

CITY OF NEWPORT BEACH  
WATERFRONT PROJECT GUIDELINES  
AND STANDARDS

HARBOR DESIGN CRITERIA  
COMMERCIAL & RESIDENTIAL  
FACILITIES



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## ABBREVIATIONS

ADA	Americans with Disabilities Act
ADAAG	ADA Accessibility Guidelines
CBC	California Building Code
C/C, C-C	center-to-center
CEC	California Electrical Code
CEQA	California Environmental Quality Act
CF	cubic feet
CFC	California Fire Code
CL	centerline
CPC	California Plumbing Code
CY	cubic yard
D.F.	Douglas fir
DL	dead load
DBW	California State Parks Division of Boating and Waterways
EE	eased edge (rounded edge on lumber)
EL., Elev.	Elevation
f <sup>c</sup>	compressive strength (force)
FDC	fire department connection
FHC	fire hose cabinet
HDG	hot dipped galvanized
ksi	thousand pounds per square inch (i.e., 1,000 psi)
Lb	length of berth (DBW definition)
Lbs., #	pounds
LED	light emitting diode (light)
LL	live load
Max.	maximum
mils	one thousandth of an inch
Min.	minimum
MLLW	mean lower low water (datum)
NAVD88	North American Vertical Datum 1988
NEC	National Electrical Code (NFPA 70)
NFPA	National Fire Protection Association
NGVD29	National Geodetic Vertical Datum 1929
OC	on-center
PL	property line, plate
psi	pound(s) per square inch
PVC	polyvinyl chloride (plastic)
ROW	right of way
RWQCB	Regional Water Quality Control Board

S4S	surfaced four sides (in reference to lumber that is smooth/straight cut)
SF	square feet
SUP	stand-up paddleboard
TOW	top of wall
UHMW-PE	ultra-high molecular weight polyethylene (plastic)
ULL	uniform live load
USACE	United States Army Corps of Engineers
WWM	welded wire mesh
w/	with
w/o	without

## **REFERENCE DESIGN STANDARDS**

(per latest edition of)

- American Society of Civil Engineers (ASCE), Standard 7-16
- American Wood Council National Design Specifications (NDS)
- California State Parks Division of Boating and Waterways (DBW), Layout and Design Guidelines for Marina Berthing Facilities, July 2005
- California State Parks Division of Boating and Waterways (DBW), Layout, Design, and Construction Handbook for Small Craft Boat Launching Facilities, March 1991
- California Building Code
- California Electrical Code
- California Fire Code
- California Green Building Standards Code (CALGreen)
- California Plumbing Code
- California Department of Transportation (Caltrans) Standard Specifications
- Caltrans Foundation Manual, 2015 or latest edition
- National Fire Protection Association (NFPA) standards 10, 14, 24, 25, and 303
- Newport Beach Life Safety Services Guideline F.01, Fire Protection for Marinas, Wharves, and Piers
- Newport Beach Standard Drawings for Public Works Construction

## **REFERENCE MATERIAL STANDARDS**

(per latest edition of)

- American Concrete Institute (ACI) 318, Building Code for Structural Concrete
- American Institute of Timber Construction (AITC)
- American Lumber Standard Committee, PS 20-15, American Softwood Lumber Standard
- ASTM International standards
- American Welding Society (AWS) welding codes
- American Wood Preservers Association (AWPA)
- Concrete Reinforcing Steel Institute (CRSI), MSP-2, Manual of Standard Practice for Reinforced Concrete Construction
- NSF International standards
- Precast/Restressed Concrete Institute (PCI), MNL-116, Quality Control for Plants and Production of Structural Concrete Products
- Society of Protective Coatings (SPPC)
- Southern Pine Inspection Bureau (SPIB) Standard Grading Rules
- West Coast Lumber Inspection Bureau (WCLIB), Standard No. 17
- Western Wood Preservers Institute (WWPI) Best Management Practices
- Western Wood Products Association (WWPA), Western Lumber Grading Rules

# HARBOR DESIGN CRITERIA

## GENERAL

The construction of harbor facilities shall accommodate the need for safety and durability as well as convenience and appearance. Structural elements of the docks, floats, gangways, piles, etc., shall be adequate to safeguard human life, boats, and boating equipment. Boat berthing facilities shall be designed to adequately handle anticipated loads with reasonable factor of safety as deemed appropriate by the City of Newport Beach. Materials of construction shall resist corrosion from saltwater in order to assure low maintenance requirements and long life of the facility. Floats shall be designed to assure stability and buoyancy for safe operations. Adequate utilities meeting all requirements of the current, applicable codes shall be provided for the convenience and safety of boaters and maintenance workers.

Harbor Permits and Plan Check shall be as per Title 17 of the City of Newport Beach Municipal Code and Council Policy H-1.

Dock systems shall be designed by a civil or structural engineer, licensed by the State of California, who is experienced in the design of marine structures. Repairs and non-structural modifications to existing residential docks can be designed by a licensed contractor experienced in dock facilities, at the discretion of the City of Newport Beach.

In accordance to California Building Code [A] 104.10 Modifications. “Wherever there are practical difficulties involved in carrying out the provisions of this code, the [Chief] Building Official shall have the authority to grant modifications for individual cases, upon application of the owner or owner’s representative, provided the [Chief] Building Official shall first find that special individual reason makes the strict letter of this code impractical and the modification is in compliance with the intent and purpose of this code and that such modification does not lessen health, accessibility, life and fire safety, or structural requirements. The details of action granting modifications shall be recorded and entered in the files of the department of building safety.” Fire Marshal approval shall be required for variances associated with the fire protection system.

In accordance to California Building Code [A] 104.11 Alternative materials, design and methods of construction and equipment. “The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been approved. An alternative material, design or method of construction shall be approved where the [Chief] Building Official finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, at least the equivalent of that prescribed in this code in quality, strength, effectiveness, fire resistance, durability and safety.” Fire Marshal approval shall be required for variances associated with the fire protection system.

## **I. WATERSIDE DEVELOPMENT**

The limits and constraints of construction in the harbor are defined by a series of lines that have been established over time by the Federal Government, as well as the City of Newport Beach. These lines have been defined in Chapter 17.01 of the Municipal Code. Prior to the preparation of documents to be submitted to the City of Newport Beach for review of a proposed project, the applicant should obtain a full understanding of these lines and have a qualified engineer, surveyor or contractor define these lines on any plans submitted for a proposed project. These lines include the existing or current edge of construction along the waterfront with respect to the Federal Bulkhead, Pierhead and Project Lines, Channel Lines, property lines (and their projections), Anchorage Area, and Turning Basins.

### **A. DOCKS**

#### **1. ALTERNATIVE BERTHING GEOMETRIES**

Various berthing geometries are available and acceptable for the berthing of boats for a docking facility. The following layouts and designs present the generalized arrangements that are considered acceptable to the City of Newport Beach for the berthing of boats. The attached Figures and “Case” geometries can be utilized as shown, or in combination with one another, in an overall marina dock scheme.

#### **2. LAYOUT AND DESIGN** (Commercial & Residential)

##### **a. General**

- (1) Layout and design of harbor facilities shall be based upon the use of the facility defined as follows:
  - (a) Single or joint residential
  - (b) Multi-residential
  - (c) Commercial (Type 1): typical
    - 1) Passenger (e.g., ferry, event cruise, etc. with no on-dock queuing)
    - 2) Recreational boat marina
    - 3) Yacht club
    - 4) Other commercial (e.g., restaurant, office, yacht broker, etc.)
    - 5) Public pier
  - (d) Commercial (Type 2): not common in Newport Harbor

- 1) On-dock passenger staging (i.e., where passengers queue on the dock prior to boarding)
    - 2) Docks used for transfer of cargo or other materials
  - (2) *Layout and Design Guidelines for Marina Berthing Facilities* (2005 edition or as updated) published by the State of California State Parks Division of Boating and Waterways, except as modified by the City's **Harbor Standard Drawings** within the Design Criteria may be used as a guide to design harbor structures.
  - (3) See the attached **Harbor Standard Drawings** for plans, sections and details of typical conditions for vessel moorings and docks, gangways, platforms, seawalls, and beach profiles. These Standards are to be considered minimum requirements for the cases represented and, at the City of Newport Beach discretion, may not apply to the specific project submitted. The City of Newport Beach reserves the right to mandate deviation from the Standards, if particular project conditions require special consideration.
- b. Slip and Boat Overhang into Adjacent Fairways
- (1) Berths shall not be occupied by vessels more than three (3) feet longer than the berth or slip, or in the case of fairways with a width of  $1.75 \times L_b$  (length of berth), not more than 10% of the length of the berth's finger.
  - (2) For berths either parallel or perpendicular to a main channel, vessels can extend beyond the limits of the slip by as much as the beam of the boat.
- c. Finger and Walkway Widths
- (1) Minimum finger widths for recreational, commercial, and residential docks shall be per **Table No. 1**.
  - (2) Fillets at the connection of walkways to fingers shall not have less than a 4-foot side.
  - (3) Outer end (end tie) and side-tie fingers shall be a minimum of one foot wider than the minimal widths for all other adjacent finger docks.
  - (4) Residential Headwalks and Mainwalks

- (a) Minimum residential headwalk widths shall be no less than six (6) feet for dock lengths up to 120 feet in total length, and eight (8) feet wide for dock lengths of more than 120 feet.
- (5) Commercial Headwalks and Mainwalks
- (a) Minimum widths shall be no less than six (6) feet for dock lengths up to 120 feet in total length, and eight (8) feet wide for dock lengths of more than 120 feet. If use of a walkway is for staging the public while waiting to board a vessel, the minimum dock width shall be 12 feet.
  - (b) At gangways, a minimum of six (6) feet of walking surface shall be maintained in front of the farthest gangway projection (including toe plate) at high tide, and have a minimum of four (4) feet of clear space to walk along the side of any gangway for access to berthed vessels.

**Table No. 1**  
**Minimum Finger Widths**

Finger float Width (Feet)	Length of Berth (Feet)
F = 5.0'	All ADA Accessible Finger floats
F = 3.0'	Up to 35'
F = 4.0'	36' to 59'
F = 5.0'	60' to 79'
F = 6.0' <sup>(1)</sup>	80' to 119'
F = 8.0' <sup>(1)</sup>	120' and over

<sup>(1)</sup> Widths of more than that shown in this Table may be necessary for specific site conditions and/or uses of fingers over 70 feet.

<sup>(\*)</sup> Minimum 5.0' widths are required for the entire path of travel for ADA access, including paths along main- and headwalks. See Section 5 of these Harbor Design Criteria for exceptions.

d. Single and Double-Wide Slips

- (1) Single-wide slips are those slips that have a finger on each side of the boat. Double-wide slips have only one finger adjacent to any given boat.

e. Vessel “Rafting”

- (1) Vessel “rafting” is the practice of connecting multiple vessels together, with only one of the vessels being tied/berthed to a walkway or finger. Rafting of vessels is not allowed, unless specifically approved by the City’s Harbor Department and/or the Fire Department for special facilities and/or events.

f. Long Docks

- (1) Long docks are defined as side-tie docks with more than one boat berthed. Unless specifically identified otherwise, and for the purpose of establishing the number of boats that may utilize a long dock per DBW *Layout and Design Guidelines for Marina Berthing Facilities* (2005 edition or as updated), it will be assumed that one boat is berthed alongside a long dock every 40 feet of long dock length. This would relate to a 30-ft berthed boat, with five (5) feet of clearance on either end. Distance between two adjacent boats shall be minimum 10 feet.

g. Loading Criteria

- (1) The design of the dock system shall incorporate all anticipated dead and live loads. These criteria conform to DBW *Layout and Design Guidelines for Marina Berthing Facilities* (2005 edition or as updated).
  - (a) Dead Loads: Dead loads shall include the weight of the dock system components (walers, bracing, bracket, etc.), which are permanently incorporated into the dock system, and non-dock system components (transformers, dock boxes, gangways, pumps, dinghy/kayak/SUP racks, trash containers, buildings, etc.) which are permanently affixed to the dock system.
  - (b) Live Loads: Live loads are loads produced by the use of the dock system, such as people, carts, mobile equipment, etc. The dock system shall be capable of supporting live loads and freeboards per the “Flotation and Freeboards” section in these standards. The structure shall also be capable of supporting a 400-pound moving point load anywhere on the deck surface, but no closer than 12” from any dock edge, while maintaining the level tolerances cited in this guideline.

- (c) Wildlife Loads: Refer to DBW Layout and Design Guidelines for Marina Berthing Facilities (2005 edition or as updated) for live loads imposed by wildlife on the docks. These wildlife live loads may include sea lions.
- (2) Wind loads shall be calculated both parallel to and perpendicular to the maximum length of vessels and structures in accordance to current California Building Code.
  - (a) Wind load on the lateral area of vessels or structures shall not be less than 15 pounds per square foot acting on the projected area of the docks as well as the profile area - “sail area” of the berthed vessels above water level.
  - (b) Lateral area of vessels for wind load calculations acting on the “sail area” of the vessel shall be as per **Exhibit No. 1**, or the actual sail area of the anticipated vessel, whichever is greater.
  - (c) Ten percent (10%) of the full wind load for an unshielded vessel shall be applied to each vessel in the leeward side of the unshielded vessel.
- (3) Current Loading: Floating docks in areas of the harbor may be subject to current loads. Dock shall be designed for minimum current velocity of 1 feet per second (1 feet/sec).
- (4) Impact Loading: Impact Load from design vessel (maximum boat size that may be moored on the dock) striking dock at 10 degree angle (from parallel to dock) with approach speed of minimum one feet per second (1 feet/sec).
- (5) Wave Loading: A simple wave analysis was conducted to provide general guidance of a 100-year return period wind waves and ocean swells at Newport Harbor. In general, the majority of Newport Harbor is dominated by wind waves except for the areas near the harbor entrance which are dominated by ocean swells. Contact the City of Newport Beach, Public Works Department for details of reference study.

A qualified civil engineer, licensed in the State of California, shall conduct site-specific engineering analysis to evaluate the appropriate design wave loading for the project.

- (6) Environmental Loads: Refer to DBW *Layout and Design Guidelines for Marina Berthing Facilities* (2005 edition or as

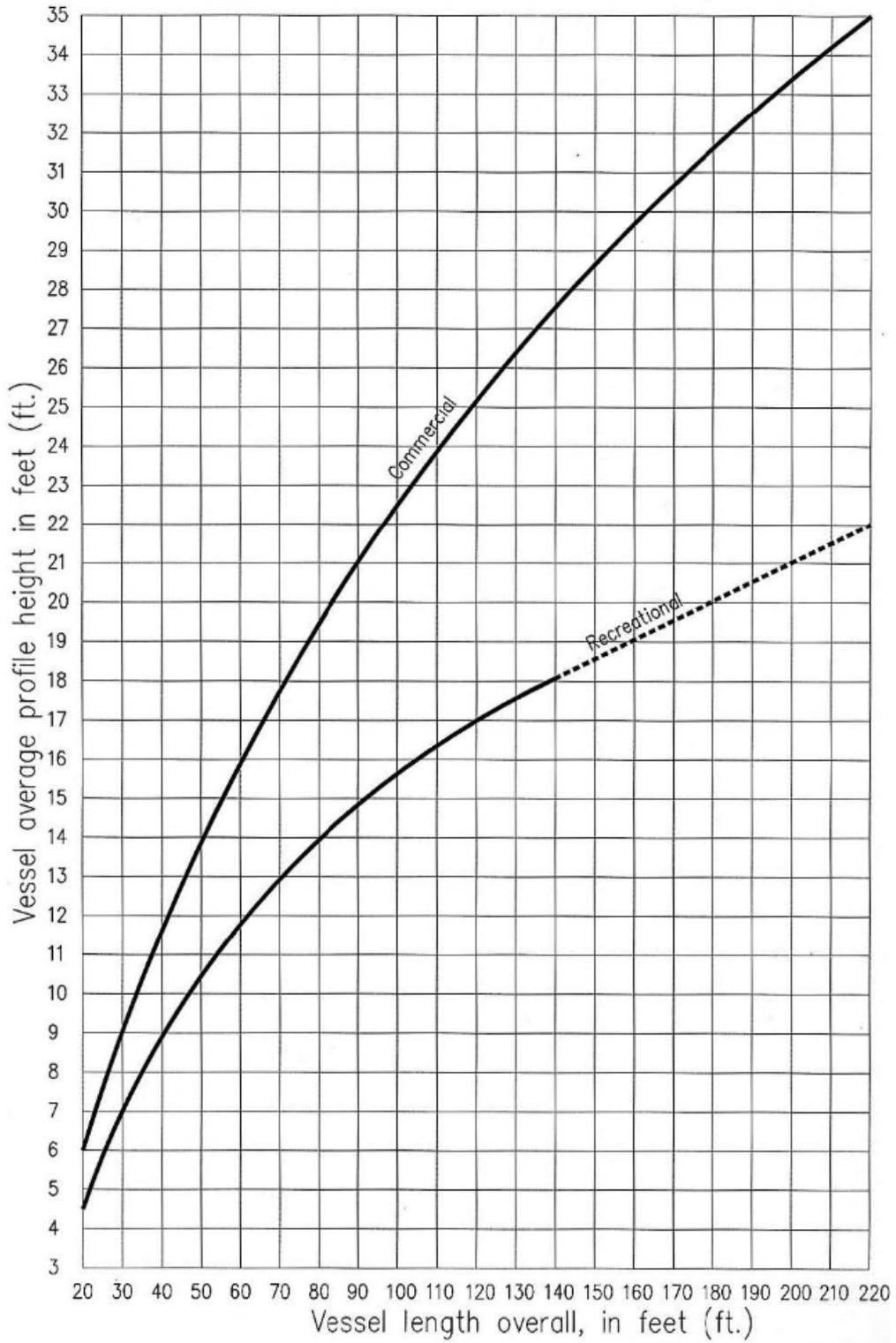
updated) for impact loads imposed by flooding, abandoned boats, broken docks, jetsam, tree limbs, or other debris. Environmental loads may occur throughout the Harbor but specifically in the Upper Bay and near the West Coast Highway bridge.

(7) Load Combinations

- (a) Combined load cases for design of docks shall include the following:
  - 1) Dead load plus uniform live load.
  - 2) Dead load plus concentrated 400-lb live load.
  - 3) Dead load plus wind load plus current & wave loads.
  - 4) Dead load plus impact load.
- (b) Fabrication, handling, and lifting loads shall also be checked in the calculation of the dock system.
- (c) For design of wood structures, the load duration factors in Table 2.3.2 of the latest edition of the American Wood Council National Design Specifications (NDS) may be applied. Allowable Stress Design and Load and Resistance Factor Design values for wood members shall be reduced by the Wet Service Factor according to Tables 4.3.1, 5.3.1 and 8.3.1 of the NDS.
- (d) Calculations shall include the transfer of forces from the dock system into the piles. All components within this transfer mechanism shall be substantiated.
- (e) Load combinations for vertical load bearing structural elements (i.e., piers, wharves, and platforms) in Section 1605 of the California Building Code (2019 or latest edition) and Section 5.3 of the Building Code Requirements for Structural Concrete (ACI 318-19 or latest edition) respectively, shall apply.

**Exhibit No. 1**

Wind Load  
Vessel profile heights for "sail area"  
(Recreational & Commercial Vessels)



h. Flotation and Freeboards

- (1) Sufficient flotation shall be provided to support dead load plus live load with freeboards as noted below. Higher live load requirements may be required by the City of Newport Beach, under special circumstances as may be deemed appropriate.

Dock freeboard shall be minimum 14 inches and maximum 24 inches, under dead load. Dock freeboard shall not be less than nine (9) inches and there shall be minimum one (1) inch of pontoon freeboard remaining, under dead plus live load. See Figure No. 13 for typical concrete dock system (where dock system itself is the pontoon) and Figure No. 14 for typical timber, aluminum, steel, and composite framing dock system (where framing is supported by pontoons).

- (a) Residential docks, including multi-family residential, shall be designed for a live load of 25 pounds per square foot.
- (b) Marinas, Public Pier (also known as Public Docks) and Commercial Docks (Type 1 docks subject to high volumes of pedestrian traffic such as docks used for ferries, charter boats, fishing boats, boat shows, shuttles, water taxis, etc.) shall be designed for a live load of 40 pounds per square foot. Type 1 commercial docks are typical in Newport Harbor.

Commercial Docks (Type 2), as previously described, which are also used for the on-dock staging (queuing) of passengers, or are subject to high volumes of cargo or other materials, shall be designed for live load of 65 pounds per square foot. Signage indicating maximum number of people (using occupant load factor 200 pounds/person) that may be staged (Dock Staging Capacity) shall be posted at a prominent location at staging area. Type 2 commercial docks are not common in Newport Harbor.

Exception 1: Docks whose functionality requires dead load freeboard less than 14 inches (docks used for kayaks, rowboat, etc.) shall be designed for 25 pounds per square foot live load. These special docks shall be exempt from the freeboard requirement on “Flotation and Freeboard” in Section h.1. Signage indicating maximum number of people (using occupant load factor = 200 pounds/person) that may use the dock (Dock Capacity) shall be posted at a prominent location.

Exception 2: Repair or modification to less than 50% of an existing dock is exempt from the freeboard requirement on “Floatation and Freeboard” in Section h.1. However, Engineer of Record shall perform freeboard calculation, to provide sufficient floatation under repaired or modified portion of dock section, to match freeboard of existing dock and support minimum live load of 25 pounds per square foot.

- (c) Weight of seawater, for the purposes of flotation calculations, shall be 64 pounds per cubic foot.
  - (2) The flotation shall use a rigid block of expanded polystyrene (EPS) cores or equivalent. The use of hollow pontoons shall not be allowed.
  - (3) Docks shall have pontoons composed of outer shells of either concrete (1” minimum thickness) or an ultra-violet stable plastic such as fiberglass or cross-linked polyethylene (1/8” minimum thickness). Other alternative materials must be submitted to the City for review and approval, per the “Request for Alternate Material or Method of Construction” appeals process. Exposed foam flotation is not allowed.
  - (4) Residential Docks: In addition to the pontoon encapsulation types noted above, residential docks may also use spray-on elastomeric encapsulation systems for pontoons. Spray-on products must demonstrate resistance to ultra-violet rays, solvents that may be present on the water surface, and environmental conditions imposed by saltwater contact. Minimum spray-on product thickness shall be 100 mils.
- i. Static Floating Tolerances
- (1) The dock surface of the in-place dock system, which includes finger floats and walkways, under various loading conditions, shall be level within the following tolerances:
    - Under Dead Load Only, & Under Dead and Live Loads:
      - 1/4” per foot, 1” maximum (transverse)
      - 1/8” per foot, 1” in 10 feet maximum (longitudinal)
    - Under Dead and Point Live Loads:
      - 1/2” per foot (4%), 2” maximum (transverse)
      - 1/4” per foot, 2” in 10 feet maximum (longitudinal)

On Accessible Routes, for ALL Loading Conditions:

- Shall not exceed 1:50 or 2% maximum (transverse)

- (2) Under Dead Load Only conditions, the free ends of finger floats shall always float level or higher than the finger float ends connected to the head or mainwalk, within the limits noted above.

j. Torsional Resistance Requirements

- (1) General: Fingers, connected walkways, and free-standing headwalks unattached to other dock elements must be designed to provide dock stability and resistance to torsional loads. Torsion bars installed in fingers, and/or dock framing construction that provides for calculated and verifiable twist resistance, is required. Free-standing headwalks need not provide independent means of torsional resistance if the width of headwalk is eight (8) feet or more.

Alternative means of providing torsional resistance to fingers and main- or headwalks may be considered by the City of Newport Beach. Methods such as twist-controlling guide roller assemblies may be considered, if acceptable twist resistance can be proved.

k. Guide Piles

- (1) Dock system pilings shall be designed by a licensed Civil or Structural Engineer, registered in the State of California, who shall have demonstrated expertise in the design of marine structures. Pile loading calculations shall be provided based on a soils investigation by a licensed Geotechnical Engineer, registered in the State of California, or based on minimum code values for soil properties.

- (a) Alternatively, a static pile load test may be conducted by a professional geotechnical or structural engineer licensed in the state of California and qualified third-party testing agency after piles have been driven, to confirm that the piles can withstand the design loads anticipated. Testing procedures shall be in general conformance with testing procedures defined in Chapter 8 of the Caltrans Foundation Manual (2015 or latest edition) and must be approved by the City prior to commencement. Static pile load tests shall be designed for the type of load to be experienced by the pile (lateral loads for guide piles and vertical/uplift loads for

platform/pier piles) and for the estimated loads based on berthed vessel sizes and dead and live loads.

- (2) Soil conditions in Newport Harbor can vary depending on the existence of rock strata near historic bluffs along the coastline. The Applicant is advised to research the soils conditions of the subject site in order to properly assess the conditions for pile stability and installation.
- (3) Loading Conditions & Criteria
  - (a) Applied lateral wind and impact loads shall be calculated for not lower than a +7.5 foot MLLW water surface, and a load height acting upon the piles at no lower than +8.5 foot MLLW.
  - (b) Loads imposed on the dock framing system, as previously noted in this loading criteria, shall be imposed in-like-kind to the piles providing the lateral load resistance for the docks.
  - (c) Pile penetration shall not be less than 15 feet.
  - (d) Pile cutoff elevation shall not be lower than +12.0 feet MLLW in protected areas of the Harbor. Applicant shall consider pile top elevation of +13.0 or higher for facilities in or near the Harbor Entrance, due to more severe environmental conditions.
  - (e) Guide pile caps shall be provided to discourage birds from perching on piles.
- (4) Special Geological Conditions
  - (a) There are locations within the Newport Harbor area that contain rock-like geological conditions, exhibiting different soil resistance characteristics than standard bay mud. The applicant is encouraged to observe the type of guide piles (e.g., driven steel piles, drilled-in concrete piles, etc.) used in the existing surrounding installations to assess the type of piles that may be required for any new project. A licensed Geotechnical Engineer could be retained to provide this information and pile design and installation recommendations, as well.

### 3. DOCK MATERIALS OF CONSTRUCTION

#### a. General

Materials used in dock systems shall have a demonstrated history of use in salt water environments of at least 10 years, or otherwise be approved by a professional civil or structural engineer that is licensed in the state of California and who practices in waterfront engineering. Materials used in dock systems are to be new and in good condition.

#### (1) Flotation

(a) Flotation systems shall be the products of manufacturers and contractors regularly engaged in the production of such items for marine construction.

(b) Flotation units shall consist of:

- 1) Concrete cast around a solid, closed cell foam core,  
or
- 2) Fiberglass, polyethylene or plastic shell with a fitting, solid, closed cell foam core.

#### (2) Plastics

All plastics used in the dock systems shall be ultra-violet light stabilized or protected. Plastics proposed for use must have a demonstrable performance history in salt water environments of at least ten years, or be the recommendation of a California-licensed Civil or Structural Engineer. Design strengths and thickness shall be appropriate for the intended purpose.

(3) Foam core for floats shall be a rigid block of closed cell expanded polystyrene with a unit weight of between 0.95 to 1.2 pounds per cubic foot. Properties of foam shall conform to ASTM C578, with maximum water absorption of 3.0 percent or less as determined by ASTM C 272, Method C. The foam core shall not have more than 10 percent reground material, and reground foam pieces shall not exceed 3/8-inch diameter.

#### b. Timber

(1) All wood-construction fingers shall have framing that includes cross-members that provide rigid connection to the full-length stringers. All connections shall be made using thru-bolts.

Commercial Dock Framing: For independent long docks that float freely and do not have docks and/or fingers attached for stability, all primary load carrying framing members shall be fabricated from glued-laminated beam construction, to prevent warpage of the major members, contributing to dock instability.

- (2) Allowable Stresses: Allowable stresses for harbor structures shall not exceed those stated in the “California Building Code.”
- (3) Timber used for walking decks shall have a minimum net thickness of 1½ inches.
- (4) Timber for walking surfaces shall be Douglas Fir, Select Structural. Sawn timber for other framing members shall be Douglas Fir, No. 1, minimum.
- (5) Glued-laminated timber shall be Douglas Fir 24F-V8, industrial grade for application in wet environments. Fabrication shall comply with Product Standard PS 56-73, “Structural Glued Laminated Timber.”
- (6) Walking surfaces shall have a non-skid finish and be maintained periodically or when worn or presenting a trip hazard. Treated timber decking requires no further non-skid finish.
- (7) Dimensional lumber is not required to be painted. However, if the applicant chooses to paint, such paint shall be maintained to good condition and appearance.
- (8) Plywood utilized within dock framing systems shall be exterior grade material. Plywood shall not be used as the walking surface for a dock system, unless the product can be demonstrated that it is provided with a factory-applied protective, non-skid walking surface that will be durable and has a proven process for patching and touch-up. Internal plywood members shall be provided in such a manner that water can be easily conveyed off the top surface of plywood and not pond or get trapped, leading to early deterioration and dry rot.
- (9) Weight of treated Douglas Fir shall be assumed to be 35 pounds per cubic foot.
- (10) All timber used for dock construction shall be marked with the appropriate grade of material and preservative treatment, or may be subject to rejection by the owner, owner’s representative, or

City Building Inspector, dependent on approved permit plan set and project permit requirements.

- (11) Wood Preservative for Timber
  - (a) All timber products shall be coated with preservative treatment to retention limits recommended by the American Wood Preservers Association Standard M4 “Standard for the Care of Preservative-Treated Wood Products” and AWWPA Standard C2 “Lumber, Timber, Bridge Ties & Mine Ties – Preservative Treatment by Pressure Processes.”
  - (b) Current State and Federal environmental requirements and guidelines for the type and application of preservative treatments will be strictly enforced.
  - (c) All lumber must bear a stamp approved by the American Lumber Standards Committee for conformance to the American Preservers Association Standards.
  - (d) Field cuts and bored holes shall receive field-applied preservative treatment in accordance with the Western Wood Preservers Institute (WWPI) Best Management Practices. Preservative treatment chemicals shall not be allowed to enter harbor waters.

c. Metal

- (1) Any steel components used in the marine environment shall be hot-dip galvanized with a minimum of three (3) mils of zinc, or epoxy coated per ASTM A 934 and manufacturers recommendations, or shall be stainless steel.
- (2) Structural steel shall conform to Standard Specifications for Structural Steel for Bridges and Buildings. Stainless Steel shall conform to 316 material specifications. Aluminum shall be marine grade.
- (3) Fabrication and erection shall comply with the latest applicable codes as noted:
  - (a) AISC, Latest Editions
  - (b) Aluminum Structural Welding Code, Latest Edition

- (c) Aluminum Design Manual, Latest Edition
  - (d) 12011 Design Manual for Structural Stainless Steel, Latest Edition
- (4) All bolts securing primary structural members shall be a minimum of ½-inch diameter thru bolts. Bolts shall be minimum A307 and include washers where direct contact with timber members occurs. Carriage bolts are also allowed.
  - (5) No connecting device shall protrude beyond the fascia or waler into the berthed area, which may contact any part of the berthed vessel, or extend up into any walking surface creating a tripping hazard.
- d. Concrete and Reinforcing  
(for concrete docks, platforms, and piers)
- (1) Concrete shall be designed for permeability, strength, chemical stability and abrasion resistance, appropriate for its application.
  - (2) In absence of geotechnical report recommendations based on soil testing, portland cement shall conform to ASTM C150 Type II/V modified, and low alkali. Chemical admixtures shall conform to ASTM C494. Chemicals designed to limit corrosion of internal reinforcing may be used. Air entrainment admixtures shall conform to ASTM C260. Coarse and fine aggregate shall conform to ASTM C33, and ASTM C330 where lightweight aggregates are used. Lightweight aggregate, if used, shall consist of expanded and coated shale or equivalent material of sufficient strength and durability to provide concrete of the required strength.
  - (3) For concrete that is not subject to saltwater splash or immersion, the minimum 28-day compressive strength shall be  $f'c=4,500$  psi and the water-to-cement ratio shall be 0.45 conforming to the requirements for concrete exposure class S2 in Table 19.3.2.1 of ACI 318-19 (or latest edition).
  - (4) For concrete that is subject to saltwater splash, saltwater immersion, and/or brackish water, the minimum 28-day compressive strength shall be  $f'c=5,000$  psi and the water-to-cement ratio shall be 0.40 conforming to the requirements for concrete exposure class C2 in Table 19.3.2.1 of ACI 318-19 (or latest edition).

- (5) Concrete structures shall be designed to provide sufficient coverage of reinforcing steel, so as to prevent corrosion, per code requirements. For structures exposed to saltwater splash or immersion, bar reinforcement shall conform to ASTM A706, and shall be epoxy coated per ASTM A775 or ASTM A934. Welded wire mesh shall conform to ASTM A185 and shall be galvanized or epoxy coated conforming to ASTM A884, with all visible defects and cut ends repair coated. Wires used to tie reinforcing steel shall be either epoxy-coated steel or 316 stainless steel.

e. Pilings and Anchorage

- (1) Piles shall be the products of manufacturers and contractors regularly engaged in the production of such items for marine construction. Typical materials approved for pile materials include:
  - (a) pre-stressed concrete
  - (b) steel
  - (c) high-strength composite materials

Timber piles are not allowed.

