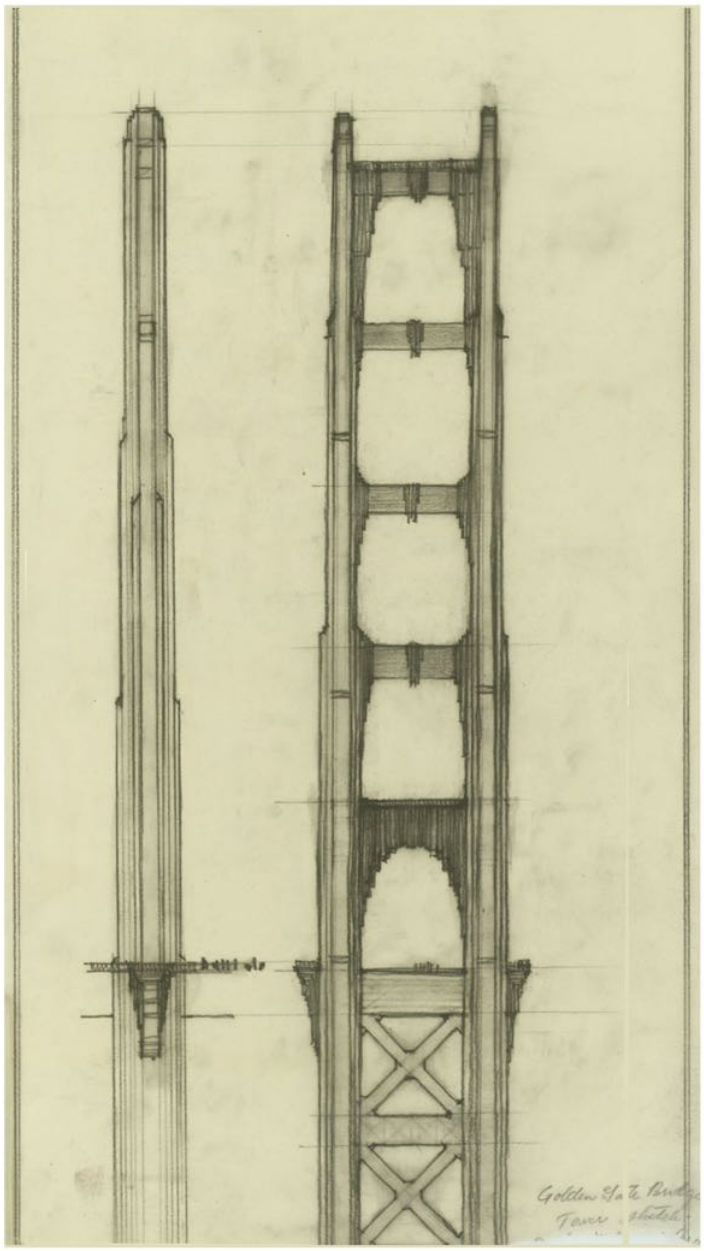
Facts & Figures

PRINCIPAL DIMENSIONS AND QUANTITIES

Total Length of Bridge including Approach Structure	8,981 ft.
Length of Suspended Structure	6,450 ft.
Length of Main Span	4,200 ft.
Length of Each Side Span	1,125 ft.
Width of Bridge	90 ft.
Width of Roadway Between Curbs	60 ft.
Height of Towers	746 ft.
Clearance Above Mean Higher High Water	220 ft.
Live Load Capacity Per Lineal Foot	4,000 lb.
Total Weight on San Francisco Pier Foundation	726,000,000 lb.
Weight of Cable Anchorage at Each End of Bridge	240,000,000 lb.
Deepest Foundation Below Mean Lower Low Water	110 ft.
Maximum Transverse Deflection, Center Span	27.7 ft.
Maximum Downward Deflection, Center Span	10.8 ft.
Maximum Upward Deflection, Center Span	5.8 ft.
TOWERS	
Height Above Water	746 ft.
Weight of Two Towers	88,800,000 lb.
Number of Cells at Base, Per Leg (3′-6″ x 3′-6″)	103
Number of Cells at Top, Per Leg	21
Base Dimension (Each Leg)	33 ft. x 54 ft.
Load on Tower from Cables	123,000,000 lb.
Transverse Deflection	12½ in.
Longitudinal Deflection: Shoreward—22 in.; Channelward—18 in.	
CABLES	
Diameter of Cables Over Wrapping	36⅜ in.
Length of One Cable	7,650 ft.
Number of Wires in Each Cable	27,572
Number of Strands in Each Cable	61
Size of Wire (No. 6) Diameter	0.196 in.
Total Length of Wire Used	80,000 miles
Weight of Cables, Suspenders and Accessories	24,500 tons
CONCRETE QUANTITIES	
San Francisco Pier and Fender	130,000 cu. yd.
Marin Pier	23,500 cu. yd.
Anchorages, Pylons and Cable Housings	182,000 cu. yd.
Approaches	28,500 cu. yd.
Paving	25,000 cu. yd.
	389,000 cu. yd.
STRUCTURAL STEEL QUANTITIES	
Main Towers	44,400 tons
Suspended Structure	24,000 tons
Anchorages	4,400 tons
Approaches	10,200 tons
	83,000 tons



Golden Gate Bridge Facts

Timeline

1916	First serious proposals for a bridge across Golden Gate
1919-'20	San Francisco City Engineer O'Shaughnessy explores possibility. Asks three noted engineers for estimates. Joseph Strauss is selected based on sketches and his estimated cost of $27 million.
1923	Golden Gate Bridge District authorized by state to fund, build and operate bridge.
1930	Final plans prepared: War Department issues final permit. Planning begins full steam; voters in Bridge District counties authorize sale of bonds to pay for bridge, using with their real property as collateral.
1933	January 5 = start of construction. Both anchorages excavated and completed. North pier completed.
1934	North tower completed.
1935	January = south pier completed. June = south tower completed. August = first cables stretched across Gate and catwalks built.
