INSTALLATION MANUAL

FOR THE

YODOCK MODEL 2001BB AND YODOCK MODEL 2001XL

INSTALLATION MANUAL No. YWSBINSTALL-01.2

Prepared By:

Yodock Wall Company, Inc.

Distributed by

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TABLE OF CONTENTS

1.0 INTRODUCTION

The Yodock Wall Company, Inc. has developed the Yodock Model 2001BB and Yodock Model 2001XL Floating Waterfront Security Barrier Systems for application as a floating protective security barrier for ports, harbors, marine terminals, shipyards, and other high value or security sensitive waterfront structures and vessels. The Yodock Waterfront Security Barriers (YWSB) have been designed, engineered, manufactured, and tested to insure that they will provide long term and reliable performance in a hostile marine environment. The molded polyethylene shell is extremely durable, is impact resistant and UV resistant and when properly installed, inspected and maintained will provide long-term service.

Like any product however, the performance and reliability of the Yodock Waterfront Security Barrier System relies on proper and adequate installation, inspection, and maintenance. This “Installation Manual” is intended to provide guidelines and to assist the installer and user with installation methods, techniques, and procedures that, when properly followed, will insure that the floating waterfront security barrier system will provide continuous service and will function as intended.

2.0 GENERAL

Each site that requires security protection and each waterfront security barrier system installation will have it's own unique set of characteristics and requirements. Yodock floating barriers have been successfully installed, operated, and maintained in situations ranging from facilities with relatively calm and protected conditions to large open water bodies with harsh sea and environmental conditions. Adequate mooring/anchoring hardware and proper installation techniques are critical to insuring that the floating waterfront security barrier system will be remain in its intended configuration, will function as designed, and will provide uninterrupted waterfront security protection.

This manual is not intended to provide detailed site-specific installation procedures, but rather an overview and checklist to insure that all of the important site-specific issues are considered and evaluated.

The manual is also intended to serve as a reminder and to provide notice that the successful operation and performance of Yodock Waterfront Security Barriers relies heavily on proper installation. To this extent, Yodock marine and ocean engineers are available to assist customers with the site-specific engineering and installation requirements of Yodock Security Barrier products and systems.

1. **3.0 SITE AND ENVIRONMENTAL STUDIES**
2. 3.1 Environmental Conditions

The first requirement for installation of a Yodock Waterfront Security Barrier System is a full and complete evaluation of the site area characteristics. The bottom composition characteristics will be important for specifying the type of anchoring system. The wind, current, and storm conditions, are important for sizing the moorings. The surface conditions, including floating debris and ice, must also be taken into consideration. Therefore the first order determination for loading will typically be the maximum or worst case (storm) conditions.

Given these criteria, the bottom composition (mud, silt, sand, rock, coral, etc.), the hydrography of the area (bottom topography), and any unusual conditions (cables, pipelines, etc) must first be evaluated in order to determine the location and type of anchoring system. Installations will differ however to the extent that some systems may have end terminations that connect directly to bulkheads, piers, or pilings requiring that an adequate connection be designed or specified that will withstand maximum loading. Historical environmental data must also be evaluated to insure that the mooring system can withstand tidal fluctuations and wind and current loads, in addition to high frequency and cyclic loads resulting from surface wave activity. This data must be analyzed, not only as input for loading at the end points or intermediate turn points, but also to specify the location of intermediate moorings to relieve and reduce the high loads that can result from installations with long lengths / long catenary configurations.

Another important factor in the installation design is the type and amount of surface debris or ice. Normally this will be associated with seasonal variations where there can

be winter months with ice flows or periods of high runoff and river flow during the spring bringing debris such as logs or trees. Unfortunately these loading conditions are sometime difficult to quantify since they can vary from relatively constant or uniform loading conditions to situations with high impact loads.

3.2 Threat Scenarios

The Yodock Waterfront Security Barrier may be also intended to act not only as a line of demarcation, but as an actual deterrent or impediment to a vessel or craft intent on impacting or crossing the barrier system. Therefore the mooring system must also be designed for expected maximum vessel impact loads on the barriers or from forces resulting from other threat scenarios.

The worst-case design condition or criteria for the moorings therefore becomes one, which results from the maximum environmental loads (storm conditions) and/or from a worst-case probable threat scenario.