- (2) Unless subsurface soil materials prevent their use, pilings shall be pre-stressed concrete. In absence of soil report recommendations based on soil testing, portland cement shall be ASTM C150 Type II concrete meeting exposure class C2 and having minimum 28-day compressive strength  $f'_c=6,000$  psi and a water cement ratio of 0.4 shall be used in compliance with ACI 318-19 Table 19.3.2.1, modified, low alkali. Water for mixing and curing shall be fresh, clean and potable. Aggregates shall conform to ASTM C33, Size Number 67, and be free from any substance that is deleteriously reactive with the alkalis in the cement. Admixtures, if used, shall conform to the requirements of ASTM C494 and not contain chlorides. Corrosion inhibiting concrete admixtures are encouraged. Pre-stressing steel shall be uncoated, seven-wire stress relieved strand with a minimum ultimate stress of 270 ksi conforming to ASTM A416, Grade 270. Spirals shall conform to ASTM A1064, and ties and other reinforcing steel shall conform to ASTM A615, Grade 60, or ASTM A706, Grade 60, plain or deformed. Piles shall cure and reach a strength of not less than  $f'_c=4,000$  psi before de-tensioning, cutoff of the strands, and transfer from forms. Piles shall have a minimum strength  $f'_c=6,000$  psi at time of driving.

- (3) Guide rollers shall be fabricated from polyethylene, UHMW, polyolefin or polyurethane roller or plate material. As an option to the use of rollers, UHMW rub blocks or sheets may be used. Minimum thickness of a rub block or sheet shall be 2 inches, with attachment bolts countersunk into the UHMW material.
- (4) Any structural steel components used in the marine environment shall be hot-dip galvanized or epoxy coated per manufacturers recommendations, or AISI Type 316 stainless steel.
- (5) Steel piles must be coated with a non-toxic coating that prevents or inhibits the corrosion of the pile base material. Design of steel piles shall include a 1/8-inch additional corrosion allowance. Coatings must be maintained to prevent growth and wear from the guide roller assemblies. Rollers should be cleaned periodically to prevent shell fragment build-up from further deteriorating the coatings protecting the steel piles. For added steel pile protection, sacrificial anodes may also be designed and installed to limit corrosion, and UHMW plastic pile wraps can be installed to limit wear of the steel surface from guide roller friction.
- (6) Installation Criteria
  - (a) Piling shall be installed by a California-licensed contractor regularly engaged in the business of pile driving. Care shall be taken in the handling and driving of piling, to prevent spalling, cracking or other damage. Contractor shall install piles per approved local, state and federal requirements. Piles may be jetted as permitted by the Local Coastal Permit, USACE permit, RWQCB Water Quality Certificate, and local CEQA mitigation measures, as applicable. If jetting is permitted, depth of jetting shall be determined by a California-licensed Geotechnical Engineer and a California-licensed Civil or Structural Engineer.
  - (b) Tolerances
    - 1) The installation elevation of the top of piles shall be within one inch of designer top of pile elevation. Minimum pile top elevation for dock systems shall be +12.0 MLLW, unless noted otherwise in these Harbor Design Criteria.

- 2) Piling shall be installed vertically plumb within tolerances defined in the construction documents, but in no cases more than 1.5% out of vertical plumb, and 2 inches out of horizontal location.

(c) Records, Certifications, and Inspection

- 1) Records of pile driving operations shall be maintained by the Engineer of Record (EOR) or qualified third-party testing agency under the supervision of the Engineer of Record (EOR), and made available to the City upon request. This work shall be performed in accordance with the requirements of CBC Sections 1704 and 1705.
- 2) Contractor shall make the pilings available for City inspection prior to installation.
- 3) Upon completion of the pile driving operation, subject to the requirements of the permit, the Owner's design EOR or qualified third-party testing agency shall certify that the pilings were installed in accordance with the design and these guidelines. Such certification shall be on the EOR's or qualified third-party testing agency's letterhead and bear the EOR's stamp and signature or the deputy inspection authorization of a qualified third-party testing agency, and shall be submitted to the City. This certification is required to final the permit and prior to issuance of the certificate of occupancy upon successful completion of all other permitted work.

f. Alternative and/or Hybrid Materials

Alternative materials such as recycled plastic, PVC, composite and others, which can show a demonstrated experience and useful lifespan in the marine environment and usage, can be proposed to the City of Newport Beach Chief Building Official for consideration. The decision of the City of Newport Beach Chief Building Official regarding the use of alternative or hybrid materials will be final.

#### 4. APPURTENANCES

##### a. Locker Boxes

- (1) Individual locker “dock” boxes may be provided for slips, and may provide housing for electrical and mechanical services. Locker boxes shall be securely attached to the dock surface. All dock boxes should be located on finger fillets; i.e., the intersection of the finger and the main or headwalk, on the triangular dock surface. Locations other than on a finger fillet require the approval of the City. Locker boxes installed in the path of travel that limits pedestrian access will not be allowed. Minimum clearances for pathways are as follows: two (2) feet clear on fingers, three (3) feet clear path on main and headwalks. See Section 5 of these Harbor Design Criteria for minimum clearances around protrusions along accessible paths of travel.
- (2) Lockers boxes shall be made of 1/8 inch minimum thick fiberglass or cross-linked polyethylene. Flammable materials shall not be kept in locker boxes.

##### b. Cleats

- (1) Cleats shall be designed to accommodate boats and loads appropriate for their location. A minimum of two cleats on each side of a finger is required. Cleats shall be attached to the dock system by means of through-bolts of adequate size to transmit loads between boats and the dock system.

##### c. Fendering

- (1) Fendering, such as rub rails and corner bumpers, shall be installed on dock surfaces that will come into contact with boats. Outer corners of fingers should be protected with corner bumpers or dock wheels. Bumper material shall be vinyl, PVC, polyester fabric foam-filled tubes, synthetic rubber, or stabilized rubber marine products. Water retentive material such as rugs, or salvage materials such as tires, shall not be used. Install bumpers with aluminum or stainless steel nails or screws.

##### d. Boarding Steps

- (1) Boarding steps shall not be kept on main walks. Boarding steps may be kept on, or attached to, finger floats, but in no case shall boarding steps on finger floats occupy more than one-half of the width of the finger float. Boarding steps shall be light-weight and

not used for storage, unless the supporting dock section has been specifically designed for the additional dead and live load. Boarding steps shall not be permanently attached to the outermost five (5) feet of any finger float.

e. Life Rings

- (1) Life rings shall be installed in strategic locations on commercial docks. Life rings for residential docks are encouraged, but not required.

f. Dock Ladders

- (1) Dock ladders shall be installed in strategic locations on commercial docks for safety purposes. Ladders shall extend into the water by at least three (3) feet, and be constructed of materials that resist corrosion and prolong ladder life. Ladders may be provided with the ability to swing out of the water in order to allow for special recreational uses of the docks. Ladders for residential docks are encouraged, but not required.

**5. ACCESS/GANGWAYS/AMERICANS WITH DISABILITIES (ADA) COMPLIANCE**

a. General

- (1) Landside facilities of commercial docks and of docks serving new multi-family developments shall meet all ADA requirements for the path of travel from the street and parking lot, to the gangway and down to the docks. These ADA requirements are not applicable to single family or joint residential docks.
- (2) Walking surfaces of gangways shall have a non-skid finish, such as punched metal, unpainted timber, or grit impregnated metal, painted non-skid coatings, etc.
- (3) Along accessible paths of travel, minimum clear width shall be five (5) feet. This width can be reduced to a minimum of three (3) feet for a maximum distance of two (2) feet provided these protrusions are separated by 5-foot-wide segments that are a minimum of 4 feet in length. At vessel access points, a clear width of 5 feet shall be provided along the dock edge (e.g., between cleats). See CBC Section 11B and ADAAG for additional requirements.

- (4) Gangway Support: Connections between gangways and the adjacent bulkheads or platforms shall be designed by a licensed engineer, and comply with the following minimum requirements:
  - (a) Gangways shall be supported by the bulkhead or platform through a mechanical connection system, such as face-mounted plates or clip angle hangers with saddles, shackles or pins, attached to the bulkhead or platform with poured-in-place anchor bolts or epoxy-anchored threaded studs. Minimum diameter of bolts shall be 5/8 inch, and material for bolts in contact with concrete or treated lumber shall be AISI Type 316 stainless steel.
  - (b) The hinge and supports shall be capable of transferring full dead and live loads generated by the gangway to the mechanical connection system.
  - (c) Steel angles, plates and other sections utilized in these connections shall be minimum ASTM A36 grade and have a minimum thickness of 3/8 inches. Any exposed edges of plates that may potentially be in the path of travel or in contact with foot traffic shall have beveled or rounded smooth edges.
  - (d) Dissimilar material shall not be in direct contact to prevent galvanic corrosion.
  - (e) All steel members and hardware shall be galvanized, or coated with a formulated non-toxic coating system designed specifically for the marine environment.
  - (f) The gangway shall be restrained from lifting out of the support saddle during extreme high tide elevations, without interfering with rotation at the gangway hinge.
- (5) Gangways shall be braced in the horizontal plane to prevent lateral deformation. The bracing system can consist of diagonal supports within or under the gangway framing system, plywood sheathing, or by decking designed to act as a shear transfer membrane.

b. Commercial Docks (Types 1 and 2)

Commercial docks servicing the public will be required to meet all applicable requirements relating to Federal ADA Compliance requirements. These requirements apply to all commercial docks listed in

Section 1 of these Harbor Design Criteria, including, but not limited to, yacht clubs, public piers, and recreation boat marinas.

- (1) Uniform live loads for the structural design of the gangway shall be 100 pounds per square foot (psf) over the entire walking surface. Dead and live loads of utilities (use 15 pounds per lineal foot, if applicable) and a 15 psf wind load, depending on the gangway geometry, shall also be considered in the structural design.
- (2) Uniform live loads for gangway operations shall be a minimum of 50 psf for gangways functioning strictly for access to the dock system, and a minimum of 100 psf for gangways that can be used as a staging area for passengers boarding vessels. The maximum allowable deflection of a gangway or bridge at mid span is  $L/240$ , with  $L/360$  suggested for walking comfort. Half the total dead and live loads of the gangway shall be applied to the floating dock and half shall be applied to the gangway landside support.
- (3) Gangway slopes shall meet current State and Federal requirements for safety and ADA compliance, where applicable. The California Building Code (2019 or latest edition) and ADAAG allow a gangway that is a minimum 80 feet in length to be compliant with ADA requirements.
- (4) All gangways serving passenger loading facilities shall be ADA compliant. At least one ADA-compliant gangway serving all approved ADA-accessible slips shall be provided at recreational boating marinas and multi-residential facilities.
- (5) All walking surfaces shall be provided with a commercial grade non-skid surface. Worn or slick non-skid surfaces shall be repaired immediately upon notice. Non-skid walking surfaces shall be maintained and/or re-applied at a minimum of every six (6) months. The maximum allowable gap in adjacent walking planks or surfaces shall be  $\frac{1}{2}$  inch, and the maximum vertical height differential between adjacent planks or surfaces shall be  $\frac{1}{4}$  inch.
- (6) All gangways shall be equipped with transition plates at the bottom of the gangway, and if fabrication details include gaps in the hinge transition of more than  $\frac{1}{2}$  inch, at the top of gangway as well. These transition plates shall be of non-skid surface material and provide the transition from the gangway platform and/or dock, onto the gangways. All transition plates shall have a slope no steeper than 1:8 for non-ADA-compliant gangways, and 1:12 for ADA-compliant gangways. Transition plates shall have rounded

edges along the path of travel and a height or thickness at the end of the plate of no greater than 3/8 inch.

- (7) Minimum clearance on the dock system around a gangway landing shall be 6 feet long by 5 feet wide.
- (8) For additional discretionary gangways, other than the required ADA-compliant gangway serving ADA-accessible slips, gangway slopes for commercial docks shall not exceed 1 foot vertically for each 3.0 feet of length, when the tide is at -1.0 feet MLLW. The minimum length of commercial gangway shall be 30 feet.
- (9) Guard, mid and hand railing heights, sizes, and geometries shall meet the requirements of the latest State of California Title 24 requirements.
- (10) Railings shall be designed to resist a uniform live load of 50 pounds per foot applied horizontally to the rail or a 200-pound point load applied vertically at any point along the length of all horizontal rails.

c. Residential Docks (Single-Family, Joint, and Multi-Family)

- (1) Uniform live loads for the structural design of all residential gangways shall be 50 pounds per square foot (psf) over the entire walking surface. Dead and live loads of utilities (use 15 pounds per lineal foot, if applicable) and a 15 psf wind load, depending on the gangway geometry, shall also be considered in the structural design.
- (2) Uniform live loads for all residential gangway operations shall be a minimum of 25 psf for gangways functioning strictly for access to the dock system. The maximum allowable deflection of a gangway or bridge at mid span is  $L/240$ , with  $L/360$  suggested for walking comfort. Half the total dead and live loads of the gangway shall be applied to the floating dock and half shall be applied to the gangway landside support.
- (3) Gangway slopes for all residential docks shall not exceed 1 foot vertically for each 2.5 feet of length, during the full design tidal range in Newport Harbor (approximately 10 feet). The minimum length of residential gangway shall be 24 feet.
- (4) Minimum gangway clearance (within handrails) shall be 30 inches wide.

- (5) A 3-foot long toe plate, at the base of a gangway, is encouraged for ease of use and safety and to provide a continuous sloping path of travel, from the surface of the gangway to the surface of the dock. A gangway bottom “step-off,” if the toe plate is not utilized, shall not exceed 7 inches in vertical height.
- (6) Worn or slick non-skid surfaces shall be repaired immediately upon notice. Non-skid walking surfaces shall be inspected and maintained annually by the owner or by a California-licensed Civil or Structural Engineer for a facility operated by a homeowners association.
- (7) Gangway handrail heights shall be 34 to 38 inches above the gangway walking surface. Openings in rails of residential gangways shall not permit a sphere 12 inches in diameter to pass through.
- (8) The gangway rail shall be designed to resist a uniform live load of 20 pounds per foot of horizontal force applied to the top of the rail.
- (9) If a residential dock system has 25 or more slips, an ADA-compliant gangway system shall be designed to the same requirements for Commercial Docks (Types 1 and 2) in Section 5.b in these Harbor Design Criteria. See Federal ADA Accessibility Guidelines.

## **6. SPECIAL HARBOR FACILITIES**

### **a. Fuel Floats**

- (1) Locate boat-fueling docks near the entrance of the harbor, in an area that is protected from waves and rough water environmental conditions.
- (2) Fuel floats used for dispensing petroleum products shall be adequately designed and placed to provide maximum service to the boater. Adequate guide piles or dolphins shall be required to provide permanence, safety, and stability to the floating docks, and shall be designed by a California-licensed Civil or Structural Engineer with waterfront experience. Fuel floats must be designed to support the dead loads imposed by the dispensers, hose reels, storage, pipe chase ways, etc.
- (3) Fuel facilities shall conform with County, State and Federal codes, ordinances, and law and shall be designed by a California-licensed

Mechanical Engineer. Equipment, such as containment booms and absorbent pads, shall be kept on the fuel dock to contain spills.

- (4) Fuel Floats shall contain all necessary firefighting equipment and systems, as deemed appropriate by the City of Newport Beach Fire Department.

b. Sewage Pump Out Facilities

- (1) Marinas with more than 50 boats are required to have at least one (1) sewage pump out facility. Sewage pump out facilities shall connect to the nearest City of Newport Beach sewage line system. Refer to *City of Newport Beach Standard Drawings for Public Works Construction* for details of these connections.
- (2) Sewage pump out equipment shall be products that have been designed, tested and installed for the specific purpose of vessel sewage pump out. All sewage pump-out facilities shall be inspected on a minimum monthly basis and maintained in operable condition. System inspection shall include checks for leaks and should consist of emptying one 5-gallon buckets of clean water dyed with a red food grade dye. One maintenance personnel team member should walk the suction pipe alignment to check for red dye in the Harbor water. The pump operation and the discharge pipe shall be inspected for leaks as well.

c. Floating Buildings

- (1) To obtain approval from the City of Newport Beach Harbor Department, Public Works Department, Development Services Department, and Planning Department for the installation of a floating building, the applicant must provide compelling reasons that such a facility is necessary and is precluded from location on land. Appropriate regulatory approvals are also required.
- (2) Only commercial facilities are allowed to consider floating buildings. Residential facilities are not allowed to have floating buildings. Potential floating building uses include restrooms, the dock master's office, enclosures on a floating fuel dock, and boat rental office. Other uses may be considered, at the discretion of the City of Newport Beach.
- (3) Floating buildings are subject to the latest edition of all local, State and Federal building codes.

d. Vessel Launching Facilities

- (1) Vessel launching facilities may include vehicle launch ramps for trailered boats, concrete launch ramps with rails and/or tracks for special vessel carriers, elevated travel lift launches, swing hoists on davits, and forklift launching.
- (2) All launch facilities shall be designed considering the launching and vehicle loads imposed on existing and/or planned structures.
- (3) Vessel launching facilities shall be designed in accordance with *Layout, Design, and Construction Handbook for Small Craft Boat Launching Facilities* (1991 edition or as updated) published by the California State Parks Division of Boating and Waterways.

e. Special Mooring Devices

- (1) Special vessel mooring devices may be required or desired for specific berthing conditions. Large vessels may require mooring and/or breasting dolphins (pile groupings designed to resist large impact and berthing loads), berthing walls, or other devices that facilitate vessel docking.
- (2) Special mooring devices shall be designed by a California-licensed Civil or Structural Engineer with input provided by California-licensed Geotechnical Engineer, all with experience in waterfront engineering. Special mooring devices shall be designed to resist berthing loads, wind, wave, and current loading for the localized area.

f. Piers, Platforms, and Wharves

- (1) Piers, platforms, and wharves shall be designed by a California-licensed Civil or Structural Engineer experienced in waterfront structures. A geotechnical report, for pile design and installation, shall be provided that addresses special issues such as liquefaction potential, and the vertical (gravity) and seismic support of the waterfront structure. The geotechnical report shall be prepared by a California-licensed Geotechnical Engineer.
- (2) Refer to the Harbor Standard Drawings for the various geometries allowed for piers and platforms that serve and provide access to residential floating docks.
- (3) Commercial: Structures shall be designed for an assembly area live load of 100 pounds per square foot (psf). If vehicles shall be used

on the structure for maintenance purposes, then vehicle loads shall be used for the design of the structure. If vehicle loads exceed 100 psf, then vehicle loads shall govern.

- (4) Residential: Structures shall be designed for a minimum live load of 50 psf.

g. Seawalls (Bulkheads)

- (1) General: Several types of seawalls are common to support soils and construction on the landside of the wall. Seawall material can be composed of various types of materials, including concrete, steel, and other manufactured materials. Typical wall types include freestanding or “cantilevered” seawalls and “tied-back” seawalls. Cantilevered seawalls are limited by the height of the wall above the waterside mudline and are generally effective for exposed heights of not more than 8 feet. For structural steel type seawalls, higher exposed heights are possible. Tied-back seawalls can be effective for exposed heights over 8 feet and may require continuous caps, walers (beams), steel tie rods and a foundation anchors (deadman), or earth anchors. Tie-back anchor systems shall require protection against corrosion. Galvanic anode cathodic protection system is recommended. Tie-back anchor system shall be designed to last the life of seawall.
- (2) Generally, seawall sheets constructed of reinforced, prestressed concrete are desirable, although for special conditions, structural steel interlocking sheets may be necessary. Steel products in the marine environment require special non-toxic coating protection and cathodic protection, in order to provide extended life spans.
- (3) The City understands there is a threat of flooding and inundation in and around Newport Harbor due to sea level rise. Newport Harbor and adjacent low-lying areas rely on a system of harbor bulkheads, seawalls, revetments, or other improvements to function. Additionally, the system of shoreline defenses protects existing development, public access, public views, and scenic qualities of the coastal zone. The City is committed to using the best available science to determine a range of sea level rise projections for use in developing harbor development standards and in reviewing Coastal Development Permit applications. Currently the best available science is the State of California *Sea Level Rise Guidance*, 2018 Update. Experts acknowledge that there is considerable uncertainty in the magnitude and rate of the rise in sea level and as a result, the City recognizes the need to set standards over time that provide protection from future sea level

rise given the inherent uncertainty of the rate and magnitude of the rise.

Bulkheads, seawalls or other protective improvements shall be constructed and maintained as shown in Table No. 2. The structure shall also be initially designed and constructed to accommodate and receive future increases in height when directed by the City to protect adjacent low-lying areas from future flooding without the need to replace or substantially alter the structure.

**Table No. 2**

Year Structure Permitted	Adopted NB Standard Elevation (feet) <sup>1</sup>		Design for Adaptability Elevation (feet) <sup>2</sup>	
	NAVD88	MLLW	NAVD88	MLLW
2020	10.7	10.9	13.7	13.9
2021-2025	10.9	11.1	14.4	14.6
2026-2030	11.0	11.1	14.6	14.8
2031-2035	11.0	11.2	14.8	15.0

*1. Derived using the Upper Limit of the Low Risk Aversion probabilistic sea level rise protection scenario for the Los Angeles tidal gauge, estimated 75 years into the future based on the State of California Sea Level Rise Guidance, 2018 Update. This scenario accounts for the upper range of what is “likely to occur” with approximately an 83 percent probability that sea level rise falls below the elevations shown.*

*2. Derived using the Medium-High Risk Aversion probabilistic sea level rise protection scenario for the Los Angeles tidal gauge, estimated 75 years into the future based on the State of California Sea Level Rise Guidance, 2018 Update. This scenario accounts for increased sea level with approximately a 1-in-200 or 0.5 percent probability that sea level rise exceeds the elevations shown.*

- (4) The distance between seawalls and all floating dock components shall be a minimum of one foot horizontal distance.
- (5) Seawalls shall be designed to resist all applicable vertical and horizontal loads.
- (6) A minimum safety factor of 1.5 shall apply to gravity loads, and a minimum safety factor of 1.1 shall apply to seismic loading cases for the stability of seawalls.
- (7) Decking may butt to the seawall cap, or cantilever over the top of the seawall, if approved.

- (8) Wing Walls: Wing walls are retaining walls that project landward and are perpendicular to the seawall. Wing walls may be necessary to isolate the seawall protection system of one property to the adjacent property. Special care must be taken to assure that the construction of a seawall for the subject property does not adversely impact the seawalls of the adjoining properties, either during construction or over the life of the structures.
- (9) Seawall design requires a soils report from a California-licensed Geotechnical Engineer experienced with the design of waterfront structures. Any sloping surface on the water or landside of the seawall must be accounted for in the calculations for the seawall.
- (10) All concrete sheets used for seawall construction shall be designed as pre-cast, pre-stressed concrete elements. Sheet design shall provide for symmetrical distribution and sizing of strands, to prevent curvature of the wall. See Section 3.e “Pilings & Anchorage” for concrete and reinforcing requirements.
- (11) All seawalls or seawall alterations shall be designed by a California-licensed Civil or Structural Engineer.

**7. DREDGING**

a. General

All projects that require dredging must follow current local, State and Federal permitting requirements.

b. Maintenance Dredging

For maintenance dredging projects involving small quantities, the City of Newport Beach, in conjunction with the U.S. Army Corps of Engineers, the California Coastal Commission and the Regional Water Quality Control Board, has a program allowing for a simplified permitting process, as long as the amount of dredging and disposal quantities are small and meet material quality requirements for local beach nourishment or disposal at the LA-3 Ocean Dredged Material Disposal Site. The applicant is encouraged to inquire about this simplified process with the City of Newport Beach Public Works Department, to verify qualifications under the Regional General Permit (RGP) 54.

## 8. UTILITIES

### a. General

All utility lines in a floating dock system may maintain clearances as outlined in the DBW *Layout & Design Guidelines for Marina Berthing Facilities*.

### b. Electrical Power and Lighting

(1) All electrical design shall be in accordance with the latest edition of the following codes and standards:

- (a) California Electrical Code (CEC), 2019 or latest edition
- (b) National Fire Protection Association (NFPA) 70 National Electric Code (NEC), 2017 or latest edition on which the current edition of the CEC is based
- (c) NFPA 303, Fire Protection Standard for Marinas and Boatyards

(2) Electrical systems shall be designed by a California-licensed Electrical Engineer and shall be in accordance with the latest requirements of the City of Newport Beach.

(3) An electric service connection shall be located at a minimum of every other slip. Electrical receptacles shall be waterproof and approved for marine waterfront exposure. The following are suggested minimum receptacle requirements based on boat size:

- (a) One (1) 120v, 30 amp outlet at each boat slip under 35ft
- (b) Two (2) 120v, 30 amp outlets at each boat slip between the sizes of 36 to 45ft
- (c) One (1) 120v, 30 amp and one (1) 120v, 50 amp receptacle at each boat slip between 46 to 55ft
- (d) Two (2) 120v, 50 amp receptacles for boats between 56 to 65ft

For vessels larger than 65ft, special power requirements may be required and the applicant should consult the vessel manufacturer. Some large vessels may require 220v or 480v, 100 amp services. Sub metering of each boat slip is recommended and has proven to reduce power usage in marinas where meters have been installed.

(4) Lighting shall be provided on all floating structures to illuminate paths of travel a minimum of one foot-candle at 15 feet from the

light source with light sources not greater than 30 feet on-center. Lighting levels shall be sufficient to illuminate dock edges and obstructions without interfering with boater navigation or projecting onto neighboring properties. All lighting on landside and waterside structures and buildings shall be designed to minimize reflection/glare on the adjacent water areas with consideration for lighting reductions in evening hours.

- (5) Electrical cables and conduits shall be fastened securely to the dock system and gangways such that the system is protected from damage by boats. All electrical equipment shall be located above the harbor water level per latest NEC requirements at all times. If distribution cabling will be subject to water contact, cabling shall be rated for submersible use. All strapping supports for conduit shall be stainless steel. All electrical conduit and cables must be concealed within the dock system.
- (6) Transformers and panels located on the docks shall meet all requirements of the NEC. Several maintenance receptacles should be placed throughout the marina system to allow dock maintenance crews to use small electric tools without using metered power dedicated to slip renters.
- (7) Commercial Facilities
  - (a) Commercial facilities shall provide minimum lighting levels for public safety along the path of travel from land to the berthed vessel. Lighting levels shall be sufficient to illuminate dock edges and obstructions without interfering with boater navigation. This is considered to be a minimum one foot-candle at 15 feet with light sources not greater than 30 feet on-center.
  - (b) Lighting fixtures with a capacity of 9 watts for compact fluorescent lights or 4 watts for LEDs mounted at heights between 1.5 to 3 feet above the floating deck surface in dock boxes or on individual pedestals along the path of travel will generally meet this requirement. Fixtures should be located such that lighting levels on the walking surface are as uniform as possible.
  - (c) In addition, pole-mounted lighting shall be provided to illuminate vertical access systems such a gangways, steps, and lifts, providing a higher level of illumination at vertical transitions in the path of travel.

- (d) Lighting systems shall be designed to provide light for the floating walking and access surfaces and not project light into neighboring properties, skyward and/or water space. Special lens and/or shields may be required to ensure that stray light is blocked and/or managed.
- (e) All lighting shall be controlled by photo cells and/or timers, to assure that their operation is automatic and energy conserving. Lighting systems and controls shall be tested annually for functionality. Light bulbs and photocells shall be replaced as required.

c. Plumbing

- (1) Plumbing systems shall be designed by a licensed Civil or Mechanical Engineer, registered in the State of California, and shall conform to the latest California Plumbing Code requirements. Water mains supplying water to domestic and fire water systems shall conform to the latest editions of the California Fire Code and applicable NFPA standards.
- (2) One hose bib shall be provided for every two (2) boats, as a minimum. Hose bibs for every boat slip are recommended for boater convenience and the reduction of clutter on the docks.
- (3) Backflow preventers shall be provided for all water supply systems into the site. Pressure reducers or booster pumps may be required to meet pressure and flow requirements.
- (4) Refer to Section 6.b “Sewage Pump Out Facilities” for criteria for sewage system installations.
- (5) Supply water and sewage piping shall accommodate the full range of tidal movement, via the installation of flexible hoses and/or mechanical swivel pipe fittings. All materials shall be suited for the salt-water marine environment and be rated as “Food Grade” materials.

d. Fire Protection

(1) General

- (a) All fire protection systems for marinas, wharves and piers shall be in accordance with NFPA Standards 14 and 303, latest edition, and the California Fire Code Appendix II-C, latest edition. See the attached Newport Beach Fire

Department Life Safety Services Guideline F.01 - Fire Protection for Marinas, Wharves, and Piers for system requirements.

- (2) Code Requirements
  - (a) Retroactivity of code provisions: At the option of the Newport Beach Fire Department, the authority can make the conditions and provisions of applicable current codes retroactive, if deemed necessary for public safety. Otherwise, the provisions of applicable codes that existed or were approved for construction or installation prior to the effective date of the standard shall apply.
- (3) Fire Department connections (FDCs), backflow preventers and pressure reducing assemblies, firehose cabinets (FHCs), fire standpipes and portable fire extinguishers shall be provided on the docks, as required by Code. Owner shall perform periodic testing and replacement of fire hoses in conformance with the City of Newport Beach Fire Department requirements.
- (4) Commercial Facilities
  - (a) All commercial dock installations shall be provided with a fire fighting system, approved by the City of Newport Beach Fire Department. If the City water pressure is not adequate to produce pressures necessary to meet City and Code requirements, an auxiliary booster pump system may be required. In accordance with CBC Sections 104.10 and 104.11, the owner may also submit a request for modification from City and Code requirements with approval by the Fire Marshal and Chief Building Official. The residual water pressure for unassisted firefighting using the on-dock fire hose cabinets and the required boosted water pressure for Fire Department use shall be noted at the FDCs serving the dock system.
  - (b) All new and existing marinas and boating facilities shall meet the requirements described in Newport Beach Fire Department Life Safety Services Guideline F.01 - "Fire Protection for Marinas, Wharves, and Piers" and the Figures as made part of these Harbor Design Criteria. The purpose of these requirements is to facilitate safe boating navigation, as well as provide fire-fighting capability.

- (5) Residential Facilities
  - (a) Fire protection systems for single-family residential docks are optional, although highly recommended. The residential owner should contact their insurance carrier for any policy requirements associated with providing a fire protection system.
  - (b) Fire protection for multi-family or condominium residential docks, piers and floats are required to have a fire protection system meeting City and Code requirements.