1936	May = cables finished. Safety net installed. Sept = roadway steel finished
1937	February 17 = eleven workers killed in platform collapse. April = deck complete. May 27 = Pedestrian Day. May 28 = Official Dedication and open to vehicles.

Golden Gate Currents

The narrow strait between Marin County and San Francisco is one of the world's most tumultuous bodies of water, up to 335 feet deep and a mile and a quarter wide. Over the course of six hours, twice a day, San Francisco Bay empties one-sixth of its volume into the ocean. The tidal action generates an average flow of 2.3 million cubic feet of water per second (about 3-1/2 times the volume of water the Mississippi River dumps into the Gulf of Mexico). Water currents at the Golden Gate range from 4-1/2 to 7-1/2 knots. When construction divers had to descend as deep as 90 feet below the surface, the combination of tumultuous tides and currents restricted underwater working time to four twenty-minute periods per day.

Anchorages

Anchorages
The first workers excavated three and a quarter million cubic feet of dirt and poured seemingly endless amounts of concrete for the bridge's two anchorages. Twelve stories high, the anchorages were designed to secure 63 million pounds -- twice the pull of the bridge's main cables. Workers stood in the anchorage pit while a long tube called an "elephant trunk" delivered wet concrete down to their level. The men labored to mix the concrete as it was poured, to remove any air pockets.

Towers

Up High
The first 745-foot tower began to rise on the Marin shore in November 1933. Prefabricated sections were fit into place and then joined together by four-man rivet gangs. Once both towers were complete, in June 1935, workers built catwalks and started spinning the cables. Roadway work would not begin until June 1936.

Cables

Largest Cables Ever
Cable spinning began in October 1935. The cables had to be flexible enough to bend up to 27 feet laterally, in the Gate's formidable winds, and strong enough to support the structure of the bridge. The planned cables would be so long and strong that they would need to be fabricated in place. Hundreds of wires, each roughly the diameter of a pencil, were bound together into strands. Hydraulic jacks then bundled and compressed 61 strands to make a cable. Each of the two main cables is just over three feet in diameter, 7,659 feet long and contains 27,572 parallel wires. The Golden Gate uses the largest bridge cables ever made -- long enough to encircle the world more than three times at the equator.

