



SHIBATA**FENDER**TEAM

ALLEMAGNE | FRANCE | AMERIQUE | ASIE

SOLUTIONS EFFICACES DE DÉFENSES MARITIMES AU MAROC

Présenté par: Alvaro Rodero – Ingénieur Commercial

RÉSUMÉ

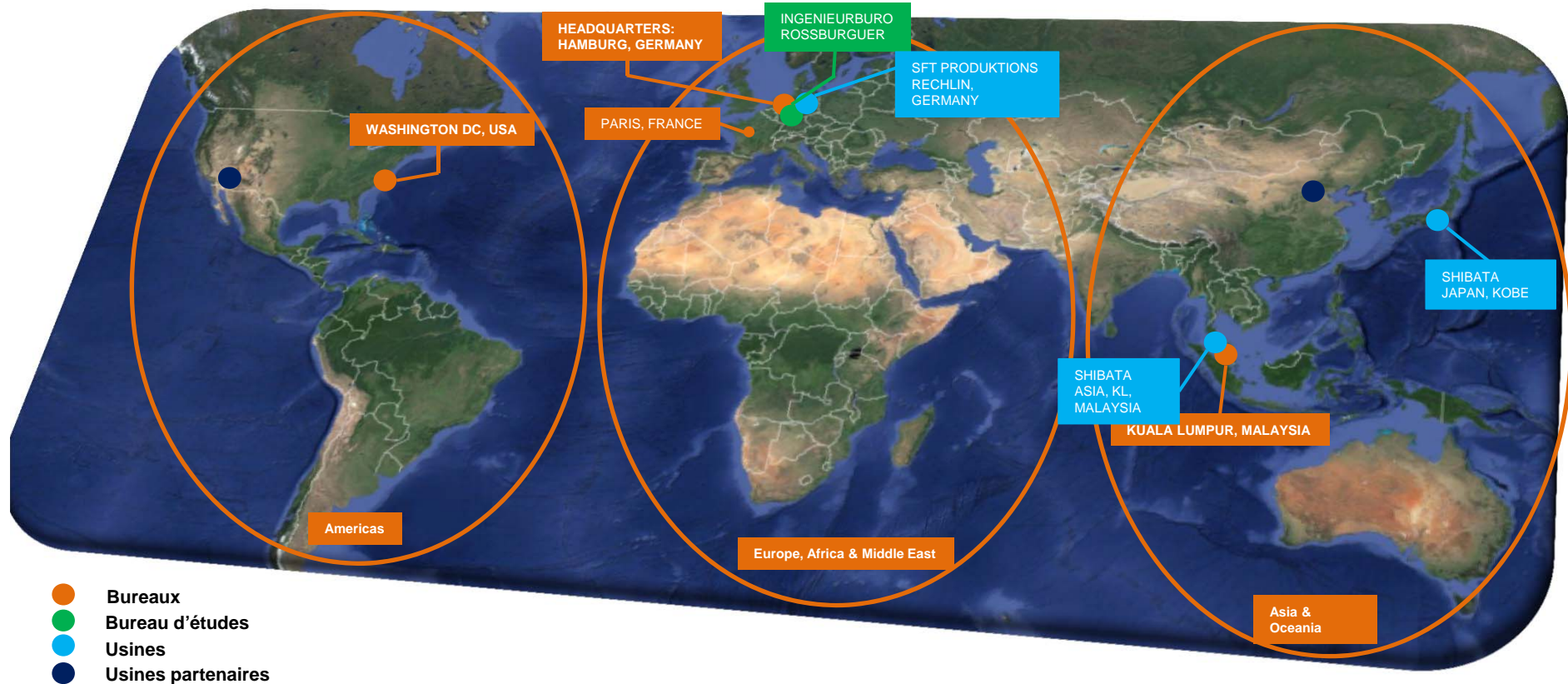
1. LA SOCIÉTÉ: BUREAUX, USINES ET MARCHÉS
2. TYPE DE DÉFENSES ET APPLICATIONS
3. ÉTUDE DE CAS: PORT DE TANGER VILLE
4. ÉTUDE DE CAS: PORT DE JORF LASFAR
5. ÉTUDE DE CAS: PORT DE KSAR SGHIR

LA SOCIÉTÉ

Bureaux, usines et marchés

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LE GROUPE SHIBATAFENDERTEAM

SIÈGE

Hamburg, Allemagne

BUREAUX

Washington, États-Unis

Paris, France

Kuala Lumpur, Malaisie (depuis 1er Juin 2016)

PRODUCTION

Production de défenses en caoutchouc au Japon et Malaisie

Propres installations de fabrication d'acier en Allemagne

Production de défenses en mousse en Allemagne et aux États-Unis

CHIFFRE D'AFFAIRES

~ 40 Millions USD

PROJETS RENDUS

> 2.800 dans le monde depuis 2006

TAILLE PROJETS

> 5 millions USD / projet

> 200 systèmes de défense/ projet

CERTIFICATION

ISO 9001

ISO 14001

AIPCN



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TYPE DE DÉFENSES ET APPLICATIONS

Il n'y a pas une solution standard pour tous les ports!



COLLECTE DE DONNÉES

PROJECT REQUIREMENTS

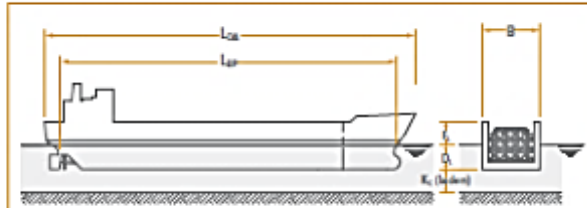
Port: _____
 Berth: _____
 Client: _____
 Designer: _____
 Contractor: _____

Accurate project information is needed to propose the most suitable fenders.

Please use the table below to describe the operating requirements with as much detail as possible

Project: New Construction Upgrade Status: Preliminary Detail Tender

SHIP INFORMATION



LARGEST SHIPS		SMALLEST SHIPS	
Type/Class	_____ def	Type/Class	_____ def
Displacement	_____ tonne	Displacement	_____ tonne
Length Overall	_____ m	Length	_____ m
Beam	_____ m	Beam	_____ m
Draft	_____ m	Draft	_____ m
Hull Pressure	_____ MPa (PSI)	Hull Pressure	_____ MPa (PSI)
Berthing	Size _____ <input type="checkbox"/> Yes <input type="checkbox"/> No	Berthing	Size _____ <input type="checkbox"/> Yes <input type="checkbox"/> No
Bow Form	_____ deg	Bow Form	_____ deg
Bow Radius	_____ m	Bow Radius	_____ m

SHIP INFORMATION



Berth type	<input type="checkbox"/> Continuous wharf <input type="checkbox"/> Dolphins <input type="checkbox"/> Pontoon <input type="checkbox"/> Lock or drydock <input type="checkbox"/> Other		
Tender spacing	_____ m	Maximum reaction	_____ kN
Deck level	_____ m (above datum)	Soft level	_____ m (above datum)
Highest tide (HAW)	_____ m (above datum)	Lowest tide (LRL)	_____ m (above datum)
Under level	_____ m (max) _____ m (min)	Wind speed	_____ m/s
Import/Export	<input type="checkbox"/> Import <input type="checkbox"/> Export <input type="checkbox"/> Both	Current speed	_____ m/s

