2nd NCWG MEETING
Monaco 26-29 April 2016

Paper for Consideration by the Nautical Cartography Working Group (NCWG)

Depiction of an artificial structure for water flow control (MOSE)

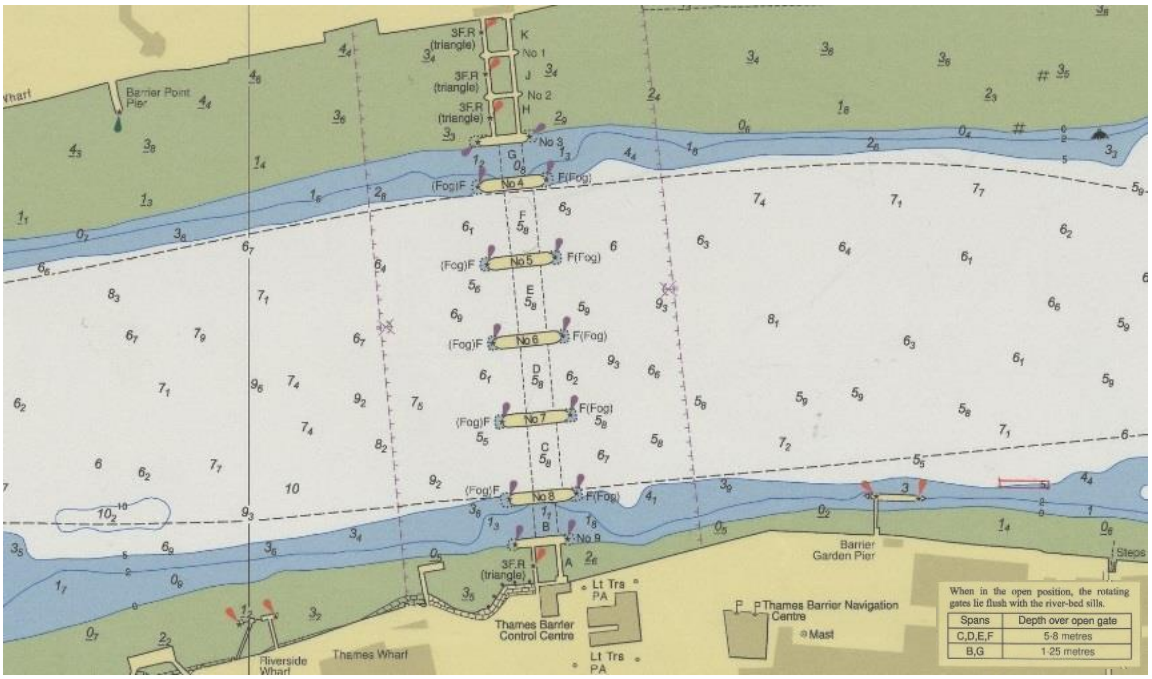
Submitted by:	Italy (IIM)
Executive Summary:	Proposal for the depiction of an artificial structure for water flow control (MOSE)
Related Documents:	S-4, INT1, S-57
Related Projects:	

Introduction / Background

An artificial structure (MOSE), for water flow control during high tides and adverse weather conditions, is being set up at the three inlets, namely Lido, Malamocco and Chioggia, which will separate the Venetian Lagoon from the Adriatic Sea. It's a unique structure in Italy, therefore we have to decide how to depict it.

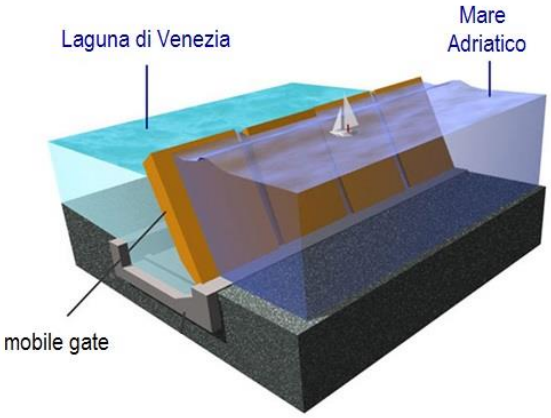
Venice Flood Barrier

Note that in Chart 3337 – published by the United Kingdom Hydrographic Office – there is a similar tidal barrier for flood prevention; although there are some differences between the Venice Flood Barrier and the Thames Tidal Barrier.



Analysis / Discussion

MOSE will consist of blocks of concrete and metal mobile gates laid at the bottom of the seabed and covered by 18 m of water. The water column will be controlled to ensure the same depth. Only during particular weather and tide conditions, the gates will emerge from the structure over sea level in order to block the flow of water towards the entrance of the channel and to avoid flooding of the surrounding land areas.



A three-dimensional picture of the MOSE flood gate system

INT 1 states the following entries to represent barrages:

Canali, Sbarramenti			*Canals, Barrages*	
Altezze Utili *Clearances* → D		Stazioni, segnali *Signal stations* → T	Distanza di Riferimento *Distance marks* → B	
40		Canale *Canal*	Can.	361.3 361.6
41.1	Lock	Chiusa (su carte a grande scala) *Lock (on large-scale charts)*		326.6 361.6
41.2		Chiusa (su carte a piccola scala) *Lock (on smaller scale charts)*		
42		Cassone, Cancello, Sbarramento *Caisson, Gate*		326.5
43	Flood Barrage	Sbarramento di flusso *Flood barrage*	Sbarramento di flusso	326.7
44	Dam	Diga, Chiusa (direzione del flusso) *Dam, Weir (direction of flow)*	Diga	364.2

S-4 clause B-326.7 provides specification for the depiction of flood barrages on charts.