Eventually, the Roebling company devised a system to spin six wires simultaneously -- color coded to prevent confusion. Six wires at a time had the spinning wheels guiding as much as 1,000 miles of wire across the span in an eight-hour shift. When the weather was good, the wheels took just six and a half minutes to travel halfway across the span.

On May 20, 1936, the spinning wheel was festooned with flags as it pulled the last wire across the bridge. Thanks to extraordinary technological innovations, Roebling finished spinning the cables eight months ahead of schedule, an impressive four times faster than had been anticipated.

Color

International Orange
Perhaps Irving Morrow's most famous contribution to the Golden Gate Bridge was its distinctive burnt red-orange hue called International Orange. Others had suggested the bridge be painted aluminum, dull gray, or the Navy's preference, highly visible yellow and black stripes. The bridge authorities at first deemed Morrow's selection ludicrous.

Opening Day

Building a Landmark
The bridge's first day was solely for pedestrians (some 200,000 showed up). Its second was for vehicles. When the immediate landmark opened to the public in May 1937, few of the men who had built it attended the celebration. Most of them figured they had seen enough of the structure.

By 6 am, the starting hour of Pedestrians Day, 18,000 people were waiting to cross the span from both the San Francisco and the Marin sides. When the hour struck, foghorns gave great blasts, the tollgates opened and the earliest and eagerest arrivals -- most of them high school students -- ran or walked out onto the bridge.

Bridgewalk 1987

Sunday, May 24, 1987, marked the bridge's fiftieth anniversary. People traveled from all over the world to see the bridge and be part of the historical event. Planners envisioned a crowd of up to 90,000 people. They grossly underestimated the Bridge's appeal. By mid-morning, approximately 300,000 people had stepped out onto the roadway. Another 500,000 were on the approaches, trying unsuccessfully to get to the bridge.

At one point, portions of the gently curved bridge deck actually flattened out under the press of shoulder-to-shoulder humanity. Although no damage occurred, it was decided no future Bridge Walks would take place.

Citizens Put Their Own Properties Up as Collateral

Little federal or state money was used to build the bridge. Most of the financing came from bonds sold by the Golden Gate Bridge and Highway District. Despite being in the Great Depression, voters in the district's six counties in 1930 approved a $35 million bond issue that required them to put their homes, farms and businesses up as collateral. The resounding approval by a three-to-one margin reflected the faith of local citizens in the long-term economic benefit of the project.

Commuters & Traffic

Commuter Conduit
After a shaky financial start, the bridge soon became a commuter conduit. Ferries were forced to cut their prices below the bridge's fifty-cent toll to compete. The ferries struggled to steal back business from the glamorous span, but to no avail. On February 28, 1941, the Golden Gate Ferry service, which had operated since 1850, was cancelled.

By the mid-1960s, the bridge carried an average of 69,267 vehicles per day. To help traffic flow among all parts of the San Francisco Bay, planners revived the Golden Gate Ferry service in 1970. In 1972, the Bridge District also began bus service.

By 2023 daily traffic averaged nearly 90,000 vehicle crossings daily, with a toll revenue of $146,053,927.

Changing Tolls

Tolls for crossing the bridge initially declined, then went up.

May 23, 1937	50¢ each way, $1 roundtrip, with a 5¢ surcharge if more than three passengers. [NB: $1 in 1937 equals $21 today]
July 1, 1950	40¢ each way
October 1, 1955	25¢ each way
October 19, 1968	50¢ southbound, free northbound
November 1, 1977	$1 southbound, free northbound
1978 – 2022	Fourteen toll increases
July 1, 2023	$9.00 cash toll: $8.75 FasTrak.

Golden Gate Bridge - Original Proposal

For more information:

https://www.pbs.org/wgbh/americanexperience/films/goldengate/

https://www.history.com/topics/landmarks/golden-gate-bridge

https://www.goldengate.org/exhibits/the-history-of-the-design-and-construction-of-the-bridge/