface, all weather.* Roads traversable throughout the year to a volume of traffic never appreciably less than their maximum dry weather capacity. Minimum maintenance is required. Surfaces are waterproof. Construction is usually concrete, bituminous surface, brick, or stone pavement.

B. *Loose or light surface, all weather.* Roads designed to carry light traffic in all weather. Volume of traffic in bad weather is considerably less than dry weather capacity. Heavy use during bad weather may cause complete collapse of road. Periodic maintenance is required. Surfaces are not waterproof but are graded and drained. Construction is usually crushed rock or waterbound macadam, gravel or stone-sand clay, oil-treated gravel, or broken stone and cinders.

C. *Loose surface, fair or dry weather.* Roads designed to carry light traffic in dry weather only. In bad weather, roads quickly become impassable to normal traffic. Surfaces are sometimes graded and drained. The roads may not be maintained. If maintained, continual maintenance is required. Construction is usually of natural or stabilized soil, sand-clay, shell-cinders, or disintegrated granite or rock. The following types of roads are also in this category:

1. *Lumber or logging roads.* Most of these roads are temporary and used only as long as the camp or sawmill is in operation. Only those roads considered permanent and which serve as connecting links to the regular road network are mapped.

2. *Abandoned Roads.* Roads no longer maintained and in normal use. When shown, they are identified by the term "ABANDONED."

3. *Corduroy Roads.* Roads through swamps, peat, and other unstable soils; they are usually constructed of a corduroy foundation or by an interweaving of gravel, logs, and rocks. These roads are shown only if they form part of the regular road network, or are the only means of surface travel in the area. The roads are identified by the term "CORDUROY."

4. *Firelanes*. Cleared land through wooded areas, designed to facilitate the movement of fire-fighting equipment. Only those roads connected to the regular road network are shown. Firelanes are not to be confused with firebreaks. The latter features are discussed in Chapter 2, Section 700, Vegetation.

D. *Tracks*. Traveled ways over a natural roadbed, with little or no improvements. These roads are capable of accommodating carts, four-wheeled drive or tracked vehicles only. These roads are not maintained. Winter roads and caravan routes are included in this area. A distinction between motorable and nonmotorable tracks may be required. The distinction is indicated by appropriate labeling. Examples: *Not Motorable; Motorable in Dry Season Only*.

203. Road Widths and Lanes

A. In determining the width of a road, only the traveled way is considered. Road shoulders, ditch limits, and right-of-way limits are disregarded.

B. When road width information is available, the following criteria are applied unless otherwise specified in supplementary project instructions.

1. *More than two lanes*. A constructed roadway at least 8.2 m (27 ft) wide. The number of lanes is indicated by labeling parallel to the road.

2. *Two lanes*. A constructed roadway at 5.5 m (18 ft) and less than 8.2 m (27 ft) wide.

3. *One lane*. A constructed roadway at 2.5 m (8 ft) and less than 5.5 m (18 ft) wide.

4. A *natural traveled way* which can accommodate four-wheeled or tracked vehicles and is at least 1.5 m (5 ft) but less than 2.5 m (8 ft) wide is classified as a track.

5. A *natural traveled way* less than 1.5 m (5 ft) wide is classified as a trail.

204. Road Classifications

A. The following road classifications are derived from the criteria established in paragraphs 3 and 4 above:

1. Hard surface, all weather roads.

a. Divided highways

201
202

b. Two or more lanes wide

203

c. One lane wide	204
2. Loose or light surface, all weather roads.	
a. Two or more lanes wide	205
b. One lane wide	206
3. Loose surface, fair or dry weather roads (at least 2.5 m [8 ft] wide).	207
4. Track.	208
5. Trail.	209
6. Footpath.	210

B. Unless specified otherwise in supplementary project instructions, footpaths are symbolized by the trail symbol.

205. Special Road Classification Principles

A. A road with one lane on either side of a median strip is symbolized as a standard two lane road and labeled "DIVIDED HIGHWAY."

B. If a road can be classified in more than one category, the lower category is selected to classify the road. This includes roads with lanes of varying construction. However, a road which is predominantly of one category, but contains short stretches of another category, is classified entirely in the category which predominates. Short stretches are interpreted to be less than 13 mm (0.50 in) in length at publication scale. Road segments longer than the above length are appropriately classified.

206. Roads Under Construction

A. A road is under construction when work is actually started on the right-of-way.

B. Roads under repair, whether open or closed to traffic, are not considered to be under construction.

C. Roads under construction are symbolized as follows:

1. If the classification is known and the road is expected to be completed by the time the map is published, or within a reasonable time afterwards, the road is symbolized as a completed road.

2. If the classification is known but the completion date is unknown, the road is symbolized as a completed road with the term "CONSTRUCTION" added parallel to the alignment. The symbol for point of change in road information is used to mark the limits of construction. If the year the road is expected to be completed is known, it is also included; e.g., "CONSTRUCTION (COMPLETION 1982)." 211

3. If the road classification is not known, the "Classification Unknown" symbol is used. 212

D. Planned roads; i.e., roads for which the right-of-way has been acquired but construction has not been started. A planned road is shown if the alignment can be accurately plotted. 213

E. Proposed roads; i.e., roads for which the right-of-way has not been acquired are not shown.

207. Private Roads

A. Private roads are those maintained by private funds and which are not normally open to the public.

B. A private road that has continuity with the public road system is shown in accordance with standard classification procedures.

C. Private roads that lack continuity include access roads, roads in cemeteries, fairgrounds, and similar enclosed areas. These roads, regardless of construction, are symbolized as "Loose Surface, Fair or Dry Weather."

208. Through Routes and Streets in Populated Places

A. A distinction is shown between through routes (through streets) and other streets in populated places.

1. For purposes of delineating those features, a populated place is defined as a developed area which contains a systemized pattern of streets. Populated places are shown as outlined tinted areas with street patterns.

2. A few buildings along a road, as at a road intersection, do not constitute a populated place for the purpose of delineating streets even though the area is identified with a populated place name.

3. Roads, including tracks and trails, which enter populated places are symbolized as streets in the outlined tinted area. Point of change of symbolization is the point of entry into the tinted area.

4. Roads that border on but do not enter a populated place are shown by normal symbolization.

B. Through Routes

1. Through routes are the main arteries for intersection of traffic through a populated place and may include both the direct routes and the alternate routes that bypass the congested areas of the city.

2. Determination of streets to be symbolized as through routes is made by reference to available source material, including aerial photography.

3. Through routes are symbolized by the standard street symbol and distinguished as such by the addition of the road fill, if any, of the main roads with which they connect. 214
215

4. Route markers are placed in the tinted built-up areas in order to clearly identify through routes.

5. Through routes are plotted to scale if their widths exceed 0.25 mm (0.02 in) at publication scale.

6. Median strips are shown only if the plotted width of a street is at least equal to 1.00 mm (0.044 in) at publication scale.

C. Streets

1. Streets are symbolized by the street symbol regardless of type of construction. This includes tracks and trails. 216
217

2. Between small detached built-up areas which are integral parts of a larger built-up area, roads that are not through routes are symbolized as streets. Excepted are tracks and trails which retain their normal symbolization.

3. All streets are plotted to scale if the plotted width at publication scale exceeds the prescribed symbol width.

D. The built-up area tint is cleared from all through routes and streets.

E. In populated places that do not contain a planned or systemized street pattern, all roads and streets, including tracks and trails, are shown by their normal symbolization.

209. Approximate Road Alignments

Road alignments that can only be approximated due to the lack of adequate information are labeled "APPROXIMATE ALIGNMENT" or "APPROX ALIGN." 218

210. Points of Change in Roads Information

Points of change in road information are indicated by a tick perpendicular to the upper side of the road. Approximate alignments less than 13 mm (0.50 in) at publication scale are not indicated. 219

211. Road Names

A. Names are shown for important named arterial roads. Example: PAN 220
AMERICAN HIGHWAY.

B. The names are preferably positioned along the upper side of the road symbol.

212. Route Markers

A. Route markers are official numbered designations that identify 221
international, national, and secondary routes. Secondary routes include roads under thru
the jurisdiction of states, provinces, prefectures, and similar administrative divisions. 223

B. Route marker symbols are preferably centered on the roads, positioned parallel with the bottom neatline. In extremely congested areas the symbol may be positioned adjacent to the road.

C. To be fully effective, a judicious positioning of symbols is necessary.

1. On roads which continue on to adjoining sheets, they are shown close to the neatlines.

2. They are shown close to and within large populated places.

3. They are shown as often as necessary to preclude any ambiguities, especially to define through routes within built-up areas.

4. They are shown as close as possible to major road junctions and intersections.

5. Individual route numbers are shown for roads which are identified by more than one route number. The markers are preferably shown in close proximity for easy identification.

213. Road Objectives

A. A road objective is a selected destination, and distance thereto, of a road that continues beyond the limits of a map.

B. A destination is usually the nearest populated place, numbered or named highway, or prominent landmark feature on the adjacent sheet; however, in sparsely developed areas it may be necessary to select an objective two or more sheets away from the map under consideration.

C. Double road objectives may be shown, space permitting, for primary routes. A double objective consists of the nearest destination and a distant, more important designation. Double road objectives are not shown in densely developed areas.

D. The selection of road objectives is based on the density of the road network.

1. Objectives are normally shown for all hard surface and loose surface, all weather roads. In developed areas with a dense concentration of hard surface roads, objectives are shown only for the primary or numbered highways.

2. In underdeveloped areas, objectives are shown for all main routes regardless of classification. This includes tracks and trails, where appropriate.

3. A populated place may be designated as a road objective even though the road in question actually bypasses the town. The distance is computed to the town and not to the nearby road junction.

4. If a road enters a populated place which straddles a sheet neatline, no objective is shown for the road.

E. *Portrayal*

1. The design and positioning of road objectives are illustrated on the Style Sheet, Appendix VI.

2. Distances are expressed in kilometers and are always abbreviated as km.

3. Distances of 10 or more kilometers are shown to the nearest full unit; decimal fractions are omitted. Example: 12 km.

4. Distances of less than 10 units are shown to the nearest tenth of a unit. Examples: 8.3 km; 7.0 km.

5. Distances of less than one unit are expressed in zero units and tenths. Example: 0.3 km.

6. The leader arrow represents a directional extension of the road. If the road branches at the neatline, two arrows are shown emanating from a common point.

7. When two roads having a common destination are a short distance apart at the neatline, a single objective is shown for both roads. A leader arrow is shown for each road.

8. A single arrow is shown for double road objectives. Both destinations are centered over the arrow with the nearest destination shown closer to the map neatline.

9. If the road objective is a numbered highway, the objective reads: 12 km to MEXICO 75.

10. If the road objective is a named highway, the objective reads: ALCAN HIGHWAY 20 km.

11. If the objective is both a numbered and named highway, the numbered designation is used as the destination.

214. Plazas, Town Squares

A. These features are shown only if their plotted sizes, at publication scale, exceed the widths of the entering roads and streets. The roads or streets remain open where they enter the plaza or town square.

B. Road fills are omitted within the limits of these features.

215. Traffic Circles

224

A. A traffic circle is a junction of roads or streets at a circular plot of ground around which traffic normally moves in one direction.

B. The feature is delineated by the prescribed symbol. If the size of the feature at publication scale exceeds the prescribed symbol size, it is shown to scale in its true shape.

C. Small traffic circles that cannot be portrayed without excessive and unwarranted scale exaggeration are omitted.

216. Interchanges

225

A. An interchange is a system of access roads designed to facilitate entrance or exit between merging of intersecting highways.

B. These features are delineated in their true shape, scale, and alignment. If necessary, the scale may be slightly exaggerated in order to portray legibly the access roads and grade separations.

217. Bridges, Causeways, Viaducts, and Elevated Highways

A. *Bridges*

1. Bridge symbols are usually representative in that their length must be exaggerated in order to portray these features legibly. The minimum plotted length for any bridge is 1.50 mm (.06 in) at publication scale. 226 thru 230
2. Bridges are shown wherever they relate to the road network portrayed on the map.
3. All bridges, other than foot bridges, are labeled as to construction materials and vertical clearance above roadway. 231 232
 - a. Construction material is classified as one of the following: steel, concrete, stone, brick, or wood.
 - b. Vertical clearance is classified as Restricted (R) or Unrestricted (U).
4. Bridges that plot longer than 1.50 mm (.06 in) at publication scale are shown to scale.
5. A bridge that carries both a road and a railroad is shown by the road bridge symbol only. The railroad symbol is dropped at the bridge abutments.
6. The bridge symbol is not used for culverts. Refer to Section 400 of this chapter for treatment of culverts.
7. Streams, shorelines and open water are broken for all bridges except foot bridges.

B. Causeways

233

1. A causeway is a constructed passageway for roads or railroads across open water. They may contain bridges to permit passage of boats.
2. The feature is not specially symbolized. The label "CAUSEWAY" is added parallel to the road or railroad alignment. Bridges are appropriately symbolized.
3. Shorelines are not delineated unless the plotted space between the shoreline and the road or railroad is 0.25 mm (0.01 in) or more at publication scale.

C. Viaducts and Elevated Highways

1. Both features are symbolized with the bridge symbol. (See paragraph 217A.)
2. If an elevated highway is of considerable length, the term "ELEVATED" is shown parallel to the road at appropriate intervals.

218. Overpasses and Tunnels

A. *Overpasses*

234

1. Road overpasses are symbolized as illustrated by the symbol.
2. The same treatment is used to portray a grade separation of more than two levels.
3. Road interchanges are discussed in paragraph 216.

B. *Tunnels*

235

1. Outside of populated places all tunnels are shown. To insure legibility, the minimum plotted size for any tunnel is 1.50 mm (0.06 in) at publication scale. Tunnels that plot longer than the above size are plotted to scale.
2. Short tunnels which enable a road to pass under other linear manmade features are portrayed as underpasses.
3. Within populated places only those tunnels that relate to through routes are shown.
4. Names of prominent, important tunnels, if available, are shown above and parallel to the symbol.
5. Tunnels are appropriately labeled if neither end appears on the sheet under consideration.

219. Ferries and Fords

A. *Ferries*

1. Vehicular and railroad ferries are portrayed only when they are in regular operation for the purpose of transporting traffic between two points separated by water. 236
237
2. Pedestrian ferries are not shown unless they are the only means of crossing in the area.
3. Ferry route destinations beyond the neatlines of a sheet are shown in the same manner as road objectives. (See paragraph 213.)
4. Ferry slips are shown if they are large enough to be legible when plotted to scale.

B. <i>Fords</i>	238
Fords are shown where they relate to roads shown on the map.	239
220. Kilometer Posts	240
A. Kilometer posts provide a positive means of map orientation in sparse, underdeveloped areas.	
B. The requirement to show kilometer posts and the interval to be shown are contained in supplementary project instructions.	
221. Roads in Mountainous Areas	
A. Roads in mountainous areas frequently contain sharp (hairpin) turns which must be represented without excessive scale distortion.	
B. To avoid excessive displacement, the turns are symbolized as illustrated in the prescribed symbol.	241
222. Railroad Categories	
Railroads are classified and symbolized as to gauge, number of tracks, and whether operating or nonoperating, or electrified.	
A. <i>Operating Railroads</i>	242
1. An operating railroad is one that is at least in limited use over a maintained, permanent right-of-way.	thru 245
2. Monorails, logging, cog, and decauville railroads are considered permanent narrow gauge railroads.	
3. Portable type railroads, such as those used in cane fields and in strip mining, are not considered permanent railroads and are not mapped.	
B. <i>Non-operating Railroads</i>	248
1. A non-operating railroad is one that is not in use and is not maintained.	thru 251
2. Abandoned Railroad. A railroad that is not in use and the right-of-way is not maintained; however, the roadbed, tracks, and bridges are largely intact and the line can be made operational with a minimum amount of repair.	

3. Destroyed Railroad. A railroad with the roadbed, tracks, or bridges at least partially destroyed and which would require more than minor repairs to be made operational. If intelligence information indicates a destroyed railroad is being repaired, it is shown as an operating railroad.

4. Railroad Under Construction. A new railroad on which construction work has actually been started. Proposed railroads, including those for which the right-of-way has been established, do not come within the meaning of "under construction" and are not shown.

5. Dismantled Railroad. A railroad with the roadbed, tracks, and bridges removed or destroyed. The remaining evidence of a railroad is primarily the cleared right-of-way. If the right-of-way is being used as a road the appropriate road symbol is used to portray the feature. 259

C. Railroad Gauges

1. The gauge of a railroad is the distance between the rails.

2. Normal gauge is the gauge used by the majority of the mainline railroads in a country.

3. Broad gauge is any gauge greater than the normal gauge.

4. Narrow gauge is any gauge less than the normal gauge.

5. The normal gauge classification is established on a country basis. If a map covers more than one country, it is possible for a railroad to have more than one gauge if the line continues from one country to another. Under such circumstances, the normal gauge for each country is indicated by an appropriate note in the map legend. Example:

Normal railroad gauge in U.S.S.R. is 1.52 m.

Normal railroad gauge in Poland is 1.44 m.

6. Normal and broad gauge railroads are portrayed by the same symbol. 242
The latter are distinguished by appropriate labeling parallel to the railroad alignment. 243

7. Narrow gauge railroads are portrayed by the prescribed symbols. If 244
the map contains narrow gauge lines of varying width, the gauge of each is added 245
parallel to the alignment. If all narrow gauge railroads are the same gauge, the gauge is indicated only in the map legend.

8. Special types of narrow gauge railroads, such as cog railroads and monorails, are indicated by appropriate labeling parallel to the railroad alignment.

9. If two different railroad gauges are on the same roadbed, the line is portrayed by the normal gauge symbol. Appropriate labeling is added parallel to the symbol to indicate the condition. Example: 1.52 m and 1.44 m.

D. *Number of Tracks*

1. A distinction is shown between single track railroads and those with more than one set of tracks. Spurs and sidings are not considered in determining the number of tracks of a railroad.

a. A single track railroad has one set of tracks.

b. A double track railroad has two sets of tracks on the same roadbed.

c. A multiple track railroad has three or more sets of tracks on the same roadbed. The number of tracks is indicated by labeling parallel to the symbol.

2. The point of change in the number of tracks is indicated by the prescribed symbol and is appropriately labeled as close as possible to the point of change symbol. 268

3. If two railroads are in juxtaposition, that is, closely parallel but on separate roadbeds, each line is symbolized individually. If the distance between the roadbeds is too narrow to plot to scale, the space is exaggerated to 3.0 mm (0.12 in). 247

223. Sidings and Spur Tracks

Sidings and spurs are shown to the extent that the map scale, density of other detail, and the length of the features permit. When the distance between the main line and a siding is too small to plot to scale, the space between is exaggerated to 3.0 mm (0.12 in). Sidings and spurs are shown joining main lines in a smooth curve. 252
253

224. Railroad Yards

A. Railroad yards are shown in true shape and size as determined by the limiting tracks. However, no attempt is made to show all the tracks. Only a general representative pattern of the interior tracks and switching lines is portrayed. 254
255

B. Main lines running through railroad yards receive their normal symbolization.

225. Railroad Stations

A. Railroad stations are shown by the appropriate symbol, depending upon location. If the station cannot be verified, the "location unknown" symbol is used. 256

B. Flag stops, halts, and similar features are shown as stations only if they include a permanent building or structure, such as a platform for loading passengers or freight.

C. Railroad stations are not labeled as such, unless they are identified with a paper name. Stations in populated places are not named if the names are the same as the populated places.

226. Buildings Allied with Railroads

Roundhouses, signal houses, guardhouses, and similar railroad buildings are symbolized as buildings in accordance with Chapter 2, Section 300, Populated Places and Buildings.

227. Snowsheds

A. A snowshed is a long structure erected over a railroad track and designed to protect the right-of-way against blockage by snowslides. These features are distinctive landmarks and are always shown. 257

B. If the snowshed is unusually long, or cuts across the corner of the sheet, it is appropriately identified by labeling.

228. Railroads in Populated Places

A. Railroads on their own right-of-way are shown by normal symbolization.

B. Railroads on narrow piers and wharves are usually symbolized by crossties only. The pier or wharf is wide enough to contain the complete railroad symbol, the line delineating the track is also shown.

C. Underground railroads are portrayed by the railroad tunnel symbol, provided the alignments can be plotted accurately. If the alignment is unknown, the dashed lines representing the underground alignment are omitted; however, the wing ticks and "headwall" symbols representing the limits of the tunnel are shown. 267

D. Minor spurs and sidings may be omitted in populated places if density of other detail does not permit legible portrayal.

E. Subways are not shown.

229. Railroads in Roads and Streets

A. Operating railroads in roads or streets are shown by the prescribed symbol. Gauges are not indicated. 246

B. Non-operating railroads are not shown in roads or streets. The alignments of such features are dropped where they enter the street or road symbol.

230. Electrification

A. Electrification is indicated by the term ELECTRIFIED added parallel to the railroad alignment. 260

B. The label is omitted provided the official railroad name, if shown, indicates the railroad is electrified. Examples: ILLINOIS ELECTRIC.

231. Railroad Names

A. Names are shown parallel to and, if possible, along straight segments of the railroad symbol.

B. The terms "Railroad," "Railway," "Line," "System," and similar terms and abbreviations of those terms, are not included with a name unless the term is part of the official name. Example: CENTRAL RAILROAD OF NEW JERSEY.

C. Normally, names are not abbreviated. However, when space limitations preclude showing the full name, official abbreviations may be used.

232. Railroad Bridges, Tunnels, Viaducts, Causeways, and Overpasses

261
thru
267

A. The requirements for showing these features are the same as those specified for roads. (See paragraphs 217 and 218.)

B. Railroad crossties are omitted within the bridge or viaduct symbol and within 6.50 mm (0.25 in) of the abutment ticks.

233. Railroad Objectives

A. A railroad objective is a selected destination, and distance thereto, of a railroad that continues beyond the limits of the map. In sparsely developed areas, the destination may be two or three sheets away from the sheet under consideration. The destination is usually a large or important place.

B. Railroad objectives are always shown on maps that contain a sparse network of roads. However, a profusion of both railroad and road objectives is undesirable. When such conditions occur, road objectives are given preference.

C. The destination and distance of railroad objectives are shown in the same manner as specified for road objectives.

234. Car Lines

A. A car line is any type of permanent roadbed with rails that provide a track for light-car units. The cars are designed primarily for suburban or interurban transportation of passengers.

B. The distinction between operating and non-operating car lines is the same as for railroads. (See paragraph 222.)

C. Operating car lines are shown only outside of populated places. 269

D. Non-operating car lines are not shown within outlined populated places. 270
They are shown outside of populated places when the rights-of-way are not in a road. A non-operating car line is dropped at the point where it becomes coincident with a road or when it enters a populated place.

E. The gauge and number of tracks of car lines are not indicated.

F. Car line stops or stations are not symbolized. Permanent buildings used as car line stations are not especially identified.

G. Objectives are not shown for car lines.

235. Other Transportation Features

A. Included in this category are all linear features of a permanent nature, other than railroads and car lines, which serve to transport people or material. These features are usually above ground level and are supported by towers, pylons, or similar structures. 271

B. Aerial cableways and ski lifts are shown if they exceed 7.50 mm (0.30 in) at publication scale.

C. Conveyor belts are shown only outside of outlined populated places, provided that they are at least 7.50 mm (0.30 in) at publication scale and begin and end at a symbolized feature.

CHAPTER 2-COMPILATION AND COLOR SEPARATION

SECTION 300-POPULATED PLACES AND BUILDINGS

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301. General*A. Definition*

The term populated place includes cities, towns, villages, settlements, hamlets, communal farms, and all other places where more than one family (or family group) live as a community. Populated places vary in size and density from hard-core, nucleated cities to tiny hamlets and widely scattered or dispersed villages.

B. Characteristics

Due to the verifying cultural, economic, climatic, and political conditions, populated places take on different characteristics in different areas of the world. The main factors that affect the nature and, subsequently, the treatment of populated places in general are:

1. The relative density or concentration of buildings and the size of the buildings and streets.
2. The symmetry of the buildings and street patterns.

3. The architectural design and the type of materials used to make the various types of buildings.

C. *General Treatment of Populated Places*

The prime consideration when compiling populated places is to reflect the distinguishing characteristics of each place and to use the same treatment and symbols for similar places regardless of the region being mapped. To portray these characteristics, populated places are represented by individual building symbols (on a one-for-one basis); a light tint for moderately to sparsely built-up areas; or a heavier tint for densely built-up areas for differentiation and clarification. A large metropolitan area may require the use of all three types of treatment to properly portray the entire area.

302. Classification of Populated Places

The relative importance of populated places is determined on a regional aspect. Symbolized classified places are classified in five categories which are determined as follows.

A. Populated places are classified by population and by administrative importance. When population data are not available, populated places are classified solely by administrative importance.

B. When complete and up-to-date population figures are available, they serve as the breakdown of the five categories. The detailed division into categories by population may vary from region to region. An example of population breakdown and the relative importance breakdown equivalent in a culturally developed area would be:

1. More than 500,000 or 1st importance.
2. 100,000 to 500,000 or 2d importance.
3. 25,000 to 100,000 or 3d importance.
4. 5,000 to 25,000 or 4th importance.
5. Less than 5,000 or 5th importance.

An example of population breakdown and the relative importance breakdown equivalent in an area not yet well-developed culturally would be:

1. More than 100,000 or 1st importance.
2. 50,000 to 100,000 or 2d importance.

3. 10,000 to 50,000 or 3d importance.
4. 2,000 to 10,000 or 4th importance.
5. Less than 2,000 or 5th importance.

C. In the absence of population data, the populated places are classified solely by administrative importance. The categories of administrative importance may vary from region to region. Examples of administrative breakdown and the relative importance breakdown equivalent are:

1. National capital-1st importance.
2. Province, state, or department capital-2d importance.
3. County seat or chartered city-3d importance.
4. Town-4th importance.
5. Village or settlement-5th importance.

D. The relative importance of populated places is shown on the final product by the unique lettering.

E. Where portions of several countries appear on the same sheet, more than one category (either by population or administrative importance) may be necessary.

F. The classification of populated places is shown on the base compilation by an appropriate figure [(1), (2), (3), (4), or (5)] placed alongside the symbolized place. The classification figure for 5th-class towns may be omitted and the following note added in the margin of the compilation.

All towns without classification figure are 5th class.

303. Built-up Areas

A. Types of Built-up Areas

Most of the large towns and cities of the world have at least a portion of their developed areas falling into the built-up area categories. Included in this type of area are:

1. The old-town, hard-core sections of the nucleated cities with their narrow, winding streets and continuous roofcover.
2. The industrial and commercial districts and public buildings.

3. The urban residential areas made up of closely spaced or attached permanent dwellings and apartment complexes.

4. Casbah-type areas consisting of a dense agglomeration of masonry or clay, permanent-type dwellings, with walled courtyards, typifying the cities of North Africa and the Middle East.

B. *Density Requirements*

1. While the degree of building density and extent of the area are the main criteria used to determine when an area is to be shown by one of the built-up area tints or by building symbols, it is also important for the final symbolization to reflect a gradual transition in building density between the sparse and more concentrated portions of the populated place whenever such a transition actually exists. In the case of most large cities, the resultant symbolization--progressing inward to the center of the city--will be individual building symbols, moderately to sparsely built-up area tint, and densely built-up area tint.

2. When compiling the outlines for the areas to be represented by the built-up area tints, the density requirements are met when the individually symbolized buildings coalesce.

a. The requirement for densely built-up area tint is satisfied only when, after having represented the streets by their proper symbolization and density to reflect the characteristic pattern of the street network, most of the buildings coalesce both side-to-side and back-to-back if drawn at their minimum size. 301

b. The requirement for moderately to sparsely built-up area tint is satisfied only when, after having represented the streets by their proper symbolization and density to reflect the characteristic pattern of the street network, most of the building if drawn at their minimum size coalesce in a side-to-side direction along the street but the space between the backs of the buildings may be such that coalescence does not occur. 302

3. Buildings in fringe areas sometimes have an inconsistent density pattern in which some of the buildings coalesce at the scale of the map and others do not. In such cases, the built-up area symbol is used only if coalescence occurs.

4. When all other factors have been considered and the density or arrangement of buildings in a particular area is such that some doubt still exists as to the tint portrayal for densely built-up area tint versus moderately to sparsely built-up area tint, the following guides are applied: doubtful areas are shown by the densely built-up area tint whenever they are surrounded by (or are contiguous to) areas that are obviously densely built-up areas; doubtful areas which are not contiguous are shown by the moderately to sparsely built-up area tint.

5. Populated places that are essentially alike receive the same treatment and type of symbolization regardless of some slight difference in degree of density. For example, if the populated places on a sheet are all of the compact-village type and differ only slightly in density, they are shown with the same type of tint symbol.

C. *Size Requirements*

1. The size requirements for the use of the built-up area tints are met when the area is a minimum of approximately 2.5 mm by 2.5 mm (0.10 in by 0.10 in), or its equivalent area, providing the narrowest dimension is not less than 1.5 mm (.06 in).

2. A single row of buildings extending along the side of a road are shown by the moderately to sparsely built-up area tint 1.0 mm (.04 in) wide.

D. *Establishing Limits of Built-up Area Tints*

1. The limits of the built-up area tints are delineated whenever possible to coincide with mapped linear features such as streams, roads, streets, and railroads. Where built-up area limits are not coincident with linear features, the outline is delineated to create an accurate portrayal of the populated place; the final limiting line is adjusted to eliminate small indentations or extensions.

2. The limits of the built-up area tints are not based on administrative limits.

3. Along the periphery of the built-up areas, factory complexes, refineries, railroad yards, port facilities, and similar building complexes which have extensive areas of open ground are not included within the built-up area limits. These features are shown by their appropriate symbols.

E. *Open Areas Within Built-up Area Tints*

1. Areas of little or no development falling inside the overall built-up area tint are excluded from the tint area, provided they are approximately 2.5 mm by 2.5 mm (0.10 in by 0.10 in) or larger. All other areas that are below the minimum size are included within the built-up area tint.

2. Parks, cemeteries, universities, and hospital complexes having extensive open grounds are treated as open areas if they meet the minimum size requirements. Factory complexes and railroad yards are given similar treatment. Buildings or other features in these open areas are shown as individual buildings or by an appropriate symbol.

304. Settlements - Southeast Asia

303

A. The typical settlements in this area are dispersed along and straddle the major land routes and extend alongside the large canals and major ditches. They are made up of a fairly dense pattern of buildings, with each individual dwelling being surrounded by a small garden plot outlined or delimited by tall trees. The buildings generally are made of wood or bamboo and are in a uniformly dense pattern, with no transition between the center and the outer limits of the settlement. Because of the landmark prominence of the trees, this type of settlement is shown by a combination of the woodland symbol and individual building symbols. The treatment or positioning of the building symbols varies with the density of the tree cover and the density and symmetry of the building alignments.

B. When the actual positions of the dwellings are unknown, either because they are obscured by trees or because of the nature of the symbolization on the base source maps, the settlement is shown by a random pattern of building symbols. The outline of the woodland symbol (the limits of the trees and gardens) is used as the limit of the building pattern; the buildings are spaced approximately 0.50 mm (0.02 in) apart.

C. When the tree canopy is less dense and most of the dwellings are visible, the building symbols in a representative building pattern are positioned and oriented to reflect the density and degree of symmetry of the dwellings in each particular settlement.

D. The trees and garden areas are shown by the woodland symbol. Open garden areas 2.5 mm by 2.5 mm (0.10 in by 0.10 in) or larger are excluded from the woodland symbol.

E. The woodland tint is devoid of tree symbols.

305. Shanty Towns

304

A. These types of developments are primarily located on the outskirts of the large cities worldwide. They are made up of tightly-packed impoverished dwellings made from salvaged materials with no streets or modern facilities. They have rather distinct limits since the tin-roofed shanties are so jumbled together that they present practically continuous roofcover.

B. A distinctive symbol is used to portray shanty towns when the developments are at least 2.5 mm by 2.5 mm (0.10 in by 0.10 in); those which do not meet this minimum size are included in the built-up area tint.

C. The shanty town symbol is shown in the legend and appropriately identified to coincide with the terminology of the country.

306. Special Types of Populated Places

The types of villages indicated below, because of their unique makeup, are especially identified on the names data compilation so they can be distinguished from the standard, compact developments. This distinction is made by open-spacing the populated place type on the final names drawing.

A. Dispersed villages similar to those found in eastern Yugoslavia are made up of numerous individual farmsteads scattered over a relatively large area. They are treated as indicated in paragraph 1004A2b of this chapter.

B. Scattered villages such as the *comunidades* of South America and the *streusudlung* of Eastern Europe are made up of widely scattered individual buildings. They are treated as indicated in paragraph 1004A2c of this chapter.

307. Farmsteads

A. A farm or farmstead is made up of a dwelling with its accompanying barns and sheds. The farmstead usually has only one house (permanent dwelling); however, in some areas of the world, members of the same family erect additional homes in close proximity to the original dwelling.

B. When the individual farmsteads have names and supplementary project instructions require that they be shown, the farmsteads are especially identified on the names-data compilation.

C. The buildings are shown by individual building symbols.

308. Buildings

305

A. A building is a roofed structure of a permanent nature, usually enclosed on four sides, which serves as a dwelling, storehouse, factory, animal shelter, or has some other useful purpose. In highly developed areas, they are made of metal, brick, dressed lumber, and/or masonry-type materials. In the underdeveloped areas, the buildings are not as durable as in the highly developed areas, since crude lumber, adobe, bamboo, and clay are the materials most commonly used in their construction. However, they are considered to be of a permanent nature. Huts, tents, and other temporary dwellings are not considered as buildings and are treated as indicated in paragraphs 311 and 312.

B. Scale permitting, buildings are shown wherever they exist by properly oriented individual building symbols; the center of the symbol is positioned over the center of the feature. When a building scales larger than the standard 0.5 mm by 0.5 mm (0.02 in by 0.02 in) building symbol, it is drawn to scale.

C. When buildings occur in groups and in conjunction with mapped linear features such as roads, railroads, and ditches, the density of the buildings and the

displacement due to symbolization may make it impossible to position all the building symbols in their true positions. Often building symbols must be moved slightly to achieve a good representative building pattern portrayal. The following limiting dimensions are used when compiling buildings under these circumstances.

1. The minimum space between building symbols is 0.20 mm (0.008 in).
2. When there is a small cluster of buildings and buildings must be moved from their true positions to avoid coalescing with each other, a displacement not to exceed 0.50 mm (0.02 in) is permitted.
3. Displacement of buildings is often necessary along symbolized roads or streets because of the exaggerated width of the road symbol. In such a case, the building symbol is drawn to touch the road casing of a double-line road symbol wherever the edge of the building is 6 m (20 ft) or less from the edge of the road.
4. A clear space of at least 0.20 mm (0.008 in) is shown between the road and the building symbol when the edge of the building is further than 6 m (20 ft) from the edge of the road.
5. The building symbol is plotted in its true position wherever an open space of 0.20 mm (0.008 in) or more exists between the building and road symbols. No attempt is made to show the true ground distance between the two features.
6. A minimum space 0.20 mm (0.008 in) is shown between building symbols and tracks and trails.

D. When two or more dwellings are actually attached (like a townhouse development), they are shown by a single symbol scaled to the length of the row, with the width drawn to scale or a minimum of 0.40 mm (0.016 in). This treatment applies only in areas or developments that are not considered as built-up areas.

E. When buildings are in clusters and will coalesce if drawn at their minimum size even if displaced, they are shown by a built-up tint. See paragraph 303B for density requirements for the built-up area tints.

309. Important Buildings

A. Buildings which are important because of their military significance, cultural importance, unique appearance or construction, or orientation value are identified by the appropriate symbol and/or by labeling.

B. Where there are numerous important buildings in the areas shown with the built-up area tint, only the most outstanding are shown. It is undesirable to have a profusion of important buildings, especially ones that require labeling, in these areas. Where a selection is required, those that are visible from afar have first preference for retention.

C. In the areas outside the built-up area tints where the selecting-out process is not required, all of the important buildings are shown by appropriate symbol and/or label.

D. Listed below are the important buildings that are shown by unique symbols. When used, these symbols are shown in the legend.

- | | |
|--|--------------|
| 1. Religious buildings. | 306 thru 319 |
| 2. Hospitals. | 321, 322 |
| 3. Schools. | 320 |
| 4. Forts (too small to plot to scale). | 323 |

The treatment of other important features similar to buildings is covered in Section 400 of this chapter.

E. Listed below are important buildings (or building complexes) that are shown by a building symbol(s) (or, if larger, drawn to scale) and identified by an appropriate label:

1. Industrial or commercial complex, e.g., copper smelter.
2. Prominent factories, e.g., cement factory.
3. Government buildings, such as capitol buildings, city or town halls, custom houses, post offices, etc.
4. Communication centers.
5. Military installations.
6. Museums.
7. Prisons or landmark police posts.
8. Large forts and castles.
9. Isolated landmark chateaus.
10. Monasteries.
11. Historic buildings.
12. Ranger stations, forester lodges.
13. Other types of important buildings peculiar to the area being mapped.

F. Important building symbols are treated as indicated below.

1. The symbols that are always aligned with the south neatline of the map are indicated in the symbol portion of this section. The street or road casings and road fills are spaced back for the symbol as required.

2. The symbols with a distinguishing characteristic attached, such as the church or school symbol, generally have the staff of the symbol at right angles to the street or road. In congested areas, the staff can be moved from its preferred position, the length of the staff can be altered, and, as in the case of the school symbol, the direction of the penant can be changed.

3. When a feature is made up of several buildings, the distinguishing characteristic is shown on the most prominent building in the group. This applies to universities, monasteries, schools, hospital complexes, and similar features.

G. Important buildings are labeled as indicated below.

1. Important buildings which have no characteristic symbol are identified in as concise a form as possible. The labeling may vary, depending on the density of the surrounding map detail. For example, *Papermill* may be shortened to *Mill* and *Automobile factory* to *Factory*.

2. The generic part of a proper name is not shown when the identity of the feature is apparent from its distinctive symbol. For example, *St. Patrick's Cathedral* or *St. John's School* is shortened to *St. Patrick's* and *St. John's*, respectively. *The Church of the Sacred Heart* is shortened to *Sacred Heart*.

310. Cave Dwellings

324

Dwellings of this type are not uncommon throughout the world, but are most prevalent in the loess area of China. They consist of a room or series of rooms dug into the side of the ravines. The symbol is shown in the map legend and labeled *Cave dwelling*.

311. Underground Dwellings

325

This type of dwelling is found in the loess plateaus and consists of underground rooms grouped around a vertical entrance shaft. The symbol is shown in the map legend and labeled *Underground dwelling*.

312. Tent Dwellings

326

A. These types of dwellings (used primarily by nomadic people) are constructed of canvas, hides, or bark, stretched over or held up by poles. Normally, the tents are moved from site to site; however, there are some instances of permanently located tent settlements.

B. Permanently located tent settlements and nomadic tent sites used on a seasonal basis are shown by a representative pattern of tent symbols aligned with the solid neatline. Sites used regularly on a seasonal basis are labeled *Winter location* or *Summer location*. When the tent settlement has a name, the labeling is shown in conjunction with the place name.

C. Tents used by non-nomadic people for recreational purposes or military operations on a temporary basis are not shown. Permanently located military tent camps are shown.

D. Two tent symbols are provided in these specifications. The symbol that more nearly represents the actual shape of the feature is selected.

313. Huts

327

A. Huts are defined as very crude dwellings of a semipermanent nature, built of mud, grass, reeds, barks, and similar materials. Their characteristics differ on a regional or tribal basis.

B. Huts are specially treated only when they can be positively distinguished from permanent-type buildings in the same area. When information is not available, they are shown by the standard building symbol.

C. Two hut symbols are provided in the specifications. The symbol that more closely represents the feature is used and shown in the map legend.

D. Rows of huts with common walls are shown by putting individual hut symbols together.

E. Specifications and guidance applicable to buildings in settlements (paragraph 303), relative to representative patterns, selection, density, and plotting of symbols also apply to the treatment of huts.

314. Destroyed Buildings and Populated Places

328

A. A destroyed building or populated place is defined as one that has been made uninhabitable as a result of a natural or manmade catastrophe or military operation.

B. When a populated place has been destroyed (in whole or in part) and it is evident that the rubble has been cleared, leaving no obstruction to cross-country movement, the area is delineated with a dashed line (same as Arc of Ruins) and labeled *Destroyed*. The place name is retained.

C. When a populated place has been destroyed (in whole or in part) and the gutted buildings are still standing, the destroyed area is shown by a gray tint. This symbol is added to the map legend and identified as *Destroyed area*. This treatment applies to populated places that would be (or were) portrayed by individual building symbols or the built-up area tint.

D. Individual gutted buildings outside the gray tinted area are shown by open square symbols or, if larger, outlined to scale. The symbol(s) is (are) labeled *Destroyed* in the map interior or shown in the legend as *Destroyed buildings*, whichever is more appropriate. 329

315. Ruins 330

A. Ruins are defined as abandoned buildings or other manmade structures similar to buildings that are in such a state of disrepair or decay that they cannot be used for their original purpose. These features are shown for their landmark, cultural, or historic significance.

B. The label *Ruins* is shown in conjunction with the symbol unless there are numerous ruins scattered throughout the map, in which case the symbol is shown in the legend and the labeling omitted from the map interior.

C. Large areas of ruins, which have deteriorated to the point of being mostly rubble, are enclosed within a dashed outline and labeled *Ruins*. 331

CHAPTER 2-COMPILATION AND COLOR SEPARATION
SECTION 400-MISCELLANEOUS CULTURAL FEATURES

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401. General

A. The term *cultural features* as used in this section refers to those features on the terrain which are the results of the workings of man. Excepted are: roads, railroads, and related features which are discussed in Section 200, and populated places and buildings which are discussed in Section 300 of this chapter.

B. The amount of cultural features in an area is directly related to the physical nature and economic development of the area. The scale permitting, and unless otherwise indicated, all features are shown for which symbolization is furnished in the symbol portion, Appendix I, of these specifications.

C. Where selectivity is required because of the density of detail, features that have landmark significance are always retained. A landmark is any feature of sufficient interest or prominence in relation to its surroundings to make it outstanding as an orientation point for the determination of a location from the air or on the ground. Landmark buildings are discussed in Section 300, Populated Places and Buildings.

D. Refer to Appendix I for type styles and sizes.

402. Located Objects

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411

A. A located object is a landmark feature other than a building or area feature which, because of size, shape, or location, serves as a means of positive orientation. Examples are: towers, chimneys, media masts, air beacons, lighthouses, watermills, windmills, tombs and monuments. Landmark area features are discussed in Section 500, Relief.

B. In urban areas where there are numerous landmark buildings, features which would be selected as located objects in other areas are not symbolized unless they are of unusual prominence. Located objects which are obstructions to aircraft are shown wherever they exist.

C. Located objects less than 61 meters (200 feet) height above ground are represented by the standard located object symbol or by a characteristic symbol. The standard symbol, labeled for identification, is used for all features that do not have a characteristic symbol. The dot of the standard symbol marks the actual location of the feature.

D. All located objects which extend 61 meters (200 feet) or more above the surrounding terrain are considered a hazard to flight and shall be shown by the obstruction symbol and labeled, indicating nature of obstruction.

1. The height of the structure above ground level, as well as the elevation of the top of the obstruction above sea level, shall be shown when they are known or can be estimated. These elevation values shall be positioned alongside (preferably to the right of) the obstruction symbol. The height above ground shall be shown in parentheses. Deviation from the specified positioning is permissible to avoid undue congestion or the overprinting of other significant detail on the graphic.

2. The estimation, based on best source available, must be high enough to assure clearance of the structure. Estimated heights shall be portrayed on the maps in the same manner as accurate heights, without an indication of reliability, except for the possible rounding off of the last digit to the next higher even five.

E. Located objects, which are represented by characteristic symbols, are not labeled but are included in the legend. The symbols are centered over the actual location of the features.

1. Names of lighthouses are shown where practicable.

2. No distinction is made between *windmills* and *windpumps*. In areas where these features are common, their value as landmark objects is relative to the number of similar features in the area. 405

3. *Water mills* are shown by their characteristic symbol wherever they are located. 406

403. Pumping Stations and Water Pumps

A. A *pumping station* is a structure which houses the machinery used to raise the level of a fluid system.

1. Pumping stations are shown when they are important because of their usage or prominence in an area. Important pumping stations include those which are used as boosters on pipelines, aqueducts and irrigation conduits.

2. The feature is symbolized as a building and labeled "Pumping station."

B. A *water pump* located in a structure is symbolized as a building. Where the water pump is not in a structure it is symbolized as a well. In both cases the symbol is labeled "Water pump."

404. Pipelines

A. *Pipelines* treated in this section are those used to convey gases or liquids other than water. Water pipelines are discussed in Section 600 of this chapter.

B. A pipeline may exist above or below ground and is shown as a continuous feature with the delineation broken for outlined built-up areas.

1. Above-ground pipelines are shown where they are either of landmark or military significance. 412

2. Underground pipelines are shown in open areas where necessary to indicate continuity with above-ground pipelines and where their existence is evidenced by conspicuous earth scars which have landmark significance. 413

C. Pipelines coincident with traveled ways are not shown, except in desert areas.

D. The product carried by the pipeline shall be indicated by labeling.

405. Wells (other than water), Tanks and Reservoirs

A. *Wells* (other than water) 414

1. Water wells are treated in Section 600 of this chapter.

2. Wells drilled for gas, oil, brine, etc., are shown if they are in operation.

3. When practicable, the type of well is indicated. The well symbol is supplemented by the appropriate identifying label as "Gas," "Oil," "Brine," etc.

4. Abandoned wells are shown only if they are of landmark significance. The well symbol is labeled "Abandoned" and without identification of its type.

5. In concentrated groups of similar wells, no attempt is made to symbolize each well; a representative pattern is shown. The retained wells are not individually identified. Appropriate labeling is applied to the pattern, as: "Oil wells," "Gas wells," etc.

B. *Tanks and Reservoirs*

415
thru
417

1. A *tank* is a manmade receptacle used for the storage of gas, oil, water, or other liquids.

a. Individual tanks are labeled as to their contents, "Oil," "Gas," etc. If the content is unknown, the symbol is labeled "Tank." Water towers are shown by the tank symbol and labeled.

b. In areas where numerous tanks exist, a representative pattern is shown which retains the general layout. Appropriate labeling is applied to the pattern (e.g., "Gas tanks," "Oil tanks," etc.).

c. A tank surrounded by a dike or levee is shown within the levee symbol and appropriately labeled as "Oil tank," etc.

2. *Open reservoirs* used for the temporary storage of asphalt, oil, or liquids other than water are shown if they are large enough to plot to scale. Those that plot less than minimum size 2.5 mm by 2.5 mm (0.10 in by 0.10 in) are shown only if they have landmark significance, in which case they are exaggerated to the minimum size. Labeling, identifying the contents, is shown in conjunction with the symbol (e.g., "Asphalt," "Oil," etc.).

3. Underground storage facilities that can be plotted to scale are shown and appropriately labeled (e.g., "Underground oil tank," "Underground water reservoir," etc.).

418

406. High-tension Power, Telephone and Telegraph Lines

A. *High-tension power lines*

419

1. High-tension power transmission lines are shown as continuous features, regardless of their landmark significance. The delineation is shown parallel to roads, railroads, canals, etc., and is broken only for symbolized populated places. Underground lines and short feeder lines are not shown.

2. The pylons of the symbol are always located at points of pronounced directional change and appropriately spaced between such points at approximately 12.5 mm (0.50 in) intervals.

3. The area containing power transformer stations, when plottable to scale, is outlined by a dashed line.

B. *Telephone and telegraph lines*

420

1. Only those portions which are of landmark significance are shown. Any line is considered as a landmark if it is conspicuous because of its height, cleared right-of-way, or the sparsity of other cultural features in the vicinity. Examples:

a. A line which runs for a long distance across grazing or other open areas.

b. A line, not parallel to a road or other linear feature, which runs across mountainous terrain.

c. A line which crosses valleys and canyons.

2. No distinction is made between telephone and telegraph lines. The names of the lines are not shown.

407. Walls and Fences

421
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424

A. *Walls and fences* that assume military importance as obstacles or serve as landmarks in open country are shown. Walls around cities and fortifications are always shown.

B. *Fences* are omitted along roads, railroads, and other linear features.

408. Recreational Areas

425
thru
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A. Included as recreational areas are fairgrounds, race tracks, stadiums, golf courses, rifle ranges, amusement parks, sports centers, and similar areas.

B. These features are plotted to scale with their prescribed symbolization and named or appropriately labeled.

C. Walls or fences which enclose recreational areas are not symbolized. The limits of the area are represented by a dashed outline.

409. Cemeteries

A. *Cemeteries* and *churtyard cemeteries* are usually shown wherever they exist. Very small cemeteries may be omitted unless they serve as landmarks in areas of sparse culture.

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429

B. The limits of cemeteries and churchyards are plotted to scale in their correct alignments. The outline is omitted when it is coincident with a linear feature.

C. The religious denomination of the cemetery is indicated by the appropriate symbol. If the type "Cem" is shown within the outline or adjacent to it if the outline is too small to contain the type.

D. Mausoleums are not symbolized.

E. Isolated graves are found in desert and other generally uninhabited areas. They are not planned burial grounds and are symbolized by their prescribed symbols. If more than one grave exists in an area, a representative pattern is shown. 430

410. Aeronautical Data

A. The aeronautical data to be shown includes obstructions as treated in paragraph 402D, airports, airfields, heliports, seaplane bases and anchorages.

1. The features may be permanent or temporary, and with or without supporting facilities.

2. No distinction is made between military or civilian features; both are shown.

3. The name of the feature is shown if known.

B. Airports and airfields are plotted to scale. An airfield (or landing area), as distinguished from an airport, usually has only one runway and few, if any, other facilities.

