Marine Information Overlays
Ice Coverage

Portrayal

Edition 1.0

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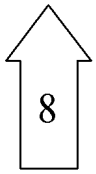
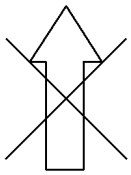
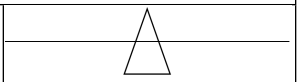
1. Introduction

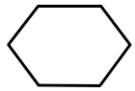
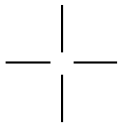
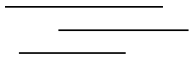
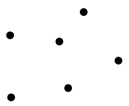
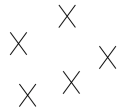
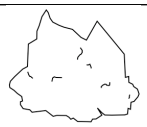
This document is intended to provide guidance for the Portrayal of Ice Coverage Marine Information Overlays (MIO). It is formatted as a supplemental addition to the IHO ECDIS presentation library and in this format is intended to be used in conjunction with S-52. However, it is recognised that not all systems use the strict S-52 rules as their presentation libraries and so it contains information on the size, shape and colour of symbols to be used. This should provide the software developer with the information they need to translate the relatively abstract description of an Ice MIO object into an effective ECDIS display.

This document is to be used in conjunction with the *Ice Coverage MIO Object Catalogue - Objects* & *Attributes* documents. Attribute conditions and combinations required for the correct display of objects are given. Developers using this guide will need to ensure they have covered every attribute combination possible.

This document assumes, that the reader fully understands the fundamentals of computer graphics and that he or she has carefully studied in advance the various standards for ECDIS, i.e., IHO S-52/S-57 (4,5,6,7) and IMO Performance Standard (3). Note that the Presentation Library does not cover all aspects of the ECDIS display. Therefore the IMO Performance Standard (3) as well as the C&S Specifications and IEC publication 61174 (9) must be studied.

2. Ice Coverage Marine Information Overlay Portrayal

Ice MIO Object	Primitive	Condition and/or S-52 rule	Symbol or Colour
icedft - Ice Drift	Ice Drift is shown as an outline arrow containing a digit. The direction of the arrow shows the direction of drift, the superimposed digit gives the forecast drift distance.		
	Point	*direction of arrow = ORIENT* *text = icedis*	
	Point	iceddr = 1 or 10 (ie ORIENT = UNKNOWN)	
brglne - Ice Berg Limit	Ice Berg Limit is a line overlaid by regulary spaced triangles. The direction of the triangles shows the direction of the ice.		
	Line	The ice is always to the left of the digitisation direction.	

Ice MIO Object	Primitive	Condition and/or S-52 rule	Symbol or Colour
seaice - Sea Ice	Sea Ice is portrayed using a combination of two attributes. The repeating pattern of the area shows the Ice Stage of development (icesod), the closer the pattern the denser the ice. The colour of the pattern shows the Total Ice Concentration (iceact). There is one special case for Fast Ice (iceflz=9) where it is always shown and takes precedence over other attributes.		
	Area - Pattern Symbol	icesod = 80 or 81 or 82 or 83 or 84 or 85 80 = 18mm spacing 81 = 15 mm 82 = 12 mm 83 = 9 mm 84 = 6 mm 85 = 3 mm	
		icesod = 86 or 87 or 88 or 89 or 91 or 93 86 = 18mm spacing 87 = 15 mm 88 = 12 mm 89 = 9 mm 91 = 6 mm 93 = 3 mm	
		icesod = 95	
		icesod = 96	
		icesod = 97	
		icesod = 98	
		icesod = UNKNOWN	
	Area - Pattern Colour	iceact = 10 or 12 or 13 or 20 or 23 or 30	
		iceact = 24 or 34 or 35 or 40 or 45 or 46 or 50 or 56 or 60	
		iceact = 57 or 67 or 68 or 70 or 78 or 80	
		iceact = 79 or 81 or 89 or 90 or 91 or 92	
	Area - Special case	iceflz = 9 Solid colour over entire area	