QUESTIONNAIRE

LOCATION

Climate	<input type="checkbox"/> Temperate <input type="checkbox"/> Tropical <input type="checkbox"/> Desert <input type="checkbox"/> Mediterranean <input type="checkbox"/> Polar
Temperature	T ₁ (min) _____ T ₁ (max) _____ Humidity <input type="checkbox"/> High <input type="checkbox"/> Medium <input type="checkbox"/> Low
Water type	<input type="checkbox"/> Sea <input type="checkbox"/> Fresh <input type="checkbox"/> SW <input type="checkbox"/> LW <input type="checkbox"/> Watercal <input type="checkbox"/> Newer <input type="checkbox"/> Sometimes <input type="checkbox"/> Every Year

BERTHING INFORMATION

Side berthing		Approach speed	_____ m/s
		Berthing angle	_____ deg
		Factor of safety	_____
End berthing		Approach speed	_____ m/s
		Berthing angle	_____ deg
		Factor of safety	_____
Dolphin berthing		Approach speed	_____ m/s
		Berthing angle	_____ deg
		Factor of safety	_____
Lock entrance		Approach speed	_____ m/s
		Berthing angle	_____ deg
		Factor of safety	_____
Lightering (Ship to ship)		Approach speed (Relative)	_____ m/s
		Berthing angle	_____ deg
		Factor of safety	_____

OTHER INFORMATION

Design code	<input type="checkbox"/> IYAS <input type="checkbox"/> ISG145 <input type="checkbox"/> ISG146 <input type="checkbox"/> ISG147 <input type="checkbox"/> ISG148 <input type="checkbox"/> ISG149 <input type="checkbox"/> ISG150 <input type="checkbox"/> ISG151 <input type="checkbox"/> ISG152 <input type="checkbox"/> ISG153 <input type="checkbox"/> ISG154 <input type="checkbox"/> ISG155 <input type="checkbox"/> ISG156 <input type="checkbox"/> ISG157 <input type="checkbox"/> ISG158 <input type="checkbox"/> ISG159 <input type="checkbox"/> ISG160 <input type="checkbox"/> ISG161 <input type="checkbox"/> ISG162 <input type="checkbox"/> ISG163 <input type="checkbox"/> ISG164 <input type="checkbox"/> ISG165 <input type="checkbox"/> ISG166 <input type="checkbox"/> ISG167 <input type="checkbox"/> ISG168 <input type="checkbox"/> ISG169 <input type="checkbox"/> ISG170 <input type="checkbox"/> ISG171 <input type="checkbox"/> ISG172 <input type="checkbox"/> ISG173 <input type="checkbox"/> ISG174 <input type="checkbox"/> ISG175 <input type="checkbox"/> ISG176 <input type="checkbox"/> ISG177 <input type="checkbox"/> ISG178 <input type="checkbox"/> ISG179 <input type="checkbox"/> ISG180 <input type="checkbox"/> ISG181 <input type="checkbox"/> ISG182 <input type="checkbox"/> ISG183 <input type="checkbox"/> ISG184 <input type="checkbox"/> ISG185 <input type="checkbox"/> ISG186 <input type="checkbox"/> ISG187 <input type="checkbox"/> ISG188 <input type="checkbox"/> ISG189 <input type="checkbox"/> ISG190 <input type="checkbox"/> ISG191 <input type="checkbox"/> ISG192 <input type="checkbox"/> ISG193 <input type="checkbox"/> ISG194 <input type="checkbox"/> ISG195 <input type="checkbox"/> ISG196 <input type="checkbox"/> ISG197 <input type="checkbox"/> ISG198 <input type="checkbox"/> ISG199 <input type="checkbox"/> ISG200
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DÉTERMINATION DES NORMES APPLICABLES

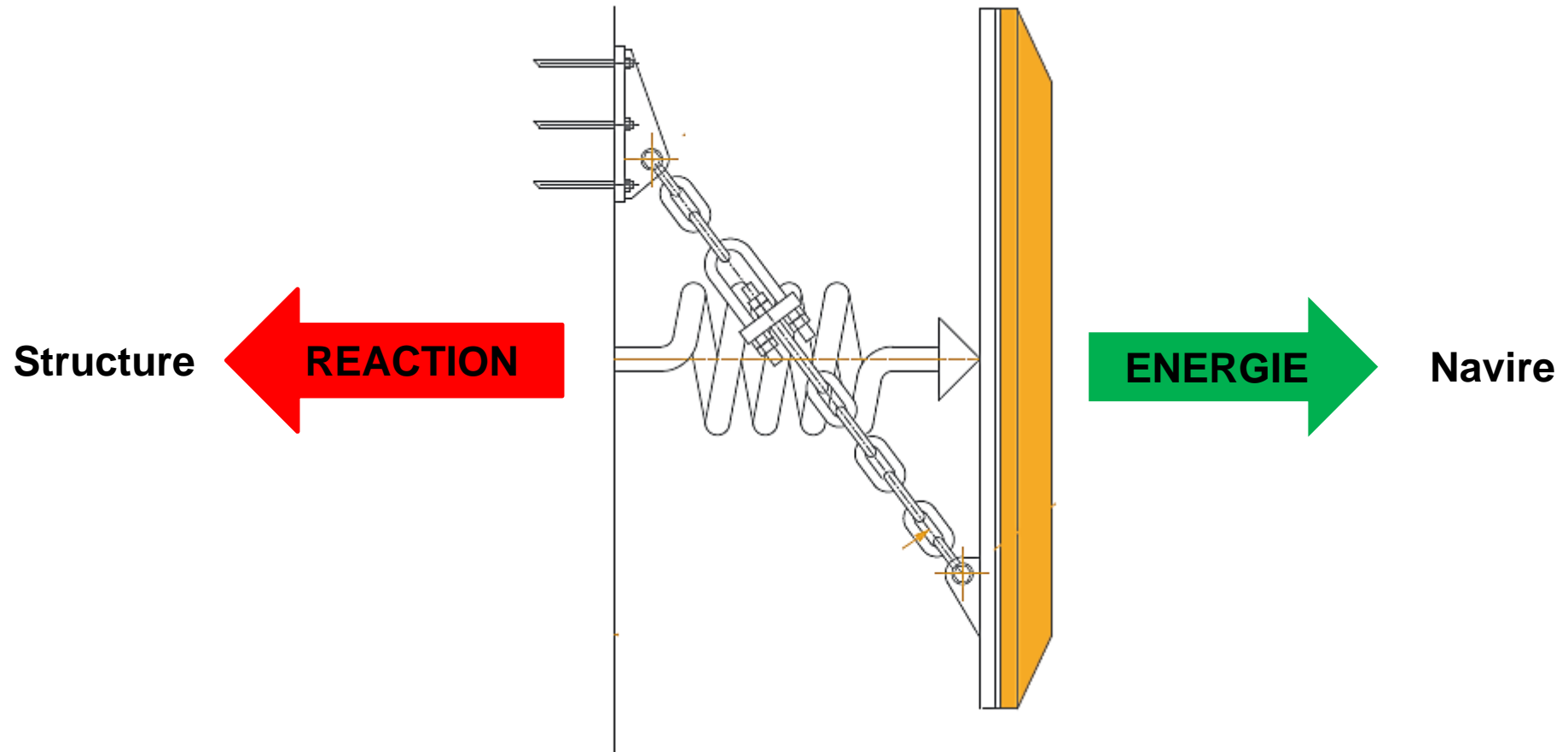
- AIPCN 2002: Recommandations relatives au dimensionnement de systems de défense
- British Standard 6349: Maritime Structures
- EAU 2004: Recommendations of the Committee for Waterfront Structures
- DIN 18800: Design and Construction of Structural Steelwork
- EUROCODE 3: Design and Construction of Structural Steelwork