1. The limit is omitted when it is coincident with a linear feature.

2. Runways, taxiways and dispersal areas are shown to scale. The runway surface characteristic, hard surface, soft surface, or surface unknown, is indicated by labeling. The elevation of the feature is shown, preferably below the surface characteristic label. 431 thru 433

3. Radio masts, observation towers, and air beacons are shown as located objects and are appropriately labeled. 434

4. Where field limits and runway information are not available, the feature is represented by the characteristic symbol.

C. Heliports with landing pads and other facilities are shown provided the symbol does not obscure other detail. Rooftop landing areas are omitted. 435

D. *Seaplane bases* and *anchorages* are plotted to scale by symbolizing the ramps, hangars, buildings, wharves, and other appurtenances.

436
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439

1. A seaplane base is a tract of land adjoining a body of water with facilities for mooring, shelter, supply, and repair of aircraft which land and takeoff on water. It is in regular use for receiving and discharging passengers and cargo. An anchorage, as distinguished from a seaplane base, provides mooring and few, if any, other facilities.

2. The water limits of the features, or designated takeoff and landing areas, are not shown except where dredged or dug channels have been prepared in shoal water. The channels are represented by dashed outlines.

3. The names of the features are shown. If unknown, the features are appropriately identified as Seaplane base or Seaplane anchorage.

4. The elevation of the feature, if not mean sea level, is preferably shown below the feature name or identification.

5. Where the feature is abandoned or the location is approximate, the information is indicated by a label enclosed in parentheses. Example: (Abandoned), (Approximate location).

411. Boundaries

A. Boundaries which fall within the purview of the Department of State, must be in accordance with prevailing policies of the Department.

B. Boundaries commonly shown consist of the following:

- | | |
|--|-----|
| 1. International boundary. | 440 |
| 2. Lines of separation of sovereignty. | 445 |
| 3. First-order administrative boundary. | 441 |
| 4. Second-order administrative boundary. | 442 |
| 5. Third-order administrative boundary. | 443 |
| 6. Reserve area. | 446 |
| 7. Military reservation. | 447 |

C. The boundaries to be shown are determined on a country-by-country basis, since the available information and the type of boundaries vary between countries. Where the information is available, boundaries listed above are normally shown. Other boundaries may be shown when specified in supplementary instructions. All boundaries on the sheet are included in the legend.

1. *International* boundaries and the limits between independent states.
2. The symbol for *lines of separation* of sovereignty shall be used for the following:
 - a. Line of control
 - b. Claim line
 - c. Armistice line
 - d. Cease-fire line
 - e. Limits of occupation
 - f. De facto boundary
 - g. Demilitarized zone (DMZ)
 - h. Demilitarized line (DML)

The requirement for this type of boundary and any special symbolization or labeling is specified in supplementary instructions for the project.

3. *First-order administrative* boundaries define the limits of the principal divisions of a country, such as provinces in China; prefectures in Japan; states in the United States; or equivalents.

4. *Second-order administrative* boundaries define the division of the first-order subdivision, such as the counties in the United States.

5. *Third-order administrative* boundaries define the division of the second-order subdivision and are shown if directed by supplementary instructions.

6. The *Reserve area* boundary symbol shall be used to show the following:
- a. Tribal reservations
 - b. National parks

- c. Forest preserves
- d. Animal sanctuaries
- e. Prohibited areas

7. The military reservation symbol is used for all military installation boundaries. The same symbol, but without highlight overprint, is used for U.S. Coast Guard installation boundaries.

D. *Approximate Boundaries*

1. An Approximate boundary is one that can only be plotted approximately because of inadequate information.

2. Where source material is insufficient to permit delineation of an approximate boundary, no boundary shall be shown on the map. Instead, an appropriately worded note shall be shown in the margin below the Boundaries Diagram explaining the condition. For example:

Boundary between Provincia de Estramadura and Provincia de Ribatejo omitted since location cannot be determined.

E. *Boundary Names and Labeling*

1. The international boundary is identified in the map interior by showing country names opposite each other on the appropriate sides of the boundary symbol.

2. Boundaries of subordinate administrative divisions (first-, second-, and third-order) are identified in the Boundary Diagram. (See Chapter 3, Section 300.) However, where insufficient information exists for plotting subordinate administrative boundaries, administrative names are shown in the map interior, centered as nearly as possible in their respective areas.

3. Where no boundaries of any kind fall on the sheet, the primary and secondary administrative divisions are identified in the Boundary Diagram only. (See Chapter 3, Section 300.)

4. Where appropriate, labeling which describes the status of a non-definitive boundary is shown parallel to the boundary symbol. The label is repeated as necessary for clarity. Examples are: IN DISPUTE; APPROXIMATE or APPROX; INDEFINITE; etc. When shown in connection with a country name, the label is shown in parentheses following the country name.

5. The point of change in the status of a boundary is shown by a perpendicular tick on the boundary symbol. The tick is omitted if the point of change

occurs at a symbolized boundary marker. Appropriate labeling is shown at the point of change. A boundary alignment that is considered to be accurate is not so labeled.

6. Where the information can be adequately indicated by a note beneath the Boundaries Diagram, labeling is omitted from the face of the map.

F. *Special Treatments*

1. When the limit of a lesser administrative division is coincident with that of a higher division, the symbol for the higher division is shown.

2. Boundaries and Roads

a. A boundary that occurs within a double-line road is delineated in its correct alignment. Every third unit of the appropriate boundary symbol is shown; the component lengths and spaces of the symbol are maintained, and the line weight is reduced to .10 mm (.004 in). Additional complete units are added at salient points—road junctions, angles, departures from the road—to provide continuity of the boundary alignment. The boundary overprint, if applicable, is shown as a continuous band. 448

b. When a boundary follows an edge of a road, track, or trail, every third unit of the appropriate boundary symbol is shown overprinting the road casing. Additional complete units are added at salient points to provide continuity. If applicable, the boundary overprint is shown touching the road casing. The width of the overprint is reduced to one-half of its normal width. 449

c. When it is uncertain whether a boundary follows the center or edge of a road, it is shown in the center of the road and labeled BOUNDARY APPROXIMATE or BDRY APPROX.

3. Boundaries in Streams

a. The boundary symbol is completely delineated in correct position when it occurs within a double-line stream which is wide enough to accommodate the delineation. When the correct position is unknown, the boundary symbol is centered in the stream and labeled APPROXIMATE. Where the boundary follows a shoreline of such a stream and information is available that the boundary coincides with the high-water line, every third unit of the appropriate boundary symbol is shown overprinting the shoreline. 450
451

b. A boundary coincident with a single-line or narrow double-line stream is shown in its correct position. Every third unit of the boundary symbol is shown. Additional units are added at salient points--stream junctions, departures from the stream--to provide continuity of the boundary alignment. The boundary overprint, when appropriate, is applied to the entire boundary. 452

c. The boundary symbol is completely delineated through areas of braided streams. When the alignment is not precisely known, the boundary is labeled APPROXIMATE.

4. Boundaries in Open Water

a. A boundary which crosses a lake, either completely on one sheet or on two adjacent sheets, is shown in its entirety. Where delineation is approximate, the label APPROXIMATE is not shown.

b. A boundary (other than international) which crosses a large body of open water is shown in its entirety if its alignment is fixed. When the alignment is not fixed, the boundary is shown in the open water area at the points of entry. At appropriate intervals, depending on the size of the body of water, two or three continuous units of the symbol are shown in logical position. Where the delineation is approximate, the label APPROXIMATE is not shown.

c. International boundaries are not shown crossing a large body of open water. The symbol will terminate at points of entry into the open water area. Exceptions will be specified in supplementary instructions.

5. Boundaries Coincident with Projection Lines

a. A boundary which is coincident with a projection line is shown in its entirety and centered on the projection line.

b. An exception to the foregoing is when the line weight of the boundary symbol is the same as the line weight of the projection line. In this case, the boundary is delineated in its entirety .25 mm (.01 in) inside the projection line.

6. Boundary Markers

a. Boundary markers or monuments are shown when their locations can be accurately plotted.

b. Space permitting, the designating names or numbers, if any, are shown. 453

412. Mining Features

A. All mining features are shown in areas of sparse culture; in other areas they are shown if they do not interfere with the legibility of other features.

B. Where a number of mines cover a general area, individual mine symbols are not shown; the area is outlined and labeled. 454

C. When practicable the material mined is indicated by labeling.

D. Abandoned mines are shown if they have landmark values; otherwise, all mining features are omitted where there is no evidence of recent or current works.	464
E. <i>Underground Mines</i>	
A distinction in symbolization is made between mines with vertical shafts and those with horizontal shafts (mine tunnels).	455 456
F. Opencast mines are those in which the excavations are performed from the surface. Included are strip mines, placer mines, open-pit mines, quarries, and gravel and borrow pits.	
1. Strip mining may result in several types of temporary or permanent surface displacements. They usually contain deep-furrowed patterns, but, in some instances, hollows and holes may result. The area of the strip mine is outlined and appropriately labeled.	457
2. Placer mines which are worked by hydraulic or dredging methods, are recognizable by the rows of disc-shaped soil deposited by the mining equipment.	458
3. Open-pit mines and quarries are worked from the surface and are represented by the escarpment symbol.	459 thru 461
a. The mine symbol is not used for open-pit mines. The product of the mine is indicated by labeling.	
b. For quarries, the escarpment symbol is augmented by the mine symbol centered within the area.	
4. Gravel and borrow pits are open excavations and are shown by the escarpment symbol. The mine symbol is not shown. These features are always labeled.	462
G. Tailing piles and mine dumps are formed by the debris deposited by the mining operations.	463
H. A prospect is a partly developed mine of unproved mineral content. Large areas containing numerous prospects are outlined and labeled "Prospects."	464
413. Cuts and Fills	
A. A <i>cut</i> is an excavation of earth and rock at a constant grade or level which provides a passageway for a line of communication such as a road, railroad, canal, etc.	466

B. A *fill* is an embankment at a constant grade or level constructed to provide a passageway for a line of communication such as a road, railroad, canal, etc.

C. *Cuts* and *fills* are shown when they are at least 2.5 mm (.10 in) long at publication scale and at least 3 meters (10 feet) in actual height.

1. Where practicable, the top of the cut line is drawn in its true position and shape with the ticks extending to .25 mm (.01 in) of the line feature.

2. The scale permitting, the lengths of the fill ticks are drawn to scale, emanating from the base lines of the fill symbol.

3. Railroad-crosstie ticks may extend into the cut or fill symbol.

414. Culverts

A. A culvert is a masonry conduit which serves as a channel-crossing for water beneath a railroad embankment or a road.

B. Large culverts at the base of fills are shown if they have landmark significance. Small culverts are not symbolized. 467

415. Dams, Levees, and Related Features

Permanent dams, levees, locks, sluice gates and related features are shown wherever practicable.

A. Dams

1. A distinction in symbolization is made between earthen and masonry dams and between dams with vertical sides and those with sloped sides. 468
thru
470

2. In congested areas and in areas of numerous small dams, those across single-line streams without backed-up water may be omitted or thinned out.

B. Levees

1. Levees, spoil banks, dikes, fortification scarps and similar earthen features having vertical or sloping sides are symbolized in the same manner.

2. A distinction in symbolization is made between levees and levee-type masonry features. 471
thru
473

3. A contour which approaches a levee is drawn into the levee symbol at the point where it becomes part of the levee symbol.

C. <i>Locks and Sluice Gates</i>	474 475
1. Where the map scale permits, locks are shown in their true shapes.	
2. The point of the lock or sluice symbol is shown pointing upstream.	
3. When practicable, the names of locks and sluices are shown.	
416. Harbor and Coastal Structures	
A. <i>Harbor and coastal structures</i> are cultural features which project from the coastline into areas of open water. Typical structures are wharves, piers, jetties, docks, breakwaters, seawalls, revetments, diversion dams, marine railroads, ramps, and similar features.	476 thru 485
1. A structure with a plotted thickness of 0.4 mm (0.016 in) and larger is represented in true width and shape; all other structures to be shown are shown 0.4 mm (0.016 in) wide with the linear shape retained.	477 476
2. When any part of a structure is submerged at mean high tide, the symbol for the submerged part is represented by dashed lines.	478 479
B. Where required for clarity, structures are identified by appropriate labeling.	
C. Sandbag revetments, unless extensive and periodically maintained, are not shown.	
D. Shorelines which are coincident with a structure are not shown.	
E. Floating drydocks are not shown.	

CHAPTER 2-COMPILATION AND COLOR SEPARATION
SECTION 500-RELIEF

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501. General

A. It is required that the user be presented with maximum graphic information that is consistent with the scale and operational use of the map. To achieve this aim, relief shall be portrayed by contours, spot elevations, form lines, hachures, special symbols, area patterns, and descriptive labeling. 501 thru 510

B. The configuration of landforms shall be presented by contours based on an established vertical datum, usually mean sea level.

C. Contour values and spot elevations shall be shown in a manner that will facilitate the reading and interpretation of elevations expressed by contour lines.

D. In those cases where contours alone do not adequately illustrate terrain conditions, the use of special symbols, area patterns, and/or descriptive labeling shall be employed.

E. The unit of measure shall be the meter unless otherwise specified in supplementary instructions.

502. Horizontal and Vertical Control

A. Guidance for the placement of elevation values and horizontal control point identifications is contained in Section 1000 of this chapter.

B. All horizontal control points used to control the compilation are usually symbolized on the map. In areas where there is an abundance of control, points are shown approximately 75 mm to 125 mm (3 in to 5 in) apart, with points of higher order accuracy given preference.

503. Contouring

A. Definitions

1. A *contour* is a line on a map which represents an imaginary line on the ground, all points of which are of equal elevation as referred to a specified common datum plane. The four principal types of contours are the index, the intermediate, the supplementary, and the depression.

2. An *index contour* is a contour accentuated in weight to indicate a multiple of the basic contour interval. Conventionally, the index contour is a multiple of 50 or 100 and, depending upon the interval, is usually every fourth or fifth contour. For example, the 0, 100, 200, 300, etc., contours serve as indexes when the interval is 20 or 25. The 0, 50, 100, 150, 200, etc., contours serve as indexes when the interval is 10.

3. *Intermediate contours* are lines at the prescribed interval which appear between the index contours.

4. *Supplementary contours* are dashed contour lines which are shown at one-half or one-quarter of the basic contour interval. They are used to augment the relief presentation where significant topographic features are not shown by the prescribed contour interval.

5. *Depression contours* are ticked contour lines that delimit areas of lower elevation than the surrounding terrain. The ticks on depression contours are always directed toward the bottom of the feature.

6. A *contour turnback* is that portion of a contour line that serves to emphasize incised features such as streams, gulleys, ravines, etc. Contour turnbacks are always directed upslope and are generally drawn in alignment with one another.

B. Contour Interval

1. The selection of the contour interval shall be based upon a study of blocks of contiguous sheets, rather than upon individual sheets. Since it is desirable to have as consistent an interval as possible throughout a series, the area to be mapped must be analyzed to determine which interval would best portray the overall terrain configuration. Rather than change the contour interval to accommodate isolated formations on individual sheets, supplementary contours should be used to portray those features which otherwise could not be shown within the specified interval.

2. In those instances where it is impossible to join two blocks or groups of sheets with a common interval, the limits of each interval shall coincide with sheet junctions so that no map contains more than one basic contour interval.

3. A guide for the selection of contour intervals at the 1:50,000 scale follows. It is based on uniform slope and is largely empirical.

<u>Relief Category</u>	<u>Slope %</u>	<u>Contour Interval</u>
Low	0- 5	10 m with 5 m supplements
Low-medium	5-20	10 m
Medium	20-45	20 m
High	45 and greater	40 m

C. *Index Contours*. Index contours are drawn continuously throughout the sheet even where they may coalesce. Contour values are always shown for index contours. 512

D. *Intermediate Contours*. Intermediate contours are shown at a prescribed interval between index contours. They are drawn continuously, except in very steep areas of uniform slope where the spacing between index contours does not allow the showing of all intermediate contours. Contour values are not shown for intermediate contours except in extremely flat areas. 513

E. *Supplementary Contours*

1. Supplementary contours are used only where necessary to depict significant relief features which would not be shown by the normal contour interval. For example, supplementary contours should be used to indicate sharp summits or isolated tops if their omission would present the top of the feature as being much flatter than it actually is.

2. It is not necessary for supplementary contours to be continuous. They may be shown, in sections of any length, wherever their presence adds to the readability of the topography. However, supplementary contours, when shown in sections, must start and end at interpolative points between the normal contours.

3. Supplementary contours are shown at one-half or one-quarter of the prescribed contour interval. 514
515

4. The one-half interval supplementary contours are used when the prescribed contour interval:

a. Does not adequately portray the character of relief and slope in flat areas.

b. Does not point up isolated relief formations.

c. Does not provide sufficient elevations to aid in determining undulating surfaces.

5. In unusual cases where the foregoing conditions cannot be adequately satisfied with one-half interval supplementary contours, the one-quarter interval shall be introduced.

6. Contour values may be shown on the one-half interval supplementary contours to assist in the interpretation of relief in flat areas. Contour values are always shown on the one-quarter interval supplementaries.

F. Depression Contours

516

1. Depression contours are used to depict closed areas of lower elevation than the surrounding terrain. They are most commonly employed in the portrayal of regions containing vast limestone deposits.

2. The depth of a depression may be greater or less than the contour interval. Under normal circumstances, only those depressions which are equal to or greater than the contour interval are shown.

3. Depressions are shown by contours augmented with ticks pointing toward the bottom of the feature. The spacing between ticks increases on each successive contour from the center of the depression.

4. Where the slope of a depression is such that the contours become very close, the depression ticks may be reduced in length. If this is not sufficient to prevent the ticks from touching the contours below, intermediate contours are omitted as necessary to achieve legibility.

5. In areas of intricate topography or in deep depressions, spot elevations are added at the bottom of the depression, especially if some of the depression contours forming the feature have been omitted.

6. Wherever possible, index contour values are added to contours in a depression and to contours in the neighborhood of a depression.

7. Mounds within depressions are shown by ticks added to the lowest contour defining the mound. (Refer to Figure 500-1.)

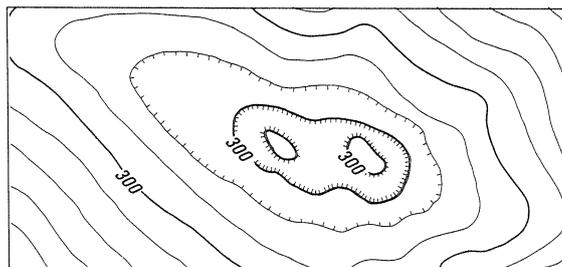


Figure 500-1. Treatment of mounds within depression.

8. In areas containing numerous small depressions too small to plot to scale a representative pattern of depressions sufficiently exaggerated to permit correct symbolization should be shown.

9. Depressions less than the contour interval are shown only when they are of landmark value or are so numerous that they present an obstacle to cross-country movement. The requirement to depict shallow depressions shall be contained in supplementary project instructions.

504. Form Lines

517

A. Form lines are a system of dashed lines applied on a map to indicate the general shapes of landforms. They are used to show relief only when source materials are not adequate to permit portrayal by normal contouring techniques.

B. Since form lines do not represent a common interval and have little or no reference to the established vertical datum, they should never be drawn as continuations of contours.

C. A definitive break between contours and form lines shall be shown by a symmetrical gap area 1.30 mm (0.05 in) wide.

D. No attempt shall be made to add elevation values to form lines; however, spot elevations shall be shown within areas depicted by form lines whenever the information is available.

505. Relief Data Incomplete

Where source materials are insufficient to show a complete illustration of the relief either by contours or form lines, a note: *Relief data incomplete* shall be centered within the void area. Large areas shall carry an additional note: *Limits of reliable relief information* appropriately repeated as necessary along the perimeter of the contoured area.

506. Compilation Principles

A. Topographic Expression

1. Contour lines should express the character of the terrain being mapped; i.e., whether the surface is flat, rolling, mountainous, smooth, rough, or dissected. Contours should be drawn and spaced to emphasize the significant shapes of the terrain, omitting small, relatively unimportant detail, and yet retaining the continuity of important features that fall between the specified interval.

2. In photogrammetric compilation, some generalization of contours is necessary since their exact representation would result in irregular and jagged patterns which would hamper readability. In such instances, the contours are

symmetrically smoothed, but not to the extent that the displacement exceeds the geometric accuracy requirement for the map or misrepresents the physical characteristics of the terrain.

3. The drainage network serves as a natural skeleton for the construction of contours. Consequently, the compiler should plot the drainage before contouring a particular area. In some cases, it may be helpful to consider small tributaries that are too short to appear on the final map. This allows a further refinement and enhancement of the contours, and the resulting turnbacks present a more realistic portrayal of the terrain. (See Figure 500-2.)

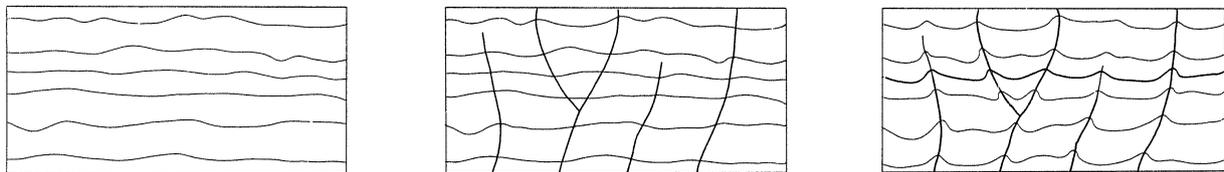


Figure 500-2. Development of shape by use of small drains.

B. *Steep Areas of Uniform Slope.* In steep areas of uniform slope, *the index contours are always shown continuous.* When the space between index contours does not permit the showing of all the intermediate contours [minimum 0.20 mm (0.008 in) clearance], the intermediate contours are dropped in compliance with the order of retention shown in Figure 500-3.

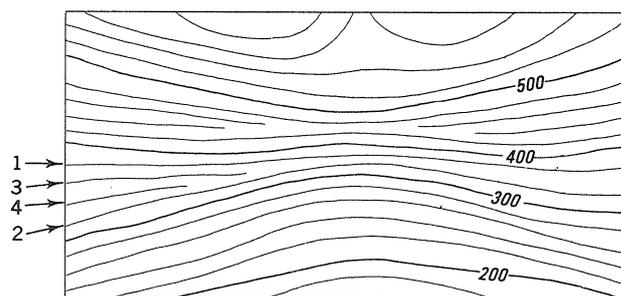
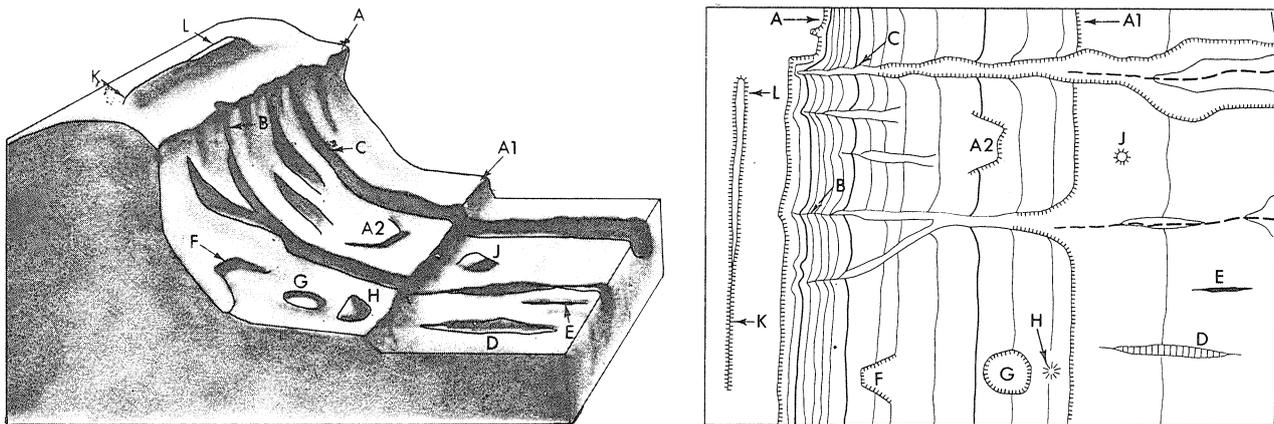


Figure 500-3. Contour treatment in steep area of uniform slope.

C. *Abrupt Changes in Slope.* Terrain features formed by abrupt changes in slope are significant because of their landmark value and their impact on cross-country movement. They are given special treatment to assure immediate recognition. Figure 500-4 illustrates these types of landforms and the appropriate map symbols.



- | | |
|-----------------------------------|------------------------------|
| A, A1, A2— Escarpments and Cliffs | G — Depression (crater-like) |
| B — Narrow Incision | H — Conical Pinnacle |
| C — Incised Stream | J — Truncated Pinnacle |
| D — Crevasse | K — Arete (sharp edge) |
| E — Crevice | L — Flattened Area |
| F — Incised Escarpments | |

Figure 500-4. Pictorial illustration and identification of terrain features appearing in abrupt changes in slope.

507. Spot Elevations

A. An adequate number of spot elevations in support of the relief presentation is a critical requirement. Whenever practicable, spot elevations are shown for selected, readily identifiable ground features.

B. A dot shall mark the exact location of spot elevations except for those instances where the elevations are coincident with identifiable points; i.e., road forks and intersections, railroad grade crossing, stream forks, and islands too small to show a locator dot. In these instances the locator dots are not shown and the elevations are positioned so that there is no question as to the feature it is identifying.

C. When the absence of spot elevations results in an incomplete relief presentation, interpolated spot elevations are added to reflect the configuration of the terrain. Interpolation shall be accomplished by adding one-half of the basic contour interval to the value of the contour that encloses the point for which the elevation is required.

D. The highest elevation on each map shall be emphasized. When a spot elevation is not available for the highest feature, the value shall be interpolated.

E. Spot elevation values shall be shown for prominent natural features such as hilltops, knolls, isolated summits, mountain tops, mountain passes, saddles, and other high points that dominate an area.

F. Whenever the information is available and their presence will significantly add to the relief presentation, elevation values shall also be shown for:

1. Road junctions.
2. Railroad grade crossings.
3. High points on grades of highways and railroads.
4. Extensive flat areas.
5. Rims and bottoms of significant depressions.
6. Water surfaces of lakes and ponds.
7. Stream junctions.

G. Spot elevations shall not be shown indiscriminately on the sides of slopes or in those areas where they cannot be readily identified with a topographic or cultural feature.

508. Treatment of Specific Topographic Features

The following paragraphs provide guidance and prescribe the treatment for relief features that are most frequently encountered. Guidance with respect to the treatment of unusual terrain conditions shall be provided in supplementary project instructions.

A. *Tops and Saddles.*

1. Contouring of the tops of mountains, ridges, hills, and their connecting saddles must be given careful attention as these features are usually most

prominent and significant. They define the extent of watersheds, often define international and civil boundaries, and may directly control the distribution and location of routes of communication. Where the terrain is relatively flat and of considerable extent, the proper use of supplementary contours will often provide for the adequate portrayal of some of these features. The most troublesome situation is usually encountered when the relief along the top of a ridge falls within the range of one or two contour intervals. A ridge may consist of a series of distinct tops; but, when strict adherence to the contour interval is maintained, the contours may indicate a smooth unbroken profile. In such cases, the judicious use of spot elevations and supplementary contours, and the application of a sufficient amount of topographic exaggeration may be necessary to bring out the distinctive characteristics of the landform.

2. Contours portraying the tops of ridges are shown in their true position and are not displaced even though space does not permit them to be drawn as continuous and separate lines. Precipitous terrain along steep ridges shall be emphasized by the escarpment symbol. Contours defining the tops of steep ridges shall be allowed to coalesce at the points where they merge with escarpments. (See Figure 500-5.)

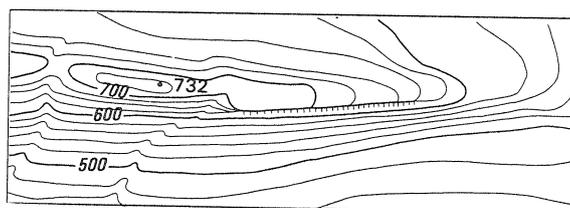


Figure 500-5. Precipitous ridge.

B. *Escarpmnts.* Escarpments are characterized as abrupt, steep-faced slopes which separate relief formations that are at distinctly different levels. Escarpments greater than the contour interval are symbolized by a continuous line with perpendicular ticks on the downslope. Escarpments less than the contour interval are symbolized by a dashed line with perpendicular ticks on the downslope. 518
519

C. *Cliffs.* A cliff is defined as a very steep, perpendicular or overhanging face of rock or earth of significant height. Cliffs equal to or greater than the contour interval shall be shown by contours augmented by short ticks on the downslope. Cliffs with heights less than the contour interval shall be omitted unless they are considered a definite obstacle to cross-country movement because of their length or location. Where the slope of a cliff is such that the contours become very close, the contours shall be omitted as necessary to achieve legibility. Figure 500-6 illustrates these principles.

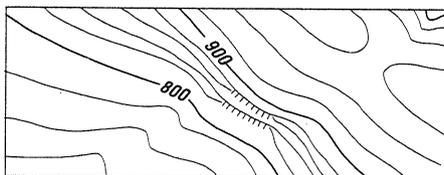


Figure 500-6. Cliffs equal to or greater than the contour interval.

D. *Pinnacles, Needle-Type Peaks, Columnar Rock Formations and Buttes.* 521
Pinnacles, needle-type peaks, columnar rock formations, and buttes with nearly perpendicular sides offer perplexing problems of portrayal, and their proper delineation is of extreme importance. These produce symmetrical, angular, and precipitous formations. Precipitous features such as these are often impossible to depict by contours alone because of coalescence. Therefore, the compiler must employ the use of escarpment and cliff symbols, where appropriate, to properly reflect the actual terrain conditions. Small pinnacles and needle-type peaks that are less than 3.80 mm (0.15 in) in diameter at map scale and do not lend to portrayal by contours shall be shown by a standard symbol. Spot elevations for the tops of these features shall be shown whenever the information is available and map density permits.

E. *Incised Features.* Incised features such as ravines, gorges, canyons, etc., are the result of a gradual eroding of the land by glaciers, wind, rain, and streams. They are steep-sided and vary in width, length, and depth.

1. Narrow incised features less than 0.50 mm (0.02 in) in width at map scale shall be portrayed by contour turnbacks.

2. Incised features 0.50 mm to 1.00 mm (0.02 in to 0.04 in) in width shall 522
be plotted true to scale with their limits delineated by a solid line. Whenever the 523
width of an incised feature exceeds 1.00 mm (0.04 in) at map scale, perpendicular
ticks shall be added on the downslope of the limiting lines.

3. Contours shall be broken for incised features represented by limiting lines.

F. *Crevices.* A crevice is a narrow opening in the earth, snow, or ice, 524
plotting less than 1.00 mm (0.04 in) wide at map scale. These features shall be shown
by a solid line, tapered at both ends. Descriptive labeling shall be added if the
feature is not shown in the map symbol legend.

G. *Crevasses*. A crevasse is a deep crevice or fissure in the earth, snow, or ice, with a relatively wide opening, plotting 1.00 mm (0.04 in) or more in width at map scale. These features shall be portrayed by a solid limiting line augmented by a ruled line fill. Descriptive labeling shall be added if the feature is not shown in the map symbol legend. 525

H. *Faults*. Faults are fractures in the Earth's crust, accompanied by a displacement of rock strata on one side of the fracture with respect to the other. Displacement is usually in a direction parallel to the fracture. Faults appear in various elongated patterns and forms and often resemble crevasses and escarpments. Contour, escarpment, and crevice symbols shall be applied as necessary to accurately depict fault formations. The names of faults shall be shown whenever the information is available.

I. *Fault-Line scarps*. Fault-line scarps shall be symbolized by a solid line with short ticks shown on the downslope as illustrated in Figure 500-7. Contours displaced by the shifting of the Earth's strata along the fault shall be depicted in their true alignment on each side and will break at the fault line. 526

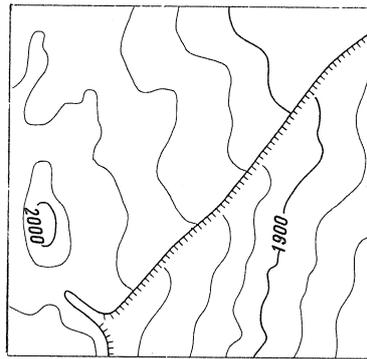


Figure 500-7. Fault-line scarp.

J. *Cuts and Fills*. The specifications and treatment for cuts and fills are prescribed in Section 400 of this chapter.

K. *Caves and Caverns*. Caves and caverns are natural underground chambers that open to the ground surface. Names are added when known. The V-part of the symbol shall mark the location of the entrance, and the shaft of the symbol should extend in the same general direction as the cave. 527

L. *Karst*

1. Karst is a limestone region of varying physical stages in which the topography may be marked by disappearing streams, basins, sinkholes, mounds, scarps, and fractures. It may be low and undulating and interspersed with abrupt ridges, irregular rock projections, caverns, and underground streams. There are few small surface streams; the surface drainage consists principally of springs and a few large streams.

2. Small areas of karst, at least 12.70 mm (0.50 in) square but no more than 25.40 mm (1.0 in) square at map scale and presenting obstacles to cross-country movement shall be shown by the distorted-surface area pattern (AP-103) and labeled *Karst*.

3. Karst areas covering more than a 25.40 mm (1.0 in) square when plotted to scale shall not be distinctly symbolized; the nature of the terrain will be apparent from standard contouring and symbolization treatments. The descriptive label *Karst* shall be added throughout such areas, as necessary, to define the overall extent of the feature.

M. *Miscellaneous Distorted-Surface Areas*. While a given contour interval may adequately portray general landform, there are instances where contours alone cannot properly reflect small surface irregularities. Included in this category are gas or oil blisters; rock outcrops; lava; loess; and rock- or boulder-covered terrain. Features such as these shall be treated in the same manner as karst and shall be identified by descriptive labeling wherever they occur. 531

N. *Cinder Cones and Craters*. Cinder cones are formed by an accumulation of loose cinders around a volcanic vent. Craters are bowl-shaped depressions around the orifice of volcanoes and often resemble inverted cones except that the crater rims are less symmetrical. When cinder cones and craters are so small that they cannot be portrayed by the contour interval and attendant symbolization, the standard cinder cone and small crater symbols are used. 528
529

O. *Fumaroles, Geysers, and Hot Springs*. These features are found in volcanic regions in the form of fissures or holes from which steam and other gases escape. They are symbolized identically and labeled according to their predominate characteristics. In areas of numerous fumaroles, geysers, and hot springs, the most significant are symbolized and the area is appropriately labeled. 530

P. *Asphalt Lakes*

1. Asphalt lakes are large pools of natural deposits of asphalt. They may be located in swampy areas or covered with water. The origin of the asphalt lakes and springs generally can be attributed to an exuding of the material from the earth in a manner similar to spring-fed lakes. 532

2. Asphalt lakes shall be shown by a dashed outline marking their limits and shall be appropriately labeled.

Q. *Levees and Dikes*. Specifications and treatment for these features are prescribed in Section 400 of this chapter.

R. *Dry Lakes, Washes, Dry Streams, and Wadis*

1. Specifications and treatment for these features are prescribed in Section 600 of this chapter.

2. Contours are shown within the limits of these features.

S. *Sand and Gravel Areas*

1. Sand and gravel areas plotting 6.35 mm (0.25 in) square and larger at map scale shall be shown. Areas smaller than the prescribed size shall be omitted. 533
534

2. Sand and gravel areas shall be contoured.

3. The treatment of sand and gravel occurring in tidal waters is prescribed in Section 800 of this chapter.

T. *Sand Dunes*

1. Sand dunes are hills or ridges of sand which are formed by prevailing winds and the shifting of winds. Sand dunes shall be shown by special patterns which are designed to simulate the configuration of the following types of sand dunes.

- | | |
|------------------------------------|-----|
| a. Star dunes | 535 |
| b. Lateral (or longitudinal) dunes | 536 |
| c. Crescent dunes | 537 |
| d. Ripple dunes | 538 |
| e. Sand dunes | 539 |
| f. Transverse dunes | 540 |

2. Sand dune patterns shall be positioned to indicate their true orientation with respect to the prevailing winds.

3. When the type of dunes is not known or the mixture cannot be shown satisfactorily by prepared dune patterns, the sand pattern symbol (AP-95) is used and the label "Dunes" is applied at sufficient intervals to define the overall extent of the feature.

4. Sand dune areas shall be shown whenever they cover an area larger than 6.35 mm (0.25 in) square at map scale.

5. Contours shall be broken for sand dunes at the limits of area patterns.

U. Terraces

1. A terrace is a horizontal or gently sloping earthwork constructed on a hillside to conserve moisture or to minimize erosion. The tops of terraces are level and frequently contain food-producing crops. 541

2. To be shown, terraced areas must cover an area equal to or greater than 12.70 mm (0.50 in) square at map scale. The extent of terraced areas shall be indicated by a dashed outline. Whenever they are shown, terraced areas shall be appropriately labeled; e.g., *Terraces*, *Low terraces*, *Numerous terraces*," etc.

3. Contours shall be shown within terraced areas.

V. Permanent Snowfields, Icefields, Glaciers, and Attendant Features

1. Permanent Snowfields and Icefields.

a. Snowfields and icefields occur in areas where warm-weather melting and evaporation fail to remove winter snowfalls, resulting in successive ice packing and snow coverage.

b. Areas of permanent snowfields and icefields shall be shown by blue contours or form lines, in that order of preference, with a blue dashed line indicating the field limits. The principles of portraying relief, previously described, shall be followed. 542

c. When the relief for snowfields and icefields cannot be shown by contours or form lines, the features are shown by AP-95 with a blue dashed outline depicting the field limits. 543

2. Glaciers. 544

a. Icefields, after attaining a critical thickness in steep sloped areas, begin to creep slowly downslope. The moving ice mass is referred to as a *glacier*.

b. The limits of glaciers shall be shown by a blue dashed outline. The configuration of glaciers shall be expressed by blue form lines. The direction of flow of the glacier is indicated by a symmetrical bending of the form lines. The spacing between form lines shall gradually diminish in the downslope along the leading edge of the feature.

3. Nunataks and Ice Peaks.

a. A nunatak is a bare rocky peak projecting above a surrounding area of permanent ice or snow. An ice peak is a similarly situated feature except that it is perpetually covered with snow or ice.

b. Nunataks are symbolized by contours, printed in brown, if they can be drawn to scale. If they cannot be shown by contours, they are symbolized by the small pinnacle symbol. 545

c. Ice peaks are symbolized the same as nunataks except that the symbols are shown in blue. 546

4. Ice Cliffs.

a. An ice cliff is a sheer-faced front of a glacier or ice shelf where it meets the sea.

b. The symbol for the ice cliff is shown in blue and shall mark the limits of the open water area so that the normal shoreline is omitted. 547

5. Ice Shelf.

a. An ice shelf is a floating ice sheet of considerable thickness, attached to the coast, and showing 3 m to 60 m (10 feet to 200 feet) above sea level. It is usually of great horizontal extent with a level or gently undulating surface. The ice shelf is nourished by annual snow accumulation and often by the seaward extension of the land glaciers. Limited areas may be aground. The seaward edge of the feature is termed an *ice front*.

b. The open water limits of the ice shelf shall be shown by a blue dashed outline and labeled *Limits of ice shelf*. If the feature is named, the name shall be incorporated in the labeling. When the date of the observed limits of the ice shelf is known, it shall be added in parentheses. 551

c. If an ice cliff forms the seaward edge of the ice shelf, it shall be symbolized by the blue cliff symbol and the dashed outline shall be omitted.

d. The ice shelf shall be devoid of open water tint.

6. Moraine.

a. Moraine is an accumulation of earth and stone debris carried and finally deposited by a glacier. To be shown, the area covered by moraine must exceed 6.35 mm by 6.35 mm (0.25 in by 0.25 in) at map scale. 552

b. Areas covered by moraine shall be indicated by scattered brown dots covering the general area of the feature.

7. Ice escarpments, crevices, crevasses, and depressions in permanent snowfields and icefields shall be symbolized in the same manner as the earthen features but shall be printed in blue. 548 thru 550

8. Pack Ice.

a. Pack ice includes any area of ice originating from the freezing of sea water. It is usually formed by the crushing together of ice floes and massive ice fragments.

b. Areas of pack ice shall be depicted in blue by a distinguishing overprint pattern which shall be enclosed by a limiting outline indicating the extent of the feature. The month and year of the source from which the limits were compiled shall be included when known. 553

CHAPTER 2-COMPILATION AND COLOR SEPARATION

SECTION 600-DRAINAGE (INLAND HYDROGRAPHY)

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601. General

A. This section provides the basic specifications for the compilation and color separation of inland hydrographic (drainage) features. As used in these specifications, the term *drainage* includes those inland features, natural or manmade, of which water is a constituent part. The amount of water may be considerable, as in rivers, lakes and aqueducts; it may be moderate, as in marshes and in intermittent streams and lakes; or the degree of wetness may be a temporary condition as in washes and areas subject to inundation. Drainage features are therefore categorized as perennial, intermittent, and dry. As a general rule, but not as a rigid practice, a feature is considered perennial if it contains water for an average of 6 or more months of the year; it is considered intermittent if it contains water for an average of less than 6 months annually; and it is considered dry if it seldom contains water, or contains water only during very short periods. When necessary, the supplementary instructions for the mapping project contain information to aid the compiler in determining the appropriate category.

B. Drainage features create obstacles and directly affect cross-country movement of troops and materiel. The possibility of transport by navigable waterways is important. A stream junction, an abrupt change in the course of a river, a group of small lakes, and an isolated pond may serve as orientation and check points. The drainage pattern, therefore, must be as complete as the scale of the map allows.

C. The amount of detail to be shown is directly related to the physical and economic nature of the area under consideration, and to the importance of a drainage feature as related to other drainage, cultural and hypsographic features shown on the map. The amount of detail should increase in inverse ratio to the amount of existing water resources.

1. In predominantly wet or well watered regions, small tributary streams, ponds and features of small areal extent may be omitted, especially if they tend to impair the legibility of the more important features.

2. In arid and moderately watered areas, the presence and location of water is important, both for survival and as a means of orientation. In these areas, as many drainage features as possible should be shown.

3. In small localized areas of a map wherein similar features are either too small or too numerous to show to scale (such as wells, springs, ditches, and small ponds), no attempt is made to show every feature. Instead a representative pattern of the symbols is shown covering the localized area, augmented by an explanatory note such as: *Numerous small ponds; Numerous springs*, etc. Small ponds may be slightly exaggerated in size.

D. The minimum lengths of streams and the minimum sizes of areal features to be shown are left to the judgment and cartographic experience of the compiler. In the selection of features to be shown that will best satisfy the purpose of the map, the relative importance of drainage features are evaluated from a standpoint of the geographic area involved, prevalency of drainage, and map scale. The criteria contained in these specifications are intended as general guidance and not as rigid practice.

602. Shorelines

A. In tidal waters the shoreline delineates the limits of land features at mean high water level.

B. In nontidal water, the shoreline is the line of contact with the land at a water level which prevails during 6 or more months of the year. This line is the *normal stage of water*.

C. Shorelines for islands are delineated at the same hydrographic datum used for the shoreline of the adjacent mainland. Features which uncover at a stage of water lower than the datum used for the mainland shoreline are not shown as islands but as foreshore features. (See *Coastal Hydrography*.)

D. A distinction is made between natural and manmade shorelines.

1. The natural shoreline is not broken for single piers, breakwaters, isolated ferry slips, or short seawalls and revetments.

2. The natural shoreline is omitted for extensive waterfronts, wharves, long seawalls, and long revetments, etc.

3. A shoreline is shown when it is coincident with a linear feature whose prescribed symbol includes short ticks; e.g., levee, fill, escarpment, etc.

E. A *definite shoreline* is one whose position and shape have been accurately determined. 601

F. An *indefinite* or *unsurveyed shoreline* is one whose position and shape are subject to change or have not been accurately determined. A shoreline being altered by dredging or filling is delineated as a natural shoreline and not as a manmade. If the progress of work indicates that the shore is not permanently established, the shoreline is considered as indefinite or unsurveyed. 602

G. A *pinpoint island* is a small island whose shoreline tends to coalesce at the publication scale. Pinpoint islands are shown as solids; the shapes of the islands are retained when the scale allows. 603

603. Lakes, Ponds; Similar Features

Lakes, ponds, and similar features are categorized as perennial, intermittent or dry.

A. A *perennial lake* or *pond* contains water for an average of 6 or more months annually. The shoreline may be definite or indefinite and corresponds to the prevailing water level (normal stage). 604

B. An *intermittent lake* or *pond* contains water for an average of less than 6 months annually. The shoreline corresponds to the outer limits of the feature (often the line of permanent vegetation) and is delineated with the indefinite or unsurveyed symbol. A portion of a large intermittent lake which always contains water is delineated as a perennial feature; i.e., the actual condition is represented by a perennial lake within the intermittent lake. Similarly, an island occurring within an intermittent lake is delineated with the indefinite shoreline; the diagonal ruling is omitted from the enclosed island. 605

C. A *dry* (or *cyclical*) *lake* or *pond* seldom contains water or contains water for only short periods of time; the outer limits are delineated by the indefinite or unsurveyed shoreline. Included in this category are playas and salt or alkali flats; these features are appropriately labeled. 606

1. Permanently drained lakes are not considered as dry lakes.

2. A portion of a dry lake which contains water at such periodic intervals as to be considered as an intermittent lake is delineated as such; i.e., the actual condition is represented by an intermittent lake within the dry lake.

D. A *salt lake* is a perennial or intermittent body of brackish water. It is symbolized the same as any other lake, except that it is labeled *Salt*. If the lake is named, the label is enclosed in parentheses and shown immediately after or below the name. If the term *salt* is part of the name, no additional labeling is shown. 607

E. A *reservoir with a natural shoreline* is an artificial lake formed by the water impounded by a dam; it is always categorized as a perennial feature with the natural shoreline representing the normal stage of water as controlled by the dam. The natural shoreline is omitted where it coincides with the dam. 608

604. Streams and Related Features

A. The term *streams* includes rivers, creeks, brooks, runs, etc. Streams are delineated in an amount sufficient to: serve as the framework for the hypsographic portrayal; provide immediate recognition of landforms and direction of slope; and reflect the existing type of drainage patterns.

1. Small tributary streams are shown to the extent necessary to reflect the distinguishing characteristics of the existing drainage pattern. Short branches of streams which are clearly evident from the contour portrayal may be omitted.

2. In areas of limited relief, streams are delineated to their sources to point up the drainage divides.

3. In arid and underdeveloped areas, it is important to show as many streams as the map scale allows. Short streams less than 6.4 mm (0.25 in) in length may be omitted, unless they are of landmark significance.

4. Streams are classified and symbolized in accordance with their width; i.e., over 25 meters wide, 18 to 25 meters, and those less than 18 meters in width.

5. Stream symbols are broken for bridges.

B. A *perennial stream* contains water for an average of 6 or more months annually. Stream width is determined at the normal stage of water. If the stream overflows its banks and inundates surrounding areas for considerable periods of time, the flooded areas are delineated as land *subject to inundation*. 609 thru 611

C. A *braided stream* is a water course of numerous subdivisions normally found in aggradated areas. The braiding and shifting of the channels is caused by deposits of sand and gravel bars on the channel floor. The main channels and a pattern of the secondary channels are shown to reflect the limits and braided characteristics. On sheets being revised by photo-planimetric methods, the alignment of double line braided streams are revised as necessary. No attempt is made to revise single line braided streams unless permanent changes are apparent on the aerial photography. 612

- D. A *meandering stream* is a stream which follows a winding course through level land. Due to the natural runoff of water, the alignment of the stream and the location of islands and sandbars therein are subject to change. The shoreline is delineated at the normal stage of water. Sandbars, flats, etc., which fall below this stage of water are not shown except if they occur at the mouth of a river which is affected by the tides; in this instance, they are delineated as foreshore features. 613
- E. An *intermittent or dry stream (wash, wadi, arroyo)* contains water for an average of less than 6 months annually. The banks of the feature at flood stage are used for determining stream width and for delineating streams. Permanent channels within the wash areas are shown as perennial or intermittent, as appropriate. 614 thru 616
- F. A *dissipating stream* is a watercourse which dissipates by seeping into the ground in flat or level plains. If the stream branches out before dissipating, the separate branches are shown to scale, when possible. The points of dissipation are shown. 617
- G. A *disappearing stream* is a watercourse which flows into a sinkhole and continues its course in a subterranean channel. The point of disappearance is shown; the underground channel is not shown. 618
- H. *Falls* are created by a vertical or near vertical descent of a stream; small falls are sometimes called a *cascade*. On double line rivers, the shape of the feature is indicated. 619 620
- I. *Rapids and cataracts* are formed where the current of a river moves with great swiftness, the surface being broken by obstructions such as rocks and boulders. On double line rivers, the beginning and end of the feature are indicated. 621 622
- 605. Canals; Canalized Streams**
- A. A *navigable canal or canalized stream* is a maintained waterway used by commercial craft. Canals over 25 meters wide are plotted to scale. Appropriate symbols are used for all others. If the feature is under construction or undergoing repair, and will be ready for operation by the time of publication of the map, the feature is delineated as being navigable. 623 thru 625
- B. An *abandoned canal containing water* is a canal, or portion thereof, which is not in use and is not maintained; it contains water sufficient for operation; the locks and gates are operational, or could be made operational with a minimum of repairs. 626 thru 628
- C. An *abandoned dry canal* is a canal, or portion thereof, which is dry or contains water insufficient for operation; there is no evidence of any plans to make it operable. 629 thru 631

D. A *canal under construction* is a new canal being constructed or an existing canal, or portion thereof, which is being repaired or restored to operation; there is no evidence that the work will be completed by the time the map is published. If the alignment of a new canal is not definite, the label *Approximate alignment* is added. 632 thru 634

E. Limiting ticks are used to indicate the degree of operability of a canal. 635

606. Drainage and Irrigation Ditches

A. A *perennial double line ditch* is a manmade excavation or trench 25 meters or more in width which is used for the control and movement of water; it contains water for an average of 6 or more months annually. 636

B. A *perennial single line ditch* is defined as A above, except that the feature is less than 25 meters wide. 637

1. Ditches used to drain swamps and areas subject to natural inundation are delineated as perennial ditches.

2. A distinction is made between major and minor single line ditches. Minor ditches are those which connect the main supply (major) ditches; minor ditches are also the smaller feeder ditches which form the basic network of the drainage or irrigation system.

