

**IALA S-201**

**Product Specification**

**Draft 0.0.7 – July 2017**

IALA AtoN Product Specification

**ANNEX D1**

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# 1 Catalogue header information

Name: Feature Catalogue for S-201 AtoN  
Scope: Ocean, Coastal, Ports, Harbors and Inland waters  
Field of Application: Marine Navigation  
Version Number: 0.0.7  
Version date: 2017-07-11

Producer information:  
Individual name:   
Organisation name: IALA  
Position Name:   
Contact Information:   
Phone:   
Address:   
Online resource information:   
Hours of Service:   
Contact Instructions: IALA e-Nav Committee WG1  
Role: pointOfContact  
Classification: unclassified

# 2 Definition Sources

No definition sources in catalogue

# 3 Simple Attributes

## 3.1 Administrative division

Name: Administrative division  
Definition: Administrative division is a generic term for an administrative region within a country at a level below that of the sovereign state.  
Code: 'administrativeDivision'  
Remarks:   
Aliases: (none)  
Value Type:text

## 3.2 Aid availability category

Name: Aid availability category  
Definition: *Definition required*  
Code: 'aidAvailabilityCategory'  
Remarks:   
Aliases: (none)  
Value Type:enumeration

Listed Values

| Label | Definition | Code | Remarks |
| --- | --- | --- | --- |
| 'Category 1' Aliases: (none) | *Definition required* | 1 |  |
| 'Category 2' Aliases: (none) | *Definition required* | 2 |  |
| 'Category 3' Aliases: (none) | *Definition required* | 3 |  |

## 3.3 AtoN maintenance record

Name: AtoN maintenance record  
Definition: *Definition required*  
Code: 'atoNMaintenanceRecord'  
Remarks:   
Aliases: (none)  
Value Type:text

## 3.4 Beacon shape

Name: Beacon shape  
Definition: The shape a beacon exhibits  
Code: 'beaconShape'  
Remarks:   
Aliases: BCNSHP  
Value Type:enumeration

Listed Values

| Label | Definition | Code | Remarks |
| --- | --- | --- | --- |
| 'stake, pole, perch, post' Aliases: (none) | an elongated wood or metal pole, embedded in the bottom to serve as a navigational aid or a support for a navigational aid. | 1 |  |
| 'withy' Aliases: (none) | a tree without roots stuck or spoiled into the bottom of the sea to serve as a navigational aid. | 2 |  |
| 'beacon tower' Aliases: (none) | a solid structure of the order of 10 metres in height used as a navigational aid. | 3 |  |
| 'lattice beacon' Aliases: (none) | a structure consisting of strips of metal or wood crossed or interlaced to form a structure to serve as an aid to navigation or as a support for an aid to navigation. | 4 |  |
| 'pile beacon' Aliases: (none) | a long heavy timber(s) or section(s) of steel, wood, concrete, etc., forced into the seabed to serve as an aid to navigation or as a support for an aid to navigation. | 5 |  |
| 'cairn' Aliases: (none) | a mound of stones, usually conical or pyramidal, raised specifically for maritime navigation. | 6 |  |
| 'buoyant beacon' Aliases: (none) | a tall spar-like beacon fitted with a permanently submerged buoyancy chamber, the lower end of the body is secured to seabed sinker either by a flexible joint or by a cable under tension. | 7 |  |

## 3.5 Building shape

Name: Building shape  
Definition: The specific shape of the building.  
Code: 'buildingShape'  
Remarks:   
Aliases: BUISHP  
Value Type:enumeration

Listed Values

| Label | Definition | Code | Remarks |
| --- | --- | --- | --- |
| 'high-rise building' Aliases: (none) | a building having many storeys. | 5 |  |
| 'pyramid' Aliases: (none) | a polyhedron of which one face is a polygon of any number of sides, and the other faces are triangles with a common vertex. | 6 |  |
| 'cylindrical' Aliases: (none) | shaped like a cylinder, which is a solid geometrical figure generated by straight lines fixed in direction and describing with one of its points a closed curve, especially a circle. | 7 |  |
| 'spherical' Aliases: (none) | shaped like a sphere, which is a body the surface of which is at all points equidistant from the centre. | 8 |  |
| 'cubic' Aliases: (none) | a shape the sides of which are six equal squares a regular hexahedron. | 9 |  |

## 3.6 Buoy shape

Name: Buoy shape  
Definition: The shape a buoy exhibits  
Code: 'buoyShape'  
Remarks: The principal shapes are those recommended in the International Association of Lighthouse Authorities - IALA System.  
Aliases: BOYSHP  
Value Type:enumeration

Listed Values

| Label | Definition | Code | Remarks |
| --- | --- | --- | --- |
| 'conical (nun, ogival)' Aliases: (none) | the upper part of the body above the water-line, or the greater part of the superstructure, has approximately the shape or the appearance of a pointed cone with the point upwards. | 1 |  |
| 'can (cylindrical)' Aliases: (none) | the upper part of the body above the water-line, or the greater part of the superstructure, has the shape of a cylinder, or a truncated cone that approximates to a cylinder, with a flat end uppermost. | 2 |  |
| 'spherical' Aliases: (none) | the upper part of the body above the water-line, or the greater part of the superstructure, has the shape of a part of a sphere. | 3 |  |
| 'pillar' Aliases: (none) | the upper part of the body above the water-line, or the greater part of the superstructure is a narrow vertical structure, pillar or lattice tower. | 4 |  |
| 'spar (spindle)' Aliases: (none) | the upper part of the body above the water-line, or the greater part of the superstructure, has the form of a pole, or of a very long cylinder, floating upright. | 5 |  |
| 'barrel (tun)' Aliases: (none) | the upper part of the body above the water-line, or the greater part of the superstructure, has the form of a barrel or cylinder floating horizontally. | 6 |  |
| 'super-buoy' Aliases: (none) | a very large buoy, generally more than 5m in diameter. | 7 |  |
| 'ice buoy' Aliases: (none) | a specially constructed shuttle shaped buoy which is used in ice conditions. | 8 |  |

## 3.7 Category of aggregation

Name: Category of aggregation  
Definition: Named aggregations between two or more aids to navigation and/or navigationally relevant features.  
Code: 'categoryOfAggregation'  
Remarks: Open enumeration codelist  
Aliases: (none)  
Value Type:S100\_CodeList

Listed Values

| Label | Definition | Code | Remarks |
| --- | --- | --- | --- |
| 'leading line' Aliases: (none) | *Definition required* | 1 |  |
| 'range system' Aliases: (none) | *Definition required* | 2 |  |
| 'measured distance' Aliases: (none) | *Definition required* | 3 |  |

## 3.8 Category of association

Name: Category of association  
Definition: Named associations between two or more aids to navigation and/or navigationally relevant features.  
Code: 'categoryOfAssociation'  
Remarks: Open enumeration codelist  
Aliases: (none)  
Value Type:S100\_CodeList

Listed Values

| Label | Definition | Code | Remarks |
| --- | --- | --- | --- |
| 'channel markings' Aliases: (none) | *Definition required* | 1 |  |
| 'danger markings' Aliases: (none) | *Definition required* | 2 |  |

## 3.9 Category of cardinal mark

Name: Category of cardinal mark  
Definition: Cardinal marks are classified according to the quadrant of space they occupy.  
Code: 'categoryOfCardinalMark'  
Remarks: Cardinal marks are used in conjunction with the compass to indicate where a mariner will find safe navigable water. Cardinal marks do not have a distinctive shape but are normally pillar or spar. They are always painted in yellow and black horizontal bands and their distinctive double cone top-marks are always black. (Note that such top-marks are encoded as separate TOPMAR objects). Cardinal marks may also have a special system of flashing white lights and if such lights are fitted they are encoded as separate LIGHTS objects.  
Aliases: CATCAM  
Value Type:enumeration

Listed Values

| Label | Definition | Code | Remarks |
| --- | --- | --- | --- |
| 'north cardinal mark' Aliases: (none) | Quadrant bounded by the true bearing NW-NE taken from the point of interest it should be passed to the north side of the mark. | 1 |  |
| 'east cardinal mark' Aliases: (none) | Quadrant bounded by the true bearing NE-SE taken from the point of interest it should be passed to the east side of the mark. | 2 |  |
| 'south cardinal mark' Aliases: (none) | Quadrant bounded by the true bearing SE-SW taken from the point of interest it should be passed to the south side of the mark. | 3 |  |
| 'west cardinal mark' Aliases: (none) | Quadrant bounded by the true bearing SW-NW taken from the point of interest it should be passed to the west side of the mark. | 4 |  |

## 3.10 Category of fog signal

Name: Category of fog signal  
Definition: Classification of the various means of generating the fog signal.  
Code: 'categoryOfFogSignal'  
Remarks: The classification 'horn' is the generic term for fog signals 'nautophone', 'reed' and 'tyfon'.  
Aliases: CATFOG  
Value Type:enumeration

Listed Values

| Label | Definition | Code | Remarks |
| --- | --- | --- | --- |
| 'explosive' Aliases: (none) | a signal produced by the firing of explosive charges. | 1 |  |
| 'diaphone' Aliases: (none) | a diaphone uses compressed air and generally emits a powerful low-pitched sound, which often concludes with a brief sound of suddenly lowered pitch, termed the 'grunt'. | 2 |  |
| 'siren' Aliases: (none) | a siren uses compressed air and exists in a variety of types which differ considerably in their sound and power. | 3 |  |
| 'nautophone' Aliases: (none) | a horn having a diaphragm oscillated by electricity | 4 |  |
| 'reed' Aliases: (none) | a reed uses compressed air and emits a weak, high pitched sound. | 5 |  |
| 'tyfon' Aliases: (none) | a diaphragm horn which operates under the influence of compressed air or steam | 6 |  |
| 'bell' Aliases: (none) | a ringing sound with a short range. | 7 |  |
| 'whistle' Aliases: (none) | a distinctive sound made by a jet of air passing through an orifice. | 8 |  |
| 'gong' Aliases: (none) | a sound produced by vibration of a disc when struck. | 9 |  |
| 'horn' Aliases: (none) | a horn uses compressed air or electricity to vibrate a diaphragm and exists in a variety of types which differ greatly in their sound and power. | 10 |  |

## 3.11 Category of installation buoy

Name: Category of installation buoy  
Definition: Classification of fixed installation buoy  
Code: 'categoryOfInstallationBuoy'  
Remarks:   
Aliases: CATINB  
Value Type:enumeration

Listed Values

| Label | Definition | Code | Remarks |
| --- | --- | --- | --- |
| 'catenary anchor leg mooring (CALM)' Aliases: (none) | incorporates a large buoy which remains on the surface at all times and is moored by 4 or more anchors. Mooring hawsers and cargo hoses lead from a turntable on top of the buoy, so that the buoy does not turn as the ship swings to wind and stream. | 1 |  |
| 'single buoy mooring (SBM)' Aliases: (none) | a mooring structure used by tankers to load and unload in port approaches or in offshore oil and gas fields. The size of the structure can vary between a large mooring buoy and a manned floating structure. Also known as single point mooring (SPM) | 2 |  |

## 3.12 Category of landmark

Name: Category of landmark  
Definition: Classification of prominent cultural and natural features in the landscape  
Code: 'categoryOfLandmark'  
Remarks:   
Aliases: CATLMK  
Value Type:enumeration

Listed Values

| Label | Definition | Code | Remarks |
| --- | --- | --- | --- |
| 'cairn' Aliases: (none) | a mound of stones, usually conical or pyramidal, raised as a landmark or to designate a point of importance in surveying. | 1 |  |
| 'cemetery' Aliases: (none) | an area of land for burying the dead. | 2 |  |
| 'chimney' Aliases: (none) | a vertical structure containing a passage or flue for discharging smoke and gases. | 3 |  |
| 'dish aerial' Aliases: (none) | a parabolic aerial for the receipt and transmission of high frequency radio signals. | 4 |  |
| 'flagstaff (flagpole)' Aliases: (none) | a staff or pole on which flags are raised. | 5 |  |
| 'flare stack' Aliases: (none) | a tall structure used for burning-off waste oil or gas. Normally showing a flame and located at refineries. | 6 |  |
| 'mast' Aliases: (none) | a straight vertical piece of timber or a hollow cylinder. | 7 |  |
| 'wind sock' Aliases: (none) | a tapered fabric sleeve mounted so as to catch and swing with the wind, thus indicating the wind direction. | 8 |  |
| 'monument' Aliases: (none) | a structure erected or maintained as a memorial to a person or event. | 9 |  |
| 'column (pillar)' Aliases: (none) | a cylindrical or slightly tapering body of considerably greater length than diameter erected vertically. | 10 |  |
| 'memorial plaque' Aliases: (none) | a slab of metal, usually ornamented, erected as a memorial to a person or event. | 11 |  |
| 'obelisk' Aliases: (none) | a tapering shaft usually of stone or concrete, square or rectangular in section, with a pyramidal apex. | 12 |  |
| 'statue' Aliases: (none) | a representation of a human, animal or fantasy figure in marble, bronze, etc. | 13 |  |
| 'cross' Aliases: (none) | a monument, or other structure in form of a cross. | 14 |  |
| 'dome' Aliases: (none) | a landmark comprising a hemispherical or spheroidal shaped structure | 15 |  |
| 'radar scanner' Aliases: (none) | a device used for directing a radar beam through a search pattern | 16 |  |
| 'tower' Aliases: (none) | a relatively tall structure which may be used for observation, support, storage or communication etc. | 17 |  |
| 'windmill' Aliases: (none) | a wind driven system of vanes attached to a tower like structure (excluding wind-generated power plants). | 18 |  |
| 'windmotor' Aliases: (none) | a modern structure for the use of windpower. | 19 |  |
| 'spire/minaret' Aliases: (none) | a tall conical or pyramid-shaped structure often built on the roof or tower of a building, especially a church or mosque. | 20 |  |
| 'large rock or boulder on land' Aliases: (none) | an isolated rocky formation or a single large stone | 21 |  |
| 'triangulation Mark' Aliases: (none) | a recoverable point on the earth, whose geographic position has been determined by angular methods with geodetic instruments. A triangulation point is a selected point, which has been marked with a station mark, or it is a conspicuous natural or artificial feature. Also called trigonometric station or triangulation station. | 22 |  |
| 'boundary Mark' Aliases: (none) | a marker identifying the location of a surveyed boundary line. | 23 |  |
| 'observation wheel' Aliases: (none) | a (very) big Ferris Wheel. | 24 |  |

## 3.13 Category of lateral mark

Name: Category of lateral mark  
Definition: Classification of lateral buoys  
Code: 'categoryOfLateralMark'  
Remarks: There are two international buoyage regions, A and B, between which lateral marks differ. The buoyage region is encoded using the separate attribute MARSYS. When top-marks, retro reflectors and/or lights are fitted to these marks, they are encoded as separate objects.  
Aliases: CATLAM  
Value Type:enumeration

Listed Values

| Label | Definition | Code | Remarks |
| --- | --- | --- | --- |
| 'port-hand lateral mark' Aliases: (none) | indicates the port boundary of a navigational channel or suggested route when proceeding in the 'conventional direction of buoyage'. | 1 |  |
| 'starboard-hand lateral mark' Aliases: (none) | indicates the starboard boundary of a navigational channel or suggested route when proceeding in the 'conventional direction of buoyage'. | 2 |  |
| 'preferred channel to starboard lateral mark' Aliases: (none) | at a point where a channel divides, when proceeding in the 'conventional direction of buoyage', the preferred channel (or primary route) is indicated by a modified port-hand lateral mark. | 3 |  |
| 'preferred channel to port lateral mark' Aliases: (none) | at a point where a channel divides, when proceeding in the 'conventional direction of buoyage', the preferred channel (or primary route) is indicated by a modified starboard-hand lateral mark. | 4 |  |

## 3.14 Category of light

Name: Category of light  
Definition: Classification of diffrent light types  
Code: 'categoryOfLight'  
Remarks: Marine light (a light intended primarily for marine navigation) is not included in the above list. All lights are considered to be marine lights unless the attribute 'category of light' indicates otherwise.  
Aliases: CATLIT  
Value Type:enumeration

Listed Values

| Label | Definition | Code | Remarks |
| --- | --- | --- | --- |
| 'leading light' Aliases: (none) | a light associated with other lights so as to form a leading line to be followed. | 4 |  |
| 'aero light' Aliases: (none) | an aero light is established for aeronautical navigation and may be of higher power than marine lights and visible from well offshore. | 5 |  |
| 'air obstruction light' Aliases: (none) | a light marking an obstacle which constitutes a danger to air navigation. | 6 |  |
| 'fog detector light' Aliases: (none) | a light used to automatically determine conditions of visibility which warrant the turning on or off of a sound signal. | 7 |  |
| 'flood light' Aliases: (none) | a broad beam light used to illuminate a structure or area. | 8 |  |
| 'strip light' Aliases: (none) | a light whose source has a linear form generally horizontal, which can reach a length of several metres. | 9 |  |
| 'subsidiary light' Aliases: (none) | a light placed on or near the support of a main light and having a special use in navigation. | 10 |  |
| 'spotlight' Aliases: (none) | a powerful light focused so as to illuminate a small area. | 11 |  |
| 'front' Aliases: (none) | term used with leading lights to describe the position of the light on the lead as viewed from seaward. | 12 |  |
| 'rear' Aliases: (none) | term used with leading lights to describe the position of the light on the lead as viewed from seaward. | 13 |  |
| 'lower' Aliases: (none) | term used with leading lights to describe the position of the light on the lead as viewed from seaward. | 14 |  |
| 'upper' Aliases: (none) | term used with leading lights to describe the position of the light on the lead as viewed from seaward. | 15 |  |
| 'emergency' Aliases: (none) | a light available as a backup to a main light which will be illuminated should the main light fail. | 17 |  |
| 'bearing light' Aliases: (none) | a light which enables its approximate bearing to be obtained without the use of a compass. | 18 |  |
| 'horizontally disposed' Aliases: (none) | a group of lights of identical character and almost identical position, that are disposed horizontally. | 19 |  |
| 'vertically disposed' Aliases: (none) | a group of lights of identical character and almost identical position, that are disposed vertically. | 20 |  |

## 3.15 Category of navigation line

Name: Category of navigation line  
Definition: Classification of route guidence given to vessels  
Code: 'categoryOfNavigationLine'  
Remarks:   
Aliases: CATNAV  
Value Type:enumeration

Listed Values

| Label | Definition | Code | Remarks |
| --- | --- | --- | --- |
| 'clearing line' Aliases: (none) | a straight line that marks the boundary between a safe and a dangerous area or that passes clear of a navigational danger. | 1 |  |
| 'transit line' Aliases: (none) | a line passing through one or more fixed marks. | 2 |  |
| 'leading line bearing a recommended track' Aliases: (none) | a line passing through one or more clearly defined objects, along the path of which a vessel can approach safely up to a certain distance off. | 3 |  |

## 3.16 Category of offshore platform

Name: Category of offshore platform  
Definition: Classification of an offshore raised structure  
Code: 'categoryOfOffshorePlatform'  
Remarks:   
Aliases: CATOFP  
Value Type:enumeration

Listed Values

| Label | Definition | Code | Remarks |
| --- | --- | --- | --- |
| 'oil derrick/rig' Aliases: (none) | a temporary mobile structure, either fixed or floating, used in the exploration stages of oil and gas fields. | 1 |  |
| 'production platform' Aliases: (none) | a term used to indicate a permanent offshore structure equipped to control the flow of oil or gas. It does not include entirely submarine structures. | 2 |  |
| 'observation/research platform' Aliases: (none) | a platform from which one's surroundings or events can be observed, noted or recorded such as for scientific study. | 3 |  |
| 'articulated loading platform (ALP)' Aliases: (none) | a metal lattice tower, buoyant at one end and attached at the other by a universal joint to a concrete filled base on the sea bed. The platform may be fitted with a helicopter platform, emergency accommodation and hawser/hose retrieval. | 4 |  |
| 'single anchor leg mooring (SALM)' Aliases: (none) | a rigid frame or tube with a buoyancy device at its upper end , secured at its lower end to a universal joint on a large steel or concrete base resting on the sea bed, and at its upper end to a mooring buoy by a chain or wire. | 5 |  |
| 'mooring tower' Aliases: (none) | a platform secured to the sea bed and surmounted by a turntable to which ships moor. | 6 |  |
| 'artificial island' Aliases: (none) | a man-made structure usually built for the exploration or exploitation of marine resources, marine scientific research, tidal observations, etc. | 7 |  |
| 'floating production, storage and offloading vessel (FPSO)' Aliases: (none) | an offshore oil/gas facility consisting of a moored tanker/barge by which the product is extracted, stored and exported. | 8 |  |
| 'accommodation platform' Aliases: (none) | a platform used primarily for eating, sleeping and recreation purposes. | 9 |  |
| 'navigation, communication and control buoy (NCCB)' Aliases: (none) | a floating structure with control room, power and storage facilities, attached to the sea bed by a flexible pipeline and cables. | 10 |  |

## 3.17 Category of pile

Name: Category of pile  
Definition: Classification of pile, driven into the earth as a foundation or support for a structure  
Code: 'categoryOfPile'  
Remarks:   
Aliases: CATPLE  
Value Type:enumeration

Listed Values

| Label | Definition | Code | Remarks |
| --- | --- | --- | --- |
| 'stake' Aliases: (none) | an elongated wood or metal pole embedded in the bottom to serve as a marker or support. | 1 |  |
| 'post' Aliases: (none) | a vertical piece of timber, metal or concrete forced into the earth or sea bed. | 3 |  |
| 'tripodal' Aliases: (none) | a single structure comprising 3 or more piles held together (sections of heavy timber, steel or concrete), and forced into the earth or sea bed. | 4 |  |

## 3.18 Category of radar transponder beacon

Name: Category of radar transponder beacon  
Definition: Classification of radar transponder beacon based on fuctionality.  
Code: 'categoryOfRadarTransponderBeacon'  
Remarks:   
Aliases: CATRTB  
Value Type:enumeration

Listed Values

| Label | Definition | Code | Remarks |
| --- | --- | --- | --- |
| 'ramark, radar beacon transmitting continuously' Aliases: (none) | a radar marker beacon which continuously transmits a signal appearing as a radial line on a radar screen, the line indicating the direction of the beacon. Ramarks are intended primarily for marine use. The name 'ramark' is derived from the words radar marker. | 1 |  |
| 'racon, radar transponder beacon' Aliases: (none) | a radar beacon which returns a coded signal which provides identification of the beacon, as well as range and bearing. The range and bearing are indicated by the location of the first character received on the radar screen. The name 'racon' is derived from the words radar beacon. | 2 |  |
| 'leading racon/radar transponder beacon' Aliases: (none) | a radar beacon that may be used (in conjunction with at least one other radar beacon) to indicate a leading line. | 3 |  |

## 3.19 Category of recommended track

Name: Category of recommended track  
Definition: Classification of track based on defining navigational marks  
Code: 'categoryOfRecommendedTrack'  
Remarks:   
Aliases: CATTRK  
Value Type:enumeration

Listed Values

| Label | Definition | Code | Remarks |
| --- | --- | --- | --- |
| 'based on a system of fixed marks' Aliases: (none) | a straight route (known as a recommended track, range or leading line), which comprises at least two structures (usually beacons or daymarks) and/or natural features, which may carry lights and/or top-marks. The structures/features are positioned so that when observed to be in line, a vessel can follow a known bearing with safety. | 1 |  |
| 'not based on a system of fixed marks' Aliases: (none) | a route (known as a recommended track or preferred route) which is not based on a series of structures or features in line. | 2 |  |

## 3.20 Category of silo/tank

Name: Category of silo/tank  
Definition: Classification based on the product  
Code: 'categoryOfSiloTank'  
Remarks:   
Aliases: CATSIL  
Value Type:enumeration

Listed Values

| Label | Definition | Code | Remarks |
| --- | --- | --- | --- |
| 'silo in general' Aliases: (none) | a generally cylindrical tower used for storing fodder or grain. | 1 |  |
| 'tank in general' Aliases: (none) | a fixed structure for storing liquids. | 2 |  |
| 'grain elevator' Aliases: (none) | a storage building for grain. Usually a tall frame, metal or concrete structure with an especially compartmented interior. | 3 |  |
| 'water tower' Aliases: (none) | a tower with an elevated container used to hold water. | 4 |  |

## 3.21 Category of special purpose mark

Name: Category of special purpose mark  
Definition: Classification of an aid to navigation which signifies some special purpose  
Code: 'categoryOfSpecialPurposeMark'  
Remarks: A mark may be a beacon, a buoy, a signpost or may take another form. NOTE: IALA added enumerate(s), code will need to be verified after approval for GI rgistry.  
Aliases: CATSPM  
Value Type:enumeration

Listed Values

| Label | Definition | Code | Remarks |
| --- | --- | --- | --- |
| 'firing danger mark' Aliases: (none) | a mark used to indicate a firing danger area, usually at sea. | 1 |  |
| 'target mark' Aliases: (none) | any object toward which something is directed. The distinctive marking or instrumentation of a ground point to aid its identification on a photograph. | 2 |  |
| 'marker ship mark' Aliases: (none) | a mark marking the position of a ship which is used as a target during some military exercise. | 3 |  |
| 'degaussing range mark' Aliases: (none) | a mark used to indicate a degaussing range. | 4 |  |
| 'barge mark' Aliases: (none) | a mark of relevance to barges. | 5 |  |
| 'cable mark' Aliases: (none) | a mark used to indicate the position of submarine cables or the point at which they run on to the land. | 6 |  |
| 'spoil ground mark' Aliases: (none) | a mark used to indicate the limit of a spoil ground | 7 |  |
| 'outfall mark' Aliases: (none) | a mark used to indicate the position of an outfall or the point at which it leaves the land. | 8 |  |
| 'ODAS' Aliases: (none) | Ocean Data Acquisition System | 9 |  |
| 'recording mark' Aliases: (none) | a mark used to record data for scientific purposes. | 10 |  |
| 'seaplane anchorage mark' Aliases: (none) | a mark used to indicate a seaplane anchorage. | 11 |  |
| 'recreation zone mark' Aliases: (none) | a mark used to indicate a recreation zone. | 12 |  |
| 'private mark' Aliases: (none) | a privately maintained mark. | 13 |  |
| 'mooring mark' Aliases: (none) | a mark indicating a mooring or moorings. | 14 |  |
| 'LANBY' Aliases: (none) | a large buoy designed to take the place of a lightship where construction of an offshore light station is not feasible. | 15 |  |
| 'leading mark' Aliases: (none) | aids to navigation or other indicators so located as to indicate the path to be followed. Leading marks identify a leading line when they are in transit. | 16 |  |
| 'measured distance mark' Aliases: (none) | a mark forming part of a transit indicating one end of a measured distance. | 17 |  |
| 'notice mark' Aliases: (none) | a notice board or sign indicating information to the mariner. | 18 |  |
| 'TSS mark' Aliases: (none) | a mark indicating a traffic separation scheme. | 19 |  |
| 'anchoring prohibited mark' Aliases: (none) | a mark indicating an anchoring prohibited area. | 20 |  |
| 'berthing prohibited mark' Aliases: (none) | a mark indicating that berthing is prohibited. | 21 |  |
| 'overtaking prohibited mark' Aliases: (none) | a mark indicating that overtaking is prohibited. | 22 |  |
| 'two-way traffic prohibited mark' Aliases: (none) | a mark indicating a one-way route. | 23 |  |
| '"reduced wake" mark' Aliases: (none) | a mark indicating that vessels must not generate excessive wake. | 24 |  |
| 'speed limit mark' Aliases: (none) | a mark indicating that a speed limit applies. | 25 |  |
| 'stop mark' Aliases: (none) | a mark indicating the place where the bow of a ship must stop when traffic lights show red. | 26 |  |
| 'general warning mark' Aliases: (none) | a mark indicating that special caution must be exercised in the vicinity of the mark. | 27 |  |
| '"sound ships siren" mark' Aliases: (none) | a mark indicating that a ship should sound its siren or horn. | 28 |  |
| 'restricted vertical clearance mark' Aliases: (none) | a mark indicating the minimum vertical space available for passage. | 29 |  |
| 'maximum vessel's draught mark' Aliases: (none) | a mark indicating the maximum draught of vessel permitted. | 30 |  |
| 'restricted horizontal clearance mark' Aliases: (none) | a mark indicating the minimum horizontal space available for passage. | 31 |  |
| 'strong current warning mark' Aliases: (none) | a mark warning of strong currents. | 32 |  |
| 'berthing permitted mark' Aliases: (none) | a mark indicating that berthing is allowed. | 33 |  |
| 'overhead power cable mark' Aliases: (none) | a mark indicating an overhead power cable. | 34 |  |
| '"channel edge gradient" mark' Aliases: (none) | a mark indicating the gradient of the slope of a dredge channel edge. | 35 |  |
| 'telephone mark' Aliases: (none) | a mark indicating the presence of a telephone. | 36 |  |
| 'ferry crossing mark' Aliases: (none) | a mark indicating that a ferry route crosses the ship route often used with a 'sound ship's siren' mark. | 37 |  |
| 'pipeline mark' Aliases: (none) | a mark used to indicate the position of submarine pipelines or the point at which they run on to the land. | 39 |  |
| 'anchorage mark' Aliases: (none) | a mark indicating an anchorage area. | 40 |  |
| 'clearing mark' Aliases: (none) | a mark used to indicate a clearing line. | 41 |  |
| 'control mark' Aliases: (none) | a mark indicating the location at which a restriction or requirement exists. | 42 |  |
| 'diving mark' Aliases: (none) | a mark indicating that diving may take place in the vicinity. | 43 |  |
| 'refuge beacon' Aliases: (none) | a mark providing or indicating a place of safety. | 44 |  |
| 'foul ground mark' Aliases: (none) | a mark indicating a foul ground. | 45 |  |
| 'yachting mark' Aliases: (none) | a mark installed for use by yachtsmen. | 46 |  |
| 'heliport mark' Aliases: (none) | a mark indicating an area where helicopters may land. | 47 |  |
| 'GNSS mark' Aliases: (none) | a mark indicating a location at which a GNSS position has been accurately determined. | 48 |  |
| 'seaplane landing mark' Aliases: (none) | a mark indicating an area where sea-planes land. | 49 |  |
| 'entry prohibited mark' Aliases: (none) | a mark indicating that entry is prohibited. | 50 |  |
| 'work in progress mark' Aliases: (none) | a mark indicating that work (generally construction) is in progress. | 51 |  |
| 'mark with unknown purpose' Aliases: (none) | a mark whose detailed characteristics are unknown. | 52 |  |
| 'wellhead mark' Aliases: (none) | a mark indicating a borehole that produces or is capable of producing oil or natural gas. | 53 |  |
| 'channel separation mark' Aliases: (none) | a mark indicating the point at which a channel divides separately into two channels. | 54 |  |
| 'marine farm mark' Aliases: (none) | a mark indicating the existence of a fish, mussel, oyster or pearl farm/ culture. | 55 |  |
| 'artificial reef mark' Aliases: (none) | a mark indicating the existence or the extent of an artificial reef. | 56 |  |
| 'jetski prohibited' Aliases: (none) | *Definition required* | 64 |  |