**9. ENVIRONMENTAL**

a. Commercial Facilities

- (1) All commercial facilities shall prepare a Best Management Practices (BMP) plan to document environmental practices to be applied to daily operations. BMP plans shall address in-water maintenance limitations, storage and handling of hazardous and/or waste products common to the boating community, and emergency response to chemical spills.
- (2) BMP plans for landside facilities such as parking lots shall meet City and County of Orange water quality management plan (WQMP) and/or low impact development (LID) requirements. Preparation of a WQMP or LID by a California-licensed Civil Engineer may be required for these developments. The RWQCB may require additional compliance with National Pollutant Discharge Elimination System (NPDES) permit requirements based on project-specific construction and post-construction impacts.
- (3) BMP plans for waterside facilities shall comply with local CEQA mitigation measures and the requirements of the Coastal Development Permit, RWQCB Water Quality Certificate, and USACE permit. The Clean Marine Program provides BMP guidance to assist marina, boatyards, and other commercial dock facility owners in the preparation of BMP implementation and operation plans.
- (4) Commercial facilities shall provide a means for vessels to pump out their bilge tanks. The wastewater byproducts shall be conveyed to an approved treatment and disposal facility.

b. Residential Facilities

Not applicable

**10. PERMITTING**

Project Types and City Classifications: The purpose of project types and City classifications noted below is to establish the permit fee structure and process for submitted projects. Percentage replacement is based on the valuation of total dock system. Values of various types of construction are based on City records for average construction, and are not necessarily based on the construction cost estimates provided to the City by the Applicant.

a. Maintenance Projects

(Does not require State and Federal permit processing)

- (1) Re-decking an existing float, gangway, or pier, like for like (not more than 20% of total replacement cost).
- (2) Fixing dry rot or damage (not more than 20% of total replacement cost).
- (3) Replacing piles, like for like, in the same hole (maximum 7 piles).
- (4) Replacing a gangway to City standards.
- (5) Raising a bulkhead to City standards.
- (6) Replacing deteriorated tie rods with earth anchors.
- (7) Repairing seawall cap beams and deadman.
- (8) Emergency repair of structures deemed by the City to jeopardize public safety. (Follow-up permitting may be required with the Coastal Commission.)
- (9) Partial demolition of structures; i.e., elimination of half of a “U” shaped dock and/or respective piles.
- (10) New waler at sea side of an existing bulkhead, minimum of 2 feet above mudline (without encroaching property line).

b. Alteration and New Construction Projects

(Requires State and Federal permit processing)

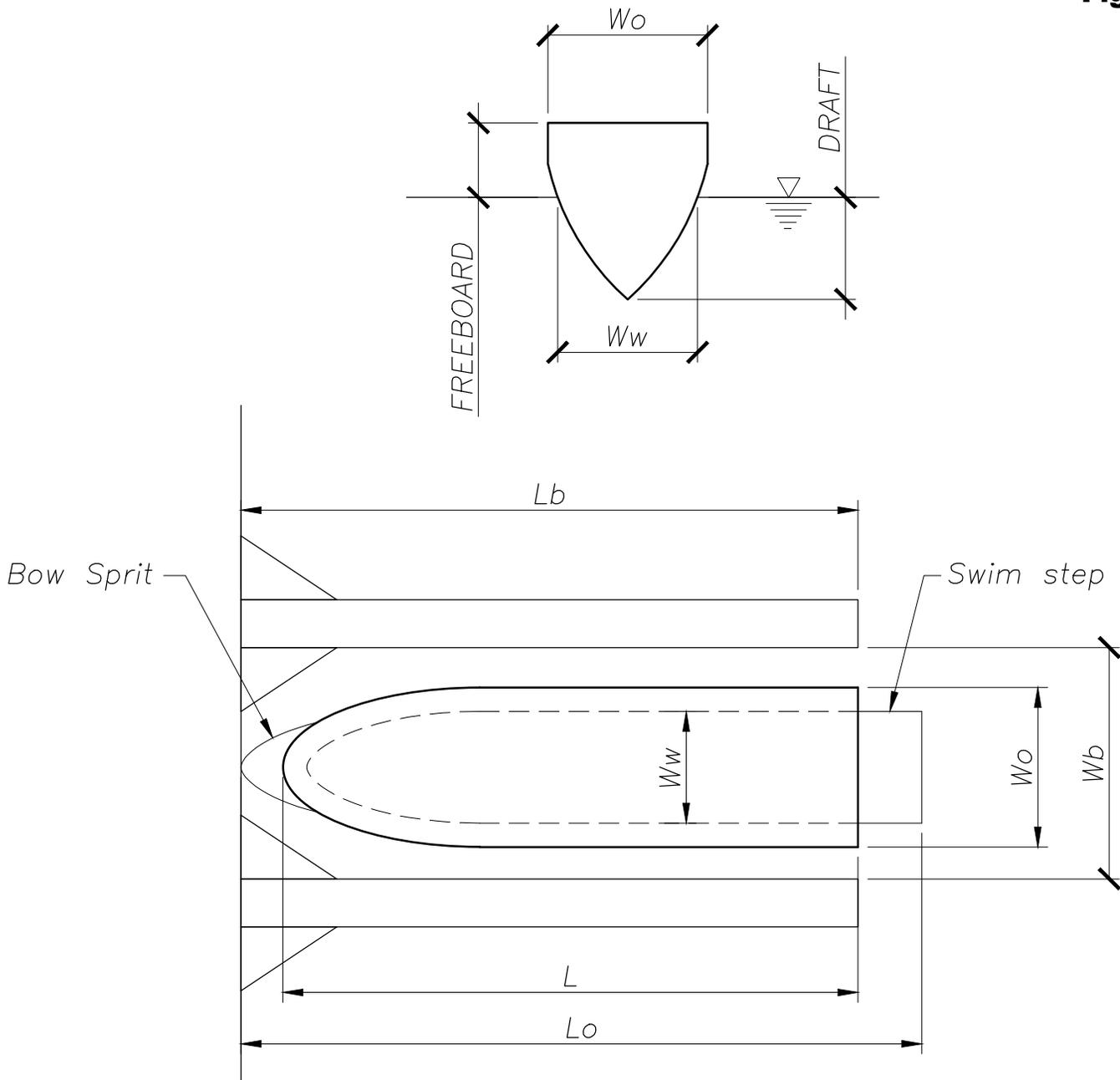
- (1) Re-decking an existing float, gangway, or pier, like for like (more than 20% of total replacement cost).
- (2) Fixing dry rot or damage (not more than 20% of total replacement cost).
- (3) Relocating one (1) or more piles.
- (4) Replace float, pier and/or gangway, like for like.
- (5) Change in orientation or configuration of an existing dock, including pile relocation.
- (6) Any increase in dock footprint.

- (7) Total reconstruction of a float, gangway, and/or pier.
- (8) New configuration of a float, gangway, and/or pier.
- (9) Replace seawall panels.
- (10) New bulkhead system.

**II. LANDSIDE DEVELOPMENTS (Commercial Only)**

- A. Landside developments of waterfront projects are subject to City of Newport Beach - Community Development Department, Building Division and Planning Division requirements.
- B. See DBW *Layout and Design Guidelines for Marina Berthing Facilities* (2005 edition or as updated) for minimum requirements for landside facilities, in support of waterfront developments.
- C. Landside requirements for marina projects include location and design of restroom facilities, minimum parking requirements and ADA compliance.

**Fig. No. 1**



LEGEND:

$W_w$  = WIDTH @ WATER LINE

$L$  = LENGTH W/O EXTENSIONS

$L_o$  = LENGTH OVERALL, WITH BOW SPRIT, SWIM STEP OR OTHER PROTRUSIONS

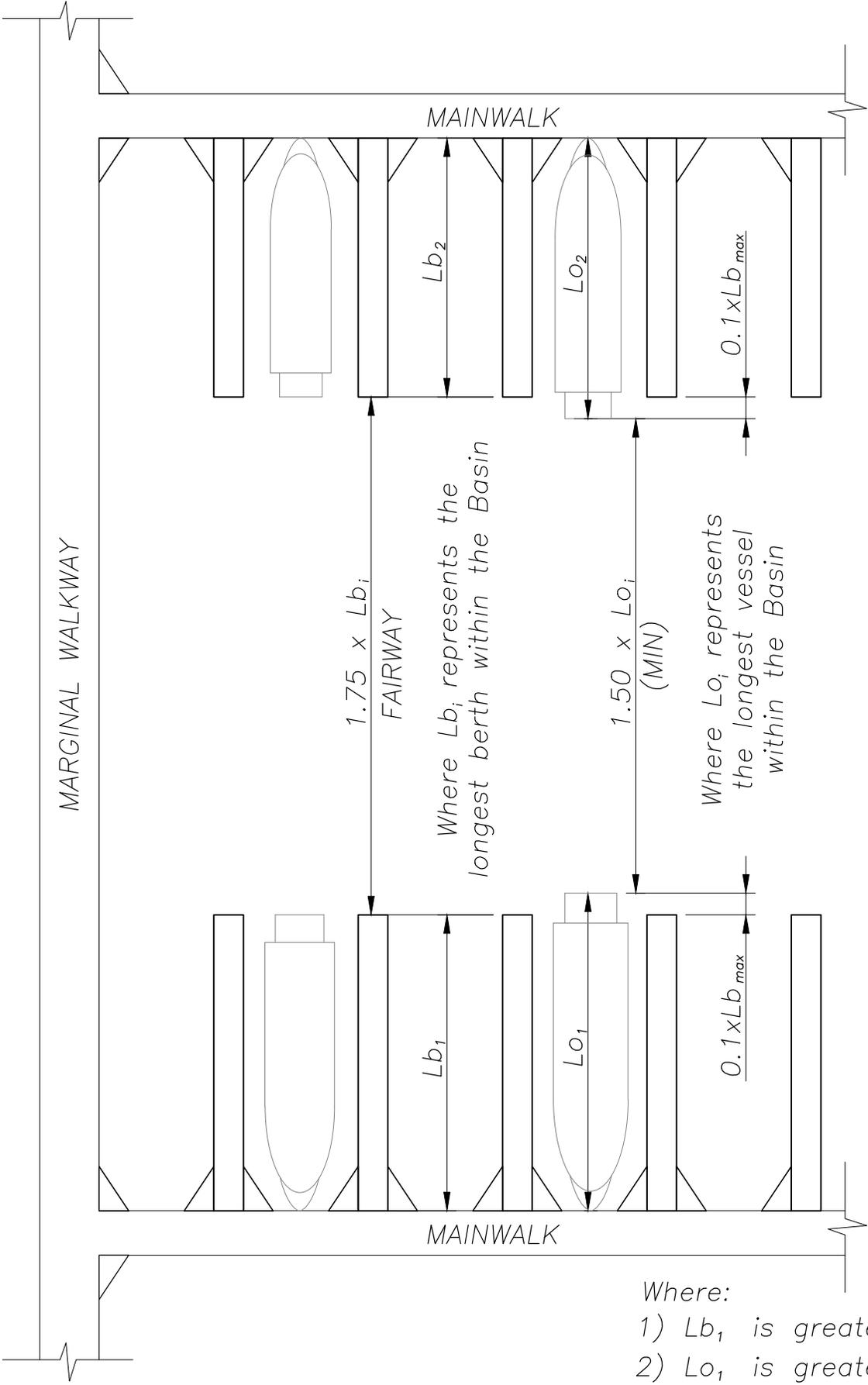
$W_o$  = WIDTH OVERALL (BEAM)

$L_b$  = LENGTH OF BERTH (FINGERFLOAT OR SLIP) (DBAW)

$W_b$  = WIDTH OF BERTH (DBAW)

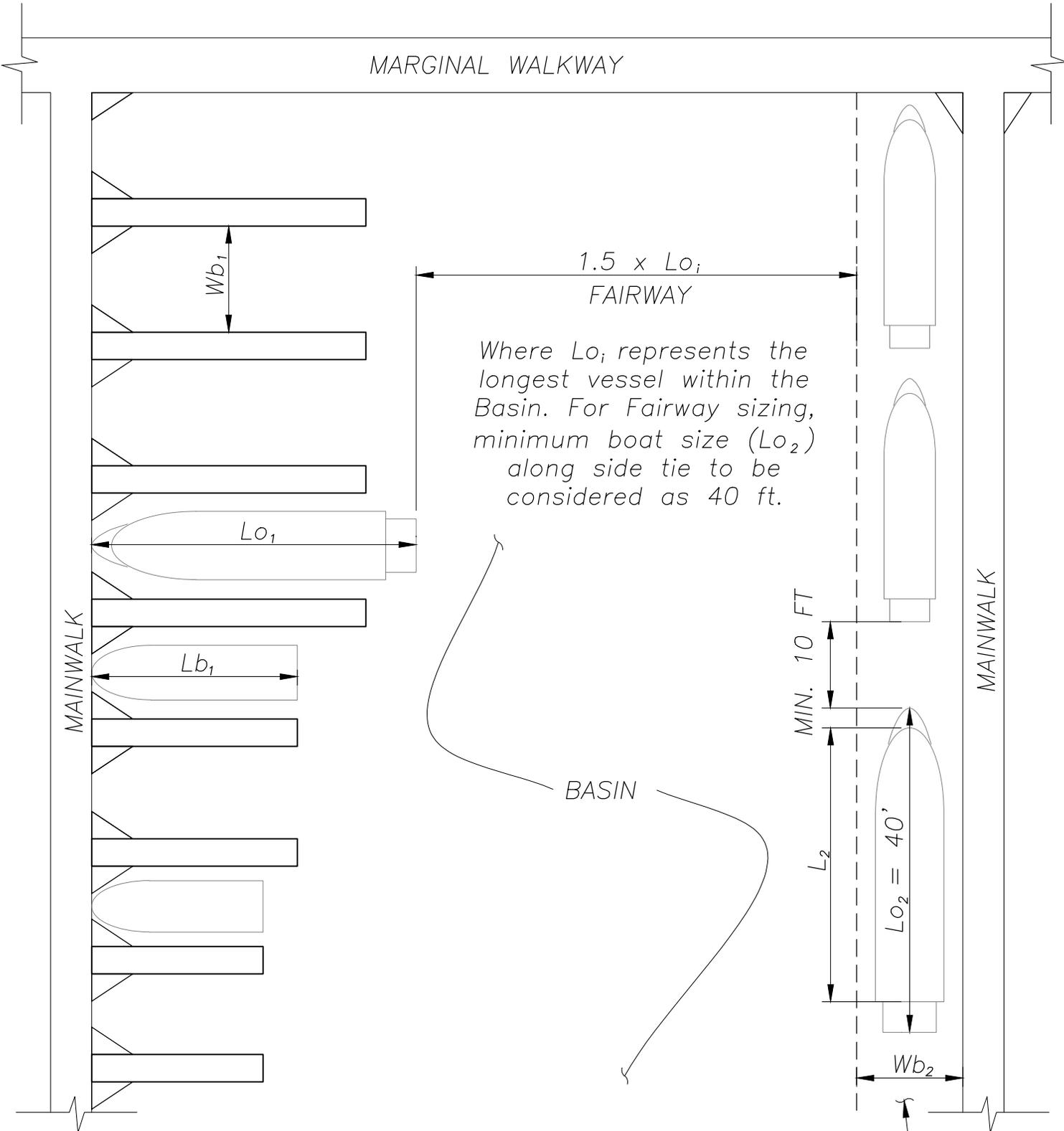
DBAW = CALIFORNIA STATE PARKS DIVISION OF BOATING AND WATERWAYS, LAYOUT AND DESIGN GUIDELINES FOR MARINA BERTHING FACILITIES

**VESSEL SIZE ILLUSTRATION**



**DOCK ARRANGEMENT  
CASE 1**

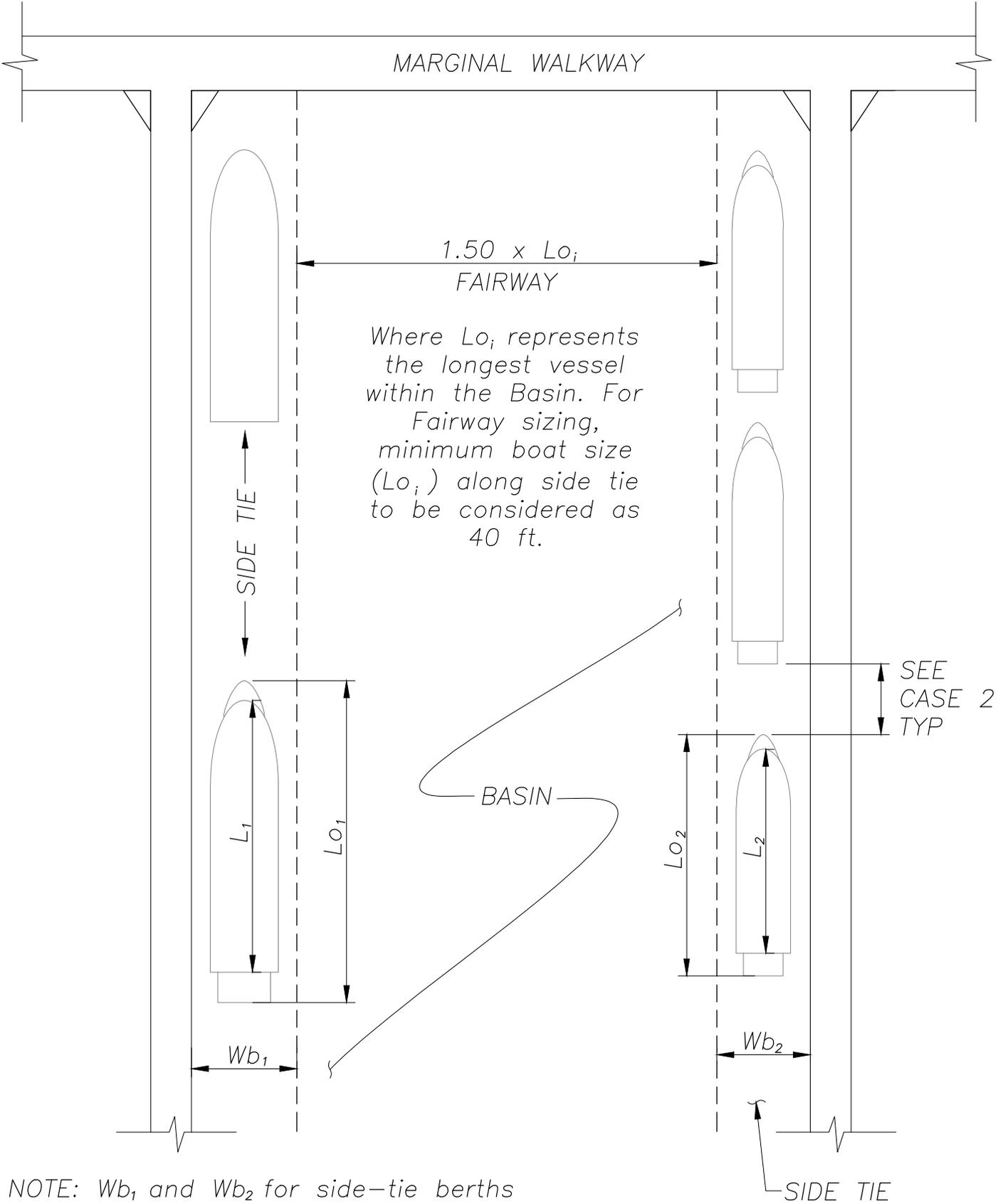
**Fig. No. 3**



NOTE: Wb<sub>2</sub> for side-tie berth is based on DBAW Table B-5, Single Berth Widths for Powerboats.

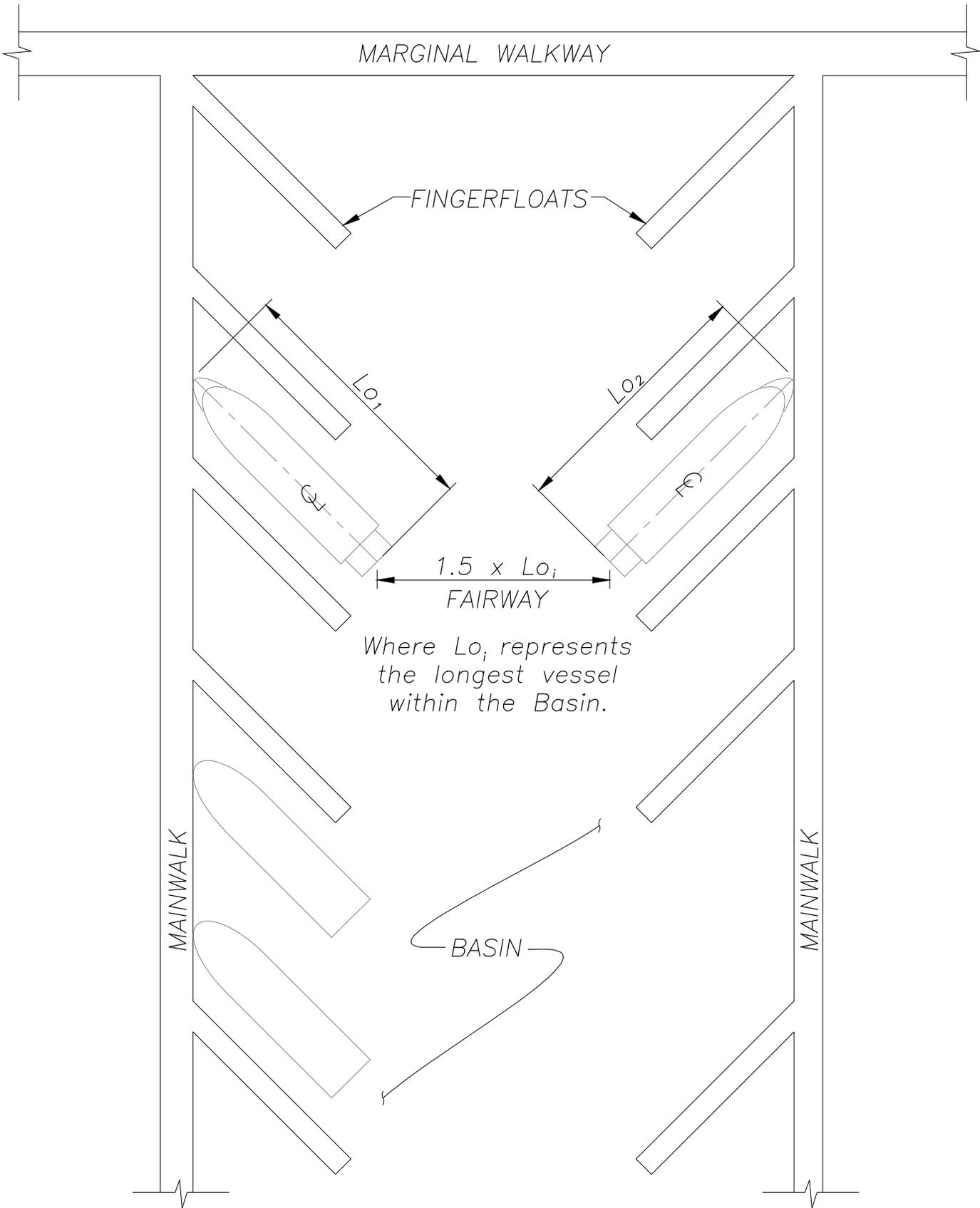
**DOCK ARRANGEMENT  
CASE 2**

**Fig. No. 4**

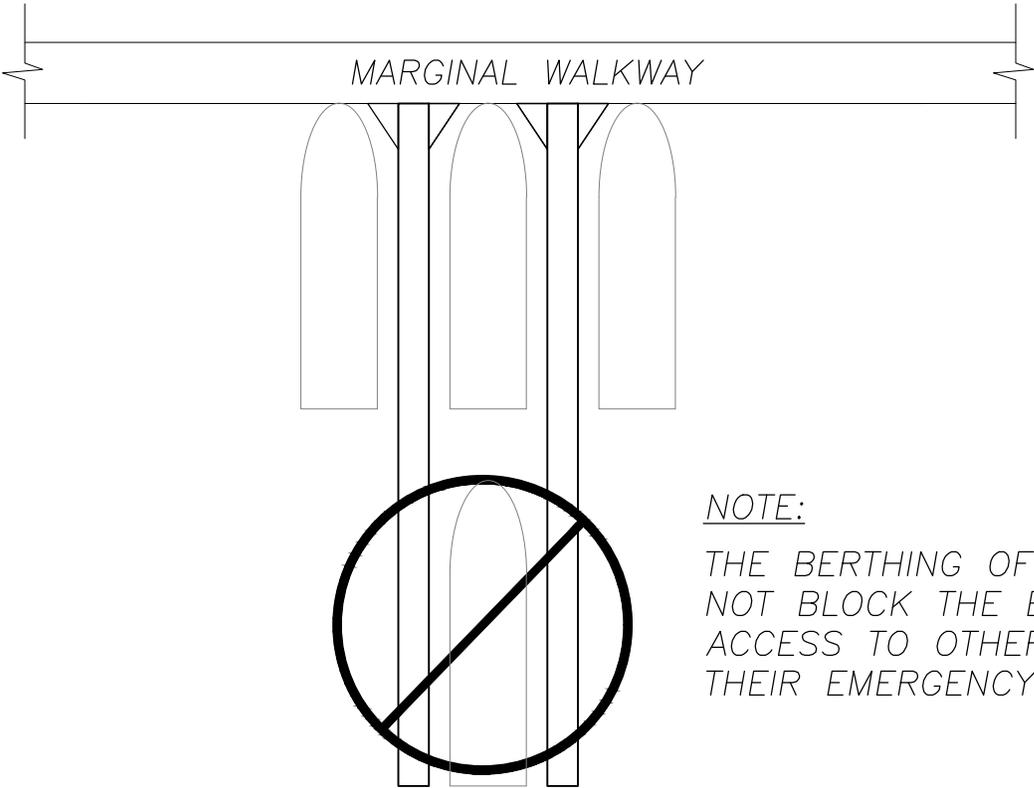


NOTE:  $W_{b_1}$  and  $W_{b_2}$  for side-tie berths are based on DBAW Table B-5, Single Berth Widths for Powerboats.

**DOCK ARRANGEMENT  
CASE 3**



**DOCK ARRANGEMENT  
CASE 4**



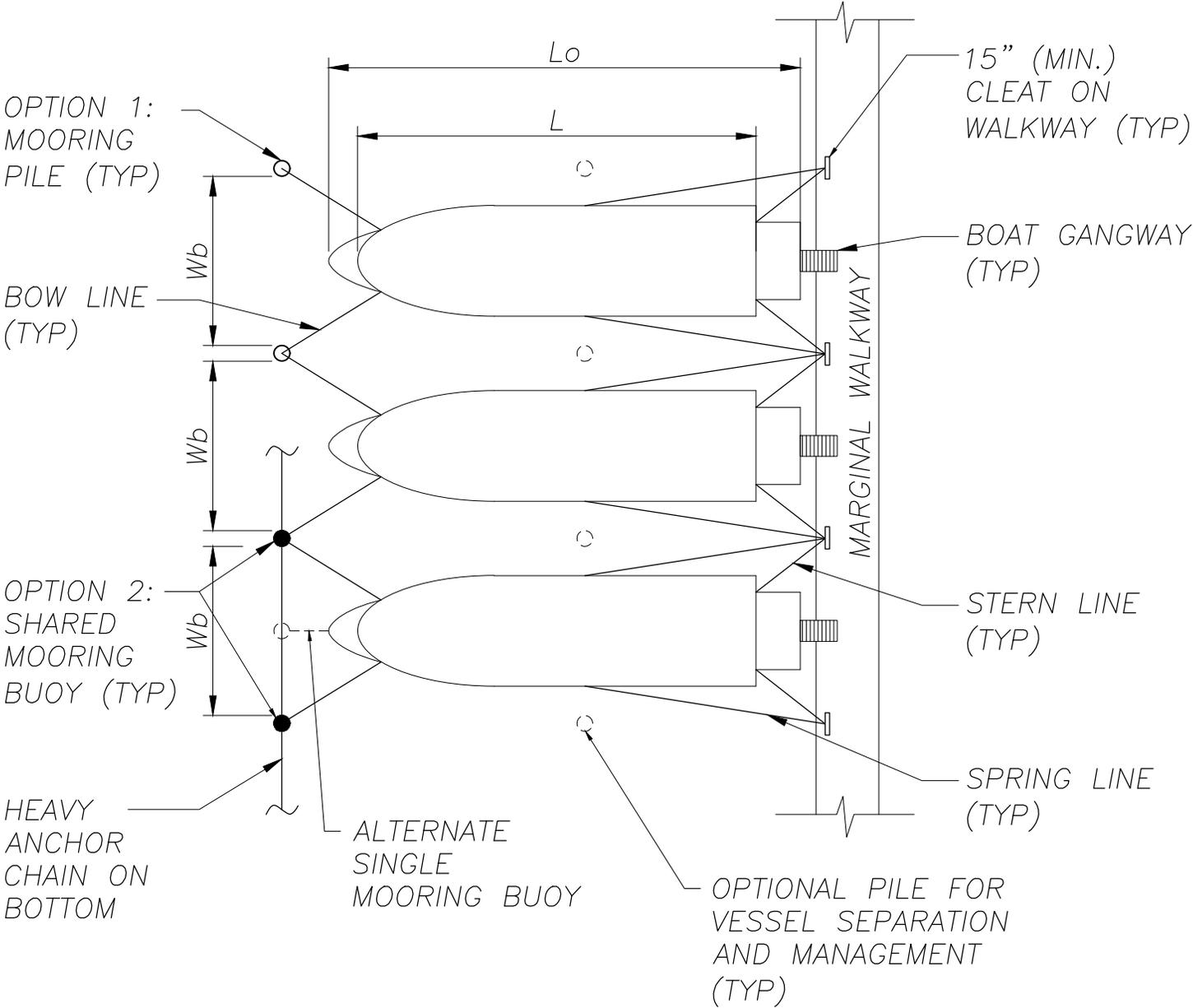
NOTE:  
THE BERTHING OF BOATS CAN NOT BLOCK THE EMERGENCY ACCESS TO OTHER BOATS OR THEIR EMERGENCY EGRESS.

**DOCK ARRANGEMENT  
CASE 5**

**Fig. No. 7**

NOTE:

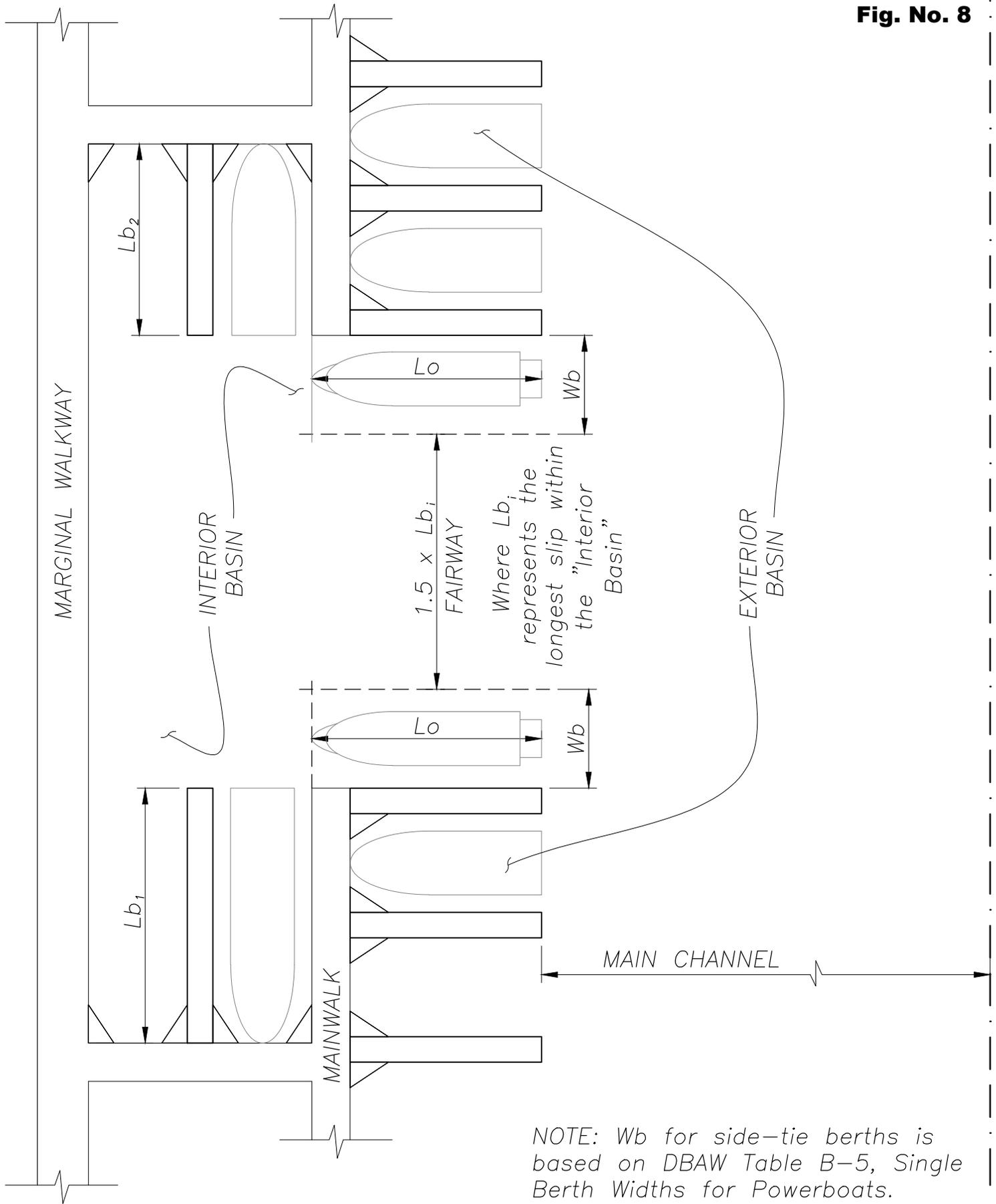
FOR VESSELS 40'-0" OR LARGER,  
SUPPORT PILES, MOORING SYSTEM, &  
ACCESS BRIDGES/GANGWAYS TO BE  
DESIGNED BY A LICENSED CIVIL OR  
STRUCTURAL ENGINEER, REGISTERED IN  
THE STATE OF CALIFORNIA, WITH  
FLOATING DOCK DESIGN EXPERIENCE.