C. An *intermittent ditch* is a manmade excavation or trench which contains water for an average of less than 6 months annually. Regardless of width, all intermittent ditches are symbolized alike. 638

D. In a network of irrigation ditches, the major supply ditches are usually perennial. The minor feeder ditches may be either perennial or intermittent.

607. Water Conduits

A. A *conduit* is an artificial or natural channel which carries water for either domestic or industrial purposes. Included in this category are aqueducts, flumes, pipelines, penstocks, and similar features; they may occur at ground level or underground, or they may be elevated. 639 thru 643

1. An *aqueduct* is an open or covered channel which carries large quantities of water. It may be constructed of brick, stone or concrete, or tunnel through rock.

2. A *flume* is an open and inclined channel, usually V-shaped, which carries water at a constant gradient. It is used in mining, irrigation, or logging operations.

3. A *penstock* is a closed pipe or channel used by hydroelectric installations to carry water, by gravity or under pressure, to the generating plant.

B. For *ground level water conduits*, the distinction between aqueducts, flumes, pipelines, and penstocks is indicated by appropriate labeling. 639

C. For *elevated water conduits*, the term *Elevated* is added at appropriate intervals, as *Elevated aqueduct*, when the feature extends for a long distance. The wing tick part of the symbol is omitted when an aqueduct or penstock enters a building. If an aqueduct is carried by a viaduct or similar feature, the aqueduct symbol is retained on the carrying feature. 640

D. For *underground water conduits*, the main lines are shown; short feeder lines to houses or villages are omitted. If another surface feature (such as a road or trail, a prominent fence, etc.) is located over the underground feature, the presence of the underground feature is indicated by labeling added to the symbol of the surface feature; e.g., *Underground aqueduct*. 641

E. *Aqueducts in tunnels* are symbolized according to the traversability of the tunnel. A tunnel is considered traversable if it permits through passage by foot. It is nontraversable if foot passage is not possible. 642
643

608. Miscellaneous Features

A. A *karez* (*kanat*, *qanat*, etc.) is an underground conduit which carries water from its source to points of distribution. A unique characteristic of the feature is the regularly spaced shafts or outlets which provide entry for construction and maintenance. The map scale permitting, the relative location of the shafts is retained. 644

B. *Salt evaporators* are shown by delineating the outline and major separations. When the map scale does not permit inclusion of all secondary separations, a representative pattern is shown. The feature is appropriately labeled. 645

C. *Fishponds* and *hatcheries* are shown when large enough to plot to scale; the limits may be exaggerated if the features are of landmark significance. The criterion for showing the separations is the same as stated for salt evaporators. 646

D. *Sewage disposal* and *filtration beds* are shown when large enough to plot to scale; the limits may be exaggerated if the features are of landmark significance. The criterion for showing the separations is the same as stated for salt evaporators. 647

E. *Swimming pools* and *manmade reservoirs* are shown when large enough to plot to scale; the limits may be exaggerated if the features are of landmark significance. 648

F. A *well* is a pit or hole which is sunk, by digging or drilling below the ground level to reach a supply of water. A symbol distinction is made between perennial and intermittent wells; the feature is considered as perennial if water is available for an average of 6 or more months annually. When available information does not permit this distinction, the feature is considered to be perennial. When practicable, the proper name of the well is shown. Additionally, labels indicating the characteristic of the well are shown if known, such as: alkaline, mineral, potable, unpotable, etc. Waterholes, walled-in springs, artesian wells, and fountains are shown as wells, and are appropriately labeled. 649
650

G. A *cistern* is a tank or similar artificial enclosure which is used for the collection and storage of water. Underground cisterns are symbolized as wells. 651

H. A *spring* is a natural outflow of water from a subsurface level. A distinction is made between perennial and intermittent springs; the feature is considered perennial if the outflow of water occurs for an average of 6 or more months annually. The treatment for this feature is similar to that prescribed for wells. 652
653

I. A *flow arrow* is shown when the direction of the flow of water of perennial (double line and single line) features is not apparent from the relief portrayal. The arrow is added parallel and adjacent to the symbol when it cannot be accommodated within the outer limits of the symbol. The arrow is also added to the end of streams whose course cannot be determined after entering areas of large swamps or rice fields. 654

J. *Water surface elevations* are shown, when practicable, for large lakes, wide rivers, and inland seas. These elevations correspond to the normal stage of water. 655

609. Area Features

The features discussed below are shown if they are equivalent to, or exceed, an area of approximately 2.5 mm by 2.5 mm (0.10 in by 0.10 in).

A. A *marsh in tidal waters* is saturated land that covers and uncovers with the tide and supports reed or grasslike aquatic growths. It is symbolized as ordinary marsh or swamp, except that the shoreline is delineated as the limits of the open water (seaside) side of the feature, and not the mean high water line. 656

B. A *marsh in nontidal waters* is saturated land, usually covered with standing water, that supports reed or grasslike aquatic growths. It is shown in the open water area, with its landside limits delineated as the shoreline. 657

C. A *swamp* is land which is saturated, though not usually covered, with water. Cross-country movement through the area is difficult or impossible except during periods of drought or when frozen. Vegetation occurring in a swamp is shown with its prescribed symbol overprinting the swamp symbol. 658

D. *Peat bog* and *peat cuttings* are symbolized as swamps; the areas are appropriately labeled *Peat bog*; *Peat cutting(s)*. The peat cutting symbol(s) is shown, in addition to labeling, if the location of the cuttings can be determined and if the area is large enough to accommodate at least one symbol.

E. A *cranberry bog* is a periodically flooded area in which cranberries are cultivated; the area is confined and subdivided by ditches or small levees. The characteristic pattern of the feature is preserved by showing the outline and the major separations. The minor separations are added insofar as the map scale permits. All separations are shown as perennial ditches. Areas of uncultivated cranberries growing in boggy land are delineated as swamp.

F. *Rice fields* are periodically flooded areas in which rice is grown; the areas are confined and subdivided by drainage ditches or small levees. The characteristic pattern of the feature is preserved by showing the outline and the major separations. Minor separations are added insofar as the map scale permits. Prominent levees are symbolized as such; other separations are symbolized as perennial ditches. Only fields which are subject to natural or controlled inundation are shown; areas of dry rice are not shown.

G. *Clearings* within swamps and rice fields—such as hummocks, ridges, and dry areas—are shown when they exceed approximately 2.50 mm (0.10 in) at their narrowest dimension. This symbol is also used to depict small clearings which are not evident by the omission of the swamp or rice symbol.

H. *Land subject to controlled inundation* is land that is flooded by the regulation of the level of water impounded by a dam. The outer limits of the area are shown by a dashed line which represents the maximum extent of inundation.

1. The permanent pool or reservoir is symbolized as such.

2. When a dam is under construction, the area that will be flooded on completion is shown as land subject to controlled inundation. The limits of this area coincide with the planned water level of the reservoir. If the planned water level is not known, the probable limits of the inundated area are shown and augmented by the label *Probable extent of reservoir*. With the exception of vegetation, all existing features within the probable area of inundation are delineated as prescribed.

I. *Land subject to natural inundation* is land which is covered by water as a result of the natural and periodic overflowing of a body of water. Also included in this category are land areas which are constantly flooded, year after year, during rainy seasons.

1. Basin-type features in arid and semiarid regions—such as playas, chotts, cyclical lakes, etc.—which are filled to varying degrees by the collection of runoff water are not considered to be in this category.

2. Land subject to natural inundation is never regarded as swamp.

J. *Mangrove* is a thick impenetrable growth of trees with tangled aerial roots which appears in tropical and semitropical regions. It occurs in low lying areas along seacoasts, and along the banks of tidal waters up to the limits of the tidal influence. Where the exact location of the shoreline (mean high water) is not apparent, the water-side limit of the feature is annotated as the shoreline. The feature is delineated both as a drainage and vegetation feature. 666
667

K. *Nipa* is a dense growth of stemless palms found in tropical and semitropical tidal or brackish waters. It usually occurs farther inland than mangrove, and generally forms strips in channels through which tides ebb and flow. The feature is sometimes cultivated and systematically planted; such plantings are symbolized as nipa and not as an orchard. The shoreline is delineated as the open water or seaside limit of the feature. The feature is delineated both as a drainage and vegetation feature. 668
669

L. *Wet sand* constitutes sandy areas in arid regions adjacent to coastal waters; the areas are continuously wet due to water seepage. Unlike sabkha areas, the wet sand is traversable. The feature is labeled to differentiate it from a sabkha area. 670

M. *Sabkha (kavir, etc.)* is a flat plain of salt encrusted clayey soil which occurs in inland desert areas and adjacent to coastal waters in arid and semiarid regions. The crust breaks up into a ragged surface which is usually impassable; when the clayey soil is saturated with water the crust will not support cross-country movement. 671

CHAPTER 2-COMPILATION AND COLOR SEPARATION

SECTION 700-VEGETATION

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701. General

A. As used in these specifications, the term *vegetation* refers to the various types of plant life indigenous to the project area. For concealment, both on the ground and from the air, vegetation is extremely important to military forces; in areas lacking significant landmark features, vegetation assumes landmark importance. Vegetation generally restricts visibility and, depending upon the type and nature of the growth, presents obstacles to free movement. It can also serve as a means of physical orientation both on the ground and from the air.

B. The amount and type of vegetation to be shown are directly related to the permanency of the vegetation and the scale of the map. Generally, a distinction is made between natural vegetation and planned plantings.

702. Features to be Mapped

- A. Woodland
 - 1. Coniferous
 - 2. Deciduous
 - 3. Mixed

- B. Scattered Trees
- C. Scrub
- D. Plantations, Orchards, and Nurseries
- E. Vineyards
- F. Mangrove
- G. Nipa
- H. Tropical Grass
- I. Cultivated Land
- J. Isolated Trees
- K. Clearings
- L. Hedgerows

703. Compilation Principles

A. Insofar as the map scale permits, areas of vegetation are shown in their true shapes.

B. The vegetation features listed above, except scattered trees, are shown provided they are approximately 2.5 mm by 2.5 mm (0.10 in by 0.10 in) or its equivalent in area and provided the narrowest dimension of the equivalent is no less than 1.25 mm (0.05 in).

C. Clearings or clumps of vegetation too small to be shown individually may be combined into one area of clearing or vegetation if the distance between these clearings or vegetation clumps is less than 2.5 mm (0.10 in). Clearings less than the equivalent of 2.5 mm by 2.5 mm (0.10 in by 0.10 in) are not shown.

D. Small areas of vegetation, less than 2.5 mm by 2.5 mm (0.10 in by 0.10 in) and when interspersed within larger areas of another type of vegetation, are symbolized the same as the larger areas.

E. Narrow strips of vegetation less than 1.25 mm (0.05 in) in width are omitted. Exceptions are made in areas containing sparse vegetation. In such cases, small clumps or narrow strips which provide concealment or orientation are shown.

F. Closely spaced rows of trees and rows of trees along roads which provide concealment or orientation are shown. 711

G. Areas of vegetation are not spaded for features portrayed as single-line features. Vegetation is spaded from double-line streams (open water), cased roads, route markers, and horizontal control points.

H. Firebreaks less than 25 meters in width are shown by a minimum clearing 0.5 mm (0.02 in) in width; those larger are plotted to scale. When firebreaks become so numerous that their portrayal is of questionable value to the user, the major firebreaks (or representative pattern if major firebreaks are not obvious) are shown and the area labeled *Numerous firebreaks*. If a firebreak deviates from the uniform pattern and can be definitely linked to the communication network in the area, or if it leads to a landmark feature, it is shown as a track. Minor tracks or trails shown entering the wooded area are terminated at the entrance of a firebreak.

I. Isolated trees normally are not shown unless they serve as landmarks in specific areas, as in a desert. When required, the supplementary project instructions indicate when they are to be shown. 713

J. Wooded marshes (cypress, swamp, sage swamps, etc.) other than mangrove and nipa require no special symbolization. The vegetation occurring in the marshes is shown with its prescribed symbol overprinting the drainage feature.

704. Woodland

A. Woodland is growth of perennial vegetation of sufficient density (approximately 50 percent or more crown cover) and 3 meters (10 ft) or more in height which affords effective concealment for troops and may present obstacles to free passage.

B. Included in the woodland category are rain-forest and/or moist evergreens, jungle (clear and dense), palm, palmetto, bamboo, orchards or plantations which are of irregular planting or wild growth, reforested areas, mesquite trees, and stunted trees (scrub oak or scrub pine) which comply with the woodland definition of density and height.

C. Excluded from the woodland category are: scattered trees; isolated trees; tropical grass; mangrove; nipa; orchards, plantations, and nurseries of systematically planted trees; and tall shrubs, cactus, thick low growths such as mesquite bush, sagebrush, and dwarf trees (willow, birch, etc.) which are less than 3 meters (10 ft) high.

D. The kinds of trees that comprise a woodland area are identified by symbols overprinting the woodland tint.

1. The kinds of trees are:

a. Coniferous

701

b. Deciduous

702

- c. A mixture of coniferous and deciduous.

703

2. Each separate area of woodland contains the symbol or symbols of the kind or kinds of trees that comprise it. A separate area is defined as one detached or non-contiguous with other woodland areas, or one wholly delineated by a linear feature (excluding contours) such as firebreaks, streams, trails, roads, etc.

a. Each woodland area should contain at least one symbol of each kind of tree that comprises it. If the area is so small that only one or two symbols will fit, the most appropriate one of the three sizes that are contained in the specified Area Patterns will be used.

b. For areas 20 mm (0.8 in) or larger, the Area Pattern screens are used.

3. Where the woodland area is comprised of one kind of tree, but is interspersed with stands of the other kind measuring 20 mm (0.8 in) or larger at map scale, the appropriate symbols for the stands are shown among the symbols for the predominant kind.

4. Where the woodland area is comprised of one kind of tree, but is interspersed with stands of the other kind measuring less than 20 mm (0.8 in) at map scale, the symbol for the predominant kind is shown over the whole area.

5. Where the woodland area is comprised of both coniferous and deciduous trees dispersed throughout the whole area and no single stand of either kind measures more than 20 mm (0.8 in) at map scale, the treatment is as follows:

a. If one kind of tree constitutes 75 percent or more of the total, the symbol for it is shown over the whole area.

b. If both kinds of trees are distributed approximately equally, the symbol for both kinds (mixed trees) is shown over the whole area.

6. Where the woodland area is comprised of both kinds of trees distributed approximately equally except for stands of one kind, each measuring 20 mm (0.8 in) or larger at map scale, the appropriate symbols are shown among the symbols for mixed trees.

705. Burned-over Areas

Areas of vegetation appearing in burned-over and/or logged-off areas, which comply in density and meet the minimum height requirements of the woodland definition, are included in the woodland category; otherwise they are treated as part of the burned-over and/or logged-off area and annotated as clearings.

704

706. Scattered Trees

A. The term *scattered trees* implies a growth of perennial vegetation of sufficient density (approximately 25 to 50 percent crown cover) and 3 meters (10 ft) or more in height which affords partial concealment for troops and may present obstacles to free passage. 705

B. Included in this category are various types of trees, orchards, or plantations which are of irregular planting or wild growth, reforested areas, mesquite trees, and stunted trees which comply to the scattered-tree definition and height.

C. Areas of scattered trees are shown provided they are approximately 5.0 mm by 5.0 mm (0.20 in by 0.20 in) or its equivalent in area and provided the narrowest dimension is no less than 2.5 mm (0.10 in).

D. Excluded from this category are areas of woodland; isolated trees; tropical grass; mangrove; nipa; orchards, plantations, and nurseries of systematically planted trees; and tall shrubs, cactus, thick low growths such as mesquite bush, sagebrush, and dwarf trees (willow, birch, etc.) which are less than 3 meters (10 ft) high.

707. Scrub

Scrub is a low stunted vegetation such as cactus, mesquite bushes, sagebrush, dwarf trees (less than 3 meters 10 ft in height), stunted shrubs, thickets, and other low plants which may present obstacles to free passage or may serve as landmarks in areas devoid of recognizable features. 706

708. Orchards, Plantations, and Nurseries

A. Orchards, plantations, and nurseries are areas covered by systematic plantings of perennial vegetation which yield fruits, nuts, spices, or other commercial products exclusive of timber. 707

1. Regularly planted palms, palmetto, bamboo, coffee, rubber, etc., are shown in this category and are identified. Tree nurseries consisting of systematic plantings are also included in this category.

2. Orchards of the common fruit and nut variety are not labeled.

B. Where the area covered by the orchard or plantation is less than the equivalent of 12.5 mm by 12.5 mm (0.50 in by 0.50 in), the feature is indicated by the appropriate symbol but is not labeled.

709. Vineyards

A. Vineyards are areas covered by the systematic planting of perennial vinelike growths, usually planted with close rows of supported vines. 708

B. No distinction is made between types of vineyards, nor are they labeled.

710. Mangrove

Mangrove is a thick growth of trees with tangled aerial roots which appears in tropical and semi-tropical regions. It occurs in low-lying areas along seacoasts and along the banks of tidal waters up to the limits of the tidal influence. The water-side limit of the feature is always shown by a dashed line. The land-side limits (mean high water line) is shown when known. The feature is delineated both as a drainage and a vegetation feature.

711. Nipa

Nipa is a dense growth of stemless palms found in tropical and semi-tropical tidal or brackish waters. It usually occurs farther inland than mangrove and generally forms strips in channels, through which tides ebb and flow. The feature is sometimes cultivated and systematically planted; such plantings are symbolized as nipa, not as an orchard. The water-side limit of the feature is always shown by a dashed line. The land-side limits (mean high water line) are shown when known. The feature is delineated both as a drainage and a vegetation feature.

712. Tropical Grass

A. Tropical grass is a dense growth of tall grass occurring in tropical or semi-tropical climates which affords concealment for and prevents rapid movement of troops. 709

B. Low grass not capable of providing concealment is not shown.

713. Cultivated Land

A. Cultivated land is tilled soil for the growing of crops. Ground left fallow on a seasonal basis is also included in this category. 710

B. Normally, cultivated land is not shown. When required, criteria for portrayal of cultivated land are set forth in supplemental project instructions.

714. Hedgerows

A. A hedgerow is a row of scrub or trees enclosing or separating fields. 712

B. Hedgerows will be shown when they constitute an obstacle to cross country movement or afford cover or concealment.

CHAPTER 2-COMPILATION AND COLOR SEPARATION

SECTION 800-COASTAL HYDROGRAPHY

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801. General

A. Coastal hydrographic features are shown in areas of tidal waters or in large lakes and rivers. Except for some basic hydrographic data, coastal hydrographic features included in these specifications are selected primarily for their landmark significance and include relatively permanent cultural and natural features.

B. Coastal definitions:

1. *Tidal waters* are those natural bodies of water—oceans, gulfs, bays, rivers, etc.—which are subject to periodic rising and falling or flowing and ebbing.

2. The *hydrographic datum* is the plane of reference for soundings. It is that stage of low tide (low water line) to which depths are referenced.

3. *Foreshore area* is that area which is bare or awash at the hydrographic datum (low water) but which is covered at mean high water.

4. *Offshore area* is that area which is always covered at the hydrographic datum.

5. A *shoreline* is the line that delineates the limit of land features of mean high water in tidal waters.

6. Figure 800-1 illustrates these definitions.

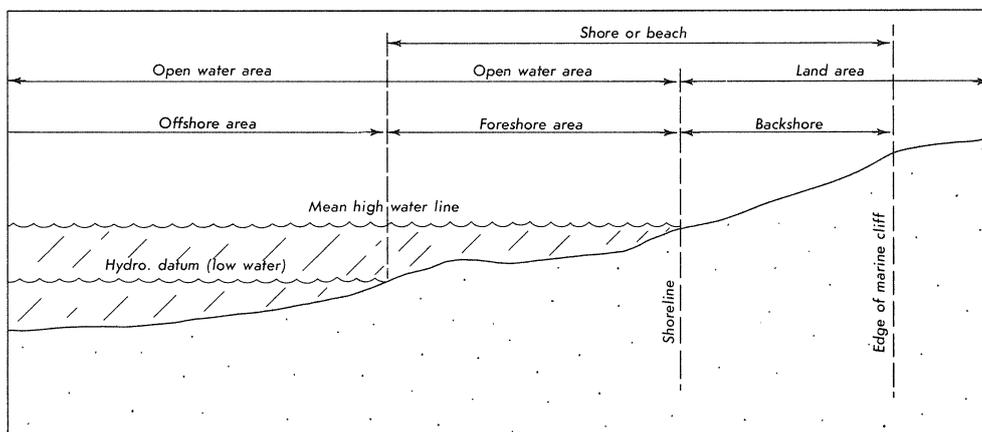


Figure 800-1. Illustration of Coastal Terms.

802. Compilation Principles

A. Coastal hydrographic features are compiled from hydrographic charts and survey manuscripts; these sources may be supplemented by aerial photographs. Accuracy, currency, and other factors being equal, preference for use in compilation is given to source materials at the largest scale available. Small scale charts are used as supplementary sources; the use of large scale insets on these charts are to be given primary consideration.

B. Natural and relatively permanent cultural features which extend above the low water line in the open water area are shown. When the elimination of coastal hydrographic features is necessary because of congestion, the more important landmark features are always retained.

803. Foreshore Flats

A. Foreshore flats occur in the foreshore areas of tidal waters only and may be either contiguous to or detached from the shore. If information indicating the composition of the flat is available, the area is labeled accordingly. The composition of foreshore flats usually consists of the following substances:

801

- | | |
|-----------------|--------------|
| Sand | Sand and mud |
| Gravel | Mud |
| Sand and gravel | Clay |

B. When the area is composed of more than one substance, the labeling is positioned to indicate the area change. When the composition of the flat is unknown or consists of small areas of different substances, the area is labeled *Tidal flat* on the compilation but this label is omitted from the final publication.

804. Reefs and Rocky Ledges

A. A reef is a rock or coral feature that is shown only when it extends above the hydrographic datum and has landmark significance. A rocky reef is detached from the shore, whereas a ledge is a rocky formation connected with and fringing the shore.

B. Reefs and ledges are shown by the reef symbol, and when the composition is known, it is labeled *Coral* or *Rocky*, for example. 802

C. An isolated reef measuring less than 2.5 mm (0.10 in) at the map scale is shown by the rock awash symbol. 803

D. Elongated areas of reefs measuring less than 2.5 mm (0.10 in) in width at map scale are symbolized by delineating the area and labeling, *Rocky Reef*, *Coral reef*, or *Reef*. 804

805. Rocks (Bare or Awash)

Rocks are classified as bare or awash. With the exception of groups of rocks, the center of the rock symbol marks the location of the rock.

A. *Bare rocks* are exposed at mean high water. Bare rocks which measure 0.75 mm (0.03 in) and more at the map scale are shown as islands. Those measuring less than 0.75 mm (0.03 in) are shown as pinpoint islands (solid) and are plotted to scale. The minimum size of a pinpoint island is 0.30 mm (0.012 in). Bare rocks measuring less than 0.30 mm (0.012 in) are enlarged to the minimum dimension. 805

B. *Rocks awash* are exposed at any stage of the tide between mean high water and the hydrographic datum. Large groups of rocks awash are symbolized by outlining the area which encloses a random arrangement of rock awash symbols. Elongated areas measuring less than 2.5 mm (0.10 in) in width at the map scale are shown by delineating the area and labeling *Rocks awash*. 806
807

806. Wrecks

A. An *exposed* or *stranded wreck* is one which has any portion of the hull or superstructure above the hydrographic datum. The base line of the symbol is shown parallel to the bottom of the map and the circle on the base line marks the location of the wreck. 808

B. A *sunken wreck with masts exposed* is one whose hull and superstructure is below the hydrographic datum and whose masts are exposed. 810

C. *Exposed wreckage* is symbolized by delineating the area containing the wreckage and labeled *Exposed wreckage*. 809

807. Dolphins, Pilings, and Stumps

A. *Dolphins, pilings, and stumps* are shown only when they protrude above the hydrographic datum (low water line). 811

B. *Dolphins, pilings, and stumps* are symbolized by a small circle or a group of small circles in a representative pattern with appropriate labeling.

C. Extensive areas are shown by delineating the area and appropriately labeling.

808. Depth Curves

A. A *depth curve* is a bathymetric line (similar to a contour) connecting points of equal depth below the hydrographic datum. 812

B. They are shown on topographic maps as an extension of the relief form.

C. The depth curve interval will be the same as the contour interval of the map sheet. Depth curves will not be shown beyond 40 meters of depth.

D. When hydrographic charts with English system units of measure are used as source material, the following conversions are used:

36 ft or 6 fathom line - 10 m
60 ft or 10 fathom line - 20 m
100 ft or 15 fathom line - 30 m
120 ft or 20 fathom line - 40 m

809. Offshore Oil/Gas Rigs

A. *Oil/gas rigs* are shown in open sea areas whenever possible. Each structure is accurately plotted in its true geographic location.

B. *Oil/gas rigs* are symbolized by the obstruction symbol shown in black. The height above sea level is shown. 813

CHAPTER 2-COMPILATION AND COLOR SEPARATION

SECTION 900-NAMES

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901. General

A. This section provides basic guidance for the treatment of names, descriptive information, and expressions of political status on maps at the standard scales of military mapping.

B. Names and descriptive information are integral components of the map which provide necessary aids to the identification of features depicted on the map; they also provide important information that cannot be portrayed by map symbols.

C. Names data include the identification of geographic features portrayed on the map, descriptive terms, administrative division and sovereignty nomenclature, and statements of political and administrative status, as well as certain information that appears in the map margin.

902. Policies

A. The spelling of geographic names on maps generally is consistent with the form prescribed, or acknowledged as official, by the United States Board on Geographic Names (BGN).

B. Names of countries, statements of political status, and descriptive information along boundaries (armistice lines, treaty lines, and other demarcations that delimit the extent of political or administrative control) are in accord with the policies of the U.S. Department of State.

C. Exceptions to these policies are made:

1. When international standardization agreements and bilateral cooperative mapping arrangements prescribe spellings different from those of the BGN.

2. When conclusive information of spellings which differ from those of the BGN are available, and this information post-dates the BGN decisions.

3. When military necessity dictates deviation.

903. Definitions

A. A *toponym* is a word, or group of words, identifying a geographic feature or reflecting a conceptual location used in mapping. The study of geographic names is called *toponymy*. Toponyms include:

1. Proper place names that identify geographic features without benefit of generic terms. Examples:

Chicago
Andes
Scotland
Everglades

2. Geographic expressions which are comprised of a generic term and specific elements. Examples:

Bay of Biscay
North Sea
Lake of the Woods
Alcan Highway
Charles Town

3. Conceptual locations. Examples:

Tropic of Capricorn
Arctic Circle
Greenwich Prime Meridian

B. A *descriptive term* is a word or group of words, not part of a name, giving some characteristic of a feature or area. Descriptive terms are always shown in English in the map interior. Examples:

Impassable in rainy weather
Under French administration
Numerous wells
Status in dispute

C. A *conventional term* is one rendered in common American usage and decided as being conventional by the BGN. Examples:

Canton (China)
Alexandria (Egypt)
Danube
Moscow

D. The *alternate name* is usually a former name or a name derived from a different romanization system which may or may not be recognized as official.

E. An *ideograph* is a composite graphic symbol expressing an idea; such graphic symbols are used, as an example, in Chinese writing.

F. A *diacritic (mark)* is a mark attached to or used in conjunction with a letter to distinguish this letter from another of similar form, or to show that the marked letter stands for a particular sound as distinguished from its other sounds. It may also be used to indicate a stressed syllable. Examples:

Á, ö, †, H, ï, Đ, ñ, ü, Š, Ł, è, t'

G. A *master glossary* is a list of the generic and descriptive terms, plus their English equivalents, that appear on the sources used for a specific mapping assignment. The master glossary is intended as an aid to the map compiler in preparing the tailored glossary.

H. A *tailored glossary* is a list of the generic and descriptive terms that appear on the individual map, plus their translated equivalents.

I. *Romanization* is the process of converting non-alphabetic characters, such as ideographs, into the Latin alphabet.

J. A *Romanization system* is a set of rules governing the rendition of characters, such as ideographs, in approximately phonetic Latin-alphabet equivalents. Systems that have been approved as official by the BGN are used.

K. A *specific term* is that part of the toponym which specifies the particular geographic feature described by the generic portion. Examples:

Long in Long Island
Potomac in Potomac River
Winds in Cave of the winds
Ontario in Lake Ontario
Fuji in Fuji San

L. A *generic term* is that part of a geographic expression that indicates the nature of the feature to which the toponym applies. Examples:

Island	in Long Island
River	in Potomac River
Cave	in Cave of the Winds
Lake	in Lake Ontario
San	in Fuji San (mountain)

M. A *syllabary* is a specific set of written symbols, each symbol typically (but not necessarily) representing a particular syllable which may be employed in the representation of the phonological elements of a language.

N. *Transliteration* is the process of recording the graphic symbols of one writing system in terms of corresponding graphic symbols of a second writing system.

O. A *transliteration system* is a set of rules for converting non-Latin alphabet words (names) into the Latin alphabet. Based on phonetics, these rules state what Latin letters or combinations of letters are to replace corresponding non-Latin alphabet letters. Transliteration systems that have been approved as official by the BGN are used.

904. Collection of Toponymy

A. Geographic names and descriptive terms are collected from three main sources:

1. Cartographic materials, such as maps, charts, plans, railroad diagrams, and other related graphic materials.
2. Textual materials, such as gazetteers, census reports, postal guides, railroad time schedules, geographic studies, and other related publications and documents.
3. Field classification survey and field edit materials.

B. Foreign cartographic materials, especially large-scale topographic maps, constitute the largest part of the fund of geographic names available for mapping projects, since the toponymy thereon has been processed and verified by the native mapping authority.

C. Textual materials are used for various facets of names servicing, including:

1. Verifying or correcting the spelling of names.
2. Bringing names up to date and incorporating names changes.

3. Clarifying the nature of features not adequately symbolized or described on other source materials.

4. Establishing changes in the nomenclature of political and administrative divisions or changes in the status of countries, territories, and other political entities.

5. Providing names that may not appear on other source materials.

D. Field classification survey materials, when available, constitute a good source of descriptive information for a mapping project. Quantitatively, they may also be a satisfactory source of geographic names. Such materials are preferable for relating names and descriptive information to the symbols represented on maps.

905. Analysis, Evaluation, and Selection of Toponymy

A. The selection of names source materials must take into account the following factors:

1. Insofar as is possible the sources selected should have been prepared by an authority or authorities native to the area to be mapped.

2. The authority preparing the sources should have been sanctioned as official by the native government. Exceptions to this practice are made when the political status or sovereignty of the area is not officially recognized. When the United States Department of State does not recognize the political status or sovereignty of an area but approves the use of *de facto* geographic names for military maps, an appropriate names disclaimer note is placed in the margin of the map.

B. The toponymy on the selected source materials is analyzed and evaluated for adequacy in terms of servicing the mapping project. The factors taken into consideration include:

1. Currency of information.

2. Density of names.

3. Legibility.

4. Tie-in of names to symbolization and placement of type in relation to the map features represented.

5. Descriptive information.

6. Regional geographic peculiarities that might require special treatment.

7. Local language characteristics that deserve special attention.

C. The final selection of names and descriptive terms to be shown depends on the geographic area that is being mapped, on the prominence or importance of specific geographic features in the area, on the scale of the map, and on the military requirements levied for the project. There can be no rigid rules established for an order of importance in naming features: populated places may take precedence in heavily populated temperate-climate areas, wells may attain prime importance in desert areas, and glaciers in polar, sub-polar, and high-mountain regions.

906. Recording of Toponymy

A. The recording of foreign geographic names and descriptive terms is divided into four broad categories:

1. Adaptation of names in Latin-alphabet areas to standard cartographic practice as established herein.
2. Transliteration of names in non-Latin alphabet areas.
3. Romanization of names in areas using ideographs.
4. Translation of generic terms, descriptive terms, and map marginal information into English.

B. The process of transliteration as it applies to military mapping, refers to the rendition of non-Latin alphabet and syllabary names in phonetic Latin-alphabet equivalents. Transliteration systems that are approved as official by the BGN for United States government agencies are used.

C. The process of romanization, as it applies to military mapping, refers to the rendition of Chinese, Japanese, and Korean characters (ideographs) in phonetic or near-phonetic Latin-alphabet equivalents.

D. All foreign-language information, including generic terms on a map, is translated into English for the purpose of identifying features that appear within the neatline, for aiding the compiler in interpreting the map and the marginal information, and for satisfying research requirements.

907. Treatment of Geographic Names

A. Forms of Presentation

1. In Latin-alphabet areas, geographic names that reflect features entirely contained within the limits of a country or other similar political entity are presented in their full (unabbreviated) native forms. All generic terms, modified letters, diacritics, and other language peculiarities are retained in the presentation. Examples:

Duričkovići	not Durickovici
Æbeltoft	not Aebeltoft
München	not Munchen

2. All geographic names in non-Latin alphabet and ideograph areas are presented in their full (unabbreviated) transliterated or romanized forms. Examples:

Şan'ā'	not Sana
Moskva	not Moscow

3. The conventional name, if one officially exists, is added in parentheses along with the native name, when required.

Ṭarābulus (Tripoli)
Cabo de Hornos (Cape Horn)

4. Geographic names that reflect features which constitute, straddle, or cross international boundaries are rendered in their conventional forms. Examples:

Rhine
Pyrenees
Dead Sea

a. When no conventional name is available for a geographic feature that encroaches on two or more political jurisdictions, the name accepted by each country is placed on the map, within the bounds of that country. This is an instance of dual nomenclature when neither name is given preference or parenthesized.

b. When no conventional name is available for a feature such as described above, and only the name used by one of the countries is available, that name is used within the bounds of the country of origin.

c. When no conventional name is available for an international feature but the countries that share the feature call it by the same name, that name is used on the map.

5. Names of countries and similar political entities are always shown in the short conventional form. Examples

Jordan	not Hashemite Kingdom of the Jordan
Pakistan	not Islamic Republic of Pakistan
Czechoslovakia	not Československo

6. Names for all international bodies of water are shown in the conventional form. Examples:

English Channel	not La Manche
North Atlantic Ocean	not Océano Atlántico
Danube	not Donau

For streams, such as the Danube, that constitute international boundaries in certain sections but flow entirely within a single political jurisdiction in other sections, only the conventional name is shown where the stream constitutes the international boundary, but the conventional name followed by the native in parentheses is shown along sections of the stream that fall within the limits of a single political jurisdiction. Examples:

Danube (Donau),	within Germany
Danube (Duna),	within Hungary
Danube (Dunav),	within Yugoslavia

7. In denoting possession or territorial sovereignty, the official name of the administering country is placed in parentheses following the name of the political or geographic entity involved. Examples:

Curaçao (Netherlands)	not Curaçao (Dutch)
Bermuda (United Kingdom)	not Bermuda (British)

a. Conventional abbreviations for the administering authority are permissible. Examples:

US	United States
Fr	France
Sp	Spain
UK	United Kingdom

b. No sovereignty or administering authority is indicated south of the 60° South parallel.

8. The use of alternate names on military maps is discouraged, although requirements of the area being mapped may occasionally call for the presentation of alternate names.

9. Railroad stations (stops, sidings, etc.) identified by designation of distance (usually in kilometers) are treated as follows on names manuscripts:

- a. The generic term is translated into English.
- b. The term "kilometers" is abbreviated to km. Examples:

Station	26 km
Siding	397 km
Stop	804 km

B. *Classification of Names*

1. All names processed for presentation on maps are classified as to the type of feature they identify. This is accomplished by means of the classification code (see paragraph 908).

2. Names are classified as an aid in the selection of type fonts, as a guide in the preparation of gazetteers, and as a reference for researchers.

3. The classification of names on large-scale maps is not necessarily coincident with the classification of the same names on maps of other scales. For example, a name which identifies a widely scattered pattern of habitation may be classified as an area name on a 1:50,000 map but, because of reduction in scale and the resulting densification of detail, may be properly classified as a populated place name on maps of 1:250,000 and 1:1,000,000 scales. Names of communes in Cambodia, Laos, and Vietnam, parishes in Spain, and the *oaza* (area name) in Japan exemplify this variation in the classification of names on maps of different scales.

C. *Agreement of Names Among Maps of Different Scales*

1. As a rule, all geographic names that appear on the body of a small-scale map are shown in the same form on the medium-scale maps, and those that appear on the medium-scale map are shown on the large-scale maps covering the same area.

2. Exceptions to this rule occur when:

a. The toponyms in question reflect major physiographic formations such as continents, mountain systems, or deserts; such terms as "Asia," "Sahara," and "Rocky Mountains," for example, appear on maps at 1:10,000,000 scale but are not repeated on each of the 1:50,000 scale maps covering these respective areas.

b. Several years have elapsed between the printing of the maps at different scales, and considerations of currency and military requirement call for deviation from standard procedure. This is likely to happen when political changes take place, as is the case with the newly created nations of Africa and Asia; when the language of the area changes, as has happened in East Prussia, Palestine (Israel), and Indochina (Laos, Cambodia, Vietnam); and when catastrophic natural disasters strike an area (the earthquakes in Chile and Alaska, for instance), thereby producing a need for changes in toponymy and descriptive information.

c. A name is extremely long on the large-scale map and it is convenient to shorten the designation but not to lose identification at the medium and small scales. Examples:

on the 1:50,000 scale map	- National Orthopedic and Rehabilitation Hospital
on the 1:250,000 scale map	- Orthopedic hospital
on the 1:1,000,000 scale map	- Hospital

In shortening the identifying nomenclature, no license is taken with the spelling or form of the proper name. In the above example only the form shown on the 1:50,000 scale map is a proper name; on the 1:250,000 and 1:1,000,000 scale maps, the proper name has been replaced by descriptive nomenclature.

D. *The Tailored Glossary*

1. Tailored glossaries are prepared for maps that contain foreign generic terms and related foreign-language terminology.

2. Care is taken not to include false generic terms (pseudogenerics), which are misleading to the map reader, in the glossary. A false generic term is that part of a toponym that has lost its original meaning and no longer expresses the nature of the feature it names. Examples of false generic terms in American toponymy are:

Fort	in Fort Worth (city)
River	in Detroit River (strait)
Vineyard	in Martha's Vineyard (island)
Forest	in Wake Forest (city)

a. Glossary translations need not be literal or linguistically reliable. It is their purpose to identify features on the map for the map user. Therefore, deviations may be made from dictionary translations, when required, to bring the tailored glossary into accord with map conditions.

b. In identifying all natural linear drainage features that are characterized by running water, the general term "stream" is used, and translations such as "river," "brook," "creek," "run," "rill," and so forth are avoided. This helps to unify glossary translations from the various foreign languages and to standardize usage. The same principles are applied to all other translations where a single general term can be used rather than numerous words that exhibit minor semantic differences or local linguistic peculiarities.

c. In treating of polysemantics (words that have more than one meaning), only the specific definition or definitions that apply to the features depicted on the map are shown in the glossary. For example, the Spanish term "arroyo" refers to both streams and ravines, but if the map in question shows only ravines then that is the sole translation that is to appear in the glossary.

908. Classification Code

A. The classification code is a series of underscorings used to indicate the type of feature identified by the nomenclature on the names manuscript. These underscorings are normally made in black ink so that they may be reproduced in monochrome without losing the classification.

B. Classification Code

Populated Places	not underscored
Spot Features and Descriptive Terms	_____ . _____
Hydrographic Features	_____ .. _____
Hypsographic Features	_____ _ _____
Area Names	_____
Vegetation	- - - - -
Roads and Railroads	=====
Administrative Divisions	_____ / _____

C. Additional underscorings may be developed for such special categories and other regional peculiarities that may be encountered during the course of research for a mapping assignment.

CHAPTER 2-COMPILATION AND COLOR SEPARATION

SECTION 1000-TYPOGRAPHY

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1001. Scope

A. This section provides the basic guidelines for the placement and selection of all interior type on the 1:50,000-scale topographic map.

B. The appendixes to this section pertain to this and other sections of this manual.

1. Appendix I, Symbols, provides the type styles and sizes selected for labeling various map features.

2. Appendix IV, Type Template, is provided to assure uniformity in selection of type sizes for area features based on the overall size of the features, and type sizes for single-line drainage based on linear extent.

3. Appendix III, Type Specimens, provides type specimens produced by electronic photo compilation. The type specimens furnished are limited to those styles which are established by those specifications.

C. Specifications for type styles, sizes, and placement of grid and margin information are contained on the style sheet, Appendix VI, to this manual.

D. The guidelines established in this section are to be followed unless altered in supplementary instructions for specific projects.

1002. General

A. The proper selection and placement of type are of extreme importance, not only to the map user, but also because of their impact on the final appearance of the map. Poor or careless type treatments can cause complications in map reading and destroy the cartographic quality of the map.

B. Type selection and placement are governed by the nature, size, and relative importance of the feature to be identified.

C. Preferred positioning of type as outlined in these specifications is established to assure standard treatment of definitive labeling.

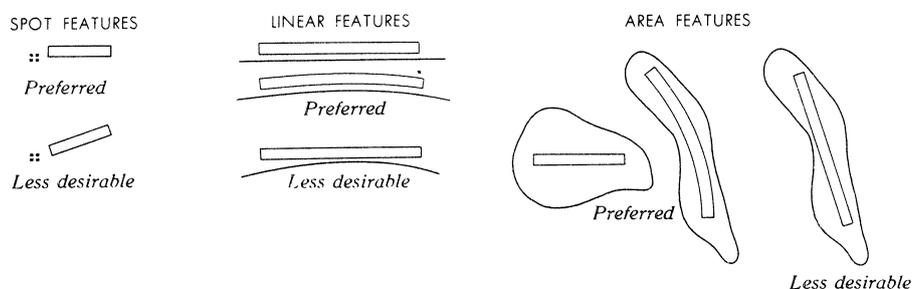
D. Punctuation is omitted except for hyphens and apostrophes which are integral parts of official designations. Periods are not used with abbreviations.

1003. Principles of Type Placement

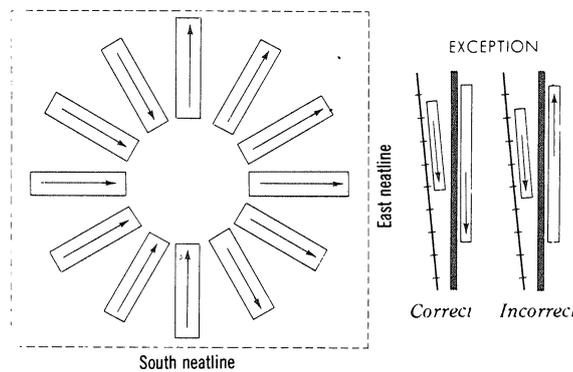
A. While this section establishes the basic guidelines for type placement as applied to individual situations, it is emphasized that these rules are subject to exceptions, such as when the juxtaposition of situations causes conflict in the rules. In such situations the overriding factors in judging which rule(s) takes precedence are determined from a standpoint of graphic legibility and order of importance.

B. Interior type is positioned to assure immediate and unmistakable identification of the features being labeled. When possible, type is placed in areas of sparse symbolization to avoid obscuring important land formations and other detail.

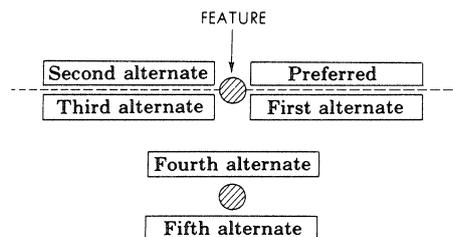
C. Type is placed either in a straight line or smooth curve depending on the character of the feature being identified. Examples:



D. The orientations of type placement, to read from left to right, are shown by the direction of the arrows in the diagram below. The one exception to these established orientations occurs when adjacent linear features are nearly parallel to a perpendicular orientation. In this case, the orientation of type for the labeling of the near-parallel adjacent features is made to agree with that of the perpendicular orientation.



E. When labeling individual symbols or small concentrated groups of symbols comprising a single feature, the type is positioned adjacent to the feature or symbol defined. Preferred and acceptable alternate positioning of type, with exception of control points and spot elevations, is illustrated in the following example:



F. Where possible, overprinting of type and detail which print in the same color is avoided. Nevertheless, all interior type printing in black and blue are processed for 0.2 mm (0.008 in) halo for all culture (black) line work, grid lines, and tree symbols.

G. There are some cases that require cartographic judgment in the placement, spacing, and treatment of type. The following paragraphs provide guidance for treatment of such cases.

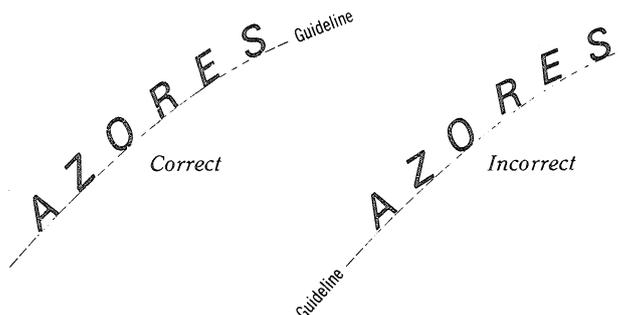
1. When map detail is extremely dense, it may be necessary to place type a distance from a feature to avoid obscuring the detail. In this situation, a leader arrow extending from the type to the identified feature is required. This practice is kept to a minimum.



2. Space permitting, names consisting of all capital letters are centered within an area being identified. Built-up areas are excepted. If the area is extensive, letter-spacing is desirable. When spacing type, the space between letters is not to exceed four times the point size of the letters. When letter-spacing is used and the name is composed of two or more words, the space between words is equal to three times the space between letters. Type which is letter- or word-spaced must be positioned so that the name stands out distinctly as a complete name. In congested areas, caution is advised on the use of maximum spacing since the continuity of names may be disrupted.

3. Only in unusual cases is it permissible to letter-space names shown in both capital and lowercase lettering. Conditions where this treatment is desirable are exemplified in the labeling of dispersed and scattered villages.

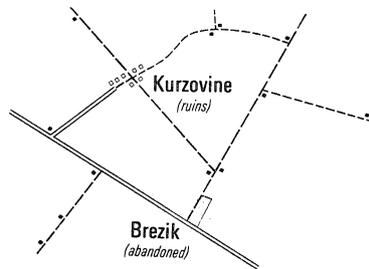
4. Regardless of the type style, when letters are spaced on a curve, the base of the letter is always aligned perpendicular to the curve. Example:



5. Alternate names are preferably positioned below the primary name in the case of spot or area features, and following the primary name in the case of linear features. Alternate names are enclosed by parentheses and shown in the same style of type as the primary name, but one size smaller. An exception to this rule occurs when the primary name is in the smallest type available or is in the smallest legible size.

6. In areas where ideograph translation of romanized names data is required, the placement of ideographs is accomplished in compliance with paragraph 5 except that: parentheses are not used; the ideograph type size is to be compatible with the romanized version; and the legibility of the ideograph is maintained.

7. When a descriptive term is added for the purpose of clarifying a primary name, it is enclosed by parentheses and shown in lowercase lettering. The parenthesized type is preferably centered directly below or positioned immediately following the primary name it clarifies. Examples: 910



8. When descriptive labels consist of more than one word, e.g., "Numerous wells," "Strip mine," "Gravel pit," etc., only the first letter of the first word is capitalized. 926

1004. Populated Places

A. Populated places are depicted on the map by either individual buildings or outlined area tints. The type size and style for place names are selected to fit predetermined classifications relative to population or political importance. See Appendix I. 901 thru 909

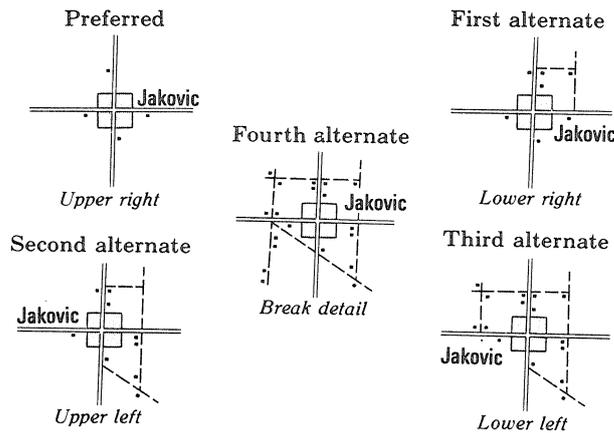
1. Built-up Areas

a. When identifying a built-up area, the name is placed adjacent to the feature and aligned in accordance with paragraph 1003E.

b. Proper names of well-known sections within a city, or outlying suburban areas, are shown in populated place type. The type is shown in capital and lowercase lettering and is centered in the area concerned. The type size is scaled relative to the size of the subject area; 5 pt. type may be used in congested areas.