## 3.22 Category of temporal variation

Name: Category of temporal variation  
Definition: An assessment of the likelihood of change within an area since last survey.  
Code: 'categoryOfTemporalVariation'  
Remarks:   
Aliases:   
Value Type:enumeration

Listed Values

| Label | Definition | Code | Remarks |
| --- | --- | --- | --- |
| 'unassessed' Aliases: (none) | Temporal variation not assessed or cannot be determined. | 1 |  |
| 'event' Aliases: (none) | No new hydrographic survey conducted after an event (e.g. hurricane, earthquake, volcanic eruption, landslide, etc), which is considered likely to have changed the seafloor significantly. | 2 |  |
| 'likely to change' Aliases: (none) | Continuous or frequent change (e.g. river siltation, sand waves, seasonal storms, icebergs, etc). | 3 |  |
| 'likely to change but significant shoaling unlikely' Aliases: (none) | Definition required. | 4 |  |
| 'unlikely to change' Aliases: (none) | Significant change to the seafloor is not expected. | 5 |  |

## 3.23 City name

Name: City name  
Definition: The name of a town or city.  
Code: 'cityName'  
Remarks:   
Aliases: (none)  
Value Type:text

## 3.24 Colour

Name: Colour  
Definition: The property possessed by an object of producing different sensations on the eye as a result of the way it reflects or emits light.  
Code: 'colour'  
Remarks:   
Aliases: COLOUR  
Value Type:enumeration

Listed Values

| Label | Definition | Code | Remarks |
| --- | --- | --- | --- |
| 'white' Aliases: (none) | *Definition required* | 1 |  |
| 'black' Aliases: (none) | *Definition required* | 2 |  |
| 'red' Aliases: (none) | *Definition required* | 3 |  |
| 'green' Aliases: (none) | *Definition required* | 4 |  |
| 'blue' Aliases: (none) | *Definition required* | 5 |  |
| 'yellow' Aliases: (none) | *Definition required* | 6 |  |
| 'grey' Aliases: (none) | *Definition required* | 7 |  |
| 'brown' Aliases: (none) | *Definition required* | 8 |  |
| 'amber' Aliases: (none) | *Definition required* | 9 |  |
| 'violet' Aliases: (none) | *Definition required* | 10 |  |
| 'orange' Aliases: (none) | *Definition required* | 11 |  |
| 'magenta' Aliases: (none) | *Definition required* | 12 |  |
| 'pink' Aliases: (none) | *Definition required* | 13 |  |

## 3.25 Colour pattern

Name: Colour pattern  
Definition: A regular repeated design containing more than one colour  
Code: 'colourPattern'  
Remarks: NOTE: IALA added listed values. The codes will have to verified when submitting the new listed values to the GI registry.  
Aliases: COLPAT  
Value Type:enumeration

Listed Values

| Label | Definition | Code | Remarks |
| --- | --- | --- | --- |
| 'horizontal stripes' Aliases: (none) | straight bands or stripes of differing colours painted horizontally. | 1 |  |
| 'vertical stripes' Aliases: (none) | straight bands or stripes of differing colours painted vertically. | 2 |  |
| 'diagonal stripes' Aliases: (none) | straight bands or stripes of differing colours painted diagonally (ie not horizontally or vertically). | 3 |  |
| 'squared' Aliases: (none) | often referred to as checker plate, where alternate colours are used to create squares similar to a chess or draught board. The pattern may be straight or diagonal. | 4 |  |
| 'stripes (direction unknown)' Aliases: (none) | straight bands or stripes of differing colours painted in an unknown direction. | 5 |  |
| 'border stripe' Aliases: (none) | a band or stripe of colour which is displayed around the outer edge of the object, which may also form a border to an inner pattern or plain colour. | 6 |  |
| 'single colour' Aliases: (none) | One solid colour of uniform coverage | 7 |  |
| 'rectangle' Aliases: (none) | A four-sided shape that is made up of two pairs of parallel lines and that has four right angles, on a different coloured background | 8 |  |
| 'triangle' Aliases: (none) | a shape that is made up of three lines and three angles, on a different coloured background | 9 |  |

## 3.26 Condition

Name: Condition  
Definition: The various conditions of buildings and other constructions.  
Code: 'condition'  
Remarks: The default 'condition' should be considered to be completed, undamaged and working normally. This attribute should, therefore, only be used to indicate objects whose condition is anything other than 'normal'.  
Aliases: CONDTN  
Value Type:enumeration

Listed Values

| Label | Definition | Code | Remarks |
| --- | --- | --- | --- |
| 'under construction' Aliases: (none) | a structure that is in the process of being built. | 1 |  |
| 'ruined' Aliases: (none) | a structure in a decayed or deteriorated condition resulting from neglect or disuse, or a damaged structure in need of repair. | 2 |  |
| 'under reclamation' Aliases: (none) | an area of the sea that is being reclaimed as land, usually by the dumping of earth and other material. | 3 |  |
| 'wingless' Aliases: (none) | a windmill or windmotor from which the turbine blades are missing. | 4 |  |
| 'planned construction' Aliases: (none) | an area where a future construction is planned. | 5 |  |

## 3.27 Country

Name: Country  
Definition: The name of a nation. (Adapted from The American Heritage Dictionaries)  
Code: 'country'  
Remarks:   
Aliases: (none)  
Value Type:text

## 3.28 Date end

Name: Date end  
Definition: The latest date on which an object (e.g., a buoy) will be present.  
Code: 'dateEnd'  
Remarks: This attribute is to be used to indicate the removal or cancellation of an object at a specific date in the future. See also 'periodic date end' (PEREND).  
Aliases: DATEND  
Value Type:S100\_TruncatedDate

## 3.29 Date start

Name: Date start  
Definition: The earliest date on which an object (e.g., a buoy) will be present.  
Code: 'dateStart'  
Remarks: This attribute is to be used to indicate the deployment or implementation of an object at a specific date in the future. See also 'periodic date start' (PERSTA).  
Aliases: DATSTA  
Value Type:S100\_TruncatedDate

## 3.30 Delivery point

Name: Delivery point  
Definition: Details of where post can be delivered such as the apartment, name and/or number of a street, building or PO Box.  
Code: 'deliveryPoint'  
Remarks:   
Aliases: (none)  
Value Type:text

## 3.31 Depth range value 2

Name: Depth range value 2  
Definition: The maximum (deepest) value of a depth range.  
Code: 'depthRangeMaximumValue'  
Remarks: Where the area dries, the value is negative. The unit of measure is defined in the DUNI subfield of the DSPM record or in the DUNITS attribute of the M\_UNIT meta object class, e.g., metre (m). The resolution is 0.1 m or 0.1 fm or 0.1 ft.  
Aliases: DRVAL2  
Value Type:real

## 3.32 Depth range value 1

Name: Depth range value 1  
Definition: The minimum (shoalest) value of a depth range.  
Code: 'depthRangeMinimumValue'  
Remarks: Where the area dries, the value is negative. The unit of measure is defined in the DUNI subfield of the DSPM record or in the DUNITS attribute of the M\_UNIT meta object class, e.g., metre (m). The resolution is 0.1 m or 0.1 fm or 0.1 ft.  
Aliases: DRVAL1  
Value Type:real

## 3.33 Direction uncertainty

Name: Direction uncertainty  
Definition: The best estimate of the accuracy of a bearing.  
Code: 'directionUncertainty'  
Remarks:   
Aliases: (none)  
Value Type:real

Unit of measure information

| name | definition | symbol |
| --- | --- | --- |
| degrees | degrees of arc | ° |

Quantity specification: planeAngle

Constraints

| string Length | text Pattern | range | precision |
| --- | --- | --- | --- |
|  |  | |  |  | | --- | --- | | lowerBound | 0.0 | | upperBound | 360.0 | | closure | closedInterval | | 1 |

## 3.34 Elevation

Name: Elevation  
Definition: The altitude of the ground level of an object, measured from a specified vertical datum.  
Code: 'elevation'  
Remarks: The unit of measure is defined in the HUNI subfield of the DSPM record or in the HUNITS attribute of the M\_UNIT meta object class, e.g., metre (m). The resolution is 0.1 m or 0.1 ft.  
Aliases: ELEVAT  
Value Type:real

## 3.35 Exhibition condition of light

Name: Exhibition condition of light  
Definition: The outward display of the light  
Code: 'exhibitionConditionOfLight'  
Remarks:   
Aliases: EXCLIT  
Value Type:enumeration

Listed Values

| Label | Definition | Code | Remarks |
| --- | --- | --- | --- |
| 'light shown without change of character' Aliases: (none) | a light shown throughout the 24 hours without change of character. | 1 |  |
| 'daytime light' Aliases: (none) | a light which is only exhibited by day. | 2 |  |
| 'fog light' Aliases: (none) | a light which is exhibited in fog or conditions of reduced visibility. | 3 |  |
| 'night light' Aliases: (none) | a light which is only exhibited at night. | 4 |  |

## 3.36 Function

Name: Function  
Definition: A specific role that describes a feature  
Code: 'function'  
Remarks:   
Aliases: FUNCTN  
Value Type:enumeration

Listed Values

| Label | Definition | Code | Remarks |
| --- | --- | --- | --- |
| 'harbour-master's office' Aliases: (none) | the office of the local official who has charge of mooring and berthing of vessels, collecting harbour fees, etc. | 2 |  |
| 'customs office' Aliases: (none) | an office which is charged with enforcing customs regulations. | 3 |  |
| 'health office' Aliases: (none) | the office which is charged with the administration of health laws and sanitary inspections. | 4 |  |
| 'hospital' Aliases: (none) | an institution or establishment providing medical or surgical treatment for the ill or wounded. | 5 |  |
| 'post office' Aliases: (none) | the public department, agency or organisation responsible primarily for the collection, transmission and distribution of mail. | 6 |  |
| 'hotel' Aliases: (none) | an establishment, especially of a comfortable or luxurious kind, where paying visitors are provided with accommodation, meals and other services. | 7 |  |
| 'railway station' Aliases: (none) | a building with platforms where trains arrive, load, discharge and depart. | 8 |  |
| 'police station' Aliases: (none) | the office of the local police force. | 9 |  |
| 'water-police station' Aliases: (none) | the headquarters of a local water-police force. | 10 |  |
| 'pilot office' Aliases: (none) | the office or headquarters of pilots the place where the services of a pilot may be obtained. | 11 |  |
| 'pilot lookout' Aliases: (none) | a distinctive structure on shore from which personnel keep watch upon events at sea or along the coast. | 12 |  |
| 'bank office' Aliases: (none) | an office for custody, deposit, loan, exchange or issue of money. | 13 |  |
| 'headquarters for district control' Aliases: (none) | the quarters of an executive officer (director, manager, etc.) with responsibility for an administrative area. | 14 |  |
| 'transit shed/warehouse' Aliases: (none) | a building or part of a building for storage of wares or goods. | 15 |  |
| 'factory' Aliases: (none) | a building or buildings with equipment for manufacturing a workshop. | 16 |  |
| 'power station' Aliases: (none) | a stationary plant containing apparatus for large scale conversion of some form of energy (such as hydraulic, steam, chemical or nuclear energy) into electrical energy. | 17 |  |
| 'administrative' Aliases: (none) | a building for the management of affairs. | 18 |  |
| 'educational facility' Aliases: (none) | a building concerned with education (e.g. school, college, university, etc.) | 19 |  |
| 'church' Aliases: (none) | a building for public Christian worship. | 20 |  |
| 'chapel' Aliases: (none) | a place for Christian worship other than a parish, cathedral or church, especially one attached to a private house or institution. | 21 |  |
| 'temple' Aliases: (none) | a building for public Jewish worship. | 22 |  |
| 'pagoda' Aliases: (none) | a Hindu or Buddhist temple or sacred building. | 23 |  |
| 'shinto shrine' Aliases: (none) | a building for public Shinto worship. | 24 |  |
| 'buddhist temple' Aliases: (none) | see pagoda. | 25 |  |
| 'mosque' Aliases: (none) | a Muslim place of worship. | 26 |  |
| 'marabout' Aliases: (none) | a shrine marking the burial place of a Muslim holy man. | 27 |  |
| 'lookout' Aliases: (none) | keeping a watch upon events at sea or along the coast. | 28 |  |
| 'communication' Aliases: (none) | transmitting and/or receiving electronic communication signals. | 29 |  |
| 'television' Aliases: (none) | broadcast of television signals. | 30 |  |
| 'radio' Aliases: (none) | broadcast of radio signals. | 31 |  |
| 'radar' Aliases: (none) | a method, system or technique of using beamed, reflected, and timed radio waves for detecting, locating, or tracking objects, and for measuring altitudes. | 32 |  |
| 'light support' Aliases: (none) | supporting a light | 33 |  |
| 'microwave' Aliases: (none) | broadcasting and receiving signals using microwaves. | 34 |  |
| 'cooling' Aliases: (none) | dissipating heat. | 35 |  |
| 'observation' Aliases: (none) | a place from which the surroundings can be observed but at which a watch is not habitually maintained. | 36 |  |
| 'time ball' Aliases: (none) | a visual time signal in form of a ball | 37 |  |
| 'clock' Aliases: (none) | visual time signal. | 38 |  |
| 'control' Aliases: (none) | used to control the flow of air, rail, or marine traffic. | 39 |  |
| 'airship mooring' Aliases: (none) | a facility to secure an airship. | 40 |  |
| 'stadium' Aliases: (none) | a large usually unroofed building with tiers of seats for spectators | 41 |  |
| 'bus station' Aliases: (none) | a location at which buses arrive and from which they depart. | 42 |  |

## 3.37 Height

Name: Height  
Definition: The value of the vertical distance to the highest point of the object, measured from a specified vertical datum.  
Code: 'height'  
Remarks: Height must not be used for floating objects. The unit of measure is defined in the HUNI subfield of the DSPM record or in the HUNITS attribute of the M\_UNIT meta object class, e.g., metre (m). The resolution is 0.1 m or 0.1 ft.  
Aliases: HEIGHT  
Value Type:real

## 3.38 Horizontal accuracy

Name: Horizontal accuracy  
Definition: The best estimate of the horizontal accuracy of horizontal clearance and distances.  
Code: 'horizontalAccuracy'  
Remarks: The expected input is the radius of the two-dimensional error. The error is assumed to be positive and negative. The plus/minus character shall not be encoded. The unit of measure is defined in the HUNI subfield of the DSPM record or in the HUNITS attribute of the M\_UNIT meta object class, e.g., metre (m). The resolution is 0.1 m or 0.1 ft. (Superseded S-57 attribute.)  
Aliases: HORACC  
Value Type:real

## 3.39 Horizontal distance uncertainty

Name: Horizontal distance uncertainty  
Definition: The best estimate of the horizontal accuracy of horizontal clearances and distances.  
Code: 'horizontalDistanceUncertainty'  
Remarks: the error is assumed to be positive and negative. The plus/minus character must not be encoded.  
Aliases: HORACC  
Value Type:real

Unit of measure information

| name | definition | symbol |
| --- | --- | --- |
| metres | SI Metres | m |

Quantity specification: length

Constraints

| string Length | text Pattern | range | precision |
| --- | --- | --- | --- |
|  |  | |  |  | | --- | --- | | lowerBound | 0 | | upperBound |  | | closure | geSemiInterval | | 1 |

## 3.40 Horizontal length

Name: Horizontal length  
Definition: A measurement of the longer of two linear axis.  
Code: 'horizontalLength'  
Remarks: The unit of measure is defined in the HUNI subfield of the DSPM record or in the HUNITS attribute of the M\_UNIT meta object class, e.g., metre (m). The resolution is 0.1 m or 0.1 ft.  
Aliases: HORLEN  
Value Type:real

## 3.41 Horizontal position uncertainty

Name: Horizontal position uncertainty  
Definition: The best estimate of the accuracy of a position.  
Code: 'horizontalPositionUncertainty'  
Remarks: The expected input is the maximum of the two-dimensional error. The error is assumed to be positive and negative. The plus/minus character shall not be encoded.  
Aliases: POSACC  
Value Type:real

Unit of measure information

| name | definition | symbol |
| --- | --- | --- |
| metres | SI Metres | m |

Quantity specification: length

Constraints

| string Length | text Pattern | range | precision |
| --- | --- | --- | --- |
|  |  | |  |  | | --- | --- | | lowerBound | 0 | | upperBound |  | | closure | geSemiInterval | | 1 |

## 3.42 Horizontal width

Name: Horizontal width  
Definition: A measurement of the shorter of two linear axis.  
Code: 'horizontalWidth'  
Remarks: The unit of measure is defined in the HUNI subfield of the DSPM record or in the HUNITS attribute of the M\_UNIT meta object class, e.g., metre (m). The resolution is 0.1 m or 0.1 ft.  
Aliases: HORWID  
Value Type:real

## 3.43 ID Code

Name: ID Code  
Definition: Identification code as specified in predefined system. Also called identification number.  
Code: 'idCode'  
Remarks:   
Aliases: (none)  
Value Type:text

## 3.44 Information

Name: Information  
Definition: Textual information about the object  
Code: 'information'  
Remarks:   
Aliases: (none)  
Value Type:text

## 3.45 Information in national language

Name: Information in national language  
Definition: Textual information in national language characters  
Code: 'informationInNationalLanguage'  
Remarks: The attribute 'information in national language' encodes any textual information about an object using a specified national language. The textual information could be, for example, a list, a table or a text. This attribute should be used, for example, to hold the information that is shown on paper charts by cautionary and explanatory notes.  
Aliases: NINFOM  
Value Type:text

## 3.46 Inspection frequency

Name: Inspection frequency  
Definition: *Definition required*  
Code: 'inspectionFrequency'  
Remarks:   
Aliases: (none)  
Value Type:text

## 3.47 Inspection requirements

Name: Inspection requirements  
Definition: *Definition required*  
Code: 'inspectionRequirements'  
Remarks:   
Aliases: (none)  
Value Type:text

## 3.48 Installation date

Name: Installation date  
Definition: *Definition required*  
Code: 'installationDate'  
Remarks:   
Aliases: (none)  
Value Type:S100\_TruncatedDate

## 3.49 Light characteristic

Name: Light characteristic  
Definition: The typical behaviour associated with the light  
Code: 'lightCharacteristic'  
Remarks: A selection of the above characteristics is defined and illustrated diagrammatically in IHO Chart Specifications, M-4, 471.2.  
Aliases: LITCHR  
Value Type:enumeration

Listed Values

| Label | Definition | Code | Remarks |
| --- | --- | --- | --- |
| 'fixed' Aliases: (none) | a signal light that shows continuously, in any given direction, with constant luminous intensity and colour. | 1 |  |
| 'flashing' Aliases: (none) | a rhythmic light in which the total duration of light in a period is clearly shorter than the total duration of darkness and all the appearances of light are of equal duration. | 2 |  |
| 'long-flashing' Aliases: (none) | a flashing light in which a single flash of not less than two seconds duration is regularly repeated. | 3 |  |
| 'quick-flashing' Aliases: (none) | a light exhibiting without interruption very rapid regular alternations of light and darkness. | 4 |  |
| 'very quick flashing' Aliases: (none) | a flashing light in which flashes are repeated at a rate of not less than 80 flashes per minute but less than 160 flashes per minute. | 5 |  |
| 'ultra quick flashing' Aliases: (none) | a flashing light in which flashes are repeated at a rate of not less than 160 flashes per minute. | 6 |  |
| 'isophased' Aliases: (none) | a light with all durations of light and darkness equal. | 7 |  |
| 'occulting' Aliases: (none) | a rhythmic light in which the total duration of light in a period is clearly longer than the total duration of darkness and all the eclipses are of equal duration. | 8 |  |
| 'interrupted quick flashing' Aliases: (none) | a quick light in which the sequence of flashes is interrupted by regularly repeated eclipses of constant and long duration. | 9 |  |
| 'interrupted very quick flashing' Aliases: (none) | a light in which the very rapid alterations of light and darkness are interrupted at regular intervals by eclipses of long duration. | 10 |  |
| 'interrupted ultra quick flashing' Aliases: (none) | a light in which the ultra quick flashes (160 or more per minute) are interrupted at regular intervals by eclipses of long duration. | 11 |  |
| 'morse' Aliases: (none) | a rhythmic light in which appearances of light of two clearly different durations are grouped to represent a character or characters in the Morse code. | 12 |  |
| 'fixed/flash' Aliases: (none) | a rhythmic light in which a fixed light is combined with a flashing light of higher luminous intensity. | 13 |  |
| 'flash/long-flash' Aliases: (none) | *Definition required* | 14 |  |
| 'occulting/flash' Aliases: (none) | *Definition required* | 15 |  |
| 'fixed/long-flash' Aliases: (none) | *Definition required* | 16 |  |
| 'occulting alternating' Aliases: (none) | *Definition required* | 17 |  |
| 'long-flash alternating' Aliases: (none) | *Definition required* | 18 |  |
| 'flash alternating' Aliases: (none) | *Definition required* | 19 |  |
| 'quick-flash plus long-flash' Aliases: (none) | *Definition required* | 25 |  |
| 'very quick-flash plus long-flash' Aliases: (none) | *Definition required* | 26 |  |
| 'ultra quick-flash plus long-flash' Aliases: (none) | *Definition required* | 27 |  |
| 'alternating' Aliases: (none) | a signal light that shows, in any given direction, two or more colours in a regularly repeated sequence with a regular periodicity. | 28 |  |
| 'fixed and alternating flashing' Aliases: (none) | *Definition required* | 29 |  |

## 3.50 Light visibility

Name: Light visibility  
Definition: The specific visibility of a light, with respect to the light's intensity and ease of recognition.  
Code: 'lightVisibility'  
Remarks: "light visibility" encodes the specific visibility of a light, with respect to the light's intensity and ease of recognition.  
Aliases: LITVIS  
Value Type:enumeration

Listed Values

| Label | Definition | Code | Remarks |
| --- | --- | --- | --- |
| 'high intensity' Aliases: (none) | non-marine lights with a higher power than marine lights and visible from well off shore (often 'Aero' lights). | 1 |  |
| 'low intensity' Aliases: (none) | non-marine lights with lower power than marine lights. | 2 |  |
| 'faint' Aliases: (none) | a decrease in the apparent intensity of a light which may occur in the case of partial obstructions. | 3 |  |
| 'intensified' Aliases: (none) | a light in a sector is intensified (i.e. has longer range than other sectors). | 4 |  |
| 'unintensified' Aliases: (none) | a light in a sector is unintensified (i.e. has shorter range than other sectors). | 5 |  |
| 'visibility deliberately restricted' Aliases: (none) | a light sector is deliberately reduced in intensity, for example to reduce its effect on a built-up area. | 6 |  |
| 'obscured' Aliases: (none) | said of the arc of a light sector designated by its limiting bearings in which the light is not visible from seaward. | 7 |  |
| 'partially obscured' Aliases: (none) | this value specifies that parts of the sector are obscured. | 8 |  |
| 'visible in line of range' Aliases: (none) | lights that must be in line to be visible. | 9 |  |

## 3.51 Manned structure

Name: Manned structure  
Definition: An expression of the feature being permanently manned or not.  
Code: 'mannedStructure'  
Remarks:   
Aliases: (none)  
Value Type:boolean

## 3.52 Marks navigational - System of

Name: Marks navigational - System of  
Definition: The system of navigational buoyage a region complies with.  
Code: 'marksNavigationalSystemOf'  
Remarks:   
Aliases: MARSYS  
Value Type:enumeration

Listed Values

| Label | Definition | Code | Remarks |
| --- | --- | --- | --- |
| 'IALA A' Aliases: (none) | navigational aids conform to the International Association of Lighthouse Authorities - IALA A system. | 1 |  |
| 'IALA B' Aliases: (none) | navigational aids conform to the International Association of Lighthouse Authorities - IALA B system. | 2 |  |
| 'no system' Aliases: (none) | navigational aids do not conform to any defined system. | 9 |  |
| 'other system' Aliases: (none) | navigational aids conform to a defined system other than International Association of Lighthouse Authorities -IALA. | 10 |  |

## 3.53 Maximum display scale

Name: Maximum display scale  
Definition: The largest intended viewing scale for the data.  
Code: 'maximumDisplayScale'  
Remarks:   
Aliases: (none)  
Value Type:integer

## 3.54 Minimum display scale

Name: Minimum display scale  
Definition: The smallest intended viewing scale for the data.  
Code: 'minimumDisplayScale'  
Remarks:   
Aliases: (none)  
Value Type:integer

## 3.55 Multiplicity of lights

Name: Multiplicity of lights  
Definition: The number of lights of identical character that exist as a co-located group.  
Code: 'multiplicityOfLights'  
Remarks:   
Aliases: MLTYLT  
Value Type:integer

## 3.56 Nature of construction

Name: Nature of construction  
Definition: The buildings primary construction material  
Code: 'natureOfConstruction'  
Remarks: NOTE: IALA added listed values, codes must be verified after GI registry approval  
Aliases: NATCON  
Value Type:enumeration

Listed Values

| Label | Definition | Code | Remarks |
| --- | --- | --- | --- |
| 'masonry' Aliases: (none) | constructed of brick or stone. | 1 |  |
| 'concreted' Aliases: (none) | constructed of concrete, a material made of sand and gravel that is united by cement into a hardened mass used for roads, foundations, etc. | 2 |  |
| 'loose boulders' Aliases: (none) | constructed from large stones or blocks of concrete, often placed loosely for protection against waves or water turbulence. | 3 |  |
| 'hard surface' Aliases: (none) | constructed with a surface of hard material, usually a term applied to roads surfaced with asphalt or concrete. | 4 |  |
| 'unsurfaced' Aliases: (none) | constructed with no extra protection, usually a term applied to roads not surfaced with a hard material. | 5 |  |
| 'wooden' Aliases: (none) | constructed from wood. | 6 |  |
| 'metal' Aliases: (none) | constructed from metal. | 7 |  |
| 'glass reinforced plastic (GRP)' Aliases: (none) | constructed from a plastic material strengthened with fibres of glass. | 8 |  |
| 'painted' Aliases: (none) | the application of paint to some other construction or natural feature. | 9 |  |
| 'fiberglass' Aliases: (none) | *Definition required* | 13 |  |
| 'plastic' Aliases: (none) | *Definition required* | 14 |  |

## 3.57 Object name

Name: Object name  
Definition: The individual name of an object.  
Code: 'objectName'  
Remarks:   
Aliases: OBJNAM  
Value Type:text

## 3.58 Object name in national language

Name: Object name in national language  
Definition: Name of object in national language characters.  
Code: 'objectNameInNationalLanguage'  
Remarks: The attribute 'object name in national language' encodes the individual name of an object in the specified national language.  
Aliases: NOBJNM  
Value Type:text

## 3.59 Orientation

Name: Orientation  
Definition: The angular distance measured from true north to the major axis of the object.  
Code: 'orientation'  
Remarks: This is a superseded S-57 attribute.  
Aliases: ORIENT  
Value Type:real

Unit of measure information

| name | definition | symbol |
| --- | --- | --- |
| degrees | degrees of arc | ° |

Quantity specification: planeAngle

Constraints

| string Length | text Pattern | range | precision |
| --- | --- | --- | --- |
|  |  | |  |  | | --- | --- | | lowerBound | 0.0 | | upperBound | 360.0 | | closure | closedInterval | | 1 |

## 3.60 Periodic date end

Name: Periodic date end  
Definition: The end of the active period for a seasonal object (e.g., a buoy).  
Code: 'periodicDateEnd'  
Remarks: See also 'date end' (DATEND).  
Aliases: PEREND  
Value Type:S100\_TruncatedDate

## 3.61 Periodic date start

Name: Periodic date start  
Definition: The start of the active period for a seasonal object (e.g., a buoy).  
Code: 'periodicDateStart'  
Remarks: See also 'date start' (DATSTA).  
Aliases: PERSTA  
Value Type:S100\_TruncatedDate

## 3.62 Pictorial representation

Name: Pictorial representation  
Definition: Indicates whether a pictorial representation of the object is available.  
Code: 'pictorialRepresentation'  
Remarks: The 'pictorial representation' could be a drawing or a photo. The string encodes the file name of an external graphic file (pixel/vector).  
Aliases: PICREP  
Value Type:text

## 3.63 Positional accuracy

Name: Positional accuracy  
Definition: The best estimate of the accuracy of a position.  
Code: 'positionalAccuracy'  
Remarks: The expected input is the maximum of the two-dimensional error. The error is assumed to be positive and negative. The plus/minus character shall not be encoded. (Superseded S-57 attribute.)  
Aliases: POSACC  
Value Type:real

Unit of measure information

| name | definition | symbol |
| --- | --- | --- |
| metres | SI Metres | m |

Quantity specification: length

Constraints

| string Length | text Pattern | range | precision |
| --- | --- | --- | --- |
|  |  | |  |  | | --- | --- | | lowerBound | 0 | | upperBound |  | | closure | geSemiInterval | | 1 |

