Placing the inlet and outlet nozzles of water storage reservoirs on opposing sides of the tank shell was for years considered to be the optimum arrangement to achieve good water blending. Adding an interior elbow to direct the water in a circular flow pattern was considered a good practice to help avoid short-circuiting through the outlet. In recent years the industry standard practice includes the installation of hydraulic tank mixing systems or TMS for short.

A typical TMS consists of an arrangement of piping placed internally in the reservoir so as to allow a homogenous mixing of all water in the reservoir each time there is a fill and/or draft cycle. The TMS consist of a manifold system, through which both inflow and outflow waters pass through two sets of properly sized and placed check valves. One set of valves is used during the fill cycle and the other is used to drain the tank. The manifold can be a common inlet/outlet system connected to one shell nozzle designed per API 650 Standards, or to a bottom-flanged nozzle connected to a 90-degree elbow. Alternate designs may include separate inlet and outlet manifolds, positioned either horizontally or vertically depending on the physical height and diameter of the reservoir. The size of the manifold piping along with the placement, number, and size of the inlet and outlet valves can be determined through calculations resulting from hydraulic studies and/or computational fluid dynamic (CFD) modeling.

The type of materials utilized to construct the TMS manifolds is largely a function of budget limitations and may consist of PVC, HDPE, fusion-bonded epoxy, liquid epoxy, or CML lined and epoxy coated carbon or ductile steel pipe and fittings. At the upper end of the scale, 316-grade stainless steel pipe and fabricated fittings can give a lifetime of maintenance free service. The type of materials will also be influenced by whether the TMS is being installed in a new tank where the parts can be placed inside the shell before the roof goes on; or if the project involves retrofitting an existing reservoir with limited access.

Learn More:
For more detailed information on Tank Mixing Systems the reader will find a wealth of information at:

The Red Valve Company manufactures Tideflex check valves in various configurations and using NSF 61 approved materials for use in potable water storage reservoirs.