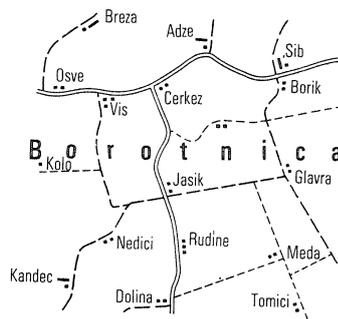
2. Towns and Villages

a. The names for developed areas represented by concentrated individual building symbols are positioned in close proximity to the subject area. Type is preferably placed at, or near, the junction of the most heavily traveled route(s) passing through the town or village. Examples:



b. Dispersed Village

A dispersed village comprised of numerous individual farmsteads requires unique treatment in that the letters in the name are spaced over the approximate center of the area covered by the village. Although it is preferable for the type to be placed parallel to the south neatline, it may be placed in an angular position or curved to better identify the approximate limits of the village. Example:



c. Scattered Villages

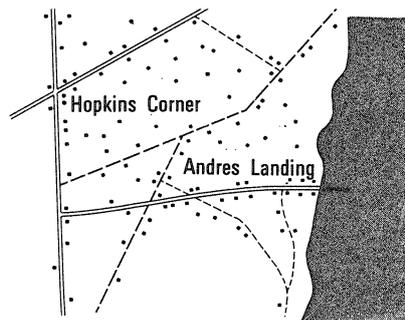
(1) In labeling villages represented by widely scattered building symbols, the type is letter-spaced or extended to indicate the approximate limits of the area defined. Example: 908



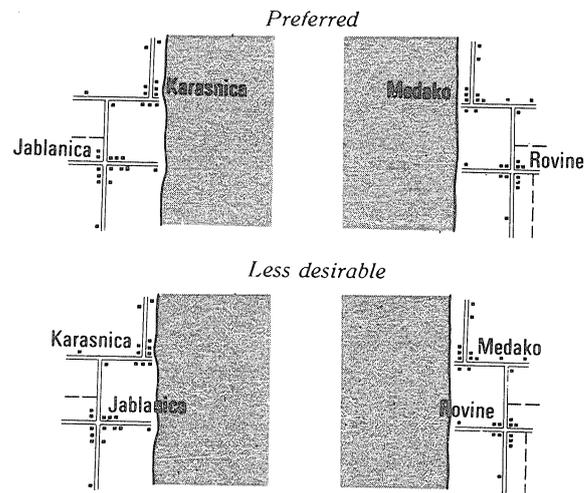
(2) Instances will occur, particularly in flat lowland areas, where villages are comprised of semi-scattered dwellings strung out along the major communication routes. When labeling this type of village, the name is placed adjacent to the junction of the main thoroughfares bisecting the village. Example:



(3) In some rural areas, populated places are comprised of widely dispersed buildings. These areas are often identified by references to prominent local features. Where this occurs, the name is positioned in the immediate vicinity of the feature referenced and extended toward the general area it serves to identify. Example:



B. Names for populated places that are located along shorelines are placed entirely in the open-water area. Where developed areas are located adjacent to (but inland from) the shoreline, the name is placed entirely on the land area. Only in extreme cases is it permissible to overprint the shoreline with type. Examples:



C. In cases when the generic term associated with populated places is repeated numerous times on a map sheet, the generic term is abbreviated. The full generic term and its properly abbreviated form is shown in the map glossary. Where mapping situations warrant this treatment, the authority to abbreviate the generic term will be included in supplementary project instructions.

D. When a populated place is comprised of a group of individual hamlets and each hamlet is referred to by the same name, a distinction is made for reference purposes. The names of the hamlets are followed by a number enclosed by parentheses. The numbers are assigned in order, based on the entire group. To avoid repetition the number sequence is not restricted to individual sheet lines where the group falls on more than one sheet. When this occurs, a note is added to the map legend stipulating that the number in parentheses indicates that more than one hamlet is so named.

1005. Spot Features

A. A spot feature consists of either an individual symbol or small group of symbols whose area is too small to accommodate the identifying type. The labels for spot features are usually descriptive. When labeling spot features, the type is positioned in accordance with paragraph 1003E. Examples: 947 thru 949



B. When a particular spot feature appears many times on the same sheet, the symbol is added to the map legend with its appropriate description, thus eliminating the need for repeated labeling.

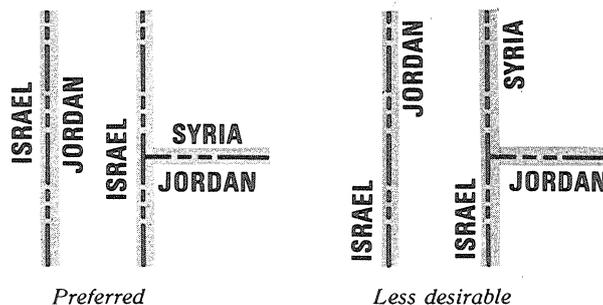
1006. Linear Features

A. Linear features include such items as roads, railroads, powerlines, pipelines, double- and single-line drainage, and similar features. When labeling linear features, it is preferable that the type be placed parallel to the upper side of the symbol as viewed from the south neatline. 929 thru 936

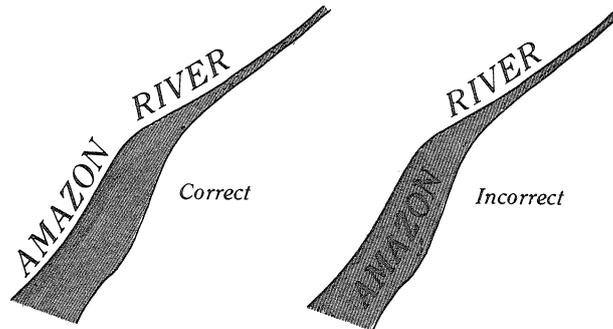
B. Names for linear features are never letter-spaced or extended. When a name placed at the middle point of a linear feature does not identify it sufficiently, the name is repeated at appropriate intervals to further clarify the symbol.

C. Wherever possible, labeling is placed along the straight segments of linear features rather than the curved portions. When there is no alternative but to label these features along a curve, a curving of type is desirable.

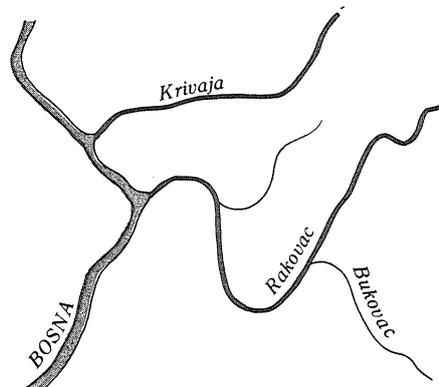
D. When labeling international boundaries, the names of the countries are placed on the side of the boundary which corresponds with the area being identified. It is preferred that the country names be positioned adjacent to one another and parallel to the boundary symbol separating them. Examples:



E. In the placement of drainage type, U- or inverted U-shaped labeling is avoided. When labeling double-line drainage, it is desirable to have the name within the shorelines, provided the feature is wide enough to accommodate the entire name. Type is never positioned partially in or out of double-line streams. Examples:



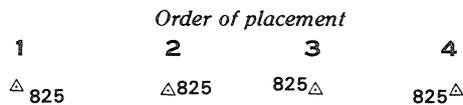
F. The names for smaller streams which form tributaries of a river or larger drain are positioned as close to their outlet as is reasonable possible. When labeling streams containing an open-water fill the name is shown in all capital letters. The names for drainage symbolized by a single line are shown in capital and lowercase lettering. Examples:



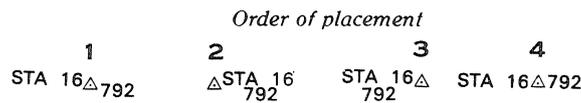
G. Identifying type is omitted where linear features are not long enough to accommodate the entire name or its authorized abbreviation.

1007. Control Points

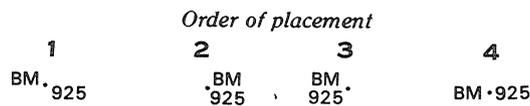
A. The elevation values for horizontal control points are preferably positioned to the southeast side of the point, and the top of the value aligned with the horizontal center of the symbol. When preferred positioning cannot be adhered to, the selection of alternative positioning is made in accordance with the following examples: 912



B. There are instances when control points are identified with a name or a station number. When this occurs, the name or number is positioned as indicated below. Examples:

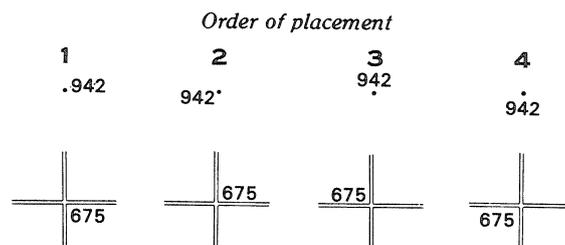


C. When labeling bench marks, the bottom of the type BM or VABM is aligned with the horizontal center of the point and preferably positioned on the northwest side. Examples: 911



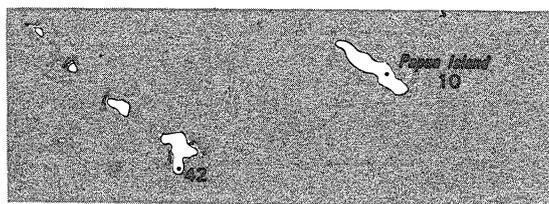
1008. Spot Elevations

A. Spot elevation values are positioned in close proximity to the symbol they identify. Where possible, elevation values are placed to avoid obscuring features of importance to the map user; i.e., small tops, ridges, saddles, etc. It is preferred that the values be positioned to the southeast of the defined point, with the top of the numerals aligned with the horizontal center of the symbol referenced. Spot elevation values are never positioned so that the dot depicting the precise location of the elevation may be mistaken for a decimal point. Examples: 913
914



B. Water-surface elevations are shown in blue and preferably centered within the limits of the feature. When elevations are provided for bodies of water which are not large enough to accommodate the numerals, it is permissible to position the value adjacent to the feature. 918

C. Instances will occur where spot elevations are provided for islands too small to accommodate the values. In such cases the value is positioned adjacent to the island and aligned in accordance with paragraph 1008A. When the island is identified by a proper name, the value is centered below the name. Examples:



1009. Contour Values

A. Contour values provide a convenient means of reading elevations portrayed by contour lines. The number and location of contour values is governed by the nature of the terrain, density of contours, and the number of control points and spot elevations. Areas of complex topography require a greater number of contour values than do areas of simple terrain. 919

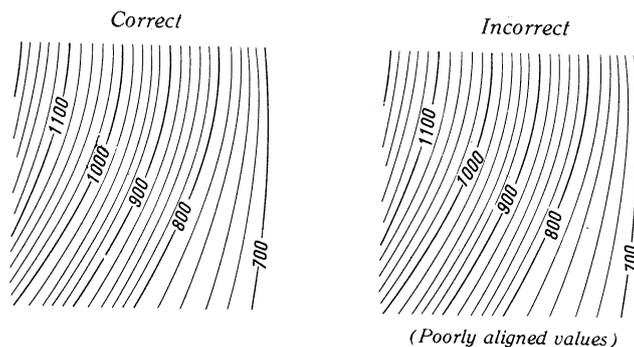
B. Contours above the datum plane are labeled with numerals. Those coinciding with the datum plane are labeled with the word "zero," and those below the datum plane, including bathymetric contours, are labeled with numerals prefixed with the word "MINUS." The negative (-) sign and the number ZERO (0) are not used when labeling contours, but are always spelled out.

C. The following guidelines deal with prevalent cases in the labeling and positioning of contour values.

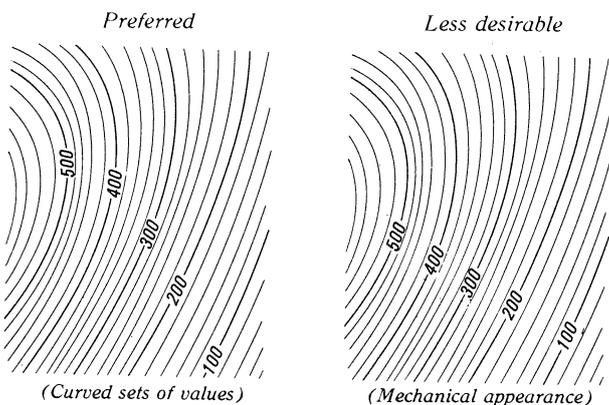
1. During the labeling of contours, every effort is made to position the value reading uphill towards the higher elevation and to make it legible from either the south or east neatline. Values for "minus" and "zero" contours are always positioned in this manner.

2. In the majority of cases, it is only necessary to label the index contours. However, in flat areas widely spaced intermediate contours are labeled to facilitate the interpretation of terrain.

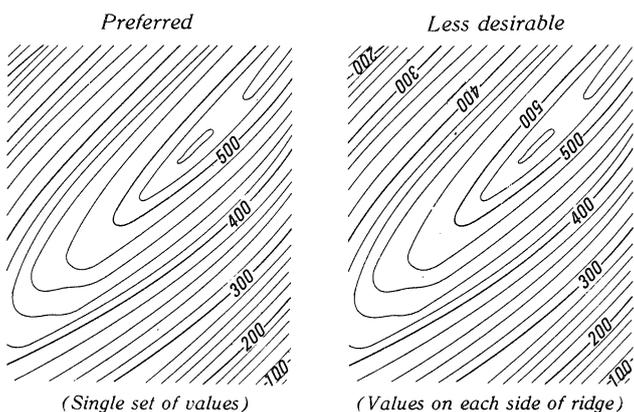
3. Contour values are centered on the axis of contour lines, and are not positioned in the immediate vicinity of control points, bench marks, or spot elevations. Examples:



4. When labeling contours, sets of numerals are positioned so that they progress in smooth-flowing curves toward the higher elevations, a mechanical or stepladder-like appearance is avoided. Examples:



5. Contour values are most effective when positioned on slopes near the ends of spurs, the side of ridges, and at pronounced changes in topography. Under no circumstances are values positioned in mirror-like sequence on each side of a particular ridge or landform. Examples:



6. Sets of contour values are evenly distributed throughout the map sheet, thus enabling the user to determine elevation without a prolonged search for reference points. When labeling contours portraying major landforms, sets of values are repeated at distances of from 10 cm to 15 cm (4.0 in to 6.0 in).

7. Space permitting, contour values are added to supplementary and depression contours wherever they are shown.

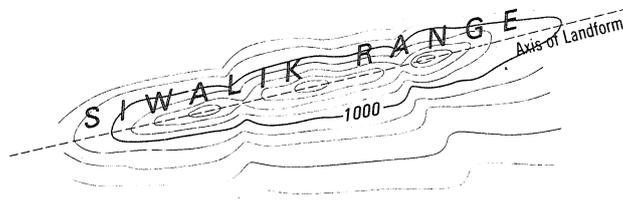
8. All contour lines are blocked-out a distance of 0.50 mm (0.02 in) from contour values.

1010. Hypsographic Features

A. Features included in this category are: mountains, mountain ranges, mesas, ridges, valleys, plains, canyons, peaks, hills, and topographic surface characteristics. 937 thru 943

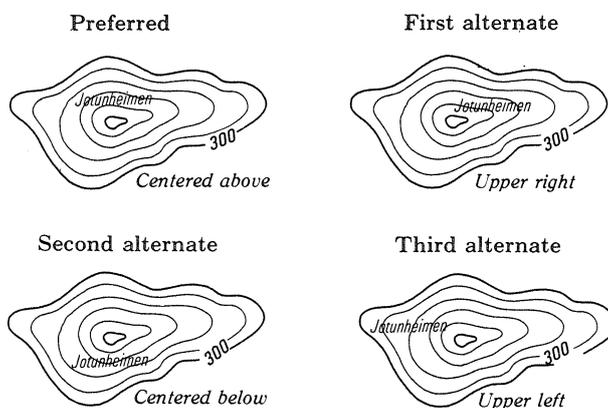
B. The following are guidelines for the positioning of type for hypsographic features:

1. When hypsographic features are extensive in size, the type is positioned slightly above the axis of the landform as viewed from the south neatline. The name is letter-spaced and aligned parallel to the general formation of the feature. Example:



2. The names for narrow valleys, canyons, gorges, and similar features are preferably placed on the upper side of, and parallel to, the axis of the feature identified.

3. When labeling hills, pinnacles, mountain peaks, and similar features, the type is centered above the summit of the feature, provided it does not obscure other prominent detail and the continuity of the relief remains unchanged. Preferred and acceptable alternate positioning of names is established by the following examples:



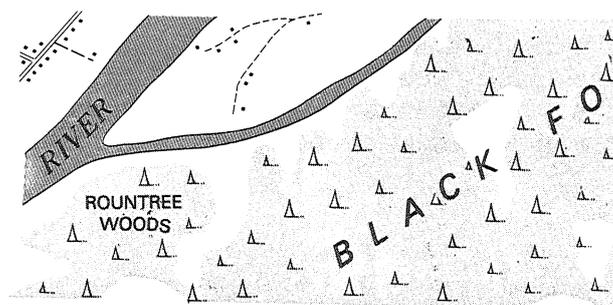
4. Terms describing the nature of surface terrain, such as karst, lava, and rocky, are required when such features cannot be precisely identified with reference to the map symbol legend or where definitive labels must serve as the only means of areal identification. When supported by a symbol pattern, labels are centered within the subject area. When labeling large areas void of distinctive symbolization, the term is repeated as often as necessary to properly define areal coverage and the approximate limits of the feature.

1011. Woodland Features

A. The proper names for forests, orchards, vineyards, and plantations are shown whenever there is sufficient space to accommodate the labeling. In labeling vegetation features, the type is centered within the overall limits of the area to be identified. The names are aligned either parallel to the south neatline or placed to follow the general character of the feature. When labeling large expanses of vegetation, letter-spacing of type is desirable.

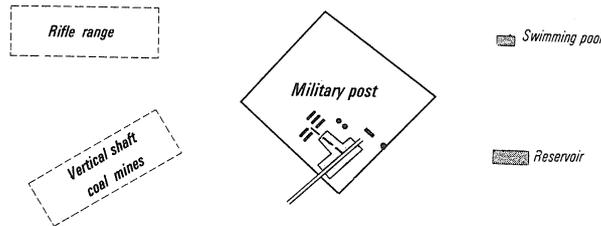
928

B. Names for small wooded sections which are integral parts of a larger named forest are shown when considered to be of importance to the map user. When labeling the smaller tracts, the type is positioned so that it cannot be confused with the forest name that is dominant throughout the entire area. Example:



1012. Enclosures

Included in this category are features whose limits are clearly defined by outlines supplemented by descriptive labeling. It is preferred that the type be centered within the outlined area. Labels are aligned either parallel to the south neatline or positioned to follow the character of the feature. Examples: 925

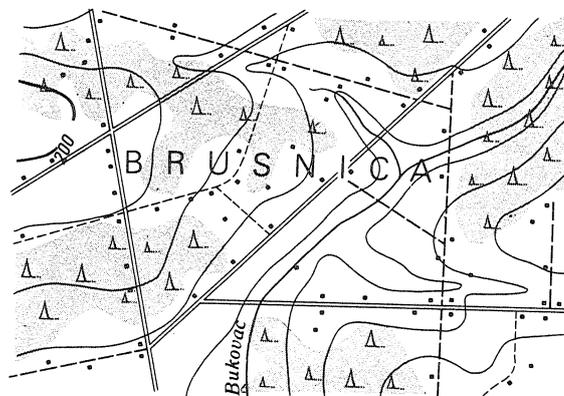


1013. Area Names

A. In some parts of the world, large tracts of terrain are identified by proper names. These named tracts are sparsely populated and may not have definite boundaries; the name refers to a general area and not a specific hydrographic, hypsographic, vegetation, or cultural feature. When shown, the names are designated as "area names" in the map symbol legend. 921

B. Proper names used by the local inhabitants to identify the general area in which they live are also considered area names. They are important, administratively, for facilitating postal operations and provide the map user a way to more readily locate a particular area of interest. When area names in this category can be expressly identified as a communal village, parish, or similar area, they are so defined in the map symbol legend. This type of area name is shown only when specified in supplementary project instructions.

C. Area names are positioned so that the area represented is clearly defined. This may require the name to be letter-spaced, curved, or placed in an angular position similar to hypsographic labeling. Example:

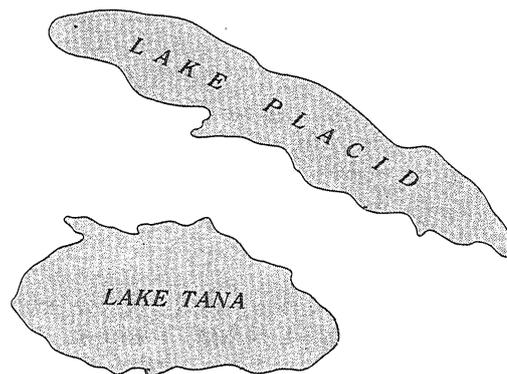


1014. Tribal Names

Tribal names are shown only when specified in supplementary project instructions. When required, they are treated in the same manner as that prescribed for area names. When area names appear elsewhere on the map, tribal names are shown in a distinctive style of type which is specified by supplementary instructions. The identification of tribal names is included in the map legend where applicable.

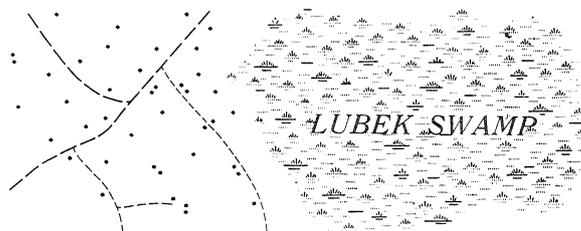
1015. Open Water and Marshland

A. In labeling bodies of water whose limits can accommodate the entire name, the type is centered within the limits of the feature. Names are aligned either parallel to the south neatline or positioned to follow the general character of the shoreline. When labeling large expanses of water, letter-spacing is desirable. Examples: 922



B. When labeling small lakes and ponds the names are positioned and aligned in accordance with paragraph 1003E. 923

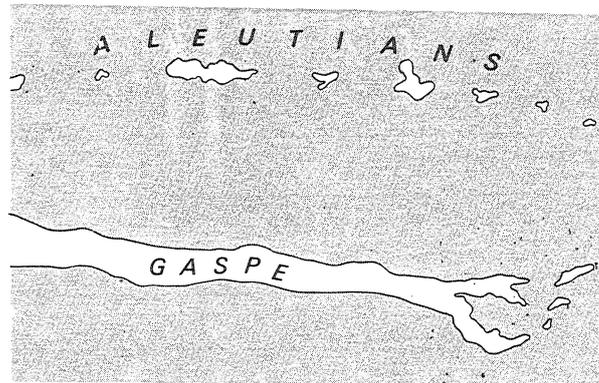
C. The identifying names for marshes, swamps, bogs, and similar features are centered within the limits of the feature defined. The type is preferably aligned parallel to the south neatline, and when the area is extensive, letter-spacing is desirable. Example: 924



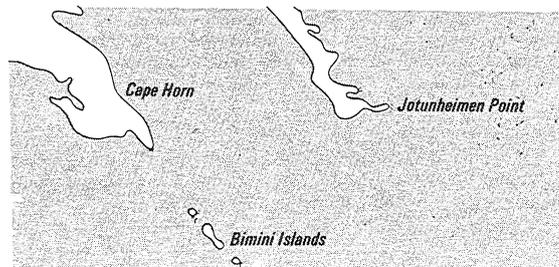
1016. Capes and Islands

A. When labeling large capes and large islands, the type is centered within the land area and parallel to the south neatline when possible; otherwise, the type should be placed to conform with the general configuration of the feature. 944

B. The names for peninsulas and island chains are placed parallel to the general formation of the feature. Where possible, the type identifying peninsulas is positioned within the land area. Examples:

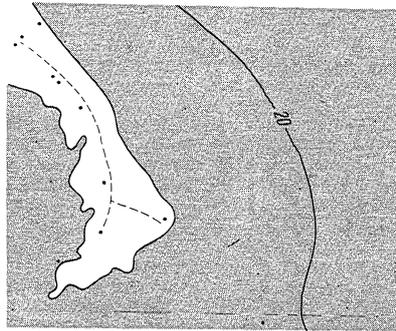


C. The names for capes, points, and small islands are placed in the open water adjacent to the feature defined. Whenever possible, the type is positioned to the right and slightly above the feature. Names are always placed to avoid overprinting the shoreline. Examples: 945

**1017. Coastal Hydrographic Features**

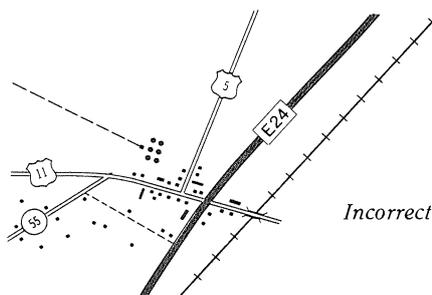
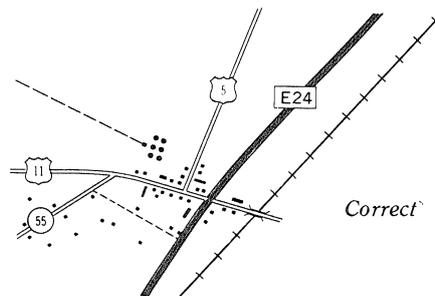
A. Coastal hydrographic landmark features require the use of descriptive notes. Definitive labels for coastal hydrographic landmark features are positioned as close to their precise location as possible. 932

B. Depth curve values are positioned similar to contour values. Where possible, the values are placed so that they are readable from the south or east neatline. Depth curves are always labeled to read toward the deepest depth, i.e., reading from the shoreline area toward the outer area of the open water. All depth curves are labeled and blocked out a distance of 0.50 mm (0.02 in) from the value. Example:



1018. Route Markers

A. Route markers are centered on their respective road symbols and aligned parallel to the south neatline. Whenever possible, route markers are positioned so as to avoid grid lines, linear drainage symbols, and congested map detail. All map detail is blocked out for route markers. Examples:



B. The following are guides for placement of route markers to assure maximum effectiveness.

1. Route markers are positioned in areas free of congested map detail.
2. On roads which continue onto adjoining sheets, route markers are shown close to the map neatline.
3. Route markers are shown close to populated places.
4. Route markers are shown as often as required to insure identification and reader continuity.
5. Route markers are shown in the vicinity of road junctions and intersections.
6. Individual route markers are shown for roads which are designated as a combination of two or more numbered roads. When this occurs, the markers are preferably shown in close proximity.

1019. Type Sizes

The type sizes prescribed in Appendix I, Symbols, are to be maintained whenever possible. Where the type specifications permit a range of type sizes based on the areal limits of a feature, Appendix IV, Type Templet, is used as a guide to assure uniformity of selections. When space prohibits the use of a prescribed size, or the size indicated by the templet will obviously distort the relative importance of the feature, a more appropriate size is to be selected.

1020. Type Printing Colors

With exception of items noted below, all interior type is to print in black.

- A. Contour values print in red-brown.
- B. All type pertaining to hydrographic features is shown in blue; included is descriptive type related to hydrographic features and water-surface elevations. Snowfields, icefields, ice crevices, glaciers (and their elevations), and limits of ice shelf, while considered relief and related features, are labeled in blue. Excepted is type pertaining to features such as reservoirs with artificial limits, swimming pools, filtration and sewage disposal beds, and peat cuttings, all of which are shown in black.
- C. Type for aeronautical data and telephone lines print in blue.

CHAPTER 3-MARGIN DATA

SECTION 100-GENERAL

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104. Language Requirements	123
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101. Map Identifications

Map identifications are those items appearing in the map margin which serve to identify the map sheet. The items are:

- A. Series Name and Scale
- B. Series Number
- C. Edition Number
- D. Sheet Name
- E. Sheet Number
- F. Stock Number
- G. Adjoining Sheets Diagram

102. Map Interpretation and Use Data

Map interpretation and use data are those items appearing in the map margin which are necessary for the map user to identify map features, evaluate map information, and use the map sheet for its intended purposes. The items are:

- A. Symbol Legend
- B. Glossary
- C. Scale Note and Bar Scale
- D. Unit of Elevation

- E. Contour Interval Note
- F. Spheroid Note
- G. Projection, Grid, and Declination Data
- H. Datum Notes
- I. Elevation Guide
- J. Boundary Diagram
- K. Disclaimer Notes
- L. Currency Notes
- M. Special Notes
- N. Conversion Graph
- O. Slope Guide
- P. Red-light Readable Note

103. Other Margin Data

Other margin data are those items appearing in the map margin which identify the mapping elements responsible for the various phases of map preparation and which pertain to release restrictions for the map sheet. These items are:

- A. Publication Note
- B. Credit Listings
- C. Printing Note
- D. DMA Seal
- E. Users Note
- F. Security Classification Notes

104. Language Requirements

A. When required by international map standardization agreements or bilateral cooperative mapping arrangements, certain marginal items are translated. The language or languages to be shown, in addition to English, are indicated in supplementary instructions for the project.

- B. As a minimum, the items listed below are translated:
1. Legend
 2. Unit of Measure
 3. Contour Interval Note
 4. Grid and Projection Information
 5. Instructions on Grid Referencing
 6. Glossary
 7. When required, the Users Note. The foreign translations refer corrections to the mapping agency of the foreign government.
 8. When required, the security classification notes.
- C. When items in addition to those listed above are required, they are specified in the supplemental instructions for the project.
- D. Language Selection. A maximum of three languages (except glossaries) is shown on a map; one of the languages is always English. The selection of the languages other than English is governed by the provisions of map standardization agreements and map agreements applying to specific projects and are specified in supplemental instructions for the project.
- E. Language Sequence. The sequence of presentation of the languages (except for glossaries) is governed by the following:
1. On a series of maps which predominantly cover the territory or only one member country of a treaty organization (NATO), the native language is listed first, followed by English; a third language, if required, is listed last.
 2. The English language is listed first in all other circumstances where additional languages are required.
- 105. Design and Location**
- A. The design of margin items and their location on the sheet are graphically illustrated on the Style Sheet, Appendix VI.
- B. Adherence to the positioning of margin data, as specified on the style sheet, is not always possible because of limited space.

1. When necessary, items of smaller areal extent, for example, users note, special notes, agency seals, etc., may be repositioned.

2. When the margin data cannot be effectively repositioned and the interior of the map includes expanses of open water areas, selected margin items (glossary, grid reference box, etc.) may be positioned therein. Remaining items are then repositioned in the available space.

CHAPTER 3-MARGIN DATA
SECTION 200-MAP IDENTIFICATIONS

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204. Edition Number	130
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206. Sheet Number	132
207. Stock Number	135
208. Adjoining Sheets Diagram	136

201. Map Series

A. Topographic maps are grouped into a map series to facilitate preparation, identification, indexing, storage, and distribution. Each series is identified by a series name and a series number.

B. A series consists of maps of a common scale, map projection, and cartographic presentation. Series are planned to cover all or part of a Continental, Regional, Sub-regional, or National area, as illustrated in Appendix V, Index to Regional Areas.

1. Peripheral sheets of a standard map series may have extended or broken projections to include small land areas. In special situations, standard sheet lines are shifted to reduce the number of sheets needed to map the area.

2. A mapping project may include one or more sheets which fall within an adjacent Region or Sub-region which is unmapped at the scale of the project. If a series at the same scale is not planned for the adjacent Region or Sub-region, the sheets in question are assigned to the series covering the area of the project.

3. Where a series exists for a specific area, a single map or a small number of maps of different scales, but within the same scale group and within the same area, are incorporated as part of the existing series instead of establishing a separate series for the odd sheets.

4. Military city maps within a given country are grouped into a common series, regardless of differences in scale.

C. When determining the limits of a series, the area covered by the peripheral sheets is considered. For example, a series covering France will include some peripheral sheets which contain portions of Spain. If the portion of France, on a peripheral sheet, is greater than that of Spain, the sheet is included in the France series. If the portion of Spain is greater, the sheet is assigned to the Spain series. This rule is subject to modifications induced by special mapping requirements, bilateral mapping arrangements, etc.

202. Series Name and Scale

A. The name assigned to a series is normally the geographic name of the area covered by the series. Rigid rules cannot be established for the assignment of all series names; with exceptions permissible for necessary deviations, the following guidance applies:

1. When more than one series, at the same scale, are designed to cover a country or region, they are identified by the Country or Regional name, qualified by a geographic term. For example: Southern Honshu; Central Philippines; Western U.S.S.R.; Northern Europe.

2. When the series covers a large well known area, it is given the name most commonly used to designate that area; usually this is a country name. In such cases, the name is spelled in accordance with DoD policy, which calls for the short form of the country name as approved by the U.S. Board on Geographic Names.

3. When the series covers a small and not widely known area, it is identified by the accepted local name.

B. The scale of a series is the ratio of map distance to ground distance. When a series consists of maps of different scales, the appropriate scale is shown with the series name in the margin of the individual maps. For cataloging purposes, the scale of such a series is listed as: Various Scales.

203. Series Number

A. The series number provides a unique identification for a group of maps which are common to one another in that they:

1. Cover a particular geographic area
2. Are on the same sheet line system
3. Are of the same scale or within one of the scale groups listed in paragraph 203B.

4. Prepared under the same cartographic specifications.

B. The series number indicates:

1. Geographic area—a systematic breakdown of the world into Continental, Regional, and Sub-regional areas. See Appendix V, Index of Regional Areas.

2. Scale—indicated by scale range.

SCALE RANGES

1	1:5,000,000 and smaller
2	Larger than 1:5,000,000 through 1:2,000,000
3	Larger than 1:2,000,000 through 1:510,000
4	Larger than 1:510,000 through 1:255,000
5	Larger than 1:255,000 through 1:150,000
6	Larger than 1:150,000 through 1:70,000
7	Larger than 1:70,000 through 1:35,000
8	Larger than 1:35,000 (excluding city maps)
9	City products (regardless of scale)
0	Photo base maps (regardless of scale)

3. Series designation—a specific identification which provides a distinction between series whose scale and geographic coverage are the same.

C. The series number is expressed in one of two forms depending on the scale and geographic extent of the series. The two forms are developed as follows:

1. Form A is used for series at the scale of 1:250,000 or smaller and that extend over more than one regional area. The number consists of three elements and is expressed by four numerals. For example:

SERIES 1301 - International Map of the World, 1:1,000,000 Scale
SERIES 1501 - Joint Operations Graphics, 1:250,000 Scale
SERIES 2201 - Africa, 1:2,000,000 Scale

a. The first element (first numeral) identifies the geographic area covered:

"1" - is used for series covering the world or extending over more than one continental area.

"2" through "9" - is used for series which fall entirely within one continental area. See Appendix V.

b. The second element (second numeral) identifies the scale group within which the series falls. See paragraph 203B2.

c. The third element (third and fourth numerals) distinguishes between series whose first and second elements are the same. The initial series of such a group is given the numerals 01 with subsequent series numbered consecutively as 02, 03, 04 . . . 09, 10, 11, etc. The number is not used a second time.

2. Form B is used for series which do not extend beyond one regional area. The number consists of four elements and is expressed by a capital letter followed by three or four numerals. For example:

SERIES U611 - Afghanistan, 1:100,000 Scale
SERIES L7014 - Vietnam, 1:50,000 Scale

a. The first element (capital letter) identifies the regional area within which the series falls. See Appendix V.

b. The second element (first numeral) indicates the scale group within which the series falls. See paragraph 203B2.

c. The third element (second numeral) identifies the sub-regional area within which the series falls. When a series extends beyond a sub-regional area, the third element is a zero "0". An exception to the rule is in regional areas L and N where the zero is used to designate a sub-regional area. See Appendix V.

d. The fourth element (third and fourth numerals) distinguishes between series whose first three elements are the same. The initial series of such a group is given the numeral 1 with subsequent series numbered consecutively as 2, 3, 4 . . . 9, 10, 11, etc. The number is not used a second time.

D. When a special map series which is based on an existing standard series is produced, the basic series number is supplemented with a single letter suffix to identify the special series. The suffixes that may be added to the series number are:

1. The letter "P" to indicate plastic relief maps.
2. The letter "R" to indicate a Roman script version of a map series originally published in non-Roman script.
3. The letter "S" to indicate special map products which include large-scale military installation maps and special-purpose flight maps formatted from existing series.

204. Edition Number

A. The edition number identifies the publication sequence of an individual map. Edition numbers run consecutively; a map bearing a higher edition number is assumed to contain more recent information than the same map bearing a lower edition number. The advancement of an edition number constitutes authority to destroy stock and reproduction material of the preceding edition.

B. The standard edition designation consists of: the word "Edition," a cardinal number, a dash, and the coded initial of the mapping agency responsible for the edition. Examples:

Edition 1 - DMA

EDITION 2 - MCE

EDITION 3 - GSGS

C. On maps produced by subsidiaries and affiliates of national mapping agencies, the coded initials of the preparing unit are included as a suffixed parenthetical code. Example:

EDITION 2 - DMA (USAEUR)

D. The following are the coded initials of some national mapping agencies which use the described edition designation system:

Australia	- AAS
Belgium	- IGMB
Canada	- MCE
Denmark	- GID
France	- IGNF
	- SGMF
German Federal Republic	- DMG
Greece	- HAGS
Italy	- CIGA
	- SMAI

Luxembourg	- IGNF. CL
Netherlands	- TDN
Norway	- NOR
Portugal	- SCEP
Turkey	- TUHUM
United Kingdom	- GSGS
United States	- DMA

E. The organization responsible for new military mapping in a given area is also responsible for coordinating the edition number. This does not prohibit another agency or its affiliate from producing a new edition. It is mandatory, however, for the producer to coordinate the edition number with the responsible organization. Similarly, it is mandatory that mapping units affiliated with DMA coordinate the assignment of edition numbers with DMA. "Edition I" is always applied to maps which are produced for the first time.

F. The edition number is advanced in the following instances:

1. Any map on which an alteration or revision is made to the factual data shown on the map, or any alteration which affects the operational soundness of the map. Examples: the addition of a new military grid; the revision of boundary information.
2. A newly compiled map which is to replace an existing map.
3. A map converted from a non-standard military scale to a standard military scale within the same range. For example: a 1:50,000 scale map which replaces a 1:63,360 scale map and retains the same series number.

G. The edition number is not advanced on facsimile reprints on which no changes are made to map content or marginal data. The only authorized modifications to the facsimile reprints are the addition of the DMA stock number to introduce map products of other national mapping agencies into the DMA distribution system, and the addition, deletion, or change of the coded initials of the printing element.

H. The word "edition" is used only in conjunction with the edition number. The words "provisional," "emergency," "special," "temporary," etc., are not used as prefixes to the word "edition." Such prefixes may be used in conjunction with the word "printing," in which case an edition number is not shown.

205. Sheet Name

A. A map is normally named after its most outstanding cultural or natural feature. Names of cultural features are preferred over natural features; however, if a natural feature is better known than any cultural feature appearing on the map, the name of the natural feature is chosen. When the feature is divided by the neatline(s)

separating two or more sheets and is the best known feature on each of the sheets, the feature name is followed by the geographic term in describing the portion of the feature for which the sheet is being named. For example:

STUTTGART (NORTH) and STUTTGART (SOUTH)

B. When a sheet does not contain a named cultural or natural feature, the name of an adjacent sheet may be used in conjunction with the appropriate directional term. The adjacent sheet that has the most prominent name is selected. For example:

EAST OF TARA

C. When a map is copied from or based on a foreign map, and uses the same sheet lines, the name of the original map is usually retained.

D. The selected sheet name is spelled exactly as it is shown in the map interior. Diacritics, hyphens, and apostrophes are shown only if they appear with the name in the interior of the map.

E. An alternate sheet name spelling (provided it appears in the map interior) is enclosed in parentheses, located immediately following the sheet name, and set in one size smaller type.

F. Sheet names are not duplicated within a map series.

G. Individual maps are given individual sheet names wherever possible. When necessary, it is permissible to name sheets of 1:25,000 scale for the 1:50,000 scale sheet in which they occur, followed by the proper geographic quarter NE, SE, SW, or NW.

206. Sheet Numbers

A. The basis for large scale sheet numbering is a 1:100,000 scale sheet layout with each sheet systematically identified by a four-digit number. The four-digit sheet number is comprised of two significant pairs of digits. The first two digits identify the column of 1:100,000 scale sheets and the second two digits, the row of 1:100,000 scale sheets. The western-most column of sheets is usually assigned the number 10 (first two digits), and the southern-most row of sheets the number 10 (second two digits). Therefore, the southwest sheet of the sheet number layout is identified as "Sheet 1010," and is referred to as the sheet of origin. The respective two digit numbers increase progressively from the sheet of origin. (See Figure 200-1.) In large areas where the number of columns or rows of sheets exceed 99, the first column or row, depending on the extent of the area to be covered, must be given a lower number as 09, 08, 07, etc., to avoid running out of two digit numbers. The numbering system is not limited to a single map series. It may also include adjacent map series of the same format and scale.

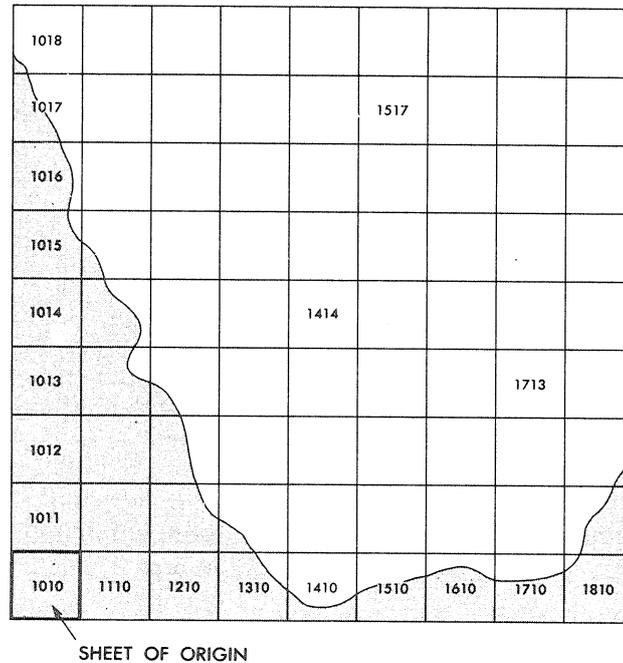


Figure 200-1. Basic development of the sheet number for 1:100,000 scale maps.

B. Sheet numbers for 1:50,000 and 1:25,000 scale maps are developed from the 1:100,000 sheet numbering system.

1. For 1:50,000 scale maps, the 1:100,000 scale map is quartered. The four quarters retain the number of the 1:100,000 scale map, and are supplemented by the Roman numerals I, II, III, and IV, numbered clockwise beginning with the northeast quarter. See Figure 200-2.

2. For 1:25,000 scale maps, the 1:50,000 scale map is quartered. The 1:25,000 quarters retain the number of the 1:50,000 scale map, and are supplemented by the geographic location of the quarter, i.e., NE, SE, SW, NW. See Figure 200-2 which shows their derivation for 1:100,00 Scale Sheet 1712.

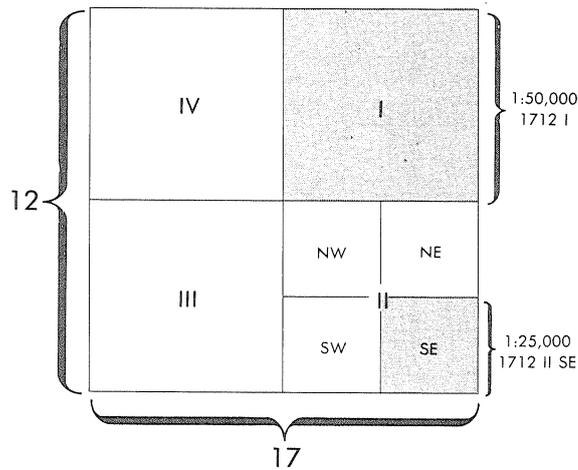


Figure 200-2. Systems for numbering 1:50,000 and 1:25,000 scale maps.

C. A sheet number is not affected by an extension of or a break in a sheet line which is made to include adjacent land areas, nor by the inclusion of an inset within the map.

D. For a sheet shifted from a standard sheet line system, the sheet number assigned is that which, in the standard system, relates to the greater part of the sheet.

E. Special sheet numbering system: A series composed of a small group of sheets which cannot be logically tied to an established numbering system is assigned Arabic numerals beginning with "1." The area covered by the series is laid out with the numbers reading from left to right in rows which are arranged from top to bottom. The word "SHEET" precedes the numbers. See Figure 200-3.

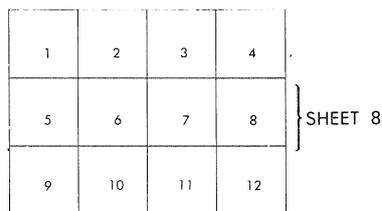


Figure 200-3. Numbering for series containing a few maps.

207. Stock Number

A. For map requisitioning, each map will contain a stock number identification which conforms to the requirements of the DMA Automated Distribution Management System (DADMS).

B. The identification consists of the words "DMA STOCK NO." followed by an alphanumeric designation not to exceed 15 units.

1. The first five units are reserved for the series number. The letter "X" is shown as the fifth unit when the series number consists of four units.

2. The 6th through 15th units are reserved for the sheet number (or sheet name for sheets not identified by number).

a. Hyphens, virgules, commas, and spaces (blanks) are not shown.

b. Sheet numbers expressed by Roman numerals are shown as Arabic numerals.

c. When the sheet name is used and it consists of more than 10 letters, only the first 10 letters are shown.

d. Generic terms are not included in the formatted name.

e. For city products which are identified by a combination of a sheet name and number, as ALEXANDRIA-SHEET 2, the first nine letters of the name are used; the remaining unit is reserved for the sheet number.

f. For military installation maps, which are identified by the name of the installation, the first seven letters of the name are used; the remaining three units are reserved for the letters MIM.

C. Examples of stock numbers used with the various large scale map types are shown as follows:

1. For Series P773, Sheet Number 4779 III:

DMA STOCK NO. P773X47793

2. For series M761, Sheet Numbers

II 16: DMA STOCK NO. M761X0216

XXII 2: DMA STOCK NO. M761X2202

X19-10: DMA STOCK NO. M761X110910

XXXVII: DMA STOCK NO. M761X37

3. For Series E823, Sheet Number 3884 IV NE:
DMA STOCK NO E823X38844NE
4. For Series L8020, Sheet Number 6312 II S:
DMA STOCK NO. L802063122S
5. For City Map Series Z901, Sheet Name Bukavu:
DMA STOCK NO. Z901XBUKAVU
6. For City Map Series P971, Sheet Name Alexandria (Sheet 2):
DMA STOCK NO. P971XALEXANDRI2
7. For Series P971, Sheet Name Cairo (Sheet 3):
DMA STOCK NO. P971XCAIRO3
8. For Series V745S, Sheet Name Fort Steward Military
Installation Map:
DMA STOCK NO. V745SFTSTEWAMIM

D. When a modification of stock numbers is required for classified maps, guidance will be included in the pertinent classification guide.

208. Adjoining Sheets Diagram

A. The diagram consists of as many rectangles, representing adjoining sheets, as are necessary to surround the rectangle which represents the sheet under consideration. The diagram usually contains nine rectangles, but the amount may vary depending on the locations of the adjoining sheets. In all instances, the entire limits of any adjoining sheet containing a land mass are represented. The diagram is not necessarily symmetrical.

1. All represented sheets are identified by their sheet numbers.
2. Adjacent sheets within the same series, whether published or planned, are represented.
3. Geographic coordinates of the represented sheets are not shown.

4. Coastlines, international boundaries, principal rivers, and lakes are represented in the diagram. The prime consideration for including these features is the value they afford for the geographic location of the sheets. Because of the small scale of the diagram, delineations of the features are generalized.

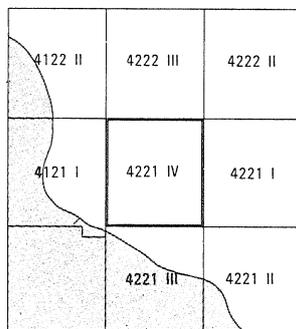
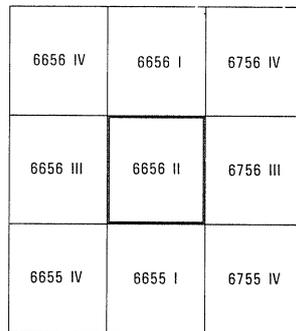
a. When a river plots 0.5 mm (0.02 in) or wider at the scale of the diagram, it is shown as an open water area.

b. The size of small islands may be exaggerated to delineate their shorelines; however, an island is omitted from the diagram if it plots less than 0.5 mm (0.02 in) in width.

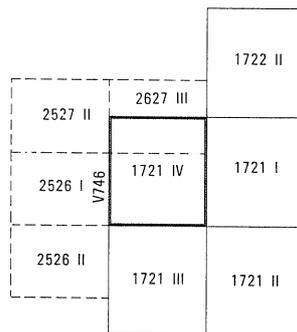
c. International boundaries appearing in the adjoining sheets diagram shall be symbolized in accordance with Appendix VI. Country names shall be shown centered within the areas defined and aligned parallel to the bottom work limits. Country names may be letter-spaced, where necessary, to avoid overprinting sheetlines. Boundary symbols shall be broken to avoid confliction with sheet or series number identifications.

d. Space permitting, the names of major rivers and bodies of water may be shown to aid the map user in locating the geographical region portrayed.