4.0 MOORING / ATTACHMENT DESIGN AND ENGINEERING

The objective to the mooring design is to provide a mooring system that is compliant while at the same time effective in keeping barrier excursion or movement to a minimum. During time of slack current or low wind conditions, it is important to keep the barriers in position or in a relatively straight line while insuring that some minimum tension is maintained in the barrier system to prevent the barrier units from bunching together or colliding with each other. Longer Yodock Waterfront Security Barrier Systems usually perform better in this respect in that there is more subsurface and surface area for even minimal currents and wind to respectively act against.

Once the bottom conditions at the installation site are fully evaluated, the maximum loading on the barrier from worst case storm or threat scenarios is quantified, and any other relevant or important information regarding the operating and maintenance requirements are identified, the final design and engineering of the mooring system and/or anchoring to piers, bulkheads, or piling can be completed.

It is important to design the strength of the mooring system to the worst case loading condition. The longitudinal strength member of both the 2001BB and the 2001XL is a C4 x 5.4 Galvanized Steel Channel with a safe working load of 15.0 tons and an ultimate or yield of over 30.0 tons. End plates or end eyes are welded to each end of the channel allowing for the installation of shackles and/or connecting rings so that barriers can be connected together or to moorings. The welded end plates and end eyes are designed to have a higher working and yield strength than that of the channel.

Connecting the barriers together are specially modified 4 3/4 ton galvanized safety shackles provided by the Yodock Wall Company, Inc. The modifications do not effect or compromise the overall strength of the shackle, but have been incorporated to improve

the combined strength of the nut, the cotter pin, and the locking features of the shackle pin. The improvements also incorporate the addition of a stainless steel washer between the nut and cotter pin, which provides a further impediment to the nut backing off the shackle pin. The shackles and connecting links are rated at a safe working load of 4 3/4 tons with a 6 to 1 factor of safety at yield (yield strength of 28.5 tons).
In summary, the mooring / anchoring system and any attachment of the barriers to piers, bulkheads, pilings, etc. should be designed for a safe working load equal to the worst case storm condition or threat condition. The yield or ultimate strength of the moorings and pier and bulkhead attachments however should be at least 28.5 tons, which is equal to the breaking strength of the connecting hardware.

5.0 BARRIER INSTALLATION

Prior to installation of the barriers at the site, the entire mooring/anchoring, and /or attachment system should be installed, inspected, and tested. Since each site is unique, the mooring designs, engineering, installation, and testing plan for a particular installation will be unique and site specific. It is therefore important and necessary in the design and installation of the mooring system to utilize every bit of information available. This includes, but is not necessarily limited to, local knowledge, bottom hydrography, bottom samples, current data, tide data, wind data, wave data (height and period), air and water temperature data, seasonal variations, floating debris, ice, etc.

Yodock Waterfront Security Barriers (YWSB) have been designed and manufactured to facilitate handling, lifting, connecting, deployment, towing, and mooring. The barriers can be easily offloaded and moved by forklift upon their arrival at a waterfront facility and normally rows of approximately 10 barriers are placed end to end in a lay down area. The barriers are connected end to end with the 4 3/4 ton Yodock supplied shackles and connecting rings. The number of barriers connected together on land (barriers sections) may vary from the recommended number of 10 depending on the dockside crane boom height and lifting capacity that will be used to lower the barrier sections into the water.

As the barrier sections are lowered into the water a small boat can be used alongside the dock to begin connecting the sections together into the desired final configuration and length. Once an adequate and manageable number of barrier sections have been coupled together (usually approximately 40 to 50 barriers total), they can be towed to the site for connection to those barriers already on location or already connected to moorings. Depending on the local environmental conditions present during installation (wind, current, waves), some larger barrier systems (greater that 100 units) may require that the installation be completed through a phased installation and /or with extra towing or positioning vessels.

All Yodock Waterfront Security Barrier units are designed for ease of handling and assembly both on shore and in the water. In most applications the entire in-water installation can be accomplished using a few small craft which have a low freeboard and with towing vessels of 300 HP or less. Obviously the more permanent and larger YWSB

installations will require larger floating assets, heavier equipment, and more personnel.

