Imperial College London

Dr. Richard Ghail

CGL

Richard Ball

Drift Filled Hollows: a case study at St. James's Square

Stephen Dixon *MSci (Hons) MSc FGS*

s.dixon@cundall.com

CUNDALL

September 1st 2016

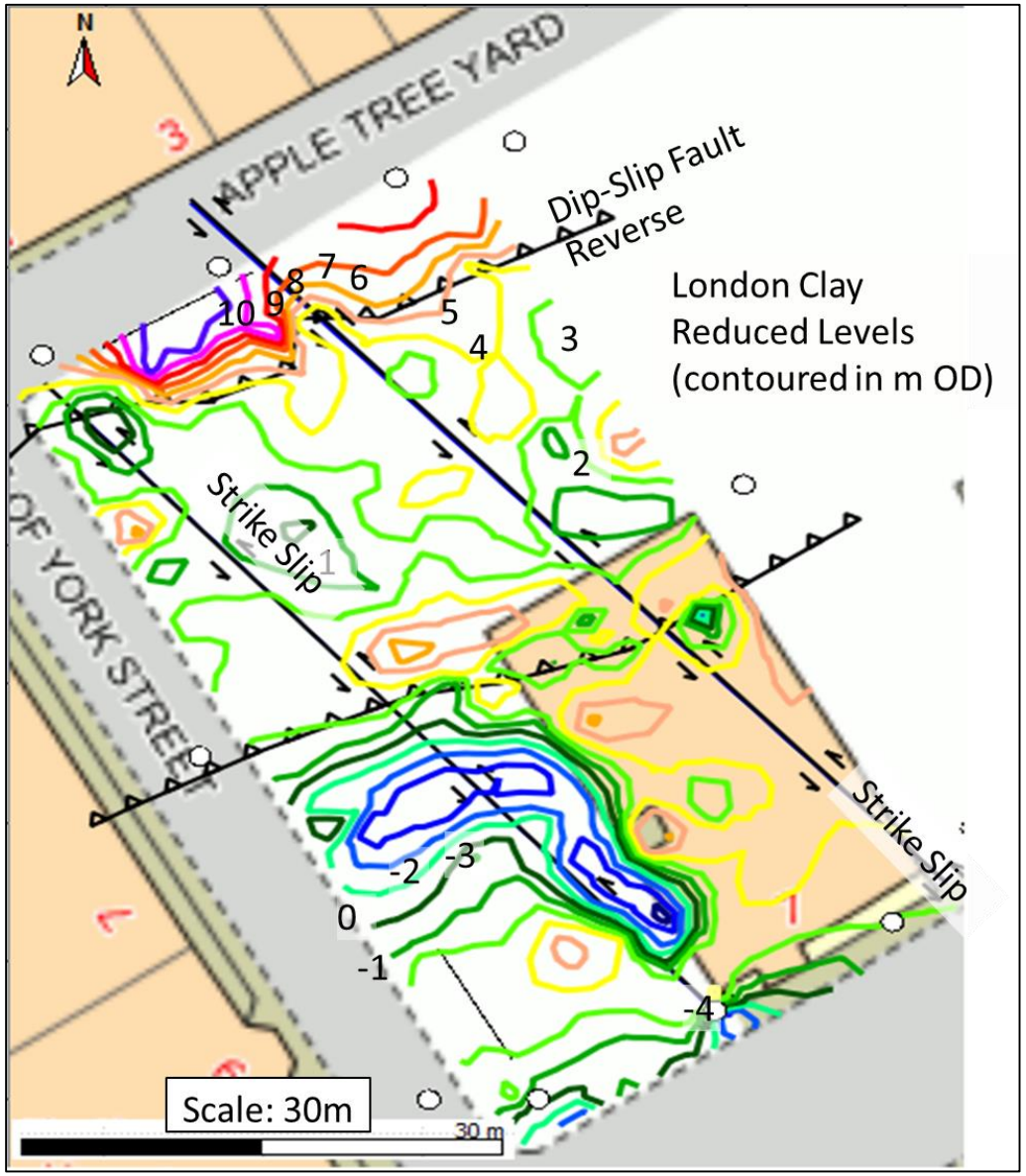
Geological Society, Burlington House

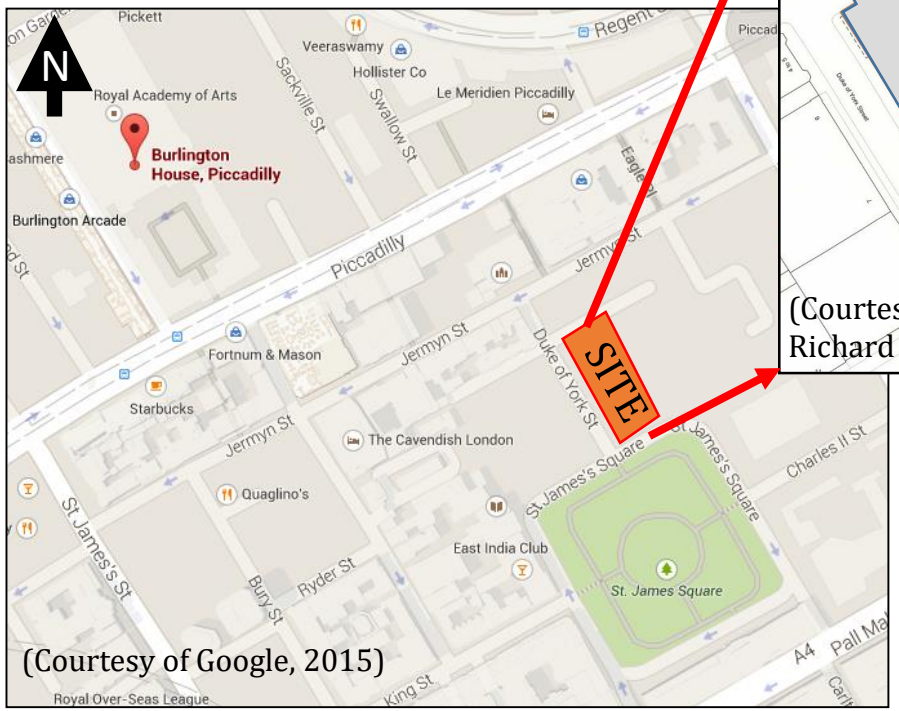
Introduction

3D models of data indicated the following:

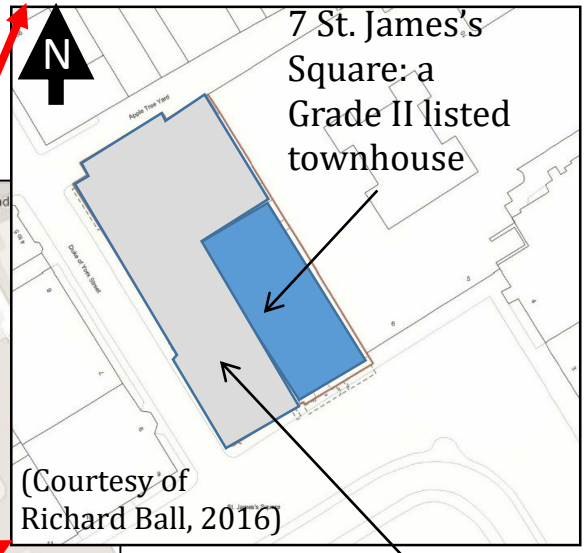
- Scour features (associated with fluvial action).
- Faulting Evidence

Furthermore the faults interpreted onsite corroborate the compartmentalisation within the London Basin.





