I.3.4 Waterway Gauge (C)
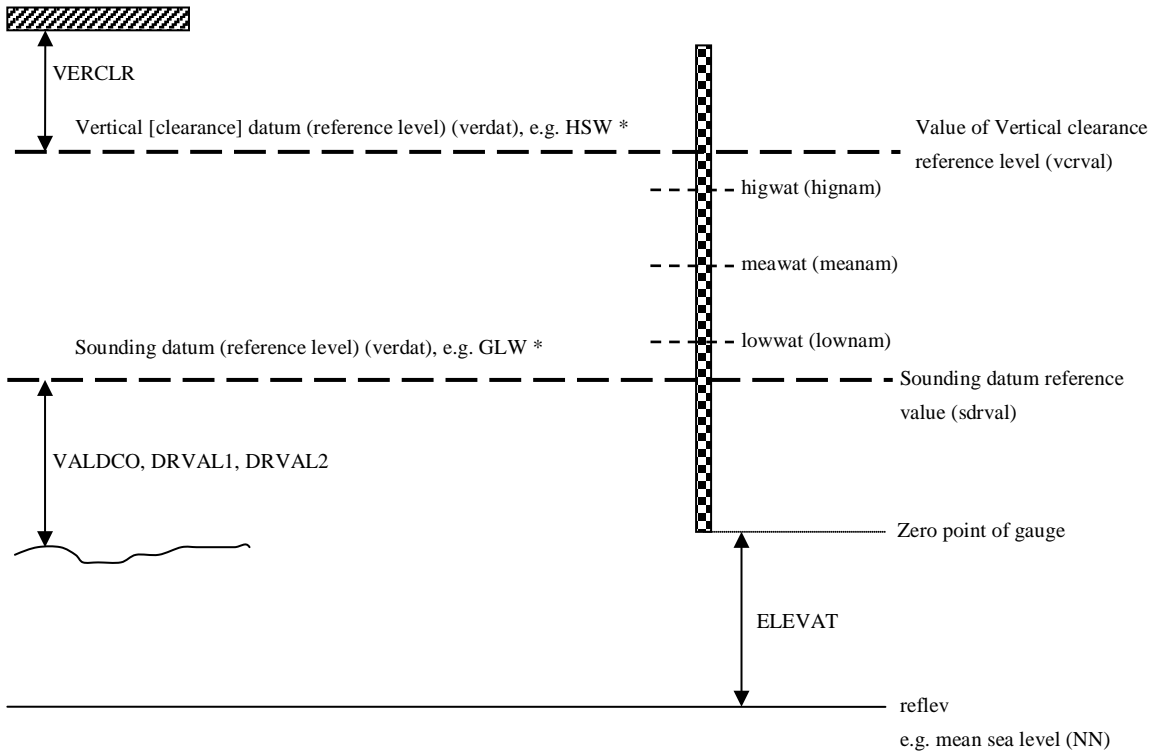
A waterway gauge is an instrument for measuring water levels. Waterway gauges provide the actual water level information to calculate actual depths and vertical clearances, taking into account the sloped nature of river water surfaces.