**MEDITERRANEAN-STYLE  
MOORING CONCEPT**

**DOCK ARRANGEMENT  
CASE 6**

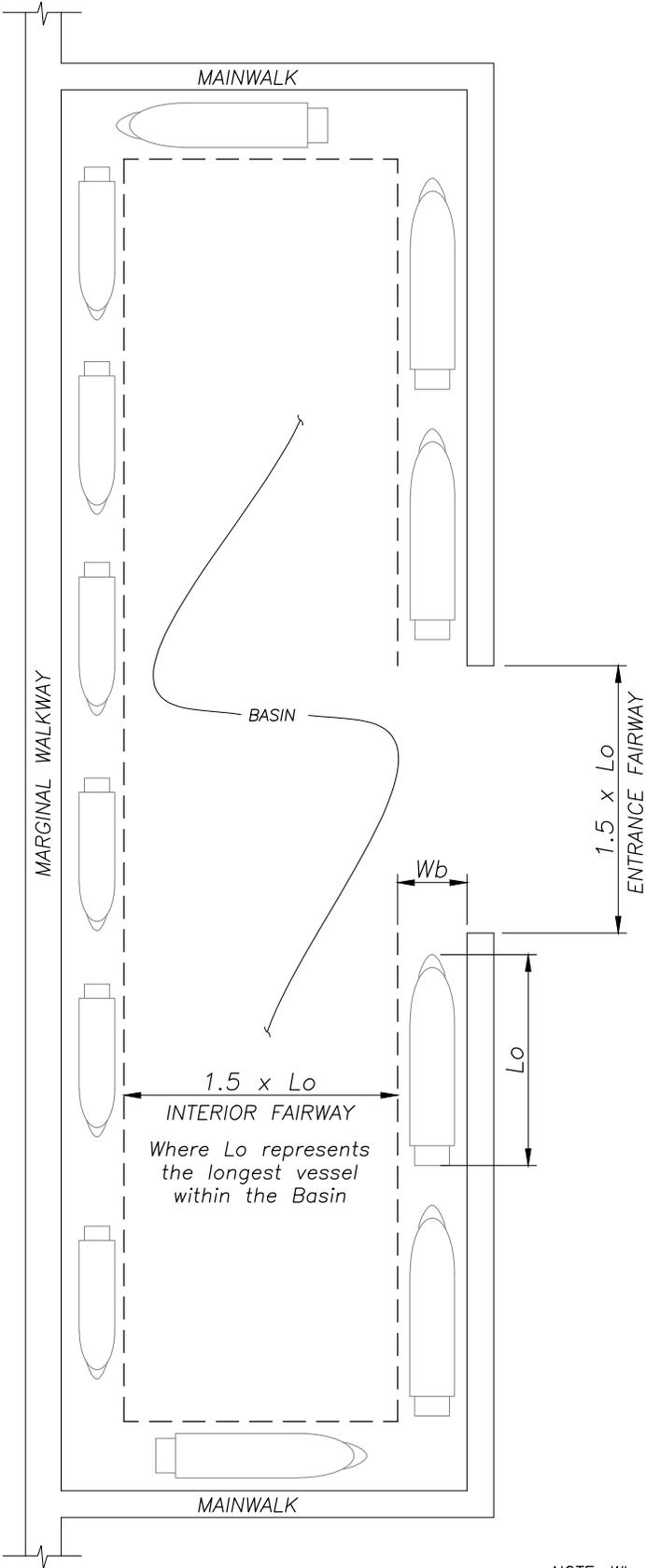
**Fig. No. 8**



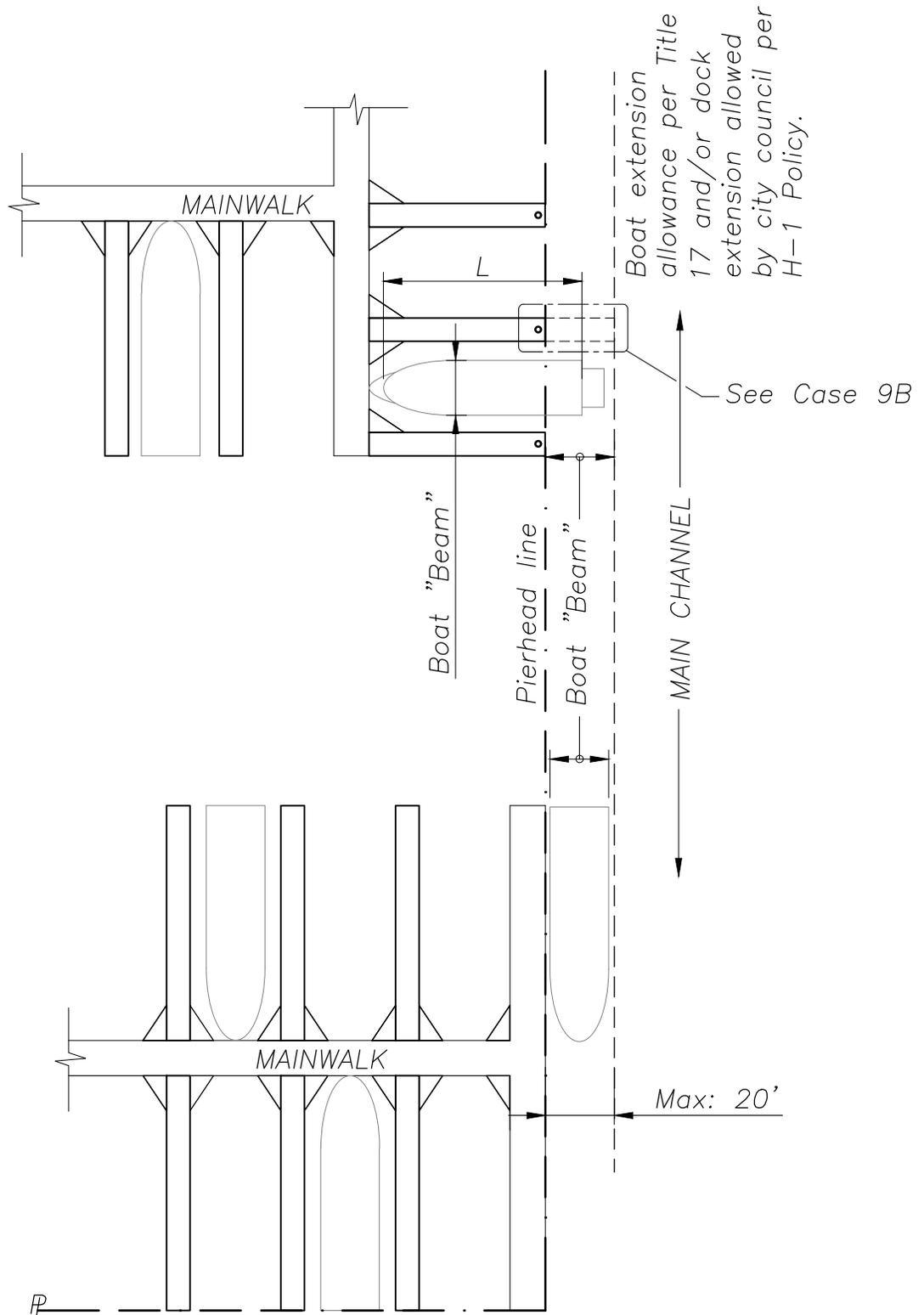
**DOCK ARRANGEMENT  
CASE 7**

NOTE:  $W_b$  for side-tie berths is based on DBAW Table B-5, Single Berth Widths for Powerboats.

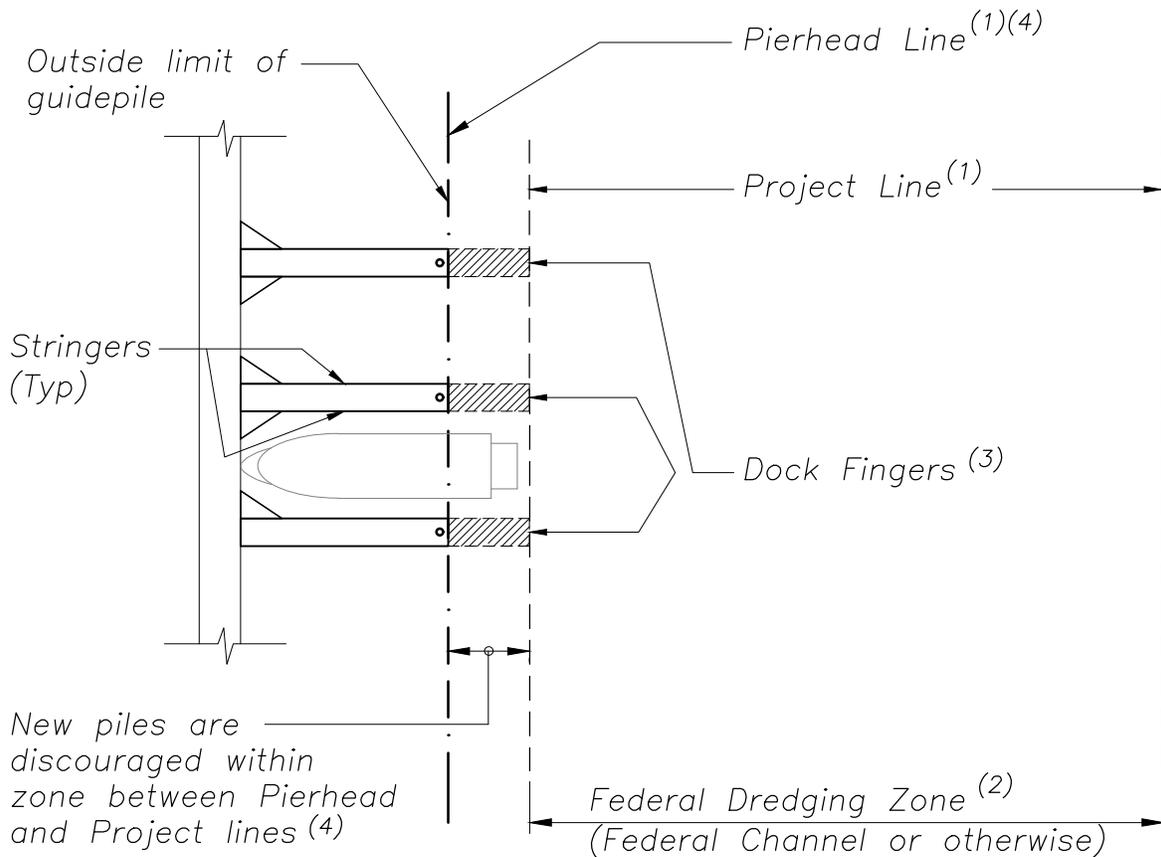
**Fig. No. 9**



# **DOCK ARRANGEMENT CASE 8**



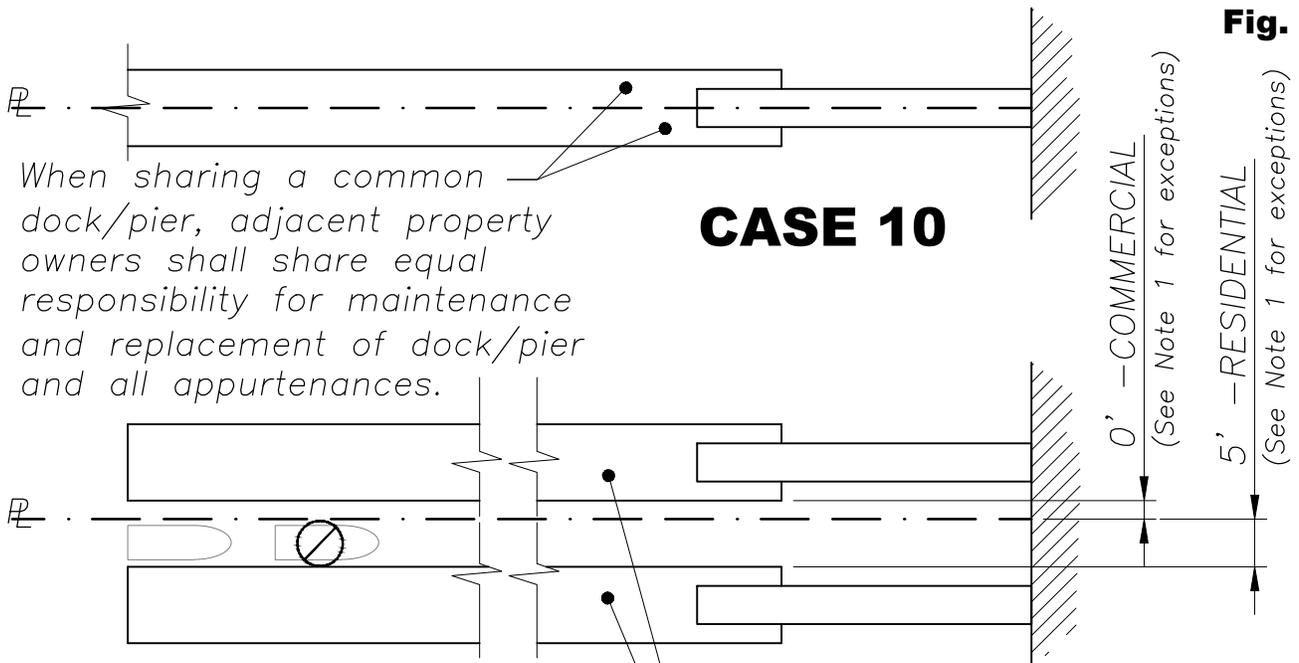
**DOCK ARRANGEMENT  
CASE 9A**



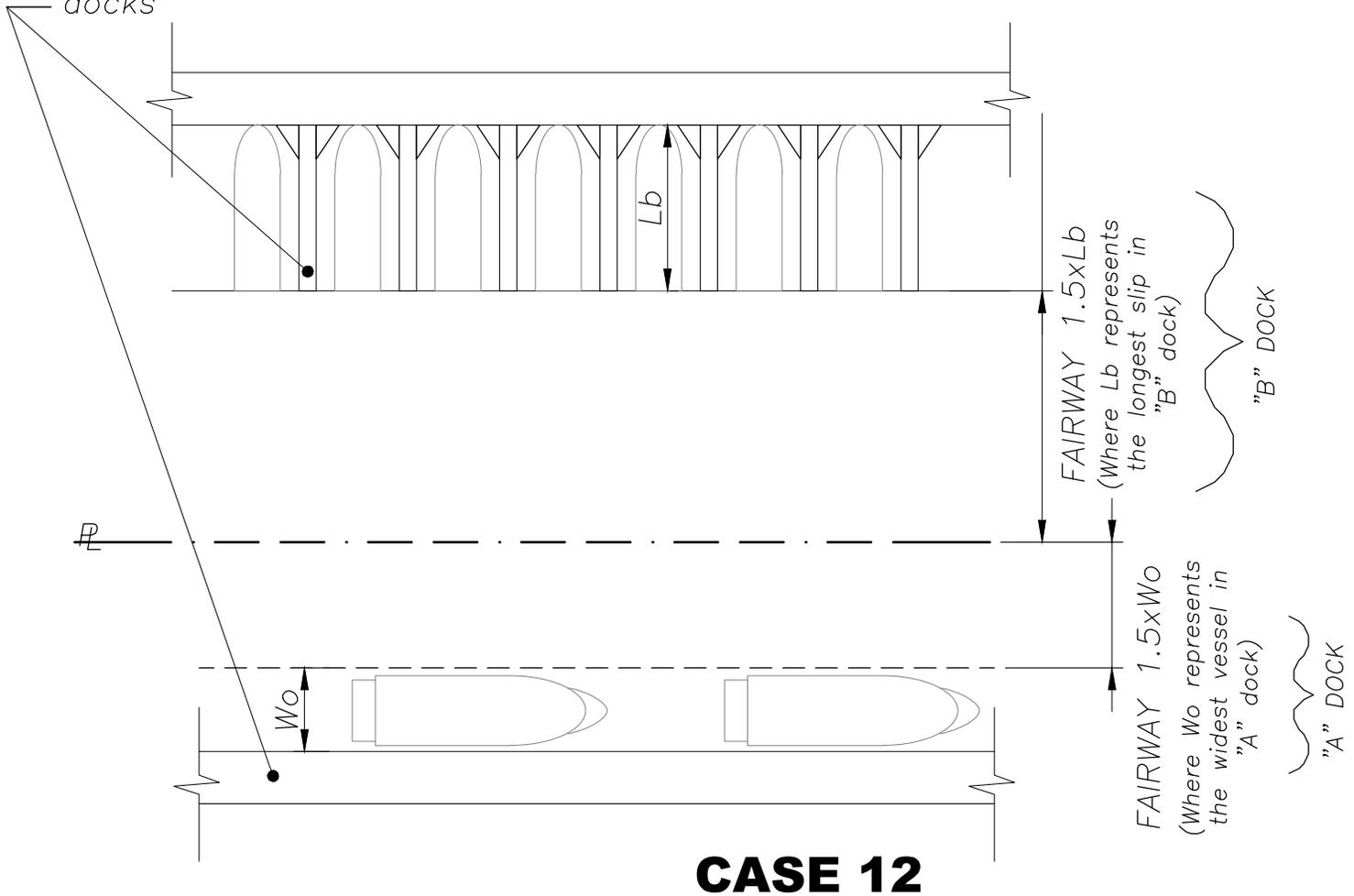
- (1) Pierhead and Project lines are established and managed by the federal government.
- (2) Portions of floating docks and/or vessels that extend into Federal Dredging Zone may be required to be removed by the dock owner at dock owner's cost when the federal government conducts periodic dredging operations.
- (3) Dock fingers must be designed and constructed in such a way that provides structural integrity of the fingers to resist lateral impact and dock line loads without guide piles at the finger ends. Continuous structural stringers and/or special moment and shear-carrying splices must be engineered and submitted to the Building Department for approval.
- (4) The City council has allowed limited exceptions for dock construction beyond the Pierhead Lines as noted in Council Policy H-1.

## **DOCK ARRANGEMENT CASE 9B**

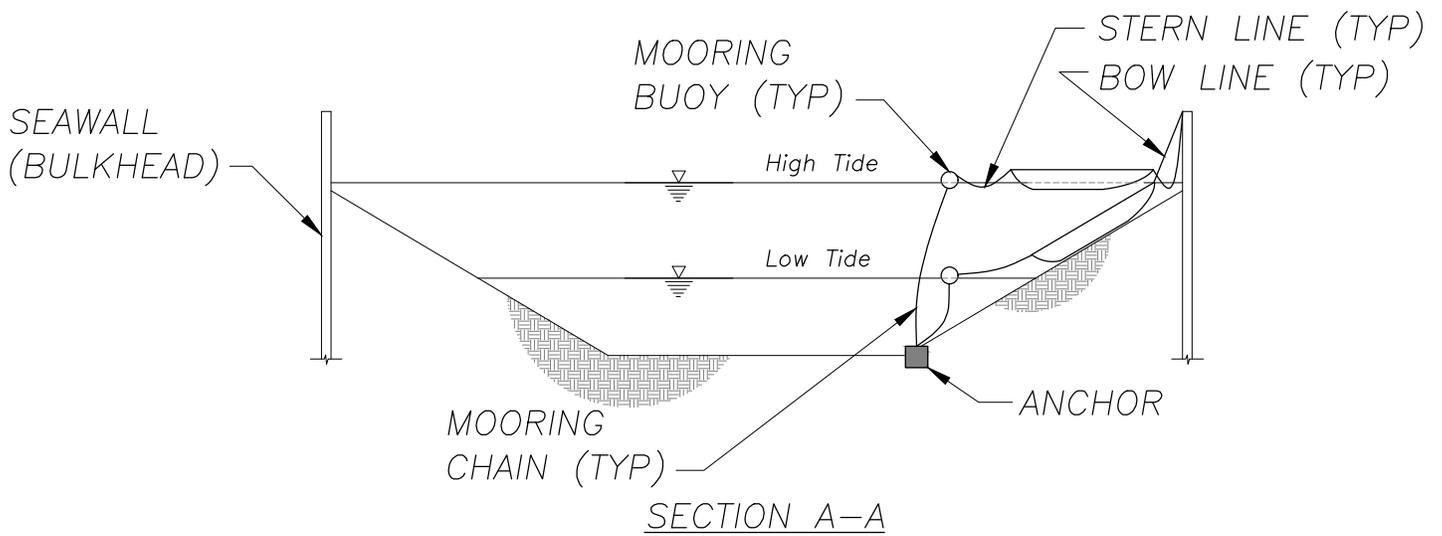
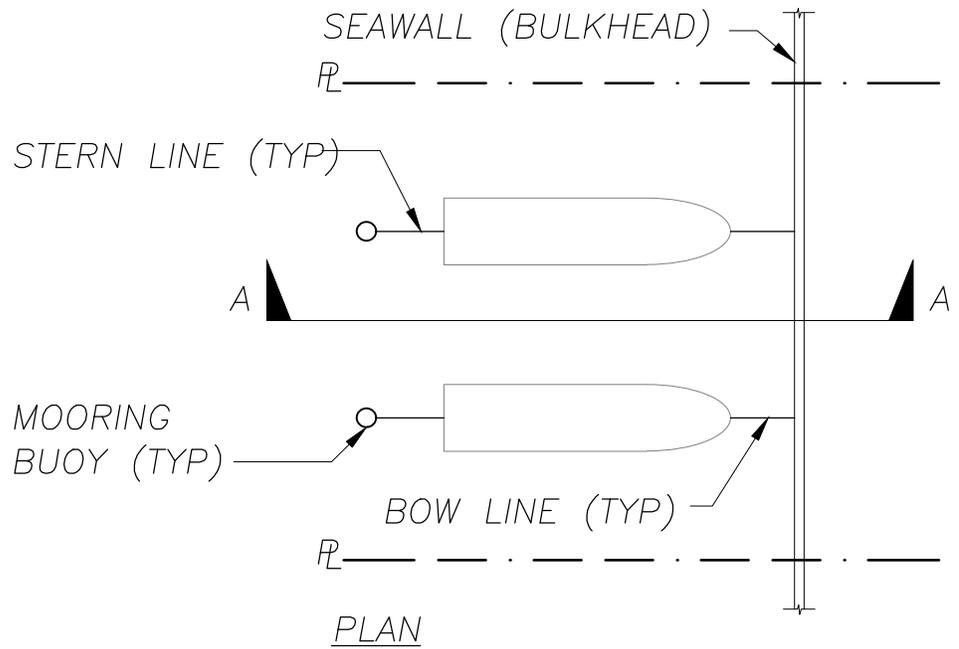
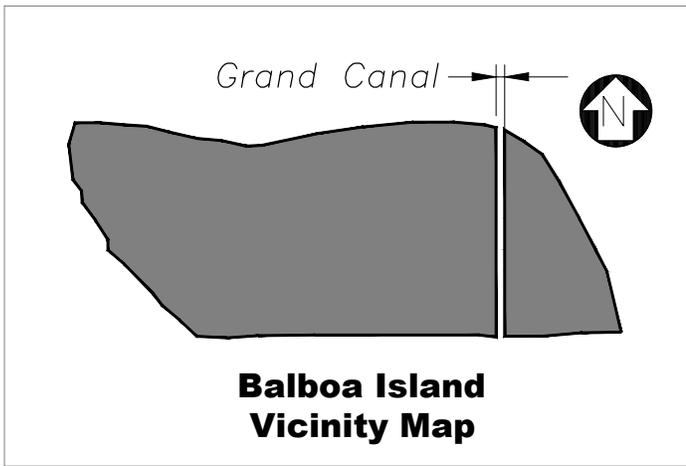
**Fig. No. 11**



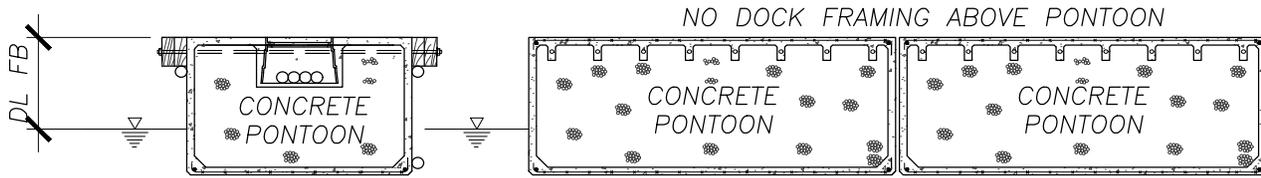
Note 1: Installation of a floating walkway can not adversely impact the existing berthing & navigation of adjacent property docks



**PROPERTY LINE CONDITIONS**



**DOCK ARRANGEMENT  
CASE 13  
(Grand Canal Only)**

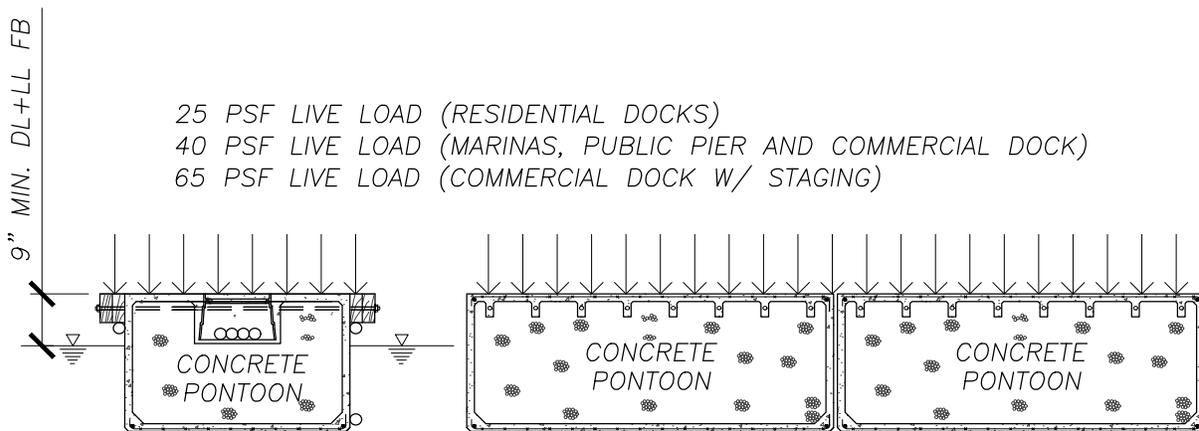


DEAD LOAD FREEBOARD (DL FB) = 14" MIN. 24" MAX  
 FLOATATION TYPICALLY VARIES FROM 90% TO 95%

DOCK CROSS SECTION

DOCK LONGITUDINAL SECTION

DEAD LOAD FREEBOARD



25 PSF LIVE LOAD (RESIDENTIAL DOCKS)  
 40 PSF LIVE LOAD (MARINAS, PUBLIC PIER AND COMMERCIAL DOCK)  
 65 PSF LIVE LOAD (COMMERCIAL DOCK W/ STAGING)

DOCK CROSS SECTION

DOCK LONGITUDINAL SECTION

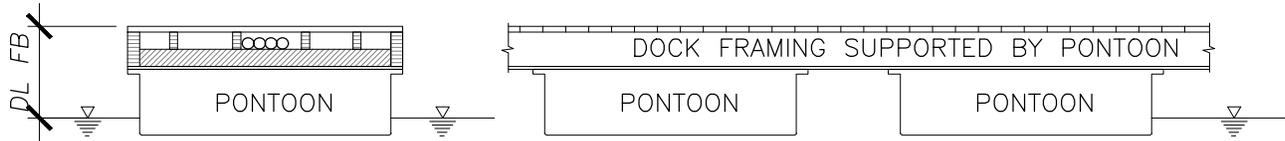
DEAD + LIVE LOAD FREEBOARD (DL+LL FB) = 9" MIN.

NOTE:

1. MIN DL+LL FB MAY BE DICTATED BY UTILITY LOCATION TO MEET ELECTRICAL AND PLUMBING CODES
2. UNDER DL+LL, STRUCTURAL WALERS SHALL NOT BE SUBMERGED
3. CONCRETE PONTOONS CONSIST OF A BUOYANT POLYSTYRENE FOAM CORE FULLY ENCASED BY A REINFORCED CONCRETE SHELL.

DEAD LOAD + LIVE LOAD FREEBOARD

**DOCK WITH NO FRAMING SUPPORTED  
 ON PONTOONS  
 (TYPICAL CONCRETE DOCK SYSTEM)**



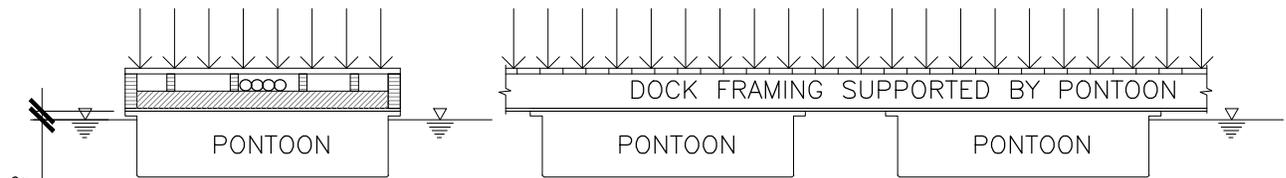
DEAD LOAD FREEBOARD (DL FB) = 14" MIN. 24" MAX  
 FLOATATION TYPICALLY VARIES FROM 60% TO 95%

DOCK CROSS SECTION

DOCK LONGITUDINAL ELEVATION

DEAD LOAD FREEBOARD

- 25 PSF LIVE LOAD (RESIDENTIAL DOCKS)
- 40 PSF LIVE LOAD (MARINAS, PUBLIC PIER AND COMMERCIAL DOCK)
- 65 PSF LIVE LOAD (COMMERCIAL DOCK W/ STAGING)



1" MIN. PONTOON DL+LL FB

DOCK CROSS SECTION

DOCK LONGITUDINAL ELEVATION

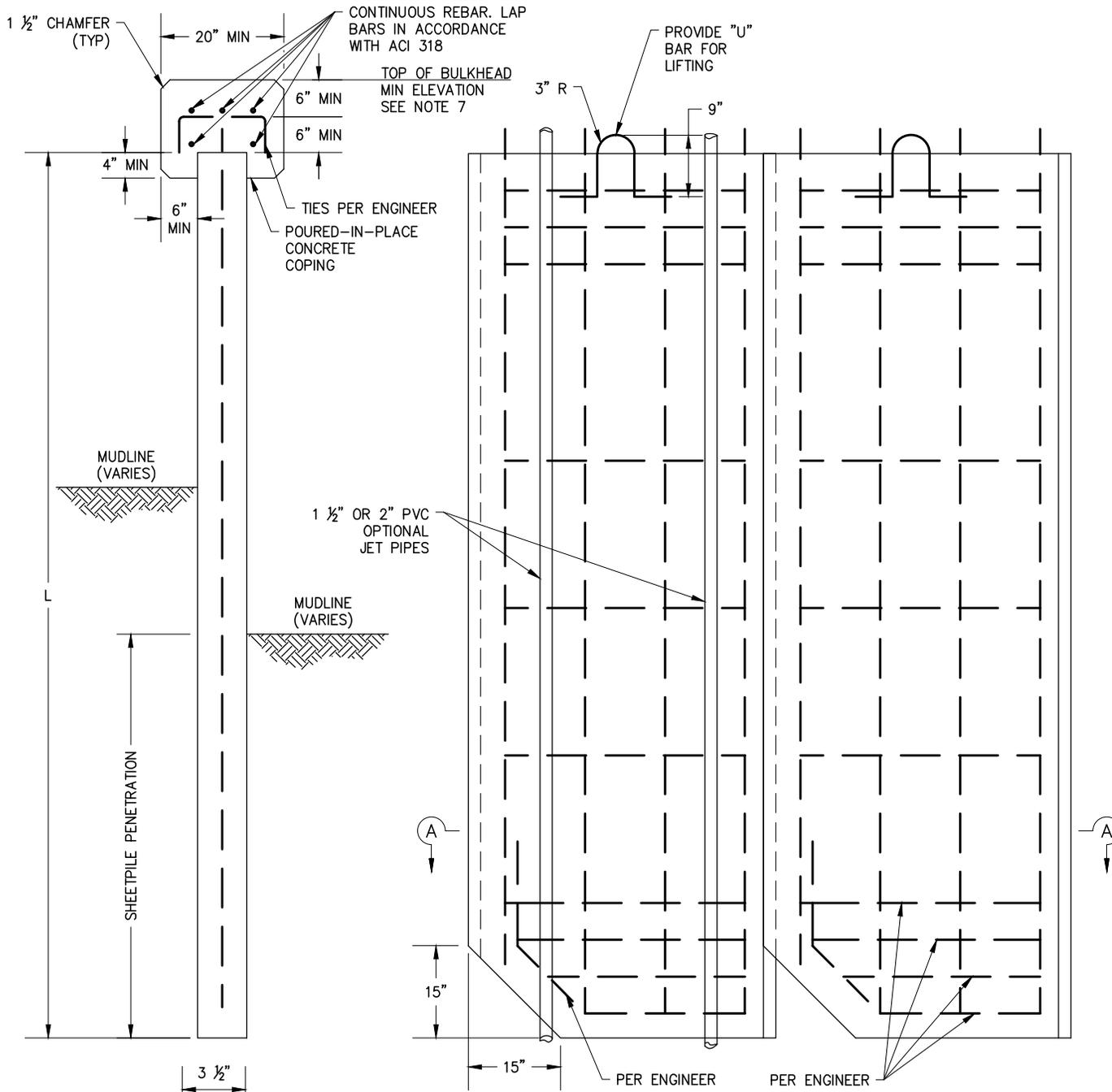
DEAD + LIVE LOAD FREEBOARD (DL+LL FB) = 1" MIN. PONTOON FREEBOARD

NOTE:

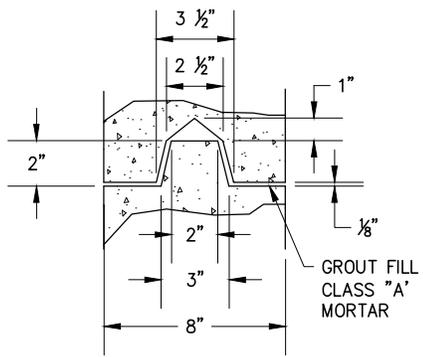
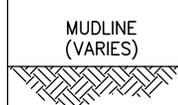
1. MIN DL+LL FB MAY BE DICTATED BY UTILITY LOCATION TO MEET ELECTRICAL AND PLUMBING CODES
2. UNDER DL+LL, STRUCTURAL WALERS/ DOCK FRAMING SHALL NOT BE SUBMERGED
3. CONCRETE PONTOONS CONSIST OF A BUOYANT POLYSTYRENE FOAM CORE FULLY ENCASED BY A REINFORCED CONCRETE SHELL.

