

*KEITH DENNISON*

# *LINKS TO INDUSTRY*

*CPD PLAN FOR NON-COLLEGE ACTIVITIES*

*(ACTION RESEARCH METHOD)*

*January 2008 to...*

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About me: -

- a. I work in three areas associated with dimensional surveying and setting out.
- I offer training courses for the Construction Industry,
  - Surveying and setting out services for Construction, and
  - Further Education lecturing for Edexcel and CIOB levels 3 and 4
- b. My Qualifications
- MQB Mine Surveyor's Certificate
  - Post Graduate Certificate in Education
  - MA in Post Compulsory Education
  - Elected Fift 2008
- c. My contact Details
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Surveying and Setting Out for Industry (2008).

Site work undertaken in 2008

Client	Site	Output	Date
Bryen Langley	Supermarket in Barnes	Set out site grids, produced CAD drawing, produced fill volumes	Jan 7 & 10
Carlton Developments	Westmount House, Croydon	Set out grids	May 14
Carlton Developments	Islamic Centre, Willesden	Set out grids, produced CAD drawing	June 8
Carlton Developments	Warehouse in Kilburn	Site survey, produce ACAD drawing	July 7
Bryen Langley	Brixton primary School	Set out site grids, produced CAD drawing	July 10
Bryen Langley	Brixton primary School	Set out building footings	July 28
Carlton Developments	Islamic Centre, Willesden	Re-set out grids, produced CAD drawing	Aug 24
Carlton Developments	Offices in Kilburn	Site survey, produce CAD drawing	Nov 2
Bryen Langley	Eastcote primary school, Welling	Set out site grids, produced CAD drawing	Nov 15

#### Observation, analysis, and Action

The above 9 jobs were undertaken by me in 2008 with assistance from various trainees. The plan is to continue with this work to keep up to date with current site practice, and to involve college trainees/students who wish to gain practical site experience.

The work often requires liaising with architects to obtain CAD setting out details, and producing suitable files for downloading to surveying instruments with a view to minimising human intervention in the actual surveying and setting out processes on site.

## Training Courses for Industry (2008)

Client	Course	Location	Date
Laing O'Rourke	Basic	Swanley Olympic Centre	Feb 6/7
Applecross Housing	Basic Total Stations	Maidstone	Mar 10
Environment Agency	Basic levelling	Haddiscoe Depot, Norfolk	Mar 11/12
Laing O'Rourke	Intermediate	Swanley Olympic Centre	Mar 18/19
Jenkins	Basic Total Stations	Swanley Olympic Centre	Apr 1
Laing O'Rourke	Basic	Swanley Olympic Centre	May 19/20
Laing O'Rourke	Advanced	Swanley Olympic Centre	June 9/10
Laing O'Rourke	Intermediate	Swanley Olympic Centre	July 14/15
Rouse Surveys	Basic Total Stations	Romford	July 26
Laing O'Rourke	Advanced	Brands Hatch Thistle	Aug 26/27
Laing O'Rourke	Basic+Inter+advanced	Brands Hatch Thistle	Sep 4-11
Laing O'Rourke	Advanced Plus	Brands Hatch Thistle	Sep 15/16
Laing O'Rourke	Employed graduates	Wakefield Data Centre	Sep 23/24

13 courses completed in 2008 (Please see appendix 1 for the course content).

Each course has a scheme of work, (programme), lesson plans, and delegate evaluation sheet. The courses usually last two days and the delegates are provided with a workbook that they must complete. The workbooks are inspected for completeness at the end of the course, and then marked before being sent to the employer.

Observation, analysis, and Action

The table below shows a sample of delegate's evaluations for two recent courses.

It can be seen that there is generally a large measure of satisfaction. However, three students are not impressed with the food. In fact the hotel has a very good reputation for its food, but site personnel often prefer big fry-ups, burgers, bacon sandwiches, etc. I enquired about this at the hotel, and was told that such tastes could be catered for. As there is no cost to the attendees, the phrase "gift horse" comes to mind.

