FM 21-31

DEPARTMENT OF THE ARMY FIELD MANUAL

TOPOGRAPHIC SYMBOLS

This copy is a reprint which includes current pages from Change 1.

HEADQUARTERS, DEPARTMENT OF THE ARMY
APRIL 1961

CHANGE No. 1

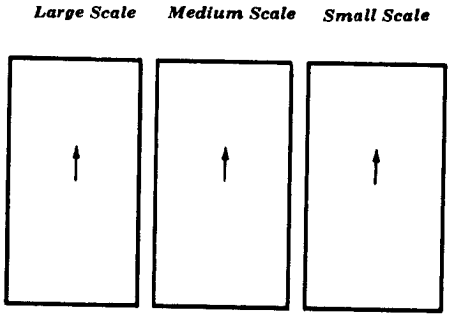
HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., *31 December 1968*

TOPOGRAPHIC SYMBOLS

FM 21-31, 19 June 1961, is changed as follows:

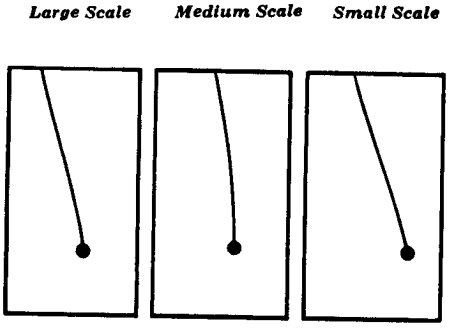
Page 7. Figure 7.1 is added after figure 7.

Figure 7.1. Direction of Flow. Shown only when direction of flow of stream or canal is not apparent.



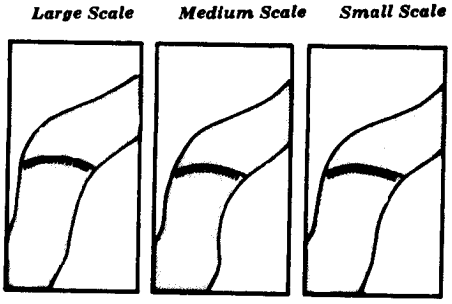
Page 9. Figure 13, the title is changed to read "Dissipating Stream."
Page 9. Figure 13.1 is added after figure 13.

Figure 13.1. Disappearing Stream.



Page 9. Figure 15 is superseded as follows:

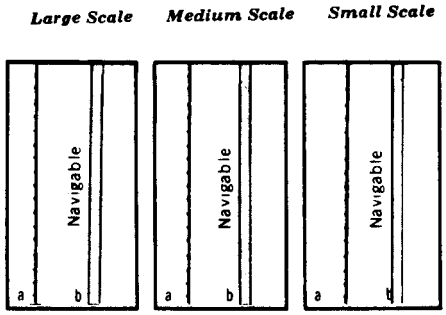
Figure 15. Large Falls.



Page 10. Figure 18 is superseded as follows:

Figure 18. Navigable Canal, In Operation.

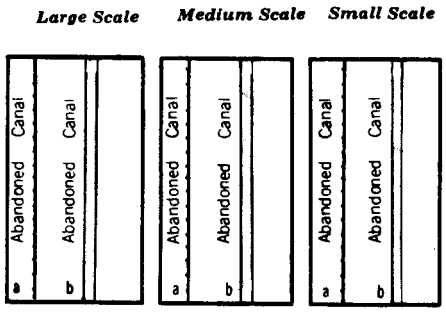
(a) Narrow. (b) Wide.



Page 10. Figure 19 is superseded as follows:

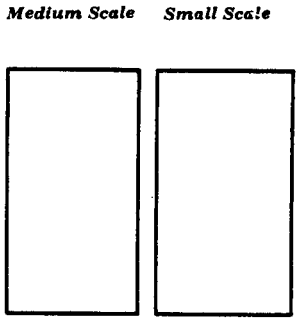
Figure 19. Abandoned Canal, Containing Water.

(a) Narrow. (b) Wide.



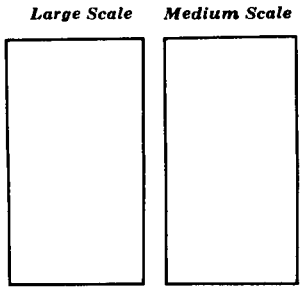
Page 24. Figure 70.1 is added after figure 70.

Figure 70.1. Limits of Ice, Sea Ice, Pack Ice.



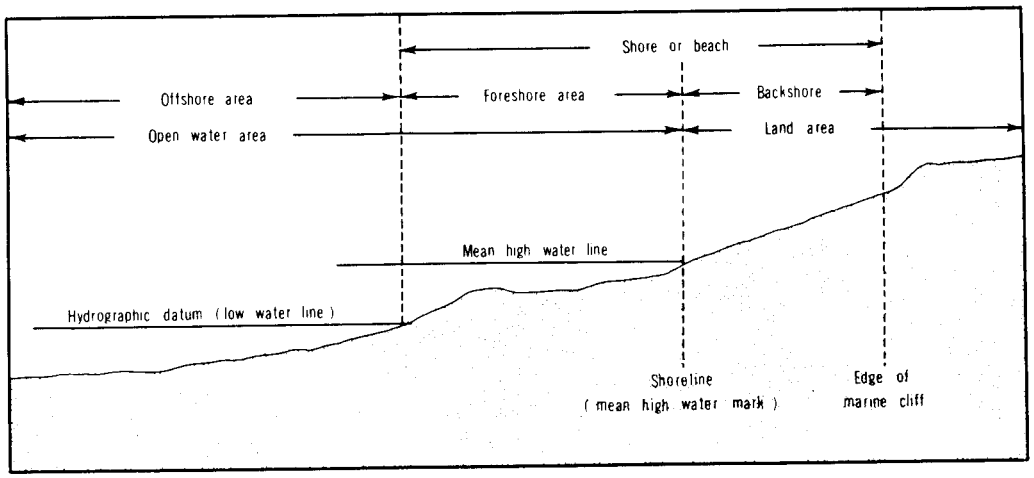
Page 27. Figure 75.1 is added after figure 75.

Figure 75.1. Scattered Trees.



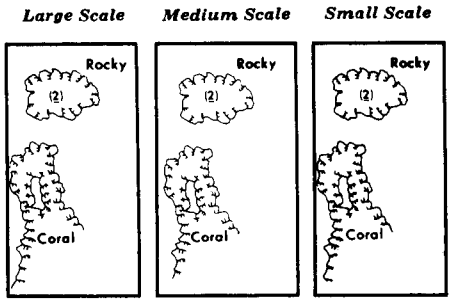
Page 29. Figure 82 is superseded as follows:

Figure 82. Definition of Coastal Terms.



Page 30. Figure 84 is superseded as follows:

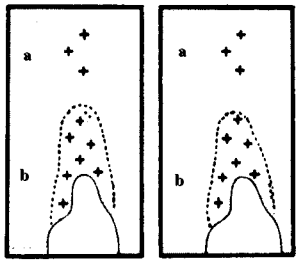
Figure 84. Reef or Ledge. Labeling indicates whether the reef is of rock or coral. The extent of uncovering of reefs at hydrographic datum is shown by labeling.



Page 30. Figure 84.1 is added after figure 84.

Figure 84.1. Submerged Reef or Ledge.

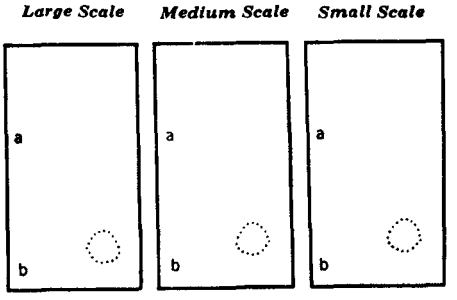
(a) Small area. (b) Large area.



Page 30. Figure 86 is superseded as follows:

Figure 86. Bare Rock, Exposed at Mean High Water.

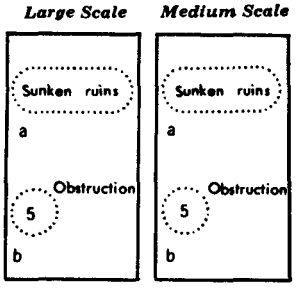
(a) Bare rocks. (b) Bare rocks, dangerous to navigation.



Page 31. Figure 89 is superseded as follows:

Figure 89. Sunken Danger, Other Than a Rock or a Wreck.

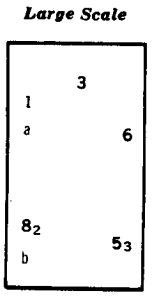
(a) Identified danger, depth unknown. (b) Unidentified danger, depth known.



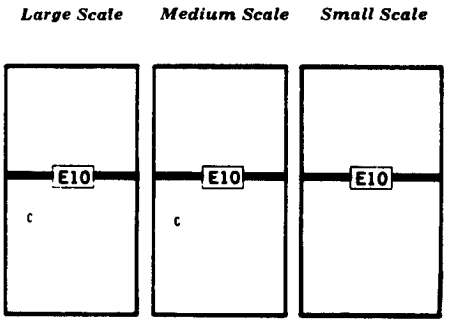
Page 32. Figure 91 is superseded as follows:

Figure 91. Soundings. A sounding is the measured depth of water at the hydrographic datum. The unit of measure may be fathoms, feet, meters, or fathoms and feet in combination, as indicated in the legend.

(a) Soundings. (b) Soundings in fathoms with fractional values in feet.



Page 44. Figure 124, the symbol "(c) International," is added to the legend line and illustration as follows:



Page 86. Paragraphs 23.1 and 23.2 and figures 243 through 332 are added as follows:

23.1. Joint Operations Graphics

a. Purpose and Scope. Joint Operations Graphics are produced in both ground and air versions. The ground version is designated as Series 1501; the air version is designated as Series 1501 AIR. Both versions are designed to provide common base graphics for use in combined operations by the ground and air forces of allied nations. The topographic information is identical on both the ground and air versions.

b. Unit of Vertical Measure. On the ground version, elevation and contour values are shown in meters. These values are converted to foot units on the air version.

c. *Aeronautical Information.* Both versions contain identical information regarding aerodromes and obstructions to pilotage. The air version contains additional information concerning aids to air navigation.

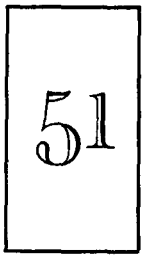
d. Shaded Relief. Both versions contain an identical representation of shading, to provide a rapid recognition of slope and landforms. The shading also serves as a means of correlating contours and elevations, with emphasis on the more significant terrain features.

e. Elevation Tints. Both versions contain a representative system of color tints which depict areas of the same elevation range. A key box on each version indicates the elevation ranges and their corresponding color tints.

j. Symbols. The following approved symbols for Joint Operations Graphics are in addition to, or different from, the standard medium-scale symbols shown in figures 1 through 242:

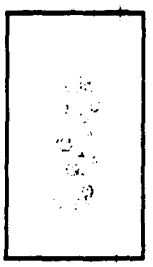
(1) *Elevations.* The following symbol is in addition to the elevation symbols shown in figures 227 through 233:

Figure 243. Highest Known Terrain Elevations. The highest known terrain elevations are shown within each 15-minute square as an aid to air navigation. The larger digit represents thousands of feet; the smaller digit represents hundreds of feet.



(2) *Vegetation.* The following symbol is different from the medium-scale symbol shown in figure 74:

Figure 244. Woods-Brushwood; Forest.



(3) *Roads in foreign areas.* The following figures show the approved symbols for roads in foreign areas:

Figure 245. Hard Surface, All-Weather Road, Two or More Lanes Wide. (a) Principal route. (b) Secondary route.

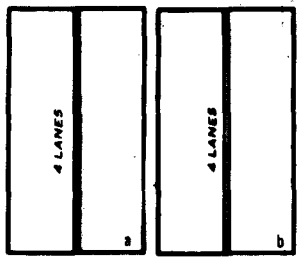


Figure 246. Hard Surface, All-Weather Road, One Lane Wide. (a) Principal route. (b) Secondary route.

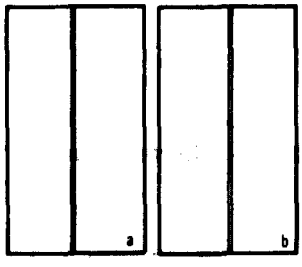


Figure 247. Loose or Light Surface, All-Weather Road, Two or More Lanes Wide. (a) Principal route. (b) Secondary route.

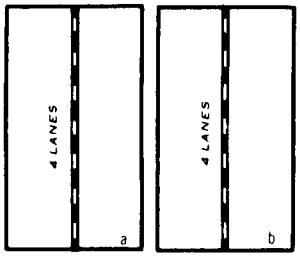


Figure 248. Loose or Light Surface, All-Weather Road, One Lane Wide. (a) Principal route. (b) Secondary route.

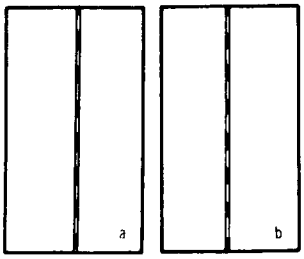


Figure 249. Loose Surface, Fair or Dry Weather Road. (a) Principal route. (b) Secondary route.

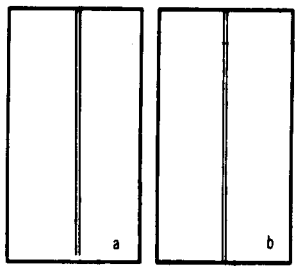


Figure 250. Cart Track. (a) Principal route. (b) Secondary route.

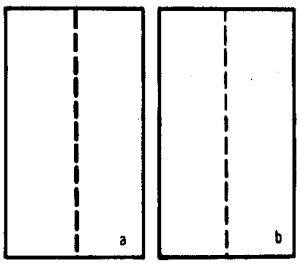


Figure 251. Footpath, Trail. (a) Principal route. (b) Secondary route.

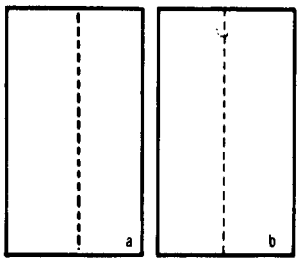


Figure 252. Road Interchange, Access, Cloverleaf.

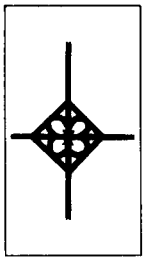


Figure 253. Dual Highway.

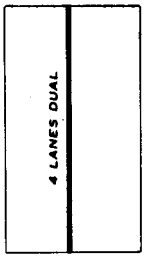
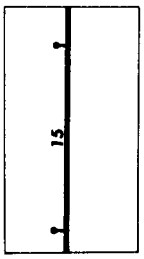


Figure 254. Distance Along Roads. Distances between selected populated places, road intersections, and road and railroad intersections are shown.



(4) *Populated places and landmark features.* The following figures show the approved symbols for populated places and landmark features which are different from, or in addition to, the symbols shown in figures 179 through 222:

Figure 255. Large Developed Areas. The outlined area generally shows that portion of a developed or urban area which comprises a dense concentration of structures. The limits of the outlined area have no relationship to political or administrative boundaries.

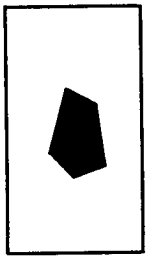


Figure 256. Native Settlement (Kampung or Kampong).

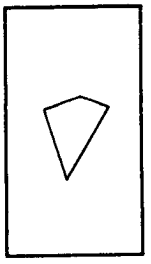


Figure 257. Walled City. The heavy black line represents walls surrounding cities or parts of cities. The word "walled" is shown in parentheses below the place name except when the wall coincides with the outlined limits of the developed area.

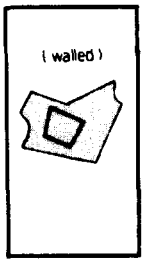


Figure 258. Landmark Features or Objects. Landmarks are those features which, because of their size, height, shape, or location, serve as means of positive orientation. They are readily recognizable from the air or on the ground. All landmark features are identified by explanatory labeling.

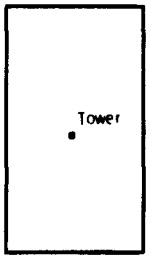


Figure 259. Outlined Landmark Areas. This symbol is used to show areas which are so different in nature or appearance from the surrounding terrain that they serve as outstanding landmarks. The nature of the area is explained by labeling.

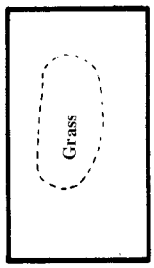
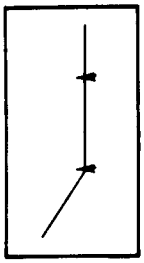


Figure 260. Powerline With Pylons. Pylon symbols are shown at points of directional change, and on straight portions as often as necessary to emphasize the hazard to air navigation.



(5) The following symbols for boundaries differ from those shown in figures 236 through 241:

Figure 261. Primary Administrative Boundary.

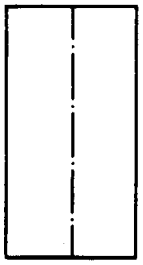


Figure 262. Secondary Administrative Boundary.

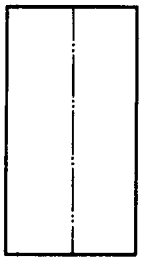


Figure 263. Tertiary Administrative Boundary.

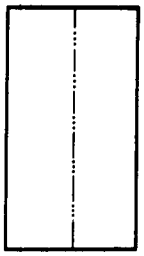
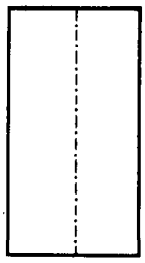


Figure 264. Reservation Boundary.



(6) *Aerodromes.* The following figures show the approved symbols for aerodromes on the 1501 and 1501 AIR Series:

Figure 265. Aerodrome (Military or Civil); Runway Pattern and Field Limits Known. Length of runway and field limits are shown to scale. Absence of the code letter "S" or "U" indicates hard surface runways.

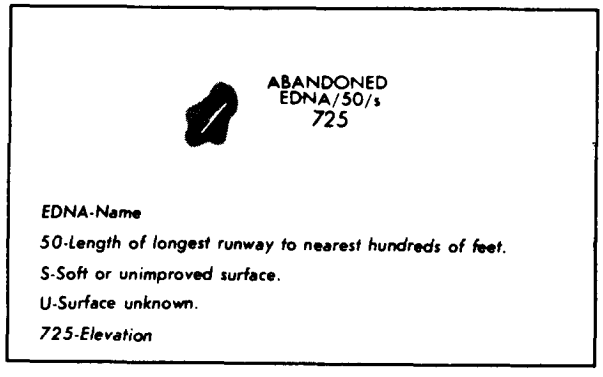


Figure 266. Aerodrome; Runway Pattern Unknown, Field Limits Known.

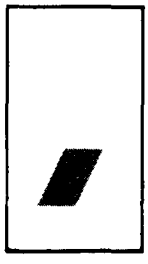


Figure 267. Aerodrome; Runway Pattern Known, Field Limits Unknown. Length of runways shown to scale.

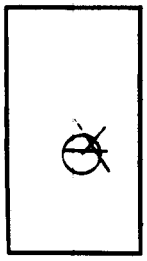


Figure 268. Aerodrome; Runway Pattern and Field Limits Unknown.

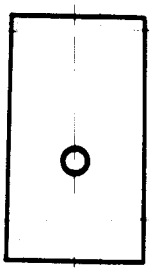


Figure 269. Seaplane Base (Military or Civil).

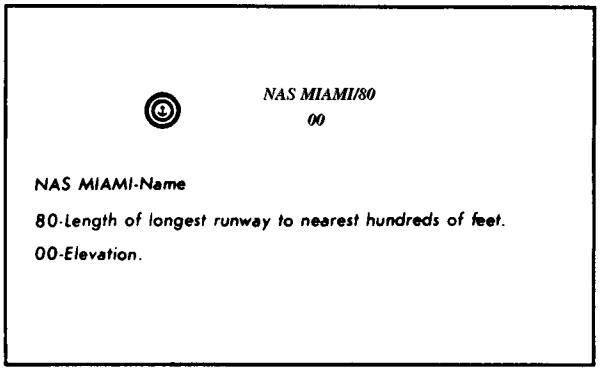


Figure 270. Seaplane-Emergency. This symbol is used to show emergency seaplane landing sites which have no facilities or for which complete information is not available.

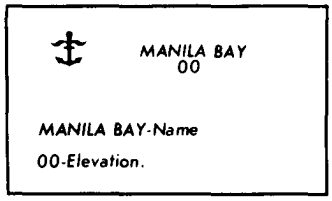
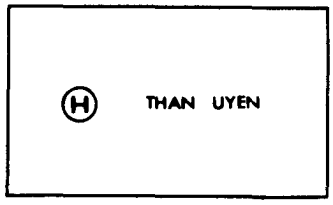


Figure 271. Heliports.



(7) *Radio navigation and communication facilities.* The following figures show the approved symbols for aeronautical, radio navigation and communication facilities:

Figure 272. OMNI Range (Omnidirectional Range). Identified as VOR (very high frequency omnidirectional range), VORTAC (very high frequency omnidirectional range Tactical Air Command), or TACAN (tactical air navigation). The compass rose (magnetic bearing circle) is oriented to magnetic north and centered on the station. Name of the facility is shown in rectangular box.

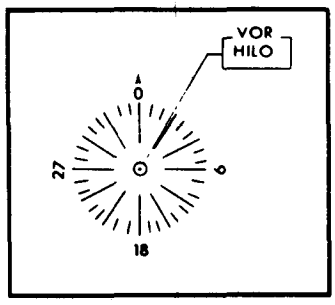


Figure 273. Radio Range (RNG).

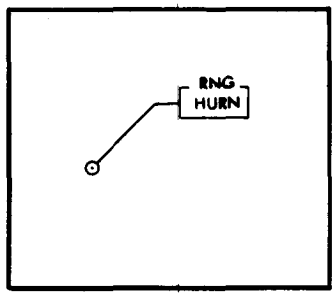


Figure 274. Visual-Aural Range (VAR).

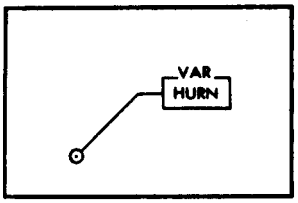


Figure 275. Radio Beacon (R Bn). May also be labeled NDB for nondirectional radio beacons.

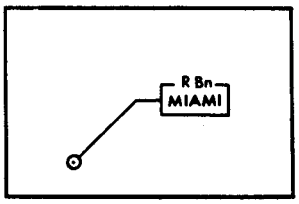


Figure 276. Consol Beacon.

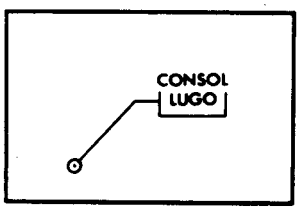


Figure 277. Direction Finders (DF).

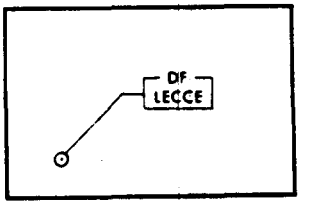


Figure 278. Radar Beacon (RACON-EUREKA).

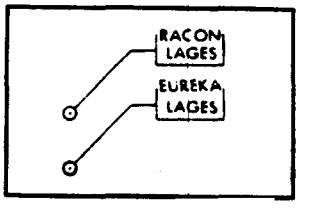


Figure 279. Broadcast Station (BS). Name of facility is shown in rectangular box.

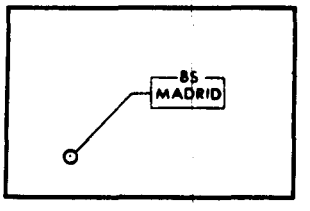


Figure 280. Ocean Station Vessel.

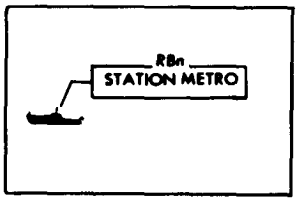
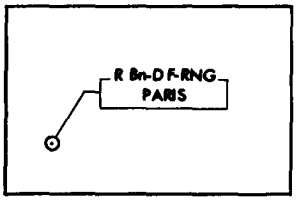


Figure 281. Multiple Radio Facilities. This symbol is used when two or more facilities are located in close proximity. The types of facilities are identified by the appropriate abbreviations.



(8) *Controlled airspace.* The following figures show the approved symbols for controlled airspace identification:

Figure 282. Air Defense Identification Zone (ADIZ).

(a) Portion of graphic covered by ADIZ.
(b) Entire graphic covered by ADIZ.

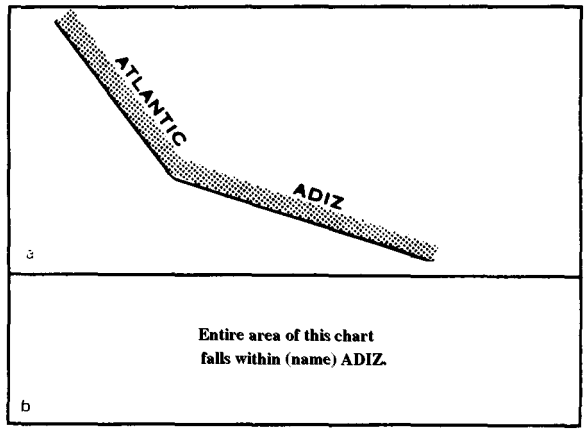


Figure 283. Buffer Zone. Name of zone is indicated by labeling.

(a) Portion of graphic covered by Buffer Zone.
(b) Entire graphic covered by Buffer Zone.

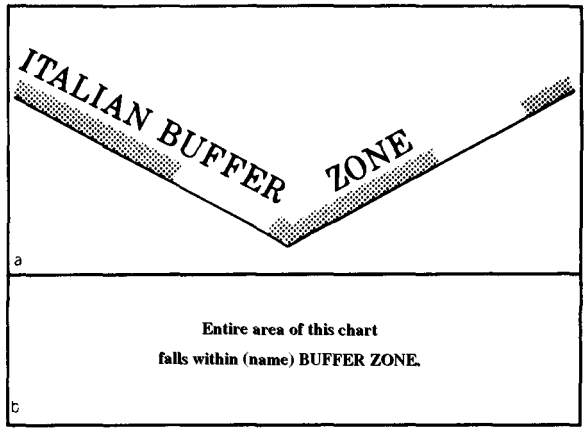
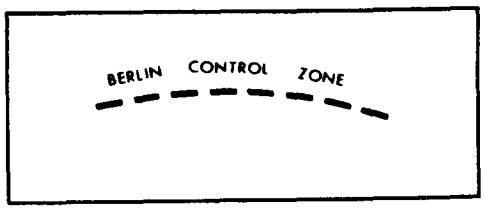
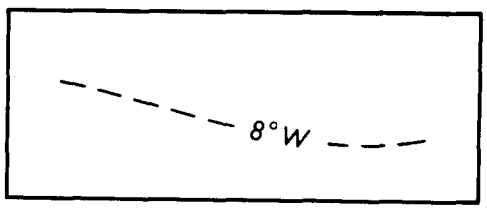


Figure 284. Berlin Control Zone. This symbol is used to show the 20 statute mile radius Berlin Control Zone and associated air corridors. The label BERLIN CONTROL ZONE is positioned immediately *outside* the dashed symbol.



(9) *Magnetic variation data.* The following figure shows the approved symbol for magnetic variation data:

Figure 285. Isogonic Line.



(10) *Visual aids and obstructions.* The following figures show the approved symbols for visual aids and obstructions to aerial navigation:

Figure 286. Aeronautical Rotating or Oscillating Light. Symbol is shown as: (a) If located on aerodrome; (b) If in isolated location.

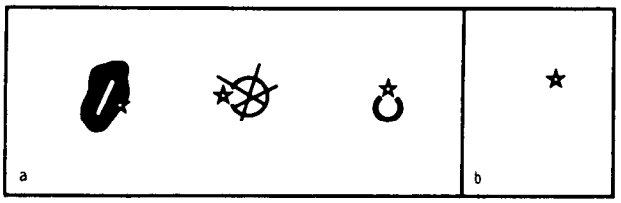


Figure 287. Aeronautical Rotating Light With Flashing Code Identification Light. Symbol is shown as: (a) If located on aerodrome; (b) If in isolated location.

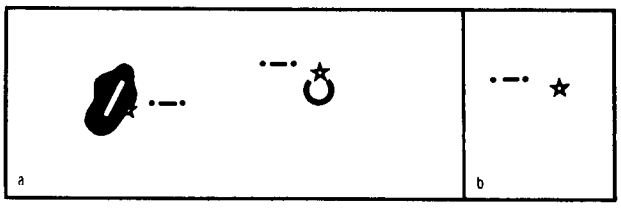


Figure 288. Aeronautical Rotating Light With Course Light and Site Number. Symbol is shown as: (a) If located on aerodrome; (b) If in isolated location.

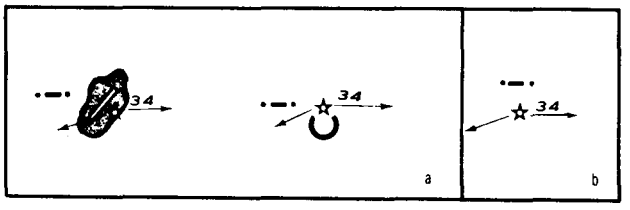


Figure 289. Aeronautical Flashing Light. Symbol is shown as: (a) Located on aerodrome; (b) In isolated location.

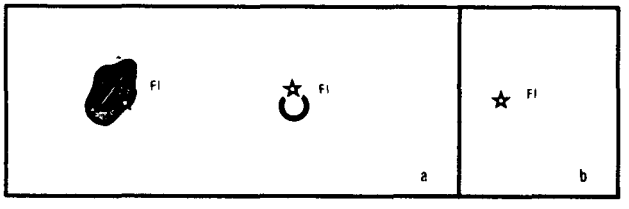


Figure 290. Aeronautical Light With Flashing Code Identification. Symbol is shown as: (a) Located on aerodrome; (b) In isolated location.

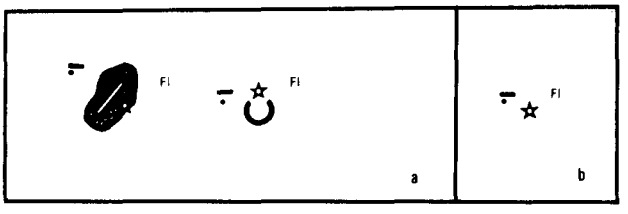


Figure 291. Marine Light With Characteristics of Light. The abbreviations used to show the characteristics are: F (Fixed), Fl (Flashing), QK (Quick Flashing), I QK Fl (Interrupted Quick Flashing), Occ (Occulating), Alt (Alternating), Gp (Group), R (Red), W (White), G (Green), B (Blue), U (Unwatched), SEC (Sector), and Sec (Second). Marine lights are white and alternating lights are red and white unless otherwise labeled. Symbol is shown as: (a) Land light; (b) Lightship.

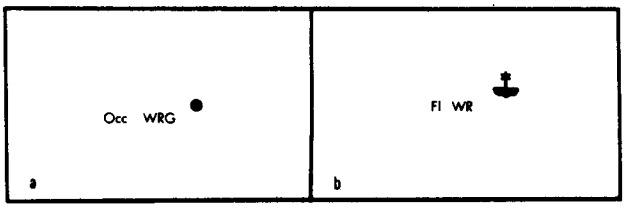


Figure 292. Visual Ground Signs (Shore and Landmarkers). Symbol is shown as: (a) Arrow pointing to location of sign; (b) Actual location of ground sign.

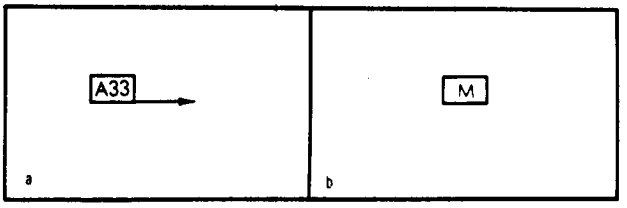


Figure 293. Obstruction. This symbol is used to show structures which extend 200 feet or more above the surrounding terrain. The height of the structure above ground is shown immediately below the symbol in parentheses, and the elevation of the top of the obstruction above sea level is shown immediately above the symbol. The nature of the obstruction, i.e., building, smokestack, etc., is shown by labeling. Symbol is shown as: (a) Obstruction; (b) Radio facility obstruction.