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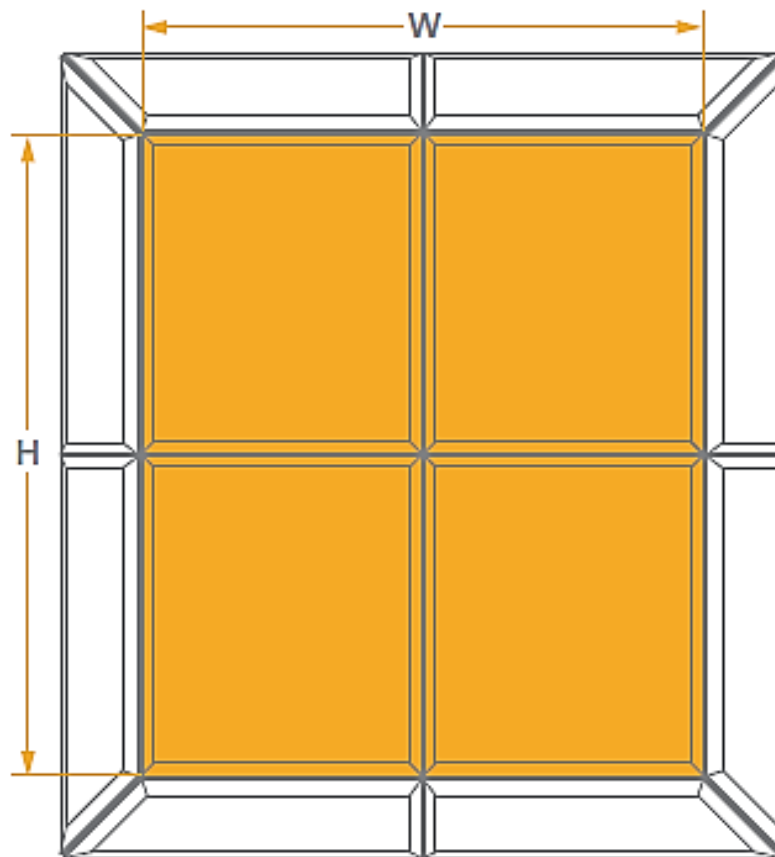
CAPACITÉ D'ABSORPTION D'ÉNERGIE > ÉNERGIE D'ACCOSTAGE

$$E = \frac{1}{2} M * v^2 * C_e * C_m * C_s * C_c$$

FORCE DE RÉACTION < RÉSISTANCE LIMITE DE LA STRUCTURE



CONCEPTION DU BOUCLIER



$$\overline{HP} = \frac{\Sigma R_F}{W \cdot H} = \frac{\Sigma R_F}{A}$$

\overline{HP} = average hull pressure (kN/m² or kPa)

ΣR_F = total fender reaction (kN)

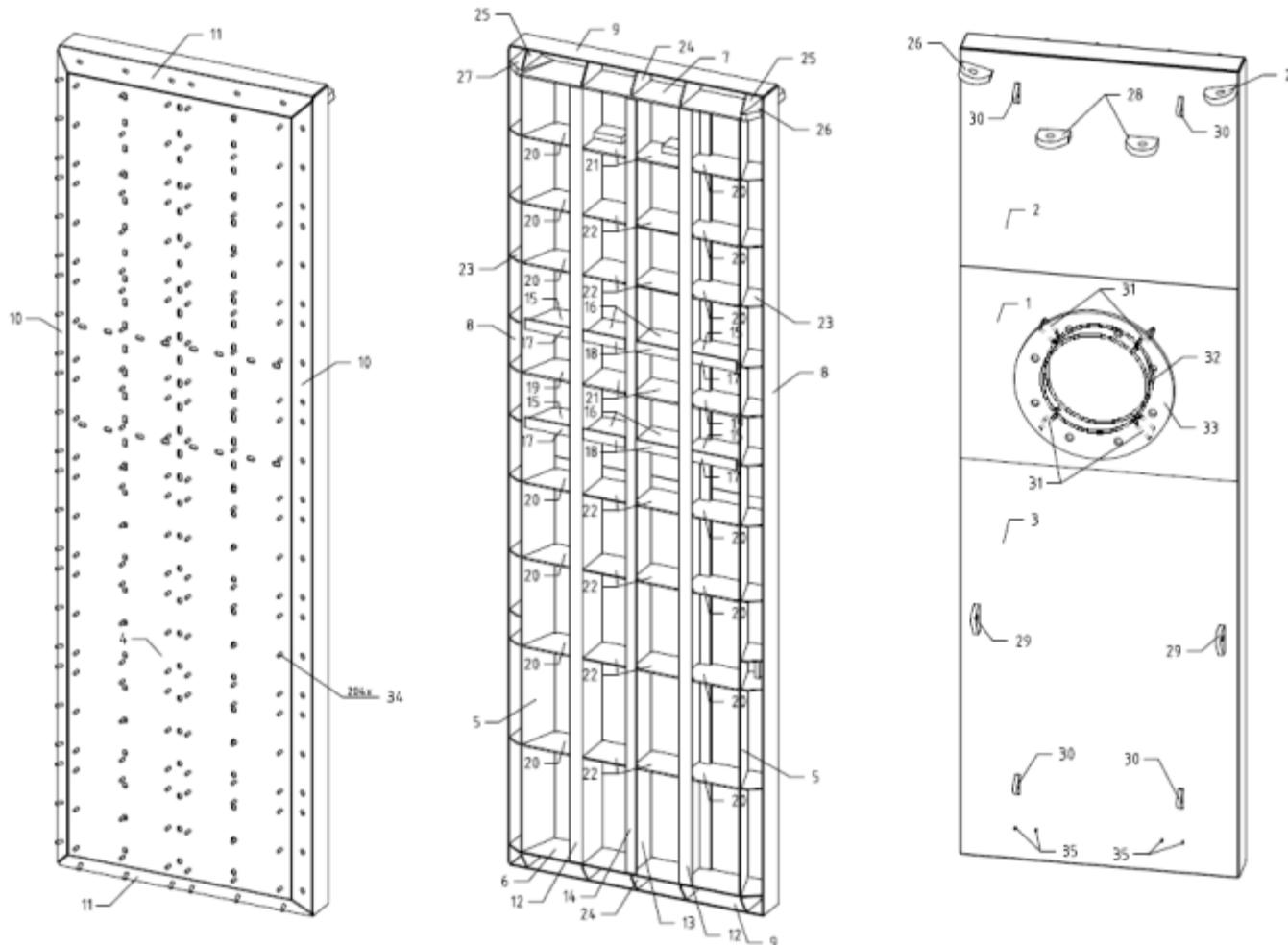
W = width of flat panel (m)