ADVANCED COURSE BRANDS HATCH	August 26 and 27 2008									4 to 12 September 2008									
	1	2	3	4	5	6	7	Average Marks out of 10	1	2	3	4	5	6	7	8	9	10	Average Marks out of 10
	Delegate	Delegate	Delegate	Delegate	Delegate	Delegate	Delegate		Delegate	Delegate	Delegate	Delegate	Delegate	Delegate	Delegate	Delegate	Delegate	Delegate	
QUALITY OF ROOM	9	8	8	9	8	10	8	9	10	10	9	9	9	10	8	9	10	10	9
QUALITY OF FOOD	5	8	6	7	8	10	8	7	9	8	7	7	4	10	7	4	8	8	7
QUALITY OF EXERCISE AREAS	9	7	7	8	7	10	9	8	10	9	9	9	9	10	7	9	9	9	9
COURSE CONTENT APPROPRIATE FOR YOU	8	8	8	9	9	10	8	9	10	10	10	9	9	10	9	10	7	10	9
COURSE CONTENT LOGICALLY PRESENTED	8	8	8	8	9	10	8	8	10	9	9	9	8	10	9	9	7	10	9
QUALITY OF INSTRUCTION	10	8	8	9	9	10	8	9	10	10	9	9	9	10	9	10	8	10	9
QUALITY OF COURSE PRESENTATION	10	8	8	8	8	10	9	9	9	10	9	9	9	9	8	10	8	10	9
BALANCE BETWEEN INSTRUCTION AND FIELDWORK	10	8	8	7	7	10	8	8	10	10	9	8	9	9	8	9	10	10	9
<b>AVERAGE</b>	<b>9</b>	<b>8</b>	<b>8</b>	<b>8</b>	<b>8</b>	<b>10</b>	<b>8</b>	<b>8</b>	<b>10</b>	<b>10</b>	<b>9</b>	<b>9</b>	<b>8</b>	<b>10</b>	<b>8</b>	<b>9</b>	<b>8</b>	<b>10</b>	<b>9</b>

The attendees on these courses are usually well motivated, and mostly have some site experience, but their educational achievements vary widely. Sometimes there is a mix of graduates and those with no GCSE's on the same course. This causes problems with the basic maths and has to be addressed with individual attention and peer involvement.

There is rarely a problem with cheating or copying. However, on the September 4 New Graduate Course all ten attendees produced identical answers to the drainage calculation. They obviously

considered they were still in full time education where, if a mistake was made all that happened was a black mark. In the real world expensive corrective action might result.

Due to the economic downturn I anticipate a reduction, or even a cessation, in this type of training. However, I propose to continue with the present format with the following modifications: -

- a. Offer delegates the option of burger type lunches.
- b. Provide ten different drainage calculations and examine the others for possible similar treatment.
- c. Stop giving handouts except for the workbooks, and direct delegates to my web site instead. This saves paper and printing ink.

### Surveying and Setting Out for Industry (2009).

Site work undertaken in 2009 – two less than in 2008

Job	Client	Site	Output	Date
1	Bryen Langley	Bishop Justus	Set out site grids, produced CAD drawing, set out piles	Sep 7,10, 14, 16, 17
2	Bryen Langley	Crockenhill School	Set out grids, produced CAD drawing	Oct 31
3	Bryen Langley	Bishop Justus	Set out steels	Nov 5
4	Joy Steel	Bermondsey floor 4	Surveyed walls & columns, produced CAD drawing	Nov 26
5	Joy Steel	Bermondsey basement	Surveyed walls & columns, produced CAD drawing	Nov 28
6	Joy Steel	Hounslow	Re-set out grids, produced CAD drawing	Dec 10
7	Joy Steel	Hampstead	Pisces survey, produce CAD drawing	Dec 18

Observation, analysis, and Action.