Yodock Waterfront Security Barriers are designed with adequate stability for normal operating conditions. However, significant additions of weight to upper portion of the barriers or changes in the local environmental conditions such as biofouling, ice, temperature changes, or changes in water density may have an adverse effect on stability.

6.0 INSTALLATION CHECKLIST

1. 1. Obtain All Applicable Historical Site Data Site Hydrography (Bathymetry) Bottom / Seafloor conditions (bottom samples, bottom cores) Current, wave, tide, salinity, water temperature Wind speed and direction, air temperature, humidity
2. 2. Determine YWSB Loading Conditions Maximum expected loads from environmental conditions (storm conditions) Maximum expected loads from threat scenarios
3. 3. Design and Engineer YWSB Installation Layout Specify YWSB configuration Specify mooring / anchoring hardware, spacing, and configuration
4. 4. Install Mooring / Anchoring / Bulkhead Connectors Use corrosion resistant chain and hardware Use stainless steel wire rope where required Prevent any chafing Set all anchors Test / determine pull out force for 10% of anchors
5. 5. Install Yodock Waterfront Security Barrier (YWSB) System Use only Yodock supplied shackles / hardware Inspect all connections For each YWSB record final position and other data Prevent barriers from grounding or colliding during installation Check for adequate barrier system catenary after installation (Could require that barriers be added or removed)
6. **7.0 POST INSTALLATION INSPECTION**

Following the in-water installation of Yodock Waterfront Security Barriers, routine and scheduled inspections of the 2001BB or the 2001XL are critical to insuring the continued performance of the security barrier system. The inspection requirements are relatively simple and easy. Bi-Monthly Inspection required of the barriers topside from a small boat and at least a Semi-annual inspection of the underwater hull of the barriers and of the mooring and anchoring system. Each YWSB installation is provided with an "Inspection and Maintenance Manual" which must be followed and complied with to insure continuous and satisfactory operation of the barrier system.

8.0 BARRIER CONNECTION HARDWARE

3/4” Galvanized Safety Anchor Shackle

3/4” Galvanized Connection Ring

Stainless Washer

Stainless Cotter Pin Assembled Shackle

(When assembling hardware connections, tighten shackle bolt & nut as tight as possible to accommodate thick washer between cotter pin and nut as shown in photo above)
Stainless Cotter Pin Assembly

(When assembling hardware connections, bend both ends of cotter pin 180 degrees in opposite directions, similar to a J shape to eliminate any possibility of connection failures. Please see photo above)

Assembled Hardware Connection

Pipe Extension Covers

YODOCK FLOATING WATERFRONT SECURITY BARRIER

SPECIFICATION WATERFRONT BARRIER MODEL 2001XL

1.0 Intent

The intent of this specification is to describe the Yodock Floating Waterfront Barrier (YFWB) Model 2001XL. The YFWB Model 2001XL has been designed and developed by the Yodock Wall Company as a relatively large, yet portable, waterfront floating security barrier for application as a floating protective barrier for ports, harbors, marine terminals, shipyards, and other high value or security sensitive waterfront structures and vessels. The design of the 2001XL is based on years of experience and testing of Yodock landside traffic barriers and Yodock waterfront security barriers including the mid-sized YFWB 2001BB waterfront barrier. The larger sized 2001XL waterfront barrier described herein is directly applicable to the following security and related requirements:

.(A) Providing a clear line of demarcation on the water

.(B) Providing an impediment to swimmers attempting to cross into a security area

.(C) Providing a substantial impediment to small vessels attempting to penetrate a security area

.(D) Providing substantial capability in the disablement of small vessels attempting to penetrate a security area

.(E) Assisting in providing wave and wind protection by providing a protective lee

.(F) Providing a floating platform for installation of other detection or monitoring equipment

2.0 Description

The YFWB Model 2001XL is comprised of an external shell of extremely durable 8mm polyethylene plastic. The interior of the barrier unit is fitted with a structural steel Horizontal strength member with a shackle connection or attachment point at each end. The strength member provides the longitudinal or tensile strength for the purpose of connecting units together. The strength member also has two sleeves that extend upward through the main cavity to the top of the unit. These sleeves are designed to accommodate options such as lifting eyes, fencing, and sign posting. The tension member also has steel bars that extend downward through the lower cavity of the unit to the concrete ballast insuring that the internal structure remains securely intact. The internal ballast, which is positioned in the lower portion of the unit cavity, has been designed to ensure that the unit will remain stable and vertical under normal current, wave, and wind conditions. The remaining interior void space of the unit is filled with polyurethane (floatation) foam. Galvanized safety shackles are used to connect the waterfront barrier units together.

