



# 19

# Choosing a site for an engineering project



Technique sheet

Problem-based learning resources

## Introduction

Engineering projects can be large! The Millennium Dome in London uses 170 acres of valuable London real estate – equivalent to 85 football pitches or enough space to plant nearly 75,000 oak trees! Of course, London probably doesn't want a forest of oak trees but decisions about what the site is suitable for requires an engineering input. What does an engineer need to know about a site before construction begins?

## What factors should be considered when selecting a site for a project?

This depends on the engineering project. Building a recording studio above a busy underground railway track or next to a motorway might be a bad idea. But building an operating theatre in a hospital might benefit from having good transport links very close. Start with your engineering project and assess its needs: does it need good power supplies, or access to water and drainage? Will it produce a lot of waste that must be carried away by road or rail? Is it a potential danger – nuclear power plants are built away from dense urban centres even though that is where most of the electricity

produced is used. Are there legal or environmental issues to consider?

- Make sure your survey considers the key needs of your project – it's not just mapping an area or checking for a few power sockets!

## What is a site survey?

A site survey is a review of the area where an engineering project will be developed. It could be very large like the Millennium Dome, or the space needed for a nuclear power plant or a solar panel farm. It could be quite small like the space in a hospital that will be developed as a secure storeroom for medicines or a pathology lab. A site survey should inform planning decisions about the project and will help the engineer to choose the right technology and design to make best use of the space.

- Make sure you do a thorough site survey. It's not good to discover problems halfway through the build! Make sure you have a list of what you need to find out before you visit.

## How do you survey really large sites?

Large projects need large sites, and you may need specialist equipment to map the area. Generally,

the site will be described by a surveyor or other consulting engineer but liaise with them if there are particular aspects (e.g. power supplies, presence of large drains or other underground structures, very wet ground) that could delay your work. A site visit initially to help with project design and another prior to your part of the task to check everything you need is available or easily transported to the site is wise.

- Make sure you liaise with other suppliers to get the information you need from them about the site and any relevant peculiarities. Don't forget access for you and any vehicles that might need to deliver large items of kit.

## Who should be involved in the site survey?

The designing engineer and the installer must be involved along with site owners and custodians. Other experts may be needed for their specialist knowledge. An environmental specialist might be needed to check for environmental assessments, particularly the presence of endangered species. Some sites also have legal restrictions so legal advice may be needed. If asbestos or some other hazardous substance is present specialist inspectors will be needed to assess the problem and advise on suitable treatment.

- Make sure you access experts with specialist knowledge and ensure that their reports are shared with the design and installation team.

## Who needs to see the site survey?

This is not straightforward. Site surveys may contain information that is commercially sensitive and some of it may be too technical for a general audience. In general, site surveys should be available to people who might be able to contribute to improve the project design but general release to everyone (e.g. eventual users of the installation) is probably not necessary and not always helpful.

- Make sure your site survey is accessible to stakeholders who have to make design and management decisions but do not share more widely than is necessary.

## And for small sites?

A server room for a computer graphics company might be quite small and your job might be to install extra power points or a new server rack. It seems simple but check you can get access to the room (server rooms are often secure with multiple locks) and that someone will be

there to open doors and switch off any security devices. In this instance you may also have to switch off the power – how will the graphics company cope if they have no access for a day – or, worse yet, important files are lost? Sometimes a plan of the site and a conversation with someone on the ground by telephone is enough – but be prepared for unexpected complications!

- Make sure you will have access to the site when you need to work there and agree with the site manager about any downtime or safety issues linked to working there.



## Check yourself

**You should be able to answer these questions easily after reading this sheet.**

1. What are the advantages of a site survey?
2. What should happen if asbestos is discovered during a site survey?
3. Do small sites need a survey or visit? Why? Why not?



## Taking it further

**These activities will deepen your understanding of this topic.**

1. Think about a simple engineering project for your college, e.g. updating the boiler or replacing the lights with a low-energy LED system. Where would you conduct a site survey and what would you look for? Who would you involve and why? Design a form to fill in – this means you are less likely to forget important issues.
2. Many people are now considering having solar panels fitted to help with electricity bills. List the issues you would need to consider when planning a solar panel installation on:
  - a semi-detached house in Leicester.
  - a rural farmhouse in North Wales.
  - a city-centre flat on the top floor of a converted three storey Victorian town house in Bristol.

What are the significant differences between these three installation jobs and how could a site survey prior to the work help to organise the project?