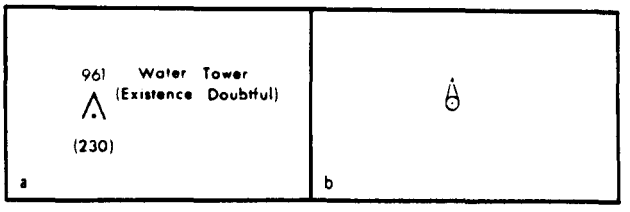
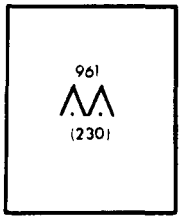


Figure 294. Group Obstruction. Two or more obstructions in close proximity are shown by this symbol. The elevation and height of the highest feature in the group is shown.



23.2. Pictomaps

a. A pictomap is a map on which photographic imagery of a standard photomosaic has been converted into interpretable colors and symbols.

b. The components of the pictomap consist of three basic color tones photographically extracted from a photomosaic, masked and drafted symbols, and names data. At the large scales used for city maps (1:5,000 to 1:12,500), the light tones and shadows on the photographic image serve to delineate many of the map features. At scales of 1:25,000 and 1:50,000, however, most planimetric features are shown by drafted symbols, printed in specified colors.

c. Tones. The three basic color tones used for area features are as follows:

(1) Landtone, a buff-like color tone which represents uncovered earth.

(2) Vegetone, green tones which represent densities of vegetation.

(3) Shadowtone, a black-green tone which represents shades and shadows.

d. Symbols. The following pictomap symbols are different from the standard large-scale symbols shown in figures 1 through 242:

Figure 295. Main Roads and Through Streets On City Maps.

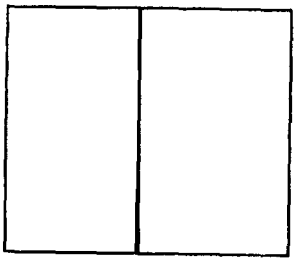


Figure 296. Roads and Streets On City Maps. (Those not shown by symbol in fig. 295.)

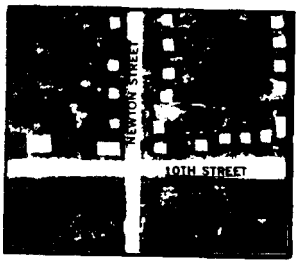


Figure 297. Hard Surface, All-Weather Road, One or More Lanes Wide (1:25,000 and 1:50,000 Scales). Number of lanes is indicated by labeling.

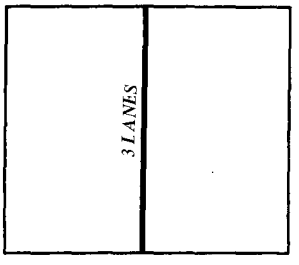


Figure 298. Loose or Light Surface, All-Weather Road, One or More Lanes Wide (1:25,000 and 1:50,000 Scales). Number of lanes is indicated by labeling.

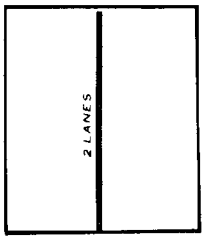


Figure 299. Point of Change in Number of Lanes (1:25,000 and 1:50,000 Scales).

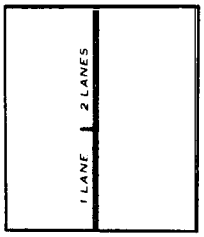


Figure 300. Loose Surface, Fair or Dry Weather Road (1:25,000 and 1:50,000 Scales).

Figure 301. Street (1:25,000 and 1:50,000 Scales). Streets are shown by a solid white line .02″ wide, or if wider, drawn to scale.

Figure 302. Track (1:25:000 and 1:50,000 Scales).

Figure 303. Trails (1:25,000 and 1:50,000 Scales).

Figure 304. Route Marker. (a) National or Federal. (b) Secondary or State. (c) Provincial, Communal or other.

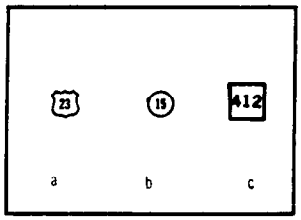


Figure 305. Railroad. All railroads are shown by this symbol with number of tracks indicated by labeling: (a) Railroad; (b) Railroad spur.

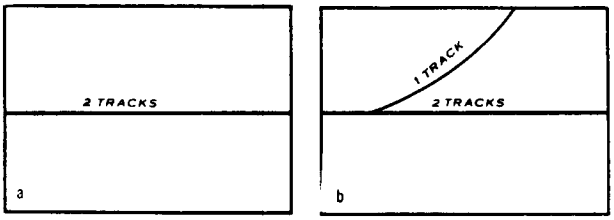


Figure 306. Railroad Station. (a) Position unknown. (b) Position known.

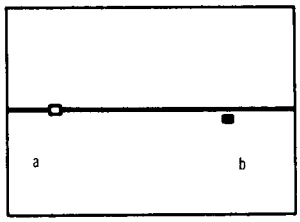


Figure 307. Tunnel, Road and Railroad. (a) Road tunnel. (b) Railroad tunnel.

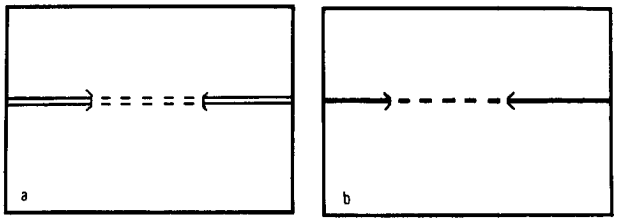


Figure 308. Railroad Overpass, Underpass. (a) Railroad overpassing road. (b) Railroad underpassing road.

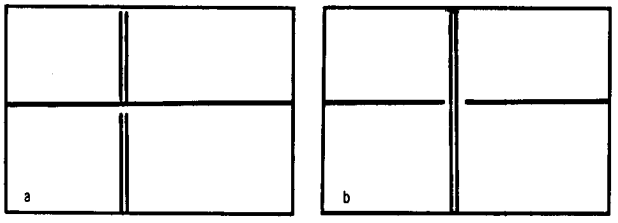


Figure 309. Fills. Fills are symbolized when they are landmark in nature and an impediment to cross-country movement.

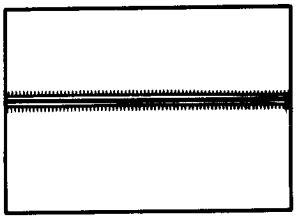


Figure 310. Cut. Cuts are symbolized when they are landmark in nature and an impediment to cross-country movement.

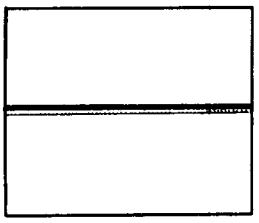


Figure 311. Small Levee. Small levees are symbolized when they are landmark in nature and an impediment to cross-country movement.

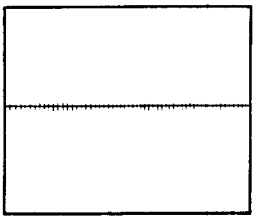


Figure 312. Large Levee and Large Earth Dams. These features are symbolized when they are landmark in nature and an impediment to cross-country movement.

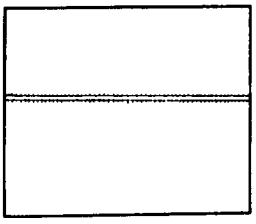


Figure 313. Small Dam. This symbol is used to show small dams of either earthen or masonry construction.

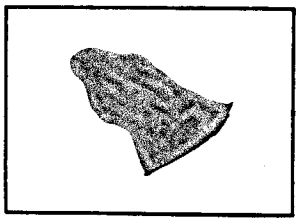


Figure 314. Escarpment. The continuous line represents the point of abrupt change in slope. Tick marks point downslope.

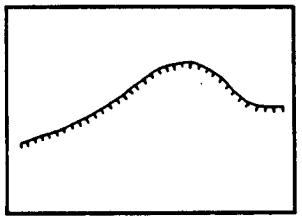


Figure 315. Buildings (1:25,000 and 1:50,000 Scales). Buildings outside the built-up areas which are not shown by the pictotone process are shown as: (a) Small buildings; (b) Larger buildings shown to scale.

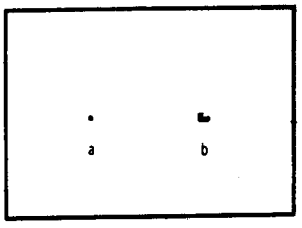


Figure 316. Church.

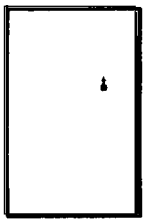


Figure 317. Mosque.

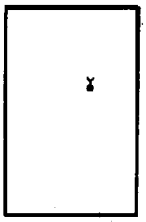


Figure 318. Shrine. (a) Christian. (b) Moslem.

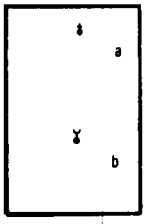


Figure 319. School.

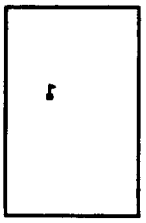


Figure 320. Windmill.

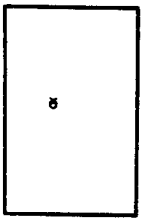


Figure 321. Located or Landmark Object. Object identified by labeling.

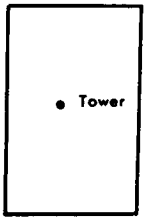


Figure 322. Telephone or Telegraph Line.

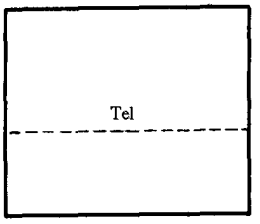


Figure 323. Ski Lift.

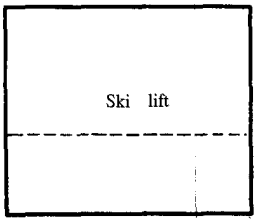


Figure 324. Powerline.

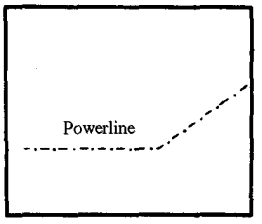


Figure 325. Tank. All types of small tanks which are not shown by the pictotone process are shown by this symbol and labeled as to contents.

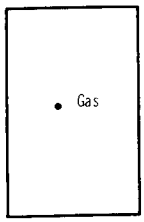


Figure 326. Triangulation Station. The symbol represents a described horizontal control point which is marked on the ground and which was established by triangulation or traverse of third or higher order accuracy.

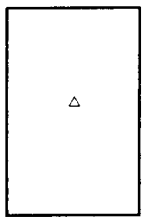


Figure 327. Bench Mark. The symbol represents a described vertical control point established by survey methods of third or higher order accuracy.

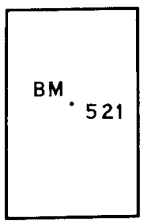


Figure 328. Spot Elevation (a) Checked elevation established by closed lines, including spirit level, stadia, and vertical angle methods. (b) Unchecked elevation determined by unchecked field surveys.

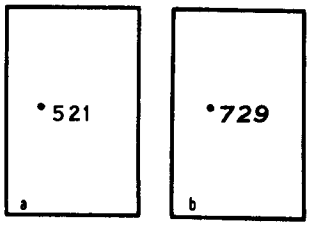


Figure 329. Highest Elevation on Pictomap. The highest elevation on the pictomap is shown as: (a) Checked; (b) Unchecked.

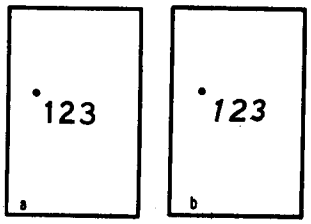


Figure 330. Contours. (a) Index. (b) Intermediate. (c) Supplementary.

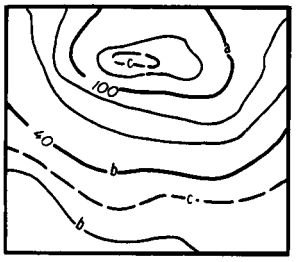


Figure 331. Lake or Pond. (a) Small. (b) Large.

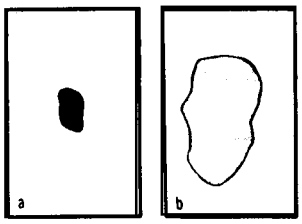


Figure 332. Small Reservoir. Larger Reservoirs shown as "b" of figure 331.

By Order of the Secretary of the Army:

W. C. WESTMORELAND,
General, United States Army,
Chief of Staff.

Official:
KENNETH G. WICKHAM,
Major General, United States Army,
The Adjutant General.

Distribution:
To be distributed in accordance with DA Form 12-11 requirements for Map Reading.

FIELD MANUAL

No. 21-31

HEADQUARTERS,
DEPARTMENT OF THE ARMY
WASHINGTON 25, D.C., *19 June 1961*

TOPOGRAPHIC SYMBOLS

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*This manual supersedes FM 21-31, 4 January 1952.

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CHAPTER 1

INTRODUCTION

1. Purpose

This manual describes the topographic symbols and abbreviations authorized for use by all echelons in the interpretation of military maps, overlays, and related features and activities.

2. Scope

This manual is divided into four chapters.

a. Chapter 1 contains general information on the use of topographic symbols, gives the basic scales for topographic maps, defines topographic maps, and discusses map detail, map accuracy, and map colors.

b. Chapter 2 gives examples and illustrations of topographic symbols arranged by categories, such as d r a i n a g e features, relief features, and roads.

c. Chapter 3 gives topographic abbreviations, their scope and application.

d. Chapter 4 discusses marginal information.

3. References

Appendix I is a list of publications which give detailed information on maps and mapping, foreign conventional signs and symbols, reference data for the various services, transportation and signal facilities, and abbreviations for administrative and electrically transmitted messages.

4. Symbols and Abbreviations

a. Some of the symbols appearing on published maps may not agree entirely with those shown in this manual, since it is necessary to devise or modify symbols to portray conditions or features which are unique to the area being mapped. Consequently, before any map is used, the symbol legend appearing in the margin should be carefully studied.

b. The symbols and abbreviations given in this manual are the result of standardization proceedings and are in general agreement with those employed by the British Army, the Canadian Army, the Aeronautical Chart and Information Service of the U.S. Air Force, the Hydrographic Office of the U.S. Navy, the U.S. Coast and Geodetic Survey, the U.S. Forest Service, the U.S. Geological Survey, and the Tennessee Valley Authority.

c. Department of the Army units engaged in map making will be guided by AR 117-5, by TM 5-230 so far as the symbols given as examples do not conflict with those given here, and by the specifications contained in technical publications prepared under the direction of the Chief of Engineers.

d. Abbreviations given in this manual are for topographic use only and in some instances conflict with those given in AR 320-50, which are authorized for use in military records, publications, correspondence, messages, and in field work. In accordance with AR 320-50, abbreviations will not be used if uncertainty may result.

e. The information contained herein is applicable without modification to both nuclear and nonnuclear warfare.

5. Use of Special Symbols

Where no symbol is prescribed for a specialized local feature, the map maker is authorized to use a special symbol, providing —

a. There is no conflict with symbols shown in this manual.

b. Any special symbol used is explained either in the legend of the map or by appropriate labeling within the body of the map, so that no uncertainty may result.

6. Scales of Topographic Maps

a. Maps fall into the following general scale categories:

Small scale	1:600,000 and smaller.
Medium scale	Larger than 1:600,000 but smaller than 1:75,000.
Large scale	1:75,000 and larger.

b. Standard scales for Department of the Army topographic maps are 1:1,000,000, 1:250,-000, 1:100,000, 1:50,000, and 1:25,000. Military city maps normally are published at the scale of 1:12,500. Photomaps normally are published at 1:25,000. General maps at scales smaller than 1:1,000,000 are issued for special purposes.

c. Depending upon the availability of mapping information and the importance of the area, the scale of 1:500,000 is sometimes substituted for 1:250,000.

d. All of the above types and scales of maps will not necessarily be available for a particular area. Their issue will be governed by military and logistic considerations.

e. Maps with scales different from those given above occasionally will be encountered. Usually, they are foreign military maps. The most common examples are 1:62,500 or 1 :63,-360 in place of 1 :50,000; 1:125,000 in place of 1 :100,000; and 1:253,440 in place of 1:250,000, In the United States, nonmilitary governmental mapping agencies may use other scales such as 1:24,000 or 1:31,680 in place of 1 :25,000; and 1:48,000 or 1:62,500 in place of 1:50,000.

7. Topographic Maps

a. Introduction. A topographic map is a graphic representation to scale, horizontal and vertical, of some portion of the earth's surface, systematically plotted on a plane surface. The ideal situation would be realized if every feature on the portion of the earth being mapped could be shown in its true shape, orientation, and proportion. Unfortunately, such a representation is impossible. This is evident when one considers that on a map at the scale of 1:50,000, a square mile must be condensed into a small square approximately 1.27 by 1.27 inches. If every feature were plotted true to scale, the resulting map would be impossible to read, for many items would be drawn so minutely as to be unrecognizable even with a magnifying glass. For a map to be intelligible, features must be indicated by symbols. Many of these must necessarily be exaggerated in size for legibility. For example, on a map at the scale of 1:50,000 the prescribed symbol for a small house covers an area corresponding to about 85 feet square, the scaled width of a road measures about 95 feet; the symbol for a single-track railroad occupies a width equivalent to about 165 feet on the ground. Consequently, only the landmarks and important features of an area can be shown. Those shown on a map represent the characteristic pattern of the area and are usually those most readily recognized in the field.

b. Map Detail. Map detail represents ground features as they existed at the date of map compilation or latest revision. Since man is continually building, demolishing, and changing ground features, the detail appearing on a map may not exactly match that appearing on the ground. This is especially true in developed areas. The amount of detail shown on a map increases with its scale. A map attempts to show the maximum of detail without impairing legibility. In areas of heavy cultural density, many of the less important items must be omitted. In areas of sparse density, fewer items are omitted. When deletions are necessary because of the density of detail, care is taken to retain the general pattern of the features in the area. For example, where all buildings of a group cannot be shown, those retained portray the general pattern of the group without exaggerating the area covered. Similarly, where numerous ditches, streams, levees, and the like exist, the less important are omitted and the more important are retained to show the characteristic pattern of the features in the area.

c. Symbols. So far as is practicable, a mapped feature is shown by the same symbol on maps of different scales, but certain modifications and departures are necessary because of varying map uses and scales. Normally, symbols resemble the features they represent. The center and the orientation of a symbol usually correspond to the true center and orientation of the feature represented. All line features such as roads, railroads, streams, power lines, and similar features retain, within

the limitations of scale, the variations of alinement which actually exist. Along such features as roads, the locations of buildings and other features are necessarily displaced because of the exaggerated size of the symbols. Reference to the positions of such features must be made with caution.

d. Accuracy of Maps. On a map of 1:1,000,000, a sixteenth of an inch represents approximately 1 mile; on a map of 1:250,000, a quarter of an inch represents approximately 1 mile. It is apparent, then, that on such maps it is impossible to obtain the precise accuracy in plotting possible on large-scale maps. Small- and medium-scale maps normally are compiled from the best available larger-scale maps. Since these sources vary in reliability, the map user should study the coverage diagram shown in the margin of the map to determine the general reliability of the map. On most large-scale maps of areas within the continental limits of the United States, 90 percent of all features shown are within 1/50 inch of their true geographic positions. The remaining 10 percent are within 1/20 inch. Ninety percent of the contours are accurate within one-half of the basic contour interval, and 90 percent of the spot heights (elevations of particular locations) are accurate within one-fourth of the contour interval. In compiling large-scale maps covering foreign areas, it is not always possible to achieve the high standards of accuracy obtainable on maps of the United States. The accuracy standards of such maps usually may be determined from the marginal coverage diagram.

e. Map Colors. Topographic symbols usually appear in characteristic colors: black for *cultural* (man-made) features other than roads, blue for *water* features, brown or gray for *relief* features, green for *vegetation*, and red for *road classifications.* Modifications of these colors occasionally are used to portray unique circumstances. Consequently, the symbol legend and other marginal information should be carefully studied before using any map.

CHAPTER 2

TOPOGRAPHIC SYMBOLS

8. Scope

This chapter illustrates and explains the topographic symbols used on military maps of all scales. The symbols are in general the same for all categories, but because of differences in use and scales, certain symbols are modified or omitted on medium- and small-scale maps.

9. Drainage Features

a. A perennial feature contains water during most of the year.

b. An intermittent feature contains water during only part of the year. The shoreline of an intermittent lake or pond is represented as indefinite and approximate.

c. A dry or *cyclical feature* or a *wash* is usually dry. The limits of such features are represented as indefinite.

d. Symbols. The following pages contain the approved symbols for drainage features:

Figure 1. Shoreline. The mean high or normal water line is the shoreline. (a) Definite. (b) Indefinite or unsurveyed.

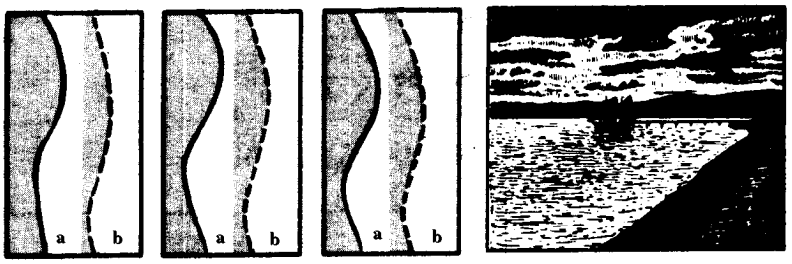


Figure 2. Perennial Lake or Pond. (a) Definite shoreline. (b) Indefinite or unsurveyed shoreline.

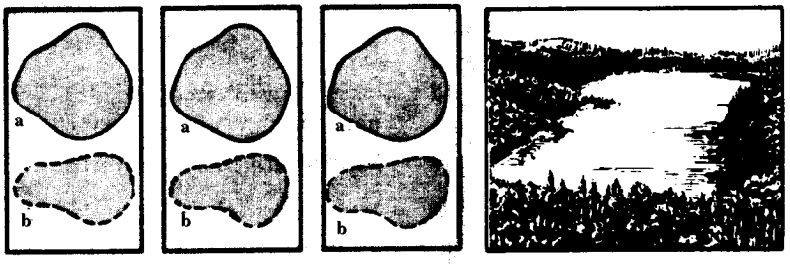


Figure 3. Intermittent Lake or Pond.

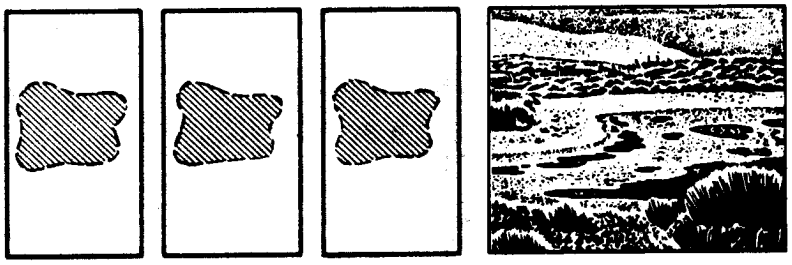


Figure 4. Dry or Cyclical Lake or Pond.

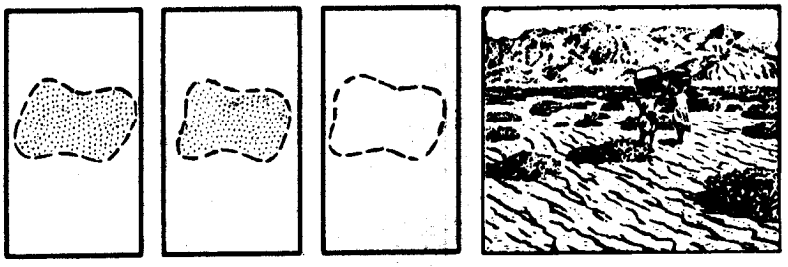


Figure 5. Reservoir with Natural Shoreline. The shoreline is controlled by the height of the dam.

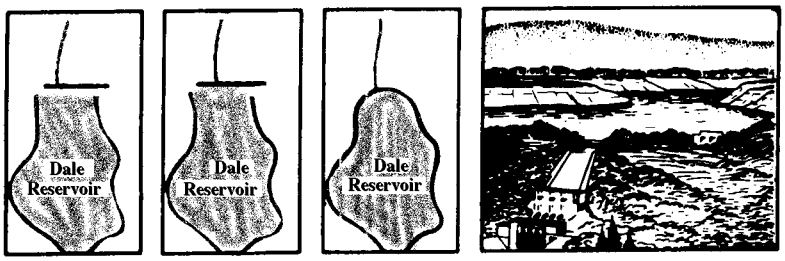


Figure 6. Narrow Perennial Stream.
(a) Surveyed. (b) Unsurveyed.

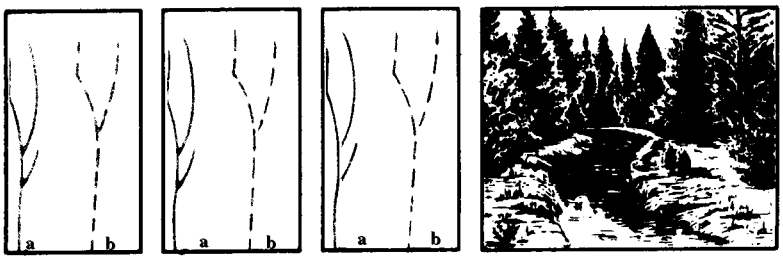


Figure 7. Wide Perennial Stream.
(a) Surveyed. (b) Unsurveyed.

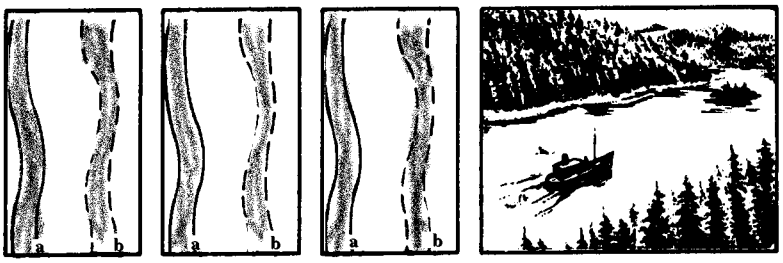


Figure 8. Intermittent Stream.

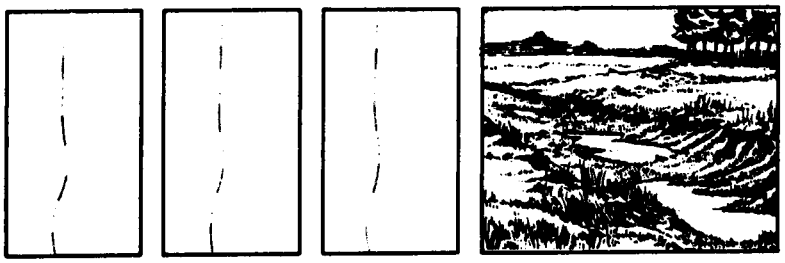


Figure 9. Narrow Wash or Dry Stream.
(a) United States or foreign. (b) Foreign (in certain arid areas).

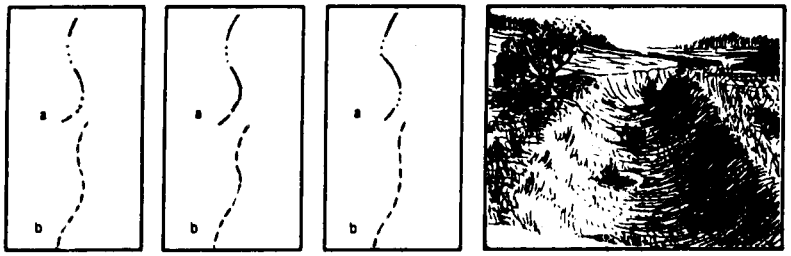


Figure 10. Wide Wash or Dry River Bed.
(a) United States or foreign. (b) Foreign (in certain arid areas).

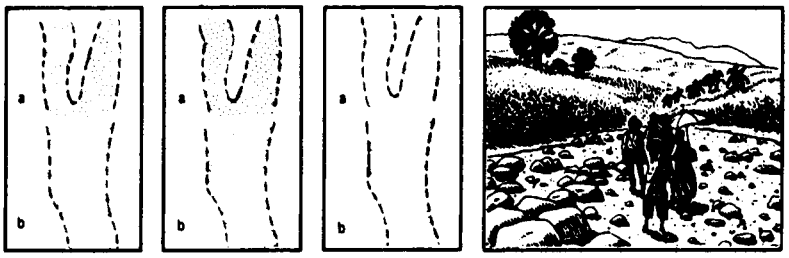


Figure 11. Unclassified Stream. This symbol is used when a stream cannot be determined to be either perennial or intermittent.

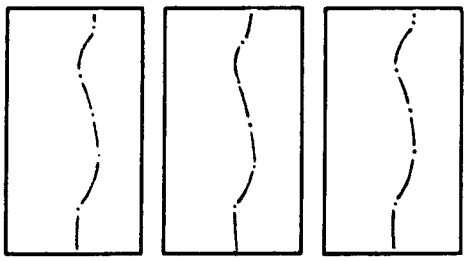


Figure 12. Braided Stream.

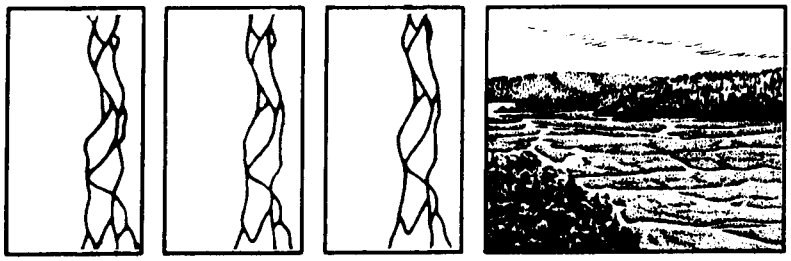


Figure 13. Disappearing Stream.

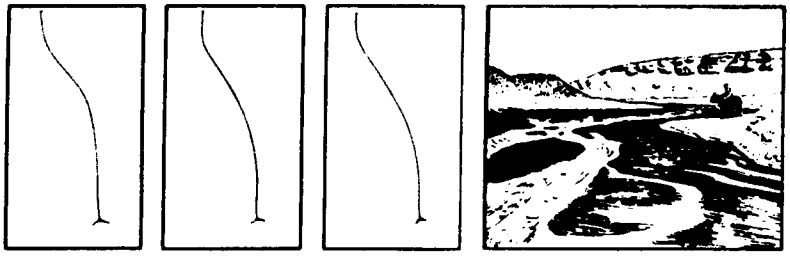


Figure 14. Large Rapids.

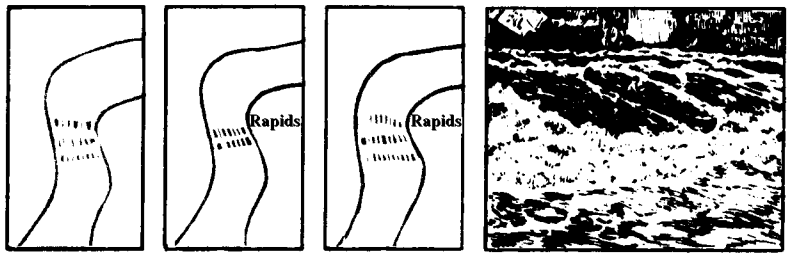


Figure 15. Large Falls.

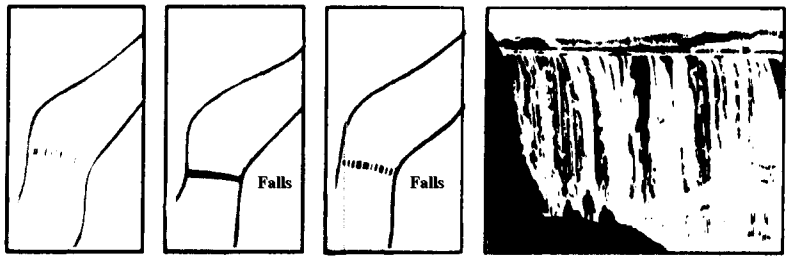


Figure 16. Small Rapids.

