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Defence Topographic Map for 1:50,000 Scale (DTM50) Data Product Specification (DPS) - Portrayal Catalogue (PC)

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Copyright:	

Document history

Version	Date	Comments	Authors
1.1	1 March 2023	First version of the DTM50 to be ratified. V1.1 is used, instead of v1.0 in order to indicate the content alignment between MTM v1.1 and this DTM50 v1.1	Chad Wettlaufer (CAN)

Foreword

The purpose of this document is to describe the content and arrangement of a Defence Topographic Map for 1:50,000 Scale (DTM50). A DTM50 is a hardcopy map characterized by a high level of planimetric detail and quantitative representation of relief using elevation contour lines. The various features shown on the map are represented by standard symbols. These symbols are explained in the margin of the map along with other information about the map and its content. Topographic map content includes symbolization of transportation and cultural features, vertical obstructions, hydrography, hypsography, vegetation, boundaries, geographic place-names, along with a Military Grid Reference System (MGRS) grid.

The Data Product Specification for Topographic Maps consists of three parts:

- **DGIWG-252-1_DTM50_DPS** - This Defence Topographic Map Data Product Specification (DTM DPS), which defines the requirements for a hardcopy topographic map product at 1:50,000 scale.
- **DGIWG-252-2_DTM50_DPS_PC** - The Defence Topographic Map Data Product Specification Portrayal Catalogue (DTM DPS PC), which defines requirements for the portrayal of feature data on hardcopy topographic maps.
- **DGIWG-252-3_DTM50_DPS_AC** - The Defence Topographic Map Data Product Specification Annotation Catalogue (DTM DPS AC), which defines requirements for the portrayal of non-feature (marginalia) data on hardcopy topographic maps.

Note: *All three of the above documents are required to produce a topographic map product.*

Comments, questions, or suggestions to improve this document should be addressed to the Defence Geospatial Information Working Group secretariat@dgiwg.org

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1 Overview

This Defence Topographic Map for 1:50,000 Scale Portrayal Catalogue (DTM50 PC) defines requirements for the portrayal of feature data on a 1:50,000 Defence Topographic Map. It is a non-normative presentation of information and provides additional detailed descriptions of data elements. See DTM50 DPS Feature Catalogue (FC) for a listing of the features to be portrayed on a DTM50. Features not listed in the DTM50 FC shall not be portrayed.

Features shall be portrayed based on the symbol criteria contained in the DTM50 PC. However, not every instance of a feature may be symbolized on a DTM50. Some feature geometries or combinations of feature attributes and enumerants are not portrayed.

1.1 Basic principles of portrayal

A topographic map is a graphic representation of a portion of the Earth's surface that is systematically plotted to scale upon a plane surface to represent the horizontal position and vertical relation of topographic and cultural features in measurable form. The following provides basic principles and concepts for the production of 1:50,000 Scale Defence Topographic Map content.

1.1.1 Finished map feature accuracy

The finished map can be no more accurate than its extracted data, nor will it contain more information than is incorporated in the extraction. Extreme care must be exercised in the portrayal and positioning of map detail so that the finished map will not only meet standards of accuracy, but also satisfies the purpose of the map.

1.1.2 Symbol representation

The ideal situation in map/chart production is realized when map features are shown true in shape, orientation, and scale. However, such representation is impossible. This is evident when, for example, a 1 kilometre square on the surface of the earth at the scale of 1:50,000 must be condensed into a small square 20.0 mm by 20.0 mm. An attempt to portray each feature true to scale would result in a map difficult to read. Many features would be delineated so minutely as to defy recognition.

To be intelligible, many of these features are shown by conventional and/or intuitive symbols which must be exaggerated in size well beyond the actual ground limits of the features represented. For example, at the reproduction scale of 1:50,000, and using prescribed symbolizations: a point building would cover an area on the ground equivalent to approximately 25 m by 25 m; the width of a two lane road would be approximately 35 m; and the symbol for a single-track railway would occupy a width equivalent to approximately 15 m. The portrayal of many other features requires similar exaggeration.

Therefore, it is impossible to show each and every feature as extracted. Only the most important and most easily recognizable features are normally shown, especially those required for the specific use of the map. The omission of unimportant features detracts little from the value of the map. Their inclusion would not only create dangerous exaggerations of position, but would also clutter the map with a multitude of

unnecessary detail, which would make it difficult for the map user to readily identify the more important features. Through finishing and generalization rules, the portrayal of extracted features can be manipulated in order to achieve this end result.

1.1.3 Portrayal of map features

Beyond basic principles, the portrayal of extracted map features involves the utilization of rules which assist in the generalization, displacement, thinning, representation, suppression, labelling, etc. of symbols (see also Annex J). This portrayal should be important from a military standpoint.

Where choice lies among several secondary features, the most prominent landmark features are preferable. In areas of moderate or dense culture, a particular feature could be unimportant and its omission would not necessarily detract from the use of the map. On the other hand, a similar feature in an area of sparse culture would be important as an aid in orientation.

1.1.4 Positioning and displacement of feature symbols

The required accuracy standards shall be applied in the positioning of map symbols. Ideally, all symbols should be placed on their true representative position wherever scale permits. The centre and orientation of a symbol should correspond with the centre and orientation of the feature represented.

Since many symbols are larger (points) or wider (curves) than the features they represent, displacement of these symbols is often necessary to maintain the minimum spacing between them for clarity on the map. Displacement of symbols representing natural hydrographic features (rivers, inland water bodies, land water boundaries, etc.) should be avoided whenever possible.

When necessary, features such as railways, roads, cart tracks, trails, pipelines, cables, embankments, canals, ditches, buildings and similar features may be displaced from each other and from natural hydrographic features. When displacing symbols, their relative position to other symbols shall be retained.

Parallel linear features shall be displaced outwardly from their collective centre (or from a natural hydrographic feature) a minimum of 0.20 mm between each succeeding feature. There is no maximum but should remain as close as possible. Building and building-like point and surface symbols shall be displaced to maintain a 0.20 mm space between themselves and between most curve feature symbols.

Unique “vertically orientated” point symbols, i.e. Aerials, Smokestacks, Towers, Water Towers and Vertical Obstructions, etc., may overprint adjacent linear symbols such as Cart Tracks, Railways, Rivers, and Roads.

2 Feature-specific portrayal guidance

The following sections provide additional clarification guidance to feature portrayal topics not otherwise contained in either the Product Objects (Annex A) or Finishing, Generalization and Labelling Rules (Annex J).

2.1 Transportation

2.1.1 Land Transportation Ways

2.1.1.1 Land Transportation Ways in Built-Up Areas

Land Transportation Ways within a Built-Up Area (BUA) shall be symbolized either as a street or as a "through-route" road (see Figure 1). "Through-routes" are those roads that provide rapid and direct passage through the Built-up Area. They serve as the main arteries of intersection through a populated place and may include both the direct routes and the alternate routes that bypass the congested areas in the city.

- A Land Transportation Way wholly contained within the limits of a Built-Up Area shall be symbolized with a street symbol (either a hard surface or loose surface street) if it is not designated as a "through-route".
- All other Land Transportation Ways within a Built-Up Area shall be considered "through-routes" and shall be symbolized the same as the original Land Transportation Ways outside a Built-Up Area. This can include a major thoroughfare entering a Built-Up Area but which ends at a connection to another "through-route" inside the Built-Up Area.
- All "loose surface" Land Transportation Ways within or along the outer edge of a Built-Up Area shall be shown with the loose surface street symbol.

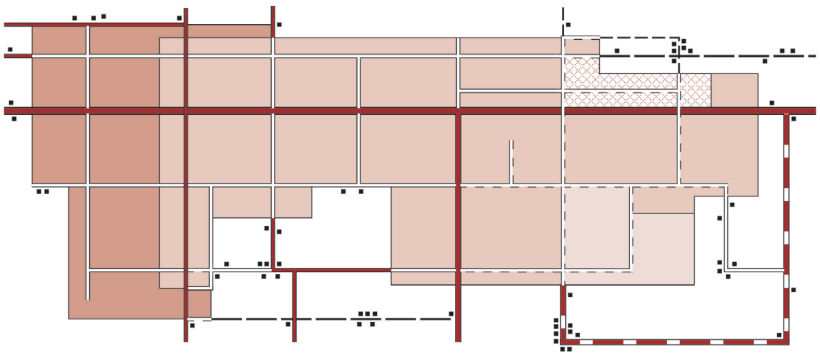

Figure 1. Streets and through routes in a BUA

2.1.1.2 Land Transportation Way points of change

Points of change in non-symbolized Land Transportation Way information (i.e. label change for number of lanes, "closed in winter" label) shall be indicated by a tick perpendicular to the upper side of the Land Transportation Way (see Point of Change symbol in Annex A).

2.1.1.3 Route markers

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

Route marker information, if not contained in Route (AP035) Route Identification [RIN] data, should be derived from official ancillary sources per project guidance. When source materials do not clearly indicate the type of route, the national route marker symbol shall be used.

See section 3.19 for route marker placement guidance.

2.1.1.4 Cart Tracks and Trails

The rules used to determine which instances of Land Transportation Way features should be depicted as Cart Tracks and Trails are, in part, defined by considering the populated width of the feature. This is the result of more comprehensive attribution not being available in the 2016-2 DGIF baseline. As a result, the features portrayed as Cart Tracks or Trails may not exactly correspond to the source data if the source vectors were derived from MGCP data.

2.1.2 Bridges, Overpasses and Tunnels

2.1.2.1 Masking of hydrographic features for bridges

All hydrographic features (surface and curve) shall be masked out for all bridges except foot bridges.

2.1.2.2 Stacking of bridges

Where two or more bridges are stacked vertically, the bridges at each level below the top level shall be masked by the above level bridge.

2.1.2.3 Bridges and Tunnels

Bridges and tunnels shall be labelled with the generic descriptive term “Bridge” or “Tunnel” if neither end of the bridge or tunnel appears on the map.

2.1.3 Railways

2.1.3.1 Railway points of change

Points of change in non-symbolized railway information (i.e. label change for number of tracks, gauge change) shall be indicated by a tick perpendicular to the upper side of the railway (see Point of Change symbol in Annex A).

2.1.3.2 Railway gauges

The standard international railway gauge is 1.435 meters. All railways with a gauge greater than 1.435 meters are considered broad gauge and railways with a gauge less than 1.435 meters are considered

narrow gauge. In each country, there is a normal or predominant railway gauge which may be a broad gauge, a narrow gauge or the standard gauge.

2.1.3.2.1 Normal gauge equals standard gauge (1.435 meters)

- Normal gauge railways are symbolized with “broad, standard” gauge railway symbols. Railway gauge labels are not required.
- Railways with a gauge greater than the normal gauge are symbolized with the “broad, standard” gauge railway symbols. Railway gauge labels are required for all broad gauge railways on the map.
- Railways with a gauge less than the normal gauge are symbolized with “narrow” gauge railway symbols. A narrow gauge railway note may be added to the notes section if all railways on the map, symbolized by narrow gauge railway symbols, are the same gauge. If a narrow gauge railway note is shown, railway gauge labels are not required. If all railways on the map symbolized by narrow gauge railway symbols are not the same gauge, then railway gauge labels are required for all narrow gauge railways.

2.1.3.2.2 Normal gauge greater than standard gauge (> 1.435 meters)

- Normal gauge railways are symbolized with “broad, standard” gauge railway symbols. Railway gauge labels are not required.
- Railways with a gauge greater than the normal gauge are symbolized with the “broad, standard” gauge railway symbols. Railway gauge labels are required for all broad gauge railways on the map.
- Railways with a gauge less than the normal gauge, but greater than or equal to the standard gauge, are symbolized with “broad, standard” gauge railway symbols. Railway gauge labels are required for all such railways on the map.
- Railways with a gauge less than the standard gauge are symbolized with “narrow” gauge railway symbols. A narrow gauge railway note may be added to the notes section if all railways on the map, symbolized by narrow gauge railway symbols, are the same gauge. If a narrow gauge railway note is shown, railway gauge labels are not required. If all railways on the map symbolized by narrow gauge railway symbols are not the same gauge, then railway gauge labels are required for all narrow gauge railways.

2.1.3.2.3 Normal gauge less than standard gauge (< 1.435 meters)

- Normal gauge railways are symbolized with “narrow” gauge railway symbols. Railway gauge labels are not required.
- Railways with a gauge greater than the normal gauge, but less than the standard gauge, are symbolized with “narrow” gauge railway symbols. Railway gauge labels are required for all such railways on the map.

- Railways with a gauge greater than or equal to the standard gauge are symbolized with “broad, standard” gauge railway symbols. Railway gauge labels are required for all such railways on the map.
- Railways with a gauge less than the normal gauge are symbolized with “narrow” gauge railway symbols. Railway gauge labels are required for all such railways on the map.

2.1.3.2.4 Railway gauge information in map legend and notes

Standard, broad and narrow gauge railway information in the map legend shall be shown as indicated in the Master Legend (DTM50 AC Annex B.5). The legend information does not vary by country or area. In each country, there is a normal or predominant railway gauge which may be a broad gauge, a narrow gauge or the standard gauge. In the “NOTES” section of the map margin, for countries with Railways, the normal railway gauge shall be indicated and the gauge labels for normal gauge railways shall not be shown on the map. Example:

THE NORMAL (PREDOMINANT) RAILWAY GAUGE IS 1.435 METERS.

It is possible for a railway to have more than one normal gauge if the line continues from one country to another. Under such circumstances, the normal gauge for each country shall be indicated. Examples:

THE NORMAL (PREDOMINANT) RAILWAY GAUGE IN RUSSIA IS 1.52 METERS.

THE NORMAL (PREDOMINANT) RAILWAY GAUGE IN POLAND IS 1.435 METERS.

See section 3.7.2 of the DTM50 AC for other applicable Railway gauge map margin notes. Railway gauge information, if not contained in Railway (AN010) - Track Information (ZI017) - Railway Gauge [GAW] data, should be derived from official ancillary sources per project guidance.

2.1.3.3 Railway yards

Railway yards shall be symbolized by a combination of the extracted Railways and Railway Sidetracks within the yard limits. Railway Sidetracks within a Railway Yard should be thinned, as needed, to maintain a minimum spacing of 0.2mm between them.

Railways running through Railway Yards shall receive their normal symbolization.

2.2 Culture

2.2.1 Important buildings

Buildings that are important because of their military significance, cultural importance, or unique appearance and/or construction can be identified by a unique symbol and/or labelling.

2.2.1.1 Important buildings in Built-Up Areas

Where numerous important buildings have been extracted in a Built-Up Area and their portrayal will produce a situation of map illegibility, only the most landmark or prominent buildings shall be retained. It is undesirable to have a profusion of important buildings, especially ones that require labelling, in these areas. Where a selection is required, those that are visible from afar should have first preference for retention. This would include the tallest, the largest and/or the most uniquely shaped building within the area of interest.

2.2.1.2 Important buildings with distinguishing staffs

When a Facility (AL010) or facility-like feature is portrayed by several buildings symbolised with the same distinguishing attached staff or unique symbol, the staff part of the symbol or the unique symbol shall be depicted on only the most prominent building in the group. If the buildings are of equal prominence, the staff or unique symbol shall be depicted on only one of the buildings, generally the most centrally situated in the group. The remaining buildings shall be depicted as regular buildings (surface or point). This may apply to educational, religious, hospital/health, and diplomatic complexes.

2.2.2 Vertical obstructions

All man-made features which are 46 meters or taller above ground level, are a hazard to flight navigation and shall be considered vertical obstructions (VOs). In most cases, the standard symbol for the feature shall be replaced by a vertical obstruction symbol and labelled, indicating the feature name/description of the obstruction and its applicable heights. When some features (Aqueduct, Basin Gate, Bridge, Dam, Defensive Revetment, Embankment, Fence, Flood Control Structure, Offshore Construction, Penstock, Pipeline, Sluice Gate, Stadium, Wall or Water Race) are vertical obstructions, both the vertical obstruction symbol and the standard symbol for the feature shall be portrayed together, with the obstruction symbol placed at the highest point of the feature. The Digital Vertical Obstruction File (DVOF), or other authoritative source(s), shall be queried to ensure all current obstruction data is verified and applied where applicable (also see section 2.2.2.3).

2.2.2.1 Labelling of vertical obstructions

The feature name of a vertical obstruction, as well as the height of the structure above ground level (HGT) and the elevation of the top of the obstruction above mean sea level (ZVH), shall be labelled. If using DVOF listings, HGT values are denoted as “AGL” (above ground level); ZVH values are denoted as “AMSL” (above mean sea level).

When there are two or more single vertical obstruction symbols with the same feature name, that are within 10.0 mm of each other at map scale (in a group such as smokestacks or in a line such as wind turbines), a single label may be applied to the group to avoid clutter. The feature name shall be made plural (i.e. “Smokestacks”), and placed with the VO symbol with the greatest ZVH (AMSL) value, and labelled with the heights of the VO with the greatest ZVH (AMSL) value.

2.2.2.2 Multiple vertical obstruction symbol and labelling

To avoid excessive clutter and improve readability of the map, when two or more vertical obstructions are located close enough to each other such that the VO symbols would coalesce or the space between the symbols is < 5.0 mm at map scale, the normal VO symbols shall be replaced with one multiple VO symbol. It shall be placed at the location of the VO with the greatest ZVH (AMSL) value, and labelled with the heights of the VO with the greatest ZVH (AMSL) value.

2.2.2.2.1 Multiple vertical obstruction feature name

If the feature names are the same for each of the vertical obstructions shown by the multiple VO symbol, the feature name shall be shown as plural (i.e. “Towers”). If the feature names for each of the vertical obstructions shown by the multiple VO symbol are not the same (i.e. a Tower, a Smokestack and a Building), the feature name shall be omitted and only the heights of the VO with the greatest ZVH (AMSL) value shall be used for the label.

2.2.2.2.2 Multiple vertical obstructions within a large city

Some large cities may contain a very dense concentration of buildings, towers, and other features which qualify as vertical obstructions. To eliminate excessive clutter in such cases, the individual VOs should be consolidated and portrayed with one multiple vertical obstruction symbol per applicable UTM grid square, and labelled as indicated in sections 2.2.2.2 and 2.2.2.2.1 above.

When following this guidance, a Blue072 ("aero blue") note shall be added to the ‘NOTES’ section of the margin as indicated below:

CAUTION: WITHIN LARGE BUILT-UP AREAS, ONLY THE HIGHEST VERTICAL OBSTRUCTION PER 1,000M GRID SQUARE IS PORTRAYED.

2.2.2.2.3 Multiple vertical obstructions near aerodromes and helipads

All single VOs within 5.0 mm at map scale (250 metres on the ground) from the portrayed edges of any aerodrome or helipad feature shall be retained and not combined into a multiple vertical obstruction symbol.

2.2.2.3 Additional labelling on vertical obstructions

When an obstruction feature is listed in the DVOF, or other authoritative source, but it is not included in the dataset and cannot be verified on the most current imagery source, additional labeling for this special circumstance is required:

- The feature shall be labeled as “Existence reported”.
- If the latitude and longitude of the unverified VO is listed in the DVOF or other authoritative source only to the nearest minute, it shall also be labeled as “Position approximate”.
- These labels shall be placed between the feature name and the elevation values.
- Use text characteristic ID 15 for these labels (see Annex D).

2.2.2.4 Features shown only if vertical obstructions

Some features are portrayed on the DTM50 only if they are considered vertical obstructions. These features shall be shown with the applicable vertical obstruction symbol only, i.e. there is no "normal" symbol for the feature in Annex A. The list below contains these "VO only" features:

- Billboard
- Bridge Superstructure
- Bridge Tower
- Building Superstructure
- Flagpole
- Gantry
- Grandstand
- Hopper
- Light Support Structure
- Mine Shaft Superstructure
- Outdoor Theatre Screen
- Pylon
- Scoreboard
- Tethered Balloon

2.2.3 Cables, Cableways and Pylons

Cable and Cableway features consist of two elements: the aerial cables or cableways and the pylons which support them. Either or both of these elements can qualify as vertical obstructions (VO) and shall be portrayed as indicated in the following paragraphs. See Annex A for further symbol specifications.

2.2.3.1 Non-vertical obstruction cables, cableways, and pylons

When neither the Cable/Cableway feature nor the supporting Pylons are VOs:

- Non-VO Cable power transmission lines shall be symbolized with a pylon icon component spaced every 20.0 mm, as part of the symbol. Non-VO Cable communication/power distribution lines shall be symbolized with a small open circle component spaced every 7.0 mm, as part of the symbol.
- Cable power transmission lines shall *not* be suppressed within Built-Up Areas, Settlements and Shantytowns. Cable communication/power distribution lines shall be suppressed within Built-Up Areas, Settlements and Shantytowns.
- The pylon icon and open circle components, constituting part of the Cable curve symbols, are *not* necessarily an indication of the actual location of supporting pylons and do *not* need to be placed at directional points of change along the Cable symbol. Pylon features that are not vertical obstructions shall not be symbolized (Figure 2).

- The default orientation for the top of the pylon icon on Cable power transmission lines should point in a northerly direction. However, if the initial rendering of a multi-directional power transmission line symbol reveals that some of the pylons are not oriented in a northerly direction (i.e. upside-down), there is *no* requirement to adjust (or "flip") the pylons (Figure 2).

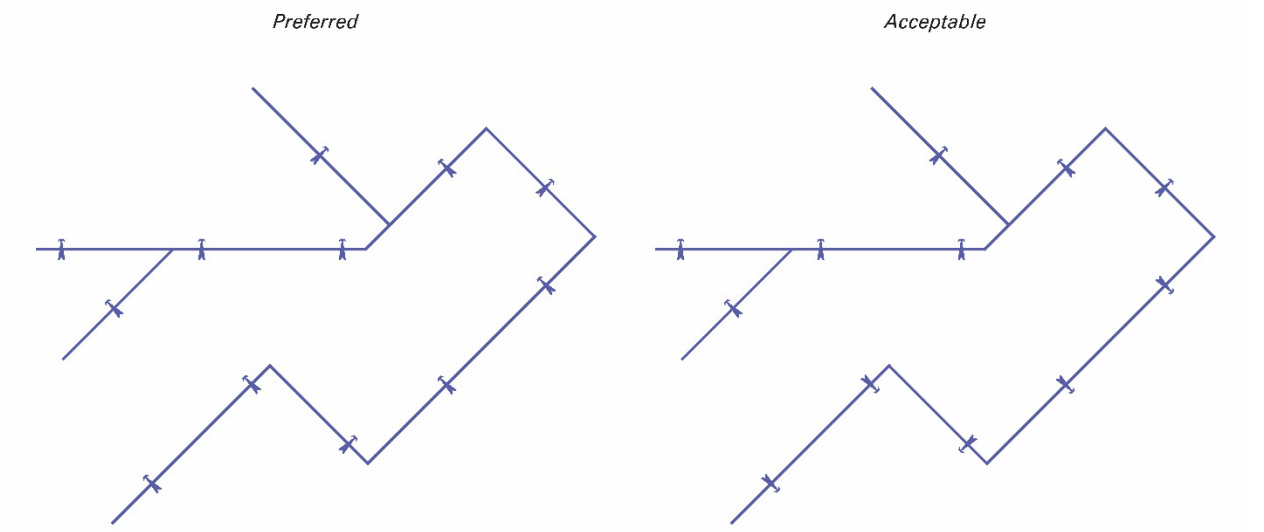

Figure 2. Non-VO Cable power transmission line symbology

2.2.3.1.1 Multiple Cable power transmission line symbolization

To avoid overlapping symbols, whenever the space between the line components of two or more parallel Cable power transmission line symbols is less than 0.5 mm at map scale, the pylon icon of the individual Cable power transmission line symbols may be replaced by a single pylon icon spanning the multiple Cable power transmission line symbols.

2.2.3.2 Pylons as vertical obstructions

When a Cable/Cableway is not a VO but the supporting pylons are VOs:

- Pylon vertical obstruction symbols shall be placed at their actual location(s). Any overlapping pylon icon components of the Cable power transmission line or open circle component of the Cable communication/power distribution line symbol, or those that are < 5.0 mm from a pylon VO symbol, shall be deleted (Figure 3).

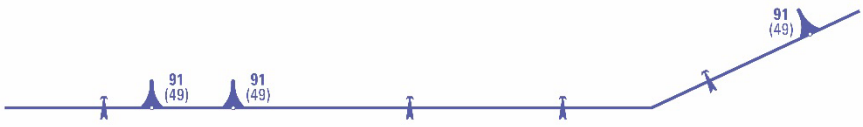

Figure 3. Pylon vertical obstructions along a Cable power transmission line

- If three or more consecutive Pylon VOs coincide with the same Cable or Cableway, and the distance between any of them is less than 15 mm at map scale, then the Pylon VO symbols shall be thinned so that they are no closer than 15 mm from each other. The two outermost Pylon VO symbols along the coincident Cable/Cableway shall be retained. When determining which other Pylon VO symbols to retain, preference should be given to those with the greatest ZVH (AMSL), and those at the change of direction or turning point of the Cable/Cableway.

2.2.3.3 Cable/Cableway as vertical obstructions

When a section of the Cable/Cableway is a VO but the supporting pylons are not VOs (i.e. catenary cable/cableway):

- The VO sections of a cable/cableway shall be symbolized with a curve VO symbol (Figure 4). This symbol is a wider line without the pylon icon or open circle components. The length of those sections less than 125 meters at 1:50,000 scale (250 meters at 1:100,000 scale) shall be increased to that length for clarity.
- Any overlapping pylon icon components of the Cable power transmission line or open circle component of the Cable communication/distribution line symbol, or those that are < 5.0 mm from a Cable VO symbol shall be deleted.

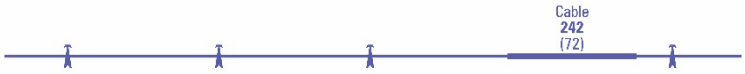

Figure 4. Sections of a Cable power transmission line with curve VO symbol

2.2.3.4 Cable/Cableway and Pylon vertical obstructions

When both the Cable/Cableway feature and supporting pylons are VOs:

- Pylon vertical obstruction symbols shall be placed at their actual location(s) (Figure 5).

Figure 5. Cable/Cableway and Pylon vertical obstructions

- If three or more consecutive Pylon VOs coincide with the same Cable or Cableway, and the distance between any of them is less than 15 mm at map scale, then the Pylon VO symbols shall be thinned so that they are no closer than 15 mm from each other. The two outermost Pylon VO symbols along the coincident Cable/Cableway shall be retained. When determining which

other Pylon VO symbols to retain, preference should be given to those with the greatest ZVH (AMSL), and those at the change of direction or turning point of the Cable/Cableway.

2.2.3.5 Labelling of numerous vertical obstruction pylons

To eliminate repetitive labelling and reduce map “clutter”, the labels for VO Pylons depicted along a Cable/Cableway may be omitted (Figure 6). When these VO labels are omitted, a Blue072 ("aero blue") note shall be added to the ‘NOTES’ section of the margin and read as indicated below based on pylon heights.

Figure 6. Unlabelled Cable/Cableway and Pylon vertical obstructions

2.2.3.5.1 Note for varying pylon heights above ground level

When pylon heights above ground level vary, the following note shall be used:

CAUTION: CABLE/CABLEWAY PYLONS, INDICATED BY AN UNLABELED VERTICAL OBSTRUCTION SYMBOL, RANGE FROM XXX TO XXX METERS IN HEIGHT ABOVE MEAN SEA LEVEL AND FROM (XXX) TO (XXX) METERS ABOVE GROUND LEVEL OVER THE ENTIRE SHEET.

2.2.3.5.2 Note for equal pylon heights above ground level

When pylon heights above ground are of equal value, the following note shall be used:

CAUTION: CABLE/CABLEWAY PYLONS, INDICATED BY AN UNLABELED VERTICAL OBSTRUCTION SYMBOL, RANGE FROM XXX TO XXX METERS IN HEIGHT ABOVE MEAN SEA LEVEL AND (XXX) METERS ABOVE GROUND LEVEL OVER THE ENTIRE SHEET.

2.2.3.6 Labelling of multiple sections of vertical obstruction Cables/Cableways

To eliminate repetitive labelling and reduce map “clutter”, the labels for interim catenary VO Cable/Cableway sections along a Cable/Cableway symbol (due to “rolling” terrain) may be omitted (Figure 7). When these VO labels are omitted, a Blue072 ("aero blue") note shall be added to the ‘NOTES’ section of the margin and read as indicated below based on cable/cableway heights.

Figure 7. Unlabelled sections of vertical obstruction Cable power transmission line

2.2.3.6.1 Note for varying cable/cableway heights above ground level

When cable/cableway heights above ground level vary, the following note shall be used:

> CAUTION: CABLE/CABLEWAY LINES, INDICATED BY AN UNLABELED VERTICAL OBSTRUCTION SYMBOL, RANGE FROM XXX TO XXX METERS IN HEIGHT ABOVE MEAN SEA LEVEL AND FROM (XXX) TO (XXX) METERS ABOVE GROUND LEVEL OVER THE ENTIRE SHEET.

2.2.3.6.2 Note for equal cable/cableway heights above ground level

When cable/cableway heights above ground are of equal value, the following note shall be used:

> CAUTION: CABLE/CABLEWAY LINES, INDICATED BY AN UNLABELED VERTICAL OBSTRUCTION SYMBOL, RANGE FROM XXX TO XXX METERS IN HEIGHT ABOVE MEAN SEA LEVEL AND (XXX) METERS ABOVE GROUND LEVEL OVER THE ENTIRE SHEET.

2.2.4 Land Aerodromes and Runways

2.2.4.1 Aeronautical information

The Automated Air Facilities Information File (AAFIF), or other authoritative source(s), shall be queried to ensure all current Land Aerodrome and Runway data is applied.

2.2.4.2 Land Aerodrome and Runway labelling

A combined label shall be shown for each Land Aerodrome and its associated Runway(s). The label shall consist of elements of the label string for the Land Aerodrome (official AAFIF name, International Civil Aviation Organization [ICAO] identification and physical condition) followed by the label string for the associated Runway(s) (surface composition), followed by the aerodrome elevation. When a land aerodrome consists of more than one runway, the surface composition for the longest intact runway shall be shown. If all runways are not intact, the surface composition for the longest runway shall be shown. The label elements are stacked and centred to each other (Figure 8).

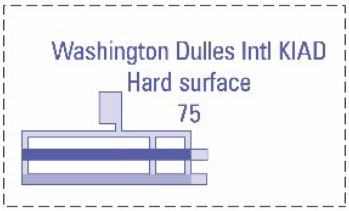

Figure 8. Land Aerodrome and Runway labelling

2.2.4.3 Runway located within a Road

When a runway is located within a road, the portion of the road symbol corresponding with the runway symbol shall be suppressed and the full runway symbol shall be shown in its place.

2.3 Hydrography

2.3.1 River flow arrows

A flow arrow shall be shown when the direction of the flow of water of perennial rivers is not apparent from relief portrayal. Only major or prominent drainage features should be considered for flow arrow clarification. The arrow shall be parallel and adjacent to the symbol when it cannot be accommodated within the outer limits of the symbol. Flow arrows should be placed at the edge of the map face when the symbol exits the sheet. The arrow should also be added to the ends of rivers whose water course cannot be determined after entering areas of large swamps or rice fields. See Annex A, River Flow Arrow (No Code) for specifications.

2.3.2 Coastal hydrographic features

Coastal hydrographic features shall be portrayed in areas of tidal water bodies or rivers, primarily for their landmark significance as referenced above the water level. They include relatively permanent cultural and natural features which are exposed either permanently or variably based on tidal effects. Those features that are “always submerged” shall not be shown.

2.4 Hypsography/Physiography

2.4.1 Landform depiction

The maximum landform information that is consistent with the scale and operational use of the map shall be shown. To achieve this aim, elevation data shall be portrayed by elevation contours, survey points, spot elevations, special symbols, area patterns, and descriptive labelling.

The configuration of landforms shall be represented by elevation contours based on the established vertical datum of mean sea level. Elevation contours shall be generated using automated methods and can utilize various elevation sources such as SRTM, TREX, etc. Although elevation contours generated

using automated methods are acceptable, it is understood that manual refinement may sometimes be necessary.

Refer to Annex A for individual symbol requirements.

2.4.1.1 Unit of measure of elevations

The unit of measure shall be the meter. All elevations shall be expressed as an integer.

Elevation contour values, survey points and spot elevations shall be shown in a manner that will facilitate the reading and interpretation of elevations expressed by elevation contour lines.

2.4.2 Elevation contours

2.4.2.1 Types of elevation contour lines

There are four types of elevation contours: Index, Intermediate, Auxiliary (Supplementary), and Depression.

2.4.2.1.1 Index elevation contours

An index elevation contour is an elevation contour accentuated in line weight to indicate a multiple of the basic elevation contour interval. Conventionally, the index elevation contour shall be a multiple of 50 or 100 and, depending upon the interval, is usually every fifth elevation contour. For example, the 0, 100, 200, 300, etc., elevation contours serve as indexes when the interval is 20. The 0, 200, 400, 600, 800, etc., elevation contours serve as indexes when the interval is 40. Index elevation contours shall be portrayed continuously throughout the sheet even where they may coalesce. Elevation contour values shall always be shown for index elevation contours if space allows. See section 3.11 for additional labelling guidance.

2.4.2.1.2 Intermediate elevation contours

Intermediate elevation contours are lines at the prescribed interval which appear between the index elevation contours and shall be portrayed continuously throughout the sheet even where they may coalesce. Elevation contour values should not be shown for intermediate elevation contours except when located in extremely flat areas.

2.4.2.1.3 Auxiliary (supplementary) elevation contours

Auxiliary elevation contours are represented on the map as dashed lines which can be portrayed at one-half or one-quarter of the basic elevation contour interval. Elevation contour values may be shown on the one-half interval auxiliary elevation contours to assist in the interpolation of relief in flat areas. Elevation contour values shall always be shown on the one-quarter auxiliary elevation contour interval.

Auxiliary elevation contours should be shown only where necessary to depict significant relief features which would not be shown by the normal elevation contour interval. For example, auxiliary elevation

contours should be used to indicate sharp summits or isolated tops if their omission would present the top of the feature as being much flatter than it actually is.

Auxiliary elevation contours should be used when the prescribed elevation contour interval:

- Does not adequately portray the character of relief and slope in flat areas.
- Does not clearly identify isolated relief formations.
- Does not provide sufficient elevations to aid in determining undulating surfaces.
- In unusual cases where the foregoing conditions cannot be adequately satisfied with one-half interval auxiliary elevation contours, the one-quarter interval shall be introduced.

Auxiliary elevation contours may not be continuous. They may be shown in sections of any length, whenever their presence adds to the readability of the topography. However, auxiliary elevation contours, when shown in sections, shall start and end at interpolative points between the normal (index or intermediate) elevation contours.

2.4.2.1.4 Depression elevation contours

Depression elevation contours are ticked elevation contour lines that delimit areas of lower elevation than the surrounding terrain. They are most commonly employed in the portrayal of regions containing vast limestone deposits; however some depressions can be extensive such as those around an intermittent or dry Inland Waterbody, Sabkha, Salt Flat or large basin area. The depth of a depression may be greater or less than the elevation contour interval. Under normal circumstances, only those depressions which are equal to or greater than the elevation contour interval should be depicted. Care should be taken in the treatment of depressions at sheet edges to ensure that the depression elevation contours are continued on or from adjacent sheets.

2.4.2.1.4.1 Portrayal of depression elevation contours

Each depression elevation contour shall have equally spaced ticks extending from the elevation contour towards the lower elevation. The tick interval for all depression elevation contours shall be 1.0mm (Figure 9). Depression elevation contours may be comprised of each of the three types of elevation contours (index, intermediate or auxiliary).

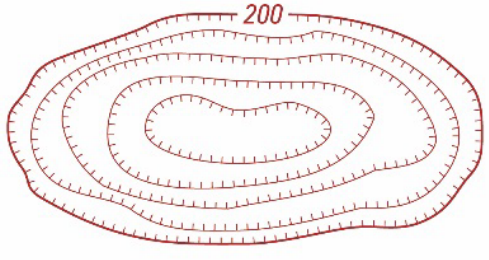

Figure 9. Portrayal of depression elevation contours

2.4.2.1.4.2 Extensive depressions

For a depression covering an extensive area, that may include one or more adjacent sheet(s), only the bottom most depression elevation contours (generally limited to five) should be shown with ticks, as indicated in section 2.4.2.1.4.1.

2.4.2.1.4.3 Depression elevation contours on steep slopes

Where the slope of a depression is such that the elevation contours become very close (near coalescence), the ticks may be reduced in length. If this is not sufficient to prevent the ticks from touching the elevation contours below, intermediate elevation contours may be omitted as necessary to achieve legibility. In areas of intricate topography or in deep depressions, spot elevations should be added at the bottom of the depression, especially if some of the depression elevation contours forming the feature have been omitted.

2.4.2.1.4.4 Index elevation contours in depressions

Wherever possible, index elevation contour values should be added to elevation contours in a depression and to elevation contours in the neighbourhood of a depression.

2.4.2.1.4.5 Mounds within depressions

Mounds within depressions (Figure 10) shall be shown by ticks (pointing downhill) added to the lowest contour defining the mound.

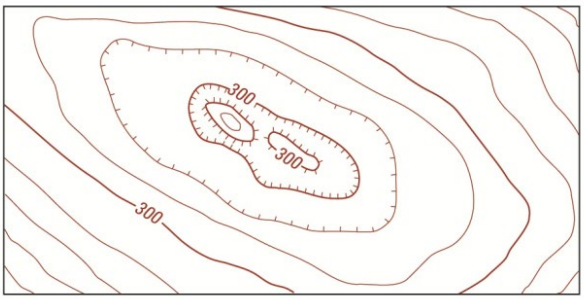

Figure 10. Treatment of mounds in a depression

2.4.2.1.4.6 Areas with numerous depressions

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

2.4.2.1.4.7 Depressions less than the elevation contour interval

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

2.4.2.2 Elevation contour interval

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

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

Guides for the selection of elevation contour intervals are shown in Table 1. These guides should be used in conjunction with other sources, such as the elevation contour interval of prior editions of the map sheets and that of other map sources at similar scales. The Elevation Range is the highest elevation minus the lowest elevation on a map sheet. When determining the elevation contour interval for contiguous sheets within a project, the average elevation range of all sheets in the project should be used.

Relief Category	Elevation Range (meters)	Elevation contour Interval	Index Contour Interval
Low	0 – 100	10 m w/5 m auxiliary	50m
Low-medium	101 – 250	10 m	50m
Medium	251 – 1200	20 m	100m
High	1201 and greater	40 m	100m

Table 1. Guide to selecting elevation contour intervals.

2.4.3 Principles of topographic elevation contouring

2.4.3.1 Topographic expression

2.4.3.1.1 Elevation contours and character of terrain

Elevation contour lines should express the character of the terrain being mapped; i.e., whether the surface is flat, rolling, mountainous, smooth, rough, or dissected. Elevation contours should be portrayed to emphasize the significant shapes of the terrain, while omitting small, relatively unimportant detail, and yet retaining the continuity of important features that fall between the specified elevation contour intervals.

Automated methods of generating elevation contours may create “false” tops and depressions, often along drainage courses, that shall be removed during editing. In relatively flat areas, the automated methods may also generate many small unconnected elevation contours that shall be generalized into a larger elevation contour.

2.4.3.1.2 Generalization of elevation contours

Elevation contours are automatically generated from measured elevation data posts. Some generalization of the resultant elevation contours may be necessary since their exact representation would result in irregular and jagged patterns which would hamper readability. In such instances, the elevation contours may be symmetrically smoothed, but not to the extent that the displacement exceeds the geometric accuracy requirement for the map or misrepresents the physical characteristics of the terrain.

While the elevation contours may be smoothed in order to remove irregular or jagged patterns, the actual elevation post data shall never be smoothed before elevation contour generation. Smoothing the elevation post data can result in the loss of tops and the flattening of valleys.

2.4.3.1.3 Elevation contour development and the drainage network

The drainage network should serve as a natural framework for the development of elevation contours. This allows for a further refinement and shaping of the elevation contours. The resulting "turnbacks" present a more realistic portrayal of the terrain and provide a visual reference of the surrounding slope. At a minimum, all false elevation contour "tops" and depressions shall be deleted when they conflict with drainage features and elevation contour "turnbacks" pointing downhill shall be adjusted (Figure 11). Additional refinement and shaping of elevation contours may be required in supplemental project instructions.

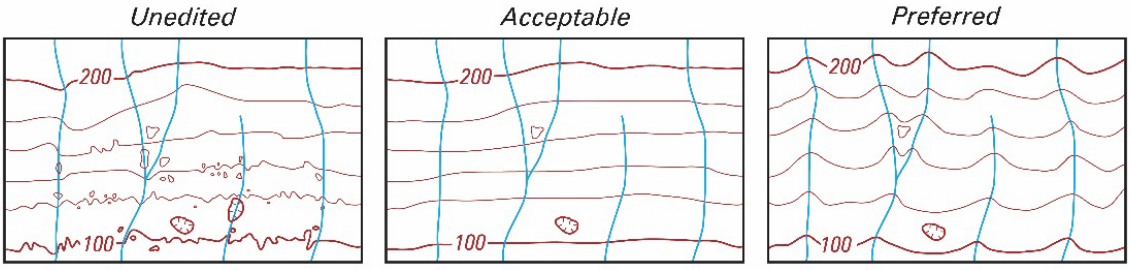

Figure 11. Development of elevation contours by use of drainage features

2.4.3.1.4 Abrupt changes in slope

Terrain features formed by abrupt changes in slope are significant because of their landmark value and their impact on cross-country movement. They may be given special treatment to ensure immediate recognition. Figure 12 illustrates these types of landforms and the appropriate map symbols.

