



# DOCK INSTALLATION GUIDE



*Published  
January 1<sup>st</sup>, 2019*



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## INSTALLATION GUIDE DISCLOSURE

**PLEASE NOTE:** This installation guide is to be used only as an overview and resource for general information regarding the installation process of Hazelett elastic moorings. It is by no means expansive and should not be used as a sole tool for completing installations. Hazelett Marine will provide a Dock Anchor Plan and Custom Tension Chart upon request to supply the necessary project-specific and comprehensive information to complete safe installations.

Every Hazelett installation should be completed by a certified and approved installer to guarantee the structural integrity and reliability of our products. Hazelett Marine is not liable for any installation completed without the approval or supervision of qualified staff.

## ANCHORING

### Deadweight (gravity) Anchors

Deadweight anchors work on the basis of gravity and include the use of a variety of materials (e.g. block of stone, concrete or iron). Once the weight is deployed onto the seabed, it may over time and depending on the substrate become partially embedded in the seabed. This may produce a suction effect, potentially increasing its resistance to being lifted. Deadweight anchors are well adapted to sandy bottoms and compact sediments.

### Embedment Anchors

Embedment anchors require professional installation either through hydraulic auger drive attached to a surface vessel, commercial diver operated rotary power tools and/or a hydraulic or pneumatic jack hammer. Embedment anchors directly anchored into the seabed are the preferred option from an environmental perspective. This approach minimizes contact with the substrate and bottom scour associated with chains from traditional block moorings.



*Deadweight Anchor, Source: SF Marina*



*Embedment Anchor, Source: Helix Mooring Systems*

## COMPONENT ASSEMBLY

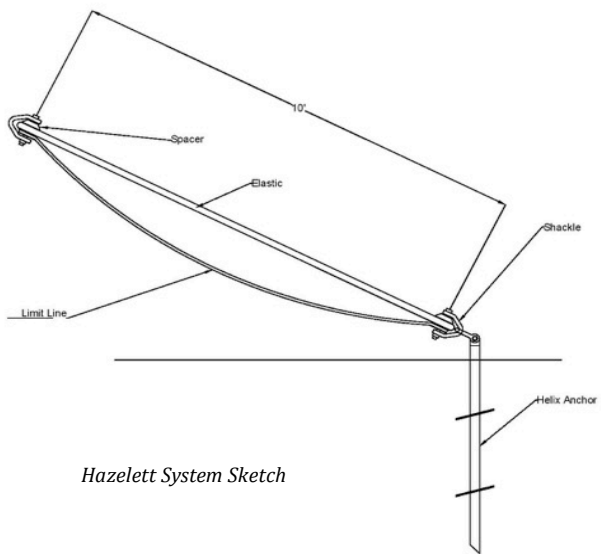
Hazelett recommends using Uniline (manufactured by Yale Cordage) as the downline from the bottom of the dock to the top of the elastics. The Uniline loops around a galvanized thimble that connects to the galvanized steel shackle to protect the Uniline from rubbing against the shackle. The Uniline is then secured with galvanized wire rope clips. Our elastics (single, double, triple or quad) are held together on either end with galvanized steel shackles.

Limit lines (generally made of Yalex rope) are included as safety factors to restrict the elastics from stretching past a certain point (typically between 30 – 70%). In severe weather events or in the highly unlikely event that something happens to the elastics, the limit line will take over. Hazelett recommends limit lines on most dock projects, though the design is flexible.

The Hazelett system should be assembled as is displayed below. Position the spacers, elastics and limit line so that the tension force is symmetrical to the shackles. Install the elastics so that they are not in contact with anything (including other elastics) in the water.

Once the system is fully assembled, the bottom shackle of the Hazelett system is connected to the anchor top terminator.

