TEST REPORT
RAPPORTO DI COLLAUDO

N° P002554-1-1-01.001

RINA file No.: *Pratica RINA N.*	P002554-1-1-01 P002554-2-1-01		
Purchaser: *Committente:*	Rosetti Marino S.p.A.		
Order No.: *Ordine N.:*	1721001190	Intended for: *Destinazione:*	Bollards at Piomboni Yard
Inspection date: *Data di ispezione:*	19th May 2021	Place of inspection: *Luogo di ispezione:*	Marina di Ravenna (RA)

Referenced standards and specifications:
Standard e specifiche di riferimento:
DNVGL-ST-N001 - Marine operations and marine warranty

Attendees:
Partecipanti:

- Mr. Dante Ranzi, *Rosetti Marino Yard Manager*
- Mr. Davide Depasquale, Rosetti Marino – *Quality Control Manager*
- Mr. Riccardo Cherotti – *RINA Inspector*

Tested material, components or equipment:
Materiali, componenti o apparecchi testati:

Item	Description	Qty	Dwgs	Rev.
5 ÷ 23	Bollards	19	79004/504	0

This report is ruled by the General Condition for service provision. As far as the nature of the activity and RINA liability are concerned, please find here below an abstract of the above mentioned General Condition.
3.1 The Document concerns the verification of the conformity of the product, the activity, the service or the process carried out by the Client with respect to a certain document of reference (here included a law), or the carrying out of technical and/or economic analysis demanded by the Client. The Client is the sole responsible of the correct carrying out of the activity and its conformity, or the conformity of its products, to the enforceable laws and to Clients and third parties' expectations in general. 3.3 To no report, declaration, document or information issued or released to implement the Services supplied by the Company can be ascribed legal effects and implications different from the certificate stating that, on the basis of the verifications carried out by the Company, the structure, the materials, the equipment, the machineries or any other element this document or information refer to complies with the document of reference. At the same time, they cannot have legal effects or implications not explicitly envisaged by the parties when requesting the Service. 11.1 In providing the Services, as well as other correlated information or advice, the Company, its Surveyors and employees, operate with due diligence for the proper execution of the activity. However, considering the nature of the activities performed, it is not possible to guarantee absolute accuracy, correctness and completeness of any information or advice supplied. 11.2 Therefore express and implied warranties are specifically disclaimed and nor the Company nor its Technicians or auxiliaries will be liable for any loss, damage or expense of whatever nature sustained by any person, in tort or in contract, derived from carrying out the Services. 11.3 Without prejudice to the provisions of the previous paragraph, if a user of the Company Services can prove to have suffered a loss or a damage because of some negligent act or omission by the Company, its Technicians or employees, the Company will pay compensation to such person for his proved loss, up to, but not exceeding, five times the amount of the fees charged for the specific services, information or opinions from which the loss or damage derives or, if no fee has been charged, a maximum of one million Euro. Where the fees charged are related to a number of Services, the amount of the fees will be apportioned for the purpose of the calculation of the maximum compensation, by reference to the estimated time involved in the performance of the Service from which the damage or loss derives. 11.4 Any liability for indirect or consequential loss, damage or expense is specifically excluded.

