H24VEP Project 3

Bridge Monitoring Preparation[a]

LKB/SI[b]

29th February 2016

NGI

[a] History of changes at `https://github.com/DfAC/TeachingSlides/`.

[b] Based on presentation given by the last year MSc cohort. All Google Map screen-shots have been attributed as per guideline. All graphics copyrights belongs to their respective owners.

Outline

Introduction

Project Introduction I

The aim of the project is to characterise bridge movement using precise geodetic sensors. We will monitor Wilford Pedestrian Bridge Monitoring Using GNSS, Robotic Total Station (RTS), IMU and Inclinometer sensors. We will also try to excite the structure to better understand sensors performance and to characterise bridge movement.

To do so we will:

- Decide where do put sensors on the bridge;
- Decide how are you going to do it;
- Analyse measurements from multiple sensors;

Project Introduction II

- Examine the bridge's response under different excitation types;
- Compare and contrast the results;
- Tell the story.

Wilford Pedestrian Bridge

Wilford Pedestrian Bridge is single span suspension bridge. Spans the River Trent; 69 m long and 3.7 m wide.

Figure 1: *Wilford Pedestrian Bridge*

Equipment

We plan to use following equipment on the bridge:

- Leica GNSS receiver x5
- Leica Robotic Total Station (RTS) x2
- Novatel SPAN IMU sensor x1
- Leica Nivel 210 inclinometer x1

Plan

- What equipment are you using?
- Where are you placing it?
- How are you going to time synchronise equipment?
- What about coordinate system?
- How many ppl you have?
- Who is responsible for what?
- How can we prevent mistakes? How can we prevent accidents?