**NOTE:** Secure cotter pins on shackles to prevent system undoing.



*Hazelett System Sketch*



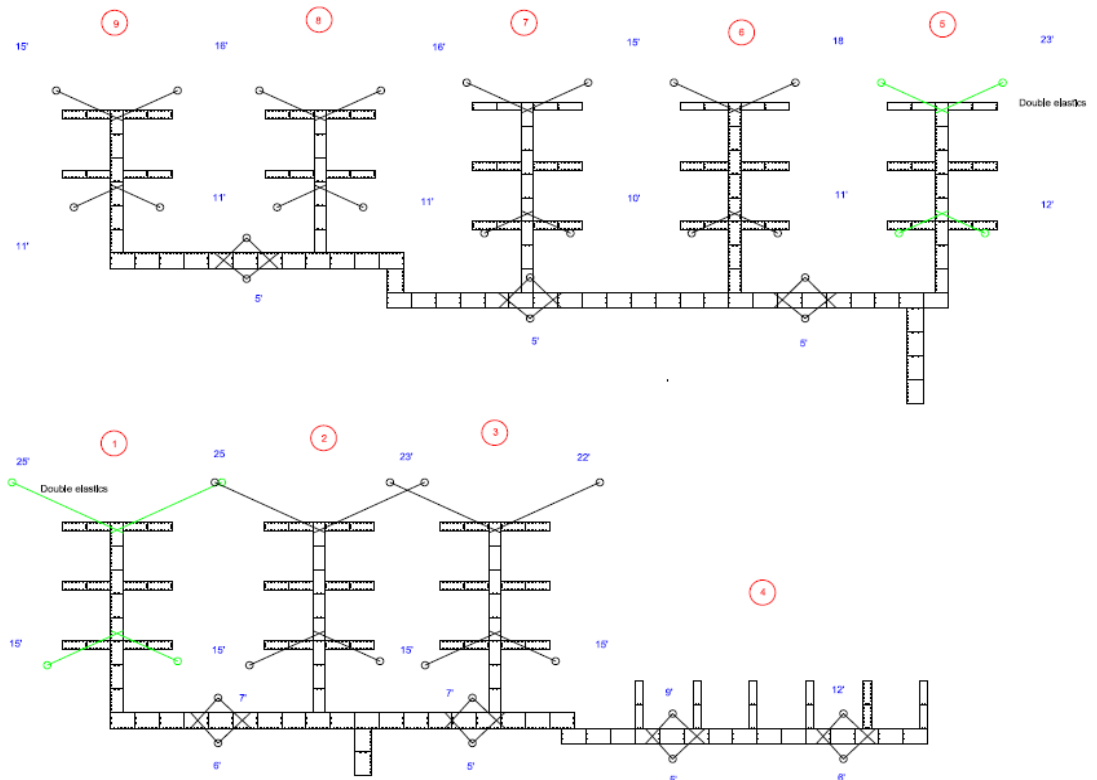
*Shackle, limit line, elastic & spacer*

## SYSTEM POSITIONING GUIDELINES

The angle and offset of the mooring systems are determined in conjunction with the anchor placement/location. The design of the dock anchor plan is unique to each project and is based on many environmental factors (e.g. min & max water depth, tidal change, wave height, current speed, wind velocity, fetch, etc). Hazelett Marine will provide a Dock Anchor Plan in response to project specifics.

As a rule of thumb, the Dock Anchor Plan is designed at a 45° angle and a minimum 2-1 scope to accommodate changes in water height.

**NOTE:** The Dock Anchor Plan and Layout are based on environmental factors and parameters signed off on by the client in the Proposal. Any changes in these parameters will negate the design.



*Sample Dock Anchor Plan*

## TENSIONING

Hazelett elastics are tensioned at low tide and sit above the seabed with a minimal environmental footprint. Tensioning is specific to each project. Hazelett Marine will provide a Custom Tension Chart to accommodate each project. Tensioning typically starts at 10% and is generally performed on the dock with an electric or hand operated (come-along) winch.



*Tensioning using a winch*

## INSPECTION SCHEDULE

The design life of Hazelett elastics is 30 years. Hazelett recommends initial inspection at 6 months to check that the system is working properly, followed by yearly inspections and after strong weather events. Yearly, above-water inspections to check tensioning on the lines should be conducted. Tensioning is checked by simply pulling or tugging up on the lines. Every 3-5 years, a diver should clear the lines of any obstructions, bend elastics and check for abrasion, and check secure hardware connections for corrosion.