H = height of flat panel (m)

A = contact area of flat panel (m²)



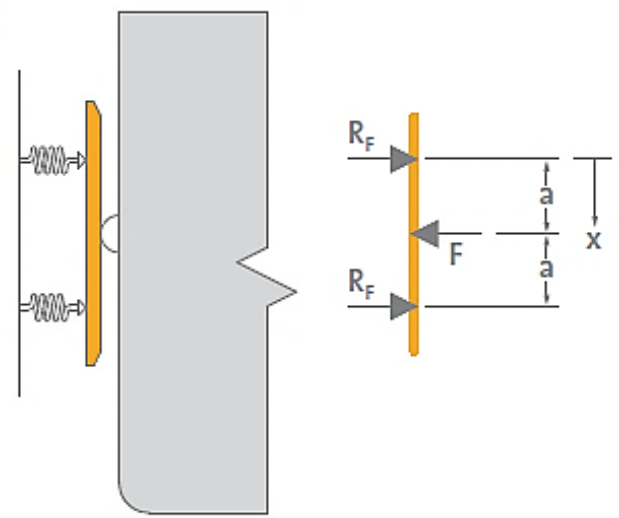
STRUCTURE INTERNE DU BOUCLIER



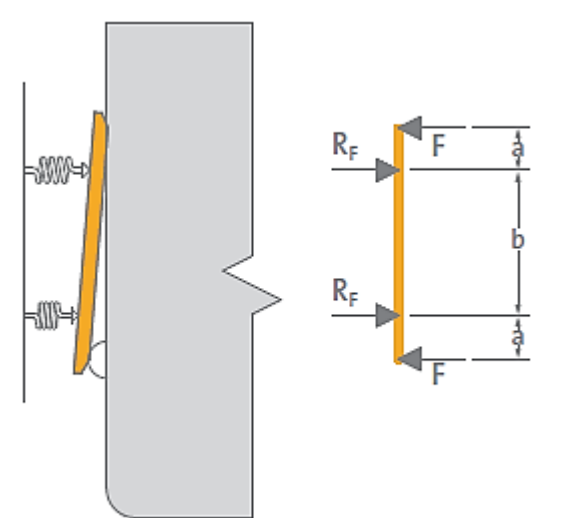


CAS DE CHARGE SUR LE BOUCLIER

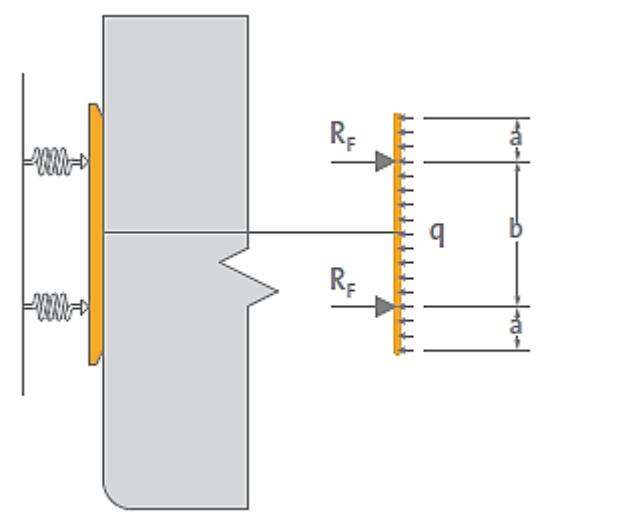
MIDDLE BELTING CONTACT



LOW BELTING CONTACT



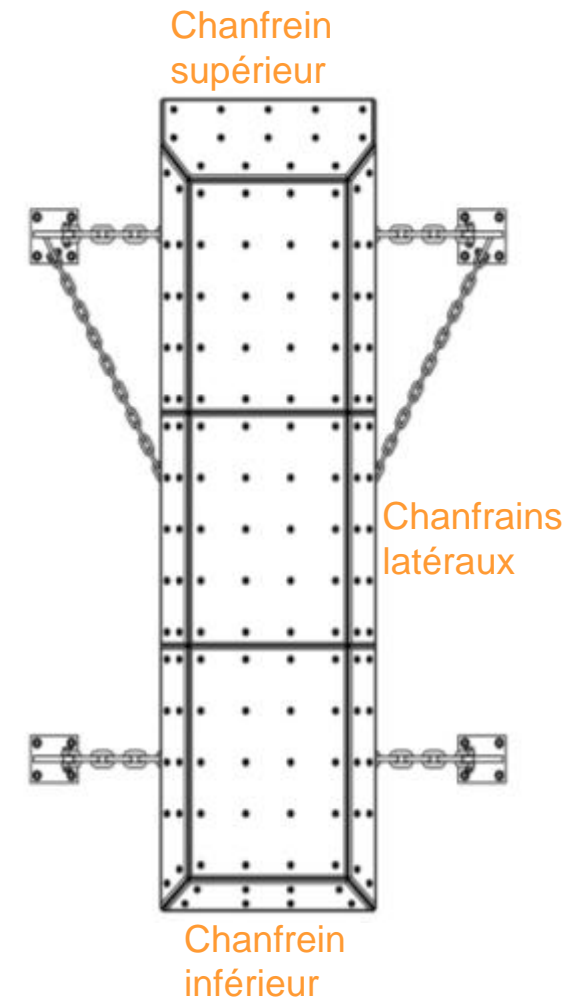
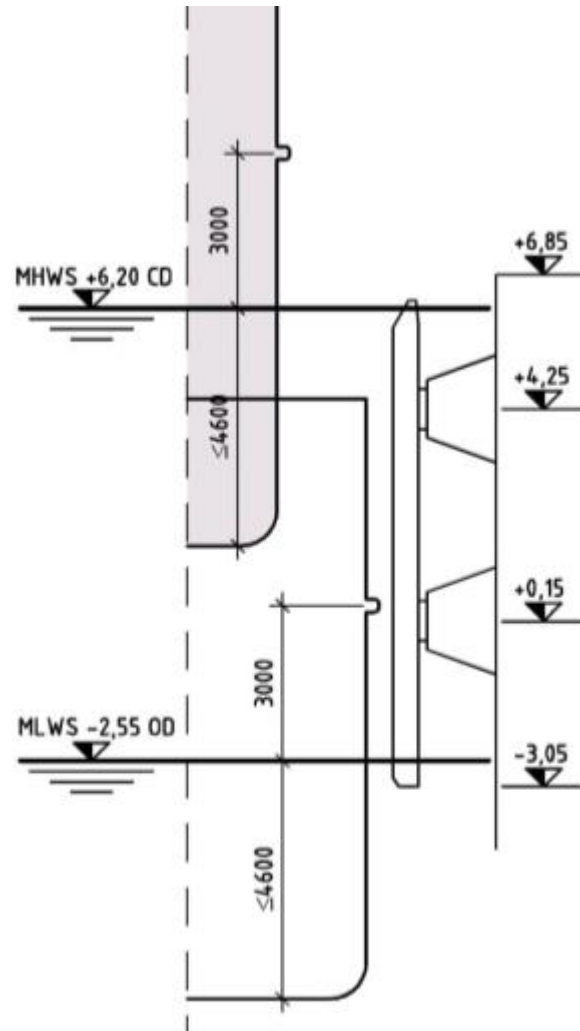
FLAT HULL CONTACT





