INTERNATIONAL HYDROGRAPHIC ORGANIZATION

ORGANISATION HYDROGRAPHIQUE INTERNATIONALE

CHART STANDARDIZATION & PAPER CHART WORKING GROUP (CSPCWG)

[A Working Group of the Committee on Hydrographic Requirements for Information Systems – CHRIS]

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To CSPCWG Members Date 29 August 2006

Dear Colleagues,

Subject: Draft revision M-4 Section B-430 to B-439, round 3

1. We are grateful to 16 WG members who responded to CSPCWG Letter 03/2006, the second draft revision of M-4 section B-430. Annex A shows how the members responded to the specific questions raised, along with their related comments. Additionally, Australia and France supplied further comments and suggestions, via track changes to the actual draft. These have been available for you to examine via the 'reply to all' email system and where applied, appear as red in the third draft (unless merely editorial).
2. Andrew and I have worked our way through all the responses, reviewing all the comments and suggestions in detail, and amended the draft as seems appropriate to us (Annex B). As usual we have included in blue:
   - original changes which did not receive adverse comments and
   - suggested changes of a minor and non-controversial nature.

   While you are welcome to study all these, **we suggest you focus on the remaining red (underlined) insertions and associated amendments**.

   Note: Deletions without replacement have been retained for the moment, as these will be needed to help the translators. Marginal comments prefaced 'DID' are for UKHO internal use when a PDF version is prepared.
3. As promised, Finland have supplied a revised proposal for specifications for Fairways (Annex C). We have included most of the suggested changes in the new draft at Annex B, we trust to the satisfaction of everyone. In particular, we have included:
   - the **option** of highlighting with grey tint
   - the addition of limits to the graphics
   - an explanation about closing the ends of fairways or sections of fairways (where minimum depth or maximum draught changes)
   - advice about showing the maximum draft when a leading line is present.

We have not included:

- the reference to a 'navigation line'. This term is not used anywhere else in M-4 or INT1. It seems to be inappropriate as a line within a fairway if it is not an actual leading line. Also, any such line not defined by fixed marks, should be dashed in accordance with INT 1 (M4)
- the suggestion of omitting the 'm' for metres. This is contrary to normal practice where a depth is shown (except for soundings, which are unmistakeable), such as in a dredged area (see B-414 which says that such depths should always be followed by 'm' or 'metres'). If we omit the 'm', it may not be obvious that the number is a depth, rather than, for example, a route number.

4. **Please examine the new draft B-430** (Annex B), paying special attention to the new insertions and marginal comments. Please send me your responses and any suggestions for improvements **by 26 September 2006.**

Yours sincerely,

Peter G.B. Jones,
Chairman

Annex A: Members' answers to Questions Arising from Draft Revision of B-430 to B-439, Round 2.
Annex B: Draft Revision of M-4 Part B-430 to B439, Round 3 (separate document, to be made available in pdf format on IHO website).
Annex C: Finland's Fairway proposal.

CSPCWG MEMBERS' ANSWERS TO QUESTIONS
ARISING FROM DRAFT REVISION OF B-430 TO B-439, ROUND 2
(from Annex C to CSPCWG Letter 03/2006)

	Specification	Question	YES	NO
1.	B-431.1	Several members asked why recommended anchorages should be black. We believe the reason to be that these are recommended purely for 'hydrographic reasons' (ie depth and seabed character) rather than any regulation. Perhaps more importantly, there is a need to distinguish those anchorages which have been reported and recommended by users as 'good anchorages', from those which have been approved and designated by a regulatory authority. It is assumed that such authority would take responsibility to ensure that a designated anchorage was adequately surveyed and, if necessary, maintained so that it is suitable for whatever vessels it is designated for. To treat 'recommended anchorages' in the same way as 'defined anchorages' may transfer any liability to the originating hydrographic office. **Do you agree to retain recommended anchorages in black?**	AU, BR, CA, CO, DE, DK, ES, FI, FR, GR, IN, NL, NO, UK, US, ZA	
2.	B-431.2	Canada suggests always using a rectangle for anchor berths (in place of the circle used when a single digit applies). However, land based berths (F19) use a circle and extend it to an oval for longer designations. We suggest for consistency, and also in the interests of minimizing change, this convention should be applied equally to water-based berths. **Do you agree to use circles and ovals for anchor berth numbers?**	AU, BR, CA, CO, DE, DK, FI, GR, IN, NL, NO, UK, US, ZA	ES, FR
3.	B-431.6	The reason mooring trot ground tackle is in magenta is explained at B-142.2(2) and is similar to the reason for depicting submarine cables and pipelines in magenta. **Do you agree to retain ground tackle in magenta?**	BR, CA, CO, DE, DK, ES, FI, FR, GR, IN, NL, NO, UK, US, ZA	
4.	B-431.9	Canada suggests a new specification for 'Holding Areas'. Such areas appear on charts of other nations too, but are often termed 'Waiting Areas'. This seems to us a more appropriate term, as 'holding ground' is associated with anchoring (see S-32) and we presume these are not areas where vessels anchor. **Do you agree with the suggested specification for Waiting Areas?**	AU, BR, CA, CO, DE, DK, ES, FI, GR, IN, NL, NO, UK, US, ZA	FR
5.	B-432.3 & 434	Recommended tracks have always been black. Perhaps today we would choose magenta, as almost all examples are designated by some kind of authority. In particular, the designation of one-way sections or the addition of maximum draughts must come from an authority, therefore comprise 'routeing elements'. However, the number of such black routes already on charts, and the possibility of confusing the user, makes changing the symbol unwise. To avoid combining black and magenta in one symbol, we have removed the rarely used specification B-432.3. **Do you agree to remove specification B-432.3, and amend one-way recommended tracks to an entirely black symbol?**	AU, BR, CA, CO, DE, DK, ES, FI, GR, IN, NL, NO, UK, US, ZA	FR

6.	B-435.4c	If the answer to 5 is YES, there will also be a need to specify a One-way Recommended **Route**. It is illogical that we have a magenta symbol for a two-way recommended route, but no way of showing a one-way version of the same. (IMO currently have an example proposed in the Hebrides (NAV 52/3/14). The suggested symbol is M5.1, which we are proposing to abolish). **Do you agree with the proposed one-way recommended route symbol (in magenta)?**	AU, BR, CA, CO, DE, DK, ES, FI, FR, GR, IN, NL, NO, UK, US, ZA	
7.	B-435.6	Australia suggests dividing M28.2 into two parts (ie separating 'one-way' sections from 'two-way' routes). This has some merit, as stating that one-way sections may exist within a two-way route is a bit of a contradiction. Perhaps the term 'two-way route' is inappropriate; it is difficult to discern a real difference from a fairway. However, this is an IMO adopted term and would be difficult to change. We would welcome suggestions, both for M-4 and INT 1. **Do you agree that the 'one-way' section symbol and specification should be separated from the symbol and specification for 'two-way routes'? (If yes, please provide suggestions below)**	AU, CA	BR, CO, DE, ES, FI, FR, GR, IN, NO, UK, US, ZA
8.	B-438.2	Cable ferries are charted in black because of the presence of permanent physical obstructions. This has always been the case. **Do you agree to retain cable ferries in black?**	AU, BR, CA, CO, DE, DK, ES, FI, FR, GR, IN, NL, NO, UK, US, ZA	
9.	B-438.2	Canada suggests a symbol for an overhead cable ferry. We suggest a new symbol is not needed, as D25 (overhead transporter, aerial cableway) already exists, and could be utilised with the addition of the legend Cable Ferry plus clearance. **Do you agree to use D25 with legend and clearance height for overhead cable ferries?**	AU, BR, CA, CO, DE, DK, ES, FI, FR, GR, IN, NL, NO, UK, US, ZA	
10.	B-439.2	Magenta T dashes are used for certain 'hazardous' areas. Some such areas do have restrictions on certain activities defined by a regulatory authority, in other cases it is just common sense. This applies to explosives/chemical dumping grounds and cable/pipeline areas. Australia asks whether a danger line or maritime limit in general should be used instead, where there is no regulation. However, a consistent symbol seems less likely to be confusing. Any regulations can be made clear by adding point symbols (eg anchoring prohibited) within the area. **Do you agree to retaining magenta T dashes for explosives/ chemical dumping grounds and cable/pipeline areas?**	BR, CA, CO, DE, DK, ES, FI, FR, GR, IN, NL, NO, UK, US, ZA	
11.	B- 439.3	Discharge/intake pipeline areas are black, to correspond with the fact that the pipes themselves are charted in black (which is explained at B-444). The use of black T dashes in this symbol is unique, to match the magenta version used in a pipeline area. There are arguments for and against changing this rare symbol, so it is probably better to retain the existing specification. **Do you agree to retain discharge/intake pipeline areas in black?**	AU, BR, CA, CO, DE, DK, ES, FI, FR, GR, IN, NL, NO, UK, US, ZA	

12.	B-439.6f	1. France suggests that the proposed optional 'emphasis' tint band should only be allocated to specific areas, because: • a regulated area is sometimes important for some users, not important for others. • there may be 'fashions' in the importance of different kinds of regulations. Over time, it would be difficult for an HO to justify why one area is emphasized and not another. • standardization between HO, the goal of the M4, will be not reached. • if the use of a tint band is subjective, the meaning of the tint band will be not clear for users. Results will differ from one cartographer to another and from one HO to another. (France asks 'what definition of tint band will be given in INT1?' In the UKHO version, we have shown it as a national symbol at N1.2 and 2.1, with '*(for emphasis)*' as explanation). 2. France suggests it would be better to specify which features the magenta tint band should be used for, ie features which generally: • often appear on charts, • appear on parts of the charts where other limits often exist (eg in harbour approaches), • are important, especially for international shipping. 3. The features France proposes that fill these requirements are: • PSSA (already defined), • precautionary areas, • fairways (including Designated Shipping Areas), • active minefields. Note that other routeing measures limits are highlighted by bold magenta dashes in the draft B430 revision. 4. Against these very good arguments can be set a lack of flexibility to allow the tint band to be used wherever it is useful to clarify a multitude of different overlapping areas, some with coincident limits. **Do you agree that the tint band should only be used with certain specified area limits?** **If yes, please state below whether you agree with FR's proposed list above, and whether you think the tint band should <u>always</u> be used for those limits (even where no confusion could exist).**	BR, CO, ES, FR, ZA	AU, CA, DE, DK, FI, GR, IN, NL, NO, UK, US,

Note: US is US(NGA)

<u>Comments on the above by WG members</u>

1. B-431.1

DK**:** Provided that INT1 is amended to reflect and state the difference between recommended anchorages and designated anchorages. I am not sure that the user understands the difference.

Chairman's comment: Clear conclusion. INT 1 subWG to consider DK's suggestion.

2. B-431.2

AU agrees to optional oval symbols and assumes the rectangle will still be an option also. If so, the strength of wording for the symbol will need to be 'should' as there will be a choice.

CA: Is this symbolization consistent with S-52?

ES: We would rather use circles and rectangles. Current version of Specification 323.1 does not mention the use of ovals, although it includes one graphic example of its use. We consider that the revision of chapter 3 should include a text on the possibility of using rectangles for consistency with 431.2.

FR: I don't think that there is a strong need to change the practice stated in current M4 and making existing charts incoherent with a new M4 rule.

To contain a 2-figure (or shorter) designation, the current practice (and rule) is to use a circle.

To contain a 3-figure (or longer) designation, the current practice (and rule) is to use a rectangle. Thus, many existing charts show rectangles. Moreover, oval will take more surface on the maritime part of the chart. I suggest to not change current M4 rule.

Chairman's comment: Clear conclusion. M-4 will have circles and ovals, although it is recognized that many HOs will continue to use rectangles (the word in M-4 is 'may'). It will not be confusing to the user and I do not see why land berths (which are probably more numerous) should be amended in preference to anchor berths. I do not believe S-52 is relevant, as berth numbers are attributes available by cursor picking. More numeric digits have curved edges and can therefore be more easily fitted into an oval, which is anyway a more logical extension of a circle than a rectangle.

3. B-431.6

AU suggests a tidy up of colour and physical obstructions, especially for symbols that are not commonly in use (Mooring trots). It is expected that the mooring cables are in magenta because of the berth number. B-142.2(2) summarises well the inconsistencies in the use of colour. Both mooring cables and anchors are physical obstructions, with flukes extending above the sea floor which are potential snags. Flukes are obstructions, just like broken piles or well heads and must be shown in black as per normal charting conventions and B-141, second bullet point. In **B-439.2** we have introduced port security limits with occasional physical barriers, which MUST be charted in black. We are moving in this direction anyway. (See also AU comments below on B-439.2 and 439.). Even if many HOs have used magenta for these anchors, it won't sink ships or cause confusion if they appear black in new editions. On the other hand, some in this office believe that in complex areas where clutter is an issue (especially with black features), that magenta ground tackle would be preferred. Of course the opposite may also be the case, where there is clutter with magenta limits such as restricted areas, cables and maritime limits in general, where black may be preferred. AU response on this issue is unresolved as we have not had an opportunity to thrash this out will all concerned. However, this is the one chance we have to remove these anomalies from the specifications and if safety isn't being compromised, let's do it! Having said that I realise many will not want this change to make physical obstructions black, but it would be my personal choice. We abstain on this vote.

Chairman's comment: Clear conclusion. No change.

4. B-431.9

AU agrees that 'waiting area' is a better term, however as this is a 'should' statement, again there is no need for the words 'if known' at the end of this section. Only for 'must' statements, do we need 'if known'.

FR: "Waiting Area" seems the term to use (the more usual) but the definition have to be modified because to anchor in a waiting area is a very usual practice if no restriction apply to anchoring. I propose to remove "without anchoring" in the sentence of the definition.

Chairman's comment: Clear conclusion. We have included both suggested changes.

5. B-432.3 and B-434

AU agrees to remove these multi-coloured symbols. The INT 1 SubWg will need to pick up on this if approved. (Note: subsequently, AU has been persuaded by FR's arguments for further consideration of this).

FR: If we remove B-432.3, even with the new M5, we will have no specification for a one-way regulated recommended track based on fixed marks.