The above 7 jobs were undertaken by me in 2009 with assistance as follows: -

- Job1, Archaeology undergraduate from UCL,
- Job 2, Site supervisor,
- Job 3, Site manager,
- Job 4, Company manager,
- Jobs 5, 6, 7, no assistance.

Previous trainees were no longer available,  
 Site managers/supervisors kept disappearing to deal with queries,  
 The UCL undergraduate was very good and should be available in 2010,  
 On sites of small extent it proved practical to do the work without an assistant.  
 It also proved practical to use public transport to London sites, (jobs 4, 5, 6, 7), rather than car in spite of having to carry the surveying equipment.

In 2010 I propose to use public transport for site work in London, and try not to rely on assistance. I expect more jobs from Joy Steel, possibly a couple from Bryen Langley, but Carlton Developments has severely constricted its operations since the credit crash.

Training Courses for Industry (2009)

9 courses completed in 2009 – 4 less than in 2008

Job	Client	Course	Location	Date
1	Sandberg	Bespoke	Clapham	Feb 6
2	Environment Agency	Basic Levelling	Ipswich	Feb 23/24
3	Laing O'Rourke	Basic	Brands Hatch Thistle	Mar 30/31
4	Laing O'Rourke	Intermediate	Brands Hatch Thistle	April 27/28
5	Walker Training	Basic	Folkestone	Sep 7/8
6	Walker Training	Basic	Verney Junction	Oct 7/8
7	Laing O'Rourke	New Graduates	Brands Hatch Thistle	Oct 12-16
8	Walker Training	Basic	Folkestone	Nov 2/3
9	Joy Steel	Bespoke	Beckton	Nov 16

Observation, Analysis, and Action.

A big reduction in Laing O'Rourke courses this year, also no jobs between April and September. No doubt as a result of the recession.

Walker proposed two more courses but they were cancelled due to lack of candidates. Sandberg was definitely a one-off, as was Joy steel. This was a poor year for the construction industry.

I continue to advertise on the Internet and by word of mouth, - hopefully things will pick up in 2010!

I have three bookings for 2010, one for the Environment Agency, one for Clarendon Homes, one for Walker Training.

Dated 7 January 2010

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Surveying and Setting Out for Industry (2010).

Site work undertaken in 2010

Job	Client	Site	Output	Date
1	Joy Steel	Hounslow	Set out grids on roof.	Feb 25
2	Joy Steel	Curwen School	Surveyed walls, trusses & columns, Provided AutoCAD drawings.	May 7, 14
3	Bryen Langley	Warden Bay	Setting out, surveying, Provided AutoCAD drawings.	July 7 to July 26
4	Bryen Langley	Hengist	Setting out, surveying, Provided AutoCAD drawings.	July 13 to Aug 17
5				
6				
7				

Observation, analysis, and action.

Public transport was used for Joy Steel jobs. This was not easy carrying instrument, tripod, accessories and small tools and proved impossible for Bryen Langley jobs. Both companies provided a chainman.

Training in the use of Total Stations, co-ordinates, etc. was given to the chainmen during the above site work. One chainman became reasonably competent in operating the instrument with me as chainman and successful setting out was accomplished with the help of two way radios to convey instructions. It took nine site visits to reach this stage.

Dated 5 Sept 2010

Training Courses for Industry (2010)

Courses completed in 2010

Job	Client	Course	Location	Date
1	Clarendon Homes	Total Stations	Leeds, Kent	Jan 14/15
2	Walker Training	Intermediate	Folkestone	Feb 22/23
2	Walker Training	Intermediate	Verney	Mar 10/11
3	Environment Agency	Basic Levelling	Haddiscoe	Mar 1/2
4	Charles Brook	Total Stations	Eltham	May 18
5	Clearline	Total Stations	Liverpool	June 7/8
6	Gentlecraft	Total Stations	Swanley	July 2
7	Plan-London	Total Stations	Lordship Lane	July 21/22
8				
9				
10				

Observation, Analysis, and Action.

Several courses were booked but later cancelled.

