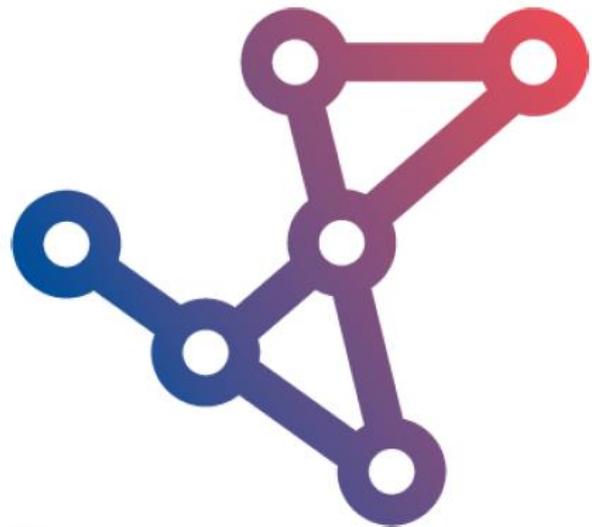


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The Engineering Profession

Sample Worked Solutions

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Edison

Exercise 1

The use of the *Smart Pole* enhances the display of traffic management, street signage, ambient lighting and other visual elements of an intersection.



Traditional intersection
with street and traffic lights



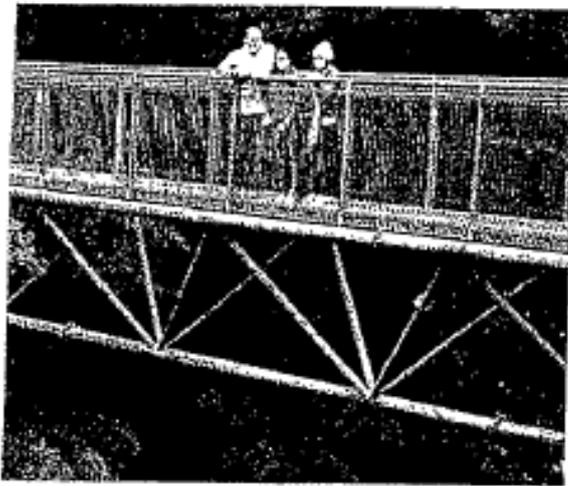
Smart Pole intersection

- (a) What criteria, other than installation cost, would an engineer use to determine the feasibility of installing a *Smart Pole* system in a city? 2

Feasibility of the smart pole may be assessed on: improved safety, aesthetics, installation issues such as road closures, maintenance, reduction in the number of poles to improve pedestrian mobility.

Exercise 2

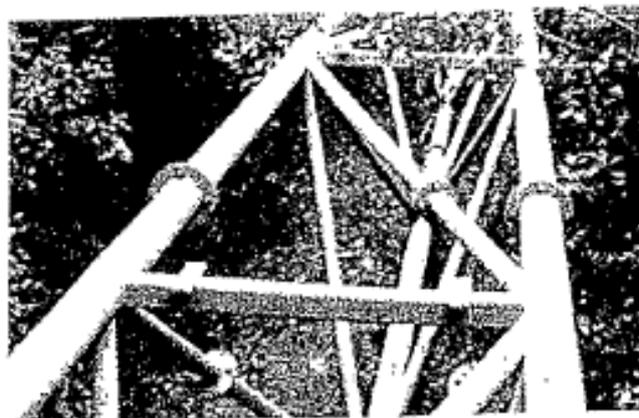
Part of an elevated treetop walkway is shown.



- (a) What factors regarding the location of the treetop walkway would be included in an engineering report? 2

Factors included may be: environmental effects, structural considerations due to height and span, access for construction and the wind loads it is subjected to.

What is the purpose of the flanges shown in the circular members? 1



The flanges allow the circular members of the walkway's sections to be joined.

Exercise 3

Describe how engineers ensure a high standard of safety at:

- the design stage;

Engineers ensure safety by analysing forces and stresses, and applying safety factors to stress calculations. Appropriate materials are selected based on research and testing.

- the construction/manufacturing stage; and

Engineers ensure manufacturing meets determined standards through quality control and non-destructive testing (eg. ultra sonic), OHS standards are also maintained

- during the service life.

Regular inspections and non destructive testing (eg. dye penetrant) through a planned maintenance schedule ensure defects are detected and components are maintained