3. S-52 Symbol reference

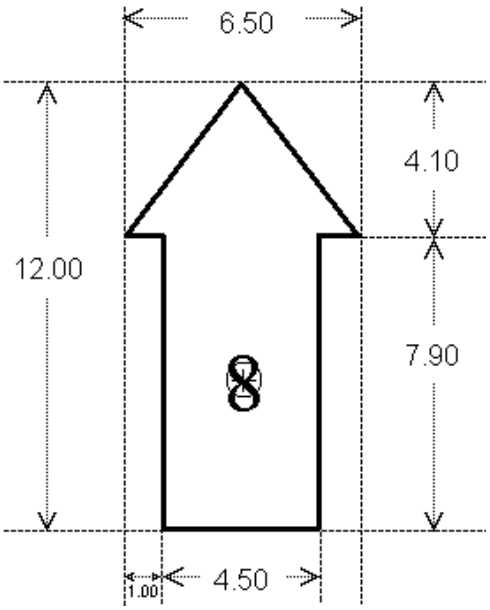
Symbol Name:	SY(**icedft01**)

Symbol Explanation: Ice Drift with drift direction and distance text

Look up table affected: point symbols

Pivot Point Column: 3.25
Pivot Point Row: 7.00

Width of Bounding Box: 6.50
Height of Bounding Box: 12.00



Symbol Colours: CHBLK

Comments: Line weight 0.6 mm
Text is drawn at the Pivot Point

Examples on ENC: N/A

References:

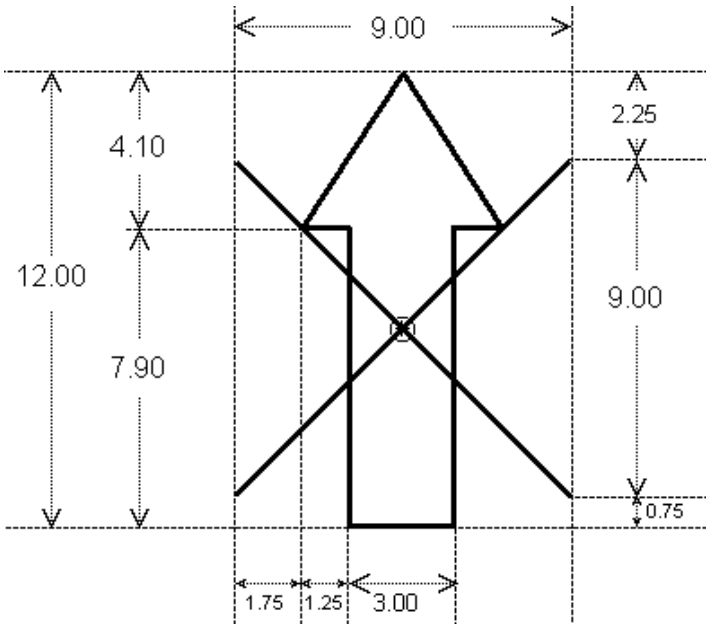
Symbol Name:	SY(**icedft02**)

Symbol Explanation: Ice Drift with *None*, *Variable* or *Unknown* direction

Look up table affected: point symbols

Pivot Point Column: 4.50
Pivot Point Row: 7.00

Width of Bounding Box: 9.00
Height of Bounding Box: 12.00



Symbol Colours: CHBLK

Comments: Line weight 0.6 mm

Examples on ENC: N/A

References:

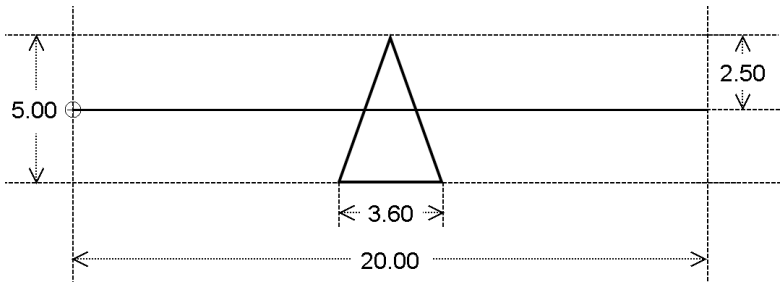
Symbol Name:	LC(**icelim01**)

Symbol Explanation: Ice Berg Limit Line

Look up table affected: line symbols

Pivot Point Column: 0.00
Pivot Point Row: 2.50

Width of Bounding Box: 20.00
Height of Bounding Box: 5.00



Symbol Colours: CHBLK

Comments: Line weight 0.6 mm

Examples on ENC: N/A

References:

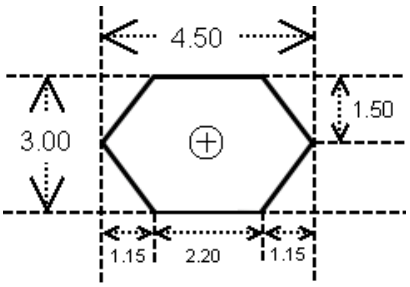
Symbol Name:	AP(**ice80, ice81, ice82, ice83, ice84, ice85**)

Symbol Explanation: Sea Ice pattern for New to Grey-White ice

Look up table affected: Area symbols

Pivot Point Column: 2.25
Pivot Point Row: 1.50

Width of Bounding Box: 4.50
Height of Bounding Box: 3.00



Symbol Colours: Variable, see section 2.

Pattern Type: Linear

Pattern Spacing: Constant

Distance: For each variation the symbol is the same, but the denser the ice the tighter the pattern spacing. See section 2.

Comments: Line weight 0.3 mm
The symbol in the box illustrated should form a continuous uniform pattern over the area of the object being symbolised.

Examples on ENC: N/A

References:

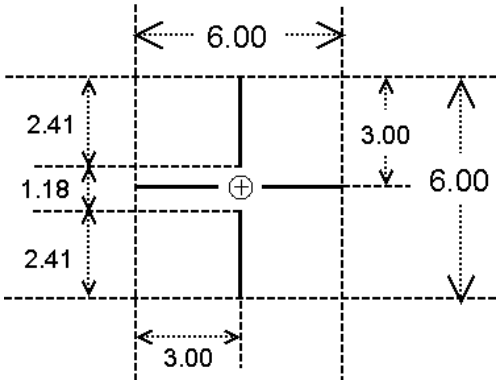
Symbol Name:	AP(**ice86, ice87, ice88, ice89, ice91, ice93**)

Symbol Explanation: Sea Ice pattern for First Year Ice

Look up table affected: Area symbols

Pivot Point Column: 3.00
Pivot Point Row: 3.00

Width of Bounding Box: 6.00
Height of Bounding Box: 6.00



Symbol Colours: Variable, see section 2.

Pattern Type: Linear

Pattern Spacing: Constant

Distance: For each variation the symbol is the same, but the denser the ice the tighter the pattern spacing. See section 2.

Comments: Line weight 0.3 mm
The symbol in the box illustrated should form a continuous uniform pattern over the area of the object being symbolised.

Examples on ENC: N/A

References:

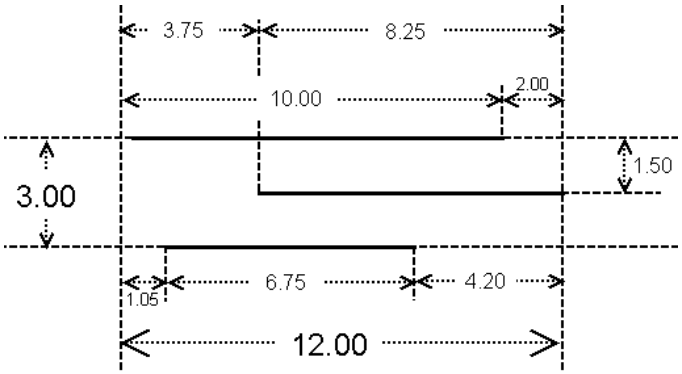
Symbol Name:	AP(**ice95**)

Symbol Explanation: Sea Ice pattern for Old Ice

Look up table affected: Area symbols

Pivot Point Column: 4.75
Pivot Point Row: 8.35

Width of Bounding Box: 12.00
Height of Bounding Box: 3.00



Symbol Colours: Variable, see section 2.

Pattern Type: Linear

Pattern Spacing: Constant

Distance: 14.00

Comments: Line weight 0.3 mm
The symbol in the box illustrated should form a continuous uniform pattern over the area of the object being symbolised.