## 3.64 Postal code

Name: Postal code  
Definition: Known in various countries as a postcode, or ZIP code, the postal code is a series of letters and/or digits that identifies each postal delivery area.  
Code: 'postalCode'  
Remarks:   
Aliases: (none)  
Value Type:text

## 3.65 Product

Name: Product  
Definition: The various substances which are transported, stored or exploited.  
Code: 'product'  
Remarks:   
Aliases: PRODCT  
Value Type:enumeration

Listed Values

| Label | Definition | Code | Remarks |
| --- | --- | --- | --- |
| 'oil' Aliases: (none) | a thick, slippery liquid that will not dissolve in water, usually petroleum based in the context of storage tanks. | 1 |  |
| 'gas' Aliases: (none) | a substance with particles that can move freely, usually a fuel substance in the context of storage tanks. | 2 |  |
| 'water' Aliases: (none) | a colourless, odourless, tasteless liquid that is a compound of hydrogen and oxygen. | 3 |  |
| 'stone' Aliases: (none) | a general term for rock fragments. | 4 |  |
| 'coal' Aliases: (none) | a hard black mineral that is burned as fuel. | 5 |  |
| 'ore' Aliases: (none) | a solid rock or mineral from which metal is obtained. | 6 |  |
| 'chemicals' Aliases: (none) | any substance obtained by or used in a chemical process. | 7 |  |
| 'drinking water' Aliases: (none) | water that is suitable for human consumption. | 8 |  |
| 'milk' Aliases: (none) | a white fluid secreted by female mammals as food for their young. | 9 |  |
| 'bauxite' Aliases: (none) | a mineral from which aluminum is obtained. | 10 |  |
| 'coke' Aliases: (none) | a solid substance obtained after gas and tar have been extracted from coal, used as a fuel. | 11 |  |
| 'iron ingots' Aliases: (none) | an oblong lump of cast iron metal. | 12 |  |
| 'salt' Aliases: (none) | sodium chloride obtained from mines or by the evaporation of sea water. | 13 |  |
| 'sand' Aliases: (none) | tiny grains of crushed or worn rock. | 14 |  |
| 'timber' Aliases: (none) | wood prepared for use in building or carpentry. | 15 |  |
| 'sawdust/wood chips' Aliases: (none) | powdery fragments of wood made in sawing timber or coarse chips produced for use in manufacturing pressed board. | 16 |  |
| 'scrap metal' Aliases: (none) | discarded metal suitable for being reprocessed. | 17 |  |
| 'liquified natural gas (LNG)' Aliases: (none) | a compressed gas consisting of flammable light hydrocarbons and derived from natural gas. | 18 |  |
| 'liquified petroleum gas (LPG)' Aliases: (none) | a compressed gas consisting of flammable light hydrocarbons and derived from petroleum. | 19 |  |
| 'wine' Aliases: (none) | the fermanted juice of grapes. | 20 |  |
| 'cement' Aliases: (none) | a substance made of powdered lime and clay, mixed with water. | 21 |  |
| 'grain' Aliases: (none) | a small hard seed, especially that of any cereal plant such as wheat, rice, corn, rye etc. | 22 |  |

## 3.66 Quality of position

Name: Quality of position  
Definition: The degree of reliability attributed to a position  
Code: 'qualityOfPosition'  
Remarks:   
Aliases: QUAPOS  
Value Type:enumeration

Listed Values

| Label | Definition | Code | Remarks |
| --- | --- | --- | --- |
| 'surveyed' Aliases: (none) | the position(s) was(were) determined by the operation of making measurements for determining the relative position of points on, above or beneath the earth's surface. Survey implies a regular, controlled survey of any date. | 1 |  |
| 'unsurveyed' Aliases: (none) | survey data is does not exist or is very poor. | 2 |  |
| 'inadequately surveyed' Aliases: (none) | position data is of a very poor quality. | 3 |  |
| 'approximate' Aliases: (none) | a position that is considered to be less than third-order accuracy, but is generally considered to be within 30.5 metres of its correct geographic location. Also may apply to an object whose position does not remain fixed. | 4 |  |
| 'position doubtful' Aliases: (none) | an object whose position has been reported but which is considered to be doubtful. | 5 |  |
| 'unreliable' Aliases: (none) | an object's position obtained from questionable or unreliable data. | 6 |  |
| 'reported (not surveyed)' Aliases: (none) | an object whose position has been reported and its position confirmed by some means other than a formal survey such as an independent report of the same object. | 7 |  |
| 'reported (not confirmed)' Aliases: (none) | an object whose position has been reported and its position has not been confirmed. | 8 |  |
| 'estimated' Aliases: (none) | the most probable position of an object determined from incomplete data or data of questionable accuracy. | 9 |  |
| 'precisely known' Aliases: (none) | a position that is of a known value, such as the position of an anchor berth or other defined object. | 10 |  |
| 'calculated' Aliases: (none) | a position that is computed from data. | 11 |  |

## 3.67 Quality of sounding measurement

Name: Quality of sounding measurement  
Definition: The reliability of the value of a sounding.  
Code: 'qualityOfSoundingMeasurement'  
Remarks:   
Aliases: QUASOU  
Value Type:enumeration

Listed Values

| Label | Definition | Code | Remarks |
| --- | --- | --- | --- |
| 'depth known' Aliases: (none) | the depth from chart datum to the bottom is a known value. | 1 |  |
| 'depth or least depth unknown' Aliases: (none) | the depth from chart datum to the bottom is unknown. | 2 |  |
| 'doubtful sounding' Aliases: (none) | a depth that may be less than indicated. | 3 |  |
| 'unreliable sounding' Aliases: (none) | a depth that is considered to be an unreliable value. | 4 |  |
| 'no bottom found at value shown' Aliases: (none) | upon investigation the bottom was not found at this depth. | 5 |  |
| 'least depth known' Aliases: (none) | the shoalest depth over a feature is of known value. | 6 |  |
| 'least depth unknown, safe clearance at depth shown' Aliases: (none) | the least depth over a feature is unknown, but there is considered to be safe clearance at this depth. | 7 |  |
| 'value reported (not surveyed)' Aliases: (none) | depth value obtained from a report, but not fully surveyed. | 8 |  |
| 'value reported (not confirmed)' Aliases: (none) | depth value obtained from a report, which it has not been possible to confirm. | 9 |  |
| 'maintained depth' Aliases: (none) | the depth at which a channel is kept by human influence, usually by dredging. | 10 |  |
| 'not regularly maintained' Aliases: (none) | depths may be altered by human influence, but will not be routinely maintained. | 11 |  |

## 3.68 Radar conspicuous

Name: Radar conspicuous  
Definition: *Definition required*  
Code: 'radarConspicuous'  
Remarks:   
Aliases: (none)  
Value Type:enumeration

Listed Values

| Label | Definition | Code | Remarks |
| --- | --- | --- | --- |
| 'radar conspicuous' Aliases: (none) | an object which returns a strong radar echo. | 1 |  |
| 'not radar conspicuous' Aliases: (none) | an object which does not return a particularly strong radar echo. | 2 |  |
| 'radar conspicuous (has radar reflector)' Aliases: (none) | an object which returns a strong radar echo, having a radar reflector. | 3 |  |

## 3.69 Radar wave length

Name: Radar wave length  
Definition: The distance between two successive peaks (or other points of identical phase) on an electromagnetic wave in the radar band of the electromagnetic spectrum.  
Code: 'radarWaveLength'  
Remarks: The attribute 'radar transponder beacon wavelength' encodes the specific wavelength at which a radar transponder beacon transmits. Radar transponder beacons generally work on the following wavelengths: 3cm (X) Band, 10cm (S) Band. Nevertheless, wavelengths outside the marine band are used.  
Aliases: RADWAL  
Value Type:text

## 3.70 Remote monitoring system

Name: Remote monitoring system  
Definition: Classification or name of system used to remotely monitor a feature  
Code: 'remoteMonitoringSystem'  
Remarks:   
Aliases: (none)  
Value Type:text

## 3.71 Remotely monitored

Name: Remotely monitored  
Definition: An expression of a feature being remotely monitored or not.  
Code: 'remotelyMonitored'  
Remarks:   
Aliases: (none)  
Value Type:boolean

## 3.72 Scale minimum

Name: Scale minimum  
Definition: The minimum scale at which the object may be used, e.g., for ECDIS presentation.  
Code: 'scaleMinimum'  
Remarks: The modulus of the scale is indicated, that is 1:1 250 000 is encoded as 1250000.  
Aliases: SCAMIN  
Value Type:integer

## 3.73 Sector limit one

Name: Sector limit one  
Definition: The sector limit 1 specifies the first limit of the sector. The order of sector limit 1 and sector limit 2 is clockwise around the central object (e.g., a light).  
Code: 'sectorLimitOne'  
Remarks: A sector is the part of a circle between two straight lines drawn from the centre to the circumference (Advanced Learner's Dictionary, 2nd Edition). The values given to the common limits of adjacent sectors should be identical. The orientation of bearing is from seaward to the central object. This conforms with the method used in 'List of Lights' publications. A generic term such as 'to shore' cannot be used; a specific bearing must be encoded. Where a light sector limit is defined as 'to the shore', it should be encoded using a value that ensures that, when the limit is drawn, it will fall entirely on land.  
Aliases: SECTR1  
Value Type:real

## 3.74 Sector limit two

Name: Sector limit two  
Definition: The sector limit 2 specifies the second limit of the sector. The order of sector limit 1 and sector limit 2 is clockwise around the central object (e.g., a light).  
Code: 'sectorLimitTwo'  
Remarks: A sector is the part of a circle between two straight lines drawn from the centre to the circumference (Advanced Learner's Dictionary, 2nd Edition). The values given to the common limits of adjacent sectors should be identical. The orientation of bearing is from seaward to the central object. This to the method used in 'List of Lights' publications. A generic term such as 'to shore' cannot be used; a specific bearing must be encoded. Where a light sector limit is defined as 'to the shore', it should be encoded using a value that ensures that, when the limit is drawn, it will fall entirely on land.  
Aliases: SECTR2  
Value Type:real

## 3.75 Signal frequency

Name: Signal frequency  
Definition: The frequency of a signal.  
Code: 'signalFrequency'  
Remarks:   
Aliases: SIGFRQ  
Value Type:integer

## 3.76 Signal generation

Name: Signal generation  
Definition: The mechanism used to generate a fog signal.  
Code: 'signalGeneration'  
Remarks:   
Aliases: SIGGEN  
Value Type:enumeration

Listed Values

| Label | Definition | Code | Remarks |
| --- | --- | --- | --- |
| 'automatically' Aliases: (none) | signal generation is initiated by a self regulating mechanism such as a timer or light sensor. | 1 |  |
| 'by wave action' Aliases: (none) | the signal is generated by the motion of the sea surface such as a bell in a buoy. | 2 |  |
| 'by hand' Aliases: (none) | the signal is generated by a manually operated mechanism such as a hand cranked siren. | 3 |  |
| 'by wind' Aliases: (none) | the signal is generated by the motion of air such as a wind driven whistle. | 4 |  |

## 3.77 Signal group

Name: Signal group  
Definition: The number of signals, the combination of signals or the morse character(s) within one period of full sequence.  
Code: 'signalGroup'  
Remarks:   
Aliases: SIGGRP  
Value Type:text

## 3.78 Signal output

Name: Signal output  
Definition: Strength of signal output  
Code: 'signalOutput'  
Remarks:   
Aliases: (none)  
Value Type:real

## 3.79 Signal period

Name: Signal period  
Definition: The time occupied by an entire cycle of intervals of light and eclipse.  
Code: 'signalPeriod'  
Remarks:   
Aliases: SIGPER  
Value Type:real

## 3.80 Signal sequence

Name: Signal sequence  
Definition: The sequence of times occupied by intervals of light and eclipse for all 'light characteristics' except for occulting where the sequence of times is occupied by intervals of eclipse and light.  
Code: 'signalSequence'  
Remarks: The 'signal sequence' for all 'light characteristics' except for occulting is indicated using a fixed format to encode the value of intervals of light (L) and eclipse (E).  
Aliases: SIGSEQ  
Value Type:text

## 3.81 Sounding uncertainty

Name: Sounding uncertainty  
Definition: The best estimate of the accuracy of the sounding data. The maximum of the one-dimensional error. The error is assumed to be positive and negative. The plus/minus character shall not be encoded.  
Code: 'soundingUncertainty'  
Remarks: The unit of measure is defined in the DUNI subfield of the DSPM record or in the DUNITS attribute of the M\_UNIT meta object class, e.g., metre (m). The resolution is 0.1 m or 0.1 fm or 0.1 ft.  
Aliases: SOUACC  
Value Type:real

## 3.82 Source date

Name: Source date  
Definition: The production date of the source, e.g., the date of measurement.  
Code: 'sourceDate'  
Remarks:   
Aliases: SORDAT  
Value Type:text

## 3.83 Source indication

Name: Source indication  
Definition: Information about the source of the object.  
Code: 'sourceIndication'  
Remarks:   
Aliases: SORIND  
Value Type:text

## 3.84 Status

Name: Status  
Definition: The condition of an object at a given instant in time. NOTE: IALA added listed values.  
Code: 'status'  
Remarks: NOTE: IALA added listed values. The codes will have to verified when submitting the new listed values to the GI registry.  
Aliases: STATUS  
Value Type:enumeration

Listed Values

| Label | Definition | Code | Remarks |
| --- | --- | --- | --- |
| 'permanent' Aliases: (none) | intended to last or function indefinitely. | 1 |  |
| 'occasional' Aliases: (none) | acting on special occasions happening irregularly. | 2 |  |
| 'recommended' Aliases: (none) | presented as worthy of confidence, acceptance, use, etc. | 3 |  |
| 'not in use' Aliases: (none) | no longer used for the purpose intended disused. | 4 |  |
| 'periodic/intermittent' Aliases: (none) | recurring at intervals. | 5 |  |
| 'reserved' Aliases: (none) | set apart for some specific use. | 6 |  |
| 'temporary' Aliases: (none) | meant to last only for a time. | 7 |  |
| 'private' Aliases: (none) | not in public ownership or operation. | 8 |  |
| 'mandatory' Aliases: (none) | compulsory enforced. | 9 |  |
| 'extinguished' Aliases: (none) | no longer lit | 11 |  |
| 'illuminated' Aliases: (none) | lit by floodlights, strip lights, etc. | 12 |  |
| 'historic' Aliases: (none) | famous in history of historical interest. | 13 |  |
| 'public' Aliases: (none) | belonging to, available to, used or shared by, the community as a whole and not restricted to private use. | 14 |  |
| 'synchronized' Aliases: (none) | occur at a time, coincide in point of time, be contemporary or simultaneous. | 15 |  |
| 'watched' Aliases: (none) | looked at or observed over a period of time especially so as to be aware of any movement or change. | 16 |  |
| 'un-watched' Aliases: (none) | usually automatic in operation, without any permanently-stationed personnel to superintend it. | 17 |  |
| 'existence doubtful' Aliases: (none) | an object that has been reported but has not been definitely determined to exist. | 18 |  |
| 'confirmed' Aliases: (none) | *Definition required* | 29 |  |
| 'candidate' Aliases: (none) | *Definition required* | 30 |  |
| 'under modification' Aliases: (none) | *Definition required* | 31 |  |
| 'candidate for modification' Aliases: (none) | *Definition required* | 32 |  |
| 'under removal/deletion' Aliases: (none) | *Definition required* | 33 |  |
| 'removed/deleted' Aliases: (none) | *Definition required* | 34 |  |

## 3.85 Technique of sounding measurement

Name: Technique of sounding measurement  
Definition: Survey method used to obtain depth information   
Code: 'techniqueOfSoundingMeasurement'  
Remarks:   
Aliases: TECSOU  
Value Type:enumeration

Listed Values

| Label | Definition | Code | Remarks |
| --- | --- | --- | --- |
| 'found by echo-sounder' Aliases: (none) | the depth was determined by using an instrument that determines depth of water by measuring the time interval between emission of a sonic or ultrasonic signal and return of its echo from the bottom. | 1 |  |
| 'found by side-scan-sonar' Aliases: (none) | the depth was computed from a record produced by active sonar in which fixed acoustic beams are directed into the water perpendicularly to the direction of travel to scan the bottom and generate a record of the bottom configuration. | 2 |  |
| 'found by multi-beam' Aliases: (none) | the depth was determined by using a wide swath echo sounder that uses multiple beams to measure depths directly below and transverse to the ship's track. | 3 |  |
| 'found by diver' Aliases: (none) | the depth was determined by a person skilled in the practice of diving. | 4 |  |
| 'found by lead-line' Aliases: (none) | the depth was determined by using a line, graduated with attached marks and fastened to a sounding lead. | 5 |  |
| 'swept by wire-drag' Aliases: (none) | the given area was determined to be free from navigational dangers to a certain depth by towing a buoyed wire at the desired depth by two launches, or a least depth was identified using the same technique. | 6 |  |
| 'found by laser' Aliases: (none) | the depth was determined by using an instrument that measures distance by emitting timed pulses of laser light and measuring the time between emission and reception of the reflected pulses. | 7 |  |
| 'swept by vertical acoustic system' Aliases: (none) | the given area has been swept using a system comprised of multiple echo sounder transducers attached to booms deployed from the survey vessel. | 8 |  |
| 'found by electromagnetic sensor' Aliases: (none) | the depth was determined by using an instrument that compares electromagnetic signals. | 9 |  |
| 'photogrammetry' Aliases: (none) | the depth was determined by applying mathematical techniques to photographs. | 10 |  |
| 'satellite imagery' Aliases: (none) | the depth was determined by using instruments placed aboard an artificial satellite. | 11 |  |
| 'found by levelling' Aliases: (none) | the depth was determined by using levelling techniques to find the elevation of the point relative to a datum. | 12 |  |
| 'swept by side-scan-sonar' Aliases: (none) | the given area was determined to be free from navigational dangers to a certain depth by towing a side-scan-sonar. | 13 |  |
| 'computer generated' Aliases: (none) | the sounding was determined from a bottom model constructed using a computer. | 14 |  |

## 3.86 Textual description

Name: Textual description  
Definition: the string encodes the file name of an external text file that contains the text in English.  
Code: 'textualDescription'  
Remarks:   
Aliases: (none)  
Value Type:text

## 3.87 Textual description in national language

Name: Textual description in national language  
Definition: The file name of an external text file that contains the text in a national language.  
Code: 'textualDescriptionInNationalLanguage'  
Remarks: The attribute 'textual description in national language' indicates whether a text file containing text extracted from relevant pilot books or navigational publications is available.  
Aliases: NTXTDS  
Value Type:text

## 3.88 Topmark/daymark shape

Name: Topmark/daymark shape  
Definition: The shape a topmark or day mark exhibits  
Code: 'topmarkDaymarkShape'  
Remarks: NOTE: IALA added enumerates, codes must be verified after approval for registry.  
Aliases: TOPSHP  
Value Type:enumeration

Listed Values

| Label | Definition | Code | Remarks |
| --- | --- | --- | --- |
| 'cone, point up' Aliases: (none) | is where the vertex points up. A cone is a solid figure generated by straight lines drawn from a fixed point (the vertex) to a circle in a plane not containing the vertex. Cones are commonly used as International Association of Lighthouse Authorities - IALA topmarks lateral. | 1 |  |
| 'cone, point down' Aliases: (none) | is where the vertex points down. A cone is a solid figure generated by straight lines drawn from a fixed point (the vertex) to a circle in a plane not containing the vertex. Cones are commonly used as International Association of Lighthouse Authorities - IALA topmarks lateral. | 2 |  |
| 'sphere' Aliases: (none) | a body the surface of which is at all points equidistant from the centre. Spheres are commonly used as International Association of Lighthouse Authorities - IALA topmarks safe water. | 3 |  |
| '2 spheres' Aliases: (none) | two black spheres are commonly used as an International Association of Lighthouse Authorities - IALA topmark (isolated danger). | 4 |  |
| 'cylinder (can)' Aliases: (none) | a solid geometrical figure generated by straight lines fixed in direction and describing with one of point a closed curve, especially a circle (in which case the figure is circular cylinder, it's ends being parallel circles). Cylinders are commonly used as International Association of Lighthouse Authorities - IALA topmarks lateral. | 5 |  |
| 'board' Aliases: (none) | usually of rectangular shape, made from timber or metal and used to provide a contrast with the natural background of a daymark. The actual daymark is often painted on to this board. | 6 |  |
| 'x-shape (St. Andrew's cross)' Aliases: (none) | having a shape or a cross-section like the capital letter X. An x-shape as an International Association of Lighthouse Authorities - IALA topmark should be 3 dimensional in shape. It is made of at least three crossed bars. | 7 |  |
| 'upright cross (St. George's Cross)' Aliases: (none) | a cross with one vertical member and one horizontal member, i.e. similar in shape to the character '+'. | 8 |  |
| 'cube, point up' Aliases: (none) | a cube standing on one of its vertexes. A cube is a solid contained by six equal squares a regular hexahedron (The New Shorter Oxford English Dictionary. 1993. vol 2) | 9 |  |
| '2 cones, point to point' Aliases: (none) | 2 cones, one above the other, with their vertices together in the centre. | 10 |  |
| '2 cones, base to base' Aliases: (none) | 2 cones, one above the other, with their bases together in the centre and their vertices pointing up and down. | 11 |  |
| 'rhombus' Aliases: (none) | a plane figure having four equal sides and equal opposite angles (two acute and two obtuse) an oblique equilateral parallelogram. | 12 |  |
| '2 cones (points upward)' Aliases: (none) | 2 cones, one above the other, with their vertices pointing up. | 13 |  |
| '2 cones (points downward)' Aliases: (none) | 2 cones, one above the other, with their vertices pointing down. | 14 |  |
| 'besom, point up (broom or perch)' Aliases: (none) | besom: a bundle of rods or twigs. perch: a staff placed on top of a buoy, rock or shoal as a mark for navigation. | 15 |  |
| 'besom, point down (broom or perch)' Aliases: (none) | besom: a bundle of rods or twigs. perch: a staff placed on top of a buoy, rock or shoal as a mark for navigation. | 16 |  |
| 'flag' Aliases: (none) | a flag mounted on a short pole. | 17 |  |
| 'sphere over rhombus' Aliases: (none) | A sphere located above a rhombus. | 18 |  |
| 'square' Aliases: (none) | a plane figure with four right angles and four equal straight sides | 19 |  |
| 'rectangle, horizontal' Aliases: (none) | a rectangle is a plane figure with four right angles and four straight sides, opposite sides being parallel and equal in length . A horizontal rectangle is where the two longer opposite sides are standing horizontally. | 20 |  |
| 'rectangle, vertical' Aliases: (none) | a rectangle is a plane figure with four right angles and four straight sides, opposite sides being parallel and equal in length. A vertical rectangle is where the two longer opposite sides are standing vertically. | 21 |  |
| 'trapezium, up' Aliases: (none) | which stands on its longer parallel side. A trapezium is a quadrilateral having one pair of opposite sides parallel. | 22 |  |
| 'trapezium, down' Aliases: (none) | which stands on its shorter parallel side. A trapezium is a quadrilateral having one pair of opposite sides parallel. | 23 |  |
| 'triangle, point up' Aliases: (none) | A triangle, point up. A triangle is a figure having three angles and three sides. | 24 |  |
| 'triangle, point down' Aliases: (none) | A triangle, point down. A triangle is a figure having three angles and three sides. | 25 |  |
| 'circle' Aliases: (none) | a perfectly round plane figure whose circumference is everywhere equidistant from its centre. | 26 |  |
| 'two upright crosses (one over the other)' Aliases: (none) | two upright crosses, generally vertically disposed one above the other. | 27 |  |
| 'T-shape' Aliases: (none) | having a shape like the capital letter T. | 28 |  |
| 'triangle pointing up over a circle' Aliases: (none) | a triangle, vertex uppermost, located above a circle. | 29 |  |
| 'upright cross over a circle' Aliases: (none) | an upright cross located above a circle. | 30 |  |
| 'rhombus over a circle' Aliases: (none) | a rhombus located above a circle. | 31 |  |
| 'circle over a triangle pointing up' Aliases: (none) | a circle located over a triangle, vertex uppermost. | 32 |  |
| 'other shape (see INFORM)' Aliases: (none) | *Definition required* | 33 |  |
| 'tubular' Aliases: (none) | *Definition required* | 34 |  |

## 3.89 Traffic flow

Name: Traffic flow  
Definition: *Definition required*  
Code: 'trafficFlow'  
Remarks: The direction of travel  
Aliases: TRAFIC  
Value Type:enumeration

Listed Values

| Label | Definition | Code | Remarks |
| --- | --- | --- | --- |
| 'inbound' Aliases: (none) | traffic flow in a general direction toward a port or similar destination. | 1 |  |
| 'outbound' Aliases: (none) | traffic flow in a general direction away from a port or similar point of origin. | 2 |  |
| 'one-way' Aliases: (none) | traffic flow in one general direction only. | 3 |  |
| 'two-way' Aliases: (none) | traffic flow in two generally opposite directions. | 4 |  |

## 3.90 Type of battery

Name: Type of battery  
Definition: Types of storage battery used to power equipment such as lights  
Code: 'typeOfBattery'  
Remarks:   
Aliases: (none)  
Value Type:text

## 3.91 Type of buoy

Name: Type of buoy  
Definition: Type equipment used as a buoy in a particular installation  
Code: 'typeOfBuoy'  
Remarks:   
Aliases: (none)  
Value Type:text

## 3.92 Type of environment observation equipment

Name: Type of environment observation equipment  
Definition: *Definition required*  
Code: 'typeOfEnvironmentObservationEquipment'  
Remarks:   
Aliases: (none)  
Value Type:text

## 3.93 Type of light

Name: Type of light   
Definition: Type of light equipment  
Code: 'typeOfLight'  
Remarks:   
Aliases: (none)  
Value Type:text

## 3.94 Value of geographical range

Name: Value of geographical range  
Definition: The greatest distance at which a light can be seen as a function of the curvature of the earth and the heights of the light source and the observer.  
Code: 'valueOfGeographicalRange'  
Remarks:   
Aliases: (none)  
Value Type:text

## 3.95 Value of luminous range

Name: Value of luminous range  
Definition: The greatest distance at which a light can be seen merely as a function of its luminous intensity, the meteorological visibility, and the sensitivity of the observer's eye.  
Code: 'valueOfLuminousRange'  
Remarks:   
Aliases: (none)  
Value Type:text

## 3.96 Value of maximum range

Name: Value of maximum range  
Definition: The extreme distance at which an object can be seen or a signal detected.  
Code: 'valueOfMaximumRange'  
Remarks: This attribute does not apply to lights where the attribute 'value of nominal range' should be used.  
Aliases: VALMXR  
Value Type:real

## 3.97 Value of nominal range

Name: Value of nominal range  
Definition: The nominal range at which an object can be seen or a signal detected.  
Code: 'valueOfNominalRange'  
Remarks: The nominal range is normally the luminous range of a light in a homogeneous atmosphere in which the meteorological visibility is 10 sea miles (IHO Hydrographic Dictionary, S-32, 5th Edition, 4218).  
Aliases: VALNMR  
Value Type:real

## 3.98 Vertical datum

Name: Vertical datum  
Definition: Vertical datum used for measuring elevations of points on the earth's surface. Its the datum to which both heights and soundings are referred.  
Code: 'verticalDatum'  
Remarks: When the vertical datum is unknown, such as water areas above locks, the value 'local datum' is to be used, and further details may be encoded using 'INFORM'. The +0.3m approximation quoted in the 'approximate' levels is somehow arbitrary and follows the British example of their definition for 'approximate LAT'.  
Aliases: VERDAT  
Value Type:enumeration