Note that we have to distinguish and treat :

- recommended track
  - based on fixed marks (M3)
  - not based on fixed marks (M4)
- regulated recommended track
  - based on fixed marks (M5.1 and M5.2 first drawings)
  - not based on fixed marks (M5.1 and M5.2 second drawings)

- recommended routes
  - one-way (new proposed B-435.4c which will need a INT 1 number)
  - two-way (M28.1)

And perhaps it is better to keep B-432.3 to state that, as channels and fairways, recommended tracks can be subject to routeing measures (even if it seems rarely exist!). If we remove B-423.3, it doesn't appear. In fact, the problem seems that some drawings are too much similar and make possible some confusions. These drawings are:

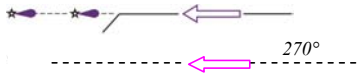
- the second representation of M5.1,
- the second representation of M5.2,
- the representation M4 (B-434.1).

If we remove B-432.3 and use the new proposed M5 (B-434.1):

- we don't describe a recommended track based on a system of fixed marks with a regulated one-way (despite of the text, I presume that proposed M5 shows a recommended track not based on a system of fixed marks with a regulated one-way),
- M4 and M5 remain rather similar and the regulated one-way of M5 is not very clear. On this point, the arrow M10 is much better.

It is possible that the best way is to modify B-423.3 symbols as proposed below :

B-432.3 A routeing (ie regulatory) element may be combined with recommended tracks in some cases, for example when certain classes of vessels are required to use a recommended track, or where part of a track is designated for one-way traffic only. In such cases, the symbol may need to be charted in a combination of black and magenta, eg:



(See Note)

M 5 One-way traffic on a recommended track based on a system of fixed marks, on a recommended track not based on a system of fixed marks.

Commentaire [c1] : Propose reduce number of examples (eg retain only the second and fourth). When would the first example be used? Would a dashed arrow ever be used? What is the difference between outline arrows and arrowheads, in this context?

We can remove the case of a regulated two-way because normally, recommended tracks are two-way tracks. Note that the well known M10 arrow is very clear for the user and means "regulation". The same kind of representation (M10 arrow) applies for both recommended tracks based on a system of fixed marks and recommended tracks not based on a system of fixed marks. In all cases (regulated tracks, DST lanes, recommended routes), the clear outline arrow is used to show the traffic direction.

Chairman's comment: Although the majority accepted the suggestion to remove B-432.3, FR's late comments (which have subsequently been largely endorsed by AU), merit further consideration. It is true that we have attempted to distinguish between tracks and routes, and that 'regulation' is not the distinctive attribute (usually it is the constraint on the width of passage due to dangers). Therefore, regulated recommended tracks may exist and that regulation would probably be 'one-way'. In fact, following FR's reasoning, we would simply be using two separate symbols, ie 'recommended track' and 'established (regulated) direction of traffic flow'. Theoretically, it should not be necessary to show as a combined symbol, but perhaps the unusual result is worth including in INT1 to avoid confusion. It does not conflict with the rule at B-439.6k, which states that 'A multi-feature line should not combine **limit** symbols of different colours'. We have inserted this detail at B-434.1, which seems a more appropriate place. If agreed, INT 1 subWG will need to consider consequential amendments.

The second element of regulation is 'when certain classes of vessels are required to use a recommended track'. The most likely example seems to be deep draught vessels, so we have included an example accordingly at B-434.1.

6. B-435.4c

AU agrees with the principles here and it is consistent with the whole section. There is however considerable differences in the BSH M11 and 5011 M11 symbols. It is suggested that INT1 SubWg should decide on an authoritative symbol which can be adopted by HOs' and manufacturers' symbol libraries.

CA: Is there a need to review the definitions of Recommended Route and Recommended Track to insure the documentation and the application of these terms is consistent?

DE: Germany agreed in principle but the symbol for a one-way recommended route should be placed in the symbol combination picture for M20.1 to M29.2. There is already nearly the same symbol M27.3 ... Deep water route, centre line as recommended one-way ... track. M5.1 is not the preferred symbol number.

FR: B432.3 deals with regulated recommended tracks whereas B-435.4 deals with recommended routes. Even if the answer to 5 is No, there will be a need to specify a One-way Recommended **Route**.

NAV 52/3/14 proposes a recommended route, not a recommended track. The NAV 52/3/14 suggested symbol is M5.1 which normally applies to a regulated one-way recommended track not based on fixed marks. Effectively, we need a symbol for one-way recommended route and the B-435.4c proposed symbol seems very good because it is in line with IMO-IHO symbols for two-way recommended route. It could used for the recommended route proposed in NAV 52/3/14.

Chairman's comment: There is a clear consensus to adopt the proposed new symbol for a one-way recommended route. However, I agree with DE that M5 is not a suitable place in INT 1. M28.3 seems more logical. It is possible that some rearranging of the 'Examples of Routeing Measures' diagram in INT 1 is necessary, in the light of this discussion, and the one on the previous issue. It will need at least a new one-way recommended route and removal of the confusing arrowhead shape of M27.2. INT 1 subWG to consider.

7. B-435.6

AU: The major reason for the initial suggestion was that ENC Encoders should be using M-4 as a basic reference document. ENCs divide Two-way routes into sections called 'Two-way route parts', with each part having a true direction of traffic flow (attribute ORIENT – reciprocals are NOT permitted), and direction of traffic flow (TRAFIC) which in this case is either 'one' or 'two-way'. If this was a real life example in INT1 and M-4, ENC encoders have serious difficulties for that section of two-way traffic to the south-east of the 28.2 label. The 2 dashed arrows are not reciprocals of one another. The encoder has to either take the mean value of the 2 (in this case the mean orientation will be about 270) and encodes TRAFFIC as value 4 (two-way). Alternatively (which is not intended by the IMO), he divides the section into two parts, using the true direction for each section (about 280 and 70) with a separate TRAFIC for each section of 3 = one-way. If it were my choice I would encode using the first explanation, because of the definition of a Two-way route (within defined limits), but neither accurately portrays this example. **Dividing the diagram into 2 separate examples, 28.2 and 28.3, would permit S-57 to use 28.3 as an example of a 'one-way' direction of a 'Two-way route part' and the existing 28.2 would be used as a 'two-way' example. M-435.6c could then refer to 28.3, removing the apparent conflict of terms, as you have pointed out.** I guess this is the problem with voting on these issues without discussion around the table with examples. If you don't understand the implications, you vote NO to this one (which most responses so far have done). But I must remember that these specifications are a compromise after all. I guess many HOs don't want changes to INT 1 but that has already happened in many examples in this review (fairways being a classic example).

CA: In principle CA agrees (and perhaps a symbol like the S-52 TWRTPT52 could be used) but CA is unsure if it would have enough information delineate these different sections on the paper chart.

ES: We consider that para c) in item 435.6 could be deleted: "One way section may exist within two-way routes". It is self evident that when a two-way route is divided into separate sections, these will be one-way sections, and consequently this explanation seems superfluous. Also, the cartographic representation of these features makes it sufficiently clear to the mariner. Nevertheless, if you wish to keep para c), it could be drafted as follows: "c) A two-way route may be split in sections where a one-way route is established".

FR: B-435.6 seems to me clear and simple. Stating that one-way sections may exist within a two-way route is not a contradiction.

NL: This subject will need more consideration of members WG and input from IMO

US: One way routes are part of a two-way route and don't need to be separated.

Chairman's comment: This is a complex issue and the conclusion is not clear. Recognising that paper charts may in future be derived from S-57 data, we need to ensure that we do not create obstacles. However, AU advises that ENC encoders should use M-4 as a basic reference document (not the other way round). If Two-way routes are divided into sections, (ie S-57 object Two-way Route parts (TWRTPT), in which reciprocals are not permitted) why is it a problem to encode the direction of traffic in accordance with the orientation of the arrow? UK ENC encoders do not find this a problem. The case of TSS separated by natural obstacles (M20.2) appears very similar. Propose no change is necessary.

8 & 9. B-438.2:

CA: Agreed, though historically, CA depicts these with magenta.

Chairman's comment: Clear conclusion. Specification for an overhead cable ferry added, as suggested.

10. B-439.2 and **11. B-439.3:**

AU:Although AU agrees to continue using magenta for dangerous features (explosives and chemical dumping grounds), agreement in this office has not been reached on the use of magenta for actual physical obstructions such as non-dangerous cable and pipeline areas. However, there is agreement that the inconsistency of having magenta pipeline areas (L40.2) and black discharge and intake pipeline areas (L41.2) needs to be resolved one way or the other. The problem seems to originate from trying to portray dangerous features by colour. For ENCs, there should be an attribute/value for this (but currently there isn't). AU suggests we adopt another guiding principle (probably for the conventions in B-100), that although physical obstructions are usually portrayed in black, when the feature is dangerous to navigation it may be portrayed in magenta. Examples include gas and acid pipelines (and related areas), high voltage submarine cables (and related areas), explosives and chemical dumping grounds, active minefields, areas of live unexploded bombs, etc.

CA: Agreed, though historically, CA depicts these with magenta.

ES: We must note that this question has caused deep controversies. In the hypothetical case of the majority of Members agrees to remove the pipelines area symbol in black, we favour the change of the black colour of symbol L41 to magenta. Consequently, all pipelines would be in magenta irrespective of their being water supply or discharge. Also, in this case the area limit for all kinds of pipelines should be in magenta.

FR: As AU, I think that N1.1 or 1.2 or K1 are appropriate when no regulation exits. At least, their use should be allowed. As the M4 is written, both N2.1 and N1.2-N1.2-K1 are possible.

Chairman's comment: Whilst the points above are acknowledged, there is certainly no convincing argument to change (as shown by the clear responses to these questions).

12. B-439.6f:

AU: Although AU does not support this overall proposal by France, AU believes it may be helpful to list those features that must use tint bands, such as PSSA, traffic separation lines and zones, radar ranges (M31), etc. We mustn't forget the new section **B-439.6k** which provides guidance for all other cases. Flexibility is the key here for reasons given in the table above. **Members need to remember that M-4 is a minimal specification and HOs are free to add to it for their own national rules, provided they do not conflict with M-4/INT1.**

BR: We agree that the **optional** use of tint band should be limited to those areas proposed by France.

CO agrees with FR suggestion about the use the tint band only in certain specific area limits, but with the option that each HO can choose the best representation of an area limits, without to cause clutter.

DE: The first choice should be avoid the use of tint bands. If the clarity and readability is not given (by any other measures) tint bands help to make the chart more understandable for the user.

DK: I do support your comments given under point 4. The cartographer must seriously consider where and why a specific area should be emphasized by adding a tint band to a line symbol. It should not be mandatory to use tint bands but an option.

ES: We agree to the limitation in use, and the list proposed by France seems adequate. Nevertheless, we do not agree to the tint band always be used. It should be left as an optional measure.

FR: Currently, the use of tint band to emphasize/clarify limits others than PSSA, traffic separation lines and zones and radars ranges limits is a national rule of some HOs.

This tint band symbol can be retained as a national symbol or we can introduce it in M4 and INT 1.

As M4 is a cartographic standard, M4 should harmonize practices for the benefit of users and should give clear rules to apply to the cartographers. The overall introduction of tint band and associated rules with too many possibilities of interpretations (to emphasize …) don't reach harmonization and aren't clear rules for cartographers.

By introducing this symbol in M4 in these conditions, it is possible to propagate a disordered employment of tint band. It would be the reverse of the goal the standard.

It would be useful to know if HOs which use tint band use it often, if their cartographers have problems, if users and HOs are happy with it.

The FR proposal reaches the M4 standard goals.

Flexibility: the use of tint band for defined features should be only encouraged (not "must" but "should" or optional) especially to manage existing portfolios in conformity with current M4.

NL: Keep it flexible and let HO/cartographer makes decision based on national or international policy

US: Tint bands should not me mandated as mandatory. It should be an option.

ZA: The proposals made by France are valid. However, South Africa does NOT agree that the tint band always be used. It should be used as an optional measure by HO to reduce the risk of confusion.

Chairman's comment: There is clearly no desire to make tint bands (for emphasis) mandatory, except for those symbols which already include it (eg PSSA). There is an 11 to 5 majority in favour of not confining the use of the tint band to a few selected limits. Those HOs that prefer to confine its use are of course free to do so. INT 1 subWG to consider whether there is a need to clarify its use in INT 1.

B-430 HARBOURS: REGULATIONS AND LIMITS

Regulations concerning navigation in harbours may be found in Sailing Directions or other publications. They should not normally be quoted or referred to on charts except:

a. where the limits to which the regulations apply can usefully be charted, eg areas in which navigation is prohibited, anchoring is restricted or recommended (see B-431) and the limits of fairways, turning circles, etc;

b. where, exceptionally, it is important to draw the mariner's attention to a regulation, eg concerning reporting points.

For land features associated with harbours, see B-320-329.

B-430.1 **Defined harbour limits** must be shown on the largest scale charts, where possible, to assist mariners in complying with harbour regulations. Only the seaward limits should be shown. The symbol must be a magenta dashed line. The legend 'Harbour Limit', 'Limit of Port of ....', or equivalent, should be inserted along the line, on the side of the line within the harbour's jurisdiction.

N 49

B-430.2 **Speed restrictions** should not normally be referred to on charts. If required, a speed restriction should be in sloping magenta figures, eg: *5 kn* with T-shaped dashed limit (N2.1) to indicate the extent.

B-430.3 **Port Security limits** should not normally be charted. See B-439.2 if there is a requirement to chart them.

B-431 HARBOURS: ANCHORAGES, ANCHOR BERTHS, PROHIBITED ANCHORAGES; MOORINGS; WAITING AREAS

a. Where the limits of anchorages, or areas in which anchoring is restricted or prohibited, are defined by a regulatory authority (eg harbour authority) they must be shown on the largest scale charts. They may also be shown on other scales where useful, eg for planning purposes. Limits and associated legends and symbols must be in magenta. For recommended anchorages not defined by harbour authorities, see B-431.1.

b. Mooring buoy symbols or legends must be shown on charts of appropriate scale to indicate buoys and moored vessels as possible hazards to navigation as well as, on the largest scales, to facilitate mooring operations. For symbols and legends, see B-431.5-7.

B-431.1 **Recommended anchorages** not defined by a regulatory authority must be shown by the double fluke anchor symbol, the centre of the symbol being its position:

N 10

The size of vessel for which the anchorage is suitable can be inferred from the depths and swinging room available or from Sailing Directions.