Examples on ENC: N/A

References:

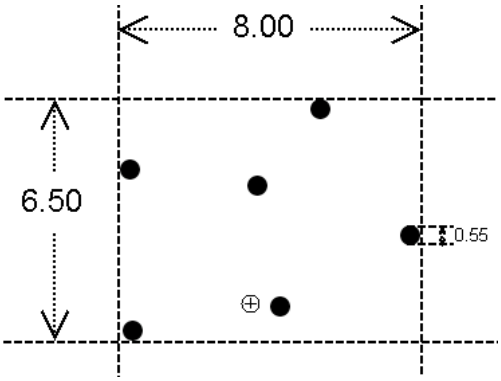
Symbol Name:	AP(**ice96**)

Symbol Explanation: Sea Ice pattern for Second year Ice

Look up table affected: Area symbols

Pivot Point Column: 3.80
Pivot Point Row: 5.40

Width of Bounding Box: 8.00
Height of Bounding Box: 6.50



Symbol Colours: Variable, see section 2.

Pattern Type: Linear

Pattern Spacing: Constant

Distance: 0.00

Comments: The 6 ‘dot’ symbols in the box illustrated should form a continuous uniform pattern over the area of the object being symbolised.

Examples on ENC: N/A

References:

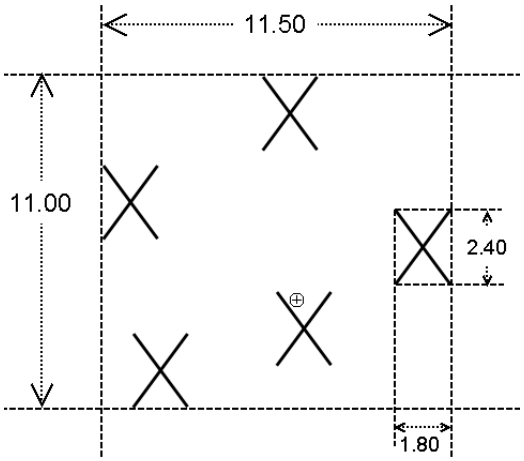
Symbol Name:	AP(**ice97**)

Symbol Explanation: Sea Ice pattern for Multi-Year Ice

Look up table affected: Area symbols

Pivot Point Column: 6.30
Pivot Point Row: 7.65

Width of Bounding Box: 11.50
Height of Bounding Box: 11.00



Symbol Colours: Variable, see section 2.

Pattern Type: Linear

Pattern Spacing: Constant

Distance: 3.00

Comments: Line weight 0.3 mm
The 5 ‘X’ symbols in the box illustrated should form a continuous uniform pattern over the area of the object being symbolised.

Examples on ENC: N/A

References:

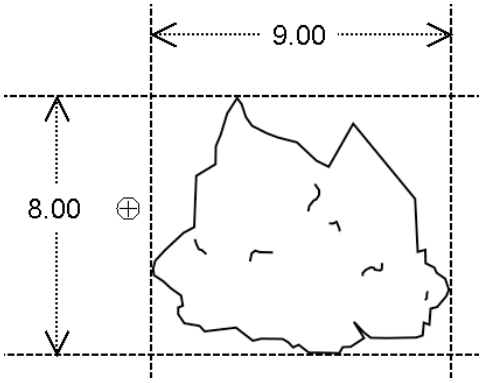
Symbol Name:	AP(**ice98**)

Symbol Explanation: Sea Ice pattern for Glacier Ice (Icebergs)

Look up table affected: Area symbols

Pivot Point Column: -0.75
Pivot Point Row: 3.45

Width of Bounding Box: 9.00
Height of Bounding Box: 8.00



Symbol Colours: Variable, see section 2.

Pattern Type: Linear

Pattern Spacing: Constant

Distance: 8.00

Comments: Line weight 0.3 mm
The symbol in the box illustrated should form a continuous uniform pattern over the area of the object being symbolised.

Examples on ENC: N/A

References:

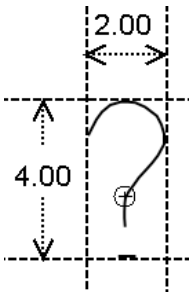
Symbol Name:	AP(**iceundf**)

Symbol Explanation: Sea Ice pattern for UNKNOWN Stage of Development

Look up table affected: Area symbols

Pivot Point Column: 3.00
Pivot Point Row: 3.00

Width of Bounding Box: 6.00
Height of Bounding Box: 6.00



Symbol Colours: Variable, see section 2.

Pattern Type: Linear

Pattern Spacing: Constant

Distance: 14.00

Comments: Line weight 0.3 mm
The symbol in the box illustrated should form a continuous uniform pattern over the area of the object being symbolised.

Examples on ENC: N/A

References:

4. Portrayal Example - seaice