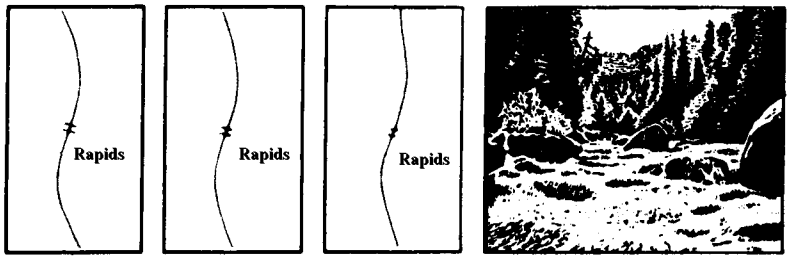


Figure 17. Small Falls.

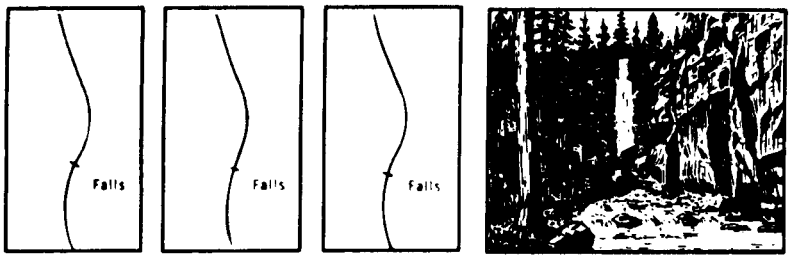


Figure 18. Navigable Canal, in Operation.
(a) Narrow. (b) Medium-width. (c) Wide.

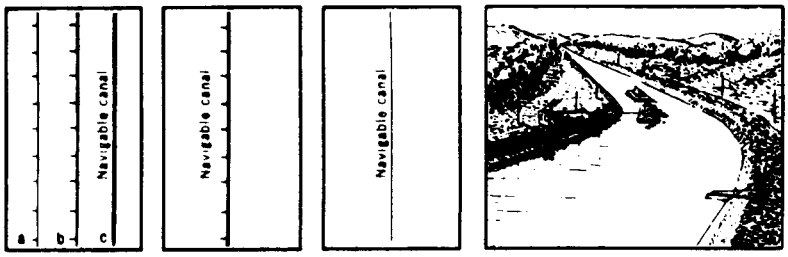


Figure 19. Abandoned Canal, Containing Water.
(a) Narrow. (b) Medium-width. (c) Wide.

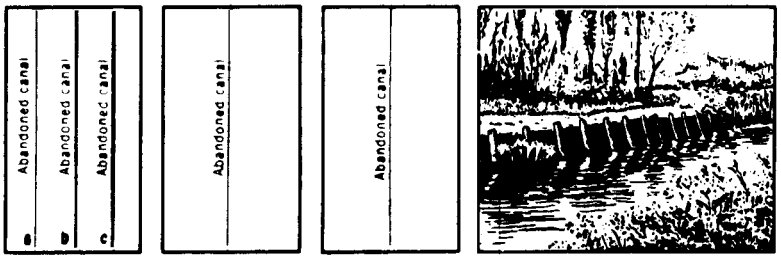


Figure 20. Abandoned Canal, Generally Dry.
(a) Narrow. (b) Medium-width. (c) Wide.

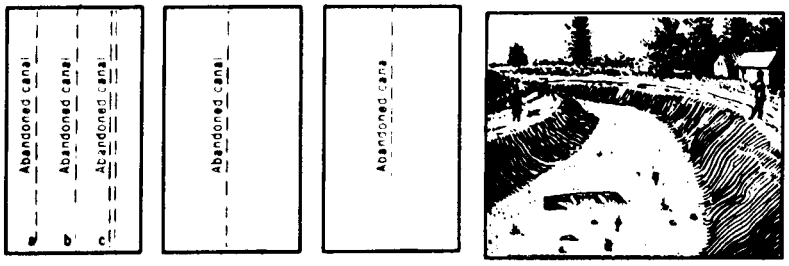


Figure 21. Perennial Ditch.
(a) Narrow. (b) Medium-width. (c) Wide.

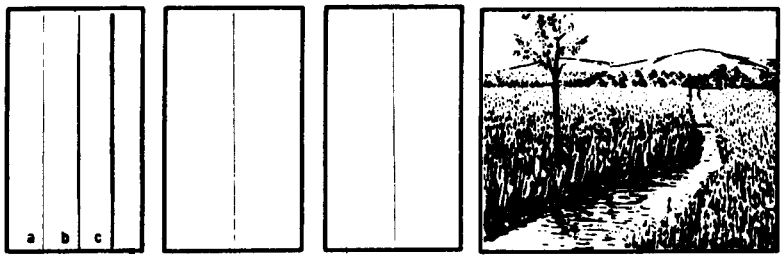


Figure 22. Intermittent Ditch.

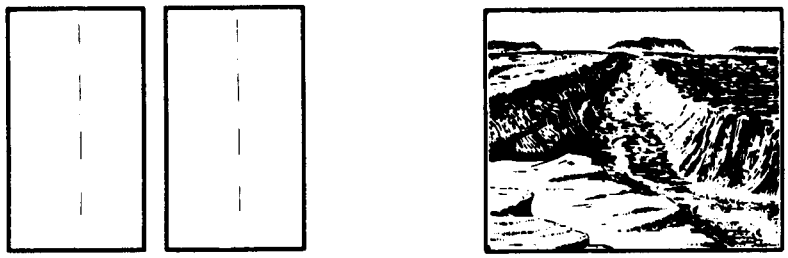


Figure 23. Aqueduct. The symbol represents a conduit used for carrying water. It may be either an open or closed canal. Water pipelines are symbolized by the aqueduct symbol.

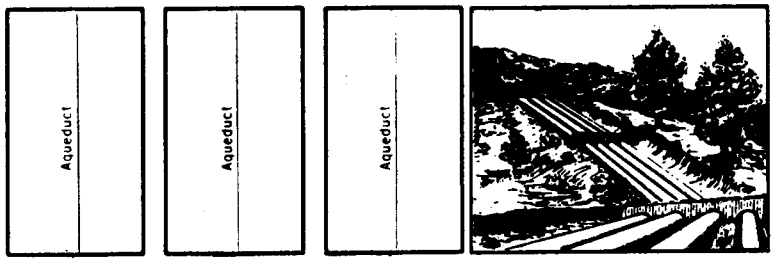


Figure 24. Underground Aqueduct, with Outlet.

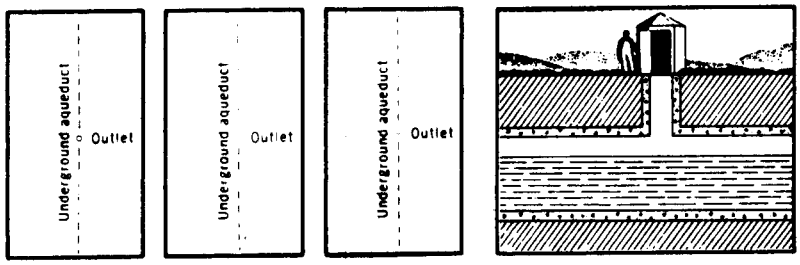


Figure 25. Aqueduct Tunnel.

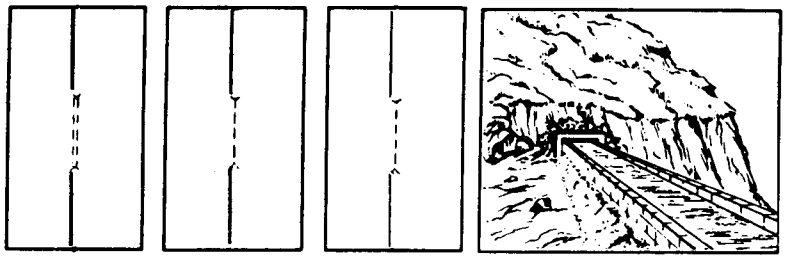


Figure 26. Elevated Conduit of Any Type.

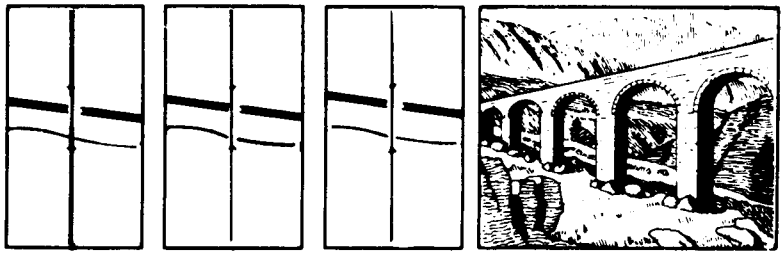


Figure 27. Flume, Penstock, and Similar Features.

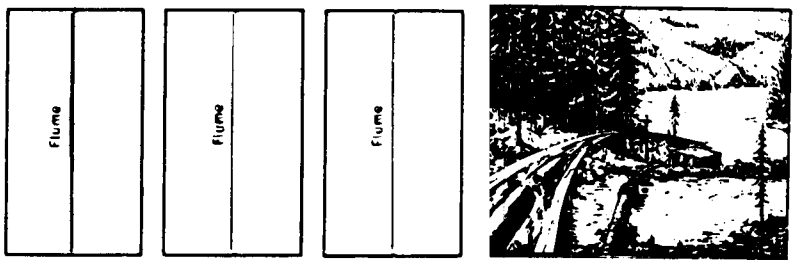


Figure 28. Salt Evaporator. Only major separations are shown; minor ditches and levees are omitted.

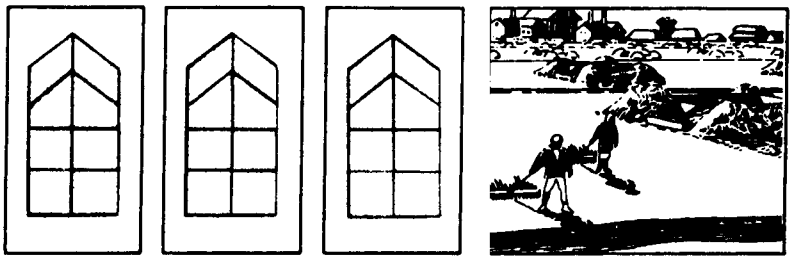


Figure 29. Marsh or Swamp. No distinction is made between fresh and salt marshes.

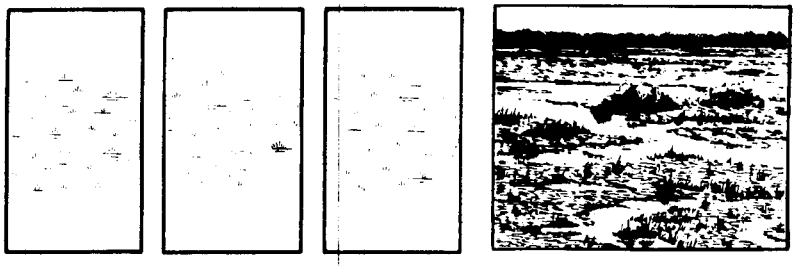


Figure 30. Coastal Marsh in Tidal Waters. The shoreline is drawn as the water side limits of the marsh.

Figure 31. Coastal Marsh in Nontidal Waters. The shoreline is drawn as the true shoreline.

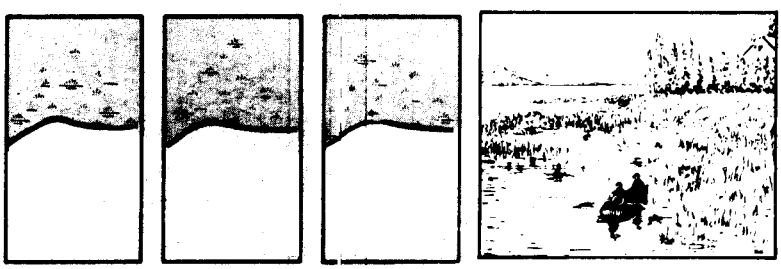


Figure 32. Hummocks and Ridges in Swamps or Marshes.

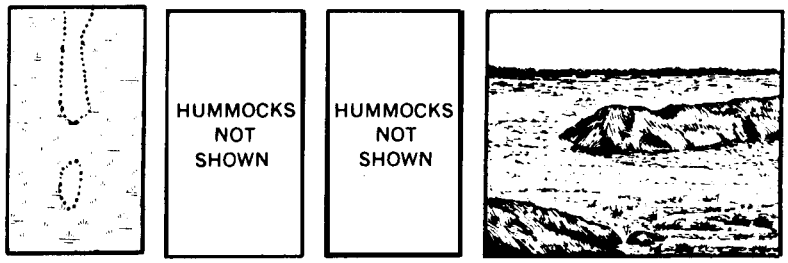


Figure 33. Peat Bogs, Peat Cuttings. The symbol is representative and does not show the actual shape or the number of cuttings.

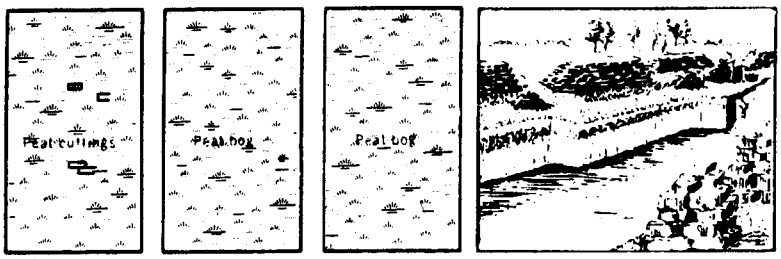


Figure 34. Cranberry Bog. Only major separations are shown. The inundation is controlled.

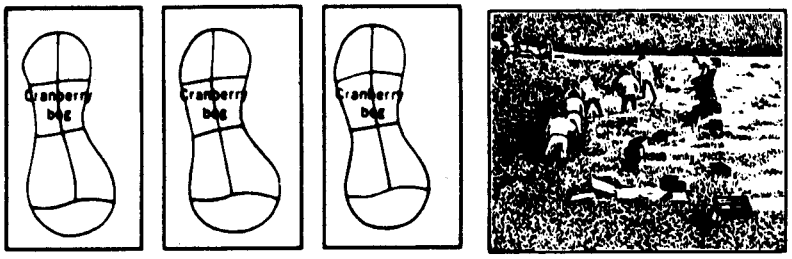


Figure 35. Fish Ponds. Features of this type are usually shown only on maps of foreign areas. Only major separations are shown.

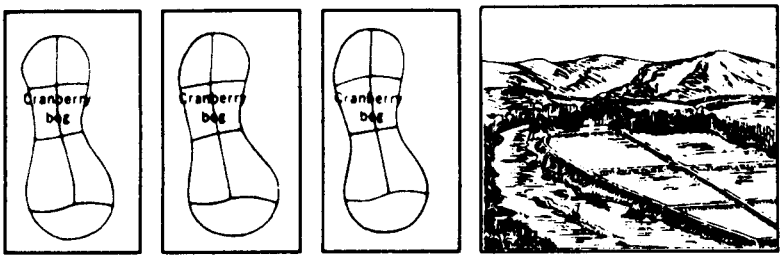


Figure 36. Rice Paddy. Only fields subject to inundation, either controlled or natural, are shown. Minor ditches and levees are omitted.

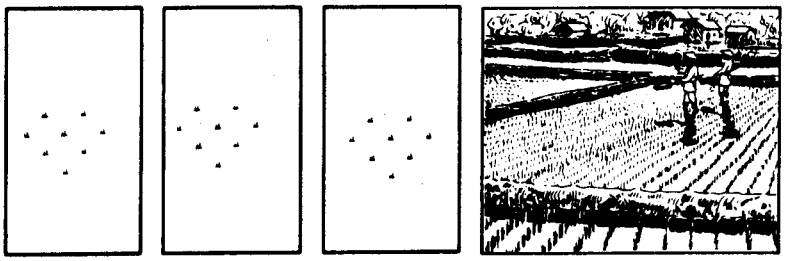


Figure 37. Land Subject to Inundation. In the United States only those areas subject to controlled inundation are shown. In foreign areas the inundation may be either controlled or natural. Areas subject to temporary natural inundation are not symbolized.

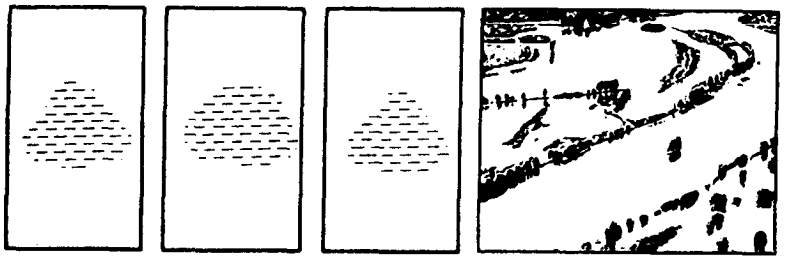


Figure 38. Spring. Springs are shown only in arid areas or where they are important landmark features. When the feature is intermittent, mineral, alkaline, undrinkable, or hot, it will be so labeled.

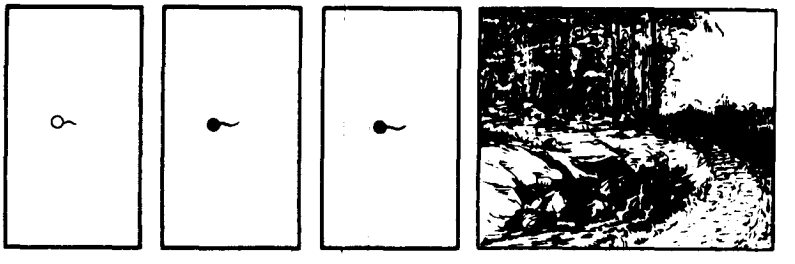
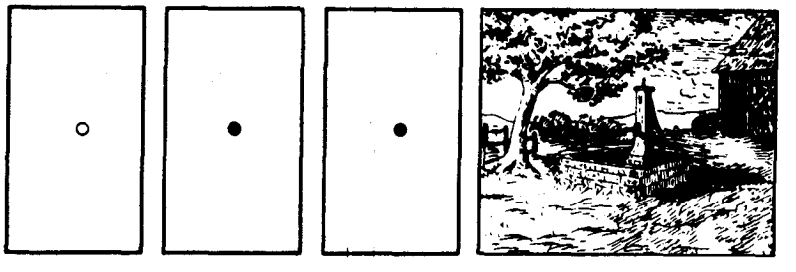


Figure 39. Well. Wells are shown only in arid areas or when they are landmark features. Walled-in springs, cisterns, and underground water tanks are shown as wells. Artesian or intermittent wells will be so labeled.



10. Relief Features

a. Methods of Showing Relief. Depending upon the accuracy of information, the shapes of the terrain are shown on a map by lines representing *contours, approximate contours,* and *form lines.* Any one or all of these methods may be used on a single map. On medium- and small-scale maps, significant relief features may be shown by *hachures* when available data are insufficient to warrant the use of contours. On large- and medium-scale maps, the lines usually are printed in brown. Also, on medium-scale maps, *hill shading* usually is added over the brown lines, to print gray. This creates a three-dimensional effect and permits a ready appreciation of the terrain, since the hills and ridges stand out much as they would on a relief map. On small-scale maps the contour lines usually are printed in gray. Normally, on small-scale maps, the contours are supplemented by layer tints. A key box on each map indicates the elevation bands and their corresponding tints.

b. Units of Measure. Except in the United States and a few other countries where the *foot* is the standard unit of measure, the elevations on military maps are in terms of the *meter* (39.37 inches or 3.28 feet).

c. Contours. Relief normally is shown by contour lines. A contour line on a map represents an imaginary line on the earth's surface, all points of which, within permissible tolerances, are of the same elevation above a fixed datum, usually mean sea level. To aid the map user, every fifth contour is a heavier line. These are commonly referred to as *index* contours. The remaining contours are called *intermediate* contours. In certain areas on a map, the normal contour interval is sometimes too large to present significant topographic formations correctly and *supplementary* half-interval contours are added. On small-scale maps, index contours are shown by using layer tints.

d. Approximate Contours. Whenever there is any question as to the reliability of the source material or of the survey, *approximate* contours are substituted for normal contours. An approximate contour on a map represents an imaginary line on the earth's surface, all points of which are estimated to be of the same elevation. As with normal contours, a distinction is made between index, intermediate, and supplementary contours.

e. Contour Intervals. Contour lines are drawn on a map at definite elevation intervals. Using a given contour interval, the lines are far apart in flat areas and close together in hilly areas. Consequently, to present the best picture, the size of the contour interval used varies with the nature of the terrain, although normally a contour interval is constant in a series of map sheets. On sheets where the relief is generally flat or gently rolling, a smaller contour interval is used than on sheets where the relief is generally hilly. Scale also affects the contour interval; if the contour interval on a 1:25,000 scale map were 5 meters, for example, the interval used on a 1:50,000 map covering the same area would be 10 meters.

f. Form Lines. When available information is insufficient to warrant the use of either normal or approximate contours, form lines are used. Normally, form lines are used only in areas outside the United States. Form lines collectively portray the general shapes of topographic features, but with little or no reference to a datum plane. They do not present an accurate representation of the terrain, but merely illustrate the general topographic shapes of an area. Since the lines are based on little or no control, their intervals cannot be used to estimate differences in elevations.

g. Hachures. Hachures are used on medium- and small-scale maps to indicate promontories, where available data are insufficient to warrant the use of normal or approximate contours, but are sufficient to determine the location of the promontories. Hachures also are used in conjunction with normal or approximate, contours to indicate important promontories which would not be properly depicted otherwise, because of the contour interval and the nature of the terrain.

h. Marginal Notes. Before reading relief from the map, the user should determine the contour interval and the nature of any other methods used to show relief. This information is found in the margin of the map either in the *contour interval note* or the *layer tint box.* Other special notes pertaining to relief are sometimes found in the lower margin. The user should also study the *coverage* diagram or re-

liability diagram in the margin to obtain additional evaluation of contour accuracy.

i. Symbols. The following pages contain the approved symbols for relief features.

Large Scale *Medium Scale* *Small Scale* *Illustration*

Figure 40. Contours.
(a) Index. (b) Intermediate. (c) Supplementary.

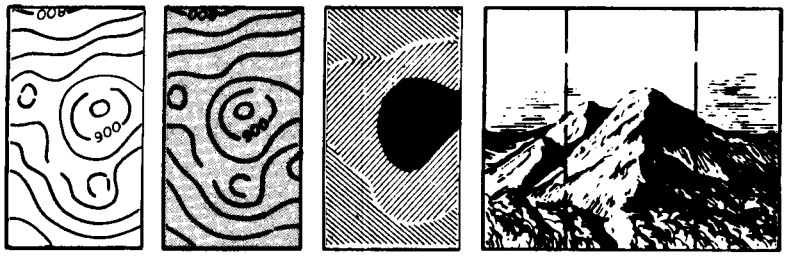


Figure 41. Approximate Contours.
(a) Index. (b) Intermediate.

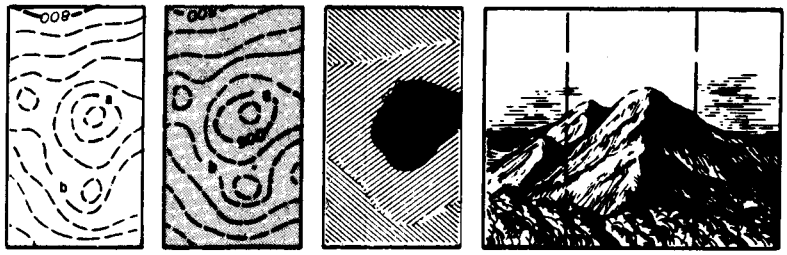


Figure 42. Form Lines.

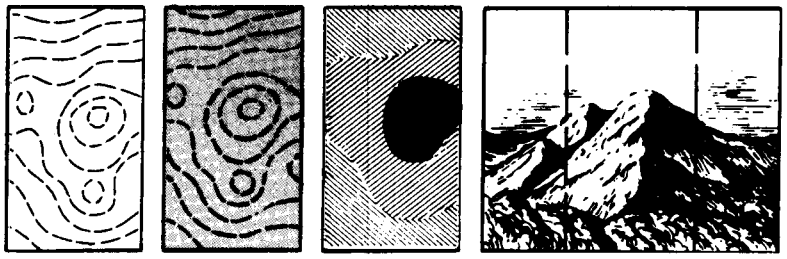


Figure 43. Hachures. This symbol is used to indicate significant formations not revealed by contours.

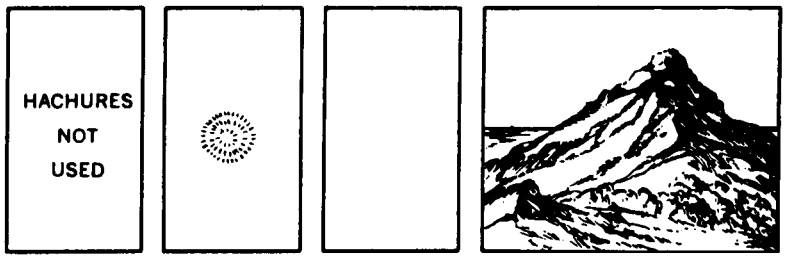


Figure 44. High Cliff, with Height Equal to or Greater than Contour Interval.

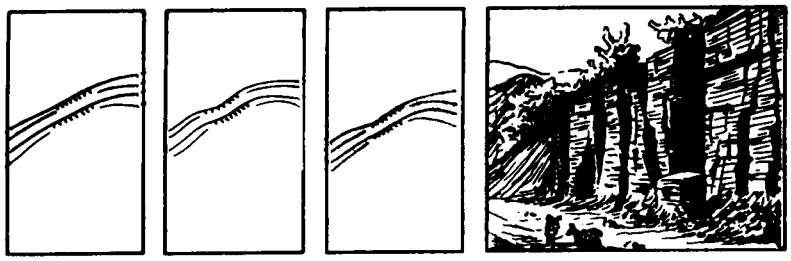


Figure 45. Abrupt Slope or Scarp, With Height Less Than the Contour Interval. Features of this type are usually shown only on maps of foreign areas. The tick marks always point downgrade.

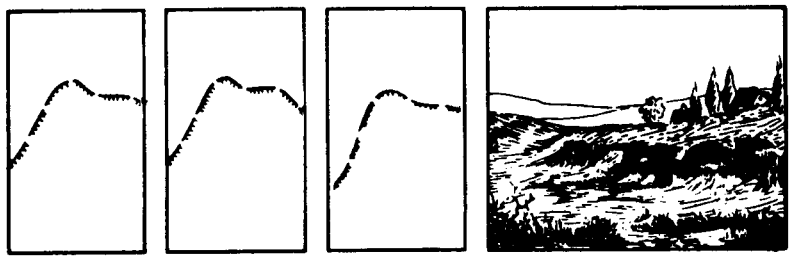


Figure 46. Depression, With Depth Less Than Contour Interval. The tick marks always point downgrade.

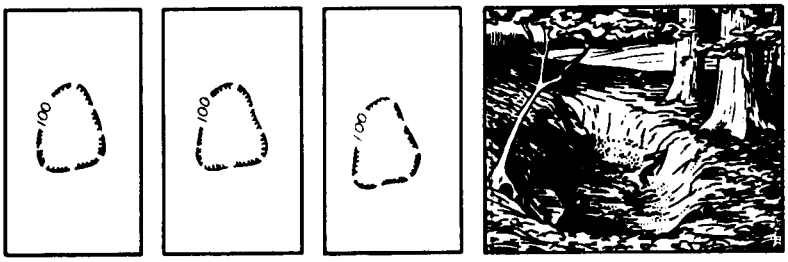


Figure 47. Depression, With Depth Greater Than Contour Interval. The tick marks always point downgrade.

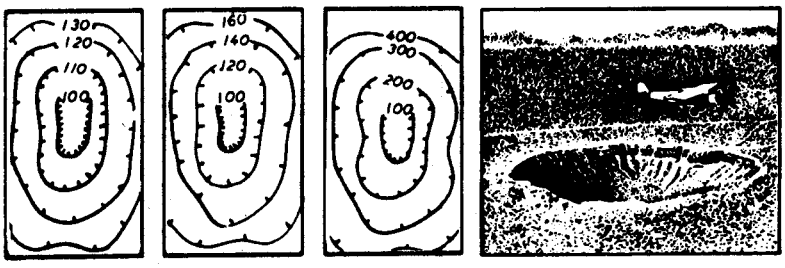


Figure 48. Crevice. (See also fig. 70, crevasse.)
(a) Large. (b) Small

Figure 49. Cut. Cuts less in depth than the contour interval are usually omitted.

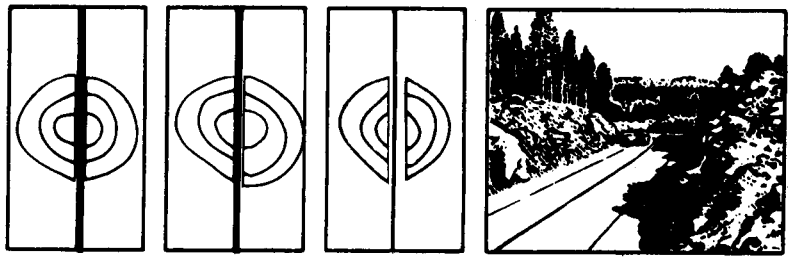


Figure 50. Fill. Fills less in height than the contour interval are usually omitted, except in extremely flat areas.

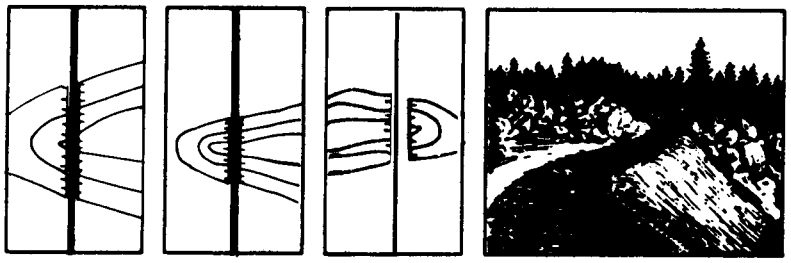


Figure 51. Small Levee. Large levees are shown by contours, except in extremely flat areas.

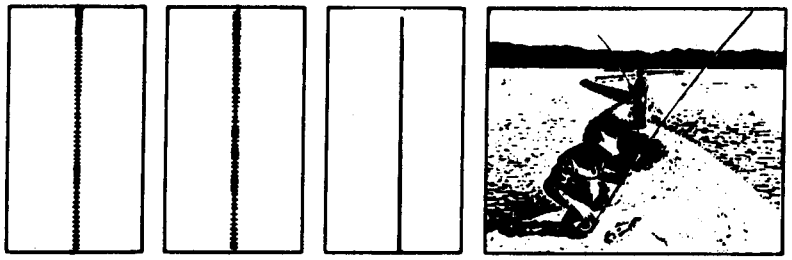


Figure 52. Small Levee Carrying Road.

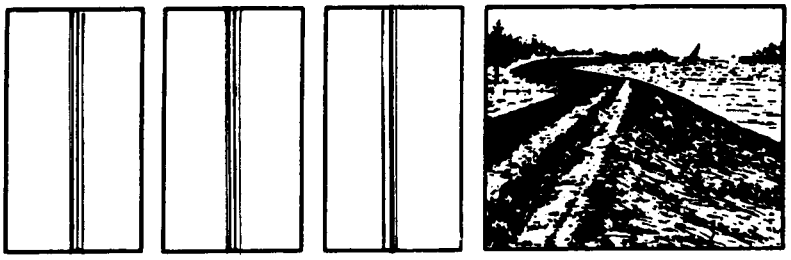


Figure 53. Small Levee Carrying Railroad.

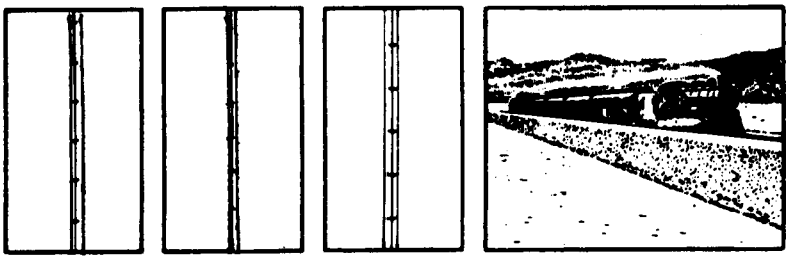


Figure 54. Sand.