Listed Values

| Label | Definition | Code | Remarks |
| --- | --- | --- | --- |
| 'mean low water springs' Aliases: (none) | (MLWS) - the average height of the low waters of spring tides. | 1 |  |
| 'mean lower low water springs' Aliases: (none) | (MLLWS) - the average height of lower low water springs at a place. | 2 |  |
| 'mean sea level' Aliases: (none) | (MSL) - the average height of the surface of the sea at a tide station for all stages of the tide over a 19-year period, usually determined from hourly height readings measured from a fixed predetermined reference level. | 3 |  |
| 'lowest low water' Aliases: (none) | an arbitrary level conforming to the lowest tide observed at a place, or some what lower. | 4 |  |
| 'mean low water' Aliases: (none) | (MLW) - the average height of all low waters at a place over a 19-year period. | 5 |  |
| 'lowest low water springs' Aliases: (none) | an arbitrary level conforming to the lowest water level observed at a place at spring tides during a period of time shorter than 19 years. | 6 |  |
| 'approximate mean low water springs' Aliases: (none) | an arbitrary level, usually within ' 0.3m from that of mean low water springs (MLWS). | 7 |  |
| 'Indian spring low water' Aliases: (none) | (ISLW) - an arbitrary tidal datum approximating the level of the mean of the lower low water at spring tides. | 8 |  |
| 'low water springs' Aliases: (none) | an arbitrary level, approximating that of mean low water springs (MLWS). | 9 |  |
| 'approximate lowest astronomical tide' Aliases: (none) | an arbitrary level, usually within ' 0.3m from that of lowest astronomical tide (LAT). | 10 |  |
| 'nearly lowest low water' Aliases: (none) | an arbitrary level approximating the lowest water level observed at a place, usually equivalent to the Indian spring low water (ISLW). | 11 |  |
| 'mean lower low water' Aliases: (none) | (MLLW) - the average height of the lower low waters at a place over a 19-year period. | 12 |  |
| 'low water' Aliases: (none) | an approximation of mean low water adopted as the reference level for a limited area, irrespective of better determinations at a later date. | 13 |  |
| 'approximate mean low water' Aliases: (none) | an arbitrary level, usually within ' 0.3m from that of mean low water (MLW). | 14 |  |
| 'approximate mean lower low water' Aliases: (none) | an arbitrary level, usually within ' 0.3m from that of mean lower low water (MLLW). | 15 |  |
| 'mean high water' Aliases: (none) | (MHW) - the average height of all high waters at a place over a 19-year period. | 16 |  |
| 'mean high water springs' Aliases: (none) | (MHWS) - the average height of the high waters of spring tides. | 17 |  |
| 'high water' Aliases: (none) | the highest level reached at a place by the water surface in one tidal cycle. | 18 |  |
| 'approximate mean sea level' Aliases: (none) | an arbitrary level, usually within ' 0.3m from that of mean sea level (MSL). | 19 |  |
| 'high water springs' Aliases: (none) | an arbitrary level, approximating that of mean high water springs (MHWS). | 20 |  |
| 'mean higher high water' Aliases: (none) | (MHHW) - the average height of higher high waters at a place over a 19-year period. | 21 |  |
| 'equinoctial spring low water' Aliases: (none) | the level of low water springs near the time of an equinox. | 22 |  |
| 'lowest astronomical tide' Aliases: (none) | (LAT) - the lowest tide level which can be predicted to occur under average meterological conditions and under any combination of astronomical conditions. | 23 |  |
| 'local datum' Aliases: (none) | an arbitrary datum defined by a local harbour authority, from which levels and tidal heights are measured by this authority. | 24 |  |
| 'international great lakes datum 1985' Aliases: (none) | (IGLD 1985) - a vertical reference system with its zero based on the mean water level at Rimouski/Pointe-au-P??re, Quebec, over the period 1970 to 1988. | 25 |  |
| 'mean water level' Aliases: (none) | the average of all hourly water levels over the available period of record. | 26 |  |
| 'lower low water large tide' Aliases: (none) | (LLWLT) - the average of the lowest low waters, one from each of 19 years of observations. | 27 |  |
| 'higher high water large tide' Aliases: (none) | (HHWLT) - the average of the highest high waters, one from each of 19 years of observations. | 28 |  |
| 'nearly highest high water' Aliases: (none) | an arbitrary level approximating the highest water level observed at a place, usually equivalent to the high water springs. | 29 |  |
| 'highest astronomical tide (HAT)' Aliases: (none) | the highest tidal level which can be predicted to occur under average meteorological conditions and under any combination of astronomical conditions. | 30 |  |

## 3.99 Vertical length

Name: Vertical length  
Definition: The total vertical length of an object.  
Code: 'verticalLength'  
Remarks: For floating objects: the vertical distance from the surface of water to the highest point of that object. For fixed objects: the vertical distance from seabed or ground to the highest point of that object. For objects on top of other objects: the vertical distance from the lowest to the highest point of that object. Vertical length measurements do not require a datum. The unit of measure is defined in the HUNI subfield of the DSPM record or in the HUNITS attribute of the M\_UNIT meta object class, e.g., metre (m). The resolution is 0.1 m or 0.1 ft.  
Aliases: VERLEN  
Value Type:real

## 3.100 Vertical uncertainty

Name: Vertical uncertainty  
Definition: The best estimate of the vertical accuracy of heights, vertical distances and vertical clearances, excluding sounding measurements. The one-dimensional error. The error is assumed to be positive and negative. The plus/minus character shall not be encoded.  
Code: 'verticalUncertainty'  
Remarks: The unit of measure is defined in the HUNI subfield of the DSPM record or in the HUNITS attribute of the M\_UNIT meta object class, e.g., metre (m). The resolution is 0.1 m or 0.1 ft.  
Aliases: VERACC  
Value Type:real

## 3.101 Visually conspicuous

Name: Visually conspicuous  
Definition: *Definition required*  
Code: 'visuallyConspicuous'  
Remarks:   
Aliases: (none)  
Value Type:enumeration

Listed Values

| Label | Definition | Code | Remarks |
| --- | --- | --- | --- |
| 'visually conspicuous' Aliases: (none) | term applied to an object either natural or artificial which is distinctly and notably visible from seaward. | 1 |  |
| 'not visually conspicuous' Aliases: (none) | an object which is visible from seaward, but is not conspicuous. | 2 |  |

# 4 Complex Attributes

## 4.1 Contact address

Name: Contact address  
Definition: Direction or superscription of a letter, package, etc., specifying the name of the place to which it is directed, and optionally a contact person or organisation who should receive it. (Oxford English Dictionary, 2nd Ed., adapted).  
Code: 'contactAddress'  
Remarks:   
Aliases: (none)

Sub-Attributes

| Sub-attribute | Mult. | Permitted Values | sequential |
| --- | --- | --- | --- |
| deliveryPoint | 0..\* |  | false |
| cityName | 0..1 |  | false |
| administrativeDivision | 0..1 |  | false |
| country | 0..1 |  | false |
| postalCode | 0..1 |  | false |

## 4.2 Survey date range

Name: Survey date range  
Definition: The complex attribute describes the period of the hydrographic survey, as the time between its sub-attributes.  
Code: 'surveyDateRange'  
Remarks:   
Aliases: (none)

Sub-Attributes

| Sub-attribute | Mult. | Permitted Values | sequential |
| --- | --- | --- | --- |
| dateEnd | 1..1 |  | false |
| dateStart | 0..1 |  | false |

# 5 Roles

## 5.1 Peer

Name: Peer  
Definition: *Definition required*  
Code: 'peer'  
Remarks:   
Aliases: (none)

## 5.2 parent

Name: parent  
Definition: *Definition required*  
Code: 'parent'  
Remarks:   
Aliases: (none)

## 5.3 Child

Name: Child  
Definition: *Definition required*  
Code: 'child'  
Remarks:   
Aliases: (none)

## 5.4 Navigable track

Name: Navigable track  
Definition: *Definition required*  
Code: 'navigableTrack'  
Remarks:   
Aliases: (none)

## 5.5 Navigation line

Name: Navigation line  
Definition: *Definition required*  
Code: 'navigationLine'  
Remarks:   
Aliases: (none)

## 5.6 Spatial Quality

Name: Spatial Quality  
Definition: special role for the GML format to use in quality associations for spatial objects  
Code: 'SpatialQuality'  
Remarks:   
Aliases: (none)

# 6 Information Associations

## 6.1 Spatial Quality

Name: Spatial Quality  
Definition: an information association for the binding between a spatial object and the Spatial Uncertainty information type.  
Code: 'SpatialQuality'  
Remarks:   
Aliases: (none)

Attribute Bindings

(No local bindings, but will inherit bindings from super-types if any)

Role: SpatialQuality

# 7 Feature Associations

## 7.1 RangeSystem

Name: RangeSystem  
Definition: *Definition required*  
Code: 'RangeSystem'  
Remarks:   
Aliases: (none)

Attribute Bindings

(No local bindings, but will inherit bindings from super-types if any)

Role(s): navigableTrack navigationLine

## 7.2 Aggregations

Name: Aggregations  
Definition: *Definition required*  
Code: 'Aggregations'  
Remarks:   
Aliases: (none)

Attribute Bindings

(No local bindings, but will inherit bindings from super-types if any)

Role(s): peer peer

## 7.3 Associations

Name: Associations  
Definition: *Definition required*  
Code: 'Associations'  
Remarks:   
Aliases: (none)

Attribute Bindings

(No local bindings, but will inherit bindings from super-types if any)

Role(s): peer peer

## 7.4 Structure/Equipment

Name: Structure/Equipment  
Definition: A feature association for the binding between a navigation aid equipment feature and the structure that supports it.  
Code: 'StructureEquipment'  
Remarks:   
Aliases: (none)

Attribute Bindings

(No local bindings, but will inherit bindings from super-types if any)

Role(s): child parent

# 8 Information Types

## 8.1 Spatial uncertainty

Name: Spatial uncertainty  
Definition: *Definition required*  
Code: 'SpatialUncertainty'  
Remarks:   
Aliases: (none)

Attribute Bindings

| Attribute | Type | Mult. | Permitted Values | Sequential |
| --- | --- | --- | --- | --- |
| qualityOfPosition | enumeration | 0..1 | 1 : surveyed 2 : unsurveyed 3 : inadequately surveyed 4 : approximate 5 : position doubtful 6 : unreliable 7 : reported (not surveyed) 8 : reported (not confirmed) 9 : estimated 10 : precisely known 11 : calculated | false |
| positionalAccuracy | real | 0..1 |  | false |

Information bindings

(Bindings are also inherited from super-types, if any.)

(No local bindings, but may inherit bindings from super-types, if any)

# 9 Feature Types

## 9.1 Beacon, special purpose/general

Name: Beacon, special purpose/general  
Definition: A special purpose beacon is primarily used to indicate an area or feature, the nature of which is apparent from reference to a chart, Sailing Directions or Notices to Mariners (UKHO NP 735, 5th Edition). Beacon in general: A beacon whose appearance or purpose is not adequately known.  
Code: 'BeaconSpecialPurposeGeneral'  
Remarks: A beacon is a prominent specially constructed object forming a conspicuous mark as a fixed aid to navigation or for use in hydrographic survey (IHO Dictionary, S-32, 5th Edition, 420). Topmark, light, fog signal, radar reflector and retro-reflector are separate objects.  
Aliases: BCNSPP Supertype: GenericBeacon  
Feature use type: geographic  
Permitted primitives: point

Attribute Bindings

| Attribute | Type | Mult. | Permitted Values | Sequential |
| --- | --- | --- | --- | --- |
| beaconShape | enumeration | 1..1 | 1 : stake, pole, perch, post 2 : withy 3 : beacon tower 4 : lattice beacon 5 : pile beacon 6 : cairn 7 : buoyant beacon | false |
| categoryOfSpecialPurposeMark | enumeration | 1..\* | 1 : firing danger mark 2 : target mark 3 : marker ship mark 4 : degaussing range mark 5 : barge mark 6 : cable mark 7 : spoil ground mark 8 : outfall mark 9 : ODAS 10 : recording mark 11 : seaplane anchorage mark 12 : recreation zone mark 13 : private mark 14 : mooring mark 15 : LANBY 16 : leading mark 17 : measured distance mark 18 : notice mark 19 : TSS mark 20 : anchoring prohibited mark 21 : berthing prohibited mark 22 : overtaking prohibited mark 23 : two-way traffic prohibited mark 24 : "reduced wake" mark 25 : speed limit mark 26 : stop mark 27 : general warning mark 28 : "sound ships siren" mark 29 : restricted vertical clearance mark 30 : maximum vessel's draught mark 31 : restricted horizontal clearance mark 32 : strong current warning mark 33 : berthing permitted mark 34 : overhead power cable mark 35 : "channel edge gradient" mark 36 : telephone mark 37 : ferry crossing mark 39 : pipeline mark 40 : anchorage mark 41 : clearing mark 42 : control mark 43 : diving mark 44 : refuge beacon 45 : foul ground mark 46 : yachting mark 47 : heliport mark 48 : GNSS mark 49 : seaplane landing mark 50 : entry prohibited mark 51 : work in progress mark 52 : mark with unknown purpose 53 : wellhead mark 54 : channel separation mark 55 : marine farm mark 56 : artificial reef mark 64 : jetski prohibited | false |
| colour | enumeration | 1..\* | 1 : white 2 : black 3 : red 4 : green 5 : blue 6 : yellow 7 : grey 8 : brown 9 : amber 10 : violet 11 : orange 12 : magenta 13 : pink | false |
| colourPattern | enumeration | 0..1 | 1 : horizontal stripes 2 : vertical stripes 3 : diagonal stripes 4 : squared 5 : stripes (direction unknown) 6 : border stripe 7 : single colour 8 : rectangle 9 : triangle | false |
| condition | enumeration | 0..1 | 1 : under construction 2 : ruined 3 : under reclamation 4 : wingless 5 : planned construction | false |
| radarConspicuous | enumeration | 0..1 | 1 : radar conspicuous 2 : not radar conspicuous 3 : radar conspicuous (has radar reflector) | false |
| visuallyConspicuous | enumeration | 0..1 | 1 : visually conspicuous 2 : not visually conspicuous | false |
| elevation | real | 0..1 |  | false |
| height | real | 0..1 |  | false |
| marksNavigationalSystemOf | enumeration | 0..1 | 1 : IALA A 2 : IALA B 9 : no system 10 : other system | false |
| natureOfConstruction | enumeration | 0..\* | 1 : masonry 2 : concreted 3 : loose boulders 4 : hard surface 5 : unsurfaced 6 : wooden 7 : metal 8 : glass reinforced plastic (GRP) 9 : painted 13 : fiberglass 14 : plastic | false |
| verticalLength | real | 0..1 |  | false |
| verticalUncertainty | real | 0..1 |  | false |
| objectNameInNationalLanguage | text | 0..1 |  | false |
| objectName | text | 0..1 |  | false |
| status | enumeration | 0..\* | 1 : permanent 2 : occasional 3 : recommended 4 : not in use 5 : periodic/intermittent 6 : reserved 7 : temporary 8 : private 9 : mandatory 11 : extinguished 12 : illuminated 13 : historic 14 : public 15 : synchronized 16 : watched 17 : un-watched 18 : existence doubtful 29 : confirmed 30 : candidate 31 : under modification 32 : candidate for modification 33 : under removal/deletion 34 : removed/deleted | false |
| aidAvailabilityCategory | enumeration | 1..1 | 1 : Category 1 2 : Category 2 3 : Category 3 | false |
| idCode | text | 1..1 |  | false |
| dateEnd | S100\_TruncatedDate | 0..1 |  | false |
| dateStart | S100\_TruncatedDate | 0..1 |  | false |
| periodicDateEnd | S100\_TruncatedDate | 0..1 |  | false |
| periodicDateStart | S100\_TruncatedDate | 0..1 |  | false |
| information | text | 0..\* |  | false |
| informationInNationalLanguage | text | 0..\* |  | false |
| textualDescriptionInNationalLanguage | text | 0..1 |  | false |
| textualDescription | text | 0..1 |  | false |
| scaleMinimum | integer | 0..1 |  | false |
| sourceDate | text | 0..1 |  | false |
| sourceIndication | text | 0..1 |  | false |
| pictorialRepresentation | text | 0..1 |  | false |
| inspectionFrequency | text | 0..1 |  | false |
| inspectionRequirements | text | 0..1 |  | false |
| atoNMaintenanceRecord | text | 0..1 |  | false |
| installationDate | S100\_TruncatedDate | 0..1 |  | false |

Information bindings

(Bindings are also inherited from super-types, if any.)

(No local bindings, but may inherit bindings from super-types, if any)

Feature bindings

(Bindings are also inherited from super-types, if any.)

(No local bindings, but will inherit super-type bindings if any)

## 9.2 Beacon, lateral

Name: Beacon, lateral  
Definition: A lateral beacon is used to indicate the port or starboard hand side of the route to be followed. They are generally used for well defined channels and are used in conjunction with a conventional direction of buoyage.  
Code: 'BeaconLateral'  
Remarks: A beacon is a prominent specially constructed object forming a conspicuous mark as a fixed aid to navigation or for use in hydrographic survey (IHO Dictionary, S-32, 5th Edition, 420). Topmark, light, fog signal, radar reflector and retro-reflector are separate objects.  
Aliases: BCNLAT Supertype: GenericBeacon  
Feature use type: geographic  
Permitted primitives: point

Attribute Bindings

| Attribute | Type | Mult. | Permitted Values | Sequential |
| --- | --- | --- | --- | --- |
| beaconShape | enumeration | 1..1 | 1 : stake, pole, perch, post 2 : withy 3 : beacon tower 4 : lattice beacon 5 : pile beacon 6 : cairn 7 : buoyant beacon | false |
| categoryOfLateralMark | enumeration | 1..1 | 1 : port-hand lateral mark 2 : starboard-hand lateral mark 3 : preferred channel to starboard lateral mark 4 : preferred channel to port lateral mark | false |
| colour | enumeration | 1..\* | 1 : white 2 : black 3 : red 4 : green 5 : blue 6 : yellow 7 : grey 8 : brown 9 : amber 10 : violet 11 : orange 12 : magenta 13 : pink | false |
| colourPattern | enumeration | 0..1 | 1 : horizontal stripes 2 : vertical stripes 3 : diagonal stripes 4 : squared 5 : stripes (direction unknown) 6 : border stripe 7 : single colour 8 : rectangle 9 : triangle | false |
| condition | enumeration | 0..1 | 1 : under construction 2 : ruined 3 : under reclamation 4 : wingless 5 : planned construction | false |
| radarConspicuous | enumeration | 0..1 | 1 : radar conspicuous 2 : not radar conspicuous 3 : radar conspicuous (has radar reflector) | false |
| visuallyConspicuous | enumeration | 0..1 | 1 : visually conspicuous 2 : not visually conspicuous | false |
| elevation | real | 0..1 |  | false |
| height | real | 0..1 |  | false |
| marksNavigationalSystemOf | enumeration | 0..1 | 1 : IALA A 2 : IALA B 9 : no system 10 : other system | false |
| natureOfConstruction | enumeration | 0..\* | 1 : masonry 2 : concreted 3 : loose boulders 4 : hard surface 5 : unsurfaced 6 : wooden 7 : metal 8 : glass reinforced plastic (GRP) 9 : painted 13 : fiberglass 14 : plastic | false |
| verticalLength | real | 0..1 |  | false |
| verticalUncertainty | real | 0..1 |  | false |
| objectName | text | 0..1 |  | false |
| objectNameInNationalLanguage | text | 0..1 |  | false |
| aidAvailabilityCategory | enumeration | 1..1 | 1 : Category 1 2 : Category 2 3 : Category 3 | false |
| idCode | text | 1..1 |  | false |
| dateEnd | S100\_TruncatedDate | 0..1 |  | false |
| dateStart | S100\_TruncatedDate | 0..1 |  | false |
| periodicDateEnd | S100\_TruncatedDate | 0..1 |  | false |
| periodicDateStart | S100\_TruncatedDate | 0..1 |  | false |
| information | text | 0..\* |  | false |
| informationInNationalLanguage | text | 0..\* |  | false |
| textualDescription | text | 0..1 |  | false |
| textualDescriptionInNationalLanguage | text | 0..1 |  | false |
| scaleMinimum | integer | 0..1 |  | false |
| sourceDate | text | 0..1 |  | false |
| pictorialRepresentation | text | 0..1 |  | false |
| inspectionFrequency | text | 0..1 |  | false |
| inspectionRequirements | text | 0..1 |  | false |
| atoNMaintenanceRecord | text | 0..1 |  | false |
| installationDate | S100\_TruncatedDate | 0..1 |  | false |
| contactAddress | complex | 0..1 |  | false |

Information bindings

(Bindings are also inherited from super-types, if any.)

(No local bindings, but may inherit bindings from super-types, if any)

Feature bindings

(Bindings are also inherited from super-types, if any.)

(No local bindings, but will inherit super-type bindings if any)

## 9.3 Beacon, cardinal

Name: Beacon, cardinal  
Definition: A cardinal beacon is used in conjunction with the compass to indicate where the mariner may find the best navigable water. It is placed in one of the four quadrants (North, East, South and West), bounded by inter-cardinal bearings from the point marked.  
Code: 'BeaconCardinal'  
Remarks: A beacon is a prominent specially constructed object forming a conspicuous mark as a fixed aid to navigation or for use in hydrographic survey (IHO Dictionary, S-32, 5th Edition, 420). Topmark, light, fog signal, radar reflector and retro-reflector are separate objects.  
Aliases: BCNCAR Supertype: GenericBeacon  
Feature use type: geographic  
Permitted primitives: point

Attribute Bindings

| Attribute | Type | Mult. | Permitted Values | Sequential |
| --- | --- | --- | --- | --- |
| beaconShape | enumeration | 1..1 | 1 : stake, pole, perch, post 2 : withy 3 : beacon tower 4 : lattice beacon 5 : pile beacon 6 : cairn 7 : buoyant beacon | false |
| categoryOfCardinalMark | enumeration | 1..1 | 1 : north cardinal mark 2 : east cardinal mark 3 : south cardinal mark 4 : west cardinal mark | false |
| colour | enumeration | 1..\* | 1 : white 2 : black 3 : red 4 : green 5 : blue 6 : yellow 7 : grey 8 : brown 9 : amber 10 : violet 11 : orange 12 : magenta 13 : pink | false |
| colourPattern | enumeration | 0..1 | 1 : horizontal stripes 2 : vertical stripes 3 : diagonal stripes 4 : squared 5 : stripes (direction unknown) 6 : border stripe 7 : single colour 8 : rectangle 9 : triangle | false |
| condition | enumeration | 0..1 | 1 : under construction 2 : ruined 3 : under reclamation 4 : wingless 5 : planned construction | false |
| radarConspicuous | enumeration | 0..1 | 1 : radar conspicuous 2 : not radar conspicuous 3 : radar conspicuous (has radar reflector) | false |
| visuallyConspicuous | enumeration | 0..1 | 1 : visually conspicuous 2 : not visually conspicuous | false |
| elevation | real | 0..1 |  | false |
| height | real | 0..1 |  | false |
| marksNavigationalSystemOf | enumeration | 0..1 | 1 : IALA A 2 : IALA B 9 : no system 10 : other system | false |
| natureOfConstruction | enumeration | 0..\* | 1 : masonry 2 : concreted 3 : loose boulders 4 : hard surface 5 : unsurfaced 6 : wooden 7 : metal 8 : glass reinforced plastic (GRP) 9 : painted 13 : fiberglass 14 : plastic | false |
| verticalLength | real | 0..1 |  | false |
| verticalUncertainty | real | 0..1 |  | false |
| objectNameInNationalLanguage | text | 0..1 |  | false |
| objectName | text | 0..1 |  | false |
| status | enumeration | 0..\* | 1 : permanent 2 : occasional 3 : recommended 4 : not in use 5 : periodic/intermittent 6 : reserved 7 : temporary 8 : private 9 : mandatory 11 : extinguished 12 : illuminated 13 : historic 14 : public 15 : synchronized 16 : watched 17 : un-watched 18 : existence doubtful 29 : confirmed 30 : candidate 31 : under modification 32 : candidate for modification 33 : under removal/deletion 34 : removed/deleted | false |
| aidAvailabilityCategory | enumeration | 1..1 | 1 : Category 1 2 : Category 2 3 : Category 3 | false |
| idCode | text | 1..1 |  | false |
| dateEnd | S100\_TruncatedDate | 0..1 |  | false |
| dateStart | S100\_TruncatedDate | 0..1 |  | false |
| periodicDateEnd | S100\_TruncatedDate | 0..1 |  | false |
| periodicDateStart | S100\_TruncatedDate | 0..1 |  | false |
| information | text | 0..\* |  | false |
| informationInNationalLanguage | text | 0..\* |  | false |
| textualDescription | text | 0..1 |  | false |
| textualDescriptionInNationalLanguage | text | 0..1 |  | false |
| scaleMinimum | integer | 0..1 |  | false |
| sourceDate | text | 0..1 |  | false |
| sourceIndication | text | 0..1 |  | false |
| pictorialRepresentation | text | 0..1 |  | false |
| inspectionFrequency | text | 0..1 |  | false |
| inspectionRequirements | text | 0..1 |  | false |
| atoNMaintenanceRecord | text | 0..1 |  | false |
| installationDate | S100\_TruncatedDate | 0..1 |  | false |
| contactAddress | complex | 0..1 |  | false |

Information bindings

(Bindings are also inherited from super-types, if any.)

(No local bindings, but may inherit bindings from super-types, if any)

Feature bindings

(Bindings are also inherited from super-types, if any.)

(No local bindings, but will inherit super-type bindings if any)

## 9.4 Beacon, isolated danger

Name: Beacon, isolated danger  
Definition: An isolated danger beacon is a beacon erected on an isolated danger of limited extent, which has navigable water all around it.  
Code: 'BeaconIsolatedDanger'  
Remarks: A beacon is a prominent specially constructed object forming a conspicuous mark as a fixed aid to navigation or for use in hydrographic survey (IHO Dictionary, S-32, 5th Edition, 420). Topmark, light, fog signal, radar reflector and retro-reflector are separate objects.  
Aliases: BCNISD Supertype: GenericBeacon  
Feature use type: geographic  
Permitted primitives: point

Attribute Bindings

| Attribute | Type | Mult. | Permitted Values | Sequential |
| --- | --- | --- | --- | --- |
| beaconShape | enumeration | 1..1 | 1 : stake, pole, perch, post 2 : withy 3 : beacon tower 4 : lattice beacon 5 : pile beacon 6 : cairn 7 : buoyant beacon | false |
| colour | enumeration | 1..\* | 1 : white 2 : black 3 : red 4 : green 5 : blue 6 : yellow 7 : grey 8 : brown 9 : amber 10 : violet 11 : orange 12 : magenta 13 : pink | false |
| colourPattern | enumeration | 0..1 | 1 : horizontal stripes 2 : vertical stripes 3 : diagonal stripes 4 : squared 5 : stripes (direction unknown) 6 : border stripe 7 : single colour 8 : rectangle 9 : triangle | false |
| condition | enumeration | 0..1 | 1 : under construction 2 : ruined 3 : under reclamation 4 : wingless 5 : planned construction | false |
| radarConspicuous | enumeration | 0..1 | 1 : radar conspicuous 2 : not radar conspicuous 3 : radar conspicuous (has radar reflector) | false |
| visuallyConspicuous | enumeration | 0..1 | 1 : visually conspicuous 2 : not visually conspicuous | false |
| elevation | real | 0..1 |  | false |
| height | real | 0..1 |  | false |
| marksNavigationalSystemOf | enumeration | 0..1 | 1 : IALA A 2 : IALA B 9 : no system 10 : other system | false |
| natureOfConstruction | enumeration | 0..\* | 1 : masonry 2 : concreted 3 : loose boulders 4 : hard surface 5 : unsurfaced 6 : wooden 7 : metal 8 : glass reinforced plastic (GRP) 9 : painted 13 : fiberglass 14 : plastic | false |
| verticalLength | real | 0..1 |  | false |
| verticalUncertainty | real | 0..1 |  | false |
| objectName | text | 0..1 |  | false |
| objectNameInNationalLanguage | text | 0..1 |  | false |
| status | enumeration | 0..\* | 1 : permanent 2 : occasional 3 : recommended 4 : not in use 5 : periodic/intermittent 6 : reserved 7 : temporary 8 : private 9 : mandatory 11 : extinguished 12 : illuminated 13 : historic 14 : public 15 : synchronized 16 : watched 17 : un-watched 18 : existence doubtful 29 : confirmed 30 : candidate 31 : under modification 32 : candidate for modification 33 : under removal/deletion 34 : removed/deleted | false |
| aidAvailabilityCategory | enumeration | 1..1 | 1 : Category 1 2 : Category 2 3 : Category 3 | false |
| idCode | text | 1..1 |  | false |
| dateEnd | S100\_TruncatedDate | 0..1 |  | false |
| dateStart | S100\_TruncatedDate | 0..1 |  | false |
| periodicDateEnd | S100\_TruncatedDate | 0..1 |  | false |
| periodicDateStart | S100\_TruncatedDate | 0..1 |  | false |
| information | text | 0..\* |  | false |
| informationInNationalLanguage | text | 0..\* |  | false |
| textualDescription | text | 0..1 |  | false |
| textualDescriptionInNationalLanguage | text | 0..1 |  | false |
| scaleMinimum | integer | 0..1 |  | false |
| sourceDate | text | 0..1 |  | false |
| sourceIndication | text | 0..1 |  | false |
| pictorialRepresentation | text | 0..1 |  | false |
| inspectionFrequency | text | 0..1 |  | false |
| inspectionRequirements | text | 0..1 |  | false |
| atoNMaintenanceRecord | text | 0..1 |  | false |
| installationDate | S100\_TruncatedDate | 0..1 |  | false |
| contactAddress | complex | 0..1 |  | false |

Information bindings

(Bindings are also inherited from super-types, if any.)

(No local bindings, but may inherit bindings from super-types, if any)

Feature bindings

(Bindings are also inherited from super-types, if any.)