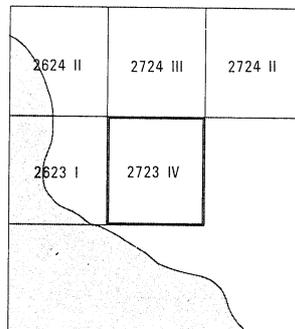
5. Examples of a nine-sheet diagram:



B. Sheets of an adjoining or overlapping series, whether published or planned, that are at the same scale are represented by dashed lines. The series number of the adjoining series is indicated along the appropriate side of the division line between the series. Example:



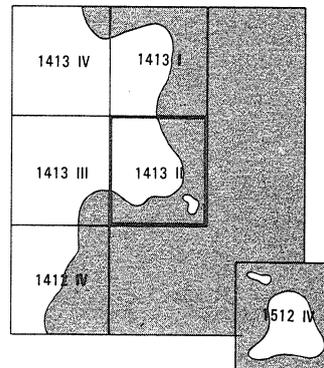
C. If a land area adjoins the series of the sheet being represented, and no series exists or is planned for the area at the same scale, no attempt is made to show hypothetical sheet lines. Example:



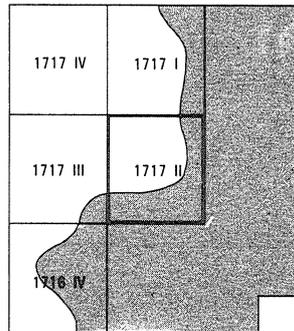
D. When the sheet under consideration adjoins an open water area, the diagram is shown in the same overall size as for a nine-sheet representation.

E. In certain instances, a sheet is displaced from its normal position within a series to include an island or group of islands.

1. If more than half of the sheet occurs within the area of the standard nine-sheet diagram, the entire sheet is represented. Example:

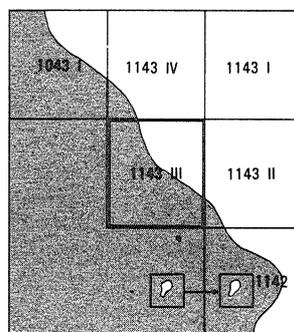


2. If less than half of the sheet occurs within the area of the standard nine-sheet diagram, the entire sheet is omitted. Thus, the diagram is irregular in shape and its limits follow, in part, the omitted sheet. Example:

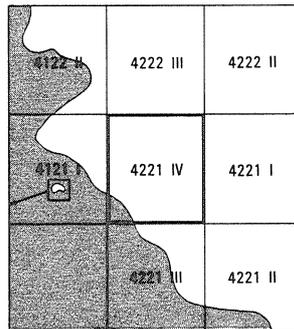


F. Insets which are shown on sheets to be included in the diagram are also represented.

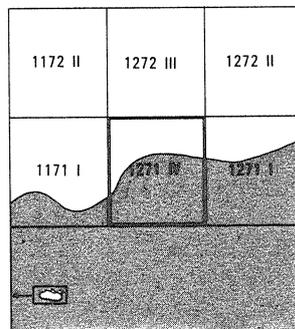
1. When the true geographic location of the inset area and the sheet containing the inset are both included within the limits of the diagram, the inset is shown in approximately the same shape and position on the sheet. An identical representation of the inset area is also shown in its approximate geographic location within the diagram. An arrow is shown pointing from the geographic location to the position of the inset. Example:



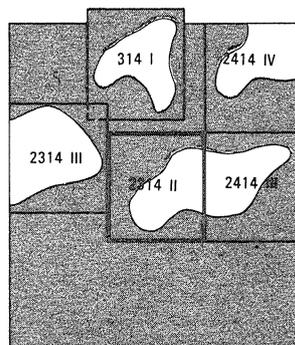
2. When the true geographic location of the inset area is beyond the limits of the diagram, the inset is shown in approximately the shape and position it occupies on the sheet. An arrow is shown pointing from the inset to the general geographic location of the inset area. Example:



3. When the true geographic location of the inset area is within the limits of the diagram, but the sheet containing the inset is not, the inset area is shown in its approximate location within the diagram. An arrow is shown pointing in the direction of the sheet containing the inset. Example:



G. When one sheet overlaps another, the sheet which is nearest to the normal position in the diagram is represented by full lines. The area of overlap of the second sheet is shown by dashed lines. Example:



H. Circumstances will arise where the normal nine-sheet diagram is not practical for the portrayal of the relationship of the sheet under consideration to the other sheets. This condition may occur when the sheet under consideration: is all or part of a number of a group of islands, and it is desirable to reflect the relative position of all islands in the group; or is part of a group of sheets which cover a region which is peninsular in shape. Under these and similar circumstances:

1. The diagram is shown at a reduced scale, and includes the representation of as many sheets as is necessary to reflect the relationship of the sheet under construction to the other sheets. A common diagram may be shown on all sheets concerned, with the sheet under consideration accentuated by a heavy line.

2. When appropriate, the treatment is specified in supplementary instructions for the project.

I. Centered under the diagram is a note identifying the Series 1501 sheet covering the 1:50,000 scale sheet. For example:

Sheet 2890 II falls within NL 34-1, 1501, 1:250,000

CHAPTER 3-MARGIN DATA

SECTION 300-INTERPRETATION AND USE DATA

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301. Symbol Legend

A. The symbol legend defines and illustrates features represented on a map. A typical legend includes: populated places, roads, railroads, drainage, vegetation, boundaries, and types of structures. Features not included are: lakes, contours, and symbols that are identified by labeling on the map. Space permitting, all symbols on the map that require explanation are shown in the legend. Figure 300-1 illustrates the design and composition of a symbol legend.

1. For map projects (a series or group of maps of a particular geographical area), a standard legend may be used for the majority of the sheets. All the symbols included on the standard legend need not appear on each sheet and are not deleted unless space is needed for modifying the legend.

2. The standard legend is modified on a sheet-by-sheet basis as necessary to incorporate symbols appearing on the map that require explanation.

3. If a feature appears only once and is symbolized by a unique symbol, it should be labeled on the map rather than added to the legend.

B. When required, the terminology of a legend is expressed in other languages in addition to English. The required languages are specified in supplementary instructions for the project. See paragraph 104 of this chapter for sequence of languages.

If English is the only language required, foreign generic terms of administrative divisions are included in the legend rather than in the glossary. The generic terms are shown in parentheses following the English terminology. Example:

First-order Administrative (Khoveng)
Second-order Administrative (Muang or Kong)

C. Each symbol in the legend is shown in its proper color unless that color does not appear in the interior of the map. In such instances the entire symbol (including any component colors), the terminology, and leader line are omitted. The legend is adjusted to present a balanced appearance.

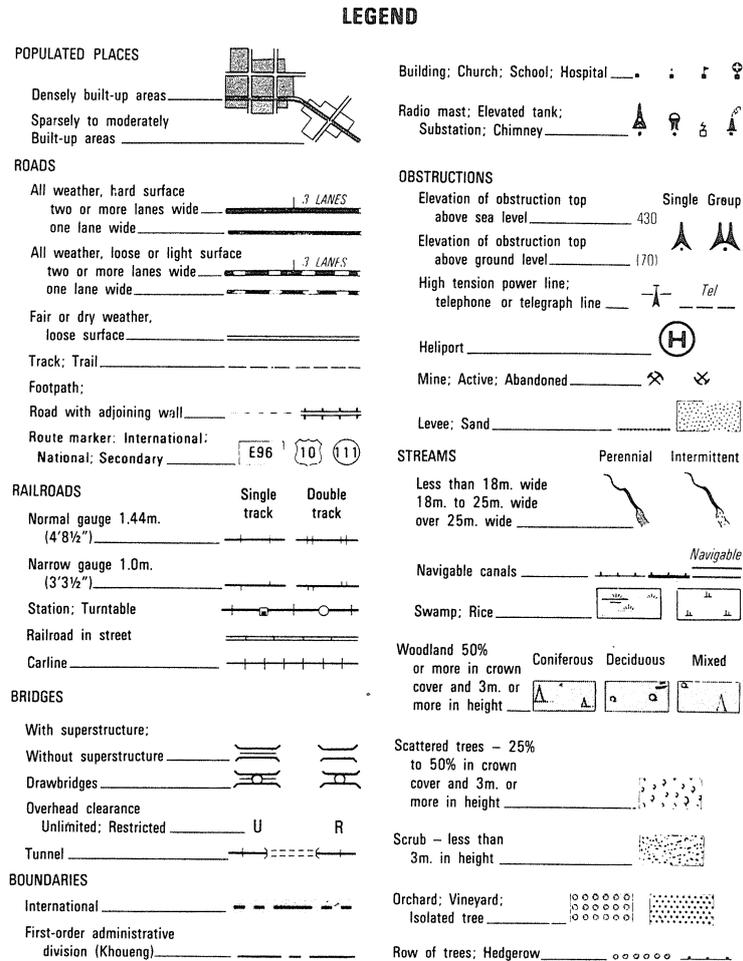


Figure 300-1 Legend

D. When coastal hydrographic features appear on a map, a hydrographic legend is shown in the open water area. If the open water area cannot accommodate the hydrographic legend, the required symbols are included in the map legend. Figure 300-2 illustrates the composition of the hydrographic legend.

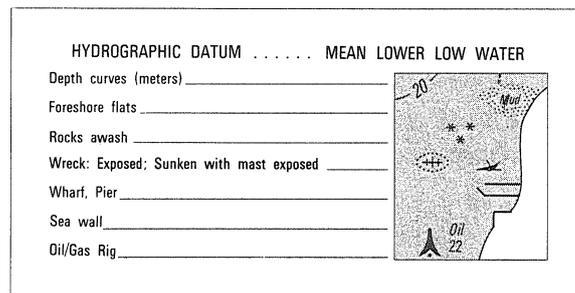


Figure 300-2 Hydrographic Legend

302. Glossary

A. The principles governing the selection of terms to be shown in the glossary are given in Chapter 2, Section 900, Names.

B. When the map contains foreign generic terms, they are listed alphabetically in the glossary according to English rules, regardless of the language. The initial letter of a term is shown as a capital or lowercase letter to agree with the form appearing on the map. When the term in the interior appears in all capitals, it is shown in the glossary in caps and lowercase. All variants of a term which appear in the map are listed.

C. When translation to English only is required, and available space in the map margin is a critical factor, terms which occur least are translated in the interior of the map. The translations are positioned immediately below or alongside the native term; they are enclosed in parentheses and shown in lowercase descriptive type. This practice is permissible until the number of terms remaining can be accommodated in the margin. Terms translated in the legend are not shown in the glossary.

D. When other translations in addition to English are required, all terms, regardless of the frequency with which they appear on the map, are listed in the glossary. If space in the map margin becomes a factor, the provisions of paragraph 105 of this chapter apply.

E. The generic terms within the glossary are arranged as follows:

1. The foreign generic terms appearing in the map interior are arranged alphabetically and shown as the first column. Example:

GLOSSARY

akna	mine shaft
Bánya, bánya	mine
Bérc, bérc	peak
Domb, domb	hill
erdő	forest
Hegy, hegy	mountain
hora	mountain
menédekház	inn
myslivna	hunting lodge
oldal	slope
örház	foresters lodge
Orom	peak
Patak	stream
pusta, puszta	estate
Táró, táró	mine shaft
telep	settlement
Tető, tető	peak
völgy	valley
výšina	hill

2. When more than one foreign language appears in the map interior, the generic terms are arranged alphabetically in the same column and shown as the first column. Example:

GLOSSARY

Álomás	railroad station
dolina	valley
Domb	hill
dvor	estate
Erdő, erdő	forest
Forrás	spring
Hegy, hegy	mountain
hora	mountain
Kút	well
major	estate
Megálló	railroad stop
Patak, patak, putok	stream
pusta, puszta	estate
Rét	meadow
Rieka	stream
tanya	estate
Tető, tető	ridge
Víz	stream
Völgy	valley
vrch	peak

3. For multilingual margins which include a foreign language which does not appear in the map interior, the generic terms of that language are shown to the right of their English equivalents. Example:

GLOSSARY

Berg, -berg, -berg1	mountain	Berg	monte
doline	valley	Tal	valle
dvar	estate	Gut	proprietà
Erad	forest	Wald	bosco
hajovna	Foresters lodge	Foresterei	casa forestale
hora	mountain	Berg	monte
hostinec	inn	Wirtshaus	osteria
Kunyha	hut	Hütte	capanna
les	forest	Wald	bosco
luky	meadows	Wiesen	prati
patak	stream	Bach	rio
Ruine	ruins	Ruine	ruine
Schloss	castle	Schloss	castello
vrch	peak	Berggipfel	picco
Wald	forest	Wald	bosco
Wiese	meadow	Wiese	prato

F. When project specifications require the use of foreign characters in addition to the romanized terms, generic terms are treated as previously stated. Descriptive terms used in the map interior and their corresponding characters are listed alphabetically following the generic forms in the map glossary. Example:

GLOSSARY 어해

-bong	peak -ho	lake, pond
-chae, -jae	pass -ji	lake, pond, reservoir
-ch'ŏn	stream -kagae	pass
-dong, tong	settlement -li, -ni, -ri	settlement
-gang	stream -ryŏng	pass
-got, -kol	settlement -san	hill, mountain
caves		굴
destroyed		파괴
ford		여울
wood		숲

G. Glossaries are prepared on a sheet-by-sheet basis. When application of an identical glossary for a group or series of maps is warranted, it is so specified in supplementary instructions for the project.

303. Scale Note and Bar Scale

A. The scale note is a representative fraction which gives the ratio of a map distance to the corresponding distance on the Earth's surface. For example, the scale note 1:50,000 indicates that one unit of measure on the map equals 50,000 units of the same measure on the ground.

B. Bar scales are graphic expressions of the map scale which provide means for making measurements. A combination of bar scales, consisting of various units of measure, is established for each standard scale military map. The zero points of the bar scales are vertically aligned. Figure 300-3 illustrates the standard bar scales for maps at 1:50,000 scale.

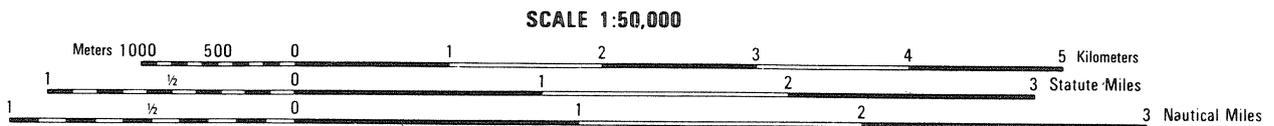


Figure 300-3. Representative Scale notes and Bar Scales

304. Unit of Elevation

The unit of elevation note gives the unit of vertical measure and reads:

ELEVATIONS IN METERS

305. Contour Interval Note

A. The contour interval note gives the elevation difference between successive intermediate contour lines. The note further indicates, when appropriate, the use of supplementary contours, form lines, and combinations thereof.

B. Examples of various conditions and the appropriate notes are given below:

1. When one contour interval is used on the map, the note reads, for example:

CONTOUR INTERVAL 20 METERS

2. When more than one contour interval is used on the map, the note reads, for example:

CONTOUR INTERVAL 20 METERS, CHANGING AT
THE 500 METER CONTOUR TO 50 METERS

3. When the map contains supplementary contours, the note is patterned after the following example:

CONTOUR INTERVAL 20 METERS
SUPPLEMENTARY CONTOURS 10 METERS

4. If relief is shown by form lines, the note indicates the method used.
Examples:

RELIEF SHOWN BY FORM LINES

CONTOUR INTERVAL 20 METERS
RELIEF PARTIALLY SHOWN BY FORM LINES

5. If the highest elevation on a map is lower than the contour interval specified for the map series, or for the surrounding maps, the note reads, for example:

MAXIMUM ELEVATION 9 METERS

6. When no contours fall on a sheet because the range of elevation is within the contour interval, the value of the contours between which the elevation of the sheet falls is included in the note, and patterned after the following:

THE TERRAIN ON THIS MAP IS BETWEEN
1040 AND 1060 METERS ABOVE (Insert vertical datum)

306. Spheroid Note

A reference to the spheroid(s) used on a map is included in a note patterned after the following examples:

For sheets containing one spheroid:

SPHEROIDWGS

For sheets which contain two spheroids, the reference to the spheroids is included in the grid note, for example:

GRID . . . 1,000 METER UTM, ZONE 48, EVEREST SPHEROID
(BLACK NUMBERED LINES)

1,000 METER UTM, ZONE 49, INTERNATIONAL SPHEROID
(BLUE NUMBERED LINES)

307. Projection, Grid, and Declination Data

Detailed specifications pertaining to the composition and portrayal of projection and grid notes, grid reference diagrams, and declination data are contained in DA TM 5-241-1, "Grids and Grid References," and Appendix VI, Style Sheet, of this manual.

308. Datum Notes

Horizontal, vertical, and hydrographic datums are specified in supplementary instructions for the project and are patterned after examples shown on Appendix VI, Style Sheet, of this manual.

309. Elevation Guide

A. *General*

1. The elevation guide is designed to provide a rapid evaluation of general landforms and to accentuate the highest and lowest terrain on a map. The guide includes selected elevation bands, spot elevations, and drainage features.

2. The guide is compiled on a sheet-by-sheet basis. No effort is made to match or tie the drainage or elevation bands shown on elevation guides on adjoining sheets.

B. *Drainage*

Sufficient drainage is shown to enhance the portrayal of the landforms. The diagram includes principal rivers and lakes, and coastlines. All major drainage shown in the Boundaries Diagram is shown in the Elevation Diagram; additionally, other drains may be added to point out high areas and land slopes.

1. Rivers whose minimum width at the diagram scale is approximately 0.5 mm (0.02 in) are shown as open water areas.
2. Rivers which plot in the diagram less than 0.5 mm (0.02 in) wide are shown as single line streams 0.15 mm (0.006 in).
3. Islands which plot less than 0.5 mm (0.02 in) wide at the scale of the diagram are not shown.
4. Drainage should be symbolized to portray the feature shown in the map, i.e., intermittent drain, dry lake, etc.

C. *Elevation Bands*

Contour lines delimiting the elevation bands are selected from the contours appearing on the map so that the high ground is immediately evident. The contours are selected at intervals to permit the best representation of the landforms.

Contour Interval of Base Map (meters)	Number of Elevation Bands for Range of Elevation				
	100m. and less	100-300m.	300-600m.	600-1200m.	1200m. and more
10	2	3	4	4	
20	*	3	3	4	4
40	**	2	3	4	4

*Two elevation bands may be necessary to point out landslope
 **Selected highest and lowest spot elevations only. The elevation band index below the guide is not shown

Figure 300-4. Table for determination of the number of bands to be shown.

1. Guidance for selection of the limiting contours and the number of elevation bands is provided in Figure 300-4. The number of elevation bands indicated are based on the difference in elevation between the lowest and highest point of the sheet.
2. The elevation bands should be sufficiently wide to lend some significance to the overall landforms. Figure 300-5 is provided to assist in the selection of the area coverage of the elevation bands, and is used primarily in areas of uniform slope and rugged relief. The figure does not apply to sheets containing large valley floors, coastal plains or extensive low and flat areas. In such cases, the limit of the low area is that contour line which includes the greatest portion of the area. In effect, the low area might constitute 80 percent of the map. Similar treatment is applied when selecting the limiting contours for extensive plateaus.

Number of Elevation Bands	% Area Ratio			
	Low	Medium	High	Highest
2	60		40	
3	30	40	30	
4	20	30	30	20

Figure 300-5. Percent area ratio for elevation bands

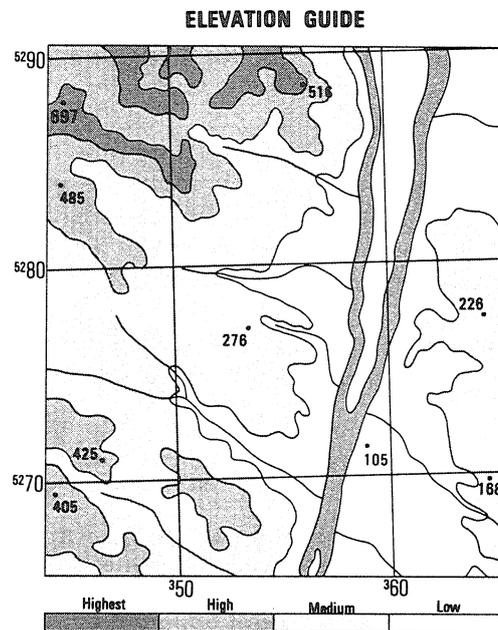


Figure 300-6. Sample Elevation Guide

D. Elevations

1. Spot elevations are included in the diagram to augment the terrain presentation. The highest and lowest elevations on the sheet plus the highest of major relief formations are shown.

2. Where the information is available and the area of open water is sufficiently large to accommodate the type, water surface elevations are shown. The values are shown in the same size and style of type as is used for the spot elevations and are printed in blue.

3. Care should be taken when placing the elevation values in the diagram that the value and dot which locates the elevation will not appear to be a decimal figure. The limiting contours are broken for the elevation values.

4. Below sea level elevations are preceded by a minus sign.

5. A maximum of ten spot elevations, including the highest spot elevation, is shown in the diagram.

E. *Insignificant Relief*

When the range of elevation change is insignificant, generally less than 50 meters, the elevation guide shows only selected spot elevations and the drainage patterns; the index of elevation bands is not shown.

1. In the flat coastal plains where there are no pronounced land forms, it is not required to add additional elevations in the elevation guide. The prime purpose of the box is to point out to the user major relief forms and the highest areas on the sheet. The value of the guide is reduced in the flat areas where the slope of the land is evident on the map itself.

2. In the flat coastal and delta areas, when the highest point's location cannot be determined because of lack of relief, it is not required to show any values in the elevation guide.

F. *Incomplete or Unreliable Relief*

On sheets having areas of incomplete relief information or when areas of relief are shown by form lines, the elevation guide is treated in the following manner:

1. For sheets having small areas of incomplete relief information or form lines, an effort is made to complete the tint bands by logically extending the limiting lines across these areas. In no case, however, should the bands be extended where they would possibly misrepresent the actual land form.

2. For sheets having large areas of incomplete relief information or form lines, the tint bands are omitted when the limiting lines are not readily interpretable or when the tints would not portray the land forms and their relative heights with a reasonable degree of accuracy. The limits of the area are delineated within the elevation guide with a black dashed line 1.0 mm (0.04 in) in length, 0.3 mm (0.012 in) space, and 0.1 mm (0.004 in) line weight.

3. The elevation guide is not shown on sheets where the relief is shown entirely by form lines or where the relief information is incomplete or not available.

G. Grid Lines

To aid in referencing points in the diagram to points on the map, the 10,000 unit lines of the grid are plotted on the diagram. The lines are labeled in the west and south sides of the diagram.

310. Boundary Diagram

A. The boundaries diagram illustrates the related boundary information. Definitions of administrative divisions are included in Chapter 2, Section 400, Miscellaneous Cultural Features.

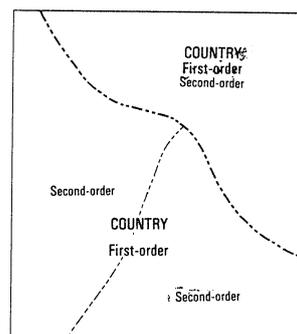
B. The diagram is a miniature representation of the map under consideration. The diagram includes coastlines, principal rivers and lakes, and the administrative boundaries which appear on the map. Exact delineation is not required, but relative positions and shapes are represented.

1. Rivers whose minimum width at the diagram scale is approximately 0.5 mm (0.02 in) are shown as open water areas.

2. Rivers which plot in the diagram less than 0.5 mm (0.02 in) wide are portrayed as single line streams 0.15 mm (0.006 in).

3. Islands which plot less than 0.5 mm (0.02 in) wide at the scale of the diagram are not shown.

C. When possible, administrative divisions are labeled within the diagram.



THE REPRESENTATION OF INTERNATIONAL BOUNDARIES
IS NOT NECESSARILY AUTHORITATIVE

Figure 300-7. Boundaries Diagram (interior listing).

1. If the sheet contains more than one country name, the names are shown in the diagram with capital letters, extended where necessary to afford a pleasing appearance. When the map falls within one country, the country name is omitted from the diagram, except in those instances where the series name does not reflect the country name, e.g., a sheet covering a portion of Southern Honshu would carry the name "JAPAN" in the Boundaries Diagram.

2. Names of other administrative divisions are placed within their areas of the diagram.

3. If no boundaries occur in the interior of the map, the names of the administrative divisions covering the sheet are centered in the diagram in descending order of importance. The first-order administrative division name may be extended for a pleasing appearance.

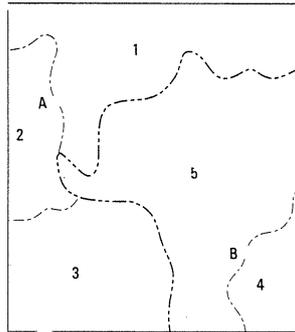
D. On sheets where the above treatment is not feasible, administrative divisions are listed below the diagram and keyed by letters and numbers to the diagram. Country names are shown as illustrated in Figure 300-8.

E. The first-order administrative divisions are keyed with capital letters. Further administrative breakdowns are keyed consecutively by Arabic numerals and by lowercase letters. Letter and number designations are not repeated. The entire listing is arranged in a logical manner with lesser administrative divisions indented below their respective higher administrative divisions.

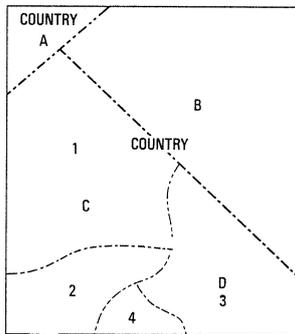
F. In certain countries, lack of information regarding internal administrative divisions preclude their accurate delineation in the body of the map. In such cases, the boundaries are approximated in the diagram and an explanatory note is shown below the diagram. The treatment is specified in supplementary instructions for the mapping project.

G. Reservations, national parks, and third-order administrative boundaries are shown only when specified in supplementary instructions for the project.

H. In certain areas, information concerning other lines of separation of sovereignty, limit of zone of occupation, etc., are included in the diagram. When required, the boundaries data and descriptive type are shown within the diagram printed in red-brown; related notes are positioned below the diagram and are printed in red-brown. The appropriate boundaries, their labels, and related notes to be used are specified in supplementary instructions for the project.



- A. First-order
- 1. Second-order
- 2. Second-order
- 3. Second-order
- B. First-order
- 4. Second-order
- 5. Second-order



- THE REPRESENTATION OF INTERNATIONAL BOUNDARIES IS NOT NECESSARILY AUTHORITATIVE.
- COUNTRY
 - A. First-order
 - COUNTRY
 - B. First-order
 - C. First-order
 - 1. Second-order
 - 2. Second-order
 - D. First-order
 - 3. Second-order
 - 4. Second-order

Figure 300-8. Boundaries Diagram (exterior listing).

311. Disclaimer Notes

A. *International Boundary Disclaimer Note.* This appears on all maps which show an international boundary or a line separating areas of sovereignty (e.g., armistice lines, cease-fire lines) in the map or in a diagram in the margin of the map.

1. For maps showing only international boundaries, the note reads:

THE REPRESENTATION OF INTERNATIONAL BOUNDARIES IS NOT NECESSARILY AUTHORITATIVE.

2. For maps showing only lines separating areas of sovereignty and for maps showing both international boundaries and lines separating areas of sovereignty, the note reads:

THE REPRESENTATION OF BOUNDARIES IS NOT NECESSARILY AUTHORITATIVE.

3. Excepted are those maps which show the international boundaries between the United States and Canada and between the United States and Mexico.

B. *Internal Boundary Disclaimer Note.* In certain areas, a disclaimer note concerning administrative divisions of a country may be necessary. When required, the note is placed directly below, or in the location specified for, the international boundary disclaimer note. Other notes and variations from the following example are specified in supplementary instructions for the project.

THE INTERNAL ADMINISTRATIVE BOUNDARIES ARE NOT NECESSARILY AUTHORITATIVE.

C. *Names Disclaimer Note.* This note appears on maps which contain names that do not necessarily reflect the officially recognized political status or sovereignty of the areas concerned.

1. The note reads:

GEOGRAPHIC NAMES OR THEIR SPELLINGS DO NOT NECESSARILY REFLECT RECOGNITION OF THE POLITICAL STATUS OF AN AREA BY THE UNITED STATES GOVERNMENT.

2. The requirement for the note is indicated in the supplementary instructions for the project.

312. Currency Notes

A. The currency notes are positive statements which aid the map user in evaluating the currency of the map information. The notes are shown immediately below the credit note.

B. The date (year) shown as part of the currency note refers to the latest date of the material used in the preparation of the map, i.e., source maps, aerial photography, field classified photography, field check, etc. The significant data for source maps and charts is considered to be the date of compilation or revision.

C. When all features of a map have been compiled or revised using the same source materials, a "standard currency note" is used to express the significant date in the currency note. For example:

1. If the materials and their significant dates are: Map source, 1968; aerial photography, 1978, the currency note reads "Map Information as of 1978."

2. If the map was compiled using source maps, 1974; aerial photography, 1975; and the map is field checked in 1977, the currency note reads "Map Information as of 1977."

D. If revision was accomplished for a limited number of features on the map, the standard currency note is replaced with statements explaining the significant date associated with the revision. In each case, the currency of the unrevised map information is given in a note which reads "Other Information" (date). Composite example of the notes are shown below:

ROAD DATA (date)—OTHER INFORMATION (date)
 VEGETATION DATE (date)—OTHER INFORMATION (date)
 MAJOR ROAD DATA (date)—OTHER INFORMATION (date)
 ROAD AND VEGETATION DATA (date)—OTHER INFORMATION (date)

E. The dates of source materials and special factors to be considered in assigning the map information date to the map compilation are given in supplementary instructions for the project.

F. To further aid the map user in evaluating the currency of the map information, a note is shown stating whether or not the map has been field checked. The term "field checked" signifies sending personnel into the area being mapped for the purpose of classifying roads and railroads, identifying buildings, locating boundaries, verifying place names, classifying vegetation and drainage, and gathering any other pertinent data. The date of the field check is expressed by year only.

1. Composite examples of the notes are shown below:

MAP FIELD CHECKED 1976

MAP NOT FIELD CHECKED

2. The field checked note is shown only on maps of the United States with metric values.

313. Special Notes

A. A special note is any information statement which relates specifically to the mapped area and has a bearing on the operational usefulness of the map. The notes are stated as briefly as clarity permits. Examples are:

A LANE IS CONSIDERED TO BE 2.5 TO LESS THAN 5.5 METERS
(8 TO LESS THAN 18 FEET) WIDE

BLACK FIGURES ALONG ROADS INDICATE ROAD WIDTHS IN METERS

WHEN REFERRING TO POPULATED PLACE NAMES,
INCLUDE UTM GRID COORDINATES

B. Pertinent special notes are specified in supplementary instructions for the project.

314. Conversion Graph

A. A graph is shown to permit the conversion from metric values to feet.

B. The graph shows meters in 10-meter increments and feet in 50-foot increments.

C. The conversion graph includes only the elevation range depicted on the map. The length of the graph is adjusted to the first 100 meters above the highest point on the sheet and to the first 100 meters below the lowest point on the sheet. The highest point on the sheet is not limited to the spot elevations depicted on the map, but includes all areas of relief within the neatline as well as manmade objects.

D. The graph is not extended below zero to convert minus values.

E. When the elevation range exceeds 700 meters, the graph is shown in two equal segments.

F. Example of Conversion Graph is shown in Figure 300-9.

CONVERSION GRAPH

(1 meter = 3.28 feet)

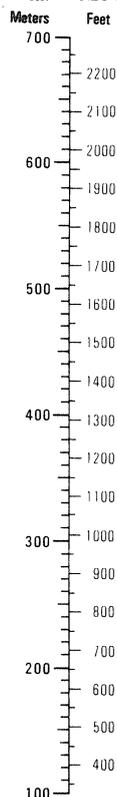


Figure 300-9. Sample Conversion Graph.

315. Slope Guide

A. A slope guide (diagram) is shown to the map user in ascertaining terrain slope. The guide allows identification of terrain slope graphically as a percent and as a gradient (degree). The range of the guide is from 5 percent (2.9°) to 15 percent (8.5°).

B. The slope guide is not shown on a map that does not contain slopes greater than 5 percent. In this case, a note is shown in the Special Notes that reads:

SLOPES ON THIS MAP ARE LESS THAN 5%

C. The guide consists of 11 horizontal lines (5 percent through 15 percent) and 6 vertical lines (representing a span of 6 contours). The intersections of these lines are the distances at the scale of the map between contours for the given percents (degrees).

D. The slope graphic is adjusted to the contour interval shown on the map.

E. The slope graphic is shown in Figure 300-10.

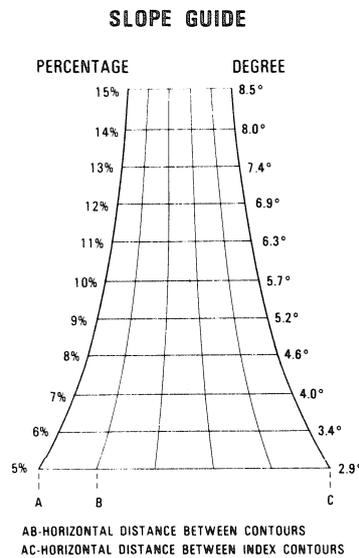


Figure 300-10. Slope Guide

316. Red-light Readable Note

A note is shown in the lower right margin to indicate the map is readable under red-light conditions. The note reads:

THIS MAP IS RED-LIGHT READABLE

CHAPTER 3-MARGIN DATA
SECTION 400-OTHER MARGIN DATA

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401. Publication Note

A. Each map produced by or for DMAHTC contains a publication note which reads:

Prepared and published by the Defense Mapping Agency
Hydrographic/Topographic Center, Washington, D.C.

B. When the map is produced under a cooperative mapping arrangement with another agency or country, the note is patterned after the following:

Prepared and published by the Defense Mapping Agency
Hydrographic/Topographic Center, Washington, D.C.
in cooperation with (country/agency concerned)

402. Credit Listings

A. When specified in supplementary project instructions, credit is given to other topographic units and cooperating agencies for their contributions to certain phases of a mapping project.

B. The credits refer to the work done by the contributing units or agencies in connection with a current map project and not to any work on antecedent map sources.

C. The notes are patterned after the following:

CONTROL BY NGS VIETNAM
NAMES DATA BYUSARPAC, NGS VIETNAM

403. Printing Note

A. The printing note will identify the center printing the map, plus the month and year of printing.

B. For maps printed at DMAHTC, the printing credit will be shown as:

Printed by DMAHTC 6-80

C. For maps printed by other agencies or military commands, the note will be shown as:

Printed by USGS 5-80

404. DMA Seal

A. The Defense Mapping Agency seal is shown on maps published by or for DMAHTC. The seal appears in the lower margin as shown on the Style Sheet, Appendix VI.

B. The DMA seal is shown on maps prepared by DMAHTC for other agencies unless specific directions to the contrary are stated in supplementary instructions for the project.

405. Users Note

A. Each unclassified map prepared by or for DMAHTC contains a users note which reads:

USERS SHOULD REFER CORRECTIONS, ADDITIONS, AND COMMENTS
FOR IMPROVING THIS PRODUCT TO DIRECTOR, DEFENSE MAPPING AGENCY
HYDROGRAPHIC/TOPOGRAPHIC CENTER, WASHINGTON, D.C. 20315, ATTN: PPO.

B. For treatment of translated users notes, see paragraph 104.

C. The note is not shown on classified maps.

406. Security Classification Notes

A. *Classification Marking.* Under certain circumstances, maps are required to bear a security classification marking. The degree of classification is determined in accordance with the provisions of Department of Defense Regulation 5200.1-R, "Information Security Program Regulation." The appropriate classification marking is indicated in the security classification guidance for the project.

B. *Downgrading/Declassification Note.* Each map bearing a security classification marking also identifies the classifier and contains downgrading/declassification instructions. The appropriate note or statement is determined in accordance with the provisions of DoD Regulation 5200.1-R. The specific note is indicated in pertinent security classification guidance for the project.

C. *Special Handling Notes.* Certain maps, classified or unclassified, require notes which restrict their distribution. When required, the appropriate note is specified in the security classification guidance pertaining to the project.

1. Caveat or Special Handling Note. A caveat may be required on maps classified CONFIDENTIAL or higher. Example:

NOT RELEASABLE TO FOREIGN NATIONALS

2. Restricted Dissemination Note. A note of this type may be required on UNCLASSIFIED maps. Example:

DISTRIBUTION LIMITED
DESTROY WHEN NO LONGER NEEDED

CHAPTER 4-REPRODUCTION

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101. Scope

A. This chapter specifies the printing colors and reproduction process screens used in the reproduction of 1:50,000 scale topographic maps of foreign areas.

B. For 1:50,000 scale topographic maps of the United States, refer to Appendix II, Symbols for Maps of the United States, for printing screens of map features.

C. The colors and screen used for special maps, reprints, and military installation maps are specified in supplementary instructions for the project.

102. Paper

Topographic maps are printed on JCP E-40 (Map Litho Finish, Chemical, Wood, White) paper.

103. Tolerances

A. The registration of the color images are accurate to within 0.5 mm (0.02 in) of the map projection and to each other as measured from one corner to another along the longest dimension of the neatline, and does not exceed 0.5 mm (0.02 in) in any direction. Map features register within ± 0.15 mm (0.006 in) between component color parts.

B. Color control blocks are positioned outside the trim limits.

104. Identification of Copy

A. Each piece of reproduction material will be identified.

B. The identification will be located between the registration punch holes as negative see-through film emulsion images. The identification will be in 14-pt gothic caps, or equivalent, set on one line. If the terms exceed the space allowed between the punch holes, the security classification may be extended beyond the second punch hole.

C. The identification will be comprised of the following items in the sequence listed:

1. Series number
2. Sheet number (key number for certain classified maps)
3. Edition number
4. Map feature
5. Security classification

D. Each piece in the set of reproduction material for a classified sheet will show the security classification. This is the only security classification marking required outside the trim limit. The declassification note and restrictive dissemination notes will not be included as a part of this identification.

E. On composites, only the most significant map feature will be retained for the identification item.

105. Printing Colors and Screens

A. The DoD Standard Printing Color (SPC) Catalog, Stock No. CATLXPRTGCOLR72, contains samples of, and standards for, colors used in the lithographic printing of large scale topographic maps.

B. The DoD Standard Printing Screen (SPS) Catalog, Stock No. CATLXPRTGSCRN72, contains samples of, and standards for, screens used in the lithographic printing of large scale topographic maps.

C. The following colors and screens are established:

<u>SEPARATION</u>	<u>SCREEN</u>	<u>SPC COLOR</u>
Culture: Projection; Roads; Railroads and Related Features; Coastal Hydrography	Solid	58600 Black
Culture Type	Solid	58600 Black
Destroyed-Area Tint	21%-120D-45°	58600 Black
Shantytown	AP-132	58600 Black
Grid Lines	Solid	58600 Black

<u>SEPARATION</u>	<u>SCREEN</u>	<u>SPC COLOR</u>
*Grid Values	Solid	58600 Black
Foreshore Flats	AP-95	58600 Black
Coniferous Trees (overprints woodland tint)	AP-60	58600 Black
Deciduous Trees (overprints woodland tint)	AP-54	58600 Black
Mixed Trees (overprints woodland tint)	AP-63	58600 Black
Elevation Guide		
Highest Tint	42%-120D-45°	58600 Black
High Tint	21%-120D-45°	58600 Black
Medium Tint	7%-120D-45°	58600 Black
Low Tint	--	(Prints White)
Road Fill	Solid	61121 Red-Brown
Densely Built-up Area Tint	31%-120D-45°	61121 Red-Brown
Sparsely to Moderately Built-up Area Tint	12%-120D-45°	61121 Red-Brown
Boundary Overprint	21%-120D-75°	61121 Red-Brown
Contours; Form Lines	Solid	61121 Red-Brown
Contour Values	Solid	61121 Red-Brown
Mine Features (Show in Brown); Cut; Fill; Levee; Earthen Dam	Solid	61121 Red-Brown
Sand	AP-95	61121 Red-Brown

*Printing color for British grid values is specified in the project instructions.

<u>SEPARATION</u>	<u>SCREEN</u>	<u>SPC COLOR</u>
Distorted Surface Area	AP-103	61121 Red-Brown
Gravel	AP-99	61121 Red-Brown
Star Dunes (Small Area)	AP-120	61121 Red-Brown
Star Dunes (Large Area)	AP-122	61121 Red-Brown
Lateral Dunes (Small Area)	AP-116	61121 Red-Brown
Lateral Dunes (Large Area)	AP-118	61121 Red-Brown
Crescent Dunes (Small Area)	AP-108	61121 Red Brown
Crescent Dunes (Large Area)	AP-110	61121 Red-Brown
Ripple Dunes (Small Area)	AP-112	61121 Red-Brown
Ripple Dunes (Large Area)	AP-114	61121 Red-Brown
Sand Mounds (Small Area)	AP-124	61121 Red-Brown
Sand Mounds (Large Area)	AP-126	61121 Red Brown
Transverse Dunes (Small Area)	AP-128	61121 Red-Brown
Transverse Dunes (Large Area)	AP-127	61121 Red-Brown
Cultivated Land	7%-120D-45°	58552 Brown
Drainage: Shorelines; Rivers and Streams; Canals; Ditches; Water Conduits; Miscellaneous Water Features	Solid	47651 Blue
Drainage Type	Solid	47651 Blue
Airfield; High Tension Line; Telephone and Telegraph Lines; Obstructions	Solid	47651 Blue
Open-water Tint	31%-120D-45°	47651 Blue

<u>SEPARATION</u>	<u>SCREEN</u>	<u>SPC COLOR</u>
Dry or Cyclical Lake Fill; Intermittent Double-Line Stream or Wadi Fill; Salt- evaporator Fill; Wet Sand	AP-95	47651 Blue
Intermittent Lake Fill	LP-3	47651 Blue
Marsh; Swamp	AP-12	47651 Blue
Rice Field	AP-4	47651 Blue
Land Subject to Inundation	AP-10	47651 Blue
Sabkha	AP-103	47651 Blue
Snow Field; Ice Field	AP-95	47651 Blue
Pack Ice	AP-136 33%-200D-15°/45°	47651 Blue
Settlement-SE Asia	21%-120D-45°	52813 Green
Mangrove (overprints Open-water Tint)	AP-8	52813 Green
Nipa (overprints Open-water Tint)	AP-7	52813 Green
Woodland	21%-120D-45°	52813 Green
Scattered Trees	AP-44	52813 Green
Scrub	AP-68	52813 Green
Orchard	AP-74	52813 Green
Vineyard	AP-77	52813 Green
Tropical Grass	AP-66	52813 Green

D. All interior type printing in black and blue are processed for a 0.2 mm (0.008 in) halo of:

1. All culture (black) linework
2. Grid lines
3. Tree Symbols.

E. Woodland tint and vegetation patterns are masked to prevent overprinting of:

1. Cased roads
2. Route markers
3. Double-line streams (open water tint)
4. Horizontal control points.

F. Drainage and open water tint is masked to prevent overprinting bridges.

G. All features are masked to prevent overprinting route markers.

106. Finishing Instructions

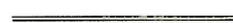
A. Topographic maps at 1:50,000 scale are trimmed 57.5 cm by 73.66 cm (22.5 in by 29.0 in).

B. Maps produced for use in NATO areas of interest are trimmed 55.88 cm by 73.66 cm (22.0 in by 29.0 in).

C. At the prerogative of the reproduction element, the 73.66 cm (29.0 in) trim limit for non-NATO maps may be increased but not to exceed 76.20 cm (30.0 in). Refer to project specifications for applicable sizes.

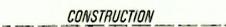
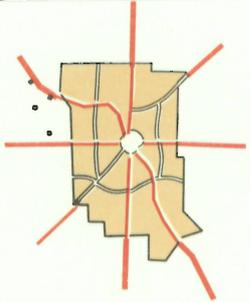
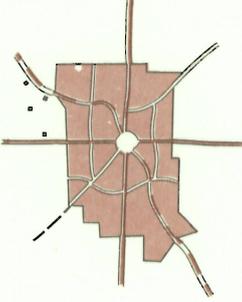
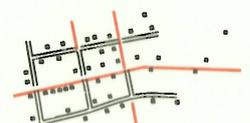
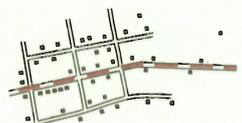
D. The topographic maps at 1:50,000 scale maps are not folded.

ROADS, RAILROADS AND RELATED DATA

HARD SURFACE—ALL WEATHER				
FEATURE	COMPILATION*	DRAFTING	SPECIFICATIONS	NO.
Divided Highway, with Median Strip			MINIMUM WIDTH OVERALL 1.1 mm (.044 in) OUTSIDE CASING WEIGHT 0.25 mm (.01 in) CENTERLINE WEIGHT 0.1 mm (.004 in)	201
Divided Highway, with Median Strip 0.25mm (.01in) or wider, at publication scale			MINIMUM MEDIAN SPACE 0.25 mm (.01 in)—PLOT TO SCALE IF WIDER EACH ROAD SEGMENT MINIMUM WIDTH OVERALL 0.6 mm (.024 in) OUTSIDE CASING WEIGHT 0.25 mm (.01 in) INSIDE CASING WEIGHT 0.1 mm (.004 in)	202
Two or more lanes wide			MINIMUM WIDTH OVERALL 0.8 mm (.032 in) CASING WEIGHT 0.15 mm (.006 in)	203
One lane wide			MINIMUM WIDTH OVERALL 0.6 mm (.024 in) CASING WEIGHT 0.15 mm (.006 in)	204
LOOSE SURFACE—ALL WEATHER				
Two or more lanes wide			MINIMUM WIDTH OVERALL 0.8 mm (.032 in) CASING WEIGHT 0.15 mm (.006 in) DASH 3.0 mm (.12 in) SPACE 1.5 mm (.06 in)	205
One lane wide			MINIMUM WIDTH OVERALL 0.6 mm (.024 in) CASING WEIGHT 0.15 mm (.006 in) DASH 3.0 mm (.12 in) SPACE 1.5 mm (.06 in)	206
LOOSE SURFACE—DRY WEATHER				
Fair or dry weather			MINIMUM WIDTH OVERALL 0.6 mm (.024 in) CASING WEIGHT 0.15 mm (.006 in)	207
Track			LINEWEIGHT 0.25 mm (.01 in) DASH 2.5 mm (.10 in) SPACE 0.5 mm (.02 in)	208
Trail			LINEWEIGHT 0.15 mm (.006 in) DASH 2.0 mm (.08 in) SPACE 0.5 mm (.02 in)	209

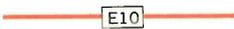
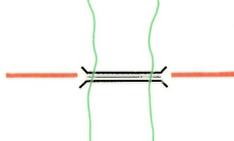
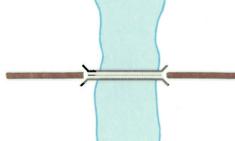
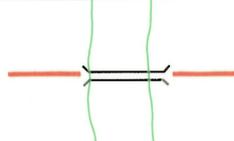
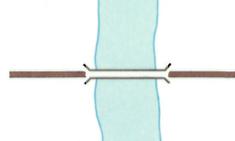
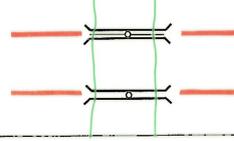
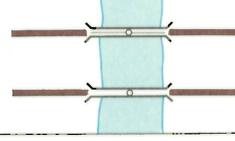
*Lineweights, length of dashes and spaces, and other dimensions approximate the specifications for drafting. Lines are delineated by fine, medium, or heavy lines. All type is freehand lettering.

ROADS, RAILROADS AND RELATED DATA

LOOSE SURFACE—DRY WEATHER				
FEATURE	COMPILATION*	DRAFTING	SPECIFICATIONS	NO.
Footpath			LINWEIGHT 0.15 mm (.006 in) DASH 1.0 mm (.04 in) SPACE 0.5 mm (.02 in) USE ONLY WHEN SPECIFIED IN SUPPLEMENTARY PROJECT INSTRUCTIONS.	210
ROADS UNDER CONSTRUCTION				
Under Construction: Classification known			USE APPROPRIATE ROAD CLASSIFICATION FILL	211
Under Construction: Classification unknown			MINIMUM WIDTH OVERALL 0.6 mm (.024 in) CASING WEIGHT 0.15 mm (.006 in) DASH 2.5 mm (.10 in) SPACE 0.5 mm (.02 in)	212
Planned road			LINWEIGHT 0.2 mm (.008 in) DASH 2.0 mm (.08 in) SPACE 0.5 mm (.02 in)	213
ROADS AND STREETS IN BUILT-UP AREA				
Through Routes in Tinted Built-up Areas				214
Through Routes in Non-tinted Built-up Areas				215
Streets in Built-up Areas			LINWEIGHT 0.1 mm (.004 in) OVERALL WIDTH 0.5 mm (.02 in) OVERALL WIDTH MAY BE REDUCED TO 0.4 mm (.016 in) IN PLACES OF DENSE CONCENTRATION OF STREETS.	216
Dead-end streets			LINWEIGHT 0.1 mm (.004 in)	217

*Lineweights, length of dashes and spaces, and other dimensions approximate the specifications for drafting. Lines are delineated by fine, medium, or heavy lines. All type is freehand lettering.