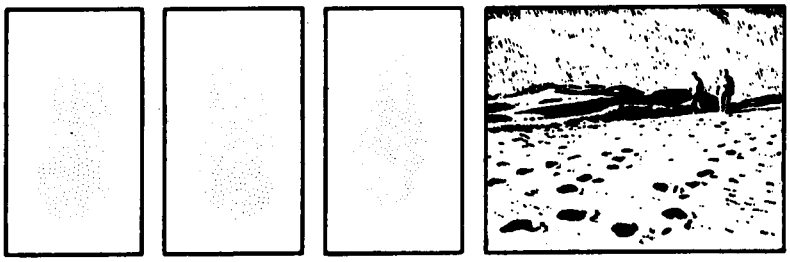


Figure 55. Sand. Alternate of symbol 54; used in certain foreign areas.

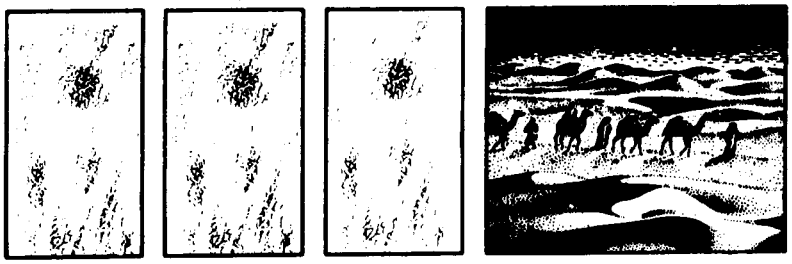


Figure 56. Crescent Dunes.

Figure 57. Lateral Dunes.

Figure 58. Wet Sand.

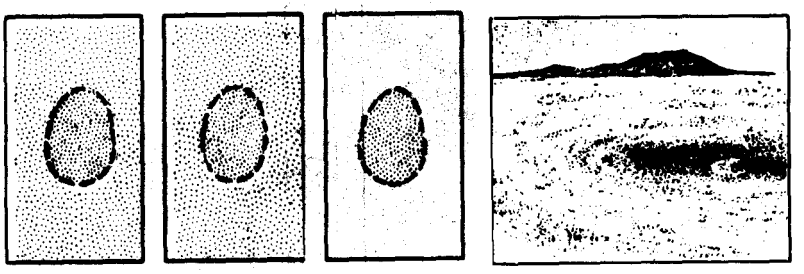


Figure 59. Sand Beach.

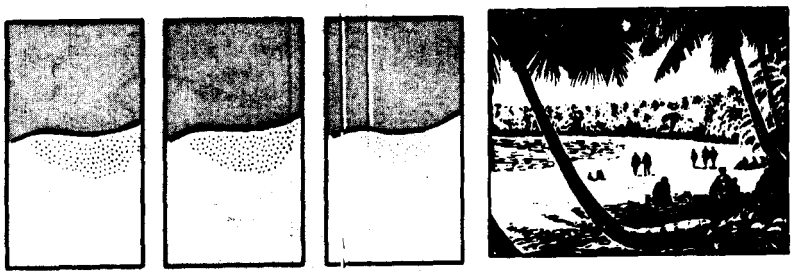


Figure 60. Gravel Beach. Gravel is defined as aggregate predominantly .2-10 inches in diameter.

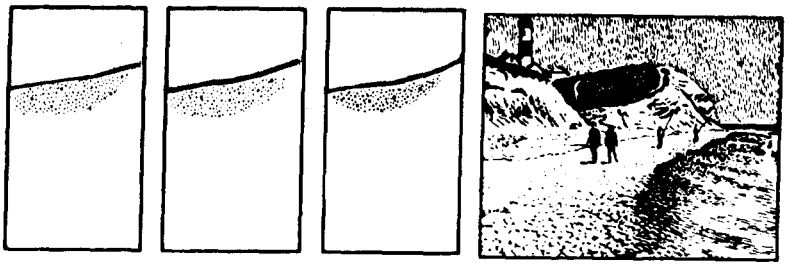


Figure 61. Boulder-Strewn Beach. Boulders are defined as aggregate predominantly over 10 inches in diameter.

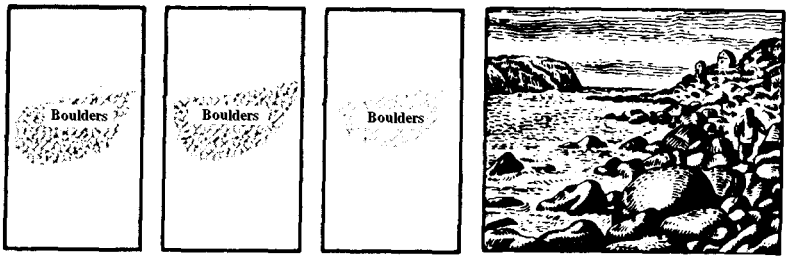


Figure 62. Distorted Surface Area. The symbol represents such features as gas or oil blisters or bumps found in the midwest United States, rock- or boulder-covered areas, rock outcrops, lava- covered areas, and areas of a similar nature. Labeling indicates nature.

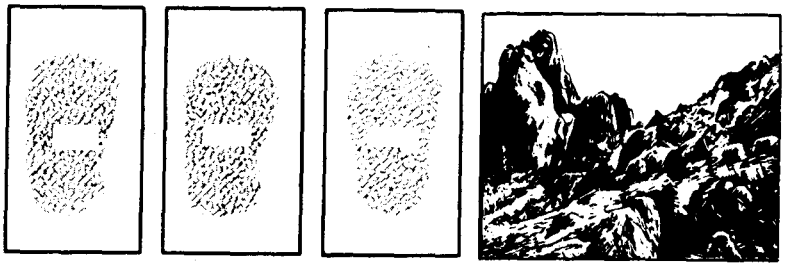


Figure 63. Isolated Boulder. Isolated boulder is shown only if of enough size or prominence to serve as a landmark.

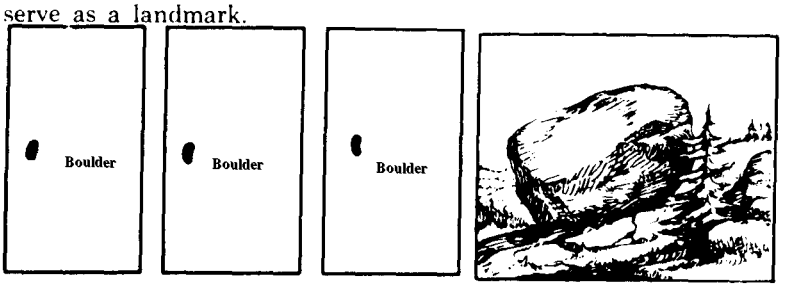


Figure 64. Strip Mine, Tailings Pile, Mine Dump.

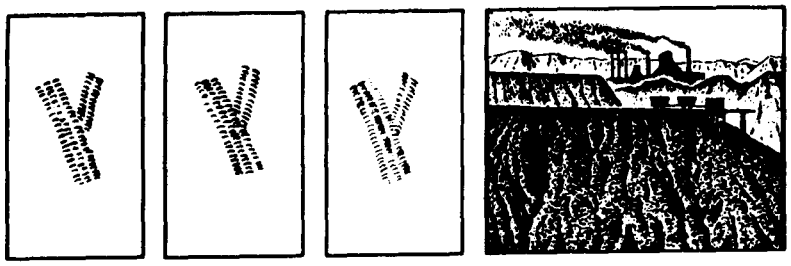


Figure 65. Icefield or Snowfield. Depending on the available information, formations are shown as: (a) Contoured. (b) Approximate contours. (c) Form lines.

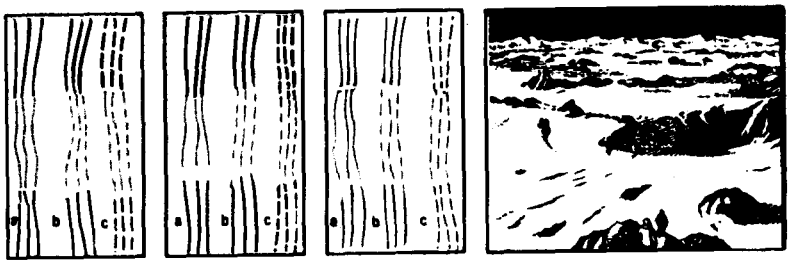


Figure 66. Glacier. Depending upon available information, shapes within the glacial area are shown as:
(a) Approximate contours. (b) Form lines.

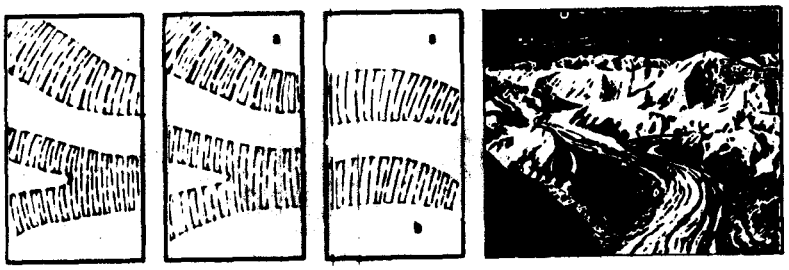


Figure 67. Glacial Moraine.

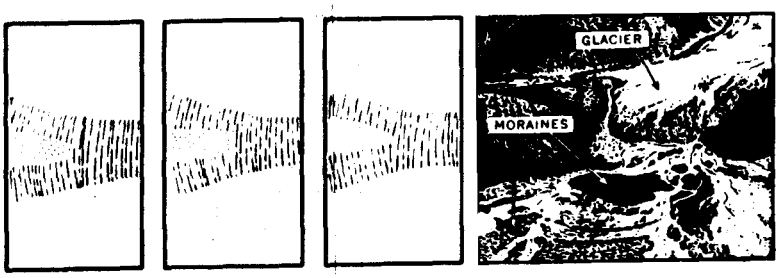


Figure 68. High Ice Cliff, With Height Equal to or Greater Than Contour Interval.

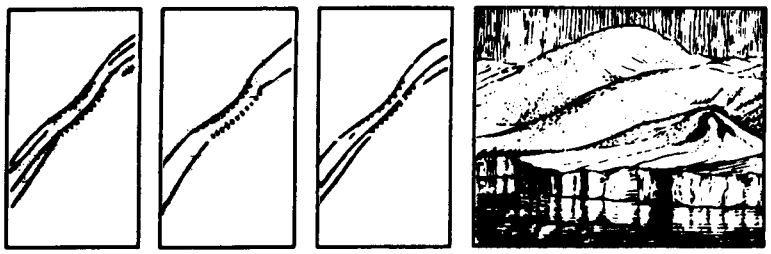


Figure 69. Low Ice Cliff, With Height Less Than Contour Interval. Only those of landmark nature are shown. The tick marks always point downgrade.

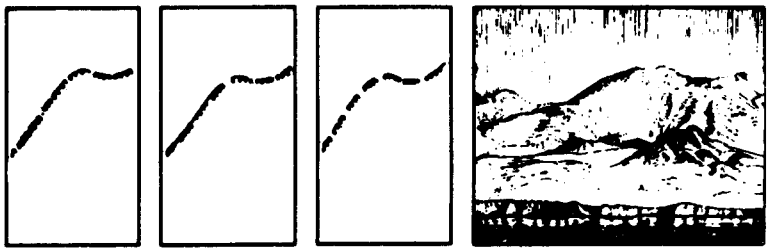


Figure 70. Crevasse. (See also fig. 48, crevice.) Crevasses are constantly forming and disappearing; the symbols indicate areas in which crevasses exist. (a) Large. (b) Small.

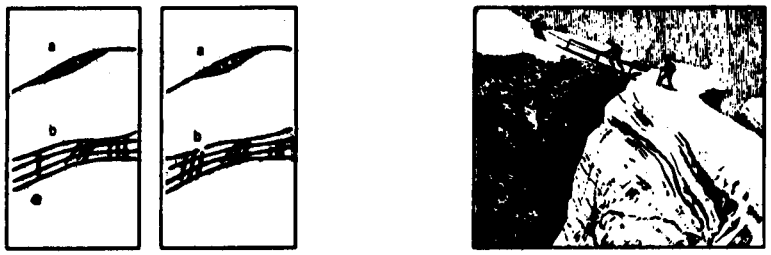


Figure 71. Cave. Only important caves and those of a landmark nature are shown. The "V" marks the location of the entrance and the shaft marks the general direction of the cave. (a) Land cave. (b) Ice cave.

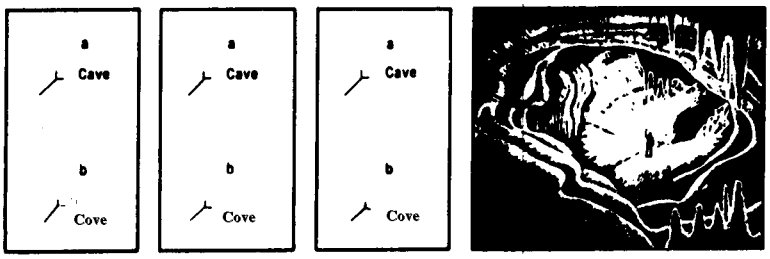


Figure 72. Asphalt Lake.

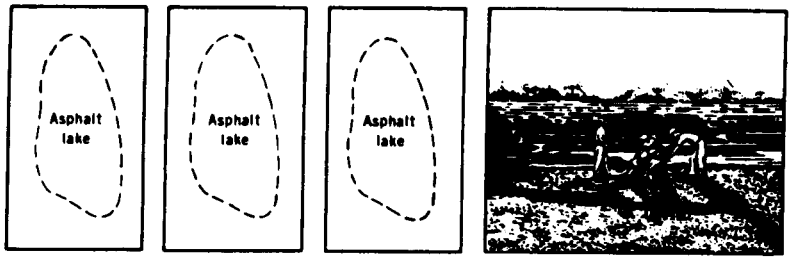
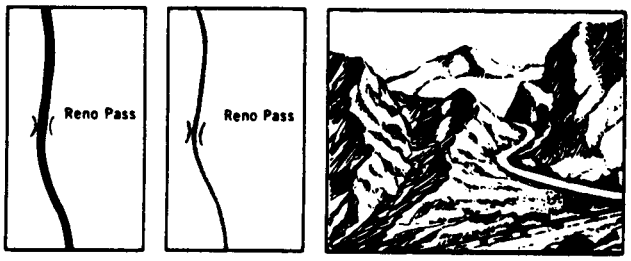


Figure 73. Mountain Pass.



11. Vegetation Features

a. General. Although special care is taken in mapping woodland cover, vegetation in many areas is subject to rapid growth or to elimination by cutting or burning. Before using the map, the user should determine the last date of information of the map (found in the notes in the lower left margin) and gage the reliability of the woodland information accordingly. The symbols used indicate such features as cover suitable for the concealment of troops, obstacles to free passage, and landmarks in areas bearing little vegetation. On small-scale maps, particularly the 1:1,000,000 scale, the vegetation is usually omitted entirely.

b. Growths Shown. Only perennial types of growth are mapped. Isolated trees and low scattered growths usually are omitted. Small clumps of growths are usually omitted, except where they serve as landmarks in areas of little woodland cover. Small clearings usually are also omitted. In certain areas, the limits and types of growth are fairly constant. In such cases, a distinction may have been made on the map between deciduous, coniferous, and brushwood growths. In many other cases, lack of information and the changing nature of growths make it impractical to make such a distinction.

c. Continuous Cover. The presence of a vegetation symbol does not necessarily mean that the area is completely covered. Depending upon the area, growth having as little as 20 to 35 percent canopy cover is symbolized as continuous.

d. Symbols. The following pages contain the approved symbols for vegetation features.

Figure 74. Woods or Brushwood. Any perennial vegetation of enough stand or height to conceal troops, or which is thick enough to be a serious obstacle to free passage is classified as woods or brushwood. No distinction is made between woods and brushwood or between different types of vegetation.

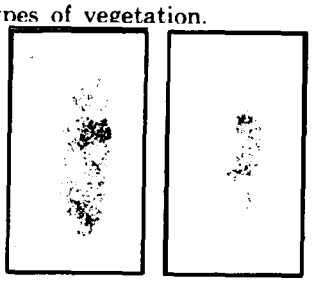


Figure 75. Scrub. Scrub growth includes cactus, stunted shrubs, sagebrush, mesquite, and similar plants of low growth which present an obstacle to free passage or which serve as landmarks in desert areas.

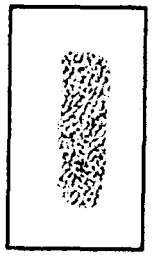


Figure 76. Orchard or Plantation. An area of orchards or plantations usually consists of rows of evenly spaced trees, showing evidence of planned planting. The type of growth is indicated except when it is of the common fruit variety, such as apple, orange, pear, or the like.

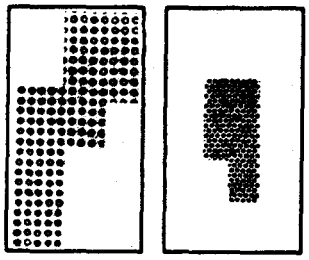


Figure 77. Vineyard. Vine growths which are not perennial are omitted. No indication as to the type of growth is given.

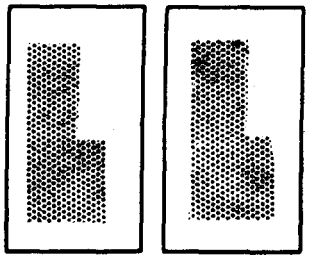


Figure 78. Tropical Grass. The symbol represents a dense growth of tall grass found in tropical or semitropical regions.

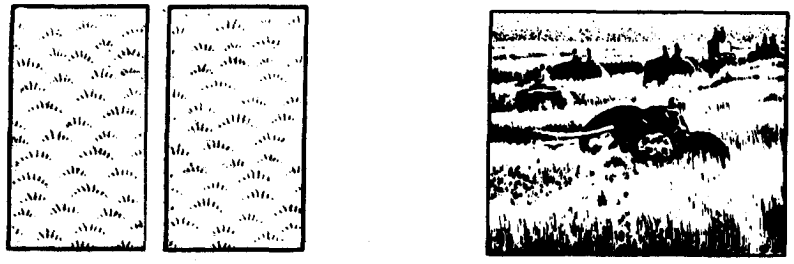


Figure 79. Mangrove. Mangrove is an impenetrable growth existing in tidal waters of tropical and semitropical areas. The shoreline shown on the seaside indicates the outer limits of mangrove and does not represent the mean high water line. Channels through mangrove are shown.

Figure 80. Nipa. Nipa is a stemless palm growing in tidal or brackish waters in tropical climates adjacent to coast lines. The shoreline as shown is the outer limits and is not the mean high water line.

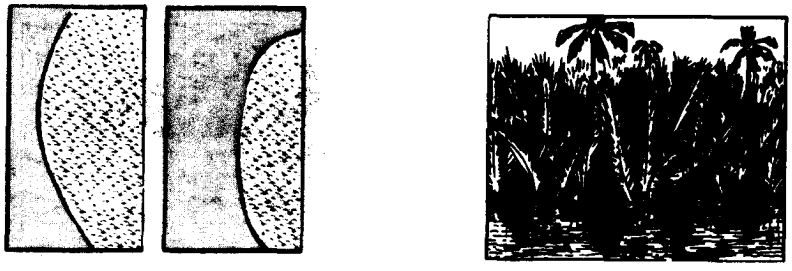
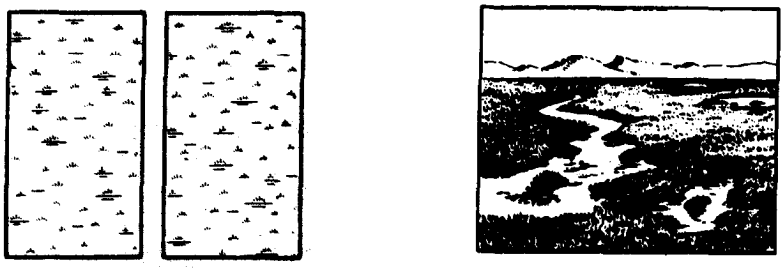


Figure 81. Marshy Areas in Northern Latitudes. This symbol represents features such as tundra in the USSR, muskeg in Canada, etc. The nature of the feature will be indicated in the legend.



12. Coastal Hydrography

a. General. Coastal hydrographic features and notes pertinent to those features usually are shown on all sheets showing navigable waters. Sheets showing land areas bordering on inland bodies of water, such as lakes, contain only offshore data. Sheets showing land areas bordering on oceans, seas, bays, or similar bodies of water contain both offshore and foreshore data.

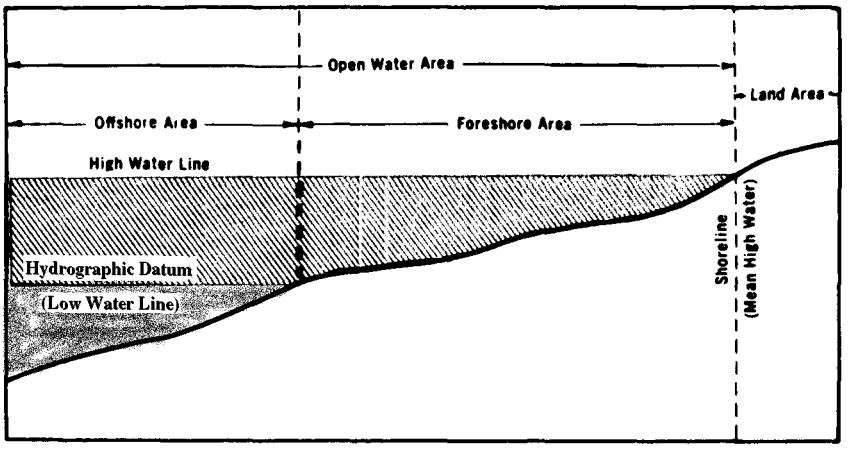
b. Definition of Coastal Terms (fig. 82).

(1) *Coastal hydrographic features.* All features within the foreshore and offshore areas, including permanent cultural and natural features which affect the navigability of the area.

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

(3) *Offshore area.* That area which is covered at the hydrographic datum.

(4) *Hydrographic datum.* That stage of low tide to which depths are referred. This varies somewhat in different parts of the world.



c. Symbols. The following pages contain the approved symbols for coastal hydrographic features.

Figure 83. Foreshore Flat. A foreshore flat occurs only in tidal waters. It is generally devoid of vegetation and is composed of sand, gravel, boulders, mud, clay, or any combination of such materials. Labeling indicates the type of composition. Labeling is omitted if the feature is small or its composition indefinable.

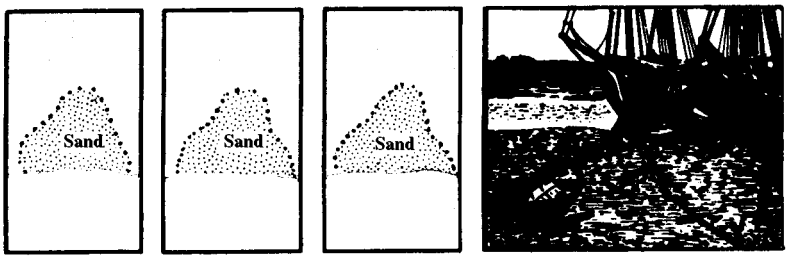


Figure 84. Reef or Ledge. Labeling indicates whether the reef is of rock or coral. (a) Large. (b) Small.

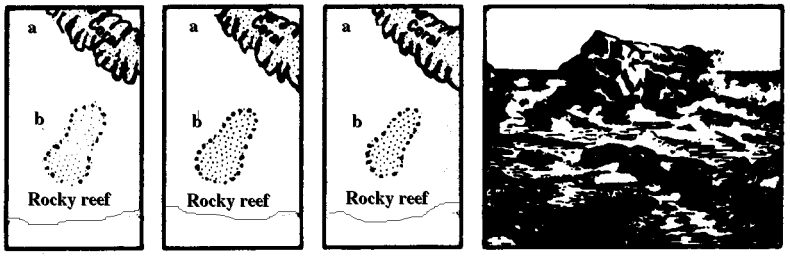


Figure 85. Sunken Rock. Rock covered at all stages of the tide. Only rocks which are actual dangers to navigation are shown on medium- and small-scale maps.
(a) Potential danger to navigation. (b) Actual danger to navigation.

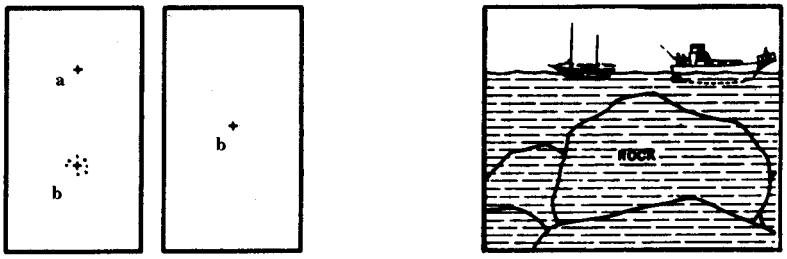


Figure 86. Rock, Bare, or Awash. This symbol represents rocks exposed or awash at the hydrographic datum. Only rocks which are actual dangers to navigation are shown on medium and small-scale maps.
(a) Potential danger to navigation. (b) Actual danger to navigation.

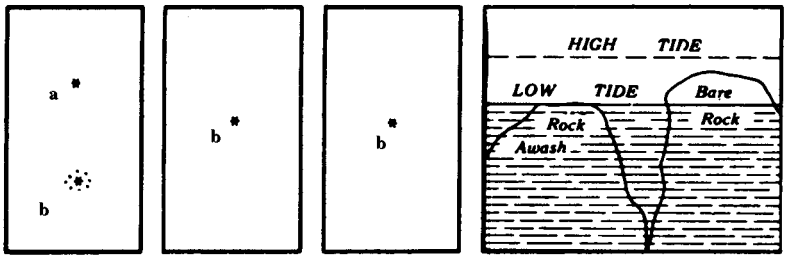


Figure 87. Exposed Wreck. A wreck is exposed when any portion of its hull is above water at the hydrographic datum plane. The circle of the symbol marks the location of the wreck.

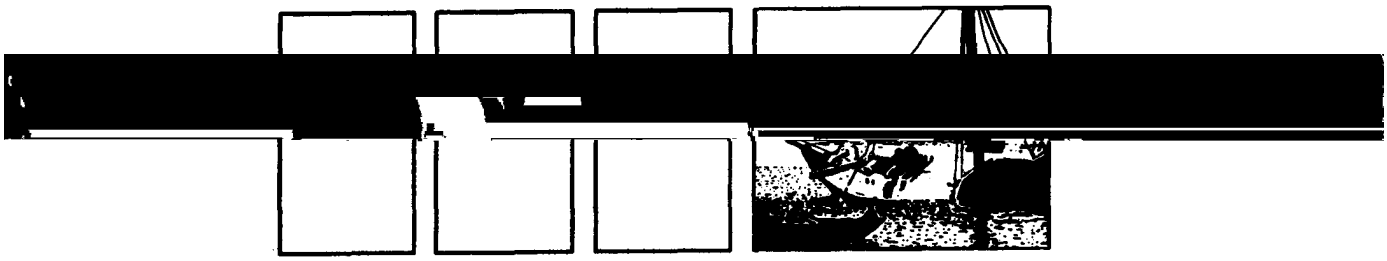


Figure 88. Sunken Wreck. The symbol represents wrecks which are less than 10 fathoms (60 feet) deep, with no part of the hull above water at the hydrographic datum. Masts may or may not be above water. The center of the symbol marks the location of the wreck. Only actual dangers are shown on medium-scale maps.
(a) Potential danger to navigation. (b) Actual danger to navigation.

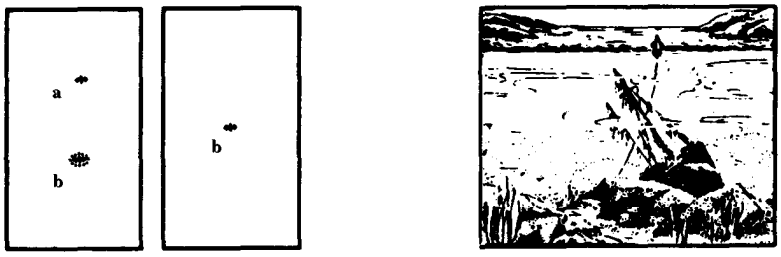


Figure 89. Sunken Danger or Obstruction. Labeling indicates the nature of the feature.
(a) Least depth indicated. (b) Depth determined by wire drag.

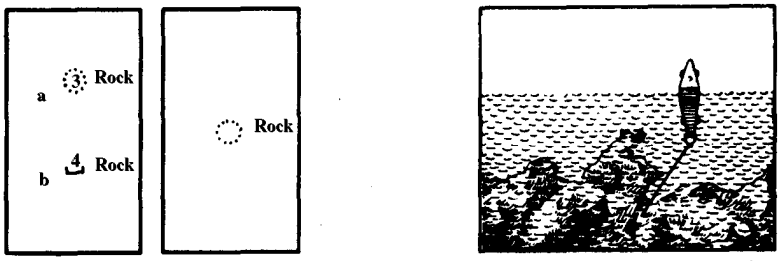


Figure 90. Limit of Danger Line. A danger line outlines any feature which is a danger to navigation, such as rocks, foul ground, shoals, small reefs and similar obstructions. Labeling usually is added to indicate the nature of the danger.

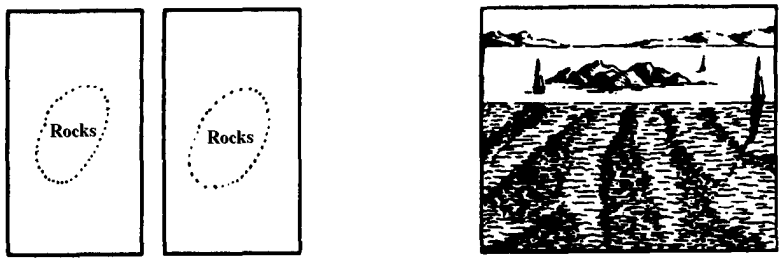
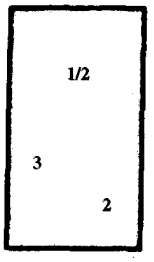


Figure 91. Sounding. The depth of the bottom at hydrographic datum is usually expressed in fathoms (6 feet). Depths are given in feet in the eastern United States and on the Gulf Coast. The map legend indicates the unit of measure.



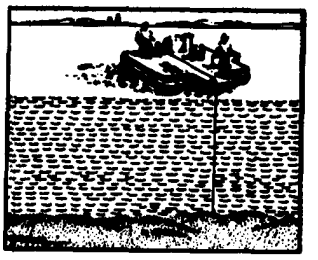
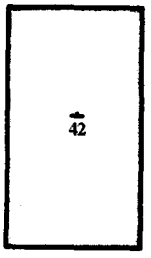


Figure 92. No-Bottom Sounding. The symbol represents soundings for which true depths have not been determined. The value indicates the depth sounded without bottom being struck.



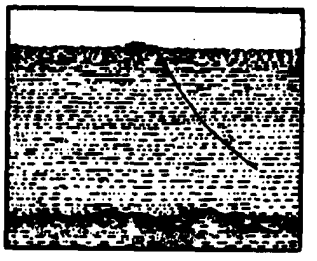
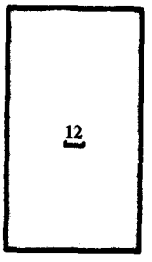


Figure 93. Swept Depth. The figure in the bracket indicates the depth of clearance. This is not necessarily the actual depth. Labeling describes the nature of any danger.



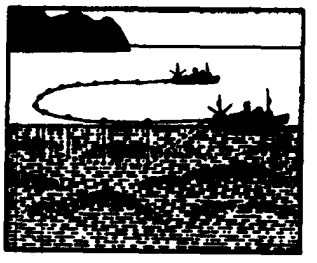


Figure 94. Depth Curves. A depth curve is a line drawn on a map to represent an imaginary line on the sea bottom, all points of which are at an equal depth below the hydrographic datum. Values labeling depth curves are in the same unit of measure as the soundings.

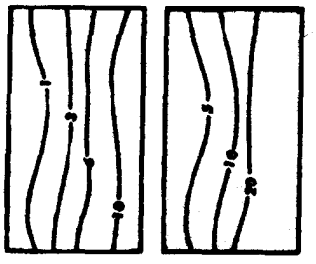


Figure 95. Bottom Characteristics. The character or composition of the bottom is indicated by labeling.