CHANFREINS

Pourquoi les chanfreins?

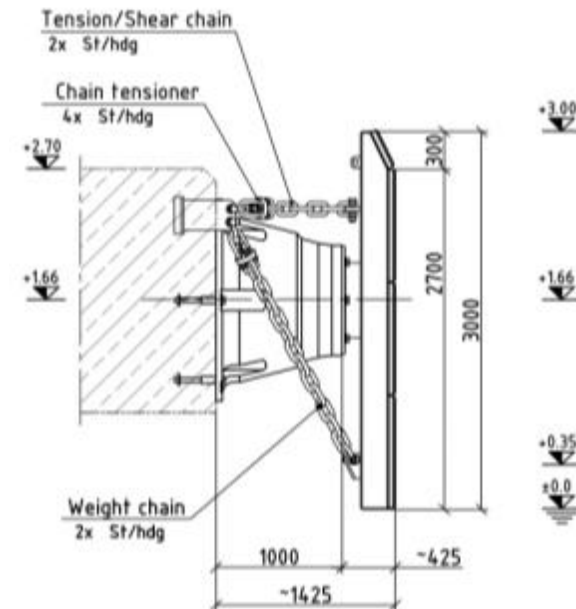




CHAINES

- Chaînes de tension
- Chaînes de poids
- Chaînes de cisaillement
- Tendeur et manilles

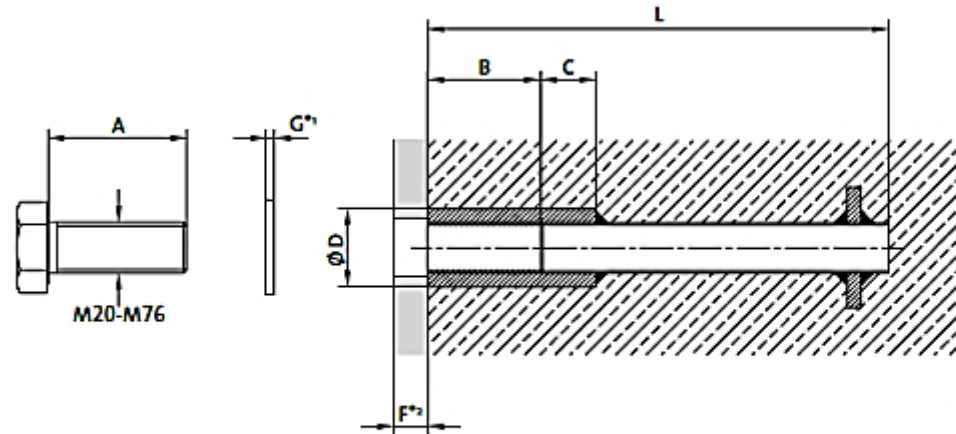
=> Utiliser le tendeur pour affiner le réglage des chaînes!