Il presente rapportoo è disciplinato dalle Condizioni Generali per la fornitura di servizi. Per quanto concerne la natura delle attività svolte e le responsabilità di RINA si riporta qui di seguito un estratto delle succitate Condizioni Generali.
3.1 Il Documento ha ad oggetto la verifica della conformità del prodotto, dell'attività, del servizio o del processo svolti del Cliente rispetto ad un dato documento, anche normativo, di riferimento, ovvero lo svolgimento di analisi tecniche e/o economiche richieste dal Cliente. Il Cliente è e rimane l'unico responsabile, sia verso se stesso, sia verso i terzi, del corretto svolgimento della propria attività e della conformità della stessa e/o dei propri prodotti alle normative applicabili ed alle aspettative dei clienti e dei terzi in genere. 3.3 A nessun rapporto, dichiarazione, documento o informazione emessi o rilasciati in esecuzione dei Servizi prestati dalla Società possono essere attribuiti effetti o implicazioni legali diversi dall'attestazione che, sulla base degli accertamenti eseguiti dalla Società, la struttura, i materiali, le apparecchiature, i macchinari o qualsiasi altro elemento cui tale documento o informazione si riferiscono sono conformi al documento di riferimento, ovvero non espressamente contemplati dalle parti all'atto della richiesta del Servizio. 11.1 Nel prestare i Servizi, come pure nel dare informazioni o pareri ad essi correlati, la Società, i suoi Tecnici, dipendenti operano con la dovuta diligenza al fine di una corretta esecuzione dell'incarico. Tuttavia, stante la natura complessa delle attività svolte, non è possibile garantire l'assoluta precisione, correttezza e completezza delle informazioni o dei pareri forniti. 11.2 La Società, pertanto, non presta alcuna garanzia esplicita od implicita e, né la stessa, né alcuno dei suoi Tecnici o ausiliari saranno responsabili di perdite, danni o spese di qualunque natura patiti da qualsiasi soggetto, sia in via contrattuale, sia in via extracontrattuale, e derivanti dall'esecuzione dei Servizi. 11.3 Ferme restando le disposizioni di cui al precedente paragrafo, qualora un utente dei Servizi della Società dimostri di aver subito una perdita o un danno a causa di qualche azione od omissione negligente da parte della Società, dei suoi Tecnici o dipendenti, la Società risarcirà il danno dimostrato fino a concorrenza della somma non superiore a cinque volte l'ammontare dei compensi dovuti per le specifiche prestazioni, informazioni o pareri da cui è derivata la perdita o il danno o, se non sono stati fatturati compensi, fino a un massimo di un milione di Euro. Qualora i compensi fatturati siano relativi a diversi Servizi, al fine di calcolare il limite massimo risarcibile, l'ammontare dei compensi sarà determinato con riferimento alla stima del tempo impiegato nell'esecuzione del Servizio dal quale è derivato il danno o la perdita. 11.4 Qualsiasi responsabilità per perdite o danni indiretti o "consequenziali" e per le relative spese è espressamente esclusa.

The calibration status and adequacy of the test measurements devices:

Lo stato di taratura e l'adeguatezza degli strumenti di misura utilizzati per il collaudo:

- Flexible tape meter 0÷5000mm, new and suitable for the purpose;
- Ultrasonic Flaw Detector "GE - USM35X LEMO", S.N.16859, calibrated before use;
- UT calibration Block "V1", Certificate No.162046 valid till May 2026.

Inspections and tests carried out, results and remark (if any):

Accertamenti e prove di collaudo effettuati, risultati ed eventuali prescrizioni:

Purpose of the visit was the inspection of the Bollards from No.5 to No.23 at Pier in Marino Rosetti SpA, Piomboni Yard.
The scope of the inspection was:

- visual inspection of the Bollards in order to verify their general conditions (integrity, concrete filling, coating);
- thickness check of the Bollards;
- visual inspection of the quay bulkhead in order to verify the integrity and general conditions.

Visual inspection of the Bollards in order to verify general their conditions (integrity, concrete filling, coating)

The Bollards have been 100% visual inspected in order to verify general conditions of the same.

Majority of the Bollards presented diffuse or localized areas affected by corrosion, concentrated at the ground level. In the below Table are reported the:

- location of the affected areas (North, South, West, East)
- elevation of the affected areas (considering the ground level as 0)
- extension of the affected areas (length and high)

Coating of the Bollards has been found damaged at the ground level, in correspondence of the normal position of mooring ropes.

Except for the Bollard No.19 (which is of different type compared to design drawings and, on the top, is of closed type), all the Bollards have been found filled with concrete as minimum till the top extremity. Some of the same were provided with concrete over-cap, other were damaged in some areas. In the below Table, the status of the concrete at the Bollards top level is reported.

Thickness check of the Bollards

Rosetti Marino presented the ultrasonic thickness check reports relevant to the Bollards No.5÷18, No.20, No.22 and No.23. The Report for the Bollard No.19 and No.21 has not yet been issued since, at the examination date, the same were engaged by mooring ropes and not accessible.