ROADS, RAILROADS AND RELATED DATA

RELATED ROAD DATA				
FEATURE	COMPILATION*	DRAFTING	SPECIFICATIONS	NO.
Approximate alignment			USE APPROPRIATE ROAD CLASSIFICATION FILL	218
Point or change in lane information			LINEWEIGHT 0.15 mm (.006 in) LENGTH 1.5 mm (.06 in)	219
Road names				220
Route Marker: European International			POSICUT 811A	221
Route marker: National			POSICUT 25A-29A	222
Route Marker: Secondary			POSICUT 19A-24A NATIVE COUNTRY SYMBOLS WILL BE USED IF INFORMATION IS AVAILABLE.	223
Traffic circle			INNER CIRCLE DIAMETER 0.75 mm (.03 in) OUTER CIRCLE DIAMETER 1.9 mm (.075 in) LINEWEIGHT 0.15 mm (.006 in) PLOT TO SCALE IF LARGER THAN STATED SIZE. SHOW ACTUAL ROAD CLASSIFICATION.	224
Interchanges (example only)			DRAFT ACCESS ROADS 0.5 mm (.02 in) REDUCTION TO 0.4 mm (.016 in) IS PERMISSIBLE IN CONGESTED AREAS PLOT INTERCHANGES IN TRUE SHAPE AND POSITION. SLIGHT EXAGGERATION IS PERMISSIBLE, IF NECESSARY, TO IMPROVE LEGIBILITY. LINEWEIGHT 0.1 mm (.004 in)	225
Highway bridge, with superstructure			BRIDGE WEIGHT 0.25 mm (.01 in) WINGTICK LENGTH 0.6 mm (.024 in) ANGLE 45° SPACE BETWEEN SIDES SAME AS OVERALL ROAD WIDTH. MINIMUM SPACE 0.6 mm (.024 in) CENTER LINEWEIGHT 0.1 mm (.004 in) ROAD BROKEN 0.5 mm (.02 in) FROM BRIDGE PLOT TO SCALE IF LONGER THAN MINIMUM LENGTH 1.5 mm (.06 in)	226
Highway bridge, without superstructure			BRIDGE WEIGHT 0.25 mm (.01 in) WINGTICK LENGTH 0.6 mm (.024 in) ANGLE 45° SPACE BETWEEN SIDES SAME AS OVERALL ROAD WIDTH. ROAD BROKEN 0.5 mm (.02 in) FROM BRIDGE PLOT TO SCALE IF LONGER THAN MINIMUM LENGTH 1.5 mm (.06 in)	227
Highway drawbridge			CIRCLE: DIAMETER SAME AS ROAD WIDTH LINEWEIGHT 0.15 mm (.006 in) OTHER DIMENSIONS SAME AS HIGHWAY BRIDGES, WITH SUPERSTRUCTURE AND WITHOUT SUPERSTRUCTURE	228

*Lineweights, length of dashes and spaces, and other dimensions approximate the specifications for drafting. Lines are delineated by fine, medium, or heavy lines. All type is freehand lettering.

ROADS, RAILROADS AND RELATED DATA

RELATED ROAD DATA				
FEATURE	COMPILATION*	DRAFTING	SPECIFICATIONS	NO.
Track bridge			DIMENSIONS SAME AS FOR HIGHWAY BRIDGES, WITH SUPERSTRUCTURE AND WITHOUT SUPERSTRUCTURE	229
Footbridge			BRIDGE WEIGHT 0.25 mm (.01 in) WINGTICK LENGTH 0.6 mm (.024 in) ANGLE 45° PLOT TO SCALE IF LONGER THAN MINIMUM LENGTH 1.5 mm (.06 in)	230
Bridge characteristics: construction material- unrestricted clearance				231
Bridge characteristics: construction material- restricted clearance				232
Causeway			LINEWEIGHT 0.25 mm (.01 in) WINGTICK LENGTH 0.6 mm (.024 in) ANGLE 45° MINIMUM PLOTTED LENGTH 1.5 mm (.06 in) PLOT TO SCALE IF LONGER THAN MINIMUM SIZE	233
Overpass; Underpass			ROADS UNDERPASSING RAILROADS ARE BROKEN 0.5 mm (.02 in) FROM CENTER LINE OF RAILROAD	234
Highway tunnel			TUNNEL LINEWEIGHT 0.15 mm (.006 in) WIDTH SAME AS ROAD WINGTICK LENGTH 0.6 mm (.024 in) ANGLE 45° DASH 1.0 mm (.04 in) SPACE 0.5 mm (.02 in)	235
Ferry across narrow streams			LINEWEIGHT 0.1 mm (.004 in) DASH 1.0 mm (.04 in) SPACE 0.5 mm (.02 in) ABBREVIATION "Fy" MAY BE USED IN CONGESTED AREAS	236
Ferry across open water			LINEWEIGHT 0.1 mm (.004 in) DASH 1.0 mm (.04 in) SPACE 0.5 mm (.02 in)	237
Ford across narrow streams			ABBREVIATION "Fd" MAY BE USED IN CONGESTED AREAS	238

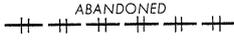
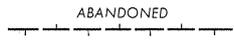
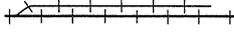
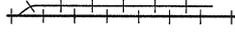
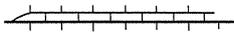
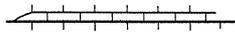
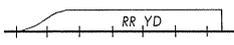
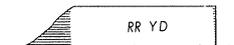
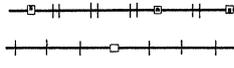
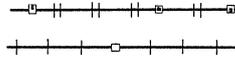
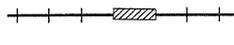
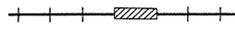
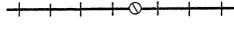
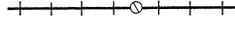
*Lineweights, length of dashes and spaces, and other dimensions approximate the specifications for drafting. Lines are delineated by fine, medium, or heavy lines. All type is freehand lettering.

ROADS, RAILROADS AND RELATED DATA

RELATED ROAD DATA				
FEATURE	COMPILATION*	DRAFTING	SPECIFICATIONS	NO.
Ford across wide streams			LINEWEIGHT 0.1 mm (.004 in) DASH 1.0 mm (.04 in) SPACE 0.5 mm (.02 in)	239
Kilometer or mileage marker			LINEWEIGHT 0.15 mm (.006 in) LENGTH 1.0 mm (.04 in)	240
Winding roads (hairpin turns)				241
OPERATING RAILROADS				
Normal or broad gauge, single track			BASE WEIGHT 0.3 mm (.012 in) TICK: LINEWEIGHT 0.15 mm (.006 in) LENGTH 1.5 mm (.06 in) SPACING 4.0 mm (.16 in) LABEL BROAD GAUGE AS TO GAUGE	242
Normal or broad gauge, double or multiple track			BASEWEIGHT 0.3 mm (.012 in) TICKS: LINEWEIGHT 0.15 mm (.006 in) LENGTH 1.5 mm (.06 in) SPACING BETWEEN SETS 4.0 mm (.16 in) SPACING BETWEEN TICKS IN EACH PAIR 0.5 mm (.02 in) LABEL BROAD GAUGE AS TO GAUGE LABEL NUMBER OF TRACKS, IF MORE THAN TWO	243
Narrow gauge single track			BASE WEIGHT 0.3 mm (.012 in) TICK: LINEWEIGHT 0.15 mm (.006 in) LENGTH 0.75 mm (.03 in) SPACING 4.0 mm (.16 in) LABEL AS TO GAUGE	244
Narrow gauge double or multiple track			BASE WEIGHT 0.3 mm (.012 in) TICKS: LINEWEIGHT 0.15 mm (.006 in) LENGTH 0.75 mm (.03 in) SPACING BETWEEN SETS 4.0 mm (.16 in) SPACING BETWEEN TICKS IN EACH PAIR 0.5 mm (.02 in) LABEL AS TO GAUGE LABEL NUMBER OF TRACKS, IF MORE THAN TWO	245
Railroad in road or street (all gauges)			TICK WEIGHT 0.15 mm (.006 in) SPACING 4.0 mm (.16 in)	246
Railroads in juxtaposition			MINIMUM SPACING BETWEEN RAILROAD CENTER LINES 0.3 mm (.012 in) PLOT TO SCALE IF WIDER LABEL BROAD GAUGE AS TO GAUGE	247
NON-OPERATING RAILROADS				
Normal or broad gauge, single track			DIMENSIONS SAME AS OPERATING RAILROAD SPACE BETWEEN SEGMENTS 0.5 mm (.02 in) LABEL ABANDONED, DESTROYED, CONSTRUCTION, AS APPLICABLE LABEL BROAD GAUGE AS TO GAUGE	248

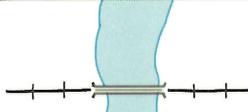
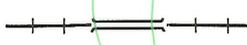
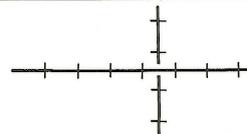
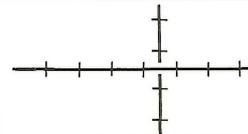
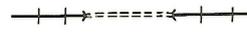
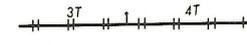
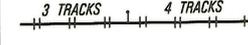
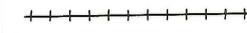
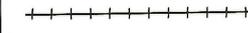
*Lineweights, length of dashes and spaces, and other dimensions approximate the specifications for drafting. Lines are delineated by fine, medium, or heavy lines. All type is freehand lettering.

ROADS, RAILROADS AND RELATED DATA

NON-OPERATING RAILROADS				
FEATURE	COMPILATION*	DRAFTING	SPECIFICATIONS	NO.
Normal or broad gauge, double or multiple track			DIMENSIONS SAME AS OPERATING RAILROAD SPACE BETWEEN SEGMENTS 0.5 mm (.02 in) LABEL ABANDONED, DESTROYED, CONSTRUCTION AS APPLICABLE LABEL BROAD GAUGE AS TO GAUGE LABEL NUMBER OF TRACKS, IF MORE THAN TWO	249
Narrow gauge, single track			DIMENSIONS SAME AS OPERATING RAILROAD SPACE BETWEEN SEGMENTS 0.5 mm (.02 in) LABEL ABANDONED, DESTROYED, CONSTRUCTION AS APPLICABLE LABEL AS TO GAUGE	250
Narrow gauge, double or multiple track			DIMENSIONS SAME AS OPERATING RAILROAD SPACE BETWEEN SEGMENTS 0.5 mm (.02 in) LABEL ABANDONED, DESTROYED, CONSTRUCTION AS APPLICABLE LABEL AS TO GAUGE LABEL NUMBER OF TRACKS, IF MORE THAN TWO	251
RELATED RAILROAD DATA				
Siding, normal or broad gauge			WEIGHT 0.2 mm (.008 in) TICK: LINEWEIGHT 0.15 mm (.006 in) LENGTH 1.5 mm (.06 in) SPACING 4.0 mm (.16 in) MINIMUM SPACING FROM CENTER LINE OF RAILROAD 0.3 mm (.012 in)	252
Siding, narrow gauge			WEIGHT 0.2 mm (.008 in) TICK: LINEWEIGHT 0.15 mm (.006 in) LENGTH 0.75 mm (.03 in) SPACING 4.0 mm (.16 in) MINIMUM SPACING FROM CENTER LINE OF RAILROAD 0.3 mm (.012 in)	253
Railroad yard, widest part less than 4.0mm (.16in) in width			YARD TRACK LINEWEIGHTS 0.1 mm (.004 in) SPACING BETWEEN YARD TRACKS 0.25 mm (.01 in) YARD TRACK TIE SPACING 4.0 mm (.16 in)	254
Railroad yard, exceeding 4.0mm (.16in) in width at the widest part			CROSS TIE LENGTHS 2.5 mm (.10 in) OTHER DIMENSIONS SAME AS 254	255
Railroad station: Location known Location unknown			OVERALL SIZE OF OPEN SQUARE 1.20 mm (.048 in) LINEWEIGHT 0.1 mm (.004 in) BUILDING SIZE 0.5 mm X 0.5 mm (.02 in X .02 in)	256
Snowshed			LINEWEIGHT 0.1 mm (.004 in) MINIMUM SHED WIDTH 1.5 mm (.06 in) PLOT SHED LENGTH TO SCALE DIAGONAL LINES 45° SPACE 0.5 mm (.02 in)	257
Turntable			LINEWEIGHT 0.1 mm (.004 in) DIAMETER 1.5 mm (.06 in) DIAGONAL LINE 45°	258

*Lineweights, length of dashes and spaces, and other dimensions approximate the specifications for drafting. Lines are delineated by fine, medium, or heavy lines. All type is freehand lettering.

ROADS, RAILROADS AND RELATED DATA

RELATED RAILROAD DATA				
FEATURE	COMPILATION*	DRAFTING	SPECIFICATIONS	NO.
Dismantled railroad			LINEWEIGHT 0.1 mm (.004 in) DASH 1.0 mm (.04 in) SPACE 0.5 mm (.02 in)	259
Electrified railroad				260
Railroad bridge, with superstructure			BRIDGE WEIGHT 0.25 mm (.01 in) WINGTICK LENGTH 0.6 mm (.024 in) ANGLE 45° SPACE BETWEEN SIDES 0.6 mm (.024 in) CENTER LINEWEIGHT 0.1 mm (.004 in) RAILROAD BROKEN 0.5 mm (.02 in) FROM BRIDGE PLOT TO SCALE IF LONGER THAN MINIMUM LENGTH 1.5 mm (.06 in)	261
Railroad bridge, without superstructure			BRIDGE WEIGHT 0.25 mm (.01 in) WINGTICK LENGTH 0.6 mm (.024 in) ANGLE 45° SPACE BETWEEN SIDES 0.6 mm (.024 in) RAILROAD BROKEN 0.5 mm (.02 in) FROM BRIDGE PLOT TO SCALE IF LONGER THAN MINIMUM LENGTH 1.5 mm (.06 in)	262
Railroad drawbridge			CIRCLE: DIAMETER 0.6 mm (.024 in) LINEWEIGHT 0.15 mm (.006 in) OTHER DIMENSIONS SAME AS FOR RAILROAD BRIDGES, WITH SUPERSTRUCTURE AND WITHOUT SUPERSTRUCTURE.	263
Bridge characteristics: construction material-unrestricted clearance				264
Bridge characteristics: construction material-restricted clearance				265
Railroad overpass			UNDERPASSING RAILROAD BROKEN 0.5 mm (.02 in) FROM CENTER LINE OF OVERPASSING RAILROAD	266
Railroad tunnel			LINEWEIGHT 0.15 mm (.006 in) WINGTICK LENGTH 0.6 mm (.024 in) ANGLE 45° DASH 1.0 mm (.04 in) SPACE 0.5 mm (.02 in) WIDTH OF TUNNEL 0.6 mm (.024 in)	267
Point of change in gauge or number of tracks			LINEWEIGHT 0.15 mm (.006 in) LENGTH 1.5 mm (.06 in) BALL DIAMETER 0.25 mm (.01 in)	268
Car line, operating			LINEWEIGHT 0.2 mm (.008 in) TICK: LINEWEIGHT 0.15 mm (.006 in) LENGTH 1.5 mm (.06 in) SPACING 2.5 mm (.10 in)	269

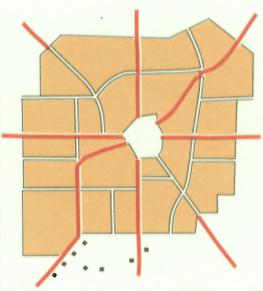
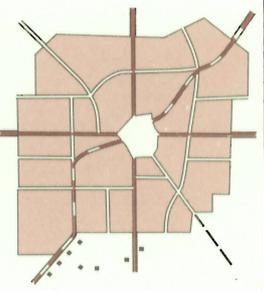
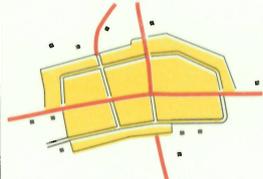
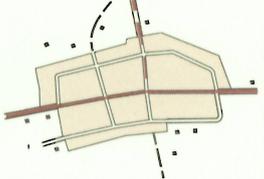
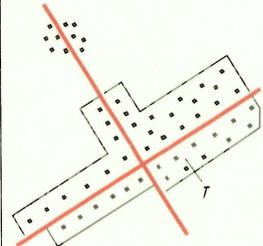
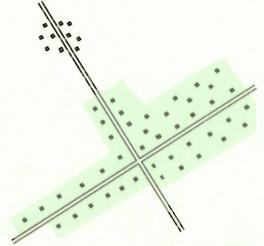
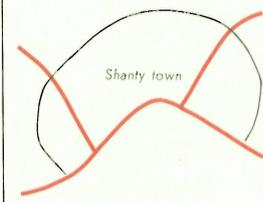
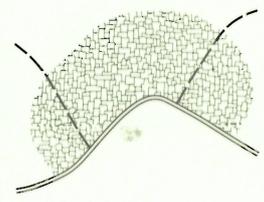
*Lineweights, length of dashes and spaces, and other dimensions approximate the specifications for drafting. Lines are delineated by fine, medium, or heavy lines. All type is freehand lettering.

ROADS, RAILROADS AND RELATED DATA

RELATED RAILROAD DATA				
FEATURE	COMPILATION*	DRAFTING	SPECIFICATIONS	NO.
Car line, non-operating	<i>ABANDONED</i> + + + + + + + + + + + + + + + + + +	<i>ABANDONED</i> + + + + + + + + + + + + + + + + + +	SAME DIMENSIONS AS OPERATING CARLINE SPACE BETWEEN SEGMENTS 0.5 mm (.02 in) LABEL ABANDONED, DESTROYED, CONSTRUCTION AS APPLICABLE	270
Conveyor belt, aerial cableway, ski lift, or other linear transportation feature	<i>Conveyor belt</i> - - - - -	<i>Conveyor belt</i> - - - - -	LINEWEIGHT 0.1 mm (.004 in) DASH 1.5 mm (.06 in) SPACE 0.5 mm (.02 in) LABEL APPROPRIATELY	271

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BUILDINGS AND POPULATED PLACES

BUILT-UP AREA				
FEATURE	COMPILATION*	DRAFTING	SPECIFICATIONS	NO.
Densely built-up area			LIMITING LINE LINEWEIGHT 0.1 mm (.004 in) FILL 31%–120D–45°	301
Sparsely-to-moderately built-up area, settlement			LIMITING LINE LINEWEIGHT 0.1 mm (.004 in) FILL 12%–120D–45°	302
Settlement, Southeast Asia			VEGETATION: 21%–120D–45°	303
Shanty town			AP 132	304
BUILDINGS				
Buildings	• •	• •	PLOT TO SCALE WHEN BUILDING EXCEEDS 0.5 mm (.02 in) SQUARE MAY BE REDUCED TO 0.4 mm (.016 in) SQUARE IN CONGESTED AREAS	305

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BUILDINGS AND POPULATED PLACES

RELIGIOUS BUILDINGS				
FEATURE	COMPILATION*	DRAFTING	SPECIFICATIONS	NO.
Church	⋮	⋮	POSICUT 3AA/101 PLOT TO SCALE WHEN BUILDING EXCEEDS 0.7 mm (.028 in) SQUARE	306
Chapel	⋮	⋮	POSICUT 3AA/101	307
Shrine	⋮	⋮	POSICUT 3AA/101	308
Mosque	⋮	⋮	POSICUT 3AA/101 PLOT TO SCALE WHEN BUILDING EXCEEDS 0.7 mm (.028 in) SQUARE	309
Koubba (Moslem shrine)	⋮	⋮	POSICUT 3AA/101	310
Marabout (tomb)	⋮	⋮	POSICUT 3AA/101	311
Synagogue	⋮	⋮	POSICUT 3AA/101 PLOT TO SCALE WHEN BUILDING EXCEEDS 0.7 mm (.028 in) SQUARE	312
Major pagoda	⋮	⋮	POSICUT 3AA/101 ALIGN WITH SOUTH NEATLINE	313
Pagoda	⋮	⋮	POSICUT 3AA/101 ALIGN WITH SOUTH NEATLINE	314
Temple	⋮	⋮	POSICUT 3AA/101 ALIGN WITH SOUTH NEATLINE	315
Shinto Shrine	⋮	⋮	POSICUT 3AA/101 ALIGN WITH SOUTH NEATLINE	316

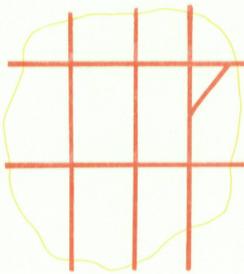
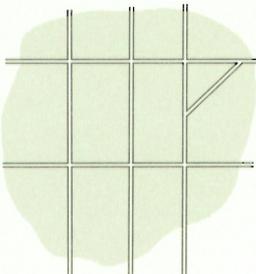
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BUILDINGS AND POPULATED PLACES

RELIGIOUS BUILDINGS				
FEATURE	COMPILATION*	DRAFTING	SPECIFICATIONS	NO.
Stupa			POSICUT 3AA/101 ALIGN WITH SOUTH NEATLINE	317
Temple (S.E. Asia)			POSICUT 3AA/101 ALIGN WITH SOUTH NEATLINE	318
Buddhist Shrine			POSICUT 3AA/101 ALIGN WITH SOUTH NEATLINE	319
OTHER IMPORTANT BUILDINGS				
School			POSICUT 3AA/101 PLOT TO SCALE WHEN BUILDING EXCEEDS 0.7 mm (.028 in) SQUARE	320
Hospital 1.5mm (.06in) square or larger			PLOT BUILDING TO SCALE SYMBOL POSICUT 3AA/101	321
Hospital less than 1.5mm (.06in) square			POSICUT 3AA/101	322
Small fort			POSICUT 3AA/101	323
OTHER DWELLINGS				
Cave dwellings			POSICUT 3AA/101 ALIGN WITH SOUTH NEATLINE	324
Underground dwelling			POSICUT 3AA/101 ALIGN WITH SOUTH NEATLINE	325
Tents			POSICUT 3AA/101 ALIGN WITH SOUTH NEATLINE	326

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BUILDINGS AND POPULATED PLACES

OTHER DWELLINGS				
FEATURE	COMPILATION*	DRAFTING	SPECIFICATIONS	NO.
Huts			POSICUT 3AA/101	327
DESTROYED BUILDINGS AND RUINS				
Destroyed areas and buildings			12%–120D–45°	328
Destroyed building			POSICUT 3AA/101 PLOT TO SCALE WHEN BUILDING EXCEEDS 0.5 mm (.02 in) SQUARE	329
Ruins			POSICUT 3AA/101 PLOT TO SCALE WHEN BUILDING EXCEEDS 0.5 mm (.02 in) SQUARE	330
Area of ruins			LINEWEIGHT 0.1 mm (.004 in) DASH 0.8mm (.032 in) SPACE 0.4 mm (.016 in)	331

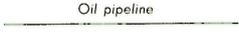
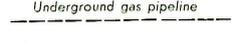
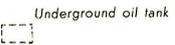
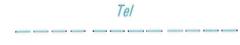
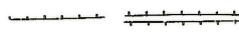
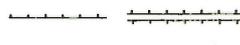
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MISCELLANEOUS CULTURAL FEATURES

LOCATED OBJECTS				
FEATURE	COMPILATION*	DRAFTING	SPECIFICATIONS	NO.
Located object less than 61m (200ft) above ground	 Tower	 Tower	POSICUT 3AA/101 OUTSIDE DIAMETER 1.0 mm (.04 in) LINEWEIGHT 0.1 mm (.004 in) DOT 0.2 mm (.008 in)	401
Chimney less than 61m (200ft) above ground	 Chimney	 Chimney	POSICUT 3AA/101 ALIGN WITH SOUTH NEATLINE	402
Lighthouse	 Lighthouse	 Lighthouse	POSICUT 3AA/101	403
Lookout tower	 Lookout tower	 Lookout tower	POSICUT 3AA/101 ALIGN WITH SOUTH NEATLINE	404
Windmill, windpump	 Windmill	 Windmill	POSICUT 3AA/101 ALIGN WITH SOUTH NEATLINE	405
Water mill	 Water mill	 Water mill	POSICUT 3AA/101 ALIGN WITH SOUTH NEATLINE	406
Monument	 Monument	 Monument	POSICUT 3AA/101 ALIGN WITH SOUTH NEATLINE	407
Radio Mast or mast less than 61m (200ft) above ground	 Radio Mast	 Radio Mast	POSICUT 3AA/101 ALIGN WITH SOUTH NEATLINE	408
Cairn	 Cairn	 Cairn	POSICUT 3AA/101 ALIGN WITH SOUTH NEATLINE	409
Power transformer station	 Power transformer station	 Power transformer station	POSICUT 3AA/101 ALIGN WITH SOUTH NEATLINE	410
Greenhouse	 Greenhouse	 Greenhouse	PLOT TO SCALE WHEN BUILDING EXCEEDS 0.5 mm (.02 in) SQUARE LINEWEIGHT 0.1 mm (.004 in)	411

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MISCELLANEOUS CULTURAL FEATURES

PIPELINES				
FEATURE	COMPILATION*	DRAFTING	SPECIFICATIONS	NO.
Landmark pipeline, gas or oil, above ground			LINEWEIGHT 0.15 mm (.006 in)	412
Landmark pipeline, gas or oil, below ground			LINEWEIGHT 0.15 mm (.006 in) DASH 2.0 mm (.08 in) SPACE 0.4 mm (.016 in)	413
WELLS, TANKS, RESERVOIRS				
Well: oil, gas, salt, etc., excluding water			POSICUT 3AA/101	414
Tank: gasoline, oil, gas, water, etc.; with levee			PLOT TO SCALE WHEN DIAMETER EXCEEDS 0.8 mm (.032 in) SEE SYMBOL 471 FOR LEVEE DIMENSIONS	415
Elevated tank			POSICUT 3AA/101 ALIGN WITH SOUTH NEATLINE	416
Reservoir, other than water, artificial (masonry) limits			PLOT TO SCALE MINIMUM SIZE 0.5 mm (.02 in) SQUARE LINEWEIGHT 0.1 mm (.004 in)	417
Underground storage facility			PLOT TO SCALE LINEWEIGHT 0.1 mm (.004 in) DASH 0.8 mm (.032 in) SPACE 0.4 mm (.016 in)	418
POWER LINES AND TELEPHONE LINES				
High tension power transmission line			LINEWEIGHT 0.3 mm (.012 in) LINE BROKEN 0.5 mm (.02 in) FROM PYLON PYLON: POSICUT 3AA/101 SPACING 20.0 mm (0.8 in)	419
Telephone or telegraph line			LINEWEIGHT 0.15 mm (.006 in) DASH 2.0 mm (.08 in) SPACE 0.4 mm (.016 in)	420
WALLS AND FENCES				
Wall; wall along road			LINEWEIGHT 0.15 mm (.006 in) ABUTMENT: HEIGHT 0.25 mm (.01 in) WIDTH 0.4 mm (.016 in) SPACE BETWEEN ABUTMENTS 2.0 mm (.08 in)	421

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MISCELLANEOUS CULTURAL FEATURES

WALLS AND FENCES				
FEATURE	COMPILATION*	DRAFTING	SPECIFICATIONS	NO.
Stone fence			LINEWEIGHT 0.15 mm (.006 in) 33% BIANGLE	422
Wood fence			LINEWEIGHT 0.1 mm (.004 in) TICKS: LENGTH 0.4 mm (.016 in) SPACE 2.5 mm (.1 in)	423
Barbed wire fence; type unknown			LINEWEIGHT 0.1 mm (.004 in) DASH 4.0 mm (.16 in) SPACE 1.5 mm (.06 in) "X": WIDTH 1.0 mm (.04 in) LENGTH 1.5 mm (.06 in)	424
RECREATIONAL AREAS				
Fairgrounds, amusement parks, golf courses, rifle ranges, sport centers and similar areas			PLOT TO SCALE LINEWEIGHT 0.1 mm (.004 in) DASH 0.8 mm (.032 in) SPACE 0.4 mm (.016 in)	425
Racetrack			LINEWEIGHT 0.1 mm (.004 in) DISTANCE BETWEEN LINES 0.5 mm (.02 in)	426
Stadium			PLOT TO SCALE LINEWEIGHT 0.1 mm (.004 in) DASH 0.8 mm (.032 in) SPACE 0.4 mm (.016 in)	427
CEMETERIES				
Cemetery	<ul style="list-style-type: none"> ⊔ Buddhist † Christian ‡ Hebrew ⴒ Mohammedan 		PLOT TO SCALE LINEWEIGHT 0.1 mm (.004 in) DASH 0.8 mm (.032 in) SPACE 0.4 mm (.016 in) MINIMUM SIZE OF OUTLINE 1.8 mm (.07 in) SQUARE MINIMUM DISTANCE BETWEEN SYMBOLS 1.25 mm (.05 in) SHOW APPROPRIATE SYMBOL WITHIN OUTLINE OR LABEL "CEM" IF RELIGION IS NOT KNOWN	428
Church yard cemetery			LINEWEIGHT 0.1 mm (.004 in) DASH 0.8 mm (.032 in) SPACE 0.4 mm (.016 in)	429
Isolated grave without outline	† ‡ ⴒ ⊔	† ‡ ⴒ ⊔	POSICUT 3AA/101	430

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MISCELLANEOUS CULTURAL FEATURES

AERONAUTICAL DATA				
FEATURE	COMPILATION*	DRAFTING*	SPECIFICATIONS	NO.
Airfield, hard surface runways			PLOT TO SCALE OUTLINE WEIGHT 0.1 mm (.004 in) DASH 0.8 mm (.032 in) SPACE 0.4 mm (.016 in)	431
Airfield, loose surface runways			PLOT TO SCALE OUTLINE WEIGHT 0.1 mm (.004 in) DASH 0.8 mm (.032 in) SPACE 0.4 mm (.016 in)	432
Airfield, limits and runway information unknown			POSICUT 3AA/101 ALIGN WITH SOUTH NEATLINE	433
Obstruction, 61m (200ft) or more above ground			POSICUT 3AA/101 ALIGN WITH SOUTH NEATLINE	434
Heliport			POSICUT 3AA/101 ALIGN WITH SOUTH NEATLINE	435
Seaplane base			LINEWEIGHT 0.1 mm (.004 in) DASH 0.8 mm (.032 in) SPACE 0.4 mm (.016 in)	436
Seaplane anchorage			LINEWEIGHT 0.1 mm (.004 in) DASH 0.8 mm (.032 in) SPACE 0.4 mm (.016 in)	437
Seaplane base, information not available			POSICUT 3AA/101 ALIGN WITH SOUTH NEATLINE	438
Seaplane anchorage, information not available			POSICUT 3AA/101 ALIGN WITH SOUTH NEATLINE	439

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MISCELLANEOUS CULTURAL FEATURES

BOUNDARIES				
FEATURE	COMPILATION*	DRAFTING	SPECIFICATIONS	NO.
International boundary			LINEWEIGHT 0.4 mm (.016 in) LONG DASH 6.5 mm (.25 in) SHORT DASH 1.5 mm (.06 in) SPACE 0.8 mm (.032 in) OVERPRINT 2.0 mm (.08 in) 21°-1200-60°	440
First-order administrative boundary			LINEWEIGHT 0.3 mm (.012 in) LONG DASH 6.5 mm (.25 in) SHORT DASH 1.5 mm (.06 in) SPACE 0.8 mm (.032 in)	441
Second-order administrative boundary			LINEWEIGHT 0.25 mm (.01 in) LONG DASH 6.5 mm (.25 in) SHORT DASH 1.5 mm (.06 in) SPACE 0.8 mm (.032 in)	442
Third-order administrative boundary			LINEWEIGHT 0.25 mm (.01 in) LONG DASH 4.0 mm (.16 in) SHORT DASH 2.0 mm (.08 in) SPACE 0.8 mm (.032 in)	443
Point of change in boundary status			TICK: LINEWEIGHT 0.2 mm (.008 in) LENGTH 1.5 mm (.06 in)	444
Other lines of separation of sovereignty or control			LINEWEIGHT 0.4 mm (.016 in) DASH 4.0 mm (.16 in) SPACE 1.2 mm (.048 in) OVERPRINT 2.0 mm (.08 in) 21°-1200-60°	445
Reserve Boundary			LINEWEIGHT 0.2 mm (.008 in) DASH 6.5 mm (.25 in) SPACE BETWEEN DASHES 2.5 mm (.10 in) DOT 0.25 mm (.01 in)	446
Military reservation boundary			LINEWEIGHT 0.2 mm (.008 in) DASH 6.5 mm (.25 in) SPACE BETWEEN DASHES 2.5 mm (.10 in) OVERPRINT 1.5 mm (.06 in) 21°-1200-60°	447
Boundary in road			LINEWEIGHT OF BOUNDARY IN ROAD 0.1 mm (.004 in) SHOW COMPLETE SYMBOLS WHERE BOUNDARY ENTERS AND LEAVES THE ROAD CASING. SHOW EVERY THIRD UNIT OF SYMBOL ALONG ROAD WHEN PRACTICABLE	448
Boundary along edge of road			SHOW OVERPRINT ONE-HALF THE NORMAL WIDTH. SHOW EVERY THIRD UNIT OF SYMBOL ALONG ROAD WHEN PRACTICABLE	449

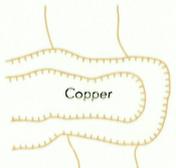
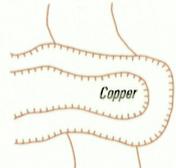
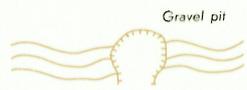
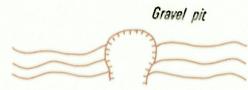
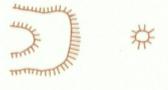
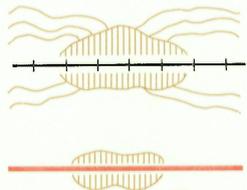
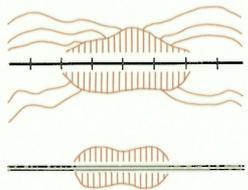
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MISCELLANEOUS CULTURAL FEATURES

BOUNDARIES				
FEATURE	COMPILATION*	DRAFTING	SPECIFICATIONS	NO.
Boundary in double line stream				450
Boundary coincident with shoreline			SHOW OVERPRINT ONE-HALF THE NORMAL WIDTH. SHOW EVERY THIRD UNIT OF SYMBOL ALONG SHORELINE WHEN PRACTICABLE.	451
Boundary coincident with single line stream			SHOW EVERY THIRD UNIT OF SYMBOL ALONG STREAM WHEN PRACTICABLE. ADDITIONAL UNITS SHOULD BE ADDED WHERE NECESSARY TO CLARIFY BOUNDARY ALIGNMENT.	452
Boundary marker with number			LINWEIGHT 0.1 mm (.004 in) SQUARE 1.0 mm (.04 in) DOT 0.2 mm (.008 in)	453
MINING FEATURES				
Mining area			LINWEIGHT 0.1 mm (.004 in) DASH 0.8 mm (.032 in) SPACE 0.4 mm (.016 in)	454
Mine, vertical shaft			POSICUT 3AA/101 ALIGN WITH SOUTH NEATLINE	455
Mine, horizontal shaft			POSICUT 3AA/101 ALIGN WITH SOUTH NEATLINE	456
Strip mine			LINWEIGHT 0.1 mm (.004 in) DASH 0.8 mm (.032 in) SPACE 0.4 mm (.016 in)	457
Placer mine			LINWEIGHT 0.1 mm (.004 in)	458

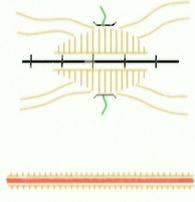
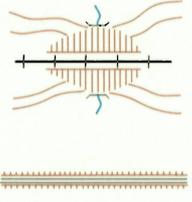
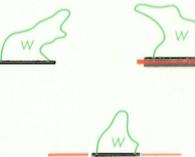
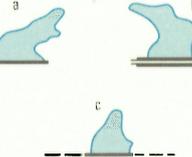
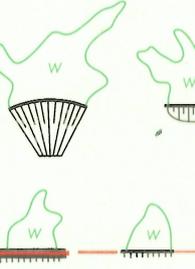
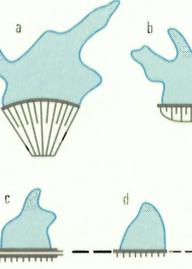
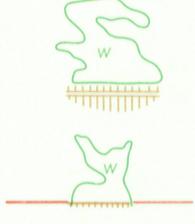
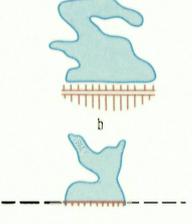
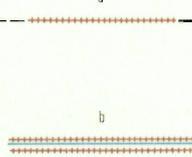
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MISCELLANEOUS CULTURAL FEATURES

MINING FEATURES				
FEATURE	COMPILATION*	DRAFTING	SPECIFICATIONS	NO.
Open-pit mine			TICKS: LINEWEIGHT 0.15 mm (.006 in) LENGTH 0.4 mm (.016 in) SPACE 0.8 mm (.032 in)	459
Quarry, active			POSICUT 3AA/101 TICKS: LINEWEIGHT 0.15 mm (.006 in) LENGTH 0.4 mm (.016 in) SPACE 0.8 mm (.032 in)	460
Quarry, inactive			POSICUT 3AA/101 TICKS: LINEWEIGHT 0.15 mm (.006 in) LENGTH 0.4 mm (.016 in) SPACE 0.8 mm (.032 in)	461
Gravel or borrow pit			TICKS: LINEWEIGHT 0.15 mm (.006 in) LENGTH 0.4 mm (.016 in) SPACE 0.8 mm (.032 in)	462
Tailings, slag dump			ALL LINEWEIGHTS 0.15 mm (.006 in) PLOT TO SCALE MINIMUM LENGTH OF TICKS 0.4 mm (.016 in) SPACE 0.4 mm (.016 in)	463
Mine, type unknown; active; abandoned			POSICUT 3AA/101	464
Prospect	X	X	POSICUT 3AA/101	465
CUTS AND FILLS				
Cut			LINEWEIGHT 0.15 mm (.006 in) TICKS: SPACE 0.6 mm (.024 in) MINIMUM LENGTH 0.4 mm (.016 in) BREAK TICKS 0.25 mm (.01 in) FROM LINEAR FEATURE WHERE POSSIBLE, PLOT OUTLINE IN TRUE SHAPE AND POSITION	466

*Lineweights, length of dashes and spaces, and other dimensions approximate the specifications for drafting. Lines are delineated by fine, medium, or heavy lines. All type is freehand lettering.

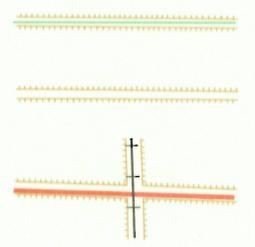
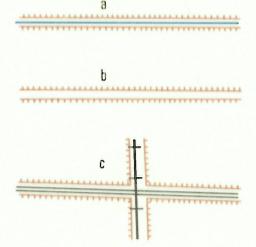
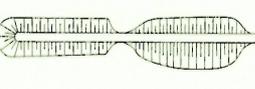
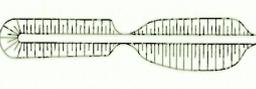
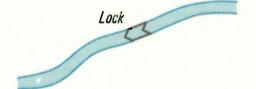
MISCELLANEOUS CULTURAL FEATURES

CUTS AND FILLS				
FEATURE	COMPILATION*	DRAFTING	SPECIFICATIONS	NO.
Fill; with culvert			<p>LINEWEIGHTS 0.15 mm (.006 in) TICKS: SPACE 0.6 mm (.024 in) LENGTH 0.4 mm (.016 in) MAY BE REDUCED WHERE NECESSARY TO AVOID CUTTING ACROSS ADJACENT LINEAR SYMBOLS. PLOT FILL TO SCALE EXTENDING TICKS TO PLOTTED BASE OF FILL. CULVERT: LINEWEIGHT 0.15 mm (.006 in) WINGTICK LINEWEIGHT 0.1 mm (.004 in) LENGTH 0.6 mm (.024 in) ANGLE 45°</p>	467
DAMS, LEVEES, AND RELATED FEATURES				
Masonry dam, with vertical sides			<p>a. EXCEEDING 0.4 mm (.016 in) IN WIDTH—PLOT TO SCALE b. ROAD ON DAM—PLOT DAM TO SCALE, MINIMUM WIDTH ON EACH SIDE OF ROAD 0.4 mm (.016 in) c. TRACK OR TRAIL ON DAM—PLOT DAM TO SCALE, MINIMUM WIDTH 0.4 mm (.016 in)</p>	468
Masonry dam, with sloped sides			<p>MINIMUM WIDTH OF TOP OF DAM 0.4 mm (.016 in) TICKS: LINEWEIGHT 0.15 mm (.006 in) SPACE BETWEEN TICKS 0.6 mm (.024 in) MINIMUM LENGTH 0.4 mm (.016 in) PLOT TO SCALE, MAY BE REDUCED TO AVOID CONFLICT WITH OTHER SYMBOLS. SHORT TICKS IN a. AND b. ARE ONE-HALF THE LENGTH OF THE LONG TICKS. a. AND b. SLOPED BASE OF DAM EXTENDS 0.75 mm (.03 in) OR MORE FROM THE TOP OF DAM. PLOT TO SCALE c. SLOPED BASE OF DAM EXTENDS LESS THAN 0.75 mm (.03 in) FROM TOP OF DAM CARRYING ROAD. d. SLOPED BASE OF DAM EXTENDS LESS THAN 0.75 mm (.03 in) FROM TOP OF DAM CARRYING TRACK OR TRAIL; OR WITHOUT ROAD</p>	469
Earthen dam			<p>a. LINEWEIGHT 0.15 mm (.006 in) SPACE BETWEEN SOLID LINES 0.3 mm (.012 in) TICKS: MINIMUM LENGTH 0.4 mm (.016 in) PLOT LENGTH OF TICKS (FROM TOP OF LEVEE TO BASE) TO SCALE WHERE LONGER THAN 0.4 mm (.016 in) SPACE BETWEEN TICKS 0.6 mm (.024 in) b. MINIMUM WIDTH OF TOP OF DAM 0.4 mm (.016 in) BASE OF DAM EXTENDS LESS THAN 0.75 mm (.03 in) FROM TOP OF DAM WHEN PLOTTED TO SCALE. TICKS: MINIMUM LENGTH 0.4 mm (.016 in) MAY BE REDUCED IF NECESSARY TO AVOID CONFLICT WITH OTHER SYMBOLS LINEWEIGHT 0.15 mm (.006 in) SPACE BETWEEN TICKS 0.6 mm (.024 in)</p>	470
Levee, less than 0.3mm (0.12") in width			<p>LINEWEIGHT 0.15 mm (.006 in) TICKS: MINIMUM LENGTH 0.8 mm (.032 in) PLOT LENGTH OF TICKS TO SCALE WHERE LONGER THAN 0.4 mm (.016 in) FROM TOP OF LEVEE TO BASE SPACE BETWEEN TICKS 0.6 mm (.024 in) a. LEVEE CARRYING TRACK OR TRAIL b. CANAL OR DITCH BETWEEN LEVEES</p>	471

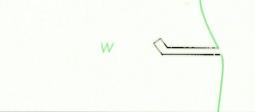
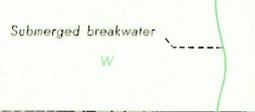
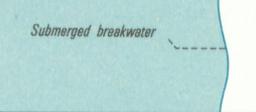
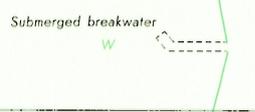
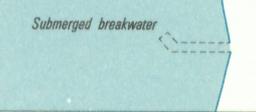
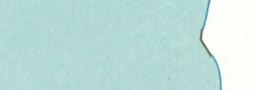
*Lineweights, length of dashes and spaces, and other dimensions approximate the specifications for drafting. Lines are delineated by fine, medium, or heavy lines. All type is freehand lettering.

