



**Title of Course: Site Surveying and Setting Out**

**Duration:** 5 days      **Chip Course Code:** SSSO

This 5- day practical course teaches the principles and practices of setting out, using the level and total station, which can be applied to all aspects of construction including earthworks, roads, buildings, foundations, piles, structural steel, structures, reinforced concrete, houses.

**What you need to bring with you:**

- Hard Hat EN397
- Hi-Visibility Vest to BS EN 471, class 3 (in good order)
- Gloves
- Safety Boots EN345-S3 or EN345-S5
- Clothes for all weather conditions

**What we will provide for you**

- All writing and drawing equipment
- Calculator
- All tools and equipment for practical sessions.
- All reference materials and assessment paperwork

**What you need to tell us beforehand**

Medical ailments particularly if you are unable to do physical manual work.

**What is available for you to book / pay for as an optional extra**

On-site accommodation is available at our Bircham Newton venue (availability must be checked and bookings made prior to the start of the course). Lecture rooms are available to book for evening sessions and group dinners can be arranged on request.

**The Course Aims and Objectives**

This course teaches the principles of setting out which can be applied to all aspects of construction including earthworks, roads, buildings, foundations, piles, structural steel, structures, reinforced concrete, houses. Real construction drawings are used for all practical exercises.

Suitable for:

- Trainee Engineers and Construction Managers
- Graduate Engineers and Construction Managers
- Site Managers who would like to be able to supervise, recruit for, check or carry out setting out activities
- People with direct experience of the construction industry who would like to broaden their skills to include setting out
- People with previous experience of setting out who have been working in a different role

for a number of years and would like to return to setting out

- Overseas site engineers and construction managers who are seeking employment in the UK, but do not have setting out experience due to differing division of responsibilities in different countries

### **Levelling and taping (Mon – Tue)**

By the end of the course, delegates will be able to:

- Record work correctly and in the industry standard way
- Incorporate robust checks to all levelling
- List the sources of error in levelling
- Carry out a level survey (existing features or as-built)
- Check that the level is in correct calibration
- Set elements to a fixed level
- Measure the reduced level of ceilings and soffits
- Transfer TBMs (install temporary benchmarks from scratch)
- Set up profile boards for level excavation
- Set up profile boards for drainage
- Set up batter rails for cut and fill
  
- List the sources of error in taping
- Incorporate checks when setting out using a tape measure
- Set out on sloping ground using a tape measure
- Set out right angles and rectangles using a tape measure

### **Days 3 – 5 Total Station (Wed – Fri)**

By the end of the course, delegates will be able to:

- Set up the total station over a point
- Carry out the relevant calibration checks (Horizontal and vertical collimation error, trunnion axis, prism constant, optical/ laser plummet, diaphragm orientation)
- List the sources of error when using a total station
- Use techniques for improving and checking your accuracy and precision
- View, edit, add and delete data
- Install accurate primary control points from scratch (traverse)
- Install accurate secondary control points (retro targets)
- Create a local coordinate system for a building on gridlines
- Use the total station for measuring and setting out reduced levels
- Describe a range of methods for plumbing columns and walls
- Set-up the position and orientation of the total station using the resection or occupied point programs
- Take a topographical survey and record the results systematically
- Measure the horizontal distance and level differences between points using the tie-distance function
- Set out points of known co-ordinates using the stake out function
- Set out points in relation to a given line using the reference line function
- Set out points at given chainages and offsets along a radius e.g. road centrelines using the reference arc function
- Measure irregular areas and volumes
- Transfer large amounts of data from the total station to the computer and vice versa

- Describe the capabilities and limitations of GNNS equipment
- Describe the capabilities of robotic total stations

This course involves some maths. If you do not have a working knowledge of the following, you should attend the 'Site Surveying Foundation course':

- Falls and gradients
- Whole circle bearings
- Working with degrees minutes and seconds
- Basic geometry
- Basic angles
- Basic trigonometry
- Pythagoras
- Co-ordinates

This course teaches principles and practices that can be applied to any total station. The equipment used for the training is the Leica TS06. There is a minimum of 1 set of equipment per two people.

**About the National Construction College.....**

*We are the largest provider of Construction training for the construction industry, offering courses either on an open basis at one of our training venues throughout the country or in-company to meet your particular training requirements.*

**National Construction College**