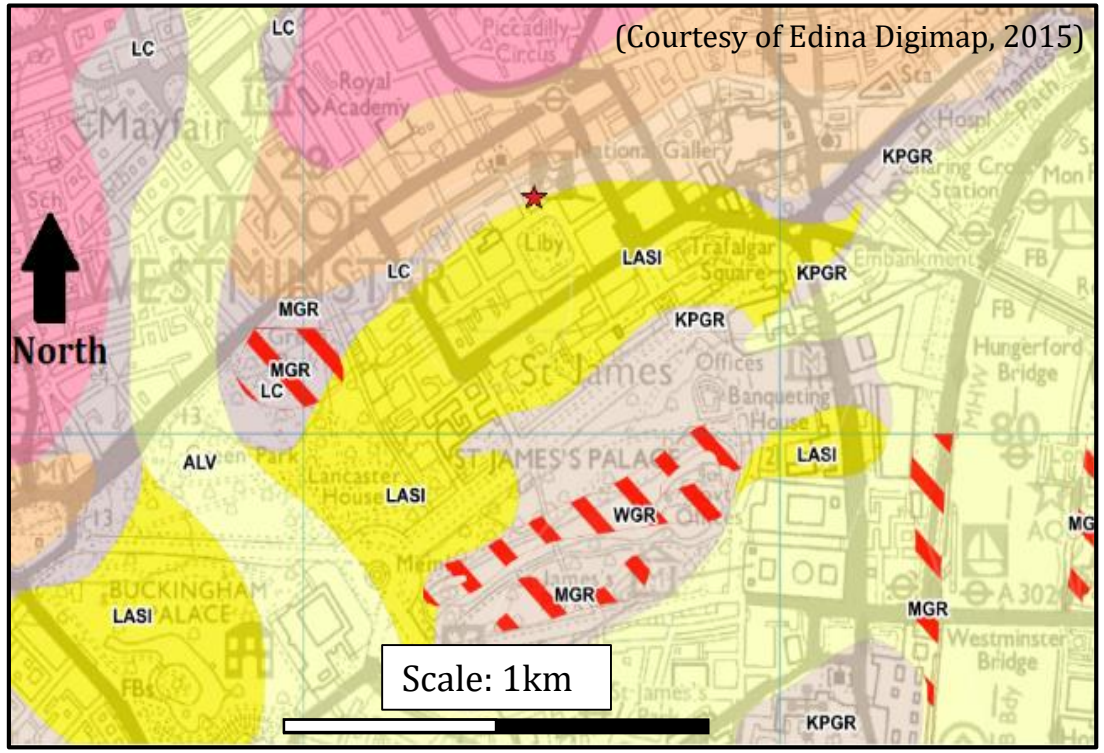
(Courtesy of Google, 2015)



7 St. James's Square: a Grade II listed townhouse

(Courtesy of Richard Ball, 2016)

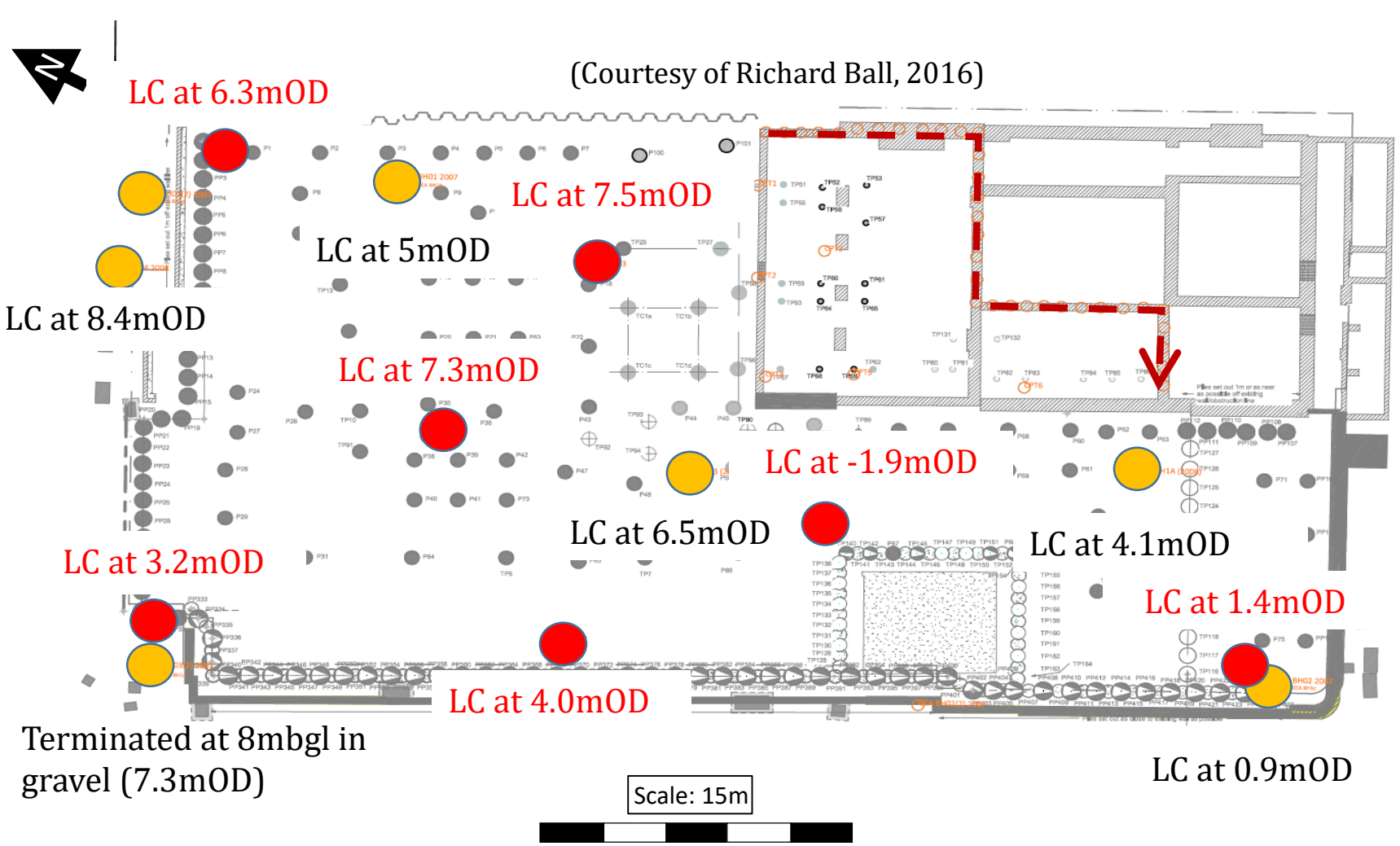
7 Appletree Yard, 12a Duke of York Street, & 8 St. James's Square