3.0 Tests

All Yodock waterfront floating security barriers have gone through a series of rigorous structural, corrosion, and survival tests in the laboratory and during field tests in high energy and environmentally harsh locations. Test results are available upon request.

4.0 Construction

Specifications for the Yodock Floating Waterfront barrier Model 2001XL (Note: Waterfront barrier Dimensions and Weights are approximate)

Manufacturer:	Yodock Wall Company, Inc. 623 N. E. 5th Terrace Fort Lauderdale, Florida 33304 Phone No. 954-462-1169
Model:	YWFB 2001XL
Shell Material:	Recyclable Polyethylene (Rotationally Molded - 8mm thickness), U.V. Inhibited
Colors:	Standard colors available are Natural (Opaque Ivory), Safety Orange and Black. Other colors are available upon request
Length (Molded):	72 inches (6.00 feet) (1.83 meters)
Length (Overall):	88 inches (7.33 feet) (2.24 meters)
Width (Beam):	24 inches (2.00 feet) (0.61 meters)
Height (Overall):	62.0 inches (4.33 feet) (1.32 meters)
Draft:	15.0 inches (1.25 feet) (0.38 meters)
Freeboard:	37.0 inches (3.08 feet) (0.94 meters)
Ballast:	Fiber Reinforced Concrete
Strength Member:	Galvanized Structural Steel Channel (C4 x 5.4)
End Eyes:	Galvanized 1” x 3” steel plate, drilled with two 7/8” holes
Interior Foam Fill:	Polyurethane Closed Cell Foam
Weight (In Air):	approximately 1160 pounds
Reserve Buoyancy:	1300 pounds
Shackle Connector:	3/4 inch (5 ton working load) Galvanized Safety Shackles & Rings (Connection hardware as required by individual site conditions)
Operating Conditions & Limitations	Air Temperature Range: 0º to 140º F (-18º to 60º C) Water Temperature Range: 32º to 110º F (0º to 43º C) Salinity Range: Fresh Water to Ocean Water (Up to 35 ppt)
Options:	Topside: Chain link fencing Barb wire / Concertina wire Marine lighting Reflective tape Signposts Lifting eyes Stainless Steel structural members and shackles/hardware Below: Silt curtain

Anti-swimmer / anti-diver netting

Hardening Options:

