

Oak Harbor's first high school was housed in a building on the waterfront, where the upstairs was used both as a school room and as a community hall for social functions. In the lower story, hay and freight were stored as they came off the steamers of the Puget Sound Mosquito Fleet.

In 1911 a new school was built on property donated by Will Izett, where, until 2006, the old Memorial Stadium stood. The high school students used the basement and lower floor, and the elementary grades were housed on the top floor. Only the basement of this building remains and is now used to house maintenance services.

In 1934 with the aid of WPA labor, a school was built to house secondary students. This brick building is still in use as the North wing of Oak Harbor Elementary School and was a great source of pride to the community and housed high school students until 1956 when the new high school was built that would later become North Whidbey Middle School.

In 1956 another new high school was completed and initially contained 330 students in grades 9-12 and an eighteen member staff. This building, which later was used as Oak Harbor Junior High School and then as North Whidbey Middle School, contained the high school program until June 1974 at which time the enrollment was 975 students in grades 10-12. This building was demolished in 2006.

In 1968 planning for the current high school began. It was to be located on a 45-acre site near what is now called NW Second Avenue and Heller Road. It was built to house 1200 students initially and be expandable to accommodate an enrollment of 1800 student grades 10–12. The facility was built with a brick exterior, steel frame throughout except for the field house dome which consists of laminated wood beams and a wood roof deck. This facility was completed in 1975. In 1991, the school was expanded to include ninth grade, reaching a capacity of 1,700 students.

By 2006 the school was at the end of its planned life, meaning that the infrastructure – plumbing and roof – were considered worn out or outdated to the point of being costly. In addition, the school was not well-suited for modern technology and undersized for the number of students. On May 16, 2006, voters approved a plan to modernize the high school. Designed by NAC Architecture, the project was phased and completed in September 2010. The redesigned campus focused on bringing daylight to all classrooms, widening corridors, updating technology and consolidating the school into three buildings.