Thickness check of the Bollards has been repeated on the affected areas (by ISO 9712 Lev.2 qualified UT Operator Mr. Stefano Annese) in order to identify the minimum available value. For each Bollard, the measured minimum thickness was found matching with the one indicated in the relevant Reports.

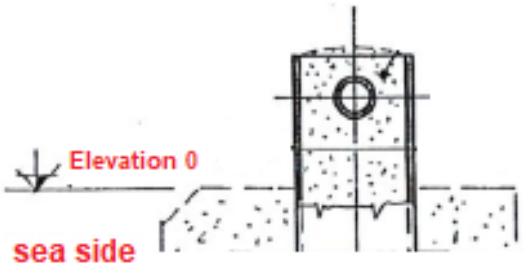
The Bollard No.19, of recent manufacturing, was found undamaged without traces of corrosion. For Bollard No. 21, the minimum measured thickness in the corrosion affected areas was 9,80 mm. Anyway, these two bollards are not included in the scope of this report, due to their partial inaccessibility at the time of inspection.

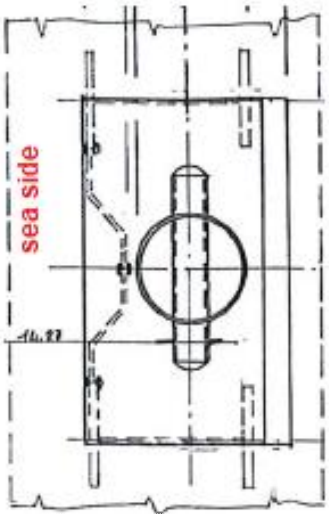
Visual inspection of the quay bulkhead in order to verify the integrity

The reinforced concrete bulkhead was found in general good conditions, intact and free of damage along the entire pier.

Bollard No.	Accessibility for inspection	Visual inspection observations (Bollard main pipe)	Elevation of the affected area (ground level 0)	Location of the affected area (N – S – W - E)	Extension of the affected area (L x H)	Coating	Concrete
5	90%	Localized corrosion	0	SW	50 x 50 mm	Acceptable except on damaged area	Acceptable
			0	NE	50 x 50 mm		
6	100%	Diffuse corrosion	0	360°	H 60 mm at 360°	Acceptable except on damaged area	Acceptable
7	100%	Localized corrosion	0	NE	100 x 70 mm	Acceptable except on damaged area	Acceptable
8	90%	Localized corrosion	0	NW	150 x 90 mm	Acceptable except on damaged area	Damages on top area

9	90%	Localized corrosion	0 0	NW SE	300 x 100 mm 300 x 60 mm	Acceptable except on damaged area	Acceptable
10	100%	• Localized corrosion • Damaged top side	0 + 430	NE S - SE	600 x 60 mm 90 x 60 mm	Acceptable except on damaged area	Damages on top area
11	100%	Localized corrosion	0	360°	H 60 mm	Acceptable except on damaged area	Damages on top area
12	90%	• Diffuse corrosion • Damaged transversal pipe	0 /	360° S	H 70 mm	Acceptable except on damaged area	Acceptable
13	90%	Localized corrosion	0	S	150 x 60 mm	Acceptable except on damaged area	Damages on top area
14	100%	Localized linear corrosion	+ 20 + 20	NW S	L 200 mm L 150 mm	Acceptable except on damaged area	Damages on top area
15	100%	Corrosion traces	0	360°	H 40 mm at 360°	Acceptable except on damaged area	Damages on top area
16	100%	Corrosion traces	0	360°	H 40 mm at 360°	Damaged on the bottom area	Damages on top area
17	100%	Localized corrosion	0 0	NE S	600 x 100 mm 400 x 60 mm	Acceptable except on damaged area	Damages on top area
18	100%	Localized corrosion	0	N	300 x 100 mm	Acceptable except on damaged area	Damages on top area
19	100%	Acceptable	/	/	/	Damaged on the bottom area	Not inspectable
20	100%	Diffuse corrosion	0	360°	H 100 mm at 360°	Acceptable except on damaged area	Damages on top area
21	100%	Diffuse corrosion	0	360°	H 100÷200 mm at 360°	Acceptable except on damaged area	Damages on top area
22	100%	Diffuse corrosion	0	360°	H 80 mm at 360°	Acceptable except on damaged area	Damages on top area
23	100%	Corrosion indication	0	360°	H 5 mm at 360°	Acceptable except on damaged area	Damages on top area