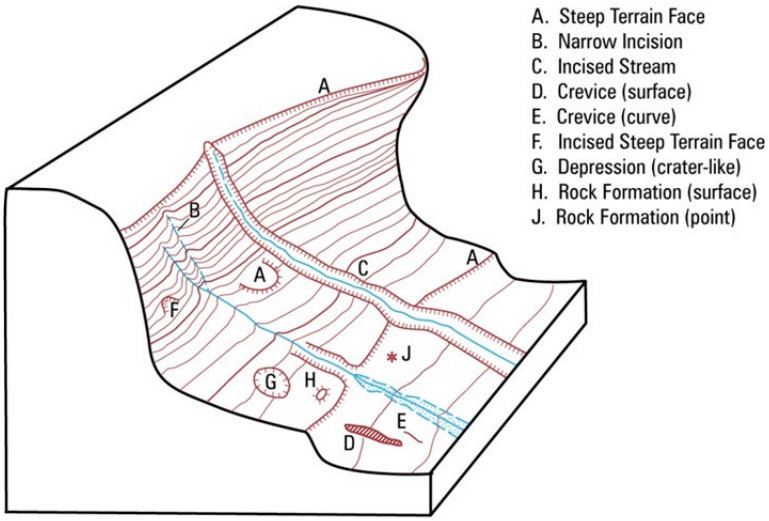

Figure 12. Pictorial illustration and identification of terrain features appearing in abrupt changes in slope

2.4.3.2 Treatment of specified topographic features

The following sections provide guidance for the treatment of hypsographic features that are most frequently encountered. Guidance with respect to the treatment of unusual terrain conditions should be provided in supplemental project instructions.

2.4.3.2.1 Tops and saddles

Elevation contouring of the tops of mountains, ridges, hills, and their connecting saddles should be given careful attention as these features are usually most prominent and significant. They define the extent of watersheds, often define international and administrative boundaries, and may directly control the distribution and location of routes of communication.

2.4.3.2.2 Ridges

Elevation contours portraying the tops of ridges shall be depicted in their true position and shall not be displaced. The most troublesome situation is usually encountered when the relief along the top of a ridge falls within the range of one or two elevation contour intervals. A ridge may consist of a series of distinct tops; but, when strict adherence to the elevation contour interval is maintained, the elevation contours may indicate a smooth unbroken profile. In such cases, the judicious use of spot elevations and auxiliary elevation contours, plus the application of sufficient amount of topographic exaggeration, may be necessary to bring out the distinctive characteristics of the landform.

Precipitous terrain along steep ridges (Figure 13) may be portrayed by the steep terrain face symbol. Elevation contours defining the tops of steep ridges should be allowed to coalesce at the points where they merge with steep terrain faces.

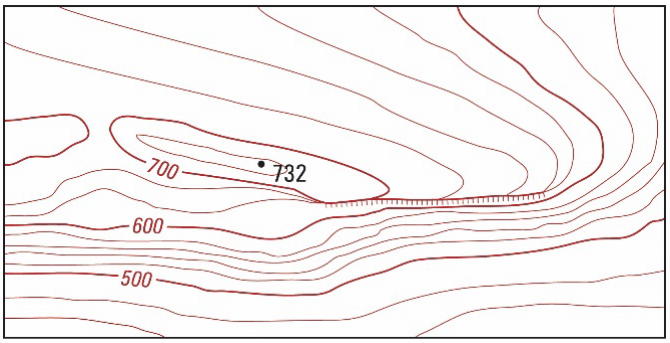

Figure 13. Precipitous ridge

2.4.3.2.3 Areas of steep slope

Areas of steep slope may be portrayed by extracted Steep Terrain Face features and/or by closely spaced or coalescing elevation contours. In areas of steep uniform slope where the elevation contours become very close, the elevation contours should be allowed to coalesce in order to better portray the nature of the terrain. In areas of abrupt change in slope, elevation contours should be allowed to coalesce at the points where they merge with steep terrain faces (Figure 14). Where the coalescing elevation contours adequately depict the steep terrain, or if the predominant feature height is less than the elevation contour interval, the Steep Terrain Face symbols may be omitted.

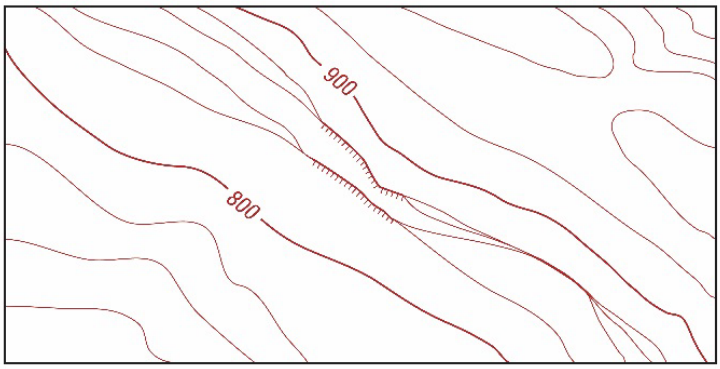

Figure 14. Depictions of areas of steep slope

2.4.3.2.4 Sand dunes

Elevation contours and spot elevations shall be suppressed in sand dune areas only when coincident with un-stabilized sand dunes – i.e. the Sand Dune Stabilized (SAD) attribute is populated as “false”. Otherwise, elevation contours and spot elevations shall be included and portrayed/labelled per standard specifications.

2.4.3.2.4.1 Sand dune area pattern orientation

Sand dune area patterns (AP) shall be orientated to the Sand Dune Orientation (SDO) value. All sand dune APs in Figure 15 are shown with an SDO value of 0 degrees.

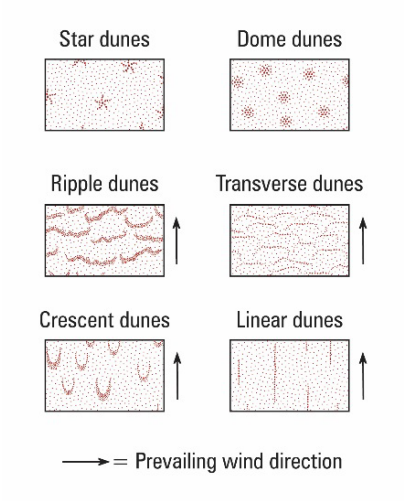

Figure 15. Sand dune pattern orientations

2.4.3.2.5 Extraction mines and quarries

Elevation contours and spot elevations shall not be suppressed in extraction mines and quarries.

2.4.4 Survey points and spot elevations

The inclusion of an adequate number of elevation points (survey points and spot elevations) in support of the relief presentations is a critical requirement. The order of precedence in the portrayal of elevation points shall be:

- geodetic survey points
- non-geodetic survey points
- spot elevations

All elevation points shall be portrayed as an integer. If the source data indicates fractional values, they shall be rounded to the closest integer (less than 0.5 to the lower value, 0.5 or more to the next higher integer). Whenever practicable, spot elevations shall be portrayed in conjunction with readily identifiable ground features.

2.4.4.1 Portrayal of survey points and spot elevations

A black dot symbol "●" shall mark the exact location of spot elevations except for those instances where the elevations are coincident with identifiable points on the ground, i.e., road forks and intersections, railway grade crossings, stream forks, and islands too small to show a locator. In these instances the locator shall not be shown and the elevation should be positioned so that there is no question as to the feature it is identifying. The specified symbol for survey points shall always be portrayed.

2.4.4.2 Elevation points and contours

Survey points and spot elevations are portrayed in conjunction with elevation contours to highlight areas of high and low relief. Since they are shown as integer values, the existence and portrayal of a survey

point or spot elevation equal to the value of a surrounding elevation contour is acceptable but should be avoided whenever possible to prevent possible confusion about slope direction. No attempt shall be made to increase or decrease the survey point or spot elevation value in order to change it from the surrounding elevation contour value.

2.4.4.3 Highest and lowest elevation on map sheet

The highest and lowest elevation points located within each map shall be identified. The highest point must be emphasized by a more prominent type size/font. See Survey Point and Spot Elevation labelling rules in Annex A for more details.

2.4.4.4 Spot elevations on prominent natural features

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

2.4.4.5 Spot elevations on other features

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

- Transportation junctions
- Transportation/Hydrography junctions
- Hydrography junctions
- High points on grades of highways and railways
- Extensive flat areas
- Rims and bottoms of significant depressions
- Surfaces of large and perennial inland water bodies

Spot elevations shall not be shown indiscriminately on the side of slopes or in those areas where they cannot be readily identified with a topographic or cultural feature, unless necessary for identifying the highest and lowest elevations on a map sheet.

2.4.4.6 Spot elevation density

The number of spot elevations portrayed should be increased in high relief areas. Areas of low, flat terrain should require fewer spot elevations. The key to spot elevation density is to show an adequate number of heights for features that are readily identifiable to a user, who may be in any location on the ground. As a general rule:

- The number of spot elevations per sheet in high relief areas should be between 50 and 150
- The number of spot elevations per sheet in low relief areas should be between 25 and 75
- The minimum spacing between spot elevations should be 20 mm
- The maximum spacing between spot elevations should be 200 mm

Spot elevations associated with mountain passes are excluded from density and spacing considerations.

2.4.4.7 Order of preference guidance for spot elevation placement

When encountering decisions as to where to place spot elevations, the following guidance should be followed:

1. In high relief areas with many prominent natural features, the following order of preference should be followed:
    - named prominent natural features
    - high elevations
    - order of preference listed in #2 below
2. In low relief areas where there is a lack of prominent natural features, the following order of preference should be followed:
    - improved transportation junctions (all-weather roads)
    - lesser transportation junctions in sparse/remote areas where improved transportation is not available
    - transportation and hydrography junctions, with preference being placed on perennial drainage hydrography junctions if transportation network is sparse

2.5 Boundaries

2.5.1 Boundaries policy

International boundaries and other lines of separation of sovereignty shall always be shown on the map. Administrative subdivision boundaries shall not be shown on the map unless exact boundary alignment information is available. All boundaries shall be included in the boundaries diagram in the margin unless otherwise specified in supplementary instructions.

The Digital International Boundaries database (DIBDB), or other authoritative source(s), shall be queried to ensure all current boundary data is applied.

See the DTM50 AC section 3.3.6.2 for details on what boundaries are shown in the boundaries diagram. All boundaries on the sheet shall be included in the legend.

2.5.2 Approximate boundaries

An “approximate” boundary is one that cannot be accurately delineated because of inadequate information. This determination is supplied as project specific guidance only. Boundaries deemed approximate shall be portrayed per PC specifications, with an additional label of "(APPROXIMATE)". Use text characteristic ID 48 for this label (See Annex D).

2.5.3 Boundary names and labelling

2.5.3.1 Labelling of international boundaries and other lines of separation

The international boundary and other lines of separation of sovereignty shall be identified in the map interior. Country names shall be placed opposite each other on the appropriate sides of the boundary symbol. See section 3.8.2 for examples of label placement.

2.5.3.2 Labelling of boundaries of administrative subdivisions

Boundaries of administrative subdivisions may be identified in the map interior. Subdivision names shall be placed opposite each other on the appropriate sides of the boundary symbol. However, where insufficient information exists for placing administrative subdivisions, the administrative subdivision boundaries and names shall only be shown in the boundaries diagram.

2.5.3.3 Labelling if no boundaries on sheet

Where no boundaries of any kind fall on the sheet, the first-order (and second-order if required by project instructions) administrative subdivision names shall be identified in the boundaries diagram only.

2.5.3.4 Labelling of status of non-definitive boundaries

Where appropriate, labelling which describes the status of a non-definitive boundary shall be shown parallel to the boundary symbol. When shown in connection with a country name, the label shall be shown in parentheses following the country name. Examples are: "(IN DISPUTE)"; "(INDEFINITE)". The label should be repeated as necessary for clarity.

2.5.3.4.1 Point of change for non-definitive boundary status

A change in the status along a non-definitive boundary shall be shown by a point of change symbol and placed perpendicular on the boundary symbol. Appropriate labelling shall be shown at the point of change. See Annex A, Point of Change for specifications.

2.5.4 Special treatments for boundaries

2.5.4.1 Coincident boundaries

When the limit of an administrative subdivision is coincident with that of an administrative boundary or other line of separation of sovereignty, the symbol for the administrative subdivision shall be suppressed.

2.5.4.2 Boundaries and Land Transportation Ways

2.5.4.2.1 Boundary within Land Transportation Ways

A boundary that occurs within a Land Transportation Ways shall be symbolized in its correct alignment. Every third unit of the appropriate boundary symbol shall be shown and the component lengths and spaces of the symbol are maintained. Additional complete units may be added at salient points--road

junctions, angles, departures from the road--to provide continuity of the boundary alignment. If applicable, the boundary overprint shall be shown as a continuous band.

2.5.4.2.2 Boundary at edge of Land Transportation Ways

When a boundary follows an edge of a Land Transportation Ways, every third unit of the appropriate boundary symbol shall be shown overprinting the edge of the Land Transportation Ways symbol. Additional complete units may be added at salient points to provide continuity. If applicable, the boundary overprint shall be shown as a continuous band touching the Land Transportation Ways edge.

2.5.4.2.3 Boundary in Land Transportation Ways with uncertain location

When it is uncertain whether a boundary follows the centre or the edge of the Land Transportation Ways, the boundary shall be shown in the centre of the Land Transportation Ways.

2.5.4.3 Boundaries and drainage features

2.5.4.3.1 Boundary within surface drainage

A boundary shall be completely symbolized in its correct position when it occurs within a surface drainage feature which is wide enough to accommodate the black-line portion of the symbol. When the correct position is unknown, the boundary symbol shall be centred in the drainage feature.

2.5.4.3.2 Boundary along shoreline of surface drainage

Where the boundary follows a shoreline of a surface drainage feature, and information is available that the boundary coincides with the high-water line, every third unit of the appropriate boundary symbol shall be shown overprinting the shoreline. If applicable, the boundary overprint shall be shown as a continuous band touching the shoreline. Boundary symbols are not shown along a Land Water Boundary adjacent to Tidal Water unless needed for clarity or otherwise required by supplementary project instructions.

2.5.4.3.3 Boundary within curve drainage

A boundary coincident with a curve drainage feature shall be symbolized in its correct position. Every third unit of the boundary symbol shall be shown. Additional units may be added at salient points - drainage feature junctions, departures from the drainage feature - to provide continuity of the boundary alignment. If applicable, the boundary overprint shall be shown as a continuous band. Boundary symbols are not shown along a Land Water Boundary adjacent to Tidal Water unless needed for clarity or otherwise required by supplementary project instructions.

2.5.4.3.4 Boundary within braided drainage

The boundary symbol shall be completely symbolized through areas of braided drainage features.

2.5.4.4 Boundaries in water bodies

2.5.4.4.1 Boundary within inland water body

A boundary which crosses an inland water body, either completely on one sheet or on two adjacent sheets, shall be completely symbolized.

2.5.4.4.2 Boundary (other than international) within tidal water body

A boundary (other than international) which crosses a large body of tidal water shall be completely symbolized if its alignment is fixed. When the boundary alignment is not fixed, the boundary shall be shown in the tidal water area at the points of entry. At appropriate intervals, depending on the size of the body of water, two or three continuous units of the symbol should be shown in logical position.

2.5.4.4.3 International boundary within tidal water body

International boundaries shall not be shown crossing a large body of tidal water. The symbol shall terminate at the points of entry into the tidal water area. Exceptions may be specified in supplementary project instructions.

2.5.4.5 Boundaries coincident with projection lines

A boundary which is coincident with a projection line shall be completely symbolized and centred on the projection line.

An exception to the foregoing shall be when the line weight of the boundary symbol is the same line weight as the projection line. In this case the boundary shall be portrayed in its entirety, 0.25 mm inside the projection line.

2.5.5 Expurgated areas and boundaries

An expurgated area of the map is an area that is devoid of almost all map features or information for a given country(s), usually as a result of non-mapping agreements between the countries to be mapped.

The expurgated area (country) shall be left completely void of map information except for projection/grid data, certain hydrographic features (described below), and the labelling of that country's name along the administrative (international) boundary separating the countries. Administrative (international) boundaries within expurgated areas shall also be shown and labelled. All other features shall terminate at the international boundary.

2.5.5.1 Boundary in hydrographic feature on expurgated map

Where the international boundary falls within a surface (area) aqueduct, canal, ditch, inland water body or river, the complete surface drainage feature shall be shown, including any islands. Surface drainage features in the expurgated area flowing into or out of the drainage feature forming the international boundary shall not be shown (the water tint terminates at the intersection of the surface drainage features).

2.5.5.2 Boundary and coastal shoreline on expurgated map

When an international boundary ends at a land-water boundary (coastal shoreline), the complete land-water boundary and tidal water symbology shall be shown. Surface drainage features in the expurgated areas flowing into or out of the tidal water area shall not be shown.

2.5.5.3 Geographic names associated with expurgated country(s)

In cases where there are different geographic names for the same drainage, tidal water, or other features, those geographic names associated with expurgated country(s) shall not be shown.

3 Geographic names and labelling

Refer to Annex A for the labelling rules and text characteristics of features.

3.1 Geographic names treatment: General

This section provides basic guidance for the treatment of geographic names, descriptive information, and expressions of political status on maps at the standard scales of military mapping. Geographic names-related data includes the identification of geographic features portrayed on the map, descriptive terms, administrative subdivision and sovereignty nomenclature, and statements of political and administrative status, as well as certain information that appears in the map margin.

3.1.1 Source of geographic names

The GEOnet Names Server (GNS), or other authoritative source(s), shall be used to determine geographic names. The GNS is not to be used for final name placement, only for determining the general location of the feature to be labelled. Whenever available, native or other source maps, materials, or data should be used to assist in determining the final placement of geographic names.

3.1.2 Importance of geographic names

Geographic names and descriptive information are integral components which provide necessary aids to the identification of features depicted on the map. They can also provide important information that cannot be portrayed by map symbols. Maximum naming of features is extremely important to the user.

3.1.3 Consistency of naming between sheet limits

Names shall also be verified across sheet limit lines. Features being named that extend across sheet lines shall be labelled on all sheets that contain that same feature. For example, the names of drainage and large area entities (mountains, Built-Up areas, area or tribal names, etc.) may need to be repeated across sheet limit lines for continuity. Ancillary native sources should be used as a reference in the placement of names.

3.1.4 Selection of names and descriptive terms

The final selection of names and descriptive terms to be shown depends on the geographic area that is being mapped, the prominence or importance of specific geographic features in the area, and the military requirements levied for the project. There can be no rigid rules established for an order of importance in naming features. Populated places may take precedence in heavily populated temperate climate areas. In arid terrain, water wells and natural pools (springs) may attain prime importance; whereas in polar and mountainous regions, glaciers, ice peaks and snow/ice fields could be significant features.

3.2 Policies for application of geographic names

3.2.1 Geographic names standards

The spelling of geographic names on maps shall be consistent with the form prescribed, or acknowledged as official, by the United States Board on Geographic Names (BGN) or the UK Permanent Committee on Geographic Names (PCGN).

3.2.2

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3.2.3 Geographic names disclaimers

Any deviations from the above policies shall be denoted with an applicable disclaimer note in the NOTES section of the margin. See DTM50 DPS AC section 3.4.1.2 for more information.

3.3 Definitions

3.3.1 Toponyms

A toponym is a proper noun applied to a topographic feature or reflecting a conceptual location used in mapping. The study of geographic names is called toponymy. Toponyms include:

Proper place names identifying geographic features.

They are either without benefit of generic terms:

- Chicago
- Andes
- Scotland
- Everglades

Or they are comprised of a generic term and specific elements:

- Bay of Biscay
- North Sea

- Lake Superior
- Amazon River
- Rocky Mountains

Proper place names identifying conceptual locations. Examples:

- Tropic of Capricorn
- Arctic Circle
- Greenwich Prime Meridian

3.3.2 Descriptive terms

Descriptive terms are labels which identify certain characteristics of a feature or area. Descriptive terms shall be shown in English in the map interior unless otherwise specified in project specific guidance. Examples:

- (construction)
- Refinery
- Rocky
- Numerous wells
- Status in dispute

3.3.3 Conventional names

A conventional name is a commonly used English-language name for use in addition to, or in lieu of, a local official name or names in an area where English is not the official language. When required, the conventional name shall be added in parentheses along with the native name. Examples:

- Tarabulus (Tripoli)
- München (Munich)
- Moskva (Moscow)

3.3.4 Variant names

A variant name is usually a former name or a name derived from a different Romanization system which may or may not be recognized as official. Variant names should not be shown on a DTM50 unless otherwise noted in the project specific guidance. Examples of variant names (with new official name in parentheses):

- Leningrad (Saint Petersburg)
- Peking (Beijing)
- German Ocean (North Sea)

3.3.5 Ideograms

An ideogram is a composite graphic symbol expressing an idea; such graphic symbols are used, for instance, in Chinese writing. Examples:

- 北京 Beijing
- 西安 Xi'an

3.3.6 Diacritics

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

- Ţ, ţ, and ū in Ţarţūs
- Ḥ and ş in Ḥimş

3.3.7 Glossary

A glossary is a list of the generic and descriptive terms, plus their English equivalents, that appear on the map or series of maps. The glossary may also contain any abbreviations used on the map or series of maps. Alternatively, a separate list may be used for abbreviations.

3.3.8 Romanization

Romanization is the process of converting non-Roman script characters into the Latin alphabet (see also Transliteration section 3.3.12).

3.3.9 Romanization system

A Romanization system is a set of rules governing the rendition of characters, such as ideograms, in approximate phonetic Latin-alphabet equivalents.

3.3.10 Specific term

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

- "Grand Bahama" in Grand Bahama Island
- "Potomac" in Potomac River
- "Carlsbad" in Carlsbad Caverns
- "Ontario" in Lake Ontario
- "Blanc" in Mont Blanc

3.3.11 Generic term

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

- "Island" in Grand Bahama Island
- "River" in Potomac River
- "Caverns" in Carlsbad Caverns
- "Lake" in Lake Ontario
- "Mont" in Mont Blanc

3.3.12 Transliteration

Transliteration is the process of recording the graphic symbols of one writing system (or script) in terms of corresponding graphic symbols of a second writing system (or script). A transliteration system is a set of rules for transliteration. For example:

Greek: Ελληνική Δημοκρατία

Transliteration: Hellēnikē Dēmokratia

English translation: Hellenic Republic

3.4 Labelling

This section provides the basic guidelines for the placement and selection of all interior labels on topographic maps. The guidelines established in this section shall be followed unless otherwise specified in project specific guidance. See also:

- Annex A, Product Objects – provides labelling rules and information for applicable map symbols.
- Annex D, Text Characteristics - provides type fonts, colours, styles and sizes established for labels.
- Annex J, Finishing, Generalization and Labelling Rules – provides baseline label placement (LP) and finishing label (FL) rules for various map symbols.

3.4.1 Importance of label placement

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

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

3.4.2 Preferred positioning of labels

Preferred positioning of labels as outlined in these specifications is established to assure standard treatment. Label placement (LP) rules in the DTM50 PC establish the baseline position of type with a symbol. Subsequent finishing label (FL) rules are to be used when this preferred baseline position does not allow for proper readability of the map.

3.4.3 Punctuation on labels

Punctuation shall be omitted except for hyphens and apostrophes which are integral parts of official designations. Periods shall not be used with abbreviations or acronyms.

3.4.4 Labelling and proper names

Topographic maps contain many unique symbols representing various features, attributes and enumerants. Annex A Label Rules indicate which of these symbols require a label to identify the symbol as well as those which may be shown with a proper name.

3.4.5 Labelling or including map symbols in legend

Map symbols which do not require an identifying label should normally be shown in the map's symbol legend. When legend space is limited, and there are only a few instances of a particular map symbol, the symbol may be labelled on the map. Conversely, a few features are shown with a unique symbol as well as a label to avoid including them in the symbol legend. On maps where these features are very common, they can be added to the legend and not labelled on the map in order to avoid clutter. Such features include Cairn, Dragon's Teeth, Extraction Mine/peat cuttings, Geothermal Outlet and Rapids.

3.4.6 Abbreviations

The use of abbreviations for generic descriptive labels should be avoided whenever possible. However, the following abbreviations may be used in areas with many symbols and labels in order to avoid map clutter. Additional abbreviations may be used if specified in project instructions. All abbreviations used shall be included in the Glossary or Abbreviations list. The list below shows how the abbreviations would be shown in the Glossary. See also DTM50 AC, section 3.6.

- Cem …….. cemetery
- Coll ……. college
- Comm …….. communication
- Const …… construction
- Damg …… damaged
- Dest …….. destroyed
- Dism ……. dismantled
- ES …… elementary school
- Elev …….. elevator
- Fac ……. facility

- Gov …… government
- HS …….. high school
- HC…….. hydrocarbon
- Instl …….. installation
- Lns …….. lanes
- Mil …….. military
- Mus …….. museum
- Obs …….. observatory
- PS …….. primary school
- RR …….. railroad, railway
- SS …….. secondary school
- Shr …….. shrine
- Sta …….. station
- Sto …….. storage
- Tks …….. tracks
- Tw …….. tower
- Univ …….. university
- Unmt …….. unmaintained

3.5 Principles of label placement

While this section establishes the basic guidelines for label placement as applied to individual situations, it is emphasized that these rules are subject to exceptions, such as when the juxtaposition of situations causes conflict in the rules. In such situations, the overriding factors in judging which label takes precedence are determined from a standpoint of graphic legibility and order of importance. To avoid overprinting other labels or symbols in areas of dense features, the feature label string may be shortened. The following attribute values may be deleted:

- Geographic Name : Full Name [ZI005_FNA]
- Structural Material Type [MCC] or Product [PPO]
- Terrain Morphology [SRD] or Terrain Surface Material [TSM]
- Physical Condition [PCF]
- Surface Material Type [SMC]
- Bog Type [BOC]
- Extraction Mine Type [MZN]
- Power Source [POS]
- Condition of Facility [COS]
- Gate Use [GTC]
- Crop Information : Crop Species [ZI013_CSP]
- Crop Information : Farming Pattern [ZI013_FFP]
- Water Resource Information : Water Type [ZI024_SCC]

3.5.1 Purpose of label placement

Labels shall be positioned to assure immediate and unmistakable identification of the feature being labelled. When possible, type shall be placed in areas of sparse symbolization to avoid obscuring important land formations and other detail.

3.5.2 Basic label placement

Labels can be placed either in a straight line or smooth curve depending on the character of the feature being identified (Figure 16).

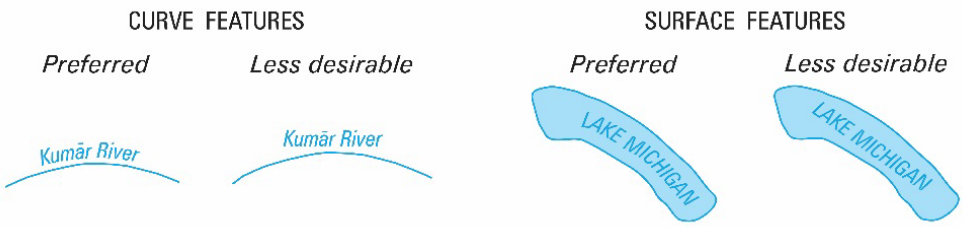


Figure 16. Straight line or smooth curve label placement

3.5.3 Orientation of label placement

The orientations for label placement, to read from left to right, are shown by the direction of the arrows in Figure 17. The one exception to these established orientations occurs when adjacent curve features are nearly parallel to a perpendicular orientation. In this case, the orientation of text for the labelling of the near-parallel adjacent features should be made to agree with that of the perpendicular orientation.

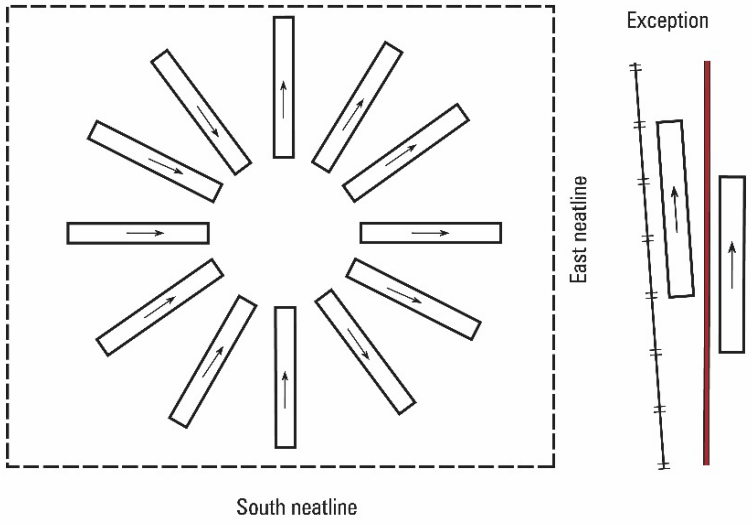


Figure 17. Orientation for label placement

3.5.4 Multiple labels/labelling small concentrated groups

When labelling individual symbols or small concentrated groups of symbols comprising a single feature, the label shall be positioned adjacent to the feature or symbol defined. Preferred and acceptable alternate positioning of labels, with exception of control and spot elevations, is illustrated in Figure 18.

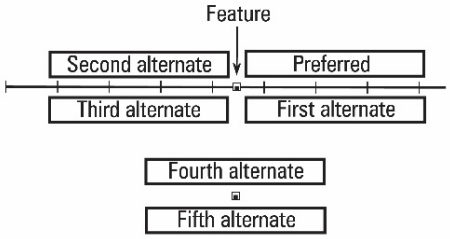


Figure 18. Labelling of a single symbol or a small concentrated group of like symbols

3.5.5 Cartographic judgment in labelling

There are some cases that require cartographic judgment in the placement, spacing, and treatment of labels. The following paragraphs provide guidance for treatment of such cases.

3.5.5.1 Labelling in dense map detail

When map detail is extremely dense, it may be necessary to place labels a distance from a feature to avoid obscuring the detail. A leader line (Figure 19) should be positioned to point from the label to the feature symbol. The colour of the leader line shall match the colour of the feature being labelled. See Annex A, Black Leader Line for specifications.

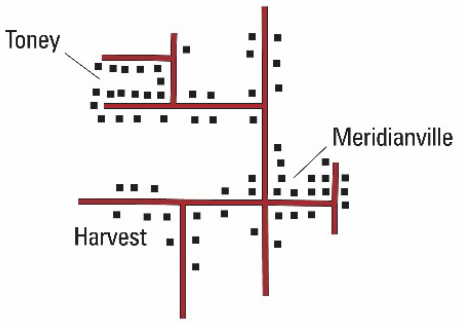


Figure 19. Labelling of features with a leader line

3.5.5.2 Letter and word spacing

Space permitting, names consisting of all capital letters (except for Built-up areas) should be centred within an area being identified. If the area is extensive, letter spacing can be used to properly identify the extent of a feature (Figure 20). When letter spacing is used and the name is composed of two or more words, the space between words shall be equal to three times the space between letters. Type which is letter or word spaced shall be positioned so that the name stands out distinctly as a complete name. In congested areas, caution is advised on the use of maximum spacing since the continuity of names may be disrupted. Letter or word spacing of multiple names that cross or intersect one another should be avoided.

Figure 20. Letter spacing of names for extensive areas

3.5.5.2.1 Letter spacing of mixed case names

It is permissible to letter space names shown in mixed case for the labelling of dispersed/scattered villages and large areas of vegetation. See section 3.6.3.1 and 3.6.3.2 for details.

3.5.5.3 Alignment of letters

Regardless of the type style, when letters are spaced on a curve, the letters shall be aligned perpendicular to the curve.

3.5.5.4 Positioning of alternate names

Alternate names should be positioned below the primary name in the case of point or surface features, and following the primary name in the case of curve features. Alternate names should be enclosed by parentheses and shown in the same style of type as the primary name, unless otherwise instructed in project specific guidance.

3.5.5.5 Ideograph placement

In areas where ideograph translation of Romanized names data is required, the placement of ideographs shall be in compliance with 3.5.5.4 (above), except that: parentheses shall not be used; the ideograph type size should be compatible with the Romanized version; and the legibility of the ideograph shall be maintained.

3.5.5.6 Clarifying terms

When a descriptive term is added for the purpose of clarifying a primary name (i.e. destroyed, construction, elevated), unless otherwise noted, it shall be enclosed by parentheses and shown in lower

case lettering. The parenthesized type should be positioned immediately following or centred directly below the primary name it clarifies.

3.6 Labelling/naming of populated areas

Populated areas can be depicted on the map by individual buildings or by various Built-Up Area symbols. The relative importance of populated areas shown by Built-Up Area symbols are portrayed on the map via the use of five unique type styles for the respective names. Built-Up Area “1st class” through “5th class” text characteristics shall be used for labeling (see Annex A for details).

3.6.1 Classification of Built-Up Areas

The classification of a Built-Up Area shall fit five predetermined categories of relative importance - normally based on population, administrative importance, or geographic extent. Previous editions of the map or other maps of the same area can be used to help determine the classification of a Built-Up Area. This classification is then used in the labeling criteria of a Built-Up Area.

The five categories of relative importance of Built-Up Areas are determined as follows.

3.6.1.1 Population figures

When accurate population figures are available, they should serve as the basis for the five categories of relative importance. The only exception being that a national capital should always be 1st importance regardless of population figures.

The population breakdown and the relative importance equivalent are:

- More than 500,000 - 1st importance.
- 100,000 to 500,000 - 2nd importance.
- 25,000 to less than 100,000 - 3rd importance.
- 5,000 to less than 25,000 - 4th importance.
- Less than 5,000 - 5th importance.

3.6.1.2 Administrative importance

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

- National capital - 1st importance.
- First order administrative subdivision (province, state, or department) capital - 2nd importance.
- Second order administrative subdivision capital (county seat or chartered city) - 3rd importance.

- Third order administrative subdivision capital or main town - 4th importance.
- Other Built-Up Area - 5th importance.

3.6.1.3 Geographic extent

When population and administrative importance data are not available or not reliable, Built-Up Area classification should then be determined by the geographic extent of the Built-Up Area. The general geographic extent breakdown and relative importance equivalent are:

- Greater than 100 sq. kilometers – 1st importance.
- 25 to 100 sq. kilometers – 2nd importance.
- 10 to 25 sq. kilometers – 3rd importance.
- 2 to 10 sq. kilometers – 4th importance.
- Less than 2 sq. kilometers – 5th importance.

Proper names of well-known sections within a large city should be shown in the text characteristics for 3rd, 4th or 5th class Built-Up Areas and should be based on the geographic extent of the respective section.

3.6.2 Populated areas names placement

When labeling a surface Built-Up Area the name should be placed within the symbol if the area is large enough to support the name. If the Built-Up Area is too small to support the location of the name inside, it should be placed adjacent to the Built-Up Area and aligned in accordance Figure 21. Built-Up Area “1st class” through “5th class” text characteristics shall be used for labelling (see Annex A for details).

The names for smaller populated areas, including those represented by individual building symbols, shall be positioned in close proximity to the subject area (Figure 21). The type should be placed at, or near, the junction of the most heavily traveled routes passing through the populated area. Built-Up Area “5th class” text characteristics shall be used for labeling small towns and villages represented by building symbols.

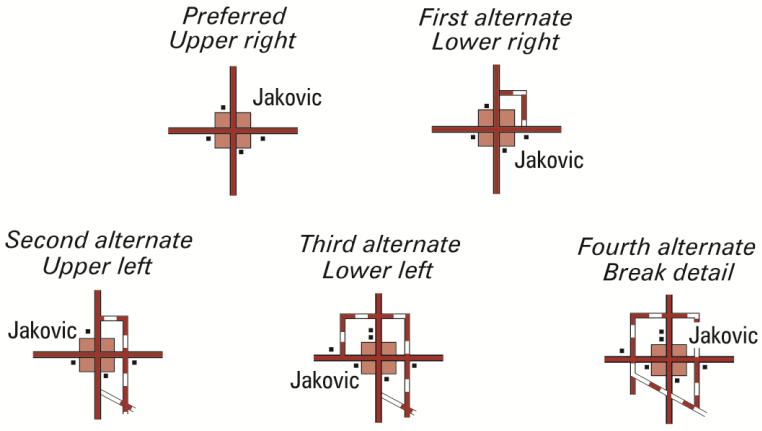


Figure 21. Labelling of small Built-Up Areas or concentrated buildings

The labelling of populated areas comprised of semi-scattered dwellings strung out along major communication routes should be placed adjacent to the junction of the main thoroughfares bisecting the populated area (Figure 22).

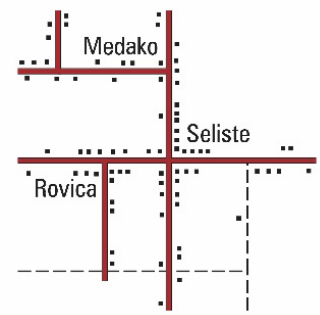


Figure 22. Labelling of populated areas along major communications routes

In some rural areas, populated areas may be comprised of dispersed buildings that are often identified by references to prominent local features. Where this occurs, the name should be positioned in the immediate vicinity of the feature referenced and extended toward the general area it serves to identify (Figure 23).

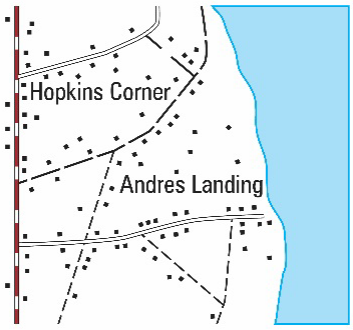


Figure 23. Labelling of populated areas relative to prominent local features

3.6.3 Other populated area names

Topographic maps may contain other “populated areas” that are not necessarily extracted and/or symbolized as distinct feature entities, but are indirectly identified via the use of proper names. These names may be shown in a different text characteristic than normal Built-Up Area text. See Annex D and sections below for details.

3.6.3.1 Dispersed populated areas and farmsteads

A dispersed populated area comprised of numerous, individual farmsteads, ranches, etc. requires unique treatment (Figure 24). The letters in the name of the populated area should be spaced over the approximate center of the area. Although it is preferable for the type to be placed parallel to the south neatline, it may be placed in an angular position or curve to better identify the approximate limits of the populated area. Use text characteristic ID 110 for dispersed populated area names and ID 113 for farmstead, ranches, etc. names (see Annex D).

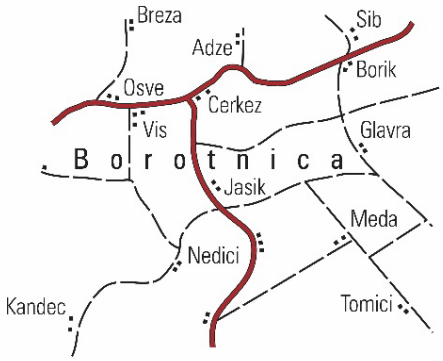


Figure 24. Labelling of a dispersed populated area with numerous farmsteads

3.6.3.2 Widely-scattered buildings

In labeling a populated area represented by widely-scattered building symbols (Figure 25), the type should be letter spaced or extended to indicate the approximate limits of the area defined. Use text characteristic ID 111 for widely-scattered populated area names (see Annex D).

Figure 25. Labelling of a populated area with widely scattered buildings

3.6.4 Special cases for labelling of populated areas

3.6.4.1 Names along shorelines

Names for populated areas that are located along shorelines should be placed entirely in the open water area (Figure 26). Where developed areas are located adjacent to (but inland from) the shoreline, the name should be placed entirely on the land area.

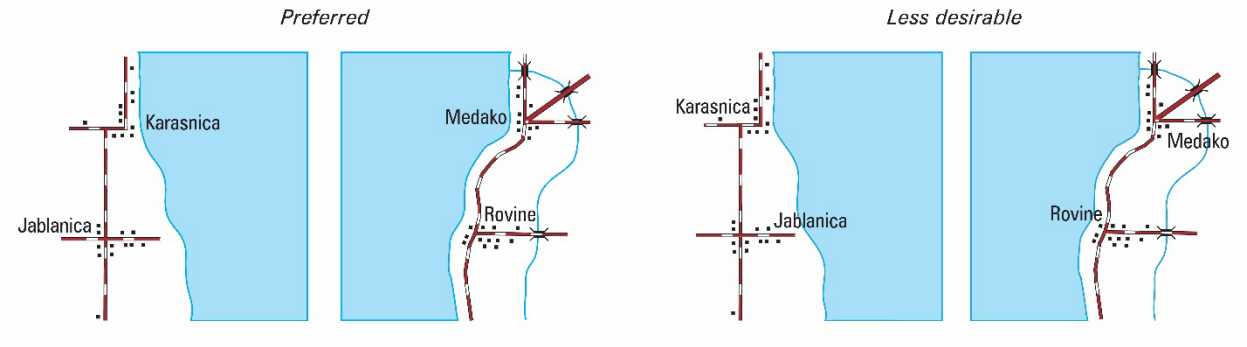


Figure 26. Placement of names along a shoreline

3.6.4.2 Repeated generic terms

In cases when the generic term associated with populated areas is repeated numerous times on a map sheet, the generic term may be abbreviated. The full generic term and its properly abbreviated form shall be included in the map glossary. Where mapping situations warrant this treatment, the authority to abbreviate the generic term should be specified in project specific guidance.

3.6.4.3 Distinct populated areas with the same name

Separate, distinct populated areas that have the same name shall be assigned sequential numbers enclosed by parentheses. These populated area names shall be numbered per individual sheet lines. When this occurs, a note shall be added to the map margin stipulating that the number in parentheses indicates that more than one populated area is so named. See also DTM50 AC section 3.7.2 for details.

3.7 Labelling of point and small surface features

When labelling point and small surface features that require descriptive text and/or a proper name, the type shall be positioned in accordance with section 3.4.2 (Figure 27).

3.7.1 Labelling groups of identical features

Small groups of identical features can have their normal singular label replaced by a plural label, i.e. “Silos” rather than placing “Silo” several times (Figure 27).

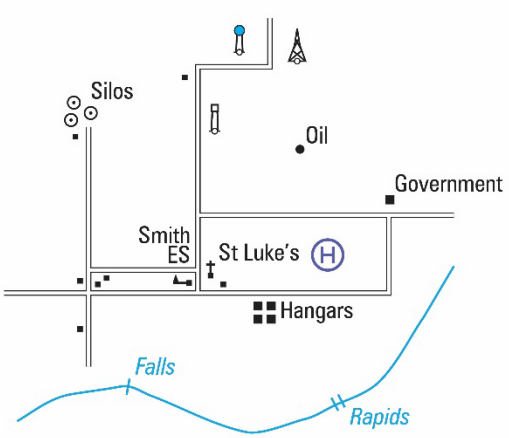


Figure 27. Point feature label placement

3.7.2 Labelling of isolated or obscured symbols

Point and small surface features which are portrayed by a unique symbol, and included in the map legend, normally are not labelled as part of their default portrayal. However, with space permitting, these features may be labelled if they are located in areas devoid of other symbols or when the symbol may be obscured by other features such as elevation contours, or hydrographic, hypsographic or vegetation area patterns. Use text characteristic ID 1 for these labels (see Annex D).

