



NAUTICAL CHART MANUAL - VOLUME 1 - POLICIES AND PROCEDURES
Seventh (1992) Edition

CHAPTER 3 - TOPOGRAPHY

U.S. Department of Commerce
Office of Coast Survey



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
Office of Coast Survey
Silver Spring, Maryland 20910-3282

JULY 12, 2000

MEMORANDUM FOR: All Cartographers
Marine Chart Division

FROM: Fannie B. Powers
Chief, Quality Assurance, Plans and Standards Branch

SUBJECT: Chapter 3

Effective immediately, the attachment replaces Chapter 3 in the Nautical Chart Manual, Volume 1, Part 1, Seventh (1992) Edition in its entirety.

Chapter 3 is revised as follows:

1. Carto Orders and Memorandums are embedded in the text.
2. Outdated procedures are deleted.
3. Acronyms are revised.
4. Pages are renumbered.

References to Chapter 3 in places, such as the Table of Contents and the Index in the Nautical Chart Manual, will be updated.

Attachment

NAUTICAL CHART MANUAL

3 TOPOGRAPHY

3.1 General

On nautical charts, coastal configuration and prominent land features are charted to help the mariner determine the vessel's position at sea in relation to various fixed visible objects. The distance inland to which topographic features are charted will vary with chart scale, type of terrain, availability of source data, and adequacy of navigational aids. The significance of such features to the mariner must also take into account the requirements of both visual and radar navigation. Since navigators see the coast in profile, their interest in land detail is greatest at the shoreline and falls off rapidly inland.

On coasts poorly marked by navigational aids, detailed coastal topography is particularly important to the navigator. Nevertheless, the density of topographic detail should be kept to a minimum consistent with showing the significant identifiable features and the general relief of the skyline. Thus landmarks should stand out from less important detail.

Treatment of detail should vary with distance inland. Inconspicuous features such as marshes and minor lakes and streams usually are shown only when they are within a short distance of the coast, usually about a mile.

On steep coasts with deep water close inshore, sea traffic is likely to be concentrated off points of land. Therefore, the nature of each headland should be made clear, e.g. cliffs, sloping or low profile. Contours are of great value for depicting this relief.

Along a low-lying coast, even minor features along the shoreline could have landmark value because of the lack of prominent features. Therefore, sand dunes, mangroves, low bluffs, etc., should be shown on larger-scale charts. Physical features that could not be easily identified such as gravel, brush, trees, etc., are not shown by symbols but by name.

Topography includes not only coastline and natural land features, but cultural (i.e., man-made) features including [berthing structures](#) (piers), [erosion-control structures](#) (breakwaters), [ports and harbors](#), as well as [bridges](#) and [roads](#), [buildings](#) and other structures (such as [tanks](#) and [towers](#)) that may serve as landmarks to the mariner.

On large-scale charts, the detail in proximity to a harbor should be comprehensive. The dock areas, roads, and buildings along the coastline should be charted to give the mariner an indication of the port facilities available. Landmarks and distinctive features in the vicinity of the harbor should be shown, whereas surrounding built-up areas need only be depicted by urban tint, if they are shown at all. On small-scale charts, some generalization will be required in congested areas.

Symbols used on NOS charts are taken from [Chart No. 1](#), Nautical Chart Symbols Abbreviations and

Terms. References to symbols throughout this and following chapters (such as C d, D 5) refer to [Chart No. 1](#). However, not all symbols shown in Chart No. 1 are used on NOS charts.

3.2 Topographic Surveys

Topographic surveys locate and identify the natural features and culture of the land surface. NOS surveys are of areas adjoining charted waterways. Delineation of detail is depicted by means of conventional symbols. The topographic "survey sheet" is the primary authority for charting the shoreline, including the geographic place names and topographic features. Survey sheets may vary in both coverage and in content, with the area of coverage generally corresponding to the chart needs at the time the survey is requested.

Photogrammetric surveys provide topographic data through the use of aerial photographs that are enlarged and compiled in map form using stereoscopic or other rectification equipment. The extent of coverage may be as much as 5 miles inland. Planimetric surveys portray land features or detail in a horizontal plane only. They are distinguished from a topographic map by the omission of relief.

From 1835 to 1927, practically all NOS topographic and planimetric surveys were made by planetable, an instrument used by surveyors to plot surveys at the time the observations are made. The planetable consists of a tripod-mounted board to which the survey sheet is clamped. The board can be adjusted in the horizontal plane. An alidade is used to measure distances and directions. The distances are usually obtained by stadia observations on a graduated board or rod.

Since 1930, aerial photographs have been used almost exclusively to supply topographic and related data for nautical charting. Modern photogrammetric surveys are registered as topographic-photogrammetric maps (TP sheets). These TP sheets are the initial source for most of the land detail shown on nautical charts produced today. On TP sheets, landmark features and possible landmark features are shown with a circle 2.5 mm in diameter (see [B 32 in Chart No. 1](#).) When a delineated feature has not been evaluated by field methods or other documented sources for its value as a landmark, it is labeled with capital and lowercase letters. Features recommended as landmarks are labeled with all capital letters. (See [Section 6.1.1](#) for a further discussion of how landmarks are charted.)

On photogrammetric survey sheets produced prior to June 1977, the 2.5-mm circle was used to denote only features of known [landmark value](#) and a 1.25-mm circle was used to denote other features (those of unknown landmark value). The small circle should not be confused with the landmark symbol denoting "position approximate" (see [B 33 in Chart No. 1](#)) since the horizontal position of both size circles complies with the accepted national standards of map accuracy.

Thus the basic topographic information to be shown on [New Charts](#) and [Reconstructions](#) should be obtained from NOS surveys.



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
Office of Coast Survey
Silver Spring, Maryland 20910-3282

JANUARY 8, 2001

MEMORANDUM FOR: All Cartographers
Marine Chart Division

FROM: Fannie B. Powers
Chief, Quality Assurance, Plans and Standards Branch

SUBJECT: Chapter 3

Effective immediately, the attachment replaces the following Chapter 3 pages of the Nautical Chart Manual, Volume 1, Part 1, Seventh (1992) Edition:

1. Page 3-3 / Page 3-4
2. Page 3-5 / Page 3-6
3. Page 3-9 / Page 3-10
4. Page 3-35 / Page 3-36

In an effort to bring the analog edition of the Nautical Chart Manual into agreement with its digital counterpart, the attachment contains only minor grammatical changes to the information provided.

The digital version of the Nautical Chart Manual can be accessed on the Web using either of the two following addresses:

1. <http://ocsnet.ncd.noaa.gov/mcd/chartman/index.htm>
or
2. <http://ocsnet.ncd.noaa.gov/mcd.htm>

Attachment

Topographic-photogrammetric maps provided to NDB prior to 1980 fall into five classes. The treatment of each is discussed below.

1. Class I and II topographic maps are the final basic registered maps which have been field inspected, edited, and the Descriptive Report signed by the Chief, Photogrammetry Branch. They should be fully applied to [New](#) and [Reconstructed](#) Charts, as well as to chart maintenance drawings as time permits.
2. Class III topographic maps are the final basic registered maps which have not been fully field inspected, edited, or signed. These maps should be partly applied to New and Reconstructed Charts until they have been field investigated, edited, and signed.
3. Class IV and V topographic maps are the final basic registered maps that are complete except for revisions made during review. These maps should be partially applied to maintenance chart drawings and may be used on New and Reconstructed Charts only as a last resort.

Since 1980, most topographic maps furnished to NDB have been Class III maps. Before these maps are registered, the Quality Control Unit of the Remote Sensing Division circles and annotates questionable items for field investigation. A duplicate copy of this annotated map is furnished to NDB as a Blueprint and is applied by the compiler as follows:

1. The compiler examines the Blueprint for critical items, omitting the encircled areas which are subject to field investigation. The Blueprint is marked "fully applied" after application, if appropriate.
2. The map (TP sheet) number and the Blueprint number should be referred to on the Chart History -- e.g., "Bp 111300 (TP 0101)" -- and marked "fully applied," if appropriate. The map (TP sheet) and its Descriptive Report are not acquired from the vault at this time for examination and application.
3. When the map (TP sheet) has been fully field examined, edited, and signed, the final basic registered map and Descriptive Report are acquired from the vault and fully applied as a Class I map.

3.2.1 New Aeronautical and Nautical Charting Investigations (NANCI)

NANCI's are no longer used.

New Aeronautical and Nautical Charting Investigations (NANCI) supplemented air photo maintenance for NOS nautical charts. NANCI source was compiled by the RSD.

Section 3.2.1

NAUTICAL CHART MANUAL

NANCI source was derived from a cooperative procedure utilizing advanced technology methods obtained through the Eastern Mapping Center of the USGS. NANCI source consisted of a graphic compilation on stable base plastic. Text, arrows and leaders were compiled in blue pencil and used by the CRU as supporting documentation. Deletions were marked in green pencil. Features which could not be located were also identified in green pencil. The acronym "NANCI" was shown on all copy.

NDB assigned blueprint or chart letter status for registration of NANCI as source documents. These blueprint/chart letter numbers were used to reference NANCI source on the History of Cartographic Work.

NANCI source identified revised shorelines, landmarks, revised topographical features such as piers, breakwaters, jetties, bulkheads, and roads. Because of the accuracy of NANCI data, NANCI revisions were applied freely by the cartographer to the chart drawing.

The shoreline on NANCI source, represented by an unbroken solid red line, was usually positioned by evaluating NANCI imagery at below predicted high tide stages. If tidal information was pertinent to the application of NANCI source (i.e., the shoreline revisions were based at high tide stages), an applicable note was added to the source. Approximate shoreline on NANCI source, represented by a broken red line, could also be directly transferred to the chart drawing.

In addition to revisions customarily applied from NANCI source, an approximate sounding datum line was often applied on the NANCI manuscript exclusively with a purple continuous line.

The approximate sounding datum line was sufficient for use as an extended green tint limit to show new green tint seaward of the shoreline. NANCI source was not used to retract the low water tint landward from a chart sounding datum line.

The outermost limit of the approximate sounding datum line was used if it was seaward of the charted sounding datum line and from a later source than the charted line. In this instance the inner limit line was removed unless there was clear evidence of deeper water from later date sources. These later date sources were not only NOS field surveys but were also traditionally from external sources such as authoritative surveys, inspection reports, and other credible reports of deeper water.

3.3 The Coastline

NOS generally considers the terms "coastline" and "shoreline" to be synonymous. Coastline symbols are shown in [section C of Chart No. 1](#). This section discusses the charting of various types of shoreline and foreshore features (see [Figure 3-1](#)).