B-431.2 **Designated anchor berths** must be shown by means of a magenta anchor with a circle (or oval) superimposed. The number or letter assigned to the berth must be inserted within the circle. If necessary, to contain a 3-figure (or longer) designation, the circle may be extended to an oval:

N 11.1

Supprimé : new

Supprimé : (calling-in or 'way')

Supprimé : , and for territorial waters etc, see B-440

Supprimé : medium weight

Supprimé : (preferably

Supprimé : printed

Supprimé : must be shown in black, although (on very large scales only) any associated ground tackle or submarine cables must which it is necessary to show shall be in magenta.

Supprimé : without defined limits

Supprimé : The position of the berth is the centre of the symbol.¶
¶

Supprimé : , on large scale charts only,

Supprimé : symbol, preferably in magenta

Supprimé : a rectangle

Commentaire [c2] : DID: please amend the rectangle to an oval (NOT an ellipse like F19, which is wrong)

On large scale charts, swinging circles for anchor berths may be shown by fine, dashed magenta lines:

N 11.2

Commentaire [c3] : DID: Left hand symbol incomplete, to be amended.

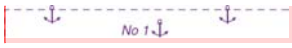
For other berths, see B-323.

B-431.3 **Anchorage areas** with limits defined by a regulatory authority should be outlined with dashed magenta lines. Long charted limits may be identified by an anchor symbol placed between the dashes at approximately 40mm intervals. Within the limits, one or more magenta anchor symbols may be shown in an appropriate size.

Supprimé : medium,

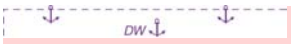
N 12.1

Named anchorage areas, or anchorages for particular vessels, should be identified as in the following examples (sloping text, anchor symbol upright, all magenta) where possible. These symbols may be adapted for other types of vessels, eg small craft. Size of text and associated anchor symbol may be adjusted to suit the size of the area.



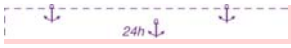
N 12.2 Numbered anchorage area

N 12.3 Named anchorage area

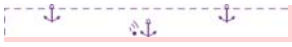


N 12.4 Deep water anchorage area / Anchorage area for Deep-Draught vessels

N 12.5 Tanker anchorage area

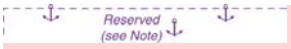


N 12.6 Anchorage area for periods up to 24 hours



N 12.7 Explosives anchorage area

N 12.8 Quarantine anchorage area



N 12.9 Reserved anchorage area

Commentaire [c4] : DID: please arrange in 'invisible' tabular form to improve layout.

For anchorage area for seaplanes, see B-449.6.

Within anchorage areas, actual anchor berths may be shown as in B-431.2.

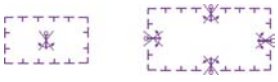
Where the scale is too small to show limits, a magenta anchor symbol with legend may be used.

Supprimé : n

B-431.4 **Areas in which anchoring is prohibited** must be outlined with T-shaped dashes. Long charted limits may be identified by the symbol placed between the dashes at intervals of approximately 40mm. Within the limits, one or more magenta symbols may be shown in an appropriate size. See B-439.

Supprimé : , other than cable areas,

Supprimé : with the symbol repeated if necessary if the area is extensive.



N 20

For IMO No Anchoring Areas, see B-435.11.

B-431.5 **Mooring buoys** must be shown by a buoy symbol with a small circle on top as the distinguishing feature. The shape of the buoy is optional but it must have a position circle in its base. The symbol may be shown open or filled in (see B-464.1), usually without any abbreviation to indicate colour unless it also serves as a navigational mark within the IALA Maritime Buoyage System.

Q 40

Lighted mooring buoy should be charted as for a normal lighted buoy (see B-466), with a light flare and light description.

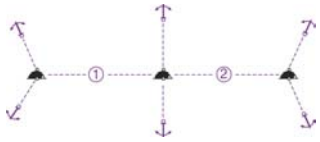
Q 41

Names or numbers referring to buoys may be shown, in sloping black text adjacent to the buoy symbol.

A mooring buoy with telegraphic or telephonic communication facilities should be shown by having a submarine cable symbol leading to it (in magenta).

Q 43

B-431.6 **Mooring trots:** Exceptionally, and on very large scales only, mooring berths between buoys may be shown with their numbers or letters inserted in circles, in magenta. Ground tackle securing the buoys, if very extensive, may be shown by fine dashed lines and double fluke anchors, in magenta.



Q 42

B-431.7 **Numerous moorings** may be shown by means of a legend, eg 'Small Craft Moorings', or equivalent. Their extent may be indicated by black dashed limits (N1.1). Alternatively, mooring buoy symbols may be used to represent a number of moorings provided this is clear to a mariner.

Q 44

B-431.8 **Very large tanker loading buoys.** See B-445.4.

B-431.9 **Waiting (Holding) Areas**. Designated areas where vessels wait, eg for a pilot or tug, should be shown by means of a magenta legend, eg 'Waiting Area', 'Holding Area' or equivalent. Their extent may be indicated by magenta dashed limits (N1.2).

B-432 RECOMMENDED TRACKS AND ROUTEING: GENERAL

A classification of track and route features is made in the following paragraphs to set out general principles before proceeding to detailed specifications. Recommended tracks are not generally subject to regulation. Routeing regulations may be complex; for definitions of routeing terms, see B-435.

B-432.1 **The term 'Recommended tracks'**, in its widest sense, includes all **channels and fairways** recommended for hydrographic reasons to lead safely between shoaler depths, obstructions, islands, etc. They are defined in IMO's *Ships' Routeing* as:

Supprimé : pictorial
Supprimé : its
Supprimé : ' (in outline)
Supprimé : preferably
Supprimé : only
Supprimé : 'Aircraft Moorings',
Supprimé : are long-established features of charts and
Supprimé : already
Supprimé : and are still developing
Supprimé : (French: voies recommandées)

A route which has been specially examined to ensure so far as possible that it is free of dangers and along which ships are advised to navigate.

The use of such tracks is generally unregulated and will depend on the vessel's draught, the state of the tide, adequacy of navigational aids and so on. Apart from channels defined only by the depth contours, such tracks include:

a. **Recommended tracks,** in the narrow sense, should have the recommended course centre line and bearing charted. For detailed specifications see:

- B-433 tracks based on fixed marks
- B-434 tracks not defined by fixed marks
- B-486.5 tracks based on radar transponder beacons in line

b. **Channels** may be entirely natural features such as passages between islands or sandbanks; apart from naming them, no other chart action should be required. Channels may also be artificially marked, and sometimes deepened. Such channels may have their outer limits shown, usually in part only, by:

- transits or 'clearing lines' (see B-433);
- light sectors (see B-475.5) or direction lights (see B-475.7);
- lateral buoys or beacons;
- dredged area (see B-414) or swept area (see B-415) limits.

It should not usually be necessary to chart the outer limits of a channel, as these should be defined by the appropriate symbols above. However, if the outer limits of a channel are not clear from natural or artificial features, but a regulatory authority requires or recommends certain vessels to navigate within defined limits, they should be charted by the appropriate Routeing Measure symbol (see B-435), in magenta.

c. A **Fairway**, sometimes called Ship Channel, is the main navigable channel in the approaches to, or within, a river or harbour. Fairways which are designated by a regulatory authority are treated as Routeing Measures (see below); see also B-434.5.

B-432.2 The term **'Routeing'** is used in these specifications to describe the regulation of navigation for the prevention of collision or avoidance of pollution risks. **Routes subject to regulations (ie Routeing Measures)** are generally laid down by a national or international regulatory authority other than the hydrographic authority (although possibly with the latter's advice).

Routeing measures as defined by IMO (see B-435), comprise:

a. traffic separation schemes (separation zones, traffic lanes, roundabouts, etc), with any associated 'inshore traffic zones';

b. precautionary areas;

c. deep water routes;

d. recommended routes;

e. established and recommended directions of traffic flow;

f. two-way routes;

g. areas to be avoided, by certain classes of ships (routeing in a negative sense);

h. archipelagic sea lanes

i. no anchoring areas.

Supprimé : based on natural objects or beacons: such lines are generally dashed to distinguish them from leading lines;

Supprimé : c. channels which have their outer limits shown, in part, by

Supprimé : d. tracks which have their centreline shown by a radio bearing line from a directional radio beacon (see B-481.2 and B-486.5).¶
These chart features may well be combined in any channel. Their common characteristics are thatthey generally occur fairly close inshore and are used primarily to avoid shoal depths rather than to regulate shipping movements.¶
Such features are to be charted in black, apart from radio bearing lines which are shown in magenta if not associated with another type of track (see B-481.2 and B-486.5).¶
Bearings quoted must refer to the true compass; bearings measured from the chart must agree with bearings stated on the chart, in the List of Lights, and in Sailing Directions¶
See B-433 and B-434 for detailed specifications of leading and clearing lines, and recommended tracks (in the narrowest sense).¶
B-432.2 A Routeing System is defined by IMO as:¶
Any system of one or more routes or routeing measures aimed at reducing the risk of casualties.¶

Supprimé : non-hydrographic reasons such as

Supprimé : (French: routes réglementées)

Supprimé : designated and

The above routeing measures must be represented by symbols, in magenta, which have been agreed between IHO and IMO and are reproduced in IMO's *Ships' Routeing*. See also B-435 and B-436.

Routeing measures which have been adopted by IMO are listed (with precise limits where applicable) in *Ships' Routeing*.

B-432.3 **A routeing (ie regulatory) element may be combined with recommended tracks** in some cases. For some examples, see B-434.1.

B-432.4 **Maximum draught and minimum depth**

a. In areas where the tidal range is not appreciable, it may be useful to state the **maximum draught** of vessels authorized by a regulatory authority to pass along a recommended track, see B-434.3.

Note: The difference in value between the actual minimum depth and the authorized (or recommended) maximum draught will vary according to the situation (eg whether the sections of track are sheltered or not). This will be determined by the regulatory authority.

b. All other depths quoted on tracks, in deep water routes and dredged channels must indicate the **minimum depth** of water at chart datum. No statements of minimum depths must be made in changeable areas unless the critical depths are regularly examined and updated. For depths within a Deep Water.route, see B-435.3f.

B-432.5 **Related features**

a. Radar reference lines: these are not necessarily tracks to be followed; their essential characteristic is that they are reference lines charted to assist guidance of mariners by coast or harbour radar stations. See B-487.2.

b. Ferry routes are charted as hazards to other vessels; they are indicative only as they may not be the actual tracks followed. See B-438.

c. Special purpose recommended tracks, eg ice-free routes, may be charted by the most appropriate symbols selected from B-433 and B-434, with a descriptive legend.

B-433 LEADING AND CLEARING LINES; TRANSITS

A leading line is a straight line passing through two or more clearly defined objects (leading marks) along which a vessel may approach safely (up to a certain distance off). Leading marks provide a leading line when they are in transit or in line ('in range': US).

A clearing line is a straight line on the chart that marks the boundary between a safe and a dangerous area, or that passes clear of a navigational danger. Clearing marks provide a clearing line when they are in transit or in line ('in range': US), or when they are associated with a bearing, eg a light sector limit.

In English, the term 'leading lights' is reserved for lights marking a lead to be followed. 'Lights in line' is used for lights which mark a danger or a limit, such as the edge of a channel. Similar terms may be used for beacons.

To reduce translation difficulties, the symbol ≠ should be used in chart legends to indicate **any** two objects in line (M1-3 and P20.2 show examples). The difference between leading and clearing lines is shown by the line symbol (see B-433.3 and B-433.4). If the marks are clearly identifiable on the chart, no legend or symbol is necessary; only the bearing should be charted along the line.

Commentaire [c5] : IHB: TR A1.17 needs updating for the latest version of Ship's Routeing.

Supprimé : internationally

Supprimé : Definitions of the routeing measures are given in TR A1.17.¶

Supprimé : , in which limits are precisely defined

Supprimé : for: a (apart from some inshore traffic zones) b, c, f . As far as possible, all scales of charts on which it is appropriate to show the measures should chart the limits, rather than centre-lines.

Mis en forme : Retrait : Gauche : 0", Suspendu : 0.79"

Supprimé : **A routeing element may be combined with recommended tracks** in some cases. A particular example occurs where part of a track is designated for one-way traffic only. In such cases, the symbol may need to be charted in a combination of black and magenta, eg:¶

M 5.1 One-way tracks¶

M 5.2 Two-way tracks (including a ¶ regulation described in a note)

Mis en forme : Police :Non Gras

Supprimé : charted

Supprimé : .

Commentaire [c6] : Revision suggested by FR, and in accordance with S-32

Supprimé : it is recommended that

Supprimé : is

Supprimé : form of the

B-433.1 **Leading and clearing marks** may be natural landmarks or specially erected features. They must be charted in black in accordance with the specifications for landmarks (see B-340). For leading beacons, see B-458; for leading lights, see B-475.6; for leading Racons, see B-486.5. No special abbreviations indicating 'leading' or 'in line' should be used against the symbols for the marks. Where the scale is too small to chart a pair of marks individually, they should be shown eg: 2 Bns, or 2F, or equivalent. Exceptionally, where it is impossible to show the leading line itself, a legend, eg. ' Ldg.2F ' may be used to show the existence of leading lights.

Light flares should be oriented along the transit line for all leading lights or lights in line, unless the flare would thereby obscure the front light or other important detail.

Where the leading marks are lighted beacons, the largest scale chart should indicate the shape and colour of the day mark as well as the characteristics of the light (see B-457).

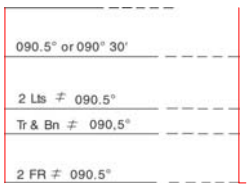
B-433.2 **Leading and clearing lines: legends (including bearings)** should normally be placed against the upper side of the seaward end of the line, but may be placed beyond or under the line if necessary, eg:

Tr and Bn ≠ 90°

Bearings must be quoted from seaward in accordance with B-132, where space permits, to give the navigator an easy means of confirming his identification of the marks.

The marks should be briefly described in the legend only if there could be doubt concerning their identity on the chart, or if one or both marks are outside the chart limits. If appropriate, phrases such as 'open of', or the equivalent, should be used instead of ≠

Examples of legends



No legend, if space is minimal

Bearing only, if identity of marks is clear

Features named, if identity of marks is not clear

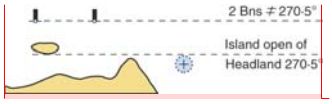
Exceptionally, character of lights given to avoid confusion with other lights

B-433.3 **Leading lines** must have the navigable part of the track shown by a bold continuous line with the remainder (up to the rear mark) shown by a fine dashed line (recommended 6 dashes per cm),eg:

M 1

Leading lines based on beacons or lights must be charted where scale permits. Leading lines based on natural objects should be charted on the largest scales where they appear to be useful, particularly if other navigational aids seem inadequate.