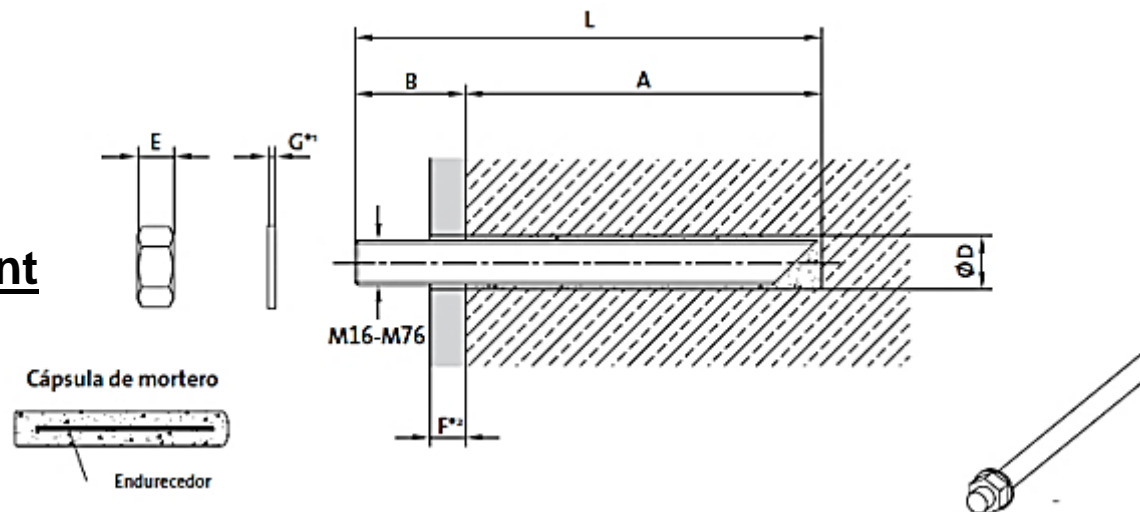


ANCRAGES

Pour béton neuf

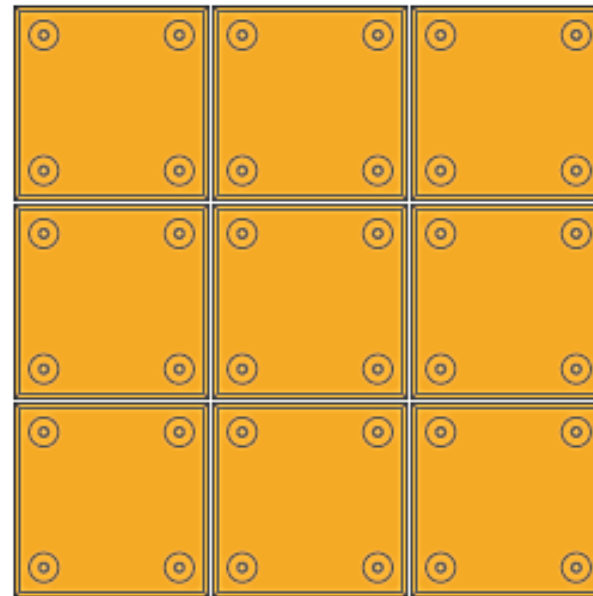
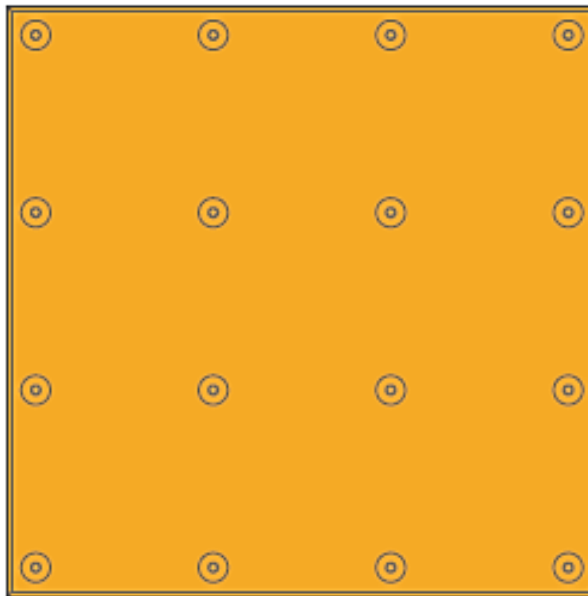


Pour béton existant

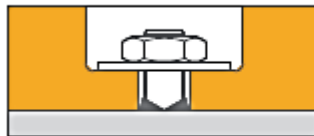




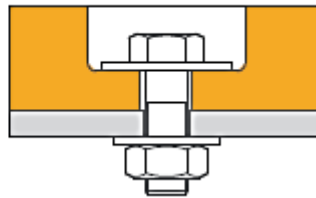
PE-UHMW



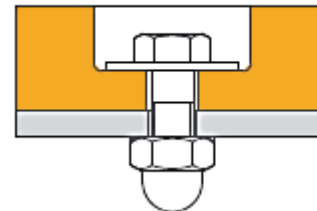
Stud Fixing



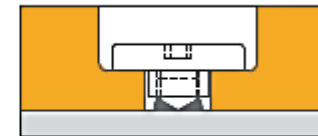
Bolt Fixing



Bolt with Blind Nut



Low Profile Fixing

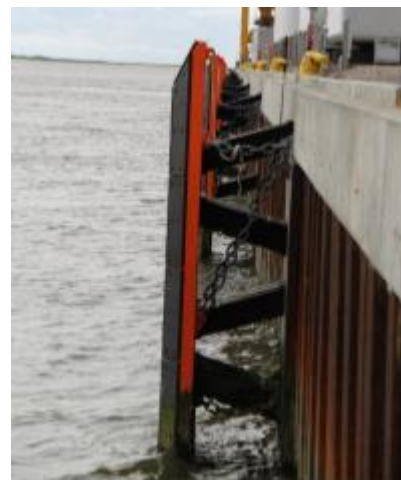




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TYPE DE DÉFENSES





ÉTUDES DE CAS

Port de Tanger Ville

Port de Ksar Sghir

Port de Jorf Lasfar





- Port de Tangerang Ville:
 - Extension du quai T5, 1ère phase (2013)
 - 6 SPC 1400
 - 3 Défenses d'angle trapézoïdales

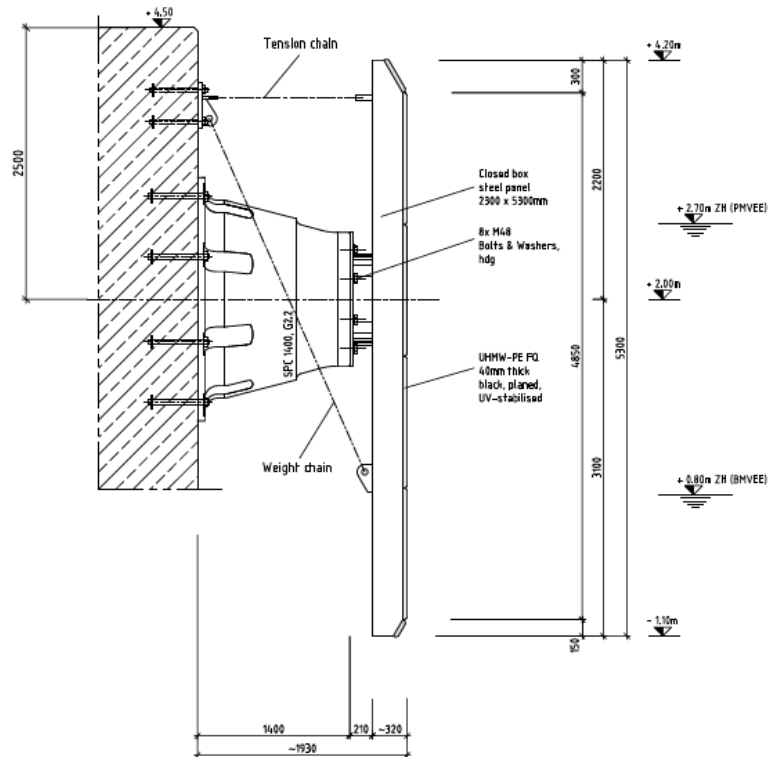
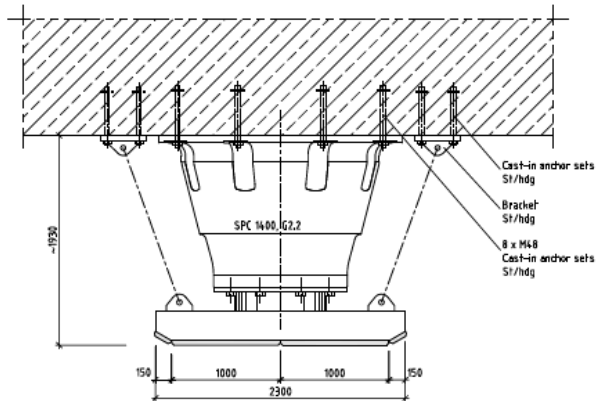
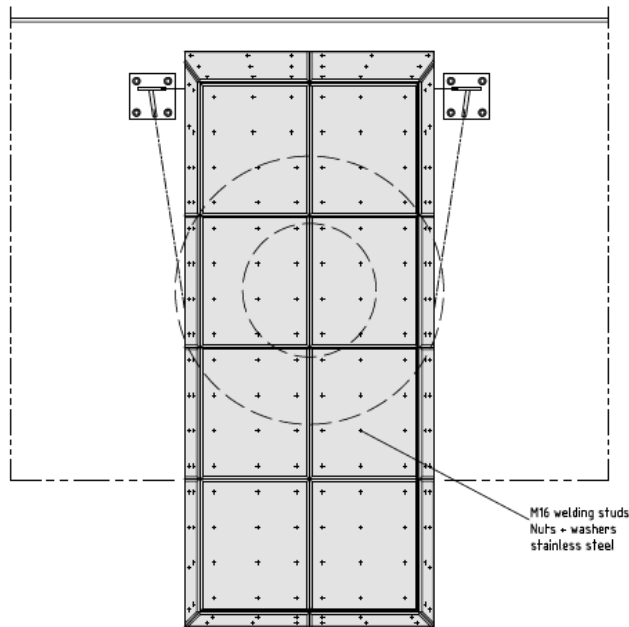
Considérations techniques:

- Quai de croisière
- Absorption d'énergie requise: 1.412 kNm
- Pression sur coque admissible: 200 kN/m²
- Distance entre la coque et le bord du quai lors de l'accostage: >500 mm.