(No local bindings, but will inherit super-type bindings if any)

## 9.5 Beacon, safe water

Name: Beacon, safe water  
Definition: A safe water beacon is a prominent specially constructed object forming a conspicuous mark as a fixed aid to navigation or for use in hydrographic survey.  
Code: 'BeaconSafeWater'  
Remarks: A safe water beacon may be used to indicate that there is navigable water around the mark. (UKHO NP 735, 5th Edition) Topmark, light, fog signal, radar reflector and retro-reflector are separate objects.  
Aliases: BCNSAW Supertype: GenericBeacon  
Feature use type: geographic  
Permitted primitives: point

Attribute Bindings

| Attribute | Type | Mult. | Permitted Values | Sequential |
| --- | --- | --- | --- | --- |
| beaconShape | enumeration | 1..1 | 1 : stake, pole, perch, post 2 : withy 3 : beacon tower 4 : lattice beacon 5 : pile beacon 6 : cairn 7 : buoyant beacon | false |
| categoryOfCardinalMark | enumeration | 1..\* | 1 : north cardinal mark 2 : east cardinal mark 3 : south cardinal mark 4 : west cardinal mark | false |
| colour | enumeration | 1..\* | 1 : white 2 : black 3 : red 4 : green 5 : blue 6 : yellow 7 : grey 8 : brown 9 : amber 10 : violet 11 : orange 12 : magenta 13 : pink | false |
| colourPattern | enumeration | 0..1 | 1 : horizontal stripes 2 : vertical stripes 3 : diagonal stripes 4 : squared 5 : stripes (direction unknown) 6 : border stripe 7 : single colour 8 : rectangle 9 : triangle | false |
| condition | enumeration | 0..1 | 1 : under construction 2 : ruined 3 : under reclamation 4 : wingless 5 : planned construction | false |
| radarConspicuous | enumeration | 0..1 | 1 : radar conspicuous 2 : not radar conspicuous 3 : radar conspicuous (has radar reflector) | false |
| visuallyConspicuous | enumeration | 0..1 | 1 : visually conspicuous 2 : not visually conspicuous | false |
| elevation | real | 0..1 |  | false |
| height | real | 0..1 |  | false |
| marksNavigationalSystemOf | enumeration | 0..1 | 1 : IALA A 2 : IALA B 9 : no system 10 : other system | false |
| natureOfConstruction | enumeration | 0..\* | 1 : masonry 2 : concreted 3 : loose boulders 4 : hard surface 5 : unsurfaced 6 : wooden 7 : metal 8 : glass reinforced plastic (GRP) 9 : painted 13 : fiberglass 14 : plastic | false |
| verticalLength | real | 0..1 |  | false |
| verticalUncertainty | real | 0..1 |  | false |
| objectName | text | 0..1 |  | false |
| objectNameInNationalLanguage | text | 0..1 |  | false |
| status | enumeration | 0..\* | 1 : permanent 2 : occasional 3 : recommended 4 : not in use 5 : periodic/intermittent 6 : reserved 7 : temporary 8 : private 9 : mandatory 11 : extinguished 12 : illuminated 13 : historic 14 : public 15 : synchronized 16 : watched 17 : un-watched 18 : existence doubtful 29 : confirmed 30 : candidate 31 : under modification 32 : candidate for modification 33 : under removal/deletion 34 : removed/deleted | false |
| aidAvailabilityCategory | enumeration | 1..1 | 1 : Category 1 2 : Category 2 3 : Category 3 | false |
| idCode | text | 0..1 |  | false |
| dateEnd | S100\_TruncatedDate | 0..1 |  | false |
| dateStart | S100\_TruncatedDate | 0..1 |  | false |
| periodicDateEnd | S100\_TruncatedDate | 0..1 |  | false |
| periodicDateStart | S100\_TruncatedDate | 0..1 |  | false |
| information | text | 0..\* |  | false |
| informationInNationalLanguage | text | 0..\* |  | false |
| textualDescription | text | 0..1 |  | false |
| textualDescriptionInNationalLanguage | text | 0..1 |  | false |
| scaleMinimum | integer | 0..1 |  | false |
| sourceDate | text | 0..1 |  | false |
| sourceIndication | text | 0..1 |  | false |
| pictorialRepresentation | text | 0..1 |  | false |
| inspectionFrequency | text | 0..1 |  | false |
| inspectionRequirements | text | 0..1 |  | false |
| atoNMaintenanceRecord | text | 0..1 |  | false |
| installationDate | S100\_TruncatedDate | 0..1 |  | false |
| contactAddress | complex | 0..1 |  | false |

Information bindings

(Bindings are also inherited from super-types, if any.)

(No local bindings, but may inherit bindings from super-types, if any)

Feature bindings

(Bindings are also inherited from super-types, if any.)

(No local bindings, but will inherit super-type bindings if any)

## 9.6 Buoy, installation

Name: Buoy, installation  
Definition: An installation buoy is a buoy used for loading tankers with gas or oil.  
Code: 'BuoyInstallation'  
Remarks: A buoy is a floating object moored to the bottom in a particular place, as an aid to navigation or for other specific purposes. (IHO Dictionary, S-32, 5th Edition, 565).  
Aliases: BOYINB Supertype: GenericBuoy  
Feature use type: geographic  
Permitted primitives: point

Attribute Bindings

| Attribute | Type | Mult. | Permitted Values | Sequential |
| --- | --- | --- | --- | --- |
| buoyShape | enumeration | 1..1 | 1 : conical (nun, ogival) 2 : can (cylindrical) 3 : spherical 4 : pillar 5 : spar (spindle) 6 : barrel (tun) 7 : super-buoy 8 : ice buoy | false |
| categoryOfInstallationBuoy | enumeration | 0..1 | 1 : catenary anchor leg mooring (CALM) 2 : single buoy mooring (SBM) | false |
| colour | enumeration | 1..\* | 1 : white 2 : black 3 : red 4 : green 5 : blue 6 : yellow 7 : grey 8 : brown 9 : amber 10 : violet 11 : orange 12 : magenta 13 : pink | false |
| colourPattern | enumeration | 0..1 | 1 : horizontal stripes 2 : vertical stripes 3 : diagonal stripes 4 : squared 5 : stripes (direction unknown) 6 : border stripe 7 : single colour 8 : rectangle 9 : triangle | false |
| radarConspicuous | enumeration | 0..1 | 1 : radar conspicuous 2 : not radar conspicuous 3 : radar conspicuous (has radar reflector) | false |
| marksNavigationalSystemOf | enumeration | 0..1 | 1 : IALA A 2 : IALA B 9 : no system 10 : other system | false |
| natureOfConstruction | enumeration | 0..\* | 1 : masonry 2 : concreted 3 : loose boulders 4 : hard surface 5 : unsurfaced 6 : wooden 7 : metal 8 : glass reinforced plastic (GRP) 9 : painted 13 : fiberglass 14 : plastic | false |
| objectName | text | 0..1 |  | false |
| objectNameInNationalLanguage | text | 0..1 |  | false |
| status | enumeration | 0..\* | 1 : permanent 2 : occasional 3 : recommended 4 : not in use 5 : periodic/intermittent 6 : reserved 7 : temporary 8 : private 9 : mandatory 11 : extinguished 12 : illuminated 13 : historic 14 : public 15 : synchronized 16 : watched 17 : un-watched 18 : existence doubtful 29 : confirmed 30 : candidate 31 : under modification 32 : candidate for modification 33 : under removal/deletion 34 : removed/deleted | false |
| verticalLength | real | 0..1 |  | false |
| verticalUncertainty | real | 0..1 |  | false |
| typeOfBuoy | text | 0..1 |  | false |
| aidAvailabilityCategory | enumeration | 1..1 | 1 : Category 1 2 : Category 2 3 : Category 3 | false |
| idCode | text | 1..1 |  | false |
| dateEnd | S100\_TruncatedDate | 0..1 |  | false |
| dateStart | S100\_TruncatedDate | 0..1 |  | false |
| periodicDateEnd | S100\_TruncatedDate | 0..1 |  | false |
| periodicDateStart | S100\_TruncatedDate | 0..1 |  | false |
| information | text | 0..\* |  | false |
| informationInNationalLanguage | text | 0..\* |  | false |
| textualDescription | text | 0..1 |  | false |
| textualDescriptionInNationalLanguage | text | 0..1 |  | false |
| scaleMinimum | integer | 0..1 |  | false |
| sourceDate | text | 0..1 |  | false |
| sourceIndication | text | 0..1 |  | false |
| pictorialRepresentation | text | 0..1 |  | false |
| inspectionFrequency | text | 0..1 |  | false |
| inspectionRequirements | text | 0..1 |  | false |
| atoNMaintenanceRecord | text | 0..1 |  | false |
| installationDate | S100\_TruncatedDate | 0..1 |  | false |
| contactAddress | complex | 0..1 |  | false |

Information bindings

(Bindings are also inherited from super-types, if any.)

(No local bindings, but may inherit bindings from super-types, if any)

Feature bindings

(Bindings are also inherited from super-types, if any.)

(No local bindings, but will inherit super-type bindings if any)

## 9.7 Buoy, lateral

Name: Buoy, lateral  
Definition: A lateral buoy is used to indicate the port or starboard hand side of the route to be followed. They are generally used for well defined channels and are used in conjunction with a conventional direction of buoyage.  
Code: 'BuoyLateral'  
Remarks:   
Aliases: BOYLAT Supertype: GenericBuoy  
Feature use type: geographic  
Permitted primitives: point

Attribute Bindings

| Attribute | Type | Mult. | Permitted Values | Sequential |
| --- | --- | --- | --- | --- |
| buoyShape | enumeration | 1..1 | 1 : conical (nun, ogival) 2 : can (cylindrical) 3 : spherical 4 : pillar 5 : spar (spindle) 6 : barrel (tun) 7 : super-buoy 8 : ice buoy | false |
| categoryOfLateralMark | enumeration | 1..1 | 1 : port-hand lateral mark 2 : starboard-hand lateral mark 3 : preferred channel to starboard lateral mark 4 : preferred channel to port lateral mark | false |
| colour | enumeration | 1..\* | 1 : white 2 : black 3 : red 4 : green 5 : blue 6 : yellow 7 : grey 8 : brown 9 : amber 10 : violet 11 : orange 12 : magenta 13 : pink | false |
| colourPattern | enumeration | 0..1 | 1 : horizontal stripes 2 : vertical stripes 3 : diagonal stripes 4 : squared 5 : stripes (direction unknown) 6 : border stripe 7 : single colour 8 : rectangle 9 : triangle | false |
| radarConspicuous | enumeration | 0..1 | 1 : radar conspicuous 2 : not radar conspicuous 3 : radar conspicuous (has radar reflector) | false |
| marksNavigationalSystemOf | enumeration | 0..1 | 1 : IALA A 2 : IALA B 9 : no system 10 : other system | false |
| natureOfConstruction | enumeration | 0..\* | 1 : masonry 2 : concreted 3 : loose boulders 4 : hard surface 5 : unsurfaced 6 : wooden 7 : metal 8 : glass reinforced plastic (GRP) 9 : painted 13 : fiberglass 14 : plastic | false |
| objectName | text | 0..1 |  | false |
| objectNameInNationalLanguage | text | 0..1 |  | false |
| status | enumeration | 0..\* | 1 : permanent 2 : occasional 3 : recommended 4 : not in use 5 : periodic/intermittent 6 : reserved 7 : temporary 8 : private 9 : mandatory 11 : extinguished 12 : illuminated 13 : historic 14 : public 15 : synchronized 16 : watched 17 : un-watched 18 : existence doubtful 29 : confirmed 30 : candidate 31 : under modification 32 : candidate for modification 33 : under removal/deletion 34 : removed/deleted | false |
| verticalLength | real | 0..1 |  | false |
| verticalUncertainty | real | 0..1 |  | false |
| typeOfBuoy | text | 0..1 |  | false |
| aidAvailabilityCategory | enumeration | 1..1 | 1 : Category 1 2 : Category 2 3 : Category 3 | false |
| idCode | text | 0..1 |  | false |
| dateEnd | S100\_TruncatedDate | 0..1 |  | false |
| dateStart | S100\_TruncatedDate | 0..1 |  | false |
| periodicDateEnd | S100\_TruncatedDate | 0..1 |  | false |
| periodicDateStart | S100\_TruncatedDate | 0..1 |  | false |
| information | text | 0..\* |  | false |
| informationInNationalLanguage | text | 0..\* |  | false |
| textualDescription | text | 0..1 |  | false |
| textualDescriptionInNationalLanguage | text | 0..1 |  | false |
| scaleMinimum | integer | 0..1 |  | false |
| sourceDate | text | 0..1 |  | false |
| sourceIndication | text | 0..1 |  | false |
| pictorialRepresentation | text | 0..1 |  | false |
| inspectionFrequency | text | 0..1 |  | false |
| inspectionRequirements | text | 0..1 |  | false |
| atoNMaintenanceRecord | text | 0..1 |  | false |
| installationDate | S100\_TruncatedDate | 0..1 |  | false |
| contactAddress | complex | 0..1 |  | false |

Information bindings

(Bindings are also inherited from super-types, if any.)

(No local bindings, but may inherit bindings from super-types, if any)

Feature bindings

(Bindings are also inherited from super-types, if any.)

(No local bindings, but will inherit super-type bindings if any)

## 9.8 Buoy, cardinal

Name: Buoy, cardinal  
Definition: A cardinal buoy is used in conjunction with the compass to indicate where the mariner may find the best navigable water. It is placed in one of the four quadrants (North, East, South and West), bounded by inter-cardinal bearings from the point marked.  
Code: 'BuoyCardinal'  
Remarks: A buoy is a floating object moored to the bottom in a particular place, as an aid to navigation or for other specific purposes. (IHO Dictionary S-32 5th Edition, 565). Topmark, light, fog signal, radar reflector and retro-reflector are separate objects.  
Aliases: BOYCAR Supertype: GenericBuoy  
Feature use type: geographic  
Permitted primitives: point

Attribute Bindings

| Attribute | Type | Mult. | Permitted Values | Sequential |
| --- | --- | --- | --- | --- |
| buoyShape | enumeration | 1..1 | 1 : conical (nun, ogival) 2 : can (cylindrical) 3 : spherical 4 : pillar 5 : spar (spindle) 6 : barrel (tun) 7 : super-buoy 8 : ice buoy | false |
| categoryOfCardinalMark | enumeration | 1..1 | 1 : north cardinal mark 2 : east cardinal mark 3 : south cardinal mark 4 : west cardinal mark | false |
| colour | enumeration | 1..\* | 1 : white 2 : black 3 : red 4 : green 5 : blue 6 : yellow 7 : grey 8 : brown 9 : amber 10 : violet 11 : orange 12 : magenta 13 : pink | false |
| colourPattern | enumeration | 0..1 | 1 : horizontal stripes 2 : vertical stripes 3 : diagonal stripes 4 : squared 5 : stripes (direction unknown) 6 : border stripe 7 : single colour 8 : rectangle 9 : triangle | false |
| radarConspicuous | enumeration | 0..1 | 1 : radar conspicuous 2 : not radar conspicuous 3 : radar conspicuous (has radar reflector) | false |
| marksNavigationalSystemOf | enumeration | 0..1 | 1 : IALA A 2 : IALA B 9 : no system 10 : other system | false |
| natureOfConstruction | enumeration | 0..\* | 1 : masonry 2 : concreted 3 : loose boulders 4 : hard surface 5 : unsurfaced 6 : wooden 7 : metal 8 : glass reinforced plastic (GRP) 9 : painted 13 : fiberglass 14 : plastic | false |
| objectName | text | 0..1 |  | false |
| objectNameInNationalLanguage | text | 0..1 |  | false |
| status | enumeration | 0..\* | 1 : permanent 2 : occasional 3 : recommended 4 : not in use 5 : periodic/intermittent 6 : reserved 7 : temporary 8 : private 9 : mandatory 11 : extinguished 12 : illuminated 13 : historic 14 : public 15 : synchronized 16 : watched 17 : un-watched 18 : existence doubtful 29 : confirmed 30 : candidate 31 : under modification 32 : candidate for modification 33 : under removal/deletion 34 : removed/deleted | false |
| verticalLength | real | 0..1 |  | false |
| verticalUncertainty | real | 0..1 |  | false |
| typeOfBuoy | text | 0..1 |  | false |
| aidAvailabilityCategory | enumeration | 1..1 | 1 : Category 1 2 : Category 2 3 : Category 3 | false |
| idCode | text | 1..1 |  | false |
| dateEnd | S100\_TruncatedDate | 0..1 |  | false |
| dateStart | S100\_TruncatedDate | 0..1 |  | false |
| periodicDateEnd | S100\_TruncatedDate | 0..1 |  | false |
| periodicDateStart | S100\_TruncatedDate | 0..1 |  | false |
| information | text | 0..\* |  | false |
| informationInNationalLanguage | text | 0..\* |  | false |
| textualDescription | text | 0..1 |  | false |
| textualDescriptionInNationalLanguage | text | 0..1 |  | false |
| scaleMinimum | integer | 0..1 |  | false |
| sourceDate | text | 0..1 |  | false |
| sourceIndication | text | 0..1 |  | false |
| pictorialRepresentation | text | 0..1 |  | false |
| inspectionFrequency | text | 0..1 |  | false |
| inspectionRequirements | text | 0..1 |  | false |
| atoNMaintenanceRecord | text | 0..1 |  | false |
| installationDate | S100\_TruncatedDate | 0..1 |  | false |
| contactAddress | complex | 0..1 |  | false |

Information bindings

(Bindings are also inherited from super-types, if any.)

(No local bindings, but may inherit bindings from super-types, if any)

Feature bindings

(Bindings are also inherited from super-types, if any.)

(No local bindings, but will inherit super-type bindings if any)

## 9.9 Buoy, safe water

Name: Buoy, safe water  
Definition: A safe water buoy is used to indicate that there is navigable water around the mark.  
Code: 'BuoySafeWater'  
Remarks: A buoy is a floating object moored to the bottom in a particular place, as an aid to navigation or for other specific purposes. (IHO Dictionary, S-32, 5th Edition, 565). Topmark, light, fog signal, radar reflector and retro-reflector are separate objects.  
Aliases: BOYSAW Supertype: GenericBuoy  
Feature use type: geographic  
Permitted primitives: point

Attribute Bindings

| Attribute | Type | Mult. | Permitted Values | Sequential |
| --- | --- | --- | --- | --- |
| buoyShape | enumeration | 1..1 | 1 : conical (nun, ogival) 2 : can (cylindrical) 3 : spherical 4 : pillar 5 : spar (spindle) 6 : barrel (tun) 7 : super-buoy 8 : ice buoy | false |
| colour | enumeration | 1..\* | 1 : white 2 : black 3 : red 4 : green 5 : blue 6 : yellow 7 : grey 8 : brown 9 : amber 10 : violet 11 : orange 12 : magenta 13 : pink | false |
| colourPattern | enumeration | 0..1 | 1 : horizontal stripes 2 : vertical stripes 3 : diagonal stripes 4 : squared 5 : stripes (direction unknown) 6 : border stripe 7 : single colour 8 : rectangle 9 : triangle | false |
| radarConspicuous | enumeration | 0..1 | 1 : radar conspicuous 2 : not radar conspicuous 3 : radar conspicuous (has radar reflector) | false |
| marksNavigationalSystemOf | enumeration | 0..1 | 1 : IALA A 2 : IALA B 9 : no system 10 : other system | false |
| natureOfConstruction | enumeration | 0..\* | 1 : masonry 2 : concreted 3 : loose boulders 4 : hard surface 5 : unsurfaced 6 : wooden 7 : metal 8 : glass reinforced plastic (GRP) 9 : painted 13 : fiberglass 14 : plastic | false |
| objectName | text | 0..1 |  | false |
| objectNameInNationalLanguage | text | 0..1 |  | false |
| status | enumeration | 0..\* | 1 : permanent 2 : occasional 3 : recommended 4 : not in use 5 : periodic/intermittent 6 : reserved 7 : temporary 8 : private 9 : mandatory 11 : extinguished 12 : illuminated 13 : historic 14 : public 15 : synchronized 16 : watched 17 : un-watched 18 : existence doubtful 29 : confirmed 30 : candidate 31 : under modification 32 : candidate for modification 33 : under removal/deletion 34 : removed/deleted | false |
| verticalLength | real | 0..1 |  | false |
| verticalUncertainty | real | 0..1 |  | false |
| typeOfBuoy | text | 0..1 |  | false |
| aidAvailabilityCategory | enumeration | 1..1 | 1 : Category 1 2 : Category 2 3 : Category 3 | false |
| idCode | text | 0..1 |  | false |
| dateEnd | S100\_TruncatedDate | 0..1 |  | false |
| dateStart | S100\_TruncatedDate | 0..1 |  | false |
| periodicDateEnd | S100\_TruncatedDate | 0..1 |  | false |
| periodicDateStart | S100\_TruncatedDate | 0..1 |  | false |
| information | text | 0..\* |  | false |
| informationInNationalLanguage | text | 0..\* |  | false |
| textualDescription | text | 0..1 |  | false |
| textualDescriptionInNationalLanguage | text | 0..1 |  | false |
| scaleMinimum | integer | 0..1 |  | false |
| sourceDate | text | 0..1 |  | false |
| sourceIndication | text | 0..1 |  | false |
| pictorialRepresentation | text | 0..1 |  | false |
| inspectionFrequency | text | 0..1 |  | false |
| inspectionRequirements | text | 0..1 |  | false |
| atoNMaintenanceRecord | text | 0..1 |  | false |
| installationDate | S100\_TruncatedDate | 0..1 |  | false |
| contactAddress | complex | 0..1 |  | false |

Information bindings

(Bindings are also inherited from super-types, if any.)

(No local bindings, but may inherit bindings from super-types, if any)

Feature bindings

(Bindings are also inherited from super-types, if any.)

(No local bindings, but will inherit super-type bindings if any)

## 9.10 Buoy, isolated danger

Name: Buoy, isolated danger  
Definition: A isolated danger buoy is a buoy moored on or above an isolated danger of limited extent, which has navigable water all around it.  
Code: 'BuoyIsolatedDanger'  
Remarks: A buoy is a floating object moored to the bottom in a particular place, as an aid to navigation or for other specific purposes. (IHO Dictionary, S-32, 5th Edition, 565). Topmark, light, fog signal, radar reflector and retro-reflector are separate objects.  
Aliases: BOYISD Supertype: GenericBuoy  
Feature use type: geographic  
Permitted primitives: point

Attribute Bindings

| Attribute | Type | Mult. | Permitted Values | Sequential |
| --- | --- | --- | --- | --- |
| buoyShape | enumeration | 1..1 | 1 : conical (nun, ogival) 2 : can (cylindrical) 3 : spherical 4 : pillar 5 : spar (spindle) 6 : barrel (tun) 7 : super-buoy 8 : ice buoy | false |
| colour | enumeration | 1..\* | 1 : white 2 : black 3 : red 4 : green 5 : blue 6 : yellow 7 : grey 8 : brown 9 : amber 10 : violet 11 : orange 12 : magenta 13 : pink | false |
| colourPattern | enumeration | 0..1 | 1 : horizontal stripes 2 : vertical stripes 3 : diagonal stripes 4 : squared 5 : stripes (direction unknown) 6 : border stripe 7 : single colour 8 : rectangle 9 : triangle | false |
| radarConspicuous | enumeration | 0..1 | 1 : radar conspicuous 2 : not radar conspicuous 3 : radar conspicuous (has radar reflector) | false |
| marksNavigationalSystemOf | enumeration | 0..1 | 1 : IALA A 2 : IALA B 9 : no system 10 : other system | false |
| natureOfConstruction | enumeration | 0..\* | 1 : masonry 2 : concreted 3 : loose boulders 4 : hard surface 5 : unsurfaced 6 : wooden 7 : metal 8 : glass reinforced plastic (GRP) 9 : painted 13 : fiberglass 14 : plastic | false |
| objectName | text | 0..1 |  | false |
| objectNameInNationalLanguage | text | 0..1 |  | false |
| status | enumeration | 0..\* | 1 : permanent 2 : occasional 3 : recommended 4 : not in use 5 : periodic/intermittent 6 : reserved 7 : temporary 8 : private 9 : mandatory 11 : extinguished 12 : illuminated 13 : historic 14 : public 15 : synchronized 16 : watched 17 : un-watched 18 : existence doubtful 29 : confirmed 30 : candidate 31 : under modification 32 : candidate for modification 33 : under removal/deletion 34 : removed/deleted | false |
| verticalLength | real | 0..1 |  | false |
| verticalUncertainty | real | 0..1 |  | false |
| typeOfBuoy | text | 0..1 |  | false |
| aidAvailabilityCategory | enumeration | 1..1 | 1 : Category 1 2 : Category 2 3 : Category 3 | false |
| idCode | text | 1..1 |  | false |
| dateEnd | S100\_TruncatedDate | 0..1 |  | false |
| dateStart | S100\_TruncatedDate | 0..1 |  | false |
| periodicDateEnd | S100\_TruncatedDate | 0..1 |  | false |
| periodicDateStart | S100\_TruncatedDate | 0..1 |  | false |
| information | text | 0..\* |  | false |
| informationInNationalLanguage | text | 0..\* |  | false |
| textualDescription | text | 0..1 |  | false |
| textualDescriptionInNationalLanguage | text | 0..1 |  | false |
| scaleMinimum | integer | 0..1 |  | false |
| sourceDate | text | 0..1 |  | false |
| sourceIndication | text | 0..1 |  | false |
| pictorialRepresentation | text | 0..1 |  | false |
| inspectionFrequency | text | 0..1 |  | false |
| inspectionRequirements | text | 0..1 |  | false |
| atoNMaintenanceRecord | text | 0..1 |  | false |
| installationDate | S100\_TruncatedDate | 0..1 |  | false |
| contactAddress | complex | 0..1 |  | false |

Information bindings

(Bindings are also inherited from super-types, if any.)

(No local bindings, but may inherit bindings from super-types, if any)

Feature bindings

(Bindings are also inherited from super-types, if any.)

(No local bindings, but will inherit super-type bindings if any)

## 9.11 Buoy, special purpose/general

Name: Buoy, special purpose/general  
Definition: A special purpose buoy is primarily used to indicate an area or feature, the nature of which is apparent from reference to a chart, Sailing Directions or Notices to Mariners (UKHO NP 735, 5th Edition). Buoy in general: A buoy whose appearance or purpose is not adequately known.  
Code: 'BuoySpecialPurposeGeneral'  
Remarks: A buoy is a floating object moored to the bottom in a particular place, as an aid to navigation or for other specific purposes. (IHO Dictionary, S-32, 5th Edition, 565). Topmark, light, fog signal, radar reflector and retro-reflector are separate objects.  
Aliases: BOYSPP Supertype: GenericBuoy  
Feature use type: geographic  
Permitted primitives: point

Attribute Bindings

| Attribute | Type | Mult. | Permitted Values | Sequential |
| --- | --- | --- | --- | --- |
| buoyShape | enumeration | 1..1 | 1 : conical (nun, ogival) 2 : can (cylindrical) 3 : spherical 4 : pillar 5 : spar (spindle) 6 : barrel (tun) 7 : super-buoy 8 : ice buoy | false |
| categoryOfSpecialPurposeMark | enumeration | 1..\* | 1 : firing danger mark 2 : target mark 3 : marker ship mark 4 : degaussing range mark 5 : barge mark 6 : cable mark 7 : spoil ground mark 8 : outfall mark 9 : ODAS 10 : recording mark 11 : seaplane anchorage mark 12 : recreation zone mark 13 : private mark 14 : mooring mark 15 : LANBY 16 : leading mark 17 : measured distance mark 18 : notice mark 19 : TSS mark 20 : anchoring prohibited mark 21 : berthing prohibited mark 22 : overtaking prohibited mark 23 : two-way traffic prohibited mark 24 : "reduced wake" mark 25 : speed limit mark 26 : stop mark 27 : general warning mark 28 : "sound ships siren" mark 29 : restricted vertical clearance mark 30 : maximum vessel's draught mark 31 : restricted horizontal clearance mark 32 : strong current warning mark 33 : berthing permitted mark 34 : overhead power cable mark 35 : "channel edge gradient" mark 36 : telephone mark 37 : ferry crossing mark 39 : pipeline mark 40 : anchorage mark 41 : clearing mark 42 : control mark 43 : diving mark 44 : refuge beacon 45 : foul ground mark 46 : yachting mark 47 : heliport mark 48 : GNSS mark 49 : seaplane landing mark 50 : entry prohibited mark 51 : work in progress mark 52 : mark with unknown purpose 53 : wellhead mark 54 : channel separation mark 55 : marine farm mark 56 : artificial reef mark 64 : jetski prohibited | false |
| colour | enumeration | 1..\* | 1 : white 2 : black 3 : red 4 : green 5 : blue 6 : yellow 7 : grey 8 : brown 9 : amber 10 : violet 11 : orange 12 : magenta 13 : pink | false |
| colourPattern | enumeration | 0..1 | 1 : horizontal stripes 2 : vertical stripes 3 : diagonal stripes 4 : squared 5 : stripes (direction unknown) 6 : border stripe 7 : single colour 8 : rectangle 9 : triangle | false |
| radarConspicuous | enumeration | 0..1 | 1 : radar conspicuous 2 : not radar conspicuous 3 : radar conspicuous (has radar reflector) | false |
| marksNavigationalSystemOf | enumeration | 0..1 | 1 : IALA A 2 : IALA B 9 : no system 10 : other system | false |
| natureOfConstruction | enumeration | 0..\* | 1 : masonry 2 : concreted 3 : loose boulders 4 : hard surface 5 : unsurfaced 6 : wooden 7 : metal 8 : glass reinforced plastic (GRP) 9 : painted 13 : fiberglass 14 : plastic | false |
| objectName | text | 0..1 |  | false |
| objectNameInNationalLanguage | text | 0..1 |  | false |
| status | enumeration | 0..\* | 1 : permanent 2 : occasional 3 : recommended 4 : not in use 5 : periodic/intermittent 6 : reserved 7 : temporary 8 : private 9 : mandatory 11 : extinguished 12 : illuminated 13 : historic 14 : public 15 : synchronized 16 : watched 17 : un-watched 18 : existence doubtful 29 : confirmed 30 : candidate 31 : under modification 32 : candidate for modification 33 : under removal/deletion 34 : removed/deleted | false |
| verticalLength | real | 0..1 |  | false |
| verticalUncertainty | real | 0..1 |  | false |
| typeOfBuoy | text | 0..1 |  | false |
| aidAvailabilityCategory | enumeration | 1..1 | 1 : Category 1 2 : Category 2 3 : Category 3 | false |
| idCode | text | 1..1 |  | false |
| dateEnd | S100\_TruncatedDate | 0..1 |  | false |
| dateStart | S100\_TruncatedDate | 0..1 |  | false |
| periodicDateEnd | S100\_TruncatedDate | 0..1 |  | false |
| periodicDateStart | S100\_TruncatedDate | 0..1 |  | false |
| information | text | 0..\* |  | false |
| informationInNationalLanguage | text | 0..\* |  | false |
| textualDescription | text | 0..1 |  | false |
| textualDescriptionInNationalLanguage | text | 0..1 |  | false |
| scaleMinimum | integer | 0..1 |  | false |
| sourceDate | text | 0..1 |  | false |
| sourceIndication | text | 0..1 |  | false |
| pictorialRepresentation | text | 0..1 |  | false |
| inspectionFrequency | text | 0..1 |  | false |
| inspectionRequirements | text | 0..1 |  | false |
| atoNMaintenanceRecord | text | 0..1 |  | false |
| installationDate | S100\_TruncatedDate | 0..1 |  | false |
| contactAddress | complex | 0..1 |  | false |

Information bindings

(Bindings are also inherited from super-types, if any.)