Figure 2: *Have you got risk assessment?*

Implementation

Bridge layout

Figure 3: *Top view*

Sensors layout

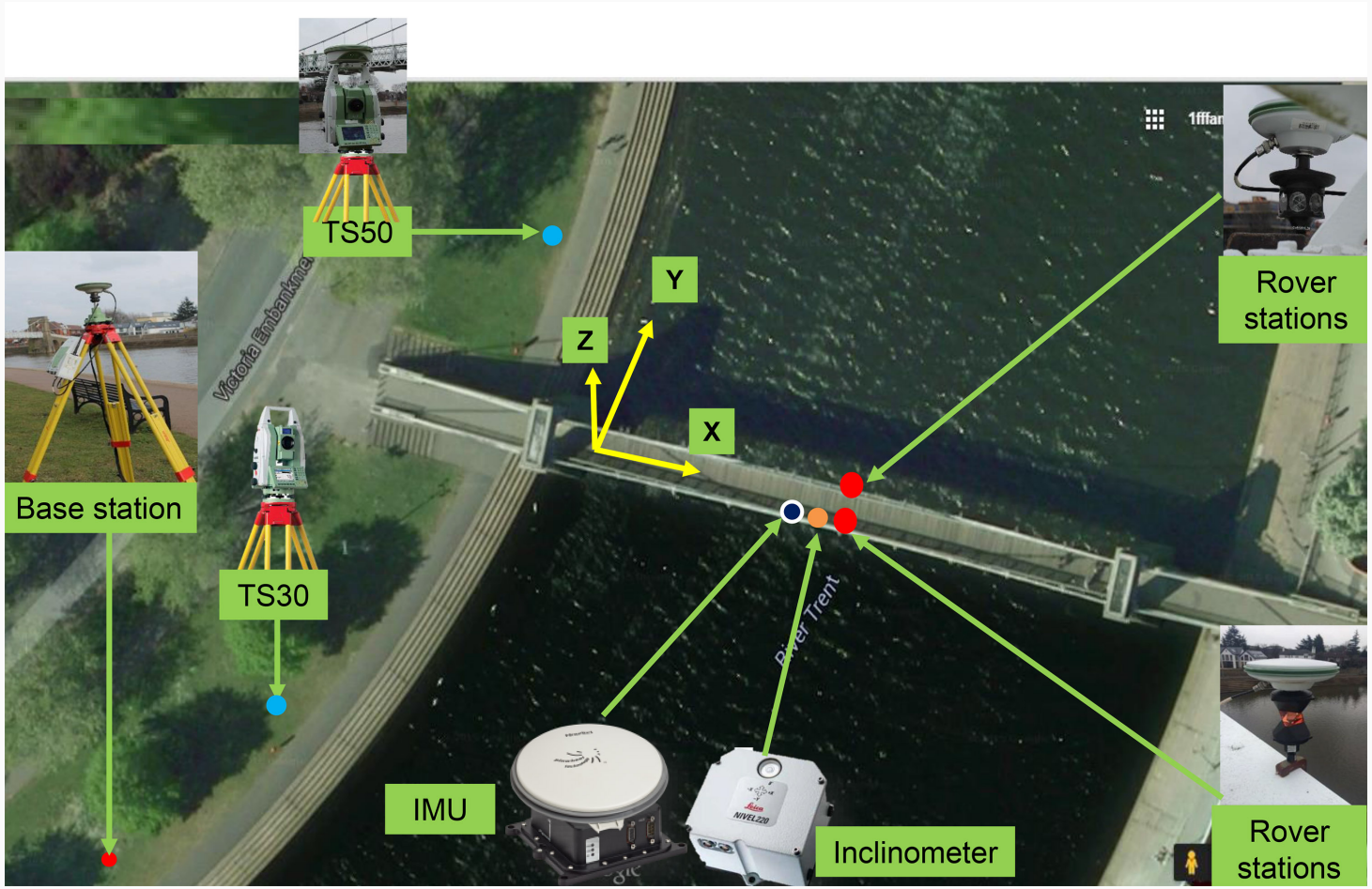

Figure 4: *Location of the sensors from last year*

Excitation

To better understand sensors performance and to characterise bridge movement we will also create artificial excitation of the bridge.

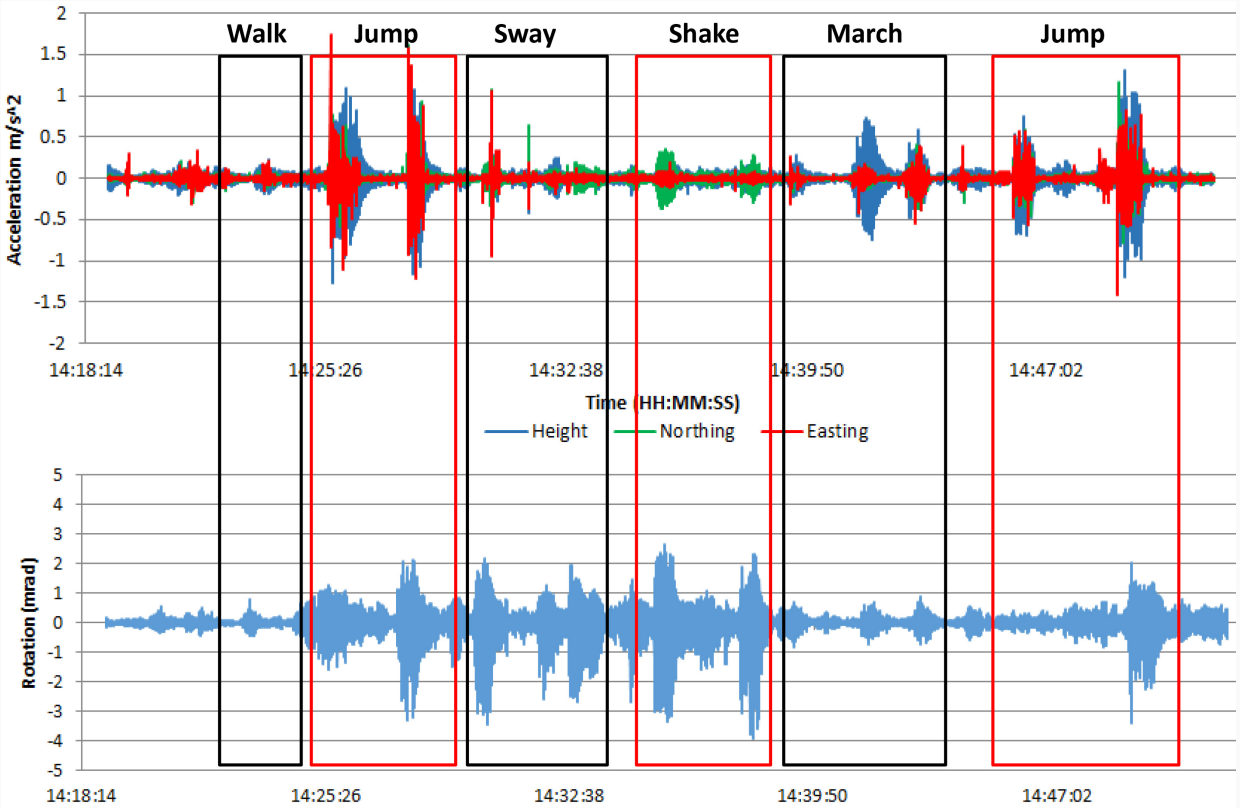

Figure 5: *Example of excitations from last year trial*

Summary

Summary

- Decide on your equipment.
- Decide on your activities.
- Select Time Keeper and Note Keeper.
- Agree on roles (responsibilities) before next Monday.
- Submit all relevant H&S forms before Thursday.

Good luck[1]

[1] History of changes at https://github.com/DfAC/TeachingSlides/.