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Paint system acc. to DIN 12944 CS-M
Colour: traffic orange RAL 2009
NDF: 325µm

Performance data at 70% deflection:

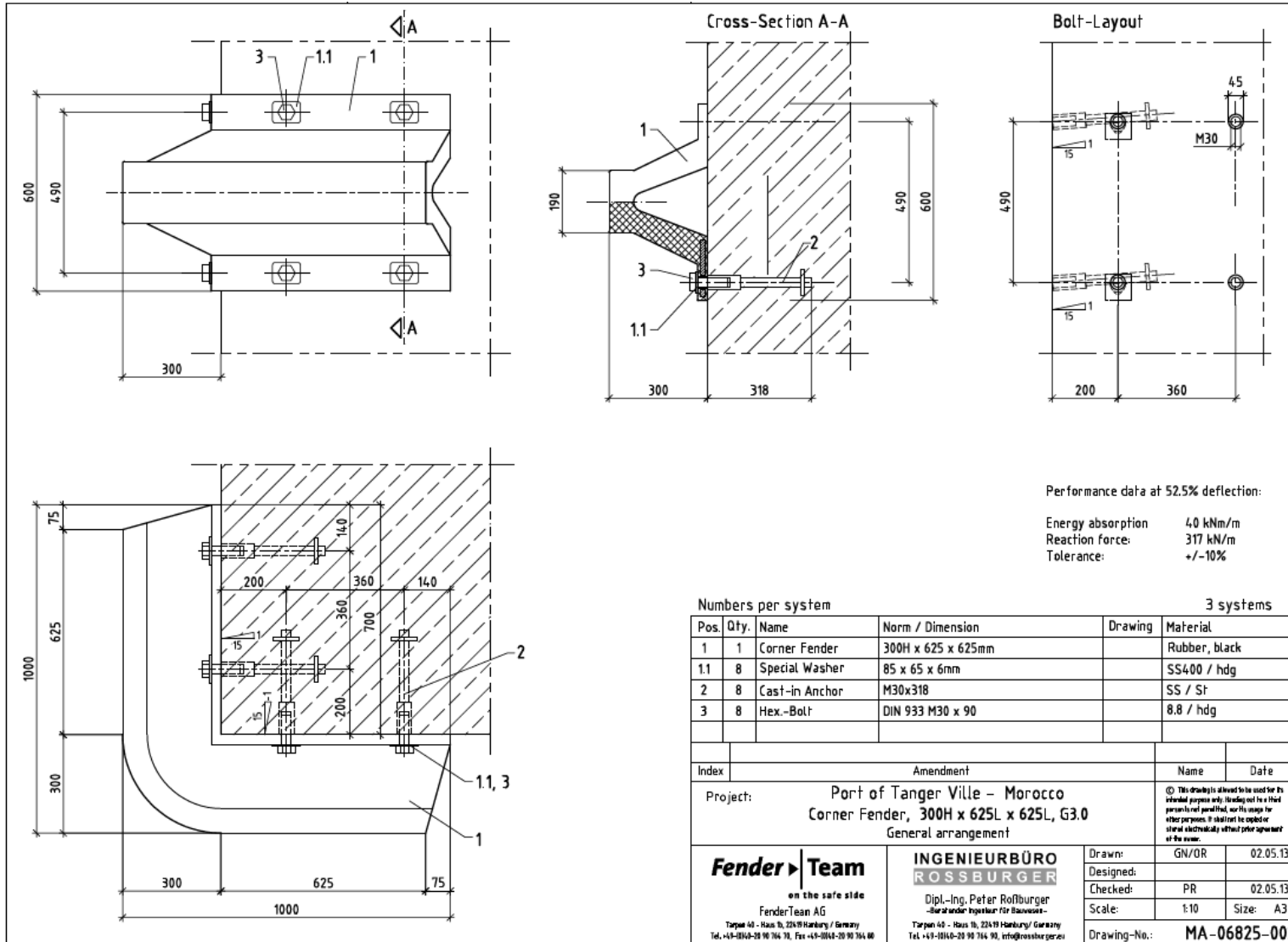
Energy absorption: 1416 kNm
Reaction force: 1931 kN
Tolerance: +/- 10%
Material: NR/ SBR - SS400
HP: ≤200 kN/m²

Index	Amendment	Name	Date
All tolerances acc. to Fenderline catalogue edition 04/2011 - Alle Toleranzen gemäß Fenderline-Katalog Ausgabe 04/2011			
Project:		Port of Tanger Ville - Morocco	
		SPC 1400, G2.2	
		General Arrangement	
Fender Team <small>on the safe side</small> Fenderline AG <small>Turner-Str. 10 • 20077 Hamburg / Germany Tel. +49-40-60 20 10 10, Fax +49-40-60 20 10 10</small>		INGENIEURBÜRO ROSSBURGER <small>Dipl.-Ing. Peter Rossburger Generaldirektor Turner-Str. 10 • 20077 Hamburg / Germany Tel. +49-40-60 20 10 10, Fax +49-40-60 20 10 10</small>	Drawn: OR 10.04.15 Designed: PR 10.04.15 Checked: PR 10.04.15 Scale: 1:25 Size: A2 Drawing-No.: MA-06825-001



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- Port de Jorf Lasfar:
 - Travaux de réhabilitation et d'extension
 - 195 SPC 1000