MISCELLANEOUS CULTURAL FEATURES

DAMS, LEVEES, AND RELATED FEATURES

FEATURE	COMPILATION*	DRAFTING	SPECIFICATIONS	NO.
Levee, 0.3mm (.012in) or more in width			<p>LINWEIGHT 0.15 mm (.006 in)</p> <p>TICKS: MINIMUM LENGTH 0.4 mm (.016 in) PLOT LENGTH OF TICKS (FROM TOP OF LEVEE TO BASE) TO SCALE WHERE LONGER THAN 0.4 mm (.016 in)</p> <p>SPACE BETWEEN TICKS 0.6 mm (.024 in)</p> <p>a. LEVEE CARRYING CANAL OR DITCH b. LARGE LEVEE c. LEVEES CARRYING ROAD AND RAILROAD</p>	472
Masonry levee type features (rip-rap slopes, dikes, fortification scarps etc.)			<p>LINWEIGHT 0.1 mm (.004 in)</p> <p>TICKS: MINIMUM LENGTH 0.4 mm (.016 in); WHERE PLOTTED LENGTH IS LESS THAN 0.4 mm (.016 in) SHOW SLOPE AS SOLID LINE (INCREASE LINWEIGHT OF LIMITING LINE)</p> <p>SPACE BETWEEN TICKS 0.6 mm (.024 in)</p> <p>SHORT TICKS ARE ONE-HALF DISTANCE BETWEEN TOP AND BOTTOM OF FEATURE AND POINT DOWNHILL</p>	473
Passable lock			<p>LOCK POINTS UPSTREAM</p> <p>LINWEIGHT OF SIDES 0.25 mm (.01 in)</p> <p>LENGTH OF SIDES 1.2 mm (.048 in) MINIMUM ANGLES ACROSS STREAM AT 45°, LINWEIGHT 0.1 mm (.004 in)</p>	474
Canal lock or sluice gate			<p>LINWEIGHT 0.1 mm (.004 in)</p> <p>LENGTH OF WINGS 0.8 mm (.032 in)</p> <p>ANGLE BETWEEN WINGS 90°</p>	475

HARBOR AND COASTAL STRUCTURES

Breakwater, jetty, diversion dam not exceeding 0.4mm (.016in) in width			LINWEIGHT 0.15 mm (.006 in)	476
Breakwater, exceeding 0.4mm (.016in) in width			LINWEIGHT 0.1 mm (.004 in)	477
Submerged breakwater, not exceeding 0.4mm (.016in) in width			<p>LINWEIGHT 0.15 mm (.006 in)</p> <p>DASH 0.8 mm (.032 in) SPACE 0.4 mm (.016 in)</p>	478
Submerged breakwater, exceeding 0.4mm (.016in) in width			<p>LINWEIGHT 0.1 mm (.004 in)</p> <p>DASH 0.8 mm (.032 in) SPACE 0.4 mm (.016 in)</p>	479
Seawall, revetment, not exceeding 0.4mm (.016in) in width			LINWEIGHT 0.25 mm (.01 in)	480

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MISCELLANEOUS CULTURAL FEATURES

HARBOR AND COASTAL STRUCTURES				
FEATURE	COMPILATION*	DRAFTING	SPECIFICATIONS	NO.
Seawall, exceeding 0.4mm (.016in) in width See 473 for rip rap slopes	w 		LINEWEIGHT 0.1 mm (.004 in)	481
Revetment, exceeding 0.4mm (.016in) in width	w 		LINEWEIGHT 0.1 mm (.004 in)	482
Pier, dock, wharf, not exceeding 0.4mm (.016in) in width	w 		LINEWEIGHT 0.25 mm (.01 in)	483
Pier, dock, wharf, exceeding 0.4mm (.016in) in width	w 		LINEWEIGHT 0.1 mm (.004 in)	484
Marine railroad	w 		LINEWEIGHT 0.2 mm (.008 in) TICK: LINEWEIGHT 0.15 mm (.006 in) LENGTH 1.5 mm (.06 in) SPACING 2.5 mm (.10 in)	485

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RELIEF

CONTROL				
FEATURE	COMPILATION*	DRAFTING	SPECIFICATIONS	NO.
Bench mark	BM • 794	BM • 794	DOT DIAMETER 0.5 mm (.02 in)	501
Horizontal control point	△	△	LINWEIGHT 0.1 mm (.004 in) SIDES 1.5 mm (.06 in) DOT DIAMETER 0.2 mm (.008 in)	502
Horizontal control point-bench mark	BM △ 794	BM △ 794	LINWEIGHT 0.1 mm (.004 in) SIDES 1.5 mm (.06 in) DOT DIAMETER 0.2 mm (.008 in)	503
Horizontal control point-landmark	△ <i>lookout tower</i>	△ <i>Lookout tower</i>	LINWEIGHT 0.1 mm (.004 in) SIDES 1.5 mm (.06 in) DOT DIAMETER 0.2 mm (.008 in)	504
Horizontal control point adjacent to landmark (located object)	△ <i>Tower</i>	△ <i>Tower</i>	LINWEIGHT 0.1 mm (.004 in) SIDES 1.5 mm (.06 in) DOT DIAMETER 0.2 mm (.008 in) POSSICUT 3AA/101 OUTSIDE DIAMETER 1.0 mm (.04 in) LINWEIGHT 0.1 mm (.004 in) DOT 0.2 mm (.008 in)	505
Horizontal control point elevation	△ 640	△ 640	LINWEIGHT 0.1 mm (.004 in) SIDES 1.5 mm (.06 in) DOT DIAMETER 0.2 mm (.008 in)	506
Spot elevation, highest on sheet	• 1246	• 1246	DOT DIAMETER 0.5 mm (.02 in)	507
Spot elevation, normal	• 240	• 240	DOT DIAMETER 0.5 mm (.02 in)	508
Water surface elevation	75	75		509
Glacial or snowfield elevation	• 3428	• 3428	DOT DIAMETER 0.5 mm (.02 in)	510

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RELIEF

CONTOURS AND FORM LINES				
FEATURE	COMPILATION*	DRAFTING	SPECIFICATIONS	NO.
Contour value				511
Index contour			LINEWEIGHT 0.2 mm (.008 in)	512
Intermediate contour			LINEWEIGHT 0.1 mm (.004 in) SEE TEXT FOR TREATMENT OF CONTOURS IN AREAS OF STEEP TERRAIN	513
Supplementary contour, one-half interval			LINEWEIGHT 0.1 mm (.004 in) DASH 3.0 mm (.12 in) SPACE 0.5 mm (.02 in)	514
Supplementary contour, one-quarter interval			LINEWEIGHT 0.1 mm (.004 in) DASH 1.5 mm (.06 in) SPACE 0.5 mm (.02 in)	515
Depression contours			TICKS: LINEWEIGHT 0.1 mm (.004 in) LENGTH 0.5 mm (.02 in) SPACE 0.5 mm (.02 in), 1.0 mm (.04 in), 2.0 mm (.08 in), 3.0 mm (.12 in), 3.0 mm (.12 in)	516
Form line			LINEWEIGHT 0.1 mm (.004 in) DASHES 3.0 mm (.12 in) TO 4.0 mm (.16 in) SPACE 0.5 mm (.02 in)	517
PRECIPITOUS AND INCISED FEATURES				
Escarpment, cliff, or abrupt slope of greater height than contour interval			BASE LINEWEIGHT 0.2 mm (.008 in) TICKS: LINEWEIGHT 0.1 mm (.004 in) LENGTH 0.5 mm (.02 in) SPACE 0.6 mm (.024 in)	518
Escarpment, cliff, or abrupt slope of less height than contour interval			BASE LINEWEIGHT 0.1 mm (.004 in) SPACE 0.5 mm (.02 in) TICKS: LINEWEIGHT 0.1 mm (.004 in) LENGTH 0.5 mm (.02 in) SPACE 0.6 mm (.024 in)	519

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RELIEF

PRECIPITOUS AND INCISED FEATURES				
FEATURE	COMPILATION*	DRAFTING	SPECIFICATIONS	NO.
Columnar rock formation			BASE LINE INCLUDING HEAVY TICK 0.2 mm (.008 in) TICKS: LINEWEIGHT 0.1 mm (.004 in) LENGTH 0.5 mm (.02 in) SPACE 0.6 mm (.024 in)	520
Small pinnacle and needle peak			LINEWEIGHT 0.1 mm (.004 in) LENGTH 0.6 mm (.024 in)	521
Ravine, gorge, canyon, etc. 0.5mm to 1.0mm (.02in to .04in) wide			LIMITING LINE LINEWEIGHT 0.1 mm (.004 in)	522
Ravine, gorge, canyon, etc. more than 1.0mm (.04in) wide			TICKS: LINEWEIGHT 0.1 mm (.004 in) LENGTH 0.5 mm (.02 in) SPACE 0.6 mm (.024 in)	523
Crevice, less than 1.0mm (.04in) in width			TAPER FROM 1.0 mm (.04 in) TO 0.1 mm (.004 in) LABEL IF NOT SHOWN IN SYMBOL LEGEND	524
Crevasse, 1.0mm (.04in) or more in width			LIMITING LINES LINEWEIGHT 0.1 mm (.004 in) INTERIOR LINES PERPENDICULAR TO SIDES: LINE WEIGHT 0.1 mm (.004 in) SPACE 0.8 mm (.032 in) LABEL IF NOT SHOWN IN SYMBOL LEGEND	525
Fault-line scarp			SCARP LINEWEIGHT 0.2 mm (.008 in) TICKS: LINEWEIGHT 0.1 mm (.004 in) LENGTH 0.5 mm (.02 in) SPACE 0.6 mm (.024 in) STOP CONTOURS 0.6 mm (.024 in) FROM TICKS.	526
MISCELLANEOUS FEATURES				
Cave or cavern			LINEWEIGHT 0.1 mm (.004 in) STEM LENGTH 1.5 mm (.06 in) V AT 90° LENGTH 0.8 mm (.032 in) LABEL WHEN NAMED	527
Small cinder cone			LINEWEIGHT 0.1 mm (.004 in) TICK LENGTH 1.0 mm (.04 in) AND 0.5 mm (.02 in)	528

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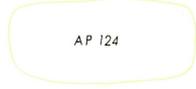
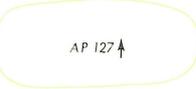
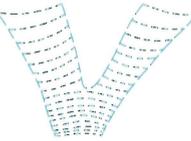
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MISCELLANEOUS FEATURES

FEATURE	COMPILATION*	DRAFTING	SPECIFICATIONS	NO.
Small crater			TICKS LINEWEIGHT 0.1 mm (.004 in) LENGTH 0.5 mm (.02 in)	529
Fumarole, geyser and hot spring			OVERALL SIZE 1.5 mm BY 2.0 mm (.06 in BY .08 in) LINEWEIGHT 0.1 mm (.004 in) DOT 0.2 mm (.008 in) SPACE 0.4 mm (.016 in) LABEL WHEN NAMED	530
Distorted surface areas (karst, loess, lava, boulders, rocks, gas blisters, etc.) less than 25.0mm (1.0in) square			AP 103 AREAS LARGER THAN 25.0 mm (1.0 in) SQUARE OMIT PATTERN AND SHOW DESCRIPTIVE LABELING THROUGHOUT AREA	531
Asphalt lake			LINEWEIGHT 0.1 mm (.004 in) DASH: LENGTH 2.0 mm (.08 in) SPACE 0.5 mm (.02 in)	532
Sand			AP 95 AREAS MEASURING LESS THAN 0.6 mm (.024 in) SQUARE ARE NOT SHOWN	533
Gravel			AP 99 AREAS MEASURING LESS THAN 0.6 mm (.024 in) SQUARE ARE NOT SHOWN	534
Star dunes			SELECT SMALL OR LARGE PATTERNS THAT APPROXIMATE DUNE SIZE AT REPRODUCTION SCALE SMALL—AP 120 LARGE—AP 122	535
Lateral (longitudinal) dunes			SELECT SMALL OR LARGE PATTERNS THAT APPROXIMATE DUNE SIZE AT REPRODUCTION SCALE SMALL—AP 116 LARGE—AP 118 ORIENT PATTERN TO REFLECT GROUND CONDITION ARROW ON COMPILATION INDICATES DIRECTION OF PREVAILING WINDS	536
Crescent dunes			SELECT SMALL OR LARGE PATTERNS THAT APPROXIMATE DUNE SIZE AT REPRODUCTION SCALE SMALL—AP 108 LARGE—AP 110 ORIENT PATTERN TO REFLECT GROUND CONDITION ARROW ON COMPILATION INDICATES DIRECTION OF PREVAILING WINDS	537
Ripple dunes			SELECT SMALL OR LARGE PATTERNS THAT APPROXIMATE DUNE SIZE AT REPRODUCTION SCALE SMALL—AP 112 LARGE—AP 114 ORIENT PATTERN TO REFLECT GROUND CONDITION ARROW ON COMPILATION INDICATES DIRECTION OF PREVAILING WINDS	538

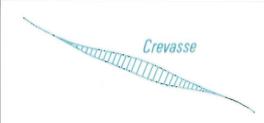
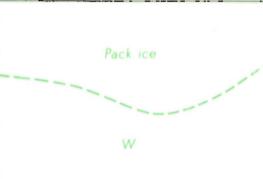
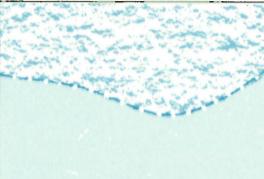
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RELIEF

MISCELLANEOUS FEATURES				
FEATURE	COMPILATION*	DRAFTING	SPECIFICATIONS	NO.
Sand mounds			SELECT SMALL OR LARGE PATTERNS THAT APPROXIMATE DUNE SIZE AT REPRODUCTION SCALE SMALL—AP 124 LARGE—AP 125	539
Transverse dunes			SELECT SMALL OR LARGE PATTERNS THAT APPROXIMATE DUNE SIZE AT REPRODUCTION SCALE SMALL—AP 128 LARGE—AP 127 ORIENT PATTERN TO REFLECT GROUND CONDITION ARROW ON COMPILATION INDICATES DIRECTION OF PRE-VAILING WINDS	540
Terraces			SHOWN ONLY FOR AREAS GREATER THAN 12.5 mm (0.5 in) SQUARE LINEWEIGHT 0.1 mm (.004 in) DASH: LENGTH 2.0 mm (.08 in) SPACE 0.5 mm (.02 in)	541
ARCTIC FEATURES				
Permanent snowfield or icefield			DASH: LINEWEIGHT 0.1 mm (.004 in) LENGTH 1.0 mm (.04 in) SPACE 0.5 mm (.02 in) USE FORM LINES AS APPROPRIATE	542
Permanent snowfield or icefield (relief not determinable)			AP 95 DASH: LINEWEIGHT 0.1 mm (.004 in) LENGTH 1.0 mm (.04 in) SPACE 0.5 mm (.02 in)	543
Glacier			OUTLINE DASHING: LINEWEIGHT 0.1 (.004 in) LENGTH 2.0 mm (.08 in) SPACE 0.5 mm (.02 in) FORM LINES: LINEWEIGHT 0.1 mm (.004 in) DASHES 0.5 mm (.02 in) TO 1.0 mm (.04 in) SPACE 0.5 mm (.02 in) SPACE BETWEEN FORM LINES DIMINISHES AS GLACIER PROGRESSES DOWNWARD	544
Small nunatak			TICKS: LINEWEIGHT 0.1 mm (.004 in) LENGTH 0.6 mm (.024 in)	545
Small ice peak			TICKS: LINEWEIGHT 0.1 mm (.004 in) LENGTH 0.6 mm (.024 in)	546
Ice cliff			BASE LINE: LINEWEIGHT 0.2 mm (.008 in) LENGTH 5.0 mm (.02 in) SPACE 1.0 mm (.04 in) TICKS: LINEWEIGHT 0.1 mm (.004 in) LENGTH 0.5 mm (.02 in) SPACE 0.6 mm (.024 in)	547
Ice escarpment			BASE LINEWEIGHT 0.2 mm (.008 in) TICKS: LINEWEIGHT 0.1 mm (.004 in) LENGTH 0.5 mm (.02 in) SPACE 0.6 mm (.024 in)	548

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RELIEF

ARCTIC FEATURES				
FEATURE	COMPILATION*	DRAFTING	SPECIFICATIONS	NO.
Ice crevice, less than 1.0mm (.04in) in width			TAPER FROM 1.0 mm (.04 in) TO 0.1 mm (.004 in) LABEL IF NOT SHOWN IN SYMBOL LEGEND	549
Ice crevasse, 1.0mm (.04in) or more in width			LIMITING LINES LINEWEIGHT 0.1 mm (.004 in) INTERIOR LINES PERPENDICULAR TO SIDES: LINE WEIGHT 0.1 mm (.004 in) SPACE 0.9 mm (.032 in) LABEL IF NOT SHOWN IN SYMBOL LEGEND	550
Limits of ice shelf, pack ice			LINEWEIGHT 0.2 mm (.008 in) DASH: LENGTH 2.0 mm (.08 in) SPACE 0.5 mm (.02 in) USE NAME OF ICE SHELF IF AVAILABLE. IF DATE OF SHELF IS KNOWN, ADD IN PARENTHESIS	551
Moraine			AP 99 AREAS MEASURING LESS THAN 0.6 mm (.024 in) SQUARE ARE NOT SHOWN	552
Pack ice			AP 136 WITH 33% BIANGLE LINEWEIGHT 0.2 mm (.008 in) DASH: LENGTH 2.0 mm (.08 in) SPACE 0.5 mm (.02 in)	553

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DRAINAGE

SHORELINES

FEATURE	COMPILATION*	DRAFTING	SPECIFICATIONS	NO.
Definite			LINWEIGHT 0.2 mm (.008 in)	601
Indefinite or unsurveyed			LINWEIGHT 0.2 mm (.008 in) DASH 3.0 mm (.12 in) SPACE 3.0 mm (.12 in) DOTS 0.25 mm (.01 in) OR USE POSICUT 843A	602
Pinpoint islands			SHOW TO SCALE NOTE FOR RETENTION IN REPRODUCTION MINIMUM SIZE 0.25 mm (.01 in)	603

LAKES AND PONDS

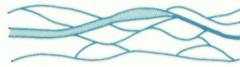
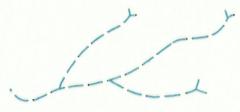
Perennial			LINWEIGHT 0.2 mm (.008 in) 31%–120D–45°	604
Intermittent			LINWEIGHT 0.2 mm (.008 in) DASH 1.0 mm (.04 in) SPACE 0.5 mm (.02 in) LP 3	605
Dry or cyclical in arid areas			LINWEIGHT 0.2 mm (.008 in) DASH 1.0 mm (.04 in) SPACE 0.5 mm (.02 in) AP 95	606
Salt lakes or ponds (perennial or intermittent)				607
Reservoir (natural shoreline)			a. SHORELINE OMITTED b. SHORELINE RETAINED	608

RIVERS AND STREAMS

Perennial, over 25 meters wide			LINWEIGHT 0.2 mm (.008 in) TAPER FROM DOUBLE LINE TO SINGLE LINE WITH DEFINITIVE POINT OF CHANGE	609
Perennial, 18 meters to 25 meters wide			LINWEIGHT 0.5 mm (.02 in)	610

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DRAINAGE

RIVERS AND STREAMS				
FEATURE	COMPILATION*	DRAFTING	SPECIFICATIONS	NO.
Perennial, less than 18 meters wide			LINEWEIGHT 0.2 mm (.008 in) CHANGE FROM 18-25 m WIDE STREAM TO LESS THAN 18 m WIDE STREAM IS ABRUPT END TO BE TAPERED FROM 0.2 mm (.008 in) TO 0.1 mm (.004 in) IN APPROX. 12.5 mm (0.5 in)	611
Braided			LINEWEIGHT 0.2 mm (.008 in)	612
Meandering			LINEWEIGHT 0.2 mm (.008 in) AP 95	613
Intermittent (wadi or wash) over 25 meters wide			LINEWEIGHT 0.2 mm (.008 in) DASH 1.0 mm (.04 in) SPACE 0.5 mm (.02 in) AP 95	614
Intermittent (wadi or wash) 18 meters to 25 meters wide			LINEWEIGHT 0.5 mm (.02 in) DASH 2.0 mm (.08 in) SPACE 0.5 mm (.02 in)	615
Intermittent (wadi or wash) less than 18 meters wide			LINEWEIGHT 0.2 mm (.008 in) DASH 2.0 mm (.08 in) SPACE 0.5 mm (.02 in)	616
RIVERS, STREAMS, AND RELATED FEATURES				
Dissipating			WING TICK LINEWEIGHT 0.2 mm (.008 in) LENGTH 1.0 mm (.04 in) ANGLE 90° SHOW AS PERENNIAL OR INTERMITTENT	617
Disappearing			DIAMETER 1.5 mm (.06 in) OPENING 0.5 mm (.02 in) SHOW AS PERENNIAL OR INTERMITTENT	618
Large falls			LINEWEIGHT 0.25 mm (.01 in) TICKS: LINEWEIGHT 0.1 mm (.004 in) LENGTH 1.0 mm (.04 in) SPACE 0.5 mm (.02 in) USE FOR STREAMS WIDER THAN 2.5 mm (0.1 in) LABEL IF REQUIRED FOR CLARITY	619
Small falls			TICK LINEWEIGHT 0.25 mm (.01 in) MINIMUM LENGTH 1.5 mm (.06 in) USE FOR STREAMS LESS THAN 2.5 mm (0.1 in) WIDE	620

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DRAINAGE

RIVERS, STREAMS, AND RELATED FEATURES

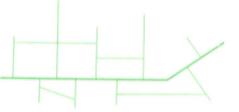
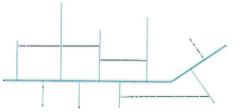
FEATURE	COMPILATION*	DRAFTING	SPECIFICATIONS	NO.
Large rapids			TICKS LINEWEIGHT 0.1 mm (.004 in) SPACE 0.5 mm (.02 in) LENGTH VARIES FROM 0.5 mm (.02 in) TO 1.0 mm (.04 in) USE FOR STREAMS WIDER THAN 2.5 mm (0.1 in) LABEL IF REQUIRED FOR CLARITY	621
Small rapids			TICKS LINEWEIGHT 0.25 mm (.01 in) MINIMUM LENGTH 1.5 mm (.06 in) SPACE 0.5 mm (.02 in) USE FOR STREAMS LESS THAN 2.5 mm (0.1 in) WIDE	622

CANALS AND CANALIZED STREAMS

Navigable, over 25 meters wide			LINWEIGHT 0.2 mm (.008 in)	623
Navigable, 18 meters to 25 meters wide			LINWEIGHT 0.5 mm (.02 in) TICKS: LINEWEIGHT 0.2 mm (.008 in) LENGTH 0.4 mm (.016 in) SPACE 1.5 mm (.06 in)	624
Navigable, less than 18 meters wide			LINWEIGHT 0.2 mm (.008 in) TICKS: LINEWEIGHT 0.2 mm (.008 in) LENGTH 0.4 mm (.016 in) SPACE 1.5 mm (.06 in)	625
Abandoned, containing water, over 25 meters wide			LINWEIGHT 0.2 mm (.008 in)	626
Abandoned, containing water, 18 meters to 25 meters wide			LINWEIGHT 0.5 mm (.02 in) TICKS: LINEWEIGHT 0.2 mm (.008 in) LENGTH 0.4 mm (.016 in) SPACE 1.5 mm (.06 in)	627
Abandoned, containing water, less than 18 meters wide			LINWEIGHT 0.2 mm (.008 in) TICKS: LINEWEIGHT 0.2 mm (.008 in) LENGTH 0.4 mm (.016 in) SPACE 1.5 mm (.06 in)	628
Abandoned, dry, over 25 meters wide			LINWEIGHT 0.2 mm (.008 in) DASH 2.0 mm (.08 in) SPACE 0.5 mm (.02 in)	629
Abandoned, dry, 18 meters to 25 meters wide			LINWEIGHT 0.5 mm (.02 in) DASH 2.0 mm (.08 in) SPACE 0.5 mm (.02 in)	630

*Lineweights, length of dashes and spaces, and other dimensions approximate the specifications for drafting. Lines are delineated by fine, medium, or heavy lines. All type is freehand lettering.

DRAINAGE

CANALS AND CANALIZED STREAMS				
FEATURE	COMPILATION*	DRAFTING	SPECIFICATIONS	NO.
Abandoned, dry, less than 18 meters wide			LINEWEIGHT 0.2 mm (.008 in) DASH 2.0 mm (.08 in) SPACE 0.5 mm (.02 in)	631
Under construction, over 25 meters wide			SPECIFICATIONS SAME AS 629	632
Under construction, 18 meters to 25 meters wide			SPECIFICATIONS SAME AS 630	633
Under construction, less than 18 meters wide			SPECIFICATIONS SAME AS 631	634
Limiting tick			TICK LINEWEIGHT 0.2 mm (.008 in) LENGTH 2.0 mm (.08 in)	635
DITCHES				
Perennial, over 25 meters wide			LINEWEIGHT 0.2 mm (.008 in)	636
Perennial, less than 25 meters wide (major and minor ditches)			LINEWEIGHTS: MAJOR 0.2 mm (.008 in) MINOR 0.1 mm (.004 in) LABEL "Numerous ditches" AS NECESSARY	637
Intermittent			LINEWEIGHT 0.2 mm (.008 in) DASH 2.0 mm (.08 in) SPACE 0.5 mm (.02 in)	638
WATER CONDUITS				
Aqueduct, penstock pipeline or flume (ground level)			LINEWEIGHT 0.25 mm (.01 in) LABEL APPROPRIATELY	639

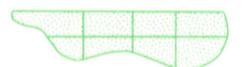
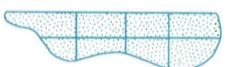
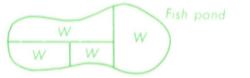
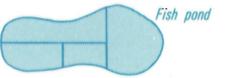
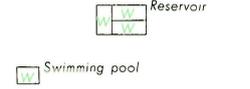
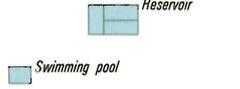
*Lineweights, length of dashes and spaces, and other dimensions approximate the specifications for drafting. Lines are delineated by fine, medium, or heavy lines. All type is freehand lettering.

DRAINAGE

WATER CONDUITS

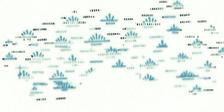
FEATURE	COMPILATION*	DRAFTING	SPECIFICATIONS	NO.
Aqueduct, penstock or flume (elevated)			LINEWEIGHT 0.25 mm (.01 in) WINGTICK LENGTH 0.6 mm (.024 in) ANGLE 45° STOP OVERPASSED FEATURES 0.5 mm (.02 in) FROM CONDUIT LABEL WHERE NECESSARY FOR CLARITY	640
Aqueduct, penstock or pipeline (underground)			LINEWEIGHT 0.25 mm (.01 in) DASH 1.0 mm (.04 in) SPACE 0.5 mm (.02 in) LABEL APPROPRIATELY	641
Aqueduct in traversable tunnel			TUNNEL: LINEWEIGHT 0.25 mm (.01 in) WIDTH 1.0 mm (.04 in) OVERALL DASH 1.0 mm (.04 in) SPACE 0.5 mm (.02 in) WINGTICKS: LINEWEIGHT 0.25 mm (.01 in) LENGTH 0.6 mm (.024 in) ANGLE 45°	642
Aqueduct in nontraversable tunnel			LINEWEIGHT 0.25 mm (.01 in) DASH 1.0 mm (.04 in) SPACE 0.5 mm (.02 in) WINGTICK LENGTH 0.6 mm (.024 in) ANGLE 45°	643

MISCELLANEOUS FEATURES

Karez (kanat, qanat, etc.)			DASH: LINEWEIGHT 0.2 mm (.008 in) LENGTH 1.0 mm (.04 in) SPACE 0.5 mm (.02 in) CIRCLE: LINEWEIGHT 0.15 mm (.006 in) DIAMETER 1.0 mm (.04 in)	644
Salt evaporator			LINEWEIGHT 0.2 mm (.008 in) AP 95	645
Fish ponds or hatcheries			LINEWEIGHT 0.2 mm (.008 in)	646
Sewage disposal and filtration beds			LINEWEIGHT 1.0 mm (.004 in) LP 3	647
Swimming pool and man made reservoir			LINEWEIGHT 1.0 mm (.004 in)	648
Well (perennial)			DIAMETER 0.75 mm (.03 in) LABEL WITH CHARACTERISTIC	649

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DRAINAGE

MISCELLANEOUS FEATURES				
FEATURE	COMPILATION*	DRAFTING	SPECIFICATIONS	NO.
Well (intermittent)			LINEWEIGHT 0.15 mm (.006 in) DIAMETER 1.0 mm (.04 in) LABEL WITH CHARACTERISTIC	650
Cistern			SQUARE 0.6 mm (.024 in)	651
Spring (perennial)			DIAMETER 0.75 mm (.03 in) TAIL: LINEWEIGHT 0.15 mm (.006 in) TAPERED LENGTH 2.0 mm (.08 in) TO POINT DOWNHILL LABEL WITH CHARACTERISTIC	652
Spring (intermittent)			LINEWEIGHT 0.15 mm (.006 in) DIAMETER 1.0 mm (.04 in) TAIL: LINEWEIGHT 0.15 mm (.006 in) TAPERED LENGTH 2.0 mm (.08 in) TO POINT DOWNHILL LABEL WITH CHARACTERISTIC	653
Flow arrow			POSICUT 3AA/101	654
Water surface elevation				655
AREA FEATURES				
Marsh in tidal waters			AP 12 AREAS SMALLER THAN 2.5 mm X 2.5 mm (0.1 in X 0.1 in) ARE NOT SHOWN	656
Marsh in nontidal waters			AP 12 AREAS SMALLER THAN 2.5 mm X 2.5 mm (0.1 in X 0.1 in) ARE NOT SHOWN	657
Swamp			AP 12 AREAS SMALLER THAN 2.5 mm X 2.5 mm (0.1 in X 0.1 in) ARE NOT SHOWN	658
Peat bog			AP 12 AREAS SMALLER THAN 2.5 mm X 2.5 mm (0.1 in X 0.1 in) ARE NOT SHOWN	659

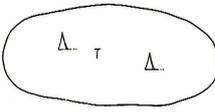
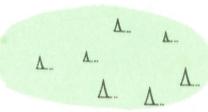
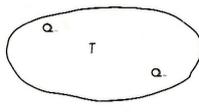
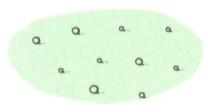
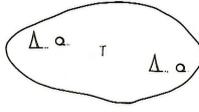
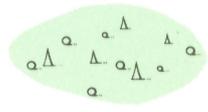
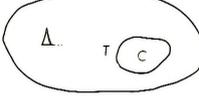
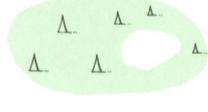
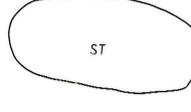
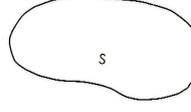
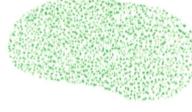
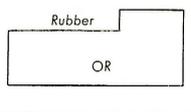
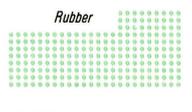
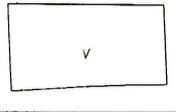
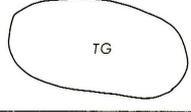
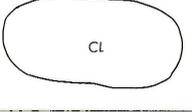
*Lineweights, length of dashes and spaces, and other dimensions approximate the specifications for drafting. Lines are delineated by fine, medium, or heavy lines. All type is freehand lettering.

DRAINAGE

AREA FEATURES				
FEATURE	COMPILATION*	DRAFTING	SPECIFICATIONS	NO.
Sabkha (Kavir, etc.)			<small>LINEWEIGHT 0.2 mm (.008 in) DASH 1.0 mm (.04 in) SPACE 0.5 mm (.02 in) AP 103 AREAS SMALLER THAN 2.5 mm X 2.5 mm (0.1 in X 0.1 in) ARE NOT SHOWN</small>	671

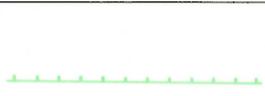
*Lineweights, length of dashes and spaces, and other dimensions approximate the specifications for drafting. Lines are delineated by fine, medium, or heavy lines. All type is freehand lettering.

VEGETATION AREA FEATURES

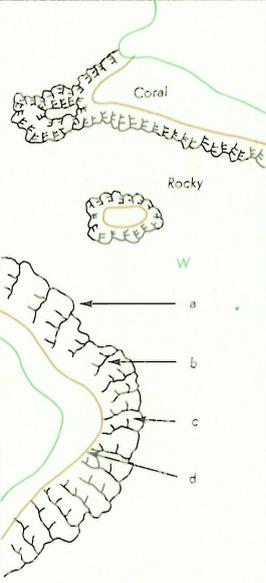
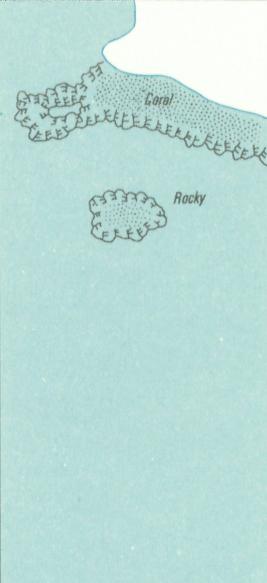
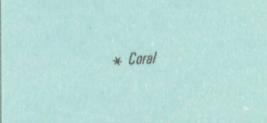
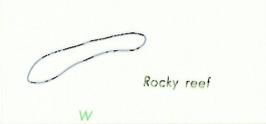
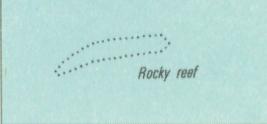
FEATURE	COMPILATION*	DRAFTING	SPECIFICATIONS	NO.
Woodland, coniferous trees			GREEN: 21%–120D–45° BLACK: AP 60 OMIT PATTERNS FROM DOUBLE LINE ROADS AND ALIGN WITH SOUTH NEATLINE AREAS SMALLER THAN 2.5 mm X 2.5 mm (0.1 in X 0.1 in) ARE NOT SHOWN	701
Woodland, deciduous trees			GREEN: 21%–120D–45° BLACK: AP 54 OMIT PATTERNS FROM DOUBLE LINE ROADS AND ALIGN WITH SOUTH NEATLINE AREAS SMALLER THAN 2.5 mm X 2.5 mm (0.1 in X 0.1 in) ARE NOT SHOWN	702
Woodland, mixed coniferous and deciduous trees			GREEN: 21%–120D–45° BLACK: AP 63 OMIT PATTERNS FROM DOUBLE LINE ROADS AND ALIGN WITH SOUTH NEATLINE AREAS SMALLER THAN 2.5 mm X 2.5 mm (0.1 in X 0.1 in) ARE NOT SHOWN	703
Clearing			CLEARINGS LESS THAN 2.5 mm X 2.5 mm (0.1 in X 0.1 in) ARE NOT SHOWN	704
Scattered trees			AP 44 OMIT PATTERN FROM DOUBLE LINE ROADS AND ALIGN WITH SOUTH NEATLINE AREAS SMALLER THAN 2.5 mm X 2.5 mm (0.1 in X 0.1 in) ARE NOT SHOWN	705
Scrub			AP 68 OMIT PATTERN FROM DOUBLE LINE ROADS AREAS SMALLER THAN 2.5 mm X 2.5 mm (0.1 in X 0.1 in) ARE NOT SHOWN	706
Plantation, orchard, and nursery			AP 74 OMIT PATTERN FROM DOUBLE LINE ROADS AND ALIGN WITH SOUTH NEATLINE AREAS SMALLER THAN 2.5 mm X 2.5 mm (0.1 in X 0.1 in) ARE NOT SHOWN	707
Vineyard			AP 77 OMIT PATTERN FROM DOUBLE LINE ROADS AND ALIGN WITH SOUTH NEATLINE AREAS SMALLER THAN 2.5 mm X 2.5 mm (0.1 in X 0.1 in) ARE NOT SHOWN	708
Tropical grass			AP 66 OMIT PATTERN FROM DOUBLE LINE ROADS AND ALIGN WITH SOUTH NEATLINE AREAS SMALLER THAN 2.5 mm X 2.5 mm (0.1 in X 0.1 in) ARE NOT SHOWN	709
Cultivated land			7%–120D–45° TO BE SHOWN ONLY WHEN SPECIFIED IN SUPPLEMENTAL PROJECT INSTRUCTIONS AREAS SMALLER THAN 2.5 mm X 2.5 mm (0.1 in X 0.1 in) ARE NOT SHOWN	710

*Lineweights, length of dashes and spaces, and other dimensions approximate the specifications for drafting. Lines are delineated by fine, medium, or heavy lines. All type is freehand lettering.

LINEAR AND SPOT FEATURES

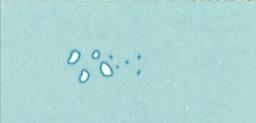
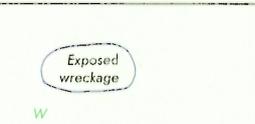
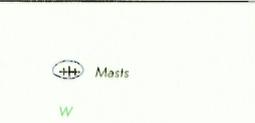
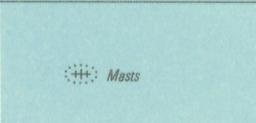
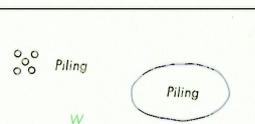
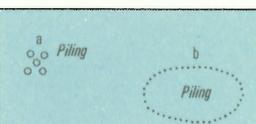
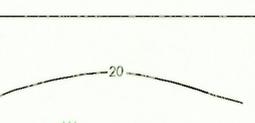
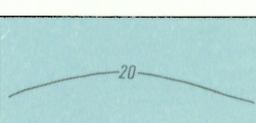
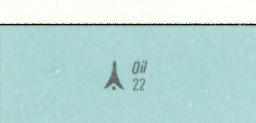
LINEAR AND SPOT FEATURES				
Row of trees			AP 74	711
Hedgerow			LINEWEIGHT 0.2 mm (.008 in) TICKS: LINEWEIGHT 0.4 mm (.016 in) LENGTH 0.4 mm (.016 in) SPACE 2.5 mm (.1 in)	712
Isolated tree			POSICUT 3AA/101 ALIGN PATTERN WITH SOUTH NEATLINE	713

COASTAL HYDROGRAPHY

FORESHORE FLATS				
FEATURE	COMPILATION*	DRAFTING	SPECIFICATIONS	NO.
Foreshore flats (sand, mud, gravel, etc.)			AP 95 LABEL APPROPRIATELY	801
REEFS AND ROCKY LEDGES				
Large reef or rocky ledge			<p>LINEWEIGHTS 0.1 mm (.004 in)</p> <p>a. REEF LIMITS: IRREGULAR LINE—AVOID SHARP ANGLES AND POINTS</p> <p>b. MAIN TICK: LENGTH 0.75 mm (.03 in) TO 2.5 mm (.1 in) SPACING 0.75 mm (.03 in) TO 2.0 mm (.08 in) IRREGULAR ALIGNMENT WITH SHARP ANGLES AVOIDED</p> <p>c. SECONDARY TICKS: EMANATE FROM RIGHT OF MAIN TICKS AS VIEWED FROM REEF LIMITS LENGTH VARIES, MUST NOT EXCEED THREE-FOURTHS DISTANCE BETWEEN MAIN TICKS, SMALLEST NEAR END OF MAIN TICK SPACE BETWEEN TICKS APPROXIMATELY 0.5 mm (.02 in)</p> <p>d. AP 95 LABEL "ROCKY" OR "CORAL", IF KNOWN</p>	802
Isolated reef; Isolated reef, less than 2.5mm (0.1in)			POSICUT 3AA/101 LABEL APPROPRIATELY	803
Elongated reef less than 2.5mm (0.1in)			DOT 0.25 mm (.01 in) SPACE 0.75 mm (.03 in) ON CENTER LABEL APPROPRIATELY	804

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COASTAL HYDROGRAPHY

ROCKS				
FEATURE	COMPILATION*	DRAFTING	SPECIFICATIONS	NO.
Bare rocks			LINWEIGHT 0.2 mm (.008 in) SHOW AS SOLID (PINPOINT) WHEN LESS THAN 0.75 mm (.03 in). MINIMUM 0.3 mm (.012 in)	805
Rock awash			LINWEIGHT 0.15 mm (.006 in) LENGTH 1.2 mm (.048 in) POSICUT 3AA/101	806
Large group of rocks awash			DOT 0.25 mm (.01 in) SPACE 0.75 mm (.03 in) ON CENTER POSICUT 3AA/101 LABEL IF SPACE DOES NOT PERMIT USE OF SYMBOL	807
WRECKS				
Exposed wreck			POSICUT 3AA/101 ALIGN BASE WITH SOUTH NEATLINE	808
Exposed wreckage			DOT 0.25 mm (.01 in) SPACE 0.75 mm (.03 in) ON CENTER LABEL APPROPRIATELY	809
Sunken wreck, mast exposed			DOT 0.25 mm (.01 in) SPACE 0.75 mm (.03 in) ON CENTER POSICUT 6/2	810
DOLPHINS, PILINGS, STUMPS				
Dolphins, piling, stumps,			a. POSICUT 3AA/101 LABEL APPROPRIATELY b. EXTENSIVE AREA— DOT 0.25 mm (.01 in) SPACE 0.75 mm (.03 in) ON CENTER LABEL APPROPRIATELY	811
DEPTH CURVES				
Depth curve			LINWEIGHT 0.1 mm (.004 in)	812
OIL/GAS RIG				
Oil/Gas Rig			POSICUT 3AA/101 ALIGN WITH SOUTH NEATLINE	813

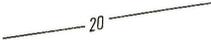
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TYPOGRAPHY

POPULATED PLACES

FEATURE	EXAMPLE	SPECIFICATIONS	TYPE CODE	NO.
First class	LONDON	16 PT. UNIVERS BOLD COND. CAPS	118A	901
Second class	MAN'NHEIM	12 PT. UNIVERS BOLD COND. CAPS	118A	902
Thrid class	Tolima	12 PT. UNIVERS BOLD COND. C&L	118A	903
Fourth class	Kelheim	12 PT. UNIVERS MEDIUM COND. C&L	117A	904
Fifth class	Tonlay	10 PT. UNIVERS MEDIUM COND. C&L	117A	905
Farmstead	Rudine	8 PT. UNIVERS LIGHT COND. C&L	116A	906
Dispersed village	Borotnica <i>Letter space or extend as necessary</i>	10-14 PT. UNIVERS MEDIUM COND. C&L <i>Use type template when making selections</i>	117A	907
Scattered village	Gradina <i>Letter space or extend as necessary</i>	10 PT. UNIVERS LIGHT C&L	114A	908
Suburban area	Paraiso	8-12 PT. UNIVERS MEDIUM C&L <i>Use type template when making selections</i>	113A	909
Clarifying labels	<i>(destroyed)</i> <i>(abandoned)</i> <i>(walled)</i>	6 PT. UNIVERS COND. ITALIC C&L	126A	910

TYPOGRAPHY

CONTROL POINTS AND ELEVATIONS				
FEATURE	EXAMPLE	SPECIFICATIONS	TYPE CODE	NO.
Bench mark	BM . 794	8 PT. UNIVERS MEDIUM CAPS	113A	911
Horizontal control point	△ 792	8 PT. UNIVERS MEDIUM	113A	912
Spot elevation, highest on sheet	· 942	12 PT. UNIVERS MEDIUM	113A	913
Spot elevation, normal	· 610	8 PT. UNIVERS MEDIUM	113A	914
Horizontal control point-landmark	△ <i>Lookout tower</i>	6 PT. UNIVERS LIGHT COND. ITALIC C&L	126A	915
Obstruction elevation	 Tower 219 (84)	6 PT. UNIVERS LIGHT COND. ITALIC C&L	126A	916
Airfield elevation	130	8 PT. UNIVERS MEDIUM COND. ITALIC	127A	917
Water surface elevation	75	8 PT. UNIVERS MEDIUM	113A	918
Contour value		8 PT. UNIVERS MEDIUM COND. ITALIC	127A	919
Depth curve values		8 PT. UNIVERS LIGHT COND. ITALIC	126A	920

TYPOGRAPHY

AREA IDENTIFICATIONS				
FEATURE	EXAMPLE	SPECIFICATIONS	TYPE CODE	NO.
Area names	BRUSNICA <small>Letter space or extend as necessary</small>	8-18 PT. UNIVERS LIGHT CAPS <small>Use type template when making selections</small>	114A	921
Large bodies of open water	<i>BALTIC SEA</i> <small>Letter space or extend as necessary</small>	10-18 PT. CLEARFACE ITALIC CAPS <small>Use type template when making selections</small>	289K	922
Small ponds, lakes, inlets, bays, swamps, marshes etc.	<i>Lake Placid</i>	6-10 PT. CLEARFACE ITALIC C&L <small>Use type template when making selections</small>	289K	923
Large marshes, swamps and similar features	<i>DISMAL SWAMP</i> <small>Letter space or extend as necessary</small>	10-18 PT. CLEARFACE ITALIC CAPS <small>Use type template when making selections</small>	289K	924
Enclosures	<i>Rifle range</i> <i>Reservoir</i> <i>Asphalt lake</i> <i>Mining area</i>	6-10 PT. UNIVERS MEDIUM COND. ITALIC C&L <small>Use type template when making selections</small>	127A	925
Descriptive labeling	<i>Peat bog</i> <i>Peat cuttings</i> <i>Salt evaporator</i>	6 PT. UNIVERS LIGHT COND. ITALIC C&L	126A	926
Foreshore flats	 * <i>Coral</i>	6 PT. UNIVERS LIGHT COND. ITALIC C&L	126A	927
Woodland features	BLACK FOREST <small>Letter space or extend as necessary</small>	6-18 PT. UNIVERS MEDIUM CAPS <small>Use type template when making selections</small>	113A	928
LINEAR FEATURES				
International boundary names and identifications	FRANCE	12 PT. UNIVERS BOLD COND. CAPS <small>Type size may be reduced in congested areas</small>	118A	929
Roads, Railroads, Lane and Track information	<i>TRANS-SIBERIAN RAILWAY</i> <i>BERLIN AUTOBAHN</i> <i>6 LANES</i>	6 PT. UNIVERS LIGHT COND. ITALIC CAPS	126A	930

TYPOGRAPHY

LINEAR FEATURES

FEATURE	EXAMPLE	SPECIFICATIONS	TYPE CODE	NO.
Bridge characteristics	Steel-U	8 PT. UNIVERS MEDIUM COND. C&L	117A	931
Descriptive labels	<i>Oil pipeline Dismantled railroad Abandoned canal Ski lift</i>	6 PT. UNIVERS LIGHT COND. ITALIC C&L	126A	932
Large rivers	<i>RHINE</i>	12 PT. CLEARFACE ITALIC CAPS <i>Use for rivers that exceed 8.0 mm (.32 in) in width</i>	289K	933
Medium width rivers	<i>VOLGA</i>	10 PT. CLEARFACE ITALIC CAPS <i>Use for rivers 4.0 mm (.16 in) to 8.0 mm (.32 in) wide</i>	289K	934
Narrow rivers	<i>NILE</i>	6-8 PT. CLEARFACE ITALIC CAPS <i>Use for rivers less than 4.0 mm (.16 in) wide</i>	289K	935
Single line drainage	<i>Little Pee Dee</i>	6-10 PT. CLEARFACE ITALIC C&L <i>Use type template when making selections</i>	289K	936

HYPSOGRAPHY

Large regional features	<i>URAL MOUNTAIN</i> <i>Letter space or extend as necessary</i>	14-18 PT. UNIVERS MEDIUM ITALIC CAPS <i>Use type template when making selections</i>	123A	937
Large single features	<i>SIWALIK RANGE</i> <i>Letter space or extend as necessary</i>	12-14 PT. UNIVERS MEDIUM ITALIC CAPS <i>Use type template when making selections</i>	123A	938
Small single features	<i>Mount Everest</i>	10 PT. UNIVERS MEDIUM ITALIC C&L	123A	939
Tops, gaps, peaks, hills, etc.	<i>Nilgiri Hill</i>	6-8 PT. UNIVERS LIGHT COND. ITALIC C&L <i>Use type template when making selections</i>	126A	940

TYPOGRAPHY

HYPSOGRAPHY				
FEATURE	EXAMPLE	SPECIFICATIONS	TYPE CODE	NO.
Terrain descriptions	<i>Karst Lava</i>	8 PT. UNIVERS LIGHT COND. ITALIC C&L	126A	941
Crevice, crevasse	<i>Crevice</i> <i>Crevasse</i>	8 PT. UNIVERS LIGHT COND. ITALIC C&L	126A	942
Limits of ice shelf	<i>Limits of ice shelf</i>	6 PT. UNIVERS LIGHT COND. ITALIC C&L	126A	943
CAPES AND ISLANDS				
Large capes, islands, island chains and peninsulas	<i>ALEUTIANS</i> <small>Letter space or extend as necessary</small>	12-18 PT. UNIVERS MEDIUM ITALIC CAPS <small>Use type template when making selections</small>	123A	944
Small capes, islands and peninsulas	<i>Bahamas</i>	6-10 PT. UNIVERS MEDIUM COND. ITALIC C&L <small>Use type template when making selections</small>	127A	945
Points	<i>Bimini Point</i>	8 PT. UNIVERS MEDIUM COND. ITALIC C&L	127A	946
SPOT FEATURES				
Churches, cemeteries, dams, fords, hospitals, landmark buildings, landmark objects, lighthouse, towers, mines, piers, wharves, public buildings, ruins, schools, stadiums, swimming pools, tanks, reservoirs, tunnels, windmills, falls, rapids, and similar features, obstructions, boundary markers, kilometer markers	<i>Ruins</i> <i>Reservoir</i> <i>Ford</i> <i>Falls</i> <i>Tower</i> <i>Gravel pit</i> <i>30 Km</i> <i>Potable</i>	6 PT. UNIVERS LIGHT COND. ITALIC C&L	126A	947
Airfield name	<i>Dunak Airfield</i>	8 PT. UNIVERS MEDIUM COND. ITALIC C&L	127A	948

TYPOGRAPHY

SPOT FEATURES

FEATURE	EXAMPLE	SPECIFICATIONS	TYPE CODE	NO.
Airfield surface	<i>Hard surface</i>	6 PT. UNIVERS MEDIUM COND. ITALIC C&L	127A	949



**UNITED STATES GEOLOGICAL SURVEY
DEFENSE MAPPING AGENCY**

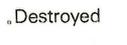
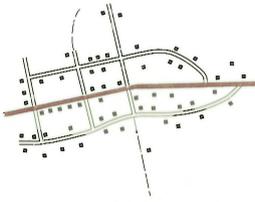
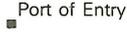


**SYMBOLS
FOR
1:50,000-SCALE
15-MINUTE QUADRANGLE
TOPOGRAPHIC MAPS
OF
THE UNITED STATES**

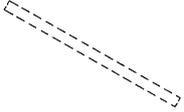
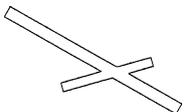
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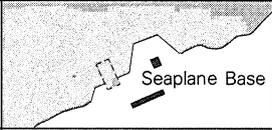
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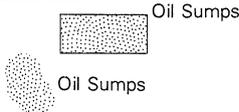
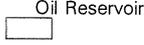
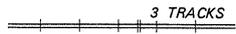
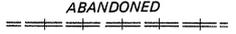
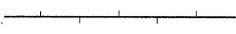
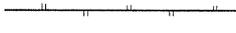
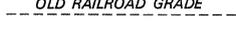
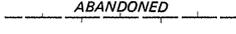
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.004	0.10	.075	1.90
.006	0.15	.080	2.00
.007	0.17	.090	2.25
.008	0.20	.10	2.50
.010	0.25	.12	3.00
.012	0.30	.15	3.75
.014	0.35	.16	4.00
.016	0.40	.17	4.25
.018	0.45	.18	4.50
.020	0.50	.20	5.00
.022	0.55	.23	5.80
.024	0.60	.24	6.00
.026	0.65	.30	7.50
.030	0.75	.40	10.00
.033	0.80	.50	12.50
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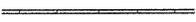
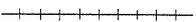
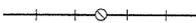
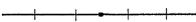
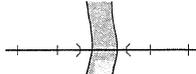
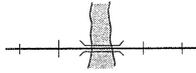
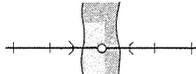
MISCELLANEOUS CULTURE				
FEATURE	SYMBOL	SPECIFICATIONS	REMARKS	SYMB. NO.
Building		TO SCALE OR SHOW MINIMUM SIZE 0.50mm x 0.50mm SOLID IF LESS THAN 2.50mm LARGER-CROSS HATCH SPACED 0.45mm ϕ to ϕ	CLASS 1: DWELLINGS, PLACES OF EMPLOYMENT, ETC.	1
Building		TO SCALE OR SHOW MINIMUM SIZE 0.65mm x 0.65mm. WHEN WIDTH EXCEEDS 1.50mm, HATCH AT 45° ANGLE.	CLASS 2: BARNs, GREENHOUSES, WAREHOUSES, ETC. SHOW LANDMARK ONLY.	2
Destroyed building		0.50mm SQUARE	PLOT TO SCALE WHEN BUILDING EXCEEDS 0.50mm. LABEL	3
Ruins and archeological site		LINEWEIGHT 0.10mm DASH 1.25mm SPACE 0.50mm SIZE 1.25mm X 1.25mm	LANDMARK, PROTECTED. IF LESS THAN 1.25mm X 1.25mm, USE SOLID OUTLINE. LABEL	4
School		TO SCALE OR SHOW MINIMUM SIZE 0.65mm X 0.65mm	SIZE MAY BE REDUCED TO 0.50 mm X 0.50 mm IN CONGESTED AREAS	5
Church		TO SCALE OR SHOW MINIMUM SIZE 0.65mm X 0.65mm	SIZE MAY BE REDUCED TO 0.50 mm X 0.50 mm IN CONGESTED AREAS	6
Town, village, settlement				7
Boardwalk		LINEWEIGHT 0.10mm	OVERALL WIDTH TO SCALE WITH MINIMUM 0.50mm	8
Port of entry		TO SCALE	MINIMUM SIZE 0.50mm X 0.50mm LABEL	9
Cliff dwelling		LINEWEIGHT 0.10mm RECTANGLE 0.50mm X 0.75mm BASE LENGTH 1.50mm	LANDMARK, PROTECTED	10

MISCELLANEOUS CULTURE				
FEATURE	SYMBOL	SPECIFICATIONS	REMARKS	SYMB. NO.
Parking area		LINEWEIGHT 0.10mm	250' (1.50mm) IN SHORTEST DIMENSION	11
Drive-in theater	 Drive-in Theater	LINEWEIGHT 0.10mm DASH 1.25mm, SPACE 0.50mm BUILDING SIZE 0.50mm X 0.50mm SCREEN 0.20mm	LABEL	12
Picnic area, roadside park	 Roadside Park	LINEWEIGHT 0.10 mm TOP LENGTH 1.25 mm LEG LENGTH 0.75 mm SPACE BETWEEN LEGS 0.75 mm	SELECTED; ONLY THOSE AREAS WHICH INCLUDE PARKING AREA, FIREPLACES, TABLES, OR SHELTERS LABEL	13
Fairgrounds		LINEWEIGHT 0.10mm DASH 1.25mm SPACE 0.50mm	TO SCALE; LABEL	14
Public campgrounds, campsites	 Campground	LINEWEIGHT 0.10 mm TRIANGLE ALTITUDE 1.90 mm TRIANGLE BASE 1.0 mm TICK LENGTH 0.65 mm	LABEL	15
Fort			LANDMARK OR NAMED HISTORICAL SITE POSICUT 976	16
Monument	 Monument	OUTSIDE DIAMETER 1.0mm LINEWEIGHT 0.10mm DOT 0.20mm	LANDMARK; LABEL	17
Lookout tower	 Lookout Tower	OUTSIDE DIAMETER 1.0mm LINEWEIGHT 0.10mm DOT 0.20mm	LANDMARK; LABEL	18
Windmill	 Dry Well	LINEWEIGHT 0.10 mm TRIANGLE ALTITUDE 1.25 mm: ANGLES 30°, 75°, 75° ARMS (LENGTH) 1.10 mm ANGLES 70° X 110° CENTER CROSS ON FEATURE	LABEL IF DRY OR SALT WELL	19
Radio tower, mast	 Radio Tower (W/MAL)		POSICUT NO. 1304 (REV) LABEL: RADIO TOWER ADD RADIO CALL LETTERS, IF KNOWN	20
Landmark object	 Chimney	OUTSIDE DIAMETER 1.0mm LINEWEIGHT 0.10mm DOT 0.20mm	LANDMARK OBJECT NOT OTHERWISE SYMBOLIZED. LABEL	21
Lighthouse			POSICUT NO. 976	22

