

Fixed Barrier - **FSB™ Fixed Security Barrier System**

Harbor Offshore Barriers owns patent #7,744,313 B2 for its Fixed Security Barrier™ (FSB™) system.

The FSB™ stops a boat's progress in milliseconds, yet remains fully capable of stopping a second or even a third swarm attack.

The FSB™ barrier is designed to be permanent and installed in place to stop:

- Fast Inshore Attack Crafts (FIAC)
- Boat-Borne Improvised Explosive Devices (BBIED)
- Multiple boat attacks
- Intruders at full power before, during and after impact
- Slow speed, heavy tonnage vessels
- High speed, lower tonnage vessels
- Underwater penetration

FSB™ Barrier System

- Ultimate stopping energy 3.7M ft lbf/5.01 MJ
- Working stopping energy 1.25M ft lbf/1.69 MJ

Constructed System

- Piling length determined by seafloor conditions, net height requirements and water depth to maximum of 80 ft (24.38 m)
- **Example:** A 60 ft (18.29 m) deep system would require 102 foot-long (31.09 m) pilings as follows depending, of course, on site conditions.

Embed in seafloor	30 ft (9.14 m)
Seafloor to surface	60 ft (18.29 m)
Extension above surface	12 ft (3.66 m)

- Pilings are generally spaced no more than 100 ft (30.48 m) apart.
- Net depth and elevation designed according to risk assessment of site conditions, water depth and above water stopping requirements generally beginning at a height of 8 ft (2.44 m).
- Galvanized or stainless steel mesh nets.
- Subject to design, there is no practical limit to the amount of energy the system can withstand under varying wind and current conditions.



Fixed Security Barrier Patent #7,744,313 B2
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Constructed FSB™ System

- Pilings and shore connection systems sized for maximum strength.
- Extensive testing with independent US Navy and academic observers.
- Pilings on the seabed and fixed nets designed to preserve the natural environment.

Performance

- Low-maintenance – Corrosion resistance proven over nearly 10 yrs. of “real-world” operations
- Attack resistance – Best resistance to high-energy boat impacts at 3.7M ft lbf/5.01 MJ
- Sustainability – Ten-year proven resistance to marine environment permanent stress including weather, sea swells, sea waves, chafing, marine fouling and sea life.

Expertise and Service

- Expert installation – teams include divers and marine constructors with over 30 years experience working with each other.
- Fosters local partnerships – local sub-contractors join the team when qualified, gaining work skills and technology training.
- Life-cycle value – team experts provide life-cycle cost estimates to be used in formulating investment and insurance calculations and in selecting the system that meets the customer's need.



Harbor Offshore Barriers at a Glance

MISSION STATEMENT:

Our mission is to meet every customer's unique needs, from project conception to completion. We offer you a full services package to assess, design, engineer, fabricate, install, and maintain your waterside perimeter barrier system with an experience foundation not offered by others.

COMPANY:

Harbor Offshore Barriers, Inc., founded 2004

AFFILIATION:

Marine security specialty company of Harbor Offshore, Inc. founded 1997

HEADQUARTERS:

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PRODUCTS:	Fixed Security Barrier FSB™ (Patent #7,744,313 B2)	Floating Barrier PSB 600™	Floating Barrier PSB 5500™	Floating PSB-T US Navy Model
Characteristic Benefit	Underwater Fixed Barrier	Global Standard	Heavy-Duty	Military Installations
Structure	Netting in intertidal zone and above water attached to steel pilings	Continuous net capture system supported on pontoon structure	Continuous net capture system supported on pontoon structure	Floating barrier on pontoon structure
Ultimate Stopping Energy	3.70M ft lbf/5.01 MJ	5.90M ft lbf/7.99 MJ	9.09M ft lbf/12.32 MJ	5.90M ft lbf/7.99 MJ
Working Stopping Energy	1.25M ft lbf/1.69 MJ	2.49M ft lbf/3.37 MJ	5.49M ft lbf/7.44 MJ	3.70M ft lbf/5.01 MJ
Unit Length*	Pilings spaced up to 100 ft (30.48 m) apart	50 ft (15.24 m) / 40 ft (12.2 m) available	50 ft (15.24 m) / 40 ft (12.2 m) available	40 ft (12.2 m) / 50 ft (15.24 m)
Netting Material *	Galvanized or stainless steel	Nylon or metal mesh	Nylon or metal mesh	Nylon
Netting Attachment	Steel pilings	Galvanized steel beam running from pontoon-to-pontoon	Galvanized steel beam running from pontoon-to-pontoon	Galvanized steel beam running from pontoon-to-pontoon
Usual Netting Height*	Height 8 ft (2.44 m) Depth to 80 ft (24.38 m)	8 ft (2.44 m)	9 ft (2.74 m)	7 ft (2.13 m)
HDPE Pontoon Dimensions*	Not Applicable	1.25 in (3.17 cm) thick 30 in (76.2 cm) diameter Length engineered for site conditions	1.75 in (4.45 cm) thick 42 in (106.68 cm) diameter Length engineered for site conditions	1.25 in (3.17 cm) thick 30 in (76.2 cm) diameter Length engineered for site conditions

*Exact dimensions may vary; all specifications depend upon conditions, customer requirements and other factors.

EXPERIENCE:

- Since 2004, over 50,000 linear ft (15 240 m) fabricated, assembled, installed worldwide from Japan to Iraq to guard naval and infrastructure facilities.
- Multiple US Department of the Interior Bureau of Reclamation dam projects – PSB 600™ model certified for Bureau of Reclamation work.
- On-going US Navy inspection and maintenance services.
- US Department of Homeland Security “Approved Product”.
- Extensive testing of the FSB™, PSB 600™ and PSB 5500™ with independent US Navy and academic observers.