DEAD LOAD + LIVE LOAD FREEBOARD

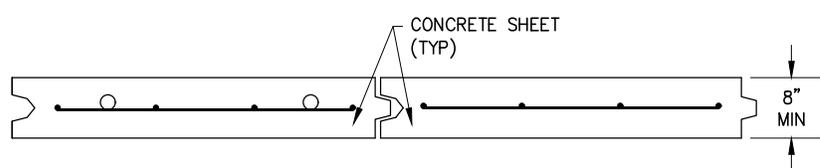
**DEAD + LIVE LOAD FREEBOARD FOR DOCKS WITH FRAMING SUPPORTED ON PONTOONS (TYPICAL TIMBER, ALUMINUM, STEEL, FIBERGLASS FRAMING DOCK SYSTEM)**



1 1/2" OR 2" PVC  
OPTIONAL  
JET PIPES



**TYPICAL PANEL JOINT**



**NOTES: SECTION A-A**

1. PANELS TO HAVE A SMOOTH FINISH ON BOTH SIDES.
2. REINFORCING STEEL SHALL HAVE A MINIMUM COVER OF 3" AND BE EPOXY-COATED PER ASTM A-775 OR ASTM A-934. GRADE 60 BARS SHALL BE USED.
3. AS AN OPTION, APPLICANT MAY USE PRESTRESSED CONCRETE SHEETS PER STD 602.
4. USE OF JETTING TECHNIQUES MAY REQUIRE SPECIAL PERMITS AND MITIGATION MEASURES BY LOCAL, STATE AND FEDERAL AGENCIES.
5. CONCRETE: SEE HARBOR DESIGN CRITERIA FOR CONCRETE REQUIREMENTS.
6. PANEL MUST BE DESIGNED BY A CALIFORNIA LICENSED CIVIL OR STRUCTURAL ENGINEER.
7. SEE TABLE NO. 2 IN THE HARBOR DESIGN CRITERIA FOR MINIMUM BULKHEAD ELEVATIONS.

APP. *James M. Hinkle* 51568 11/24/2020  
CITY ENGINEER RCE DATE

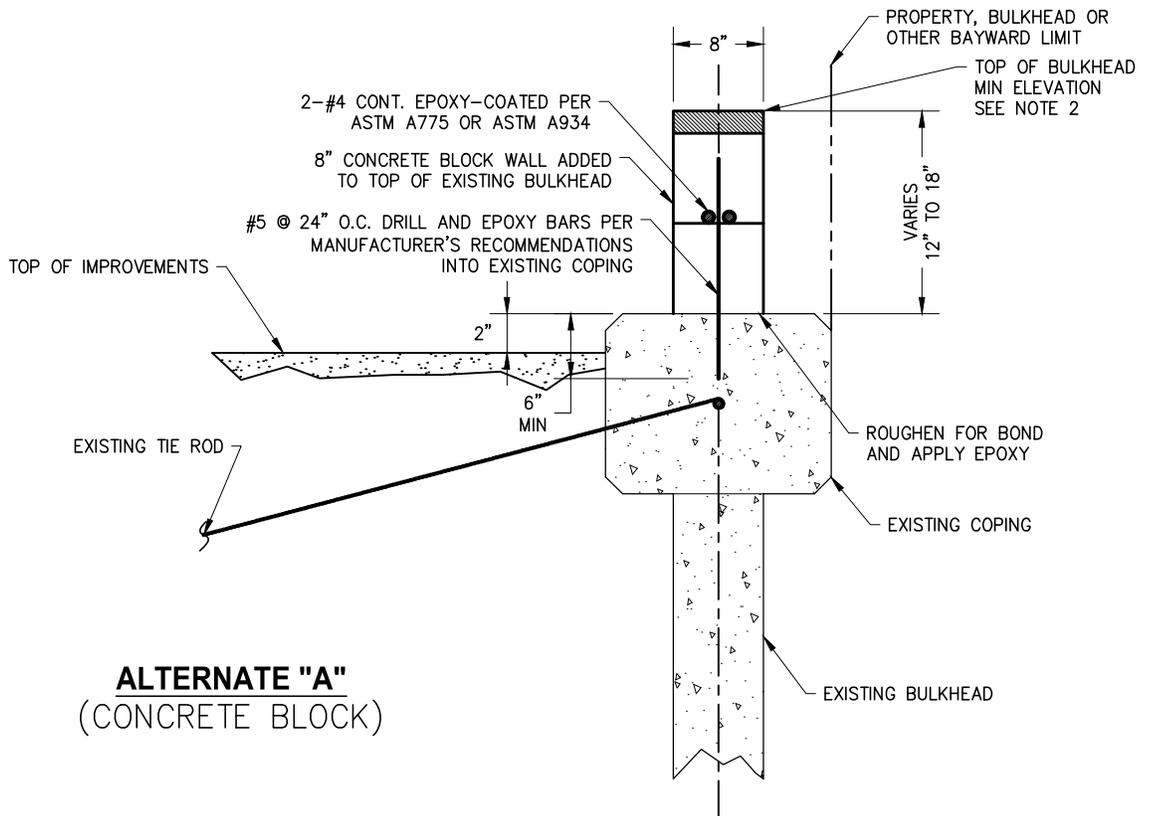
NO.	DATE	DESCRIPTION OF REVISIONS

**CITY OF NEWPORT BEACH DEPARTMENT OF PUBLIC WORKS**

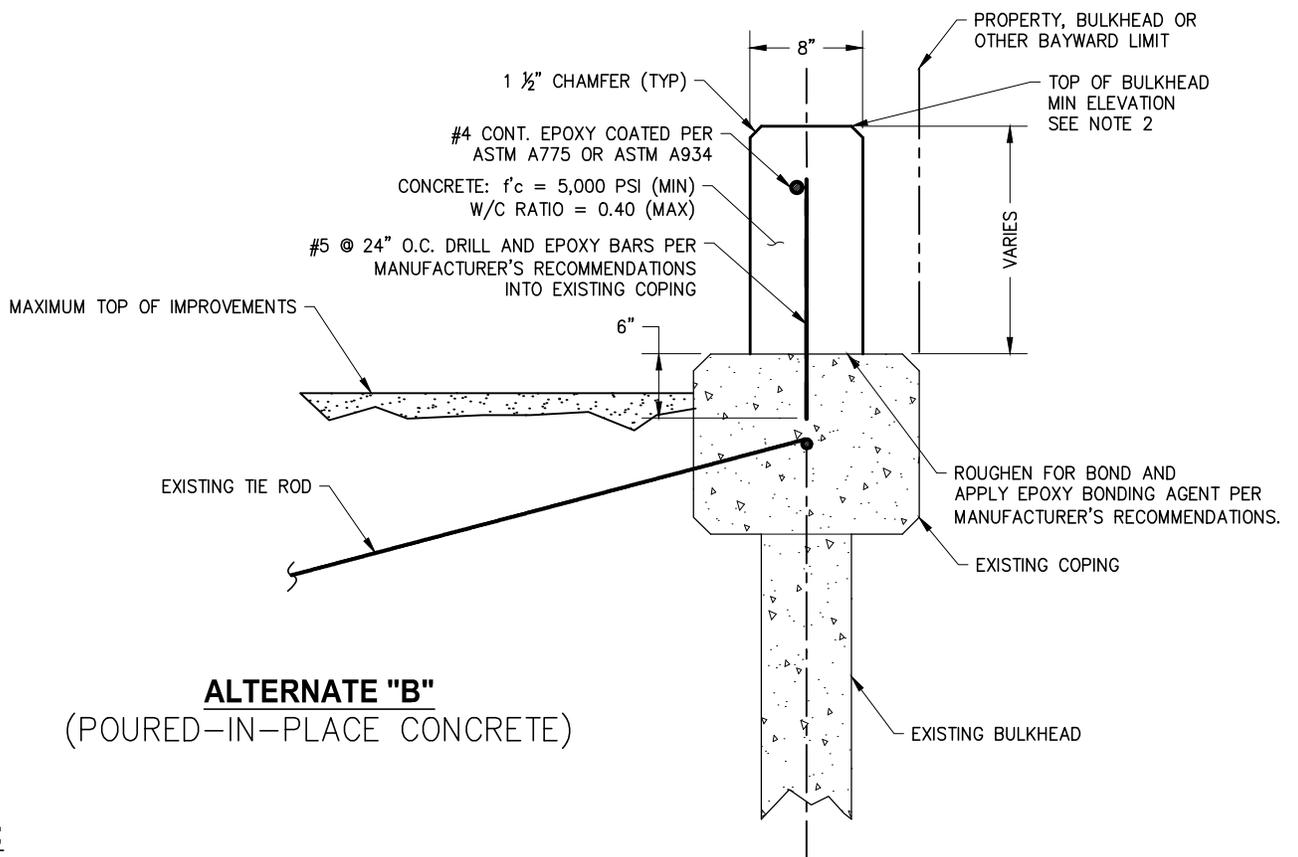
DRAWN: P. KHARAZMI  
DATE: 11/3/2020

**PRECAST REINFORCED CONCRETE GROIN PANEL  
(NOT FOR BULKHEAD USE)**

STANDARD DRAWING NO.  
**600**  
SHEET 1 OF 1



**ALTERNATE "A"**  
(CONCRETE BLOCK)



**ALTERNATE "B"**  
(POURED-IN-PLACE CONCRETE)

**NOTES:**

1. EPOXY SHALL CONFORM TO ASTM C881 STANDARD AND BE USED IN STRICT ACCORDANCE WITH THE MANUFACTURER'S PRINTED INSTRUCTIONS.
2. SEE TABLE NO. 2 IN THE HARBOR DESIGN CRITERIA FOR MINIMUM BULKHEAD ELEVATIONS.

APP. *James M. Hinkle* 51568 11/24/2020  
 CITY ENGINEER RCE DATE

NO.	DATE	DESCRIPTION OF REVISIONS

CITY OF NEWPORT BEACH DEPARTMENT OF PUBLIC WORKS

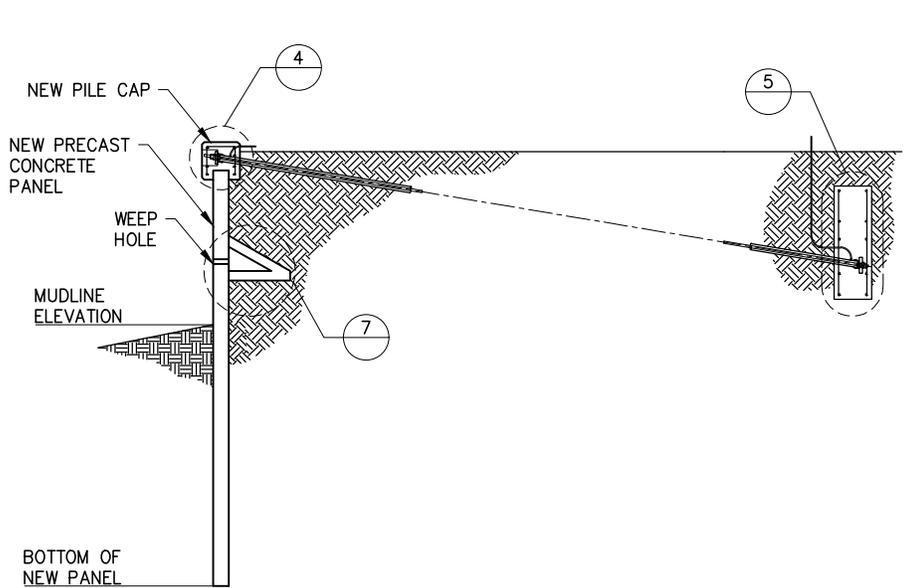
DRAWN: P. KHARAZMI  
 DATE: 11/3/2020

**DETAIL FOR RAISING BULKHEADS**

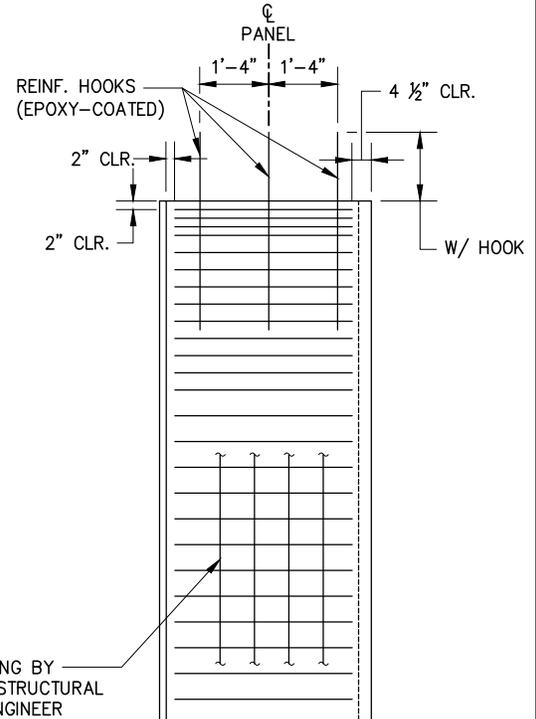
STANDARD DRAWING NO.

**601**

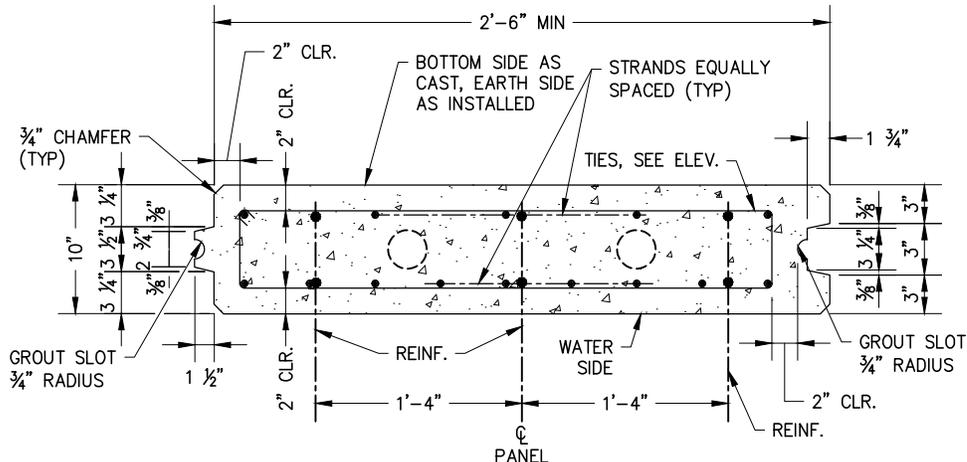
SHEET 1 OF 1



**SECTION AT BULKHEAD** (1)



**PRECAST (PRESTRESSED) PANEL ELEVATION** (1) (2)  
(WATER SIDE)



**PRECAST (PRESTRESSED) PANEL SECTION** (1) (3)

**NOTES:**

1. DIMENSIONS AND SIZES NOTED TO BE CONFIRMED OR AMENDED BY THE ENGINEER OF RECORD.
2. CONCRETE: SEE NEWPORT BEACH HARBOR DESIGN CRITERIA FOR CONCRETE REQUIREMENTS.

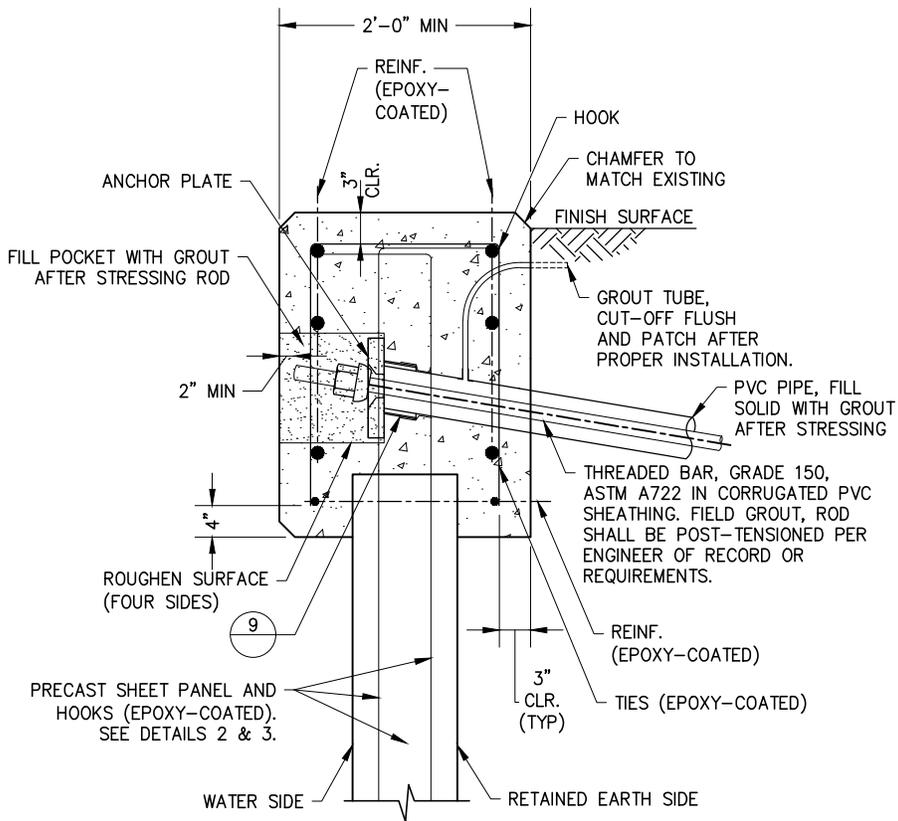
APP. <i>James M. Hinkle</i>	51568	11/24/2020	
CITY ENGINEER	RCE	DATE	
			NO. DATE DESCRIPTION OF REVISIONS

**CITY OF NEWPORT BEACH DEPARTMENT OF PUBLIC WORKS**

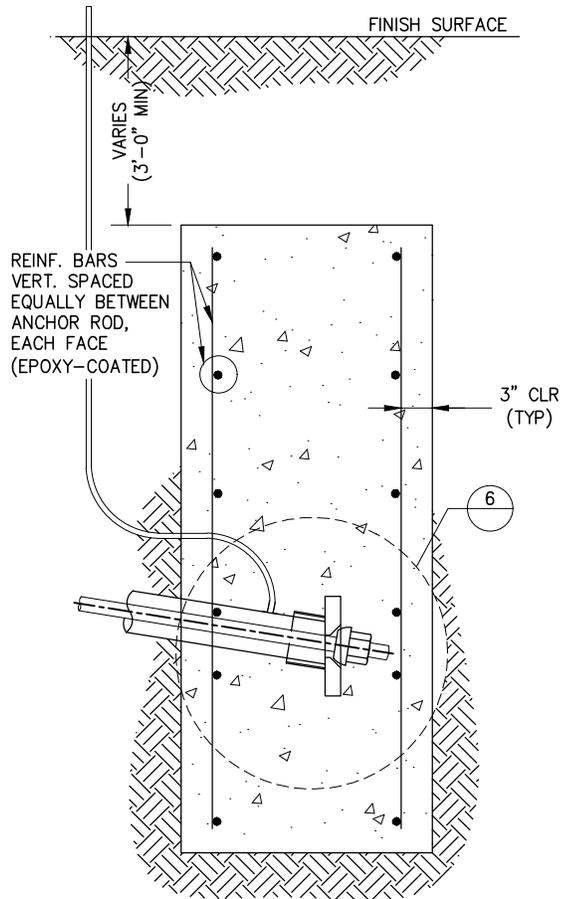
# BULKHEAD & PRECAST PANEL SECTION & ELEVATION

DRAWN: P. KHARAZMI  
DATE: 11/3/2020

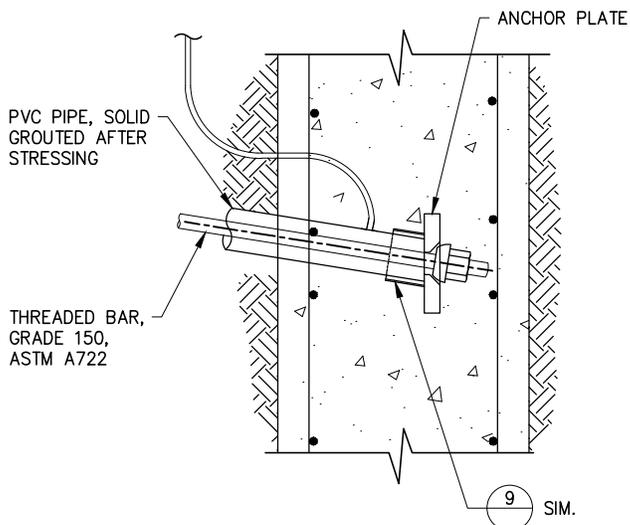
STANDARD DRAWING NO.  
**602**  
SHEET 1 OF 3



**SECTION AT BULKHEAD CAP  
(STRESSING END)<sup>(1)</sup>** 4



**CONCRETE DEADMAN SECTION  
(FIXED END)<sup>(1)</sup>** 5



**DETAIL (FIXED END)<sup>(1)</sup>** 6

**NOTES:**

- DIMENSIONS AND SIZES NOTED TO BE CONFIRMED OR AMENDED BY THE CIVIL OR STRUCTURAL ENGINEER OF RECORD.
- DETAILS OF THREAD BAR, ENCASMENT, ANCHOR PLATES, NUTS, WASHERS AND POCKETS MAY DIFFER FROM MANUFACTURER TO MANUFACTURER.
- THE 2'-0" PILE CAP WIDTH IS A MINIMUM DIMENSION AND DOES NOT ALLOW FOR MISALIGNMENT OF CONCRETE PANEL. CONTRACTOR SHALL MAKE ALL NECESSARY ADJUSTMENTS TO THE CAP WIDTH TO MAINTAIN INDICATED CLEARANCES. WIDTH OF CAP SHALL BE MAINTAINED FOR THE ENTIRE LENGTH OF NEW CAP.
- REINFORCEMENT, WALL DIMENSIONS AND THICKNESSES TO BE DESIGNED FOR THE SPECIFIC SITE CONDITIONS AND LOADS.

APP. *James M. Hinkle* 51568 11/24/2020  
 CITY ENGINEER RCE DATE

NO.	DATE	DESCRIPTION OF REVISIONS

**CITY OF NEWPORT BEACH DEPARTMENT OF PUBLIC WORKS**

DRAWN: P. KHARAZMI

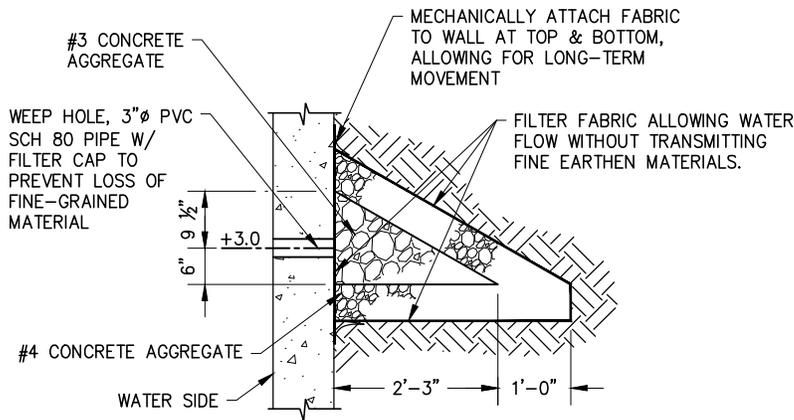
**BULKHEAD CAP & DEADMAN  
SECTIONS & DETAIL**

STANDARD DRAWING NO.

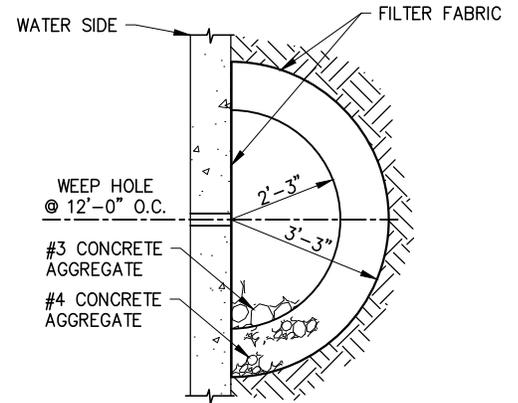
**602**

DATE: 11/3/2020

SHEET 2 OF 3



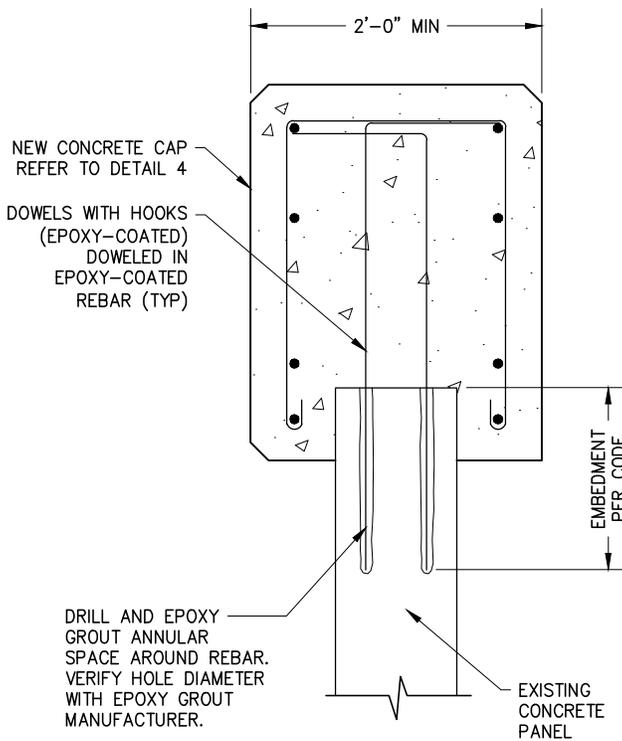
**ELEVATION**



**PLAN**

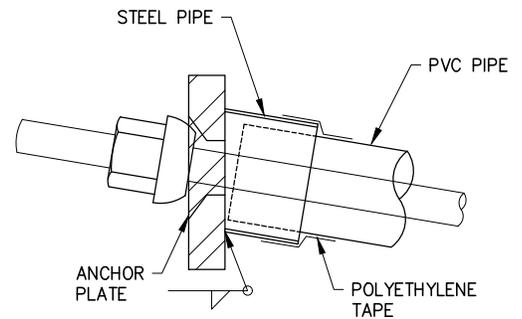
**WEEP HOLE SECTION**

7



**SECTION AT BULKHEAD DOWELS**

8



**NOTE:**

PLATE DETAIL AT STRESSING END (CAP) SHOWN, PLATE DETAIL, SIMILAR AT FIXED END (DEADMAN).

**DETAIL**

9

APP. <i>James M. Hinkle</i>	51568	11/24/2020			
CITY ENGINEER	RCE	DATE			
			NO.	DATE	DESCRIPTION OF REVISIONS

**CITY OF NEWPORT BEACH DEPARTMENT OF PUBLIC WORKS**

**BULKHEAD SECTIONS & DETAILS**

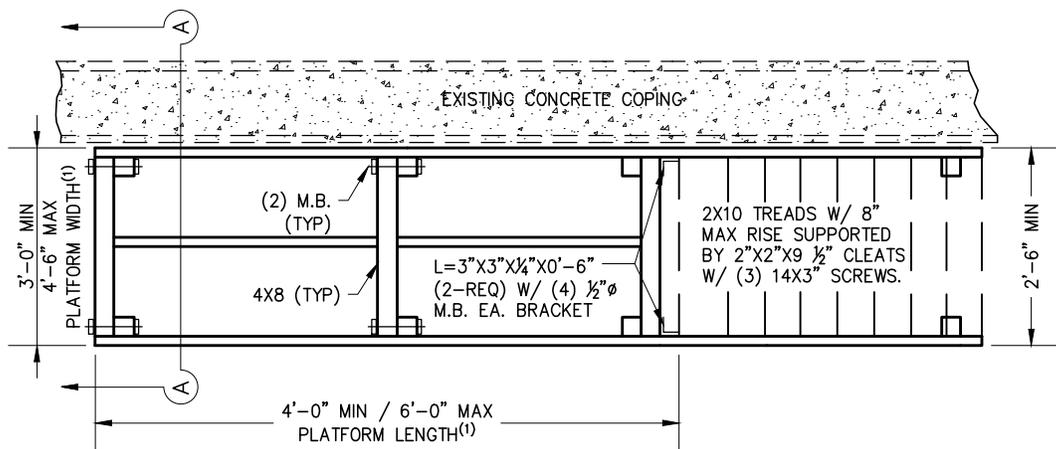
STANDARD DRAWING NO.

