Assuming that the weight of the aqueduct is not included in the load the structure can support, one needs to first test the weight of the water in the aqueduct at maximum depth. Given the trapezoidal cross-section of the aqueduct the weight of the water can be calculated as the volume of the water in cubic feet times the weight of a cubic foot of water (62.42796 pounds).

Volume = 0.5*(50+70)*15*200= 180,000 cubic feet

Weight = 180,000*62.42796 = 1,1237,033 pounds or about 5,620 tons

This means that the span can hold a full load of water.

The barges are 90 feet by 40 feet and can have a maximum draft of 14 feet.

The loaded barge displaces its weight of water when it is in the canal (unless it is grounded). So, given a maximum draft of 14 feet and "footprint" of 3600 feet, the maximum displacement is 50,400 cubic feet which is equivalent to a displacement of 3,146,369 pounds or about 1570 tons allowing about 1/3 of an inch of clearance at 14 feet depth.

The maximum gross weight of a barge should be 1570 tons. 1500 tons would be safer to avoid bottom scraping (also keeps with 2 significant figures as given in the problem).