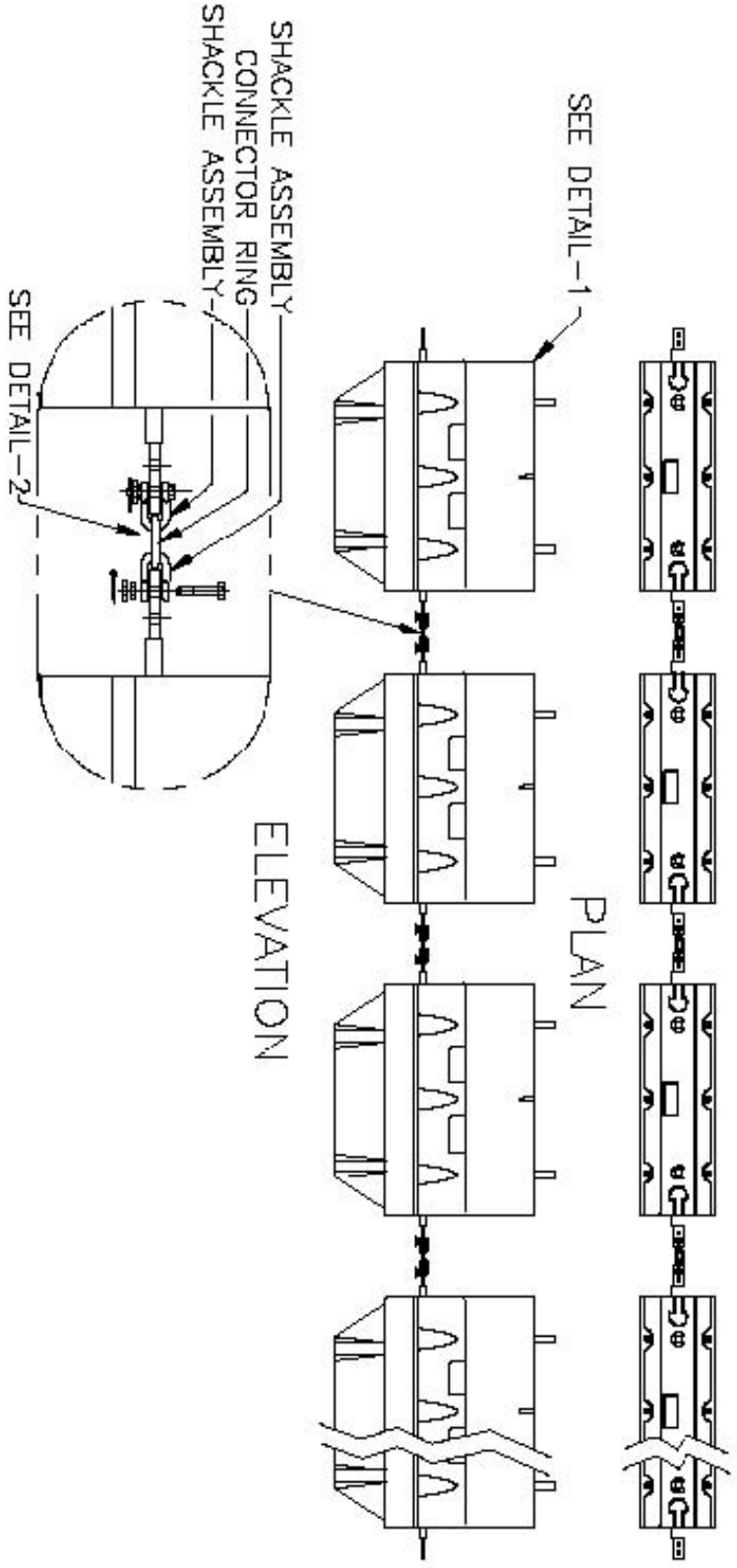
Welded shackle connections

Wire rope for moorings

Note: Yodock Wall Company, Inc. reserves the right to modify or substitute barrier components, parts, and fittings with items that will meet or exceed the stated specifications.

Yodock Model 2001XL Waterfront Barrier

72.00
61.50
23.75
23.75
72.00
61.50



YODOCK FLOATING WATERFRONT SECURITY BARRIER

SPECIFICATION WATERFRONT BARRIER MODEL 2001BB

3.0 Intent

The intent of this specification is to describe the Yodock Floating Waterfront Barrier (YFWB) Model 2001BB. The YFWB Model 2001BB has been designed and developed by the Yodock Wall Company as a lightweight portable waterfront floating security barrier for application as a floating protective barrier for ports, harbors, marine terminals, shipyards, and other high value or security sensitive waterfront structures and vessels. The design of the 2001BB is based on years of experience and testing of Yodock landside traffic barriers and security systems similar in size and construction. The mid-sized 2001BB waterfront barrier is directly applicable to the following security and related requirements:

.(G) Providing a clear line of demarcation on the water
.(H) Providing an impediment to swimmers attempting to cross into a security area
.(I) Providing an impediment to small vessels attempting to penetrate a security area
.(J) Assisting in the disablement of small vessels attempting to penetrate a security area
.(K) Assisting in providing wave and wind protection by providing a protective lee

4.0 Description

The YFWB Model 2001BB is comprised of an external shell of extremely durable 8mm polyethylene plastic. The interior of the barrier unit is fitted with a longitudinal structural steel strength member with a “U” shaped connection or attachment point at each end. The strength member provides the longitudinal or tensile strength for the purpose of connecting units together. The strength member also has two sleeves that extend upward through the main cavity to the top of the unit. These sleeves are designed to accommodate options such as lifting eyes, fencing, and sign posting. The tension member also has steel bars that extend downward through the lower cavity of the unit to the concrete ballast insuring that the internal structure remains securely intact. The internal ballast, which is positioned in the lower portion of the unit cavity, has been designed to ensure that the unit will remain stable and vertical under normal current, wave, and wind conditions. The remaining interior void space of the unit is filled with polyurethane (floatation) foam. Galvanized safety shackles are used to connect the waterfront barrier units together.