B-326.7 **A flood barrage** is an opening dam across a channel which, when required, is closed to control flood waters. The outline of the barrage must be charted, true to scale if possible, with the sections normally open to traffic shown as dashed lines. A legend, in upright text, should be added if space permits:

F43

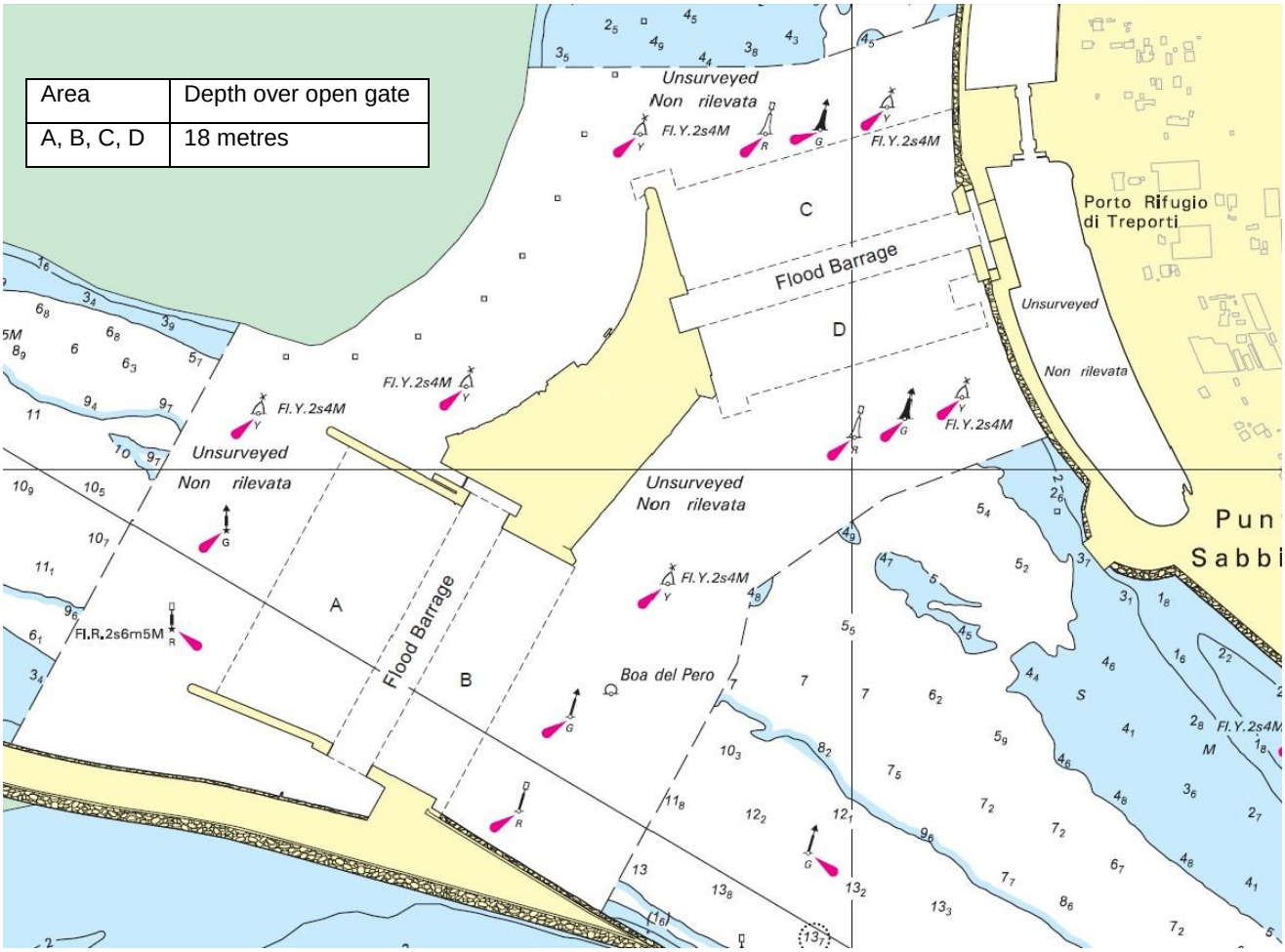
In the corresponding ENC, when the structure will be finished, a possible encoding will be:
Object Class: DRGARE (Dredged area); Attributes: DRVAL1 = 18m; QUASOU = maintained depth
Object Class: GATCON (Gate); Attribute: CATGAT = flood barrage gate or sluice
(the gate is normally 18m deep and emerges over sea level only during high tide)
Object Class: CTNARE (Caution area); Attribute: INFORM with a brief explanation of the structure

Conclusions

Our suggestion is to represent the Venice Flood Barrier (MOSE) as follows:

1) symbol INT F43 (flood barrage) with an associated table to explain the depth over the open gate;
2) note with a brief explanation of the structure.

It's important to highlight that there will be inconsistencies between the depiction on paper charts and symbolization on ECDIS display due to the use of DRGARE for ENC encoding.



Recommendations

None

Justification and Impacts

None

Action required of NCWG

The NCWG is invited to:

a. Discuss this paper.

b. Approve the recommendations above.