Marketing emails to previous contacts did not produce enough interest to justify running any further courses. Google Adwords has produced most of the work top date.

Clarendon, Clearline, Gentlecraft, and Plan-London needed email support following their courses. Two days is really not sufficient training even for those who have used theodolites previously.

The Clarendon training took place on one of their new sites. I have used this method previously and the trainees seem to be happier on a site that they are, or will be, working on but it does not seem to result in a greater success rate as far as learning is concerned.

Dated 5 Sept 2010

## Setting Out Courses

### **The Venue:**

Thistle Hotel, Brands Hatch, Longfield, Kent. DA3 8PE. Tel: 0870 333 9128

### **Time:**

9:00am to 5:00pm. Lunch 12:30 to 1:15.

Tea, coffee, lunch will be provided.

### **Dates:**

Please email [keithdennison@hotmail.com](mailto:keithdennison@hotmail.com)

### **Instructor:**

Keith Dennison. MA, PGCE.

Web: [www.keithdennison.com](http://www.keithdennison.com)

Email: [keithdennison@hotmail.com](mailto:keithdennison@hotmail.com)

### **Driving directions:**

Leave the M25 at Junction 3.

Take the A20 towards Farningham.

The hotel is 3.6 miles on the left.

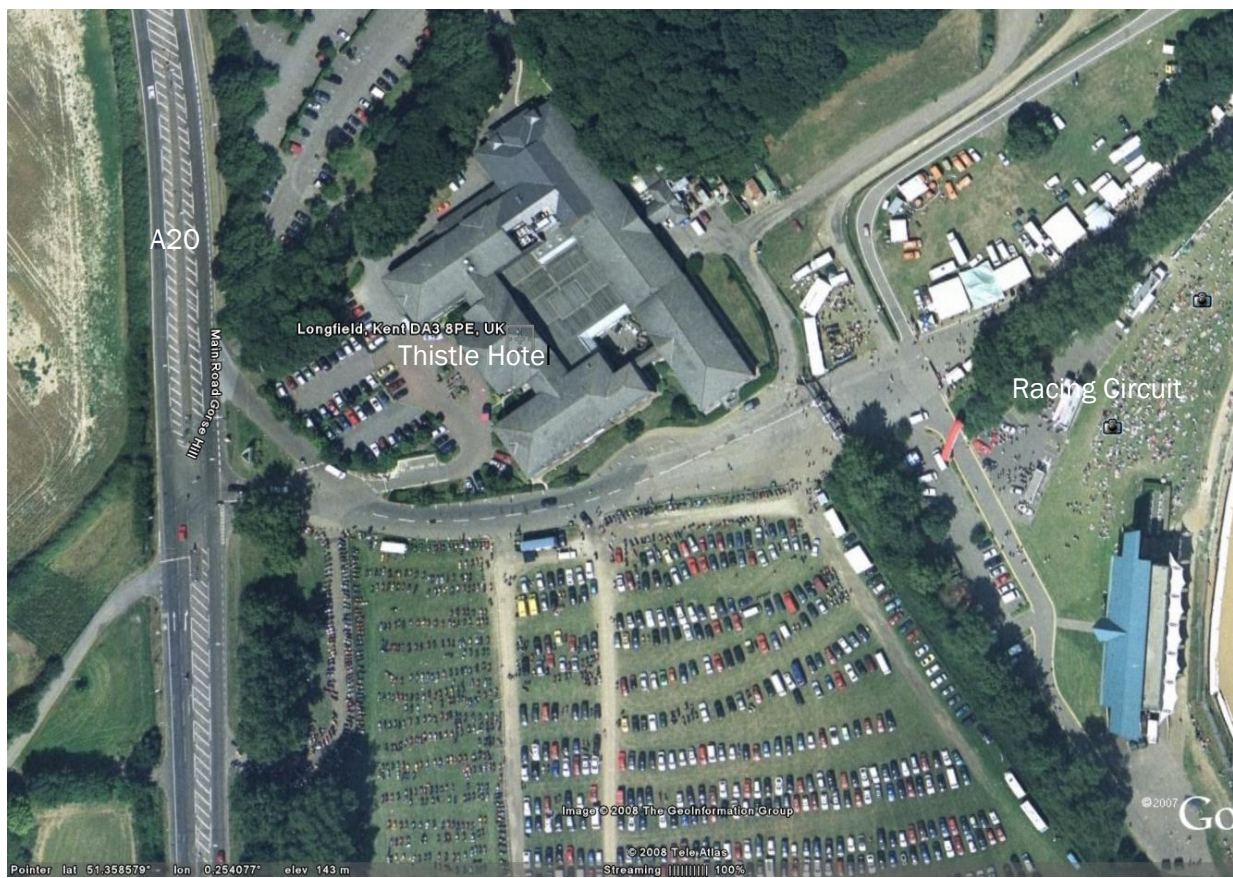
There is ample car parking.

