

Name \_\_\_\_\_

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## **Richard Hammond's Engineering Connections**

### **Season 3 Episode 4 – Earthquake Proof Bridge**

**Summary:** Richard Hammond reveals how engineers made one of the longest bridges in the world earthquake-proof - bridging the Gulf of Corinth in Greece.

**Instructions:** Access the video on your teacher's website/Google Classroom. As you watch the video, complete the following questions. At the end, be sure to reflect on how this bridge construction fits into the engineering and design process by completing the open response.

1. Prior to the construction of the bridge, how far was the detour between these two different parts of the country?
2. The Rio-Antirrio Bridge is nearly \_\_\_\_\_ in length.
3. What was the benefit of having a bridge in this location following the tremor that struck the region in 2008?
4. How deep is the ocean at the bridge site? \_\_\_\_\_
5. What material covering the seafloor in this region was a challenge for bridge designers and engineers?
6. What is a little known hazard that happens in areas of soft sediment at times of seismic activity?
7. How many support rods were eventually used **beneath each pier** on the Rio-Antirrio Bridge?
8. In order to compensate for the shearing motion of the ground in an earthquake, what must the piers on the Rio-Antirrio Bridge be able to do on the seafloor?
9. What is the side-to-side force referred to in the movie? \_\_\_\_\_

10. A. Describe the design challenge of “toeing”

B. How was the problem resolved with the piers of the Rio-Antirrio Bridge?

11. What piece of “technology” is used in the modeling of bridge deck experiment to compensate for the earthquake motion? What does it represent?

12. Though this bridge is designed to withstand earthquakes, what other natural force could easily topple the towers?

**Open Response:**

Considering the many challenges faced by engineers on the Rio-Antirrio Bridge project, select one item from the video and attempt to fit it into the “Engineering and Design Process – Figure 1” diagram.

*For example: **Step 1: Identify need** - residents had to drive around the river using a long detour. The bridge was needed to save time for residents.*