3.0 Tests

The YFWB Model 2001BB has gone through a series of rigorous structural, corrosion, and survival tests in the laboratory and during field tests in high energy and environmentally harsh locations. Test results on the YFWB Model 2001BB are available upon request.

4.0 Construction

Specifications for the Yodock Floating Waterfront barrier Model 2001BB (Note: Waterfront barrier Dimensions and Weights are approximate)

Manufacturer:

Model:
Shell Material:

Colors:

Length (Molded):
Length (Overall):
Width (Beam):
Height (Overall):
Draft:
Freeboard:
Ballast:
Strength Member:
End Eyes:
Interior Foam Fill:
Weight (In Air):
Reserve Buoyancy:

Yodock Wall Company, Inc. 623 N. E. 5th Terrace Fort Lauderdale, Florida 33304 Phone No. 954-462-1169 YWFB 2001BB Recyclable Polyethylene (Rotationally Molded - 8mm thickness),
U.V. Inhibited Standard colors available are Natural (Opaque Ivory), Safety Orange and Black. Other colors are available upon request 72 inches (6.00 feet) (1.83 meters) 88 inches (7.33 feet) (2.24 meters) 18 inches (1.50 feet) (0.46 meters)
47.5 inches (3.96 feet) (1.21 meters)
1. 23.5 inches (1.96 feet) (0.60 meters)
2. 24.0 inches (2.00 feet) (0.61 meters) Fiber Reinforced Concrete Galvanized Structural Steel Channel (C4 x 5.4) Galvanized 1” x 3” steel plate, drilled with two 7/8” holes Polyurethane Closed Cell Foam 800 pounds 750 pounds

Shackle Connector:

Operating Conditions & Limitations

Options:

3/4 inch (5 ton working load) Galvanized Safety Shackles & Rings

(Connection hardware as required by individual site conditions)

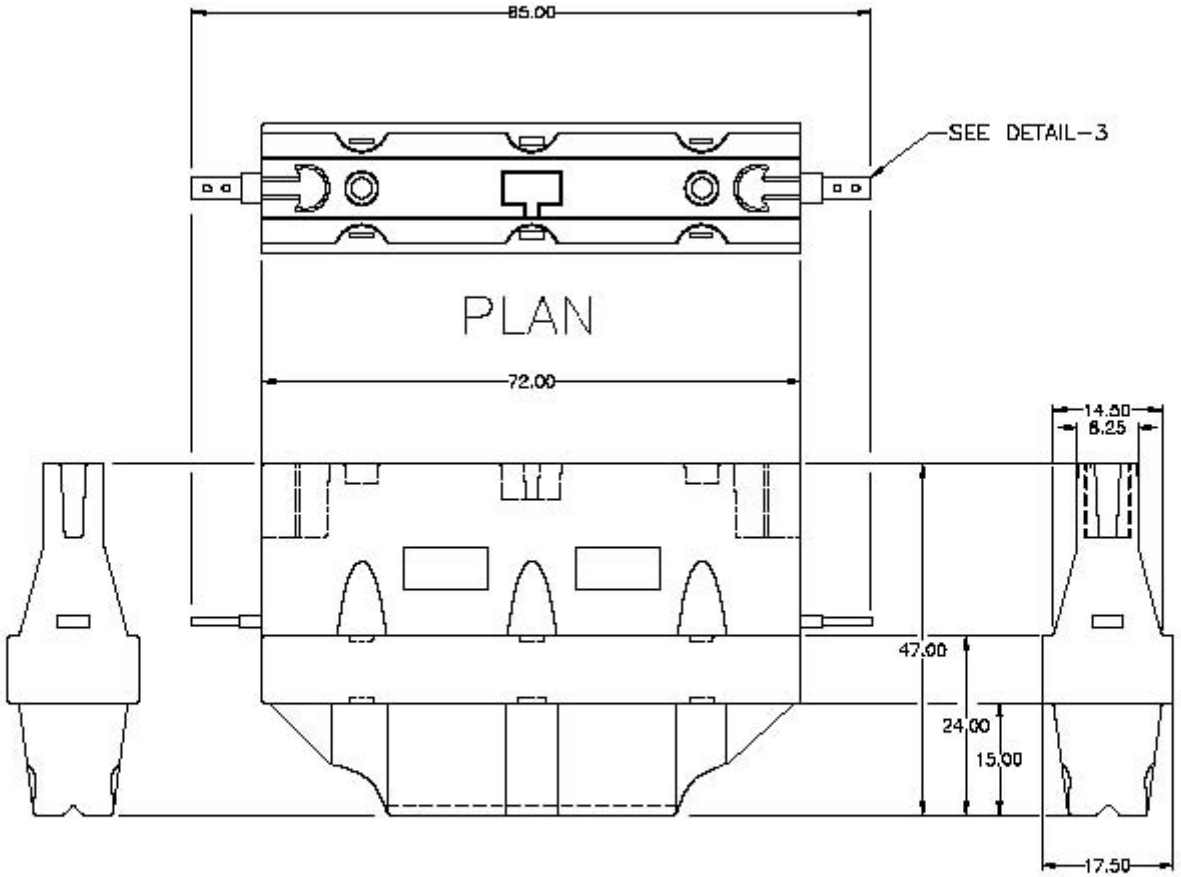
Air Temperature Range: 0º to 140º F (-18º to 60º C) Water Temperature Range: 32º to 110º F (0º to 43º C) Salinity Range: Fresh Water to Ocean Water (Up to 35 ppt)