3.8 Labelling of linear (curve) features

When practicable, the labels for linear features such as rivers, roads, railways, etc., shall be placed parallel to the upper side of the feature as viewed from the south neatline.

Wherever possible, labelling should be placed along the straight segments of linear features rather than the curved portions. When there is no alternative but to label these features along a curve, a curving of type should be maintained (see Figure 16).

3.8.1 Repetition of linear feature names

Names for linear features shall never be letter spaced or extended. When a name placed at the middle point of a linear feature does not identify it sufficiently, the name shall be repeated at distances of between 150 mm to 300 mm to further clarify the symbol. When names consist of more than one word, the words should be retained as a unit and not be spaced far apart. Placing names with large gaps between the individual words will lead to confusion as to the correct name of the feature.

3.8.2 Labelling of boundaries

When labelling boundaries, the names of the countries or administrative subdivisions shall be placed on the side of the boundary symbol which corresponds with the area being identified (Figure 28). The names should be positioned adjacent to one another and parallel to the boundary symbol separating them.

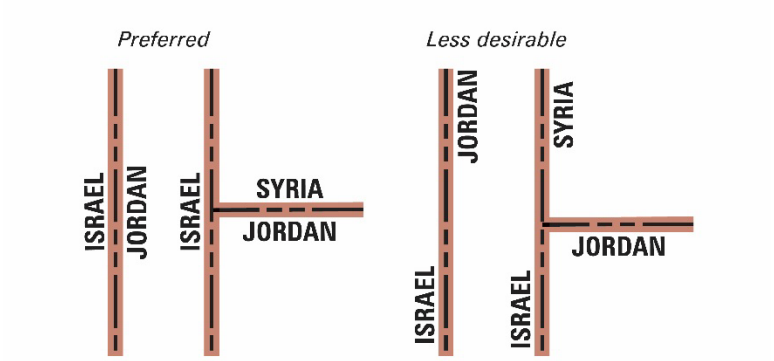


Figure 28. Boundary labelling

3.8.3 Labelling of drainage

In the placement of drainage type, "U" or inverted "U" shaped labelling should be avoided. When labelling surface (“double-line”) drainage, the name should be placed within the shorelines, provided the feature is wide enough to accommodate the entire name (Figure 29). Type shall not be positioned partially in or out of double-line drainage. The names for double-line drainage features shall be shown in all capital letters.

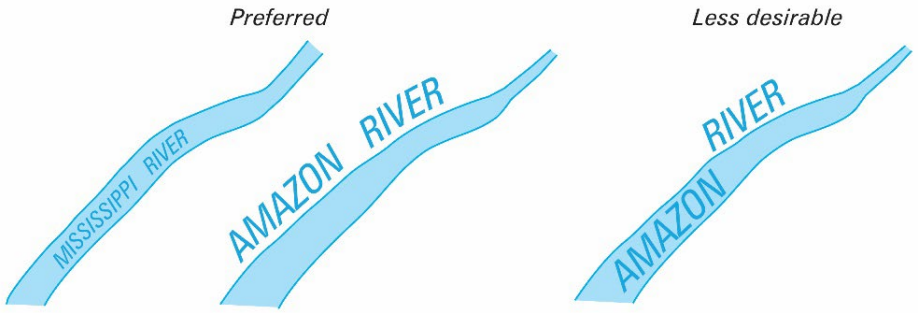


Figure 29. Labelling of surface drainage features

3.8.4 Labelling of tributary drainage features

The names for smaller drainage features which form tributaries of a river or larger drainage feature should be positioned as close to their outlet as is reasonably possible (Figure 30).The names for drainage symbolized by a single line shall be shown in upper and lower case lettering.

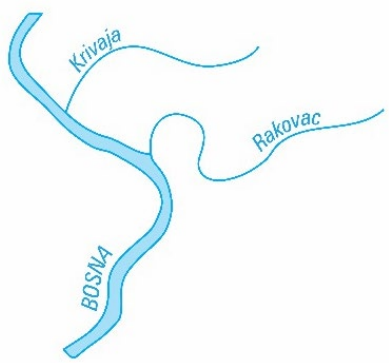


Figure 30. Labelling of small rivers and tributaries

3.8.5 Small linear features

Geographic names may be omitted when linear features are not long enough to accommodate the entire name or its authorized abbreviation. Descriptive labels required for short curve symbols can be identified via the use of a leader line (see Figure 19).

3.9 Labelling of survey points

3.9.1 Preferred positioning of survey point elevation values

The elevation values for survey points shall be positioned to the southeast side of the point symbol. When this is not possible, the values shall be positioned as indicated in Figure 31.

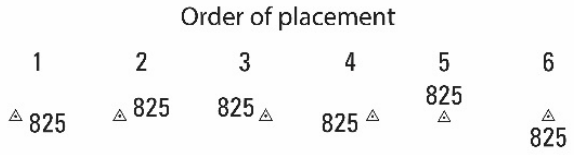


Figure 31. Survey point labelling

3.9.2 Survey point identification

There are instances when survey points are identified with a name or a station number. When this occurs, the name/number and corresponding value shall be positioned as indicated in Figure 32.

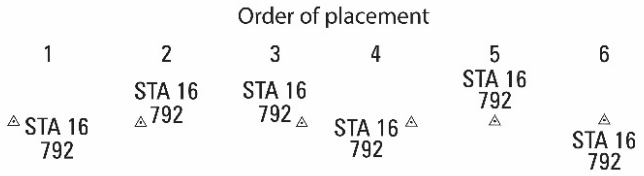


Figure 32. Survey point labelling with a name or number

3.9.3 Bench mark label placement

When labelling bench marks, the "BM" (Bench mark) and corresponding value shall be positioned as indicated in Figure 33.

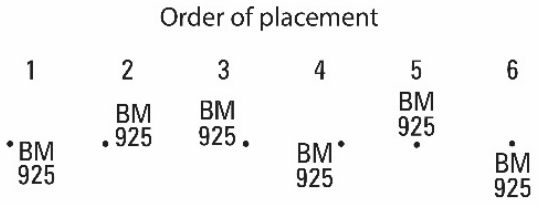


Figure 33. Bench mark label placement

3.10 Labelling of spot elevations

3.10.1 Preferred positioning of spot elevation values

Spot elevation values shall be positioned in close proximity to their respective dot symbol "●" or to the geographically identifiable location (i.e. road or drainage feature intersections in lieu of the dot "●") they identify. Where possible, elevation values should be placed to avoid obscuring features of importance for the map user; i.e., small tops, ridges, saddles, etc. Spot elevation values shall be positioned to the southeast side of the point symbol. When this is not possible, the values shall be positioned as indicated in Figure 34.

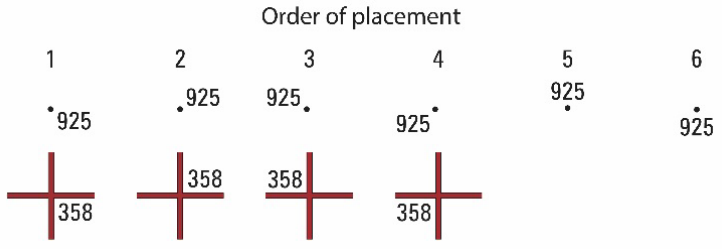


Figure 34. Spot elevation value placement

3.10.2 Water surface elevation value placement

Water surface elevations shall be shown in cyan and should be centred within the limits of inland water bodies.

3.10.3 Spot elevations for islands

Instances may occur when spot elevations need to be included for islands too small to accommodate the values. In such cases, the value shall be positioned adjacent to the island and aligned in accordance with 3.10.1 (Figure 35).

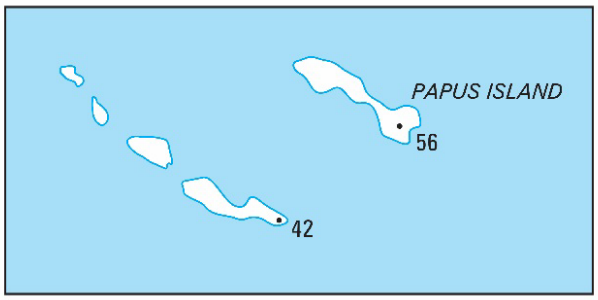


Figure 35. Alternative spot elevation placement for small islands

3.11 Labelling of elevation contours

Elevation contour value labels provide a convenient means of reading elevations portrayed by elevation contour lines. The number and location of elevation contour labels should be governed by the nature of the terrain, density of elevation contours, and the number of survey points and spot elevations. Areas of complex topography normally require a greater number of elevation contour labels than do areas of simple or flat terrain.

3.11.1 Elevation contour label format in relation to datum plane

Elevation contours above Mean Sea Level shall be labelled with numerals. The negative (-) sign and the numeral zero (0) shall not be used when labelling elevation contours. Those coinciding with Mean Sea Level shall be labelled with the word “ZERO” and those below the datum plane shall be labelled with numerals prefixed with the word “MINUS”. NOTE: Zero elevation contour lines are only shown in areas of depressions and not when coincident with the Land Water Boundary (coastline).

3.11.2 Labelling types of elevation contours

Normally, only index elevation contours shall be labelled. However, in flat areas, widely spaced intermediate elevation contours should be labelled to facilitate the interpretation of terrain.

Space permitting, elevation contour labels should be added to supplementary (auxiliary), depression and mound elevation contours wherever they are shown.

3.11.3 Effective placement of elevation contour labels

- Elevation contour labels shall be centred on the axis of elevation contour lines (Figure 36).

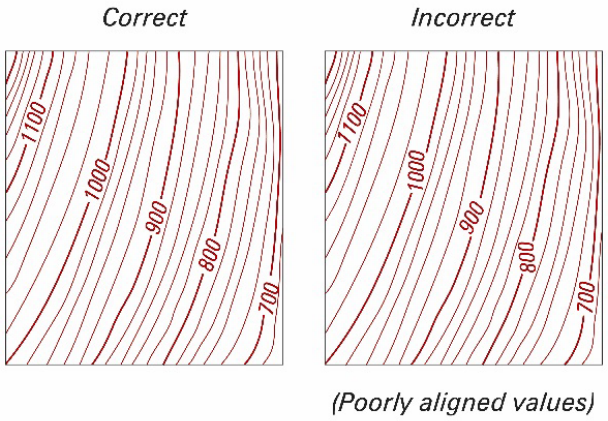


Figure 36. Sample elevation contour label placement on lines

- Elevation contour labels shall be positioned so that the top of the elevation contour label is towards the higher elevation (reading uphill). The elevation contour label should be legible from either the south or east neatline. There may be instances where the label is placed "upside down" in order to keep it positioned reading uphill towards the higher elevation.

- When labelling elevation contours, sets of numerals should be positioned so that they progress in smooth-flowing curves toward the higher elevations. A mechanical or stepladder-like appearance should be avoided (Figure 37).

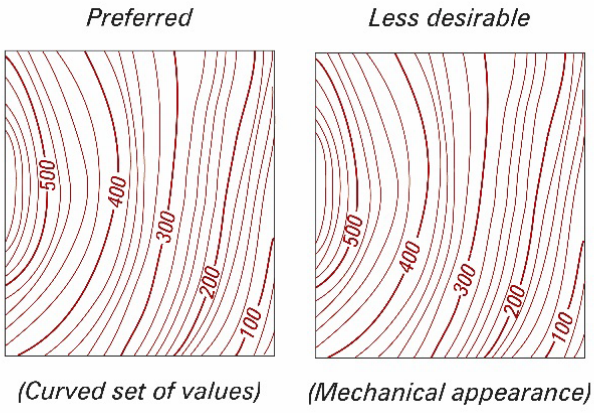


Figure 37. Sample of smooth-flowing elevation contour value labelling

- Elevation contour labels should be positioned on slopes near the ends of spurs, the sides of ridges, and at pronounced changes in topography. Elevation contour labels shall not be positioned in a mirror-like sequence on each side of a particular ridge or landform (Figure 38).

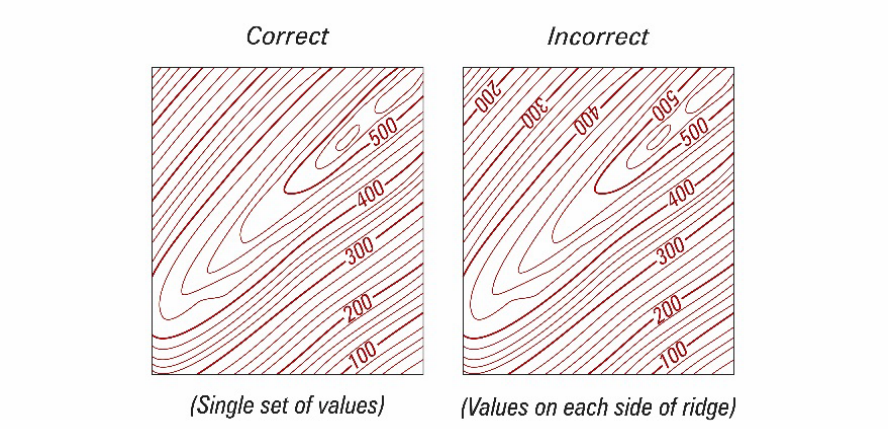


Figure 38. Sample positioning of elevation contour labels on ends of spurs and sides of ridges

- Elevation contour labels should not be positioned in the immediate vicinity of survey points, bench marks, or spot elevations.

- Sets of elevation contour labels shall be evenly distributed throughout the map sheet, thus enabling the user to determine elevation without a prolonged search for reference points. When labelling elevation contours portraying major landforms, sets of labels shall be repeated at distances of between 100 mm to 150 mm.

3.11.4 Elevation contour line block-outs for labels

All elevation contour lines shall be blocked-out behind and a distance of 0.50 mm from the outside edge of all elevation contour labels.

3.12 Labelling of hypsographic features

Topographic maps may contain named hypsographic landforms that are not necessarily extracted and/or symbolized as distinct feature entities, but are indirectly portrayed via the use of elevation contours, etc. Features included in this category are: mountains, mountain ranges, mesas, ridges, valleys, plains, canyons, peaks, hills, etc. The following sections contain guidelines for the positioning of labels for these types of hypsographic features. Use text characteristic IDs 103 - 108 for these features (see Annex D).

3.12.1 Labelling of extensive hypsographic features

When hypsographic features are extensive in size, the name should be positioned above the axis of the landform as viewed from the south neatline. The name shall be aligned parallel to the general formation of the feature and can be letter spaced as needed (Figure 39).

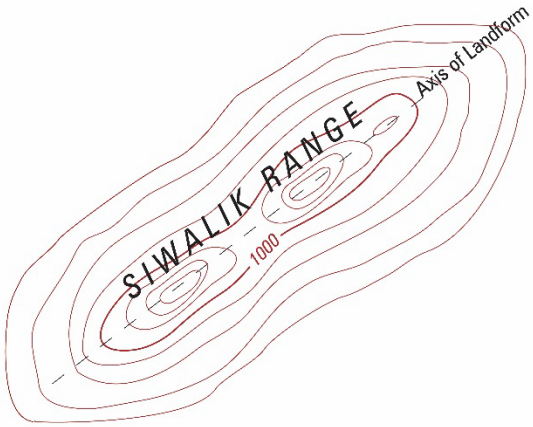


Figure 39. Placement of names for long hypsographic features

3.12.2 Labelling of narrow hypsographic features

The names of narrow valleys, canyons, gorges, and similar features should be placed on the upper side of, and parallel to, the axis of the feature identified.

3.12.3 Labelling of hills, pinnacles, peaks and similar features

When labelling hills, pinnacles, mountain peaks, and similar hypsographic features, the type should be centred above the summit of the feature, provided it does not obscure other prominent detail and the continuity of the relief remains unchanged. Preferred and acceptable alternate positioning of names is indicated in Figure 40. Spot elevation values are shown in their preferred position in relation to the labelling of the hypsographic feature.

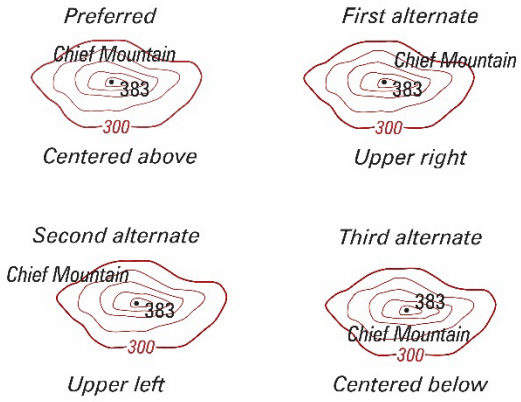


Figure 40. Placement of names for tops of hypsographic features

3.12.4 Labelling of Soil Surface Regions

Terms describing the nature of Soil Surface Region terrain morphology or surface material, (e.g. karst, lava, rocky, etc.) shall be added when such attributes cannot be precisely identified with reference to a map symbol or where definitive labels must serve as the only means of identification. When supported by a symbol pattern, labels should be centred within the subject area if possible. When labelling large areas void of distinctive symbolization, the term should be repeated as often as necessary to properly define areal coverage and the approximate limits of the feature.

3.13 Labelling of vegetation features

3.13.1 Labelling of large vegetation areas

The proper names for forests, orchards, vineyards, hop fields and industrial farms should be shown whenever there is sufficient space to accommodate the labelling. In labelling vegetation features, the type should be placed within the overall limits of the area to be identified. The names shall be aligned either parallel to the south neatline or placed to follow the general character of the feature. Letter spacing of type can be used when labelling large expanses of vegetation.

3.13.2 Labelling of small wooded tracts

Names for small wooded tracts which are integral parts of a larger named forest should be shown when considered to be of importance to the map user. When labelling the smaller tracts, the type should be positioned so that it cannot be confused with the forest name (Figure 41) that is dominant throughout the entire area.

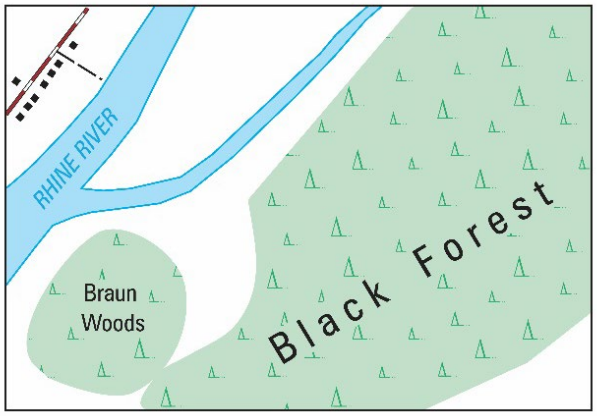


Figure 41. Label placement for forested areas

3.14 Labelling of enclosures

Enclosed features are those whose limits are clearly defined by outlines and supplemented by descriptive labelling. The label should be centred within the outlined area if space permits. Labels should be aligned either parallel to the south neatline (preferred) or can be positioned to follow the character of the feature (Figure 42).

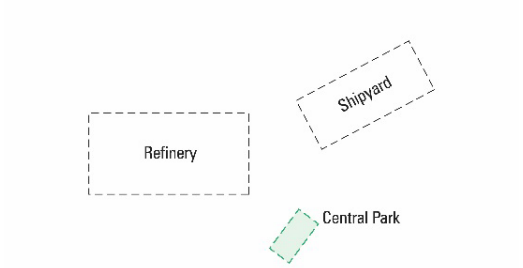


Figure 42. Enclosure labelling

3.15 Area/locality names

3.15.1 Area names

In some parts of the world, large tracts of terrain may be identified by the Named Location feature and designated as “area names”. These named tracts are sparsely populated and may not have definite boundaries; the name refers to a general area and not a specific hydrographic, hypsographic, vegetation, or cultural feature. Use text characteristic ID 45 for area names (see Annex D).

3.15.2 Locality names

Named locations used by the local inhabitants to identify the general area in which they live are considered “locality names”. They are important, administratively, for facilitating postal operations and provide the map user a way to more readily locate a particular area of interest. This type of name should be shown only when specified in supplementary project instructions. Use text characteristic ID 45 for locality names (see Annex D).

3.15.3 Positioning of area/locality names

Area and locality names shall be positioned so that the area represented is clearly defined (Figure 43). This may require the name to be letter-spaced, curved, or placed in an angular position similar to hydrographic labelling.

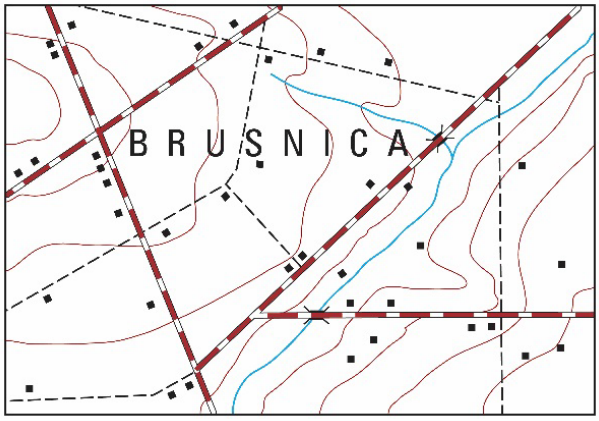


Figure 43. Area/locality names labelling

3.16 Tribal names

Tribal names should be shown only when specified in supplemental project instructions. When required, they shall be treated in the same manner as that described for area/locality names but are shown in a different colour – Dk-Brown1815. The identification of tribal names shall be included in the map legend, when applicable. Use text characteristic ID 109 for tribal names (see Annex D).

3.17 Labelling of water bodies, marshes/bogs, and swamps

3.17.1 Labelling of large water bodies

The label for bodies of water whose limits can accommodate the entire name should be centred within limits of the feature. Names should be aligned either parallel to the south neatline or can be positioned to follow the general character of the shoreline (Figure 44). Letter spacing of type can be used when labelling large expanses of water.

Figure 44. Label placement for bodies of water

3.17.2 Labelling of small inland water bodies

When labelling small inland water bodies (small lakes and ponds), the names should be positioned and aligned in accordance with section 3.7.

3.17.3 Labelling of marshes, bogs, swamps, and similar features

The names for marshes, bogs, swamps, and similar features should be centred within the limits of the feature defined and the type should be aligned parallel to the south neatline (Figure 45). Letter spacing of type can be used when the area is extensive.

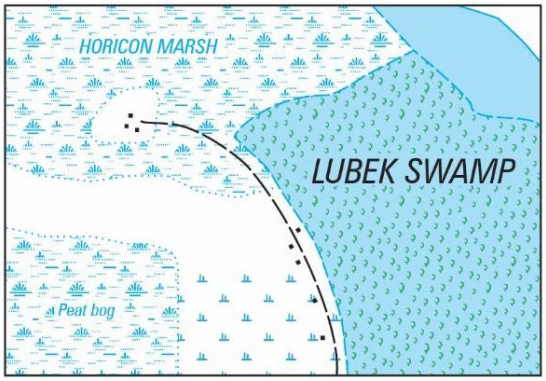


Figure 45. Label placement for marshes, bogs, swamps, and similar features

3.18 Labelling of coastal landforms

Topographic maps may contain named coastal landforms that are not necessarily extracted and/or symbolized as distinct feature entities, but are indirectly portrayed via the use of shorelines. Features included in this category are: capes, peninsulas, points, etc. Use text characteristic IDs 12 and 114 for coastal landform features (see Annex D).

3.18.1 Labelling of capes and islands

When labelling large capes and large islands, the type shall be centred within the land area and parallel to the south neatline when possible; otherwise, the type should be placed to conform to the general configuration of the feature.

The names of capes, points, and small islands (Figure 46) shall be placed in the open water adjacent to the feature defined. Whenever possible, the type should be positioned to the right and slightly above the feature. Names shall be placed to avoid overprinting the shoreline.

Figure 46. Labelling capes, points, and small islands

3.18.2 Labelling of peninsulas and island chains

The names for peninsulas and island chains (Figure 47) should be placed parallel to the general configuration of the feature. When possible, the type identifying peninsulas should be positioned within the land area.

Figure 47. Labelling peninsulas and island chains

3.19 Route markers

3.19.1 General Route marker positioning guidance

Route markers shall be centred on their respective Land Transportation Way symbols (Figure 48) and aligned parallel to the south neatline. Whenever possible, route markers should be positioned to avoid grid lines and other map detail. All map detail shall be blocked out for route markers when overprinting.

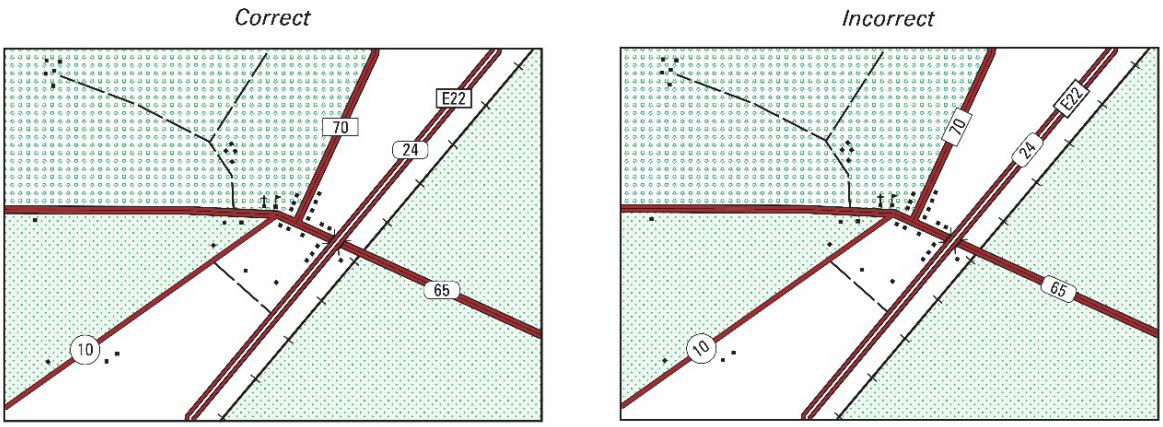


Figure 48. Route marker positioning

3.19.2 Route marker positioning guidelines

The following are guidelines for the placement of Route markers to assure maximum effectiveness:

- Route markers should be positioned in areas free of congested map detail. In extremely congested areas, the symbol may be positioned adjacent to the Land Transportation Way.
- Route markers should be positioned in close proximity to populated areas.
- Route markers should be positioned along Land Transportation Ways as needed to insure identification and continuity, especially to define through routes within Built-Up Areas.
- Route markers should be positioned in the vicinity of transportation junctions and intersections.
- On numbered routes which continue onto adjoining sheets, route markers should be positioned close to the map neatline.
- Individual route markers shall be shown for Land Transportation Ways which are designated as a combination of two or more numbered routes. When this occurs, the markers should be positioned in close proximity to each other.

3.20 UNESCO World Heritage sites

3.20.1 Labeling of UNESCO World Heritage sites

All United Nations Educational, Scientific and Cultural Organization (UNESCO) designated World Heritage sites shall be symbolized and labeled. The symbol shall be the applicable feature symbol(s). The label shall include the distinctive UNESCO World Heritage site symbol following the site's official name (Figure 49).

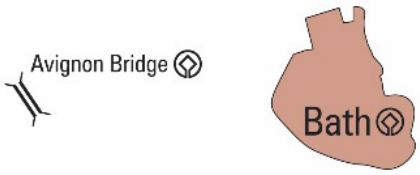


Figure 49. UNESCO World Heritage site Labelling.

4 Portrayal Catalogue Report Organization

The DTM50 PC report is organized into the following annexes:

- Annex A – Portrayal Information: provides feature portrayal information. Subsequent annexes provide additional supporting information and are described therein.
- Annex B – *intentionally excluded*
- Annex C – Colour: defines the colours used in the DTM50 PC in several well-known colour specification methodologies.
- Annex D – Text Characteristics: defines the characteristics of the text used for labels on feature symbols in Annex A.
- Annex E – Area Components: lists each of the area components used in Annex A.
- Annex F – Line Components: lists each of the line components used in Annex A.
- Annex G – Point Components: lists each of the point components used in Annex A.
- Annex H – Detailed Drawing Instructions: provides the detailed specifications for reusable graphic icons used in Annex A.
- Annex I – Patterns: provides examples of the area patterns used for feature symbols in Annex A.
- Annex J – Finishing, Generalization, and Label Rules: provides the content of the finishing, generalization, and label rules that are assigned to features and symbols in Annex A.
- Annex K – Glossary: provides definitions for many of the terms used in the DTM50 PC.

4.1 Portrayal Information (Annex A)

The Portrayal Information (Annex A) provides the necessary information to describe how a DGIF dataset is portrayed (symbolized and labelled) for the DTM50 product. The Portrayal Information utilizes the Product Object Concept to categorize the “things” to be shown within the map’s neatline. Each unique “thing” is captured as its own Product Object. The following subsections will describe the content and layout of Annex A to assist in navigation and understanding.

4.1.1 Product Object Information

Each unique “thing” to be portrayed on a DTM50 map is described by a Product Object. Each Product Object has a unique Name, AlphaCode, and Identifier. These are shown in Annex A in the grey columns titled: ProductObject_FullName, ProductObject_AlphaCode, and ProductObject_ID (Figure 50). The Name is derived from combining the feature or real-world name of the object (ex. parking garage,

reservoir, etc.) with the object's primary characteristics (ex. intact/not intact, obstruction/non-obstruction, elevated, etc.) and an indication of its geometry (P = point, L = line, A = area). The AlphaCode is simple the Full Name with all spaces and special characters removed. The AlphaCode is the primary identification used in the DGIF modelling environment.

ProductObject_ID	ProductObject_FullName	ProductObject_AlphaCode
PO_1235	Parking Garage Not Intact (P)	ParkingGarageNotIntactP
PO_1234	Parking Garage Intact (P)	ParkingGarageIntactP

Figure 50. Product Object identification columns from Annex A

4.1.2 DGIF Information

For each Product Object the required DGIF content is identified in the yellow columns titled DGIF_Feature_AlphaCode and ProductObject_Rule (Figure 51).

DGIF_Feature_AlphaCode	ProductObject_Rule
RecyclingSite	((physicalCondition = intact) OR (physicalCondition = noInformation))
RecyclingSite	((physicalCondition = construction) OR (physicalCondition = dismantled) OR (physicalCondition = destroyed) OR (physicalCondition = unmaintained) OR (physicalCondition = damaged))

Figure 51. DGIF Information columns from Annex A

4.1.2.1 DGIF_Feature_AlphaCode

The DGIF_Feature_AlphaCode column references the DGIF feature which is to be portrayed. The DTM50 also portrays information which is not derived from a DGIF feature but are needed to support symbols or labels for use during product finishing - Leader Line, Point of Change, River Flow Arrow, Road Route Marker, and Annotated Location. In these cases, the DGIF_Feature_AlphaCode column is populated as "n/a".

4.1.2.2 ProductObject_Rule

The ProductObject_Rule column describes the unique combination attribute values associated with the DGIF feature need for portrayal. This combination of feature and attribute values associates a particular instance of geospatial data with its DTM50 portrayal.

The syntax utilized in the Product Object rule criteria is based on the Structured Query Language (SQL) and thereby is easily interpreted by implementation software applications. Attribute names and enumerants are indicated by text and their corresponding codes.

Operators are generally defined as follows:

=	is equal
<>	is not equal
>	greater than
<	less than
>=	greater than or equal
<=	less than or equal

Other syntax operators:

( )	used to group like attributes or indicate precedence
OR	indicates true if at least one of the conditions is true
AND	indicates true if all conditions are true

NOTE: for some features, not all of the possible enumerant values of an attribute are used to symbolize data on a DTM50. For these features, only those instances which meet the indicated criteria shall be shown. Those instances not meeting any of the indicated criteria are not shown on the map. There is no “default” symbol for any feature.

4.1.3 Symbology Description

For each Product Object the required symbology information is identified in the violet columns titled: SymbolObject_ID; Symbol Sample; SymbolObject_CompoentConfiguration; and SymbolPlacementRuleObject_ID (Figure 52).

SymbolObject_ID	Symbol Sample	SymbolObject_ComponentConfiguration	SymbolPlacementRuleObject_ID
SO_0347		Component P00207 is applied to the perimeter with a spacing of 0.75mm between origins, and the area is filled with Component A00048. The vertical axis of Component P00207 is perpendicular to the area/surface delineation and	SPO_055, SPO_057, SPO_058, SPO_082
SO_0348		Component P00207 is applied with a spacing of 0.75mm between the origins. The vertical axis of Component P00207 is perpendicular to the line/curve delineation with the open end of the symbol facing landward.	SPO_007, SPO_034, SPO_082
SO_0343		P00095	SPO_007, SPO_063, SPO_082
SO_0301		A00019	SPO_025, SPO_055, SPO_057
SO_0006		P00008. If the symbol is moved away from the associated solid circle element, a Leader Line / blue072 is added connecting the symbol and thesolid circle.	SPO_009, SPO_073
SO_0084		P00161. If the symbol is moved away from the associated solid circle element, a Leader Line / black is added connecting the symbol and the solid circle.	SPO_007, SPO_063, SPO_068

Figure 52. Symbology Description columns from Annex A

4.1.3.1 SymbolObject_ID

The SymbolObject_ID is a unique identifier given to the symbol and used to catalogue the symbols in the DGIWG Portrayal registry.

4.1.3.2 Symbol Sample

This column contains sample graphics of the symbols, giving a general representation of their appearance in order to better understand the specifications needed to construct it. Many of the graphics are shown in an enlarged size compared to what would appear on a topographic map. This enlargement was made in order to make the components of the symbol graphic more visible.

4.1.3.3 SymbolObject_CompoentConfiguration

This column lists the individual competent(s) needed to create each symbol as well as instructions on how multiple components need to be constructed for more complex symbols. Descriptions of each component (ex. colour, size, spacing, etc.) can be found in Annexes E-G.

4.1.3.4 SymbolPlacementRuleObject_ID

Symbol placement rules generally define relationships between symbols and other symbols to achieve the desired result. Finishing rules take the rendered portrayal and refine it to resolve issues such as overprinting and congestion to make the portrayal easier to understand by the recipient. Individual symbol placement rules are called 'Symbol Placement Rule Objects' and have a unique ID assigned (ex. SPO_005). The Symbol Placement Rule Object(s) applicable for each Product Object are listed in the column titled "SymbolPlacementRuleObject_ID". Symbol placement rules are defined in Annex J.

4.1.4 Labelling Information

Labelling can be used to identify or assist in identification of the meaning of symbols, and also may supply additional information about the feature being portrayed. Labelling requirements for symbols are identified in the orange columns titled as: LabelObject_ID; LabelObject_LabelString; and LabelPlacementRuleObject_ID (Figure 53). If the label information cells are populated with “n/a”, then a label is not required for that object.

LabelObject_ID	LabelObject_LabelString	LabelPlacementRuleObject_ID
LO_0407	[fullName] Golf course "("[physicalCondition]")"	LPO_006, LPO_012, LPO_014, LPO_022, LPO_037, LPO_042, LPO_052
LO_0408	Golf driving range	LPO_006, LPO_012, LPO_014, LPO_022, LPO_037, LPO_052
LO_0409	Golf driving range "("[physicalCondition]")"	LPO_006, LPO_012, LPO_014, LPO_022, LPO_037, LPO_052

Figure 53. Labelling Information columns from Annex A

4.1.4.1 LabelObject_ID

The LabelObject_ID is a unique identifier given to the unique label string and used to catalogue the label rules in the DGIWG Portrayal registry.

4.1.4.2 LabelObject_LabelString

The label string describes the content(s) of the label listed in sequence, which can be fixed text, variable label portraying attribute, varying label derived from attribute, or a combination of these.

4.1.4.2.1 Types of labels

Labels can be of the following types:

- Fixed label – the symbol has a label, and the content of the label is fixed, for example, the label “Falls” on a Waterfall, or “Rest area” on a Roadside Rest Area.
- Variable label portraying attribute – the content of the label changes, depending on attribute information being portrayed. An example would be showing the [Product] label on an Extraction Mine, such as “Coal”, “Diamond”, “Gravel”, “Lead”, etc. Another example would be to show the name of a feature [fullName] as a label, for example, “Olympic Stadium”, or “Central Park”.
- Variable label derived from attribute – the content of a label changes based on the attribute information, but the text of the label is not the attribute value. An example would be a Fairgrounds with a [fullName] = "No Information" being labelled simply as “Fairgrounds”.
- Combination – a series of labels of the various types listed above.

4.1.4.2.2 Modification of label strings based on attribution

Note that in some cases, the label string may have to be modified depending on whether attribute information is portrayed. For example, if a label string is made up of a variable or attribute based element and a static element, then it wouldn't make sense to have the label "No Information" or "Other" for the variable portion. In these cases, the variable portion should be omitted rather than place the label containing an attribute value such as "No Information" on the symbol. When concatenating multiple static or dynamic label string elements into a single label string, each static or dynamic label string element is separated from the next element by a single space.

4.1.4.2.3 Attribute enumerants not intended for labelling

Attribute values that are not intended to be labelled include:

- noInformation [-999999]
- notApplicable [998]
- other [999]

If an attribute is noInformation [-999999] or has not been collected, the label is also not shown. Examples of these types of attributes are heightAboveSurfaceLevel [HGT], railwayGauge [GAW], trackOrLaneCount [LTN], fullName [FNA], or highestElevation [ZVH].

4.1.4.2.4 Specified Domain Values [OTH] attribute

Whenever the other [999] enumerant for any feature attribute is selected, the specifiedDomainValues [OTH] attribute for that feature must be populated. Since the text entered for the [OTH] attribute can refer to the other [999] enumerant of one or more attributes, no rule can determine if or how the text should be used on the map. However, the text should be considered for potential feature labelling where applicable.

4.1.4.2.5 Additional named features

Topographic maps may contain names that are not necessarily extracted and/or symbolized as distinct feature entities. Examples of named "features" included in this category are: dispersed and scattered villages, farmsteads, suburban areas, mountains, mountain ranges, mesas, ridges, valleys, plains, canyons, peaks, hills, capes, points, peninsulas, inlets, etc. Refer to Annex D for the recommended text characteristics of these additional named features (or similar features as appropriate). Label placement rule LP-0050 shall be used to determine the appropriate size of text based on the size of the feature at map scale

4.1.4.3 LabelPlacementRuleObject_ID

Label placement rules are used to provide the initial baseline type placement for the rendered portrayal of an applicable symbol. These rules may also indicate variation from the initial baseline placement of labels that may be required in order to resolve overprints and otherwise achieve the desired map readability. Individual label placement rules are called 'Label Placement Rule Objects' and have a unique

ID assigned (ex. LPO_028). The Label Placement Rule Object(s) applicable for each Product Object are listed in the column titled “LabelPlacementRuleObject_ID”. Label placement rules are defined in Annex J.

4.1.5 Font information

For each Product Object the applicable font information is identified in the blue columns titled: FontObject_ID and FontObject_CharacteristicConfiguration (Figure 54).

FontObject_ID	FontObject_CharacteristicConfiguration
FO_088	41
FO_021	15 46 95,95,95
FO_053	24

Figure 54: Font information columns from Annex A

4.1.5.1 FontObject_ID

The FontObject_ID is a unique identifier given to each unique occurrence of a font characteristic, or combination of characteristics.

4.1.5.2 FontObject_CharacteristicConfiguration

The FontObject_CharacteristicConfiguration column lists the font characteristic(s) needed for each Product Object and shows the configuration of those characteristics in relation to the label string requirements. The values listed in this column correlate to descriptions of font information (ex. colour, size, case, and style parameters) in Annex D.

4.1.5.2.1 Substitution of type sizes

When space prohibits the use of a prescribed type size, a more appropriate size may be selected by the cartographer.

4.1.5.2.2 Capitalization of label information

Capitalization of label information on a symbol follows the general structure below:

- The first letter is capitalized, for example, “Falls”.
- For multiple words in a descriptive label, the first letter of the first word is capitalized, for example, “Paper mill” or “Water pumping station”.
- For proper names, the first letter in each word is capitalized, for example, “Yellowstone National Park”.

4.1.6 Finishing Rules

Finishing rules are used to adjust or reassign the display space delineation of a map feature for the purpose of achieving the desired cartographic result. Individual finishing rules are called 'Finishing Rule Objects' and have a unique ID assigned (ex. FRO_005). The Finishing Rule Object(s) applicable for each Product Object are identified in the light blue column titled "FinishingRuleObject_ID" (Figure 55). Finishing Rule Objects are defined in Annex J.

Figure 55. Finishing Rules column from Annex A

4.1.7 MTM / TM Reference

Annex A also includes a column titled "MTM / TM Ref" which provides references back to the symbol and label rules taken from those sources (Figure 56). This lineage information is provided purely for informational purposes since these standards were the source for much of the DTM50 content.

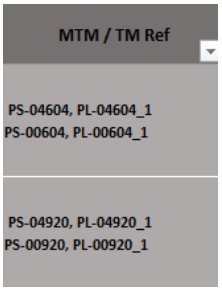


Figure 56. MTM /TM Reference column from Annex A

4.2 Colour and screens

A particular symbol may be a single colour, or composed of multiple colours. Labels are generally specified in one colour.

4.2.1 Methodologies for defining colours

Colours can be specified using several methodologies:

- Pantone colours – Pantone colours are commonly used in the printing industry and are based on specific mixes of inks. They are sometimes referred to as “spot” colours. Each pantone colour has an identifier assigned to it. Information on Pantone colours is available at http://www.pantone.com.
- CMYK – Identifies the percentage of Cyan, Magenta, Yellow and Black (key) that is used to generate a specific colour in process lithographic printing. Process printing allows a wide variety of colours to be produced from these three primary colours and the black.

4.2.2 Colour tokens

The Colour Token definitions utilized for this standard are provided in Annex C. This Annex provides a mapping from a specific colour token to Pantone colour names and CMYK values. This mapping allows considerable flexibility in specifying equivalent colours in a variety of methodologies.

Colour tokens are used to specify generic names of colours for symbol components. Colour tokens can be replaced with different tokens if maps require different viewing conditions. For example, different viewing conditions may be required for red-light readable, or red and blue/green-light readable.

The use of a Colour Token methodology provides for the greatest degree of flexibility at implementation to provide for an easy adaptation to various colour needs. It further allows for colours to be defined by the software applications as necessary to fulfil product requirements.