**602**

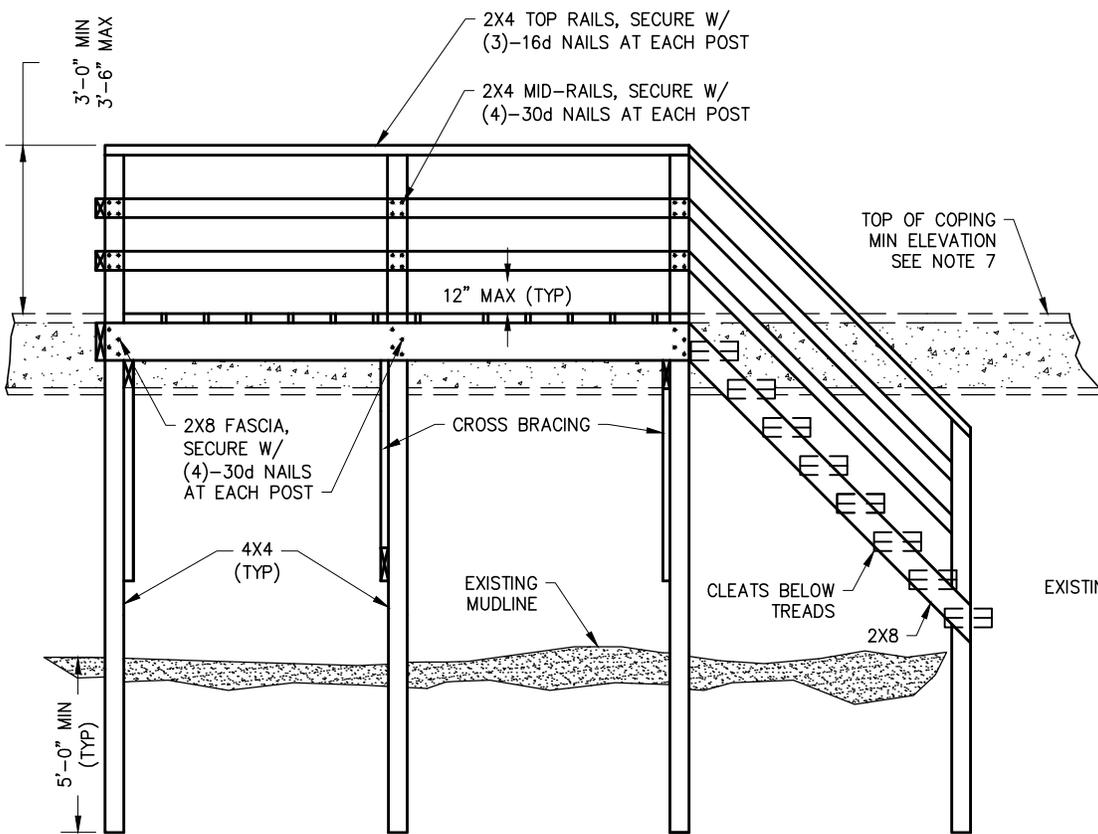
SHEET 3 OF 3

DRAWN: P. KHARAZMI

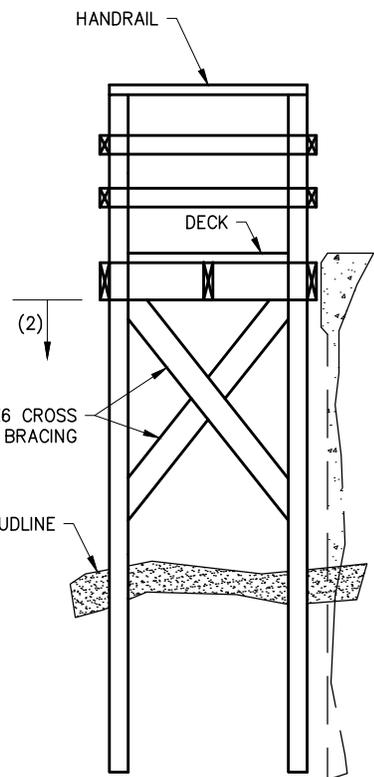
DATE: 11/3/2020



**PLAN**



**ELEVATION**



**SECTION A-A**

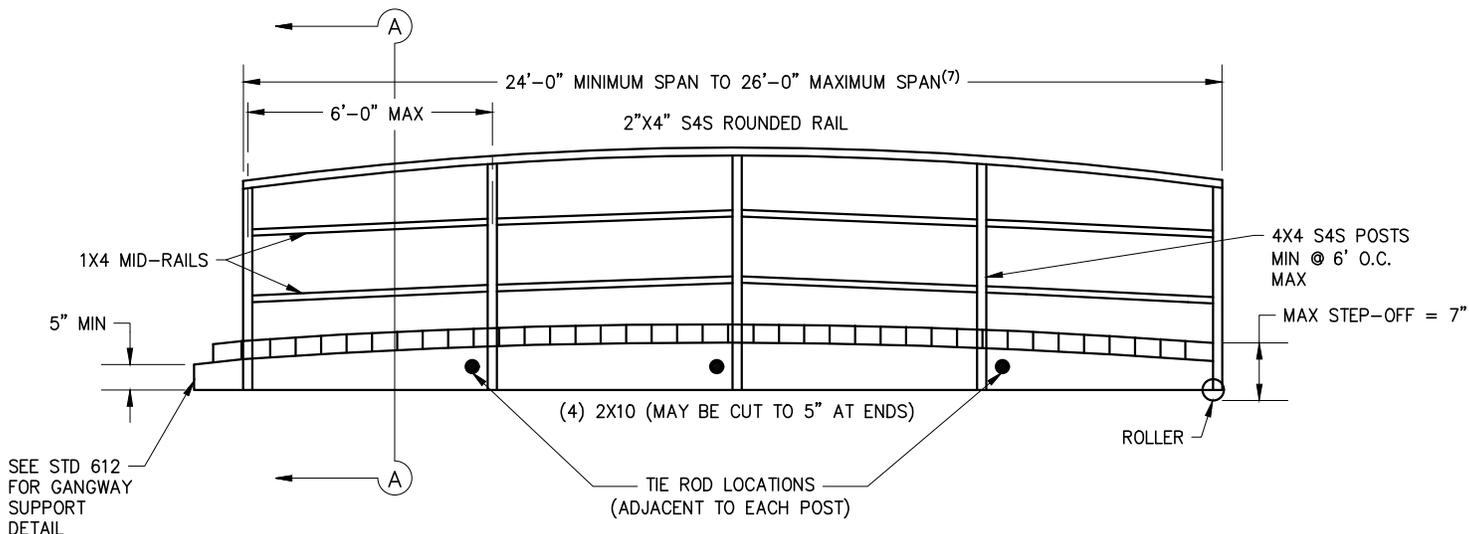
**NOTES:**

1. OVERALL PLATFORM SIZE (NOT INCLUDING STEPS) SHALL NOT BE GREATER THAN 27 SQ. FT.
2. ALL STRUCTURAL PLATFORM SUPPORTING MEMBERS BELOW ELEV 7.5 MLLW SHALL BE SUITABLE FOR MARINE ENVIRONMENT SUBMERSION INTO HARBOR WATERS AS WELL AS SUBTERRANEAN EMBEDMENT INTO THE MUDFLATS. TREATED LUMBER IS NOT ALLOWED FOR THIS SERVICE, UNLESS ENCAPSULATED IN AN IMPERVIOUS MEMBRANE. ALTERNATIVE OR COMPOSITE MATERIALS OR CONSTRUCTION CAN BE SUBMITTED FOR CITY APPROVAL.
3. PLATFORM SHALL NOT BE ANCHORED TO COPING.
4. PRESERVATIVE TREATMENT FOR ALL LUMBER USED ABOVE ELEV 7.5 MLLW SHALL MEET STATE OF CALIFORNIA REQUIREMENTS.
5. ALL METAL CONNECTION PLATES SHALL BE GALVANIZED OR STAINLESS STEEL. ALL FASTENERS (LAG BOLTS, SCREWS AND/OR NAILS) SHALL BE GALVANIZED STEEL, STAINLESS STEEL OR A PRODUCT SPECIFICALLY DESIGNED TO RESIST CORROSION IN THE MARINE ENVIRONMENT, AND APPROVED BY THE CITY.
6. NON-STRUCTURAL MEMBERS MAY BE ALTERNATIVE MATERIALS SUCH AS PLASTIC DIMENSIONAL LUMBER. SUBMIT PRODUCT SPECIFICATIONS TO THE CITY FOR APPROVAL.
7. SEE TABLE NO. 2 IN THE HARBOR DESIGN CRITERIA FOR MINIMUM BULKHEAD ELEVATIONS.

APP.	 CITY ENGINEER	51568 RCE	11/24/2020 DATE	
				NO.    DATE    DESCRIPTION OF REVISIONS

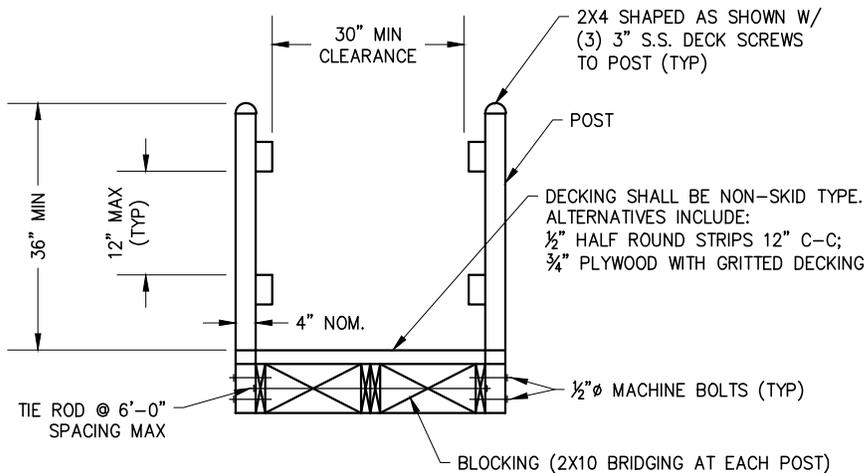
**CITY OF NEWPORT BEACH DEPARTMENT OF PUBLIC WORKS**

DRAWN: P. KHARAZMI	<h1>GRAND CANAL - PLATFORM &amp; STEPS</h1>	STANDARD DRAWING NO. <h2>603</h2> SHEET 1 OF 1
DATE: 11/3/2020		



**GANGWAY SIDE ELEVATION**

(USING STANDARD SAWN LUMBER STRINGERS)  
 (MAX SLOPE FOR RESIDENTIAL USE = 1:2.5)



**SECTION A-A**

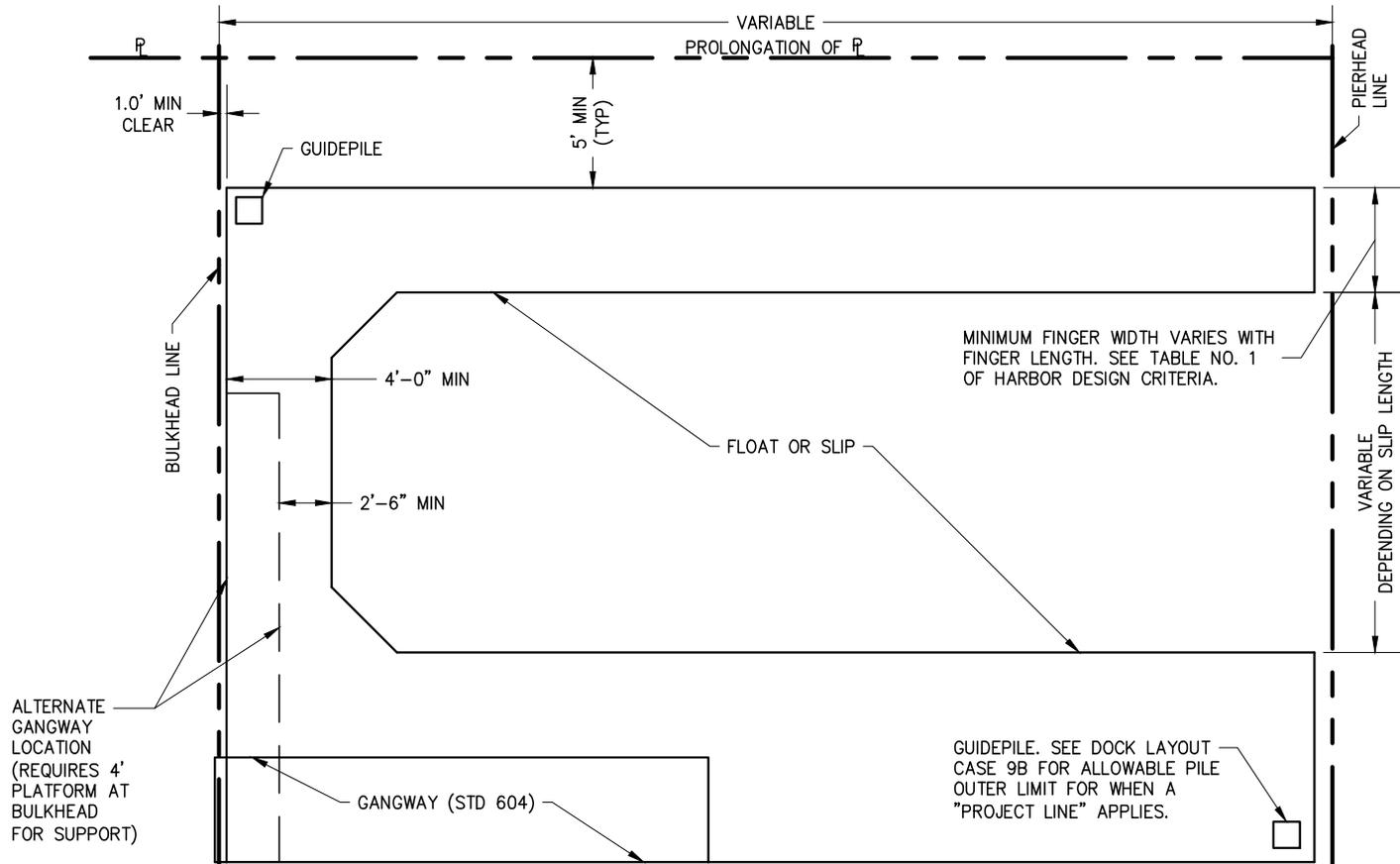
**NOTES:**

1. TIMBER SHALL BE SELECT STRUCTURAL DOUGLAS FIR TREATED WITH A STATE OF CALIFORNIA-APPROVED PRESERVATIVE (CALIFORNIA COASTAL COMMISSION AND REGIONAL WATER QUALITY CONTROL BOARD). (ALLOWABLE BENDING STRESS,  $F_b = 1500$  PSI).
2. FIELD CUTS AND BORED HOLES SHALL RECEIVE A FIELD-APPLIED COAT OF PRESERVATIVE TREATMENT, PER STATE AND FEDERAL GUIDELINES.
3. FASTENERS SHALL BE STAINLESS, HOT-DIP GALVANIZED OR EPOXY-COATED STEEL.
4. WALKING SURFACES SHALL HAVE A SKID-RESISTANT FINISH, SUCH AS UNPAINTED TIMBER, GRIT ON TIMBER, OR OTHER SURFACING DEEMED APPROPRIATE FOR THE INTENDED SERVICE BY THE CITY.
5. NON-STRUCTURAL MEMBERS MAY BE ALTERNATIVE MATERIALS SUCH AS COMPOSITE DIMENSIONAL LUMBER. SUBMIT PRODUCT SPECIFICATIONS TO THE CITY FOR APPROVAL.
6. OPTIONAL GANGWAY TYPES:  
 ALUMINUM GANGWAYS WITH NON-SKID WALKING PLANKS ARE RECOMMENDED AS A SUBSTITUTE FOR THE DETAILS NOTED IN THIS STANDARD. ALUMINUM GANGWAYS ARE NORMALLY PROVIDED BY QUALIFIED DESIGN/BUILD ALUMINUM FABRICATORS.
7. FOR LENGTHS OVER 26', APPLICANT TO PROVIDE STRUCTURAL ENGINEERING CALCULATIONS.

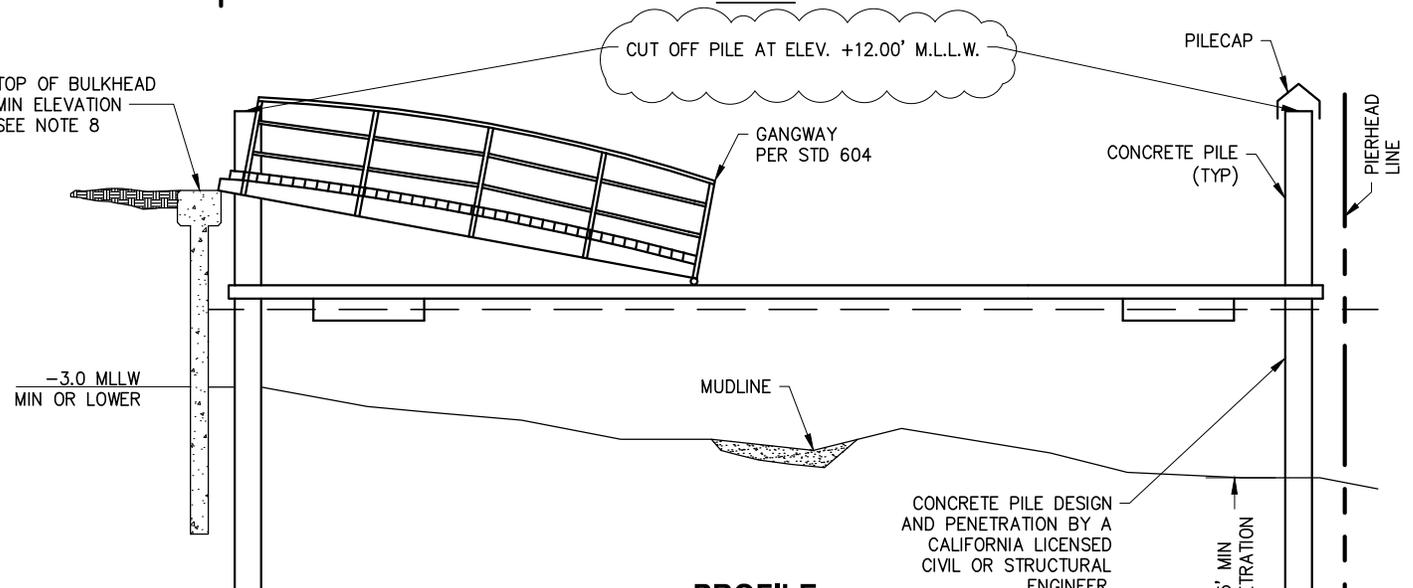
APP. <i>James M. Hinkle</i>	51568	11/24/2020			
CITY ENGINEER	RCE	DATE	NO.	DATE	DESCRIPTION OF REVISIONS

**CITY OF NEWPORT BEACH DEPARTMENT OF PUBLIC WORKS**

DRAWN: P. KHARAZMI	<b>SINGLE OR JOINT RESIDENTIAL USE GANGWAY</b>	STANDARD DRAWING NO.
DATE: 11/3/2020		<b>604</b>
		SHEET 1 OF 1



**PLAN**



**PROFILE**

**NOTES:**

1. TIMBER SHALL BE SELECT STRUCTURAL DOUGLAS FIR TREATED WITH PRESERVATIVE APPROVED BY THE STATE OF CALIFORNIA (CALIFORNIA COASTAL COMMISSION AND REGIONAL WATER QUALITY CONTROL BOARD).
2. FIELD CUTS AND BORED HOLES SHALL RECEIVE A BRUSH COAT OF PRESERVATIVE TREATMENT PER STATE AND FEDERAL GUIDELINES.
3. FASTENERS SHALL BE STAINLESS, HOT-DIP GALVANIZED OR EPOXY-COATED STEEL.
4. WALKING SURFACES SHALL HAVE A SKID RESISTANT FINISH, SUCH AS UNPAINTED TIMBER OR GRIT ON TIMBER, OR OTHER SURFACING DEEMED APPROPRIATE FOR THE INTENDED SERVICE, BY THE CITY.
5. NON-STRUCTURAL MEMBERS MAY BE ALTERNATIVE MATERIALS SUCH AS COMPOSITE DIMENSIONAL LUMBER. SUBMIT PRODUCT SPECIFICATIONS TO THE CITY FOR APPROVAL.
6. SEE STD 604 & HARBOR DESIGN CRITERIA FOR GANGWAY DESIGN REQUIREMENTS.
7. LOCATION OF PLATFORM, GANGWAY, SLIP & FLOATS IS OPTIONAL PROVIDING PROPER SETBACKS ARE MAINTAINED.
8. SEE TABLE NO. 2 IN THE HARBOR DESIGN CRITERIA FOR MINIMUM BULKHEAD ELEVATIONS.

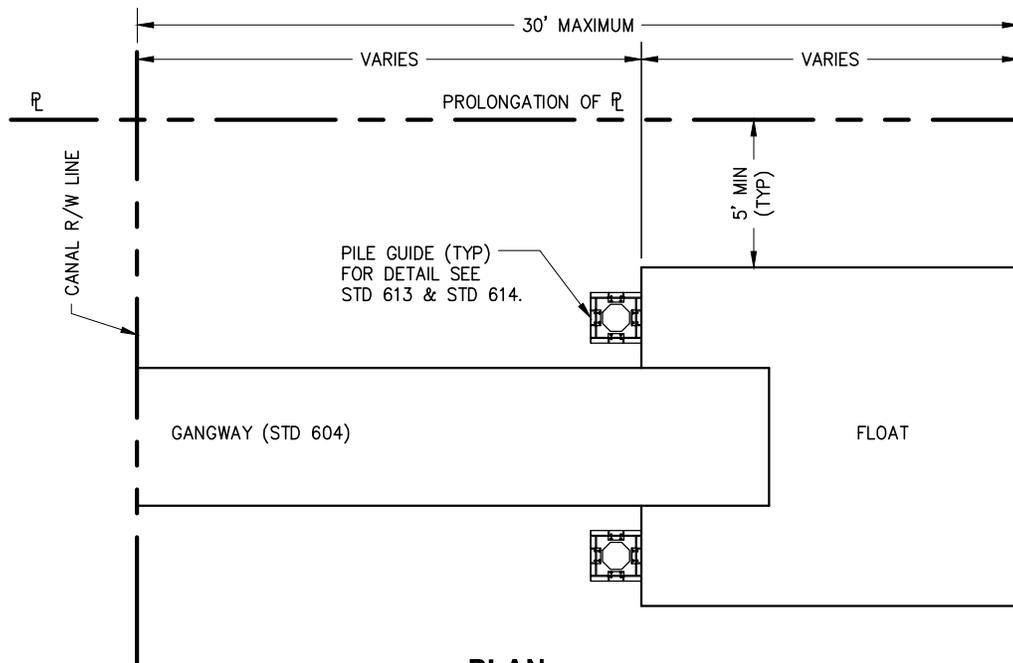
APP. <i>James M. Hinkle</i>	51568	11/24/2020			
CITY ENGINEER	RCE	DATE	NO.	DATE	DESCRIPTION OF REVISIONS

**CITY OF NEWPORT BEACH DEPARTMENT OF PUBLIC WORKS**

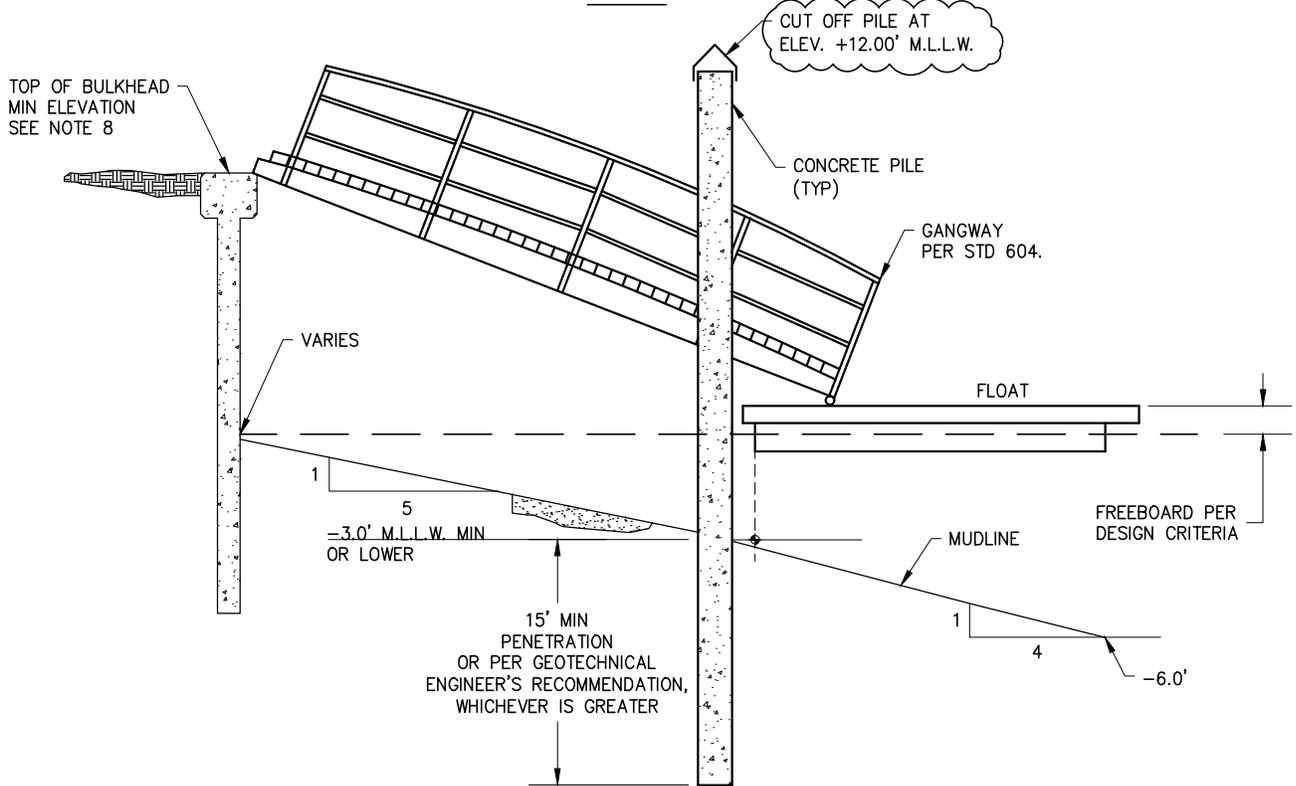
DRAWN: P. KHARAZMI  
DATE: 11/3/2020

**SINGLE RESIDENTIAL USE  
FLOAT WITHOUT PIER**

STANDARD DRAWING NO.  
**605**  
SHEET 1 OF 1



**PLAN**



**PROFILE**

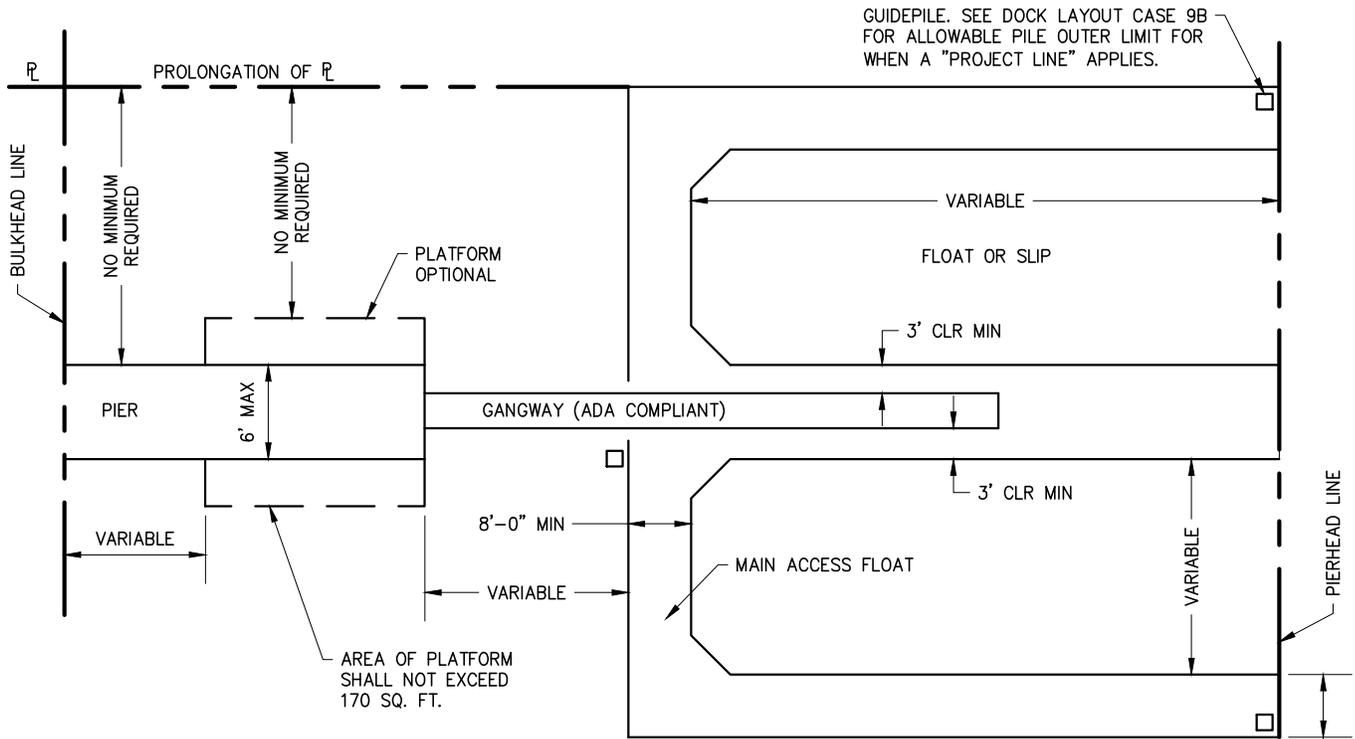
**NOTES:**

1. TIMBER SHALL BE SELECT STRUCTURAL DOUGLAS FIR TREATED WITH PRESERVATIVE APPROVED BY THE STATE OF CALIFORNIA (CALIFORNIA COASTAL COMMISSION AND REGIONAL WATER QUALITY CONTROL BOARD).
2. FIELD CUTS AND BORED HOLES SHALL RECEIVE A BRUSH COAT OF PRESERVATIVE TREATMENT PER STATE AND FEDERAL GUIDELINES.
3. FASTENERS SHALL BE STAINLESS, HOT DIP GALVANIZED OR EPOXY-COATED STEEL.
4. WALKING SURFACES SHALL HAVE A SKID RESISTANT FINISH, SUCH AS UNPAINTED TIMBER OR GRIT ON TIMBER, OR OTHER SURFACING DEEMED APPROPRIATE FOR THE INTENDED SERVICE, BY THE CITY.
5. NON-STRUCTURAL MEMBERS MAY BE ALTERNATIVE MATERIALS SUCH AS COMPOSITE DIMENSIONAL LUMBER, SUBMIT PRODUCT SPECIFICATIONS TO THE CITY FOR APPROVAL.
6. SEE STD 604 & HARBOR DESIGN CRITERIA FOR GANGWAY DESIGN REQUIREMENTS.
7. LOCATION OF PLATFORM, GANGWAY, SLIP & FLOATS IS OPTIONAL PROVIDING PROPER SETBACKS ARE MAINTAINED.
8. SEE TABLE NO. 2 IN THE HARBOR DESIGN CRITERIA FOR MINIMUM BULKHEAD ELEVATIONS.

APP.	51568 RCE	11/24/2020 DATE	
CITY ENGINEER	RCE	DATE	
			NO.    DATE    DESCRIPTION OF REVISIONS

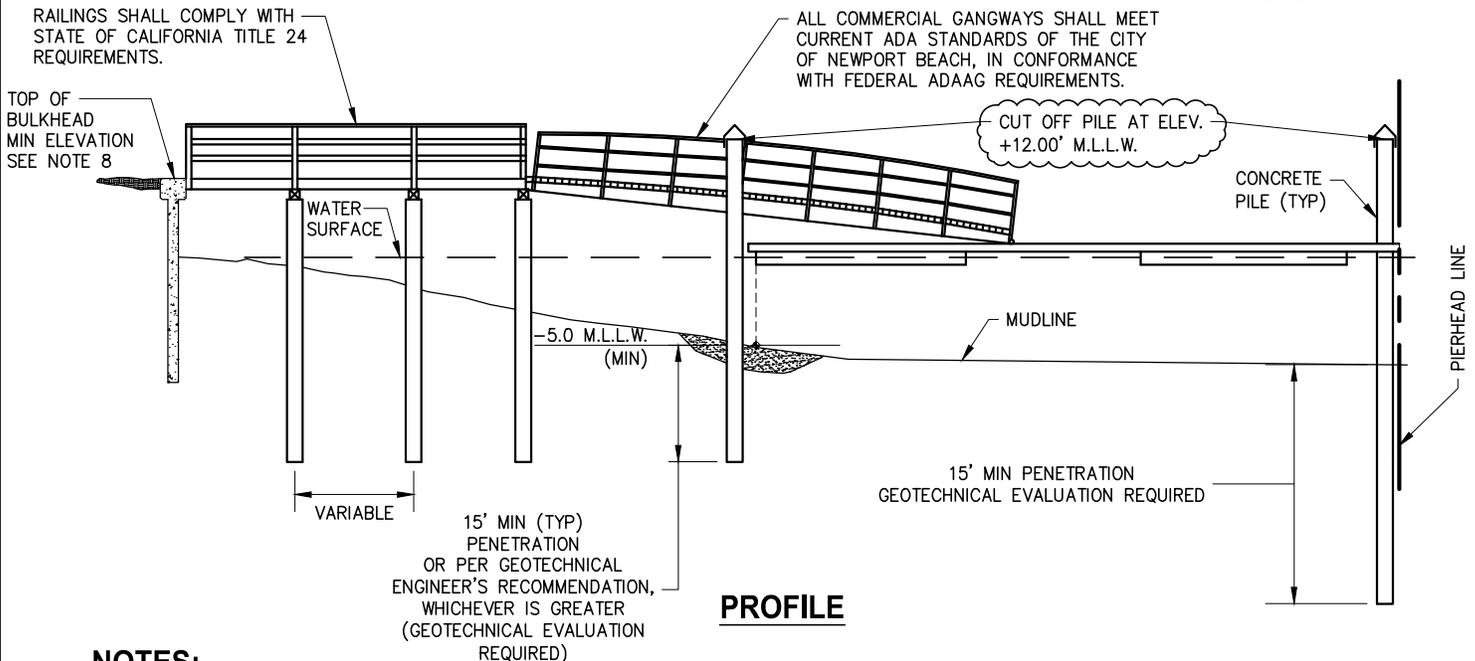
**CITY OF NEWPORT BEACH DEPARTMENT OF PUBLIC WORKS**

DRAWN: P. KHARAZMI	SINGLE RESIDENTIAL USE FLOAT WEST NEWPORT CHANNELS	606
DATE: 11/3/2020		STANDARD DRAWING NO. SHEET 1 OF 1



**PLAN**

MIN FINGER WIDTH VARIES WITH FINGER LENGTH. SEE TABLE NO. 1 OF HARBOR DESIGN CRITERIA.