Topside: Chain link fencing
Barb wire / Concertina wire
Marine lighting
Reflective tape
Signposts
Lifting eyes
Stainless Steel structural members and shackles/hardware

Below: Silt curtain Anti-swimmer / anti-diver netting

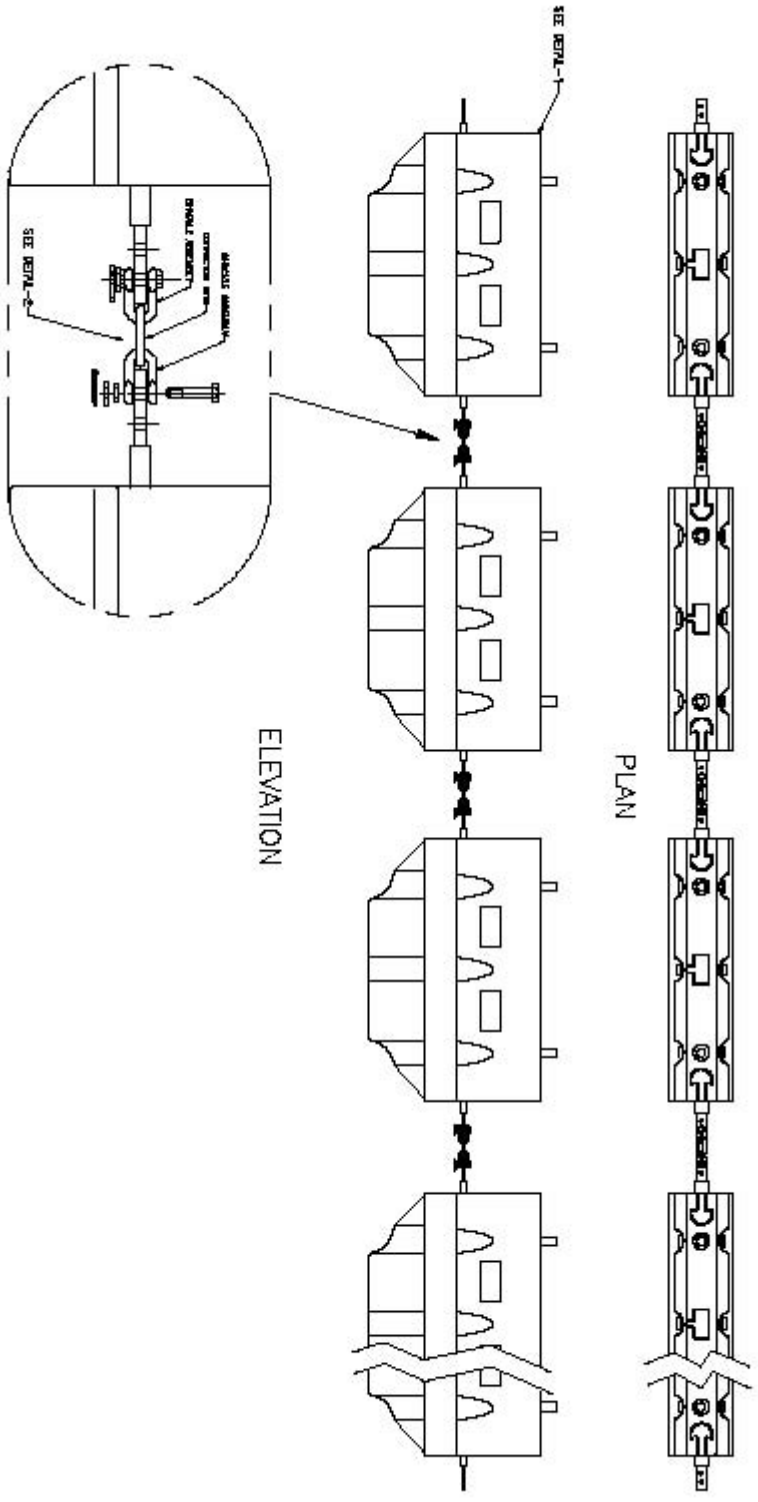
Hardening Options:
Welded shackle connections
Wire rope for moorings Note: Yodock Wall Company, Inc. reserves the right to modify or substitute barrier components, parts, and fittings with items, which will meet or exceed the stated specifications.