B-433.4 **Clearing Lines** are important in rocky areas where dangers are not guarded by buoys and where sailing vessels (which are not always able to keep to a direct track) and other small craft may navigate close inshore. They must be represented by a fine dashed line, (recommended 6 dashes per cm), eg:



M 2

Supprimé : directional radiobeacons, see B-480 and B-481.2 and for

Supprimé : , if possible,

Supprimé : (preferably on

Supprimé : Bearings, from seaward, shall be quoted in degrees and tenths of a degree, or in degrees and minutes.

Supprimé : any

Commentaire [c7] : DID: Delete the minutes version (top example). Commas in lieu of stops. Slightly enlarge the 'in line' symbol.

Supprimé : which may be followed

Commentaire [c8] : DID: Amend decimal to comma. Enlarge in line symbol.

Supprimé : on the larger scale charts (

Supprimé : always

Supprimé : or dotted

Commentaire [c9] : DID: Amend decimal to comma. Enlarge in line symbol

B-433.5 **Transits marking isolated dangers**. Occasionally, beacons or other marks are erected on shore to indicate (approximately, unless there are two pairs of beacons) the position of an isolated danger. Such lines should be represented in the same way as clearing lines, as their nature will be apparent from the chart.

M 2

B-434 RECOMMENDED TRACKS AND FAIRWAYS

Recommended tracks and fairways usually comprise a number of sections (sometimes termed 'legs') which lead between dangers lying close on both sides of the track or fairway. Tracks commonly include some sections which are leading lines (see B-433). The distinction between tracks and fairways, in this context, is that tracks have no specified outer limits and fairways do have specified outer limits.

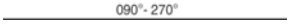
Supprimé : rocky

Supprimé : but not always,

Supprimé : Under the present heading, only recommended tracks in the strict sense of those with their centrelines charted are dealt with.

B-434.1 Recommended tracks

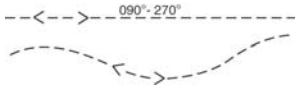
a. **A recommended track,** where based on a system of fixed marks, must be represented by a bold continuous line, as specified for a leading line in B-433.3.



M 3

b. When not based on a system of fixed marks, a track must be represented by a bold dashed line in which opposing pairs of arrowheads are inserted at regular intervals (approximately 100mm), to represent a two-way track.

Supprimé : in opposing pairs

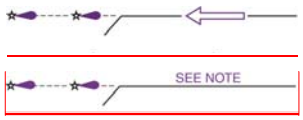


M 4

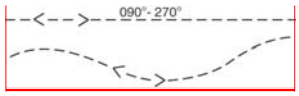
c. A legend may be added to the symbol to describe the purpose of the track, or as a reference to a note giving such details, eg:

'Recommended track for yachts' or *'Recommended track (see Note)'*

d. **A routeing (ie regulatory) element** may be combined with recommended tracks, for example when certain classes of vessels are required to use a recommended track, or where part of a track is designated for one-way traffic only. Such cases may need to be charted by a combination of black and magenta symbols, eg:



M 5.1 One-way track and DW track based on a system of fixed marks



M 5.2 One-way track and DW track not based on a system of fixed marks

A note may be added explaining the purpose of the track and its regulations as necessary.

B-434.2 Legends on tracks: bearings

Commentaire [c10] : DID: amend graphic to substitute *DW* astride the line, with *(see Note)* under the legend.

Commentaire [c11] : This effectively introduces an alternative to M27.3, in respect of DW tracks/route.

Commentaire [c12] : DID: please amend graphics so that:
an open arrow is inserted in the top example (and the 090° and opposing arrow heads are removed).
In the bottom example, a *DW* legend is inserted somewhere in the line, but not between the arrow heads.

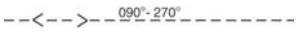
Supprimé : One-way recommended tracks must be represented by a bold dashed line with single arrowheads.¶

M 5¶
A legend may be added to the symbol to describe the purpose of the track, or as a reference to a note giving such details, eg:¶
'Recommended track for yachts' or *'Recommended track (see Note)'*¶

a. Where a track is based on fixed marks, the legend referring to its bearing must be shown as for a leading line (see B-433.2) but with the option of quoting the reciprocal bearing following the bearing from seaward, thus:

M 3

b. Where a track is not based on fixed marks, the two bearings only must be shown, first the bearing from seaward (or in the direction of the buoyage system) followed by its reciprocal, thus:



M 4

Where a two-way track is of such length that the reciprocal bearings are shown near both extremities, the bearing quoted first must in each case be that followed by a vessel joining the track at the extremity. See B-132 for conventions on bearings.

B-434.3 **Legends on tracks: maximum authorized (or recommended) draught.** As stated in B-432.4, in areas without appreciable tides, a regulatory authority may assign each track (or sections of a track) a maximum authorized (or recommended) draught of vessel which may use it (eg in Finnish and Swedish waters).

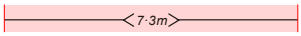
Supprimé : These maximum draughts are not regarded as routeing features.

It is important to show the maximum draught where the bottom is so irregular that it is difficult to ascertain the least depth from the charted soundings. The figure must be charted between arrowheads (or behind one arrowhead if a single way track) thus:

M 6

Commentaire [c13] : DID: amend decimal to comma

and similarly on tracks based on fixed marks thus:



M 6

Commentaire [c14] : DID: amend decimal to comma

To avoid combining black and magenta in one symbol, the draught must be shown in black.

B-434.4 **Variations with chart scale.** On large scales (suitable for navigation), all important tracks together with associated fixed marks and buoyage must be shown.

Supprimé : On every chart which shows maximum authorised draughts, there shall be inserted a short cautionary note explaining the meaning of the symbol, so that navigators are not misled into confusing maximum draught with least depth. As an example, there may be differences between the two figures of about 1,5 metres in the Baltic Sea.¶

On smaller scales, tracks may be generalized so that they are adequate for passage planning, but require minimal chart maintenance. The outer sections of important tracks, outer marks and landfall buoys, plus the maximum draught, should be shown. The inner sections of tracks may be shown by dashed lines (with arrowheads) throughout, omitting bearings, minor lights and buoys.

B-434.5 A **Fairway** designated by a regulatory authority (see B-432.1c) must be delimited by bold magenta dashed lines (M15). The ends of the fairway should be closed. Sections of different minimum depth or maximum draught should be separated by the same limit symbol (M15).

Supprimé : the

Supprimé : st

Supprimé : second and

The magenta legend *FAIRWAY* (or its name) should be inserted, if possible in the area and parallel with the channel's limits. Soundings and depth contours should be included as appropriate. Fairways may consist partly or entirely of dredged or maintained areas, see B-414. If the limits of the Fairway coincide with the limits of a dredged or maintained area, or light sector limit, the usual cartographic principles apply, see B-439.6.

A Fairway may be highlighted with grey tint. Regulated or recommended direction of traffic flow arrows may be added, as with a two-way route (see B-435.6). A note may be added to provide further guidance, eg: classes of vessel recommended to use the fairway, survey quality and date, an explanation of the maximum draught symbol.

a. A **minimum depth** (and a survey year date if not maintained) may be indicated, eg:

FAIRWAY 7,3m (2006)

Commentaire [c15] : DID: please add a bold magenta dashed limit (M15)

b. In areas without appreciable tides, an indication of any authorized (or recommended) **maximum draught** may be indicated, eg:

FAIRWAY <7,3m>
(see Note)

Commentaire [c16] : DID: please add a bold magenta dashed limit (M15). Please also add second version alongside with 10% grey tint.

Alternatively, where a leading line lies within a fairway, the maximum authorized (or recommended) draught may be shown on the leading line (M6), see B-343.3.

B-435 SHIPS' ROUTEING SYSTEMS

IMO is recognized [according to Regulation 10 of SOLAS Chapter V (Safety of Navigation – as amended 2000)] as:

> 'the only international body for developing guidelines, criteria and regulations on an international level for ships' routeing systems'.

It also states that:

> 'Governments implementing ships' routeing systems not intended to be submitted to the Organization for adoption or which have not been adopted by the Organization are encouraged to take into account, wherever possible, the guidelines and criteria developed by the IMO'.

The following principles and methods, agreed between IMO and IHO, for charting IMO-adopted routeing sytems, therefore **apply equally to the charting of routeing measures not adopted by IMO**.

a. The **purpose of ships' routeing**, according to the **International Maritime Organization (IMO)** in its publication *Ships' Routeing* (Edition 8 - 2003), Part A 'General Provisions on Ships' Routeing' is:

> 'to improve the safety of navigation in converging areas and in areas where the density of traffic is great or where freedom of movement of shipping is inhibited by restricted sea-room, the existence of obstructions to navigation, limited depths or unfavourable meteorological conditions. Ships' routeing may also be used for the purpose of preventing or reducing the risk of pollution or other damage to the marine environment caused by ships colliding, grounding or anchoring in or near environmentally sensitive areas'.

b. A **routeing system** is defined by IMO as:

> 'Any system of one or more routes or routeing measures aimed at reducing the risk of casualties; it includes traffic separation schemes, two-way routes, recommended tracks, areas to be avoided, no anchoring areas, inshore traffic zones, roundabouts, precautionary areas and deep-water routes.'

Note: Not *all* routeing measures, eg some recommended tracks, fairways, fall within IMO's definition of a routeing system.

c. The internationally accepted **IHO/IMO terms, symbols and abbreviations** for routeing measures are listed in *Ships' Routeing*, together with descriptions of all the measures which have been adopted internationally. The definitions and principles of routeing which most affect hydrographic offices are reproduced in the following paragraphs from *Ships' Routeing*

d. Hydrographic offices should advise their governments on appropriate terms and symbols, particularly for national measures, to ensure that the international symbols are correctly used where applied to such national measures. Where possible, the limits of routeing measures should be charted, and the use of centreline symbols should be avoided. Centreline routeing symbols have proved hazardous in the past both for two-way traffic, where the danger is obvious, and one-way systems, where overtaking collisions are a lesser but significant danger. The 'recommended route' symbol (see B-435.4) is a centreline symbol but is designed to encourage a degree of traffic separation. For recommended tracks, see B-434.

e. The only routeing measures recognised in the **International Collision Regulations** are traffic separation schemes and any associated inshore traffic zones. Recommended directions of traffic flow arrows (M11) should be used where necessary in measures other than traffic separation schemes, unless a national regulatory authority has made the directions compulsory within its territorial sea or internal waters.

f. **Names of routeing measures**. The names of individual routeing measures should be included on the chart where appropriate; it is particularly useful where several routeing measures adjoin, or where they need to be referred to in chart notes and/or associated publications. References should have the initial letters of the principal words capitalized, eg Traffic Separation Scheme Off San Francisco.

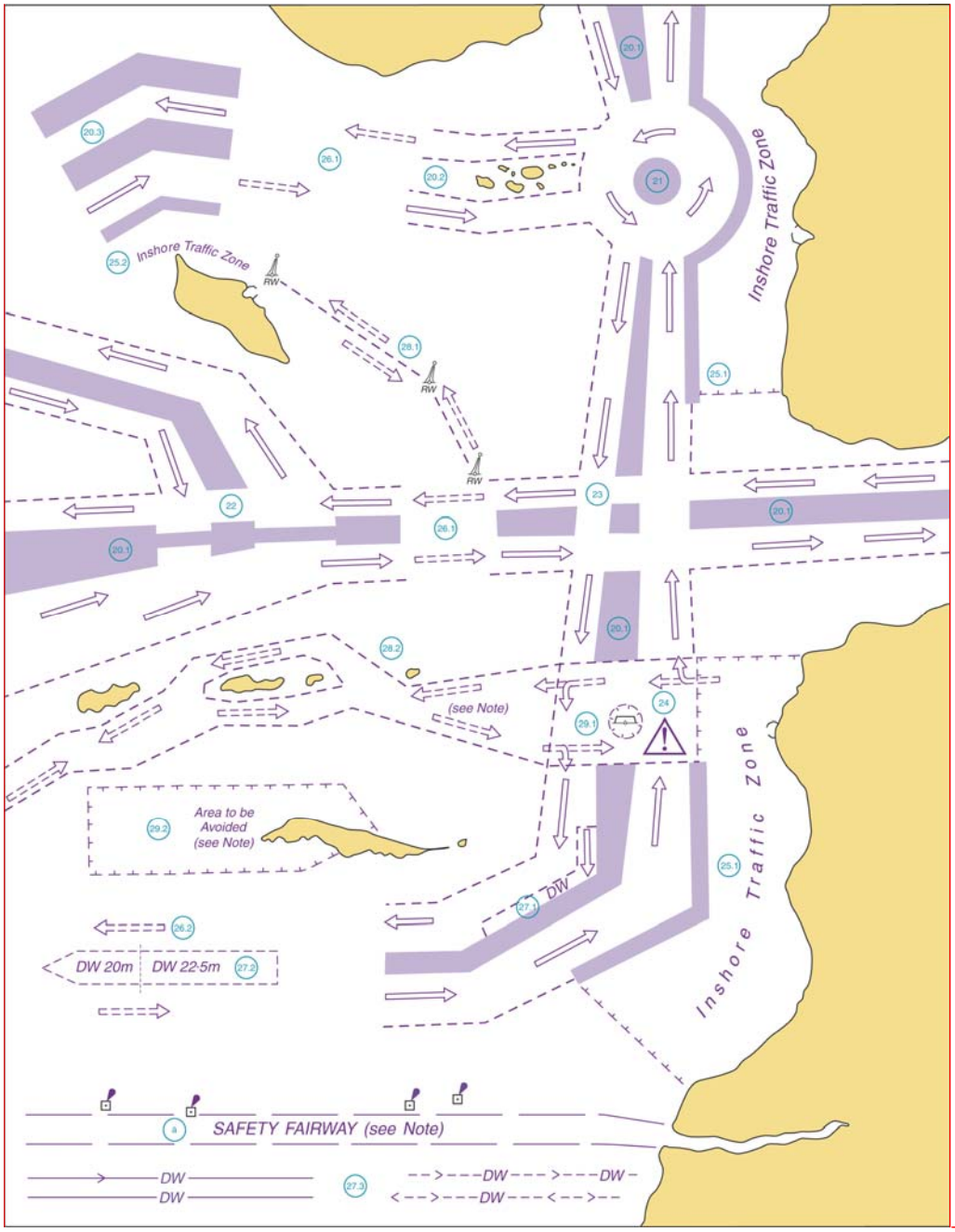
g. For the distinction between 'tracks' and 'routes', see B-432, and specifically for recommended tracks, see B-434.

h. Routeing measures may be designated as **associated protective measures** for Particularly Sensitive Sea Areas (PSSA); see B-437.6.

i. **Positions.** The geographical positions of routeing measures, quoted in *Ships' Routeing*, apply specifically to the stated reference chart. Care must be taken in plotting the details on other charts, including different editions of the reference chart, to allow for any differences in horizontal datum.

j. The symbols for the features described in B-435 are illustrated in the following diagram. Chart INT 1 references in the specifications correspond to those shown on the diagram, in blue. All symbols and text associated with routeing measures must be magenta.