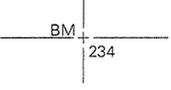
MISCELLANEOUS CULTURE				
FEATURE	SYMBOL	SPECIFICATIONS	REMARKS	SYMB. NO.
Tollgate		TICK LINEWEIGHT 0.20mm	PROJECT 0.50mm BEYOND ROAD EDGE. LABEL	23
Gaging station	• Gaging Station	LINEWEIGHT 0.10mm CIRCLE OUTSIDE DIAM 1.25mm	DIVIDE IN 4 EQUAL SECTORS. LABEL	24
Coke ovens	 Coke Ovens	CASING LINEWEIGHT 0.10mm WIDTH 0.50mm FILL DASH 0.75mm SPACE 0.50mm	LABEL	25
Race track		LINEWEIGHT 0.10mm DISTANCE BETWEEN LINES 0.50mm	TO SCALE IF LONGER THAN 1000' (6.0 mm)	26
Stadium	 Stadium	LINEWEIGHT 0.10mm DASH 1.25mm SPACE 0.50mm	TO SCALE; LABEL	27
Watermill	✱		POSCUT NO. 976; LABEL	28
Pumping station	■ Pumping Station	SOLID SQUARE TO SCALE	MAJOR, MINIMUM SIZE 0.50mm X 0.50mm LABEL	29
Airfield, loose surface runways		LINEWEIGHT 0.10mm DASH 1.25mm SPACE 0.50mm	TO SCALE OR WITH MINIMUM WIDTH 0.50mm. MINIMUM LENGTH 1000' (6.0mm) NO BOUNDARY OR TINT.	30
Airfield, hard surface runway		LINEWEIGHT 0.10mm AS BUILT	TO SCALE OR WITH MINIMUM WIDTH 0.50mm. MINIMUM LENGTH 1000' (6.0mm) NO BOUNDARY OR TINT.	31
Airfield, runway information not available	⊕		POSCUT NO. 976	32
Heliport	⊙		POSCUT NO. 976	33

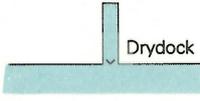
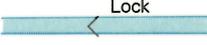
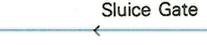
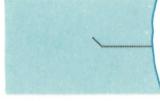
MISCELLANEOUS CULTURE				
FEATURE	SYMBOL	SPECIFICATIONS	REMARKS	SYMB. NO.
Seaplane base		LINWEIGHT 0.10mm DASH 1.25mm, SPACE 0.50mm	SHOW BUILDINGS AND RAMPS. LABEL	34
Seaplane base, information not available			POSICUT NO. 976	35
Seaplane anchorage, information not available			POSICUT NO. 976	36
Power transmission line		LINWEIGHT 0.20mm	PLACE PYLONS AT ANGLE POINTS. SPACING BETWEEN PYLONS 12.50 mm PYLONS POSICUT NO. 879A	37
Pipeline, above ground	<u>ABOVEGROUND PIPELINE</u>	LINWEIGHT 0.15mm	LABEL	38
Pipeline underground	<u>PIPELINE</u>	LINWEIGHT 0.15mm DASH 2.50mm SPACE 0.50mm	LABEL	39
Wall		LINWEIGHT 0.15mm ABUTMENT 0.25mm HIGH; 0.40mm LONG. SPACE BETWEEN ABUTMENTS 2.0mm.		40
Stone fence		LINWEIGHT 0.15mm 33% BIANGLE		41
Telephone or telegraph line		LINWEIGHT 0.10mm SQUARES SOLID, 0.45mm X 0.45mm. SPACING 12.50mm.	LABEL	42
Well: oil, gas	 Gas Well	DIAMETER 0.80mm LINWEIGHT 0.10mm	POSICUT NO. 976. CAN BE SCRIBED LABEL AS TO TYPE	43
Oil or gas field	 Oil	DIAMETER 0.80mm LINWEIGHT 0.10mm	POSICUT NO. 976. CAN BE SCRIBED SHOW REPRESENTATIVE PATTERN. LABEL	44
Tank	 Gas	SOLID DOT	MINIMUM DIAMETER 0.75mm LABEL	45

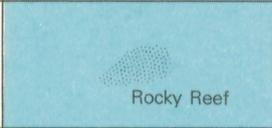
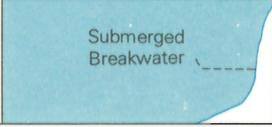
MISCELLANEOUS CULTURE				
FEATURE	SYMBOL	SPECIFICATIONS	REMARKS	SYMB. NO.
Cavern, Mine Tunnel	←	LINWEIGHT 0.10mm ARM LENGTH 0.80mm SHAFT LENGTH 1.70mm ANGLE 90°	LABEL	46
Power sub station		LINWEIGHT 0.10 mm DASH 1.25 mm SPACE 0.50 mm	POSICUT NO. 976 OR OUTLINE TO SCALE IF LARGER THAN 400' (2.50 mm). LABEL	47
Oil sump or sludge pit		OUTLINE LINWEIGHT 0.10mm FILL-USGS 17	USE OUTLINE IF CONSTRUCTED OF MATERIALS OTHER THAN EARTH. LANDMARK. LABEL	48
Open oil reservoir		TO SCALE LINWEIGHT 0.10mm MINIMUM SIZE 0.50mm X 0.50mm	LABEL	49
Railroad, standard gauge single track		BASE WEIGHT 0.20mm TICK WEIGHT 0.10mm TICK LENGTH 1.50mm TICK SPACING 5.0mm		50
Railroad, standard gauge multiple track		BASE LINWEIGHT 0.10 mm TICK WEIGHT 0.10 mm TICK LENGTH 1.50 mm TICK SPACING 5.0 mm OVERALL WIDTH 0.45 mm	LABEL CHANGE	51
Railroad, standard gauge, single track, nonoperating		SPACE BETWEEN SEGMENTS 0.50mm- ALL OTHER DIMENSIONS SAME AS OPERATING SINGLE TRACK	LABEL	52
Railroad standard gauge, multiple track, nonoperating		SPACE BETWEEN SEGMENTS 0.50mm- ALL OTHER DIMENSIONS SAME AS OPERATING SINGLE TRACK	LABEL	53
Railroad, narrow gauge, single track		BASE WEIGHT 0.20mm TICK WEIGHT 0.10mm TICK LENGTH 0.75mm TICK SPACING 5.0mm	TIES ALTERNATED	54
Railroad, narrow gauge, multiple track		LINWEIGHT 0.20mm TICK WEIGHT 0.10mm TICK LENGTH 0.75mm SPACING BETWEEN SETS OF TICKS 5.0 mm. SPACING BETWEEN TICKS IN EACH PAIR 0.50mm	TIES ALTERNATED	55
Railroad, dismantled		LINWEIGHT 0.10mm DASH 1.25mm SPACE 0.50mm	LABEL	56
Narrow gauge, abandoned		DIMENSIONS SAME AS OPERATING RAILROAD. SPACE BETWEEN SEGMENTS 0.50mm.	LABEL	57

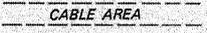
MISCELLANEOUS CULTURE				
FEATURE	SYMBOL	SPECIFICATIONS	REMARKS	SYMB. NO.
Railroad siding		LINEWEIGHT 0.10 mm TICK WEIGHT 0.10 mm TICK LENGTH 1.50 mm TICK SPACING 5.0 mm MINIMUM SPACE BETWEEN TRACK 0.30 mm	MINIMUM LENGTH 500' (3.0); SHOW MINIMUM OF ONE CROSSTIE.	58
Railroad yard		LINEWEIGHT 0.10 mm TICK WEIGHT 0.10 mm TICK LENGTH 1.0 mm TICK SPACING 5.0 mm MAXIMUM TICK LENGTH TO TOUCH 6 TRACKS MINIMUM SPACE BETWEEN TRACK 0.30 mm	SHOW MAIN THROUGH LINE AND SHOW LIMITING SIDINGS TO SCALE.	59
Railroad in road		TICK WEIGHT 0.10mm SPACING 5.0mm		60
Car line		LINEWEIGHT 0.15mm TICK WEIGHT 0.10mm TICK LENGTH 1.50mm TICK SPACING 2.50mm		61
Roundhouse		TO SCALE		62
Turntable		TO SCALE LINEWEIGHT 0.10mm DIAMETER 1.50mm DIAGONAL LINE 45° TO TRACK.	MINIMUM CIRCLE 1.50mm OVERALL.	63
Railroad station, location known		BUILDING SYMBOL 0.50mm X 0.50mm MINIMUM, WHERE POSITION IS KNOWN; ADD LABEL "STATION"	SHOW SYMBOL WHEN NO SIDING, BUILDING OR OTHER IDENTIFYING FEATURE SHOWN.	64
Railroad station, location unknown		WHERE POSITION IS NOT KNOWN, CENTER 0.50mm X 1.0mm SOLID BLACK RECTANGLE ON TRACK WITH LONG DIMENSION PERPENDICULAR TO THE TRACK.	SHOW SYMBOL WHEN NO SIDING, BUILDING OR OTHER IDENTIFYING FEATURE SHOWN.	65
Railroad bridge, without superstructure		LINEWEIGHT 0.20mm. CROSS TICK 0.85mm WING TICKS (45°) 0.60mm LINE WEIGHT 0.10mm	MINIMUM LENGTH 500' (3.0mm). NO CROSS TIES ON BRIDGES LESS THAN 5.0mm IN LENGTH, NONE CLOSER THAN 2.50mm TO BRIDGE TICKS.	66
Railroad bridge, with superstructure		BRIDGE WEIGHT 0.15mm WINGTICK LENGTH 0.60mm ANGLE 45°. DISTANCE FROM CENTER LINE OF RAILROAD 0.25mm EACH SIDE.	MINIMUM LENGTH 500' (3.0mm). NO CROSS TIES ON BRIDGE.	67
Drawbridge, railroad		LINEWEIGHT OF CIRCLE 0.10mm DIAMETER 1.10mm OVERALL	CLEAR TINT FROM CIRCLE	68
Railroad tunnel		LINEWEIGHT 0.20mm DASH 1.25mm, SPACE 0.50mm CROSS TICK 0.85mm, WINGTICK 45° WINGTICK LINEWEIGHT 0.10mm WINGTICK LENGTH 0.60mm	SHOW ACTUAL SIZE; MINIMUM LENGTH 500' (3.0mm). SHOW ALL LANDMARK TUNNELS. NO CROSSTIES THROUGH TUNNEL.	69

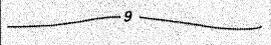
MISCELLANEOUS CULTURE				
FEATURE	SYMBOL	SPECIFICATIONS	REMARKS	SYMB. NO.
Railroad underpass, overpass		SPACE 0.50mm		70
Railroad ferry		LINEWEIGHT 0.20mm DASH 1.25mm SPACE 0.50mm	MINIMUM LENGTH 500' (3.0mm). NO CROSSIES ON FERRY SYMBOL LABEL.	71
Snowshed		LINEWEIGHT 0.10mm MINIMUM SHED WIDTH 1.50mm PLOT SHED LENGTH TO SCALE. DIAGONAL LINES 45°, SPACE 0.50mm.		72
Tramway, ski lift, incline railway, etc.		LINEWEIGHT 0.15mm. DASH 2.50mm SPACE 0.50mm.	LABEL	73
National, state forest reservation boundary		LINEWEIGHT 0.20mm. DASH 6.0mm, SPACE BETWEEN DASHES 2.40mm. DOT 0.25mm.	MINIMUM SIZE 1000' (6.0mm) IN SHORTEST DIMENSION. LABEL	74
Military reservation boundary		LINEWEIGHT 0.20mm. DASH 6.0mm, SPACE BETWEEN DASHES 2.44mm. DOT 0.25mm. OVERPRINT 2.0mm WIDE. 21%-1200-45°	LABEL "MILITARY RESERVATION" OR "MIL RES"	75
National cemetery		LINEWEIGHT 0.10mm DASH 1.0mm SPACE 0.50mm	SHOW ALL NATIONAL CEMETERIES LABEL	76
Other cemeteries		LINEWEIGHT 0.10mm DASH 1.25mm SPACE 0.50mm	MINIMUM SIZE 250' (1.50mm) IN SHORTEST DIMENSION. LABEL. IF LARGER THAN 2.50 mm X 2.50mm ADD CROSS. CROSS BAR LENGTH 2/3 OF UPRIGHT, PLACED 1/3 UPRIGHT FROM TOP. SPACE PERMITTING, OMIT CROSS, LABEL INSIDE.	77
Isolated grave			POSICUT NO. 976	78
Spot elevation		DOT 0.50mm	DOT NOT SHOWN FOR MAP IDENTIFIABLE FEATURES	79
Horizontal control station, 3rd order or better, permanent mark		LINEWEIGHT 0.10mm TRIANGLE 1.75mm SIDE DOT 0.15mm	NO LINES OR TINTS INSIDE TRIANGLE	80
Horizontal control station, elevation 3rd order or better		LINEWEIGHT 0.10mm TRIANGLE 1.75mm SIDE DOT 0.15mm	NO LINES OR TINTS INSIDE TRIANGLE	81

MISCELLANEOUS CULTURE				
FEATURE	SYMBOL	SPECIFICATIONS	REMARKS	SYMB. NO.
Horizontal control station vertical angle elevation	VABM \triangle 324	LINEWEIGHT 0.10mm TRIANGLE 1.75mm SIDE DOT 0.15mm	NO LINES OR TINTS INSIDE TRIANGLE	82
Vertical control station, marked with tablet: elevation 3rd order or better	BM \times 972	LINEWEIGHT 0.10mm CROSS LENGTH 2.0mm ANGLE 90°		83
Vertical station recoverable mark, no tablet: elevation 3rd order or better	\times 1246	LINEWEIGHT 0.10mm CROSS LENGTH 2.0mm ANGLE 90°		84
Boundary monument with tablet: elevation 3rd order or better	BM \square 1208	LINEWEIGHT 0.10mm SIZE 1.0mm X 1.0mm DOT 0.15mm		85
Boundary monument without tablet: elevation 3rd order or better	\square 628	LINEWEIGHT 0.10mm SIZE 1.0mm X 1.0mm DOT 0.15mm		86
Horizontal control station: checked spot elevation	\triangle 168	LINEWEIGHT 0.10mm TRIANGLE SIDE 1.75mm DOT 0.15mm	NO LINES OR TINTS INSIDE TRIANGLE	87
Mineral or location monument	\blacktriangle	TRIANGLE, SOLID BASE 1.50mm HEIGHT 1.0mm		88
Boundary monument with number and elevation	57 \square 988	LINEWEIGHT 0.10mm SIZE 1.0mm X 1.0mm DOT 0.15mm		89
Reference monument	\square	LINEWEIGHT 0.10mm SIZE 1.0mm X 1.0mm DOT 0.15mm		90
Horizontal control station coincident with section corner		LINEWEIGHT 0.10mm TRIANGLE LENGTH 1.0mm DOT 0.15mm SPACE 0.80mm	SHOW TRIANGLE, OMIT SECTION CORNER. NO LINES OR TINTS INSIDE TRIANGLE	91
Bench mark coincident with found section corner				92
Open pit mine or quarry	\otimes	LINEWEIGHT 0.10 mm OVERALL LENGTH 2.0 mm ARC LENGTH 1.0 mm	LABEL	93

MISCELLANEOUS CULTURE				
FEATURE	SYMBOL	SPECIFICATIONS	REMARKS	SYMB. NO.
Gravel, sand or clay pits	 Gravel Pit	LINEWEIGHT 0.10mm OVERALL LENGTH 2.0mm TRIANGLE 0.65mm X 0.65mm X 0.75mm	LABEL	94
Mine shaft		LINEWEIGHT 0.10mm 1.0mm X 1.0mm		95
Dam masonry		LINEWEIGHT 0.30mm	MINIMUM LENGTH 500' (3.0mm) SHOW ACTUAL SIZE IF LARGER.	96
Dam with lock (navigable waterways)		LINEWEIGHT 0.10mm LOCK 1.90mm X 0.80mm	POINT UPSTREAM. 45° ANGLE.	97
Dam carrying road		A. ROAD ON DAM (PLOT TO SCALE) MINIMUM WIDTH ON EACH SIDE OF ROAD 0.4mm. B. TRACK OR TRAIL ON DAM (PLOT DAM TO SCALE) MINIMUM WIDTH 0.4mm.	MINIMUM LENGTH 500' (3.0mm)	98
Drydock		LINEWEIGHT 0.10mm TICK WEIGHT 0.20mm TICK LENGTH 5.80mm TICK ANGLE 45°	LABEL	99
Lock, shipping canal		LINEWEIGHT 0.20mm ANGLE 45°	TICK TO PROJECT 0.50mm BEYOND CANAL EDGE. POINT UPSTREAM. LABEL.	100
Seawall		LINEWEIGHT 0.20mm DASH 0.80mm SPACE 0.40mm	MINIMUM LENGTH 500' (3.0mm). LABEL	101
Canal, lock or sluice gate		LINEWEIGHT 0.20mm TICKS: 0.60mm LENGTH ANGLE 45°	POINT UPSTREAM. LABEL.	102
Fish hatchery		LINEWEIGHT 0.10mm	MINIMUM SIZE 250' (1.5 mm) IN SHORTEST DIMENSION. LABEL LP-8 33% BIANGLE	103
Sewage disposal, filtration plant		LINEWEIGHT 0.10mm	MINIMUM SIZE 250' (3.0 mm) IN SHORTEST DIMENSION. LABEL LP-8 33% BIANGLE	104
Breakwater, pier, etc.		LINEWEIGHT 0.20mm	MINIMUM LENGTH 500' (3.0mm)	105

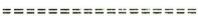
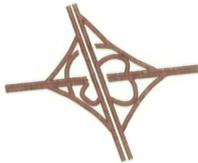
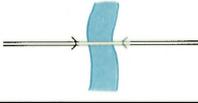
MISCELLANEOUS CULTURE				
FEATURE	SYMBOL	SPECIFICATIONS	REMARKS	SYMB. NO.
Foreshore flat			LABEL SAND, GRAVEL, MUD, ETC. IF UNKNOWN, LABEL "TIDAL FLAT". AP-95	106
Rock or coral reef		<p>REEF LIMITS IRREGULAR LINE-AVOID SHARP ANGLES AND POINTS.</p> <p>MAIN TICK LENGTH 0.75mm TO 0.25mm SPACING 0.75mm TO 2.0mm AT REEF LINE. TICKS IRREGULAR ALIGNMENT WITH SHARP ANGLES AVOIDED.</p> <p>SECONDARY TICKS TICKS TO EMANATE FROM RIGHT OF MAIN TICKS AS VIEWED FROM REEF LIMITS. LENGTH VARIES, MUST NOT EXCEED THREE-FOURTHS DISTANCE BETWEEN MAIN TICKS. SMALLEST NEAR END OF MAIN TICK. SPACE BETWEEN TICKS APPROXIMATELY 0.60mm.</p>	LABEL "ROCKY" OR "CORAL" IF KNOWN. AP 95	107
Rock, bare or awash, dangerous to navigation		<p>LINEWEIGHT 0.10mm LENGTH 1.25mm ANGLES 60° DOTS 0.20mm SPACE 0.45mm</p>	POSICUT 672	108
Group of rocks		<p>LINEWEIGHT 0.10mm LENGTH 1.25mm ANGLES 60°</p>	POSICUT 672	109
Small rock or coral reef		<p>DOTS 0.20mm SPACE 0.45mm</p>	MINIMUM SIZE 250' (1.50mm) IN SHORTEST DIMENSION. LABEL.	110
Exposed wreck			USGS 24 POSICUT 672	111
Exposed wreckage		<p>DOTS 0.20mm SPACE 0.45mm</p>	LABEL	112
Masts Exposed		<p>OUTLINE DOTS 0.20mm SPACE 0.45mm.</p>	USGS 24 POSICUT 672 LABEL.	113
Submerged breakwater		<p>LINEWEIGHT 0.15mm DASH 0.80mm SPACE 0.40mm</p>	LABEL	114

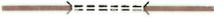
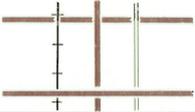
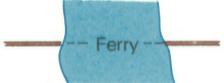
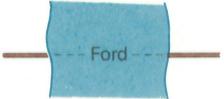
MISCELLANEOUS CULTURE				
FEATURE	SYMBOL	SPECIFICATIONS	REMARKS	SYMB. NO.
Dolphins, pilings	 Piling		LABEL	115
Soundings				116
Bottom characteristics	Mud Sand Gravel			117
Anchorage			ALIGN BASE WITH SOUTH NEATLINE POSICUT 672	118
Area limits		LINEWEIGHT 0.10mm DASH 2.50mm, SPACE 0.50mm	LABEL	119
Shoal	 Shoal	DOTS 0.20mm SPACE 0.45mm	LABEL	120

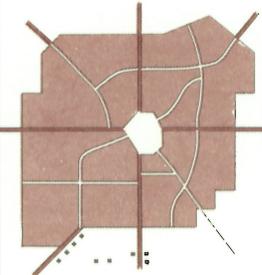
BATHYMETRIC CONTOURS				
FEATURE	SYMBOL	SPECIFICATIONS	REMARKS	SYMB. NO.
Bathymetric contour		LINEWEIGHT 0.05mm		1

CIVIL BOUNDARIES				
FEATURE	SYMBOL	SPECIFICATIONS	REMARKS	SYMB. NO.
National		LINEWEIGHT 0.40mm LONG DASH 6.0mm SHORT DASH 1.75mm SPACE 0.80mm OVERPRINT 2.0mm 21°-120D-45°	REDUCE SYMBOL LINEWEIGHT TO 0.10mm IN ROAD. OMIT SYMBOL WHEN COINCIDENT WITH RAILROAD. SHOW OVERPRINT.	1
State or territorial		LINEWEIGHT 0.30mm LONG DASH 6.0mm SHORT DASH 1.75mm SPACE 0.80mm	REDUCE SYMBOL LINEWEIGHT TO 0.10mm IN ROAD. OMIT SYMBOL WHEN COINCIDENT WITH RAILROAD. ADD LABEL IF NECESSARY FOR CLARITY.	2
County, parish, Alaska borough		LINEWEIGHT 0.25mm LONG DASH 6.0mm SHORT DASH 1.75mm SPACE 0.80mm	REDUCE SYMBOL LINEWEIGHT TO 0.10mm IN ROAD. OMIT SYMBOL WHEN COINCIDENT WITH RAILROAD. ADD LABEL IF NECESSARY FOR CLARITY.	3
Civil township, town, etc.		LINEWEIGHT 0.20mm DASH 4.25mm SPACE 0.80mm	REDUCE SYMBOL LINEWEIGHT TO 0.10mm IN ROAD. OMIT SYMBOL WHEN COINCIDENT WITH RAILROAD. ADD LABEL IF NECESSARY FOR CLARITY.	4
Incorporated city, village, town, etc.		LINEWEIGHT 0.20mm LONG DASH 2.0mm SHORT DASH 1.0mm SPACE 0.50mm	REDUCE SYMBOL LINEWEIGHT TO 0.10mm IN ROAD. OMIT SYMBOL WHEN COINCIDENT WITH RAILROAD. ADD LABEL IF NECESSARY FOR CLARITY.	5

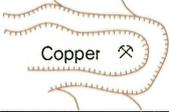
PUBLIC-LAND SURVEY				
FEATURE	SYMBOL	SPECIFICATIONS	REMARKS	SYMB. NO.
Range, township lines (surveyed)		LINEWEIGHT 0.25mm	INCLUDING PRIVATE SURVEYS ACCEPTED BY BLM	1
Section lines (surveyed)		LINEWEIGHT 0.15mm	LABEL EACH SECTION	2
Land grant lines		LINEWEIGHT 0.15 DASH 6.0mm DOTS 0.20mm SPACE BETWEEN DASHES 2.50mm	LABEL	3
Indian treaty lines	OLD INDIAN TREATY LINE	LINEWEIGHT 0.15mm	LABEL	4
Range, township lines location doubtful		LINEWEIGHT 0.25mm DASH 2.50mm SPACE 0.50mm	LEAVE SPACE BETWEEN SOLID AND DASHED LANDLINES.	5
Section lines location doubtful		LINEWEIGHT 0.15mm DASH 2.50mm SPACE 0.50mm		6
Base line, principal meridian		LINEWEIGHT 0.25mm	LABEL	7
Section corner: found		LINEWEIGHT 0.25mm LENGTH 1.50mm SPACE 0.80mm		8
				9
Closing corner: found		LINEWEIGHT 0.25mm LENGTH 0.75mm-1.50mm SPACE 0.80mm		10
				11
Witness corner		LINEWEIGHT 0.25mm LENGTH 1.50mm SPACE 0.80mm	LABEL	12
Meander corner		LINEWEIGHT 0.25mm LENGTH 0.75mm-1.50mm SPACE 0.80mm	LABEL	13
Grant monument		LINEWEIGHT 0.10mm LENGTH SIDE 1.0mm DOT 0.15mm		14

ROADS				
FEATURE	SYMBOL	SPECIFICATIONS	REMARKS	SYMB. NO.
Primary highway, all weather, hard surface (class 1)		MINIMUM WIDTH OVERALL 0.50mm CASING WEIGHT 0.10mm		1
Secondary highway, all weather, hard surface (class 2)		MAXIMUM WIDTH OVERALL 0.50 mm CASING WEIGHT 0.10 mm FILL 3.0 mm, SPACE 3.0 mm		2
Light duty road, all weather, hard or improved surface (class 3)		MINIMUM WIDTH OVERALL 0.50mm CASING WEIGHT 0.10 mm		3
Unimproved road, fair or dry-weather (class 4)		MINIMUM WIDTH 0.50mm CASING WEIGHT 0.10mm DASH 1.25mm SPACE 0.50mm	SHOW ALL 4TH CLASS CONNECTING ROADS AND OTHERS MEASURING 500' (3.0 mm) OR LONGER. (3 DASHES)	4
Trail (class 5)		LINEWEIGHT 0.15mm DASH 1.25mm SPACE 0.50mm	LABEL IF OTHER THAN FOOT TRAIL MINIMUM LENGTH. .5 MILE (16.0mm)	5
Divided Highway, with median strip		MINIMUM WIDTH OVERALL 1.0mm OUTSIDE CASING WEIGHT 0.10mm CENTERLINE WEIGHT 0.10mm	SHOW APPROPRIATE FILL	6
Divided highway, with median strip 0.25mm or wider		MINIMUM MEDIAN SPACE 0.25mm EACH ROAD SEGMENT MINIMUM WIDTH OVERALL 0.50mm OUTSIDE CASING WEIGHT 0.10mm INSIDE CASING WEIGHT 0.10mm	SHOW APPROPRIATE FILL	7
Road under construction	<u>UNDER CONSTRUCTION</u>	CASING WEIGHT 0.10 mm DASH 2.5 mm SPACE 0.50 mm	CLASS 1 AND 2 ONLY	8
Interchange (example only)		DRAFT ACCESS ROADS 0.50mm LINEWEIGHT 0.075mm	WIDTH OF RAMPS MAY BE DECREASED TO 0.35 mm IF NECESSARY TO PRESERVE INTEGRITY OF INTERCHANGE	9
Bridge, with superstructure		BRIDGE WEIGHT 0.25mm WINGTICK LENGTH 0.60mm ANGLE 45°	MINIMUM LENGTH 500' (3.0mm)	10
Bridge, without superstructure		LINEWEIGHT 0.10mm. CROSS TICK SAME AS ROAD WIDTH WINGTICK LENGTH 0.60mm WINGTICK ANGLE 45°	MINIMUM LENGTH 500' (3.0mm)	11

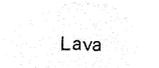
ROADS				
FEATURE	SYMBOL	SPECIFICATIONS	REMARKS	SYMB. NO.
Tunnel		TUNNEL WEIGHT 0.10mm WIDTH 0.50mm. WINGTICK LENGTH 0.60mm ANGLE 45° DASH 1.0mm, SPACE 0.50mm	SHOW ACTUAL SIZE MINIMUM LENGTH 500' (3.0mm) SHOW ALL LANDMARK TUNNELS.	12
Overpass, underpass		ROADS OR RAILROADS UNDERPASSING OTHER ROADS OR RAILROADS ARE BROKEN 0.50 mm FROM CENTERLINE OF RAILROAD OR EDGE OF ROAD CASING.		13
Service, rest area		MINIMUM ROAD WIDTH 0.50 mm CASING 0.075mm	LANDMARK TO SCALE	14
Traffic circle		MINIMUM INNER CIRCLE DIAMETER 1.0 mm ROAD WIDTH OF CIRCLE SAME AS WIDEST ROAD ENTERING CIRCLE.		15
Ferry		LINEWEIGHT 0.10mm DASH 1.25mm, SPACE 0.50mm		16
Ford		LINEWEIGHT 0.10mm DASH 1.25mm,SPACE 0.50mm	FOR STREAMS LESS THAN 500' (3.0 mm) LABEL ADJACENT TO STREAM	17
Route markers			USGS PLATES 9, 9A, 9K POSICUT NO. 462A, 19A-29A	18

URBAN AREA				
FEATURE	SYMBOL	SPECIFICATIONS	REMARKS	SYMB. NO.
Urban area		LIMITING LINEWEIGHT 0.10 mm SCREEN 54%-120G-45°	CLEAR TINT FROM ROADS	1

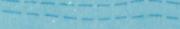
CONTOURS				
FEATURE	SYMBOL	SPECIFICATIONS	REMARKS	SYMB. NO.
Index contour		LINEWEIGHT 0.17mm	INCLUDES UNDERWATER CONTOURS SHOWN ON EXISTING QUADRANGLES.	1
Intermediate contour		LINEWEIGHT 0.05 mm	INCLUDES UNDERWATER CONTOURS SHOWN ON EXISTING QUADRANGLES.	2
Supplementary contour, one-half interval		LINEWEIGHT 0.05mm	33% BANGLE	3
Levees, rims, dike		LINEWEIGHT 0.10 mm TICK LENGTH 0.50 mm SPACE 0.45 mm CENTER TO CENTER	MINIMUM LENGTH 1000' (6.0mm)	4
Bluffs, cliffs		TICK LINEWEIGHT 0.15mm LENGTH OF TICK 0.50mm SPACE BETWEEN TICKS 0.75mm	MINIMUM LENGTH 1000' (6.0mm)	5
Earthen dam		LINEWEIGHT 0.35mm	MINIMUM LENGTH 1000' (6.0mm)	6
Continental divide	<u>CONTINENTAL DIVIDE</u>	LINEWEIGHT 0.30mm DASH 10.0mm SPACE 2.50mm	LABEL	7

INTRICATE SURFACE AREA				
FEATURE	SYMBOL	SPECIFICATIONS	REMARKS	SYMB. NO.
Strip mine	 Strip Mine	PATTERN	SHOW ALL STRIP MINES 1000' (6.0mm) OR MORE IN LENGTH TO SCALE. STRIP MINES LESS THAN 150' WIDE WILL BE SHOWN WITH AP 104 PATTERN 0.85mm WIDE. LABEL	1
Tailings, mine dumps	 Tailings	LINEWEIGHT 0.15mm MINIMUM LENGTH OF TICKS 0.40mm SPACE 0.40mm	MINIMUM SIZE 1000' (6.0mm) IN SHORTEST DIMENSION. LABEL	2
Open pit mine	 Copper	TICKS: LINEWEIGHT 0.15mm LENGTH 0.40mm SPACE 0.40mm	LABEL	3
Quarry	 Quarry	TICKS: LINEWEIGHT 0.15mm LENGTH 0.40mm SPACE 0.40mm	LABEL	4
Gravel, sand, or clay pit	 Gravel Pit	TICKS: LINEWEIGHT 0.15mm LENGTH 0.40mm SPACE 0.40mm	LABEL	5

SAND AREAS				
FEATURE	SYMBOL	SPECIFICATIONS	REMARKS	SYMB. NO.
Ephemeral drainage			MINIMUM LENGTH .5 MILE (16.0mm); MINIMUM WIDTH 250' (1.50mm). AP 95	1
Tailings pond		LINWEIGHT 0.10 mm	MINIMUM SIZE 250' (1.50mm) IN SHORTEST DIMENSION. AP 95 LABEL	2
Sand areas, mud, washes			MINIMUM SIZE 1000' (6.0mm) IN SHORTEST DIMENSION. AP 95 LABEL	3
Glacial moraine		HAND DRAFT DOTS 0.15mm IN DIAMETER	MINIMUM SIZE 500' (3.0mm) IN SHORTEST DIMENSION. AP 95	4
Gravel			MINIMUM SIZE 500' (3.0mm) IN SHORTEST DIMENSION. AP 99	5
Shifting sand or dune area			MINIMUM SIZE 500' (3.0mm) IN SHORTEST DIMENSION. AP 95	6

LAVA				
FEATURE	SYMBOL	SPECIFICATIONS	REMARKS	SYMB. NO.
Lava		12%-1200-45°	MINIMUM SIZE 1000' (6.0mm) IN SHORTEST DIMENSION. LABEL	1

DRAINAGE				
FEATURE	SYMBOL	SPECIFICATIONS	REMARKS	SYMB. NO.
Perennial stream, single and double line		LINEWEIGHT 0.15 mm	MINIMUM LENGTH .5 MILE (16.0 mm) WHEN 80' (0.5 mm) OR WIDER, SHOW AS DOUBLE LINE WITH WATER TINT. SCREEN 31%-1200-45°	1
Intermittent stream		LINEWEIGHT 0.15 mm DASH 4.50 mm SPACE BETWEEN DASHES 3.0 mm DOTS 0.2 mm	MINIMUM LENGTH 0.75 MILE (23.75 mm)	2
Unsurveyed perennial stream		LINEWEIGHT 0.15 mm DASH 1.75 mm SPACE 0.50 mm	SCREEN 31%-1200-45°	3
Shoreline		LINEWEIGHT 0.15 mm	SCREEN 31%-1200-45°	4
Lake or pond, perennial		LINEWEIGHT 0.15 mm	MINIMUM SIZE 150' (1.0 mm) IN SHORTEST DIMENSION. SCREEN 31%-1200-45°	5
Lake or pond, intermittent		LINEWEIGHT 0.15 mm DASH 1.75 mm, SPACE 0.50 mm	MINIMUM SIZE 150' (1.0 mm) IN SHORTEST DIMENSION. SCREEN LP-8 33% BIANGLE	6
Dry lake or pond		LINEWEIGHT 0.15 mm DASH 1.75 mm, SPACE 0.50 mm	MINIMUM SIZE 150' (1.0 mm) IN SHORTEST DIMENSION. AP-95	7
Land subject to controlled inundation		LINEWEIGHT 0.15 mm DASH 1.75 mm, SPACE 0.50 mm	MINIMUM SIZE 1000' (6.0mm) IN SHORTEST DIMENSION UNLESS PARALLELING SHORELINE, THEN 500' (3.0mm) MINIMUM WIDTH. AP 10. 33% BIANGLE	8
Canal, flume, aqueduct, or perennial ditch		LINEWEIGHT 0.15 mm	MINIMUM LENGTH .5 MILE (16.0mm). LABEL	9
Intermittent ditch, canal		LINEWEIGHT 0.15 mm DASH 4.50 mm, SPACE BETWEEN DASHES 3.0 mm DOTS 0.20 mm	MINIMUM LENGTH 0.75 MILE (23.75 mm). LABEL	10
Underground flume, penstock, aqueduct		LINEWEIGHT 0.15 mm DASH 1.25 mm SPACE 0.50 mm	MINIMUM LENGTH .5 MILE (16.0 mm) LANDMARK ONLY. LABEL. USE SYMBOL NO. 2 WITH LABEL IF FEATURE IS INTERMITTENT	11
Elevated aqueduct, flume, conduit		LINEWEIGHT 0.15 mm WINGTICKS: LINEWEIGHT 0.10 mm AT 45° ANGLE LENGTH 0.60 mm STOP OVERPASS FEATURES 0.50 mm FROM CONDUIT	MINIMUM LENGTH .5 MILE (16.0 mm) LABEL ELEVATED WHEN LONG. USE SYMBOL NO. 2 WITH LABEL IF FEATURE IS INTERMITTENT	12

DRAINAGE				
FEATURE	SYMBOL	SPECIFICATIONS	REMARKS	SYMB. NO.
Water well		LINWEIGHT 0.10mm CIRCLE DIAMETER 0.80mm	LABEL	13
Spring		LINWEIGHT 0.10mm CIRCLE DIAMETER 0.80mm TAIL LENGTH 2.0mm	LABEL	14
Glacier or permanent snow field		OUTLINE LINWEIGHT 0.15 mm DASH 1.75 mm SPACE 0.50 mm CONTOUR LINWEIGHT 0.20 mm-0.10 mm	MINIMUM SIZE 500' (3.0mm) IN SHORTEST DIMENSION	15
Glacier or permanent snow field		OUTLINE LINWEIGHT 0.15 mm DASH 1.75 mm SPACE 0.50 mm FORMLINE LINWEIGHT 0.10 mm FORMLINE LENGTH 1.0 mm-5.0 mm	MINIMUM SIZE 500' (3.0mm) IN SHORTEST DIMENSION. USE THIS SYMBOL ONLY WHEN DATA FOR CONTOURING IS WEAK OR UNAVAILABLE	15a
Cranberry bog		LINWEIGHT 0.15 mm	MINIMUM SIZE 1000' (6.0mm) IN SHORTEST DIMENSION. SHOW MAJOR SEPARATIONS. LABEL	16
Salt evaporator		LINWEIGHT 0.15 mm	MINIMUM SIZE 1000' (6.0mm) IN SHORTEST DIMENSION. SHOW MAJOR SEPARATIONS. LABEL. AP 95	17
Large waterfalls		TICKS: LINWEIGHT 0.10mm LENGTH 0.80mm SPACE 0.45mm	USE THIS SYMBOL ON RIVERS 500' (3.0mm) OR WIDER.	18
Small waterfalls		TICKS: LINWEIGHT 0.15 mm MINIMUM LENGTH 1.25 mm	USE THIS SYMBOL ON SINGLE LINE STREAMS AND DOUBLE LINE STREAMS LESS THAN 500' (3.0mm) WIDE. LABEL	19
Large rapids		TICKS: LINWEIGHT 0.10mm SPACE 0.45mm LENGTH VARIES FROM 0.50mm TO 1.0mm	USE ON RIVERS 500' (3.0mm) OR WIDER	20
Small rapids		TICKS: LINWEIGHT 0.15 mm MINIMUM LENGTH 1.25 mm SPACE 0.75 mm	USED ON SINGLE LINE STREAMS AND DOUBLE LINE STREAMS LESS THAN 500' (3.0mm) WIDE. LABEL	21
Channels in water area		LINWEIGHT 0.15 mm DASH 1.75 mm SPACE 0.50 mm	SHOW ONLY IMPOUNDED RIVERS AND INTRACOASTAL WATERWAY	22
Area to be submerged		LINWEIGHT 0.15 mm DASH 1.75 mm, SPACE 0.50 mm	LP-8 33% BIANGLE	23

DRAINAGE				
FEATURE	SYMBOL	SPECIFICATIONS	REMARKS	SYMB. NO.
Siphon		LINWEIGHT 0.15 mm DASH 1.75 mm SPACE 0.50 mm	SELECTED. MINIMUM LENGTH 500' (3.0mm). LABEL	24
Siphon		LINWEIGHT 0.15 mm TICK LENGTH 1.75 mm	SIPHONS LESS THAN 500' (3.0mm) IN LENGTH. LABEL	25
Flow arrow			SHOW ARROW WHEN DIRECTION OF FLOW IS NOT APPARENT. POSICUT 132A	26
Mangrove		LINWEIGHT 0.15 mm DASH 1.0 mm SPACE 0.50 mm 31% 1200-45° (BLUE) AP-8 (GREEN)	SHORELINE IS DELINEATED AS THE HIGH WATER LINE WHEN KNOWN	27

MARSH, SWAMP				
FEATURE	SYMBOL	SPECIFICATIONS	REMARKS	SYMB. NO.
Marsh, swamp			MINIMUM SIZE 1000' (6.0mm) IN SHORTEST DIMENSION. AP-12.	1

VEGETATION				
FEATURE	SYMBOL	SPECIFICATIONS	REMARKS	SYMB. NO.
Woodland			21% 1200 45°	1
Scattered trees			AP 44	2
Scrub			AP 68	3
Orchard, plantation			LABEL IF KNOWN AP 74	4
Vineyard			AP 77	5

TYPE SPECIMENS

UNIVERS MEDIUM (113A)

6PT.ABCDEFGHIJKLMNOPQRSTabcd^{efghijklmno}12

8PT.ABCDEFGHIJKLMNOPQRSabcd^{efghijkl}12

10PT.ABCDEFGHIJKLMabcd^{efghijk}1

12PT.ABCDEFGHIJabcd^{efgh}12

14PT.ABCDEFGHIabcd^e12

16PT.ABCDEFGabcd¹²

18PT.ABCDEFabcde

UNIVERS MEDIUM ITALIC (123A)

6PT.ABCDEFGHIJKLMNOPQRSTabcd^{efghijklmno}q

8PT.ABCDEFGHIJKLMNOPQRabcd^{efghijklm}n

10PT.ABCDEFGHIJKLabcd^{efghijk}12

12PT.ABCDEFGHIJabcd^{efghi}12

14PT.ABCDEFGHIJabcd^{ef}12

16PT.ABCDEFGHIabcd¹²

18PT.ABCDEFabcde

CLEARFACE ITALIC (289K)

6PT. ABCDEFGHIJKabcd^{efghijklm}123456

8PT. ABCDEFGHIJKabcd^{efghijk}1234

10PT. ABCDEFGabcd^{efghij}123

12PT. ABCDEFGabcde¹²

14PT. ABCDabcd¹²³

16PT. ABCabcd¹²³

18PT. ABabc¹²³⁴

UNIVERS LIGHT (114A)

6PT.ABCDEFGHIJKLMNOPRSTWXabcd^{efghijklmnop}

8PT.ABCDEFGHIJKLMNOPRSTabcd^{efghijklm}n

10PT.ABCDEFGHIJKMabcd^{efghijklm}r

12PT.ABCDEFGHGabcd^{efghijkl}

14PT.ABCDEFGHIabcd^{efg}

16PT.ABCDEGHIabcd^{ef}

18PT.ABCDabcd^{ef}12

UNIVERS MEDIUM COND. (117A)

6PT. ABCDEFGHIJKLMNOPRSTUabcd^{efghijklmnop}12345678

8PT. ABCDEFGHIJKLMNOabcd^{efghijklmnop}qr12345678

10PT. ABCDEFGHIJKLabcd^{efghijklm}1234567

12PT. ABCDEFGHIJabcd^{efghi}1234567

14PT. ABCDEFGabcd^{efg}1234567

16PT. ABCDEFabcd^{efg}1234567

18PT. ABCDEabcd^{ef}1234

UNIVERS MEDIUM COND. ITALIC (127A)

6PT. ABCDEFGHIJKLMNOPRSTUabcd^{efghijklmnop}12345678

8PT. ABCDEFGHIJKLMNOabcd^{efghijklmnop}qr12345678

10PT. ABCDEFGHIJKLabcd^{efghijklm}1234567.

12PT. ABCDEFGHIJabcd^{efghi}123456.

14PT. ABCDEFGabcd^{efg}123456.

16PT. ABCDEFabcd^{efg}12345

18PT. ABCDEabcd^{ef}1234

UNIVERS LIGHT COND. (116A)

6PT. ABCDEFGHIJKLMNOPRSTUVWXYZabcd^{efghijklmnopqr}123456

8PT. ABCDEFGHIJKLMNOPQabcd^{efghijklmnopqrstu}123456789

10PT. ABCDEFGHIJKLMabcd^{efghijklmno}1234567

12PT. ABCDEFGHIJKabcd^{efghijklmn}123456

14PT. ABCDEFGabcd^{efghijkl}1234567

16PT. ABCDEFabcd^{efghij}1234567

18PT. ABCDEabcd^{efgh}12345

UNIVERS LIGHT COND. ITALIC (126A)

6PT. ABCDEFGHIJKLMNOPRSTUVWXYZabcd^{efghijklmnopqr}123456

8PT. ABCDEFGHIJKLMNOPQabcd^{efghijklmnopqrstu}123456789

10PT. ABCDEFGHIJKLMabcd^{efghijklmno}123456.

12PT. ABCDEFGHIJKabcd^{efghijklmn}123456.

14PT. ABCDEFGabcd^{efghijkl}123456

16PT. ABCDEFabcd^{efghij}12345

18PT. ABCDEabcd^{efgh}12345

UNIVERS BOLD COND. (118A)

6PT. ABCDEFGHIJKLMNOPQabcd^{efghijklmnop}12345678

8PT. ABCDEFGHIJKLMNabcd^{efghijklmn}123456789

10PT. ABCDEFGHIJKLabcd^{efghijkl}123456

12PT. ABCDEFGHIJabcd^{efghij}1234

14PT. ABCDEFGabcd^{efg}12345

16PT. ABCDEabcd^{ef}12345

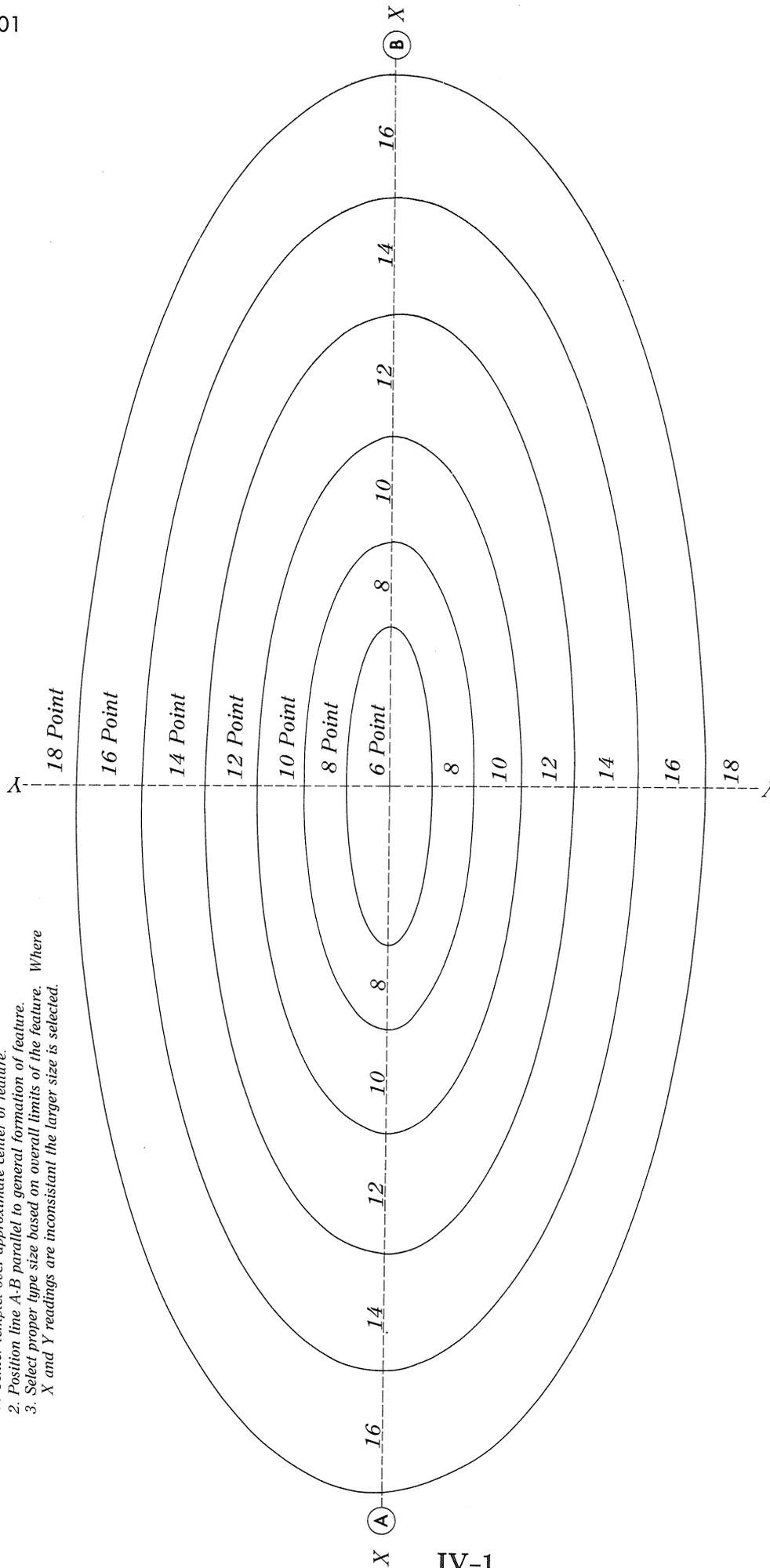
18PT. ABCDabcd¹²³⁴

TYPE M PLATE

AREA FEATURES

Instructions:

1. Center templet over approximate center of feature.
2. Position line A-B parallel to general formation of feature.
3. Select proper type size based on overall limits of the feature. Where X and Y readings are inconsistent the larger size is selected.



IV-1