**PROFILE**

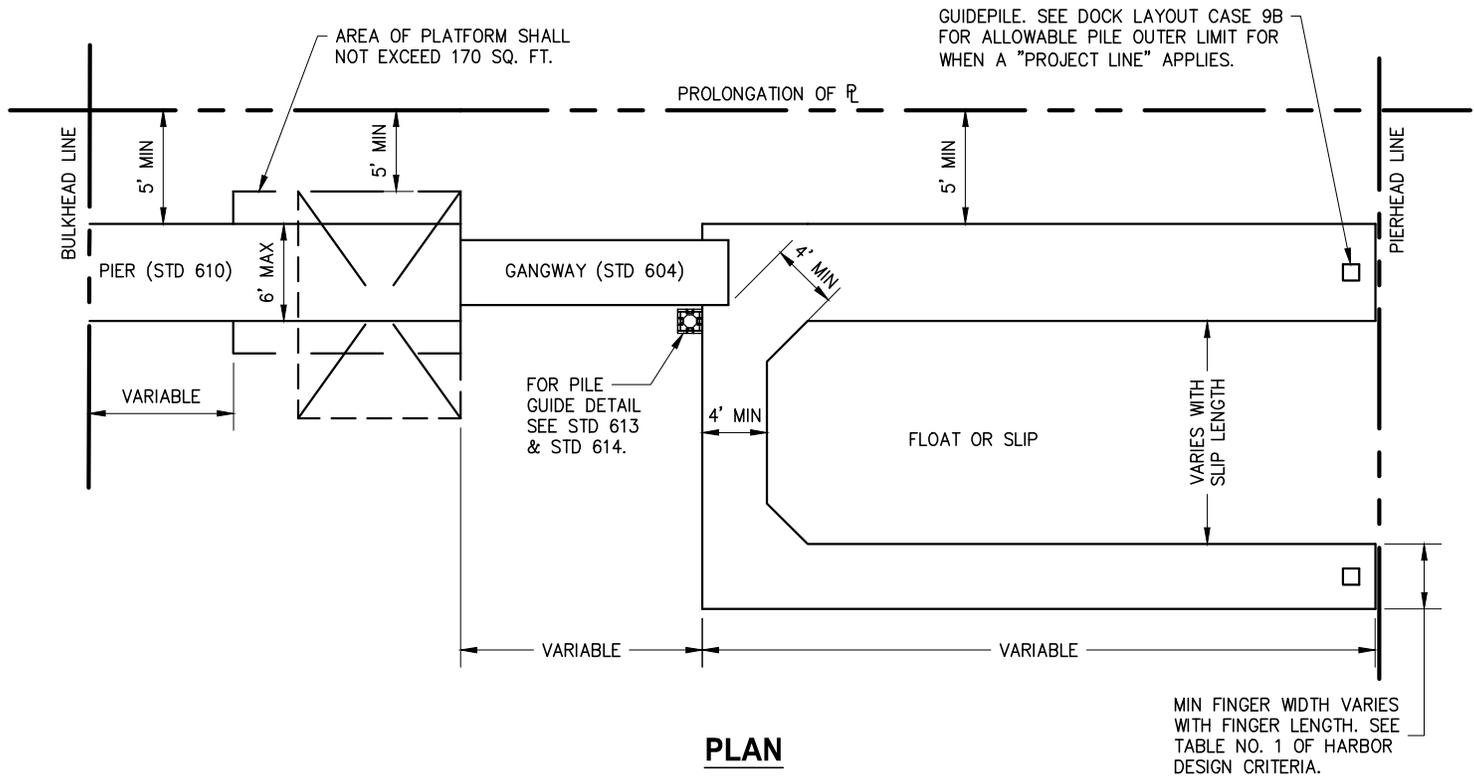
**NOTES:**

1. TIMBER SHALL BE SELECT STRUCTURAL DOUGLAS FIR TREATED WITH PRESERVATIVE APPROVED BY THE STATE OF CALIFORNIA (CALIFORNIA COASTAL COMMISSION AND REGIONAL WATER QUALITY CONTROL BOARD).
2. FIELD CUTS AND BORED HOLES SHALL RECEIVE A BRUSH COAT OF PRESERVATIVE TREATMENT PER STATE AND FEDERAL GUIDELINES.
3. FASTENERS SHALL BE STAINLESS, HOT DIP GALVANIZED OR EPOXY-COATED STEEL.
4. WALKING SURFACES SHALL HAVE A SKID RESISTANT FINISH, SUCH AS UNPAINTED TIMBER OR GRIT ON TIMBER, OR OTHER SURFACING DEEMED APPROPRIATE FOR THE INTENDED SERVICE, BY THE CITY.
5. NON-STRUCTURAL MEMBERS MAY BE ALTERNATIVE MATERIALS SUCH AS COMPOSITE DIMENSIONAL LUMBER, SUBMIT PRODUCT SPECIFICATIONS TO THE CITY FOR APPROVAL.
6. COMMERCIAL PIERS, GANGWAYS, FLOATS AND PILES TO BE DESIGNED BY A CALIFORNIA LICENSED CIVIL OR STRUCTURAL ENGINEER.
7. LOCATION OF PLATFORM, GANGWAY, SLIP & FLOATS IS OPTIONAL PROVIDING PROPER SETBACKS ARE MAINTAINED.
8. SEE TABLE NO. 2 IN THE HARBOR DESIGN CRITERIA FOR MINIMUM BULKHEAD ELEVATIONS.

APP.  CITY ENGINEER	51568 RCE	11/24/2020 DATE										
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NO.	DATE	DESCRIPTION OF REVISIONS										

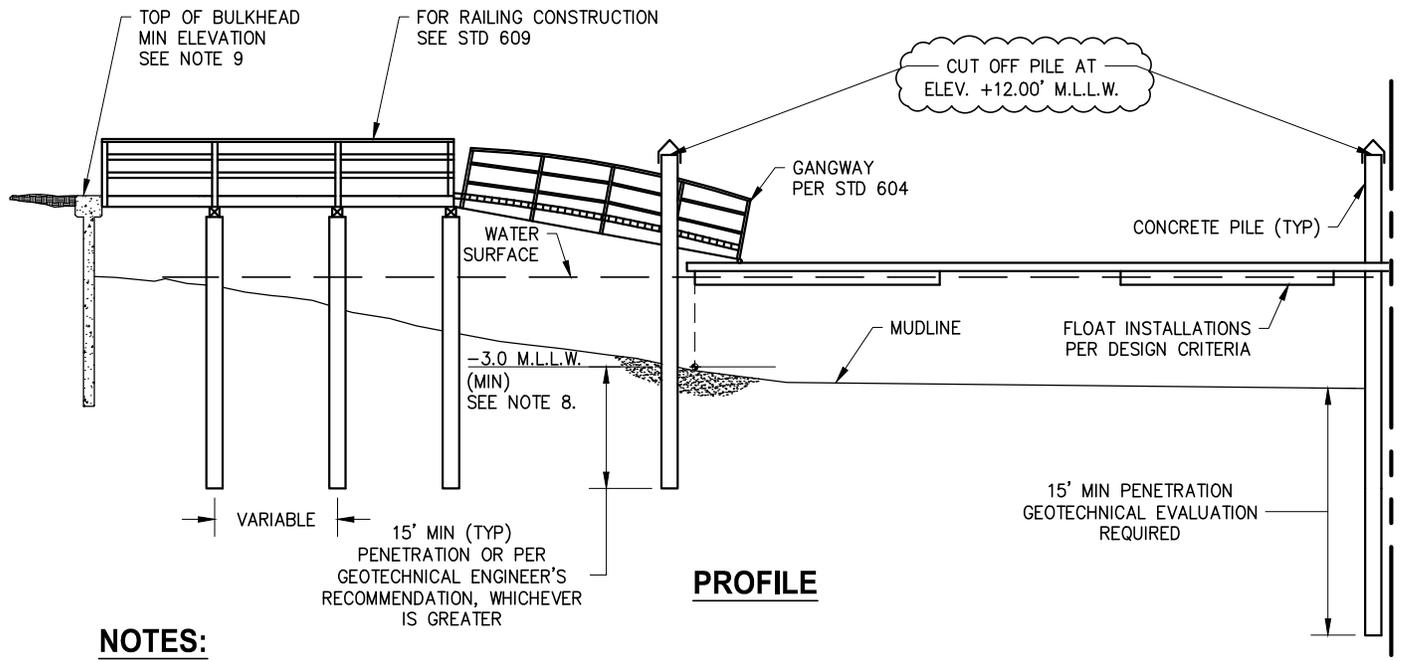
**CITY OF NEWPORT BEACH DEPARTMENT OF PUBLIC WORKS**

DRAWN: P. KHARAZMI	COMMERCIAL PIER & FLOAT INSTALLATION	607
DATE: 11/3/2020		STANDARD DRAWING NO. SHEET 1 OF 1



**PLAN**

MIN FINGER WIDTH VARIES WITH FINGER LENGTH. SEE TABLE NO. 1 OF HARBOR DESIGN CRITERIA.



**PROFILE**

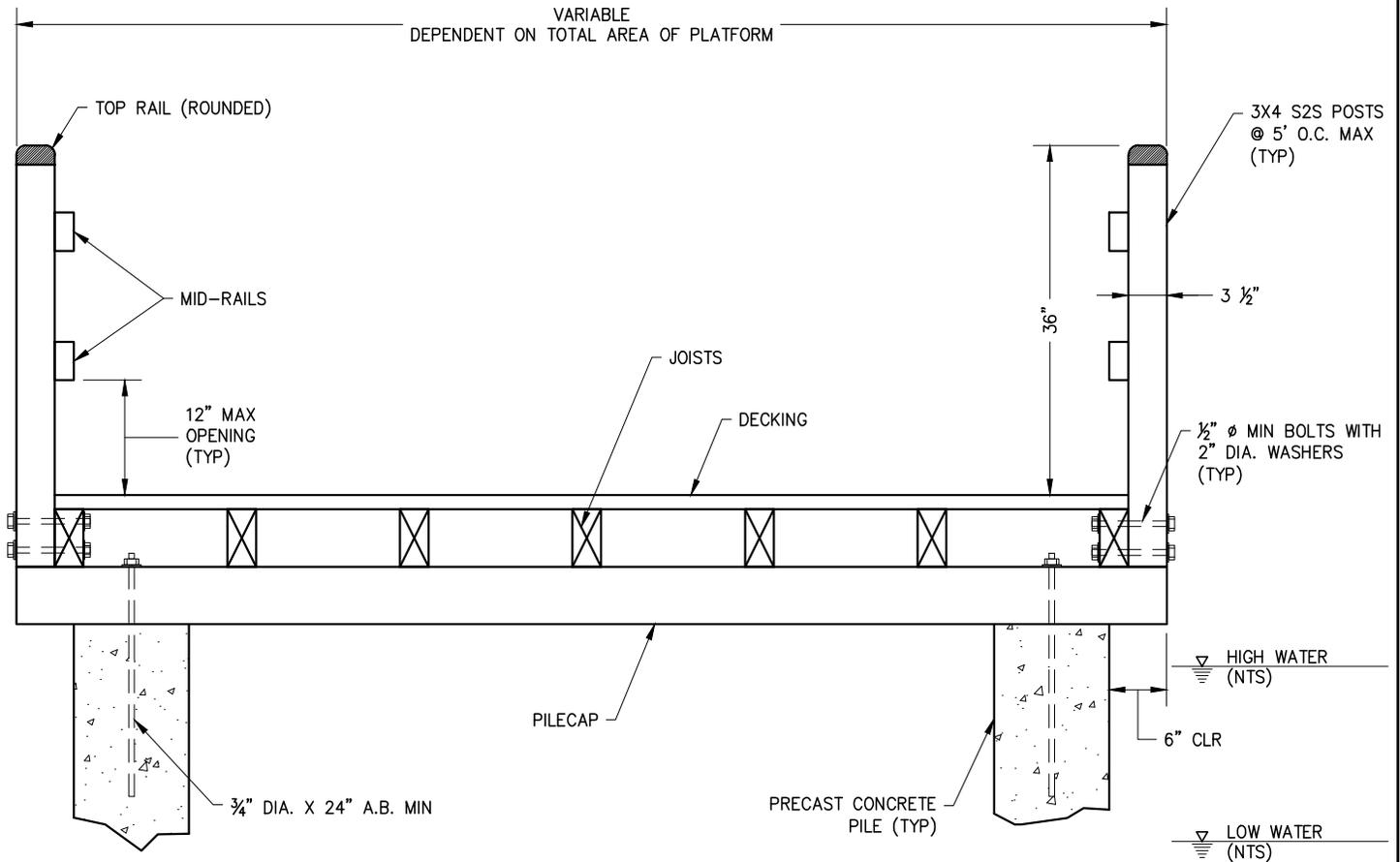
**NOTES:**

1. TIMBER SHALL BE SELECT STRUCTURAL DOUGLAS FIR TREATED WITH PRESERVATIVE APPROVED BY THE STATE OF CALIFORNIA (CALIFORNIA COASTAL COMMISSION AND REGIONAL WATER QUALITY CONTROL BOARD).
2. FIELD CUTS AND BORED HOLES SHALL RECEIVE A BRUSH COAT OF PRESERVATIVE TREATMENT PER STATE AND FEDERAL GUIDELINES.
3. FASTENERS SHALL BE STAINLESS, HOT DIP GALVANIZED OR EPOXY-COATED STEEL.
4. WALKING SURFACES SHALL HAVE A SKID RESISTANT FINISH, SUCH AS UNPAINTED TIMBER OR GRIT ON TIMBER, OR OTHER SURFACING DEEMED APPROPRIATE FOR THE INTENDED SERVICE, BY THE CITY.
5. NON-STRUCTURAL MEMBERS MAY BE ALTERNATIVE MATERIALS SUCH AS COMPOSITE DIMENSIONAL LUMBER, SUBMIT PRODUCT SPECIFICATIONS TO THE CITY FOR APPROVAL.
5. SEE STD 604 & HARBOR DESIGN CRITERIA FOR GANGWAY DESIGN REQUIREMENTS.
6. LOCATION OF PLATFORM, GANGWAY, SLIP & FLOATS IS OPTIONAL PROVIDING PROPER SETBACKS ARE MAINTAINED.
7. UNDER EXTREME LOW WATER CONDITIONS, PONTOON MAY CONTACT MUDLINE. VERIFY IF PONTOONS AND DOCK SYSTEM CAN WITHSTAND THIS STRESS.
8. SEE TABLE NO. 2 IN THE HARBOR DESIGN CRITERIA FOR MINIMUM BULKHEAD ELEVATIONS.

APP.	51568	11/24/2020	
CITY ENGINEER	RCE	DATE	
			NO.      DATE      DESCRIPTION OF REVISIONS

**CITY OF NEWPORT BEACH DEPARTMENT OF PUBLIC WORKS**

DRAWN: P. KHARAZMI	SINGLE RESIDENTIAL USE FLOAT WITH PIER	608
DATE: 11/3/2020		STANDARD DRAWING NO. SHEET 1 OF 1



**TYPICAL PLATFORM SECTION**

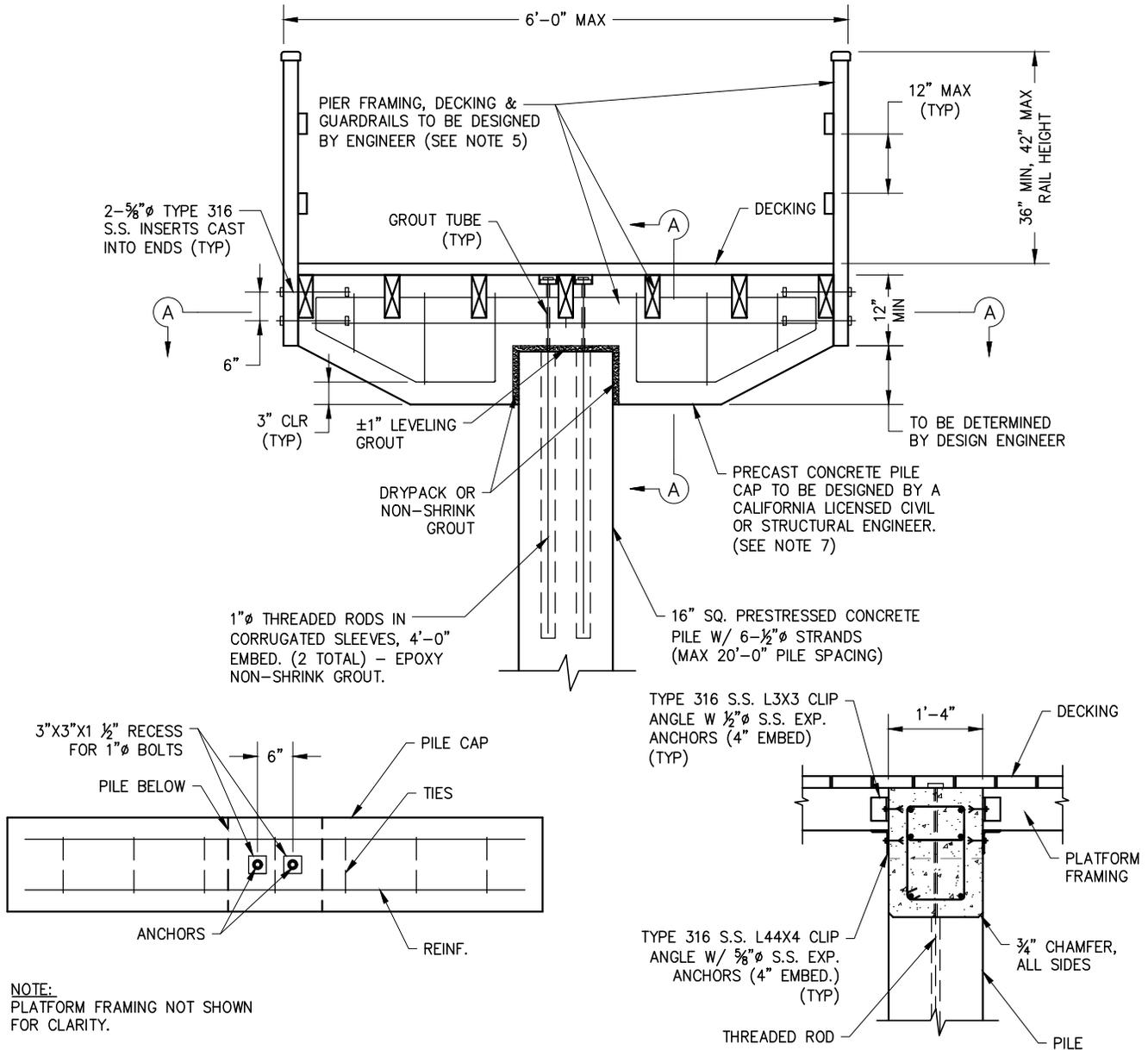
**NOTES:**

1. TIMBER SHALL BE SELECT STRUCTURAL DOUGLAS FIR TREATED WITH PRESERVATIVE APPROVED BY THE STATE OF CALIFORNIA (CALIFORNIA COASTAL COMMISSION AND REGIONAL WATER QUALITY CONTROL BOARD).
2. FIELD CUTS AND BORED HOLES SHALL RECEIVE A BRUSH COAT OF PRESERVATIVE TREATMENT PER STATE AND FEDERAL GUIDELINES.
3. FASTENERS SHALL BE STAINLESS, HOT DIP GALVANIZED OR EPOXY-COATED STEEL.
4. WALKING SURFACES SHALL HAVE A SKID RESISTANT FINISH, SUCH AS UNPAINTED TIMBER OR GRIT ON TIMBER, OR OTHER SURFACING DEEMED APPROPRIATE FOR THE INTENDED SERVICE, BY THE CITY OF.
5. NON-STRUCTURAL MEMBERS MAY BE ALTERNATIVE MATERIALS SUCH AS COMPOSITE DIMENSIONAL LUMBER, SUBMIT PRODUCT SPECIFICATIONS TO THE CITY.
6. JOIST SPLICES ARE NOT PERMITTED BETWEEN PILES.
7. DESIGN TO BE BY A CALIFORNIA LICENSED CIVIL OR STRUCTURAL ENGINEER.

APP.	51568 RCE	11/24/2020 DATE	
CITY ENGINEER			
			NO.      DATE      DESCRIPTION OF REVISIONS

**CITY OF NEWPORT BEACH DEPARTMENT OF PUBLIC WORKS**

DRAWN: P. KHARAZMI	<b>SINGLE OR JOINT RESIDENTIAL USE PLATFORM SECTION</b>	STANDARD DRAWING NO. <b>609</b> SHEET 1 OF 1
DATE: 11/3/2020		



**SECTION A-A**

**SECTION B-B**

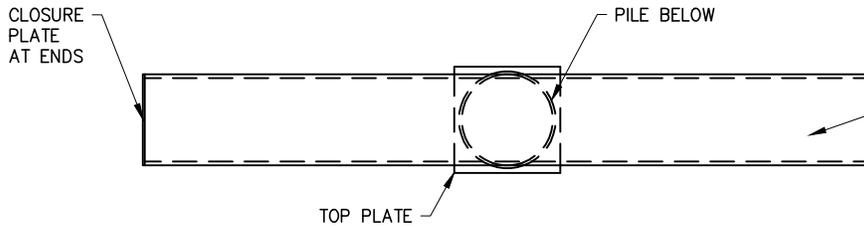
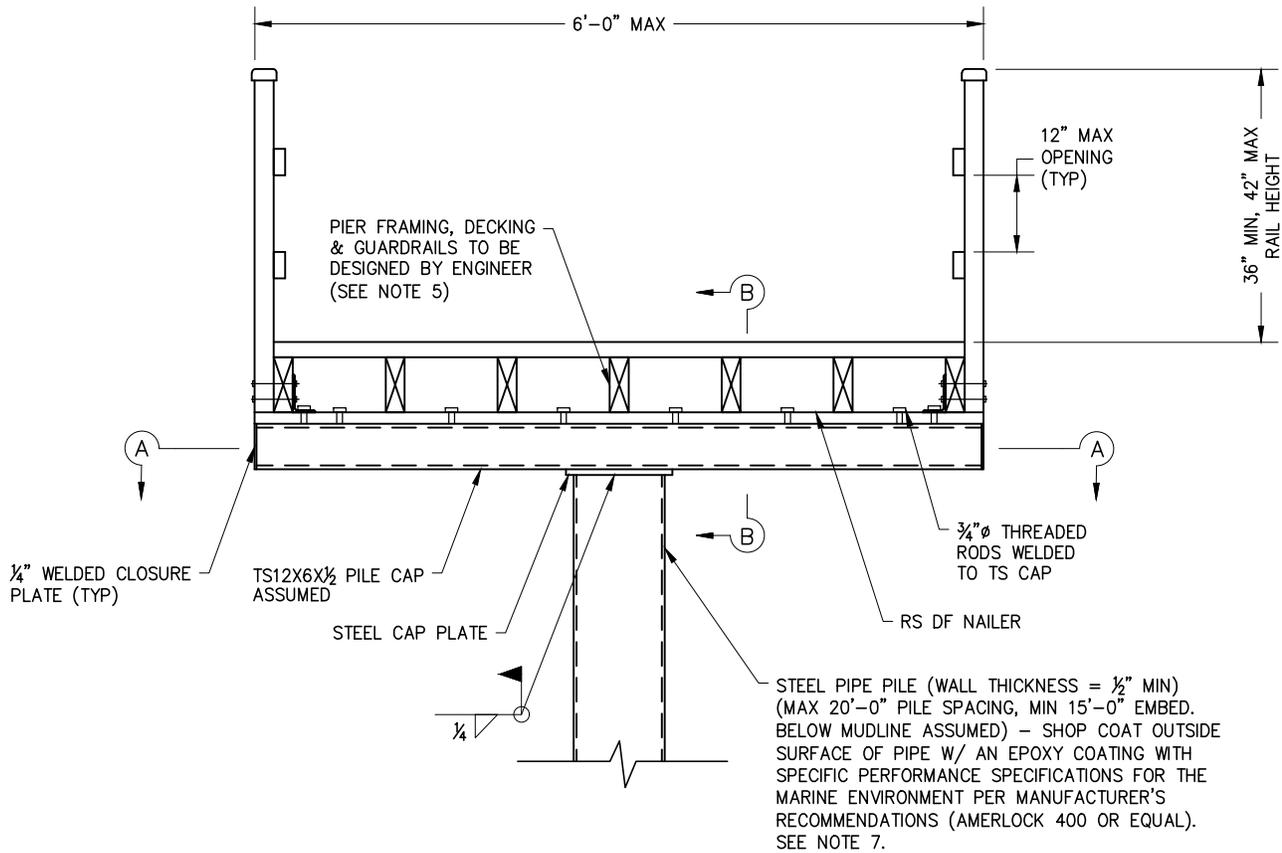
**NOTES:**

1. CONCRETE SHALL HAVE A MINIMUM 28-DAY STRENGTH  $f'_c = 6,000$  PSI. PRE-STRESSING STRANDS SHALL HAVE A MINIMUM  $f_{pu} = 270$  KSI. SEE HARBOR DESIGN CRITERIA FOR ADDITIONAL CONCRETE REQUIREMENTS.
2. ALL TIMBER SHALL BE TREATED PER ACCEPTED STATE OF CALIFORNIA REQUIREMENTS.
3. BRACKETS AND FASTENERS FOR TIMBER FRAMING SHALL BE HOTDIP GALVANIZED, EPOXY-COATED OR STAINLESS STEEL. CONNECTORS TO BE  $\frac{1}{4}$ " MIN THICKNESS, UNLESS OTHERWISE NOTED.
4. WALKING SURFACES SHALL BE SKID RESISTANT.
5. ALL TIMBER PLATFORM FRAMING AND RAILINGS SHALL BE DESIGNED BY A LICENSED CIVIL OR STRUCTURAL ENGINEER REGISTERED IN CALIFORNIA AND ARE NOT DETAILED IN THIS STANDARD.
6. TIMBER STRINGER SPLICES ARE NOT PERMITTED BETWEEN PILES.
7. OPTIONAL CAST-IN-PLACE CONSTRUCTION IS ACCEPTABLE. IF SO, LEVELING GROUT AND DRYPACK OR NON-SHRINK GROUT ILLUSTRATION WOULD NOT BE REQUIRED.
8. A LICENSED GEOTECHNICAL ENGINEER REGISTERED IN CALIFORNIA SHALL VERIFY PILE SIZE AND TYPE, AS WELL AS EMBEDMENT. GEOTECHNICAL ENGINEER SHALL COORDINATE THE DESIGN WITH INPUT FROM A LICENSED CIVIL OR STRUCTURAL ENGINEER REGISTERED IN CALIFORNIA.

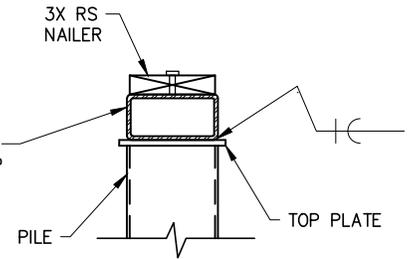
APP.	51568 RCE	11/24/2020 DATE	
CITY ENGINEER	RCE	DATE	

**CITY OF NEWPORT BEACH DEPARTMENT OF PUBLIC WORKS**

DRAWN: P. KHARAZMI	<h1>TYPICAL PIER SECTION</h1>	STANDARD DRAWING NO. <h2>610</h2>
DATE: 11/3/2020		SHEET 1 OF 2



**SECTION A-A**



**SECTION B-B**

**NOTES:**

1. ALL STEEL COMPONENTS SHALL BE MINIMUM ASTM A36 (MIN Fy = 36 KSI). ALL STEEL PIPE PILES SHALL BE ASTM A53, GR B MATERIAL (MIN Fy = 35 KSI).
2. ALL TIMBER SHALL BE TREATED PER ACCEPTED STATE OF CALIFORNIA REQUIREMENTS.
3. BRACKETS AND FASTENERS FOR TIMBER FRAMING SHALL BE HOT-DIP GALVANIZED, EPOXY-COATED OR STAINLESS STEEL. CONNECTORS TO BE 1/4" MIN THICKNESS, UNLESS OTHERWISE NOTED.
4. WALKING SURFACES SHALL HAVE A SKID-RESISTANT FINISH, SUCH AS UNPAINTED TIMBER.
5. ALL TIMBER PLATFORM FRAMING AND RAILINGS SHALL BE DESIGNED BY A LICENSED ENGINEER AND ARE NOT DETAILED IN THIS STANDARD.
6. TIMBER STRINGER SPLICES ARE NOT PERMITTED BETWEEN PILES.
7. NO COATING ON STEELWORK 4" FROM WELDED PARTS (PILE AND CAP) TO ALLOW FOR FIELD WELDING. TOUCH-UP THIS UNCOATED AREA AFTER FABRICATION PER MANUFACTURER'S RECOMMENDATIONS, INCLUDING SURFACE PREPARATION. IF PILES REQUIRE CUT-OFF DUE TO SUFFICIENT BLOW COUNTS PRIOR TO OBTAINING TIP ELEVATION, REMOVE COATING IN UPPER 4" OF PILE TO ALLOW FIELD WELDING.
8. FOR ADDITIONAL CORROSION RESISTANCE, THE APPLICANT MAY WISH TO CONSIDER INSTALLING A PASSIVE OR ACTIVE CATHODIC PROTECTION SYSTEM.
9. AN ENGINEER LICENSED IN THE STATE OF CALIFORNIA SHALL VERIFY PILE SIZE AND TYPE, AS WELL AS EMBEDMENT.

APP. *James M. Hinkle* 51568 11/24/2020  
 CITY ENGINEER RCE DATE

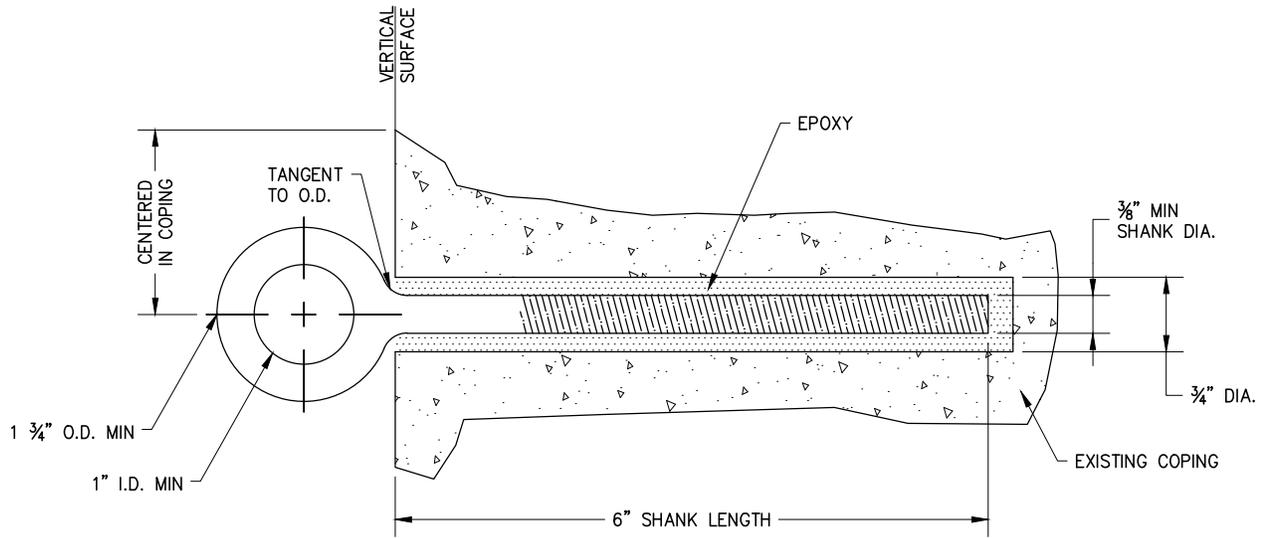
NO.	DATE	DESCRIPTION OF REVISIONS

**CITY OF NEWPORT BEACH DEPARTMENT OF PUBLIC WORKS**

DRAWN: P. KHARAZMI  
 DATE: 11/3/2020

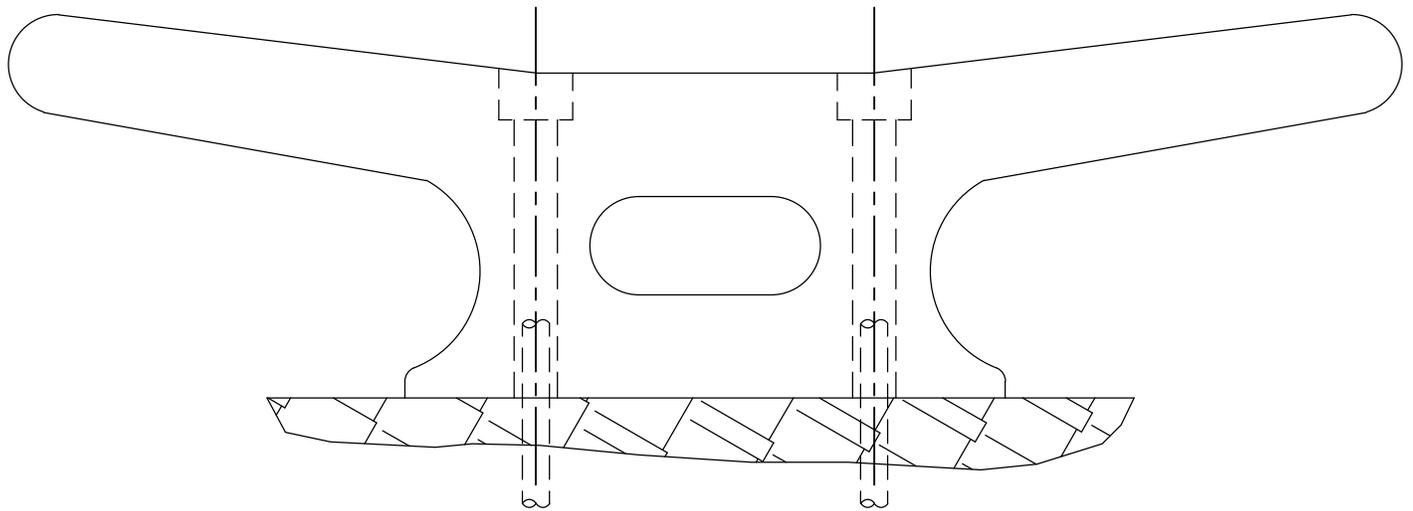
**TYPICAL PIER SECTION  
 (ALTERNATE)**

STANDARD DRAWING NO.  
**610**  
 SHEET 2 OF 2



**EYE BOLT**

(SHORE MOORING)



**DOCK CLEAT**

(TYPICAL DOCK MOORING CLEAT)

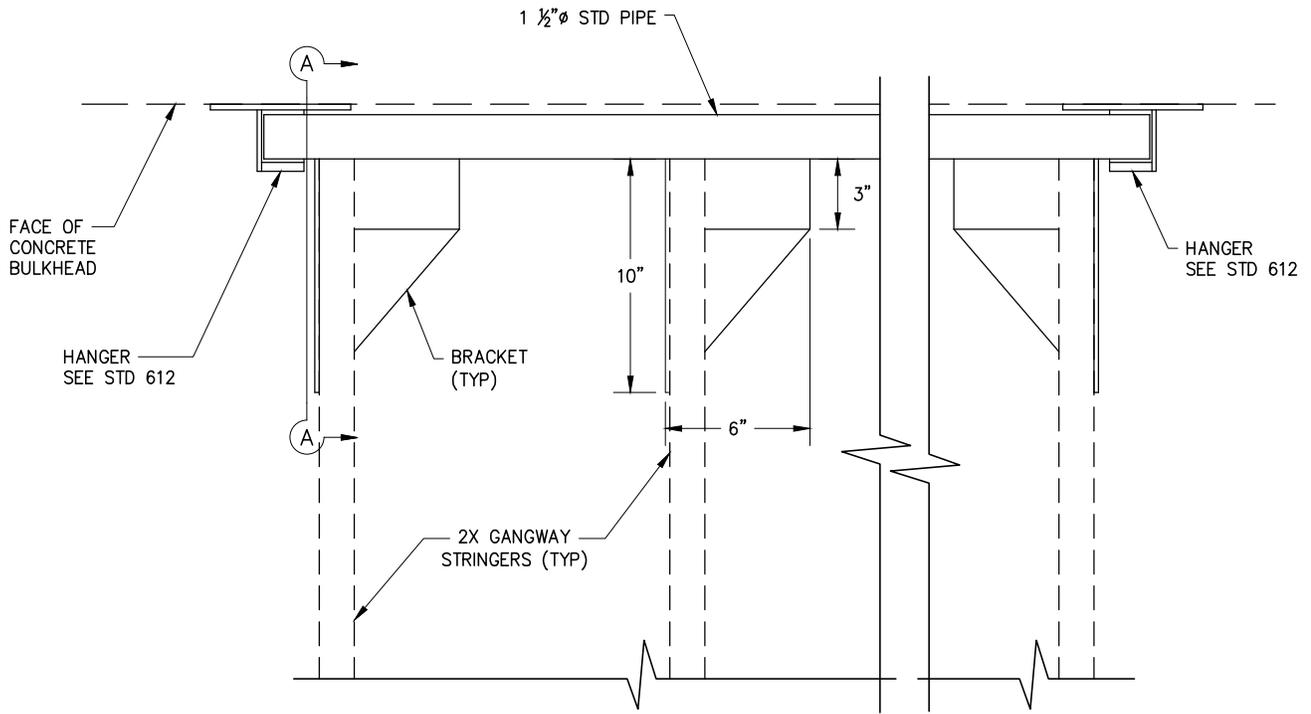
**NOTES:**

1. EYE BOLT SHALL BE FABRICATED OF STAINLESS STEEL.
2. EPOXY SHALL CONFORM TO ASTM C881 STANDARD, OR SHALL BE AN EPOXY FORTIFIED GROUT INTENDED TO BE USED FOR PERMANENT ANCHORAGE OF EQUIPMENT, AND SHALL BE APPLIED IN ACCORDANCE WITH THE MANUFACTURER'S WRITTEN INSTRUCTIONS.
3. DOCK CLEATS SHALL BE CAST ALUMINUM OR GALVANIZED CAST METAL WITH HEX-HEAD THRU-BOLTS CONNECTED INTO THE TIMBER FRAMING WITH WASHER AND NUT, ALL GALVANIZED.
4. DIAMETER OF THRU-BOLT PER CLEAT MANUFACTURER RECOMMENDATIONS.
5. CLEAT AND BOLT SIZES BY DESIGN ENGINEER.