B-435 (continued) EXAMPLES OF ROUTEING MEASURES



The blue encircled numbers refer to INT 1 section M, and the references in the following specifications.

Commentaire [c17] : This diagram will need some alteration to reflect the revised specifications, ie one-way recommended route, DW recommended routes and tracks, removal of misleading 'arrowhead' on DW route, inclusion of Fairway.

Commentaire [c18] : DID: Replace safety fairway by *FAIRWAY 7.3m (2006)* with shorter dashes (as other routeing measures). See B-434.5 for details. Remove circle 'a'. Further changes are likely.

B-435.1 Traffic separation schemes and inshore traffic zones

a. A **traffic separation scheme** (M20.1-3) is defined in *Ships' Routeing* as:

> 'A routeing measure aimed at the separation of opposing streams of traffic by appropriate means and by the establishment of traffic lanes.'

Traffic separation schemes established by regulatory authorities and those adopted by IMO (which are listed in *Ship's Routeing* Part B) must be represented on charts in magenta.

b. A **traffic lane** is defined in *Ships' Routeing* as:

> 'An area within defined limits in which one-way traffic is established. Natural obstacles, including those forming separation zones, may constitute a boundary.'

The outer limits of traffic lanes must be represented by bold dashed lines (M15), except where a separation zone or line is designated or required (eg between a traffic separation scheme and an inshore traffic zone) (See also B-436).

c. **A separation zone or line** (M12-13) is defined in *Ships' Routeing* as:

> 'A zone or line separating the traffic lanes in which ships are proceeding in opposite or nearly opposite directions; or separating a traffic lane from the adjacent sea area; or separating traffic lanes designated for particular classes of ship proceeding in the same direction.'

A separation zone must be shown by a tint light enough not to obscure any hydrographic detail. **A separation line** must be shown by a similar tinted line 3mm wide (or less on smaller scale charts). If the traffic lanes are separated by natural obstructions such as islands or marked shoals, representation of the separation zone may be omitted.

d. **The established (mandatory) direction of traffic flow** is defined in *Ships' Routeing* as:

> 'A traffic flow pattern indicating the directional movement of traffic as established within a traffic separation scheme.'

It must be shown in traffic separation schemes by outline arrows  (M10), in dispersed or staggered formation, where scale permits, to encourage use of the full width of the traffic lanes (subject to the requirement to keep clear of separation zones). Established direction of traffic flow arrows may be used within other routeing systems if established by a regulatory authority. For **recommended** direction of traffic flow (dashed outline) arrows, see B-435.5.

e. **Junctions.** Full separation of opposing flows of traffic is impossible at junctions where routes meet or cross each other. Types of junction and crossing within traffic separation schemes include:

- A **Roundabout** (M21) is defined in *Ships' Routeing* as:

  > 'A routeing measure comprising a separation point or circular separation zone and a circular traffic lane within defined limits. Traffic within the roundabout is separated by moving in a counter-clockwise direction around the separation point or zone.'

- A **Junction** (M22), where a central separation zone may be narrowed to a separation line as indication where there will be crossing traffic. Note that arrows must be omitted at such intersections to avoid implying priority of one lane over another (but see B-435.2).

- A **Crossing** (M23). Note that arrows must be omitted at the intersections (but see B-435.2).

In some cases, a precautionary area is established where routes meet or cross. See B-435.2.

f. An **inshore traffic zone** (M25.1-2) is defined in *Ships' Routeing* as:

> 'A routeing measure comprising a designated area between the landward boundary of a traffic separation scheme and the adjacent coast, to be used in accordance with the provisions of rule 10(d), as amended, of the International Regulations for Preventing Collisions at Sea, 1972 (Collision Regulations).'

Inshore traffic zones are used to exclude most classes of through traffic. They must be represented by the legend 'Inshore Traffic Zone', 'ITZ', or equivalent. Where end-limits are explicitly stated in *Ships' Routeing*, they must be charted by bold T-shaped dashes. Traffic in an inshore traffic zone is separated from traffic in the adjacent traffic lane by either a separation zone or a separation line. An inshore traffic zone may be adjacent to a precautionary area. For boundary symbols, see B-436.

g. Charts on which traffic separation schemes are shown should carry notes, either indicating which schemes have been adopted by IMO, or referring the chart user to a document which gives such information.

h. **Special regulations** may apply to schemes which are not IMO-adopted within territorial waters; such regulations should be included in associated publications and referred to in a charted note.

B-435.2 Precautionary areas

a. A **Precautionary area** (M24) is defined in *Ships' Routeing* as:

> 'A routeing measure comprising an area within defined limits where ships must navigate with particular caution and within which the direction of traffic flow may be recommended.'

Precautionary areas are commonly designated by IMO for certain areas of converging or crossing traffic, usually in association with traffic separation schemes.

b. The **triangular danger symbol**, ⚠ in magenta (M16), must be used to represent a precautionary area. A legend '*Precautionary Area*' may be used in addition, especially if there is an associated note.. The limits of precautionary areas must be bold dashed magenta lines (M15), which should continue uninterrupted across the ends of traffic lanes.

c. **The size** of the symbol may be varied to suit the charted size of the precautionary area, and the symbol may be repeated if necessary.

d. **Directions of traffic flow** (see B-435.5) may be recommended within the precautionary area. The placing of the arrows should carefully follow that in *Ships' Routeing*, where the scale of the chart permits.

B-435.3 Deep Water routes

a. A **Deep Water (DW) route** (M27.1-3) is defined in *Ships' Routeing* as:

> 'A route within defined limits which has been accurately surveyed for clearance of sea bottom and submerged obstacles as indicated on the chart.'

IMO-designated deep water routes are listed in *Ships' Routeing* Part C.

b. **The international abbreviation *DW*,** in magenta capital letters, must be inserted on charts at intervals within the limits of DW routes.

c. **Limits of DW routes** must be shown as bold dashed magenta lines (M15) except where they coincide with the limits of other routeing measures. DW routes should be charted 'open-ended' only where one DW route leads directly into another; see B-436.

d. **DW routes combined with other routeing measures.** Where a DW route lies within a lane of a traffic separation scheme (M27.1), outline arrows ⇨ (M10) representing the **established** direction of traffic flow must be charted; see B435.1d.

Where a DW route is combined with a two-way route (M26.2), arrows representing the **established** ⇨ (M10) or **recommended** ⇨ (M11) direction of traffic flow must be charted, if it opposes other traffic flows.; otherwise, arrows may be charted if required for clarity.

A DW route may also continue through a precautionary area.

e. **Exceptionally, the centrelines of DW routes** may be charted (rather than their limits) by the symbol for recommended tracks but in magenta (M27.3, but see B-434.1 for other details), and with the abbreviation ***DW*** at regular intervals (approximately 100mm).

f. **Depths within a DW route** (M27.2)**.** Deep Water routes, unlike dredged areas, are likely to be designated in offshore waters outside the immediate supervision of harbour authorities (although some do form the outer approaches to deep water ports). No least depth quoted can be fully guaranteed in most cases. Normally, least depths must be depicted by soundings as elsewhere on the chart so that the navigator will not assume that the depths are continually monitored. However, in those cases where a hydrographic authority feels confident to guarantee the existence of a minimum depth of water in a DW route, it may be charted in magenta (M27.2). If appropriate, the date of the latest survey may be added in parenthesis. Where least depths are quoted in *Ships' Routeing* they should not be regarded as more authoritative than those shown on the latest charts of the responsible authority.

g. **The notes in** *Ships' Routeing* which accompany the descriptions of DW routes may be appropriate for a charted cautionary note.

B-435.4 Recommended routes

a. A **Recommended route** (M28.1) is defined in *Ships' Routeing* as:

> 'A route of undefined width, for the convenience of ships in transit, which is often marked by centreline buoys.'

b. IMO-designated recommended routes are listed in *Ships' Routeing* Part E. The distinctive characteristic of recommended routes is that they are charted by bold dashed magenta centrelines, with recommended direction of traffic flow arrows ⇨ (M11) alongside. This type of routeing measure was adopted to include such features as the 'transit routes' (through former minefields) in the entrances to the Baltic Sea.

c. A one-way recommended route should be shown by replacing centreline dashes by recommended direction of traffic flow arrows at regular intervals (approximately 100mm):

d. In contrast to recommended tracks (see B-434), there is usually ample sea-room for vessels to keep well starboard (to the right) of the centreline.

e. A legend may be added in bold magenta sloping text to the symbol to designate the route, or as a reference to a note giving such details, eg:

***ROUTE T** (see Note)*

B-435.5 Recommended direction of traffic flow

Commentaire [c19] : Revised following comment by FR.

Commentaire [c20] : Avoids repetition of details about firm and dashed lines and frequency of arrowheads, etc

Commentaire [c21] : Proposed new symbol. Please comment at Annex C.

Commentaire [c22] : DID: please realign , so arrow lines up with dashes

a. The recommended direction of traffic flow (M11) is defined in *Ships' Routeing* as:

> 'A traffic flow pattern indicating a recommended directional movement of traffic where it is impractical or unnecessary to adopt an established direction of traffic flow.'

b. The recommended direction of traffic flow is represented on charts by dashed outline arrows ⊏⊏⊏⊏⇨ (M11), in magenta. These arrows are an essential part of the symbols for two-way routes and recommended routes (M26.2, M28.1, M28.2). They may also appear in other routeing measures, such as precautionary areas (M24). See B-435.1d for **established** (regulated) direction of traffic flow arrows.

c. Recommended direction of traffic flow arrows may also be used on charts outside the limits of other routeing measures, eg the arrows may link two traffic separation schemes (M26.1). Arrows should usually be charted in dispersed or staggered formation. This is to avoid the risk of concentrating traffic when vessels follow the arrows, instead of spreading out across the available area.

d. IMO-designated recommended directions of traffic flow are listed in *Ships' Routeing* Part E. Several hydrographic offices, in consultation with their Ministries of Transport, have added recommended directions in areas such as the outer approaches to major ports in order to show the best routes for crossing traffic or to minimise the risk of head-on encounters. Recommended direction arrows may be charted as a national measure, even outside territorial waters.

B-435.6 Two-way routes

a. **A designated two-way route** (M28.2) is defined in *Ships' Routeing* as:

> 'A route within defined limits inside which two-way traffic is established, aimed at providing safe passage of ships through waters where navigation is difficult or dangerous.'

Such routes are established by regulatory authorities and may be adopted by IMO. IMO-designated two-way routes are listed in *Ships' Routeing* Part E. They must be charted in magenta.

b. **The limits of two-way routes** must be shown by means of bold dashed magenta lines (M15). The two-way nature of the route must be shown by dashed outline arrows ⊏⊏⊏⊏⇨ (M11) indicating the 'recommended direction of the traffic flow'. The arrows must be positioned so as to reinforce the 'keep to starboard where practicable' rule, and they should be distributed along the route in a dispersed or staggered formation (see B-435.5c).

c. **One-way sections** may exist within two-way routes.

Commentaire [c23] : AU suggests a division of M28.2 into two parts to separate two-way and one-way sections. This will mean a change to INT 1. Please comment at Annex C.

d. **A cautionary note** should be charted to explain the reason for the establishment of a designated two-way route (and, if appropriate, give a warning that some vessels may not be able to keep to the starboard side of the route at all times). The note may also indicate whether the route is IMO-approved, and may refer to other publications for more detail.

e. **On charts where the width of a route** does not allow arrows to be included within the limits, the sloping magenta legend '***Two-way Route***' (or equivalent) may be shown instead.

B-435.7 Areas to be Avoided (ATBA)

The term 'Area to be Avoided' is used to identify the IMO-defined routeing measure of that name (but is not limited to IMO-adopted areas). All symbols and text must be in magenta. For the charting of areas which should be avoided for any of a variety of other reasons, see B-439.

a. An **Area to be Avoided** is defined in *Ships' Routeing* as:

> 'A routeing measure comprising an area within defined limits in

which either navigation is particularly hazardous or it is exceptionally important to avoid casualties and which should be avoided by all ships, or certain classes of ships.'

b. ATBA vary in size from small circular areas, which 'protect' vital buoys or major lights (M29.1), to much larger areas which protect natural features, such as large coral reefs (M 29.2). IMO-designated ATBA are listed in *Ships' Routeing* Part D.

c. ATBA may be established specifically to provide additional environmental protection to the areas concerned. See also B-437.6.

d. The limits of an ATBA must be shown by bold T-shaped magenta dashes (M14).

e. The magenta legend '*AREA TO BE AVOIDED (see Note)*' should be inserted within the area of the ATBA. Where space is limited, the abbreviated legend '*ATBA (see Note)*' should be inserted.

f. A magenta note should be inserted explaining the reasons for establishment of the area, specifying the vessels to which it applies and stating whether the ATBA is IMO-adopted, as appropriate,eg:

AREA TO BE AVOIDED (ATBA)
(...insert approximate position ...)
To avoid the risk of pollution and damage to the environment, this area has been designated an Area to be Avoided. All vessels carrying dangerous or toxic cargoes, or any other vessel exceeding ... grt, should avoid the area. This Area is IMO-adopted.

Alternatively, the note may begin:

An IMO-adopted Area to be Avoided .....

The exact wording of the note should be tailored to reflect the specific criteria for each area; it may be detailed, as in the example above, or may be simply a reference which draws attention to the full details contained in a publication.

