3. Obtain Existing Design References

Use current aerial photographs, nautical charts, and other references to save time and provide information on site characteristics and physical constraints.

3.10 Aerial Photographs

A large aerial photograph is one of the best preliminary design tools available, and you should obtain one as soon as practical. The photograph scale depends on the scope of the project, but it should correspond to a standard engineering scale and provide sufficient resolution to distinguish important project features.

Benefits of using an AERIAL PHOTOGRAPH:

1) It is a good reference for discussion with the local community. Local residents can easily point out features for you to consider in the design.

2) You can often identify submerged features, such as rocks or reefs, that may not be on a chart.

3) You can lay transparencies of proposed breakwaters, basins, and uplands over the photograph for visual display. You can then readily identify potential benefits and detriments.

4) You can estimate the size of existing objects, such as boats, armor stone, docks, or mooring floats, from the photograph.

Note 1. Aerial photographs always have some distortion, and you **should not use them as a substitute** for a proper survey (Section 7.10).

Note 2. If it becomes important to know the small-scale variations in the photograph, you **can identify several points** in the photograph to be included in the upland surveys.

Note 3. When ordering photographs, be sure to **include the date and time.** This allows correlation of the visible tide line with an estimated tide height. Photographs taken at low tide and printed "light" will give more information throughout the tidal zone.

REFERENCES:

1. Aeromap Inc., Anchorage, AK.

3.20 Nautical Charts

Nautical charts are one of the best sources of information for estimating water depths at proposed sites, identifying potential navigational hazards, and delineating fetches. They are developed primarily for the boating community, so they are lacking in upland detail, except for those features that may be useful for navigation.

You will need NAUTICAL CHARTS to:

1) Distinguish basic shoreline features**.**
2) Identify water depth and effective fetches.
3) Locate potential hazards to navigation.

Note 1. If you require more detail than the chart shows, you may order the boat sheets. Boat sheets include all original soundings.

Note 2. A good reference scale for nautical charts is the latitude shown along the border (one minute of latitude is one nautical mile).

Note 3. Verify the sounding units. They are usually in fathoms but may also be in feet or, on recent charts, meters.

REFERENCES:

1. National Oceanographic and Atmospheric Administration (NOAA).

3.30 USGS Quadrangle Maps

You can find geologic and topographic information used during the site-selection process on United States Geological Service (USGS) maps (a.k.a. quadrangles).

Use USGS maps:

1) When other maps and charts are not available or do not provide sufficient scale.
2) When the project extent requires decisions on upland use and development.
3) To identify geologic structures such as faults and slides.
4) To identify rivers, streams, creeks, and other drainages.
5) To perform a preliminary evaluation of coastal processes and morphology.
6) To locate and identify material sources. Rock outcrops along the shoreline may also indicate a higher risk of dredging rock versus sand or gravel.

Note 1. USGS maps may show availability of construction materials near the site.

Note 2. You can infer what kinds of materials you may encounter.

REFERENCES:

1. Bernknopf, R.L., et al. 1993. U.S. Geologic Survey Circular 1111. *Societal Value of Geologic Maps*. U.S. Govt. Printing Office.

3.40 Existing Engineering Drawings and Documents

Harbors that are expanding or requiring repairs may have existing drawings available. By using them, you will be consistent with existing structures. Additionally, design study documents may be available for existing structures.

Use EXISTING drawings when you are:

1) Designing harbors or marine structures near existing docks, buildings, or other structures for which drawings or documents are available.

2) Designing the expansion, repair, or replacement of existing facilities.

Note 1. **Review existing drawings and documents** for accuracy. Even if an existing structure is performing well, make certain that the design parameters are consistent with future use.

Note 2. If there is an existing structure, be cautious in using smaller stone. There may be a local perception that the larger, existing stone is needed.

REFERENCES:

1. Alaska Department of Transportation and Public Facilities.

2. US Army Corps of Engineers, Alaska District.

3.50 Existing Hydrographic/Topographic Surveys

You may roughly sketch out preliminary evaluation of all proposed sites for function and design layout using NOAA charts, USGS maps, DMA maps, or hydrographic and topographic surveys. Site specific surveys for new projects in remote locations may not be available. Federally maintained harbor features are surveyed periodically. Published surveys show existing project basin limits, recent hydrographic survey data, horizontal and vertical control monuments, and other useful information.

Use HYDROGRAPHIC/TOPOGRAPHIC surveys when:

1) Nautical Charts do not provide sufficient resolution.
2) Conditions that may not be evident on charts or maps may be changing due to erosion or accretion.

Note 1. If you need additional surveys, refer to Sections 7.10 - 7.13.

Note 2. **One field crew** can complete both the **hydrographic and topographic surveys.** Concurrent surveys can significantly reduce project costs, especially in remote areas, by combining mobilization and demobilization.

Note 3. Check that **water level data (MLLW, NGVD, MSL, etc) is consistent** for all applications of construction, design or layout.

Note 4. Always inquire about electronically available surveys when exploring references.

REFERENCES:

1. ASCE Manual No. 50. Task Committee on Marinas 2000. 1892. *Planning and Design Guidelines for Small Craft Harbors.* New York. Pg. 9-12.

2. Tobiasson, B.O. & Kollmeyer, R.C. 1991. Marinas and Small Craft Harbors. New York: Van Nostrand Reinhold. Pg. 77-79.

3.60 Land Use Maps

Land use maps defining zoning, rights-of-way, and other upland features are available through local communities.

Benefits of using a LAND USE MAP:

1) It is a good reference for discussions with the local community.
2) You can more easily contact landowners who may be affected. You can show the location of their property with respect to a proposed project.
3) You can readily identify parklands or other sensitive areas.

Note 1. City officials often provide these maps upon request.

REFERENCES:

1. Community Planners or Officials.