Yodock model 2001BB Waterfront Barrier



ELEVATION

DETAIL-1



9.0 WARRANTY

LIMITED WARRANTY

Yodock warrants the Yodock Waterfront Security Barrier (the "Barrier"), as described in the "Specification for Waterfront Barrier System" to be free from defects in material and workmanship for a period of one (1) year from purchase (the “Warranty Period”). All warranty claims by the customer shall be made to The Yodock Wall Company, Inc. 623 N.E. 5th Terrace, Fort Lauderdale, Florida 33304. Replacements shall not interrupt or prolong the term of this Warranty.

Cables, connection points and any other materials for connecting the barrier system to desired locations are to be supplied by the customer, and are expressly excluded from this Warranty.

Yodock's obligation under this Warranty is limited, at its sole and exclusive option, to either the repair or replacement of the Barrier where a defect hasbeen claimed during the Warranty Period, and which isreturned, freight prepaid, to Yodock at the address givenabove. Upon inspection by Yodock, the Barrier or partsthereof, which prove to be defective, will be repaired orreplaced at no charge.

THE WARRANTY SET FORTH ABOVE IS EXCLUSIVE AND NO OTHER WARRANTY, WHETHER WRITTEN OR ORAL, IS EXPRESSED ORIMPLIED. YODOCK SPECIFICALLY DISCLAIMS THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

The warranties set forth herein apply only to theoriginal customer and are conditional upon the customergiving prompt notice to Yodock of any discovered defectsduring the Warranty Period. Yodock shall not be responsible for any other defects or damage, including, butnot limited to, any defects or damage caused by or resulting from: (a) alterations to the Barrier by any oneother than Yodock; (b) accident; (c) damage due to anintentional or negligent act of a third party; (d) abuse or negligence; (e) wear and tear; (f) mishandling; (g)failure to use the Barrier in a safe and reasonable manner,or (h) force majeure. If the Barrier, in the judgment ofYodock, shows evidence of having been altered, modified orserviced without the authorization of Yodock, the warranties set forth herein shall not apply.

Yodock's cumulative liability for damages of anykind whatsoever and regardless of the form of action,whether in contract or tort, including negligence or strictliability, shall be limited to the purchase price of the Barrier that caused the damages or that is the subjectmatter of, or is directly related, to the cause of action.

IN NO EVENT SHALL YODOCK BE LIABLE FOR INDIRECT,SPECIAL, INCIDENTAL, CONTINGENT OR CONSEQUENTIAL DAMAGESARISING OUT OF THE USE OR POSSESSION OF THE BARRIER,WHETHER OR NOT YODOCK HAS RECEIVED NOTICE OF THE POSSIBILITY OR CERTAINTY OR SUCH DAMAGES OR LOSSES.