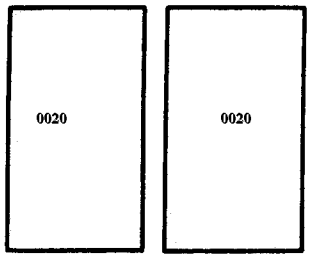


Figure 96. Breaker.
(a) Limits known. (b) Limits unknown.

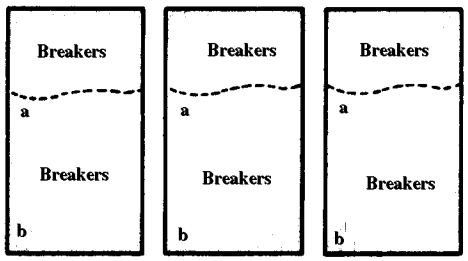


Figure 97. Current. If the speed is known, it is indicated in knots.
(a) General. (b) Flood. (c) Ebb.

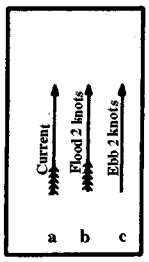
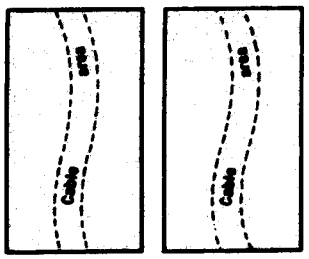


Figure 98. Area Limits. The symbol represents the limits of anchorages, fishing stakes, fishing weirs, cable areas, dredged channels, dredge dumps, pipeline areas, prohibited areas, spoil ground, swept areas, and similar areas.



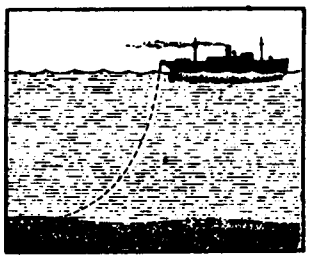


Figure 99. Dolphin, Piling, Stump, Snag. Appropriate labeling indicates the type of obstruction.

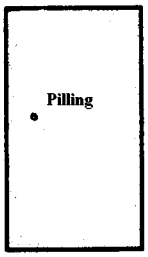


Figure 100. Anchorage for Large Vessels. Shown only on maps of foreign areas.

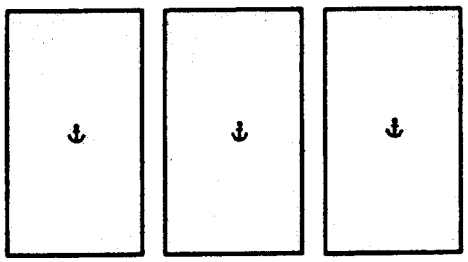
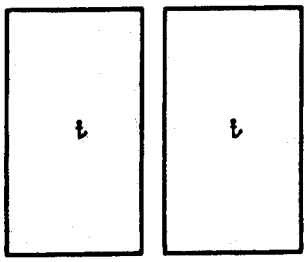


Figure 101. Anchorage for Small Vessels. Shown only on maps of foreign areas.



13. Roads in the United States on Large- and Medium-Scale Maps

a. Road Classifications on Large-scale Maps. Roads within the limits of the United States are classified on large-scale maps as—

(1) Hard-surface, heavy-duty roads.
  (a) Four or more lanes wide.
  (b) Two or three lanes wide.
(2) Hard-surface, medium-duty roads.
  (a) Four or more lanes wide.
  (b) Two or three lanes wide.
(3) Improved, light-duty roads.
(4) Unimproved dirt roads.
(5) Trails.

b. Road Classifications on Medium-Scale Maps. The classifications on medium-scale maps are the same, except for hard-surface roads, where a distinction is made between roads two lanes wide and roads more than two lanes wide.

c. Hard-Surface, Heavy-Duty Roads. Roads of this classification carry heavy truck loads in all weather with a minimum of maintenance. The construction is usually of portland-cement concrete, bituminous concrete, or sheet asphalt, rock asphalt, bituminous penetration, or mixed bituminous on a heavy foundation. Brick or block roads are also included in this category.

d. Hard-Surface, Medium-Duty Roads. These roads carry medium-heavy truck loads in all weather. Occasional maintenance is required. Construction is usually a bituminous-penetration or mixed-bituminous surface, or bituminous-treated surface on a light foundation.

e. Improved, Light-Duty Roads. These roads carry light loads in all weather. Periodic maintenance is usually necessary. Construction consists of stabilized or oiled-surface gravel or stone, graded and drained gravel or stone, or graded and drained soil surface. Included in this category are hard-surface roads less than two lanes wide and improved private roads which normally are not practical for use in rerouting of traffic in emergencies.

f. Unimproved Dirt Roads. These roads are suitable only for light loads in dry weather. They are without surface improvement and are seldom maintained. Included are abandoned roads, fire roads, and lumber roads.

g. Trails. The map shows important foot paths, foot trails, and pack trails which can accommodate 1/4-ton trucks in dry weather. Minor and short connecting trails usually are omitted.

h. Symbols. The following pages contain the approved symbols for roads in the United States.

Figure 102. Hard-Surface, Heavy-Duty Road.
LARGE-SCALE: Four or more lanes wide.
MEDIUM-SCALE: Three or more lanes wide.
Labeling indicates the number of lanes.

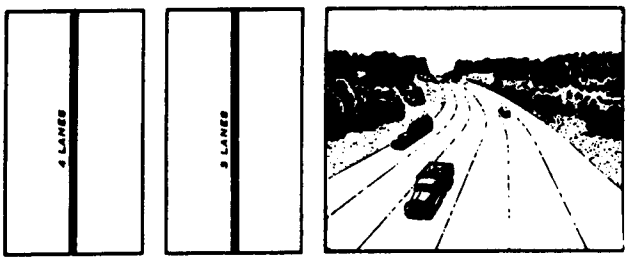


Figure 103. Hard-Surface, Heavy-Duty Road.
LARGE-SCALE: Two or three lanes wide. Unless otherwise labeled, the road is two lanes wide.
MEDIUM-SCALE: Two lanes wide.

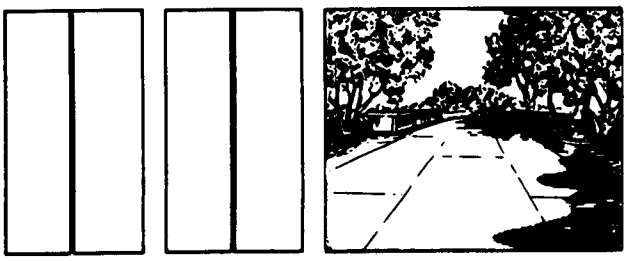


Figure 104. Hard-Surface, Medium-Duty Road.
LARGE-SCALE: Four or more lanes wide.
MEDIUM-SCALE: Three or more lanes wide.
Labeling indicates the number of lanes.

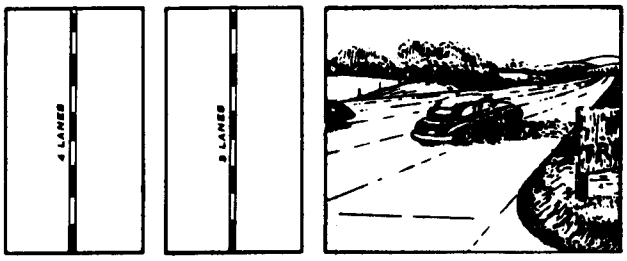


Figure 105. Hard-Surface, Medium-Duty Road.
LARGE-SCALE: Two or three lanes wide. Unless otherwise labeled, the road is two lanes wide.
MEDIUM-SCALE: Two lanes wide.

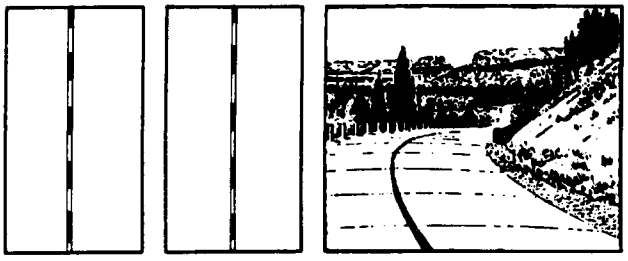


Figure 106. Improved, Light-Duty Road.

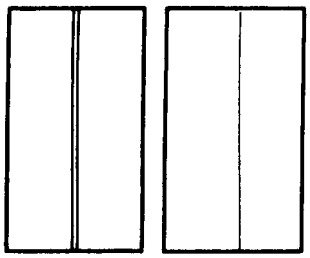


Figure 107. Unimproved Dirt-Road.

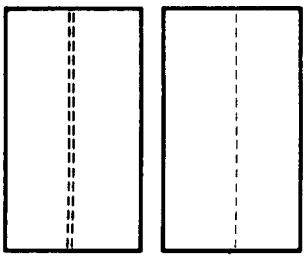
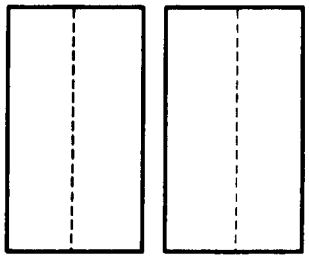


Figure 108. Trail.



14. Roads in Foreign Areas on Large- and Medium-Scale Maps

a. Road Classifications. Roads outside the limits of the United States are classified on both large- and medium-scale maps as—

(1) Hard-surface, all-weather roads.
  (a) Two or more lanes wide.
  (b) One lane wide.
(2) Loose or light surface, all-weather roads.
  (a) Two or more lanes wide.
  (b) One lane wide.
(3) Loose surface, fair- or dry-weather roads.
(4) Tracks.
(5) Trails.

b. Hard-Surface, All- Weather Road. These roads carry fairly heavy truck loads in all weather. Minimum maintenance requirements are periodic inspection and repair. The construction is usually concrete or asphaltic concrete, bituminous macadam, surface-treated oiled gravel, and light tar-bound macadam.

c. Loose or Light Surface, All-Weather Road. These carry light loads in all weather. The roads generally are drained and graded. Periodic maintenance is required. Construction is usually of gravel, stone, or some stable material, such as sand-clay, on a light foundation.

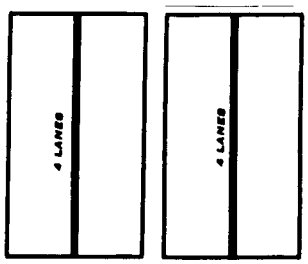
d. Loose *Surface, Fair- or Dry- Weather Road.* These roads carry light loads in dry weather only. The road may or may not be graded or drained and requires continual maintenance. Any surfacing consists of gravel, or sand-clay with a poor foundation.

e. Tracks. Tracks include winter roads, caravan routes, and natural roadways and can accommodate very light vehicles, such as 1/4-ton trucks, in dry weather. Tracks are normally shown only in areas having poor road systems.

f. Trails. Trails include important foot trails, foot paths, and pack trails. Minor trails and unimportant connecting trails are omitted. In areas with good road systems, tracks are included in this category.

g. Symbols. The following pages contain the approved symbols for roads in foreign areas.

Figure 109. Hard-Surface, All-Weather Road, Two or More Lanes Wide.



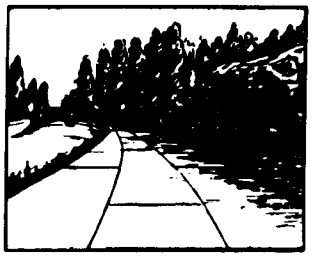


Figure 110. Hard-Surface, All-Weather Road, One Lane Wide.

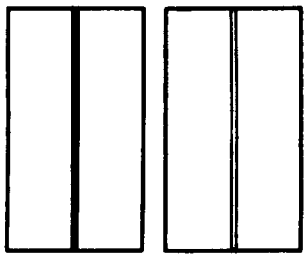
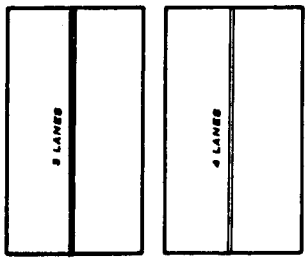


Figure 111. Loose or Light-Surface, All-Weather Road, Two or More Lanes Wide.



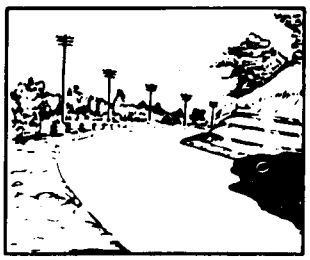


Figure 112. Loose or Light-Surface, All-Weather Road, One Lane Wide.

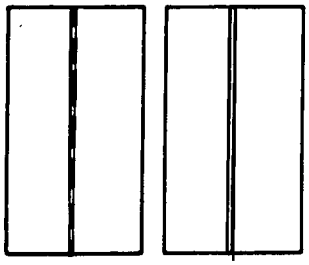


Figure 113. Loose-Surface. Fair or Dry-Weather Road.

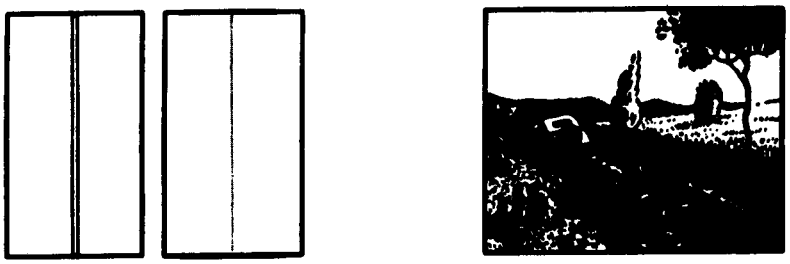


Figure 114. Track

Figure 115. Trail

15. Roads on Small-Scale Maps

a. Road Classifications. Roads on small-scale maps are classified as—

(1) Dual or super highways.
(2) Main roads.
(3) Secondary roads.
(4) Other roads.
(5) Tracks or trails.

b. Main Roads. Main roads are those which serve as the main thoroughfares between the important populated places of an area. Well alined roads of a substantial width and surface which connect a number of populated places, and cross-country roads which form a direct route connecting with roads and trails leading to important features are included in this category. Main roads are generally hard-surfaced except in areas with poor road systems.

c. Secondary Roads. Secondary roads include those roads connecting the minor cities and towns of an area. A road connecting two main roads, at least one of which is higher in classification than the connecting road, is included in this category. In comparison with main roads, secondary roads have less reported use and less substantial construction, and are generally loose-surfaced roads.

d. Other Roads. Included in this category are local community roads serving the villages and settlements of an area. Also included are those connecting roads important to the communications network but obviously of a lower classification than the secondary roads. Such roads may be loose-surfaced or dirt roads.

e. Tracks or Trails. Tracks and trails are symbolized alike. Both normally are shown only in areas of sparse culture where they supply the only means of communication. Minor tracks and trails are omitted. Included in this category are winter roads and caravan routes. Normally, the roadway is natural with little or no improvements.

f. Symbols. The following pages contain the approved symbols for roads on small-scale maps.

Figure 116. Dual or Super Highway.

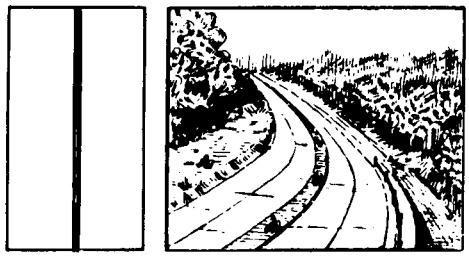


Figure 117. Main Road.

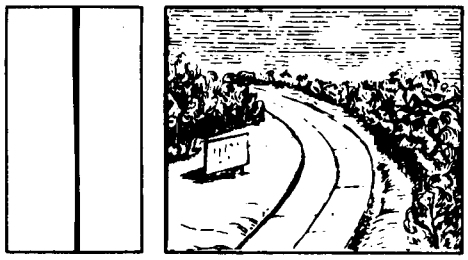


Figure 118. Secondary Road.

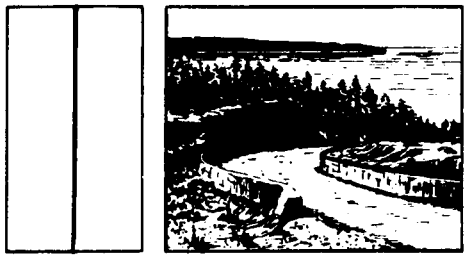


Figure 119. Other Road.

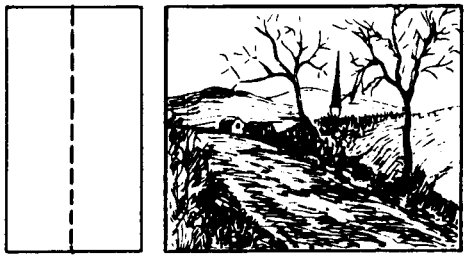


Figure 120. Track or Trail.

16. Related Road Features

The following symbols indicate eatures related to roads.

Large Scale *Medium Scale* *Small Scale* *Illustration*

Figure 121. Dual Highway. A dual highway consists of two or more lanes on each side of a physical separation such as a parkway. Surface and construction are indicated by the proper road fill. The number of lanes is indicated by labeling. When scale permits, each side of the highway is symbolized separately.

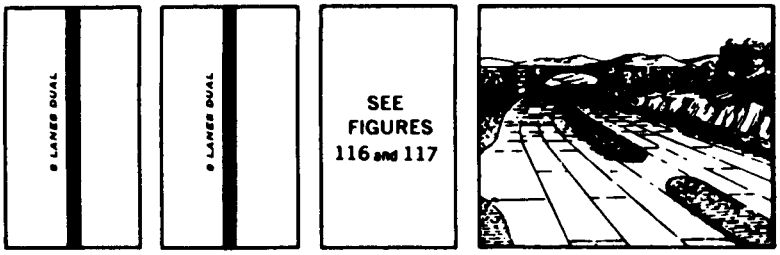


Figure 122. Road Under Construction. Only roads on which construction is actually under way are shown. If information is available, the classification of the completed road is shown by the proper road fill. Proposed roads are omitted.

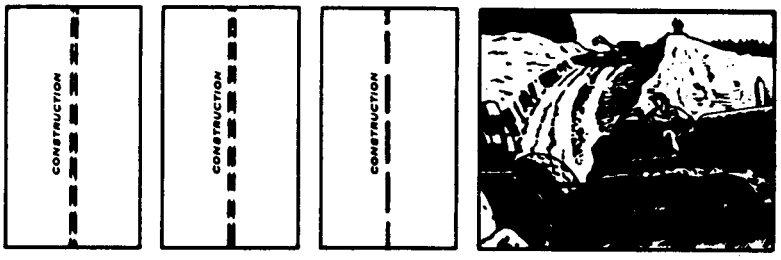


Figure 123. Point of Change in Number of Lanes of Extra-Width Road.

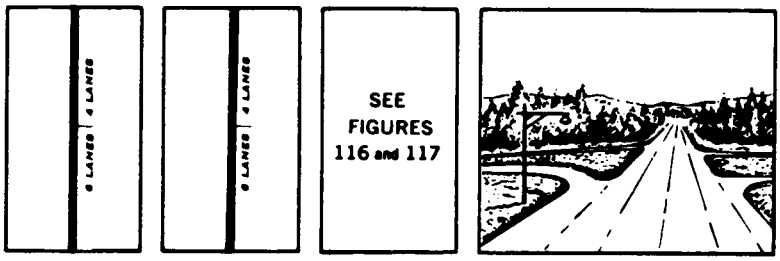


Figure 124. Route Marker. (a) Federal or national. (b) State, province or equivalent.

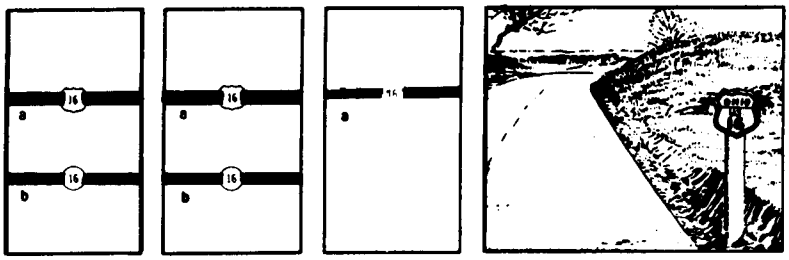


Figure 125. Streets in Developed Areas. In areas having a developed street pattern, streets are shown to agree with the cultural density and the scale of the map. Normally, streets are symbolized alike regardless of construction. If width permits, a street is shown to scale. Alleys are not shown. Through routes are indicated by red fills.

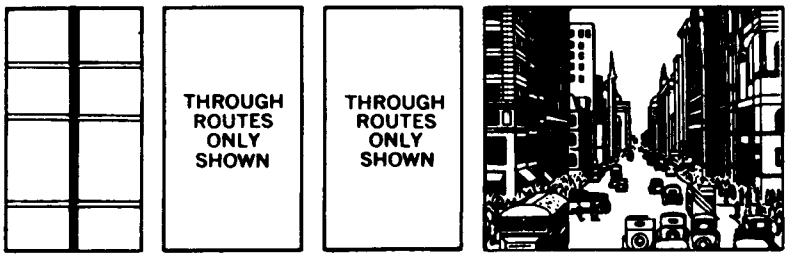


Figure 126. Street Ending at Barrier or Embankment.

Figure 127. Traffic Circle. These are sometimes omitted on 1:50,000 scale maps, especially in congested areas.

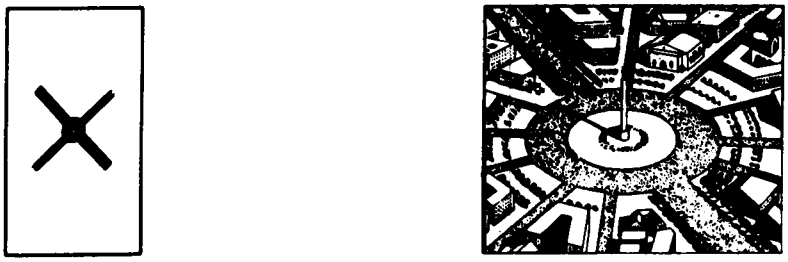


Figure 128. Traffic Circle, Cloverleaf, and Interchange. A cloverleaf is shown to true shape whenever the scale permits. They are sometimes omitted on 1:50,000 scale maps, especially in congested areas. On medium-scale maps the access points on limited-access roads are the only cloverleafs shown.

Figure 129. Steep Gradients on Roads.

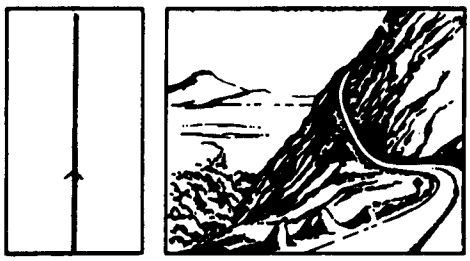


Figure 130. Road Distances. Distances are shown between towns and road junctions.

17. Railroads

a. Gage.

(1) Normal gage is the gage used on the majority of the mainline railroads of a country. Normal gage in the United States is standard (4' 8 1/2") gage.

(2) Broad gage is any gage greater than the normal gage used in a country.

(3) Narrow gage is any gage lesser than the normal gage used in a country.

(4) Either the symbol legend in the margin or labeling on the map identifies the gage of the railroads.

b. Multiple-Track Railroad. A multiple-track railroad contains three or more mainline tracks paralleling each other. The number of tracks of a multiple-track railroad is indicated by labeling placed parallel to the symbol.

c. Nonoperating Railroad. A nonoperating railroad is one not in use. Included in this category are railroads under construction, abandoned railroads, and destroyed railroads. Labeling placed parallel to the symbol indicates whether the line is abandoned, destroyed, or under construction.

(1) An abandoned railroad is one which is no longer in use, but the ballast, bridges, and tracks remain in major part and could be put into limited or full operation with a minimum of repair.

(2) Only those railroads on which actual work is under way are symbolized as under construction. Proposed lines are not shown. An operating line sometimes has additional tracks under construction. The symbol for the operating line is shown with appropriate labeling to indicate the construction.

d. Dismantled Railroad. A dismantled railroad is one which is no longer in use and which has the major part of its tracks and bridges removed. If the right-of-way is being used as a road only, the proper road symbol will be shown. If there is no road and the feature is of landmark importance, it is symbolized by a dashed line and labeled.

e. Electrified Railroad. Electrified railroads are shown by the proper symbol indicating the gage and number of tracks, with the word *Electrified* added parallel to the symbol.

f. Developed Areas.

(1) Minor line and sidings sometimes are omitted in congested areas. Through lines are always shown.

(2) Railroads which run underground for long distances in a city are not shown. The dashed lines indicating tunnels are omitted. Only the headwalls and wings of the tunnel entrances are shown.

(3) Rapid transit lines, when located in subways, are not shown. They are shown by the appropriate railroad symbol when located in open cut, on the surface, or on above-surface structures.

g. Symbols. The following pages contain the approved symbols for railroads and related features.

Figure 131. Single-Track Railroad, in Operation.
(a) Normal or broad gage. (b) Narrow gage. Broad and narrow gage railroads are labeled as to gage.

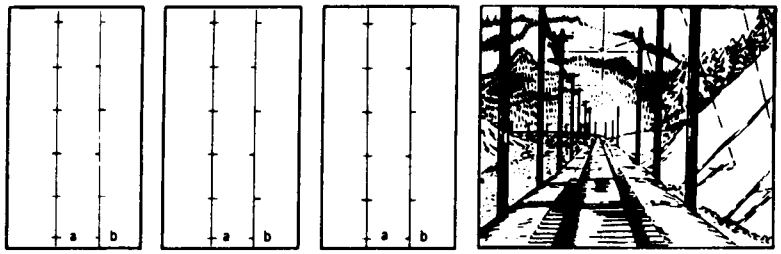


Figure 132. Single-Track Railroad, Nonoperating. Labeling indicates whether railroad is abandoned, destroyed, or under construction.
(a) Normal or broad gage. (b) Narrow gage. Broad and narrow gage railroads are labeled as to gage.

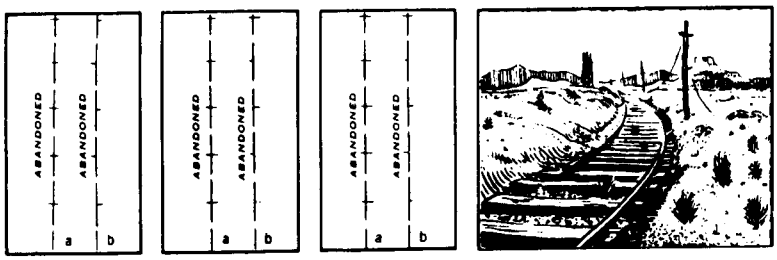


Figure 133. Double- or Multiple-Track Railroad, in Operation. Railroad is double-track if not otherwise labeled.
(a) Normal or broad gage. (b) Narrow gage. (c) Standard gage (for use in United States only). Broad gage railroads are labeled as to gage.

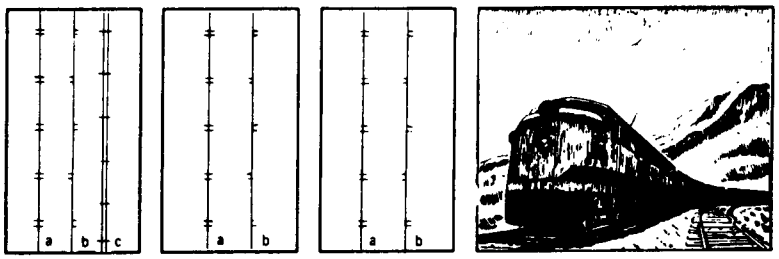


Figure 134. Double- or Multiple-Track Railroad, Nonoperating. Labeling indicates whether railroad is abandoned, destroyed, or under construction. (a) Normal or broad gage. (b) Narrow gage. (c) Standard gage (for use in United States only). Broad gage railroads are labeled as to gage.

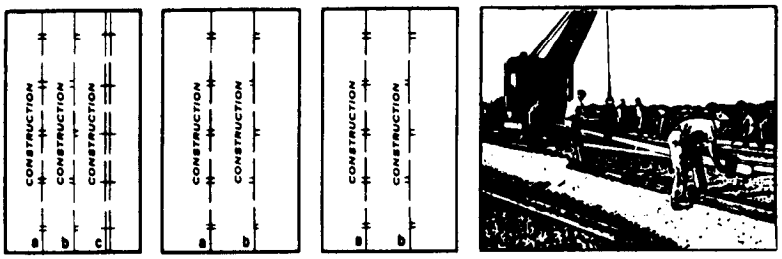


Figure 135. Point of Change in the Gage or the Number of Tracks.

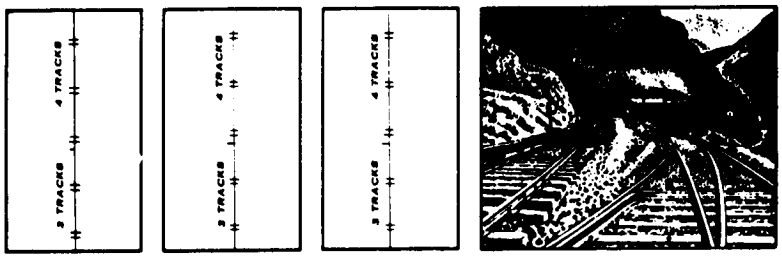


Figure 136. Railroad in Street or Wharf. Normal symbols are used if the width of the containing feature permits. On medium-scale maps appropriate labeling shall indicate where a railroad coincides with a road.

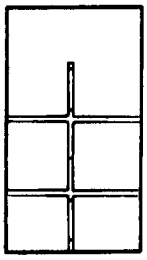


Figure 137. Railroad Siding. Included are tracks for passing, storage, and loading and unloadir of passengers or freight. In congested areas, sidings are sometimes omitted.

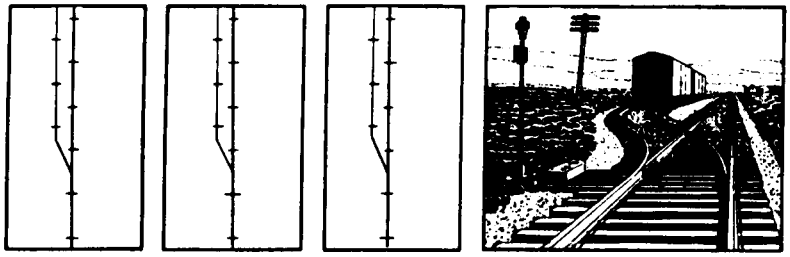


Figure 138. Railroad Yard. The limiting sidings indicate the correct shape of the yard. Lines inside the outline are symbolic and do not show the correct number of sidings.

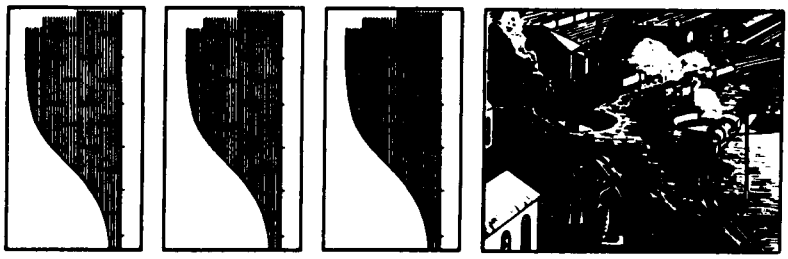


Figure 139. Railroads in Juxtaposition. Railroads of different ownership closely parallel to each othe

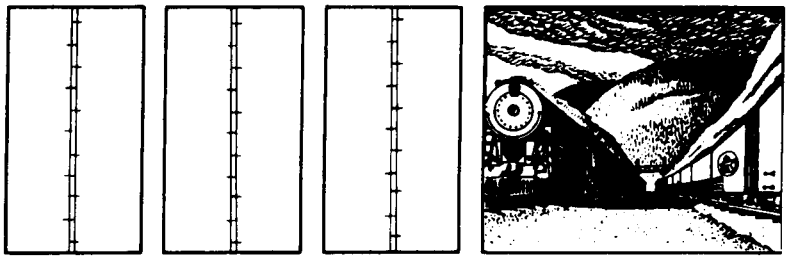
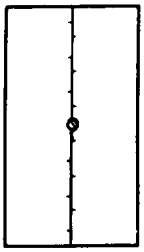


Figure 140. Turntable. A turntable is not drawn to scale. It is usually omitted in congested areas.