B-435.8 IMO associated rules and recommendations on navigation

a. **IMO rules and recommendations** give detailed advice on the navigation in certain international straits subject to heavy traffic. They are listed in *Ships' Routeing* Part F.

b. Attention should be drawn to such rules and recommendations by cautionary notes, in magenta, on the charts principally affected. They should also be quoted in Mariners' Routeing Guides, where such Guides exist, and in Sailing Directions.

B-435.9 Mandatory routeing system

a. A **mandatory routeing system** is defined in *Ships' Routeing* as:

'A routeing system adopted by the Organization, in accordance with the requirements of regulation V/10 of the International Convention for the Safety of Life at Sea 1974, for mandatory use by all ships, certain categories of ships or ships carrying certain cargoes.'

b. No special chart symbol denotes that a routeing measure is mandatory; this must be stated in an associated note. Mandatory measures (including mandatory ship reporting systems) adopted by IMO are listed in *Ships' Routeing* Part G.

B-435.10 Archipelagic Sea Lanes (ASL)

a. **Definition.** Article 53 of the United Nations Convention on the Law of the Sea (UNCLOS) states that:

'an archipelagic State may designate sea lanes ..., suitable for the continuous and expeditious passage of foreign ships ... through ... its

archipelagic waters and the adjacent territorial sea. ... All ships ... enjoy the right of archipelagic sea lanes passage in such sea lanes ... [which] include all normal passage routes used as routes for international navigation … through archipelagic waters'.

(Note: references to aircraft and air routes in UNCLOS have been omitted in these extracts from Article 53).

b. Any archipelagic State which wishes to designate ASL shall propose them to IMO for adoption as ASL including all normal passage routes and navigational channels as required by UNCLOS. ASL are adopted by IMO in accordance with the relevant provisions of UNCLOS.

c. Details of ASL are given in *Ships' Routeing* Part H. Further information is provided in the IHO publication S-51 (Manual on Technical Aspects of the United Nations Convention on the Law of the Sea).

d. **Characteristics.** The **unique character** of the ASL routeing measure is reflected in the very specific considerations required for charting them. UNCLOS states that:

- 'ASL shall be defined by a series of **continuous axis lines** from the entry points of passage routes to the exit points.'
- 'Ships in archipelagic sea lanes passage **shall not deviate more than 25 nautical miles** to either side of such axis lines during passage, provided that such ships **shall not navigate closer to the coasts than 10 per cent** of the distance between the nearest points on islands bordering the sea lane' (referred to subsequently as 'the 10% rule'). (Note: The word 'coast' is interpreted by IHO to mean the charted High Water line).
- 'The archipelagic State shall clearly indicate the axis of the sea lanes…on charts, to which due publicity shall be given.'

e. Traffic within ASL is not separated, except in any traffic separation schemes which may be designated in an ASL for the safe passage of ships; see B-435.1.

f. The **axis line** of an ASL is shown on charts only for the purpose of defining the sea lane. The axis line does not indicate any routes or recommended tracks as defined in B-434 and *Ships' Routeing* Part A.

g. The **symbols** for ASL must be inserted in magenta as follows:

i. Axis line of ASL:

Magenta line long dashes 12mm, short dashes 5mm, gaps 4mm.

Line weight bold (if screened tint) or light (if full strength).

ii. Dashes should be joined at turning points:

iii. The axis line must be shown through other routeing measures without interruption, since it may not necessarily form the centre line of a routeing measure established within the ASL, in accordance with *Ships' Routeing* Part A.

iv. The abbreviated legend

ASL (see Note) **M 17**

should be inserted at intervals (approximately 100mm) along the axis line, and may be inserted within the lanes.

The full legend *Archipelagic Sea Lane (see Note)* may be used in cases where it is considered appropriate.

v. The outer limit of an ASL, including where the 10% rule applies, should be indicated as:

Length of each dash 6mm, gap 2mm. Base of triangle 3.3mm, height 1.62mm.

The triangles must point into the ASL.

If appropriate, the full outer limit of the ASL may be charted.

vi. Linear symbols should be inserted as a bold line in a tint light enough to be printed over hydrographic detail without obscuring it. If a tint is not used, the line should be fine. Associated legends must be inserted in full strength magenta.

vii. An **explanatory note,** providing information on the unique characteristics of an ASL, should be inserted, preferably in the title area of relevant charts. The following notes provide examples of the type of information which should be included in the note. The first note is appropriate when the full outer limit is charted. The second note is appropriate when the outer limit is only charted where the 10% rule applies.

ASL — ARCHIPELAGIC SEA LANE

Archipelagic Sea Lanes, as defined in UNCLOS, have been designated in the area of this chart. Vessels exercising archipelagic sea lanes passage shall not navigate to shoreward of the limits indicated thus:  . The axis line of the ASL does not indicate the deepest water nor any recommended route or track. [For further details see *any relevant publications*]

ASL — ARCHIPELAGIC SEA LANE

Archipelagic Sea Lanes, as defined in UNCLOS, have been designated in the area of this chart. Vessels exercising archipelagic sea lanes passage shall not navigate to shoreward of the limits indicated thus:  and shall not deviate more than 25 miles from the charted axis line. The axis line of the ASL does not indicate the deepest water nor any recommended route or track. [For further details see *any relevant publications*]

Details in [ ] are optional.

B-435.11 No anchoring areas

The term 'no anchoring area' is used to identify the IMO routeing measure of that name. For the charting of areas in which anchoring is prohibited for any of a variety of other reasons, see B-439.

a. **A no anchoring area** is defined in *Ships' Routeing* as:

> 'A routeing measure comprising an area within defined limits where anchoring is hazardous or could result in unacceptable damage to the marine environment. Anchoring in a no anchoring area should be avoided by all ships or certain classes of ships, except in case of immediate danger to the ship or the persons on board.'

b. There is no restriction to navigation over these areas. In considering the initial concept of such areas, IMO concluded that anchoring is a normal part of following a route during a voyage, so that establishment of a 'no anchoring area' could be regarded as a routeing measure, the establishment of which should be governed by the General Provisions in *Ships' Routeing*.

c. No anchoring areas may be adopted in areas where anchoring is unsafe, unstable, hazardous, or it is particularly important to avoid damage to the marine environment, and therefore anchoring should be avoided by all ships or certain classes of ships. These mandatory no anchoring areas are listed in *Ships' Routeing* Part G.

d. The limits of the no anchoring area should be inserted using N20. For small areas, the symbol should be inserted within the area, instead of in the limit.

Commentaire [c24] : Although technically a routeing measure, when this specification was originally agreed, the symbol N20 was used. It is also referenced in INT1. To the user, introducing a different symbol (M14) meaning the same thing (ie do not anchor) may be confusing. The IMO aspect is covered by the legend and note.

e. The magenta legend '*No Anchoring Area (see Note)*' should be inserted within the area (or alongside for small areas).

f. A magenta note should be inserted on relevant charts explaining the reasons for establishment of the area, specifying the vessels to which it applies and stating that the charted no anchoring area is IMO-adopted and that it is mandatory. For example:

NO ANCHORING AREA

(.....[insert approximate position].....)

To avoid the risk of damage to the environment, [all vessels *or detail certain classes or sizes of vessels, if appropriate*] should avoid anchoring in the charted IMO-adopted mandatory No Anchoring Area.

The exact wording of the note should be tailored to reflect the specific criteria for each area; it may be detailed as in the example above or may be simply a reference which draws attention to the full details contained in an associated publication.

B-436 BOUNDARIES OF ROUTEING MEASURES

B-436.1 a. The following paragraphs give the rules specifying which symbol (if any) is to be used at the boundary between different routeing measures, or between any measure and the open sea. All symbols are in magenta.

b. Archipelagic sea lane boundaries are not listed, as the symbols in B-435.10 are used irrespective of the presence of other routeing measures. For the convention to be used when a separation line or zone coincides with a PSSA limit, see B-437.6b.

B-436.2 The table below is designed to cover existing situations. As an example, in number 8, where the boundary of a precautionary area coincides with that of an inshore traffic zone, the symbol to be used is a line of bold T-shaped dashes, with the stems of the Ts towards the inshore traffic zone.

B-436.3

Commentaire [c25] : DID: please replace dashes and T dashes with the longer, bolder variety used for routeing measures

	Routeing measures	Symbol
1	Traffic separation scheme (ends) ---------- Open sea	No symbol
2	Traffic separation scheme (sides) ---------- Open sea	M15 or (line) M12 or (zone) M13

	Routeing measures	Symbol
3	Traffic separation scheme ---------- Inshore traffic zone	(line) **M12** or (zone) **M13**
4	Traffic separation scheme leading into another traffic separation scheme	No symbol
5	Inshore traffic zone ends ---------- Open sea	**M14** (no symbol, if limits are undefined)
6	Precautionary area ---------- Open sea	**M15**
7	Precautionary area ---------- Traffic Separation Scheme	**M15**
8	Precautionary area ---------- Inshore traffic zone	**M14**
9	Deep water route (sides) ---------- Open sea	**M15**
10	Deep water route (ends) ---------- Open sea	**M15**
11	Deep water route (ends) ---------- Traffic separation scheme	**M15**

	Routeing measures	Symbol
12	Deep water route leading into another deep water route	No symbol (if there are stated and differing minimum depths, use M15)
13	Deep water route (ends) --- Precautionary area	M15
14	Deep water route --- Separation zone/line	M12, M13 (separation zone/line acts as boundary)
15	Two-way route or regulated fairway --- All other areas	Same rules as for deep water route
16	Areas to be avoided --- All other areas	M14
17	No anchoring area --- All other areas	N20

Commentaire [c26] : As with Fairways and other routeing limits

Commentaire [c27] : DID: note that these T dashes should be the smaller size.

For guidance on cartographic principles for portraying maritime limits, see B-439.6.

B-437 ENVIRONMENTALLY SENSITIVE SEA AREA (ESSA)

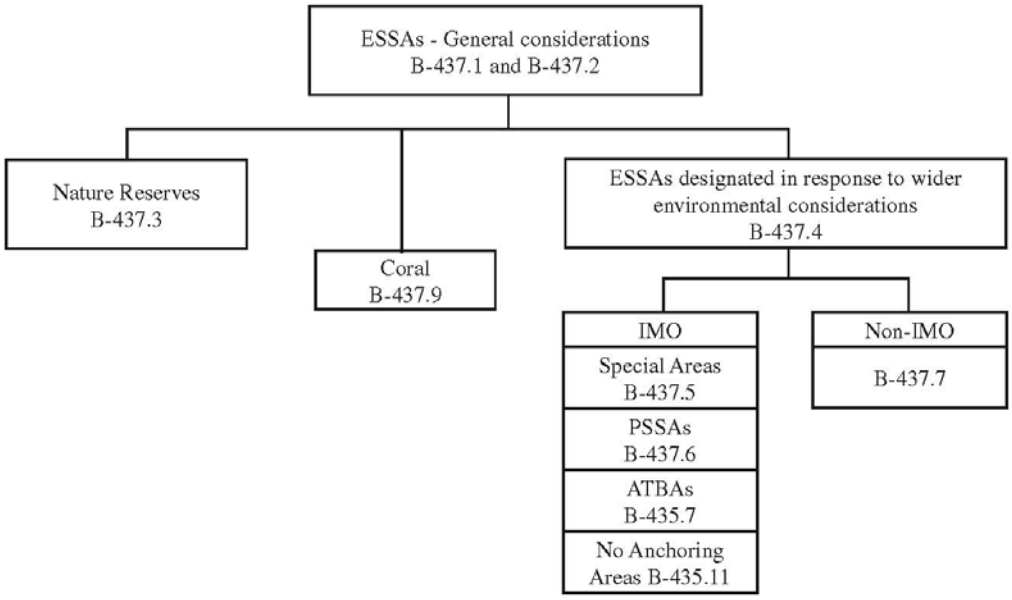
B-437.1 **Environmentally Sensitive Sea Area (ESSA)** is a generic term which may be used to describe a wide range of areas, considered sensitive for a variety of environmental reasons. The implications which each of these have for charting and navigation may be different. Specific types of ESSA are detailed in the paragraphs which follow.

There are two broad types of Environmentally Sensitive Sea Areas (ESSA):

a. those established to protect specific types of nature from disturbance (usually close inshore and established under national legislation); see B-437.3;

b. those specifically designated in response to wider environmental considerations, potentially 'the total environment' (usually including some degree of risk from shipping, possibly covering extensive sea areas, and established under state, national or international legislation); see B-437.4, B-437.5, B-437.6, B-437.7, B-437.9.

The relationships between the different types of ESSA and the relevant paragraphs in B-437 are tabulated as follows:



The **primary reason for charting ESSA** is to inform mariners of any impact on their activities (such as anti-pollution measures, restrictions on entry, anchoring or fishing) and, where possible, the reasons for their sensitivity. General considerations for the charting of ESSA are detailed in B-437.2.

B-437.2 General considerations for the charting of ESSA.

a. **Inclusion on charts.** ESSA should be included on charts where there is a specifically identified requirement, and where it is practicable, given the scale of the chart and the extent of the ESSA. If there is no such requirement, or if it is not practicable, details of ESSA should only be inserted in associated publications, such as Sailing Directions. It should be noted that their inclusion or mention on smaller scale charts may be appropriate for voyage planning purposes.

b. **Colour.** All details associated with ESSA should be charted in green (the colour internationally associated with environmental matters) or may be charted in magenta (superimposed information); see B-140-144. The use of green for ESSA has the advantages of being immediately identifiable as an ESSA and of reducing the amount of detail on the magenta plate. The use of magenta has the advantage of being one of the four basic colours which all Member States use. All other aspects of specification B-437 apply equally, whichever colour is used. It is recommended that Member States move towards the use of green for ESSA if there are no other considerations preventing this. However, certain areas discussed in B-435 and B-439 should be inserted in magenta for consistency. If green is used for the ESSA limits, all associated symbols, texts and notes should also be green. The exception is when a note about an ESSA is combined with a magenta note (eg about an associated restriction), then the entire note should be in magenta.

c. **Options available.** The extremely varied extent and complexity of ESSA means that, in theory, the appropriateness of each of the available options should be considered before charting a specific ESSA. In addition, the options available for consideration may be affected by the scale of the chart; for example, whilst limits may be inserted on larger scale charts, it may be more appropriate to insert just a note on a smaller scale chart of the same area.

