The Dominion Astrophysical Observatory telescope was designed by Dr. John Stanley Plaskett, astronomer with the Department of the Interior in Ottawa. The 72-inch reflecting telescope was the largest of its kind in the world when it was built. The large mirror disc weighing 1,960 pounds was made in Belgium at the St. Gobain glass works, and shipped from there just days before the beginning of World War One. The disc was ground at the John A. Brashear Company in Pittsburg. The sixty-six foot dome and mounting required to house the telescope was fabricated by the Warner and Swasey Company in Cleveland, Ohio. It was then dismantled and shipped to Victoria, where it was installed in the double-walled steel observatory constructed by the McAlpine-Robertson Company of Vancouver for a contract price of $75,000. Eight hundred tons of concrete were used in the construction of the foundation and piers inside the building, on which the telescope and its mounting rest. The buildings were designed by William Henderson, resident architect of the Dominion Public Works Department in Victoria. These included residences for the chief astronomer, Dr. Plaskett, and assistants, and an office building.

Various areas in Western Canada were considered as possible sites for the observatory, but Saanich was chosen because of the stability of atmospheric conditions and the equability of year-round temperatures, more than for the clarity of its air. The provincial government constructed the road from West Saanich Road to the summit of Little Saanich Mountain as a relief project for the unemployed of the municipality. The province also contributed $10,000 to the project, which cost over $200,000.