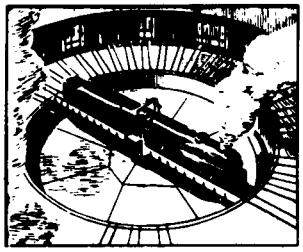
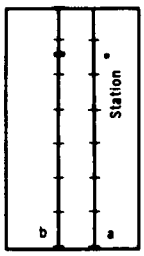
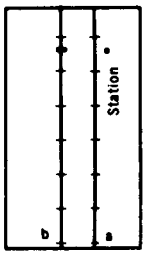
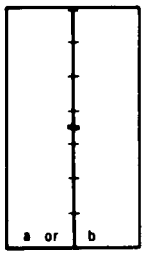


Figure 141. Railroal Station. Within built-up areas, stations are shown only when they are significant as landmarks. If the building is identifiable, it appears in correct location. Flagstops, halts and similar stops without permanent buildings are not shown on medium-scale maps. On large-scale maps they are shown by name only.
(a) Position known. (b) Position unknown.







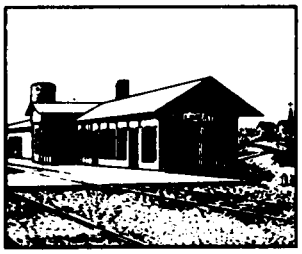
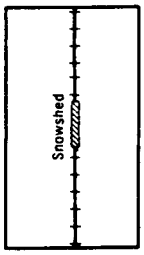


Figure 142. Railroad Snowshed.



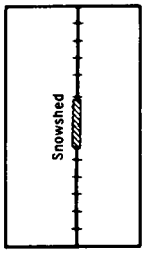
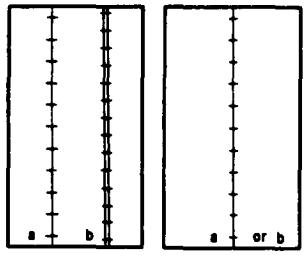


Figure 143. Carline. Carlines are shown only in open areas; they are omitted in built-up areas, streets, and roads. If the line is not in operation, labeling indicates whether it is abandoned, destroyed, or under construction. Single and double-track lines are shown by the same symbol on medium-scale maps. Carlines which are not in operation are symbolized the same as those in operation, except that appropriate labeling is added. Dismantled carlines are shown in the same manner as dismantled railroads. (a) Single. (b) Double.



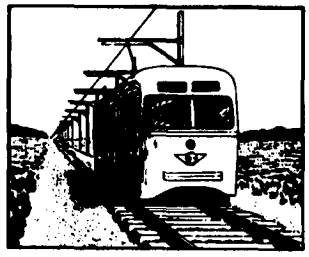
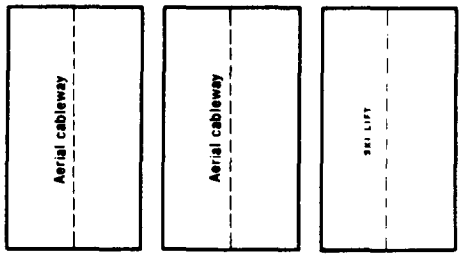


Figure 144. Aerial Cableway, Ski Lift, or Conveyor Belt. Included in this category are linear features, other than railroads or carlines, whose function is the transportation of people or material. Usually, these features are suspended above ground level. They are shown only when they are permanent installations and of sufficient size and importance. Appropriate labeling indicates the type of feature.



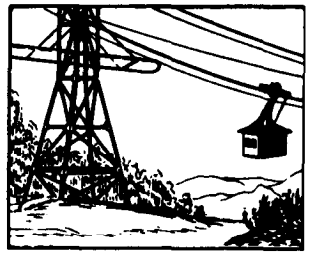
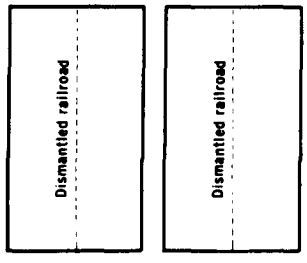
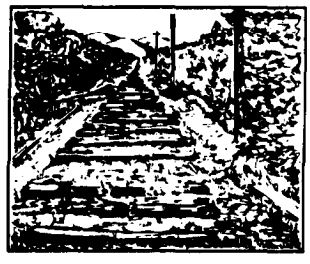


Figure 145. Dismantled Railroad or Carline. Used when the major parts of the tracks and bridges have been removed.





18. Features Related to Communications

a. Overpasses and Underpasses. On large-scale maps, overpasses and underpasses normally are shown wherever they exist. On medium- and small-scale maps they generally are shown only in open areas. An overpass is a short viaduct carrying a road or railroad above the grade of another road or railroad. An underpass is a short tunnel carrying a road or railroad below the grade of another road or railroad.

b. Bridges and Viaducts.

(1) The distinction between a bridge and a viaduct is that a bridge passes over what is predominantly water while a viaduct passes over what is predominantly land.

(2) Long bridges or viaducts are always shown. A shorter bridge or viaduct is shown if it serves as an identifiable landmark or is the only means of crossing within the general area.

(3) On long bridges or viaducts, the ends of the symbol appear in their correct locations. On shorter ones, the symbol is merely representative and the ends are not necessarily in their correct locations.

(4) Bridges and viaducts less than 20 feet long normally are not shown except when they are underpasses or overpasses.

(5) When a bridge is used to carry both a road and a railroad on either the same or different levels, the feature is shown by the road-bridge symbol with the railroad shown to the bridge ends. The symbol is labeled "Road and railroad".

(6) Footbridges are shown only in areas of sparse culture.

c. Drawbridges.

(1) Drawbridges are structures of which either the whole or part can be raised, lowered, pivoted, or turned aside to allow or to interrupt traffic.

(2) On large-scale maps, the small circle of the symbol is centered on the true location of the center of the movable part of the bridge.

d. Ferries.

(1) Ferries capable of carrying vehicular or railroad traffic normally are shown wherever they exist.

(2) Ferries for pedestrians are shown only in areas of sparse culture or where they provide the only means of water-crossing in the general area.

(3) The dashed line connects the points between which the ferry operates, without regard for the actual navigating course of the ferry.

(4) Steamship lines are not shown.

e. Fords. Fords are shown only in areas of sparse culture or where they provide the only means of water-crossing in the general area.

f. Symbols. The following pages contain the approved symbols for features related to communications.

Figure 146. Overpass or Underpass.

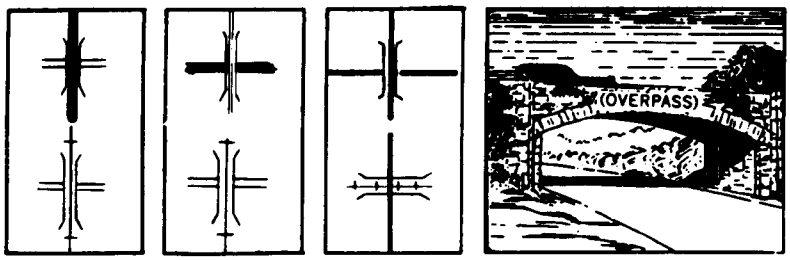


Figure 147. Grade Crossing.

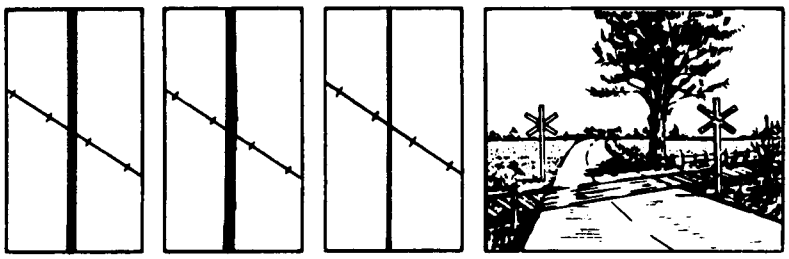


Figure 148. Road Tunnel. Road classification fills are omitted within the tunnel.

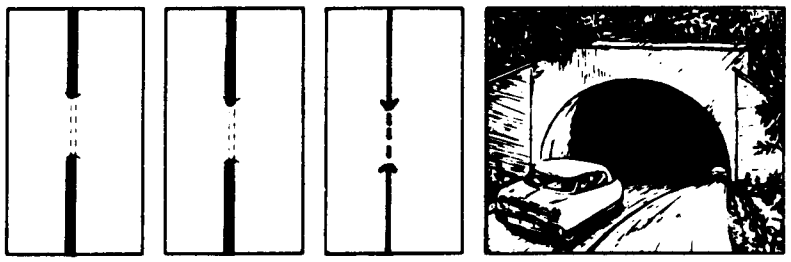


Figure 149. Railroad Tunnel. The railroad symbol is omitted within the tunnel.

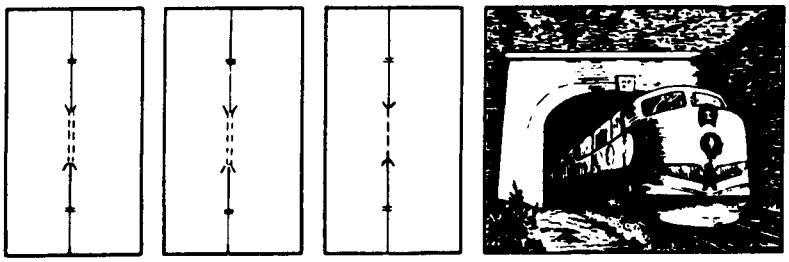


Figure 150. Railroad Bridge or Viaduct.

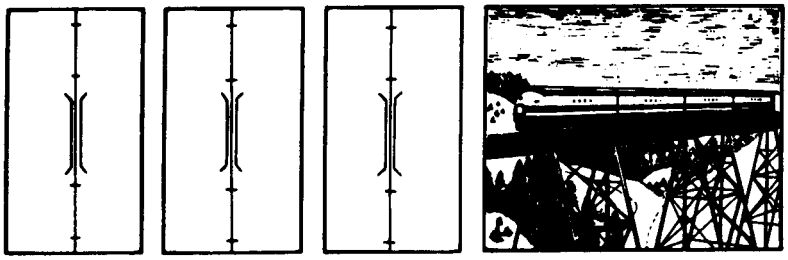


Figure 151. Railroad Drawbridge. Drawbridges are not indicated on medium and small-scale maps.

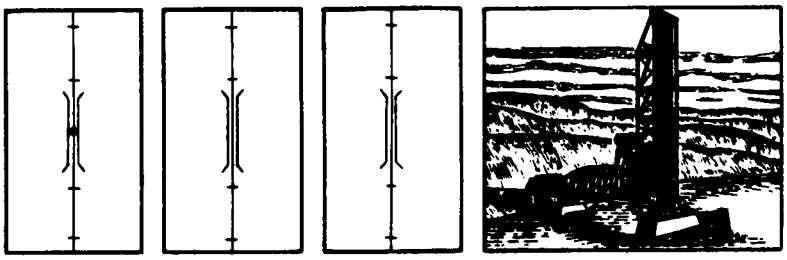


Figure 152. Highway Bridge or Viaduct.

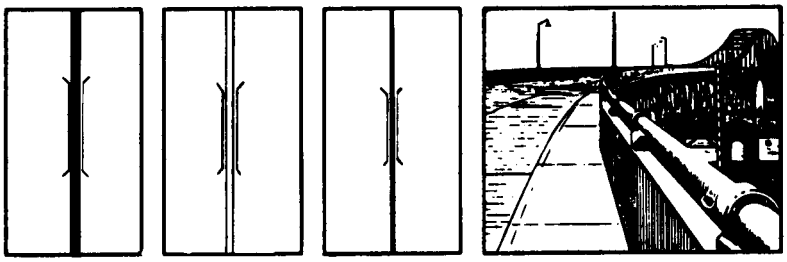


Figure 153. Highway Drawbridge. Drawbridges are not indicated on medium and small-scale maps.

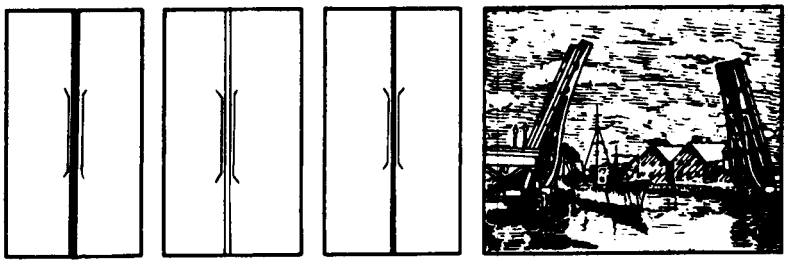


Figure 154. Footbridge.

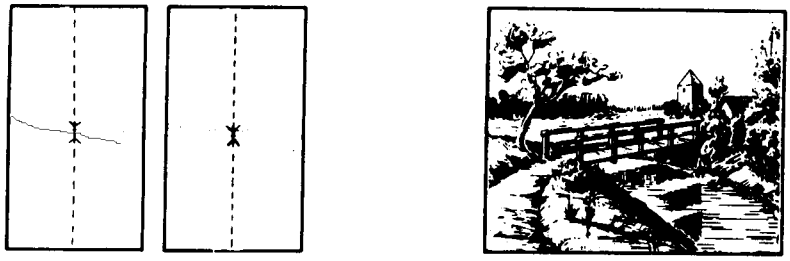


Figure 155. Ferry.

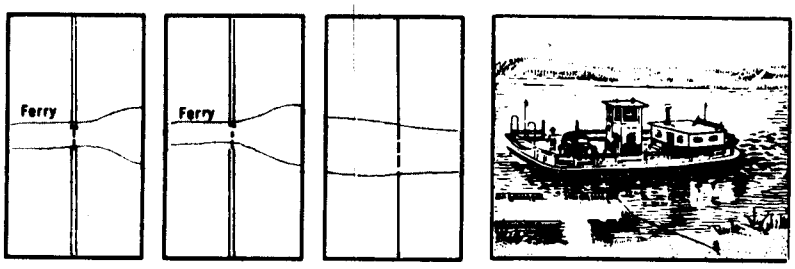
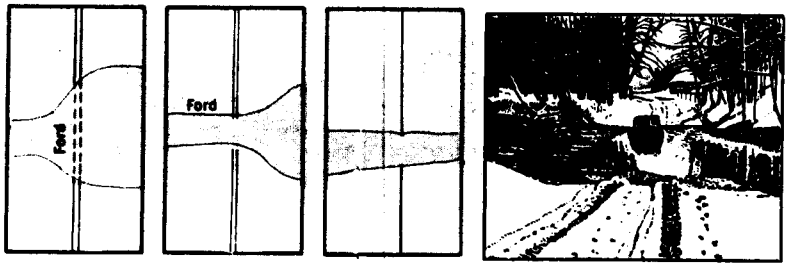


Figure 156. Ford.



19. Buildings and Populated Places on Large-Scale Maps

a. Built-Up Areas.

(1) A built-up area is a large continuous area which is developed or is in the advanced stage of development for occupancy by concentrated populations. It usually is laid out in a definite street pattern and normally contains a business or industrial district. Since all buildings cannot be shown individually, the area is indicated by an overall screened red tint.

(2) Only landmark buildings are shown individually in built-up areas. These are buildings which are prominent because of size, location, or usage, such as government or public buildings, colleges, schools, churches, hospitals, railroad stations, markets, factories, and buildings of historical or cultural interest.

(3) Within the general outline of the built-up area, individual symbols are used and the built-up area tint is generally omitted for the following features:

(a) Parks and cemeteries equivalent to or larger than one block.

(b) Institutions such as colleges, schools, and hospitals possessing open ground areas equivalent to or larger than one block.

(c) Section with little construction or development if equivalent to or larger than two blocks.

(4) All woodland cover is omitted in built-up areas.

b. Native Settlements. These include native settlements in foreign areas in which the buildings are not usually of permanent construction. Kampongs in southwestern Asia and encampments in western Africa are examples. The symbol legend of the map defines the symbol properly.

c. Buildings in General.

(1) Conventional symbols are used to show a small building or a small structure similar to a building. The symbol is shown in correct orientation and its center usually coincides with the correct location of the center of the structure.

(2) Buildings and similar structures whose plotted size exceeds the conventional symbols are shown in correct orientation and shape and usually in correct location.

(3) Buildings and structures located along roads are shown in their correct location unless they would then fall within the road. In such cases, the symbol is moved back.

(4) In many cases it is impossible to show all buildings because of congestion. The map retains the general shape and pattern of the area and omits the less important buildings.

d. Structures Similar to Buildings.

(1) These are features of substantial construction not definable as buildings. In many instances they are roofed, although not necessarily enclosed on all sides. The term includes barns, grandstands, railroad sheds, large open sheds, fruit packing sheds, snow sheds, open-air refineries, and similar structures.

(2) Structures which are smaller than the average dwelling in the locality are not shown.

(3) In foreign areas, when information is unavailable, no distinction is made between buildings and structures similar to buildings.

e. Schools and Churches.

(1) When a building is used both as a church and a school, it is symbolized as a school.

(2) In the United States, the church symbol is used commonly for all denominations. On maps of foreign areas, this symbol usually denotes a Christian place of worship, with other symbols being used to denote places of worship of other sects. In such cases, the marginal symbol legend should be consulted for detailed information.

(3) When a school has numerous buildings, the flag symbol is shown only on the administration building or the most prominent building in the group.

(4) When there are numerous religious buildings in a group, as in a convent or monastery, the cross symbol is shown only on the building used for religious services or the most prominent building in the group.

f. Ruins. Ruins are buildings or structures in such a state of dilapidation or decay that they can no longer be used for their original purpose. Ruins which are smaller than the average dwelling in the locality are not shown unless they possess unusual significance.

g. Symbols. The following pages contain the approved symbols for buildings and populated places on large-scale maps.

Figure 157. Built-Up Area.

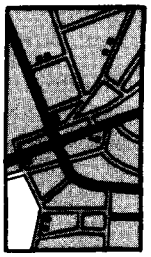


Figure 158. Native Settlement. Native settlements occur only in foreign areas. The map legend fully defines the symbol.

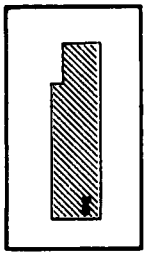


Figure 159. Buildings in General.

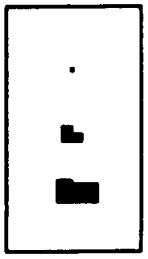
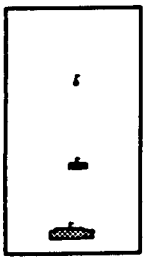


Figure 160. School.



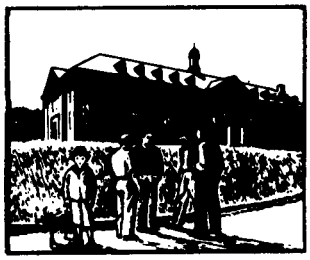
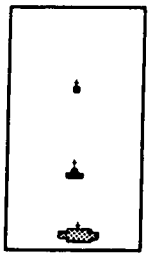


Figure 161. Church.



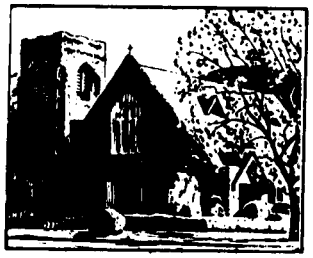


Figure 162. **Christian Shrine.** A Christian shrine is shown only in foreign areas. (a) and (b) are alternate symbols, or are sometimes used on the same map to denote different features. Consult the map legend for distinctions.

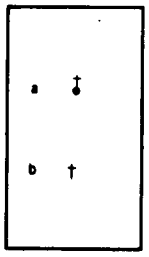


Figure 163. **Non-Christian House of Worship.** A non-Christian house of worship is shown only in foreign areas. The map legend fully defines the symbol. (a) and (b) are alternate symbols, or are sometimes used on the same map to denote different features. Consult the map legend for distinctions.

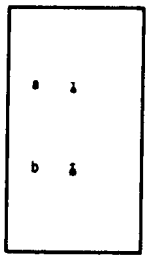
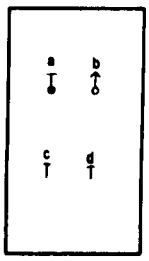


Figure 164. **Non-Christian Shrine.** A non-Christian shrine is shown only in foreign areas. The map legend fully defines the symbol. (a), (b), (c), and (d) are alternate symbols, or are sometimes used on the same map to denote different features. Consult the map legend for distinctions.



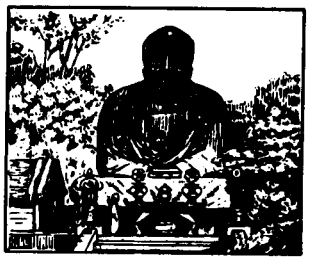
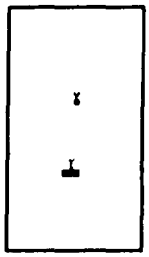


Figure 165. Mosque. A mosque is shown only in foreign areas.



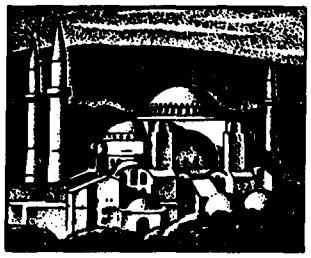
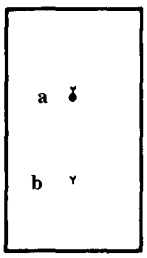


Figure 166. Moslem Shrine. A Moslem shrine is shown only in foreign areas. (a) and (b) are alternate symbols, or are sometimes used on the same map to denote different features. Consult the map legend for distinctions.



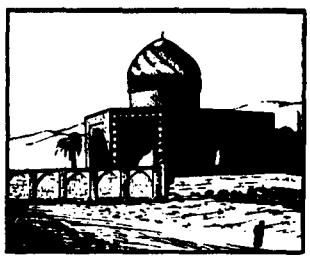
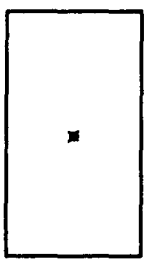


Figure 167. Pagoda. A pagoda is shown only in foreign areas.



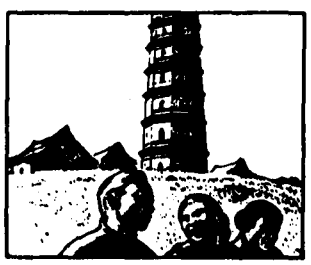


Figure 168. Structures Similar to Buildings.

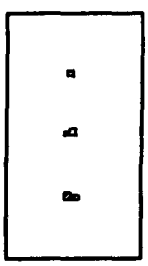


Figure 169. Ruins. (a) Large. (b) Small.

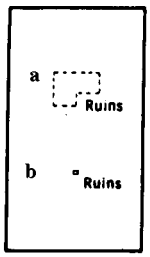


Figure 170. Greenhouse.

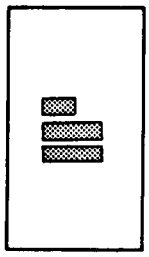


Figure 171. Ruined or Destroyed Areas.

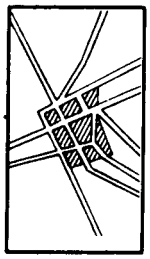


Figure 172. Lighthouse or Light.

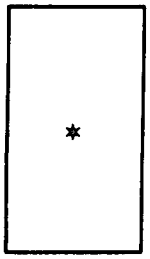


Figure 173. **Windmill or Windpump.**

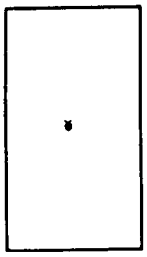
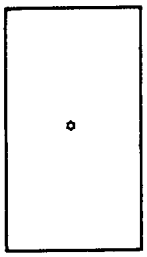


Figure 174. **Watermill.**



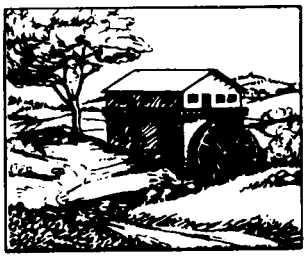


Figure 175. **Cliff Dwelling.** Cliff dwellings occur in the southwestern United States. Where numerous cliff dwellings occur, one symbol is usually used to represent several.

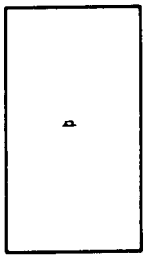


Figure 176. Historical Site. Historical sites are shown only in foreign areas.

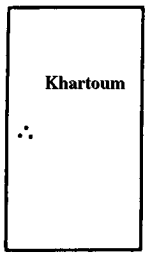
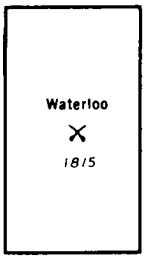


Figure 177. Historical Battlefield. Historical battlefields are shown only in foreign areas. If they cover a large area, historical battlefields are shown with outlines.



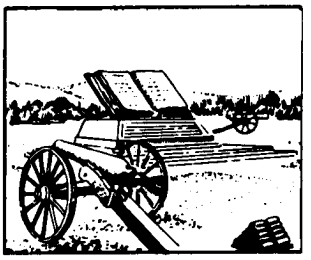
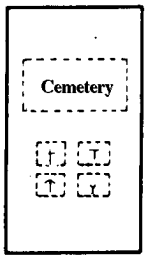


Figure 178. Cemetery. In cemeteries in the United States no distinction is made between denomination or race. In cemeteries in foreign areas, religious denominations are indicated if the information is available. Small private cemeteries and isolated graves are usually omitted.



20. Buildings and Populated Places on Medium- and Small-Scale Maps

a. Reduced Scale. Because of the reduced scale, it is impossible to show the buildings and populated places on medium- and small-scale maps in great detail. Consequently, the symbols are truly symbolic or representative. The only buildings shown are those which serve as outstanding landmarks in isolated areas.

b. Populated Places. A small populated place is shown by a small circle. A larger populated place is shown, generally true to shape, by an outlined and tinted area. Within the outline, the only features usually shown are the main-line railroads and through-route roads. On 1:250,000 scale maps, the tint is usually shown in yellow; on small-scale maps, it is shown in red.

c. Use of Tinted Squares. In many areas, there is insufficient information available to plot the correct outlines of populated places. In such cases, tinted squares of varying sizes are used as symbols, with the size depending upon the population or importance. Explanation of these squares is contained in the marginal legend of the map.

d. Names of Populated Places. The names of populated places are shown in type of varying size, with the size depending upon population or importance. When information is available, the marginal legend shows the different sizes keyed to a population breakdown. When information is not available, the sizes are keyed to an important breakdown.

e. Symbols. The following pages contain the approved symbols for buildings and populated places on medium- and small-scale maps.

Figure 179. Populated Place, Limits Known. Size of type used for name indicates population or relative importance.

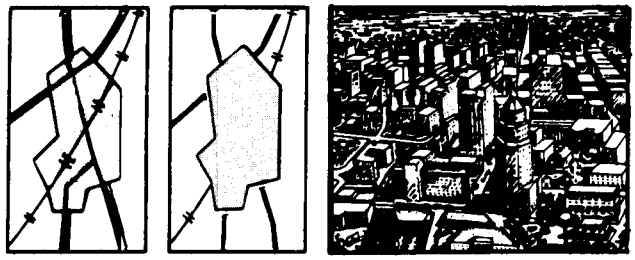


Figure 180. Populated Place, Limits Unknown, First Importance. Usually a large city or metropolitan area.

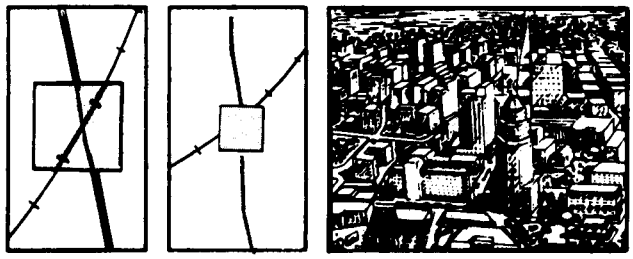


Figure 181. Populated Place, Limits Unknown, Second Importance. Usually a medium sized city.

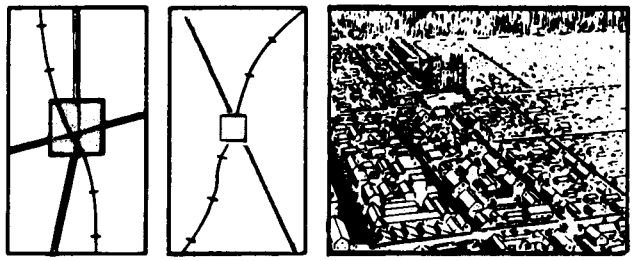


Figure 182. Populated Place, Limits Unknown, Third Importance. Usually a small city.

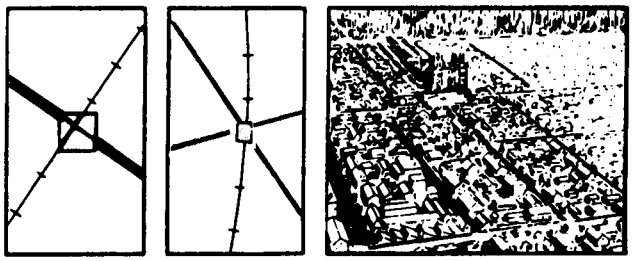


Figure 183. Populated Place, Limits Unknown, Fourth Importance. Usually a small city or large town.

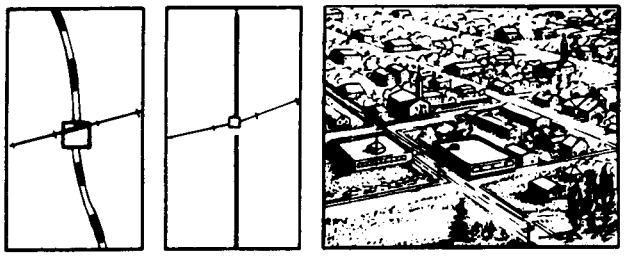


Figure 184. Populated Place, Limits Unknown, Fifth Importance. Usually a town of fair size.

Figure 185. Town, Village or Settlement.

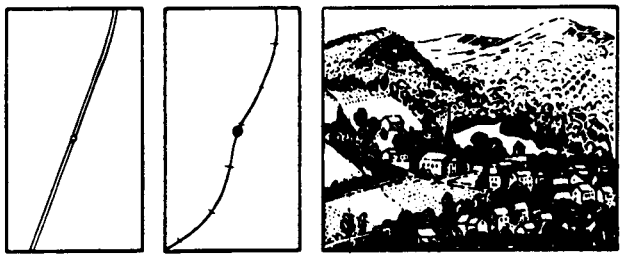


Figure 186. Landmark Building. Labeling indicates nature or identity of structure.

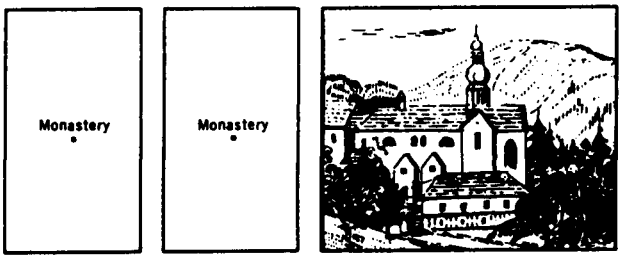
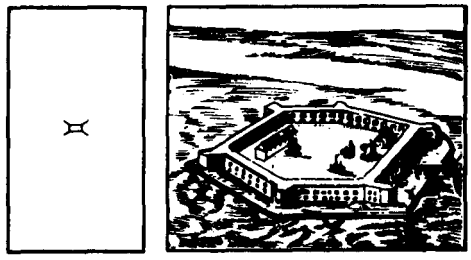


Figure 187. Fort.



21. Industrial and Public Works

The following symbols indicate the industrial and public works shown at the various scales.

Large Scale *Medium Scale* *Small Scale* *Illustration*

Figure 188. Small Dam. Includes those dams, either earthen or masonry, too narrow to plot to scale. On certain maps, the symbol in black indicates a masonry dam, and in brown, an earthen dam.

Figure 189. Dam Carrying Road.

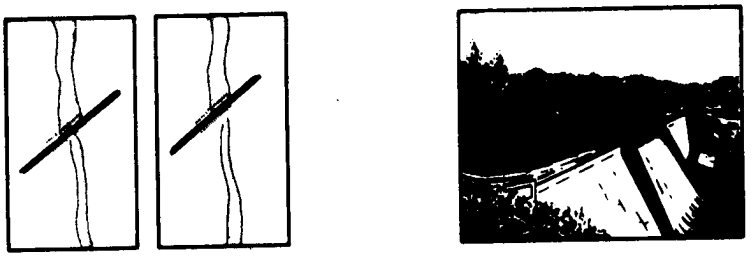


Figure 190. Large Masonry Dam. The correct shape of the feature is shown and spillways or other details are included wherever possible. Buildings located on the dam are shown in their correct position. Only the important dams are shown on small-scale maps.

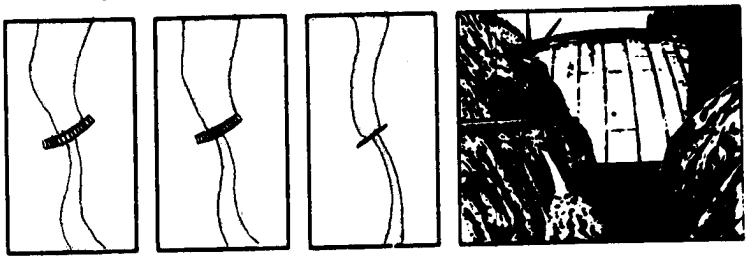


Figure 191. Passable Lock. The angle of the symbol always points upstream.

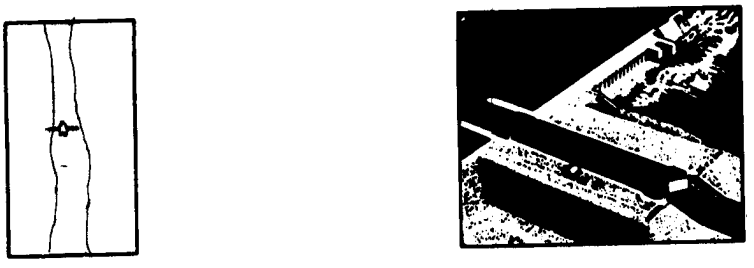


Figure 192. Sluice Gate or Small Canal Lock. The angle of the symbol always points upstream.

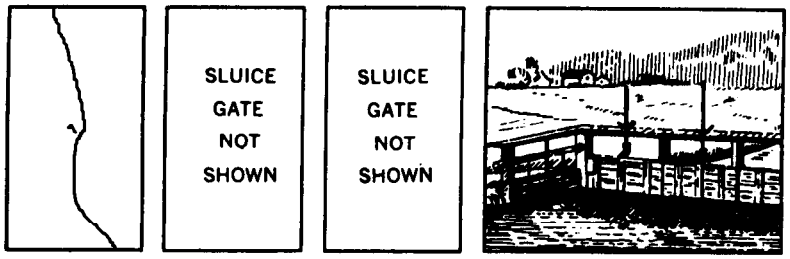


Figure 193. Small Breakwater, Jetty or Diversion Dam. Unimportant features are usually omitted.

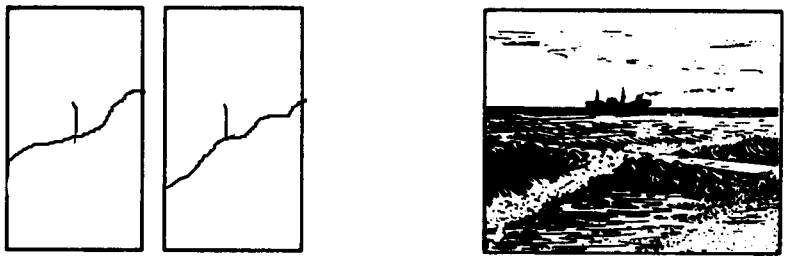


Figure 194. Large Breakwater.

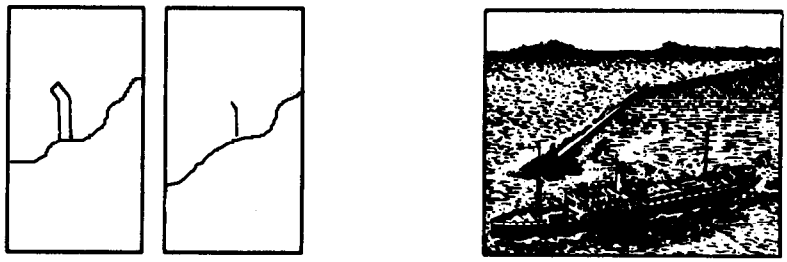
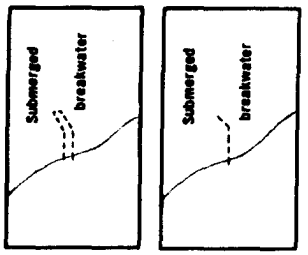


Figure 195. Submerged Breakwater. Breakwaters which are submerged at mean high tide even though exposed at low tide are included.



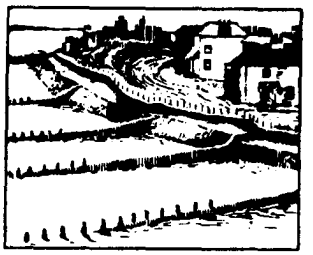


Figure 196. Narrow Seawall or Revetment.

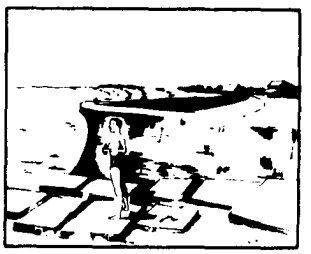


Figure 197. Large Seawall.

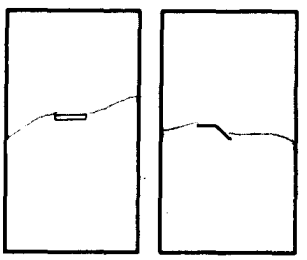


Figure 198. Large Revetment.

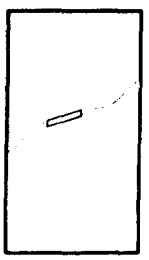
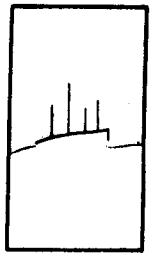


Figure 199. Small Pier, Dock or Wharf.



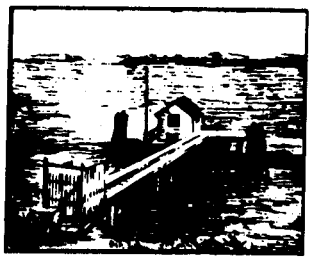
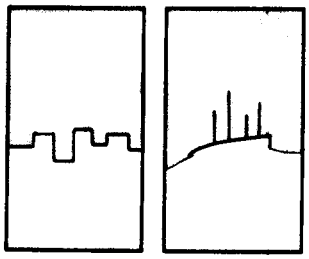


Figure 200. Large Pier, Dock or Wharf.



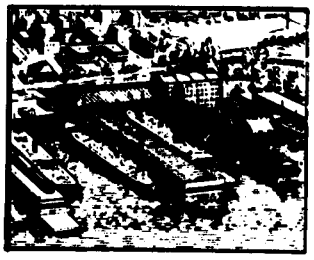
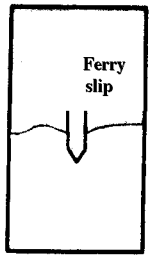


Figure 201. Ferry Slip.



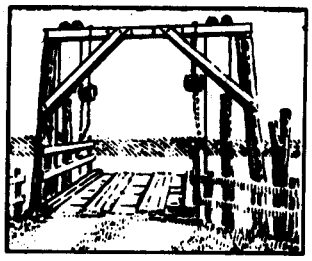


Figure 202. Ramp. The part submerged at mean high tide is shown by a dashed line.

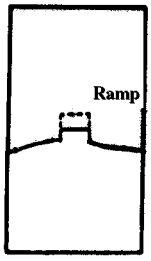
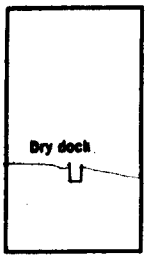


Figure 203. Drydock.



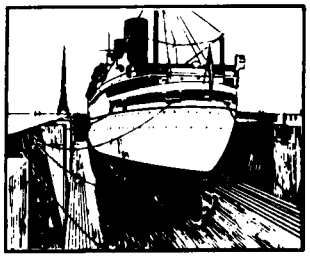
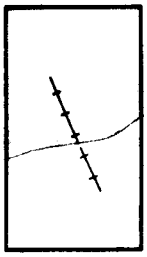


Figure 204. Marine Railroad.



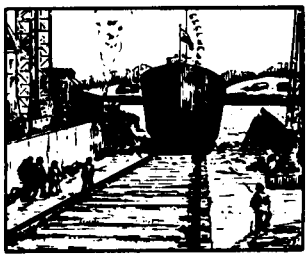
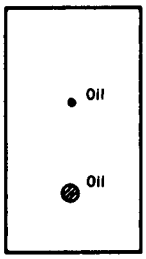
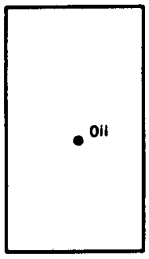
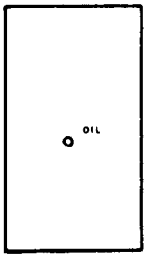


Figure 205. Tank. Tanks which are used for storage of oil, gas, water, vinegar, or other liquids. Labeling usually describes the contents. Large tanks are plotted to scale on large-scale maps.







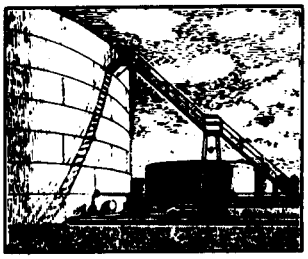
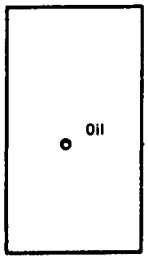
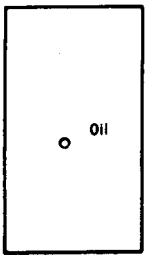
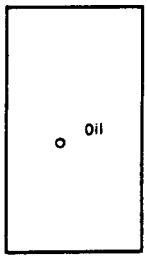


Figure 206. Well. This symbol includes wells drilled for gas, oil, or other minerals, which are in operation. Wells for water are not included. Labeling usually indicates the kind of well.







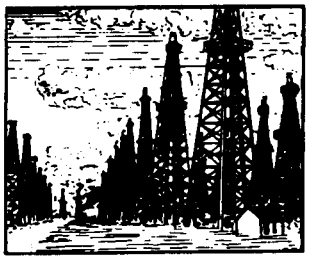
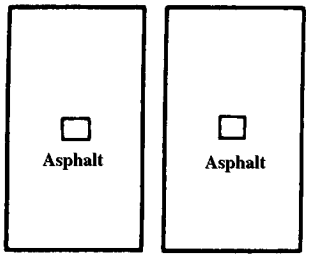


Figure 207. Reservoir, Other Than Water. Open reservoirs used for the storage of asphalt, oil, or other liquids except water are indicated if they can be plotted to scale. Those too small to show to scale are omitted. Labeling identifies the feature.



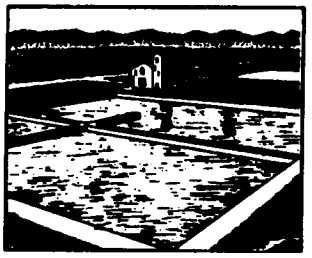


Figure 208. Sewage Disposal or Filtration Bed. These are shown only when they can be plotted to scale. Wherever possible, major separations within the feature are shown. Labeling identifies the feature.

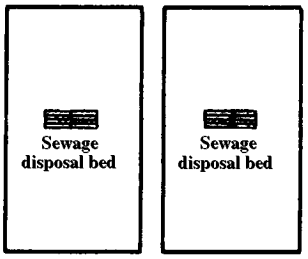
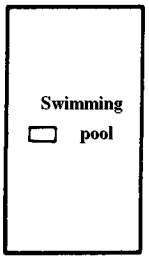


Figure 209. Swimming Pool.



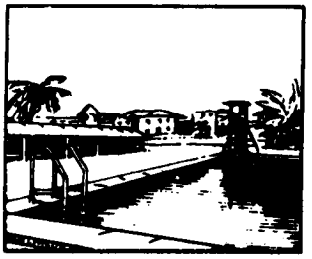


Figure 210. Pipeline. This includes only those pipelines not used for water which are landmark features in areas of sparse culture. They are omitted in developed areas. No effort is made to show pipelines as a continuous feature and only landmark parts are shown.

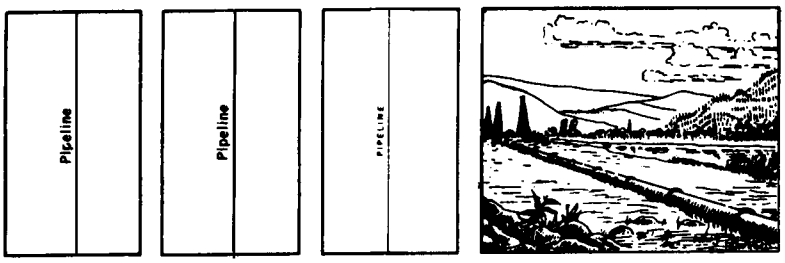


Figure 211. Underground Pipeline. The symbol represents underground pipelines which are obvious from cleared rights-of-way, ground scars, or levee-like mounds.

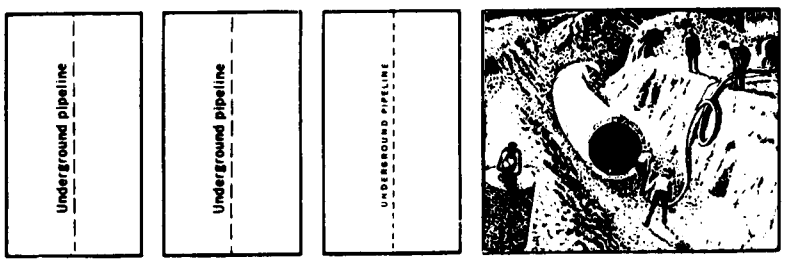


Figure 212. Landmark or Located Object. A feature is a landmark when it is visible from a distance. Landmarks include towers, chimneys, air beacons, monuments, and similar features. Labeling indicates the nature of the object.

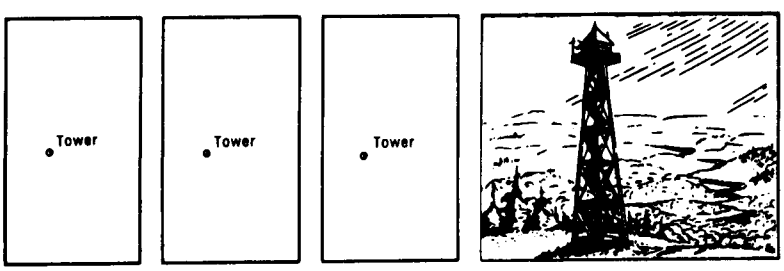


Figure 213. Open-Pit Mine or Quarry. This feature is usually omitted in areas of dense culture. In foreign areas all types of mines are shown by this symbol. Whenever possible, the appropriate labeling supplements the symbol indicating the material mined.

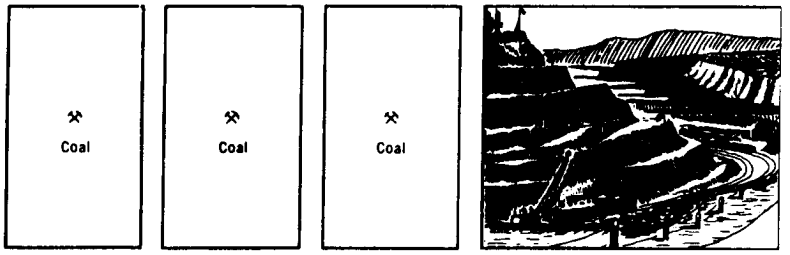


Figure 214. Mine Shaft. A mine shaft is vertical or nearly vertical in direction. (a) United States. (b) Foreign.

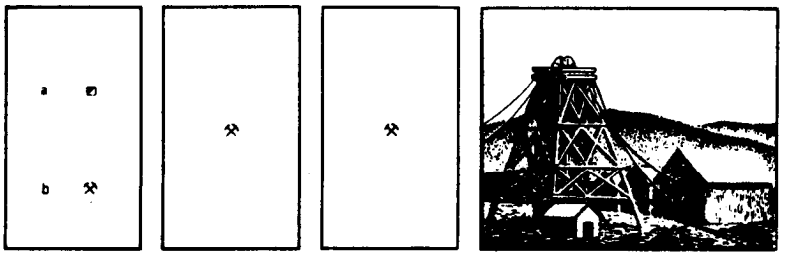


Figure 215. Mine Tunnel. A mine tunnel is horizontal or nearly horizontal in direction. (a) United States. (b) Foreign.

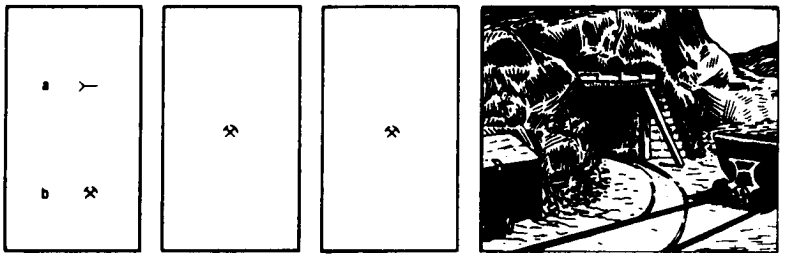


Figure 216. Prospect. Prospects are shown only on large-scale maps of the United States. A prospect is shown only where there is evidence of current or recent digging.

Figure 217. Telephone and Telegraph Lines. These are shown only when they are landmark features in areas of sparse cultural development. They are usually omitted along roads or railroads.

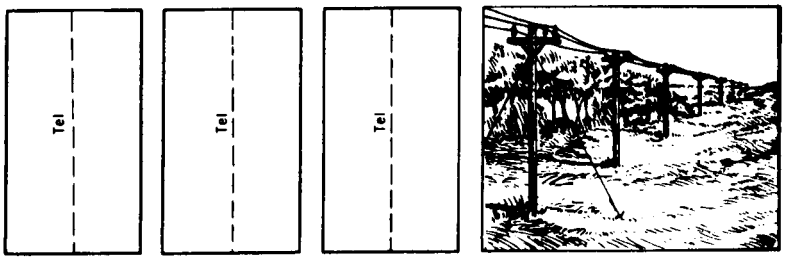


Figure 218. Power-Transmission Line. These are shown only when they are landmark features in areas of sparse cultural development. They are seldom shown along roads and railroads. Voltage is not indicated.

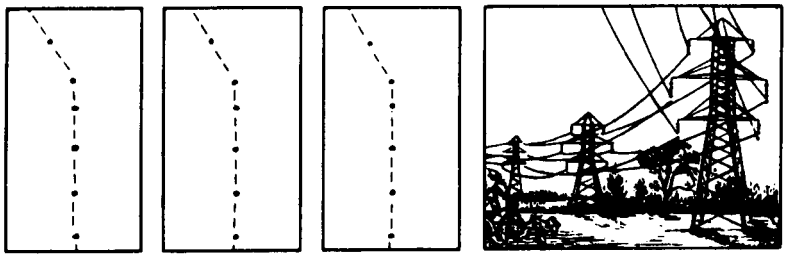


Figure 219. Fence, Hedgerow, Field Line. This symbol applies to maps of certain foreign areas only.

Figure 220. Prominent Fence. Only fences which provide definite landmarks in areas of sparse culture are shown.

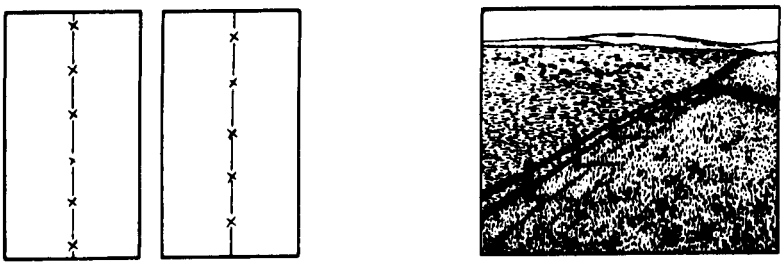


Figure 221. Prominent Wall. Such walls as the Great Wall of China and walls surrounding forts or cities, and the like are included. Minor walls are usually not shown.

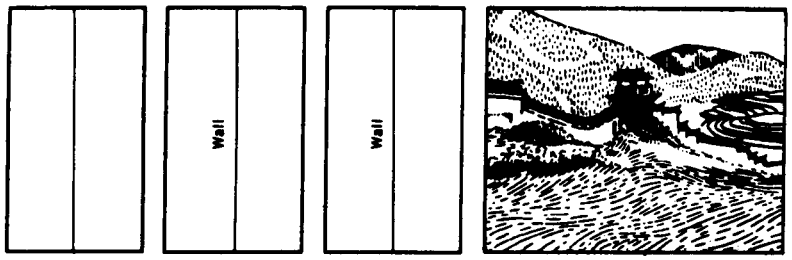


Figure 222. Race Track.

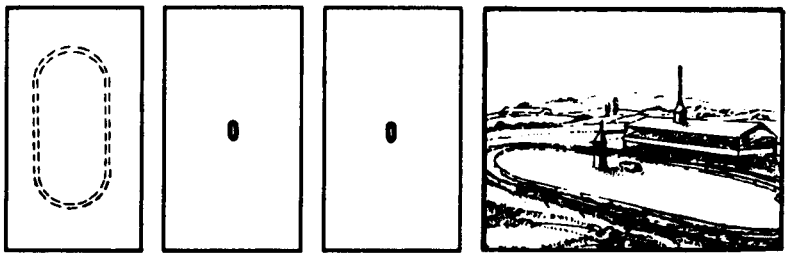


Figure 223. Airport or Airfield. Airports and airfields are shown to true shape on large-scale maps.

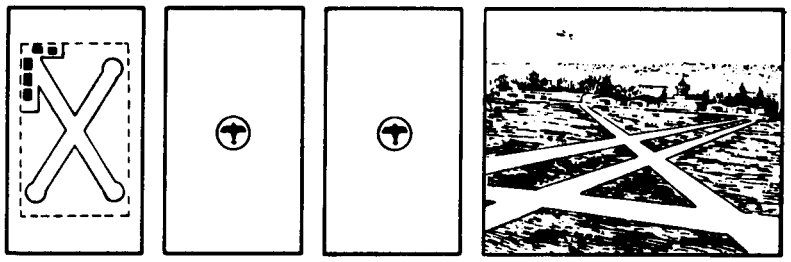


Figure 224. Landing Ground. Landing grounds are shown to true shape on large-scale maps.

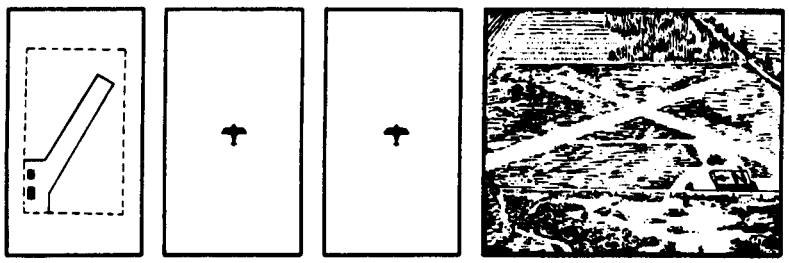


Figure 225. Seaplane Base. Seaplane bases are shown to true shape on large-scale maps.

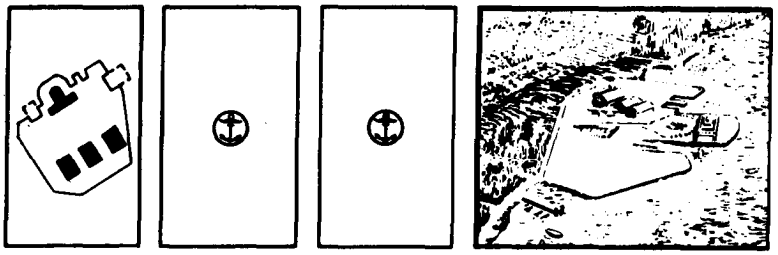
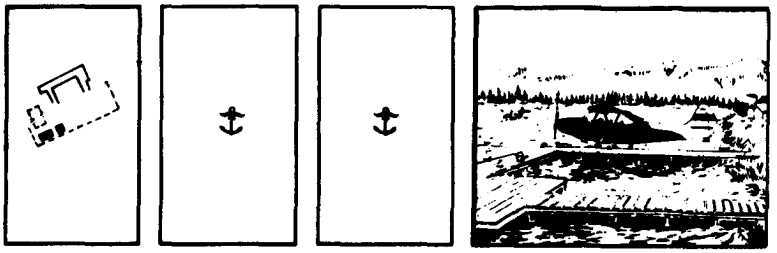


Figure 226. Seaplane Anchorage. Seaplane anchorages are shown to true shape on large-scale maps.



22. Control Points and Elevations

a. Application of Definitions. The definitions of horizontal and vertical control stations which follow are generally applicable only to the United States.

b. Exceptions. In foreign areas, horizontal control stations may not be monmented and in some cases, may be less than third order accuracy. Whenever information is available. exceptions are noted in the marginal legend of the map.

c. Symbols. The following pages contain the approved symbols for control points and elevations.

Figure 227. Horizontal Control Point. The symbol represents a described horizontal control point which is marked on the ground and which was established by triangulation or traverse of third or higher order accuracy.

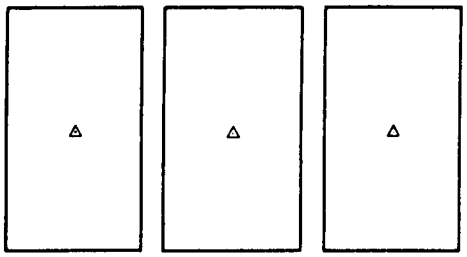


Figure 228. Monumented Bench Mark. The symbol represents a described vertical control point which is marked by a tablet on the ground and which was established by survey methods of third or higher order accuracy. On medium and small-scale maps Bench Marks are not specially symbolized. Their elevations are shown as spot elevations. (a) and (b) are alternate symbols.

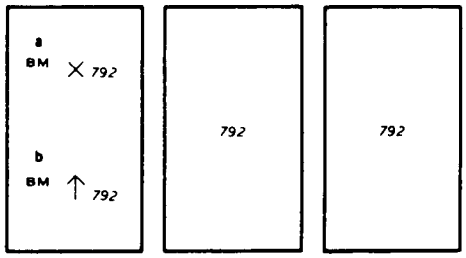


Figure 229. Monumented Bench Mark At Horizontal Control Point. The symbol represents a described control point which is marked on the ground and whose horizontal and vertical positions were established by survey methods of third or higher order accuracy.

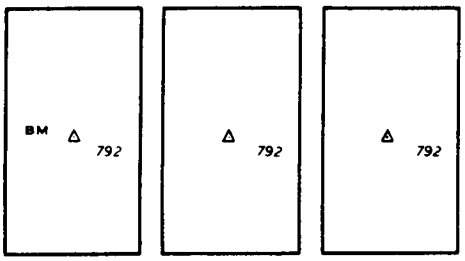


Figure 230. Non-monumented Bench Mark. (sometimes called temporary, supplementary, or intermediate). The symbol represents a described vertical control point which was established by survey methods of third or higher order accuracy. The point is usually recoverable. The mark does not bear a tablet.

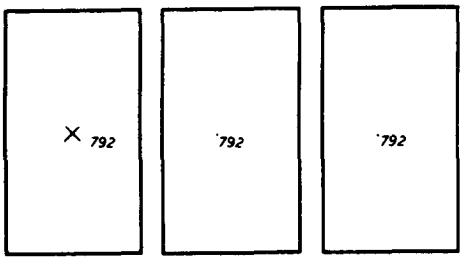


Figure 231. Astronomic Position. The symbol represents a described horizontal control point whose geographic position was determined through local astronomic observations.

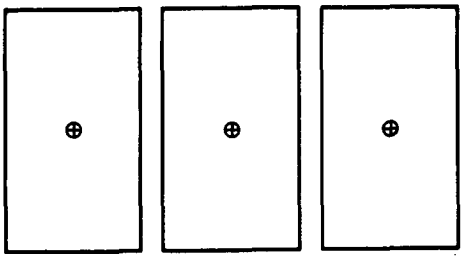


Figure 232. Checked Spot Elevation. The symbol represents an elevation established by closed lines, including spirit level, stadia, and vertical angle methods.
(a) Identifiable point. (b) Unidentifiable point. (c) Unidentifiable point, alternate symbol on large-scale maps.

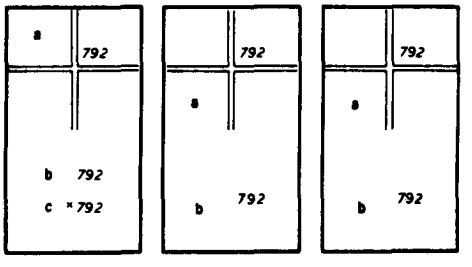
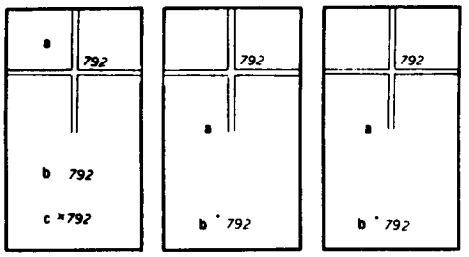


Figure 233. Unchecked Spot Elevation. The symbol represents an elevation determined by unchecked field surveys such as side shots on stadia lines, unchecked vertical angle or precision altimetry, or by repeated photogrammetric readings. An un-checked spot elevation is not as reliable as checked spot elevations. (a) Identifiable point. (b) Unidentifiable point. (c) Unidentifiable point, alternate symbol on large-scale maps.



23. Boundaries

a. Where two or more boundaries coincide, only the symbol representing the higher-ranking boundary is shown.

b. Boundaries which are approximate or indefinite are appropriately labeled.

c. In cases where a boundary follows a road, stream, or river, usually only every third unit of the symbol is shown. The intervening symbol units are omitted, except where the omission would create uncertainty as to the alinement of the boundary.

d. Terminology of boundaries in foreign areas varies; see the map legend for the correct terms.

e. The following pages contain the approved symbols for boundaries.

Figure 234. **International.**

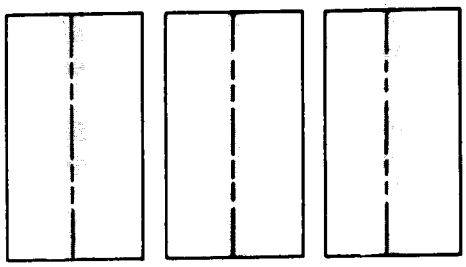


Figure 235. **Major Administrative.** (As Intercolonial in French West Africa.)

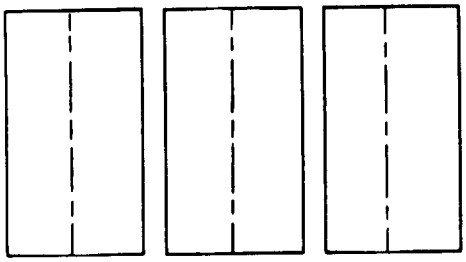


Figure 236. **First Class Administrative.** (As State in United States; Province or equivalent in foreign areas.)

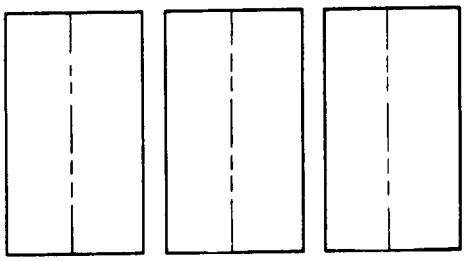


Figure 237. **Second Class Administrative.** (As County or Parish in the United States.)

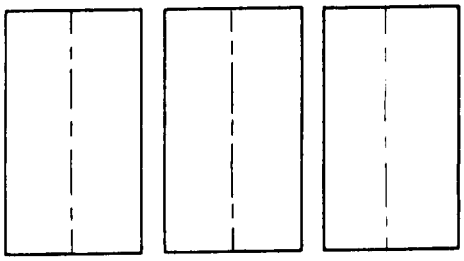


Figure 238. Third Class Administrative. (As Township in the United States.)

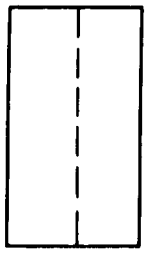


Figure 239. Fourth Class Administrative. (As Corporate Limits in the United States.)

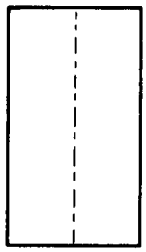


Figure 240. Fifth Class Administrative. (As Ward in the United States.) Shown only on verv-large-scale maps.

