6.4.4.11 Ordinary High Water

The following definition was obtained from the Division of State Lands. "The Ordinary High Water (OHW) mark is a line on the bank or shore to which the high water ordinarily rises each year and is the waterward limit of upland vegetation and soil. This line is not established based on the level to which the water rises during major floods. It is generally recognizable by a visible change in the soil and vegetation." OHW is used by regulatory agencies to define the boundary of in-water work. Any work below the OHW elevation is considered to be in-water work and special measures must be taken to protect the waterway.

OHW corresponds to the elevation or stage where water just begins to overflow onto the floodplain for streams with well-defined floodplains. OHW will be contained in the channel and field stage indicators will need to be used to determine OHW for streams that are entrenched in the landform. Field stage indicators must also be used at sites where floodplains are not well developed. Following are field indicators of OHW. These are the same indicators geomorphologists use to determine bankfull stage. As many corroborating features as possible should be used to determine the OHW elevation.

- The elevation of the floodplain. This is the most reliable indicator of OHW.
- The lowest extent of woody vegetation in the bank or where aquatic vegetation changes to terrestrial vegetation. Willows can be misleading as willows may become established below OHW, especially during periods of drought or low flow. Certain mature species of birch, dogwood, and alder tend to consistently colonize and become established at levels very close to OHW.
- The elevation associated with the top of the highest depositional features (e.g., point bars, central bars within the active channel). This is typically considered the lowest elevation to be considered as OHW.
- A break in the slope of the banks and/or a change in the particle size distribution.
- The top of the zone of washed roots (exposed root hairs below an intact soil layer indicating exposure to erosive flow).
- Staining of rocks and lower limit of lichen or moss growth on rocks.
- Stains on bridge piers or culverts.
- Evidence of inundation features such as small benches.
- The elevation of flood deposited debris if corroborated by other indicators. High water marks are used to confirm OHW and should not be used as the primary evidence.

It is important to know the recent flood and/or drought history of the area to avoid being misled by false indicators such as colonization of riparian species below OHW during drought. A recent flood can give the impression that OHW is higher than it actually is.

The most common means to establish OHW is by the field marks previously discussed. These marks are used when OHW elevations are staked in the field by the biologist or hydraulics designer.

Occasionally OHW can be determined or verified by calculation. This is often the best method where field marks have been obliterated by a recent flood, or where there is an absence of appropriate field indicators. This is done by determining the 1.5-year flood profile. This is the typical recurrence interval of the OHW. Stage-discharge relationships from nearby stream gages can also be used to calibrate or verify OHW elevations based on field marks.

Published data can also provide OHW elevations. As an example, OHW elevations for the Portland-Vancouver Harbor are available in a published study. These elevations are often acceptable to regulatory agencies. A critical aspect of using published elevations is to convert them to the project elevations while considering any differences in reference datums. The ODOT project elevation datum is often different than the published study elevation datum.

6.4.5 Hydrologic and Meteorologic Data

Hydrologic and meteorologic data includes historic streamflow and precipitation data for the watershed as well as low flow data. The data is needed to estimate the hydrology of a site using the methods presented in Chapter 7. The major source of stream flow data is the USGS. Stream flow data for Oregon is also available from the Oregon Water Resources Department (OWRD). The major source of meteorologic data is the National Weather Service (NWS) and the National Climatic Data Center. The Oregon Climate Service is also a source of meteorological data for Oregon.

6.5 Field Reviews

Field reviews should be made by the hydraulic designer in order for the designer to become familiar with the site. It also allows the designer to determine required cross-section locations and other survey requirements unique to the site. The most complete survey data cannot adequately depict all site conditions or substitute for personal inspection by someone experienced in drainage design. Site and watershed characteristics that most often need to be confirmed or determined by field inspection are:

- selection of roughness coefficients,
- evaluation/observation of flow patterns, flow diversions, flow concentration, and likely flood patterns,
- watershed characteristics including land use and watershed boundaries,
- high-water marks or profiles,
- existing bridge/culvert dimensions and features (e.g., culvert size and material, culvert inlet and outlet geometry, etc.)
- drift/debris characteristics,