

## 1. Determine Basin Area

---

The number and size of vessels in the design fleet and the moorage density will ultimately determine basin area. Specific float and dock criteria also affect space requirements. Once you have determined the basin area, site it to take advantage of natural depths and protective features (Chapter 4).

---

- **Fleet Characteristics** **1.10**
  
- **Stall Float Layout** **1.20**
  
- **Transient Float Layout** **1.30**

## 1.10 Fleet Characteristics

Fleet characteristics include the number of vessels in the harbor as well as their overall length (LOA), beam, and draft. The first step in harbor design is to make determinations about the **vessels** serviced and **type** of harbor designed.

---

**For FLEET IDENTIFICATION, you should consider the following:**

- 1) Industry trends in vessel design. The trend toward larger, beamier, and more heavily equipped vessels has considerably changed design criteria in the last few decades.
- 2) Whether a harbor will be used for recreation, commercial fishing, tourism, refuge, or a combination of these activities. Identify the numbers and sizes of boats to establish most harbor design parameters. The type of vessels serviced will affect float layout.
- 3) The relationship among vessel design parameters such as draft, beam, tonnage, and overall length. This relationship varies depending on type of vessel, and it is a major factor in determining plan area and depths of channels and moorage basins.
- 4) You can identify the total size requirements of the basin based only on length and number of vessels. You can use these determinations to estimate inner harbor facility costs.
- 5) Transient use (Section 1-30).
- 6) The maximum length of vessel requiring protection for the wave climate at a given site.

---

**Note 1.** Length Over All (**LOA**) is the standard reference for determining capacity.

**Note 2.** Generally, identification of the fleet is the responsibility of the planner or economist through a need or economic benefit analysis.

---

### REFERENCES:

1. ASCE Manual No. 50. Task Committee on Marinas 2000. 1982. *Planning and Design Guidelines for Small Craft Harbors*. New York. Pg. 40-41.
2. Tobiasson, B.O., & Kollmeyer, R.C. 1991. *Marinas and Small Craft Harbors*, New York: Van Nostrand Reinhold. Pg. 231-242 & 275-277.

## 1.20 Stall Float Layout

Once you have identified the fleet, the next step is to determine a practical berthing arrangement to optimize the basin area. Situate smaller boats on the inner slips in shallower areas of the basin; situate larger vessels near the harbor entrance for ease in maneuvering and greater depth requirements.

---

**For STALL FLOAT layout, you should consider the following:**

- 1) Ease of maneuvering for the user.
- 2) Optimization of available basin area. Float and fairway dimensions may vary, depending on anticipated use. Wider floats, which are more stable and may be desirable for tourist traffic, require greater space and thereby reduce moorage density. Similarly, wider fairways may improve ease of maneuverability but decrease moorage density.
- 3) Orientation of boats. Vessels can tolerate higher waves head-on than in beam seas.
- 4) Floats can create some inner harbor wave attenuation depending on layout. You must design floats to structurally withstand the highest anticipated wind and wave loading.
- 5) Usually, you should step up the basin depths, with deeper areas near the entrance and shallower areas further into the basin. This improves circulation and may help optimize dredging costs.
- 6) Wind loading.
- 7) Access for people with disabilities.
- 8) Walking distance from parking to the farthest stalls.
- 9) Other needs, such as transient moorage, fuel and sewage pump-out docks, seaplane floats, launch ramps, work floats, and boat handling and haul-out facilities.

---

**Note 1.** **Parallel moorage** is best suited to transient vessels and can accommodate a diversity of sizes. You can achieve high density when rafting is allowed. Harbor staff must pay greater attention to move and/or direct vessels to optimize moorage. Parallel moorage provides the greatest flexibility to harbor staff.

**Note 2.** **Stall moorage** is typically considered better for “home porting.” However, it does not accommodate diversity in vessel size and can become inefficient if fleet characteristics change significantly.

---

### REFERENCES:

1. ASCE Manual No. 50. Task Committee on Marinas 2000. 1982. *Planning and Design Guidelines for Small Craft Harbors*. New York. Pg. 40-43.
2. Tobiasson, B.O., & Kollmeyer, R.C. 1991. *Marinas and Small Craft Harbors*, New York: Van Nostrand Reinhold. Pg. 243-292.
3. Accessibility Guidelines: Recreational Facilities and Outdoor Developed Areas, Boating Facilities, U.S. Government, The Access Board, 1331 F Street, NW, Suite 1000, Washington, DC.

### 1.30 Transient Float Layout

Transient moorage in Alaskan harbors is required because increased seasonal vessel use causes a higher potential need for refuge. Parallel floats provide flexibility for accommodating a wide range of vessel sizes. When designing the dock structure and piles, always consider the largest vessel that may be using the float. Beam-to-length ratios and weight-to-length ratios continue to increase with newer vessels, and you should consider them in the design.

---

**For TRANSIENT FLOAT layout, you should consider the following:**



- 1) State policy requires that at least 20% of the moorage in public harbors remain unassigned. This provides some assurance that transient vessels will find refuge in state harbors.
- 2) Consider the regional location and use of the harbor when assessing the need for transient moorage.
- 3) If properly designed, transient floats may serve a dual purpose, acting 1) as a floating breakwater during winter months and 2) as a rafting float when demand is highest.
- 4) The number and types of vessels the harbormaster must turn away due to insufficient moorage.
- 5) Transient moorage is generally located near the harbor entrance and is often designed for heavier use.

---

**Note 1.** **Rafting** is an economical method of accommodating a large transient fleet. We recommend rafting two vessels deep for economic benefits; greater numbers increase safety risks.

**Note 2.** You can adjust **percentage of transient moorage** to allow for a greater amount depending on site specific requirements such as location of harbor and fleet type.

---

**REFERENCES:**

1. ASCE Manual No. 50. Task Committee on Marinas 2000. 1982. *Planning and Design Guidelines for Small Craft Harbors*. New York. Pg. 23 & 40.



**Denotes State Policy**

Any State funded harbor facility must provide approximately 20% of its capacity for transient users, which may include local residents not assigned a permanent preferential use berth. Municipalities may make preferential use assignments of up to 80% of the slip capacity to long-term users.