The range of options available (which may be used in combination) includes insertion of the following:

- no details or reference on charts; rather, insertion of details in associated publications, such as Sailing Directions and Annual Notices to Mariners, only;
- a simple note on charts referring to details in associated publications, such as Sailing Directions and Annual Notices to Mariners, etc;
- a note giving details of the ESSA;
- legend '*... [name or type of area] ... (see Note)*';
- legend '*... [name or type of area] ...*';
- limits of ESSA;
- details of associated restrictions;
- limits of associated restrictions;
- limits of ESSA and details and limits of associated restrictions, incorporated in a multi-feature line; see B-437.2.f;
- point symbol.

In practice, it is possible to define general guidelines for the charting of each general type of ESSA referred to in B-437.1; see B-437.3 and B-437.4.

d. **ESSA limits and associated limits.** To ensure that the differing measures and restrictions, which apply in all, or part, of an ESSA's area, are correctly interpreted, it is important to ensure that any limits which are charted clearly indicate the area of coverage of each of the different areas. The following illustrate the combinations which may occur:

- the limit of the ESSA coincides with that of the measures or restrictions which apply in the ESSA area;
- the limit of the ESSA encompasses several other areas and their limits, for example, anchoring may be prohibited in part of an ESSA, whilst entry is restricted in another part of the ESSA;
- the limit of the ESSA overlaps with the limit of another area, for example an area where anchoring is prohibited.

Such limits should be inserted in accordance with the relevant guidance in B-435, B-437, B-439 and B-449.

e. **Charting of ESSA limits.** Where it is appropriate to chart the limits of ESSAs (see B-437.1 and B-437.2.a), it should be in accordance with the methods detailed below and, depending on the type of ESSA, in B-437.4 to B-437.9, as appropriate.

Limits may be shown by a symbolized line or, if such a line is not appropriate or available, limits may be charted by a general maritime limit or restricted area limit (see below), with an appropriate legend within the area of the ESSA. Where it is necessary to highlight specific restrictions, reference to a charted note may be included. Where symbols are incorporated in an ESSA limit, they must be oriented to indicate the side of the line on which the area lies.

In all cases, the basic line style employed in the depiction of these limits (which may or may not be amplified by specific ESSA symbology referred to below), should follow the normal conventions for charting of unrestricted and restricted areas (see B-439.2), that is:

- dashed line (N 1.2), the general maritime limit, in green or magenta (see B-437.2.b), implying no restrictions or physical obstructions;
- T-shaped dashed line with down-strokes pointing inwards, in green or magenta (see B-437.2.b), if legislation prohibits certain activities such as anchoring or fishing (N 2.1), or restricts entry to certain types of vessels (N 2.2).

f. **Multi-feature lines.** Where the limit of the ESSA coincides with other limits which need to be charted, for example associated protective measures such as anchoring and fishing prohibited which apply within the ESSA, they may be incorporated in the symbolized charted limit. Such limits are described as multi-feature lines; see B-439.6.

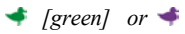
B-437.3 **Nature Reserves** (in a marine context) are ESSA which have been established to protect specific types of nature, or all nature within a defined area, against disturbance. They are usually close inshore and established under national legislation. Examples include:

- Conservation Areas;
- Marine Nature Reserves;
- Marine Sanctuaries;
- Bird Sanctuaries;
- Game Preserves;
- Seal Sanctuaries;
- National Parks.

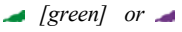
For general guidance on the charting of ESSA, see B-437.1 and B-437.2. Nature Reserves should only be inserted on charts when considered appropriate to the scale and purpose of the chart; they should be charted in accordance with the specifications which follow.

The limit of the Nature Reserve may be inserted using the appropriate basic line style as described in B-437.2.e with the appropriate symbol below inserted within the area. However, for large areas, the use of a patterned line should be considered, combining the appropriate basic line style (see B-437.2.e) with the appropriate symbol oriented in the line so as to indicate the side on which the area falls (ie base of the symbol innermost). Symbols used should be selected from the following:

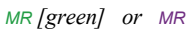
a. Bird Sanctuary or similar nature reserve



b. Seal sanctuary



c. Non-specific nature reserve, National Park, Marine Sanctuary, Marine Reserve, etc



If other limits which need to be charted coincide with the limit of the Nature Reserve, for example restrictions which apply within the Nature Reserve, they may be incorporated in the symbolized charted limit. Such limits are described as multi-feature lines; see B-439.6k. See also B-437.2f.

If insufficient space is available, they may be charted using one of the symbols above as a point symbol, eg:

 *[green]* *[magenta]* **N 22**

A legend, eg *'Marine Sanctuary (see Note)'* may be inserted (in green or magenta) within the area. (Omit the reference *'(see Note)'* if a note is not necessary).

A suitably worded note may be inserted in the title area of relevant charts; the following are examples, and may be in green or magenta:

MARINE SANCTUARY

(...insert approximate position...)

To avoid the risk of pollution and damage to the environment, this area has been designated a Marine Sanctuary. All vessels carrying dangerous or toxic cargoes, or any other vessel exceeding .... grt, should avoid the area.

NATIONAL PARKS

(...insert approximate positions...)

Entry into the national parks shown on this chart is affected by numerous restrictions and prohibitions. For further details, see ... *[name of publication]* ....

The exact wording of the note should be tailored to cover the specific case, ie location, the type of measures, restrictions, etc; it may be detailed or may be simply a reference which draws attention to the full details contained in a publication. Such a note may be combined with other related notes.

For nature reserves on land, omit the MR from the limit. A note will not usually be necessary.

B-437.4 **ESSA specifically designated in response to wider environmental considerations, potentially 'the total environment'.** The basic reason for the establishment of most of these areas is the coincidence of environmental sensitivity and some degree of risk from shipping. One of the main reasons for charting them is to alert mariners to their existence and to inform them of the reasons for their sensitivity. They may cover extensive sea areas and may be established under state, national or international legislation. They include:

a. Environmental areas defined or designated by IMO:

- Special Areas (SA) - see B-437.5;
- Particularly Sensitive Sea Areas (PSSA) - see B-437.6;
- Areas To Be Avoided (ATBA) - see B-435.7;
- No Anchoring Areas - see B-435.11.

b. Other environmental areas not defined or designated by IMO, which include:

- Marine and Estuarine Protected Areas (MEPA) in Australia;
- Marine Environmentally Sensitive Areas (MESA) in the European Union;
- Particular Sensitive Areas (PSA);
- Sites of Special Scientific Interest (SSSI).
- Protected Areas (PA) in the Antarctic;
- Specially Protected Areas (SPA) in the Antarctic;
- Antarctic Specially Protected Areas (ASPA) combining SPA and SSSI;
- Marine Environmental High Risk Areas (MEHRA) in the United Kingdom.
- Non-IMO Areas to be Avoided (ATBA) – see B-435.7

See B-437.7.

For general points on the charting of ESSA, see B-437.1 and B-437.2.

B-437.5 Special Area

A Special Area is an IMO-adopted measure designated under the International Convention for the Prevention of Pollution from Ships 1973, modified by the Protocol of 1978 (MARPOL 73/78). It is defined in IMO Resolution A.927(22) as:

> 'a sea area where for recognized technical reasons in relation to its oceanographical and ecological conditions and to the particular character of its traffic, the adoption of special mandatory methods for the prevention of sea pollution by oil, noxious liquid substances, or garbage, as applicable, is required'.

IMO Resolution A.720(17) states:

> 'Sea can be seen as an oceanographical or geographical term; in both cases a sea will, by definition, be a rather large area. Every existing "special area", is a (semi)-enclosed sea in an oceanographical sense and pursuant to the methods of protection .... a special area has to be rather large.'

A Special Area may encompass the maritime zones of several States, or even an entire enclosed or semi-enclosed area.

Special Areas are defined in terms of the pollution types covered in each of the Annexes to MARPOL 73/78 (Annex I - oil; Annex II - noxious liquid substances; Annex V - garbage; Annex VI - SOx emission control areas). They are designated by IMO's Marine Environment Protection Committee (MEPC) and include: the Mediterranean Sea area; Baltic Sea area; Black Sea area; Red Sea area; Gulfs area; Gulf of Aden; Antarctic area; North Sea; Wider Caribbean; North West European waters.

Given the wide extent of the area covered by individual designated Special Areas, and the fact that they are not directly related to safety of navigation, their **limits should not normally be inserted on navigation charts.** It is more appropriate to include details in associated publications, such as Sailing Directions, Annual Notices to Mariners or special charts depicting MARPOL 73/78 limits. If necessary, a note may be inserted (in green or magenta) on appropriate charts referring to the fact that the chart (or a specified part of it) lies within an IMO-designated Special Area:

MARPOL 73/78 SPECIAL AREA
This chart lies within a Special Area designated by IMO under MARPOL 73/78.
For details, see .....*[name of chart or publication]*.....

Special Areas may be identified as an associated protective measure for Particularly Sensitive Sea Areas (PSSA); see B-437.6.

B-437.6 Particularly Sensitive Sea Area (PSSA)

a. General.

A **Particularly Sensitive Sea Area (PSSA)** is an IMO-designated measure, established in accordance with IMO Resolution. It is defined in IMO Resolution A.927(22) as:

> 'an area that needs special protection through action by IMO because of its significance for recognized ecological, socio-economic or scientific reasons and because it may be vulnerable to damage by international shipping activities.'

PSSAs vary in extent and include the Great Barrier Reef in Australia, the Archipelago of Sabana-Camagüey in Cuba, Malpelo Island in Colombia, Florida Keys in the USA and the Wadden Sea area of The Netherlands, Germany and Denmark.

Identification of areas as PSSAs is approved by the IMO's Marine Environment Protection Committee (MEPC), but no final determination is made until after the pertinent IMO Sub-Committee or Committee has approved the associated protective measures. In the case of the Great Barrier Reef, the charting of the PSSA is itself considered to be a protective measure.

An **associated protective measure** is defined in IMO Resolution A.885(21) as:

> 'an international rule or standard that falls within the purview of IMO and regulates international maritime activities for the protection of the area at risk.'

Measures within the purview of IMO comprise:

- designation of an area as a Special Area under Annexes of MARPOL 73/78 or to apply special discharge restrictions to vessels operating in a PSSA;
- adoption of ships' routeing and reporting measures near or in the area;
- other measures such as compulsory pilotage schemes or vessel traffic management systems.

All associated protective measures should be identified on charts to comply with IMO Resolution A.927(22), which specifically states:

> 'When a PSSA is finally designated, all associated protective measures should be identified on charts in accordance with symbols and methods of the International Hydrographic Organization (IHO).'

The relevant symbols and methods of the IHO, referred to in the IMO Resolution, are detailed in B-437 in general, and in B-437.6.b and B-437.6.c in particular. They include cross-references, as appropriate, to B-435, B-488 and B-491.

b. Charting of PSSA.

A suitably worded note should be inserted on the relevant charts; the following is an example (and may be in green or magenta):

> **PARTICULARLY SENSITIVE SEA AREA (PSSA)**
> An IMO-approved PSSA is designated in *[general area or the area of this chart]*. Mariners ... *[insert any special requirements, procedures, etc]*. For further details, see *[insert name of publication]*.

It is important to indicate that the measure is IMO-adopted. The exact wording of the note should be tailored to cover each specific area, ie location, the type of associated protective measures, etc. It may be detailed or may be simply a reference which draws attention to the full details contained in an associated publication such as Sailing Directions. Such a note may be combined with other related notes. A simple note, providing a reference to an associated publication may be the only way in which some associated protective measures, such as special discharge restrictions, can be identified on charts.

The legend '*Particularly Sensitive Sea Area (see Note)*' should be inserted within the area of the PSSA, at appropriate positions on relevant charts. Where space is limited, the abbreviated legend '*PSSA (see Note)*' may be inserted.

The limit of a PSSA should be charted using a dashed line (in green or magenta), with a tint band of maximum 5 mm width and abbreviation '*PSSA*' on the PSSA side of the dashed line limit, in green or magenta to match the line colour. The actual width of the band, and density of the tint, should be carefully selected so that the area is not given undue prominence compared with other areas. In general, magenta tint bands tend to be more prominent than green, so a narrower band is likely to be appropriate.

[green or magenta] **N 22**

[green or magenta] **N 22**

B-437.6.a indicates the complexities of charting PSSA. Use of the tint band in addition to the dashed limit serves to emphasize or differentiate the limit and provides visual continuity to the entirety of a PSSA's area. The dashed limit may be broken for any associated protective measures whose limits coincide with those of the PSSA itself (see B-437.2f). It may be appropriate to reverse this convention (ie instead of breaking the dashed limit, break the tint band and continue the dashes) where the limit coincides with a Traffic Separation Scheme tint band.

c. Charting of the associated protective measures

As stated in B-437.6.a, all associated protective measures should be identified on charts. Such identification on charts should be in accordance with the relevant specification for each specific associated protective measure:

Associated Protective Measure	*Action on charts*
Special Area under Annexes of MARPOL 73/78, or the application of special discharge restrictions to vessels operating in a PSSA.	Combine Special Area note (B-437.5) with PSSA note (B-437.6.b). Limits of Special Area not normally charted.
Adoption of ships' routeing and reporting measures.	Insert ships' routeing measures and reporting measures in accordance with appropriate specification (B-435 and B-488). Consider combining any associated note with PSSA note (B-437.6.b).
Other measures such as compulsory pilotage schemes or vessel traffic management systems.	Consider combining any associated note with PSSA note (B-437.6.b).

Where the limits of any associated protective measures, which according to the specifications detailed above should be inserted on charts, coincide with those of the PSSA, both limits should be inserted. The associated protective measure limits should be in accordance with the appropriate specifications, one component of the limit of the PSSA (ie the tint band or the dashes) being broken in accordance with (b) above.

B-437.7 Other environmental areas, defined nationally or internationally

For general points on the charting of ESSA, see B-437.1 and B-437.2.

B-437.4 details ESSA specifically designated in response to wider environmental considerations, potentially 'the total environment'. Those designated by IMO are covered in B-437.5, B-437.6, B-435.7 and B-435.11. Other environmental areas, defined nationally or internationally, are listed in B-437.4.b; they include, for example, Marine and Estuarine Protected Areas (MEPA) in Australia and Marine Environmental High Risk Areas (MEHRA) in the United Kingdom.

The terms applied to ESSA with a specific environmental element to their designation are often incorporated and defined in national or international legislation. Such specific terms carry with them an implication of associated measures. It is therefore important that these terms are reflected in the methods used to incorporate such ESSA in charts and associated publications.