Graphics	Encoding Instructions	Object Encoding
Chart Symbol (USACE Gauge)	A) The waterway gauge may be encoded as a point object at the location of the real world entity. Preferably the gauge should be encoded as an area object covering its complete area of applicability (to be decided by the chart producer if this area covers only the fairway or the complete riverbed). B) The name of the gauge shall be encoded by OBJNAM. As the name the term known by the skippers shall be chosen. In case an additional name in e.g., Cyrillic letters is well known this name may be encoded in the NINFOM attribute. C) If the ISRS code is available it has to be encoded (refer to General Guidance section H). D) Category of the gauge may be encoded by using the 'catgag' attribute. E) The river km or mile of the location of the gauge shall be encoded by using the 'wtwdis' attribute. F) The zero point of the gauge is defined by the attributes ELEVAT (indicating the units above the locally used gravitational level) and 'reflev', indicating the used gravitational level itself (also refer to the picture below). G) When a gauge is encoded as a point object (mainly in case a water level model is available), the area of applicability may be provided by a specific distance of impact down and up stream using the attributes 'disipd' (downstream) and 'disipu' (upstream). 'disipd' and 'disipu' should be used for both point and area objects. H) Reference to specific defined water levels shall be enabled.	**Object Encoding** **Object Class =** wtwgag(P,A) (C) OBJNAM = [name of gauge] (O) NOBJNM = (Refer to Section B, General Guidance) (C) unlocd = [ISRS code] (O) catgag = [1 (water level staff / pole), 2 (recording water level gauge), 3 (recording water level gauge with remote access), 4 (recording water level gauge with external indicator), 5 (recording water level gauge with remote access and remote indicator)] (O) wtwdis = [xxxx.xxx] (units defined in hunits), e.g., 2451.732 (O) hunits = [3 (kilometres), 4 (hectometres), 5 (statute miles), 6 (nautical miles)] (O) ELEVAT = [xxx.x] (metres), e.g., 139.5 (O) reflev = [1 (Baltic datum), 2 (Adriatic level), 3 (Amsterdam Ordnance Datum (NAP)), 4 (Mean Sea Level), 5 (Other datum), 6 (National Geodetic Vertical Datum - NGVD29), 7 (North American Vertical Datum - NAVD88), 8 (Mean sea level 1912), 9 (Mean sea level 1929)] (O) disipd = [distance of impact, downstream: unit defined in the M_UNIT meta object class, e.g., metre (m), resolution: 1m] (O) disipu = [distance of impact, upstream: unit defined in the M_UNIT meta object class, e.g., metre (m), resolution: 1m] (O) higwat = [xxx.xxx] (metres), e.g., 4.78 (O) hignam = Name of water level, which is used for the attribute higwat (value at relevant high water level) including version identification, for example year of issue or period, e.g., HSW 96 (O) lowwat = [xxx.xxx] (metres), e.g., 4.78 (O) lownam = Name of water level, which is used for the attribute lowwat (value at relevant low water level) including version identification, for example year of issue or period, e.g., RNW 96

	1. For high water levels: - 'higwat' to indicate the defined high water level (e.g. 567 cm) - 'hignam' to indicate the specific high water level including the year of publication or a period indication (e.g., HSW96) 2. For mean water levels: - 'meawat' to indicate the mean water level (value and units) - 'meanam' to indicate the specific mean water level including the year of publication or a period indication (name and year) 3. For low water levels: - 'lowwat' to indicate the low water level (value and units) - 'lownam' to indicate the specific low water level including the year of publication or a period indication (name and year) In the event that there is another specific and important water level, this may be encoded by using the attributes 'othwat' and 'othnam'.	(O) meawat = [xxx.xxx] (metres), e.g., 2.46 (O) meanam = Name of water level, which is used for the attribute meawat (value at relevant mean water level) including version identification, for example year of issue or period, e.g., HSW 96 (O) othwat = [xxx.xxx] (metres), e.g., 0.567 (O) othnam = (name of water level, which is used for the attribute othwat (value at other locally relevant water level) including version identification, for example year of issue or period) (e.g., HQ100-96) (O) sdrlev = (name of reference level to which depth are referred (from verdat list) plus version indication), e.g. GlW 2002 (O) vcrlev = Name of reference level to which vertical clearances are referred (from verdat list) plus version indication, e.g., HSW 2002 (O) CONDTN = [1 (under construction), 2 (ruined), 3 (under reclamation), 5 (planned construction)] (M) SCAMIN = [EU: 22000; US: 45000] (C) SORDAT = [YYYYMMDD] (C) SORIND = (Refer to Section B, General Guidance)
	I) In order to enable IENC based applications to calculate clearances and depths automatically the following information is used: Vertical clearances at bridges shall always be referred to a specific water level. This level shall be indicated within the 'vcrlev' attribute (preferably according to the list of 'verdat' values. This water level should be the same as indicated in 'hignam'. J) The same way as in the last point shall be followed for providing information on the reference water level for depth information. In this case the attribute 'vcrlev' may be used and should be equal to 'lownam' in most cases. K) EU: Waterway gauges that are relevant and useable for navigation must be encoded. L) This feature could be aggregated to a bridge or a lock, etc. by a C_AGGR object.	

VERCLR

Vertical [clearance] datum (reference level) (verdat), e.g. HSW *

Value of Vertical clearance reference level (vcrval)

higwat (hignam)

meawat (meanam)

Sounding datum (reference level) (verdat), e.g. GLW *

lowwat (lownam)

Sounding datum reference value (sdrval)

VALDCO, DRVAL1, DRVAL2

Zero point of gauge

ELEVAT

reflev
e.g. mean sea level (NN)

* The sounding or vertical datum (reference level) are defined either in

- in the cell header (valid for all objects in the cell)

- at the meta objects m_sdat or m_vdat, if another value than in cell header

- at the object itself (attribute verdat), if another value than in cell header or meta object.