APP.	51568 RCE	11/24/2020 DATE			
CITY ENGINEER			NO.	DATE	DESCRIPTION OF REVISIONS

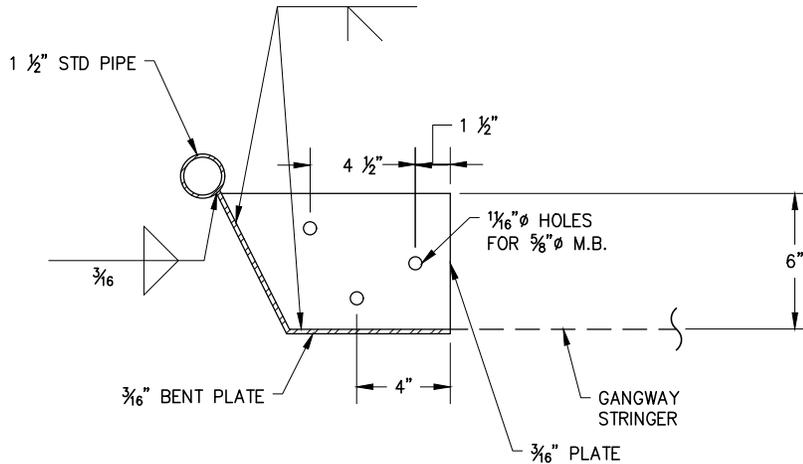
**CITY OF NEWPORT BEACH DEPARTMENT OF PUBLIC WORKS**

DRAWN: P. KHARAZMI	<b>EYE BOLT OR CLEAT FOR BOAT ANCHORAGE</b>	STANDARD DRAWING NO. <b>611</b> SHEET 1 OF 1
DATE: 11/3/2020		



**PARTIAL PLAN AT GANGWAY**

NOTE: 1 1/2"  $\phi$  PIPE AND "KEEPER" PLATE NOT SHOWN FOR CLARITY.



**DETAIL A - GANGWAY BRACKET**

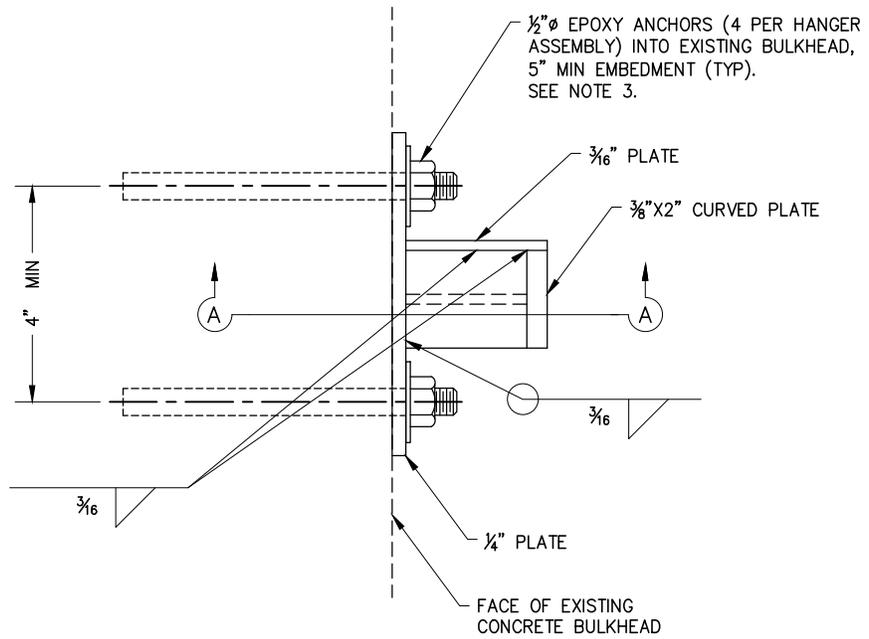
**NOTES:**

1. ALL STEEL SHALL BE GALVANIZED.
2. PROVIDE ONE BRACKET PER GANGWAY STRINGER.

APP. 	51568	11/24/2020			
CITY ENGINEER	RCE	DATE	NO.	DATE	DESCRIPTION OF REVISIONS

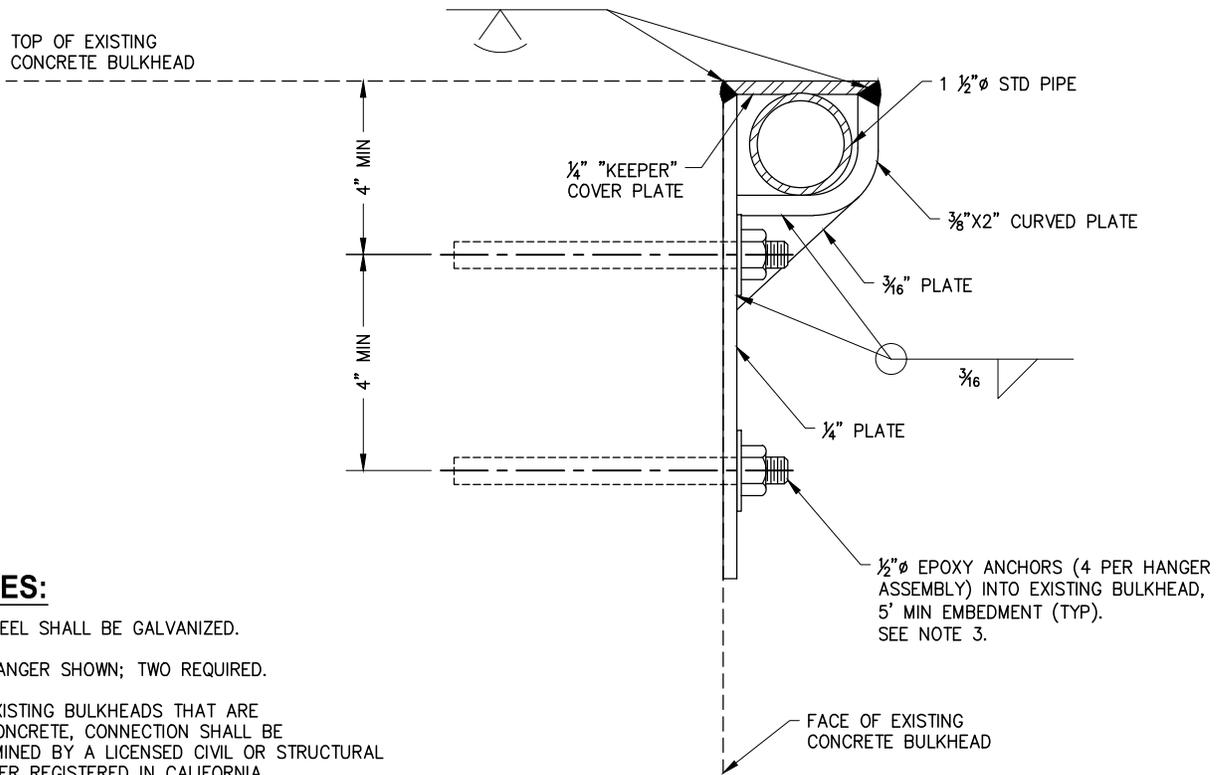
**CITY OF NEWPORT BEACH DEPARTMENT OF PUBLIC WORKS**

DRAWN: P. KHARAZMI	<b>RESIDENTIAL GANGWAY BRACKET - TYPICAL (CONCEPT)</b>	STANDARD DRAWING NO.
DATE: 11/3/2020		<b>612</b> SHEET 1 OF 2



**PLAN DETAIL - GANGWAY HANGER**

NOTE: 1 1/2 inch diameter pipe and "KEEPER" plate not shown for clarity.



**NOTES:**

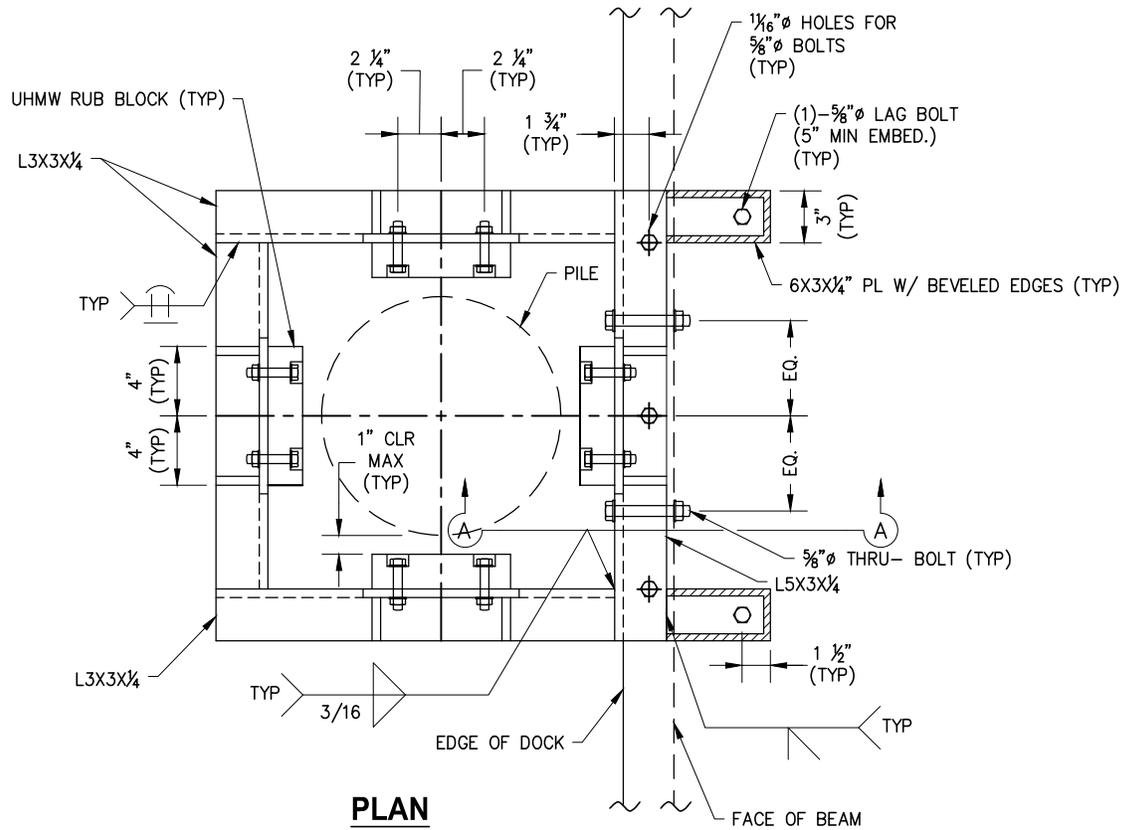
1. ALL STEEL SHALL BE GALVANIZED.
2. ONE HANGER SHOWN; TWO REQUIRED.
3. FOR EXISTING BULKHEADS THAT ARE NOT CONCRETE, CONNECTION SHALL BE DETERMINED BY A LICENSED CIVIL OR STRUCTURAL ENGINEER REGISTERED IN CALIFORNIA.

**DETAIL A - GANGWAY BRACKET**

APP.	51568 RCE	11/24/2020 DATE	
CITY ENGINEER			NO.    DATE    DESCRIPTION OF REVISIONS

**CITY OF NEWPORT BEACH DEPARTMENT OF PUBLIC WORKS**

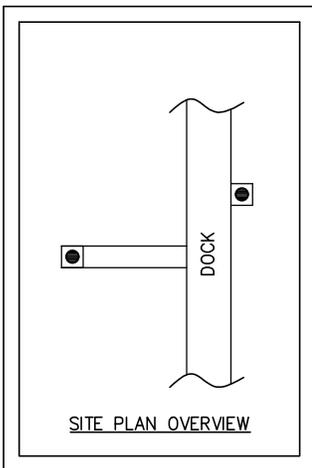
DRAWN: P. KHARAZMI	<h1 style="margin: 0;">RESIDENTIAL GANGWAY HANGER - TYPICAL (CONCEPT)</h1>	STANDARD DRAWING NO. <h2 style="margin: 0;">612</h2> SHEET 2 OF 2
DATE: 11/3/2020		



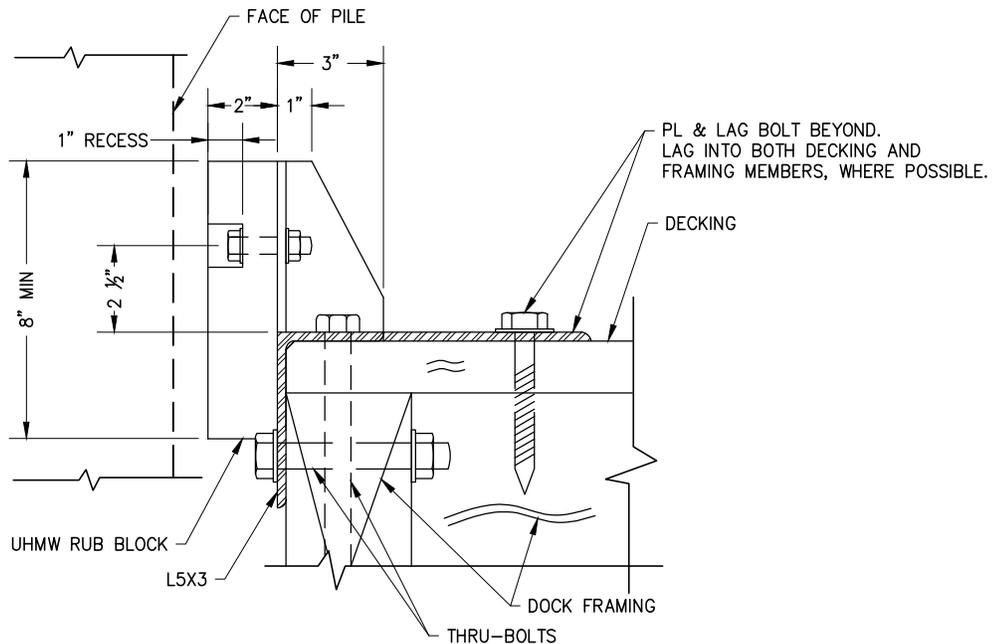
**PLAN**  
(CONDITION WITH GUIDE FRAME SUPPORTED ON ONE SIDE ONLY)

**NOTES:**

1. ALL STEEL ANGLES, PLATES AND CONNECTIONS SHALL BE GALVANIZED.
2. ALL WELDING TO BE 3/16" FILLET WELDS ALL AROUND BETWEEN CONNECTED PARTS, UNLESS OTHERWISE NOTED.
3. ALL PLATES TO BE 3/8" THICKNESS, UNLESS OTHERWISE NOTED.



**KEY PLAN**

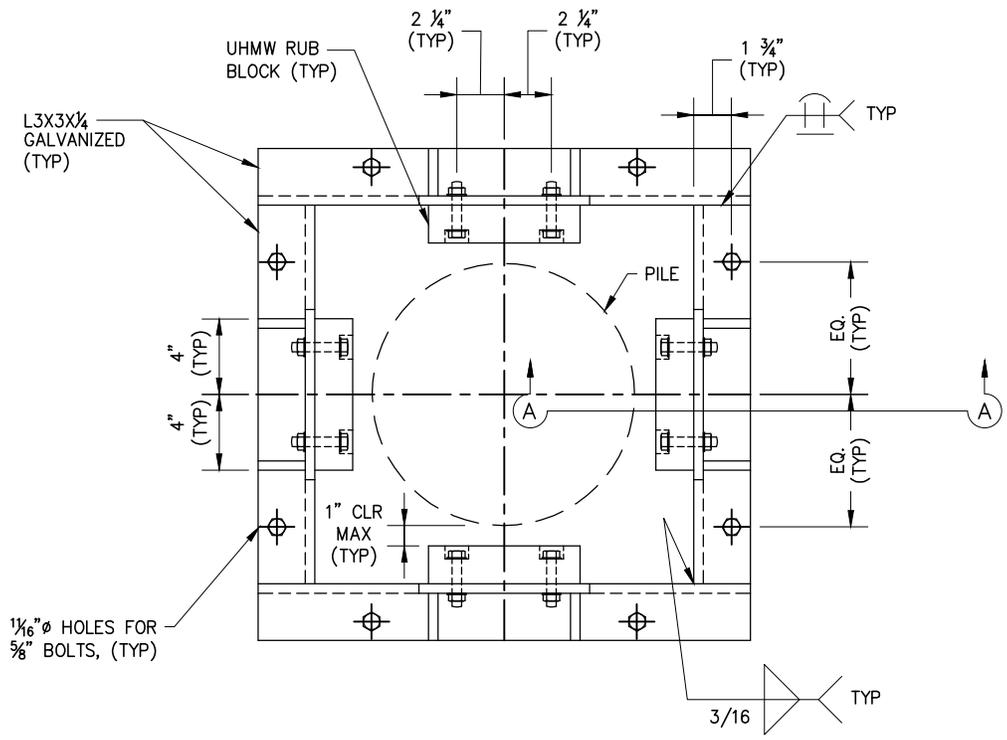


**SECTION A-A**

APP. <i>James M. Hinkle</i>	51568	11/24/2020			
CITY ENGINEER	RCE	DATE	NO.	DATE	DESCRIPTION OF REVISIONS

**CITY OF NEWPORT BEACH DEPARTMENT OF PUBLIC WORKS**

DRAWN: P. KHARAZMI	<b>PILE GUIDE RUB BLOCK TYPICAL DETAIL (CASE I)</b>	STANDARD DRAWING NO.
DATE: 11/3/2020		<b>613</b> SHEET 1 OF 1

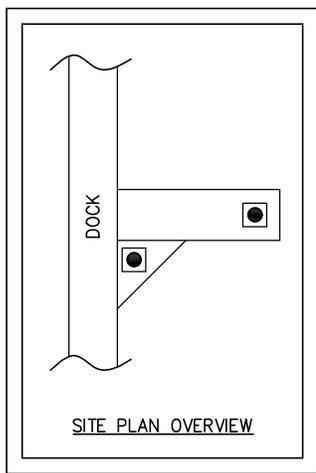


**PLAN**

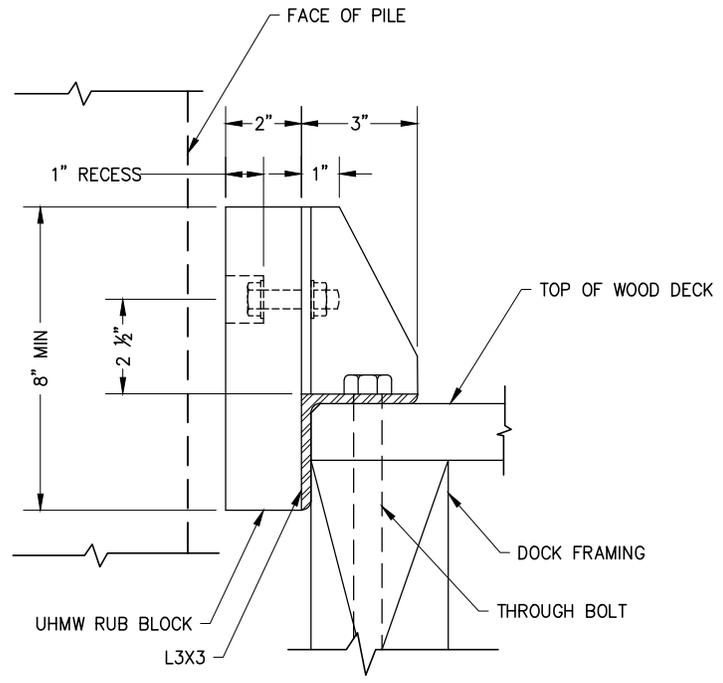
(CONDITION WITH SUPPORT ALL AROUND GUIDE FRAME)

**NOTES:**

1. ALL STEEL ANGLES, PLATES AND CONNECTIONS SHALL BE GALVANIZED.
2. ALL WELDING TO BE 3/16" FILLET WELDS ALL AROUND BETWEEN CONNECTED PARTS, UNLESS OTHERWISE NOTED.
3. ALL PLATES TO BE 3/8" THICKNESS, UNLESS OTHERWISE NOTED.



**KEY PLAN**



**SECTION A-A**

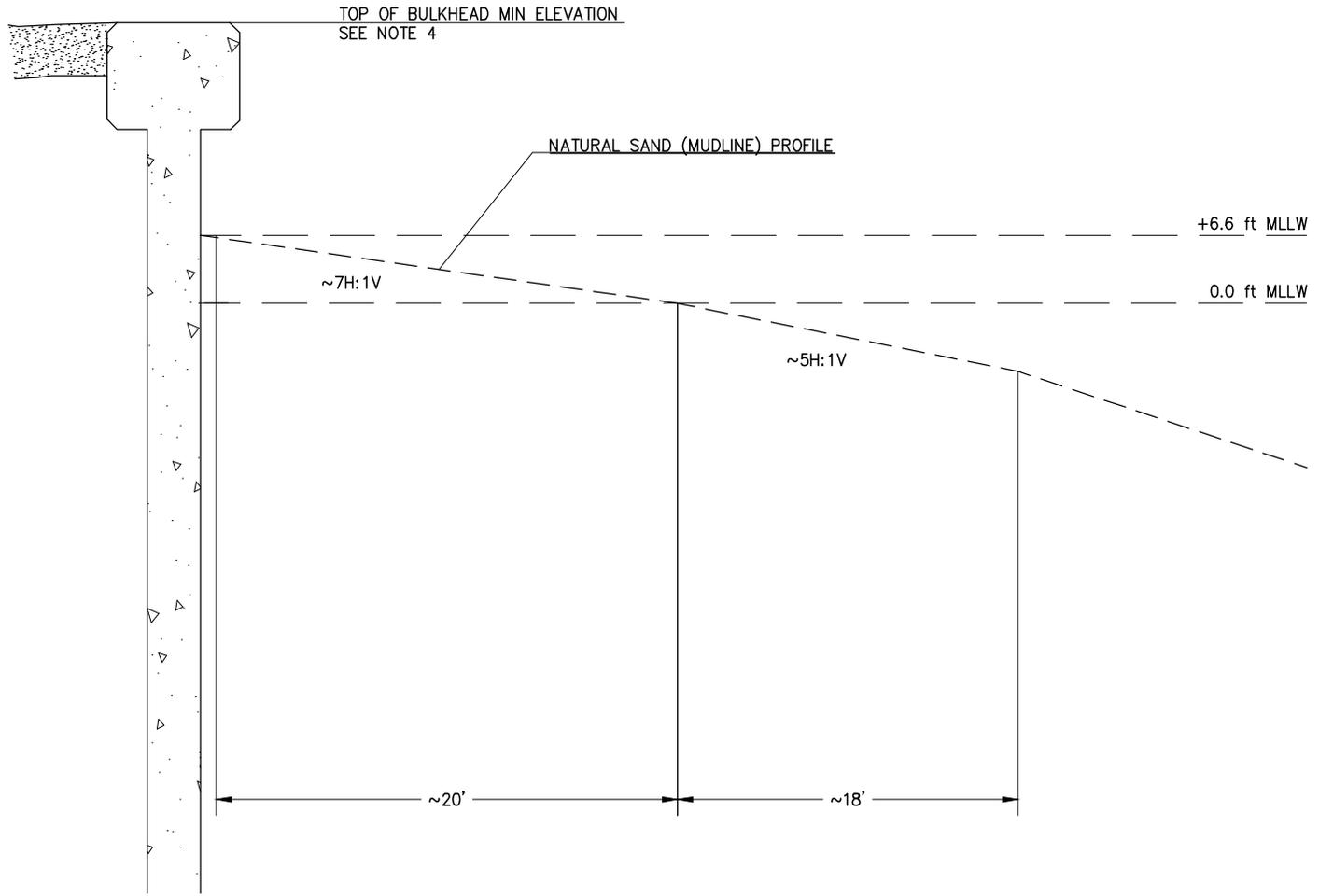
APP. <i>James M. Hinkle</i>	51568	11/24/2020			
CITY ENGINEER	RCE	DATE	NO.	DATE	DESCRIPTION OF REVISIONS

**CITY OF NEWPORT BEACH DEPARTMENT OF PUBLIC WORKS**

**PILE GUIDE RUB BLOCK  
TYPICAL DETAIL (CASE II)**

STANDARD DRAWING NO.  
**614**  
SHEET 1 OF 1

DRAWN: P. KHARAZMI  
DATE: 11/3/2020



**PROFILE**

**NOTES:**

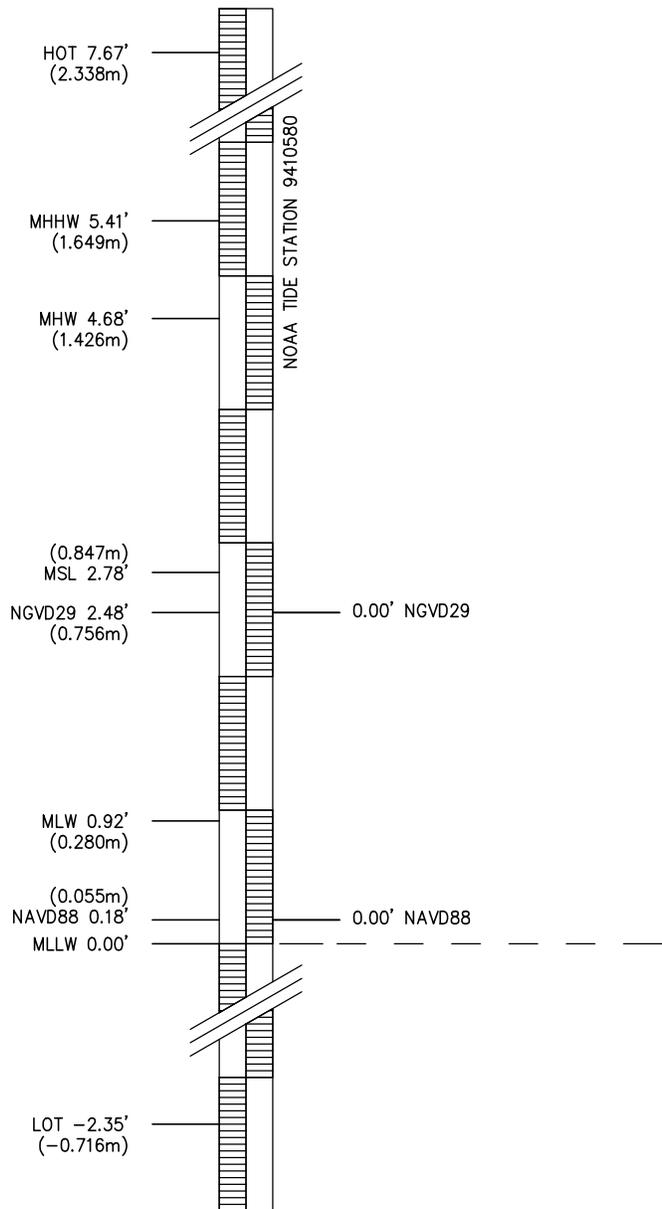
1. NATURAL SAND PROFILES VARY BY LOCATION WITHIN THE HARBOR.
2. H:V = HORIZONTAL TO VERTICAL
3. MLLW = MEAN LOWER LOW WATER
4. SEE TABLE NO. 2 IN THE HARBOR DESIGN CRITERIA FOR MINIMUM BULKHEAD ELEVATIONS.

APP. <i>James M. Hinkle</i>	51568	11/24/2020			
CITY ENGINEER	RCE	DATE	NO.	DATE	DESCRIPTION OF REVISIONS

**CITY OF NEWPORT BEACH DEPARTMENT OF PUBLIC WORKS**

DRAWN: P. KHARAZMI	<b>NATURAL SAND PROFILES IN NEWPORT HARBOR</b>	STANDARD DRAWING NO.
DATE: 11/3/2020		<b>615</b> SHEET 1 OF 1

# TIDAL DATUMS AND ELEVATIONS



## ABBREVIATIONS:

HOT = HIGHEST OBSERVED TIDE (1983.01.28)  
 MHHW = MEAN HIGHER HIGH WATER  
 MHW = MEAN HIGH WATER  
 MSL = MEAN SEA LEVEL  
 MLW = MEAN LOW WATER  
 MLLW = MEAN LOWER LOW WATER  
 LOT = LOWEST OBSERVED TIDE (1988.01.20)  
 NAVD88 = NORTH AMERICAN VERTICAL DATUM 1988  
 NGVD29 = NATIONAL GEODETIC VERTICAL DATUM 1929

TIDAL DATUM SEPARATIONS SHOWN FOR  
 NOAA TIDE STATION 9410580, NEWPORT BAY ENTRANCE  
 TIDAL EPOCH 1983 - 2001 (PUBLICATION DATE: 04/21/2003)  
<https://co-ops.nos.noaa.gov/datums.html?id=9410580>

APP.	51568 CITY ENGINEER	11/24/2020 DATE													
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## CITY OF NEWPORT BEACH DEPARTMENT OF PUBLIC WORKS

DRAWN: P. KHARAZMI	<h1 style="margin: 0;">TIDE PLANES AND TIDAL DATUM RELATIONSHIPS</h1>	STANDARD DRAWING NO. <h1 style="margin: 0;">616</h1> SHEET 1 OF 1
DATE: 11/3/2020		