Historic England

Measured Survey for Cultural Heritage
Fountains Abbey & Studley Royal, North Yorkshire 2016

Date	Monday 5th September 2016
Session	Session 1: GNSS SURVEY
Duration	9.30 – 17.30
Objectives	The session will introduce the fundamental principles of GNSS survey and explain the key issues involved in using the equipment to set out survey control for a fieldwork project. Delegates will get hands-on experience of using various grades of GNSS equipment to learn how they are best deployed to create maps and plans and to gather data for use in GIS systems. The session will provide a critique of the different techniques, explain their limitations and outline the use of GNSS as one of a number of complementary recording techniques.
Outcome	By the end of this session, delegates will have learnt • The basic principles of GNSS • The practicalities of using GNSS for setting out control, for landscape survey and for GIS data collection • The concept of analytical earthwork survey • The different types of GNSS and their uses in field archaeology • The integration of GNSS survey data with other datasets
Background Reading	(PDF) Where on earth are we? The role of Global Navigation Satellite Systems (GNSS) in archaeological field survey https://historicengland.org.uk/images-books/publications/where-on-earth-gnss-archaeological-field-survey/ June 2015 (PDF) Guidelines for the use of GNSS in survey and mapping (second edition) https://www.isurv.com/site/scripts/download_info.aspx?downloadID=156 (Webpage) Ordnance Survey GPS support page http://www.ordnancesurvey.co.uk/business-and-government/help-and-support/navigation-technology/gps-support.html

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Date	Tuesday 6th September 2016
Session	Session 2: PHOTOGRAPHY
Duration	9.00 – 18.00
Objectives	The session will provide a basic introduction to architectural photography, concentrating on the techniques required to record buildings. This will be achieved through a series of lectures, demonstrations and practical hands on experience. Delegates will have the opportunity to use DSLR cameras with perspective control lenses and there will be practical sessions using wireless lighting techniques to illustrate how lighting can enhance the record of an interior. There will also be the opportunity for delegates to use their own cameras on location. The session will finish with a look at image processing using Photoshop where delegates will receive techniques, skills and advice on how to make the most of their images.
Outcome	By the end of this session, delegates will have learnt • The principles of architectural photography. • The delivery of information in a single architectural photograph. • The practicalities of eliminating converging verticals. • The effect of daylight and artificial light in recording architectural elevations/details. • Principles of image processing through demonstration and hands on experience using Photoshop.

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Date	Wednesday 7TH September 2016
Session	Session 3: TST SURVEY & RECTIFIED PHOTOGRAPHY
Duration	09.30 – 17.30
Objectives	The session will provide a basic introduction to the fundamental principles of TST survey and explain the key issues involved in using the equipment to set out survey control for a fieldwork project. Delegates will get hands-on experience of using TST equipment to learn how they are best deployed to create plans, sections and elevations. The session will then focus on the use of rectified photography and its incorporation into a drawing. The session will provide a critique of the different techniques, explain their limitations and outline the use of the TST and rectified photography as one of a number of complementary recording techniques. Throughout the day, students will also be instructed, in groups of two, in the value of hand drawing and integrating this with TST derived data.
Outcome	By the end of this session, delegates will have learned: • The basic principles of the TS T. • The practicalities of using a TST for setting out control, and using control generated by other means, e.g. GNSS. • The concepts involved in building survey using a TST. • When and how to use rectified photography. • The integration of TST and rectified photography data with other forms of survey data.
Background Reading	(PDF) Traversing the Past: The total station theodolite in archaeological landscape survey http://historicengland.org.uk/images-books/publications/traversingthepast/ (PDF) Measured and drawn: techniques and practice for the metric survey of historic buildings http://historicengland.org.uk/images-books/publications/measured-and-drawn/ (PDF) Understanding Historic Buildings: A guide to good recording practice https://www.historicengland.org.uk/images-books/publications/understanding-historic-buildings/

Measured Survey for Cultural Heritage

Fountains Abbey & Studley Royal, North Yorkshire 2016

Date	Thursday 8TH September 2016 Friday 9TH September 2016
Session	Session 4: GEOSPATIAL IMAGING Session 5: PHOTOGRAMMETRY AND PROCUREMENT
Duration	9.30 – 18.30 Thursday 9.30 – 13.00 Friday
Objectives	The sessions will provide a basic introduction to Geospatial Imaging techniques with specific reference to Photogrammetry, Structure-from-Motion (SfM) and laser scanning. This will be achieved through a combination of lectures, demonstrations and hands-on exercises: • Opening lecture to explain the principles and heritage application of Geospatial Imaging techniques • Demonstration of laser scanning including data acquisition, scan registration and output extraction • Lecture and demonstration of Structure-from-Motion processing. • Demonstration of photography acquisition for photogrammetry using Structure-from-Motion. Delegates will use their own cameras to capture overlapping photographs and process them using Agisoft Photoscan • Lecture and demonstration of low-level aerial photography capture using drones (SUA, UAV & RPAS) • Lecture and demonstration of Building Information Modelling (BIM) within a heritage context The first session will provide a critique of the two techniques, explain their limitations and outline the use of photogrammetry and laser scanning as two of a number of complementary recording techniques. The final session will consider the practical application of SfM photogrammetry using case study examples before focusing on the increasing application BIM across heritage and the procurement of measured survey datasets using standard specifications.
Outcome	By the end of this session, delegates will have learnt • The basic principles of photogrammetry, structure-from-motion and laser scanning

	• The practicalities of using the techniques in the field for recording landscapes, buildings and objects • The principles of data capture for photogrammetry, structure-from-motion and laser scanning • The process of laser scan data registration and the extraction of suitable outputs • The principles of photogrammetric processing through demonstration and hands on experience • An awareness of how a drone should be used on site and the generation for imagery and/or survey data across multiple heritage applications • What BIM is, how to derive BIM models from survey datasets and its application across heritage applications.
Background Reading	(Website) Please download and pre-install the trial version of Agisoft Photoscan on a laptop and bring it and a camera with you on the day http://www.agisoft.com/downloads/request-trial/ **Please note this is a 30 day trial so don't install it too early.** (PDF) 3D Laser Scanning for Heritage http://historicengland.org.uk/images-books/publications/3d-laser-scanning-heritage2/ (PDF) Measured and Drawn: Techniques and practice for the metric survey of historic buildings http://historicengland.org.uk/images-books/publications/measured-and-drawn/ (PDF) TSA Client Guide to Small Unmanned Aircraft Surveys http://www.tsa-uk.org.uk/new-tsa-client-guide-on-small-unmanned-aircraft-sua-surveys/ (PDF) Metric Survey Specifications for Cultural Heritage https://historicengland.org.uk/images-books/publications/metric-survey-specifications-cultural-heritage/ BIM - Survey and the Digital Plan of Works http://www.bimtaskgroup.org/resources/