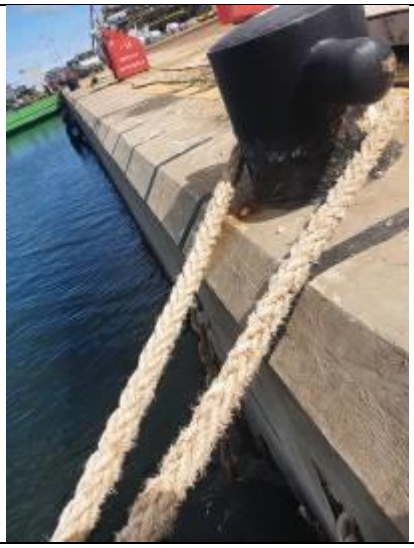






Pictures:
Foto:

BOLLARD No. 5	
	
Bollard visual inspection	***Bollard visual inspection***
	
Reinforced concrete Bulkhead integrity check	***Bollard corrosion affected area visual inspection***
BOLLARD No. 6	
	
Bollard visual inspection	***Bollard visual inspection***



Reinforced concrete Bulkhead integrity check



Bollard corrosion affected area visual inspection



Bollard corrosion affected area visual inspection



Bollard corrosion affected area visual inspection

BOLLARD No. 7



Bollard visual inspection



Bollard visual inspection



Reinforced concrete Bulkhead integrity check



Bollard corrosion affected area visual inspection and dimensional check

BOLLARD No. 8



Bollard visual inspection



Bollard visual inspection



Bollard corrosion affected area visual inspection



Bollard concrete filling visual inspection

BOLLARD No. 9



Bollard visual inspection



Bollard visual inspection



Reinforced concrete Bulkhead integrity check



Bollard corrosion affected area visual inspection

BOLLARD No. 10



Bollard visual inspection



Bollard visual inspection

	
Bollard corrosion affected area visual inspection	***Bollard corrosion affected area visual inspection***
	
Bollard damaged are visual inspection	***Bollard damaged are visual inspection and dimensional check***
BOLLARD No. 11	
	
Bollard visual inspection	***Bollard visual inspection***

	
Reinforced concrete Bulkhead integrity check	***Bollard corrosion affected area visual inspection***
BOLLARD No. 12	
	
Bollard visual inspection	***Bollard visual inspection***
	
Reinforced concrete Bulkhead integrity check	***Bollard corrosion affected area visual inspection***