Colours in Annex A and Annex D are specified for each symbol component by Colour Token. Annex C provides a listing of Pantone colours and CMYK values that are applicable to the DTM50 product. The colour token values used in this specification can be mapped to this table to determine the CMYK.

4.2.3 Specification of colours in digital exchange files

When exchanging digital files of finished DTM50 products in Portable Document Format (PDF), it is important to note that specifying colours using the spot colour channels in the PDF allows for much greater flexibility in the lithographic printing of the map. If colours are specified only in CMYK, then four-colour process printing is the only printing option available and red-light or red and blue/green-light readability cannot be absolutely assured.

4.3 Type fonts

The TrueType Zurich font has been selected as the most appropriate font to represent the label information for the DTM50. The following criteria were considered in selecting the font:

- Format should be TrueType
- Must be compatible with the Windows environment
- Cost of the purchase of commercial fonts
- All the diacritic marks must be supported
- Extendable (must be possible to add new characters)

4.3.1 Use of commercial type fonts

The analysis concluded that the standard should not be too rigid regarding the use of one or another font. Nevertheless, for avoiding problems with the diacritical marks, the best choice is to use commercial fonts of recognized brand. These have Unicode codification and, in general, support all the current idiomatic characters.

Secondly, the analysis included not only TrueType but also OpenType because to choose one font in particular would lead to extra cost depending on the national mapping work flow. Therefore, the standard should be as flexible as possible.

4.3.2 Use of OpenType font

OpenType will likely become the standard in the near future, given that OpenType has greater capabilities in complex writings (languages), is extendable and has advanced typography (kerning, and so on). However, some national mapping work flows are not yet fully compatible with the OpenType fonts. An example of this is what happens with the PDF/X standard. The fonts used in the document must be embedded in it, including the metric and the codification's data. Under the 1.6 version, the OpenType fonts are not accepted by the PDF format.

4.3.3 Compatible equivalent type fonts

The Swiss742 font is one of the "sans serif" style types. The first step was to look for any commercial font available similar to the Swiss742 being, at least, TrueType specification. The digital format of the font was not available so the MIL-STD-2410 in PDF version was utilized for comparison. The main brands like Bitstream/Corel, Monotype and Linotype were taken into account. Even though the criterion of the MIL-STD-2410 was to choose a single font, it was determined that the output for paper maps is better if a set of diverse fonts is used. These are TrueType fonts and they produce a good balance of functionality and aesthetics.

Nevertheless, on the basis of these, a set of compatible or equivalent fonts can be established, and the producers may use them at will. Conversion tables must be as flexible and extendable as possible. Table 2, Font Mapping, provides a mapping from the Swiss742 to Zurich and Univers® TrueType fonts.

Font	Style	To Zurich BT	Style	To Univers	Style
Swiss 742	Regular (Medium)	Zurich BT		Univers® 55	Roman
	Italic		*Italic*		*Roman Oblique*
	Bold		**Bold**	**Univers® 65**	**Bold**
	Condensed		Condensed	Univers® 57	Condensed
	Bold Condensed		**Bold Condensed**	**Univers® 67**	**Bold Condensed**
	Light Condensed		Light Condensed	Univers® 47	Light Condensed
	Light Condensed Italic		*Light Condensed Italic*		*Light Condensed Italic*

Table 2. Font Mapping

4.4 Masking

4.4.1 Masking for “open” point symbols

In the DTM50 PC, there are a number of point components or symbols that have "open" or white areas. It is intended that underlying symbology (such as vegetation) shall not show through any of these white openings, but rather the component shall mask out all underlying symbols, not allowing them to fill any of the open or white portions of the symbol. For example, the open or white portion of the Tower symbol shall mask the underlying Built-up Area tint, not allowing it to fill any open portion of the Tower symbol.

The following is a complete listing of Component Reference numbers from Annex A containing an open or white area as part of the symbol.

P00009 Non-water well
P00010 Located object
P00011 Building hospital with stem
P00012 Building hospital
P00018 Building temple
P00019 Building pagoda
P00022 Cairn
P00025 Aerodrome beacon
P00028 Vanishing point disappearing
P00031 Building stupa
P00032 Natural pool intermittent
P00040 Qanat/Water well intermittent
P00048 Bridge non-fixed open circle
P00071 Rock formation
P00079 Railway station
P00084 Extraction mine peat
P00089 Helipad at hospital
P00090 Helipad
P00103 Dolphin/Snag/Structural pile
P00108 Fortified building
P00111 Forest line/curve
P00130 Castle

P00131 Crane
P00132 Building checkpoint
P00133 Dish aerial
P00134 Building health office
P00135 Lighthouse
P00136 Memorial monument
P00137 Cooling tower
P00140 Smokestack
P00141 Tower non-communication
P00142 Water tower
P00143 Wind turbine
P00144 Windmill
P00145 Flare pipe
P00147 Water mill
P00148 Water intake tower
P00155 Aerial/Tower communication
P00157 Salt evaporator
P00158 Route marker national motorway
P00160 Route marker local/secondary
P00162 Rig inland
P00163 Offshore construction
P00165 Motor vehicle station
P00168 Holding pen
P00175 Dragons teeth
P00179 Survey point geodetic
P00184 Building minaret
P00186 Building diplomatic
P00187 Building health office with stem
P00189 Boundary monument
P00192 Light vessel
P00198 Mooring mast
P00202 Bridge not fixed
P00206 Wreck
P00238 Railway turntable
P00251 Fountain
P00252 Underground bunker
P00266 Anchorage
P00267 Route marker international
P00268 Route marker national
P00271 Cemetery/Tomb other
P00275 Motor vehicle station symbol
P00276 Gate
P00283 Surface bunker
P00284 Hut
P00285 Building diplomatic flag
P00287 Cable/Communication line
P00292 Vertical obstruction pylon
P00300 Wind turbine/obstruction/single
P00301 Wind turbine/obstruction/multiple

4.4.2 Masking for Land Transportation Way

Any surface symbol and the curve symbols for Ice Route, Land Water Boundary, Aqueduct, Canal, Ditch, River, Penstock, and Pipeline (except those that are above ground level) shall be masked to prevent overprinting of Land Transportation Ways.

4.5 Halos

Where possible, overprinting of type and symbols which print in the same colour should be avoided. If this is not possible, type "halos" shall be utilized to improve legibility of labels. Type halos shall not be applied to fine dot screen symbols.

4.5.1 Non-Black Interior Type

A 0.2 mm halo mask or equivalent shall be prepared for all cyan, blue072, dk-brown1815 and green362 type (labels and annotations) and applied to all: curve feature symbols (excluding Elevation Contour), outline or symbolized perimeter of surface feature symbols, geographic ticks and intercepts, and UTM grid lines and ticks. A block-out mask (or equivalent), along with a 0.5 mm halo, shall be prepared for all cyan, blue072, dk-brown1815 and green362 type (labels and annotations) and applied to all area pattern

(AP) and line pattern (LP) surface symbols. A halo or block-out mask shall not be applied to fine dot screen symbols. See section 3.11.4 for type halos for elevation contour values.

4.5.2 Black Interior Type

A 0.2 mm halo mask or equivalent shall be prepared for all black type (labels and annotations including UTM ladder grid values) and applied to all: black curve feature symbols, black outline or symbolized perimeter of surface feature symbols, geographic ticks and intercepts, and UTM grid lines and ticks. A block-out mask (or equivalent), along with a 0.5 mm halo, shall be prepared for all black type (labels and annotations) and applied to all area pattern (AP) and line pattern (LP) surface symbols. A halo or block-out mask shall not be applied to fine dot screen symbols. See keyed note B on the Annotation Catalogue style sheets for the block out of UTM grid lines for UTM grid ladder values.

Annex A - Portrayal Information

This annex presents the necessary information to describe how a DGIF dataset is portrayed (symbolized and labelled) for the DTM50 product. This annex utilizes the Product Object Concept to categorize the "things" to be shown within the map's neatline. Each unique "thing" is captured as its own Product Object. This annex is found in the spreadsheet **DTM50_DPS_PC_AnnexA.xlsx**

NOTE – The bookmark tool on the left panel of the PDF also provides hyperlinks to each feature and symbol.

Annex B – Intentionally excluded

Annex C - Colour

This Annex presents the mapping from a specific colour token to Pantone colour names and CMYK values. The colours presented in each row of the table are approximately equivalent. This mapping allows considerable flexibility in identifying equivalent colours in a variety of methodologies. The colour token name provides a link between Annex A and Annex C.

Colour tokens can be replaced with different tokens if maps require different viewing conditions. This annex provides both the standard red-light readable and alternative red-light and blue/green-light readable colour tokens where applicable.

The Pantone colours are normative/required because they provide the best consistency for lithographic printing. CMYK colours are provided as an alternative and are informative. CMYK values in the colour tables may be altered as necessary in order to best match the intended Pantone colours.

NOTE: Red-light and red and blue/green-light readability cannot be absolutely assured when using CMYK process printing or plotting.

Color Token Name	Color Description	Pantone Ink Code	Red-Light	Red & Blue / Green-Light	C	M	Y	K	SPC Ink Code
Black	Black	Process Black U	☑	☑	0	0	0	100	58600
Black-07	Black 7%	Process Black U	☑	☑	0	0	0	7	58600
Black-12	Black 12%	Process Black U	☑	☑	0	0	0	12	58600
Black-21	Black 21%	Process Black U	☑	☑	0	0	0	21	58600
Black-42	Black 42%	Process Black U	☑	☑	0	0	0	42	58600
Black-54	Black 54%	Process Black U	☑	☑	0	0	0	54	58600
Blue072	Blue	Blue 072 U	☑	☑	75	70	1	0	46351
Blue072-12	Blue 12%	Blue 072 U	☑	☑	9	8	0	0	46351
Blue072-42	Blue 42%	Blue 072 U	☑	☑	32	29	0	0	46351
Cyan	Cyan	Process Cyan U	☑	☐	100	0	0	0	48253
Cyan-07	Cyan 7%	Process Cyan U	☑	☐	7	0	0	0	48253
Cyan-31	Cyan 31%	Process Cyan U	☑	☐	31	0	0	0	48253
Dk-Blue662	Dark-Blue	662 U	☐	☑	96	63	0	12	46961
Dk-Blue662-07	Dark-Blue 7%	662 U	☐	☑	7	4	0	1	46961
Dk-Blue662-31	Dark-Blue 31%	662 U	☐	☑	30	20	0	4	46961
Dk-Brown1815	Dark Brown	1815 U	☑	☑	40	100	100	0	61121
Dk-Brown1815-07	Dark-Brown 7%	1815 U	☑	☑	3	7	7	0	61121
Dk-Brown1815-12	Dark-Brown 12%	1815 U	☑	☑	5	12	12	0	61121
Dk-Brown1815-21	Dark-Brown 21%	1815 U	☑	☑	8	21	21	0	61121
Dk-Brown1815-42	Dark-Brown 42%	1815 U	☑	☑	17	42	42	0	61121
Dk-Brown1815-54	Dark-Brown 54%	1815 U	☑	☑	22	54	54	0	61121
Green355	Green	355 U	☐	☑	80	0	80	7	51022
Green355-07	Green 7%	355 U	☐	☑	6	0	6	0	51022
Green355-12	Green 12%	355 U	☐	☑	10	0	10	1	51022
Green355-31	Green 31%	355 U	☐	☑	25	0	25	2	51022
Green355-42	Green 42%	355 U	☐	☑	34	0	34	3	51022
Green362	Green	362 U	☑	☐	76	4	76	0	52813
Green362-07	Green 7%	362 U	☑	☐	5	0	5	0	52813
Green362-12	Green 12%	362 U	☑	☐	9	0	9	0	52813
Green362-31	Green 31%	362 U	☑	☐	24	1	24	0	52813
Green362-42	Green 42%	362 U	☑	☐	32	2	32	0	52813

Annex D - Text Characteristics

The Text Characteristics associated with the label information provided in Annex A is detailed in this Annex. The Characteristic ID provides the link to Label Rules in Annex A. The Colour token name provides the link to Annex C, Colour information.

NOTE – In order to meet red-light and red and blue/green-light readable requirements, Cyan and Green362 text shall be changed to Dk-Blue662 and Green355 respectively.

Text Characteristic #	Color Token	Font Style	Light	Bold	Italic	Font Size	Case	Sample Usage(s)
1	Black	Condensed	☐	☐	☐	6	Mixed	point features (descriptive), pass
3	Black	Condensed	☐	☐	☐	6-16	Mixed	vegetation areas
4	Black	Condensed	☐	☐	☐	6-16	Lower	vegetation labels
5	Black	Condensed	☐	☐	☑	6	Mixed	rock, man made features
6	Black	Condensed	☐	☐	☑	6-9	Mixed	crevice, reef (line/curve)
7	Black	Condensed	☐	☐	☑	7-10	Mixed	sand dunes, volcano
8	Black	Condensed	☐	☐	☑	6-16	Mixed	rock formation (area/surface)
10	Black	Condensed	☑	☐	☑	6	Mixed	cart track, railway turntable, trail
12	Black	Condensed	☐	☐	☑	6-16	Upper	island, reef (area/surface), cape, peninsula
14	Cyan	Condensed	☐	☐	☐	6	Mixed	pipeline, tunnel (water)
15	Blue072	Condensed	☐	☐	☐	6	Mixed	vo
16	Cyan	Condensed	☐	☐	☑	6	Mixed	named water features
17	Cyan	Condensed	☐	☑	☐	10	Lower	snow spot elev high
18	Black	Condensed	☐	☑	☐	10	Lower	survey pt, land spot elev high
19	Cyan	Condensed	☐	☐	☑	7	Lower	snow contour
20	Dk-Brown1815	Condensed	☐	☐	☑	7	Lower	land contour
21	Black	Condensed	☐	☐	☐	8	Upper	administrative subdivision, survey point
22	Black	Condensed	☐	☐	☐	6	Lower	point feature descriptive
23	Cyan	Condensed	☐	☐	☑	6	Lower	water features (descriptive)
24	Blue072	Condensed	☐	☐	☐	7	Mixed	aerodrome, heliport
25	Black	Condensed	☐	☐	☐	8	Lower	survey pt, land spot elev normal
26	Blue072	Condensed	☐	☐	☐	7	Lower	aerodrome, heliport
27	Black	Condensed	☑	☐	☑	6	Upper	railway, road
28	Black	Condensed	☑	☐	☑	6	Lower	railway, road (gauge/lane)
29	Blue072	Condensed	☐	☐	☐	7	Upper	aerodromes, heliport, navaids
30	Cyan	Condensed	☐	☐	☐	8	Lower	snow, water spot elev normal
32	Cyan	Condensed	☐	☐	☑	6-9	Mixed	crevasse
33	Cyan	Condensed	☐	☐	☑	7-16	Lower	inland water descriptive
35	Black	Condensed	☐	☐	☑	6	Lower	inland water descriptive (man-made)
37	Cyan	Condensed	☐	☐	☑	7-16	Upper	river & inland water (area/surface)
38	Cyan	Condensed	☐	☐	☑	6-16	Mixed	glacier, snow/ice field
39	Black	Condensed	☐	☐	☑	7-16	Upper	mangrove, nipa, swamp, tundra
40	Black	Condensed	☐	☐	☐	6-16	Upper	military installation, void collection area
41	Black	Condensed	☐	☐	☐	6-12	Mixed	settlement, shanty town
42	Black	Condensed	☐	☐	☐	8	Mixed	bua 5th class
45	Black	Condensed	☑	☐	☐	6-16	Upper	named location, area/locality name
46	Blue072	Condensed	☐	☑	☐	6	Lower	vo (ZVH)

Text Characteristic #	Color Token	Font Style	Light	Bold	Italic	Font Size	Case	Sample Usage(s)
47	Black	Condensed	☐	☑	☐	14	Upper	bua 1st class
48	Black	Condensed	☐	☑	☐	10	Upper	bua 2nd class, admin boundary
49	Black	Condensed	☐	☑	☐	10	Mixed	bua 3rd class
50	Black	Condensed	☐	☐	☐	10	Mixed	bua 4th class
58	Cyan	Condensed	☐	☐	☑	7-9	Mixed	river (line/curve)
59	Cyan	Condensed	☐	☐	☑	8-18	Upper	tidal water
90	Cyan	Condensed	☐	☐	☑	7	Upper	snow/ice elevation contour
92	Dk-Brown1815	Condensed	☐	☐	☑	7	Upper	land elevation contour
93	Cyan	Condensed	☐	☐	☐	6	Lower	pipeline, tunnel (water)
95	Blue072	Condensed	☐	☐	☐	6	Lower	vo (HGT)
103	Black	Regular	☐	☑	☑	16-18	Upper	regional mountain range
104	Black	Regular	☐	☐	☑	12-14	Upper	small mountain range
105	Black	Regular	☐	☐	☑	8-10	Mixed	single mountain
106	Black	Condensed	☑	☐	☑	7-8	Mixed	small gap, hill, spur
107	Black	Condensed	☑	☐	☑	10-18	Upper	large terrain (plains, desert, ravine, gorge)
108	Black	Condensed	☑	☐	☑	7-10	Mixed	small terrain (plains, desert, ravine, gorge)
109	Dk-Brown1815	Condensed	☑	☐	☐	6-16	Upper	tribal name
110	Black	Condensed	☐	☐	☐	10-14	Mixed	dispersed village
111	Black	Condensed	☑	☐	☐	10	Mixed	scattered village
113	Black	Condensed	☑	☐	☐	6	Mixed	farmstead
114	Black	Condensed	☐	☐	☑	6-12	Mixed	coastal points
115	Green362	Condensed	☐	☐	☐	6	Mixed	sports ground

Annex E - Area Components

Each of the area components used in Annex A have been listed only once in this Annex.

Area - Fill

A00002
Description: Blue072 solid fill Color Token: Blue072
Note: The area/surface geometry is filled with the solid color.

A00005
Description: Dk-Brown1815-42 area fill Color Token: Dk-Brown1815-42
Screen Angle: 45 degrees Screen Percent: 42%

A00006
Description: Black solid fill Color Token: Black
Note: The area/surface geometry is filled with the solid color.

A00007
Description: Cyan-31 area fill Color Token: Cyan-31
Screen Angle: 45 degrees Screen Percent: 31%

A00008
Description: Cyan-07 area fill Color Token: Cyan-07
Screen Angle: 45 degrees Screen Percent: 7%

A00009
Description: Green362-31 area Fill Color Token: Green362-31
Screen Angle: 45 degrees Screen Percent: 31%

A00048
Description: Black-12 area fill Color Token: Black-12
Screen Angle: 15 degrees Screen Percent: 12%

A00059
Description: Green362-42 area fill Color Token: Green362-42
Screen Angle: 45 degrees Screen Percent: 42%

A00060
Description: Dk-Brown1815-07 area fill Color Token: Dk-Brown1815-07
Screen Angle: 45 degrees Screen Percent: 7%

A00064
Description: Black-12 area fill Color Token: Black-12
Screen Angle: 45 degrees Screen Percent: 12%

A00101
Description: Green362-12 area fill Color Token: Green362-12
Screen Angle: 45 degrees Screen Percent: 12%

A00121
Description: Dk-Brown1815-21 area fill Color Token: Dk-Brown1815-21
Screen Angle: 45 degrees Screen Percent: 21%

A00122
Description: Dk-Brown1815-12 area fill Color Token: Dk-Brown1815-12
Screen Angle: 45 degrees Screen Percent: 12%

A00123
Description: Blue072-42 area fill Color Token: Blue072-42
Screen Angle: 45 degrees Screen Percent: 42%

A00125
Description: Blue072-12 area fill Color Token: Blue072-12
Screen Angle: 45 degrees Screen Percent: 12%

A00127
Description: Green362-07 area fill Color Token: Green362-07
Screen Angle: 45 degrees Screen Percent: 7%

Area - Pattern

A00001
Description: Black Peat Fill Color Token: Black
Area Pattern: AP-129, see Annex I

A00011
Description: Green362 Deciduous Tree Fill Color Token: Green362
Area Pattern: AP-54, see Annex I

A00012
Description: Green362 Evergreen Tree Fill Color Token: Green362
Area Pattern: AP-60, see Annex I

A00013
Description: Green362 Mixed Tree Fill Color Token: Green362
Area Pattern: AP-63, see Annex I

A00014
Description: Black-42 Shantytown Screened Fill Color Token: Black-42
Area Pattern: AP-132, see Annex I
Screen Angle: 45 degrees Screen Percent: 42%

A00015
Description: Cyan Land Subject to Inundation Fill Color Token: Cyan
Area Pattern: AP-10, see Annex I

A00016
Description: Cyan Sabkha Fill Color Token: Cyan
Area Pattern: AP-103, see Annex I

A00017
Description: Cyan Glacier Fill Color Token: Cyan
Area Pattern: AP-104, see Annex I

A00018
Description: Cyan Bog, Marsh Fill Color Token: Cyan
Area Pattern: AP-12, see Annex I

A00019
Description: Cyan Rice Fill Color Token: Cyan
Area Pattern: AP-4, see Annex I

A00020
Description: Cyan Dry Drainage Fill Color Token: Cyan
Area Pattern: AP-95, see Annex I

A00024
Description: Green362 Nipa Fill Color Token: Green362
Area Pattern: AP-7, see Annex I

A00025
Description: Green362 Mangrove Fill Color Token: Green362
Area Pattern: AP-8, see Annex I

A00027
Description: Green362 Scrub / Thicket Fill Color Token: Green362
Area Pattern: AP-68, see Annex I

A00028
Description: Green362 Orchard / Plantation Fill Color Token: Green362
Area Pattern: AP-74, see Annex I

A00029
Description: Green362 Vineyard / Hops Fill Color Token: Green362
Area Pattern: AP-77, see Annex I

A00030
Description: Dk-Brown1815-54 Distorted Surface Screened Fill Color Token: Dk-Brown1815-54
Area Pattern: AP-103, see Annex I
Screen Angle: 45 degrees Screen Percent: 54%

A00031
Description: Dk-Brown1815 Crescent Sand Dunes Fill Color Token: Dk-Brown1815
Area Pattern: AP-108, see Annex I

A00032
Description: Dk-Brown1815 Ripple Sand Dunes Fill Color Token: Dk-Brown1815
Area Pattern: AP-112, see Annex I

A00033
Description: Dk-Brown1815 Star Sand Dunes Fill Color Token: Dk-Brown1815
Area Pattern: AP-120, see Annex I

A00034
Description: Dk-Brown1815 Transverse Sand Dunes Fill Color Token: Dk-Brown1815
Area Pattern: AP-127, see Annex I

A00035
Description: Dk-Brown1815 Sand Fill Color Token: Dk-Brown1815
Area Pattern: AP-95, see Annex I

A00036
Description: Dk-Brown1815 Gravel Fill Color Token: Dk-Brown1815
Area Pattern: AP-99, see Annex I

A00042
Description: Dk-Brown1815 Dome Sand Dunes Fill Color Token: Dk-Brown1815
Area Pattern: AP-126, see Annex I

A00043
Description: Dk-Brown1815 Linear Sand Dunes Fill Color Token: Dk-Brown1815
Area Pattern: AP-118, see Annex I

A00044
Description: Cyan Salt Evaporator Fill Color Token: Cyan
Area Pattern: No existing MIL_STD_2410 area pattern. See Annex I for detailed drawing instructions.

A00047
Description: Green362 Scattered Trees Fill Color Token: Green362
Area Pattern: AP-44, see Annex I

A00050
Description: Green362 Cane Fill Color Token: Green362
Area Pattern: AP-86, see Annex I

A00061
Description: Dk-Brown1815 Crevice Fill Color Token: Dk-Brown1815
Area Pattern: LP-3, see Annex I

A00062
Description: Cyan Crevasse Fill Color Token: Cyan
Area Pattern: LP-3, see Annex I

A00063
Description: Dk-Brown1815-54 Not Intact BUA Screened Fill Color Token: Dk-Brown1815-54
Area Pattern: LP-6, see Annex I
Screen Angle: 45 degrees Screen Percent: 54%

A00065
Description: Cyan Rapids Fill Color Token: Cyan
Area Pattern: AP-105, see Annex I

A00118
Description: Green362 Cropland dot fill Color Token: Green362
Area Pattern: No existing MIL_STD_2410 area pattern. See Annex I for detailed drawing instructions.

A00124
Description: Green362 Greenhouse Fill Color Token: Green362
Area Pattern: LP-6, see Annex I

A00126
Description: Green362 Grassland Fill Color Token: Green362
Area Pattern: No existing MIL_STD_2410 area pattern. See Annex I for detailed drawing instructions.

Annex F - Line Components

Each of the line components used in Annex A have been listed only once in this Annex.

Line - Simple

L00005
Description: Blue072 0.4mm Solid Line Color Token: Blue072
Line Weight: 0.4mm

L00006
Description: Blue072 0.73mm Solid Line Color Token: Blue072
Line Weight: 0.73mm

L00007
Description: Black 0.1mm Solid Line Color Token: Black
Line Weight: 0.1mm

L00008
Description: Black 0.15mm Solid Line Color Token: Black
Line Weight: 0.15mm

L00009
Description: Black 0.2mm Solid Line Color Token: Black
Line Weight: 0.2mm

L00010
Description: Black 0.25mm Solid Line Color Token: Black
Line Weight: 0.25mm

L00011
Description: Black 0.3mm Solid Line Color Token: Black
Line Weight: 0.3mm

L00013
Description: Black 0.4mm Solid Line Color Token: Black
Line Weight: 0.4mm

L00014
Description: Black 0.5mm Solid Line Color Token: Black
Line Weight: 0.5mm

L00015
Description: Cyan 0.2mm Solid Line Color Token: Cyan
Line Weight: 0.2mm

L00016
Description: Cyan 0.3mm Solid Line Color Token: Cyan
Line Weight: 0.3mm

L00017
Description: Cyan 0.4mm Solid Line Color Token: Cyan
Line Weight: 0.4mm

L00019
Description: Two parallel Black 0.3mm Solid Lines Color Token: Black
Line Weight: 0.3mm
Note: Spacing is variable based on the width of the overpassing feature.

L00021
Description: Green362 0.2mm Solid Line Color Token: Green362
Line Weight: 0.2mm

L00023
Description: Dk-Brown1815 0.2mm Solid Line Color Token: Dk-Brown1815
Line Weight: 0.2mm

L00024
Description: Dk-Brown1815 0.25mm Solid Line Color Token: Dk-Brown1815
Line Weight: 0.25mm

L00105
Description: Dk-Brown1815 0.3mm Solid Line Color Token: Dk-Brown1815
Line Weight: 0.3mm

L00107
Description: Dk-Brown1815 0.1mm Solid Line Color Token: Dk-Brown1815
Line Weight: 0.1mm

L00108
Description: Cyan 0.1mm Solid Line Color Token: Cyan
Line Weight: 0.1mm

L00123
Description: Dk-Brown1815-54 2.0mm Screened Line Color Token: Dk-Brown1815-54
Line Weight: 2.0mm
Screen Angle: 60 degrees Screen Percent: 54%

L00126
Description: Dk-Brown1815-42 2.0mm Screened Line Color Token: Dk-Brown1815-42
Line Weight: 2.0mm
Screen Angle: 60 degrees Screen Percent: 42%

L00145
Description: 0.0mm Line weight line. This is a place holder for lines that do not have any line component. Color Token: N/A
Line Weight: 0.0mm

L00153
Description: Black 0.6mm Solid Line Color Token: Black
Line Weight: 0.6mm

L00156
Description: Dk-Brown1815 0.5mm Solid Line Color Token: Dk-Brown1815
Line Weight: 0.5mm

L00159
Description: Dk-Brown1815 0.6mm Solid Line Color Token: Dk-Brown1815
Line Weight: 0.6mm

L00166
Description: PaperWhite 0.3mm Solid Line Color Token: PaperWhite
Line Weight: 0.3mm

L00182
Description: PaperWhite 0.6mm Solid Line Color Token: PaperWhite
Line Weight: 0.6mm

L00183
Description: PaperWhite 0.8mm Solid Line Color Token: PaperWhite

Line Weight: 0.8mm

L00186
Description: PaperWhite 0.5mm Solid Line Color Token: PaperWhite
Line Weight: 0.5mm

L00195
Description: Dk-Brown1815 0.4mm Solid Line Color Token: Dk-Brown1815
Line Weight: 0.4mm

L00200
Description: Black 1.5mm Solid Line Color Token: Black
Line Weight: 1.5mm

L00217
Description: Blue072 0.1mm Solid Line Color Token: Blue072
Line Weight: 0.1mm

L00231
Description: PaperWhite 0.45mm Solid Line Color Token: PaperWhite
Line Weight: 0.45mm

L00232
Description: Black 0.75mm Solid Line Color Token: Black
Line Weight: 0.75mm

L00240
Description: Dk-Brown1815 0.15mm Solid Line Color Token: Dk-Brown1815
Line Weight: 0.15mm

L00241
Description: Two parallel Dk-Brown1815 0.15mm Solid Lines Color Token: Dk-Brown1815
Line Weight: 0.15mm

Note: Spacing is variable based on the width of the overpassing feature. The minimum space between each line and the linear portion of the over passing feature shall be 0.2 mm.

L00247
Description: Two parallel Dk-Brown1815 0.3mm Solid Lines Color Token: Dk-Brown1815
Line Weight: 0.3mm

Note: Spacing is variable based on the width of the overpassing feature.

L00248
Description: Cyan 0.25mm Solid Line Color Token: Cyan
Line Weight: 0.25mm

L00361
Description: Green362 0.15mm Solid Line Color Token: Green362
Line Weight: 0.15mm

L00374
Description: Dk-Brown1815-54 0.6mm Screened Line Color Token: Dk-Brown1815-54
Line Weight: 0.6mm

Screen Angle: 45 degrees Screen Percent: 54%

L00376
Description: Dk-Brown1815-54 0.5mm Screened Line Color Token: Dk-Brown1815-54
Line Weight: 0.5mm

Screen Angle: 45 degrees Screen Percent: 54%

L00387
Description: Dk-Brown1815-54 0.3mm Screened Line Color Token: Dk-Brown1815-54
Line Weight: 0.3mm
Screen Angle: 45 degrees Screen Percent: 54%

L00426
Description: Black 0.7mm Solid Line Color Token: Black
Line Weight: 0.7mm

L00427
Description: PaperWhite 0.7mm Solid Line Color Token: PaperWhite
Line Weight: 0.7mm

L00430
Description: Black 1.1mm Solid Line Color Token: Black
Line Weight: 1.1mm

L00431
Description: Dk-Brown1815 0.8mm Solid Line Color Token: Dk-Brown1815
Line Weight: 0.8mm

L00433
Description: Black 0.9mm Solid Line Color Token: Black
Line Weight: 0.9mm

L00439
Description: PaperWhite 1.1mm Solid Line Color Token: PaperWhite
Line Weight: 1.1mm

L00444
Description: Dk-Brown1815-42 1.0mm Screened Line Color Token: Dk-Brown1815-42
Line Weight: 1.0mm
Screen Angle: 60 degrees Screen Percent: 42%

L00445
Description: Blue072 0.25mm Solid Line Color Token: Blue072
Line Weight: 0.25mm

L00451
Description: Black area/surface lock "V" (0.15mm wt) Color Token: Black
Line Weight: 0.15mm
Note: Each leg is equal and based on width of the area/surface geometry, and is connected to form a "V" at a 90 degree angle.

L00455
Description: Black-42 1.0mm Screened Line Color Token: Black-42
Line Weight: 1.0mm
Screen Angle: 60 degrees Screen Percent: 42%

Line - Styled

L00029
Description: Black 0.1mm Dashed Line (0.1mm wt, 2.0mm dash, 0.5mm gap) Color Token: Black
Line Weight: 0.1mm Dash Length: 2.0mm Dash Spacing: 0.5mm

L00030
Description: Black 0.2mm Dashed Line (0.2mm wt, 1.5mm dash, 0.5mm gap) Color Token: Black

Line Weight: 0.2mm Dash Length: 1.5mm Dash Spacing: 0.5mm

L00031
Description: Black 0.2mm Dashed Line (0.2mm wt, 1.0mm dash, 0.5mm gap) Color Token: Black
Line Weight: 0.2mm Dash Length: 1.0mm Dash Spacing: 0.5mm

L00032
Description: Black 0.2mm Dashed Line (0.2mm wt, 2.0mm dash, 0.5mm gap) Color Token: Black
Line Weight: 0.2mm Dash Length: 2.0mm Dash Spacing: 0.5mm

L00035
Description: Black 0.25mm Dashed Line (0.25mm wt, 3.5mm dash, 0.5mm gap) Color Token: Black
Line Weight: 0.25mm Dash Length: 3.5mm Dash Spacing: 0.5mm

L00036
Description: Black 0.3mm Dashed Line (0.3mm wt, 2.0mm dash, 0.5mm gap) Color Token: Black
Line Weight: 0.3mm Dash Length: 2.0mm Dash Spacing: 0.5mm

L00039
Description: Black 0.3mm Dashed Line (0.3mm wt, 5.9mm dash, 0.5mm gap) Color Token: Black
Line Weight: 0.3mm Dash Length: 5.9mm Dash Spacing: 0.5mm

L00040
Description: Cyan 0.2mm Dashed Line (0.2mm wt, 1.0mm dash, 0.5mm gap) Color Token: Cyan
Line Weight: 0.2mm Dash Length: 1.0mm Dash Spacing: 0.5mm

L00041
Description: Cyan 0.2mm Dashed Line (0.2mm wt, 2.0mm dash, 0.5mm gap) Color Token: Cyan
Line Weight: 0.2mm Dash Length: 2.0mm Dash Spacing: 0.5mm

L00045
Description: Cyan 0.4mm Dashed Line (0.4mm wt, 2.0mm dash, 0.5mm gap) Color Token: Cyan
Line Weight: 0.4mm Dash Length: 2.0mm Dash Spacing: 0.5mm

L00089
Description: Black 0.1mm Dashed Line (0.1mm wt, 1.0mm dash, 1.0mm gap) Color Token: Black
Line Weight: 0.1mm Dash Length: 1.0mm Dash Spacing: 1.0mm

L00109
Description: Dk-Brown1815 0.1mm Dashed Line (0.1mm wt, 3.0mm dash, 0.5mm gap) Color Token: Dk-Brown1815
Line Weight: 0.1mm Dash Length: 3.0mm Dash Spacing: 0.5mm

L00110
Description: Cyan 0.1mm Dashed Line (0.1mm wt, 3.0mm dash, 0.5mm gap) Color Token: Cyan
Line Weight: 0.1mm Dash Length: 3.0mm Dash Spacing: 0.5mm

L00117
Description: Dk-Brown1815 0.1mm Dashed Line (0.1mm wt, 1.5mm dash, 0.5mm gap) Color Token: Dk-Brown1815
Line Weight: 0.1mm Dash Length: 1.5mm Dash Spacing: 0.5mm

L00118
Description: Cyan 0.1mm Dashed Line (0.1mm wt, 1.5mm dash, 0.5mm gap) Color Token: Cyan
Line Weight: 0.1mm Dash Length: 1.5mm Dash Spacing: 0.5mm

L00122
Description: Black 0.5mm Dashed Line (0.5mm wt, 7.0mm dash, 2-2.0mm dashes, 1.0mm gaps) Color Token: Black
Line Weight: 0.5mm Dash Length: 7.0mm Dash Spacing: 1.0mm
Dash 2 Length: 2.0mm Dash 2 Spacing: 1.0mm

Dash 3 Length: 2.0mm Dash 3 Spacing: 1.0mm

Note: The line style is a 7.0mm dash, 1.0mm gap, 2.0mm dash, 1.0mm gap, 2.0mm dash, 1.0mm gap, then the pattern repeats.

L00133
Description: Black 0.3mm Dashed Line (0.3mm wt, 7.0mm dash, 3.4mm gap) Color Token: Black
Line Weight: 0.3mm Dash Length: 7.0mm Dash Spacing: 3.4mm

L00169
Description: Dk-Brown1815 0.6mm Dashed Line (0.6mm wt, 3.5mm dash, 1.5mm gap) Color Token: Dk-Brown1815
Line Weight: 0.6mm Dash Length: 3.5mm Dash Spacing: 1.5mm

L00170
Description: Black 0.1mm Dashed Line (0.1mm wt, 2.5mm dash, 0.5mm gap) Color Token: Black
Line Weight: 0.1mm Dash Length: 2.5mm Dash Spacing: 0.5mm

L00191
Description: Dk-Brown1815 0.3mm Dashed Line (0.3mm wt, 3.5mm dash, 1.5mm gap) Color Token: Dk-Brown1815
Line Weight: 0.3mm Dash Length: 3.5mm Dash Spacing: 1.5mm

L00192
Description: Dk-Brown1815 0.5mm Dashed Line (0.5mm wt, 3.5mm dash, 1.5mm gap) Color Token: Dk-Brown1815
Line Weight: 0.5mm Dash Length: 3.5mm Dash Spacing: 1.5mm

L00198
Description: Black 0.15mm Dashed Line (0.15mm wt, 3.3mm dash, 0.5mm gap) Color Token: Black
Line Weight: 0.15mm Dash Length: 3.3mm Dash Spacing: 0.5mm

L00205
Description: Black 0.15mm Dashed Line (0.15mm wt, 5.4mm dash, 1.0mm gap) Color Token: Black
Line Weight: 0.15mm Dash Length: 5.4mm Dash Spacing: 1.0mm

L00210
Description: Black 0.1mm Dashed Line (0.1mm wt, 1.0mm dash, 0.5mm gap) Color Token: Black
Line Weight: 0.1mm Dash Length: 1.0mm Dash Spacing: 0.5mm

L00213
Description: Two parallel Black 0.2mm Dashed Lines (0.2mm wt, 1.0mm dash, 0.5mm gap) spaced 1.3mm apart Color Token: Black
Line Weight: 0.2mm Dash Length: 1.0mm Dash Spacing: 0.5mm

Note: The two parallel Black 0.2mm Dashed Lines are spaced 1.3mm apart from center to center.

L00214
Description: Two parallel Cyan 0.2mm Dashed Lines (0.2mm wt, 1.0mm dash, 0.5mm gap) spaced 1.3mm apart Color Token: Cyan
Line Weight: 0.2mm Dash Length: 1.0mm Dash Spacing: 0.5mm

Note: The two parallel Cyan 0.2mm Dashed Lines are spaced 1.3mm apart from center to center.

L00230
Description: Black 0.75mm Dashed Line (0.75mm wt, 5.9mm dash, 0.5mm gap) Color Token: Black
Line Weight: 0.75mm Dash Length: 5.9mm Dash Spacing: 0.5mm

L00235
Description: Cyan 0.3mm Dashed Line (0.3mm wt, 1.0mm dash, 0.5mm gap) Color Token: Cyan
Line Weight: 0.3mm Dash Length: 1.0mm Dash Spacing: 0.5mm

L00237
Description: Black 0.25mm Dashed Line (0.25mm wt, 5.0mm dash, 1.0mm gap) Color Token: Black

Line Weight: 0.25mm Dash Length: 5.0mm Dash Spacing: 1.0mm

L00243

Description: Black 0.3mm Dashed Line (0.3mm wt, 4.0mm dash, 1.0mm gap) Color Token: Black

Line Weight: 0.3mm Dash Length: 4.0mm Dash Spacing: 1.0mm

L00246

Description: Cyan 0.1mm Dashed Line (0.1mm wt, 2.0mm dash, 0.5mm gap) Color Token: Cyan

Line Weight: 0.1mm Dash Length: 2.0mm Dash Spacing: 0.5mm

L00253

Description: Dk-Brown1815 0.5mm Dashed Line (0.5mm wt, 2-2.0mm dashes, 7.0mm dash, 1.0mm gaps) Color Token: Dk-Brown1815

Line Weight: 0.5mm Dash Length: 2.0mm Dash Spacing: 1.0mm

Dash 2 Length: 2.0mm Dash 2 Spacing: 1.0mm

Dash 3 Length: 7.0mm Dash 3 Spacing: 1.0mm

Note: The line style is a 2.0mm dash, 1.0mm gap, 2.0mm dash, 1.0mm gap, 7.0mm dash, 1.0mm gap, then the pattern repeats.

L00368

Description: Green362 0.15mm Dashed Line (0.15mm wt, 1.0mm dash, 0.5mm gap) Color Token: Green362

Line Weight: 0.15mm Dash Length: 1.0mm Dash Spacing: 0.5mm

L00378

Description: Dk-Brown1815-54 0.5mm Screened Dashed Line (0.5mm wt, 3.5mm, 1.5mm gap) Color Token: Dk-Brown1815-54

Line Weight: 0.5mm Dash Length: 3.5mm Dash Spacing: 1.5mm

Screen Angle: 45 degrees Screen Percent: 54%

L00382

Description: Dk-Brown1815-54 0.3mm Screened Dashed Line (0.3mm wt, 3.5mm, 1.5mm gap) Color Token: Dk-Brown1815-54

Line Weight: 0.3mm Dash Length: 3.5mm Dash Spacing: 1.5mm

Screen Angle: 45 degrees Screen Percent: 54%

L00398

Description: Black 0.4mm Dashed Line (0.4mm wt, 3.0mm dash, 1.0mm gap) Color Token: Black

Line Weight: 0.4mm Dash Length: 3.0mm Dash Spacing: 1.0mm

L00404

Description: Black 0.2mm Dashed Line (0.2mm wt, 4.0mm dash, 1.0mm gap) Color Token: Black

Line Weight: 0.2mm Dash Length: 4.0mm Dash Spacing: 1.0mm

L00405

Description: Cyan 0.2mm Dashed Line (0.2mm wt, 4.0mm dash, 1.0mm gap) Color Token: Cyan

Line Weight: 0.2mm Dash Length: 4.0mm Dash Spacing: 1.0mm

L00428

Description: Black 0.7mm Dashed Line (0.7mm wt, 2.5mm dash, 0.5mm gap) Color Token: Black

Line Weight: 0.7mm Dash Length: 2.5mm Dash Spacing: 0.5mm

L00436

Description: Dk-Brown1815-54 0.6mm Screened Dashed Line (0.6mm wt, 3.5mm, 1.5mm gap) Color Token: Dk-Brown1815-54

Line Weight: 0.6mm Dash Length: 3.5mm Dash Spacing: 1.5mm

Screen Angle: 45 degrees Screen Percent: 54%

L00440

Description: Black 1.1mm Dashed Line (1.1mm wt, 2.5mm dash, 0.5mm gap) Color Token: Black

Line Weight: 1.1mm Dash Length: 2.5mm Dash Spacing: 0.5mm

L00442
Description: Black 0.15mm Dashed Line (0.15mm wt, 3.0mm dash, 1.0mm gap) Color Token: Black
Line Weight: 0.15mm Dash Length: 3.0mm Dash Spacing: 1.0mm

L00447
Description: Black 0.15mm Dashed Line (0.15mm wt, 2.0mm dash, 0.5mm gap) Color Token: Black
Line Weight: 0.15mm Dash Length: 2.0mm Dash Spacing: 0.5mm

L00448
Description: Black 0.3mm Dashed Line (0.3mm wt, 7.0mm dash, 5.3mm gap) Color Token: Black
Line Weight: 0.3mm Dash Length: 7.0mm Dash Spacing: 5.3mm

L00449
Description: Black 0.3mm Dashed Line (0.3mm wt, 7.0mm dash, 7.2mm gap) Color Token: Black
Line Weight: 0.3mm Dash Length: 7.0mm Dash Spacing: 7.2mm

L00450
Description: Black 0.15mm Dashed Line (0.15mm wt, 3.0mm dash, 2.0mm gap) Color Token: Black
Line Weight: 0.15mm Dash Length: 3.0mm Dash Spacing: 2.0mm

L00452
Description: Black-54 0.2mm Screened Dashed Line (0.2mm wt, 1.0mm dash, 0.5mm gap) Color Token: Black-54
Line Weight: 0.2mm Dash Length: 1.0mm Dash Spacing: 0.5mm
Screen Angle: 45 degrees Screen Percent: 54%

Annex G - Point Components

Each of the point components used in Annex A have been listed only once in this Annex.

Point - Shape

P00001
Description: Extraction mine intact not peat
Color Token: Black
Note: See Annex H for detailed drawing instructions.

P00002
Description: Extraction mine not intact not peat
Color Token: Black
Note: See Annex H for detailed drawing instructions.

P00005
Description: Camp/campsite
Color Token: Black
Note: See Annex H for detailed drawing instructions.

P00008
Description: Vertical obstruction
Color Token: Blue072
Note: See Annex H for detailed drawing instructions.

P00010
Description: Located object
Color Token: Black
Note: See Annex H for detailed drawing instructions.

P00012
Description: Building hospital
Color Token: Black
Note: See Annex H for detailed drawing instructions.

P00013
Description: Building Christian cross
Color Token: Black
Note: See Annex H for detailed drawing instructions.

P00014
Description: Building Islamic crescent
Color Token: Black
Note: See Annex H for detailed drawing instructions.

P00016
Description: Building school flag
Color Token: Black
Note: See Annex H for detailed drawing instructions.

P00017
Description: Building Judaism "T"
Color Token: Black
Note: See Annex H for detailed drawing instructions.

P00018
Description: Building temple
Color Token: Black
Note: See Annex H for detailed drawing instructions.

P00019
Description: Building pagoda
Color Token: Black
Note: See Annex H for detailed drawing instructions.

P00020
Description: Pylon
Color Token: Blue072
Note: See Annex H for detailed drawing instructions.

P00022
Description: Cairn
Color Token: Black
Note: See Annex H for detailed drawing instructions.

P00026
Description: Natural pool perennial Color Token: Cyan
Note: See Annex H for detailed drawing instructions.

P00027
Description: Geothermal outlet Color Token: Dk-Brown1815
Note: See Annex H for detailed drawing instructions.

P00028
Description: Vanishing point disappearing Color Token: Cyan
Note: See Annex H for detailed drawing instructions.

P00029
Description: Mountain pass Color Token: Black
Note: See Annex H for detailed drawing instructions.

P00030
Description: Tree other Color Token: Green362
Note: See Annex H for detailed drawing instructions.

P00031
Description: Building stupa Color Token: Black
Note: See Annex H for detailed drawing instructions.

P00032
Description: Natural pool intermittent Color Token: Cyan
Note: See Annex H for detailed drawing instructions.

P00035
Description: Basin gate/lock Color Token: Black
Note: See Annex H for detailed drawing instructions.

P00045
Description: Pipeline elevated "V" Color Token: Black
Note: See Annex H for detailed drawing instructions.

P00058
Description: Pipeline water elevated "V" Color Token: Cyan
Note: See Annex H for detailed drawing instructions.

P00059
Description: Vanishing point dissipating Color Token: Cyan
Note: See Annex H for detailed drawing instructions.

P00064
Description: Volcano Color Token: Dk-Brown1815
Note: See Annex H for detailed drawing instructions.

P00066
Description: Ice peak not frozen water Color Token: Dk-Brown1815
Note: See Annex H for detailed drawing instructions.

P00071
Description: Rock formation Color Token: Dk-Brown1815
Note: See Annex H for detailed drawing instructions.

P00073
Description: Tunnel entrance not water Color Token: Black
Note: See Annex H for detailed drawing instructions.

P00074
Description: Tunnel entrance water Color Token: Cyan
Note: See Annex H for detailed drawing instructions.

P00075
Description: Building Christian Color Token: Black
Note: See Annex H for detailed drawing instructions.

P00076
Description: Building Islamic Color Token: Black
Note: See Annex H for detailed drawing instructions.

P00077
Description: Building Judaism Color Token: Black
Note: See Annex H for detailed drawing instructions.

P00079
Description: Railway station Color Token: Black
Note: See Annex H for detailed drawing instructions.

P00084
Description: Extraction mine peat Color Token: Black
Note: See Annex H for detailed drawing instructions.

P00088
Description: Swimming pool Color Token: Black/Cyan-31
Note: See Annex H for detailed drawing instructions.

P00089
Description: Helipad at hospital Color Token: Blue072
Note: See Annex H for detailed drawing instructions.

P00090
Description: Helipad Color Token: Blue072
Note: See Annex H for detailed drawing instructions.

P00095
Description: Hazardous rock/reef Color Token: Black
Note: See Annex H for detailed drawing instructions.

P00101
Description: Vertical obstruction multiple Color Token: Blue072
Note: See Annex H for detailed drawing instructions.

P00105
Description: Lock/pedestrian bridge/sluice gate "V" Color Token: Black
Note: See Annex H for detailed drawing instructions.

P00106
Description: Culvert double "V" Color Token: Black
Note: See Annex H for detailed drawing instructions.

P00108
Description: Fortified building Color Token: Black
Note: See Annex H for detailed drawing instructions.

P00113
Description: Vertical obstruction linear Color Token: Blue072

Note: See Annex H for detailed drawing instructions.

P00118
Description: Building school Color Token: Black
Note: See Annex H for detailed drawing instructions.

P00131
Description: Crane Color Token: Black
Note: See Annex H for detailed drawing instructions.

P00132
Description: Building checkpoint Color Token: Black
Note: See Annex H for detailed drawing instructions.

P00133
Description: Dish aerial Color Token: Black
Note: See Annex H for detailed drawing instructions.

P00135
Description: Lighthouse Color Token: Black
Note: See Annex H for detailed drawing instructions.

P00136
Description: Memorial monument Color Token: Black
Note: See Annex H for detailed drawing instructions.

P00137
Description: Cooling tower Color Token: Black
Note: See Annex H for detailed drawing instructions.

P00138
Description: Power substation Color Token: Black/Blue072-42
Note: See Annex H for detailed drawing instructions.

P00140
Description: Smokestack Color Token: Black
Note: See Annex H for detailed drawing instructions.

P00141
Description: Tower non-communication Color Token: Black
Note: See Annex H for detailed drawing instructions.

P00142
Description: Water tower Color Token: Black/Cyan
Note: See Annex H for detailed drawing instructions.

P00143
Description: Wind turbine Color Token: Black
Note: See Annex H for detailed drawing instructions.

P00144
Description: Windmill Color Token: Black
Note: See Annex H for detailed drawing instructions.

P00145
Description: Flare pipe Color Token: Black
Note: See Annex H for detailed drawing instructions.

P00148
Description: Water intake tower Color Token: Black
Note: See Annex H for detailed drawing instructions.

P00155
Description: Aerial/tower communication Color Token: Black
Note: See Annex H for detailed drawing instructions.

P00162
Description: Rig inland Color Token: Black
Note: See Annex H for detailed drawing instructions.

P00163
Description: Offshore construction point Color Token: Black
Note: See Annex H for detailed drawing instructions.

P00165
Description: Motor vehicle station Color Token: Black
Note: See Annex H for detailed drawing instructions.

P00171
Description: Greenhouse Color Token: Black/Green362-42
Note: See Annex H for detailed drawing instructions.

P00173
Description: Not intact square 0.8mm Color Token: Black/Black-12
Note: See Annex H for detailed drawing instructions.

P00179
Description: Survey point geodetic Color Token: Black
Note: See Annex H for detailed drawing instructions.

P00183
Description: Cave mouth Color Token: Black
Note: See Annex H for detailed drawing instructions.

P00184
Description: Building minaret Color Token: Black
Note: See Annex H for detailed drawing instructions.

P00186
Description: Building diplomatic Color Token: Black
Note: See Annex H for detailed drawing instructions.

P00195
Description: Rapids Color Token: Cyan
Note: See Annex H for detailed drawing instructions.

P00198
Description: Mooring mast Color Token: Black
Note: See Annex H for detailed drawing instructions.

P00200
Description: River flow arrow Color Token: Cyan
Note: See Annex H for detailed drawing instructions.

P00206
Description: Wreck Color Token: Black
Note: See Annex H for detailed drawing instructions.

P00207
Description: Reef arc
Color Token: Black-54
Note: See Annex H for detailed drawing instructions.

P00208
Description: Aqueduct/penstock/water race "V"
Color Token: Cyan
Note: See Annex H for detailed drawing instructions.

P00210
Description: Sports ground
Color Token: Green362/Green362-12
Note: See Annex H for detailed drawing instructions.

P00238
Description: Railway turntable
Color Token: Black
Note: See Annex H for detailed drawing instructions.

P00253
Description: Cemetery/tomb Christian
Color Token: Black
Note: See Annex H for detailed drawing instructions.

P00254
Description: Cemetery/tomb Islam
Color Token: Black
Note: See Annex H for detailed drawing instructions.

P00255
Description: Cemetery/tomb Judaism
Color Token: Black
Note: See Annex H for detailed drawing instructions.

P00257
Description: Water aerodrome
Color Token: Blue072
Note: See Annex H for detailed drawing instructions.

P00260
Description: Oasis
Color Token: Green362
Note: See Annex H for detailed drawing instructions.

P00261
Description: Inland waterbody
Color Token: Cyan/Cyan-31
Note: See Annex H for detailed drawing instructions.

P00265
Description: Ruins
Color Token: Black
Note: See Annex H for detailed drawing instructions.

P00268
Description: Road route marker national non-USA
Color Token: Black
Note: See Annex H for detailed drawing instructions.

P00271
Description: Cemetery/tomb other
Color Token: Black
Note: See Annex H for detailed drawing instructions.

P00272
Description: Cemetery/tomb Buddhism
Color Token: Black
Note: See Annex H for detailed drawing instructions.

P00274
Description: Ski jump Color Token: Black
Note: See Annex H for detailed drawing instructions.

P00275
Description: Motor vehicle station symbol Color Token: Black
Note: See Annex H for detailed drawing instructions.

P00277
Description: Railway tick narrow double Color Token: Black
Note: See Annex H for detailed drawing instructions.

P00278
Description: Railway tick broad double Color Token: Black
Note: See Annex H for detailed drawing instructions.

P00279
Description: Railway tick narrow electrified Color Token: Black
Note: See Annex H for detailed drawing instructions.

P00280
Description: Railway tick broad electrified Color Token: Black
Note: See Annex H for detailed drawing instructions.

P00281
Description: Railway tick narrow electrified double Color Token: Black
Note: See Annex H for detailed drawing instructions.

P00282
Description: Railway tick broad electrified double Color Token: Black
Note: See Annex H for detailed drawing instructions.

P00283
Description: Surface bunker Color Token: Black/Dk-Brown1815
Note: See Annex H for detailed drawing instructions.

P00285
Description: Building diplomatic flag Color Token: Black
Note: See Annex H for detailed drawing instructions.

P00286
Description: Fence "X" Color Token: Black
Note: See Annex H for detailed drawing instructions.

P00288
Description: Settling pond Color Token: Black/Cyan-31
Note: See Annex H for detailed drawing instructions.

P00291
Description: Not intact circle 0.8mm Color Token: Black/Black-12
Note: See Annex H for detailed drawing instructions.

P00292
Description: Vertical obstruction pylon Color Token: Blue072
Note: See Annex H for detailed drawing instructions.

P00293
Description: Not intact square 0.6mm
Color Token: Black/Black-12
Note: See Annex H for detailed drawing instructions.

P00295
Description: Aircraft revetment
Color Token: Dk-Brown1815
Note: See Annex H for detailed drawing instructions.

P00296
Description: Building hospital symbol
Color Token: Black
Note: See Annex H for detailed drawing instructions.

P00300
Description: Vertical Obstruction Wind Turbine
Color Token: Blue072
Note: See Annex H for detailed drawing instructions.

P00301
Description: Vertical Obstruction Wind Turbine Multiple
Color Token: Blue072
Note: See Annex H for detailed drawing instructions.

P00302
Description: UNESCO World Heritage Site
Color Token: Black
Note: See Annex H for detailed drawing instructions.

Point - Simple

P00006
Description: Black filled square with all sides 0.8mm
Color Token: Black
Length: 0.8mm
Note: The component is a square and is filled with the solid color.

P00007
Description: Cyan filled square with all sides 0.8mm
Color Token: Cyan
Length: 0.8mm
Note: The component is a square and is filled with the solid color.

P00009
Description: Non-water well
Color Token: Black
Line Weight: 0.15mm
Diameter: 1.0mm
Note: The component is an open circle.

P00038
Description: Black 0.75mm length line with a 0.15mm lineweight
Color Token: Black
Line Weight: 0.15mm
Length: 0.75mm

P00040
Description: Qanat/Water well intermittent
Color Token: Cyan
Line Weight: 0.15mm
Diameter: 1.0mm
Note: The component is an open circle.

P00041
Description: Cyan 0.8mm diameter filled circle
Color Token: Cyan
Diameter: 0.8mm

Note: The component is a circle and is filled with the solid color.

P00044

Description: Black 1.5mm length line with a 0.15mm lineweight Color Token: Black

Line Weight: 0.15mm

Length: 1.5mm

P00047

Description: Black 0.25mm diameter filled circle Color Token: Black

Diameter: 0.25mm

Note: The component is a circle and is filled with the solid color.

P00048

Description: Bridge non-fixed open circle Color Token: Black

Line Weight: 0.2mm

Note: The diameter of the open circle is variable based on the width of the overpassing feature.

P00050

Description: Black filled square with all sides 0.5mm Color Token: Black

Length: 0.5mm

Note: The component is a square and is filled with the solid color.

P00053

Description: Black 0.8mm diameter filled circle Color Token: Black

Diameter: 0.8mm

Note: The component is a circle and is filled with the solid color.

P00055

Description: Cyan 0.5mm length line with a 0.1mm lineweight Color Token: Cyan

Line Weight: 0.1mm

Length: 0.5mm

P00061

Description: Cyan 1.5mm length line with a 0.2mm lineweight Color Token: Cyan

Line Weight: 0.2mm

Length: 1.5mm

P00065

Description: Dk-Brown1815 0.5mm length line with a 0.1mm lineweight Color Token: Dk-Brown1815

Line Weight: 0.1mm

Length: 0.5mm

P00067

Description: Dk-Brown1815 0.8mm length line with a 0.15mm lineweight Color Token: Dk-Brown1815

Line Weight: 0.15mm

Length: 0.8mm

P00069

Description: Dk-Brown1815 1.0mm length line with a 0.2mm lineweight Color Token: Dk-Brown1815

Line Weight: 0.2mm

Length: 1.0mm

P00081
Description: Black 0.64mm diameter filled circle
Color Token: Black
Diameter: 0.64mm
Note: The component is a circle and is filled with the solid color.

P00082
Description: Black 0.4mm diameter filled circle
Color Token: Black
Diameter: 0.4mm
Note: The component is a circle and is filled with the solid color.

P00103
Description: Dolphin/Snag/Structural pile
Color Token: Black
Line Weight: 0.15mm
Diameter: 0.8mm
Note: The component is an open circle.

P00111
Description: Forest line/curve
Color Token: Green362
Line Weight: 0.1mm
Diameter: 0.5mm
Note: The component is an open circle.

P00112
Description: Cyan 1.3mm length line with a 0.20mm lineweight
Color Token: Cyan
Line Weight: 0.2mm
Length: 1.3mm

P00125
Description: Cyan 0.7mm diameter filled circle
Color Token: Cyan
Diameter: 0.7mm
Note: The component is a circle and is filled with the solid color.

P00146
Description: Green362 filled square with all sides 0.8mm
Color Token: Green362
Length: 0.8mm
Note: The component is a square and is filled with the solid color.

P00149
Description: Black 0.35mm length line with a 0.45mm lineweight
Color Token: Black
Line Weight: 0.45mm
Length: 0.35mm

P00152
Description: Black 2.5mm length line with a 1.5mm lineweight
Color Token: Black
Line Weight: 1.5mm
Length: 2.5mm

P00153
Description: Black 2.0mm length line with a 0.15mm lineweight
Color Token: Black
Line Weight: 0.15mm
Length: 2.0mm

P00157
Description: Salt evaporator
Color Token: Cyan
Line Weight: 0.2mm
Line Weight: 1.5mm
Note: The component is an open square.

P00158
Description: Road route marker national motorway non-USA
Color Token: Black
Line Weight: 0.1mm
Length: 4.5mm long; 2.25mm wide
Note: The component is an open rectangle.

P00160
Description: Road route marker local/secondary
Color Token: Black
Line Weight: 0.1mm
Diameter: 3.8mm
Note: The component is an open circle.

P00167
Description: Cyan 0.25mm diameter filled circle
Color Token: Cyan
Diameter: 0.25mm
Note: The component is a circle and is filled with the solid color.

P00168
Description: Holding pen
Color Token: Dk-Brown1815
Line Weight: 0.15mm
Length: 0.8mm
Note: The component is an open square.

P00174
Description: Dk-Brown1815 0.5mm length line with 0.15mm lineweight
Color Token: Dk-Brown1815
Line Weight: 0.15mm
Length: 0.5mm

P00175
Description: Dragons teeth
Color Token: Black
Line Weight: 0.3mm
Length: 1.0mm
Note: The component is an open square.

P00193
Description: Black 0.7mm diameter filled circle
Color Token: Black
Diameter: 0.7mm
Note: The component is a circle and is filled with the solid color.

P00235
Description: Green362 0.35mm length line with a 0.45mm lineweight
Color Token: Green362
Line Weight: 0.45mm
Length: 0.35mm

P00267

Description: Road route marker international
Color Token: Black
Line Weight: 0.2mm
Length: 4.5mm long; 2.5mm wide
Note: The component is an open rectangle.

P00269

Description: Black 1.5mm length line with a 0.4mm lineweight
Color Token: Black
Line Weight: 0.4mm
Length: 1.5mm

P00270

Description: Dk-Brown1815 1.5mm length line with a 0.4mm lineweight
Color Token: Dk-Brown1815
Line Weight: 0.4mm
Length: 1.5mm

P00284

Description: Hut
Color Token: Black
Line Weight: 0.1mm
Length: 0.6mm
Note: The component is an open square.

P00287

Description: Blue072 0.8mm diameter open circle
Color Token: Blue072
Line Weight: 0.25mm
Diameter: 0.8mm
Note: The component is an open circle.

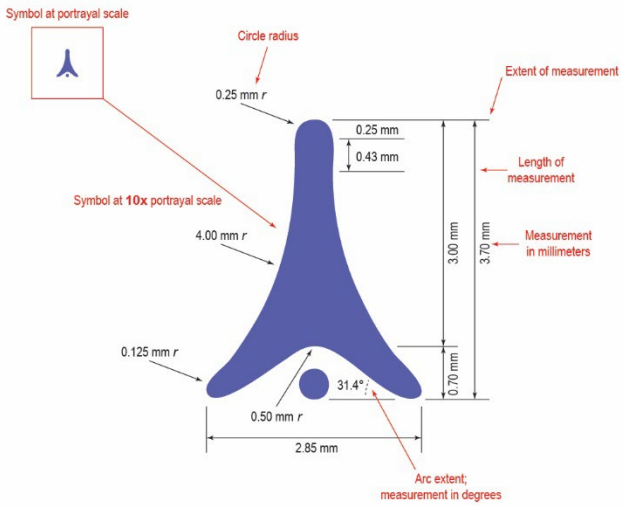
Annex H - Detailed Drawing Instructions

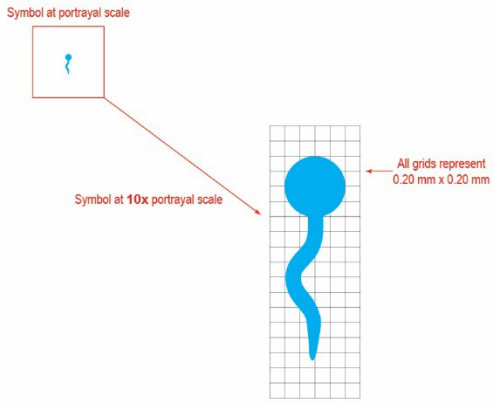
This Annex contains detailed drawing instructions for the point shape components used in Annex A for symbols that could not be easily explained in a small set of parameters. Since many of the components were inherited from the MIL-STD-2410, a historical reference has been made in the document for each applicable component in Annex H, to identify its original Posicut number in the MIL-STD-2410. In some cases, the parameters of the component have been modified from those in MIL-STD-2410. For example, the field "*MIL-STD-2410 Reference: Posicut #1*" means that the component was originally Posicut #1 in the MIL-STD-2410 document and "*MIL-STD-2410 Reference: Posicut #22 (modified)*" means that the component is a modified version of Posicut #22 in the MIL-STD-2410 document.

This Annex contains a number of point components or symbols that have "open" or white areas. It is intended that underlying symbology (such as vegetation) would not show through any of these white openings, but rather the component would mask out underlying symbols, not allowing it to fill any of the open or white portions of the symbol. For example, the open or white portion of the Tower symbol would mask the underlying Built-up Area tint, not allowing it to fill any open portion of the Tower symbol. See section 4.4.1 for Component Reference numbers in Annex H that contain an open or white area as part(s) of the symbol.

The symbols shown in this Annex have been enlarged ten times (10X) to make it easier to view the drawing. Unless otherwise noted in the Symbol Placement Instructions in Annex A, all symbol components in Annex H are shown in their default orientation of 0 degrees (i.e. to the south neatline). The red annotations in the examples below provide explanatory information for the detailed drawings.

NOTE - The bookmark tool on the left panel of the PDF also provides hyperlinks to each point shape component in Annex H.



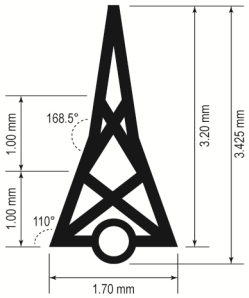


Description: **Aerial/tower communication**

Component Ref #: P00155 Color Token: Black

Origin: Center of open circle

Overall component height:	3.425mm
Overall component width:	1.70mm
Diameter of open circle:	0.60mm
Lineweight of open circle:	0.10mm
Lineweight (all or other):	0.15mm
MIL-STD-2410 Reference:	Posicut #239 (modified)

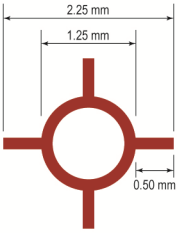


Description: **Aircraft revetment**

Component Ref #: P00295 Color Token: Dk-Brown1815

Origin: Center of symbol

Overall component height:	2.25mm
Overall component width:	2.25mm
Diameter of open circle:	1.25mm
Lineweight of open circle:	0.15mm
Length of stem or segment:	0.50mm
Lineweight of ticks:	0.15mm
Angle between elements:	90°

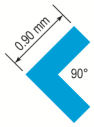


Description: **Aqueduct/penstock/water race "V"**

Component Ref #: P00208 Color Token: Cyan

Origin: Apex of "V"

Length of stem or segment:	0.90mm
Lineweight (all or other):	0.30mm
Angle between elements:	90°
Note:	Apex is where the lines connect to form a "V".

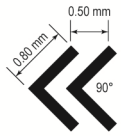


Description: **Basin gate/lock**

Component Ref #: P00035 Color Token: Black

Origin: Center of symbol

Length of stem or segment: 0.80mm
Lineweight (all or other): 0.15mm
Angle between elements: 90°
Space between elements: 0.50mm

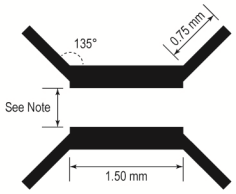


Description: **Bridge fixed**

Component Ref #: P00188 Color Token: Black

Origin: Center of symbol

Length of stem or segment: 1.50mm
Lineweight of stem or base: 0.30mm
Lineweight of ticks: 0.15mm
Space between elements: 0.30mm to 1.15mm
Note: Distance between component segments vary depending on the overpassing feature symbol. See finishing displacement rules FD-9997 and FD-9998.

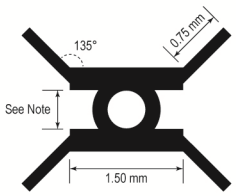


Description: **Bridge not fixed**

Component Ref #: P00202 Color Token: Black

Origin: Center of symbol

Lineweight of open circle: 0.20mm
Length of stem or segment: 1.50mm
Lineweight of stem or base: 0.30mm
Lineweight of ticks: 0.15mm
Space between elements: 0.30mm to 1.15mm
Note: Distance between component segments vary depending on the overpassing feature symbol. See finishing displacement rules FD-9997 and FD-9998. Diameter of open circle is variable based on the distance between the component segments.

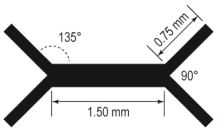


Description: **Bridge pedestrian**

Component Ref #: P00201 Color Token: Black

Origin: Center of symbol

Length of stem or segment: 1.50mm
Lineweight of ticks: 0.15mm
Lineweight (all or other): 0.30mm

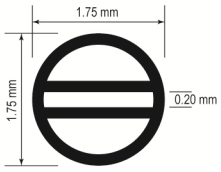


Description: **Building checkpoint**

Component Ref #: P00132 Color Token: Black

Origin: Center of symbol

Overall component height: 1.75mm
Overall component width: 1.75mm
Diameter of open circle: 1.75mm
Lineweight (all or other): 0.15mm
Space between elements: 0.20mm
MIL-STD-2410 Reference: Posicut #15 (modified)
Note: Horizontal lines are centered in the circle.

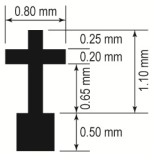


Description: **Building Christian**

Component Ref #: P00075 Color Token: Black

Origin: Center of solid square

Overall component height: 1.60mm
Overall component width: 0.80mm
Lineweight (all or other): 0.20mm
Angle between elements: 90°
MIL-STD-2410 Reference: Posicut #20 (modified)
Note: Solid square 0.50mm.

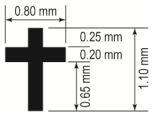


Description: **Building Christian cross**

Component Ref #: P00013 Color Token: Black

Origin: Center of base of staff

Overall component height: 1.10mm
Overall component width: 0.80mm
Lineweight (all or other): 0.20mm
Angle between elements: 90°
MIL-STD-2410 Reference: Posicut #21 (modified)

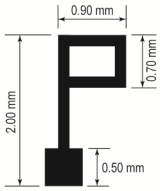


Description: **Building diplomatic**

Component Ref #: P00186 Color Token: Black

Origin: Center of solid square

Overall component height: 2.00mm
Overall component width: 1.075mm
Lineweight (all or other): 0.15mm
Angle between elements: 90°
Note: Solid square 0.50mm.

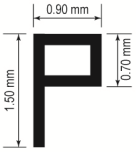


Description: **Building diplomatic flag**

Component Ref #: P00285 Color Token: Black

Origin: Center of base of staff

Overall component height: 1.50mm
Overall component width: 0.90mm
Lineweight (all or other): 0.15mm
Angle between elements: 90°
MIL-STD-2410 Reference: Posicut #214 (modified)

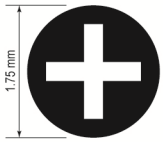


Description: **Building hospital**

Component Ref #: P00012 Color Token: Black

Origin: Center of symbol

Overall component height:	1.75mm
Overall component width:	1.75mm
Diameter of solid circle:	1.75mm
Lineweight (all or other):	0.25mm
Angle between elements:	90°
MIL-STD-2410 Reference:	Posicut #18
Note:	White cross bars are 1.25mm centered within solid circle.

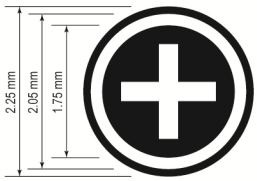


Description: **Building hospital symbol**

Component Ref #: P00296 Color Token: Black

Origin: Center of symbol

Overall component height:	2.25mm
Overall component width:	2.25mm
Diameter of solid circle:	1.75mm
Lineweight of open circle:	0.10mm
Lineweight (all or other):	0.25mm
Angle between elements:	90°
Note:	White cross bars are 1.25mm centered within solid circle. Lineweight of white circle 0.15mm.

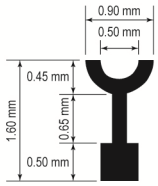


Description: **Building Islamic**

Component Ref #: P00076 Color Token: Black

Origin: Center of solid square

Overall component height:	1.60mm
Overall component width:	0.90mm
Lineweight (all or other):	0.20mm
Angle between elements:	90°
MIL-STD-2410 Reference:	Posicut #22 (modified)
Note:	Solid square 0.50mm.

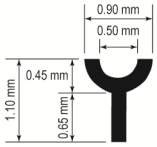


Description: **Building Islamic crescent**

Component Ref #: P00014 Color Token: Black

Origin: Center of base of staff

Overall component height: 1.10mm
Overall component width: 0.90mm
Lineweight (all or other): 0.20mm
Angle between elements: 90°
MIL-STD-2410 Reference: Posicut #23 (modified)
Note: Half circle is centered on staff.

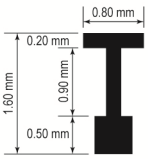


Description: **Building Judaism**

Component Ref #: P00077 Color Token: Black

Origin: Center of solid square

Overall component height: 1.60mm
Overall component width: 0.80mm
Lineweight (all or other): 0.20mm
Angle between elements: 90°
MIL-STD-2410 Reference: Posicut #31 (modified)
Note: Solid square 0.50mm.

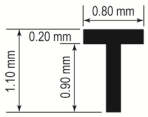


Description: **Building Judaism "T"**

Component Ref #: P00017 Color Token: Black

Origin: Center of symbol

Overall component height: 1.10mm
Overall component width: 0.80mm
Length of stem or segment: 0.90mm
Lineweight (all or other): 0.20mm
Angle between elements: 90°
MIL-STD-2410 Reference: Posicut #32 (modified)

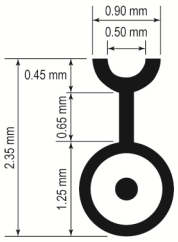


Description: **Building minaret**

Component Ref #: P00184 Color Token: Black

Origin: Center of open circle

Overall component height: 2.35mm
Overall component width: 1.25mm
Diameter of solid circle: 0.30mm
Diameter of open circle: 1.25mm
Lineweight of open circle: 0.15mm
Lineweight (all or other): 0.20mm
Angle between elements: 90°
MIL-STD-2410 Reference: Posicut #28 (modified)

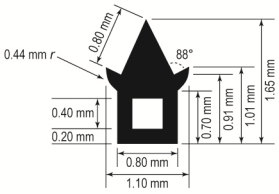


Description: **Building pagoda**

Component Ref #: P00019 Color Token: Black

Origin: Center of symbol

Overall component height: 1.65mm
Overall component width: 1.10mm
Lineweight (all or other): 0.20mm
MIL-STD-2410 Reference: Posicut #34
Note: A white 0.40mm square is placed 0.20mm from bottom. Arc radii 0.44mm.

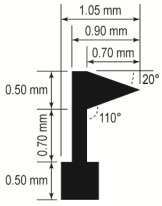


Description: **Building school**

Component Ref #: P00118 Color Token: Black

Origin: Center of solid square

Overall component height: 1.70mm
Overall component width: 0.90mm
Lineweight (all or other): 0.20mm
MIL-STD-2410 Reference: Posicut #16 (modified)
Note: Solid square 0.50mm.

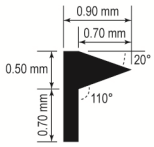


Description: **Building school flag**

Component Ref #: P00016 Color Token: Black

Origin: Center of base of staff

Overall component height: 1.20mm
Overall component width: 0.90mm
Lineweight (all or other): 0.20mm
MIL-STD-2410 Reference: Posicut #30

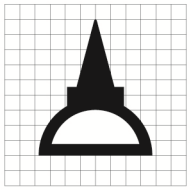


Description: **Building stupa**

Component Ref #: P00031 Color Token: Black

Origin: Center of symbol

Overall component height: 1.80mm
Overall component width: 1.50mm
Lineweight (all or other): 0.15mm
MIL-STD-2410 Reference: Posicut #200
Note: Steeple top radius 0.04mm.

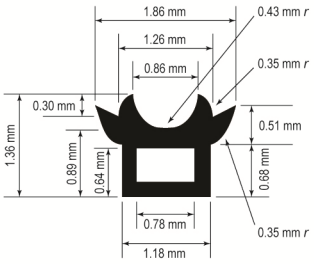


Description: **Building temple**

Component Ref #: P00018 Color Token: Black

Origin: Center of symbol

Overall component height: 1.36mm
Overall component width: 1.86mm
Lineweight (all or other): 0.20mm
MIL-STD-2410 Reference: Posicut #33
Note: Large arc radius 0.43mm. Small arc radii 0.35mm.

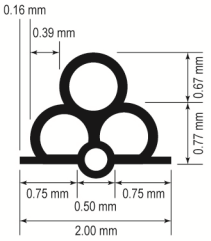


Description: **Cairn**

Component Ref #: P00022 Color Token: Black

Origin: Center of open circle

Overall component height:	1.65mm
Overall component width:	2.00mm
Diameter of open circle:	0.50mm
Lineweight of open circle:	0.10mm
Lineweight of stem or base:	0.10mm
MIL-STD-2410 Reference:	Posicut #38
Note:	Diameter of large circles 0.90mm. Lineweight 0.13mm.

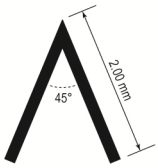


Description: **Camp/campsite**

Component Ref #: P00005 Color Token: Black

Origin: Center of symbol

Length of stem or segment:	2.00mm
Lineweight (all or other):	0.15mm
Angle between elements:	45°

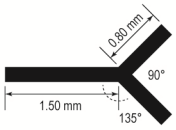


Description: **Cave mouth**

Component Ref #: P00183 Color Token: Black

Origin: Center of symbol

Overall component height:	1.334mm
Overall component width:	2.205mm
Length of stem or segment:	1.50mm
Lineweight (all or other):	0.20mm
Angle between elements:	135°

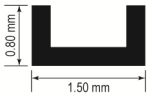


Description: **Cemetery/tomb Buddhism**

Component Ref #: P00272 Color Token: Black

Origin: Center of symbol

Overall component height: 0.80mm
Overall component width: 1.50mm
Lineweight (all or other): 0.25mm
Angle between elements: 90°
MIL-STD-2410 Reference: Posicut #40 (modified)

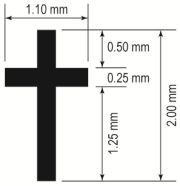


Description: **Cemetery/tomb Christian**

Component Ref #: P00253 Color Token: Black

Origin: Center of symbol

Overall component height: 2.00mm
Overall component width: 1.10mm
Lineweight (all or other): 0.25mm
Angle between elements: 90°
MIL-STD-2410 Reference: Posicut #21 (modified)

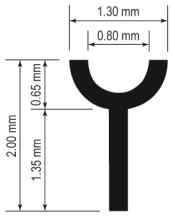


Description: **Cemetery/tomb Islam**

Component Ref #: P00254 Color Token: Black

Origin: Center of symbol

Overall component height: 2.00mm
Overall component width: 1.30mm
Lineweight (all or other): 0.25mm
Angle between elements: 90°
MIL-STD-2410 Reference: Posicut #23 (modified)
Note: Half circle is centered on staff.

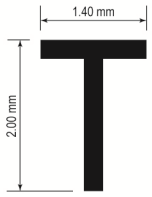


Description: **Cemetery/tomb Judaism**

Component Ref #: P00255 Color Token: Black

Origin: Center of symbol

Overall component height: 2.00mm
Overall component width: 1.40mm
Lineweight (all or other): 0.25mm
Angle between elements: 90°
MIL-STD-2410 Reference: Posicut #32 (modified)



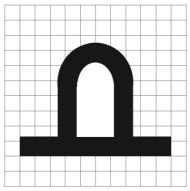
T

Description: **Cemetery/tomb other**

Component Ref #: P00271 Color Token: Black

Origin: Center of symbol

Overall component height: 1.50mm
Overall component width: 2.00mm
Lineweight (all or other): 0.25mm
Note: Top of symbol is the upper part of an ellipse 1.00mm wide by 1.1 mm high.

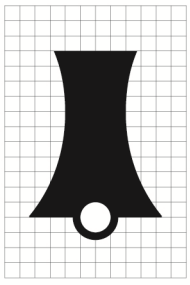


Description: **Cooling tower**

Component Ref #: P00137 Color Token: Black

Origin: Center of open circle

Overall component height: 2.50mm
Overall component width: 1.75mm
Diameter of open circle: 0.60mm
Lineweight of open circle: 0.10mm
Note: Width at top 1.10mm. Width at narrowest part 0.80mm. Width at bottom 1.75mm.

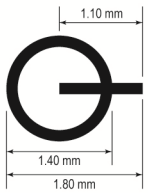


Description: **Crane**

Component Ref #: P00131 Color Token: Black

Origin: Center of open circle

Overall component height:	1.40mm
Overall component width:	1.80mm
Diameter of open circle:	1.40mm
Lineweight of open circle:	0.15mm
Length of stem or segment:	1.10mm
Lineweight (all or other):	0.15mm
MIL-STD-2410 Reference:	Posicut #8 (modified)

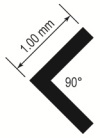


Description: **Culvert "V"**

Component Ref #: P00107 Color Token: Black

Origin: Apex of "V"

Length of stem or segment:	1.00mm
Lineweight (all or other):	0.20mm
Angle between elements:	90°
Note:	Apex is where the lines connect to form a "V".

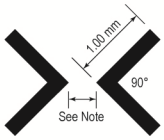


Description: **Culvert double "V"**

Component Ref #: P00106 Color Token: Black

Origin: Center of symbol

Length of stem or segment:	1.00mm
Lineweight (all or other):	0.20mm
Angle between elements:	90°
Note:	Spacing between "V" elements is variable based on the width of the corresponding transportation feature.

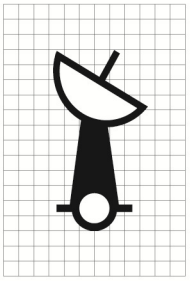


Description: **Dish aerial**

Component Ref #: P00133 Color Token: Black

Origin: Center of open circle

Overall component height:	2.40mm
Overall component width:	1.25mm
Diameter of open circle:	0.60mm
Lineweight of open circle:	0.10mm
Lineweight of stem or base:	0.10mm
Lineweight (all or other):	0.10mm
Note:	Length of base 1.00mm. Body tapers from 0.35mm to 0.65mm at the base.

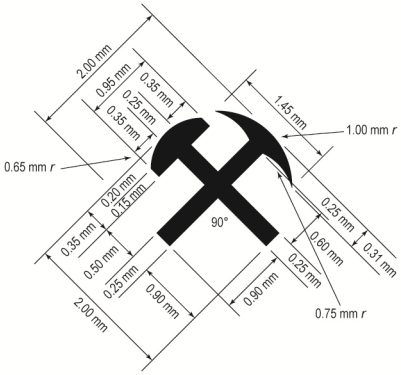


Description: **Extraction mine intact not peat**

Component Ref #: P00001 Color Token: Black

Origin: Center of symbol

Overall component height:	1.794mm
Overall component width:	1.868mm
Lineweight (all or other):	0.25mm
MIL-STD-2410 Reference:	Posicut #1
Note:	Outer axe radius 1.00mm. Inner axe radii 0.75mm. Hammer radius 0.65mm.



Description: **Extraction mine not intact not peat**

Component Ref #: P00002 Color Token: Black

Origin: Center of symbol

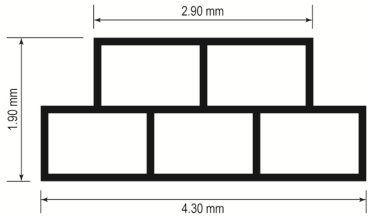
Overall component height:	1.794mm
Overall component width:	1.85mm
Lineweight (all or other):	0.25mm
Note:	Component P00001 "Extraction mine intact not peat" rotated 180°.

Description: **Extraction mine peat**

Component Ref #: P00084 Color Token: Black

Origin: Center of symbol

Overall component height: 1.90mm
Overall component width: 4.30mm
Lineweight (all or other): 0.10mm
Note: Each overlapping rectangle 1.50mm x 1.00mm.

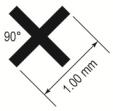


Description: **Fence "X"**

Component Ref #: P00286 Color Token: Black

Origin: Center of symbol

Length of stem or segment: 1.00mm
Lineweight (all or other): 0.15mm
Angle between elements: 90°

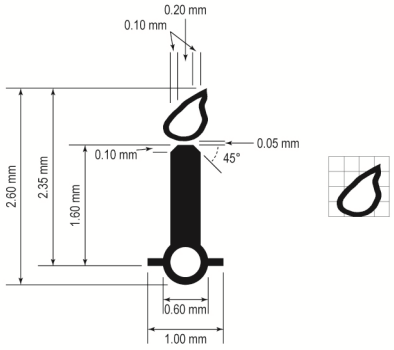


Description: **Flare pipe**

Component Ref #: P00145 Color Token: Black

Origin: Center of open circle

Overall component height: 2.60mm
Overall component width: 1.00mm
Diameter of open circle: 0.60mm
Lineweight of open circle: 0.10mm
Lineweight of stem or base: 0.10mm
MIL-STD-2410 Reference: Posicut #9 (modified)

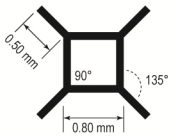


Description: **Fortified building**

Component Ref #: P00108 Color Token: Black

Origin: Center of symbol

Overall component height: 1.50mm
Overall component width: 1.50mm
Length of stem or segment: 0.50mm
Lineweight (all or other): 0.10mm
Note: Open square 0.80mm.

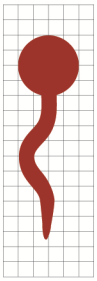


Description: **Geothermal outlet**

Component Ref #: P00027 Color Token: Dk-Brown1815

Origin: Center of solid circle

Overall component height: 2.70mm
Overall component width: 0.80mm
Diameter of solid circle: 0.80mm
Lineweight (all or other): 0.20mm
MIL-STD-2410 Reference: Posicut #124



Description: **Greenhouse**

Component Ref #: P00171 Color Token: Black/Green362-42

Origin: Center of symbol

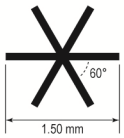
Overall component height: 0.60mm
Overall component width: 0.60mm
Lineweight (all or other): 0.10mm
Note: Outline is Black. Fill is Green362-42 (42% screen, 45° angle).

Description: **Hazardous rock/reef**

Component Ref #: P00095 Color Token: Black

Origin: Center of symbol

Length of stem or segment: 1.50mm
Lineweight (all or other): 0.10mm
Angle between elements: 60°
MIL-STD-2410 Reference: Posicut #231 (modified)

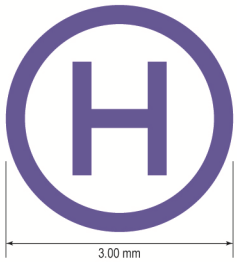


Description: **Helipad**

Component Ref #: P00090 Color Token: Blue072

Origin: Center of symbol

Overall component height: 3.00mm
Overall component width: 3.00mm
Diameter of open circle: 3.00mm
Lineweight (all or other): 0.25mm
Note: The "H" is formed by two 1.50mm vertical lines and one 1.20mm horizontal line.

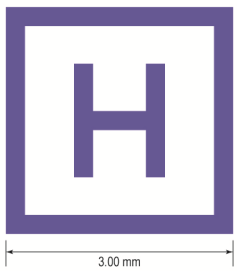


Description: **Helipad at hospital**

Component Ref #: P00089 Color Token: Blue072

Origin: Center of symbol

Overall component height: 3.00mm
Overall component width: 3.00mm
Lineweight (all or other): 0.25mm
Note: The "H" is formed by two 1.50mm vertical lines and one 1.20mm horizontal line.

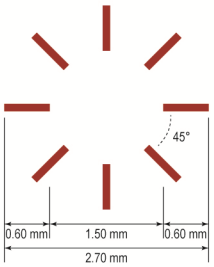


Description: **Ice peak not frozen water**

Component Ref #: P00066 Color Token: Dk-Brown1815

Origin: Center of symbol

Overall component height:	2.70mm
Overall component width:	2.70mm
Length of stem or segment:	0.60mm
Lineweight (all or other):	0.15mm
Angle between elements:	45°
MIL-STD-2410 Reference:	Posicut #232 (modified)
Note:	Ticks emanate from a 1.50mm circle.



Description: **Inland waterbody**

Component Ref #: P00261 Color Token: Cyan/Cyan-31

Origin: Center of symbol

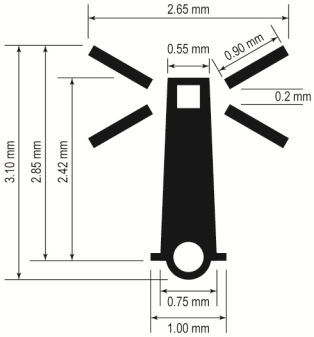
Overall component height:	1.00mm
Overall component width:	1.00mm
Diameter of open circle:	1.00mm
Lineweight (all or other):	0.15mm
Note:	Fill is Cyan-31 (31% screen 45° angle).

Description: **Lighthouse**

Component Ref #: P00135 Color Token: Black

Origin: Center of open circle

Overall component height:	3.10mm
Overall component width:	2.65mm
Diameter of open circle:	0.60mm
Lineweight of open circle:	0.10mm
Lineweight of stem or base:	0.10mm
Lineweight of ticks:	0.15mm
Note:	Four 0.90mm "rays" rotated 30, 150, 210, and 330 degrees. A white 0.30mm square is placed 0.10mm from top.

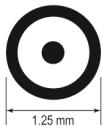


Description: **Located object**

Component Ref #: P00010 Color Token: Black

Origin: Center of symbol

Overall component height:	1.25mm
Overall component width:	1.25mm
Diameter of solid circle:	0.30mm
Diameter of open circle:	1.25mm
Lineweight of open circle:	0.15mm
MIL-STD-2410 Reference:	Posicut #7

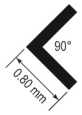


Description: **Lock/pedestrian bridge/sluice gate "V"**

Component Ref #: P00105 Color Token: Black

Origin: Apex of "V"

Length of stem or segment:	0.80mm
Lineweight (all or other):	0.15mm
Angle between elements:	90°
Note:	Apex is where the lines connect to form a "V".

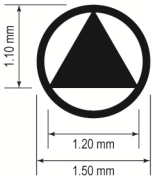


Description: **Memorial monument**

Component Ref #: P00136 Color Token: Black

Origin: Center of symbol

Overall component height:	1.50mm
Overall component width:	1.50mm
Diameter of open circle:	1.50mm
Lineweight of open circle:	0.10mm
Note:	Equilateral triangle fits within open circle and is 1.20mm on each side.

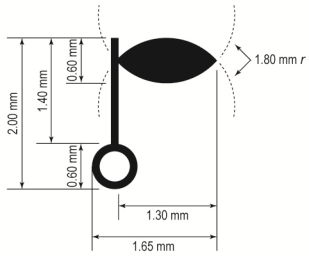


Description: **Mooring mast**

Component Ref #: P00198 Color Token: Black

Origin: Center of open circle

Overall component height: 2.00mm
Overall component width: 1.65mm
Diameter of open circle: 0.60mm
Lineweight of open circle: 0.10mm
Length of stem or segment: 1.40mm
Lineweight of stem or base: 0.10mm
MIL-STD-2410 Reference: Posicut #45 (modified)

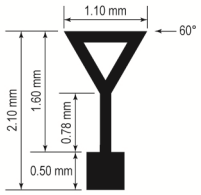


Description: **Motor vehicle station**

Component Ref #: P00165 Color Token: Black

Origin: Center of solid square

Overall component height: 2.10mm
Overall component width: 1.10mm
Length of stem or segment: 0.78mm
Lineweight (all or other): 0.15mm
Angle between elements: 60°
Note: Solid square 0.50mm.

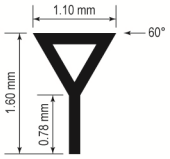


Description: **Motor vehicle station symbol**

Component Ref #: P00275 Color Token: Black

Origin: Center of base of staff

Overall component height: 1.60mm
Overall component width: 1.10mm
Length of stem or segment: 0.78mm
Lineweight (all or other): 0.15mm
Angle between elements: 60°
MIL-STD-2410 Reference: Posicut #194 (modified)

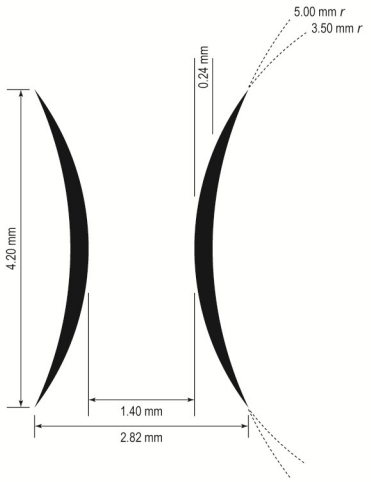


Description: **Mountain pass**

Component Ref #: P00029 Color Token: Black

Origin: Center of symbol

Overall component height: 4.20mm
Overall component width: 2.82mm
MIL-STD-2410 Reference: Posicut #126
Note: Space between inner and outer arc radii form the symbol. Inner arc radii 3.50mm. Outer arc radii 5.00mm.

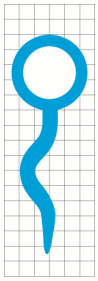


Description: **Natural pool intermittent**

Component Ref #: P00032 Color Token: Cyan

Origin: Center of open circle

Overall component height: 2.90mm
Overall component width: 1.00mm
Diameter of open circle: 1.00mm
Lineweight of open circle: 0.15mm
Lineweight (all or other): 0.20mm
MIL-STD-2410 Reference: Posicut #215

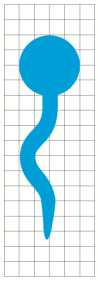


Description: **Natural pool perennial**

Component Ref #: P00026 Color Token: Cyan

Origin: Center of solid circle

Overall component height: 2.70mm
Overall component width: 0.80mm
Diameter of solid circle: 0.80mm
Lineweight (all or other): 0.20mm
MIL-STD-2410 Reference: Posicut #124

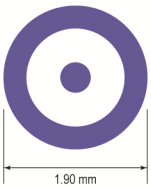


Description: **NAVAID - Radio aid**

Component Ref #: P00294 Color Token: Blue072

Origin: Center of symbol

Overall component height:	1.90mm
Overall component width:	1.90mm
Diameter of solid circle:	0.40mm
Diameter of open circle:	1.90mm
Lineweight of open circle:	0.30mm
MIL-STD-2410 Reference:	Posicut #55



Description: **Not intact circle 0.8mm**

Component Ref #: P00291 Color Token: Black/Black-12

Origin: Center of symbol

Overall component height:	0.80mm
Overall component width:	0.80mm
Diameter of open circle:	0.80mm
Lineweight (all or other):	0.10mm
Note:	Fill is Black-12 (12% screen 45° angle).

Description: **Not intact square 0.6mm**

Component Ref #: P00293 Color Token: Black/Black-12

Origin: Center of symbol

Overall component height:	0.60mm
Overall component width:	0.60mm
Lineweight (all or other):	0.10mm
Note:	Fill is Black-12 (12% screen 45° angle).

Description: **Not intact square 0.8mm**

Component Ref #: P00173 Color Token: Black/Black-12

Origin: Center of symbol

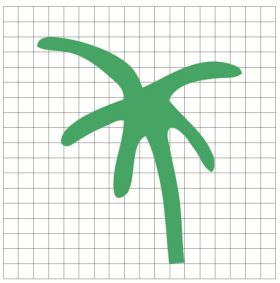
Overall component height: 0.80mm
Overall component width: 0.80mm
Lineweight (all or other): 0.10mm
Note: Fill is Black-12 (12% screen 45° angle).

Description: **Oasis**

Component Ref #: P00260 Color Token: Green362

Origin: Center of symbol

Overall component height: 3.00mm
Overall component width: 2.70mm
Lineweight of stem or base: 0.20mm
MIL-STD-2410 Reference: Posicut #130 (modified)

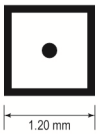


Description: **Offshore construction point**

Component Ref #: P00163 Color Token: Black

Origin: Center of symbol

Overall component height: 1.20mm
Overall component width: 1.20mm
Diameter of solid circle: 0.20mm
Lineweight (all or other): 0.10mm
MIL-STD-2410 Reference: Posicut #236 (modified)



Description: **Pipeline elevated "V"**

Component Ref #: P00045 Color Token: Black

Origin: Apex of "V"

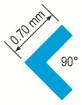
Length of stem or segment: 0.70mm
Lineweight (all or other): 0.20mm
Angle between elements: 90°
Note: Apex is where the lines connect to form a "V".

Description: **Pipeline water elevated "V"**

Component Ref #: P00058 Color Token: Cyan

Origin: Apex of "V"

Length of stem or segment: 0.70mm
Lineweight (all or other): 0.20mm
Angle between elements: 90°
Note: Apex is where the lines connect to form a "V".

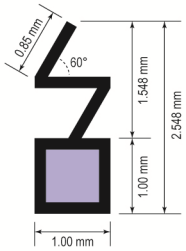


Description: **Power substation**

Component Ref #: P00138 Color Token: Black/Blue072-42

Origin: Center of symbol

Overall component height: 2.548mm
Overall component width: 1.00mm
Lineweight (all or other): 0.15mm
Angle between elements: 60°
Note: Outline is Black. Fill is Blue072-42 (42% screen 45° angle).

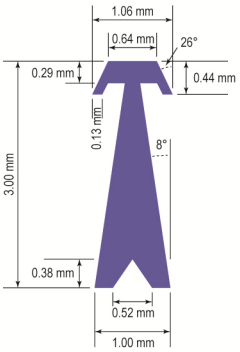


Description: **Pylon**

Component Ref #: P00020 Color Token: Blue072

Origin: Center of symbol

Overall component height: 3.00mm
Overall component width: 1.06mm
MIL-STD-2410 Reference: Posicut #35

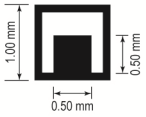


Description: **Railway station**

Component Ref #: P00079 Color Token: Black

Origin: Center of symbol

Overall component height: 1.00mm
Overall component width: 1.00mm
Lineweight (all or other): 0.10mm
Note: Open square 1.00mm each side. Solid square 0.50mm.

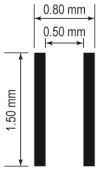


Description: **Railway tick broad double**

Component Ref #: P00278 Color Token: Black

Origin: Center of symbol

Overall component height: 1.50mm
Overall component width: 0.80mm
Length of stem or segment: 1.50mm
Lineweight (all or other): 0.15mm
Space between elements: 0.50mm

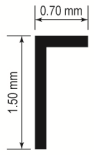


Description: **Railway tick broad electrified**

Component Ref #: P00280 Color Token: Black

Origin: Center of symbol

Overall component height:	1.50mm
Overall component width:	0.70mm
Length of stem or segment:	1.50mm
Lineweight (all or other):	0.15mm
Angle between elements:	90°
Note:	Length of top segment 0.70mm.

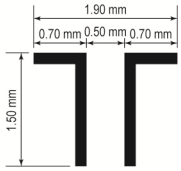


Description: **Railway tick broad electrified double**

Component Ref #: P00282 Color Token: Black

Origin: Center of symbol

Overall component height:	1.50mm
Overall component width:	1.90mm
Length of stem or segment:	1.50mm
Lineweight (all or other):	0.15mm
Angle between elements:	90°
Space between elements:	0.50mm
Note:	Length of top segment 0.70mm.

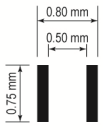


Description: **Railway tick narrow double**

Component Ref #: P00277 Color Token: Black

Origin: Center of symbol

Overall component height:	0.75mm
Overall component width:	0.80mm
Length of stem or segment:	0.75mm
Lineweight (all or other):	0.15mm
Space between elements:	0.50mm



Description: **Railway tick narrow electrified**

Component Ref #: P00279 Color Token: Black

Origin: Center of symbol

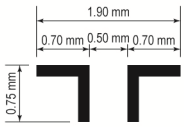
Overall component height:	0.75mm
Overall component width:	0.70mm
Length of stem or segment:	0.75mm
Lineweight (all or other):	0.15mm
Angle between elements:	90°
Note:	Length of top segment 0.70mm.

Description: **Railway tick narrow electrified double**

Component Ref #: P00281 Color Token: Black

Origin: Center of symbol

Overall component height:	0.75mm
Overall component width:	1.90mm
Length of stem or segment:	0.75mm
Lineweight (all or other):	0.15mm
Angle between elements:	90°
Space between elements:	0.50mm
Note:	Length of top segment 0.70mm.



Description: **Railway turntable**

Component Ref #: P00238 Color Token: Black

Origin: Center of symbol

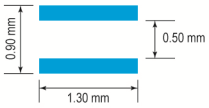
Overall component height:	1.50mm
Overall component width:	1.50mm
Diameter of open circle:	1.50mm
Lineweight of open circle:	0.15mm
Lineweight (all or other):	0.15mm
Note:	Interior line orientation is 45° centered inside the circle.

Description: **Rapids**

Component Ref #: P00195 Color Token: Cyan

Origin: Center of symbol

Overall component height: 0.90mm
Overall component width: 1.30mm
Length of stem or segment: 1.30mm
Lineweight (all or other): 0.20mm
Space between elements: 0.50mm

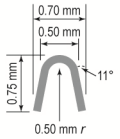


Description: **Reef arc**

Component Ref #: P00207 Color Token: Black-54

Origin: Center of symbol

Overall component height: 0.75mm
Overall component width: 0.70mm
Lineweight (all or other): 0.10mm
Angle between elements: 11°
Note: Arc radius 0.25mm. Symbol is Black-54 (54% screen 45° angle).

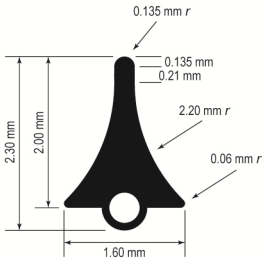


Description: **Rig inland**

Component Ref #: P00162 Color Token: Black

Origin: Center of open circle

Overall component height: 2.30mm
Overall component width: 1.60mm
Diameter of open circle: 0.60mm
Lineweight of open circle: 0.10mm
Note: Base leg end arc radii 0.06mm. Tip arc radius 0.135mm.

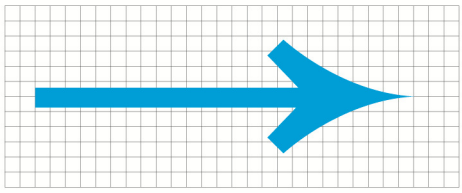


Description: **River flow arrow**

Component Ref #: P00200 Color Token: Cyan

Origin: Center of symbol

Overall component height: 1.50mm
Overall component width: 5.00mm
Lineweight (all or other): 0.25mm
MIL-STD-2410 Reference: Posicut #118 (modified)
Note: The linear portion of the symbol may be shortened when space is limited.

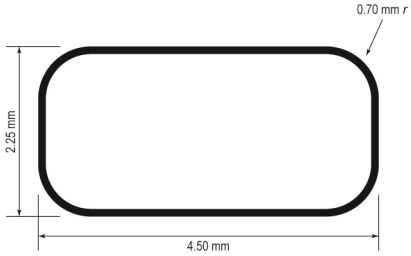


Description: **Road route marker national non-USA**

Component Ref #: P00268 Color Token: Black

Origin: Center of symbol

Overall component height: 2.25mm
Overall component width: 4.50mm
Lineweight (all or other): 0.10mm
Note: Arc radii 0.70mm. The symbol may be enlarged in the horizontal axis to accommodate the route designation.

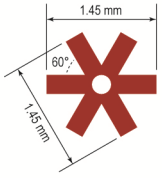


Description: **Rock formation**

Component Ref #: P00071 Color Token: Dk-Brown1815

Origin: Center of symbol

Diameter of open circle: 0.25mm
Length of stem or segment: 0.60mm
Lineweight (all or other): 0.25mm
Angle between elements: 60°
Note: Ticks emanate from a 0.25mm circle.

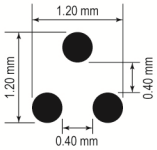


Description: **Ruins**

Component Ref #: P00265 Color Token: Black

Origin: Center of symbol

Overall component height: 1.20mm
Overall component width: 1.20mm
Diameter of solid circle: 0.40mm
Angle between elements: 60°
Space between elements: 0.40mm

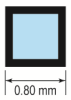


Description: **Settling pond**

Component Ref #: P00288 Color Token: Black/Cyan-31

Origin: Center of symbol

Overall component height: 0.80mm
Overall component width: 0.80mm
Lineweight (all or other): 0.10mm
Note: Outline is Black. Fill is Cyan-31 (31% screen 45° angle).

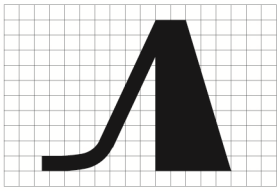


Description: **Ski jump**

Component Ref #: P00274 Color Token: Black

Origin: Center of symbol

Overall component height: 2.00mm
Overall component width: 2.50mm
Lineweight (all or other): 0.20mm
Note: Width of top 0.40mm. Width of bottom of thick base 1.00mm. Height of thick base to apex of ramp 1.50mm. Angle between ramp and thick base is 25 degrees.

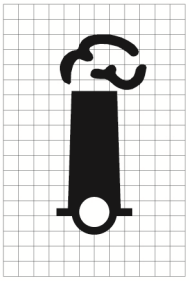


Description: **Smokestack**

Component Ref #: P00140 Color Token: Black

Origin: Center of open circle

Overall component height:	2.65mm
Overall component width:	1.189mm
Diameter of open circle:	0.60mm
Lineweight of open circle:	0.10mm
Lineweight of stem or base:	0.10mm
MIL-STD-2410 Reference:	Posicut #6 (modified)



Description: **Sports ground**

Component Ref #: P00210 Color Token: Green362/Green362-12

Origin: Center of symbol

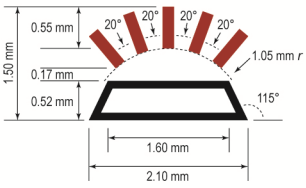
Overall component height:	2.15mm
Overall component width:	2.15mm
Lineweight (all or other):	0.15mm
Note:	Fill is Green362-12 (12% screen 45° angle). Green, 6 pt. condensed, upper case "S" is centered within square.

Description: **Surface bunker**

Component Ref #: P00283 Color Token: Black/Dk-Brown1815

Origin: Center of symbol

Overall component height:	1.50mm
Overall component width:	2.10mm
Lineweight of ticks:	0.15mm
Lineweight (all or other):	0.10mm
MIL-STD-2410 Reference:	Posicut #36 (modified)
Note:	Tick spacing (intersecting the ellipse) is 0.35mm. Angle of sides 65 and 115 degrees. Base is Black. Rays are Dk-Brown1815.

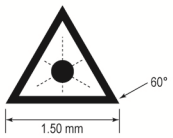


Description: **Survey point geodetic**

Component Ref #: P00179 Color Token: Black

Origin: Center of symbol

Overall component height:	1.30mm
Overall component width:	1.50mm
Diameter of solid circle:	0.30mm
Length of stem or segment:	1.50mm
Lineweight (all or other):	0.10mm
Angle between elements:	60°
MIL-STD-2410 Reference:	Posicut #234 (modified)
Note:	Dashed lines in detailed drawing indicate the solid circle is centered on three axes within the symbol.

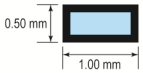


Description: **Swimming pool**

Component Ref #: P00088 Color Token: Black/Cyan-31

Origin: Center of symbol

Overall component height:	0.50mm
Overall component width:	1.00mm
Lineweight (all or other):	0.10mm
Note:	Outline is Black. Fill is Cyan-31 (31% screen 45° angle).

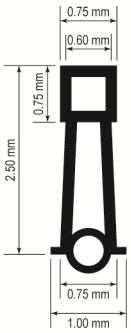


Description: **Tower non-communication**

Component Ref #: P00141 Color Token: Black

Origin: Center of open circle

Overall component height:	2.75mm
Overall component width:	1.00mm
Diameter of open circle:	0.60mm
Lineweight of open circle:	0.10mm
Lineweight of stem or base:	0.10mm
Lineweight (all or other):	0.15mm
MIL-STD-2410 Reference:	Posicut #69 (modified)
Note:	Distance between sides of symbol taper from 0.75mm at base to 0.60mm at top.

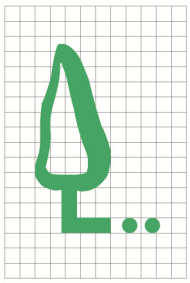


Description: **Tree other**

Component Ref #: P00030 Color Token: Green362

Origin: Center of symbol

Overall component height: 2.50mm
Overall component width: 1.65mm
Lineweight (all or other): 0.20mm
MIL-STD-2410 Reference: Posicut #129

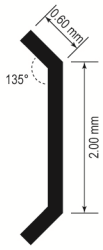


Description: **Tunnel entrance not water**

Component Ref #: P00073 Color Token: Black

Origin: Center of symbol

Length of stem or segment: 2.00mm
Lineweight (all or other): 0.20mm
Angle between elements: 135°
Note: Tick length 0.60mm.

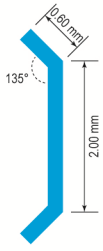


Description: **Tunnel entrance water**

Component Ref #: P00074 Color Token: Cyan

Origin: Center of symbol

Length of stem or segment: 2.00mm
Lineweight (all or other): 0.20mm
Angle between elements: 135°
Note: Tick length 0.60mm.

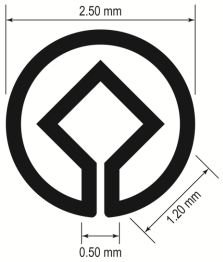


Description: **UNESCO World Heritage Site**

Component Ref #: P00302 Color Token: Black

Origin: Center of symbol

Overall component height: 2.487mm
Overall component width: 2.50mm
Lineweight (all or other): 0.20mm

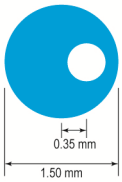


Description: **Vanishing point disappearing**

Component Ref #: P00028 Color Token: Cyan

Origin: Center of symbol

Overall component height: 1.50mm
Overall component width: 1.50mm
Diameter of solid circle: 1.50mm
Diameter of open circle: 0.50mm
MIL-STD-2410 Reference: Posicut #125 (modified)
Note: Open circle is offset 0.35mm from center of the symbol.

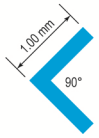


Description: **Vanishing point dissipating**

Component Ref #: P00059 Color Token: Cyan

Origin: Apex of "V"

Length of stem or segment: 1.00mm
Lineweight (all or other): 0.20mm
Angle between elements: 90°
Note: Apex is where the lines connect to form a "V".

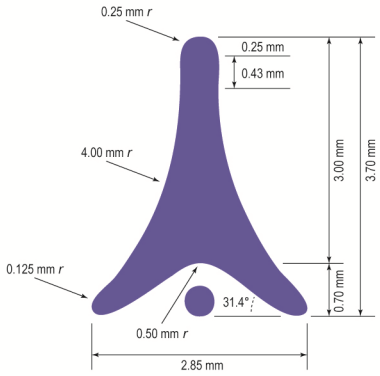


Description: **Vertical obstruction**

Component Ref #: P00008 Color Token: Blue072

Origin: Center of solid circle

Overall component height: 3.70mm
Overall component width: 2.85mm
Diameter of solid circle: 0.40mm
MIL-STD-2410 Reference: Posicut #3
Note: Base leg end radii 0.125mm. Tip radius 0.25mm. Bottom arc radius 0.50mm.

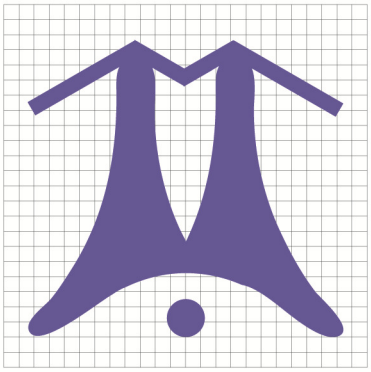


Description: **Vertical obstruction linear**

Component Ref #: P00113 Color Token: Blue072

Origin: Center of solid circle

Overall component height: 3.90mm
Overall component width: 4.16mm
Diameter of solid circle: 0.50mm
Lineweight (all or other): 0.20mm
Note: Base leg end radii 0.125mm. Tip radius 0.25mm. Bottom arc radius 1.85mm.

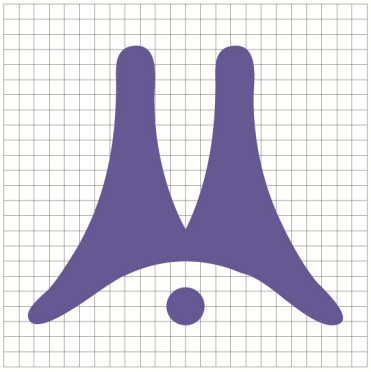


Description: **Vertical obstruction multiple**

Component Ref #: P00101 Color Token: Blue072

Origin: Center of solid circle

Overall component height: 3.70mm
Overall component width: 4.16mm
Diameter of solid circle: 0.50mm
MIL-STD-2410 Reference: Posicut #217
Note: Base leg end radii 0.125mm. Tip radius 0.25mm. Bottom arc radius 1.85mm.

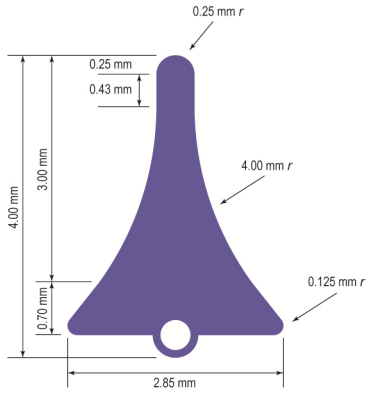


Description: **Vertical obstruction pylon**

Component Ref #: P00292 Color Token: Blue072

Origin: Center of open circle

Overall component height:	4.00mm
Overall component width:	2.85mm
Diameter of open circle:	0.60mm
Lineweight of open circle:	0.10mm
Lineweight of stem or base:	0.15mm
Lineweight (all or other):	0.35mm
Note:	Base leg end radii 0.125mm. Tip radius 0.25mm.

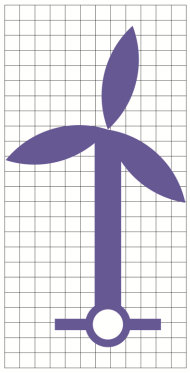


Description: **Vertical Obstruction Wind Turbine**

Component Ref #: P00300 Color Token: Blue072

Origin: Center of open circle

Overall component height:	4.25mm
Overall component width:	2.372mm
Diameter of open circle:	0.60mm
Lineweight of open circle:	0.10mm
Lineweight of stem or base:	0.15mm
Lineweight (all or other):	0.35mm

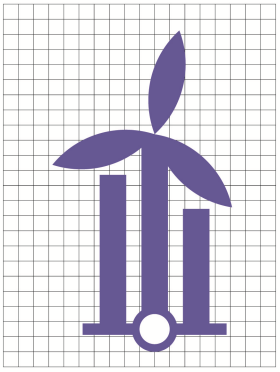


Description: **Vertical Obstruction Wind Turbine Multiple**

Component Ref #: P00301 Color Token: Blue072

Origin: Center of open circle

Overall component height:	4.25mm
Overall component width:	2.372mm
Diameter of open circle:	0.60mm
Lineweight of open circle:	0.10mm
Lineweight of stem or base:	0.15mm
Lineweight (all or other):	0.35mm

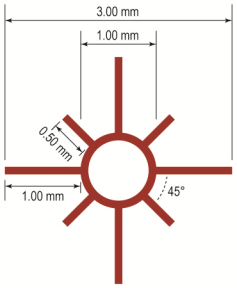


Description: **Volcano**

Component Ref #: P00064 Color Token: Dk-Brown1815

Origin: Center of symbol

Overall component height:	3.00mm
Overall component width:	3.00mm
Diameter of open circle:	1.00mm
Lineweight of open circle:	0.10mm
Length of stem or segment:	1.00mm
Lineweight (all or other):	0.10mm
Angle between elements:	45°
MIL-STD-2410 Reference:	Posicut #233

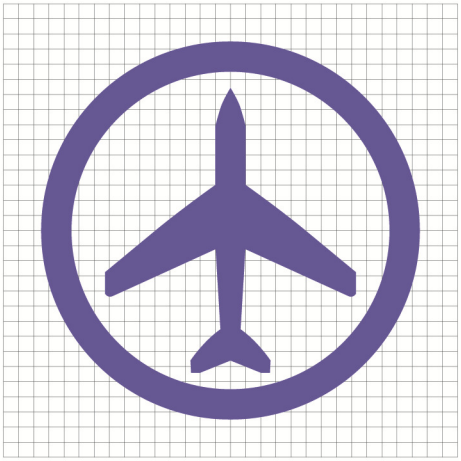


Description: **Water aerodrome**

Component Ref #: P00257 Color Token: Blue072

Origin: Center of symbol

Overall component height:	5.0mm
Overall component width:	5.00mm
Diameter of open circle:	5.00mm
Lineweight of open circle:	0.40mm
MIL-STD-2410 Reference:	Posicut #82

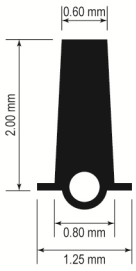


Description: **Water intake tower**

Component Ref #: P00148 Color Token: Black

Origin: Center of open circle

Overall component height:	2.25mm
Overall component width:	1.25mm
Diameter of open circle:	0.60mm
Lineweight of open circle:	0.10mm
Lineweight of stem or base:	0.10mm
MIL-STD-2410 Reference:	Posicut #238 (modified)
Note:	Body tapers from 0.60mm to 0.80mm at the base.

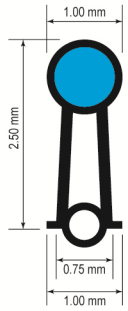


Description: **Water tower**

Component Ref #: P00142 Color Token: Black/Cyan

Origin: Center of open circle

Overall component height:	2.75mm
Overall component width:	1.00mm
Diameter of open circle:	0.60mm
Lineweight of open circle:	0.10mm
Lineweight of stem or base:	0.10mm
Lineweight (all or other):	0.15mm
Note:	Outline is black. Fill of circle at top is solid cyan.

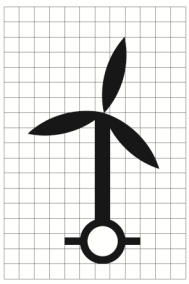


Description: **Wind turbine**

Component Ref #: P00143 Color Token: Black

Origin: Center of open circle

Overall component height:	3.00mm
Overall component width:	1.75mm
Diameter of open circle:	0.60mm
Lineweight of open circle:	0.10mm
Length of stem or segment:	1.40mm
Lineweight of stem or base:	0.10mm
Lineweight (all or other):	0.20mm
Note:	Length of base 1.00mm. Blades at widest point 0.25mm. Blade length 1.05mm. Angle between blades is 120 degrees.

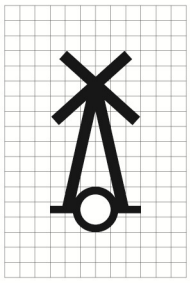


Description: **Windmill**

Component Ref #: P00144 Color Token: Black

Origin: Center of open circle

Overall component height:	2.40mm
Overall component width:	1.20mm
Diameter of open circle:	0.60mm
Lineweight of open circle:	0.10mm
Lineweight of stem or base:	0.10mm
Lineweight (all or other):	0.15mm
Note:	Length of base 1.20mm. Body is joined at the top and expands to 0.75mm. Vane length 1.30mm. Acute angle between vanes is 84 degrees; obtuse angle between vanes is 96 degrees.

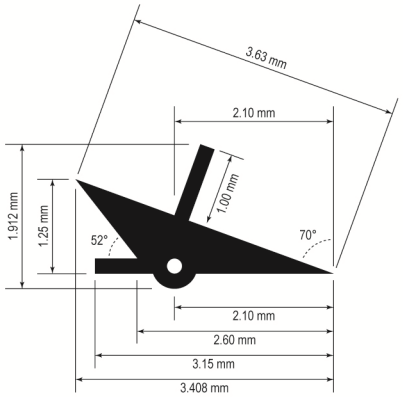


Description: **Wreck**

Component Ref #: P00206 Color Token: Black

Origin: Center of open circle

Overall component height: 1.912mm
Overall component width: 3.408mm
Diameter of open circle: 0.20mm
Lineweight (all or other): 0.20mm
MIL-STD-2410 Reference: Posicut #114



Annex I - Patterns

Samples of the patterns referenced in Annex A & E are provided in this annex. The Component Reference number provides the link in Annex A to where the pattern is included as part of a symbol. Since most of the area patterns were inherited from the MIL-STD-2410, a historical reference has been made in the document for each of the patterns in Annex I to identify its original pattern number in the MIL-STD-2410. For example, the field “MIL-STD-2410 Reference: AP-95” means that the area pattern was originally AP-95 in the MIL-STD-2410 document. The reader may wish to reference the listed area pattern in the MILSTD-2410 for additional information.

Each pattern in Annex I is broken down into the following image windows that help to define its creation and portrayal:

Components – The Components window depicts all individual components within a Tile (in no specific order) necessary for the creation of a Pattern. These components may appear once or numerous times within one pattern tile. Some components are simple points or lines, while other components are more complex.

Tile –The Tile window depicts the minimum replicating building block for the pattern tile and demonstrates the layout of components within the pattern. The tile size varies depending on the pattern, with a maximum tile size of 20mm x 20mm. The tile may be “framed” with a red outline, showing the extent of the tile within the tile window.

Tile 5x – The Tile 5x window depicts the tile at a scale of 5 times the actual portrayal. This window displays the spatial relationship between components within the tile, as well as a zoomed-in view of the components. The Tile 5x should be used as a reference only and is not for actual portrayal.

Pattern – The Pattern window depicts the pattern portrayed over a larger area than one tile, while also demonstrating the repeating nature of the pattern. The pattern window covers an area of 60mm x 60mm and provides enough space to display the repeating pattern.

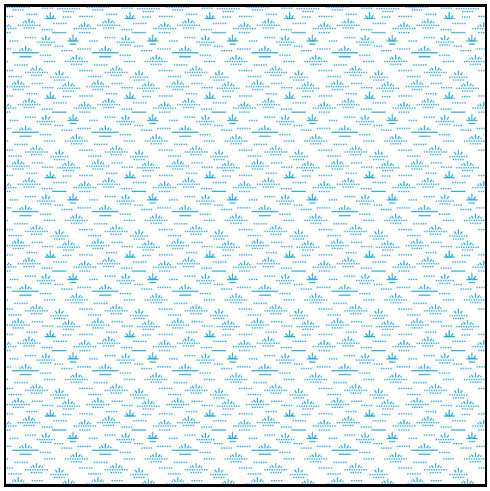
Supplemental information accompanies each pattern such as: colour token, tile size, number of components, line weight, diameter of solid circles and special explanatory notes.

All pattern samples provided in Annex I are shown in their default orientation (0 degrees). Some area patterns will require rotation to correctly portray the depicted features with ground truth (for example Sand Dunes).

Description: **Bog, Marsh**
Component Ref: A00018
Color Token: Cyan
Tile Size: 10.0mm x 10.0mm
No. of Components: 9
MIL-STD-2410 Reference: AP-12

Lineweight: 0.10mm
Diameter of solid circle(s): 0.10mm

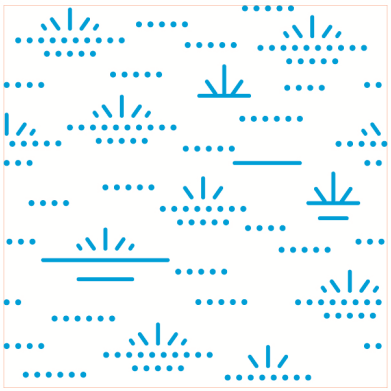
Pattern



Tile

Components

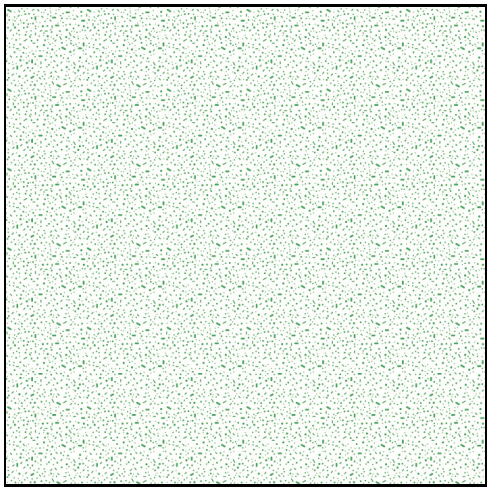
Tile 5x



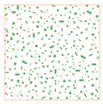
Description: **Brush, Thicket**
Component Ref: A00027
Color Token: Green362
Tile Size: 10.0mm x 10.0mm
No. of Components: 14
MIL-STD-2410 Reference: AP-68

Lineweight: 0.10mm, 0.20mm
Diameter of solid circle(s): 0.10mm, 0.15mm, 0.20mm, 0.35mm

Pattern

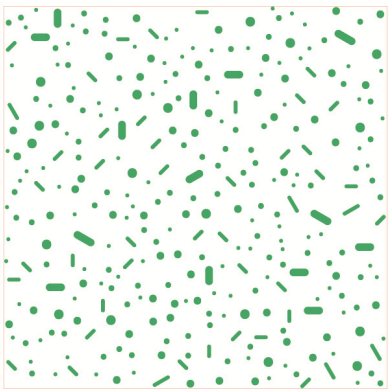


Tile



Components

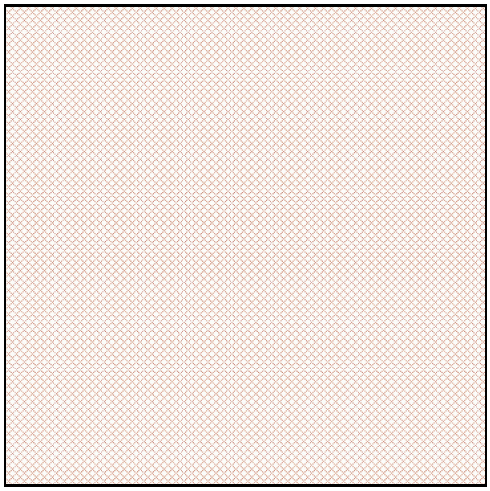
Tile 5x



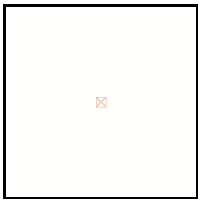
Description: **Built Up Area / Not Intact**
Component Ref: A00063
Color Token: Dk-Brown1815-54
Tile Size: 1.00mm x 1.00mm
No. of Components: 1
MIL-STD-2410 Reference: LP-6 modified
Note: Line pattern angle 45° and 135°

Diameter of solid circle(s): 0.10mm

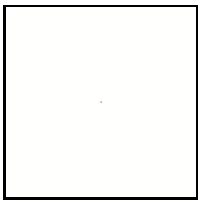
Pattern



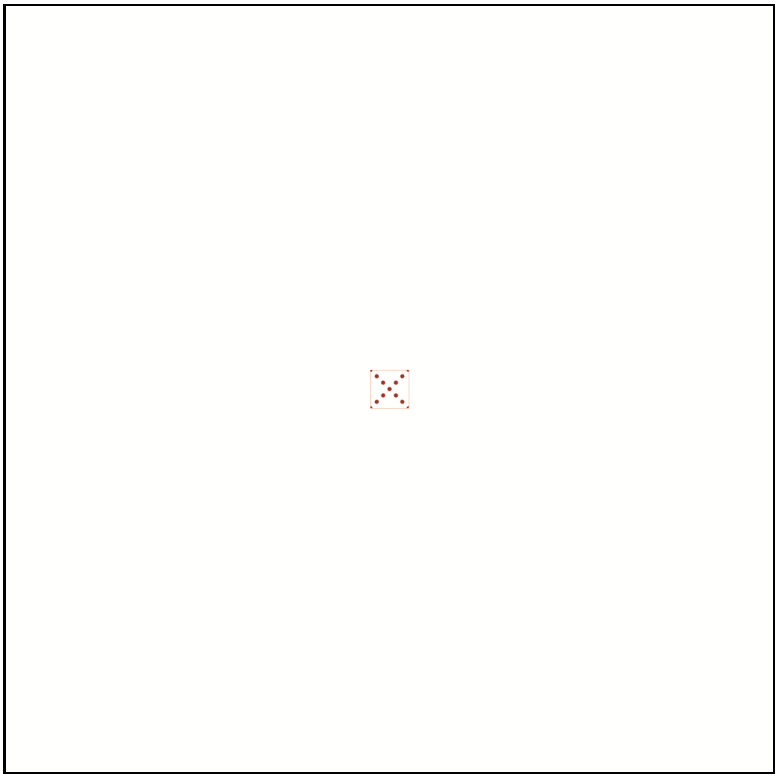
Tile



Components



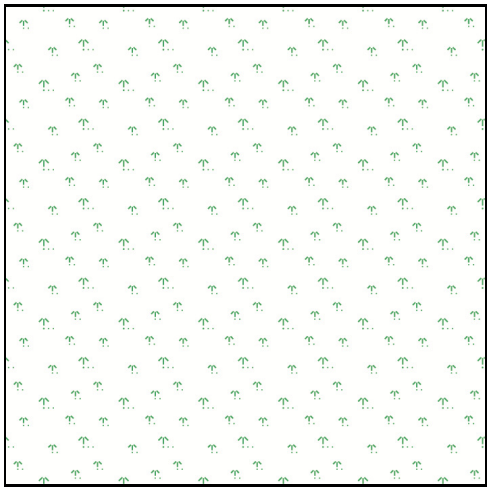
Tile 5x



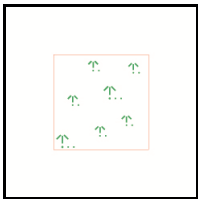
Description: **Cane**
Component Ref: A00050
Color Token: Green362
Tile Size: 10.0mm x 10.0mm
No. of Components: 2
MIL-STD-2410 Reference: AP-86

Lineweight: 0.15mm
Diameter of solid circle(s): 0.20mm, 0.15mm

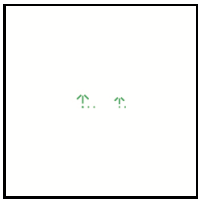
Pattern



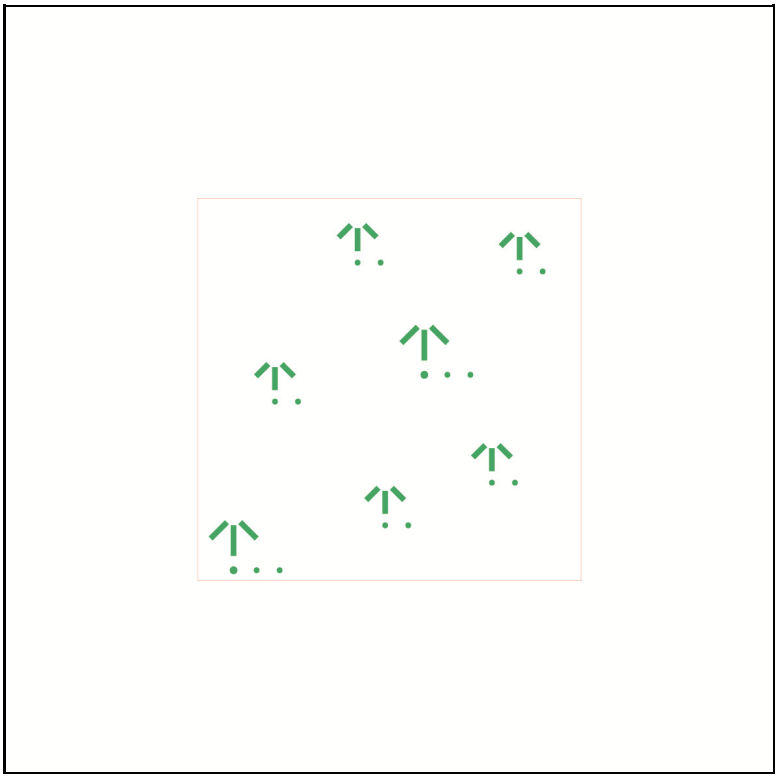
Tile



Components



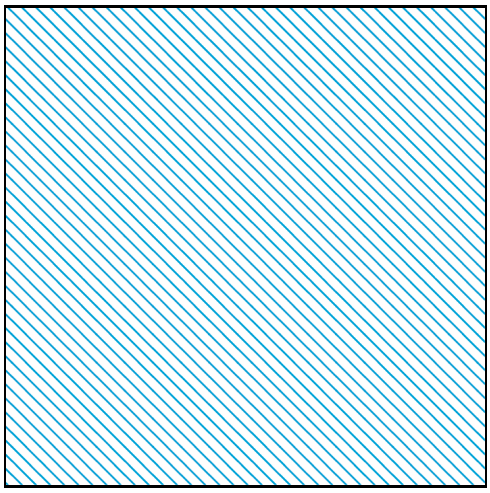
Tile 5x



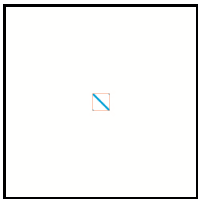
Description: **Crevasse**
Component Ref: A00062
Color Token: Cyan
Tile Size: 1.768mm x 1.768mm
No. of Components: 1
MIL-STD-2410 Reference: LP-3
Note: Line pattern angle 135°

Lineweight: 0.20mm

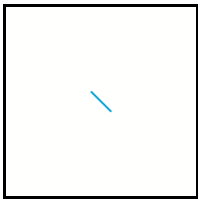
Pattern



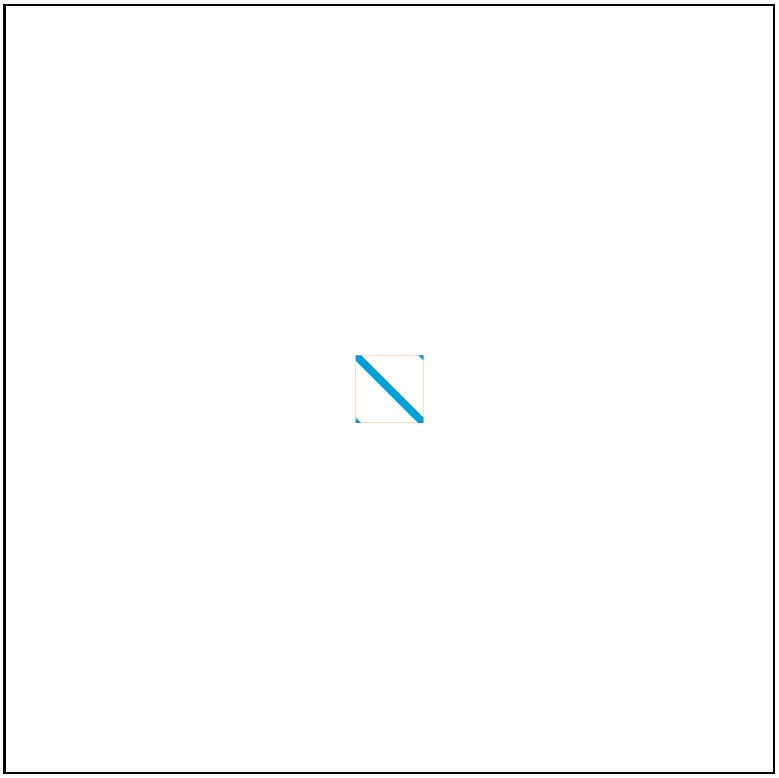
Tile



Components



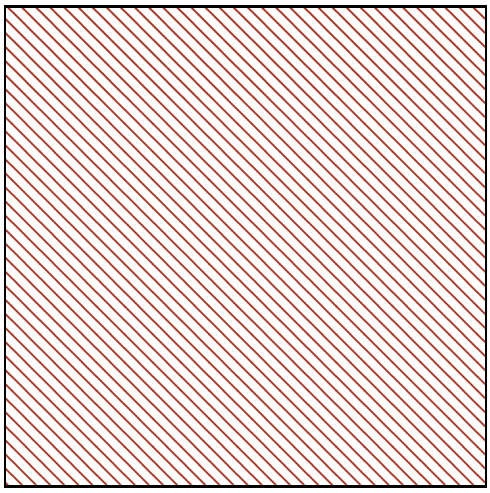
Tile 5x



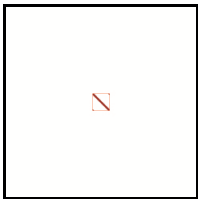
Description: **Crevice**
Component Ref: A00061
Color Token: Dk-Brown1815
Tile Size: 1.768mm x 1.768mm
No. of Components: 1
MIL-STD-2410 Reference: LP-3
Note: Line pattern angle 135°

Lineweight: 0.20mm

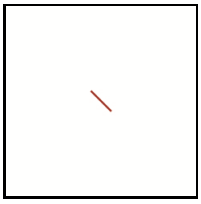
Pattern



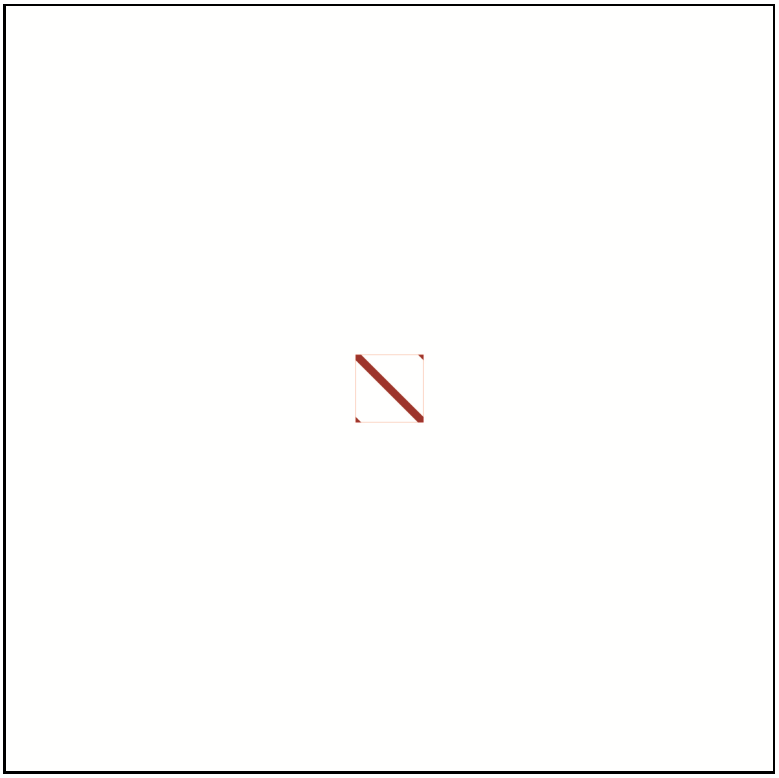
Tile



Components



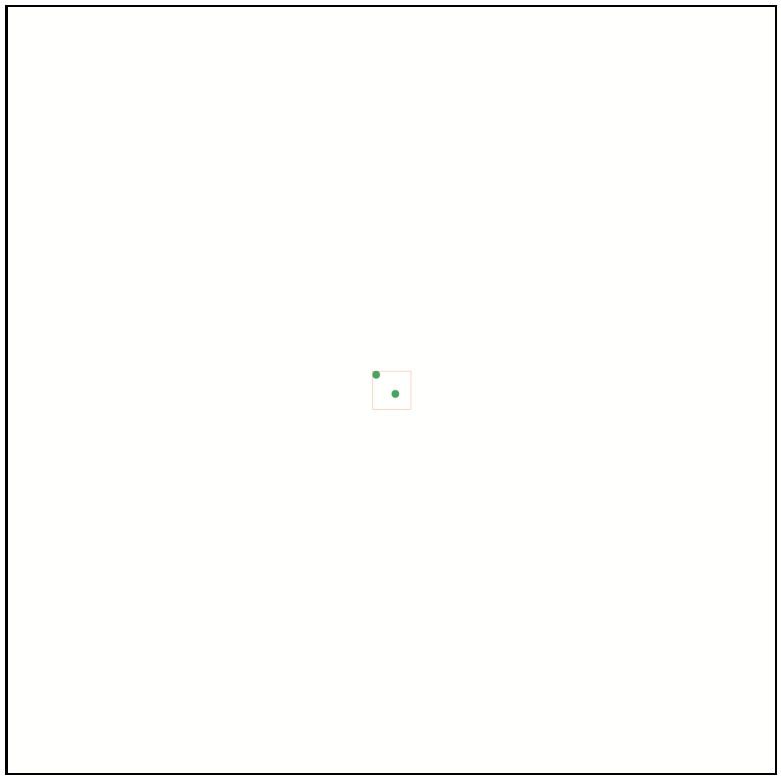
Tile 5x



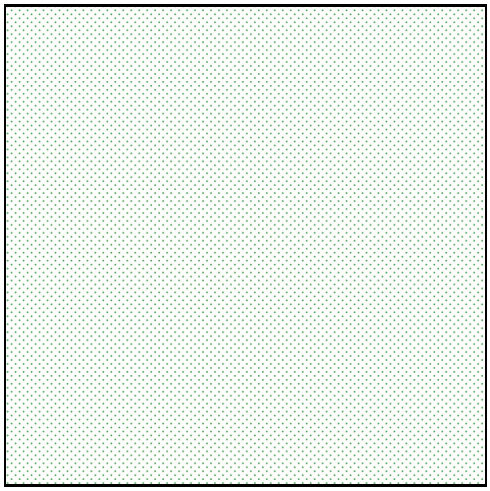
Description: **Cropland**
Component Ref: A00118
Color Token: Green362
Tile Size: 1.00mm x 1.00mm
No. of Components: 1
MIL-STD-2410 Reference: None
Note: Pattern shown with A00060 and A00127.

Diameter of solid circle(s): 0.20mm

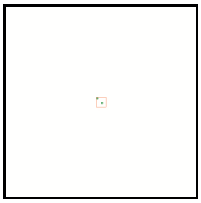
Tile 5x



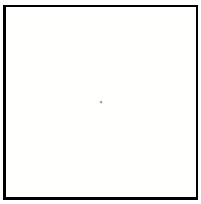
Pattern



Tile



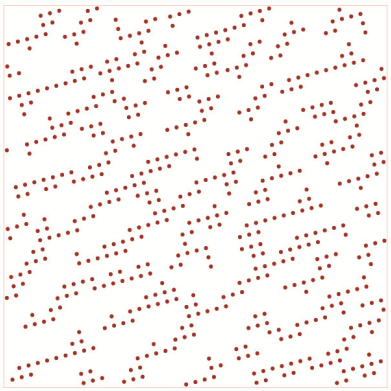
Components



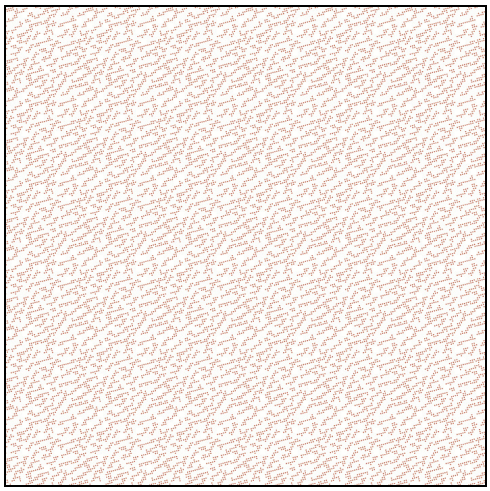
Description: **Distorted Surface**
Component Ref: A00030
Color Token: Dk-Brown1815-54
Tile Size: 10.0mm x 10.0mm
No. of Components: 10
MIL-STD-2410 Reference: AP-103 modified

Diameter of solid circle(s): 0.10mm

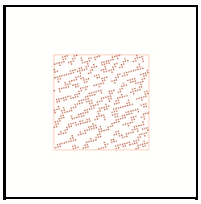
Tile 5x



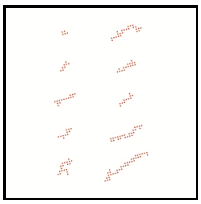
Pattern



Tile



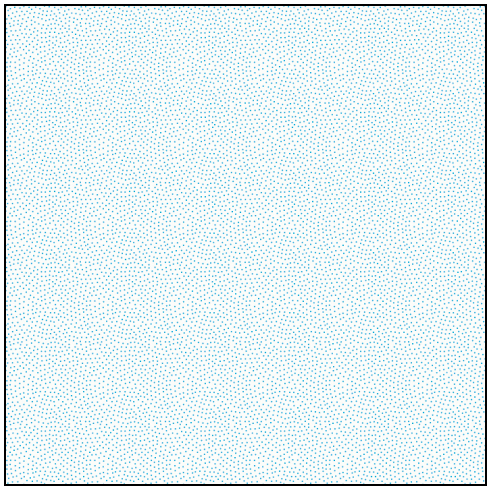
Components



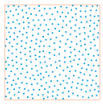
Description: **Dry Drainage**
Component Ref: A00020
Color Token: Cyan
Tile Size: 10.0mm x 10.0mm
No. of Components: 1
MIL-STD-2410 Reference: AP-95

Diameter of solid circle(s): 0.10mm

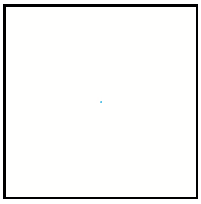
Pattern



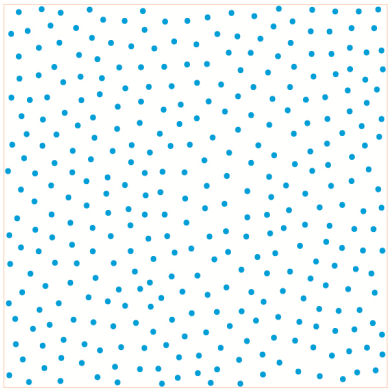
Tile



Components



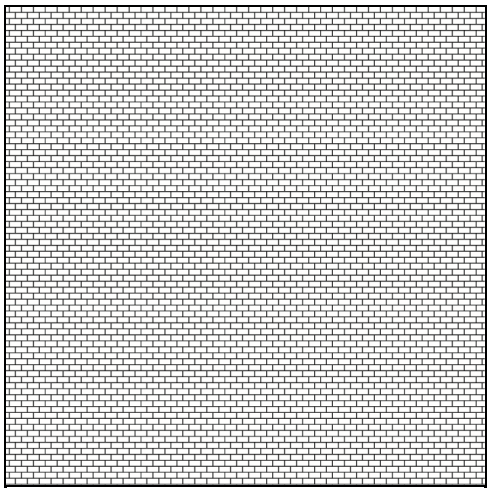
Tile 5x



Description: **Extraction Mine Peat**
Component Ref: A00001
Color Token: Black
Tile Size: 1.50mm x 1.50mm
No. of Components: 1
MIL-STD-2410 Reference: AP-129

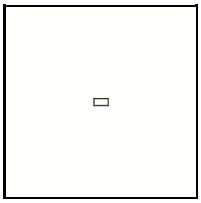
Lineweight: 0.10mm

Pattern



Tile

Components

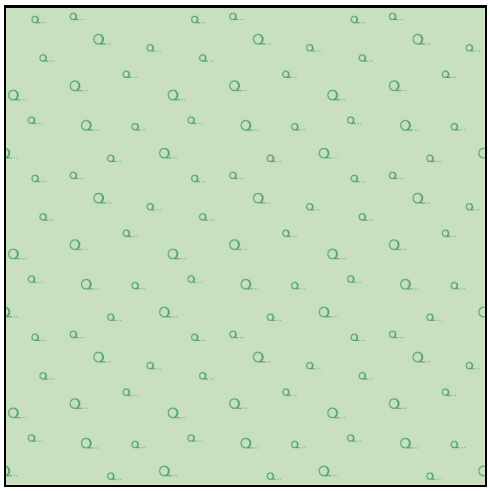


Tile 5x

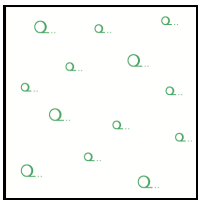
Description: **Forest-Wood / Deciduous**
Component Ref: A00011
Color Token: Green362
Tile Size: 20.0mm x 20.0mm
No. of Components: 2
MIL-STD-2410 Reference: AP-54
Note: Pattern shown with A00009.

Lineweight: 0.10mm, 0.20mm
Diameter of solid circle(s): 0.10mm

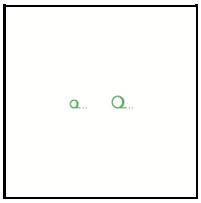
Pattern



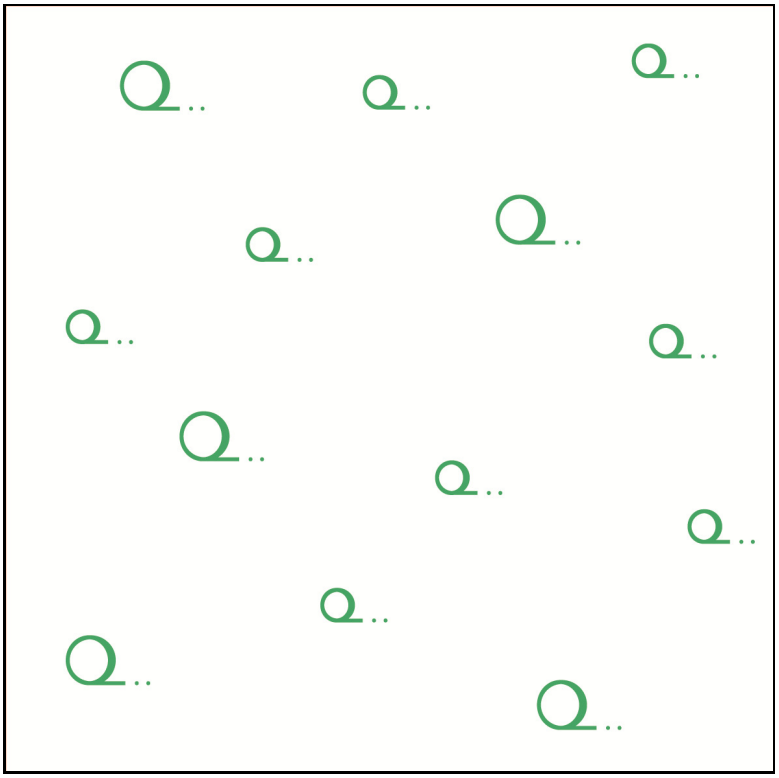
Tile



Components



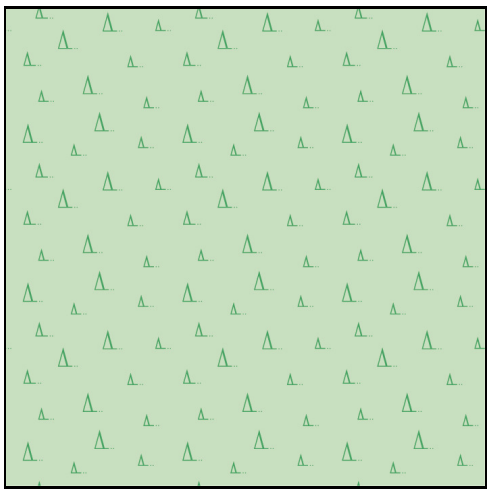
Tile 5x



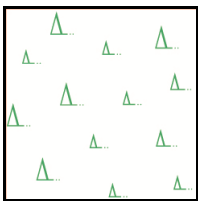
Description: **Forest-Wood / Evergreen**
Component Ref: A00012
Color Token: Green362
Tile Size: 20.0mm x 20.0mm
No. of Components: 3
MIL-STD-2410 Reference: AP-60
Note: Pattern shown with A00009.

Lineweight: 0.10mm, 0.15mm, 0.20mm
Diameter of solid circle(s): 0.10mm

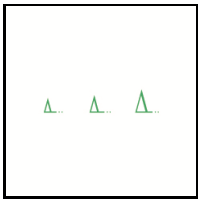
Pattern



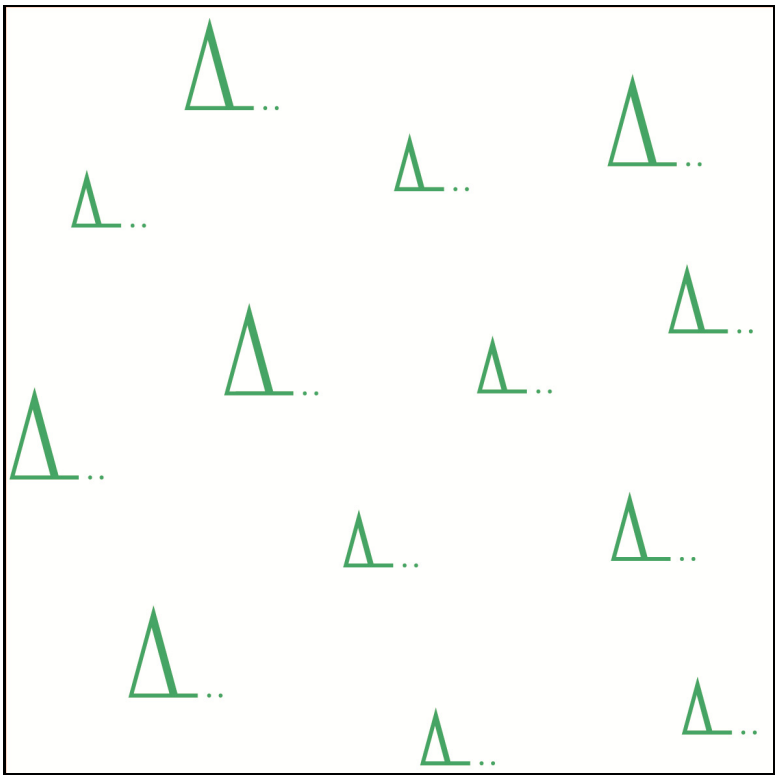
Tile



Components



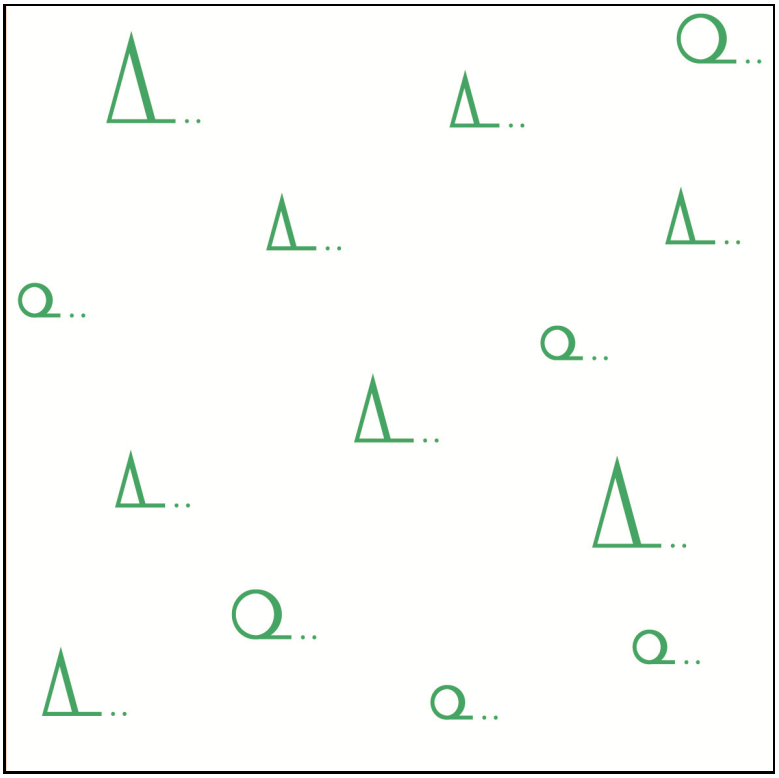
Tile 5x



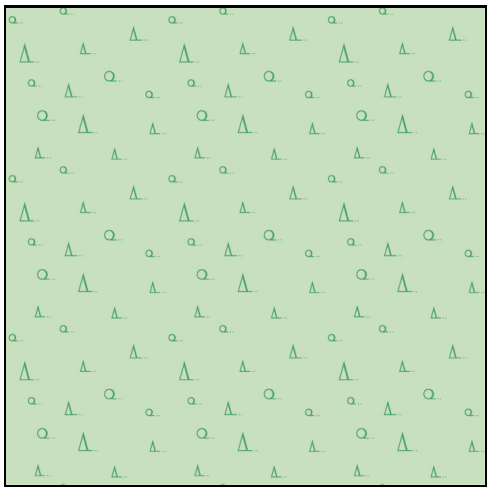
Description: **Forest-Wood / Mixed**
Component Ref: A00013
Color Token: Green362
Tile Size: 20.0mm x 20.0mm
No. of Components: 5
MIL-STD-2410 Reference: AP-63
Note: Pattern shown with A00009.

Lineweight: 0.10mm, 0.15mm
Diameter of solid circle(s): 0.10mm

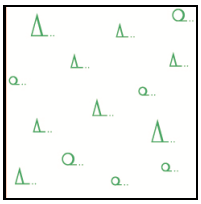
Tile 5x



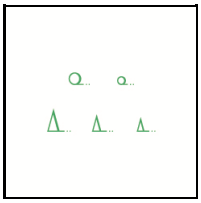
Pattern



Tile



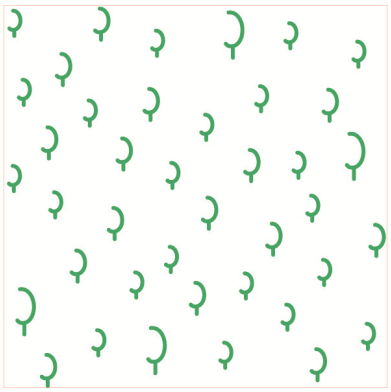
Components



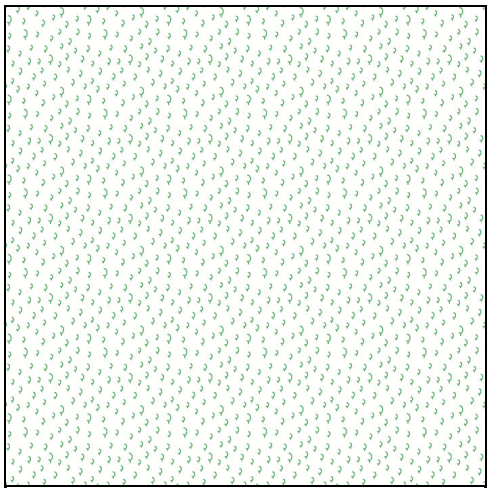
Description: **Forest-Wood / Scattered**
Component Ref: A00047
Color Token: Green362
Tile Size: 10.0mm x 10.0mm
No. of Components: 3
MIL-STD-2410 Reference: AP-44
Note: Also part of Swamp / cypress symbol

Lineweight: 0.10mm

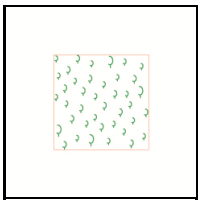
Tile 5x



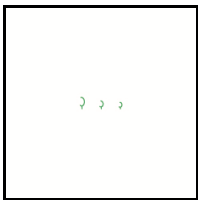
Pattern



Tile



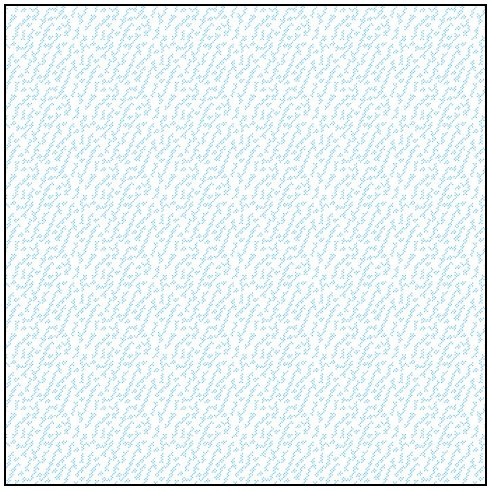
Components



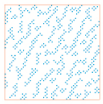
Description: **Glacier**
Component Ref: A00017
Color Token: Cyan
Tile Size: 10.0mm x 10.0mm
No. of Components: 10
MIL-STD-2410 Reference: AP-104

Diameter of solid circle(s): 0.10mm

Pattern

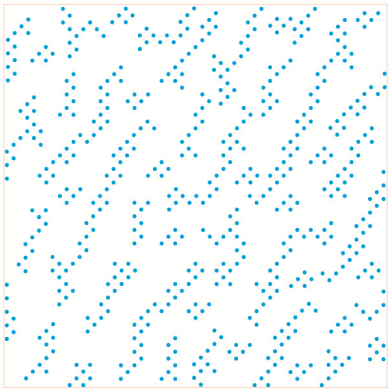


Tile



Components

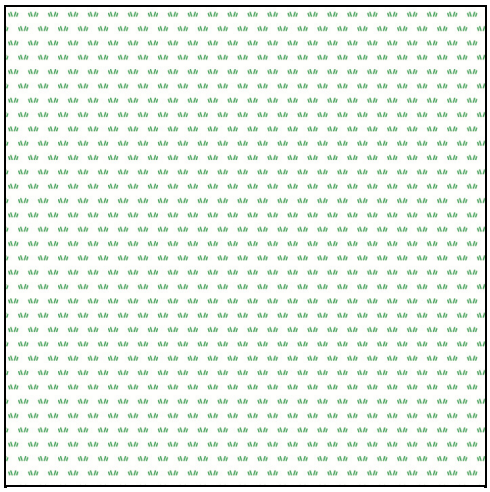
Tile 5x



Description: **Grassland**
Component Ref: A00126
Color Token: Green362
Tile Size: 10.0mm x 10.0mm
No. of Components: 2
MIL-STD-2410 Reference: None

Lineweight: 0.15mm

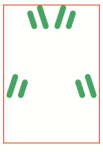
Pattern



Tile

Components

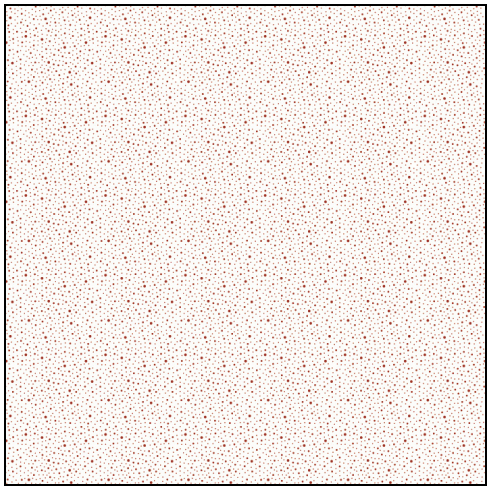
Tile 5x



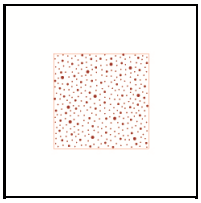
Description: **Gravel, Moraine**
Component Ref: A00036
Color Token: Dk-Brown1815
Tile Size: 10.0mm x 10.0mm
No. of Components: 3
MIL-STD-2410 Reference: AP-99 modified

Diameter of solid circle(s): 0.175mm, 0.25mm, 0.40mm

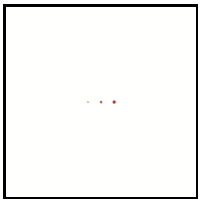
Pattern



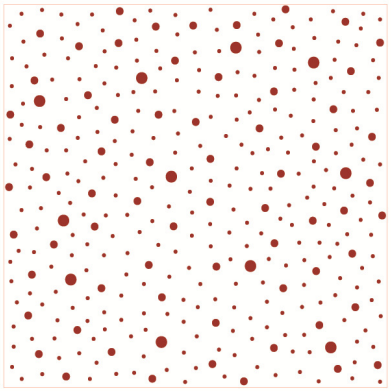
Tile



Components



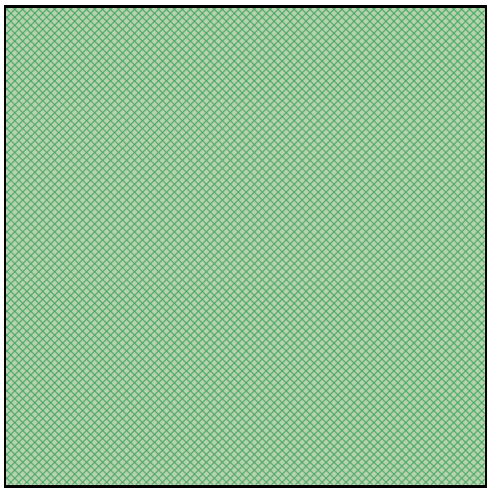
Tile 5x



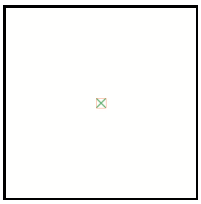
Description: **Greenhouse**
Component Ref: A00124
Color Token: Green362
Tile Size: 1.00mm x 1.00mm
No. of Components: 1
MIL-STD-2410 Reference: LP-6
Note: Line pattern angle 45° and 135°. Pattern shown with A00059.

Lineweight: 0.10mm

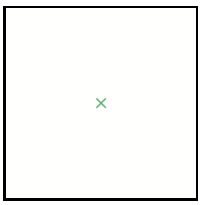
Pattern



Tile



Components

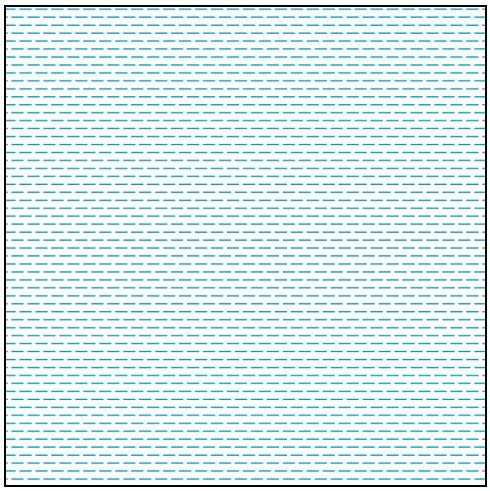


Tile 5x

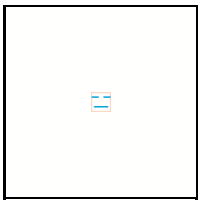
Description: **Land Subject to Inundation**
Component Ref: A00015
Color Token: Cyan
Tile Size: 2.00mm x 2.00mm
No. of Components: 1
MIL-STD-2410 Reference: AP-10

Lineweight: 0.15mm

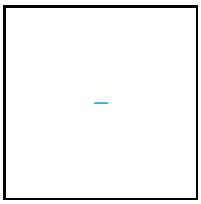
Pattern



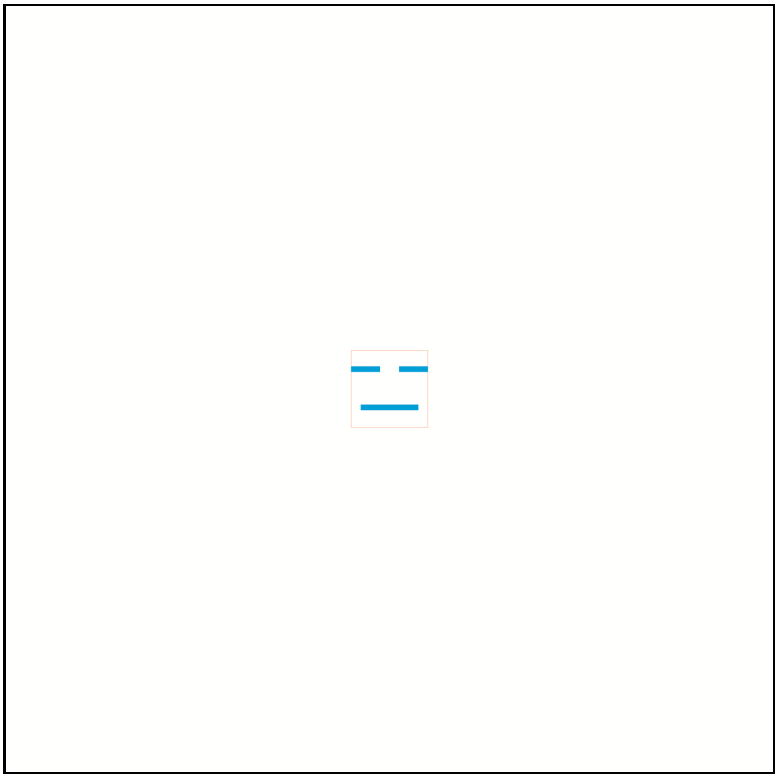
Tile



Components



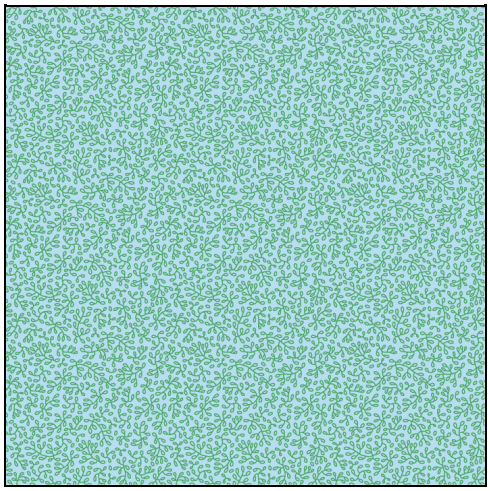
Tile 5x



Description: **Mangrove**
Component Ref: A00025
Color Token: Green362
Tile Size: 20.0mm x 20.0mm
No. of Components: 11
MIL-STD-2410 Reference: AP-8
Note: Pattern shown with A00007.

Lineweight: 0.10mm

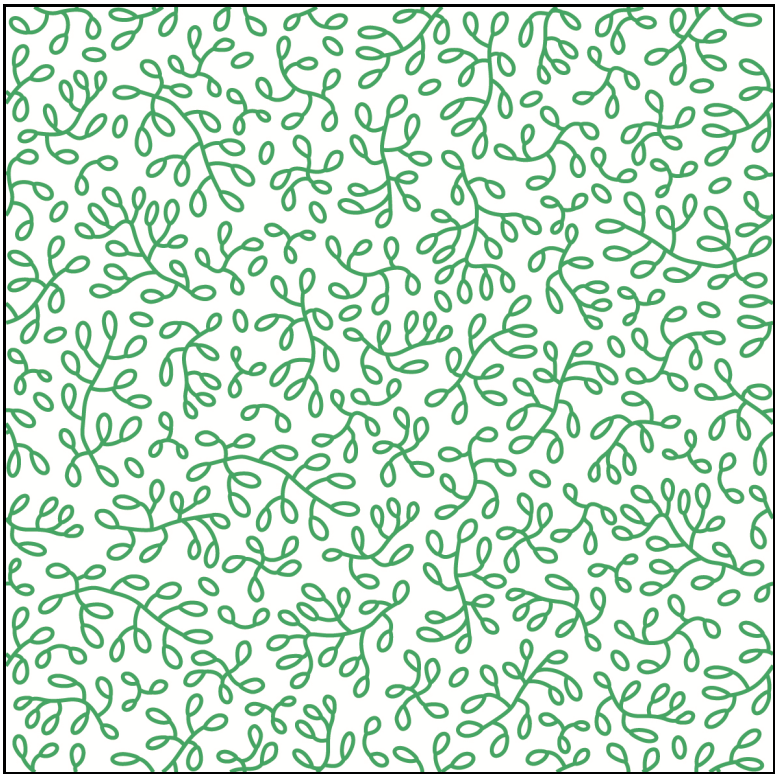
Pattern



Tile

Components

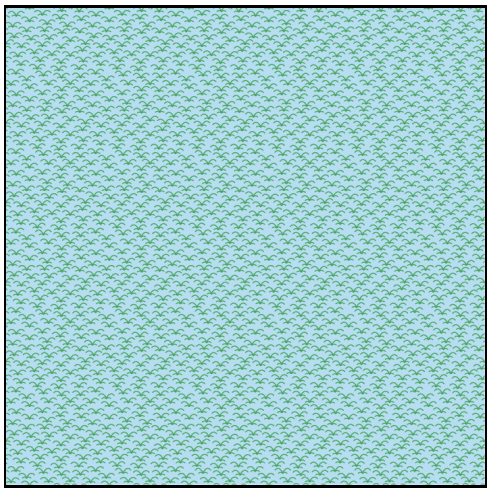
Tile 5x



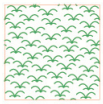
Description: **Nipa**
Component Ref: A00024
Color Token: Green362
Tile Size: 10.0mm x 10.0mm
No. of Components: 1
MIL-STD-2410 Reference: AP-7
Note: Pattern shown with A00007.

Lineweight: 0.10mm

Pattern

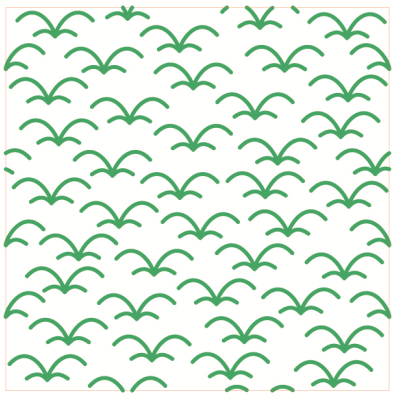


Tile



Components

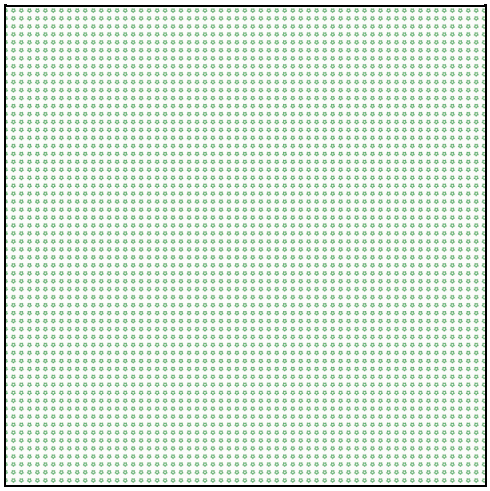
Tile 5x



Description: **Orchard**
Component Ref: A00028
Color Token: Green362
Tile Size: 1.00mm x 1.00mm
No. of Components: 1
MIL-STD-2410 Reference: AP-74

Lineweight: 0.08mm

Pattern



Tile

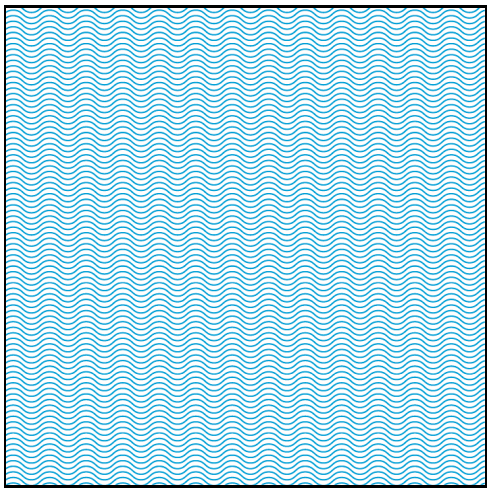
Components

Tile 5x

Description: **Rapids**
Component Ref: A00065
Color Token: Cyan
Tile Size: 4.575mm x 1.40mm
No. of Components: 1
MIL-STD-2410 Reference: AP-105
Note: Pattern shown with A00007.

Lineweight: 0.15mm

Pattern



Tile

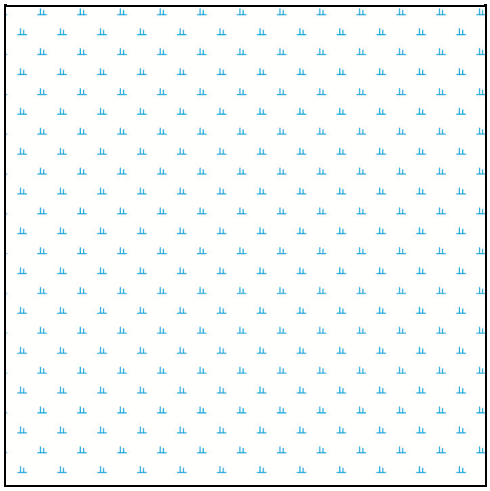
Components

Tile 5x

Description: **Rice**
Component Ref: A00019
Color Token: Cyan
Tile Size: 5.00mm x 5.00mm
No. of Components: 1
MIL-STD-2410 Reference: AP-4

Lineweight: 0.10mm

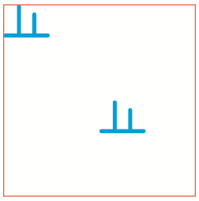
Pattern



Tile

Components

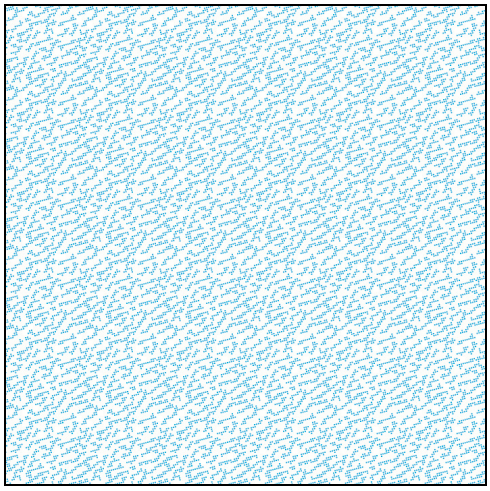
Tile 5x



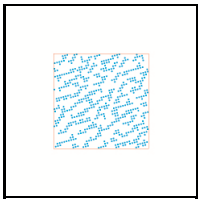
Description: **Sabkha**
Component Ref: A00016
Color Token: Cyan
Tile Size: 10.0mm x 10.0mm
No. of Components: 10
MIL-STD-2410 Reference: AP-103

Diameter of solid circle(s): 0.15mm

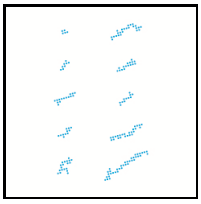
Pattern



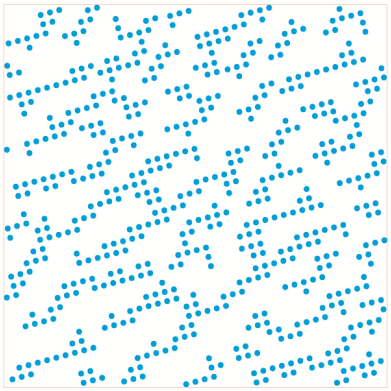
Tile



Components



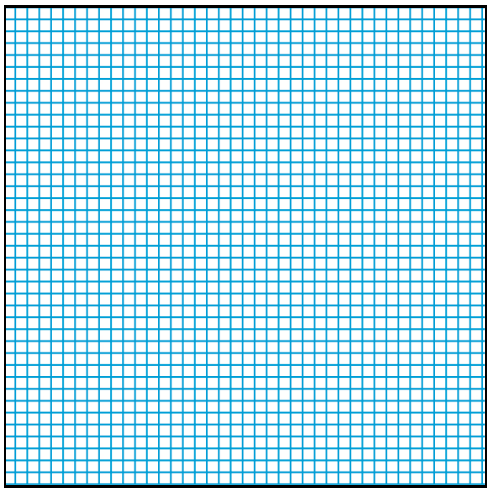
Tile 5x



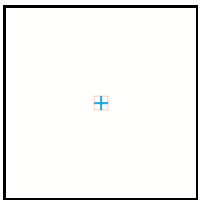
Description: **Salt Evaporator**
Component Ref: A00044
Color Token: Cyan
Tile Size: 1.50mm x 1.50mm
No. of Components: 1
MIL-STD-2410 Reference: None
Note: Line pattern angle 0° and 90°

Lineweight: 0.20mm

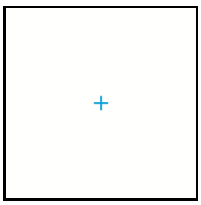
Pattern



Tile



Components

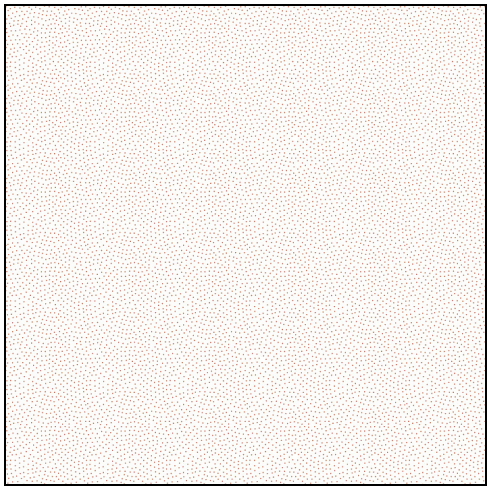


Tile 5x

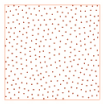
Description: **Sand**
Component Ref: A00035
Color Token: Dk-Brown1815
Tile Size: 10.0mm x 10.0mm
No. of Components: 1
MIL-STD-2410 Reference: AP-95

Diameter of solid circle(s): 0.10mm

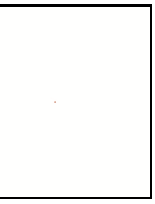
Pattern



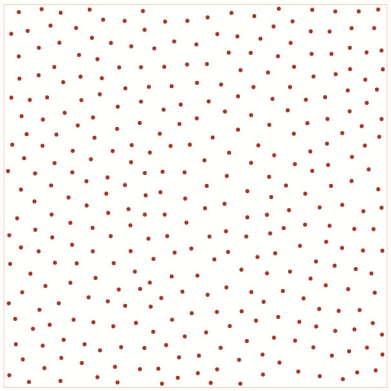
Tile



Components



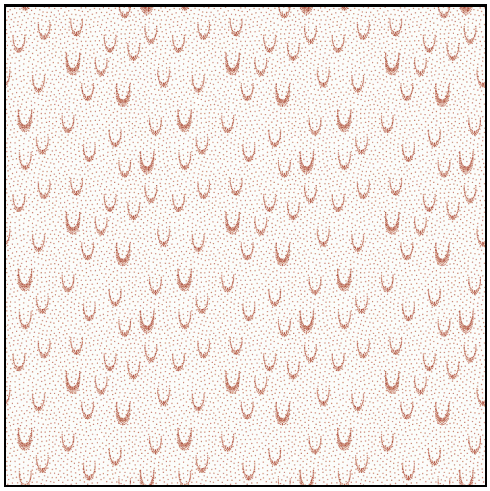
Tile 5x



Description: **Sand Dune / Crescent**
Component Ref: A00031
Color Token: Dk-Brown1815
Tile Size: 20.0mm x 20.0mm
No. of Components: 2
MIL-STD-2410 Reference: AP-108
Note: Shown with Sand Dune Orientation at 0°. Pattern shown with A00035.

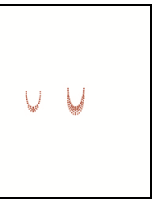
Diameter of solid circle(s): 0.10mm, 0.125mm, 0.15mm

Pattern

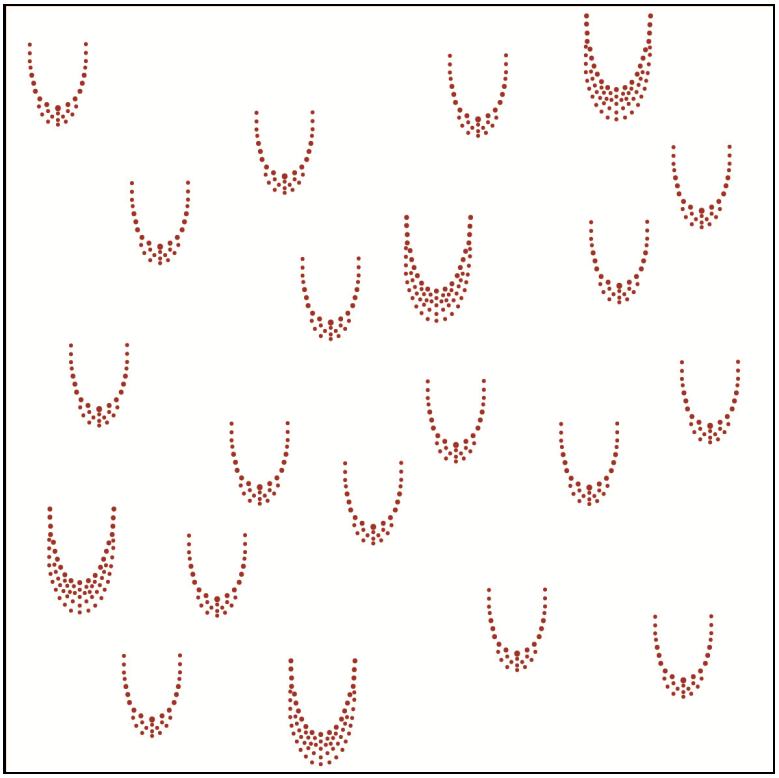


Tile

Components



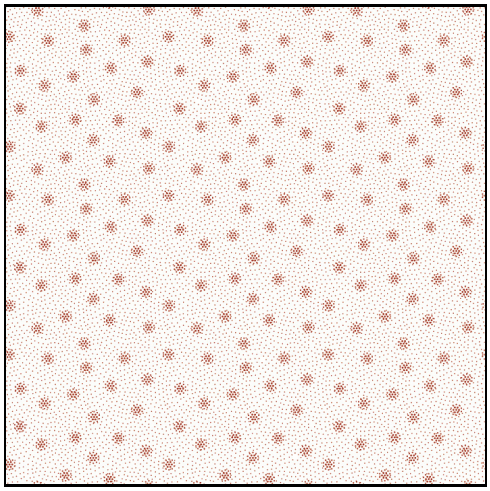
Tile 5x



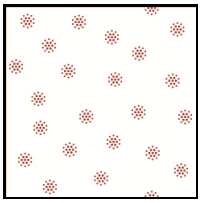
Description: **Sand Dune / Dome**
Component Ref: A00042
Color Token: Dk-Brown1815
Tile Size: 20.0mm x 20.0mm
No. of Components: 1
MIL-STD-2410 Reference: AP-124
Note: Pattern shown with A00035.

Diameter of solid circle(s): 0.125mm, 0.15mm, 0.20mm

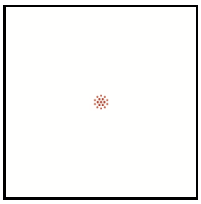
Pattern



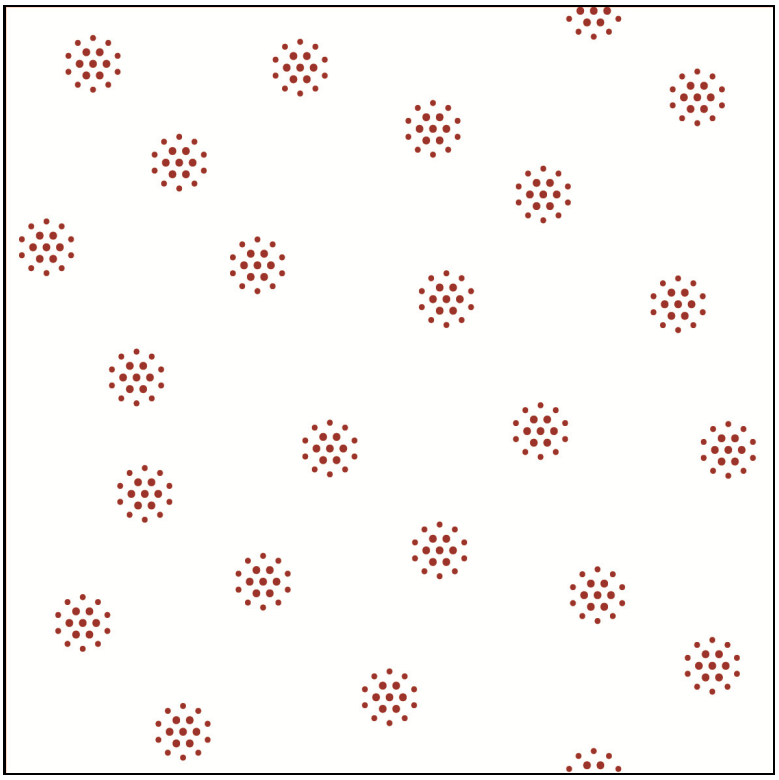
Tile



Components



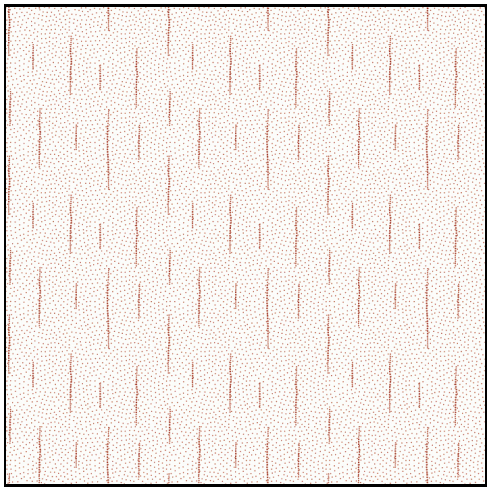
Tile 5x



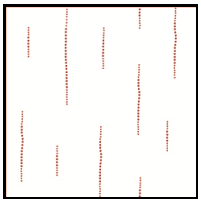
Description: **Sand Dune / Linear**
Component Ref: A00043
Color Token: Dk-Brown1815
Tile Size: 20.0mm x 20.0mm
No. of Components: 4
MIL-STD-2410 Reference: AP-116
Note: Shown with Sand Dune Orientation at 0°. Pattern shown with A00035.

Diameter of solid circle(s): 0.125mm, 0.15mm, 0.175mm

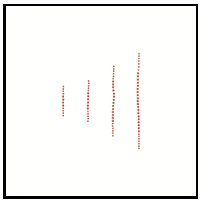
Pattern



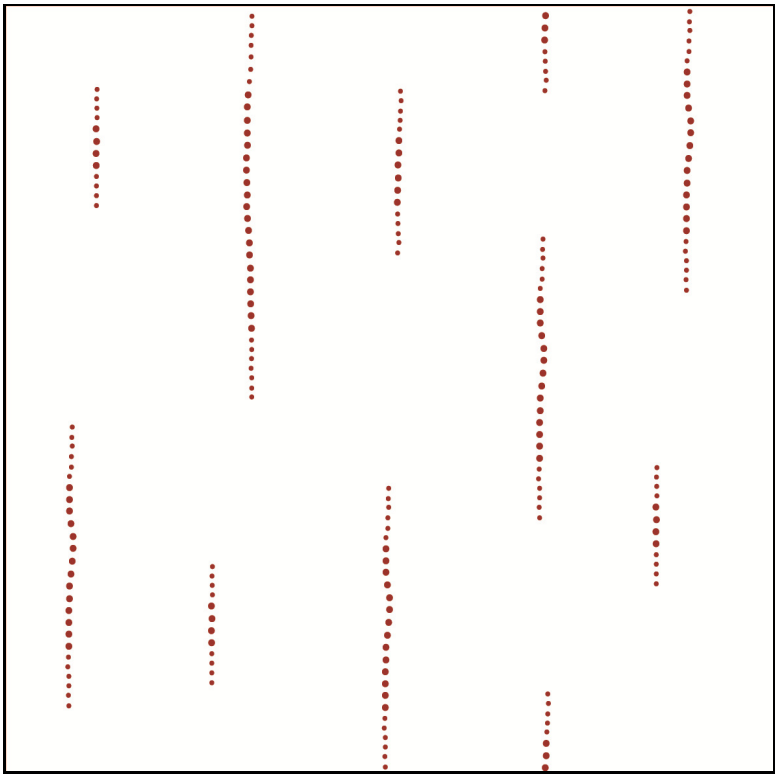
Tile



Components



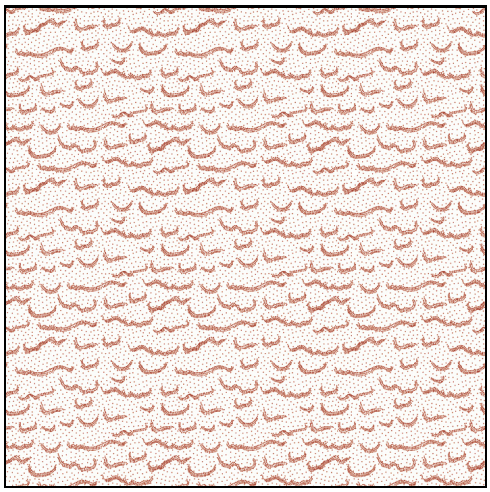
Tile 5x



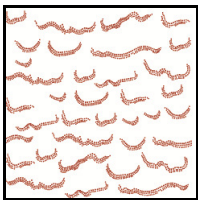
Description: **Sand Dune / Ripple**
Component Ref: A00032
Color Token: Dk-Brown1815
Tile Size: 20.0mm x 20.0mm
No. of Components: 10
MIL-STD-2410 Reference: AP-112
Note: Shown with Sand Dune Orientation at 0°. Pattern shown with A00035.

Diameter of solid circle(s): 0.10mm, 0.125mm

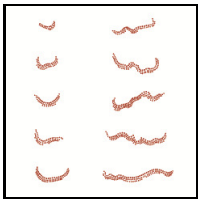
Pattern



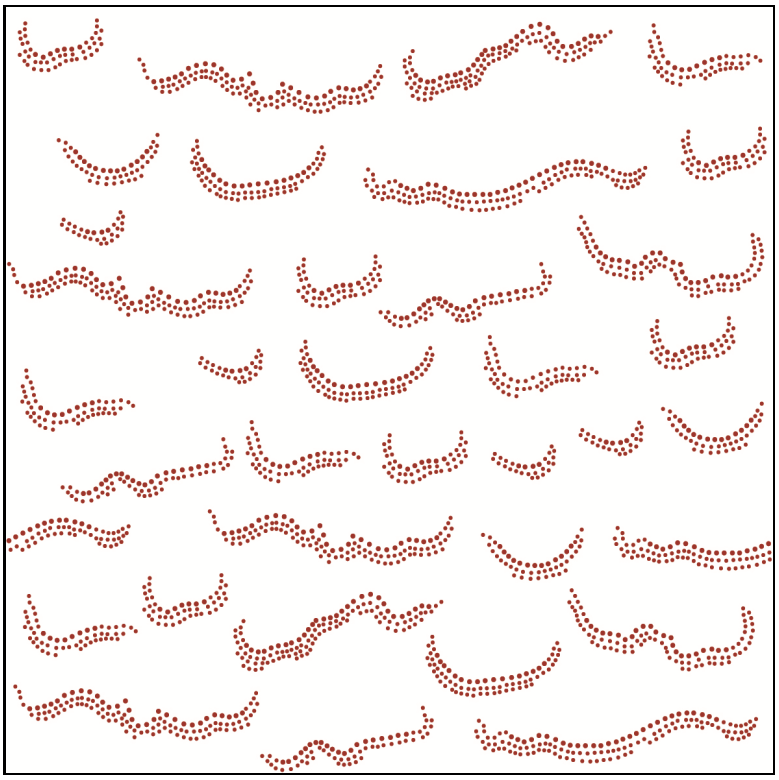
Tile



Components



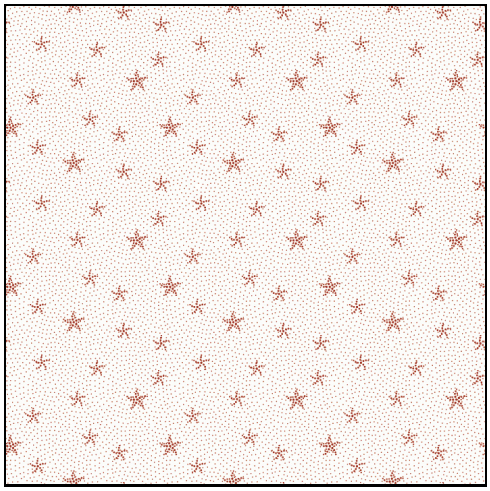
Tile 5x



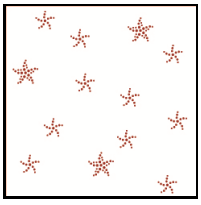
Description: **Sand Dune / Star**
Component Ref: A00033
Color Token: Dk-Brown1815
Tile Size: 20.0mm x 20.0mm
No. of Components: 2
MIL-STD-2410 Reference: AP-120
Note: Pattern shown with A00035.

Diameter of solid circle(s): 0.15mm, 0.20mm, 0.25mm

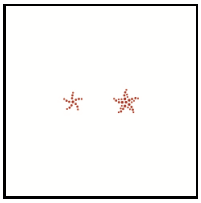
Pattern



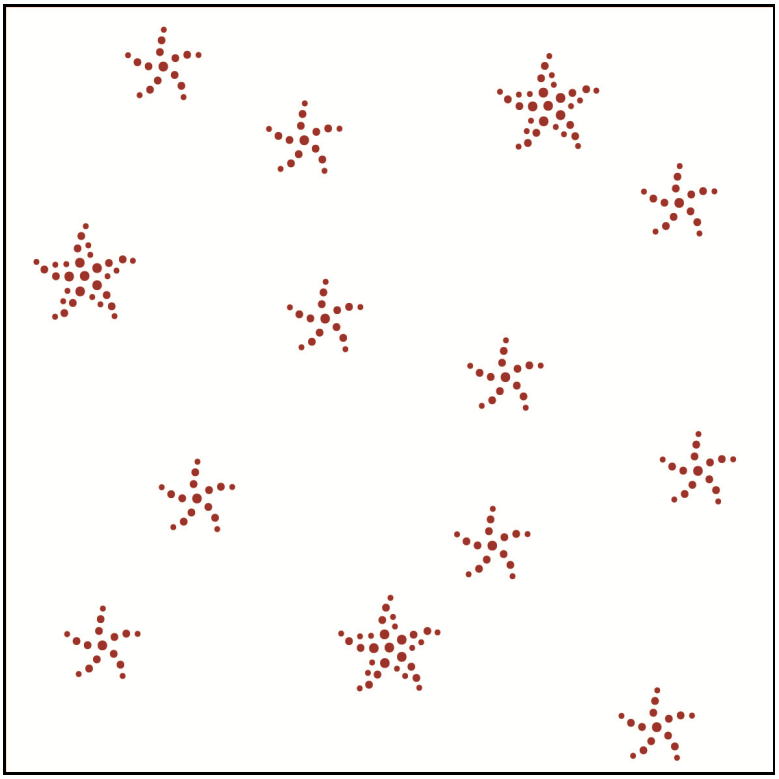
Tile



Components



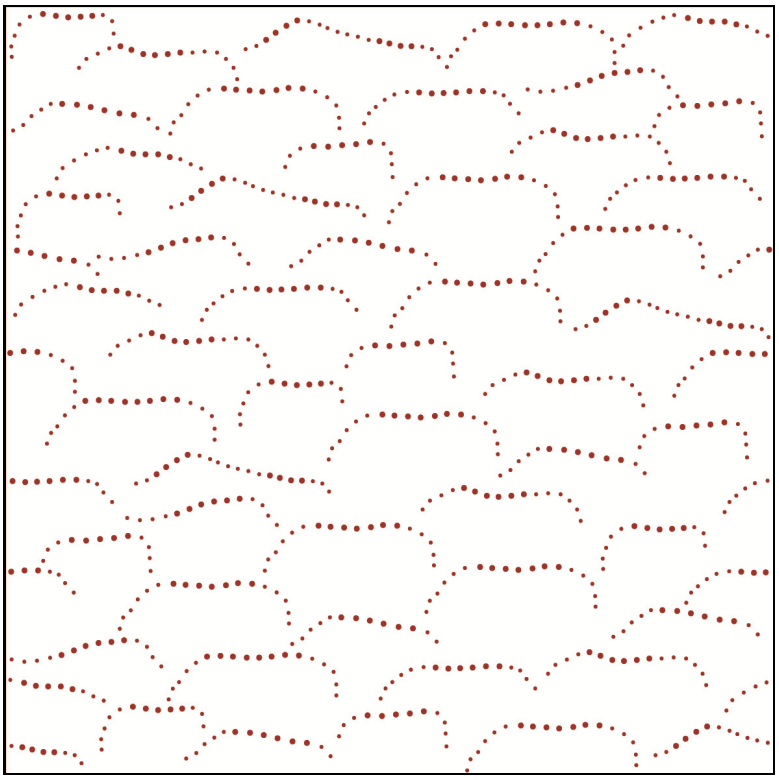
Tile 5x



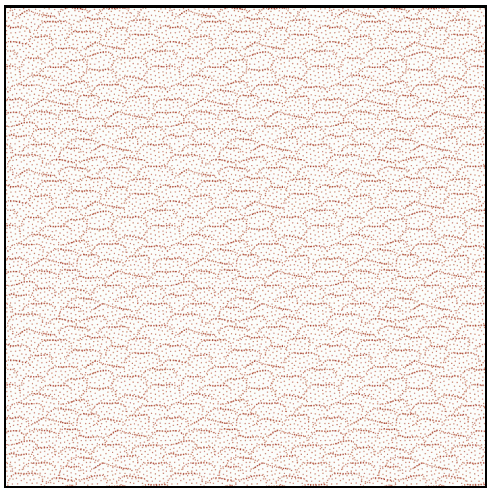
Description: **Sand Dune / Transverse**
Component Ref: A00034
Color Token: Dk-Brown1815
Tile Size: 20.0mm x 20.0mm
No. of Components: 2
MIL-STD-2410 Reference: AP-127
Note: Shown with Sand Dune Orientation at 0°. Pattern shown with A00035.

Diameter of solid circle(s): 0.10mm, 0.15mm

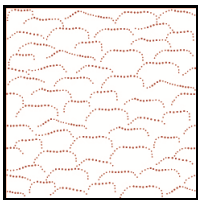
Tile 5x



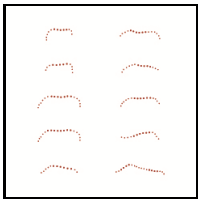
Pattern



Tile



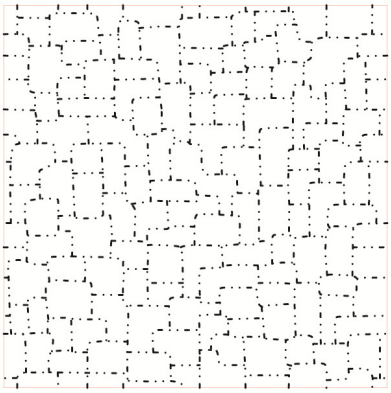
Components



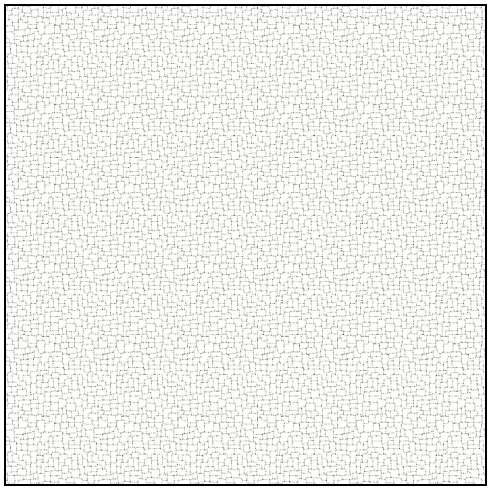
Description: **Shantytown**
Component Ref: A00014
Color Token: Black-42
Tile Size: 10.0mm x 10.0mm
No. of Components: 1
MIL-STD-2410 Reference: AP-132 modified
Note: Dash length 0.15mm, Space between elements 0.15mm

Lineweight: 0.05mm
Diameter of solid circle(s): 0.05mm

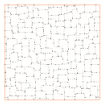
Tile 5x



Pattern



Tile

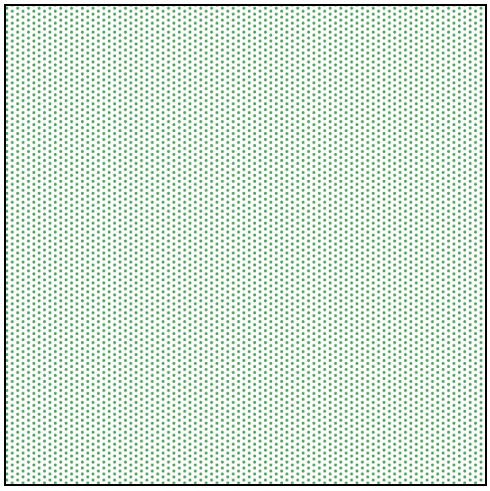


Components

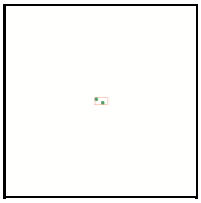
Description: **Vineyard**
Component Ref: A00029
Color Token: Green362
Tile Size: 1.35mm x 0.75mm
No. of Components: 1
MIL-STD-2410 Reference: AP-77

Diameter of solid circle(s): 0.35mm

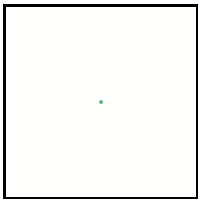
Pattern



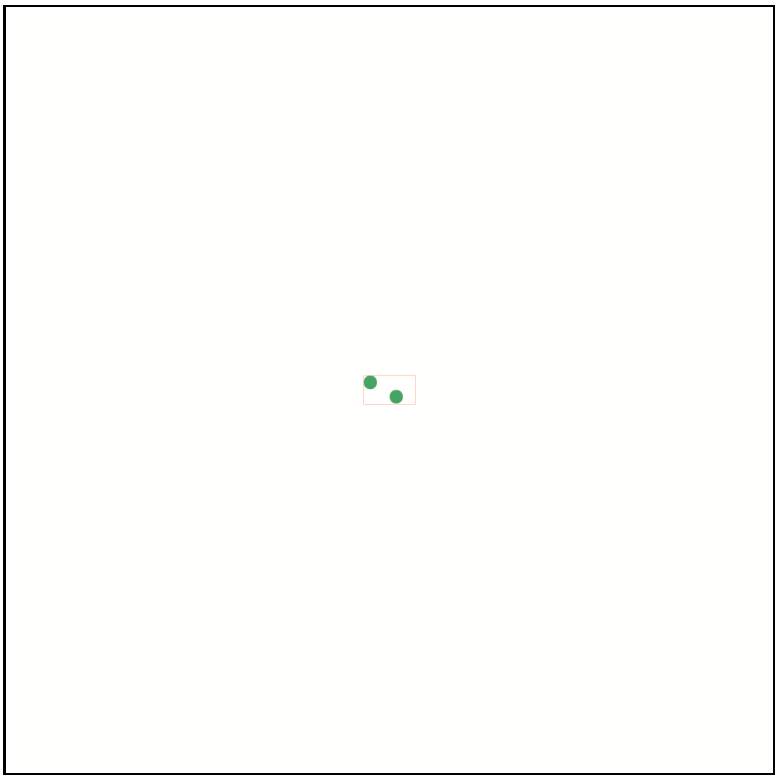
Tile



Components



Tile 5x



Annex J – Symbol Placement, Label Placement, and Finishing Rules

The symbol placement, label placement, and finishing rules associated with individual Product Objects in Annex A are listed in the attached spreadsheet (**DTM50_DPS_PC_Annex J.xlsx**). Each rule category has its own tab with rules then sorted sequentially buy rule number. Rules are listed once, though a particular rule may be associated with multiple Product Objects.

NOTE: columns have been included in each tab showing the original wording of each rule as it was written in the MTM/TM specification. This purely for informational purposes and allows for reviewing the edits made to accommodate using the DGIF.

Annex K - Glossary

The following annex contains definitions of commonly used terms found within the Portrayal Catalogue.

Area - Fill

- A fill screen or pattern depicted within a surface symbol.

Area – Pattern (AP)

- A unique and continuous graphic pattern depicted within a surface symbol.

Arrow

- A symbol or component of a symbol indicating direction, or a vector.

Attribute

- A characteristic of a feature.

Cased

- Two parallel lines representing a linear feature.

Catenary

- A cable or wire that hangs freely from two fixed points (for example over a valley).

Centroid

- The geometric centre of the object's shape.

Colour

- The quality of an object or substance with respect to light reflected by the object, usually determined visually by measurement of hue, saturation, and brightness of the reflected light; saturation or chroma; hue.

Colour Token

- A name by which a colour is known. Colour tokens are associated with different colours optimized for the viewing condition, such as red-light readable, or red and blue/green-light readable.

Component

- An area, line or point geometry used in the construction of a symbol.

Concatenate

- To link or join together, especially in a chain or series.

Dash Spacing

- The distance between two consecutive dashes.

Distance between lines/line spacing

- Distance measured from closest edges of two lines.

Drainage

- The pattern of streams, rivers, lakes and other inland waterbodies.

Expurgate

- The removal or deletion of features within a portion of a map sheet.

Feature

- An abstraction of a real world phenomenon.

Fill

- The appropriate colour or pattern depicted within or overprinting the symbol.

Font

- The characteristic or form of a typeface.

Label

- Labels consist of a variety of terminology and abbreviations, descriptive, or identifying, that are either free-standing (geographic names, text description), or directly associated with a graphic symbol (point, curve, surface).

Line Weight

- The thickness of a line (in millimetres) measured between outside edges.

Line Fill

- A line pattern (LP) depicted within the bounding outlines of a surface symbol.

Line Pattern (LP)

- A unique and continuous graphic pattern depicted within a surface symbol.

Line Style

- A group of parameters (e.g. line weight, colour, dash length, dash spacing) which defines the appearance of the symbology (or portion of a symbology) applied to a linear component.

Lower case

- All letters of a word or words are in lower case text. All numbers are considered lower case text in this standard.

Mixed case

- The first letter in the first word entry is a capital letter, followed by all lower case text.

Neatline

- The border or sheet line delineating the extent of the geographic data on a map.

Open circle

- A circle whose dimensions are measured across the circle, outside perimeter edge to outside perimeter edge.

Open square

- A square whose dimensions are measured across the square, outside perimeter edge to outside perimeter edge.

Origin (of symbol)

- The place on a symbol that corresponds to the geographic location of the object it represents.

Perimeter

- The limits of a surface (area) feature as centred on the peripheral edge of that feature.

Portrayal

- The presentation of information to users.

Portrayal catalogue

- A collection of all defined portrayal.

Portrayal specification

- A collection of operations applied to the feature instance to portray it.

Representative pattern

- A portrayal of some, but not all, of a dense group of similar features within a defined area.

Screen

- A regular pattern of dots, defined by a predetermined percentage (100% being solid) used to create tones of a given colour.

Shape

- A unique graphic symbol with a fixed geometry and used primarily for point features. Shape specifications are defined in Annex H.

Symbol

- An object that represents information.

Symbol parameter

- Basic drawing instructions needed to construct the symbol graphic.

Symbol rule

- A rule that is applied to the feature to determine which portrayal specification to use.

Tick

- A short line located at specific intervals along a linear symbol and normally positioned perpendicular to that line.

Type

- The letters, numbers, diacritics, etc., associated with labels.

Type size

- The size of type, measured in point size.

Type style

- Specifications on capitalization and appearance of the type, such as normal, light, bold, italic and condensed.

Upper case

- All letters of a word or words are in capital letters.