### **By rail:**

The nearest station is Swanley, (5 miles). Local buses, (No. 427), are rare. Taxi about £14.

Please bring wet weather clothing, pen, pencil, scale rule, set square, scientific calculator.

A certificate will be issued on satisfactory completion of the course.



## Setting Out Courses

### **1) BEGINNERS COURSE**

Intended for:

Assistant site engineers with little experience.

Aims:

To provide basic instruction and practice to enable attendees to use auto levels and total stations on a construction site.

Objectives:

At the end of the course attendees will be able to:

Check and adjust an auto level. Undertake a levelling circuit, check and adjust a Total Station, set out a house with drainage using rectangular coordinates, survey and plot a small site by rectangular coordinates.

Day one a.m: – Instruction on the principles of levelling followed by - Group exercise, check and adjust a level. Group exercise, undertake a simple levelling circuit. Individual exercise, calculate levels by the collimation method.

Day one p.m: – Instruction on Theodolite Basics, followed by - Individual exercise, check and adjust a theodolite/Total Station.

Day two a.m: - Instruction on Total Stations, Coordinates, and AutoCAD.

Day two p.m: - Group exercise, set out a building, check the setting out, survey the boundary, take levels by Total Station, plot the survey.

### **2) INTERMEDIATE COURSE**

Intended for:

Site engineers with limited experience, or who are progressing from the beginner's course

Aims:

It is assumed that attendees are familiar with the use of auto levels and total stations on site, and this course focuses on the skills and knowledge underpinning the work of the setting out engineer including the need to demonstrate professionalism in addition to technical skills.

Objectives:

At the end of the course attendees will be able to:

Check and adjust a rotating laser. Undertake a more complex levelling circuit, Calculate levels using MS Excel, Calculate polar and rectangular coordinates, Calculate drainage, undertake a control traverse using raw data, Calculate and adjust the traverse manually and by MS Excel

Day one a.m: – Instruction on more advanced Levelling followed by - Group exercise, check and adjust a level and Laser. Using a Pipe Laser. Group exercise, undertake a levelling circuit. Individual exercise, calculate reduced levels by collimation and rise and fall methods.

Day one p.m: – Instruction on Recording and Reporting. Instruction and exercise on polar/rectangular coordinate calculations, by trigonometric, analytical, and graphical methods. Calculate a complex drainage system.

Day two a.m: – Traversing instruction, adjustment, Group traversing exercise.

Day two p.m: – Individual exercise to calculate the traverse from raw data.

### **3) ADVANCED COURSE**

#### Intended for:

Site engineers with good experience, or who are progressing from the intermediate course

#### Aims:

It is assumed that attendees are fully competent using setting out instruments on site and have demonstrated the ability to set out without supervision. This course focuses on more unusual calculations and the use of computer software to speed up setting out and to minimise errors by limiting human intervention.

#### Objectives:

At the end of the course attendees will be able to:

Calculate and set out a highway curve, Calculate and set out a small radius curve by chord and offsets, Calculate and plot concentric ellipses, Calculate coordinate transformations. Undertake an As-Built survey using data logging and produce a table of residuals in MS Excel.