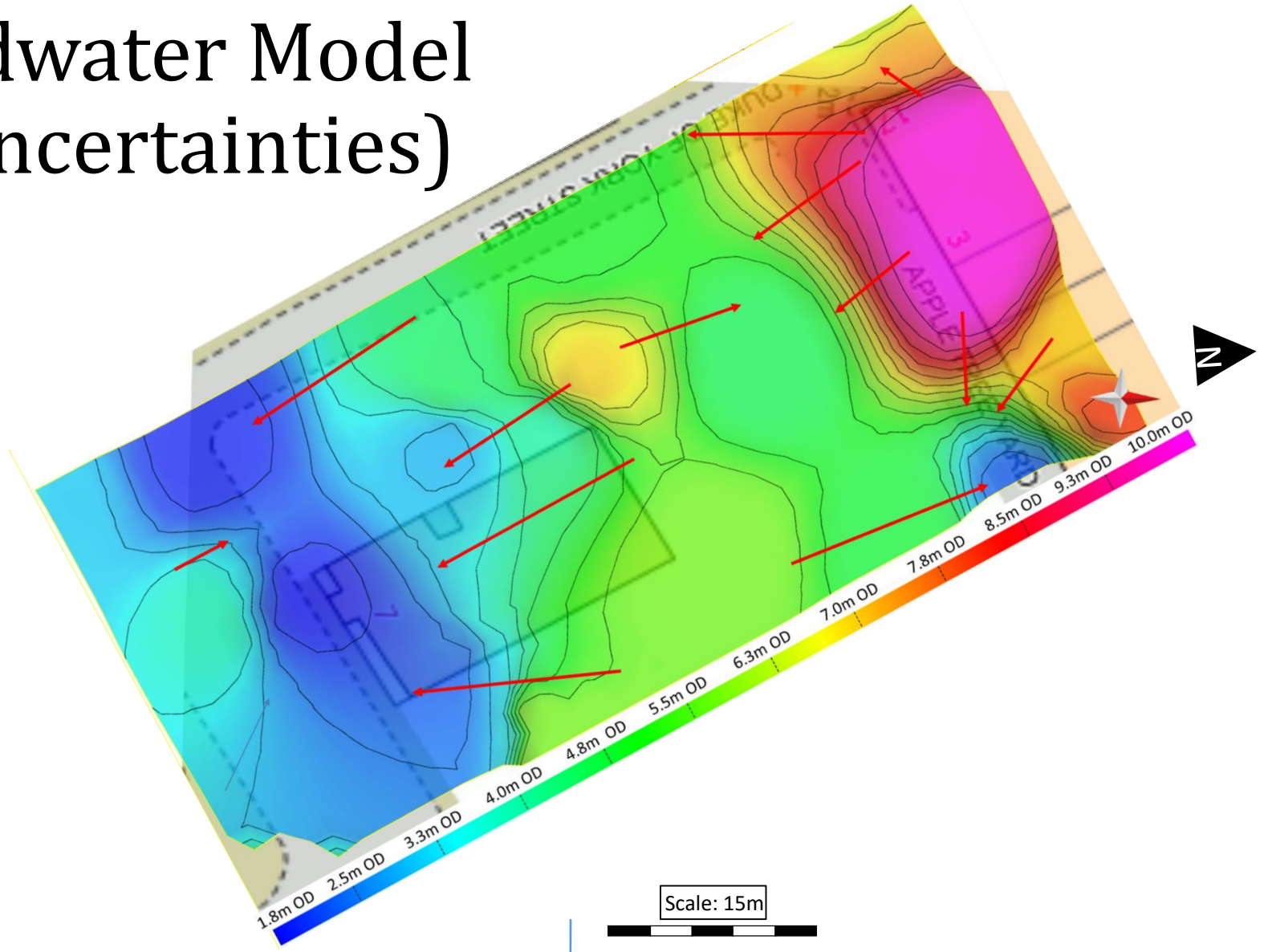
Alluvium (ALV)		Interglacial Lacustrine Deposits (IGLD)	
Boyn Hill Gravel Member (BHT)		Kempton Park Gravel Formation (KPGR)	
Finsbury Gravel Member (FIGR)		Langley Silt Member (LASI)	
Hackney Gravel Member (HAGR)		Lynch Hill Gravel Member (LHGR)	
Head (HEAD)		Peat (PEAT)	
		Taplow Gravel Formation (TPGR)	

Site Location and Geology

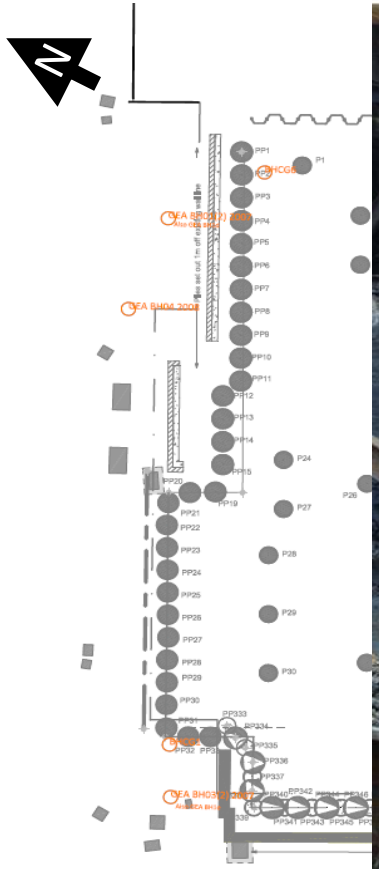
Ground Investigation phases

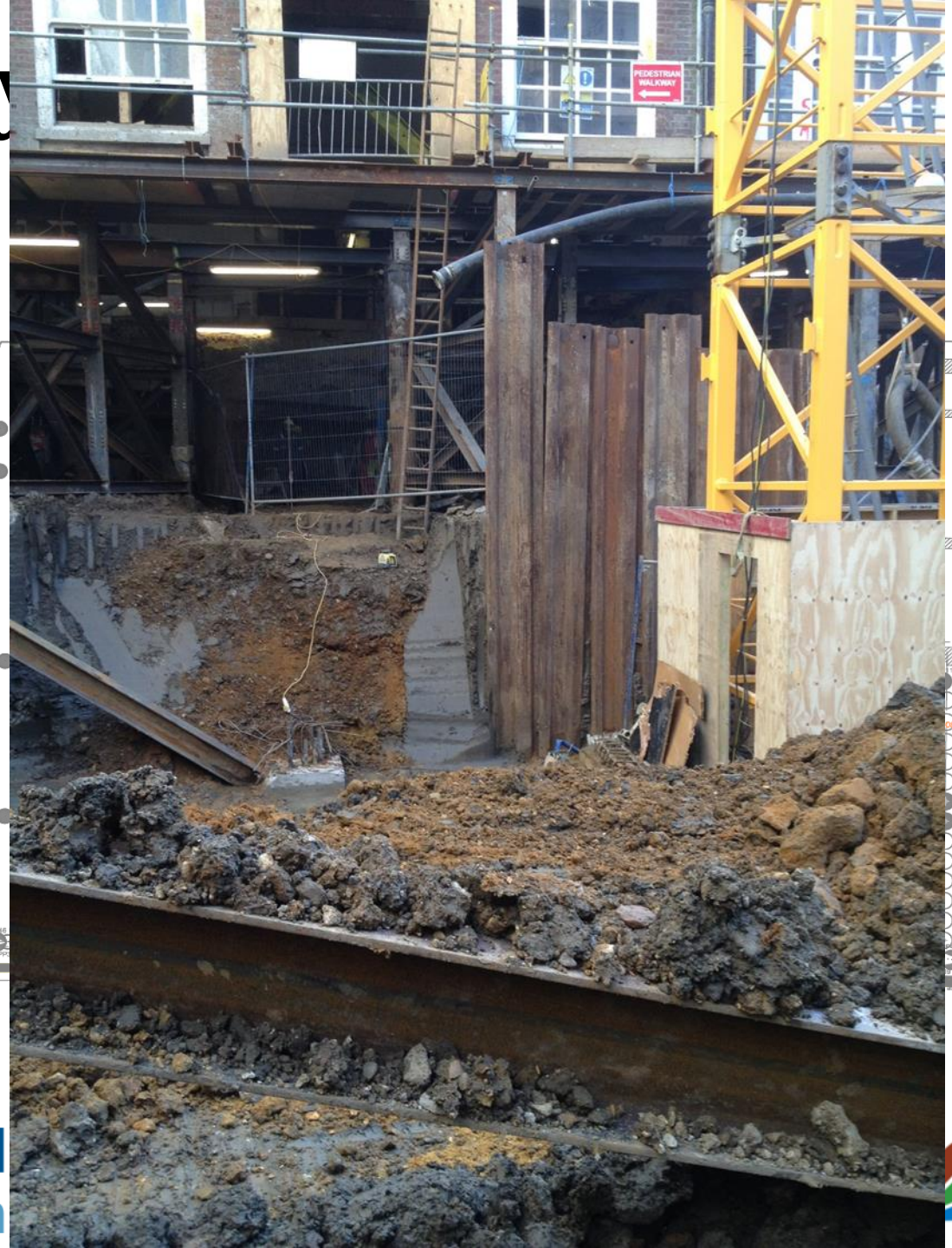


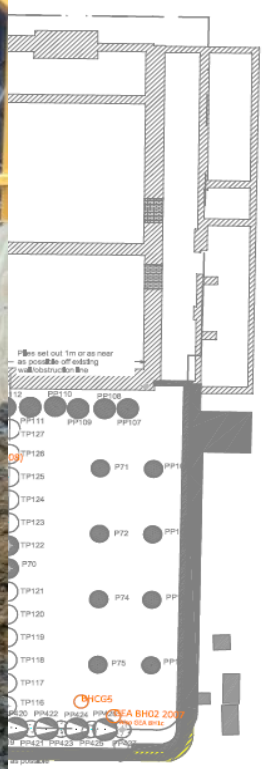
Groundwater Model (and Uncertainties)



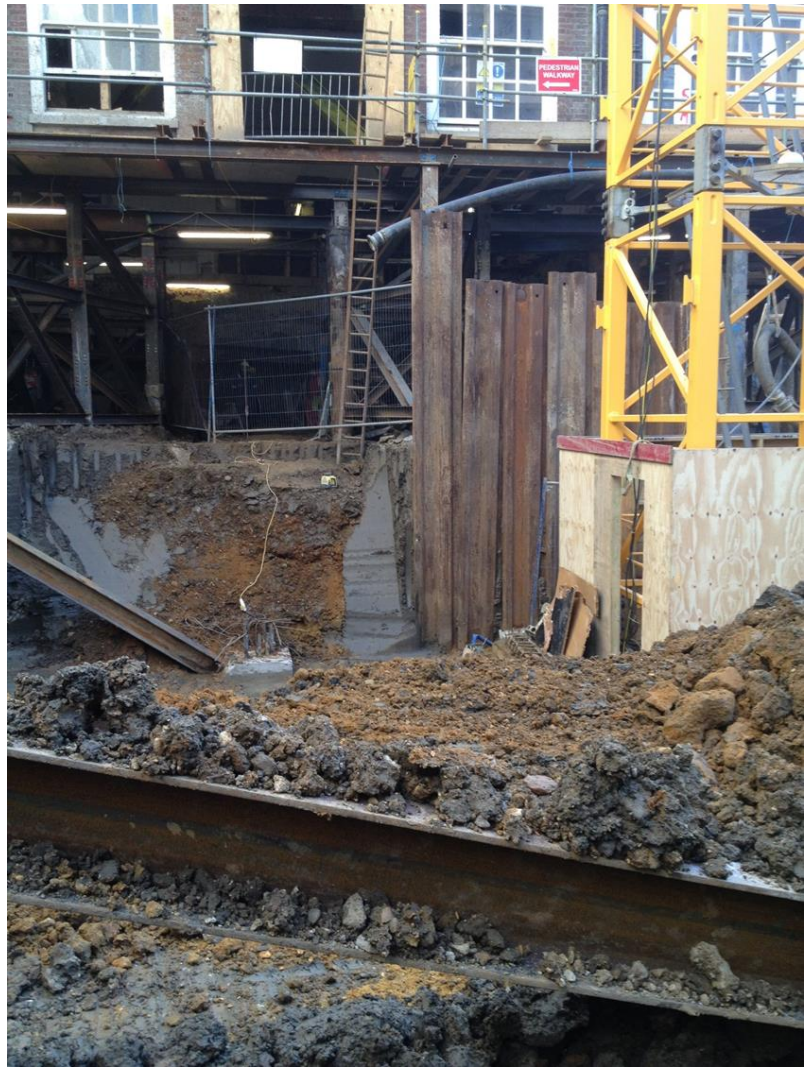
Excavation Lay







Looking south-east



(Courtesy of Richard Ball, 2016)

Looking north-north-west

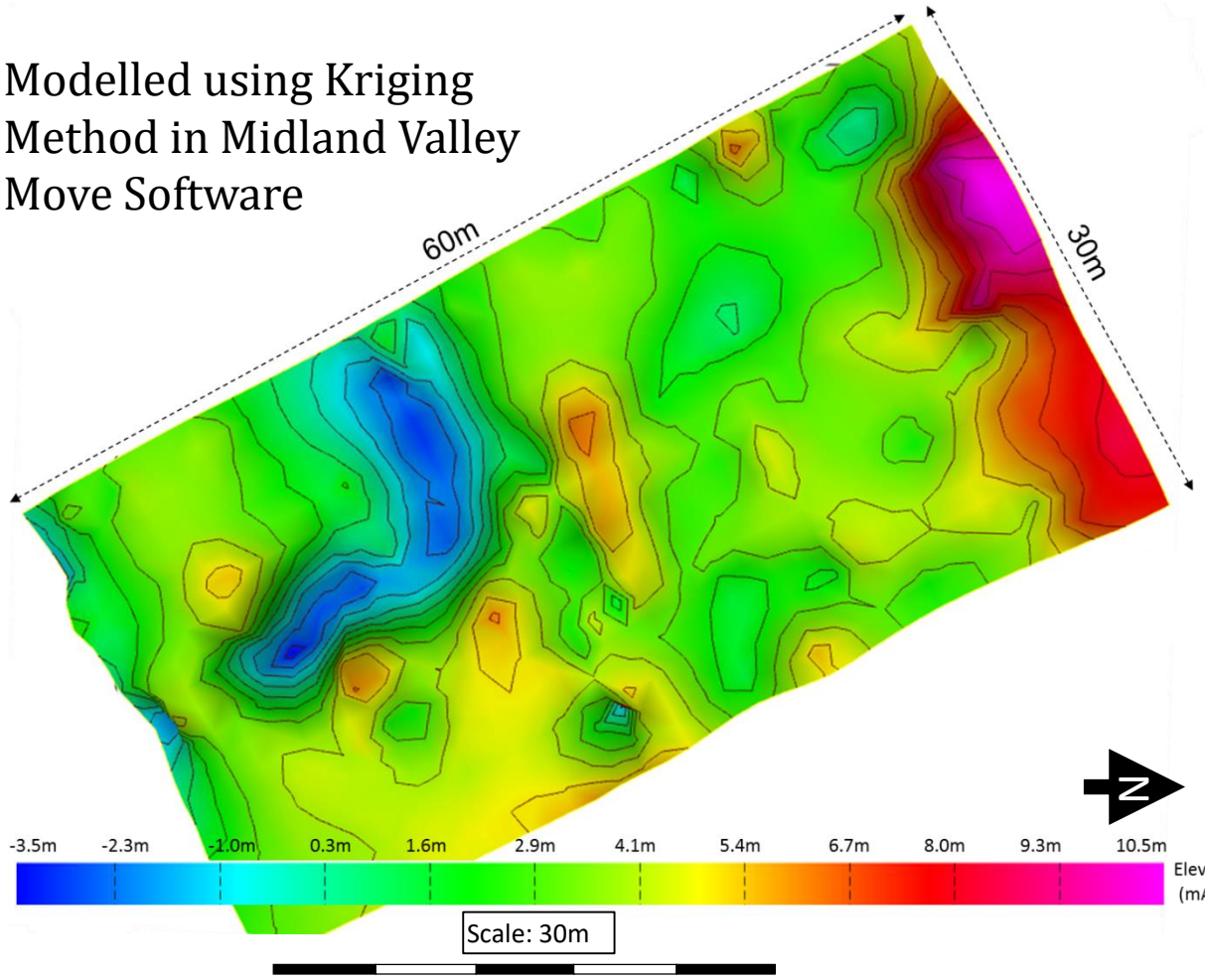
Looking south-west

Excavation Photographs

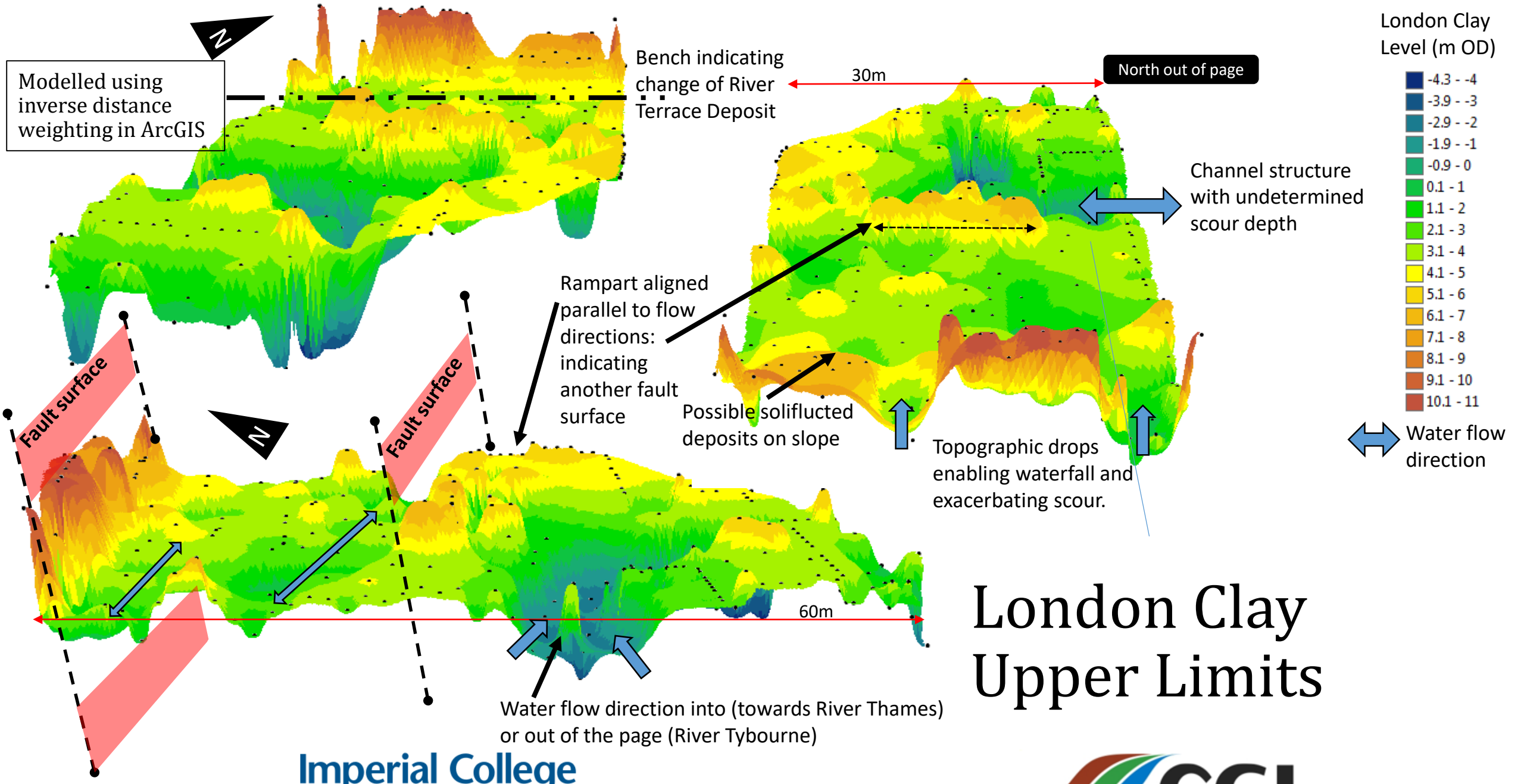
Scale: 15m

London Clay Upper Limits

Modelled using Kriging Method in Midland Valley Move Software

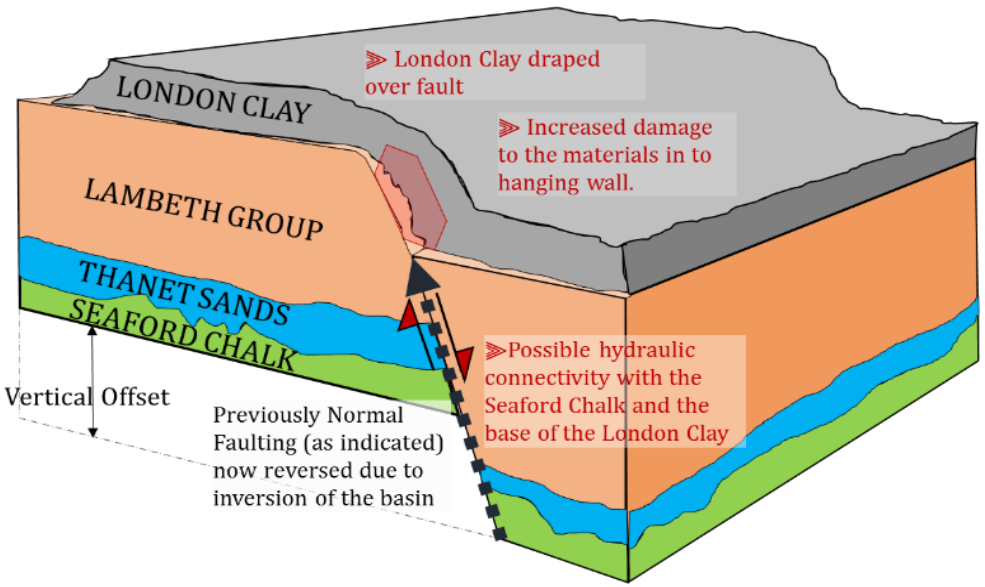


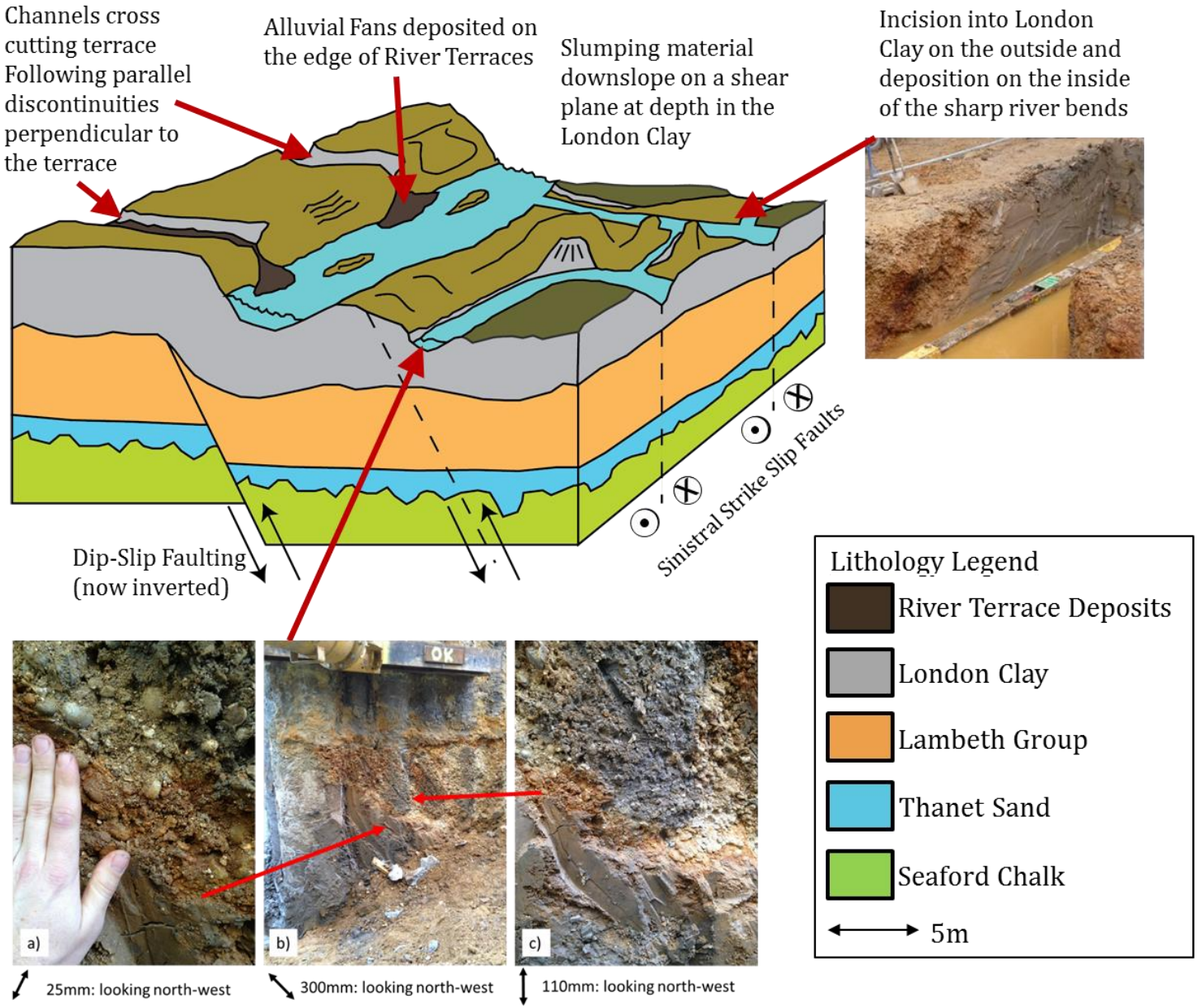
Hand Drawn from data points



London Clay Upper Limits

Palaeo-geomorphological Model



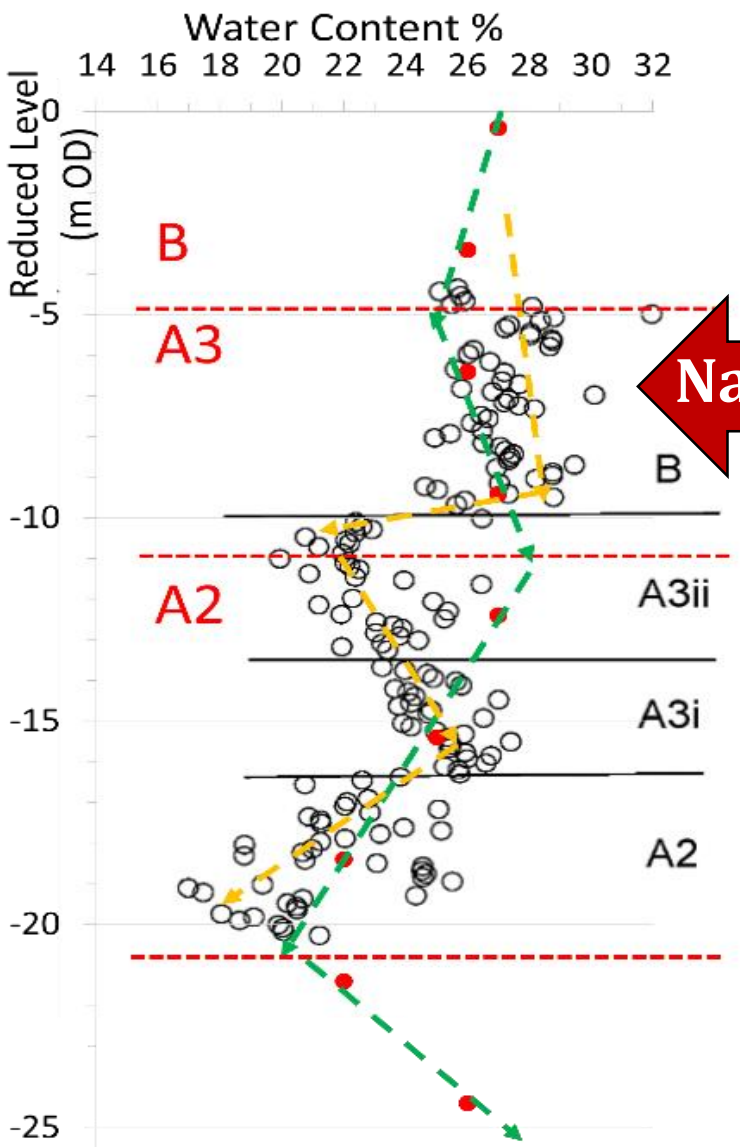


(Photographs courtesy of Richard Ball, 2015)

Imperial College London

CGL

(Background graph courtesy of Hight et al., 2003)

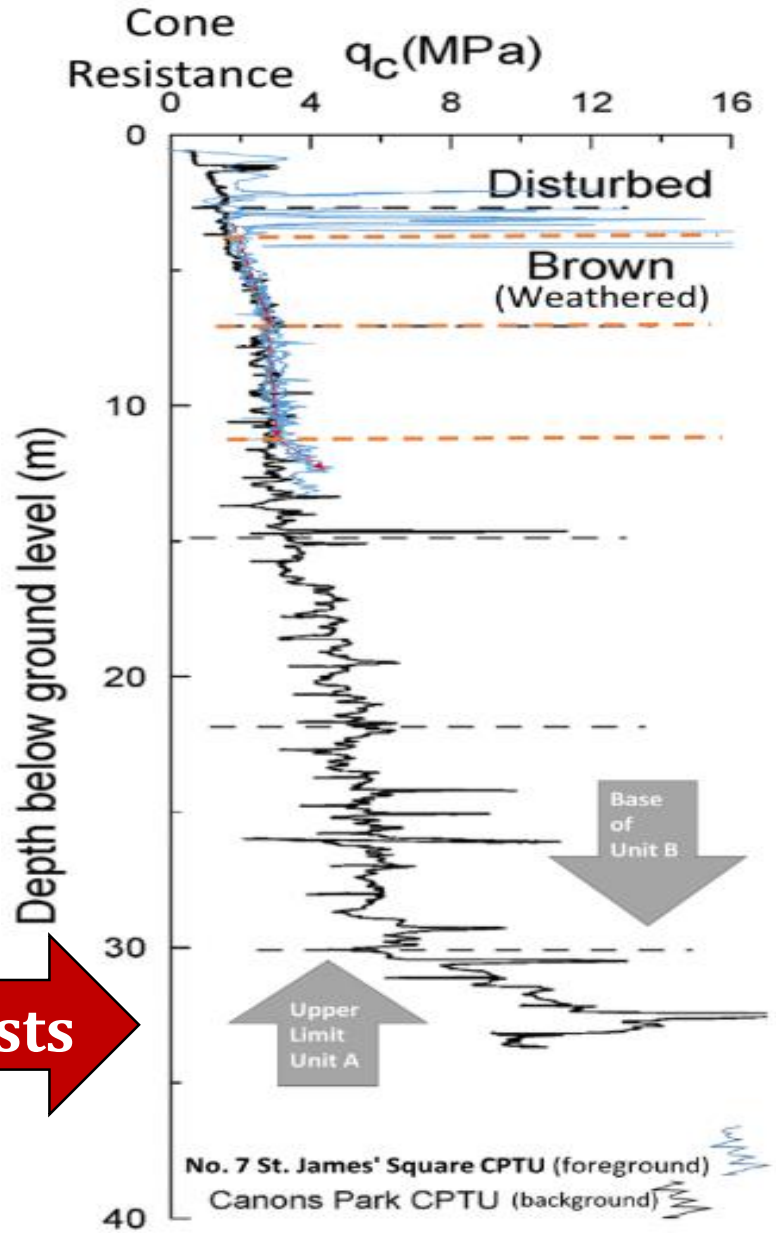


Natural Moisture Content

Geotechnical Data

Cone Penetration Tests

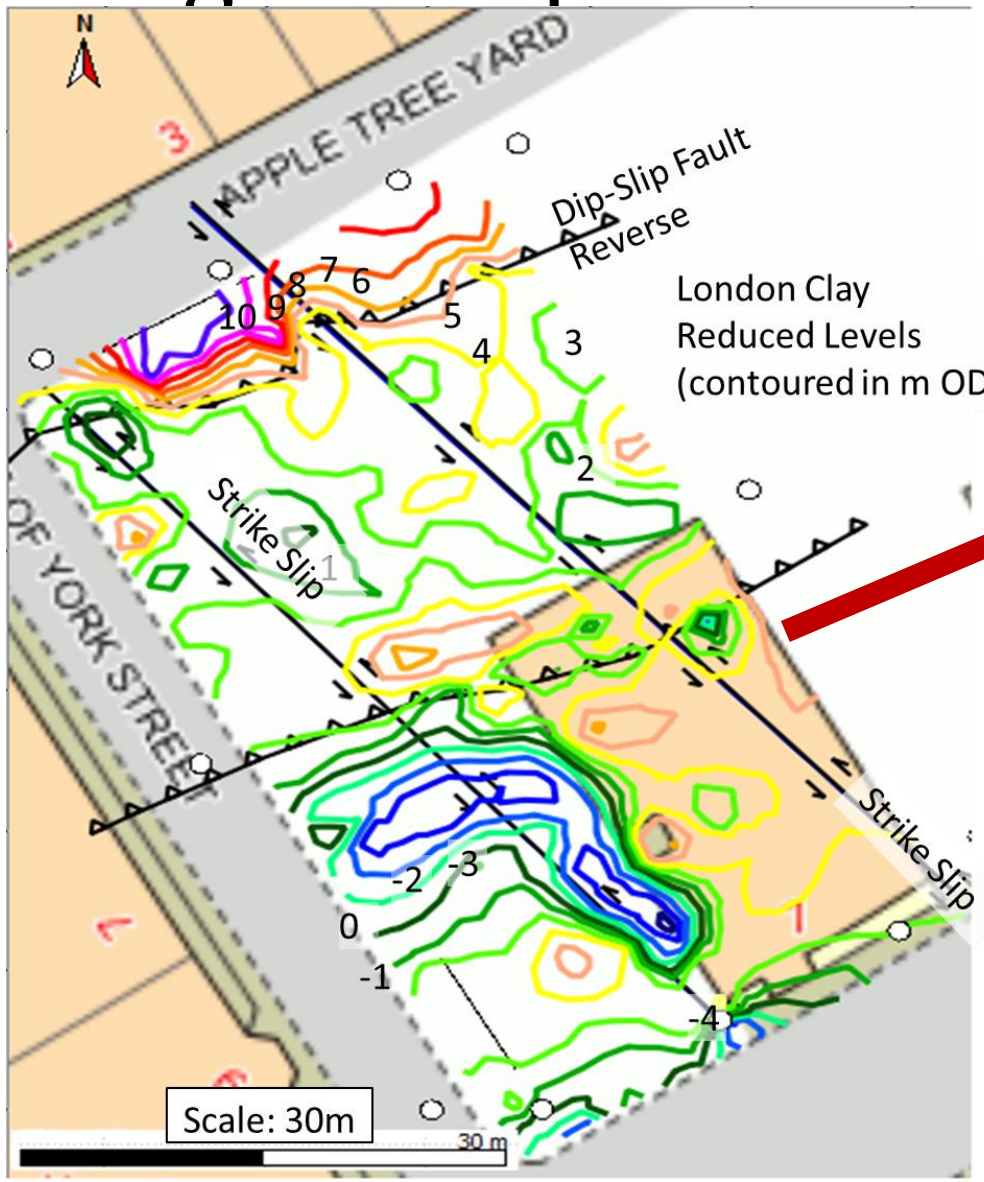
(Background graph courtesy of Hight et al., 2003)

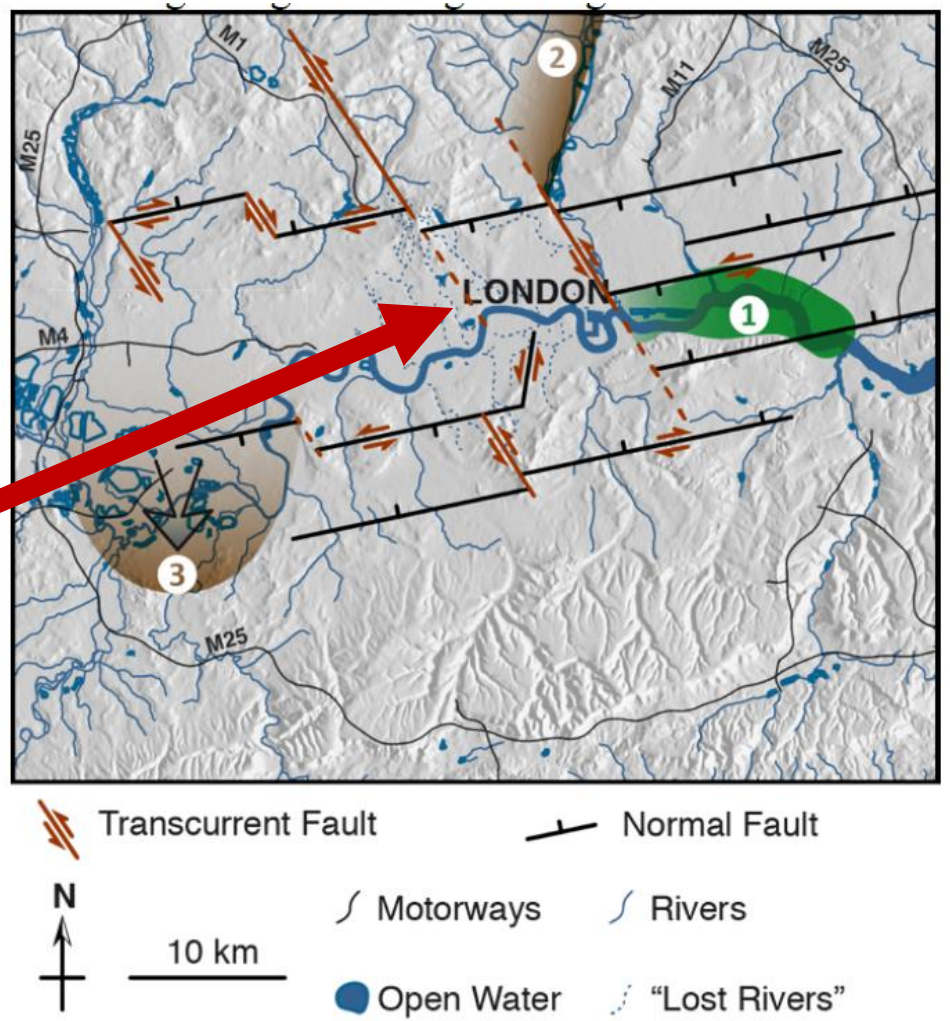


Imperial College London

CGL

Geological Implications….in a Regional Context





Ghail, Mason and Skipper, 2015

Conclusions…

- Scour features onsite are inferred to be associated with fluvial action.
- At least one fault, possibly more have been determined to be onsite based on the parallel channel features.
- Natural moisture contents from the London Clay indicate an offset between the site and St. James's Park.
- Cone Penetration Testing onsite delimits the offset to be between the rear of 7 St. James's Square and the north (perimeter wall) of the site.

…and Uncertainties

- Groundwater data (unknown response zones or inclusion of bentonite seals)
- Natural Moisture Content from only one borehole
- No statistical analysis of the discrepancies between each data point and the digital surface produces
- London Clay Levels provided deemed accurate to within 0.5m
- Types of River Terrace Deposits onsite
- Faults: locations, movement (timing), extent, zone or discrete locations.

Thank You.

Stephen Dixon *MSci (Hons) MSc FGS*

s.dixon@cundall.com

Also thanks to:

Dr. Richard Ghail
Richard Ball
Mark Creighton
Jackie Skipper
My Imperial College colleagues

Questions?