Description



Damaged transversal pipe

BOLLARD No. 13



Bollard visual inspection



Reinforced concrete Bulkhead integrity check



Bollard corrosion affected area visual inspection



Bollard concrete filling visual inspection

BOLLARD No. 14



Bollard visual inspection



Bollard visual inspection



Reinforced concrete Bulkhead integrity check



Bollard corrosion affected area visual inspection



Bollard corrosion affected area visual inspection



Bollard corrosion affected area visual inspection

BOLLARD No. 15



Bollard visual inspection



Reinforced concrete Bulkhead integrity check



Bollard corrosion affected area visual inspection



Bollard concrete filling visual inspection

BOLLARD No. 16



Bollard visual inspection



Bollard visual inspection



Reinforced concrete Bulkhead integrity check



Bollard corrosion affected area visual inspection

BOLLARD No. 17



Bollard visual inspection



Bollard corrosion affected area visual inspection



Bollard corrosion affected area visual inspection



Bollard concrete filling visual inspection

BOLLARD No. 18



Bollard visual inspection



Bollard corrosion affected area visual inspection



Bollard corrosion affected area visual inspection



Bollard concrete filling visual inspection

BOLLARD No. 19



Bollard visual inspection



Bollard visual inspection – coating damaged

BOLLARD No. 20



Bollard visual inspection



Bollard corrosion affected area visual inspection



Bollard corrosion affected area visual inspection and dimensional check

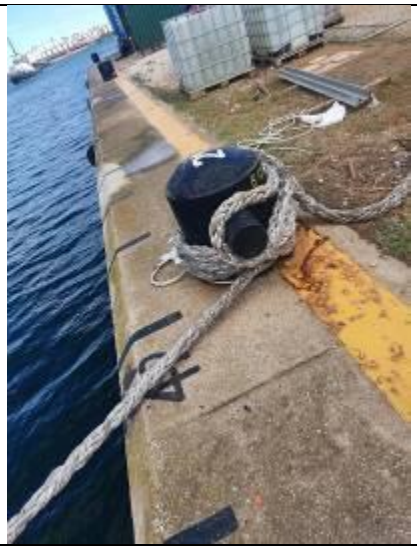


Bollard concrete filling visual inspection

BOLLARD No. 21



Bollard visual inspection



Reinforced concrete Bulkhead integrity check



Bollard corrosion affected area visual inspection



Bollard concrete filling visual inspection

BOLLARD No. 22



Bollard visual inspection



Bollard visual inspection



Reinforced concrete Bulkhead integrity check



Bollard corrosion affected area visual inspection

BOLLARD No. 23



Bollard visual inspection



Reinforced concrete Bulkhead integrity check



Bollard corrosion affected area visual inspection



Bollard concrete filling visual inspection

	
Ultrasonic Flaw detector calibration	***Ultrasonic Flaw detector calibration***
	
Ultrasonic thickness check of corrosion affected areas	***Ultrasonic thickness check of corrosion affected areas***

Marking: ***Marcature apposte:***	Not Applicable for this visit

Bollard Design Verification
Verifica della progettazione delle bitte

RINA engineering staff (EOGOF) has examined the followings documents related to the structural check of the bollards and their foundation:

Doc No.	Titolo	Rev.
79004-42	Sezione tipo - casseratura ed armatura	3
79004-43	Particolari costruttivi	3
79004-73	Banchina con fondale -11.50 (-9.50) Pianta palancolato bitte e tiranti banchina - dettagli di bitte staffe e palancole	4
79004-73 A	Banchina con fondale -11.50 (-9.50) Pianta palancolato bitte e tiranti banchina - dettagli di bitte staffe e palancole	4
79004/54	Banchina con fondale -11.50 (-9.50)	0

	Tratto "36÷46" _ linea di varo "2" Trave di coronamento - planimetria 1:500 con posizione delle bitte di ormeggio	
79004/494	Banchina con fondale -11.50 (-9.50) Tratto "24÷36" _ linea di varo 1" Trave di coronamento - planimetria 1:500 con posizione delle bitte di ormeggio	0
-	Progetto di banchina nel porto di Ravenna in località "Piomboni", per fondale di 9,60 m - Relazione di calcolo	-
-	Realizzazione di un diaframma metallico e di una linea di varo in località Piomboni - Relazione di calcolo	1
-	Summary.pdf – RMI YPB BOLLARD FROM No 1 to No 12 & RMI YPB BOLLARD FROM No 13 to No 23	-
-	Addendum alla relazione di calcolo della banchina metallica del Cantiere Rosetti – Piomboni	2

The design reports have been developed according to the Rules in force at the time of the quay construction, they confirm the adequacy of the bollards, as described in the drawings, to withstand the design pull force.

In addition, the calculation demonstrates that, even considering a certain amount of corrosion (thickness reduction assumed), the bollards are still adequate for the maximum allowable pull force reported in the capacity diagrams (maximum pull vs. pull angle).

Results:
Risultati

Inspection results are related to bollards No. from 5 to 18, 20, 22 and 23 only.
Examination of the bollards shows a certain level of thickness reduction due to corrosion and wear, anyway such reduction does not reach the limits assumed in the examined structural calculations and therefore does not affect the bollard capacity to withstand the nominal loads.

Enclosures: UT Thickness check Reports from No.001/2021 to 015/2021, from No.017/2021 to 018/2021
Allegati: Addendum alla relazione di calcolo della banchina metallica del Cantiere Rosetti – Piomboni

Issued at: Marina di Ravenna (RA) - Italy **on:** 19th May 2021
Rilasciato a: ***il:***

RINA W R IT 105 Date: 19 MAY 2021 Company:

RINA