(No local bindings, but may inherit bindings from super-types, if any)

Feature bindings

(Bindings are also inherited from super-types, if any.)

(No local bindings, but will inherit super-type bindings if any)

## 9.12 Offshore platform

Name: Offshore platform  
Definition: A permanent offshore structure, either fixed or floating, used in the production of oil or natural gas.  
Code: 'OffshorePlatform'  
Remarks:   
Aliases: OFSPLF Supertype: StructureObject  
Feature use type: geographic  
Permitted primitives: point surface

Attribute Bindings

| Attribute | Type | Mult. | Permitted Values | Sequential |
| --- | --- | --- | --- | --- |
| categoryOfOffshorePlatform | enumeration | 0..1 | 1 : oil derrick/rig 2 : production platform 3 : observation/research platform 4 : articulated loading platform (ALP) 5 : single anchor leg mooring (SALM) 6 : mooring tower 7 : artificial island 8 : floating production, storage and offloading vessel (FPSO) 9 : accommodation platform 10 : navigation, communication and control buoy (NCCB) | false |
| colour | enumeration | 0..\* | 1 : white 2 : black 3 : red 4 : green 5 : blue 6 : yellow 7 : grey 8 : brown 9 : amber 10 : violet 11 : orange 12 : magenta 13 : pink | false |
| colourPattern | enumeration | 0..1 | 1 : horizontal stripes 2 : vertical stripes 3 : diagonal stripes 4 : squared 5 : stripes (direction unknown) 6 : border stripe 7 : single colour 8 : rectangle 9 : triangle | false |
| condition | enumeration | 0..1 | 1 : under construction 2 : ruined 3 : under reclamation 4 : wingless 5 : planned construction | false |
| radarConspicuous | enumeration | 0..1 | 1 : radar conspicuous 2 : not radar conspicuous 3 : radar conspicuous (has radar reflector) | false |
| visuallyConspicuous | enumeration | 0..1 | 1 : visually conspicuous 2 : not visually conspicuous | false |
| height | real | 0..1 |  | false |
| natureOfConstruction | enumeration | 0..\* | 1 : masonry 2 : concreted 3 : loose boulders 4 : hard surface 5 : unsurfaced 6 : wooden 7 : metal 8 : glass reinforced plastic (GRP) 9 : painted 13 : fiberglass 14 : plastic | false |
| objectName | text | 0..1 |  | false |
| objectNameInNationalLanguage | text | 0..1 |  | false |
| product | enumeration | 0..\* | 1 : oil 2 : gas 3 : water 4 : stone 5 : coal 6 : ore 7 : chemicals 8 : drinking water 9 : milk 10 : bauxite 11 : coke 12 : iron ingots 13 : salt 14 : sand 15 : timber 16 : sawdust/wood chips 17 : scrap metal 18 : liquified natural gas (LNG) 19 : liquified petroleum gas (LPG) 20 : wine 21 : cement 22 : grain | false |
| status | enumeration | 0..\* | 1 : permanent 2 : occasional 3 : recommended 4 : not in use 5 : periodic/intermittent 6 : reserved 7 : temporary 8 : private 9 : mandatory 11 : extinguished 12 : illuminated 13 : historic 14 : public 15 : synchronized 16 : watched 17 : un-watched 18 : existence doubtful 29 : confirmed 30 : candidate 31 : under modification 32 : candidate for modification 33 : under removal/deletion 34 : removed/deleted | false |
| verticalUncertainty | real | 0..1 |  | false |
| verticalDatum | enumeration | 0..1 | 1 : mean low water springs 2 : mean lower low water springs 3 : mean sea level 4 : lowest low water 5 : mean low water 6 : lowest low water springs 7 : approximate mean low water springs 8 : Indian spring low water 9 : low water springs 10 : approximate lowest astronomical tide 11 : nearly lowest low water 12 : mean lower low water 13 : low water 14 : approximate mean low water 15 : approximate mean lower low water 16 : mean high water 17 : mean high water springs 18 : high water 19 : approximate mean sea level 20 : high water springs 21 : mean higher high water 22 : equinoctial spring low water 23 : lowest astronomical tide 24 : local datum 25 : international great lakes datum 1985 26 : mean water level 27 : lower low water large tide 28 : higher high water large tide 29 : nearly highest high water 30 : highest astronomical tide (HAT) | false |
| verticalLength | real | 0..1 |  | false |
| aidAvailabilityCategory | enumeration | 1..1 | 1 : Category 1 2 : Category 2 3 : Category 3 | false |
| idCode | text | 1..1 |  | false |
| dateEnd | S100\_TruncatedDate | 0..1 |  | false |
| dateStart | S100\_TruncatedDate | 0..1 |  | false |
| periodicDateEnd | S100\_TruncatedDate | 0..1 |  | false |
| periodicDateStart | S100\_TruncatedDate | 0..1 |  | false |
| information | text | 0..\* |  | false |
| informationInNationalLanguage | text | 0..\* |  | false |
| textualDescription | text | 0..1 |  | false |
| textualDescriptionInNationalLanguage | text | 0..1 |  | false |
| scaleMinimum | integer | 0..1 |  | false |
| sourceDate | text | 0..1 |  | false |
| sourceIndication | text | 0..1 |  | false |
| pictorialRepresentation | text | 0..1 |  | false |
| inspectionFrequency | text | 0..1 |  | false |
| inspectionRequirements | text | 0..1 |  | false |
| atoNMaintenanceRecord | text | 0..1 |  | false |
| installationDate | S100\_TruncatedDate | 0..1 |  | false |
| mannedStructure | boolean | 0..1 |  | false |
| contactAddress | complex | 0..1 |  | false |

Information bindings

(Bindings are also inherited from super-types, if any.)

(No local bindings, but may inherit bindings from super-types, if any)

Feature bindings

(Bindings are also inherited from super-types, if any.)

(No local bindings, but will inherit super-type bindings if any)

## 9.13 Light vessel

Name: Light vessel  
Definition: A distinctively marked vessel anchored or moored at a charted point, to serve as an aid to navigation. By night, it displays a characteristic light(s) and is usually equipped with other devices, such as fog signal, submarine sound signal, and radio-beacon, to assist navigation.  
Code: 'LightVessel'  
Remarks: Also called 'light ship'. The light(s), fog signal etc. of a light vessel is a separate object, handled as with buoys, beacons, etc.  
Aliases: LITVES Supertype: StructureObject  
Feature use type: geographic  
Permitted primitives: point

Attribute Bindings

| Attribute | Type | Mult. | Permitted Values | Sequential |
| --- | --- | --- | --- | --- |
| colour | enumeration | 1..\* | 1 : white 2 : black 3 : red 4 : green 5 : blue 6 : yellow 7 : grey 8 : brown 9 : amber 10 : violet 11 : orange 12 : magenta 13 : pink | false |
| colourPattern | enumeration | 0..1 | 1 : horizontal stripes 2 : vertical stripes 3 : diagonal stripes 4 : squared 5 : stripes (direction unknown) 6 : border stripe 7 : single colour 8 : rectangle 9 : triangle | false |
| radarConspicuous | enumeration | 0..1 | 1 : radar conspicuous 2 : not radar conspicuous 3 : radar conspicuous (has radar reflector) | false |
| visuallyConspicuous | enumeration | 0..1 | 1 : visually conspicuous 2 : not visually conspicuous | false |
| horizontalAccuracy | real | 0..1 |  | false |
| horizontalLength | real | 0..1 |  | false |
| horizontalWidth | real | 0..1 |  | false |
| natureOfConstruction | enumeration | 0..\* | 1 : masonry 2 : concreted 3 : loose boulders 4 : hard surface 5 : unsurfaced 6 : wooden 7 : metal 8 : glass reinforced plastic (GRP) 9 : painted 13 : fiberglass 14 : plastic | false |
| objectName | text | 0..1 |  | false |
| objectNameInNationalLanguage | text | 0..1 |  | false |
| status | enumeration | 0..\* | 1 : permanent 2 : occasional 3 : recommended 4 : not in use 5 : periodic/intermittent 6 : reserved 7 : temporary 8 : private 9 : mandatory 11 : extinguished 12 : illuminated 13 : historic 14 : public 15 : synchronized 16 : watched 17 : un-watched 18 : existence doubtful 29 : confirmed 30 : candidate 31 : under modification 32 : candidate for modification 33 : under removal/deletion 34 : removed/deleted | false |
| verticalUncertainty | real | 0..1 |  | false |
| verticalLength | real | 0..1 |  | false |
| mannedStructure | boolean | 0..1 |  | false |
| aidAvailabilityCategory | enumeration | 1..1 | 1 : Category 1 2 : Category 2 3 : Category 3 | false |
| idCode | text | 1..1 |  | false |
| dateEnd | S100\_TruncatedDate | 0..1 |  | false |
| dateStart | S100\_TruncatedDate | 0..1 |  | false |
| periodicDateEnd | S100\_TruncatedDate | 0..1 |  | false |
| periodicDateStart | S100\_TruncatedDate | 0..1 |  | false |
| information | text | 0..\* |  | false |
| informationInNationalLanguage | text | 0..\* |  | false |
| textualDescription | text | 0..1 |  | false |
| textualDescriptionInNationalLanguage | text | 0..1 |  | false |
| scaleMinimum | integer | 0..1 |  | false |
| sourceDate | text | 0..1 |  | false |
| sourceIndication | text | 0..1 |  | false |
| pictorialRepresentation | text | 0..1 |  | false |
| inspectionFrequency | text | 0..1 |  | false |
| inspectionRequirements | text | 0..1 |  | false |
| atoNMaintenanceRecord | text | 0..1 |  | false |
| installationDate | S100\_TruncatedDate | 0..1 |  | false |
| contactAddress | complex | 0..1 |  | false |

Information bindings

(Bindings are also inherited from super-types, if any.)

(No local bindings, but may inherit bindings from super-types, if any)

Feature bindings

(Bindings are also inherited from super-types, if any.)

(No local bindings, but will inherit super-type bindings if any)

## 9.14 Pile

Name: Pile  
Definition: A long heavy timber or section of steel, wood, concrete, etc. forced into the earth which may serve as a support, as for a pier, or a free standing pole within a marine environment.  
Code: 'Pile'  
Remarks:   
Aliases: PILPNT Supertype: StructureObject  
Feature use type: geographic  
Permitted primitives: point curve surface

Attribute Bindings

| Attribute | Type | Mult. | Permitted Values | Sequential |
| --- | --- | --- | --- | --- |
| categoryOfPile | enumeration | 0..1 | 1 : stake 3 : post 4 : tripodal | false |
| colour | enumeration | 0..\* | 1 : white 2 : black 3 : red 4 : green 5 : blue 6 : yellow 7 : grey 8 : brown 9 : amber 10 : violet 11 : orange 12 : magenta 13 : pink | false |
| colourPattern | enumeration | 0..1 | 1 : horizontal stripes 2 : vertical stripes 3 : diagonal stripes 4 : squared 5 : stripes (direction unknown) 6 : border stripe 7 : single colour 8 : rectangle 9 : triangle | false |
| visuallyConspicuous | enumeration | 0..1 | 1 : visually conspicuous 2 : not visually conspicuous | false |
| height | real | 0..1 |  | false |
| verticalUncertainty | real | 0..1 |  | false |
| verticalLength | real | 0..1 |  | false |
| verticalDatum | enumeration | 0..1 | 1 : mean low water springs 2 : mean lower low water springs 3 : mean sea level 4 : lowest low water 5 : mean low water 6 : lowest low water springs 7 : approximate mean low water springs 8 : Indian spring low water 9 : low water springs 10 : approximate lowest astronomical tide 11 : nearly lowest low water 12 : mean lower low water 13 : low water 14 : approximate mean low water 15 : approximate mean lower low water 16 : mean high water 17 : mean high water springs 18 : high water 19 : approximate mean sea level 20 : high water springs 21 : mean higher high water 22 : equinoctial spring low water 23 : lowest astronomical tide 24 : local datum 25 : international great lakes datum 1985 26 : mean water level 27 : lower low water large tide 28 : higher high water large tide 29 : nearly highest high water 30 : highest astronomical tide (HAT) | false |
| aidAvailabilityCategory | enumeration | 1..1 | 1 : Category 1 2 : Category 2 3 : Category 3 | false |
| idCode | text | 1..1 |  | false |
| dateEnd | S100\_TruncatedDate | 0..1 |  | false |
| dateStart | S100\_TruncatedDate | 0..1 |  | false |
| periodicDateEnd | S100\_TruncatedDate | 0..1 |  | false |
| periodicDateStart | S100\_TruncatedDate | 0..1 |  | false |
| information | text | 0..\* |  | false |
| informationInNationalLanguage | text | 0..\* |  | false |
| textualDescription | text | 0..1 |  | false |
| textualDescriptionInNationalLanguage | text | 0..1 |  | false |
| scaleMinimum | integer | 0..1 |  | false |
| sourceDate | text | 0..1 |  | false |
| sourceIndication | text | 0..1 |  | false |
| pictorialRepresentation | text | 0..1 |  | false |
| inspectionFrequency | text | 0..1 |  | false |
| inspectionRequirements | text | 0..1 |  | false |
| atoNMaintenanceRecord | text | 0..1 |  | false |
| installationDate | S100\_TruncatedDate | 0..1 |  | false |
| contactAddress | complex | 0..1 |  | false |

Information bindings

(Bindings are also inherited from super-types, if any.)

(No local bindings, but may inherit bindings from super-types, if any)

Feature bindings

(Bindings are also inherited from super-types, if any.)

(No local bindings, but will inherit super-type bindings if any)

## 9.15 Silo/tank

Name: Silo/tank  
Definition: An enclosed container, used for storage.  
Code: 'SiloTank'  
Remarks:   
Aliases: SILTNK Supertype: StructureObject  
Feature use type: geographic  
Permitted primitives: point surface

Attribute Bindings

| Attribute | Type | Mult. | Permitted Values | Sequential |
| --- | --- | --- | --- | --- |
| buildingShape | enumeration | 0..1 | 5 : high-rise building 6 : pyramid 7 : cylindrical 8 : spherical 9 : cubic | false |
| categoryOfSiloTank | enumeration | 0..1 | 1 : silo in general 2 : tank in general 3 : grain elevator 4 : water tower | false |
| colour | enumeration | 0..\* | 1 : white 2 : black 3 : red 4 : green 5 : blue 6 : yellow 7 : grey 8 : brown 9 : amber 10 : violet 11 : orange 12 : magenta 13 : pink | false |
| colourPattern | enumeration | 0..1 | 1 : horizontal stripes 2 : vertical stripes 3 : diagonal stripes 4 : squared 5 : stripes (direction unknown) 6 : border stripe 7 : single colour 8 : rectangle 9 : triangle | false |
| condition | enumeration | 0..1 | 1 : under construction 2 : ruined 3 : under reclamation 4 : wingless 5 : planned construction | false |
| radarConspicuous | enumeration | 0..1 | 1 : radar conspicuous 2 : not radar conspicuous 3 : radar conspicuous (has radar reflector) | false |
| visuallyConspicuous | enumeration | 0..1 | 1 : visually conspicuous 2 : not visually conspicuous | false |
| elevation | real | 0..1 |  | false |
| height | real | 0..1 |  | false |
| natureOfConstruction | enumeration | 0..\* | 1 : masonry 2 : concreted 3 : loose boulders 4 : hard surface 5 : unsurfaced 6 : wooden 7 : metal 8 : glass reinforced plastic (GRP) 9 : painted | false |
| objectName | text | 0..1 |  | false |
| objectNameInNationalLanguage | text | 0..1 |  | false |
| product | enumeration | 0..\* | 1 : oil 2 : gas 3 : water 4 : stone 5 : coal 6 : ore 7 : chemicals 8 : drinking water 9 : milk 10 : bauxite 11 : coke 12 : iron ingots 13 : salt 14 : sand 15 : timber 16 : sawdust/wood chips 17 : scrap metal 18 : liquified natural gas (LNG) 19 : liquified petroleum gas (LPG) 20 : wine 21 : cement 22 : grain | false |
| status | enumeration | 0..\* | 1 : permanent 2 : occasional 3 : recommended 4 : not in use 5 : periodic/intermittent 6 : reserved 7 : temporary 8 : private 9 : mandatory 11 : extinguished 12 : illuminated 13 : historic 14 : public 15 : synchronized 16 : watched 17 : un-watched 18 : existence doubtful 29 : confirmed 30 : candidate 31 : under modification 32 : candidate for modification 33 : under removal/deletion 34 : removed/deleted | false |
| verticalUncertainty | real | 0..1 |  | false |
| verticalLength | real | 0..1 |  | false |
| verticalDatum | enumeration | 0..1 | 1 : mean low water springs 2 : mean lower low water springs 3 : mean sea level 4 : lowest low water 5 : mean low water 6 : lowest low water springs 7 : approximate mean low water springs 8 : Indian spring low water 9 : low water springs 10 : approximate lowest astronomical tide 11 : nearly lowest low water 12 : mean lower low water 13 : low water 14 : approximate mean low water 15 : approximate mean lower low water 16 : mean high water 17 : mean high water springs 18 : high water 19 : approximate mean sea level 20 : high water springs 21 : mean higher high water 22 : equinoctial spring low water 23 : lowest astronomical tide 24 : local datum 25 : international great lakes datum 1985 26 : mean water level 27 : lower low water large tide 28 : higher high water large tide 29 : nearly highest high water 30 : highest astronomical tide (HAT) | false |
| aidAvailabilityCategory | enumeration | 1..1 | 1 : Category 1 2 : Category 2 3 : Category 3 | false |
| idCode | text | 1..1 |  | false |
| dateEnd | S100\_TruncatedDate | 0..1 |  | false |
| dateStart | S100\_TruncatedDate | 0..1 |  | false |
| periodicDateEnd | S100\_TruncatedDate | 0..1 |  | false |
| periodicDateStart | S100\_TruncatedDate | 0..1 |  | false |
| information | text | 0..\* |  | false |
| informationInNationalLanguage | text | 0..\* |  | false |
| textualDescription | text | 0..1 |  | false |
| textualDescriptionInNationalLanguage | text | 0..1 |  | false |
| scaleMinimum | integer | 0..1 |  | false |
| sourceDate | text | 0..1 |  | false |
| sourceIndication | text | 0..1 |  | false |
| pictorialRepresentation | text | 0..1 |  | false |
| inspectionFrequency | text | 0..1 |  | false |
| inspectionRequirements | text | 0..1 |  | false |
| atoNMaintenanceRecord | text | 0..1 |  | false |
| installationDate | S100\_TruncatedDate | 0..1 |  | false |
| contactAddress | complex | 0..1 |  | false |

Information bindings

(Bindings are also inherited from super-types, if any.)

(No local bindings, but may inherit bindings from super-types, if any)

Feature bindings

(Bindings are also inherited from super-types, if any.)

(No local bindings, but will inherit super-type bindings if any)

## 9.16 Landmark

Name: Landmark  
Definition: A prominent object at a fixed location which can be used in determining a location or a direction.  
Code: 'Landmark'  
Remarks:   
Aliases: LNDMRK Supertype: StructureObject  
Feature use type: geographic  
Permitted primitives: point curve surface

Attribute Bindings

| Attribute | Type | Mult. | Permitted Values | Sequential |
| --- | --- | --- | --- | --- |
| categoryOfLandmark | enumeration | 1..\* | 1 : cairn 2 : cemetery 3 : chimney 4 : dish aerial 5 : flagstaff (flagpole) 6 : flare stack 7 : mast 8 : wind sock 9 : monument 10 : column (pillar) 11 : memorial plaque 12 : obelisk 13 : statue 14 : cross 15 : dome 16 : radar scanner 17 : tower 18 : windmill 19 : windmotor 20 : spire/minaret 21 : large rock or boulder on land 22 : triangulation Mark 23 : boundary Mark 24 : observation wheel | false |
| colour | enumeration | 0..\* | 1 : white 2 : black 3 : red 4 : green 5 : blue 6 : yellow 7 : grey 8 : brown 9 : amber 10 : violet 11 : orange 12 : magenta 13 : pink | false |
| colourPattern | enumeration | 0..1 | 1 : horizontal stripes 2 : vertical stripes 3 : diagonal stripes 4 : squared 5 : stripes (direction unknown) 6 : border stripe 7 : single colour 8 : rectangle 9 : triangle | false |
| condition | enumeration | 0..1 | 1 : under construction 2 : ruined 4 : wingless 5 : planned construction | false |
| radarConspicuous | enumeration | 0..1 | 1 : radar conspicuous 2 : not radar conspicuous 3 : radar conspicuous (has radar reflector) | false |
| visuallyConspicuous | enumeration | 0..1 | 1 : visually conspicuous 2 : not visually conspicuous | false |
| elevation | real | 0..1 |  | false |
| function | enumeration | 0..\* | 2 : harbour-master's office 3 : customs office 4 : health office 5 : hospital 6 : post office 7 : hotel 8 : railway station 9 : police station 10 : water-police station 11 : pilot office 12 : pilot lookout 13 : bank office 14 : headquarters for district control 15 : transit shed/warehouse 16 : factory 17 : power station 18 : administrative 19 : educational facility 20 : church 21 : chapel 22 : temple 23 : pagoda 24 : shinto shrine 25 : buddhist temple 26 : mosque 27 : marabout 28 : lookout 29 : communication 30 : television 31 : radio 32 : radar 33 : light support 34 : microwave 35 : cooling 36 : observation 37 : time ball 38 : clock 39 : control 40 : airship mooring 41 : stadium 42 : bus station | false |
| height | real | 0..\* |  | false |
| natureOfConstruction | enumeration | 0..\* | 1 : masonry 2 : concreted 3 : loose boulders 4 : hard surface 5 : unsurfaced 6 : wooden 7 : metal 8 : glass reinforced plastic (GRP) 9 : painted | false |
| objectName | text | 0..1 |  | false |
| objectNameInNationalLanguage | text | 0..1 |  | false |
| status | enumeration | 0..\* | 1 : permanent 2 : occasional 3 : recommended 4 : not in use 5 : periodic/intermittent 6 : reserved 7 : temporary 8 : private 9 : mandatory 11 : extinguished 12 : illuminated 13 : historic 14 : public 15 : synchronized 16 : watched 17 : un-watched 18 : existence doubtful 29 : confirmed 30 : candidate 31 : under modification 32 : candidate for modification 33 : under removal/deletion 34 : removed/deleted | false |
| verticalUncertainty | real | 0..1 |  | false |
| verticalLength | real | 0..1 |  | false |
| verticalDatum | enumeration | 0..1 | 1 : mean low water springs 2 : mean lower low water springs 3 : mean sea level 4 : lowest low water 5 : mean low water 6 : lowest low water springs 7 : approximate mean low water springs 8 : Indian spring low water 9 : low water springs 10 : approximate lowest astronomical tide 11 : nearly lowest low water 12 : mean lower low water 13 : low water 14 : approximate mean low water 15 : approximate mean lower low water 16 : mean high water 17 : mean high water springs 18 : high water 19 : approximate mean sea level 20 : high water springs 21 : mean higher high water 22 : equinoctial spring low water 23 : lowest astronomical tide 24 : local datum 25 : international great lakes datum 1985 26 : mean water level 27 : lower low water large tide 28 : higher high water large tide 29 : nearly highest high water 30 : highest astronomical tide (HAT) | false |
| mannedStructure | boolean | 0..1 |  | false |
| aidAvailabilityCategory | enumeration | 1..1 | 1 : Category 1 2 : Category 2 3 : Category 3 | false |
| idCode | text | 1..1 |  | false |
| dateEnd | S100\_TruncatedDate | 0..1 |  | false |
| dateStart | S100\_TruncatedDate | 0..1 |  | false |
| periodicDateEnd | S100\_TruncatedDate | 0..1 |  | false |
| periodicDateStart | S100\_TruncatedDate | 0..1 |  | false |
| information | text | 0..\* |  | false |
| informationInNationalLanguage | text | 0..\* |  | false |
| textualDescription | text | 0..1 |  | false |
| textualDescriptionInNationalLanguage | text | 0..1 |  | false |
| scaleMinimum | integer | 0..1 |  | false |
| sourceDate | text | 0..1 |  | false |
| sourceIndication | text | 0..1 |  | false |
| pictorialRepresentation | text | 0..1 |  | false |
| inspectionFrequency | text | 0..1 |  | false |
| inspectionRequirements | text | 0..1 |  | false |
| atoNMaintenanceRecord | text | 0..1 |  | false |
| installationDate | S100\_TruncatedDate | 0..1 |  | false |
| contactAddress | complex | 0..1 |  | false |

Information bindings

(Bindings are also inherited from super-types, if any.)

(No local bindings, but may inherit bindings from super-types, if any)

Feature bindings

(Bindings are also inherited from super-types, if any.)

(No local bindings, but will inherit super-type bindings if any)

## 9.17 Light float

Name: Light float  
Definition: A boat-like structure used instead of a light buoy in waters where strong streams or currents are experienced, or when a greater elevation than that of a light buoy is necessary.  
Code: 'LightFloat'  
Remarks: The light of a light float is a separate object, handled as with buoys, beacons, etc.  
Aliases: LITFLT Supertype: StructureObject  
Feature use type: geographic  
Permitted primitives: point

Attribute Bindings

| Attribute | Type | Mult. | Permitted Values | Sequential |
| --- | --- | --- | --- | --- |
| colour | enumeration | 1..\* | 1 : white 2 : black 3 : red 4 : green 5 : blue 6 : yellow 7 : grey 8 : brown 9 : amber 10 : violet 11 : orange 12 : magenta 13 : pink | false |
| colourPattern | enumeration | 0..1 | 1 : horizontal stripes 2 : vertical stripes 3 : diagonal stripes 4 : squared 5 : stripes (direction unknown) 6 : border stripe 7 : single colour 8 : rectangle 9 : triangle | false |
| radarConspicuous | enumeration | 0..1 | 1 : radar conspicuous 2 : not radar conspicuous 3 : radar conspicuous (has radar reflector) | false |
| visuallyConspicuous | enumeration | 0..1 | 1 : visually conspicuous 2 : not visually conspicuous | false |
| horizontalLength | real | 0..1 |  | false |
| horizontalWidth | real | 0..1 |  | false |
| natureOfConstruction | enumeration | 0..\* | 1 : masonry 2 : concreted 3 : loose boulders 4 : hard surface 5 : unsurfaced 6 : wooden 7 : metal 8 : glass reinforced plastic (GRP) 9 : painted 13 : fiberglass 14 : plastic | false |
| objectName | text | 0..1 |  | false |
| objectNameInNationalLanguage | text | 0..1 |  | false |
| status | enumeration | 0..\* | 1 : permanent 2 : occasional 3 : recommended 4 : not in use 5 : periodic/intermittent 6 : reserved 7 : temporary 8 : private 9 : mandatory 11 : extinguished 12 : illuminated 13 : historic 14 : public 15 : synchronized 16 : watched 17 : un-watched 18 : existence doubtful 29 : confirmed 30 : candidate 31 : under modification 32 : candidate for modification 33 : under removal/deletion 34 : removed/deleted | false |
| verticalLength | real | 0..1 |  | false |
| verticalUncertainty | real | 0..1 |  | false |
| mannedStructure | boolean | 0..1 |  | false |
| aidAvailabilityCategory | enumeration | 1..1 | 1 : Category 1 2 : Category 2 3 : Category 3 | false |
| idCode | text | 1..1 |  | false |
| dateEnd | S100\_TruncatedDate | 0..1 |  | false |
| dateStart | S100\_TruncatedDate | 0..1 |  | false |
| periodicDateEnd | S100\_TruncatedDate | 0..1 |  | false |
| periodicDateStart | S100\_TruncatedDate | 0..1 |  | false |
| information | text | 0..\* |  | false |
| informationInNationalLanguage | text | 0..\* |  | false |
| textualDescription | text | 0..1 |  | false |
| textualDescriptionInNationalLanguage | text | 0..1 |  | false |
| scaleMinimum | integer | 0..1 |  | false |
| sourceDate | text | 0..1 |  | false |
| sourceIndication | text | 0..1 |  | false |
| pictorialRepresentation | text | 0..1 |  | false |
| inspectionFrequency | text | 0..1 |  | false |
| inspectionRequirements | text | 0..1 |  | false |
| atoNMaintenanceRecord | text | 0..1 |  | false |
| installationDate | S100\_TruncatedDate | 0..1 |  | false |
| contactAddress | complex | 0..1 |  | false |

Information bindings

(Bindings are also inherited from super-types, if any.)

(No local bindings, but may inherit bindings from super-types, if any)

Feature bindings

(Bindings are also inherited from super-types, if any.)

(No local bindings, but will inherit super-type bindings if any)

## 9.18 Lighthouse

Name: Lighthouse  
Definition: A distinctive structure on or off a coast exhibiting a major light designed to serve as an aid to navigation. (IHO S-32 - 2822, 5th Edition, 1994).  
Code: 'Lighthouse'  
Remarks:   
Aliases: (none) Supertype: Landmark  
Feature use type: geographic  
Permitted primitives: point surface

Attribute Bindings

| Attribute | Type | Mult. | Permitted Values | Sequential |
| --- | --- | --- | --- | --- |
| categoryOfLandmark | enumeration | 1..\* | 1 : cairn 2 : cemetery 3 : chimney 4 : dish aerial 5 : flagstaff (flagpole) 6 : flare stack 7 : mast 8 : wind sock 9 : monument 10 : column (pillar) 11 : memorial plaque 12 : obelisk 13 : statue 14 : cross 15 : dome 16 : radar scanner 17 : tower 18 : windmill 19 : windmotor 20 : spire/minaret 21 : large rock or boulder on land 22 : triangulation Mark 23 : boundary Mark 24 : observation wheel | false |
| colour | enumeration | 0..\* | 1 : white 2 : black 3 : red 4 : green 5 : blue 6 : yellow 7 : grey 8 : brown 9 : amber 10 : violet 11 : orange 12 : magenta 13 : pink | false |
| colourPattern | enumeration | 0..1 | 1 : horizontal stripes 2 : vertical stripes 3 : diagonal stripes 4 : squared 5 : stripes (direction unknown) 6 : border stripe 7 : single colour 8 : rectangle 9 : triangle | false |
| condition | enumeration | 0..1 | 1 : under construction 2 : ruined 4 : wingless 5 : planned construction | false |
| radarConspicuous | enumeration | 0..1 | 1 : radar conspicuous 2 : not radar conspicuous 3 : radar conspicuous (has radar reflector) | false |
| visuallyConspicuous | enumeration | 0..1 | 1 : visually conspicuous 2 : not visually conspicuous | false |
| elevation | real | 0..1 |  | false |
| function | enumeration | 0..\* | 2 : harbour-master's office 3 : customs office 4 : health office 5 : hospital 6 : post office 7 : hotel 8 : railway station 9 : police station 10 : water-police station 11 : pilot office 12 : pilot lookout 13 : bank office 14 : headquarters for district control 15 : transit shed/warehouse 16 : factory 17 : power station 18 : administrative 19 : educational facility 20 : church 21 : chapel 22 : temple 23 : pagoda 24 : shinto shrine 25 : buddhist temple 26 : mosque 27 : marabout 28 : lookout 29 : communication 30 : television 31 : radio 32 : radar 33 : light support 34 : microwave 35 : cooling 36 : observation 37 : time ball 38 : clock 39 : control 40 : airship mooring 41 : stadium 42 : bus station | false |
| height | real | 0..\* |  | false |
| natureOfConstruction | enumeration | 0..\* | 1 : masonry 2 : concreted 3 : loose boulders 4 : hard surface 5 : unsurfaced 6 : wooden 7 : metal 8 : glass reinforced plastic (GRP) 9 : painted | false |
| objectName | text | 0..1 |  | false |
| objectNameInNationalLanguage | text | 0..1 |  | false |
| status | enumeration | 0..\* | 1 : permanent 2 : occasional 3 : recommended 4 : not in use 5 : periodic/intermittent 6 : reserved 7 : temporary 8 : private 9 : mandatory 11 : extinguished 12 : illuminated 13 : historic 14 : public 15 : synchronized 16 : watched 17 : un-watched 18 : existence doubtful 29 : confirmed 30 : candidate 31 : under modification 32 : candidate for modification 33 : under removal/deletion 34 : removed/deleted | false |
| verticalUncertainty | real | 0..1 |  | false |
| verticalLength | real | 0..1 |  | false |
| verticalDatum | enumeration | 0..1 | 1 : mean low water springs 2 : mean lower low water springs 3 : mean sea level 4 : lowest low water 5 : mean low water 6 : lowest low water springs 7 : approximate mean low water springs 8 : Indian spring low water 9 : low water springs 10 : approximate lowest astronomical tide 11 : nearly lowest low water 12 : mean lower low water 13 : low water 14 : approximate mean low water 15 : approximate mean lower low water 16 : mean high water 17 : mean high water springs 18 : high water 19 : approximate mean sea level 20 : high water springs 21 : mean higher high water 22 : equinoctial spring low water 23 : lowest astronomical tide 24 : local datum 25 : international great lakes datum 1985 26 : mean water level 27 : lower low water large tide 28 : higher high water large tide 29 : nearly highest high water 30 : highest astronomical tide (HAT) | false |
| mannedStructure | boolean | 0..1 |  | false |
| aidAvailabilityCategory | enumeration | 1..1 | 1 : Category 1 2 : Category 2 3 : Category 3 | false |
| idCode | text | 1..1 |  | false |
| dateEnd | S100\_TruncatedDate | 0..1 |  | false |
| dateStart | S100\_TruncatedDate | 0..1 |  | false |
| periodicDateEnd | S100\_TruncatedDate | 0..1 |  | false |
| periodicDateStart | S100\_TruncatedDate | 0..1 |  | false |
| information | text | 0..\* |  | false |
| informationInNationalLanguage | text | 0..\* |  | false |
| textualDescription | text | 0..1 |  | false |
| textualDescriptionInNationalLanguage | text | 0..1 |  | false |
| scaleMinimum | integer | 0..1 |  | false |
| sourceDate | text | 0..1 |  | false |
| sourceIndication | text | 0..1 |  | false |
| pictorialRepresentation | text | 0..1 |  | false |
| inspectionFrequency | text | 0..1 |  | false |
| inspectionRequirements | text | 0..1 |  | false |
| atoNMaintenanceRecord | text | 0..1 |  | false |
| installationDate | S100\_TruncatedDate | 0..1 |  | false |
| contactAddress | complex | 0..1 |  | false |

Information bindings

(Bindings are also inherited from super-types, if any.)

(No local bindings, but may inherit bindings from super-types, if any)

Feature bindings

(Bindings are also inherited from super-types, if any.)

(No local bindings, but will inherit super-type bindings if any)

## 9.19 Topmark

Name: Topmark  
Definition: A characteristic shape secured at the top of a buoy or beacon to aid in its identification.  
Code: 'Topmark'  
Remarks: The body carrying the topmark is a separate object.  
Aliases: TOPMAR Supertype: Equipment  
Feature use type: geographic  
Permitted primitives: point

Attribute Bindings

| Attribute | Type | Mult. | Permitted Values | Sequential |
| --- | --- | --- | --- | --- |
| colour | enumeration | 1..\* | 1 : white 2 : black 3 : red 4 : green 5 : blue 6 : yellow 7 : grey 8 : brown 9 : amber 10 : violet 11 : orange 12 : magenta 13 : pink | false |
| colourPattern | enumeration | 0..1 | 1 : horizontal stripes 2 : vertical stripes 3 : diagonal stripes 4 : squared 5 : stripes (direction unknown) 6 : border stripe 7 : single colour 8 : rectangle 9 : triangle | false |
| height | real | 0..1 |  | false |
| marksNavigationalSystemOf | enumeration | 0..1 | 1 : IALA A 2 : IALA B 9 : no system 10 : other system | false |
| status | enumeration | 0..\* | 1 : permanent 2 : occasional 3 : recommended 4 : not in use 5 : periodic/intermittent 6 : reserved 7 : temporary 8 : private 9 : mandatory 11 : extinguished 12 : illuminated 13 : historic 14 : public 15 : synchronized 16 : watched 17 : un-watched 18 : existence doubtful 29 : confirmed 30 : candidate 31 : under modification 32 : candidate for modification 33 : under removal/deletion 34 : removed/deleted | false |
| topmarkDaymarkShape | enumeration | 1..1 | 1 : cone, point up 2 : cone, point down 3 : sphere 4 : 2 spheres 5 : cylinder (can) 6 : board 7 : x-shape (St. Andrew's cross) 8 : upright cross (St. George's Cross) 9 : cube, point up 10 : 2 cones, point to point 11 : 2 cones, base to base 12 : rhombus 13 : 2 cones (points upward) 14 : 2 cones (points downward) 15 : besom, point up (broom or perch) 16 : besom, point down (broom or perch) 17 : flag 18 : sphere over rhombus 19 : square 20 : rectangle, horizontal 21 : rectangle, vertical 22 : trapezium, up 23 : trapezium, down 24 : triangle, point up 25 : triangle, point down 26 : circle 27 : two upright crosses (one over the other) 28 : T-shape 29 : triangle pointing up over a circle 30 : upright cross over a circle 31 : rhombus over a circle 32 : circle over a triangle pointing up 33 : other shape (see INFORM) 34 : tubular | false |
| verticalUncertainty | real | 0..1 |  | false |
| verticalLength | real | 0..1 |  | false |
| verticalDatum | enumeration | 0..1 | 1 : mean low water springs 2 : mean lower low water springs 3 : mean sea level 4 : lowest low water 5 : mean low water 6 : lowest low water springs 7 : approximate mean low water springs 8 : Indian spring low water 9 : low water springs 10 : approximate lowest astronomical tide 11 : nearly lowest low water 12 : mean lower low water 13 : low water 14 : approximate mean low water 15 : approximate mean lower low water 16 : mean high water 17 : mean high water springs 18 : high water 19 : approximate mean sea level 20 : high water springs 21 : mean higher high water 22 : equinoctial spring low water 23 : lowest astronomical tide 24 : local datum 25 : international great lakes datum 1985 26 : mean water level 27 : lower low water large tide 28 : higher high water large tide 29 : nearly highest high water 30 : highest astronomical tide (HAT) | false |
| remoteMonitoringSystem | text | 0..\* |  | false |
| remotelyMonitored | boolean | 0..1 |  | false |
| idCode | text | 1..1 |  | false |
| dateEnd | S100\_TruncatedDate | 0..1 |  | false |
| dateStart | S100\_TruncatedDate | 0..1 |  | false |
| periodicDateEnd | S100\_TruncatedDate | 0..1 |  | false |
| periodicDateStart | S100\_TruncatedDate | 0..1 |  | false |
| information | text | 0..\* |  | false |
| informationInNationalLanguage | text | 0..\* |  | false |
| textualDescription | text | 0..1 |  | false |
| textualDescriptionInNationalLanguage | text | 0..1 |  | false |
| scaleMinimum | integer | 0..1 |  | false |
| sourceDate | text | 0..1 |  | false |
| sourceIndication | text | 0..1 |  | false |
| pictorialRepresentation | text | 0..1 |  | false |
| inspectionFrequency | text | 0..1 |  | false |
| inspectionRequirements | text | 0..1 |  | false |
| atoNMaintenanceRecord | text | 0..1 |  | false |
| installationDate | S100\_TruncatedDate | 0..1 |  | false |

Information bindings

(Bindings are also inherited from super-types, if any.)

(No local bindings, but may inherit bindings from super-types, if any)

Feature bindings

(Bindings are also inherited from super-types, if any.)

(No local bindings, but will inherit super-type bindings if any)

## 9.20 Light

Name: Light  
Definition: A luminous or lighted aid to navigation.  
Code: 'Light'  
Remarks: A light may be fixed on a buoy, beacon, tower, etc. These are separate objects.  
Aliases: LIGHTS Supertype: Equipment  
Feature use type: geographic  
Permitted primitives: point

Attribute Bindings

| Attribute | Type | Mult. | Permitted Values | Sequential |
| --- | --- | --- | --- | --- |
| categoryOfLight | enumeration | 0..\* | 4 : leading light 5 : aero light 6 : air obstruction light 7 : fog detector light 8 : flood light 9 : strip light 10 : subsidiary light 11 : spotlight 12 : front 13 : rear 14 : lower 15 : upper 17 : emergency 18 : bearing light 19 : horizontally disposed 20 : vertically disposed | false |
| colour | enumeration | 1..\* | 1 : white 2 : black 3 : red 4 : green 5 : blue 6 : yellow 7 : grey 8 : brown 9 : amber 10 : violet 11 : orange 12 : magenta 13 : pink | false |
| exhibitionConditionOfLight | enumeration | 0..1 | 1 : light shown without change of character 2 : daytime light 3 : fog light 4 : night light | false |
| height | real | 0..1 |  | false |
| lightCharacteristic | enumeration | 1..1 | 1 : fixed 2 : flashing 3 : long-flashing 4 : quick-flashing 5 : very quick flashing 6 : ultra quick flashing 7 : isophased 8 : occulting 9 : interrupted quick flashing 10 : interrupted very quick flashing 11 : interrupted ultra quick flashing 12 : morse 13 : fixed/flash 14 : flash/long-flash 15 : occulting/flash 16 : fixed/long-flash 17 : occulting alternating 18 : long-flash alternating 19 : flash alternating 25 : quick-flash plus long-flash 26 : very quick-flash plus long-flash 27 : ultra quick-flash plus long-flash 28 : alternating 29 : fixed and alternating flashing | false |
| lightVisibility | enumeration | 0..\* | 1 : high intensity 2 : low intensity 3 : faint 4 : intensified 5 : unintensified 6 : visibility deliberately restricted 7 : obscured 8 : partially obscured 9 : visible in line of range | false |
| marksNavigationalSystemOf | enumeration | 0..1 | 1 : IALA A 2 : IALA B 9 : no system 10 : other system | false |
| multiplicityOfLights | integer | 0..1 |  | false |
| objectName | text | 0..1 |  | false |
| objectNameInNationalLanguage | text | 0..1 |  | false |
| orientation | real | 0..1 |  | false |
| sectorLimitOne | real | 0..1 |  | false |
| sectorLimitTwo | real | 0..1 |  | false |
| signalGroup | text | 0..1 |  | false |
| signalPeriod | real | 0..1 |  | false |
| status | enumeration | 0..\* | 1 : permanent 2 : occasional 3 : recommended 4 : not in use 5 : periodic/intermittent 6 : reserved 7 : temporary 8 : private 9 : mandatory 11 : extinguished 12 : illuminated 13 : historic 14 : public 15 : synchronized 16 : watched 17 : un-watched 18 : existence doubtful 29 : confirmed 30 : candidate 31 : under modification 32 : candidate for modification 33 : under removal/deletion 34 : removed/deleted | false |
| verticalUncertainty | real | 0..1 |  | false |
| verticalLength | real | 0..1 |  | false |
| verticalDatum | enumeration | 0..1 | 1 : mean low water springs 2 : mean lower low water springs 3 : mean sea level 4 : lowest low water 5 : mean low water 6 : lowest low water springs 7 : approximate mean low water springs 8 : Indian spring low water 9 : low water springs 10 : approximate lowest astronomical tide 11 : nearly lowest low water 12 : mean lower low water 13 : low water 14 : approximate mean low water 15 : approximate mean lower low water 16 : mean high water 17 : mean high water springs 18 : high water 19 : approximate mean sea level 20 : high water springs 21 : mean higher high water 22 : equinoctial spring low water 23 : lowest astronomical tide 24 : local datum 25 : international great lakes datum 1985 26 : mean water level 27 : lower low water large tide 28 : higher high water large tide 29 : nearly highest high water 30 : highest astronomical tide (HAT) | false |
| typeOfLight | text | 0..1 |  | false |
| typeOfBattery | text | 0..1 |  | false |
| valueOfGeographicalRange | text | 0..1 |  | false |
| valueOfLuminousRange | text | 0..1 |  | false |
| remoteMonitoringSystem | text | 0..\* |  | false |
| remotelyMonitored | boolean | 0..1 |  | false |
| idCode | text | 1..1 |  | false |
| dateEnd | S100\_TruncatedDate | 0..1 |  | false |
| dateStart | S100\_TruncatedDate | 0..1 |  | false |
| periodicDateEnd | S100\_TruncatedDate | 0..1 |  | false |
| periodicDateStart | S100\_TruncatedDate | 0..1 |  | false |
| information | text | 0..\* |  | false |
| informationInNationalLanguage | text | 0..\* |  | false |
| textualDescription | text | 0..1 |  | false |
| textualDescriptionInNationalLanguage | text | 0..1 |  | false |
| scaleMinimum | integer | 0..1 |  | false |
| sourceDate | text | 0..1 |  | false |
| sourceIndication | text | 0..1 |  | false |
| pictorialRepresentation | text | 0..1 |  | false |
| inspectionFrequency | text | 0..1 |  | false |
| inspectionRequirements | text | 0..1 |  | false |
| atoNMaintenanceRecord | text | 0..1 |  | false |
| installationDate | S100\_TruncatedDate | 0..1 |  | false |

Information bindings

(Bindings are also inherited from super-types, if any.)

(No local bindings, but may inherit bindings from super-types, if any)

Feature bindings

(Bindings are also inherited from super-types, if any.)

(No local bindings, but will inherit super-type bindings if any)

## 9.21 Fog signal

Name: Fog signal  
Definition: A warning signal transmitted by a vessel, or aid to navigation, during periods of low visibility. Also, the device producing such a signal.  
Code: 'FogSignal'  
Remarks:   
Aliases: FOGSIG Supertype: Equipment  
Feature use type: geographic  
Permitted primitives: point

Attribute Bindings

| Attribute | Type | Mult. | Permitted Values | Sequential |
| --- | --- | --- | --- | --- |
| categoryOfFogSignal | enumeration | 1..1 | 1 : explosive 2 : diaphone 3 : siren 4 : nautophone 5 : reed 6 : tyfon 7 : bell 8 : whistle 9 : gong 10 : horn | false |
| signalFrequency | integer | 0..1 |  | false |
| signalGeneration | enumeration | 0..1 | 1 : automatically 2 : by wave action 3 : by hand 4 : by wind | false |
| signalGroup | text | 0..1 |  | false |
| signalPeriod | real | 0..1 |  | false |
| signalSequence | text | 0..1 |  | false |
| status | enumeration | 0..\* | 1 : permanent 2 : occasional 3 : recommended 4 : not in use 5 : periodic/intermittent 6 : reserved 7 : temporary 8 : private 9 : mandatory 11 : extinguished 12 : illuminated 13 : historic 14 : public 15 : synchronized 16 : watched 17 : un-watched 18 : existence doubtful 29 : confirmed 30 : candidate 31 : under modification 32 : candidate for modification 33 : under removal/deletion 34 : removed/deleted | false |
| valueOfMaximumRange | real | 0..1 |  | false |
| signalOutput | real | 0..1 |  | false |
| typeOfBattery | text | 0..1 |  | false |
| remoteMonitoringSystem | text | 0..\* |  | false |
| remotelyMonitored | boolean | 0..1 |  | false |
| idCode | text | 1..1 |  | false |
| dateEnd | S100\_TruncatedDate | 0..1 |  | false |
| dateStart | S100\_TruncatedDate | 0..1 |  | false |
| periodicDateEnd | S100\_TruncatedDate | 0..1 |  | false |
| periodicDateStart | S100\_TruncatedDate | 0..1 |  | false |
| information | text | 0..\* |  | false |
| informationInNationalLanguage | text | 0..\* |  | false |
| textualDescription | text | 0..1 |  | false |
| textualDescriptionInNationalLanguage | text | 0..1 |  | false |
| scaleMinimum | integer | 0..1 |  | false |
| sourceDate | text | 0..1 |  | false |
| sourceIndication | text | 0..1 |  | false |
| pictorialRepresentation | text | 0..1 |  | false |
| inspectionFrequency | text | 0..1 |  | false |
| inspectionRequirements | text | 0..1 |  | false |
| atoNMaintenanceRecord | text | 0..1 |  | false |
| installationDate | S100\_TruncatedDate | 0..1 |  | false |

Information bindings

(Bindings are also inherited from super-types, if any.)

(No local bindings, but may inherit bindings from super-types, if any)

Feature bindings

(Bindings are also inherited from super-types, if any.)

(No local bindings, but will inherit super-type bindings if any)

## 9.22 Retro-reflector

Name: Retro-reflector  
Definition: A means of distinguishing unlighted marks at night. Retro-reflective material is secured to the mark in a particular pattern to reflect back light.  
Code: 'RetroReflector'  
Remarks: The body carrying the retro-reflector is a separate object.  
Aliases: RETRFL Supertype: Equipment  
Feature use type: geographic  
Permitted primitives: point

Attribute Bindings

| Attribute | Type | Mult. | Permitted Values | Sequential |
| --- | --- | --- | --- | --- |
| colour | enumeration | 0..\* | 1 : white 2 : black 3 : red 4 : green 5 : blue 6 : yellow 7 : grey 8 : brown 9 : amber 10 : violet 11 : orange 12 : magenta 13 : pink | false |
| colourPattern | enumeration | 0..1 | 1 : horizontal stripes 2 : vertical stripes 3 : diagonal stripes 4 : squared 5 : stripes (direction unknown) 6 : border stripe 7 : single colour 8 : rectangle 9 : triangle | false |
| height | real | 0..1 |  | false |
| marksNavigationalSystemOf | enumeration | 0..1 | 1 : IALA A 2 : IALA B 9 : no system 10 : other system | false |
| status | enumeration | 0..\* | 1 : permanent 2 : occasional 3 : recommended 4 : not in use 5 : periodic/intermittent 6 : reserved 7 : temporary 8 : private 9 : mandatory 11 : extinguished 12 : illuminated 13 : historic 14 : public 15 : synchronized 16 : watched 17 : un-watched 18 : existence doubtful 29 : confirmed 30 : candidate 31 : under modification 32 : candidate for modification 33 : under removal/deletion 34 : removed/deleted | false |
| verticalUncertainty | real | 0..1 |  | false |
| verticalDatum | enumeration | 0..1 | 1 : mean low water springs 2 : mean lower low water springs 3 : mean sea level 4 : lowest low water 5 : mean low water 6 : lowest low water springs 7 : approximate mean low water springs 8 : Indian spring low water 9 : low water springs 10 : approximate lowest astronomical tide 11 : nearly lowest low water 12 : mean lower low water 13 : low water 14 : approximate mean low water 15 : approximate mean lower low water 16 : mean high water 17 : mean high water springs 18 : high water 19 : approximate mean sea level 20 : high water springs 21 : mean higher high water 22 : equinoctial spring low water 23 : lowest astronomical tide 24 : local datum 25 : international great lakes datum 1985 26 : mean water level 27 : lower low water large tide 28 : higher high water large tide 29 : nearly highest high water 30 : highest astronomical tide (HAT) | false |
| remoteMonitoringSystem | text | 0..\* |  | false |
| remotelyMonitored | boolean | 0..1 |  | false |
| idCode | text | 1..1 |  | false |
| dateEnd | S100\_TruncatedDate | 0..1 |  | false |
| dateStart | S100\_TruncatedDate | 0..1 |  | false |
| periodicDateEnd | S100\_TruncatedDate | 0..1 |  | false |
| periodicDateStart | S100\_TruncatedDate | 0..1 |  | false |
| information | text | 0..\* |  | false |
| informationInNationalLanguage | text | 0..\* |  | false |
| textualDescription | text | 0..1 |  | false |
| textualDescriptionInNationalLanguage | text | 0..1 |  | false |
| scaleMinimum | integer | 0..1 |  | false |
| sourceDate | text | 0..1 |  | false |
| sourceIndication | text | 0..1 |  | false |
| pictorialRepresentation | text | 0..1 |  | false |
| inspectionFrequency | text | 0..1 |  | false |
| inspectionRequirements | text | 0..1 |  | false |
| atoNMaintenanceRecord | text | 0..1 |  | false |
| installationDate | S100\_TruncatedDate | 0..1 |  | false |

Information bindings

(Bindings are also inherited from super-types, if any.)

(No local bindings, but may inherit bindings from super-types, if any)

Feature bindings

(Bindings are also inherited from super-types, if any.)

(No local bindings, but will inherit super-type bindings if any)

## 9.23 Radar reflector

Name: Radar reflector  
Definition: A device capable of, or intended for, reflecting radar signals.  
Code: 'RadarReflector'  
Remarks: A radar reflector is usually a tetrahedron or pentagonal corner reflector to facilitate reflection towards the sender.(International Maritime Dictionary, 2nd Ed.). The object 'radar reflector' is only used to encode a device specifically intended to reflect radar signals. If any other object, e.g. topmark, buoy, beacon, etc. is radar conspicuous, because of its construction, the attribute 'CONRAD' must be used.  
Aliases: RADRFL Supertype: Equipment  
Feature use type: geographic  
Permitted primitives: point

Attribute Bindings

| Attribute | Type | Mult. | Permitted Values | Sequential |
| --- | --- | --- | --- | --- |
| height | real | 0..1 |  | false |
| status | enumeration | 0..\* | 1 : permanent 2 : occasional 3 : recommended 4 : not in use 5 : periodic/intermittent 6 : reserved 7 : temporary 8 : private 9 : mandatory 11 : extinguished 12 : illuminated 13 : historic 14 : public 15 : synchronized 16 : watched 17 : un-watched 18 : existence doubtful 29 : confirmed 30 : candidate 31 : under modification 32 : candidate for modification 33 : under removal/deletion 34 : removed/deleted | false |
| verticalUncertainty | real | 0..1 |  | false |
| verticalDatum | enumeration | 0..1 | 1 : mean low water springs 2 : mean lower low water springs 3 : mean sea level 4 : lowest low water 5 : mean low water 6 : lowest low water springs 7 : approximate mean low water springs 8 : Indian spring low water 9 : low water springs 10 : approximate lowest astronomical tide 11 : nearly lowest low water 12 : mean lower low water 13 : low water 14 : approximate mean low water 15 : approximate mean lower low water 16 : mean high water 17 : mean high water springs 18 : high water 19 : approximate mean sea level 20 : high water springs 21 : mean higher high water 22 : equinoctial spring low water 23 : lowest astronomical tide 24 : local datum 25 : international great lakes datum 1985 26 : mean water level 27 : lower low water large tide 28 : higher high water large tide 29 : nearly highest high water 30 : highest astronomical tide (HAT) | false |
| remoteMonitoringSystem | text | 0..\* |  | false |
| remotelyMonitored | boolean | 0..1 |  | false |
| idCode | text | 1..1 |  | false |
| dateEnd | S100\_TruncatedDate | 0..1 |  | false |
| dateStart | S100\_TruncatedDate | 0..1 |  | false |
| periodicDateEnd | S100\_TruncatedDate | 0..1 |  | false |
| periodicDateStart | S100\_TruncatedDate | 0..1 |  | false |
| information | text | 0..\* |  | false |
| informationInNationalLanguage | text | 0..\* |  | false |
| textualDescription | text | 0..1 |  | false |
| textualDescriptionInNationalLanguage | text | 0..1 |  | false |
| scaleMinimum | integer | 0..1 |  | false |
| sourceDate | text | 0..1 |  | false |
| sourceIndication | text | 0..1 |  | false |
| pictorialRepresentation | text | 0..1 |  | false |
| inspectionFrequency | text | 0..1 |  | false |
| inspectionRequirements | text | 0..1 |  | false |
| atoNMaintenanceRecord | text | 0..1 |  | false |
| installationDate | S100\_TruncatedDate | 0..1 |  | false |

Information bindings

(Bindings are also inherited from super-types, if any.)

(No local bindings, but may inherit bindings from super-types, if any)

Feature bindings

(Bindings are also inherited from super-types, if any.)

(No local bindings, but will inherit super-type bindings if any)

## 9.24 Environment Observation Equipment

Name: Environment Observation Equipment  
Definition: *Definition required*  
Code: 'EnvironmentObservationEquipment'  
Remarks:   
Aliases: (none) Supertype: Equipment  
Feature use type: geographic  
Permitted primitives: point

Attribute Bindings

| Attribute | Type | Mult. | Permitted Values | Sequential |
| --- | --- | --- | --- | --- |
| height | real | 0..1 |  | false |
| status | enumeration | 0..\* | 1 : permanent 2 : occasional 3 : recommended 4 : not in use 5 : periodic/intermittent 6 : reserved 7 : temporary 8 : private 9 : mandatory 11 : extinguished 12 : illuminated 13 : historic 14 : public 15 : synchronized 16 : watched 17 : un-watched 18 : existence doubtful 29 : confirmed 30 : candidate 31 : under modification 32 : candidate for modification 33 : under removal/deletion 34 : removed/deleted | false |
| typeOfEnvironmentObservationEquipment | text | 1..\* |  | false |
| typeOfBattery | text | 0..1 |  | false |
| remoteMonitoringSystem | text | 0..\* |  | false |
| remotelyMonitored | boolean | 0..1 |  | false |
| idCode | text | 1..1 |  | false |
| dateEnd | S100\_TruncatedDate | 0..1 |  | false |
| dateStart | S100\_TruncatedDate | 0..1 |  | false |
| periodicDateEnd | S100\_TruncatedDate | 0..1 |  | false |
| periodicDateStart | S100\_TruncatedDate | 0..1 |  | false |
| information | text | 0..\* |  | false |
| informationInNationalLanguage | text | 0..\* |  | false |
| textualDescription | text | 0..1 |  | false |
| textualDescriptionInNationalLanguage | text | 0..1 |  | false |
| scaleMinimum | integer | 0..1 |  | false |
| sourceDate | text | 0..1 |  | false |
| sourceIndication | text | 0..1 |  | false |
| pictorialRepresentation | text | 0..1 |  | false |
| inspectionFrequency | text | 0..1 |  | false |
| inspectionRequirements | text | 0..1 |  | false |
| atoNMaintenanceRecord | text | 0..1 |  | false |
| installationDate | S100\_TruncatedDate | 0..1 |  | false |

Information bindings

(Bindings are also inherited from super-types, if any.)

(No local bindings, but may inherit bindings from super-types, if any)

Feature bindings

(Bindings are also inherited from super-types, if any.)