Although the normal preference is to avoid the use of legends where possible, in this specific case it is appropriate to use the specific legends defined in legislation; the very use of these names will, by definition, convey specific characteristics and implications to a proportion of chart users.

Consideration of the use of associated nautical publications is particularly important where ESSA cover an extensive area and where specific requirements are attached to large areas.

Insert note (in green or magenta):

***[INSERT TYPE OF AREA]* (may be abbreviated name, eg MEHRA)**
(... Insert geographical coordinates if appropriate ...)
A *...[insert type of area] ...* exists in *[general area or the area of this chart]*. Mariners *... [insert any special requirements, procedures, etc]*. For further details, see *[insert publication title and/or number]*.

The exact wording of the note should be tailored to cover the specific case, ie location, associated restrictions or requirements, etc. It may be detailed or may be simply a reference which draws attention to the full details contained in a publication. Such a note may be combined with other related notes.

The legend '*... [insert type of area] ... (see Note)*' should be inserted (in green or magenta) within the area, at appropriate positions on relevant charts. Where space is limited, the legend may be abbreviated if appropriate.

The detailed methods used to depict such areas depend upon the requirements which are defined for each specific type of area.

The guidelines in B-437.2 and below should be applied. The line style may be simple N 1.2 (as in the example of the Protected Areas in Antarctica) or may incorporate an appropriate symbol from those detailed in B-437.2 and in N 22, for example the Australian Marine Protected Areas. The options available include, for example:

a. Seahorse

 *[green] or* *[magenta]*

b. Inanimate examples

MR [green] or MR [magenta]

c. Accepted abbreviated name (examples)

ESSA SSSI MEPA *ESSA SSSI MEPA*

Such areas may have associated measures requiring charting. These should be charted in accordance with the relevant specifications. Note that other animal silhouettes may be used, such as penguins, seals or flying birds on charts of Antarctica, and other abbreviated names.

B-437.8 Not currently used.

B-437.9 **Coral**

Coral areas represent a particularly distinctive type of ESSA, whilst at the same time having a number of similarities with other types of ESSA.

From the charting point of view, coral has two main characteristics:

a. as the physical danger which its existence may present to shipping; for details see B-417.6, B-417.8, B-421.5 and B-426.3;

b. as a sensitive habitat in its own right (see below).

Damage to sensitive coral habitats is taken very seriously, and is being approached from a number of angles:

a. international discussions within IHO's Committees, Working Groups and Hydrographic Commissions;

b. international discussions within IMO's Committees and Sub-Committees;

c. international participation in the International Coral Reef Initiative;

d. national discussions leading to national legislation to strengthen protection of ocean and coastal resources by creating marine protected areas to permanently protect the coral reefs.

All such initiatives can have an impact on the charting of coral areas; some are specific to coral areas, whilst others may also be appropriate in different contexts. They illustrate the range and complexity of overlaps and inter-relationships between different types of ESSA and different types of measures implemented to protect those areas; all are implemented as a means of preventing damage to areas of coral.

The following IMO-adopted measures may be used in coral areas; for details, see the referenced paragraphs:

- Area to be Avoided - see B-435.7;
- No anchoring areas - see B-435.11;
- Particularly Sensitive Sea Areas - see B-437.6.

Other specifications which may be applied when charting coral areas include:

- non-IMO-adopted environmental areas, defined by a regulatory authority; see B-437.7;
- symbols for the nature of the seabed; see B-425.5;
- areas with inadequate depth information; see B-417.6;
- submerged coral reefs and pinnacles, and associated danger line; see B-421.5;
- coral reefs and foreshores; see B-426.3.
- unsurveyed areas; see B-418.

B-438 FERRIES

Ferry routes should be charted (or referred to by a note):

- where they cross fairly narrow channels, in order that through traffic is warned of their existence;
- where the ferry tracks are short enough to be reasonably accurately represented;
- on harbour plans, as part of the general information about the area.

B-438.1 **Ferry routes.** The following symbol, in magenta, must be used:

 M 50

B-438.2 **Cable ferries.** On all scales, where space permits, any ferry depending on cables crossing the navigation channel must be identified as a 'Cable Ferry', or equivalent, in black even though the cable(s) may be dropped to the bed of the channel when the ferry is not operating.

M 51

Ferries that depend on fixed overhead cables should be charted by the Overhead Transporter symbol (D25), with legend Cable Ferry in black.

B-438.3 **Long distance ferries** which have routes varying with weather, tide and traffic should not generally be charted, although the terminals should be shown on appropriate scales, generally by means of a legend, eg **RoRo (F50)**. Where ferries cross congested traffic schemes, a cautionary note should be inserted.

B-439 RESTRICTED AND OTHER MARITIME AREAS

There are many types of areas within which certain activities are discouraged or prohibited, or from which certain classes of vessels are excluded. The general term for all areas in which certain aspects of navigation may be restricted or prohibited by regulations is **'Restricted Area'**, or equivalent. The word 'prohibited', or its equivalent, may appear in legends relating to activities which are contrary to the regulations, eg 'Anchoring Prohibited', 'Entry Prohibited'. The term **'Prohibited Area'** should be avoided if possible - most areas loosely termed 'Prohibited Areas' are in fact prohibited only for certain activities or classes of vessels. The nature of the prohibition should be stated if possible.

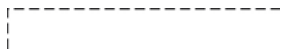
Some maritime areas are not restricted by regulation but caution is required in navigating them; in some cases preference is given to certain classes of traffic. Examples are: anchorages, spoil grounds, poorly surveyed areas, fairways, dredged areas, areas specially surveyed for deep draught vessels, and harbour limits.

In practice, the division between restricted and non-restricted areas must sometimes be a subjective one, eg a fairway is primarily a non-restricted area although anchoring within it may often be discouraged by custom or by regulation; similarly, an anchorage for a specified class of vessel implies a restriction on other vessels, but is generally not a 'restricted area'.

Political and territorial boundaries are special cases; see B-440.

B-439.1 **The limits of non-restricted areas** must be represented by a dashed line (except where there is a specific symbol):

- in **black** when associated with depths (except swept areas and declared DW routes) or with permanent physical obstructions. If no other limit is specified, the general limit should be used:



N 1.1

- in **magenta** when regulated and where there is no permanent physical obstruction. If no other limit is specified, the general limit should be used:

N 1.2

See the appropriate specifications for particular types of areas (which may include length of dashes and line weights). A list of the more common areas is given below:

BLACK

Works in progress, reclamation	see B-329
Dredged areas, channels, turning basins	see B-414
Inadequately surveyed	see B-417
Unsurveyed	see B-418
Foul ground	see B-422.8
Moorings	see B-431.7
Wind farms, current farms	see B-445
Spoil ground	see B-446
Marine farms	see B-447.3 and 447.6
Log pond	see B-449.2

MAGENTA

Swept area	see B-415.1
Inadequately surveyed	see B-417
Unsurveyed	see B-418
Harbour authority limit	see B-430.1
Swinging circle around anchor berth	see B-431.2
Designated anchorage	see B-431.3
Fairway, channel	see B-432.1
Routeing measure boundaries	see B-435
ESSA (without regulations)	see B-437
Customs limit	see B-440.2
Dredging area	see B-446.4
Shellfish beds (without obstructions)	see B-447.4
Cargo transhipment	see B-449.4

Commentaire [c28] : Added at request of AU (alternative depiction allowed, see B-417 & 418)

B-439.2 **The limits of restricted areas** should be represented by T-shaped dashed lines with the down-strokes pointing into the restricted area, usually in magenta, eg:.

N 2.1

Green should be used for areas restricted for environmental reasons, see B-437.2.

The symbol is used for areas (within territorial waters) which local or national regulatory authorities have specifically declared to be restricted for one or more aspects of navigation. A legend or note may be added to the chart giving a brief description of the nature of, or reason for, the restriction, if it is not evident from the chart. Such notes should be kept to a minimum; see B-439.3 and B-439.4.

The symbol may be used for areas where anchoring, fishing or seabed activities are potentially hazardous, eg dumping grounds for harmful materials, even though there is no formal restriction.

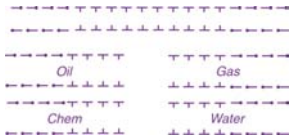
A similar, but larger and bolder symbol (M14) must be used for restricted areas which are regarded as routeing measures: ie Inshore Traffic Zones (B-435.1) and Areas to be Avoided (B-435.7). These may exist outside territorial waters, if IMO-adopted.

Port security limits, if required to be charted, should normally be charted as restricted areas (N2.1). A cautionary note describing the restriction, and/or a reference to associated publications for further information, may be added if necessary. Exceptionally, if there is a physical barrier, then this must be charted in black by the appropriate symbol, eg a continuous line (F14), a dashed line (N1.1) if floating, with piles (F22) at fixed turning points, sunken blocks (K11-13), a caisson or gate (F42).

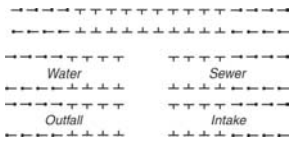
B-439.3 **The nature of the restriction** may be indicated by modifying the T.shaped dashed line as follows:

L 30.2 Submarine cable area (see B-443.2)

L 31.2 Submarine power cable area (see B-443.2)



L 40.2 Supply pipeline area (see B-444.2)



L 41.2 Discharge/intake pipeline area (see B-444.2)

N 2.2 Area into which entry is prohibited (see B-444.2)

N 20 Area where anchoring is prohibited (see B-439.4)

N 21 Area where fishing is prohibited (see B-439.4)

These line symbols, with the exception of L41.2, must be shown in magenta.

These approved multi-feature symbols combine two line symbols or one line symbol with one point symbol. For the possibility of further combinations, see B-439.6k.

Seasonal or other time-related restrictions may be charted by a note or legend, eg *(Mar-Oct)*.

B-439.4 **Small restricted and other maritime areas**. A centred symbol may be used within the appropriate general maritime limit (N1-2), eg:

Commentaire [c29] : DID, please replace with a landscape format version, to match the other examples.

or combinations, eg:

Where the restriction arises because of the existence of cables or pipelines, this may, if space permits, be indicated by use of the appropriate line symbol for cable or pipeline areas (see B-439.3), thus avoiding the need for a legend or note. See B-431.4, B-443 and B-444.

B-439.5 **Areas charted by special symbols**

A list of the more common areas is given below:

a.	Separation zones	see B-435.1
b.	Archipelagic Sea Lanes	see B-435.10
c.	Environmentally Sensitive Sea Areas, marine reserves	see B-437
d.	Military practice areas	see B-441
e.	International boundaries and national limits	see B-440
f.	Ice fields	see B-449

B-439.6 **Cartographic principles for portraying maritime limits** (including boundaries – see also B440):

a. For coincident limits, the limit symbol (line) portraying the area which is considered to be potentially the most dangerous to navigation (usually bounding permanent physical obstructions) has priority. In general, restrictive limits have precedence over non-restrictive limits, other limits being broken accordingly. However, where an important area feature includes restrictions, the restrictions may be shown by an associated note or one or more point symbols within the area (eg for a designated fairway, an anchoring prohibited symbol could be inserted within the fairway without its associated limit). The colour hierarchy is generally: black, magenta, green, other.

b. The graticule may be broken for limits.

c. All limits should be portrayed in their true location, but may be offset for clarity.

d. A tint band may be added on the inside of the limit symbol for emphasis or clarity when required.

e. Tint bands must be of the same colour as the limit they emphasize.

f. Where a limit symbol is broken for coincident limits, any supplementary tint band should continue unbroken along the appropriate side of the coincident limit line.

g. Bolder and longer dashes (or T shaped dashes) must be used to emphasize areas associated with routeing measures (except No Anchoring Areas).

h. Legends may be added within areas as necessary to improve clarity.

i. Legends alongside limits must be placed on the inside of the limit and should not be inverted.

j. The coastline and depth contours must not be broken for any maritime limit that is coincident with it. In such cases, the limit may be offset, or information describing this fact may be included in a chart note or associated nautical publication.

k. **Multi-feature lines.** In addition to the examples approved as international symbols at B-439.3, it is possible to make other combinations of line and point symbols. What combinations are appropriate is a matter for cartographic judgement and will vary according to the specific information that needs to be conveyed, the size and significance of the area and complexity of detail in the vicinity. The aim must be to provide information in as clear a way as possible. Therefore, the first consideration must be whether the maritime area limit is relevant for the chart user. It is not practicable to provide examples of every possible combination, or to provide detailed instructions for what is or is not appropriate. However, some general principles are possible:

- A multi-feature line should not combine limit symbols of different colours.
- No more than three point symbols should be combined with a single line symbol.
- No more than three line symbols should be combined (eg sections of cable and pipeline alternating with T-shaped dashes); in such cases no point symbols should be added.
- It is usually clearer to use the line symbol combinations to show the nature of the area (eg pipeline area) with point symbols inside the area (repeated or enlarged if necessary in large areas) to show the nature of the restriction.

Finland's Fairway Proposal

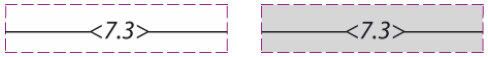
B-434.5 A **Fairway** designated by a competent authority (see B-432.1c) must be delimited by bold magenta dashed line. The delimited Fairway can be highlighted by the use of a grey tint. The legend *FAIRWAY* (or its name) can be inserted, if possible, in the area and parallel with the channel's limits. Soundings and depth contours should be included as appropriate. Recommended direction of traffic flow arrows may be added, as with a two-way route (see B-435.6).

a. A minimum depth may be indicated, e.g.:

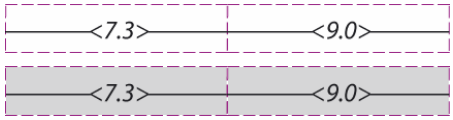
b. Maximum (authorized) draught.

i. In areas without appreciable tides, an indication of any authorized (or recommended) maximum draught may be indicated, e.g.:

ii. When a leading line or navigation line is contained in a fairway area, the maximum authorized draught is indicated in black as part of the line, (See B-434.3) e.g.:



iii. When there is a change in minimum depth or maximum draught, the fairway is intersected by a single dashed bold magenta line, e.g.:



c. A note may be inserted explaining what classes of vessel are recommended to use the fairway, and provide any further guidance (eg about survey quality, an explanation of the maximum depth symbol. The abbreviation 'm' for metres may be omitted when the chart legend informs of the use of metres as the measurement unit).