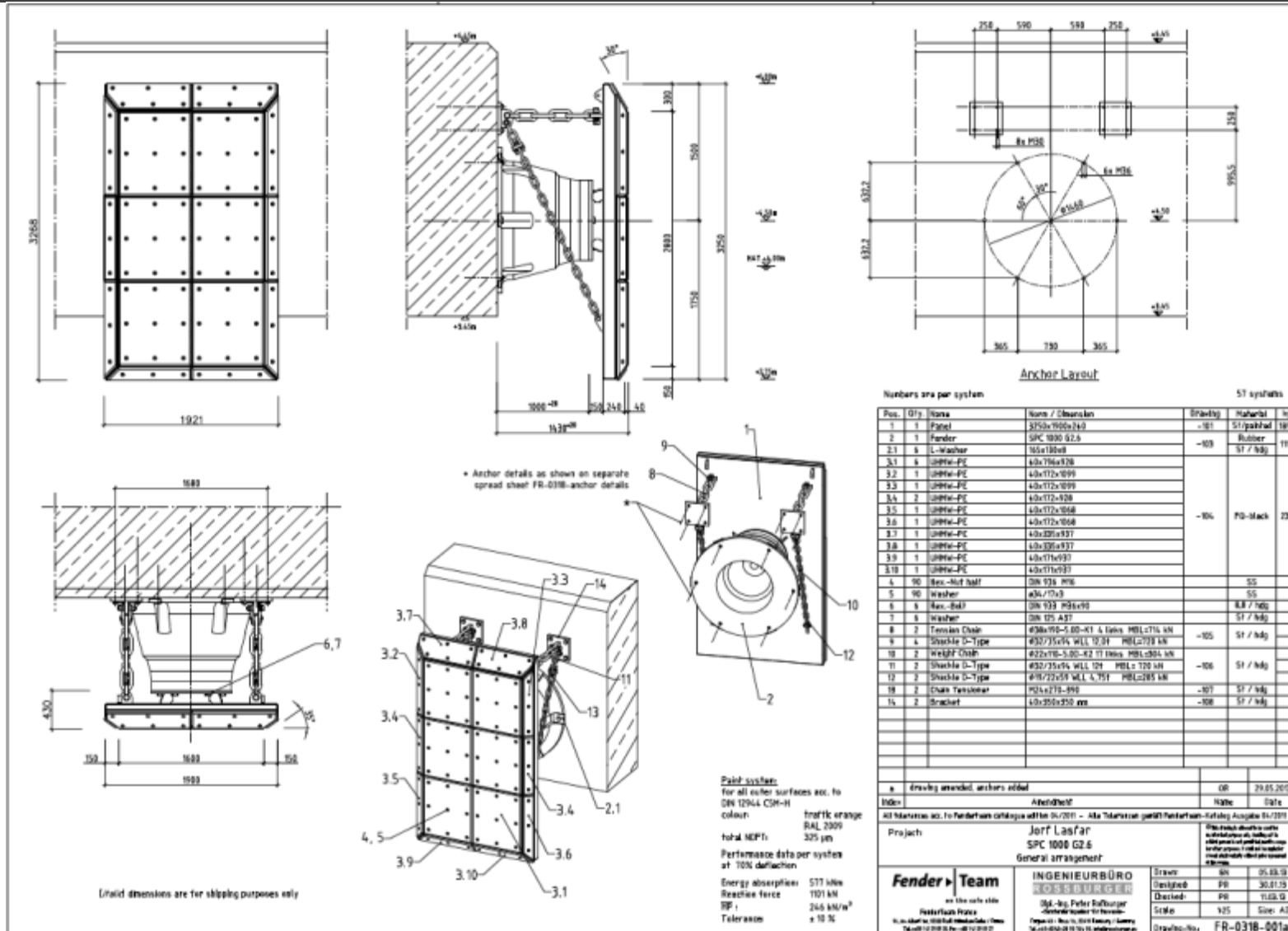
Considérations techniques:

- Quai vraquier
- Navires de 270 m de longueur
- Absorption d'énergie requise: 577 kNm
- Pression sur coque admissible: 250 kN/m²



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- Port de Ksar Sghir:

- 18 Ocean Guard Ø2500 x L 4770 mm

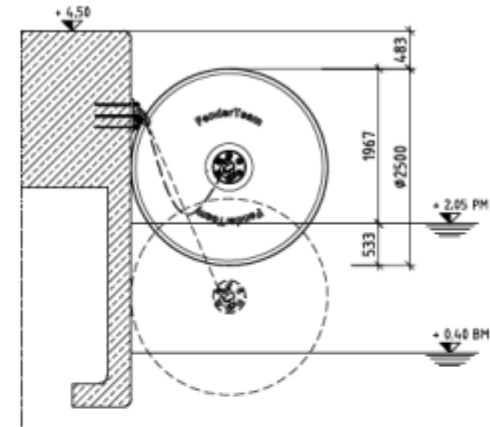
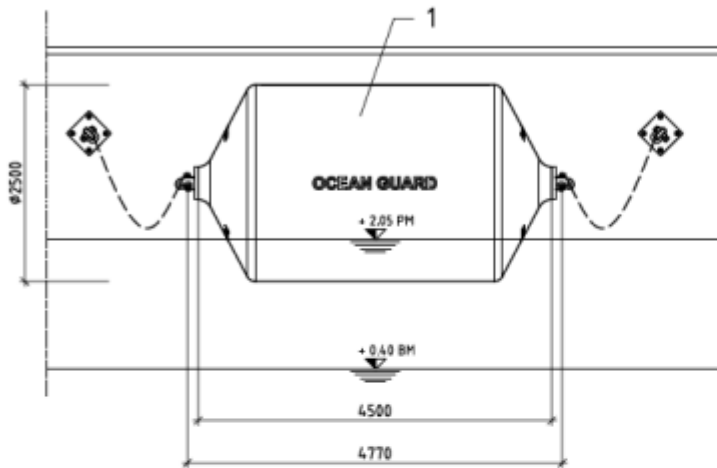
Considérations techniques:

- Énergie à absorber: 920 kNm
- Force de réaction maximale: 1403 kN



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Quantités par système

18 systèmes

Pos.	Qté.	Désignation	Normes / Dimensions	Plan	Matériau	Σ kg
1	1	Défense flottante en mousse	002500xL4770			
a				Correction quantité et nom de projet	PR	05.02.2016
Index				Modification	Non	Date
All tolérances acc. to FenderTeam catalogue édition 02/2014 - Toutes les tolérances selon catalogue FenderTeam édition 02/2014						
Projet:		Samima - Ksar Sghir Défense flottante en mousse 002500 x L4770 Plan d'ensemble			<small>Si l'utilisateur du système a été informé en des lieux de son usage prévu, la transmission de ce plan à un tiers constitue un usage illégal. L'utilisateur est informé qu'il ne peut pas être tenu responsable de l'usage de ce plan.</small>	
Fender Team on the safe side FenderTeam France 16, rue Albert 1er, 10550 Roséville-la-Clay / France Tel. +33 1 41 21 01 20, Fax +33 1 41 21 01 21		INGENIEURBÜRO ROSSBURGER Dipl.-Ing. Peter Rossburger -Bismarckstrasse 174 - Düsseldorf Tel. +49-204-40 1000 000, e-mail rossburger@i-rossburger.de		Dessiné:	KS	04.02.16
				Compu:	PR	04.02.16
				Véifié:	PR	04.02.16
				Echelle:	1:50	Format: A3
				Plan-No.:	FR0538-001a	



- Avantages des défenses en mousse:
 - Très bon ratio E/R
 - Faible entretien
 - Dimensions de diamètre et longueur variables en fonction des besoins du projet.
 - Possibilité de choisir différentes capacités sans changer les dimensions de la défense
 - Très bonne résistance aux rayons UV et à l'Ozone
 - Ne laisse pas de traces



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**Merci beaucoup pour votre
attention!**