## PRODUCT WARNINGS

### GENERAL

- Do not cut elastics.
- Use only for the specified purpose of mooring boats or docks.
- System design is based on environmental factors and parameters signed off on by the client in the Proposal. Any changes in these parameters or forces that exceed specified conditions risk failure of system.
- Do not exceed rated capacity. System can fail if damaged, misused or overloaded.
- Do not use nylon or three strand-laid (twisted) rope for downline. Excessive elongation and twisting under tension can occur.
- Do not install any damaged elastic.

### INSTALLATION, TENSIONING & INSPECTION

- Use care when handling elastics. Avoid placement and stretching on sharp surfaces.
- Use caution when stretching elastics. Elastics have a lot of stored energy when stretched and can result in catastrophic injury if released unexpectedly. Serious injury or death can occur.
- Recommended two man lift for any system bigger than a single. Injury can occur due to weight of system.
- Personnel keep out from under a raised load and out of the line of force of any load. Conduct all lifting operations responsibly to prevent injury if equipment failure. Do not ride on loads.
- Avoid impacting, jerking or swinging system abruptly during installation. Avoid shock loads. A shock load is generally significantly greater than the static load.
- Secure all components of system. Secure cotter pins on shackles. Failure to do so can result in undoing and failure of system.
- Do not twist or tangle elastics during installation.
- Install below water. Surface exposure can result in elastic damage due to unexpected forces.
- Follow installation guide and install system only per specifications.
- Complete installation with a qualified installer. Any installation performed by a non-qualified installer voids all warranties unless the installation is approved post-installation by a qualified Hazelett representative.
- Perform tensioning and inspections with a qualified installer.
- Anchor placement that deviates from design risks excessive wear and force on system not accounted for in the design. Decreased system life can occur.



## LIMITED WARRANTY

### What is covered by this warranty?

Hazelett warrants the hardware product and accessories against defects in materials and/or workmanship under normal installation, use, service, and maintenance over the warranty period described below.

### What is not covered by this warranty?

This warranty does not cover any:

- Personal transportation costs incurred during the course of seeking repair or service
- Cosmetic damage, including but not limited to, scratches and dents
- Damage caused by improper use of the product or another product
- Damage by external causes, including but not limited to, accident, abuse, misuse, fire, or natural disasters
- Defects caused by normal wear and tear or otherwise due to normal aging of product, including consumable parts that are designed to diminish over time, unless caused by defects in materials and/or workmanship, or
- Products if any serial numbers or warnings have been altered or removed from the product.

### What Hazelett will do:

If during the warranty period a valid claim is submitted to Hazelett, Hazelett will, at its discretion, (a) repair the product using new or previously used parts that are equivalent to new in performance and reliability, (b) replace the product with a functionally equivalent device, or (c) exchange the product for a refund of the purchase price.

### Warranty Service Options:

A claim must be submitted to Hazelett during the warranty period by phone or email. Warranty services will be provided by Hazelett based on a valid claim through one of the following options:

- **Carry-in service.** You may return your Hazelett product to the main office as specified in the Agreement for the product to be serviced at Hazelett. Hazelett will notify you when services are complete, and your product can be retrieved from the main office or sent by common carrier.
- **Mail-in service.** If Hazelett determines that your product is eligible for mail-in service, Hazelett will supply you with packaging materials if necessary and reimburse for the cost of shipping. When service is complete, Hazelett will ship the product back to the specified destination at its own cost.
- **On-site service.** If possible, Hazelett will remotely access products and correct issues as able. Hazelett representatives may also travel to the product's location at its own cost to remedy the products issues if deemed both necessary and cost effective.

Hazelett reserves the right to change the method by which warranty services are provided and eligibility for a particular method of service, pending product type. Additionally, if a product must be shipped internationally, you must comply with all import and export laws and regulations and pay customs fees.

### Warranty Limitations and Limitation of Liability:

Warranties and liabilities are limited in accordance with the Terms and Conditions of Sale.

**This Warranty is effective for two (2) years from date of purchase.**