REVISED NOVEMBER 8, 2000

**NATIONAL OCEAN SERVICE
Office of Coast Survey
Marine Chart Division**

CARTOGRAPHIC ORDER 012/04

July 29, 2004

FILE WITH NAUTICAL CHART MANUAL, VOLUME 1, PART 1, SECTION 3.3.1

TO: All Cartographers
Marine Chart Division

SUBJECT: Shoreline

APPLICATION: All Nautical Charts

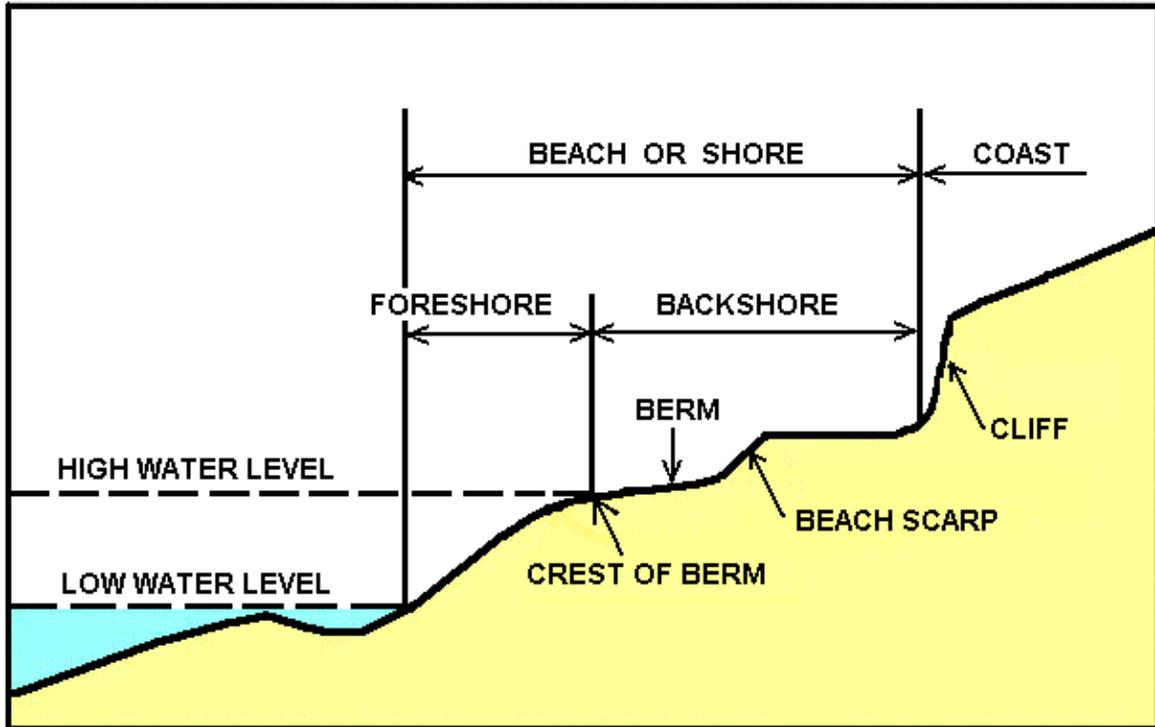
Effective immediately, the attachment replaces Pages 3-5 and 3-6 in the Nautical Chart Manual, Volume 1, Part 1, Seventh (1992) Edition.

This directive incorporates the following changes to the manual:

- Details the circumstances under which shoreline may be applied to nautical charts from United States Geological Survey quadrangles.
- Specifies the symbolization to be used when applying shoreline to nautical charts from United States Geological Survey quadrangles.
- Specifies the symbolization of shoreline applied to nautical charts from smaller scale charts or smaller scale source material.
- Requires cartographers to request contemporary imagery, based on the shoreline plane of reference of the chart, when using quadrangles or smaller scale source for shoreline.
- Reorganizes the descriptions of “Types of Natural Shoreline” and “Specific Shoreline Features Landward of the High Water Line”.

Attachment

James C. Gardner
Chief, Marine Chart Division



Shoreline and Foreshore Features
Figure 3-1

3.3.1 Shoreline Plane of Reference

The shoreline represents the line of contact between the land and a selected water elevation. This dividing line between land and water features is also referred to as the "Shoreline Plane of Reference" (SPOR). In areas affected by tidal fluctuation, this line of contact is usually the mean high water line. In confined coastal waters of diminished tidal influence, a [mean water level](#) line may be used. The shoreline of interior waters (rivers, lakes) is usually a line representing a specific elevation above a selected [datum](#). Whenever possible, the shoreline shall be delineated from NOS surveys.

Section 3.3.1

NAUTICAL CHART MANUAL

Shoreline from United States Geological Survey (USGS) Quadrangles

Shoreline shown on most USGS quadrangles is referenced to [mean sea level](#) and shall not be used in compiling or revising nautical charts, **except** as noted in the following paragraphs. In relatively flat coastal areas there could be a significant difference between shoreline based on mean sea level and [mean high water](#). However, the shoreline shown on the quadrangle may be used for charting when the quadrangle has been revised from NOS imagery. [Man-made features](#) along the coast, such as [piers](#), bulkheads, etc., may be transferred from the quadrangle since normal fluctuations in water level would not result in a chartable difference in those features. See Sections [3.5](#) and [3.6](#).

In **non-tidal areas**, USGS quadrangles may selectively be used in compiling or revising the shoreline **when** adequate surveys, based on the chart's [shoreline plane of reference](#), are not available. In non-tidal areas, there is very little difference between the shoreline plane of reference shown on the quadrangle and the shoreline plane of reference shown on the nautical chart. Types of natural shoreline, in non-tidal areas, applied from USGS quadrangles shall follow the symbolization specifications found in [Section 3.3.1.1](#). Approval from the Chief, Marine Chart Division, **must** be obtained prior to compiling or revising natural (non-manmade) shoreline from quadrangles.

In rare circumstances, shoreline in **coastal and other tidal areas** may have to be compiled or revised from USGS quadrangles when adequate shoreline based on the chart's shoreline plane of reference is not available. Approval from the Chief, Marine Chart Division, must be obtained prior to compiling or revising natural (non-manmade) shoreline from quadrangles.

Natural shoreline in coastal and other tidal areas, applied from source material that is based on a different shoreline plane of reference than the chart (such as a USGS quadrangle), shall be shown as approximate shoreline ([C 2](#); see [Section 3.3.1.1](#)).

A request for contemporary shoreline data, using the shoreline plane of reference of the chart, must be forwarded to the [Remote Sensing Division](#), through the Nautical Data Branch, whenever USGS quadrangles are used for compiling or revising shoreline.

REVISED JULY 29, 2004

Shoreline from Smaller Scale Charts or Smaller Scale Source Material

[Surveyed](#) or [unsurveyed](#) shoreline, applied to a nautical chart from smaller scale source material or a smaller scale chart, shall be charted as [approximate shoreline](#) (C 2; see [Section 3.3.1.1](#)). Apparent shoreline applied to a nautical chart from smaller scale source or a smaller scale chart, shall still be shown as apparent shoreline (C 32, C 33; see [Section 3.3.1.1](#)).

A request for contemporary shoreline data, using the [shoreline plane of reference](#) of the chart, must be forwarded to the [Remote Sensing Division](#), through the Nautical Data Branch, whenever smaller scale source material or smaller scale charts are used for compiling or revising shoreline.

3.3.1.1 Types of Natural Shoreline

Surveyed Coastline (C 1)

Surveyed natural coastline is symbolized by a solid black line (0.25 mm) delimiting the gold tint. The exceptions to this linewidth are for [apparent shoreline](#) (see below) and minimum sized islets (see [Section 4.9](#)). Apparent shoreline and minimum sized islets are delineated with a 0.15 mm solid black line.

Approximate Shoreline (C 2)

Approximate shoreline shall be shown on larger scale charts by a dashed black line (0.25 mm) delimiting the gold tint. This is used to show that the coast has been inadequately surveyed.

Unsurveyed Shoreline (C 2)

Unsurveyed shoreline shall be charted the same as approximate shoreline.

(The remainder of this page is intentionally blank.)

Apparent Shoreline ([C 32](#), [C 33](#))

Apparent shoreline is used on charts to show the outer edge of [marine vegetation](#) where the limit would reasonably appear as the shoreline to the mariner, or where it prevents the shoreline from being clearly defined. Apparent shoreline is symbolized by a light solid black line (0.15 mm). See also, [Section 3.4.7, “Marshes and Swamps.”](#)

3.3.1.2 Specific Shoreline Features Landward of the High Water Line

Specific features landward of the shoreline (generally the [mean high water line](#)) are shown as follows:

Flat Coast ([C 5](#))

Flat coast is depicted as any other coastline, but often will include a descriptive label -- e.g., "Sandy", "Stony", or "Dunes" -- when required by the chart specifications or when it is considered useful to inform the mariner of the character of a coast that is very flat and without distinguishing features.

Steep Coast-Bluff; Cliff ([C 3](#))

A coast backed by a very sharp, conspicuous rise is considered to be a bluff (if it is not rocky) or a cliff (if it is rocky). Such a coast is useful for visual and radar identification. Cliffs and bluffs are an exceptionally useful locating reference where they alternate with low-lying coast along the shoreline. Where cliffs or bluffs are prominent features, they should be shown on all scales of charts provided there is charted hydrography within their range of visibility. The top height of a cliff may be used by mariners for determining a vessel's distance offshore and should be shown as an elevation when it is prominent and conspicuous (see [C 11](#)).

3.3.2 Foreshore

The intersection of the low water tidal plane with the shore is commonly called the “chart sounding

**NATIONAL OCEAN SERVICE
Office of Coast Survey
Marine Chart Division**

CARTOGRAPHIC ORDER 006/03

APRIL 11, 2003

FILE WITH NAUTICAL CHART MANUAL, VOLUME 1, PART 1, SECTION 3.3.2

TO: All Cartographers
Marine Chart Division

SUBJECT: Correction to Specifications for Breakers

APPLICATION: All Affected Nautical Charts

Effective immediately, the attachment replaces page 3-7 through 3-8 in the Nautical Chart Manual, Volume 1, Part 1, Seventh (1992) Edition.

The attachment makes the following changes:

To the subheading Breakers, the Chart 1 reference K-17 has been added. The Chart 1 reference in the text has been revised from P 9 to C d K 17, and line weight and type style specifications have been added.

In addition, a number of minor changes have been made throughout. Most of these took the form of minor rewording, either for the sake of clarity, or to account for new procedures (e.g., mentioning Gcs in the sounding datum section).

Attachment

Nicholas E. Perugini
Captain, NOAA
Chief, Marine Chart Division

datum line," and is based on tidal definition. It follows the plane of reference used on the hydrographic surveys on which the chart is based. For more information on tidal datums, see Section [2.8.2, Vertical Datums](#).

The part of the shore lying between the crest of the seaward berm (the upper limit of wave wash at high tide, and thus an area that extends farther inshore than the shore) and the ordinary low water mark, and which is ordinarily traversed by the uprush and back rush of the waves as the tide rises and falls, is called the [foreshore](#). Note that the upper limit of the wave wash at high tide and the [MHWL](#) may not be the same and may differ significantly on low lying coasts.

Foreshore areas (the area between the [Shoreline Plane of Reference](#) and either the chart sounding datum line or the approximate sounding datum line) shall be tinted green. The character of the area, when known, shall be labeled as the chart scale permits (see [C c in Chart No. 1](#)). Descriptive labels would include "[Mud](#)", "[Sand](#)", "[Stone](#)", "[Gravel](#)", et cetera, and are discussed below. These labels may assist the mariner in deciding where a safe landing can be made in an emergency and in determining the vessel's location.

Chart Sounding Datum Line ([C a](#))

The chart sounding datum line in tidal areas shall be represented by a single row of dots (called the low water line). The low water line shall be charted only from NOS surveys (hydrographic or topographic), and [USACE](#) sources.

The charted low water line shall reflect the delineation shown on the most contemporary NOS topographic survey, including [Class I](#), [Class II](#), Provisional Surveys, Digital Manuscripts (DM), or Geographic Cells (GC), unless other contemporary supporting hydrographic data is available.

Approximate Sounding Datum Line ([C b](#))

Where a source of a lower order than a field survey is used to determine the sounding datum line, the resulting line where the tint changes from green to blue is considered to be an approximate sounding datum line. The area which uncovers (the green tint) shall not be delimited by a black low water line, either dashed or dotted. Such an approximation may result from an indistinct aerial photographic image or an on site visual observation.

Mud

Sand

Stone or Gravel

Sand and Mud

Sand and Gravel

An appropriate label describing the foreshore ("[Mud](#)", "[Sand](#)", etc.) may be added along the inshore

Section 3.3.2

NAUTICAL CHART MANUAL

side of the low water line, and the enclosed area shall be shown with green tint. The offshore limit is symbolized by a low water line ([C c](#), [J 20](#)) or an approximate sounding datum line ([C b](#)).

Grass

Areas seaward of the high water line which are identified only as grass on the source shall be charted using a dashed line to show the limit of the grassy area, and the label "*Grass*" as discussed in [Section 4.14.2, "Miscellaneous Marine Areas."](#)

Breakers ([C d](#), [K 17](#))

Breakers along a coast should be labeled where they appear consistently in a location in which no shoals or reefs are charted. Wherever they are charted, they should be labeled "*Breakers*" in 6 pt. Swiss Light Italic. Limits of large areas of breakers shall be shown with a black dashed line (.008/.080/.030", [C d](#), [K 17](#)). See [Section 4.14.2, "Miscellaneous Marine Areas."](#)

Rock ([J 21](#)); Coral ([J 22](#))

Rock or coral that uncovers at sounding datum is charted using the label "*Rock*" or "*Coral*" in the intertidal area. The offshore limit of the uncovering (green-tinted) area is symbolized by the ledge symbol.

For charting of rocks and coral, see also [Section 4.8, "Ledges and Reefs"](#), and [Section 4.9 "Rocks."](#)

Rubble ([C e](#))

[Foreshore](#) covered with rubble shall be labeled "*Rock*".

3.4 **The Land**

Land features such as elevations, coastal vegetation, and certain inland waters are charted when they will be of aid to mariners. Land symbols are shown in [Section C of Chart No. 1](#). Elevations are shown by land contours and hachures. Form lines ([C 13](#)) and shading ([C g](#)), once used on NOS charts, could still appear on some charts that have not seen recent printings. These shall be replaced with modern symbols when a new edition is printed.

3.4.1 **Land Contours**

Land contours are one way of showing land elevations and relief on nautical charts. On charts where a need for visual or radar requirements exist, land contour lines should be shown. Contour lines specify a vertical distance above a datum plane, usually mean sea level. The vertical distance between contour lines is the contour interval

REVISED APRIL 9, 2003



UNITED STATES DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

NATIONAL OCEAN SERVICE

Office of Coast Survey

Silver Spring, Maryland 20910-3282

SEPTEMBER 11, 2003

MEMORANDUM FOR: All Cartographers
Marine Chart Division

FROM: Fannie B. Powers
Chief, Quality Assurance, Plans and Standards Branch

SUBJECT: Land Contour Type Style Corrections, Line Weight Clarifications

Effective immediately, the attachment replaces pages 3-9 and 3-10 of the Nautical Chart Manual, Volume 1, Part 1, Seventh (1992) Edition.

These revised pages make the following changes to specifications found on pages 3-9 and 3-10:

- contour line type specifications have been revised to match the example found in Volume 2 of the Nautical Chart Manual,
- treetop elevation type specifications have been clarified, and an example provided,
- all line weight references have been revised to show both English and metric units.

The source for land contours and spot elevations ([C 11](#)) will usually be USGS quadrangles. When contour and spot elevations are charted, a note labeled "HEIGHTS" shall be included specifying what plane of reference (usually [mean sea level](#)) the elevations are based on. See the sample "[Heights](#)" note in [Section 2.8.2](#).

Contour Lines ([C 10](#))

Contours on nautical charts shall be charted as follows:

In general, contour lines are to be shown only where they are considered useful for radar navigation or for identifying land features and profiles from seaward. Landforms on the back side of features which are out of view of the mariner or radar add little or nothing to the usefulness of the chart.

Contour intervals are selected considering clarity of depiction, scale, and general slope, and need to show the character of details which constitute the relief of an area. The interval shall be uniform on any one chart, except that an intermediate interval may be approximated by a dashed line to define a summit or other important feature.

Contour lines are transferred exactly from the source to the chart. They must not be smoothed to the extent that they change recognizable features or characteristics of the terrain. In general, smoothing should be avoided.

Contour lines shall be fine 0.004" (0.10 mm) lines, but index contours, usually every fifth contour, may be emphasized by use of a bolder 0.008" (0.20 mm) line.

Where slopes are steep, contours should not be merged, but intermediate ones shall be omitted to leave a space of about 0.012" (0.3 mm) between those shown. However, index contours, if used, should not be omitted.

The label for the contour value shall be placed at suitable intervals parallel with and centered on the index lines. In flat areas where the index lines are far apart, the labels should be shown on every line. In steep areas usually only the index contour is labeled. Labels shall be 6 point Swiss Light Italic type.

Contours should be updated on [New Editions](#) only to meet the real needs of the mariner. If the existing chart displays incorrect contours in areas not visible from the water, they should be deleted from the chart rather than making extensive revisions unnecessarily.

Approximate Contour Lines ([C 12](#))

Approximate contours are shown using dashed (rather than solid) lines, and are labeled from the source in 6 point Swiss Light Italic.

Section 3.4.1

NAUTICAL CHART MANUAL

Peaks ([C 10](#), [C 11](#)); Treetop Elevations ([C 14](#))

Selected peaks shall be represented by the spot elevation dot and accompanying elevation label ([C 11](#)). Note that an intermediate interval may be approximated by a dashed line, and labeled, to show a summit ([C 10](#)). Elevations of points on slopes shall be omitted. Treetop elevations may be charted on peaks in southeast Alaska only and are labeled in 6 point Swiss Light Italic with the height followed by a space and then the abbreviation "TT" (e.g., *61 TT*). A treetop height may also be useful to show the profile height of an island and may be charted upon recommendation by a reliable source as the result of a on site inspection ([C 14](#)).

3.4.2 Hachures

Hachures ([C f](#)), may be used to identify a steep coast, but unlike contours they do not show degree of slope or actual elevation of ground above chart datum. Hachures shall not be used to represent large areas of relief.

Peaks Accentuated with Hachures

Hachures may also be used to accentuate a spot elevation on very small-scale charts without contours. If used in this manner, they must be used consistently throughout a chart.

3.4.3 Inland Waters

Shoreline that bounds navigable inland waters shall be charted as fully as practicable, consistent with the scale of the chart. Shoreline that bounds non-navigable inland waters shall be charted only to provide a general picture of land and water areas.

Inland bodies of water shall be charted as follows:

Glaciers ([C 25](#))

A glacier is considered to be a landform and shall be outlined by a 0.006" (0.15 mm) dashed line within which there is no tint. The label "Glacier" or the geographic name thereof should be shown inside the feature in lieu of interior fill. Labels shall be in Swiss Light type.

Intermittent Rivers and Streams ([C 21](#))

Intermittent rivers and streams, which are dry much of the time, shall be represented by a line composed of a series of three dots and a dash.

Lakes and Ponds ([C 23](#)); Lagoons ([C h](#))

Lakes, ponds, and lagoons shall be shown where they are part of the course of major rivers or are close to the coastline. This shoreline shall be an 0.25-mm line. Names shall be in Swiss Regular Italic type placed inside the feature. Such features are normally tinted blue.

Rapids and Waterfalls ([C 22](#))

When rapids or waterfalls limit navigation, they shall be represented by one or more lines of dashes drawn parallel to the shoreline.

Rivers and Streams ([C 20](#))

Rivers and streams are shown with an 0.25-mm lineweight. Where a double line is used for a pictorial presentation (without hydro), the tint shall be blue. Names of rivers shall be in Swiss Regular Italic. The type should follow the course of the river.

Salt Pans

A salt pan is an area bounded by dikes in which sea water is evaporated. Generally, the symbol in Chart No. 1, [section C 24](#) is not used. The label "Salt pans" should be charted in lieu of the lined square interior fill shown in [Chart No. 1](#).

3.4.4 Trees

Isolated trees are seldom charted as landmarks (see [Section 6.1](#)) due to their relatively temporary nature, variable height, and lack of distinction in a group. However, they may be shown in exceptional instances where no other visual references are available to mariners. When a conspicuous and prominent tree is recommended for charting, the landmark symbol and label ("TREE") shall be used. Pictorial tree symbols shown in Chart No. 1, [section C 31](#), are not used on NOS nautical charts.

3.4.5 Lava Flow

A lava flow shall be outlined by an 0.15-mm dashed line with the land tint shown within the enclosed area (see also [Section 4.14.2, Miscellaneous Marine Limits](#)). The label "Lava" should be charted in lieu of the symbol shown in Chart No. 1 ([C 26](#)).

3.4.6 Vegetation

In general, the vegetation cover is of little importance on charts, except along the coastline where

Section 3.4.6

NAUTICAL CHART MANUAL

isolated features may aid in identifying stretches of shoreline lacking other features. Since mangrove is often impenetrable, identifying it will aid the mariner in knowing where the shoreline can be accessed.

Bushes ([Co](#))
Coniferous Woodland ([Cj](#))
Cultivated Fields ([C 1](#))
Deciduous Woodland ([Ci](#))
Grass ([Cm](#))
Paddy (Rice) Fields ([Cn](#))
Park
Tree Plantation ([Ck](#))
Woods, in General ([C 30](#))

These features shall be charted by label only (no symbols) where they are recommended by a field observation. The symbols shown in Chart No. 1, [section C](#) (as shown above) are not used on NOS nautical charts. The labels that should be used ("Bushes", "Wooded", "Cultivated", etc.) are shown in [Chart No. 1](#).

3.4.7 Marshes and Swamps

The shoreline in marsh, mangrove, cypress, or similar swamp areas is generally obscured by vegetation and will not ordinarily be located on NOS surveys. In these areas, the apparent shoreline is usually depicted by a fine line on NOS surveys and transferred to the chart. Marsh and swamp areas depicted on NOS surveys shall be represented on charts as follows:

Mangrove ([C 32](#))

The seaward limits of mangrove are shown with the apparent shoreline (0.15 mm) symbol. A dashed 0.15-mm line shall be used for the landward limits of the area. Gold tint and the label "Mangrove" shall be shown within the charted limits. The pictorial mangrove symbol shall be used only when space is not available for the label.

Marshes ([C 33](#))

A marsh area inside the shoreline shall be represented by green tint and labeled "Marsh" or "Ma" where space permits. A dashed 0.15-mm line shall be used for the landward limits of the area. Other symbols (e.g., for roads, railroads, levees, and bluffs) may be used for the inshore limits of the marsh area. The apparent shoreline shall be shown with an 0.15-mm line.

Swamps ([C 33](#))

A swamp area inside the shoreline shall be shown with gold tint, represented by an 0.15-mm dashed line to denote the inshore limit, and labeled "Swamp".

3.5 Ports and Harbors

Man-made shoreline and structures (such as piers and breakwaters) are always shown with an 0.15-mm line weight. Any feature, or a portion thereof at or above the [Shoreline Plane of Reference](#) is shown with a solid line and gold tint; the portion of the feature below the Shoreline Plane of Reference (such as the submerged end of a jetty) is shown with a dashed line and blue tint.

The single-line/double-line criteria presented in [Section 3.5.1](#) for charting piers shall be used as a guide for the other structures of this group as well (such as breakwaters, etc.).

Work in Progress ([F 31](#), [F 32](#))

New construction projects extending into the water area shall be charted upon notification that construction has begun. The limits of the new construction shall be outlined with a black dashed 0.15-mm line and labeled "Under construction". All charted detail, including the shoreline, shall be deleted from within the new area, and gold tint shall be added. The dashed line shall be changed to a solid line at the completion of the project, providing the project was constructed according to plan.

3.5.1 Berthing Structures

Berthing structures are usually constructed to afford facilities for mooring a vessel. They adjoin berthing areas and are connected to the shoreline at one end. Berthing structures include fixed and floating piers, wharfs, and gridirons.

Grids; Gridirons ([F 24](#))

A grid or gridiron is a flat frame structure erected on the foreshore so that a vessel may be placed on it at high water for servicing at low water. The outline is charted and labeled "Grid" in Swiss Light Italic.

Piers ([F 14](#))

A pier is a structure extending into the water to provide a mooring or landing.

The following specifications are provided for guidance in the application of pier detail and that of other port and harbor structures.

Section 3.5.1

NAUTICAL CHART MANUAL

Piers should be shown with an 0.15-mm double line where space and scale permit, filled with a gold tint. When the centerline separation of the sides of a parallel, double line pier is less than 0.3 mm at chart scale, the pier shall be shown as a single 0.25-mm line centered on the space between the two sides.

Positions of any piers along a shoreline should not be displaced. All piers charted must be in their true position.

1. "Essential" Piers

Piers shall not be charted that are less than 0.8 mm in their greatest dimension at chart scale except when they are identified as navigationally essential by label on the source document or by cartographic evaluation. "Essential" piers that are less than the minimum specified length at charting scale must be extended to the minimum length so that they are recognizable.

Examples of "essential" piers follow:

- (a) Piers of unusual commercial importance, e.g., a ferry terminal, cannery/processing plant, or oil terminal
- (b) Piers at possible emergency facilities, e.g., USCG station, harbor police, or hospital
- (c) Piers at commercial marine facilities (small-craft charts only)
- (d) Piers which indicate the extension or termination of a primary (or charted) road
- (e) Piers limiting a harbor entrance or inlet, i.e., similar to a breakwater
- (f) Piers adjoining or encroaching into a channel, natural or man-made
- (g) Conspicuous piers that could be used as a navigational reference in an area otherwise devoid of conspicuous features

When it is not clear whether a pier should be considered "essential," its retention should always be favored on larger-scale charts.

2. Piers Close Together

The congestion of piers in some areas precludes the portrayal of all data on charts in a useful manner. Elimination of piers from a chart to avoid illegible congestion of waterfront detail requires careful application of these procedures. Determination of "essential" piers will also identify the "nonessential" piers that can be eliminated. Thus the following "drop-out" specifications have been established.

REVISED JULY 12, 2000

If the centerline separation of two adjacent parallel piers of different lengths is less than 0.3 mm at chart scale, the shorter of the two piers should not be charted unless it is identified as "essential" (as previously defined). For example, a short pier that locates a harbor police facility should be charted even though it may be closer than prescribed tolerances to a much longer pier. Thus, the depiction of two piers as one wide-based pier will sometimes occur, especially at smaller chart scales.

Adjacent parallel piers of the same length (including finger piers) shall be reduced in number when the centerline separation between them is less than 0.3 mm at chart scale. This may mean showing only alternate piers (or fewer, depending on chart scale) for groups of three or more.

This "thinning out" procedure must be done carefully to ensure that the end piers of a group and those toward the most navigable or heavily trafficked areas are retained.

Piers with irregular configuration must be individually evaluated before removal from charting requirement (except for nonessential piers that are too small at chart scale, as discussed previously).

Floating Piers

Floating piers shall be charted, subject to the same provisions that apply to other piers. Floating piers that meet the charting criteria shall be identified by symbol and label whenever possible. The label "Floating pier" shall be shown where space permits in 5 pt. Swiss Light Italic.

The line symbol for a floating pier shall be detached from any fixed portion of pier or the shoreline by a gap of 0.3 mm.

Floating piers are sometimes removed at the end of the boating season. This possibility must be considered when evaluating recommendations for changing charted features to ruins based on Cooperative Charting Program reports or photographic revisions.

See [Section 4.13.3](#) for charting of other floating structures.

Piers In Ruins ([F 33.1](#), [F 33.2](#))

The area surrounding a pier in ruins, especially those submerged at the [SPOR](#) datum, represents a potential hazard to navigation. Because of this danger, it is important that ruined piers be charted in a way that will alert mariners to the possibility of submerged dangers nearby. For this reason, a dashed line shall be used for piers, or portions of piers, that are submerged at SPOR. The same symbol may also be used for piers above SPOR that are known to be in a ruined condition, thereby giving warning that submerged debris may be nearby.

If it is significant that a pier is in ruins, e.g., a pier formerly considered "[essential](#)" that can no longer be used for landings, it should carry the label "Ruins" if space permits. Such piers should continue

Section 3.5.1

NAUTICAL CHART MANUAL

to be charted until their appearance on a chart is no longer considered useful to chart users.

When double-line, gold-tinted piers become ruins, blue tint should be substituted for the former gold tint. Charts which carry no blue tint will show such ruined piers with no tint.

In general, piers in ruins which are 0.8 mm and longer at chart scale are considered hazardous and should be charted. Exception from charting shall be considered only when the pier in ruins is covered by notation or when it lies within a foul or otherwise delimited area.

Piers in ruins that are less than 0.8 mm in their greatest dimension at chart scale, shall not be charted except when they are identified for retention through cartographic evaluation. Such piers should be enlarged to minimum charting size.

Piers in ruins that should be exaggerated to the minimum charting size include the following:

- (a) Those that are considered navigationally hazardous
- (b) Those that are located in an isolated area or present an unexpected obstruction to landing
- (c) Piers of unusual commercial importance which have become ruins

In cases of doubt, piers in ruins should be charted, especially on largest-scale charts.

The dash symbol (constituting an 0.6-mm dash and an 0.2-mm space) shall always begin with the space adjoining the point of origin, e.g., the shoreline or other structure.

The terminating dash in a series of dashes depicting a pier in ruins may be longer or shorter than the prescribed 0.6 mm, but not more than 1.0 mm or shorter than 0.3 mm. This will prevent charting an unrecognizable "speck" and enable the symbol to depict the pier's true termination (within 0.1 mm).

Wharfs ([F 13](#))

A wharf usually runs parallel with the shoreline and is used for loading and discharging cargo. Its seaward face should be charted, as should the depth alongside.

3.5.2 Erosion-Control Structures

Structures that extend into the water, or are solely within the water, usually constructed to protect an area harbor or shoreline and not intended for berthing are described as breakwaters. Jetties, groins, seawalls, dikes, and levees all have similar purposes.

REVISED JULY 12, 2000

Breakwaters ([F 4.1](#))

A breakwater is an artificial embankment built to form or protect a harbor. It is usually a relatively large and extensive structure built of masonry and stone, but occasionally may be made of wood. It may extend out from shore in various configurations, or it may be placed roughly parallel to and separated some distance from the shore, thus providing access to the protected area behind. Breakwaters detached from the shoreline usually represent a significant obstruction to navigation and are always charted. The lineweight used to symbolize a breakwater is exaggerated to 0.25 mm on small-scale charts if a single line rather than a double line is used. The length of the breakwater shall be a minimum of 0.8 mm at chart scale. Floating breakwaters shall be charted the same as fixed breakwaters, but labeled "Breakwater", and with the addition of any anchoring appurtenance symbolization (see [Section 4.13.7](#)).

Groins ([F 6.1](#), [F 6.2](#), [F 6.3](#))

A groin is a low wall-like structure usually extending perpendicular to the shore to prevent shoreline erosion.

Jetties ([F a](#), [F b](#), [F c](#))

A jetty is a structure, ordinarily of riprap, stone, and concrete, extending into the water perpendicular to the shoreline, usually used to protect a channel entrance. It is charted according to the same charting specifications as piers (see [Section 3.5.1](#)).

Seawalls ([F 2.1](#), [F 2.2](#))

A seawall is a solid erosion-control structure, usually of masonry, sometimes with a sloping face, and usually aligned with the shoreline. On very large-scale charts, the feature may be outlined as shown on the source. On smaller-scale charts, the 0.15 mm lineweight used to symbolize man-made shoreline is used.

Dikes and Levees ([F 1](#))

Dikes and levees are considered synonymous for charting purposes. Both are man-made embankments usually composed of earth rubble and constructed for shoreline protection, landside containment of material (e.g. dredged spoil), or protection from flooding. The symbol may be slightly displaced so as not to overprint the shoreline. A half symbol may be shown in congested circumstances. A label "Road on levee" may be charted if this is important.

3.5.3 Docks and Tidal Basins

A dock may be defined as the berthing slip between two piers or an area cut into land for the berthing

Section 3.5.3

NAUTICAL CHART MANUAL

of vessels. A pier is sometimes erroneously called a dock but the two should be distinguished. A dock is also a basin or enclosure for the reception of vessels which has a means for controlling the water level.

Docks

A dock is usually shown as the area between two piers. A "slip" is another term for a dock.

Dry Docks ([F 25](#))

A dry dock is a structure in which vessels can be floated for servicing. It is charted by its actual shape, with the gate closed.

Floating Dry Dock ([F 26](#))

These are charted by actual outline and gold tint only when they are known to be permanently moored in a fixed position.

Tidal Basins ([F 28](#))

A tidal basin serves as a dock but has no gate to control the water level, which rises and falls with the tide. It is charted by its actual shape and should be labeled "Tidal basin" in Swiss Regular Italic.

Wet Docks ([F 27](#))

A wet dock is an enclosed area within which water can be maintained at a desired level to keep vessels afloat. The ship enters the dock through a lock or gate which can be opened at a high water level or over a fixed sill. It is charted by its actual shape and should be labeled "Wet Dock" in Swiss Regular. See also Section 3.5.4.

3.5.4 Locks and Other Barriers

Locks, gates, barriers, and other man-made structures are used to control the height and flow of water. Any such structure which may prevent navigation under certain conditions or which closes an otherwise navigable waterway must be charted, preferably to scale or at least by symbol.

Clearances shall be shown in the same manner as for bridges, giving the lock dimensions, sill clearances, traffic control lights and information, CFR references, and any other information that is not subject to change and which may aid the mariner.

The same procedure for noting VHF radio monitoring facilities for communication with mariners applies to these structures as applies to bridges (see the discussion of bridge radio services in [Section 3.11.1](#)).

REVISED JULY 12, 2000

Locks ([F 41.1, 41.2](#))

Navigation locks shall be shown in the closed position by a solid black line (0.15 mm lineweight). Caissons and gates for controlling the water level in a wet dock or nontidal basin shall also be shown in the closed position by a solid line. Power plant cooling water intakes and discharges, and barriers for dam spillways, intakes, and overflows are also shown by solid line.

Floodgates and Sills

Floodgates and saltwater intrusion barriers shall be shown in the open position, with the closed position shown by a black dashed line (0.15 mm lineweight). Sills, when charted as part of these structures or as a separate structure for controlling a water level, are also shown by a dashed line since they are submerged at some tide stage.

3.5.5 Landing and Launching SitesMarine Railways ([F 23](#))

A marine railway is used to haul boats from the water, usually to expose the hull as in a dry dock. It is charted with the hatched railroad symbol for the visible portion, and a dashed line for the submerged portion, and is labeled "Marine railway". On charts produced by foreign countries, the marine railway may be denoted as a "Patent slip".

Ramps ([F 23](#))

Ramps are sloping runways, usually hard surfaced, used for launching boats from a trailer. An outline is shown, as appropriate to the scale, and labeled "Ramp". The label alone may be charted at small scale.

3.6 Man-Made Features

On large-scale charts, man-made features along the coastline such as roads, railroads, embankments, levees, power lines, etc., should be charted where scale permits. Some major features may be charted inland to give an indication of the degree of development. Symbols for these features are shown in [section D](#) of Chart No. 1.

Major railroads, streets, and highways shall be shown in port areas, adjacent to coast, and approaching bridges across navigable waterways. These shall be charted, named, and numbered as appropriate. The determination of "major" is obtained from the USGS quadrangles, State maps, atlases, or other sources of authority. Major features are shown with emphasized symbolization such as the red lining on quadrangles.

Canal ([F 40](#))

Where possible, a canal should be shown by a double line with a blue tint between the lines. Where the scale is too small to use the double line, a single line (0.15 mm) may be used with the label "Canal" in 6 pt. Swiss Light Italic. See [Section 3.5.4](#) for charting of canal locks.

Dam ([F 44](#))

A dam shall be represented to scale whenever possible. At small scale, a comb-shaped symbol is drawn across and slightly overlapping the banks of the river, the teeth pointing in the direction of the water flow. See [Section 3.5.4](#) for charting of barriers for dam spillways.

Ditch ([F 40](#))

A ditch is shown as a single line (0.15 mm) with the label "Ditch" in 6 pt. Swiss Light Italic. See [Section 3.5.4](#) for charting of ditch flood gates or sluices.

Log Boom ([N 61](#))

See [Section 4.13.4, "Logging Structures."](#)

Pipelines on Land ([D 29](#))

Pipelines on land are generally not charted, but they are shown in black if they cross above navigable waters. Buried pipes are not charted.

Railroads ([D b](#))

A single 0.20-mm hatched line is used to symbolize both single- and double-track railroads. The initials of the railroad name, if known, should be charted along the track in 5 pt. Swiss Light. In the case of railroad yards, enough of the tracks should be represented to indicate the area covered or the limiting tracks and an appropriate legend may be shown. Electric railways in cities are generally not charted.

Roads and Road Patterns ([D 1](#), [D 2](#), [D 10](#), [D 11](#), [D a](#))

Roads should generally not be shown on charts smaller in scale than 1:250,000. At scales larger than 1:250,000, only through or connecting public highways and roads leading from highways and terminating at the shore need be shown. Private roads leading from public highways to buildings should be omitted. In urban and suburban areas, only streets which are actually constructed and in use are to be charted. Streets may be omitted as necessary for clarity. Numbers and names of important U.S. highways shall be charted when the information is available. Lesser routes shall be

labeled provided the labels do not cause undue congestion.

Primary transportation routes in cities, towns, and rural areas are symbolized by single or double lines depending on the chart scale. Generally the double-line road symbol is used only on charts of scale at 1:20,000 and larger. Roads may also be shown to scale at charts of 1:10,000 scale and larger where this will be useful to the chart user. This determination must be based on the cartographers judgement.

The lineweight for double-line roads is 0.1 mm with 0.75-mm spacing between lines, centerline to centerline. The single-line road lineweight is 0.3 mm. Single- and double-line roads shall not be used on the same chart except where it is appropriate to use a double line on a large-scale inset and a single line on the smaller-scale base chart.

Streets and roads providing access to marine facilities and potential waterfront landing sites shall be shown where reasonably practical. Some roads in rural areas that serve as connectors to major highways must also be shown, even though they are not considered major. All highways thus selected for charting will be shown regardless of subsequent "urban screening." These highways shall be kept up to date by newly arriving sources.

Roads shown by dashed lines on the survey sheets are not to be charted unless they are considered vital, in which case they are charted using solid lines.

Extensive street patterns serve little purpose on charts and rapidly become a significant maintenance problem. Their obsolescence is quickly recognized by the chart user, thus affecting the credibility of the chart. The urban screen (see also [Section 3.8](#)) shall be used in lieu of street patterns to denote built-up areas. However, major named or numbered streets shall be shown through the screened area.

Trails ([D 12](#))

Trails are not generally shown on nautical charts. However, portage trails are shown on canoe charts.

Tunnel Entrances ([D 16](#))

Tunnel entrances shall be indicated by a symbol similar to a bracket; the path of the railway or road underground shall be represented by dashed lines.

3.7 Land Boundaries and Limits

Land boundaries shall be shown in black on nautical charts. In general, State boundaries are shown over land areas only, stopping at the shoreline. International boundaries are shown over land areas and may be shown beyond the shoreline into water areas. Along the border line the name of the State

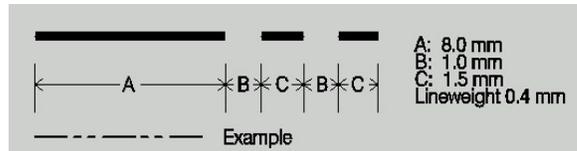
Section 3.7

NAUTICAL CHART MANUAL

or nation shall be shown at appropriate intervals in 8 pt. Swiss Light type. Limits of airports and civil reservations are also charted on occasion.

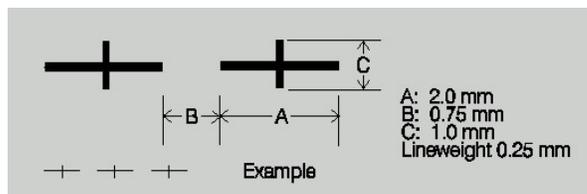
State Boundaries

State boundaries shall be symbolized by a solid black dashed line as shown below:



International Boundaries (N 40)

International boundaries on land shall be symbolized by a black dashed line of crosses as shown below:



Airport Limits (N e)

On large-scale charts, important airport limits shall be shown with a line of short black dashes (0.15 mm lineweight). The label "Airport" in 7 pt. Swiss Light type should be included within the charted limits. (See also Section 3.8)

Civil Reservation Limits (N f)

These limits shall be shown only if requested by a cognizant agency. (See also [Section 4.14.7](#))

3.8 Buildings and Structures

When charting buildings in urban and suburban areas, villages, and other built-up areas, the aim of the cartographer should be to create a correct impression of the extent of the built-up area and the density of the buildings. Within built-up areas, only waterfront, landmark, and certain public buildings of interest shall generally be shown individually. The built-up areas should be shown by urban screen.

REVISED JULY 12, 2000

Away from ports and other built-up areas, even minor buildings (such as a boathouse) may be charted individually where they lie close to the coastline. Waterfront buildings are considered to be of navigational interest and shall be charted in some detail, not overgeneralized. In ports, buildings along the waterfront considered of significance to commercial shipping or recreational boating are individually represented, scale permitting.

Conspicuous buildings may be charted as landmarks to aid in navigating the waters adjacent thereto. Landmarks (See [Section 6.1](#)) must be prominent as viewed from seaward and be useful to mariners in determining a vessels direction or position.

Airports ([D 17](#); [N e](#))

On large-scale charts, the limits of runways of commercial airports may be shown. See also [Section 3.7](#) for charting limits of major airports. Pictorial symbols are not used for airports.

Buildings ([D 5](#), [D 6](#), [E d](#), [F 61](#), [F 62.2](#), [F 63](#))

Tanks ([E 32](#))

Prominent buildings along the waterfront and large individual buildings back from the waterfront that could be of navigational assistance to mariners should be shown by actual shape on charts 1:40,000 scale or larger, when at all possible. No other buildings are shown. A landmark symbol and label is usually charted for prominent buildings on small-scale charts.

General criteria to be applied to these features are these:

1. All symbols and labels shall be printed black.
2. Labels shall be in 6 pt. Swiss Light.
3. Lineweights shall be 0.15 mm.
4. All structures charted shall be shown to scale, subject to minimum size criteria.
5. Ruins are subject to the same size criteria as active structures and shall be labeled.
6. Normal land or urban tints will be shown as required by other charting criteria.
7. Crosshatching used to fill in buildings and tanks is normally oriented 45° as shown in [Figure 3-2](#). Crosshatching aligned the same way should be avoided in buildings angled differently over a large area; opposing crosshatching should be avoided in adjoining buildings. Considerable judgment may be needed to prevent a strained and unskilled effect when using crosshatching to depict buildings.

Section 3.8

NAUTICAL CHART MANUAL

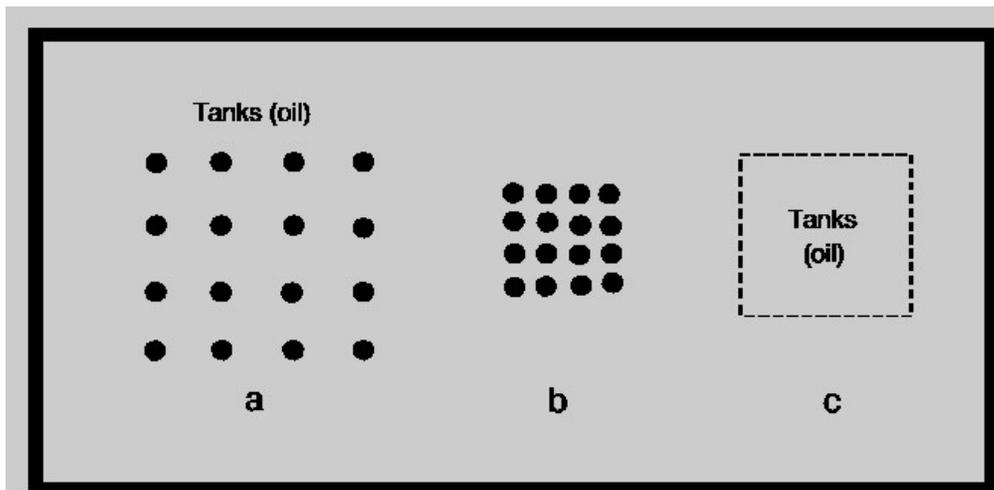
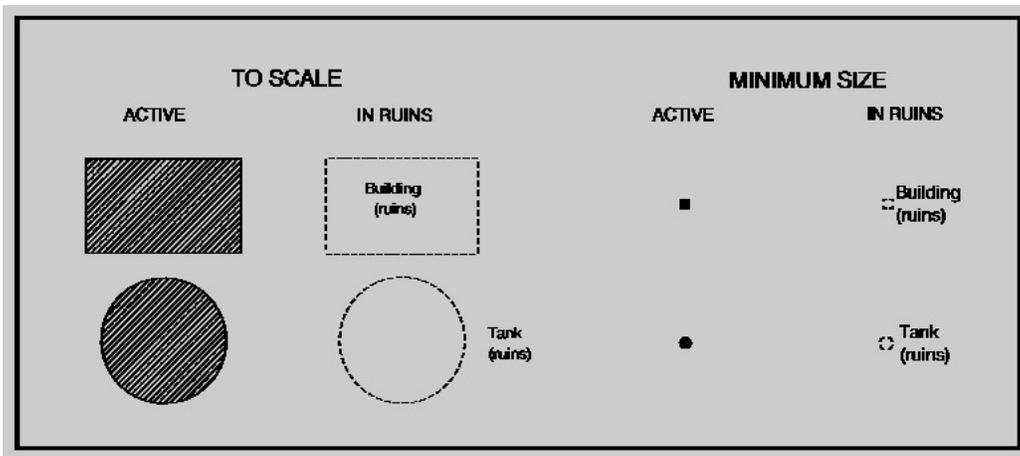
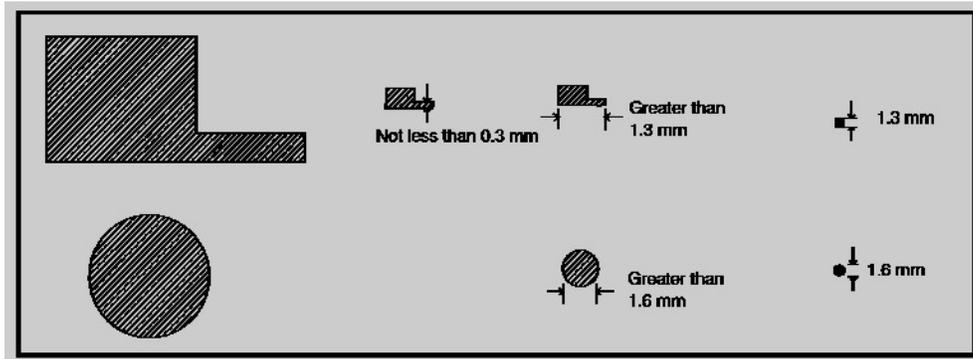
The following size criteria shall be applied to specific cases (see [Figure 3-2](#)):

1. Noncylindrical structures considered active (i.e., not in ruins) shall be charted to scale by solid outline and crosshatching when the charting size is greater than 1.3 mm in any dimension. The smallest dimension for an outlined symbol shall not be less than 0.3 mm (double lineweight). When the greatest dimension at chart scale is 1.3 mm or less, a minimum-size solid black square, 1.3 mm on a side shall be used to depict the structure.

Ruins shall be labeled and shown by a dashed outline without crosshatching. When the greatest dimension at chart scale is 1.3 mm or less, a minimum-size open black dashed square, 1.3 mm on a side, shall be used to depict the structure.

2. Cylindrical structures or tanks considered active shall be charted to scale by solid outline and crosshatching when the charting diameter is greater than 1.6 mm. When the charting dimension is 1.6 mm or less, a solid black circle with a 1.6-mm diameter shall be shown. Ruins shall be labeled and shown by a dashed outline without crosshatching. When the charting dimension of a tank in ruins is 1.6-mm or less, an open black dashed circle with a 1.6-mm diameter shall be shown.

SYMBOLIZATION AT SUCCESSIVELY SMALLER SCALES



At small scales (a) should be shown as (c), and not as (b).

Figure 3-2

Section 3.8

NAUTICAL CHART MANUAL

At smaller scales, the minimum-size symbols for tanks or buildings in a dense group may get too closely spaced. Rather than deleting some of the symbols where the individual structures cannot be symbolized clearly and distinctly, a dashed area outline shall replace the group of symbols and shall be labeled (e.g., Tanks (oil)) so that active structures are not mistaken for ruins. The dashed area outline for groups of tank or buildings shall not be smaller than 1.3 mm on any side.

A primary and a secondary description in the label shall be used whenever possible e.g., "Tanks (oil)," "Building (World Trade Center)," or "Building (aquarium)". The term "Tank Farm" shall not be used.

Cemeteries ([E 19](#))

On large-scale charts, the limit of prominent cemeteries may be shown with the label "Cemetery" or "Cem" in 6 pt. Swiss Light.

Church Buildings ([E 10.1](#) through [E 18](#))

Church buildings considered to be prominent features, but which have not been recommended as landmarks, may be charted by their symbols. When the greatest dimension at chart scale is 1.3 mm or less, a minimum-size solid black square, 1.3 mm on side, with a cross attached, shall be used to depict the structure. A label may be added if considered useful.

Hospitals ([F 62.2](#))

All hospitals should be shown, where appropriate, using the same guideline previously stated for buildings, and with the legend "Hospital" in 7 pt. Swiss Light.

Landmarks

A prominent feature on a building or the building itself may be shown by a landmark symbol ([B 32](#), [B 33](#)) and labeled (as appropriate from section E) when it is specifically recommended for charting as a landmark (see [Section 6.1](#)).

Urban Screen

The urban screen (dark gold tint) is charted primarily to enable the mariner to identify developed areas at night by the projection and reflection of lights in the low atmosphere (called "nightglow"). These lighted areas of sky can be seen for great distances offshore under many conditions and provide assistance in many a landfall.

The USGS quadrangles are the principal source for delineating urban areas, supplemented by photographs or other authoritative sources. The limits for the area to be screened are compiled from



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL OCEAN SERVICE
Office of Coast Survey
Silver Spring, Maryland 20910-3282

MARCH 14, 2002

MEMORANDUM FOR: All Cartographers
Marine Chart Division

FROM: Fannie B. Powers
Chief, Quality Assurance, Plans and Standards Branch

SUBJECT: Nautical Chart Manual Correction Pages - [Pump-out Facility](#)
Example

Effective immediately, the following attachment replaces pages 3-27 and 3-28 in the Nautical Chart Manual, Volume 1, Part I, Seventh (1992) Edition, and serves to improve the legibility of the Pump-out facility example.

Pages 3-27 and 3-28 are to be inserted into the Nautical Chart Manual, Volume 1, Part 1, Seventh (1992) Edition immediately after page 3-26.

Attachment

source onto the digital chart files. The screen is an additional gold (30 percent, 120 LPI) screen overprinting the regular gold (20 percent, 120 LPI) screen land tint, but rotated 30 degrees to avoid creating a moiré pattern.

The outline of an area to be screened must be applied with care. Undeveloped areas that will not produce nightglow must not be screened. Normally excluded from screening will be larger parks and recreation areas (stadium lights are considered unreliable for this purpose), strips of development along the shore, and industrial areas.

Urban screen is also useful in updating older charts to avoid the largely useless and time-consuming updating of road networks which have not been routinely maintained over the years. See discussion of Roads and Road Patterns in [Section 3.6](#).

3.9 Miscellaneous Stations

Pump-out Facilities ([Fd](#))

Definition: A **PUMP-OUT FACILITY** is a location where vessels may empty their sewage holding tanks.

General Requirements (All Charts):

In accordance with Public Law 102-587, Section 5603(d), NOS charts shall indicate the locations of pump-out stations and waste reception facilities for the use of operators of recreational vessels.

Private pump-out facilities, not intended for public use, shall not be charted.

Federal, state and local governments and facility owners shall be considered authoritative sources for charting pump-out facilities. Locations of pump-out facilities provided by authoritative sources shall be considered stations available for public use and shall be charted.

Reports of locations provided by non-authoritative sources (e.g. U.S. Power Squadron and U.S. Coast Guard Auxiliary Reports, photo revisions without field edit) do not have sufficient authority to chart pump-out facilities, unless accompanied by information from an authoritative source. Pump-out facilities reported by non-authoritative sources shall be referred to the Nautical Data Branch for confirmation by an authoritative source.

The [pump-out facility symbol](#) shall not obscure critical features such as aids to navigation, rocks, shoal depths, submerged obstructions etc.

The pump-out facility symbol shall not be shown in areas devoid of hydrography.

General Requirements (Small-Craft Charts and Marine Facilities Charts Only):

Pump-out facilities shall be indicated with the capital letter "P" in the appropriate column of the facility tabulation. A pump-out facility symbol shall not be charted when a pump-out facility is referenced in a charted facility tabulation.

The pump-out facility symbol shall be charted at the exact geographic position provided in the source document when a pump-out facility is not listed in the facility tabulation. Also see direction in this section under Labels and Notes.

General Requirements (All other charts):

The pump-out facility symbol shall be charted at the exact geographic position provided in the source document. Also see direction in this section under Labels and Notes.

Size and Shape:

The pump-out facility symbol shall be charted to the size and shape of the standard cartographic symbol in Chart No. 1 [Fd].

Labels and Notes:

When the symbol for a pump-out facility is charted, that chart shall display a sample pump-out facility symbol immediately followed by the note "Pump-out facilities" anywhere within the land area of the chart, preferably grouped with other notes. The note shall be charted in 8 point Swiss Light type.

Example:  Pump-out facilities

The sample pump-out facility symbol and note "Pump-out facilities" shall not be charted when all such facilities are identified in tabulated form.

Color and Screening:

The pump-out facility symbol, sample pump-out facility symbol and pump-out facilities note shall be charted with magenta.

Feature Removal from the Chart:

A charted pump-out facility shall not be removed from the chart until an established authority provides information that this service is no longer provided for public use. Non-authoritative sources (e.g. U.S. Power Squadron and U.S. Coast Guard Auxiliary Reports, photo revisions without field

edit) do not have sufficient authority to delete pump-out facilities unless accompanied by information from an authoritative source. A recommendation for removal of a pump-out facility from a non-authoritative source shall be referred to the Nautical Data Branch for confirmation by an authoritative source.

When the only or last remaining [pump-out facility symbol](#) has been removed from the chart, the sample pump-out facility symbol and associated note "Pump-out facilities" shall also be removed from the chart.

Of the various types of services which are available to assist the mariner, those which rely to some extent on visual communication must be identified on large-scale charts and, in the case of pilotage services, on smaller scale charts. Charts should primarily show the location of such services. Mariners can obtain details concerning these services from other sources. Many of these stations are recommended for charting as landmarks (see [Section 6.1](#)).

U.S. Coast Guard Stations ([T 10](#), [T 11](#))

The USCG provides both watchkeeping and rescue services. Stations at which a continuous watch is kept must have a commanding view, are often associated with signal stations, and are visually prominent.

Stations with lifesaving equipment, especially lifeboats, are usually in relatively sheltered positions. They are not necessarily visually prominent and their precise positions are unimportant. They are described as lifesaving stations ([T 12](#)).

A landmark symbol (a circle enclosing a dot) shall be shown for accurately located USCG stations. The name of the station shall also be shown on coastal series and larger-scale charts ([T 10](#)). When the station is not a recommended visual landmark, the pictorial symbol ([T 12](#)) is used. On charts smaller than the coastal series, the abbreviation "CG" shall be used with the pictorial symbol.

Fireboat Station ([T d](#))

These stations shall be shown on the largest-scale chart coverage and labeled "FIREBOAT STATION" in 7 pt. Swiss Light, all caps. The small landmark symbol is also used.

Flagstaffs; Flagpoles ([E 27](#))

A flagpole rising from a building is referred to as a "flagstaff". It is not usually recommended as a landmark because it is not often the most conspicuous part of the feature.

A single-staff flagpole rising from the ground and not attached to a building is usually more conspicuous and is more frequently charted. A flagpole recommended as a landmark is charted using a landmark symbol (position accurate or position approximate) and labeled "FP" or "Fp" as appropriate.

Flag Towers ([E 27](#))

Any scaffold-like tower on which flags are hoisted, such as a USCG skeleton steel flagpole, is called a "Flag Tower". The term "signal tower" shall not be used. A flag tower recommended as a landmark is charted using a landmark symbol (position accurate or position approximate) and labeled "F TR" or "F Tr", as appropriate.

Lookout Towers ([T f](#))

A lookout tower is any tower surmounted by a small house in which a watch is habitually kept, such as a USCG lookout tower or a fire lookout tower. This term must not be used for an observation tower or a part of a building in which a watch is not kept. The standard procedure for selecting a position accurate or position approximate symbol and label is used.

Marine Police Stations ([T c](#))

These stations should be shown on the largest-scale charts and labeled "MARINE POLICE" in 7 pt. Swiss Light, all caps. The position approximate symbol is also used.

Pilot Stations ([T 3](#))

The most important feature of a pilot station is the position of the meeting (or boarding) place. A special magenta pictorial symbol (see [T 1.1](#)) is used for this purpose. The shore station may sometimes communicate visually with ships but cannot generally be considered a signal station. It should be charted with a landmark symbol and the legend "PIL STA".

3.10 Military Features

Military Installations

Routine charting of military features without researching for a possible security clearance requirement can include only the outline of the installation and the proper name label.

Prominent natural features and unclassified aids to navigation that are included in the Light List within the limits of a military installation may be charted. However, objects of present military importance that are considered to be important navigational features (e.g., [stacks](#), [towers](#), [domes](#), aeronautical lights, etc.) may be charted only with the consent of proper military authorities. Requirements for charting objects within military installation are as follows:

1. A feature located within a military reservation shall not be charted without first obtaining a written security clearance from the appropriate military authorities.

(a) If the security clearance is denied, the feature will not be applied to any chart nor will an entry be made in the documentation system. The source shall be destroyed and no further action will be taken.

(b) If security clearance is granted, the feature shall be charted and evaluated for possible publication in the Notice to Mariners. The limits of a military installation shall be shown with a long-short dashed line. The feature should be outlined in black.

2. A security clearance is not required if the object is already shown on a public document such as an aeronautical chart, USGS quadrangle or other unclassified charts or maps. (Aerial photographs available to the public shall not be considered a public document.)

3. A security clearance is also not required if the object recommended for charting is requested by the military organization that has jurisdiction over the landmark.

Abandoned Military Features ([E 34.1](#))

Some coastlines have prominent, abandoned military structures that are in ruins or are used for civil purposes. These structures, which range from forts to minor lookout posts, are often the main distinctive feature of headlands or stretches of coastline. Abandoned features visible from seaward may be shown on charts where military regulations permit.

Structures shown on large-scale charts should be charted by outline to scale, generalized where necessary. On small-scale charts the normal symbols for individual buildings shall be used ([D 5, D 6](#)). Where possible, the structure should be named. Buildings which are clearly in ruins shall be shown in dashed lines. (See also [Section 3.8, "Buildings and Structures"](#).)

3.11 Bridges and Overhead Cables

3.11.1 Bridges

1. General ([D 22](#) through [D 24, D d, D e](#))

Bridge symbols shall be shown as appropriate for roadways, railroads, and other crossings where they intersect navigable waterways on nautical charts, i.e., those showing hydrography, a legend, or a tabulated (numbered) marine facility shown above the bridge.

If known, names of bridges shall be charted. They are sometimes used to separate channel reaches, are often used as locating references by the mariner, and are used to coordinate other graphics and texts with the chart.

The first source for bridge names shall be the USCG Bridge Book or permit plans. Any disagreements with the Bridge Book name shall be resolved with the USCG by the NDB before charting. The bridge name shall be in 5 pt. Swiss Light.

Section 3.11.1

NAUTICAL CHART MANUAL

The terms "left" and "right" when referring to bridge spans means left and right proceeding in the direction of increasing mileage values assigned to the waterway, including the Intracoastal Waterway. The Bridge Book shall provide guidance for labeling existing bridges spans, and Completion Reports shall be the source for new construction. Discrepancies shall be referred to the NDB for resolution.

Names for railroads, major streets and highways, and routes at bridges shall be labeled with the name and route number.

Critical dangers to navigation located under bridges (such as rocks and shoal soundings) must be charted in their positions on the largest-scale chart coverage. The bridge symbol should be broken when such dangers are charted beneath the bridge structure. Dolphins, piles, snags, etc., charted prior to bridge construction will be removed from the chart when construction of the bridge is complete only if the completion report or other authoritative source states that they have been removed.

In general, the bridge symbol should be omitted where navigation is obviously not intended, e.g., drainage canals, cooling outlets, oil exploratory canals, etc., and where the bridge is not listed in the Bridge Book. In these instances, the waterway crossing shall be shown without the bridge symbol detail.

2. Bridge Clearances ([D 20](#), [D 21](#))

Bridge clearances, both horizontal and vertical, shall be shown on all charts having hydrography or other information which shows that navigation can take place on both sides of the structure. Charted clearances shall be rounded down to the nearest foot. Bridge clearance notes should be kept short and long explanations should be avoided where possible.

The USCG is the authority for bridge clearance information and for resolving discrepancies in bridge clearance data. The information in the USCG Completion Reports (USCG form CG-4599) is usually considered final and approved, and the data from this source shall be used on all NOS publications. The four-volume "Bridges Over Navigable Waters of the United States," or Bridge Books are on file in the NDB. The Bridge Books are not to be used as the authority for clearances. Any questionable data concerning bridges shall be resolved by this Unit before application of such data to NOS publications. Many bascule bridges do not open to a fully vertical position due to bridge operator intervention, physical limitations of the bridge design, or capability of the operating machinery.

If the USCG form CG-4599 and associated bridge plans do not indicate any restricted horizontal clearance information for the bascule bridge in the open position, the bridge label text will carry clearances for the bridge in the closed position only. These clearances shall be charted similar to the following example:

REVISED JULY 12, 2000



UNITED STATES DEPARTMENT OF COMMERCE
 National Oceanic and Atmospheric Administration
 NATIONAL OCEAN SERVICE
 Office of Coast Survey
 Silver Spring, Maryland 20910-3282

MARCH 14, 2002

MEMORANDUM FOR: All Cartographers
 Marine Chart Division

FROM: Fannie B. Powers
 Chief, Quality Assurance, Plans and Standards Branch

SUBJECT: Nautical Chart Manual Correction Pages - Bridges and Overhead
 Power Cables

Effective immediately, the following attachment replaces pages 3-33 through 3-40 in the Nautical Chart Manual, Volume 1, Part I, Seventh (1992) Edition, and serves to improve the legibility of the following notes, labels and Figure.

Nautical Chart Manual Volume	Nautical Chart Manual Page	Illegible Note/Label Introduced during Digital Conversion	
1	3-33	1. Bascule Bridge label (no restricted horizontal clearance information in open position)	
		2. Bascule Bridge label (restricted horizontal clearance information in open position)	
		3. Bascule Bridge Clearances Caution Note	
	3-34 (Figure 3-3)	Bridge and Cable Card Example	
	3-35	1. Bridge under construction magenta caution note	
		2. Fixed Bridge label with authorized clearance	
	3-38	Overhead power cable label	
3-39	Overhead cable car with overhead power label		

Pages 3-33 through 3-40 are to be inserted into the Nautical Chart Manual, Volume 1, Part 1, Seventh (1992) Edition immediately after page 3-32.

Attachment

BASCULE BRIDGE
 HOR CL 46 FT
 VERT CL 10 FT

Many bascule bridges do not provide the same horizontal clearance between the open ends of the drawspan(s) as is provided between the bridge fenders at the water surface. The drawspan(s) may overhang the bridge fenders when the bridge is open. If the USCG form CG-4599 and associated bridge plans provide restricted horizontal clearance information for the bascule bridge in the open position, the restricted horizontal clearance shall be incorporated into the bridge clearance text following the closed horizontal clearance. These clearances shall be charted similar to the following example:

BASCULE BRIDGE
 HOR CL 173 FT
 HOR CL 102 FT (OPEN)
 VERT CL 44 FT

Under no circumstances, will UNLIMITED clearances for bascule bridges be charted.

In addition to adding restricted horizontal clearance information to the bascule bridge label text, the following caution note will be added to all nautical products depicting bascule bridges:

CAUTION
 BASCULE BRIDGE CLEARANCES

For bascule bridges, whose spans do not open to a full upright or vertical position, unlimited vertical clearance is not available for the entire charted horizontal clearance

The caution note shall be in black, 7 pt. Swiss Light type style, set either 2 inches or 3 1/2 inches wide, and be placed in a prominent location on the chart.

a. Bridge Card File

Bridge clearances ([NOAA Form 76-90](#)) are filed in the production branches. They are compiled by the cartographer making the chart application from [USACE](#) construction permits and USCG Completion Reports, the five volume Bridge Book, supplements to the Bridge Book, and information from State governments.

The bridge card (see [Figure 3-3](#)) is compiled as follows: The section headed "[Charts](#)" lists all charts showing the clearance for a particular bridge. The "[Mile](#)" designation on the form is the distance (to the nearest hundredth of a mile) from the mouth of the waterway to the bridge, with lines drawn through the geographic areas unaffected by this application. The "[Waterway](#)" designation is the name of the waterway the bridge crosses. The "[Description](#)" should include the name associated with the bridge (e.g. Interstate 70, Norfolk Southern Railroad, etc.) and the name of any nearby locality. The ("[Latitude](#)" and "[Longitude](#)" shall be scaled from the chart using the center of the waterway as the

2. Gulf coast from longitude 84°00' to the Mexican border, filed first by longitude and second by latitude.
3. Pacific coast including Alaska and Hawaii, filed first by latitude and second by longitude.
4. Great Lakes, filed first by longitude and second by latitude.

c. Charting Clearances for New Bridges

Bridge structures are charted in three stages as follows:

(1) Upon Receipt of a USCG Construction Permit

A bridge under construction is charted using a dashed line ([H c](#)) and is labeled "Bridge under construction". A magenta (20 percent 120 LPI) screen extending 500 feet (150 meters) each side of the bridge centerline, from shoreline to shoreline, will be supplemented by the following magenta caution note, if appropriate.

CAUTION
Fixed and floating obstructions, some submerged, may exist within the magenta tinted bridge construction area. Mariners are advised to proceed with caution.

The caution note shall be 7 pt Swiss Light and set either 2" or 3 1/2" wide.

(2) Upon Completion as Reported by the LNM or USCG

When the bridge is reported to be complete, the dashed lines shall be changed to solid lines, the authorized permit clearances shall be added, as shown, and the magenta screen deleted.

Example:

FIXED BRIDGE	
HOR CL 35 FT	AUTH
VERT CL 9 FT	

(3) Upon Receipt of the Completion Report

When the official Completion Report has been received, the bridge clearances should be revised as necessary, and the notation "AUTHORIZED", shall be removed.

When it is necessary to chart a clearance on a newly completed bridge and a USCG-approved "as built" clearance is not available from the Completion Report or Bridge Book, the cartographer should do the following:

Section 3.11.1

NAUTICAL CHART MANUAL

When it is necessary to chart a clearance on a newly completed bridge and a USCG-approved "as built" clearance is not available from the Completion Report or Bridge Book, the cartographer should do the following:

- (a) The clearance as stated in the construction permit should be applied and labeled "AUTHORIZED", provided it is from an approved charting source. After the bridge has been inspected by the USCG and NOS receives "as built" clearances and approval, the label "AUTHORIZED" shall be removed.
- (b) Clearance from a reliable source that has not been issued or approved by the USCG may be charted only if it is clearly labeled as "REPORTED". Special care must be taken to adjust all "reported" values to the bridge clearance datum.
- (c) All fractions of a foot shall be disregarded in determining the final charted clearance.
- (d) The tabulation in the Bridge Book lists clearances referred to low water and high water, except as follows:
 - (i) In tidal waters, the clearance shown refers to MHW and MLW, except in regions of diurnal inequality where the MLLW clearance may be given.
 - (ii) In nontidal waters, the clearance shown at high water refers to the stage at which navigation generally ceases, although there are exceptions. In the Columbia River, charted clearances are referred to Columbia River Datum (MLLW during lowest river stages).
- (e) Clearances above dams are referred to the datum of soundings, which is ordinarily the Normal Pool Elevation.
- (f) Normal Water Surface elevation on certain rivers is considered MHW, for charting purposes.
- (g) Bridge clearance notes (and the bridge name) shall be in 5 pt. Swiss Light type.

3. VHF Radio Capability

Bridge tenders at many of the bridges across navigable waterways are equipped with VHF radios for communication with mariners. Establishing radio communication between the bridge tender and the

REVISED JULY 12, 2000

vessel operator is both convenient and safer than depending upon whistle signals. Using radio, opening arrangements can be made from a greater distance and with greater clarity. Sound signals may be inadequate especially if there is to be a delay in opening the bridge. An unscheduled delay and information as to its reason and duration can be communicated by radio, but not by whistle signals.

The desirability of using radio contact has been specifically recognized in changes to USCG bridge regulations. Accordingly, the information required for mariners to establish VHF radio communication with a bridge tender shall be shown as the last line of the charted bridge clearance note in 5 pt. Swiss type. This information may be accepted from any reliable source. The line shall state "VHF," the call letters and the calling channel, and include "REP" (for "reported") unless specifically cleared or verified by the FCC, the USCG, their official publications, or NOS field parties or inspections. Communication channel numbers should not be shown since this information is given to the mariner by the bridge tender over channel 16, the universal contact channel known to all VHF operators.

3.11.2 Overhead Cables and Crossings

Overhead cables shall be shown across all charted waterways, including single line streams. An identifying label shall be charted with each cable, or group of cables, and shall not be removed unless the cable is removed. Clearances shall be added if the waterway is known to be used for navigation.

The [USACE](#) is the authority for cable clearances, location, and labeling information and for the resolution of discrepancies in cable data. This information is generally provided to the NDB in the form of permits and completion notices which are made into Chart Letters. The overhead cable symbol shall be charted when requested by the cable authority, court or National Transportation Safety Board (NTSB) recommendation, or requestor of similar authority provided the topography is charted or can be justified for charting for other reasons.

In addition, some overhead cable crossing locations are charted from other sources such as NOS [surveys](#), USGS quadrangles, aerial photos, [Notice to Mariners](#), and similar authoritative sources. Great care must be taken in selecting an identifying label for cables from these sources due to the hazardous nature of high voltage power lines. The preliminary label "OVERHEAD POWER CABLE" or "OVHD PWR CAB" is recommended for any cable where identification is questionable. NDB shall be requested to obtain the proper charting information from the USACE.

Overhead Cables ([D 26](#))

Overhead cables are charted with a black dashed line and a label. The label shall state the type of cable and the authorized vertical clearance if hydrographic information shows that navigation can take place on both sides of the cable. Groups of cables attached to the same structure or closely spaced due to chart scale may be represented by a single dashed line. The label shall include all types of cables in the group and the lowest authorized vertical clearance for the group. In areas where

Section 3.11.2

NAUTICAL CHART MANUAL

hydrography or navigation information is not available for both sides of the overhead cable or in areas where this information has been deleted due to larger-scale coverage, the overhead cable symbol shall be charted with a label identifying the type of cable.

The clearance authorized by the USACE, rounded down to the nearest foot or meter, is used for charting.

This information can usually be extracted from the USACE permit or completion notice. Clearances received from sources other than the USACE must be labeled "REPORTED" and forwarded, through NDB, to the USACE for verification. Surveyed or "as built" clearances are of questionable value and may be dangerous due to the fluctuations in the clearance caused by extreme changes in atmospheric conditions.

The difference in electrical potential between power cables and telephone cables must be recognized by cartographers. Power cables may carry many thousands of volts and sometimes high amperage as well. They constitute an extreme electrical hazard to mariners, as well as a physical obstruction. Cables known to be power cables must always carry the word "POWER" in the label. Telephone cables normally carry 0.95 volts and 0.3 milliamps, and then only while ringing; therefore, telephone cables are principally an obstruction. Cables known to be telephone cables shall include the word "TELEPHONE" in the charted label.

For reference to a datum other than Shoreline Plane of Reference, see [Section 3.11.1 "Bridge Clearances"](#).

A card file of cable clearances ([NOAA Form 76-90](#)) is maintained in the same manner as for bridge clearances. See [Section 3.11.1](#) for instructions for filling out this card. The files are compiled primarily from information furnished by the USACE in the form of construction permits and from other authoritative sources. The cable card shall be filled out in red ink.

Overhead cable data are applied the same way that bridge data are applied (see [Section 3.11.1](#)). Cable clearance notes shall be in 5 pt. Swiss Light type:

OVHD PWR CAB
AUTH CL 100 FT

3.11.3 Overhead Cable Cars

The label "OVERHEAD CABLE CAR" shall be used for charting overhead cable cars. The term "tramway" shall not be used.