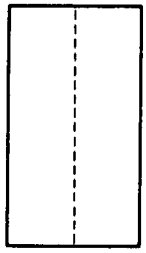


Figure 241. Special. (As Reservation in the United States). On large-scale maps of the United States, a red overprint is shown for Military Reservations.

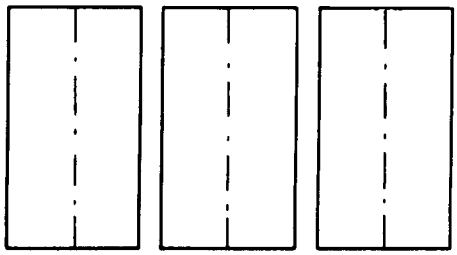
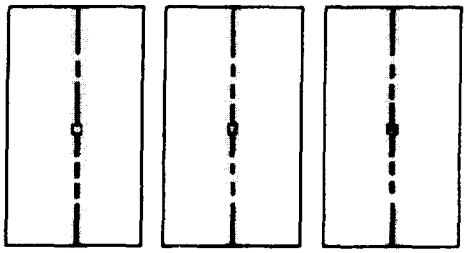


Figure 242. International Boundary Marker.



CHAPTER 3

TOPOGRAPHIC ABBREVIATIONS

24. List of Abbreviations

Appendix II contains the list of topographic abbreviations. with their meanings, authorized for use on the standard topographic maps discussed in this manual.

25. Application

a. Abbreviations on the face of the map are held to an absolute minimum. They are employed only where space prohibits the use of a full term or where use of the full term would require unreasonable repetition.

b. Periods are omitted from abbreviations on the face of the map. In the margin, periods normally are retained. They are, however, omitted from coded abbreviations of governmental agency names. In such cases, no spacing is shown between the coded letters.

c. In addition to the abbreviations listed herein, commonly accepted abbreviations of time, measures, and countries are authorized.

CHAPTER 4

MARGINAL INFORMATION

26. Scope

a. This chapter explains the map identifications and other marginal data appearing on topographic maps prepared for use by the Department of the Army.

b. These marginal items are illustrated in the charts which appear in appendix III. They are—

Chart 1 — large-scale and 1:100,000 scale maps.

Chart 2 — medium-scale (except 1 :100,-000) maps.

Chart 3 — 1:1,000,000 scale maps.

c. The arrangement of marginal items will vary. For example, on sheets having a narrow east-west neatline dimension, certain items will appear in the right-hand margin rather than in the lower margin. The composition is generally the same for maps of like scales.

d. Detailed information on marginal data will be found in AMS technical manuals and style sheets published under the direction of the Chief of Engineers.

27. Map Identifications

a. Purpose. Map identifications are those items appearing in the margins of maps which serve to identify any individual map completely. On maps prepared for the Department of the Army, these identifications are the series name and scale, the series number, the edition number, the sheet name, the sheet number, the unit imprint, and the geographic location name.

b. Series Name and Scale. A map series, which normally consists of a common scale of maps which collectively cover a specific area, is generally assigned the geographic or political name of the area covered. The map scale is written as a ratio of map distance to ground distance. *Example:* GERMANY 1:25,000.

c. Series Number. The series number is a comprehensive reference composed of four and sometimes five elements, usually four numerals or a letter and three numerals. The number is unique for the series. It identifies the area and scale of the series. *Example:* M841.

d. Edition Number. The edition number is a specific identification based on the publication sequence of a particular map. Edition numbers run consecutively; thus, it can be assumed that a map labeled with a higher edition number contains more recent information than another printing with a lower edition number. The edition number also identifies the agency which produced the map. *Example:* Edition 4-AMS.

e. Sheet Name. Generally, a map is named after its outstanding cultural or geographic feature. The name of a cultural feature is customarily chosen, but if a geographic feature is better known than any cultural feature appearing on the map, the geographic name is chosen. *Example:* FORT KNOX.

f. Sheet Number. Sheet numbers for large-scale maps are based on an arbitrary geographic coordinate system covering the area to be mapped. The sheet number of a 1:25,000 scale sheet is directly related to the number of a 1 :50,-000 scale sheet covering the same area, which in turn is directly related to the sheet number of a 1:100,000 scale sheet covering the same area. Sheet numbers for 1:250,000 and 1 :1,000,-000 scale maps are based on the International Map of the World (IMW) numbering system. Examples: 1:25,000 — 6123 III NW; 1:50,000 — 6123 III; 1:100,000 — 6123 ; 1:250,000 — NJ 16-4 ; 1:1,000,000 — NJ 16.

g. Unit Imprint. The unit imprint is the signature of the agency responsible for printing the map. This is followed by the date identify-

ing the particular printing. *Example:* Printed by Army Map Service, Corps of Engineers, 7-60.

h. Geographic Location Name. The geographic location name indicates the country, state, or general geographic area within which the map lies. The geographic location name includes the sheet name, which is repeated in the lower margin. Large-scale maps of the United States which cover an area entirely within one county or parish, carry the county or parish name below the sheet name and geographic location name. *Example:* FUJI — SAN, JAPAN.

i. Refer to Note. In the upper right corner of the map margin, the sheet number and series number are grouped under a note, REFER TO THIS MAP AS. This group provides the primary identification for ordering copies of a map.

Example: REFER TO THIS MAP AS:
SHEET NJ 16-4
SERIES V501

j. Identification Panels. For quick identification of maps when filed or stacked, identification panels in opposite corners of the map sheet, outside the printed limits of other marginal information, are provided. These panels contain the *series number, sheet number,* and *edition number.*

Example: SERIES 1301
SHEET NK52
EDITION 2-AMS

28. Other Marginal Data

In addition to the identifications described above, the margin of a map contains other information important to the user in evaluating and interpreting the map (table I).

a. Credit Note. The credit note aids in evaluating the map and contains interpretive information. The note describes the method of preparation, identifies the source material used in compilation, gives the dates of aerial photography, and lists the source of horizontal and vertical control. It notes whether the map conforms with national map accuracy requirements and whether the map has been field checked. It includes any special information pertinent to the particular sheet.

b. Symbol Legend. The symbol legend defines and illustrates the symbols most commonly used such as populated places, roads, and railroads. It also contains symbols for items peculiar to the area being mapped.

Table 1. Other Marginal Data

Marginal data	Large scale	Medium scale	Small scale
Bar scales and scale note	Yes	Yes	Yes.
Contour interval note, or altitude tint legend.	Yes	Yes	Yes.
Copyright note (on CE maps utilizing materials for which another agency has a copyright).	Yes	Yes	Yes.
Coverage diagram	Yes	No *	No.
Credit or sources note	Yes	Yes	Yes.
Glossary (in foreign areas where native language is other than English).	Yes	Yes	Yes.
Grid notes and information	Yes	Yes	Yes.
Horizontal datum-plane note	Yes	No *	No.
Hydrographic datum notes	Yes	No *	No.
Index to adjoining sheets, or location diagram.	Yes	Yes	Yes
Index to boundaries, or location diagram.	Yes	Yes	Yes.
Magnetic declination note	Yes	Yes	No.
Projection note	Yes	Yes	Yes.
Reliability diagram	No	Yes	Yes.
Security classification when required.	Yes	Yes	Yes.
Symbol legend	Yes	Yes	Yes.
Unit insignia	Yes	Yes	Yes.
Users' note (concerning corrections).	Yes	Yes	Yes.
Vertical datum note	Yes	No *	Yes.

NOTES:
(1) When required, special notes referring to items within the map are placed in the lower margin.
(2) *These data are shown on 1:100,000 scale maps for tactical use.

c. Index to Adjoining Sheets. The index to adjoining sheets, or on 1:250,000 scale maps the location diagram, identifies the surrounding sheets.

d. Index to Boundaries. The index to boundaries identifies the political areas appearing in the body of the map. The boundaries in the diagram are schematic but serve as aids in locating the boundaries on the map. On the 1:250,000 scale maps this information is shown in the location diagram.

e. Coverage Diagram. The coverage diagram, shown on large-scale maps, portrays in graphic form the methods of compilation, notes the dates of any photography used, and identifies and evaluates any maps used as bases.

f. Reliability Diagram. The reliability diagram, shown on medium- and small-scale maps, contains graphic references to the reliability of the sources used and identifies the scale, method of survey, and date of the basic sources.

g. Datum Notes. The horizontal, vertical, and hydrographic datum notes identify the controls used for these items on the map. Generally, horizontal and hydrographic datum notes are not shown on medium- and small-scale maps.

h. Grid Notes and Data. Maps of 1:1,000,000 and larger scale contain grid notes and a grid reference box with sample reference, to explain the grid data on the map. Maps carrying 1,000-unit-interval grid lines also show a declination diagram and a protractor scale in the margin. The declination diagram shows the relationship bet wee n true north, magnetic north, and grid north for the major grid at the center of the sheet. Maps carrying 10,000-unit-interval grid lines show a magnetic declination note. This note indicates the variation in the east and west map edges. It also shows the mean annual change.

APPENDIX I

REFERENCES

1. Army Regulations (AR)

AR 117-5	Military Mapping and Surveying.
AR 320-5	Dictionary of United States Army Terms.
AR 320-50	Authorized Abbreviations and Brevity Codes.

2. Department of the Army Pamphlets (DA Pam)

DA PAM 108-1	Index of Army Motion Pictures, Film Strips, Slides and Phono-Recordings.
DA PAM 310-1	Military Publications: Index of Administrative Publications.
DA PAM 310-3	Military Publications: Index of Training Publications.
DA PAM 310-4	Index of Technical Manuals, Technical Bulletins, Supply Bulletins, Lubrication Orders, and Modification Work Orders.
DA PAM 310-5	Military Publications: Index of Graphic Training Aids and Devices.
DA PAM 310-7	Military Publications: Index of Tables of Organization and Equipment, Type Tables of Distribution and Tables of Allowances.
DA PAM 310-25	Military Publications: Index of Supply Manuals, Corps of Engineers.

3. Field Manuals (FM)

FM 5-1	Engineer Troop Organizations and Operations.
FM 5-30	Engineer Intelligence.
FM 21-5	Military Training.
FM 21-6	Techniques of Military Instruction.
FM 21-26	Map Reading.
FM 21-30	Military Symbols.
FM 30-5	Combat Intelligence.
FM 30-10	Terrain Intelligence.
FM 101-10, Part 1	Staff Officer's Field Manual: Organization, Technical and Logistical Data.

4. Technical Manuais (TM)

TM 5-230	General Drafting.
TM 5-240	A Guide to the Compilation and Revision of Maps.
TM 5-244	Multiplex Mapping.
TM 5-245	Map Reproduction.
TM 5-248	Foreign Maps.
TM 5-9990	Kit Instruction Map Reading.
TM 30-246	Tactical Interpretation of Air Photos.

5. Tables of Organization and Equipment

TOE 5-55D	Engineer Topographic Battalion, Army.
TOE 5-56D	Headquarters and Headquarters Company, Engineer Topographic Battalion, Army.
TOE 5-57D	Engineer Map Reproduction and Distribution Company, Army.
TOE 5-59D	Engineer Photomapping Company, Army.
TOE 5-167C	Engineer Topographic Company, Corps.
TOE 5-344R	Engineer Base Map Depot Company.

TOE 5-446D	Headquarters and Headquarters Detachment, Engineer Base Topographic Battalion.
TOE 5-347D	Engineer Base Reproduction Company.
TOE 5-348D	Engineer Base Survey Company.
TOE 5-349D	Engineer Base Photomapping Company.
TOE 5-500C	Engineer Service Organization:
	1A Engineer Topographic Staff Team.
	lB Engineer Survey Team.
	lC Engineer Survey Platoon.
	lD Engineer Photomapping Platoon.
	1E Engineer Reproduction Platoon.
	lF Engineer Map Distribution Platoon.
	lG Engineer Relief Map Making Team.
	lH Engineer Relief Map Making Platoon.
	lN Engineer Hydrology Team.
	1P Engineer Geodetic Survey Team.

6. Graphic Training Aids

GTA 5-2	Elementary Map Reading.
GTA 5-12	Coordinate Scales and Protractor.

7. Motion Pictures, Film Strips, Slides, and Phono-Recordings

TF 5-1788	Topographic Symbols.
TF 5-1789	Elevation, Distance, and Grid.
TF 5-1791	Direction, Orientation, and Location With Compass.
TF 5-1790	Direction, Orientation, and Location Without Compass.
TF 5-1792	Photos and Photomaps.
TF 5-1270	British Conventional Signs and Symbols.
TF 5-2406	Azimuth.
TF 5-2409	Contour Lines and Intervals.
TF 5-2410	Direction.
TF 5-2411	Elevation.
TF 5-2412	Intersection.
TF 5-2413	Location.
TF 5-2415	Resection.
TF 5-2416	Scale and Distance.
TF 5-2417	Using the Protractor.
TF 5-2407	Azimuth Conversion.
TF 5-2414	Percent of Slope.
TF 5-2408	Characteristic of Contour Lines.
TF 55-2365	Sextant Adjustment.
TF 5-1546	Multiplex Mapping, Part II.
TF 5-1549	Multiplex Mapping, Part I.
MF 5-8275	Maps for the Army.

8. Army Map Service Technical Manuals

AMS TM 22	Map Identification and Other Marginal Information.
AMS TM 23A	Symbols for Large-Scale Maps, No Reduction.
AMS TM 33A	Symbols for Medium-Scale Maps, No Reduction.
AMS TM 43A	Symbols for Small-Scale Maps, No Reduction.

9. Supply Manuals (Sets of Equipment)

SM 5-4 Series

3610-S01	Reproduction Set, Ammonia Process: Reproduction of Line Tracings.
3610-S02	Reproduction Set, Black and White Process: Drawing Tracings.
3610-S07	Reproduction Set, Topographic, Photolithographic: Reproduction Company.
3610-S13	Reproduction Set, Silk Screen Process: Sign Reproduction.
6675-S02	Computing and Drafting Equipment Set: Field Survey Data.
6675-S03	Drafting Equipment Set, Battalion: For Charts, Sketches, and Overlays.
6675-S12	Drafting Equipment Set, Topographic Battalion, Headquarters and Service Company: For Operational Plans, Maps, Drawings, and Charts.

6675-S13	Drafting Equipment Set, Topographic Battalion, Photomapping Company: For Map Revision, Compilation and Color Separation.
6675-S15	Drafting and Duplication Equipment Set: For Small Sketches, Notes and Orders.
6675-S16	Drafting Instrument Set: Field.
6675-S17	Drafting Instrument Set: Office.
6675-S18	Drafting Instrument Set: Pocket.
6675-S19	Plotting Instrument Set, Stereoplotter Multiplex Control Booth.
6675-S20	Plotting Instrument Set, Stereoplotter, Multiplex Drafting Unit.
6675-S21	Plotting Instrument Set, Stereoplotter, Multiplex Laboratory.
6675-S22	Plotting Instrument Set, Stereoplotter, Multiplex Plotting Booth.
6675-S23	Plotting Instrument Repair Set, Stereoplotter, Projection: For Minor Mechanical Repairs.
6675-S24	Plotting Instrument Repair Set, Stereoplotter, Projection: Supplementary.
6675-S30	Sketching Set, Surveying: Military Field Sketching.
6675-S31	Stereometer Set, Stereocomparagraph, Photogrammetric.
6675-S48	Map Distribution Set: Portable.
6675-S49	Map Distribution Set: Depot.
7520-S01	Sign Painting Set.
7610-S07	Book Set: Topographic, General Purpose.
7610-S09	Book Set: Topographic Battalion, Photomapping Company.
7610-S10	Book Set: Topographic 'Battalion, Reproduction Company.

10. Department of Commerce Publications

a. U.S. Coast and Geodetic Survey Special Publications.

No.	
8	Tables and Formulas for the Computation of Geodetic Positions.
28	Application of the Theory of Least Squares to the Adjustment of Triangulations.
68	Elements of Map Projection.
193	Manual of Plane Coordinate Computation.
200	Formulas am-l Tables for the Computation of Geodetic Positions on the International Ellipsoid.
235	State Coordinate System (Manual for Surveyors).
241	Natural Tables for the Computation of Geodetic Positions.
242	Definitions of Terms Used in Geodetic and Other Surveys.

b. U.S. Coast and Geodetic Survey Serial.

580 Control Surveys and Their Uses.

11. Department of Interior Publications

U.S. Geological Survey Bulletin

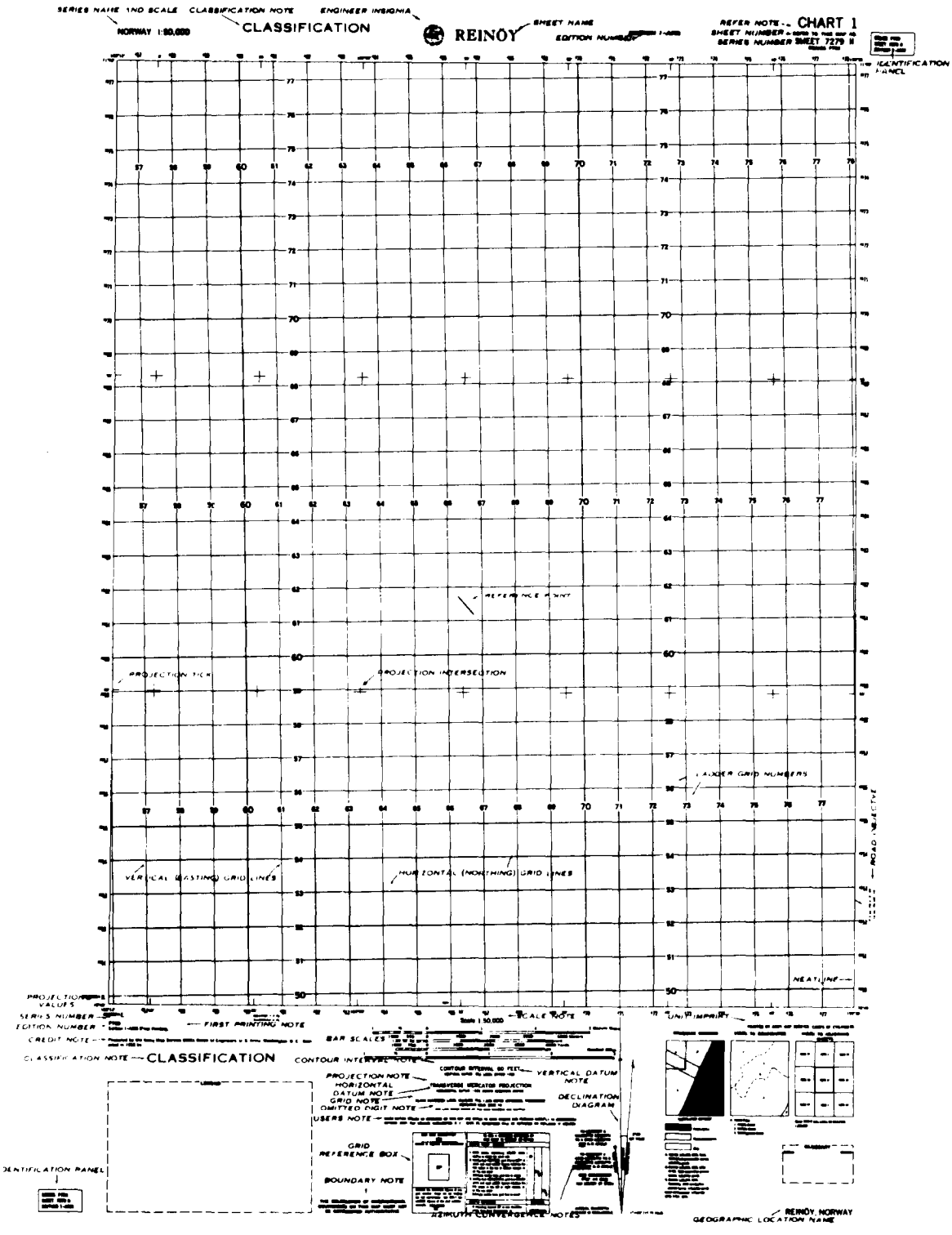
Topographic Instructions: Symbols for standard topographic maps published at the scale of 1:63,360 and larger, to be scribed at 1:24,000" and 1:48,000, dated May 1958.

APPENDIX II

TOPOGRAPHIC ABBREVIATIONS

A ..... Army
Aband ..... abandoned
AF ..... Air Force
AFB ..... Air Force Base
Ala ..... Alabama
Alin ..... alinement
Alt ..... alternate
AMS ..... Army Map Service
Anc ..... ancient
Anch ..... anchorage
Approx ..... approximate
Apr ..... April
Arch ..... archipelago
Ariz ..... Arizona
Ark ..... Arkansas
ASE ..... Army Survey Establishment (Canada)
Aug ..... August
Ave ..... Avenue
B ..... bay
Bdry ..... boundary
Bk ..... brook
Bldg ..... building
Blvd ..... boulevard
BM ..... benchmark
Br ..... branch
Brg ..... bridge
Byp ..... bypass
C ..... cape
Calif ..... California
Cath ..... cathedral
CE ..... Corps of Engineers
Cem ..... cemetery
CG ..... Coast Guard
CH ..... courthouse
Ch ..... church
Chan ..... channel
Chy ..... chimney
Co ..... country
Col ..... college
Colo ..... Colorado
Comm ..... Commission
Conn ..... Connecticut
Const ..... construction
CR ..... crossroads
Cr ..... creek
Cus Ho ..... custom house
DC ..... District of Columbia
Dec ..... December
Deg ..... degrees
Del ..... Delaware
Dept ..... department
Div ..... division
DSvy ..... Directorate of Military Surveys (Great Britian)
E ..... east
Elec ..... electric, electrified
Elev ..... elevated
Fd ..... ford
Feb ..... February
Fl ..... flood
Fla ..... Florida
Fld ..... field
Fm ..... fathom
For ..... forest
Ft ..... fort
Fy ..... ferry
G ..... gulf
Ga ..... Georgia
Gas ..... gasoline
GN ..... grid north
Govt ..... government
Grd ..... ground
GSGS ..... Geographic General Staff (Great Britain)
Hbr ..... harbor
Hosp ..... hospital
HS ..... high school
Hy ..... highway
I ..... island
Ill ..... Illinois
In ..... inlet
Ind ..... Indiana
Jan ..... January
Jul ..... July
Jun ..... June
Junc ..... junction
Kans ..... Kansas
Km ..... kilometer
Kn ..... knot
Ky ..... Kentucky
L ..... lake
La ..... Louisiana
Lat ..... latitude

Ldg ..... landing
LH ..... lighthouse
Long ..... longitude
M ..... meter (s)
Mag ..... magnetic
Mar ..... March
Mass ..... Massachusetts
Md ..... Maryland
Mi ..... mile (s)
Mich ..... Michigan
Mil ..... military
Min ..... minute (s)
Minn ..... Minnesota
Miss ..... Mississippi
Mo ..... Missouri
Mon ..... monument
Mont ..... Montana
Mt ..... mount, mountain
Mts ..... mountains
N ..... north
Natl ..... national
Nav ..... navigable
NC ..... North Carolina
N Dak ..... North Dakota
Nebr ..... Nebraska
Nev ..... Nevada
NH ..... New Hampshire
NJ ..... New Jersey
NMex ..... New Mexico
No ..... number
Nov ..... November
NY ..... New York
Obs ..... obstacle
Obstr ..... obstruction
Oct ..... October
Okla ..... Oklahoma
Oreg ..... Oregon
P ..... protractor point (pivot point)
Pa ..... Pennsylvania
Pen, Pena ..... peninsula
Pk ..... peak
Pky ..... parkway
PO ..... post office
Pt ..... point
PT ..... post and telegraph office
Quar ..... quarantine
Rd ..... road
Res ..... reservation
Res ..... reservoir
RI ..... Rhode Island
RR ..... railroad
RS ..... radio station
Ry ..... railway
S ..... south
SC ..... South Carolina
Sch ..... school
S Dak ..... South Dakota
sec ..... second (s)
Sept ..... September
St ..... Saint
St ..... street
Sta ..... station
Ste ..... Sainte
Str ..... stream
Subm ..... submerged
T ..... telegraph office
Tel ..... telephone or telegraph line
Temp ..... temporary
Tenn ..... Tennessee
Tex ..... Texas
Tnpk ..... turnpike
Tr ..... tower
Univ ..... university
US ..... United States
USC&GS ..... United States Coast and Geodetic Survey.
USDA ..... United State Department of Agriculture.
USFS ..... United States Forest Service
USGS ..... United States Geological Survey.
USNHO ..... United States Navy Hydrographic Office.
USLS ..... United States Lake Survey
Va ..... Virginia
VABM ..... vertical angle benchmark
Vil ..... village
Vt ..... Vermont
W ..... west
Wash ..... Washington
Wdm ..... windmill
Wis ..... Wisconsin
WM ..... water mill
WT ..... water tank, water tower
W Va ..... West Virginia
Wyo ..... Wyoming
Yd ..... yard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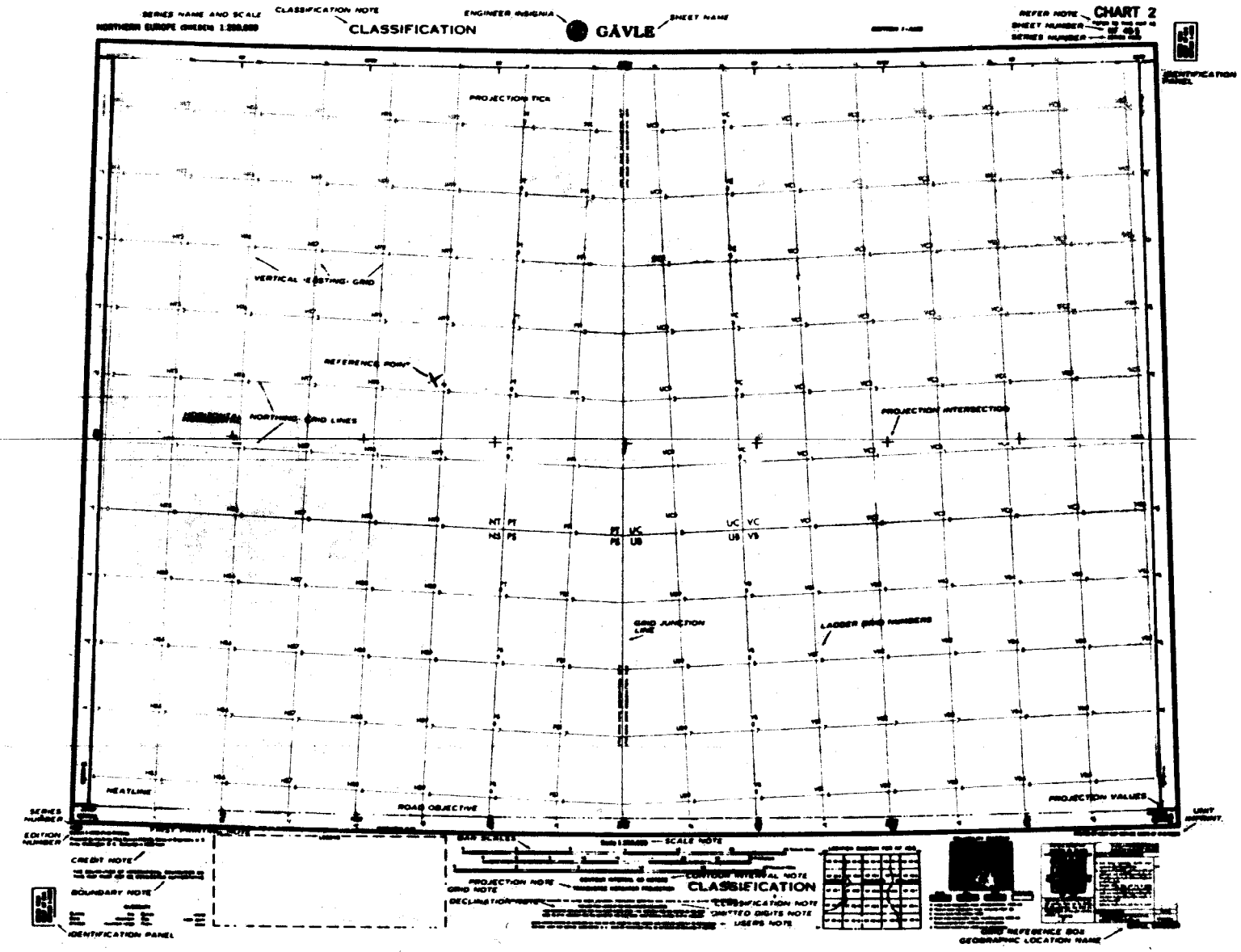
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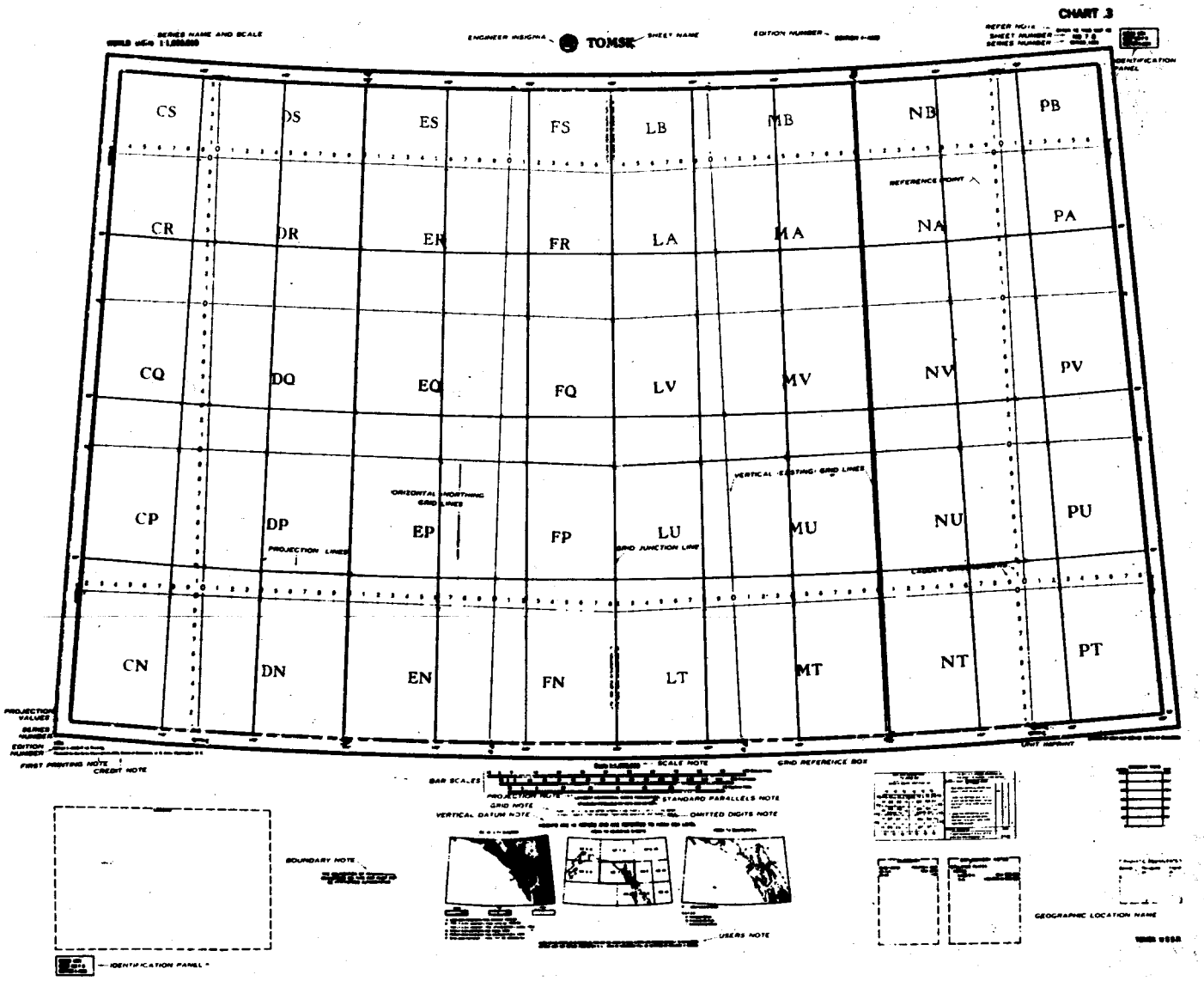
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