(No local bindings, but will inherit super-type bindings if any)

## 9.25 Daymark

Name: Daymark  
Definition: The identifying characteristics of an aid to navigation which serve to facilitate its recognition against a daylight viewing background.  
Code: 'Daymark'  
Remarks: On those structures that do not by themselves present an adequate viewing area to be seen at the required distance, the aid is made more visible by affixing a daymark to the structure. A daymark so affixed has a distinctive colour and shape depending on the purpose of the aid.  
Aliases: DAYMAR Supertype: Equipment  
Feature use type: geographic  
Permitted primitives: point

Attribute Bindings

| Attribute | Type | Mult. | Permitted Values | Sequential |
| --- | --- | --- | --- | --- |
| categoryOfSpecialPurposeMark | enumeration | 0..\* | 1 : firing danger mark 2 : target mark 3 : marker ship mark 4 : degaussing range mark 5 : barge mark 6 : cable mark 7 : spoil ground mark 8 : outfall mark 9 : ODAS 10 : recording mark 11 : seaplane anchorage mark 12 : recreation zone mark 13 : private mark 14 : mooring mark 15 : LANBY 16 : leading mark 17 : measured distance mark 18 : notice mark 19 : TSS mark 20 : anchoring prohibited mark 21 : berthing prohibited mark 22 : overtaking prohibited mark 23 : two-way traffic prohibited mark 24 : "reduced wake" mark 25 : speed limit mark 26 : stop mark 27 : general warning mark 28 : "sound ships siren" mark 29 : restricted vertical clearance mark 30 : maximum vessel's draught mark 31 : restricted horizontal clearance mark 32 : strong current warning mark 33 : berthing permitted mark 34 : overhead power cable mark 35 : "channel edge gradient" mark 36 : telephone mark 37 : ferry crossing mark 39 : pipeline mark 40 : anchorage mark 41 : clearing mark 42 : control mark 43 : diving mark 44 : refuge beacon 45 : foul ground mark 46 : yachting mark 47 : heliport mark 48 : GNSS mark 49 : seaplane landing mark 50 : entry prohibited mark 51 : work in progress mark 52 : mark with unknown purpose 53 : wellhead mark 54 : channel separation mark 55 : marine farm mark 56 : artificial reef mark 64 : jetski prohibited | false |
| colour | enumeration | 1..\* | 1 : white 2 : black 3 : red 4 : green 5 : blue 6 : yellow 7 : grey 8 : brown 9 : amber 10 : violet 11 : orange 12 : magenta 13 : pink | false |
| colourPattern | enumeration | 0..1 | 1 : horizontal stripes 2 : vertical stripes 3 : diagonal stripes 4 : squared 5 : stripes (direction unknown) 6 : border stripe 7 : single colour 8 : rectangle 9 : triangle | false |
| elevation | real | 0..1 |  | false |
| height | real | 0..1 |  | false |
| natureOfConstruction | enumeration | 0..\* | 1 : masonry 2 : concreted 3 : loose boulders 4 : hard surface 5 : unsurfaced 6 : wooden 7 : metal 8 : glass reinforced plastic (GRP) 9 : painted 13 : fiberglass 14 : plastic | false |
| objectName | text | 0..1 |  | false |
| objectNameInNationalLanguage | text | 0..1 |  | false |
| status | enumeration | 0..\* | 1 : permanent 2 : occasional 3 : recommended 4 : not in use 5 : periodic/intermittent 6 : reserved 7 : temporary 8 : private 9 : mandatory 11 : extinguished 12 : illuminated 13 : historic 14 : public 15 : synchronized 16 : watched 17 : un-watched 18 : existence doubtful 29 : confirmed 30 : candidate 31 : under modification 32 : candidate for modification 33 : under removal/deletion 34 : removed/deleted | false |
| topmarkDaymarkShape | enumeration | 1..1 | 1 : cone, point up 2 : cone, point down 3 : sphere 4 : 2 spheres 5 : cylinder (can) 6 : board 7 : x-shape (St. Andrew's cross) 8 : upright cross (St. George's Cross) 9 : cube, point up 10 : 2 cones, point to point 11 : 2 cones, base to base 12 : rhombus 13 : 2 cones (points upward) 14 : 2 cones (points downward) 15 : besom, point up (broom or perch) 16 : besom, point down (broom or perch) 17 : flag 18 : sphere over rhombus 19 : square 20 : rectangle, horizontal 21 : rectangle, vertical 22 : trapezium, up 23 : trapezium, down 24 : triangle, point up 25 : triangle, point down 26 : circle 27 : two upright crosses (one over the other) 28 : T-shape 29 : triangle pointing up over a circle 30 : upright cross over a circle 31 : rhombus over a circle 32 : circle over a triangle pointing up 33 : other shape (see INFORM) 34 : tubular | false |
| verticalUncertainty | real | 0..1 |  | false |
| verticalDatum | enumeration | 0..1 | 1 : mean low water springs 2 : mean lower low water springs 3 : mean sea level 4 : lowest low water 5 : mean low water 6 : lowest low water springs 7 : approximate mean low water springs 8 : Indian spring low water 9 : low water springs 10 : approximate lowest astronomical tide 11 : nearly lowest low water 12 : mean lower low water 13 : low water 14 : approximate mean low water 15 : approximate mean lower low water 16 : mean high water 17 : mean high water springs 18 : high water 19 : approximate mean sea level 20 : high water springs 21 : mean higher high water 22 : equinoctial spring low water 23 : lowest astronomical tide 24 : local datum 25 : international great lakes datum 1985 26 : mean water level 27 : lower low water large tide 28 : higher high water large tide 29 : nearly highest high water 30 : highest astronomical tide (HAT) | false |
| verticalLength | real | 0..1 |  | false |
| remoteMonitoringSystem | text | 0..\* |  | false |
| remotelyMonitored | boolean | 0..1 |  | false |
| idCode | text | 1..1 |  | false |
| dateEnd | S100\_TruncatedDate | 0..1 |  | false |
| dateStart | S100\_TruncatedDate | 0..1 |  | false |
| periodicDateEnd | S100\_TruncatedDate | 0..1 |  | false |
| periodicDateStart | S100\_TruncatedDate | 0..1 |  | false |
| information | text | 0..\* |  | false |
| informationInNationalLanguage | text | 0..\* |  | false |
| textualDescription | text | 0..1 |  | false |
| textualDescriptionInNationalLanguage | text | 0..1 |  | false |
| scaleMinimum | integer | 0..1 |  | false |
| sourceDate | text | 0..1 |  | false |
| sourceIndication | text | 0..1 |  | false |
| pictorialRepresentation | text | 0..1 |  | false |
| inspectionFrequency | text | 0..1 |  | false |
| inspectionRequirements | text | 0..1 |  | false |
| atoNMaintenanceRecord | text | 0..1 |  | false |
| installationDate | S100\_TruncatedDate | 0..1 |  | false |

Information bindings

(Bindings are also inherited from super-types, if any.)

(No local bindings, but may inherit bindings from super-types, if any)

Feature bindings

(Bindings are also inherited from super-types, if any.)

| Assoc. type | Mult. | Name of association | Role of assoc. target | Name of target class |
| --- | --- | --- | --- | --- |
| association | 0..\* | StructureEquipment | child | Equipment |

## 9.26 Radar transponder beacon

Name: Radar transponder beacon  
Definition: A transponder beacon transmitting a coded signal on radar frequency, permitting an interrogating craft to determine the bearing and range of the transponder.  
Code: 'RadarTransponderBeacon'  
Remarks: The object class 'radar transponder beacon' is only used to encode the technical equipment independent of the structure on which it is located (e.g. a beacon, light-vessel or tower).  
Aliases: RTPBCN Supertype: Equipment  
Feature use type: geographic  
Permitted primitives: point

Attribute Bindings

| Attribute | Type | Mult. | Permitted Values | Sequential |
| --- | --- | --- | --- | --- |
| categoryOfRadarTransponderBeacon | enumeration | 1..1 | 1 : ramark, radar beacon transmitting continuously 2 : racon, radar transponder beacon 3 : leading racon/radar transponder beacon | false |
| objectName | text | 0..1 |  | false |
| objectNameInNationalLanguage | text | 0..1 |  | false |
| radarWaveLength | text | 0..1 |  | false |
| sectorLimitOne | real | 0..1 |  | false |
| sectorLimitTwo | real | 0..1 |  | false |
| signalGroup | text | 0..1 |  | false |
| signalSequence | text | 0..1 |  | false |
| status | enumeration | 0..\* | 1 : permanent 2 : occasional 3 : recommended 4 : not in use 5 : periodic/intermittent 6 : reserved 7 : temporary 8 : private 9 : mandatory 11 : extinguished 12 : illuminated 13 : historic 14 : public 15 : synchronized 16 : watched 17 : un-watched 18 : existence doubtful 29 : confirmed 30 : candidate 31 : under modification 32 : candidate for modification 33 : under removal/deletion 34 : removed/deleted | false |
| valueOfNominalRange | real | 0..1 |  | false |
| typeOfBattery | text | 0..1 |  | false |
| remoteMonitoringSystem | text | 0..\* |  | false |
| remotelyMonitored | boolean | 0..1 |  | false |
| idCode | text | 1..1 |  | false |
| dateEnd | S100\_TruncatedDate | 0..1 |  | false |
| dateStart | S100\_TruncatedDate | 0..1 |  | false |
| periodicDateEnd | S100\_TruncatedDate | 0..1 |  | false |
| periodicDateStart | S100\_TruncatedDate | 0..1 |  | false |
| information | text | 0..\* |  | false |
| informationInNationalLanguage | text | 0..\* |  | false |
| textualDescription | text | 0..1 |  | false |
| textualDescriptionInNationalLanguage | text | 0..1 |  | false |
| scaleMinimum | integer | 0..1 |  | false |
| sourceDate | text | 0..1 |  | false |
| sourceIndication | text | 0..1 |  | false |
| pictorialRepresentation | text | 0..1 |  | false |
| inspectionFrequency | text | 0..1 |  | false |
| inspectionRequirements | text | 0..1 |  | false |
| atoNMaintenanceRecord | text | 0..1 |  | false |
| installationDate | S100\_TruncatedDate | 0..1 |  | false |

Information bindings

(Bindings are also inherited from super-types, if any.)

(No local bindings, but may inherit bindings from super-types, if any)

Feature bindings

(Bindings are also inherited from super-types, if any.)

(No local bindings, but will inherit super-type bindings if any)

## 9.27 Recommended track

Name: Recommended track  
Definition: A track recommended to all or only certain vessels.  
Code: 'RecommendedTrack'  
Remarks: Recommended tracks include all channels recommended for hydrographic reasons to lead safely between shoal depths. The use of such tracks is generally left to the discretion of the mariner and will depend on the vessel's draught, the state of the tide, adequacy of navigational aids and so on (IHO Chart Specifications, M-4). The recommended track is that portion of a 'navigation line' that a ship should use for navigation. In the case of a two-way recommended track only one value of orientation is encoded (in the attribute ORIENT); the other value can be deduced (i.e. the value in ORIENT + 180 degrees).  
Aliases: RECTRC Supertype: AidsToNavigation  
Feature use type: geographic  
Permitted primitives: curve surface

Attribute Bindings

| Attribute | Type | Mult. | Permitted Values | Sequential |
| --- | --- | --- | --- | --- |
| categoryOfRecommendedTrack | enumeration | 1..1 | 1 : based on a system of fixed marks 2 : not based on a system of fixed marks | false |
| depthRangeMaximumValue | real | 0..1 |  | false |
| depthRangeMinimumValue | real | 0..1 |  | false |
| objectName | text | 0..1 |  | false |
| objectNameInNationalLanguage | text | 0..1 |  | false |
| qualityOfSoundingMeasurement | enumeration | 0..\* | 1 : depth known 2 : depth or least depth unknown 3 : doubtful sounding 4 : unreliable sounding 5 : no bottom found at value shown 6 : least depth known 7 : least depth unknown, safe clearance at depth shown 8 : value reported (not surveyed) 9 : value reported (not confirmed) 10 : maintained depth 11 : not regularly maintained | false |
| soundingUncertainty | real | 0..1 |  | false |
| status | enumeration | 0..\* | 1 : permanent 2 : occasional 3 : recommended 4 : not in use 5 : periodic/intermittent 6 : reserved 7 : temporary 8 : private 9 : mandatory 11 : extinguished 12 : illuminated 13 : historic 14 : public 15 : synchronized 16 : watched 17 : un-watched 18 : existence doubtful 29 : confirmed 30 : candidate 31 : under modification 32 : candidate for modification 33 : under removal/deletion 34 : removed/deleted | false |
| techniqueOfSoundingMeasurement | enumeration | 0..\* | 1 : found by echo-sounder 2 : found by side-scan-sonar 3 : found by multi-beam 4 : found by diver 5 : found by lead-line 6 : swept by wire-drag 7 : found by laser 8 : swept by vertical acoustic system 9 : found by electromagnetic sensor 10 : photogrammetry 11 : satellite imagery 12 : found by levelling 13 : swept by side-scan-sonar 14 : computer generated | false |
| trafficFlow | enumeration | 0..1 | 1 : inbound 2 : outbound 3 : one-way 4 : two-way | false |
| verticalDatum | enumeration | 0..1 | 1 : mean low water springs 2 : mean lower low water springs 3 : mean sea level 4 : lowest low water 5 : mean low water 6 : lowest low water springs 7 : approximate mean low water springs 8 : Indian spring low water 9 : low water springs 10 : approximate lowest astronomical tide 11 : nearly lowest low water 12 : mean lower low water 13 : low water 14 : approximate mean low water 15 : approximate mean lower low water 16 : mean high water 17 : mean high water springs 18 : high water 19 : approximate mean sea level 20 : high water springs 21 : mean higher high water 22 : equinoctial spring low water 23 : lowest astronomical tide 24 : local datum 25 : international great lakes datum 1985 26 : mean water level 27 : lower low water large tide 28 : higher high water large tide 29 : nearly highest high water 30 : highest astronomical tide (HAT) | false |
| idCode | text | 1..1 |  | false |
| dateEnd | S100\_TruncatedDate | 0..1 |  | false |
| dateStart | S100\_TruncatedDate | 0..1 |  | false |
| periodicDateEnd | S100\_TruncatedDate | 0..1 |  | false |
| periodicDateStart | S100\_TruncatedDate | 0..1 |  | false |
| information | text | 0..\* |  | false |
| informationInNationalLanguage | text | 0..\* |  | false |
| textualDescription | text | 0..1 |  | false |
| textualDescriptionInNationalLanguage | text | 0..1 |  | false |
| scaleMinimum | integer | 0..1 |  | false |
| sourceDate | text | 0..1 |  | false |
| sourceIndication | text | 0..1 |  | false |
| pictorialRepresentation | text | 0..1 |  | false |
| inspectionFrequency | text | 0..1 |  | false |
| inspectionRequirements | text | 0..1 |  | false |
| atoNMaintenanceRecord | text | 0..1 |  | false |
| installationDate | S100\_TruncatedDate | 0..1 |  | false |

Information bindings

(Bindings are also inherited from super-types, if any.)

(No local bindings, but may inherit bindings from super-types, if any)

Feature bindings

(Bindings are also inherited from super-types, if any.)

| Assoc. type | Mult. | Name of association | Role of assoc. target | Name of target class |
| --- | --- | --- | --- | --- |
| association | 1..\* | RangeSystem | navigationLine | NavigationLine |

## 9.28 Navigation line

Name: Navigation line  
Definition: A navigation line is a straight line extending towards an area of navigational interest and generally generated by two navigational aids or one navigational aid and a bearing.  
Code: 'NavigationLine'  
Remarks: The extent of the navigation line depends on the visibility of the navigational aid(s). The attribute 'orientation' (ORIENT) specifies the orientation of the navigation line measured from the water towards the navigational aid(s). The recommended track is that portion of a 'navigation line' that a ship should use for navigation.  
Aliases: NAVLNE Supertype: AidsToNavigation  
Feature use type: geographic  
Permitted primitives: curve

Attribute Bindings

| Attribute | Type | Mult. | Permitted Values | Sequential |
| --- | --- | --- | --- | --- |
| categoryOfNavigationLine | enumeration | 1..1 | 1 : clearing line 2 : transit line 3 : leading line bearing a recommended track | false |
| orientation | real | 1..1 |  | false |
| status | enumeration | 0..\* | 1 : permanent 2 : occasional 3 : recommended 4 : not in use 5 : periodic/intermittent 6 : reserved 7 : temporary 8 : private 9 : mandatory 11 : extinguished 12 : illuminated 13 : historic 14 : public 15 : synchronized 16 : watched 17 : un-watched 18 : existence doubtful 29 : confirmed 30 : candidate 31 : under modification 32 : candidate for modification 33 : under removal/deletion 34 : removed/deleted | false |
| idCode | text | 1..1 |  | false |
| dateEnd | S100\_TruncatedDate | 0..1 |  | false |
| dateStart | S100\_TruncatedDate | 0..1 |  | false |
| periodicDateEnd | S100\_TruncatedDate | 0..1 |  | false |
| periodicDateStart | S100\_TruncatedDate | 0..1 |  | false |
| information | text | 0..\* |  | false |
| informationInNationalLanguage | text | 0..\* |  | false |
| textualDescription | text | 0..1 |  | false |
| textualDescriptionInNationalLanguage | text | 0..1 |  | false |
| scaleMinimum | integer | 0..1 |  | false |
| sourceDate | text | 0..1 |  | false |
| sourceIndication | text | 0..1 |  | false |
| pictorialRepresentation | text | 0..1 |  | false |
| inspectionFrequency | text | 0..1 |  | false |
| inspectionRequirements | text | 0..1 |  | false |
| atoNMaintenanceRecord | text | 0..1 |  | false |
| installationDate | S100\_TruncatedDate | 0..1 |  | false |

Information bindings

(Bindings are also inherited from super-types, if any.)

(No local bindings, but may inherit bindings from super-types, if any)

Feature bindings

(Bindings are also inherited from super-types, if any.)

| Assoc. type | Mult. | Name of association | Role of assoc. target | Name of target class |
| --- | --- | --- | --- | --- |
| association | 0..\* | RangeSystem | navigableTrack | RecommendedTrack |

## 9.29 Aggregation

Name: Aggregation  
Definition: Used to identify an aggregation of two or more objects. This aggregation may be named.  
Code: 'Aggregation'  
Remarks: An aggregation could be used to combine objects that are related in some way (is-a-part-of, is-a-component-of) into a higher level object. For example: an aggregation relationship may be used to form a traffic separation scheme from traffic separation lane parts, boundaries, etc.  
Aliases: C\_AGGR  
Feature use type: geographic  
Permitted primitives: noGeometry

Attribute Bindings

| Attribute | Type | Mult. | Permitted Values | Sequential |
| --- | --- | --- | --- | --- |
| categoryOfAggregation | S100\_CodeList | 1..1 | 1 : leading line 2 : range system 3 : measured distance | false |

Information bindings

(Bindings are also inherited from super-types, if any.)

(No local bindings, but may inherit bindings from super-types, if any)

Feature bindings

(Bindings are also inherited from super-types, if any.)

| Assoc. type | Mult. | Name of association | Role of assoc. target | Name of target class |
| --- | --- | --- | --- | --- |
| association | 0..\* | Aggregations | peer | AidsToNavigation |

## 9.30 Association

Name: Association  
Definition: Used to identify an association between two or more objects. The association may be named.  
Code: 'Association'  
Remarks: For example, an association relationship may be used to indicate that a buoy marks a wreck.  
Aliases: C\_ASSO  
Feature use type: geographic  
Permitted primitives: noGeometry

Attribute Bindings

| Attribute | Type | Mult. | Permitted Values | Sequential |
| --- | --- | --- | --- | --- |
| categoryOfAssociation | S100\_CodeList | 1..1 | 1 : channel markings 2 : danger markings | false |

Information bindings

(Bindings are also inherited from super-types, if any.)

(No local bindings, but may inherit bindings from super-types, if any)

Feature bindings

(Bindings are also inherited from super-types, if any.)

| Assoc. type | Mult. | Name of association | Role of assoc. target | Name of target class |
| --- | --- | --- | --- | --- |
| association | 0..\* | Associations | peer | AidsToNavigation |

## 9.31 Data coverage

Name: Data coverage  
Definition: A geographical area that describes the coverage and extent of spatial types.  
Code: 'DataCoverage'  
Remarks: Manually added, and types of attribute max and min display scale changed to integer in accordance with latest guidance.  
Aliases: (none)  
Feature use type: meta  
Permitted primitives: surface

Attribute Bindings

| Attribute | Type | Mult. | Permitted Values | Sequential |
| --- | --- | --- | --- | --- |
| maximumDisplayScale | integer | 1..1 |  | false |
| minimumDisplayScale | integer | 1..1 |  | false |

Information bindings

(Bindings are also inherited from super-types, if any.)

(No local bindings, but may inherit bindings from super-types, if any)

Feature bindings

(Bindings are also inherited from super-types, if any.)

(No local bindings, but will inherit super-type bindings if any)

## 9.32 Navigational system of marks

Name: Navigational system of marks  
Definition: An area within which a specific system of navigational marks applies and/or a common direction of buoyage.  
Code: 'NavigationalSystemOfMarks'  
Remarks:   
Aliases: M\_NSYS  
Feature use type: meta  
Permitted primitives: surface

Attribute Bindings

| Attribute | Type | Mult. | Permitted Values | Sequential |
| --- | --- | --- | --- | --- |
| marksNavigationalSystemOf | enumeration | 1..1 | 1 : IALA A 2 : IALA B 9 : no system 10 : other system | false |

Information bindings

(Bindings are also inherited from super-types, if any.)

(No local bindings, but may inherit bindings from super-types, if any)

Feature bindings

(Bindings are also inherited from super-types, if any.)

(No local bindings, but will inherit super-type bindings if any)

## 9.33 Local Direction of Buoyage

Name: Local Direction of Buoyage  
Definition: *Definition required*  
Code: 'LocalDirectionOfBuoyage'  
Remarks:   
Aliases: (none)  
Feature use type: geographic  
Permitted primitives: surface

Attribute Bindings

| Attribute | Type | Mult. | Permitted Values | Sequential |
| --- | --- | --- | --- | --- |
| orientation | real | 1..1 |  | false |
| scaleMinimum | integer | 0..1 |  | false |

Information bindings

(Bindings are also inherited from super-types, if any.)

(No local bindings, but may inherit bindings from super-types, if any)

Feature bindings

(Bindings are also inherited from super-types, if any.)

(No local bindings, but will inherit super-type bindings if any)

## 9.34 Quality of NonBathymetric Data

Name: Quality of NonBathymetric Data  
Definition: *Definition required*  
Code: 'QualityOfNonBathymetricData'  
Remarks:   
Aliases: (none)  
Feature use type: meta  
Permitted primitives: surface

Attribute Bindings

| Attribute | Type | Mult. | Permitted Values | Sequential |
| --- | --- | --- | --- | --- |
| categoryOfTemporalVariation | enumeration | 1..1 | 1 : unassessed 2 : event 3 : likely to change 4 : likely to change but significant shoaling unlikely 5 : unlikely to change | false |
| directionUncertainty | real | 0..1 |  | false |
| horizontalDistanceUncertainty | real | 0..1 |  | false |
| horizontalPositionUncertainty | real | 1..1 |  | false |
| information | text | 0..1 |  | false |
| informationInNationalLanguage | text | 0..1 |  | false |
| textualDescription | text | 0..1 |  | false |
| textualDescriptionInNationalLanguage | text | 0..1 |  | false |
| verticalUncertainty | real | 0..1 |  | false |
| surveyDateRange | complex | 0..1 |  | false |

Information bindings

(Bindings are also inherited from super-types, if any.)

(No local bindings, but may inherit bindings from super-types, if any)

Feature bindings

(Bindings are also inherited from super-types, if any.)

(No local bindings, but will inherit super-type bindings if any)

## 9.35 Sounding datum

Name: Sounding datum  
Definition: An area of uniform sounding datum.  
Code: 'SoundingDatum'  
Remarks:   
Aliases: M\_SDAT  
Feature use type: meta  
Permitted primitives: surface

Attribute Bindings

| Attribute | Type | Mult. | Permitted Values | Sequential |
| --- | --- | --- | --- | --- |
| verticalDatum | enumeration | 1..1 | 1 : mean low water springs 2 : mean lower low water springs 3 : mean sea level 4 : lowest low water 5 : mean low water 6 : lowest low water springs 7 : approximate mean low water springs 8 : Indian spring low water 9 : low water springs 10 : approximate lowest astronomical tide 11 : nearly lowest low water 12 : mean lower low water 13 : low water 14 : approximate mean low water 15 : approximate mean lower low water 16 : mean high water 17 : mean high water springs 18 : high water 19 : approximate mean sea level 20 : high water springs 21 : mean higher high water 22 : equinoctial spring low water 23 : lowest astronomical tide 24 : local datum 25 : international great lakes datum 1985 26 : mean water level 27 : lower low water large tide 28 : higher high water large tide 29 : nearly highest high water 30 : highest astronomical tide (HAT) | false |

Information bindings

(Bindings are also inherited from super-types, if any.)

(No local bindings, but may inherit bindings from super-types, if any)

Feature bindings

(Bindings are also inherited from super-types, if any.)

(No local bindings, but will inherit super-type bindings if any)

## 9.36 Vertical datum of data

Name: Vertical datum of data  
Definition: Any level surface from which to reference elevations. Also called datum level, reference level, reference plane, levelling datum, datum for heights.  
Code: 'VerticalDatumOfData'  
Remarks:   
Aliases: M\_VDAT  
Feature use type: meta  
Permitted primitives: surface

Attribute Bindings

| Attribute | Type | Mult. | Permitted Values | Sequential |
| --- | --- | --- | --- | --- |
| verticalDatum | enumeration | 1..1 | 3 : mean sea level 16 : mean high water 17 : mean high water springs 18 : high water 19 : approximate mean sea level 20 : high water springs 21 : mean higher high water 24 : local datum 25 : international great lakes datum 1985 26 : mean water level 28 : higher high water large tide 29 : nearly highest high water 30 : highest astronomical tide (HAT) | false |

Information bindings

(Bindings are also inherited from super-types, if any.)

(No local bindings, but may inherit bindings from super-types, if any)

Feature bindings

(Bindings are also inherited from super-types, if any.)

(No local bindings, but will inherit super-type bindings if any)

## 9.37 Aids To Navigation

Name: Aids To Navigation Abstract type: true  
Definition: A visual, acoustical, or radio device, external to a ship, designed to assist in determining a safe course or a vessel's position, or to warn of dangers and/or obstructions. Aids to navigation usually include buoys, beacons, fog signals, lights, radio beacons, leading marks, radio position fixing systems and GNSS which are chart-related and assist safe navigation.  
Code: 'AidsToNavigation'  
Remarks: Abstract features are defined only in skeletal form in the catalogue, i.e., without attribute bindings. They are used to reduce the need to specify associations in their sub-types, since the number of such 'inline' association specifications is quite large for the Structure/Equipment associations. The attributes are defined within the non-abstract sub-types.  
Aliases: (none)  
Feature use type: geographic  
Permitted primitives: noGeometry

Attribute Bindings

(No local bindings, but will inherit bindings from super-types if any)

Information bindings

(Bindings are also inherited from super-types, if any.)

(No local bindings, but may inherit bindings from super-types, if any)

Feature bindings

(Bindings are also inherited from super-types, if any.)

| Assoc. type | Mult. | Name of association | Role of assoc. target | Name of target class |
| --- | --- | --- | --- | --- |
| association | 0..\* | Aggregations | peer | Aggregation |
| association | 0..\* | Associations | peer | Association |

## 9.38 Equipment

Name: Equipment Abstract type: true  
Definition: The implements used in an operation or activity.  
Code: 'Equipment'  
Remarks: Abstract features are defined only in skeletal form in the catalogue, i.e., without attribute bindings. They are used to reduce the need to specify associations in their sub-types, since the number of such 'inline' association specifications is quite large for the Structure/Equipment associations. The attributes are defined within the non-abstract sub-types.  
Aliases: (none) Supertype: AidsToNavigation  
Feature use type: geographic  
Permitted primitives: noGeometry

Attribute Bindings

(No local bindings, but will inherit bindings from super-types if any)

Information bindings

(Bindings are also inherited from super-types, if any.)

(No local bindings, but may inherit bindings from super-types, if any)

Feature bindings

(Bindings are also inherited from super-types, if any.)

| Assoc. type | Mult. | Name of association | Role of assoc. target | Name of target class |
| --- | --- | --- | --- | --- |
| association | 1..1 | StructureEquipment | parent | StructureObject |

## 9.39 Structure Object

Name: Structure Object Abstract type: true  
Definition: Something (such as a house, tower, bridge, etc.) that is built by putting parts together and that usually stands on its own.  
Code: 'StructureObject'  
Remarks: Abstract features are defined only in skeletal form in the catalogue, i.e., without attribute bindings. They are used to reduce the need to specify associations in their sub-types, since the number of such 'inline' association specifications is quite large for the Structure/Equipment associations. The attributes are defined within the non-abstract sub-types.  
Aliases: (none) Supertype: AidsToNavigation  
Feature use type: geographic  
Permitted primitives: noGeometry

Attribute Bindings

(No local bindings, but will inherit bindings from super-types if any)

Information bindings

(Bindings are also inherited from super-types, if any.)

(No local bindings, but may inherit bindings from super-types, if any)

Feature bindings

(Bindings are also inherited from super-types, if any.)

| Assoc. type | Mult. | Name of association | Role of assoc. target | Name of target class |
| --- | --- | --- | --- | --- |
| association | 0..\* | StructureEquipment | child | Equipment |

## 9.40 Generic Beacon

Name: Generic Beacon Abstract type: true  
Definition: A fixed artificial navigation mark that can be recognised by its shape, colour, pattern, topmark or light character, or a combination of these. It may carry various additional aids to navigation.  
Code: 'GenericBeacon'  
Remarks: Abstract features are defined only in skeletal form in the catalogue, i.e., without attribute bindings. They are used to reduce the need to specify associations in their sub-types, since the number of such 'inline' association specifications is quite large for the Structure/Equipment associations. The attributes are defined within the non-abstract sub-types.  
Aliases: (none) Supertype: StructureObject  
Feature use type: geographic  
Permitted primitives: noGeometry

Attribute Bindings

(No local bindings, but will inherit bindings from super-types if any)

Information bindings

(Bindings are also inherited from super-types, if any.)

(No local bindings, but may inherit bindings from super-types, if any)

Feature bindings

(Bindings are also inherited from super-types, if any.)

(No local bindings, but will inherit super-type bindings if any)

## 9.41 Generic Buoy

Name: Generic Buoy Abstract type: true  
Definition: A floating object moored to the bottom in a particular (charted) place, as an aid to navigation or for other specific purposes.  
Code: 'GenericBuoy'  
Remarks: Abstract features are defined only in skeletal form in the catalogue, i.e., without attribute bindings. They are used to reduce the need to specify associations in their sub-types, since the number of such 'inline' association specifications is quite large for the Structure/Equipment associations. The attributes are defined within the non-abstract sub-types.  
Aliases: (none) Supertype: StructureObject  
Feature use type: geographic  
Permitted primitives: noGeometry

Attribute Bindings

(No local bindings, but will inherit bindings from super-types if any)

Information bindings

(Bindings are also inherited from super-types, if any.)

(No local bindings, but may inherit bindings from super-types, if any)

Feature bindings

(Bindings are also inherited from super-types, if any.)

(No local bindings, but will inherit super-type bindings if any)