This feature shall be charted with short dashed black lines as for an overhead power cable ([D 26](#)).

REVISED JULY 12, 2000

If the source states that the cable suspending the car does not carry electric power, it shall be labeled "OVERHEAD CABLE". Otherwise it must be assumed that it may carry power and should be labeled

"OVERHEAD POWER CABLE". This will alert the chart user to the possible hazard to be expected.

The vertical clearance to both the car and the cable shall always be charted when it is available. This will avoid restricting the available clearance for a waterway unnecessarily by charting only the clearance to the car. The car may only cross the waterway occasionally, or even seasonally, thus presenting an obstruction to the mariner only at that time.

These clearances shall be charted as one note:

OVHD CABLE CAR
AUTH CL 37FT
OVHD PWR CAB
AUTH CL 49 FT

**NATIONAL OCEAN SERVICE
Office of Coast Survey
Marine Chart Division**

CARTOGRAPHIC ORDER 029/00

AUGUST 9, 2000

File With Nautical Chart Manual Volume 1, Section 3.12

TO: All Cartographers
Marine Chart Division

SUBJECT: [Overhead Pipes](#)

APPLICATION: All Affected Nautical Charts

Effective immediately, the attachment adds pages 3-41 through 3-48 to the Nautical Chart Manual, Volume 1, Part 1, Seventh (1992) Edition.

The attachment provides guidance for charting overhead pipes. It supersedes any guidance regarding overhead pipes contained in the Desk Reference Guide.

Attachment

Nicholas E. Perugini
Captain, NOAA
Chief, Marine Chart Division

3.12 Overhead Pipe (D 28)

Definition: An OVERHEAD PIPE is a conduit for transporting materials at some height over a land or water surface.

Location and Orientation on the Chart:

U.S. Army Corps of Engineers (USACE) permits are the authority for the location and the vertical clearance of overhead pipes. NOS Surveys, U.S. Geological Survey (USGS) maps, aerial photos, other imagery, construction drawings and Notice to Mariners are additional authoritative sources for charting the location of overhead pipe crossing symbols.

The Nautical Data Branch (NDB) shall refer reports of overhead pipes from non-authoritative sources such as U.S. Power Squadron (USPS) Reports, U.S. Coast Guard Auxiliary Reports, private reports, etc. to the USACE for permits. Until positional information is received from an authoritative source listed above, the overhead pipe symbol shall be charted from the non-authoritative source.

Overhead pipe symbols shall be charted across all waterways, including single line streams.

Overhead pipes shall be charted in their exact geographic position.

Text referring to an overhead pipe shall be located adjacent to the overhead pipe symbol to which it refers.

When the supporting structures for an overhead pipe are considered of landmark value and are located with sufficient accuracy, they shall be charted with the appropriate landmark symbol.

An overhead pipe symbol shall not be charted when attached to a bridge.

An overhead pipe symbol may be displaced slightly when located near a bridge.

An overhead pipe shall not be charted on land.

Feature Recommendation for Notice to Mariners:

A newly applied, revised or deleted overhead pipe shall be referred for a Notice to Mariners.

Line Type and Weight:

Overhead pipes shall be charted with as a distinctive solid line, 0.20mm in line weight.

Size and Shape:

An overhead pipe symbol shall be charted to the size and shape of the standard cartographic symbol shown in [Chart No. 1 \[D 28\]](#).

Vertical Datum Reference:

Vertical clearances are always referenced to a known vertical datum.

In tidal waters, vertical clearances shall be referenced to [Mean High Water \(MHW\)](#).

In non-tidal waters, the vertical clearance shall refer to the [shoreline plane of reference \(SPOR\)](#). Any variation from this practice shall be clearly stated in an explanatory note in the title area of the chart.

For charting purposes, Normal Water Surface elevation on certain rivers shall be considered SPOR.

Vertical clearances above dams shall be referred to the sounding datum stated on the chart, which is ordinarily the Normal Pool Elevation.

Labels (General Rules):

The label for an overhead pipe is typically comprised of two parts; a label identifying the symbol as an overhead pipe and a vertical clearance.

Example:

OVERHEAD PIPE
VERTICAL CLEARANCE 35 FEET

When an overhead pipe symbol is charted from a non-authoritative source for location such as U.S. Power Squadron (USPS) and U.S. Coast Guard Auxiliary Reports, private reports, etc., the overhead pipe shall be labeled as a reported feature.

Example:

OVERHEAD PIPE REPORTED

The [USACE](#) is the authoritative source for all overhead pipe clearances. The Nautical Data Branch shall obtain a permit from the USACE for the vertical clearance of any overhead pipe charted from another source.

A vertical clearance shall be shown for any overhead pipe crossing a waterway showing depth information or if a tabulated marine facility is charted upstream from the overhead pipe.

Vertical clearances of overhead pipes shall be rounded down to the nearest foot (or meter on metric charts; meter and decimeter if the clearance is less than 10 meters).

An overhead pipe shall not be labeled, "Overhead pipeline."

Where space is limited, the following abbreviations are authorized: OVHD, REP, VERT, CL, FT and m.

Labels for overhead pipes shall be charted with 5 pt. Swiss Light type, all capitals.

Labeling (Specific Guidance):

1. Labeling an overhead pipe charted from a USACE permit.

An overhead pipe, authorized by the USACE, shall be labeled as shown.

Example:

OVERHEAD PIPE
VERTICAL CLEARANCE 35 FEET

2. Labeling an overhead pipe when a non-USACE source reports a vertical clearance greater than the vertical clearance authorized by the USACE.

The vertical clearance authorized by the USACE shall be retained when a non-USACE source reports a vertical clearance greater than the vertical clearance authorized by the USACE. The NDB shall refer the reported clearance to the USACE for confirmation upon receipt of the report.

Example:

OVERHEAD PIPE
VERTICAL CLEARANCE 35 FEET

Section 3.12

NAUTICAL CHART MANUAL

3. Labeling an overhead pipe when a non-USACE source reports a vertical clearance less than the clearance authorized by the USACE.

The vertical clearance authorized by the USACE shall be retained when a non-USACE source reports a vertical clearance less than the vertical clearance authorized by the USACE. In addition, the vertical clearance reported by a non-USACE source shall also be shown immediately below the authorized clearance as a reported clearance with the year of the report included. The NDB shall refer the reported clearance to the USACE for confirmation upon receipt of the report.

Example:

OVERHEAD PIPE
VERTICAL CL 35 FEET
VERTICAL CL 31 FEET REPORTED 1999

4. Labeling an overhead pipe when a vertical clearance is reported by an authoritative source for location listed above other than the USACE and no authorized clearance has been received from the USACE.

The vertical clearance reported by an authoritative source for location other than the USACE shall be charted as a reported clearance with the year of the report included. The NDB shall refer the reported clearance to the USACE for confirmation upon receipt of the report.

Example:

OVERHEAD PIPE
VERTICAL CL 31 FEET REPORTED 1999

5. Labeling an overhead pipe when a vertical clearance is reported by a non-authoritative source such as U.S. Power Squadron (USPS) Reports, U.S. Coast Guard Auxiliary Reports, private reports, etc. and no authorized clearance is available from the USACE.

No vertical clearance shall be charted. The overhead pipe shall be labeled as a reported feature when the overhead pipe symbol is charted from a non-authoritative source. The NDB shall refer the reported overhead pipe and vertical clearance to the USACE for confirmation upon receipt of the report.

Example:

OVERHEAD PIPE REPORTED

ADDED AUGUST 9, 2000

6. Labeling an overhead pipe when no vertical clearance information is available.

A label identifying the symbol as an overhead pipe shall be charted when a vertical clearance has not been obtained. An overhead pipe symbol shall be labeled as reported when the symbol is charted from a non-authoritative source for location such as U.S. Power Squadron (USPS) Reports, U.S. Coast Guard Auxiliary Reports, private reports, etc. In either case, the NDB shall refer the overhead pipe to the USACE for a permit.

Examples:

OVERHEAD PIPE

OVERHEAD PIPE REPORTED

7. Labeling an overhead pipe charted across a waterway that does not show depth information nor a tabulated marine facility charted upstream from the overhead pipe.

A vertical clearance shall not be charted when an overhead pipe symbol is charted across a waterway that does not show depth information nor a tabulated marine facility upstream from the overhead pipe. A label identifying the symbol as an overhead pipe shall be charted. An overhead pipe symbol shall be labeled as a reported feature when the symbol is charted from a non-authoritative source for location such as U.S. Power Squadron (USPS) reports, U.S. Coast Guard Auxiliary reports, private reports, etc.

Examples:

OVERHEAD PIPE

OVERHEAD PIPE REPORTED

8. Labeling an overhead pipe attached to a bridge when the vertical clearance of the pipe is less than the vertical clearance of the bridge.

The vertical clearance of an overhead pipe attached to a bridge shall be shown when the vertical clearance of the overhead pipe is less than the vertical clearance of the bridge.

Example:

OVERHEAD PIPE
VERTICAL CLEARANCE 47 FEET
FIXED BRIDGE
HOR CLEARANCE 200 FEET
VERTICAL CLEARANCE 50 FEET

9. Labeling an overhead pipe crossing a waterway near a bridge.

In these instances the vertical clearance of the overhead pipe shall be combined with the bridge clearances, as close as possible to the symbols for the overhead pipe and the bridge.

Example:

OVERHEAD PIPE
VERTICAL CLEARANCE 47 FEET
FIXED BRIDGE
HOR CLEARANCE 200 FEET
VERTICAL CLEARANCE 50 FEET

10. Labeling multiple overhead pipes that cross a waterway adjacent to each other

The vertical clearances authorized by the USACE shall be combined, showing the clearance of the lowest overhead pipe. The total number of overhead pipes represented shall be listed first in the label. Vertical clearances authorized by the USACE shall not be combined with reported clearances.

Example:

3 OVERHEAD PIPES
VERTICAL CLEARANCE 37 FEET

Color:

Overhead pipes and associated labeling shall be charted with black.

ADDED AUGUST 9, 2000

Feature Removal from Chart:

A charted overhead pipe shall not be removed until conclusive evidence that the feature does not exist in the charted position. Such evidence shall be from USACE reports, NOS hydrographic surveys, USGS maps with field inspection, aerial photos or other imagery with field inspection, or construction drawings with specific reference to removal. Non-authoritative sources (e.g., U.S. Power Squadron Reports, U.S. Coast Guard Auxiliary Reports, private reports, etc.) do not have sufficient authority to declare a feature non-existent.

In instances where non-authoritative sources identify an overhead pipe not visible in its charted position, the feature shall remain charted until removal has been confirmed by an authoritative source listed above.

Overhead Pipe Card File:

A card ([NOAA Form 76-90](#)) for each overhead pipe shall be maintained with the Bridge Card File (see [Section 3.11.1](#)) in the compilation area. The specific card shall be revised every time source data is selected regarding that specific overhead pipe. The card is completed as follows:

1. CHART(S):

List all charts showing the specific overhead pipe.

2. MILE:

Enter the distance (to the nearest hundredth of a mile) from the mouth of the waterway to the overhead pipe, if known.

3. TYPE OF STRUCTURE:

Cross out the words “Bridge” and “Cable” and add the term, “Overhead Pipe”.

4. GEOGRAPHIC AREA:

Cross out the geographic areas unaffected by this application. “Great Lakes” may need to be added, if appropriate.

5. WATERWAY:

List the name of the waterway the overhead pipe crosses.

6. LATITUDE, LONGITUDE:

The latitude and longitude shall be scaled using the center of the crossing as the reference point.

7. CHARTING NOTE:

List the overhead pipe labeling exactly as charted.

8. AUTHORITY:

List the source document identification that added, revised or deleted the overhead pipe symbol, associated label or clearance.

9. REMARKS:

Write a short narrative of the cartographic action taken, substance flowing through pipe, ownership of pipe and telephone number of owner, if known.

10. DATE:

Enter month, day and year the overhead pipe was compiled and the date reviewed.

11. INITIAL:

List initials of compiler and reviewer.