Memorial Park 2 Video Answers

Tuesday 13 May 2014

1. Progress on the Underpass

Meet with Structures Project Engineer Cole Meiring to get the lowdown on progress made with the underpass since the first field trip in November.

1. Why do you have to sign a form before entering the construction site?
    - To show that you understand the potential hazards on site.
2. What two things have had to be moved for construction to begin?
    - The road and underground services.
3. List three of the main parts of the underpass that have been put in place since last November.
    - Drainage, base slab, walls and most of the roof.

Next step learning: Have a look at some videos from the first *Memorial Park* field trip to get more of an idea on the progress that has been made on the underpass since last November.

2. Temporary Structures for a Permanent Tunnel

Meet Site Engineer Russell Scoones to see what sort of temporary structures have to be built on site before the concrete is poured.

1. How long does it take for 40 metres of scaffolding to be set up for the pouring a roof slab?
    - One month.
2. How long does it take for the concrete to be hard enough to support itself before the scaffolding can be taken away?
    - About one week.
3. What is between the scaffolding and the concrete roof slab?
    - A timber structure to provide a working platform and sealed surface to work on.

Next step learning: Create a labelled diagram to show how formworks are used to create a mould which concrete is then poured into to make the tunnel walls.

3. A Strong and Resilient Tunnel

Join Cole Meiring as he describes in more detail how the tunnel is being built strong enough to withstand a 1 in 25,000 year earthquake.

1. Why is the steel reinforcing coming out through the top of the wall panels?
    - So that the walls can be connected to the roof when those slabs are poured (this will make the structure stronger).
2. What are the two main components that make up the roof?
    - Steel reinforcing and concrete.
3. What are the two forces that concrete and steel are there to withstand in an earthquake?
    - Compression and tension. Concrete can withstand compression and steel can withstand tension.

Next step learning: Find out what are other materials used in construction for the purpose of providing strength.

4. Concrete – a Technological Product

The construction of the Memorial Park underpass is an ideal opportunity to put the technology curriculum into a real-life context. Join Cole and Andrew as they focus on concrete as a technological product.

1. What are the three key ingredients of concrete?
   - Aggregate, water, cement.
2. What makes concrete a good material to use in a construction project like this?
   - It is strong, durable, and things can be added to it to alter its performance
3. What do the subjective versus objective aspects of concrete mean?
   - What do people think and feel about the concrete versus how it performs and can be manipulated for the purpose of construction.

Next step learning: Do a similar analysis of another "technological product" used in construction.

5. Anchoring the Underpass

Meet Geotechnical Engineer Sam Glue. Sam explains why piles are such an important part of making the Memorial Park underpass strong and resilient.

1. What can happen to the silt, sand and gravel during an earthquake?
   - They can liquefy.
2. How do the piles help keep the underpass structure in place?
   - The piles anchor it in place. (The structure is lighter than the earth that was there before it and it is effectively a hollow structure giving it the effect of a boat – solid on the outside and hollow in the middle).
3. How were the piles changed after testing showed the straight shaft would not hold the underpass structure in place during an earthquake?
   - They were made with a bell shape at the bottom.

Next step learning: Find out what other measures are put in place for buildings and so on to help them withstand large earthquakes.

6. Memorial Park Project – an example of Technological Practice

Cole Meiring gives an overview of the Memorial Park and underpass project as it relates to technological practice.

1. What are the four main parts of this project?
   - Prepare the site, dig the trench, construct the tunnel, build the park.
2. What is another name Cole uses for the progress table he refers to in the video?
   - Gaant chart.
3. What happens in a "peer review" for evaluating certain parts of a project like this?
   - Evaluation is also done by an independent group of people that are off-site or separate from the Memorial Park Alliance team.

Next step learning: Do a similar analysis of "technological practice" for a different project.