Day one a.m: – Calculate and set out a long radius curve by coordinates.

Day one p.m: – Calculate a short radius curve by chord and offsets

Day two a.m: – Set out the chord and offset curve. Calculate and plot an elliptical curve

Day two p.m: – Undertake and calculate an as-built survey using Leica Geo Office and Excel, Plot the survey into AutoCAD, Recording and Reporting.

#### **4) ADVANCED PLUS COURSE**

##### Intended for:

Site engineers with wide experience, or who are progressing from the advanced course.

##### Aims:

The emphasis of this course is less on instrument work and more on procedures to minimize errors on site. Objectives 1 to 8 include a substantial proportion of revision, but give the attendees the opportunity to expand their learning from previous courses in the light of their subsequent experiences on site.

However, two new topics will be introduced i.e. instruction and exercises on basic GPS, also 2D and 3D CAD with particular reference to the construction process. These will be covered in objectives 9 to 12.

There will be a test at the end of the course in which attendees will be asked to write their comments on each topic discussed. It is therefore important that they are able to debate critically and with some intelligence on these and related subjects. This should provide valuable insight into each attendees attitude, knowledge, and aptitude for senior positions in surveying and setting out.

##### Objectives:

On completion of this course attendees will be able to: -

01. Check and adjust all types of surveying instruments.
02. Debate the advantages and constraints of free stationing vs. traditional methods.
03. Debate the advantages and constraints of raw data vs. coordinates for control surveys; be able to identify rogue observations, and undertake calculation by MS Excel.
04. Debate the advantages and disadvantages of levelling by Total Station.
05. Debate the importance of self-checking procedures, and method statements for dimensional control.
06. Recognize the importance of reporting, recording, and archiving requirements.
07. Use CAD as an aid to obtaining setting out information.
08. Understand 3D CAD basics, Wireframe, solid modelling, parametric construction, animation, and walk-through files.
09. Use CAD add-ins for monitoring/as-built surveys: - Colvar, Pointor, P2f.
010. Understand GPS basics: - principles, instruments, accuracy, costs, Leica Smart Rover, Smart Net, Trimble VRS, OS correction network
011. Participate in field exercises, Surveying, Setting out, Quality control
012. Observe data transfer to laptop, Observe data processing
013. Use automated data collection for as-builts and setting out
014. Use MS Excel, Leica Geo Office, and AutoCAD for Monitoring and as-built surveys. Use Leica format files for reports

Day one a.m: – Objectives 1 to 10

Day one p.m: – Objectives 11 and 12.

Day two a.m: – Objectives 13 and 14

Day two p.m: – end test.

## 1 Day Setting Out Course

### **5) TOTAL STATION AUTOMATION**

#### Intended for:

Site engineers/surveyors who are familiar with the use of total stations on site but who need to automate their site and office work.

#### Aims:

The purpose of this course is to automate data collection on site with a view to eliminating site errors, and to provide a full record of total station observations.

The procedure requires the site engineer/surveyor to validate all observations before leaving the workplace, and also produces a report file containing point numbers, design coordinates, observed coordinates, and differences, in three dimensions. Production of a CAD drawing will be touched upon.

There will be a field exercise, (see objective 5).

#### **Objectives:**

On completion of this course attendees will be able to: -

01. Recognize the importance of reporting, recording, and archiving.
02. Extract 3D design coordinates from a CAD file.
03. Load the extracted values into a Leica total station using Geo Office
04. Load relevant format files into the total station
05. Undertake a field exercise – setting out, monitoring, and as-built, both parallel to the site grid and at an angle. Record all observations into the total station memory
06. Transfer data from the total station to a laptop
07. Process the data into report format
08. Use CAD add-ins as an aid to producing as-built records.

Day one a.m: – Objectives 01 to 05

Day one p.m: – Objectives 06 to 08

Appendix 2: