NEW CITY COURT

Basement Impact Assessment
AKT II

3948 New City Court

Basement Impact Assessment

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Appendices

Revision	Date	Status
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1 Introduction

The following report provides a summary of the work undertaken to date in assessing the impact of the proposed basement expansion within the New City Court redevelopment scheme. The report also outlines the work that is required in order to achieve the necessary third party approvals and the design philosophy to be applied in completing this work.

The report sets out the preferred strategy based on the information currently available. It is noted that a site specific geotechnical and fabric investigations with detailed information will be available at later design stages. As such, the proposals outlined here are preliminary and based upon recorded information for this and adjacent sites obtained following a comprehensive desk study.

This information is to be read in conjunction with and forms part of, the planning application and responds to the requirements outlined by Southwark Council for basement construction and expansion. Detailed construction drawings and supporting calculations will be prepared during subsequent design stages as information relating to the ground conditions is established, allowing the design to be finalised. Method statements for the excavations, construction sequence and temporary works will ultimately be developed by the Contractor, although design proposals with regards to construction sequence have been outlined for information.

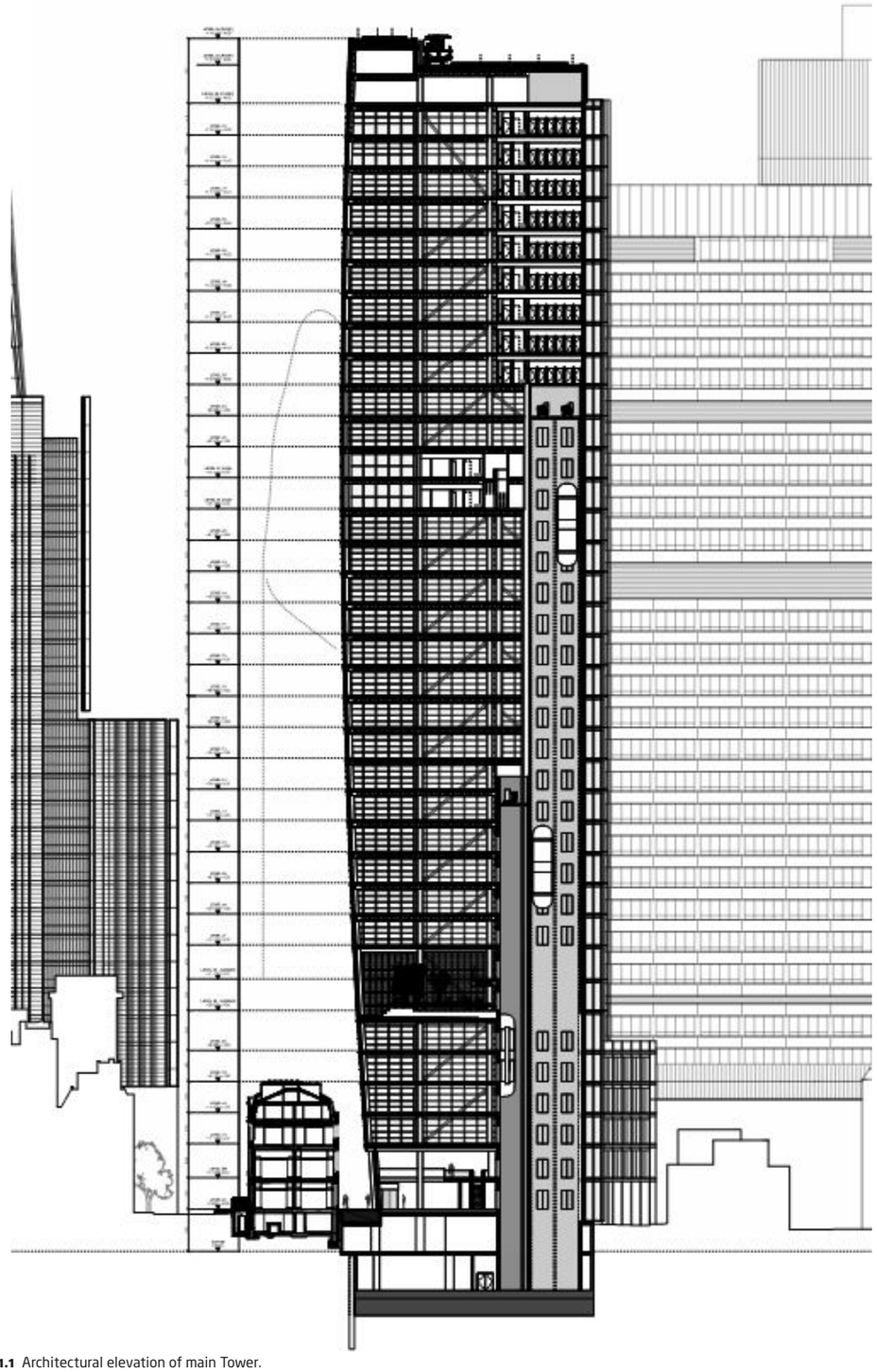


Figure 1.1 Architectural elevation of main Tower.

2 The Project

The site to be redeveloped is located in the borough of Southwark in the London Bridge area. The site boundary lies directly along the south side of St. Thomas Street, between the cross roads of London Bridge Street, to the east; and Borough High Street, to the west. It is located adjacent to the Guy's Hospital accommodation and King's College Guy's Campus buildings. The Site is bordered by Kings Head Yard, to the south.

The project comprises the construction of a 37 storey tower on the south side, adjacent to King's Head Yard, after demolishing the existing New City Court office building.

Keats House, a smaller building located in the northeast corner, will be reconstructed with a new internal structure intended to reflect the Venetian style of its facade. The front facade is to be carefully deconstructed and rebuilt 3 to 4m away to the west side, to allow for space for a servicing area.

The whole expansion of the existing level of basement and the construction of a second level across the site is proposed, to accommodate extensive cycle parking and gym facilities, in addition to servicing and plantrooms.

Additionally the scheme will create a new public realm at the ground floor as part of the redevelopment project, providing an enhanced entrance from St. Thomas Street to New City Court. A direct passage from Borough High Street to New City through the London Bridge Underground station is also part of the project.

Finally, the project proposes to retain and refurbish the existing terrace houses located along St. Thomas Street (no. 4 to 16), following special requirements for listed buildings (Grade II).

This report provides reference to the preliminary findings of the available ground investigation results and desk study, together with outline site constraint information. A summary of the assumed ground model is included as well as a description of the proposed superstructure and substructure works. Comprehensive structural and geotechnical basement impact assessment has been completed according to the current level of information available. Detailed assessment with calculations will be carried out in the next design stages.

Several third party interfaces are involved in the proposed development as described later in this report and preliminary comments/discussions carried out to date will be included.

Please note that this report is to be read in conjunction with all relevant documents supporting the planning application.

Figure 2.1 New City Court exit (AHMM render)

Figure 2.2 King's Head Yard (AHMM render)

Figure 2.3 Georgian Houses shop front (AHMM render)

Figure 2.4 St. Thomas Street (AHMM render)

Figure 2.5 New City Court towards the pub (AHMM render)

3 The Site

3.1 Site Location

The site is located between St. Thomas Street (N); King's Head Yard (S); and occupied retail buildings running along Borough High Street (W) and Guy's hospital Buildings (E). It is located in close proximity to London Bridge station, the Shard and Borough Market. (Fig 3.1)

The Site is currently occupied by Office blocks with pedestrian access from St. Thomas Street and vehicular access to the building from the carpark located on the SW corner, plus a loading bay on St. Thomas Street.

The wider contextual location (Fig 3.2) shows the site located South to the River Thames.

Among the buildings along the High Street there is the London Bridge Tube station which serves the Jubilee and Northern Line.

On the south east corner the existing building is bounded adjacent with the nurses' accommodation on the East elevation.

Figure 3.1 Aerial image of the site

3.2 Surrounding Land Use

The New City Court Site is surrounded by a series of low rise buildings and several buildings of interest in relation to our site.

Borough High street is lined by shops and limited residential units above. There is also one of the entrances to the London Bridge underground Station, with access to the LUL tunnels, which cut across the NW boundary of the site. On the western edge of the site a large ventilation grill enclosure can be seen.

Directly west of the St. Thomas Street properties is a public house called 'Bunch of Grapes', which was built in 1819.

To the east of Keats house are the Guy's and St. Thomas Hospital accommodation buildings and Kings College Guy's campus. Also adjacent is the Guy's Chapel, which was completed in 1780. The Chapel borders the existing site boundary and has had an extension added, although it is not believed to be part of the chapel building itself. Existing record drawings show this to be a computer suite for the college campus with basement bar and art store above. The extent of the site boundary of the proposed development here is uncertain due to the extent of the extension, existing chapel and constraints of the party walls as much of this area was previously connected and changed over time.

On King's Head Yard, there is another public house, ' Old King's Head' which burnt down in the borough fire of 1676 and was later rebuilt. The pub itself has a cellar located on the King's head Yard cobbled street and close to the Borough High Street egress point.

Figure 3.2 Site Location (wider view)

3.3 Site History

Historical Background

The history of the site and its surrounding area has been assessed using extracts of historical Ordnance Survey (OS) maps dating from 1875 to the present day. Note, that the maps only indicate information of the date the survey was carried out, they do not give a continuous record of the development. Other sources used include archive information from the London Metropolitan archives and from reports commissioned for the local area and research online.

It is suggested that the area was first occupied as part of the Roman settlement. During this time the area was actually an islet sitting within the course of the Thames. During its peak, in around the 2nd century, it is estimated as many as 3000 people may have lived in this area.

The area's history is intrinsically connected with that of Guy's Hospital which was rebuilt on the site in the 13th century. During this time, the area to the east of Borough High Street from St Thomas Street in the north, down to Newcomen Street in the south and across to the Maze was within the demise of the Archbishop of Canterbury's manor.

Site history

The earliest map showing the site dates from 1878-79 and shows St Thomas Street and King's Head Yard both flanked by rows of houses. This arrangement had not changed to any great extent by 1973. However, by 1991 the buildings along King's Head Yard had been demolished and replaced with the current building that occupies the site, the New City Court Office development.

The historical map shown in Figure 3.3 shows a graveyard to the south of numbers 4-16 St Thomas Street which was used by St Thomas Church (north side of St Thomas Street) and was accessed via a narrow lane between the houses.

Historic information collated as part of this desk study indicates that terraces 2-14 along St Thomas Street were constructed in 1819 at a cost of £7,000. No. 2 St Thomas Street which is now 'Bunch of Grapes' public house was formerly two houses that were combined, now adjacent to the site boundary.

The terraces, along with Keats House were built at the request of Guys' Hospital. The terraces were originally used as lodgings for students although converted to offices when the New City Court development in the 80's was built.

The office development was completed by 1984 as a 6 storey office building. Drawings from the architects at the time (The Halpern Partnership) have been used to assess the existing building which were made available to AKTII.

London Bridge Area

Of all the bridges along the Thames in London, London bridge has the longest history. The earliest bridge dates back to Roman founders of London and until Putney Bridge opened in 1729, London Bridge was the only road crossing on the Thames downstream of Kingston upon Thames. The current bridge crossing, which opened to traffic in 1974, is a box girder bridge built from concrete and steel, designed by Lord Holford which took 5 years to complete. This replaced a 19th century stone arched bridge and previously a 600 year old medieval structure. During the tudor period there were 200 buildings on London bridge, some more than 6 storeys. The crossing also delineates an area along the southern bank of the River Thames, between London Bridge and Tower Bridge, that has in more recent years been designated as a Business Improvement District (BID).

London Bridge Station was Central London's first railway terminus and by the 19th century ships from around the world came to trade in the area bringing great prosperity.

In the 1960s the area started to lose importance as an international port. The warehouse and port buildings not destroyed in the blitz fell into disrepair.

The 1980's property boom later meant St. Martins property corporation Ltd developed what is known as London Bridge area today, recognising the need for central London to grow and converting the wharf buildings into housing, offices and retail units.

During the mid 1990's local landowners became increasingly concerned with the poor environment of the area and three local authorities formed to become the Pool of London Partnership (PLP), recognising the potential of the area and the need to capitalise on the decision to extend the Jubilee Line in time for the millennium.

In 2006 the Business improvement district (BID) was founded to manage and continue to improve the area when PLP ended activities in March 2007.

The BID, which includes Guy's and St. Thomas' Hospital, is an area of commercial and historic interest today. Also known as the pool of London, stretching from London bridge to Tower Bridge it includes: London Dungeons; Borough Market (the oldest food market in London); the oldest gothic church, Southwark Cathedral; and more recently the Shard, the tallest building in western Europe. Fig. 3.4 shows the new construction sites in and around this BID which borders the New City Court Site:

- The News Building: 600,000 sq ft office and retail (1)
- The Shard, 72 storey tower over 300m tall (2)
- London Bridge Station and Thameslink (5)
- The Quill: home to 450 students from Kings college London's Guy's (6)
- Vinegar Yard, planning due to be submitted (7)

Guy's & St. Thomas' Hospital

Guy's hospital along with St. Thomas' and Kings college Hospital are all part of Guy's and St. Thomas' NHS Foundation Trust. It is the largest teaching hospital in London and the location of Kings College London School of Medicine.

The Tower Wing formerly known as Guy's tower is the World's tallest hospital building, standing 148.65m with 34 floors, which was added in 1974 to the hospital.

The hospital was founded in 1721 by Thomas Guy, a publisher of unlicensed bibles and originally established as a hospital to treat 'incurables'.

Guy's has expanded over the centuries. Despite substantial bomb damage during World War, the original 18th Century chapel remains intact including the tomb of Thomas Guy.

Now over 13,650 staff work in the hospital and the site consists of 19 buildings.

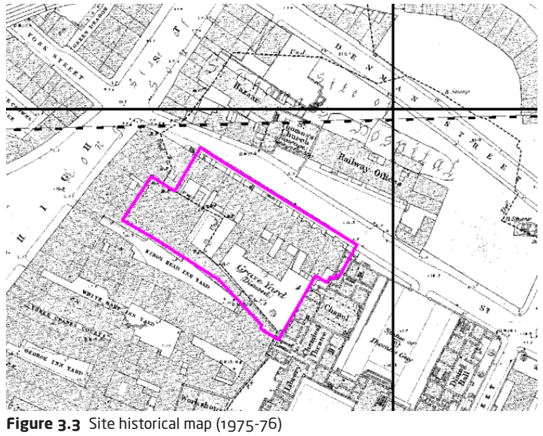


Figure 3.3 Site historical map (1975-76)

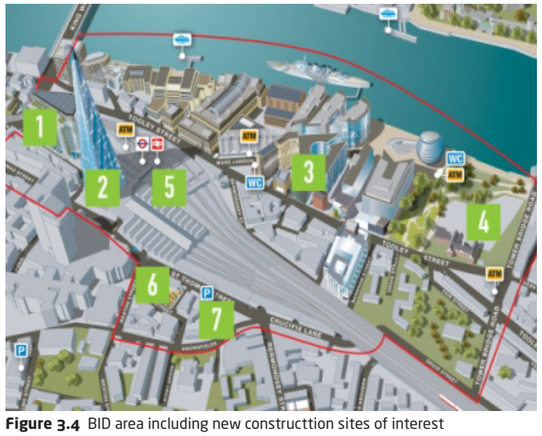


Figure 3.4 BID area including new constructtion sites of interest

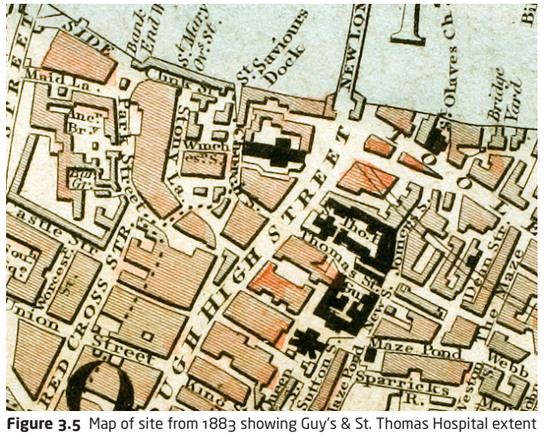


Figure 3.5 Map of site from 1883 showing Guy's & St. Thomas Hospital extent

Figure 3.6 lLondon Bridge today

4 Ground Conditions

4.1 Typical Geology

Alluvium

Alluvium consists of a variety of materials ranging from soft compressible variable clays to silts, sands, gravels and also commonly contain organic material in the form of peat and vegetation remains. It may have previously been removed during excavations of the existing site and replaced by Made Ground, therefore it is only likely to be anticipated of a thickness of 0.5m to 1m.

Terrace Gravels

Terrace Gravels are a mixture of quartz sand, comminuted quartz and mainly brown flint and chert gravel. The proportions of sand and gravel vary considerably in short lateral and vertical distances, depending on the local conditions at deposition. There are also frequent zones of finer-grained material, such as clay and silty sand and even occasional organic deposits. The Terrace Gravel is typically medium dense to dense orange brown, very sandy (medium to coarse) sub-angular to sub-rounded, fine to coarse, flint gravel.

It is anticipated that it is likely to encounter Terrace Gravels at thickness of approximately 1.5-5.5m underlying the site.

London Clay

London Clay is well documented locally and is generally weathered with silty sandy bands and Limestone nodules, becoming firm grey fissured silty clay with depth. It is generally characterised by a high plasticity, high shrinkage potential, low to very low compressibility and low hydraulic conductivity.

It is anticipated that it is likely to encounter London Clay at thicknesses of approximately 20-25m underlain the site.

Lambeth Group

Lambeth Group is well documented throughout the London and Hampshire basins, comprising of a variable series of clay, loam, sand and pebble beds which are locally cemented into sandstone or conglomerate. It consists of three formations

The Reading Formation is a series of lenticular mottled clays and masses of fine sands converted into quartzite.

The Woolwich Formation consists of grey clays and pale sands, often full of estuarine shells with pebble beds located at the base.

The Upnor formation consists of light coloured false bedded sands. Where it overlies Thanet Sands, it is formed of an argillaceous greensand with rounded flint pebbles. Where it directly overlies chalk, it is more clayey and the flints are less rounded and are green-coated.

It is anticipated that it is likely to encounter the Lambeth Group at thicknesses of approximately 15-17m underlying the clay.

Thanet Beds

The Thanet Sand formation is the oldest deposit from the Palaeogene. At the base, the "Bullhead bed" comprising a conglomerate of rounded flint pebbles and almost unworn nodular flints "Bullhead". The flints are typically coated with dark green glauconite and lie within a matrix of glauconitic sandy clay. The bulk of the Thanet Sand comprises of silty, fine-grained sand. The colour varies between greenish and brownish grey. At the surface, the sands weather to a pale yellowish grey.

It is anticipated that it is likely to encounter Thanet Sands at thicknesses of approximately 10-11m.

Upper Chalk

The Upper Chalk band is softer than the Middle Chalk. Flints are abundant as a general rule. The base of the division is a hard band called the Chalk Rock, which in the area north of the Thames, is the most prominent horizon in the Chalk. It consists of one or more beds of hard, creamy limestone each approximately 1 foot thick, usually with scattered green grains of glauconite. Between the creamy limestone bands are layers of hard nodular chalk formed in a softer matrix.

Risks

Although the boreholes purchased from BGS provide a good indication of the likely conditions on the site, it is recommended that a full site investigation is carried out in order to investigate the ground conditions specific to the site.

Preliminary geotechnical design parameters are advised in this report. This data is based on referenced material and AKT II's experience of the geology local to the site and will be confirmed by a comprehensive, site specific investigation.

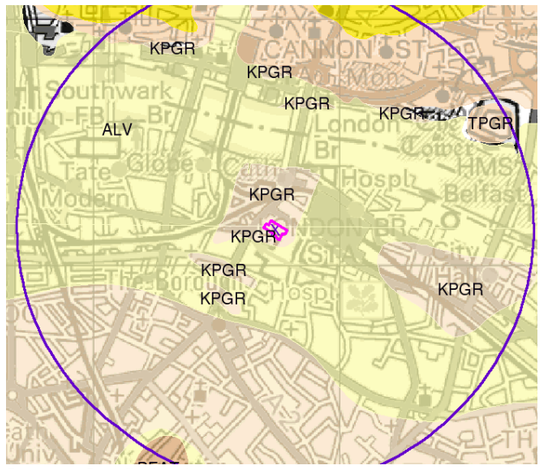


Figure 4.1 Superficial geology

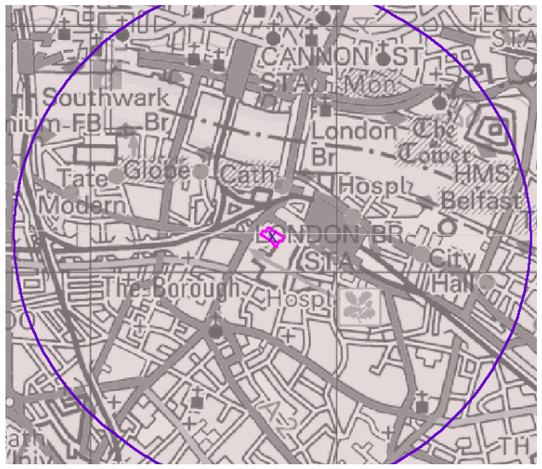


Figure 4.2 Underlaying geology

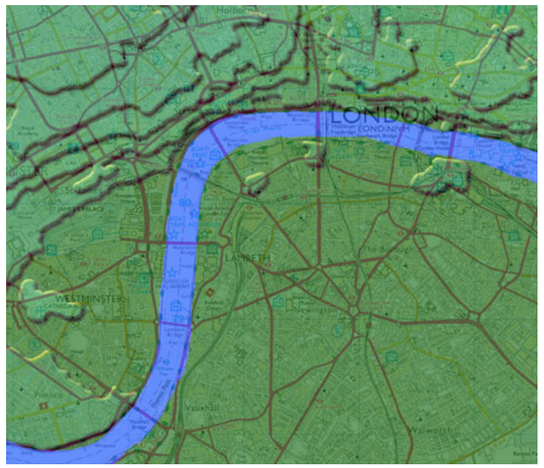


Figure 4.3 Topography 3D Map

Superficial Geology

Map Colour	Lex Code	Rock Name	Rock Type	Min and Max Age
	ALV	Alluvium	Clay and Silt	Flandrian - Pleistocene
	KPGR	Kempton Park Gravel Formation	Sand and Gravel	Devensian - Ipswichian
	LASI	Langley Silt Member	Silt	Devensian - Ipswichian
	TPGR	Taplow Gravel Formation	Sand and Gravel	Wolstonian - Chokierian
	HAGR	Hackney Gravel Member	Sand and Gravel	Wolstonian - Chokierian
	PEAT	Peat	Peat [Unlithified Deposits Coding Scheme]	Quaternary - Ryazanian

Bedrock and Faults

Map Colour	Lex Code	Rock Name	Rock Type	Min and Max Age
	LC	London Clay Formation	Clay	Eocene - Eocene
	LMBE	Lambeth Group	Clay, Silt, Sand and Gravel	Paleocene - Paleocene

Figure 4.4 Geology strata

4.2 Anticipated Ground Conditions

The results from the Envirocheck report form the outline description of the ground conditions and borehole information taken within close vicinity to the site.

This allows an initial picture to be developed of the underlying geology and depth of the key layers outlined in section 4.1 although none of the boreholes have been taken directly on the site of the proposed development.

Whilst no boreholes are available for the actual site the borehole records that are available from the wider area (Figure 4.5) indicate the site to be highly consistent in terms of the depth of each layer of strata below the surface.

The deep borehole logs show that the London Clay extends only to a depth of approximately 27 m, and sits on the Lambeth group layer.

The superficial geology and borehole logs showed the site to be underlaid by 5 main layers:

Made ground

Made ground is a layer of fill material considered to have little or no bearing capacity, usually consisting of a variety of materials, often sands and gravels but in some cases concrete and brick among other substances. The thickness of the made ground, and its composition, vary accross the borehole logs. On the Eastern side within the site of Guy's & St. Thomas' a larger thickness of made ground is found ranging from 9m to 12.5m (Boreholes 4 & 5). The investigations have found the made ground to consist of topsoil, coarse gravel sized brick, concrete, flint and some coal fragments.

Alluvium

The alluvium layer is found in three out of the 5 chosen borehole logs (1,2 &3) which range from 40-110mm in thickness, therefore it is possible that alluvium will be found on site. The alluvium consists of a 'soft bluish-grey mottled grey and black sandy clay'. The stiffness range in laboratory tests range from very soft to stiff in nature.

Kempton Park Gravels

Kempton Park Gravels are a form of terrace gravels, a layer of material deposited by the river and are a mixture of quartz sand, comminuted quartz and mainly brown flint and chert gravel. From the borehole logs it is assumed that the site may experience terrace gravels from 0m to -6m (AOD).

London Clay

London Clay is well documented locally and the clay located can be expected to be approximately 20m in depth. Formation is described to consist of stiff to very stiff grey-brown clay with occasional pockets of light grey silt.

During the construction of the Shard, located close to the proposed New city Court site, a fault was discovered below the site running north-to-south direction, with a downthrow of about 6m to the SE. This is documented in Pile test reported by Byrne Looby partners in 2012. To the West another fault of similar displacement and orientation was encountered during the JLE construction. Along these two geological faults, the ground forms a minor horst feature, with marginally elevated London clay.

Lambeth Group

Lambeth group is expected to be in between 30m and 35m below ground level and consists of a very stiff clay matrix, either grey or multicoloured fissured clay, with gravel, green gravelly sand or green shelly gravelly clay pebbles.

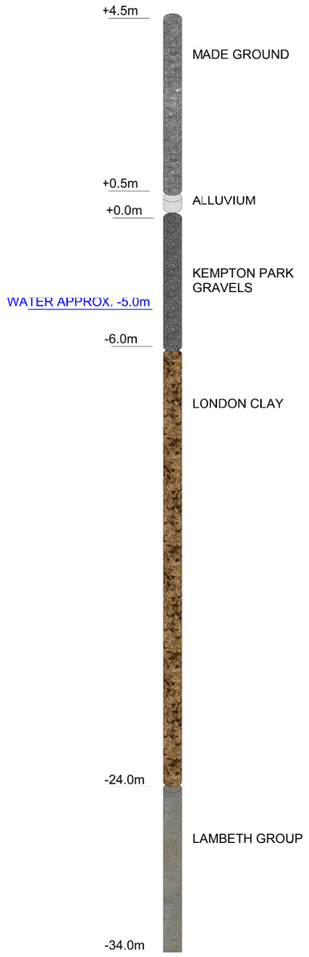


Figure 4.5 Predicted borehole diagram

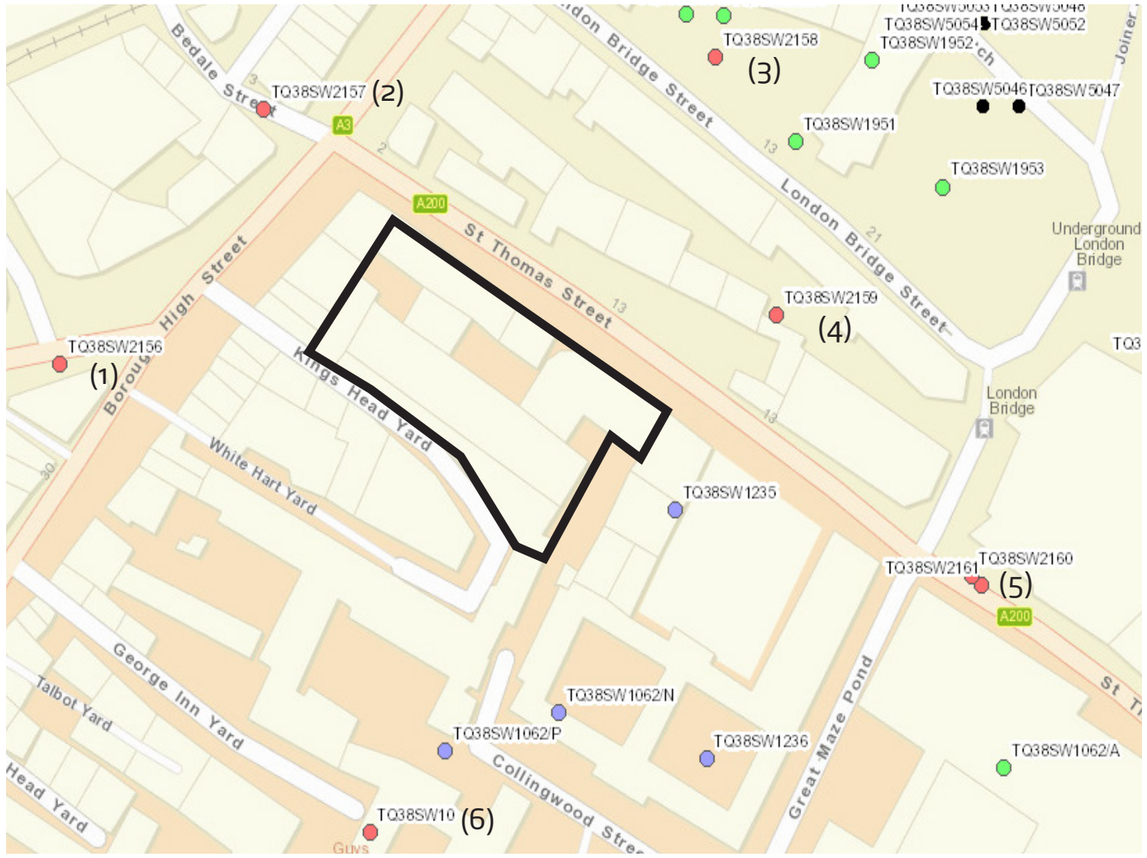


Figure 4.6 Borehole location key plan map

4.3 Hydrogeology and hydrology

4.3.1 Environmental Agency Classification

A Principal Aquifer is defined by the Environment Agency as layers of rock or drift deposits that have high intergranular and/or fracture permeability - meaning they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale.

A Secondary A Aquifer is defined by the environment Agency as permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers.

A Secondary B Aquifer is defined by the Environment Agency as predominantly lower permeability layers which may store and yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering.

A Secondary Undifferentiated (U) Aquifer is defined by the Environment Agency as has been assigned in cases where it has not been possible to attribute either category A or B to a rock type.

According to the Envirocheck Superficial Aquifer Map in Figure 4.7, the site is underlain by a Secondary A Aquifer with surrounding areas of A secondary Undifferentiated Aquifer.

According to the Bedrock Aquifer Map in Figure 4.8, the bedrock underlying the site is defined as unproductive Strata. Unproductive Strata have negligible permeability and are generally regarded as not containing groundwater in exploitable quantities. In this stratum, the groundwater flows imperceptibly and requires consideration for the risk of slow degrading pollutants.

London Clay and Lambeth Group are classified as non-aquifers and should provide a natural barrier to prevent contaminants migrating to the deep Thanet Sands and Chalk Aquifers. A summary of the hydrogeological properties of the main geological units that are anticipated to underlie the site is shown in Figure 4.9.

The superficial geology is designated as a Secondary A Aquifer with a potential for groundwater flooding owing to its close proximity with the River Thames.

4.3.2 Groundwater Level

Indications from the available boreholes suggests that the water table is generally 5m below ground level (0.00m AOD). A few boreholes show higher water which could be a result of some rain water retained in a less permeable made ground layer.

This information will be confirmed in subsequent stages further to ground investigations.

4.3.3 Source Protection zone

The EA have defined Source Protection Zones (SPZ's) for groundwater sources such as wells, boreholes and springs used for public drinking water supply. The zones are defined by the EA as outline below:

- The Inner Protection Zone is the distance travelled by groundwater from any point below the water table to the abstraction in 50 days for a particular area. It has a minimum radius of 50m.
- The Outer Protection Zone is the distance travelled by groundwater from any point below the water table to the abstraction in 400 days for a particular area. It has a minimum radius of 250m.
- The Total Catchment Zone is the area around the abstraction within which all groundwater recharge is presumed to be discharged to the source.

The SPZ Map from Envirocheck indicates that the site is not located within a Protection Zone. It is likely that the ground water abstractions are from the Chalk Aquifer. This means that there is no risk of pollutants or contaminants from the site making their way into a source of drinking water.

4.4 Construction within archaeological remains

Due to the location and previous history of the site and surrounding area, it is believed that there is a low potential for archaeological remains to be present at the site. However if archaeological remains were to be found, the presence of the existing building on the site means that they are likely to have been partially truncated by basement, foundation or service trench excavations. If archaeological remains are to be found, there are engineering principles to reduce the impact of construction on the archaeological heritage:

- Minimise the extent of excavation required for the construction
- Minimise the number of vertical penetrations
- Minimise the extent of excavation required for the foundations

Activities such as level reduction, new basement and foundation construction, new service trenches or demolition works for example will raise archaeological issues.

4.5 Risks associated with Geology

Unknown geology is often one of the biggest risks facing a project due to the difficulty in knowing the exact profile of the soil across the entire site.

The existing piled structure and the extensive works carried out in the area as part of the Jubilee line extension would suggest that the risk is low. However, issues to be aware of include:

Inclusions of weak or strong layers which can affect capacity of piles and ability to bore

- Perched water tables
- Local fissures
- Variable properties
- Existing Thames Water Sewer

Whilst this list is not exhaustive it gives a background to elements that might be encountered.

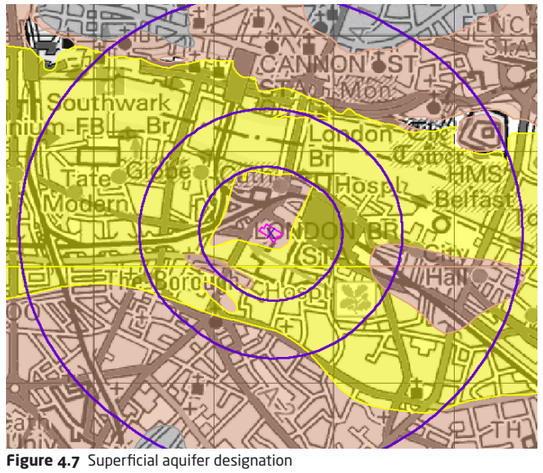


Figure 4.7 Superficial aquifer designation

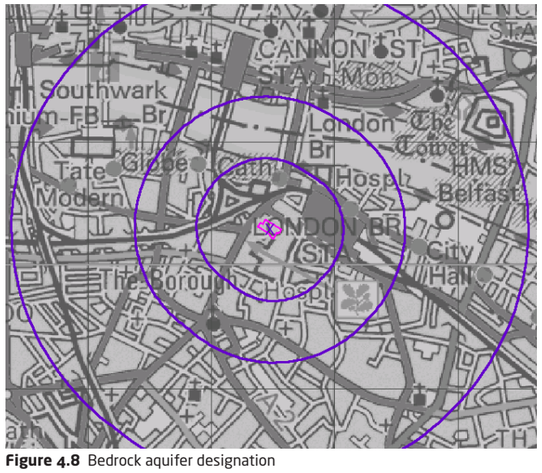


Figure 4.8 Bedrock aquifer designation

Strata	Hydrogeological significance	Classification (Environment Agency)
Alluvium	Has potential to transmit relatively small quantities of water. The site is located in close vicinity of the River Thames, so it is likely to contain significant quantities of groundwater.	Secondary (U)
Terrace Gravel	Has potential to transmit significant quantities of water. The site is located in close vicinity of the River Thames and the Terrace Gravel is underlain by relatively impermeable Clay, so it is likely to contain significant quantities of groundwater.	Secondary (A)
London Clay	The London Clay is an aquitard and therefore will not contain significantly large quantities of groundwater.	Unproductive Stratum
Lambeth Group	The Lambeth Group is unlikely to contain significantly large quantities of groundwater, however the lower part of the stratum where the material has less clay content may be in hydraulic continuity with the lower layers.	Unproductive Stratum
Thanet sands	This strata is highly permeable and is often in hydraulic continuity with the underlying Chalk.	Principal Aquifer

Figure 4.9 Summary of Environmental Agency aquifer classification of the anticipated geology

5 Environmental assessment

5.1 Introduction

The aim of this part of the report is to provide an initial assessment of the environmental conditions of the site as well as the potential contamination of the site.

To note Envirocheck site sensitivity search showed a registered radioactive site present, however on investigating this it was found that Guy's & St. Thomas' NHS Foundation Trust contract procurement department was previously located on the 2nd floor of the New City Court Office building. Therefore this meant it was a registered address for the contract of Radio pharmaceuticals and radioactive materials and no radioactive substances would be found in the ground.

Additionally, the objective is to characterise the contaminants, their pathways and potential receptors for the purpose of a risk assessment. This aims to provide relevant information to protect the health and safety of future site users and construction workers and protection to the environment.

Information on the potential contaminants that could be present within the ground can come from many sources (historical maps, Environment Agency, Envirocheck Report, previous contamination tests, etc.).

Contamination may arise from a wide range of activities on the site or off-site. This may include:

- Heavy industries
- Electric substations, power stations, gas works, etc.
- Chemical plants
- Landfill sites, recycling or disposal sites
- Railway sidings
- Works including finishing processes (plating, painting, etc.)
- Fuel storage facilities, garages, etc.
- Former mining sites
- Ministry of Defence sites
- Timber treatment works
- Sewer farms or sewage treatment plants

During a site walkover, suspect soils usually are identified by sight and olfactory observations. Some obvious signs of contamination include, but are not limited to:

- Soil discolouration
- Unusual or different soil texture
- Unusual odour
- Standing water or trench with hydrocarbon sheen
- Abandoned industrial waste such as drums or asbestos sheeting

5.2 Statutory information

AKT II instructed Envirocheck to carry out a search of their records and report on the following aspects:

Water:

- Abstractions and discharge consents
- Red list discharge consents
- Pollution incidents and prosecutions relating to controlled water
- Groundwater vulnerability and river quality

Waste:

- Landfill sites (historical and current)
- Waste water treatment or disposal and transfer sites
- IPC registered waste sites

Statutory controls:

- Integrated pollution and air pollution controls
- Prosecutions relating to authorised processes
- Enforcement and probation notices
- Planning hazardous substance consents and enforcements
- COMAH, NIHHS and explosive sites

The following is a factual summary of the information obtained from the Envirocheck search.

Contaminant	Level
Chromium	Moderate
Lead	Moderate
Nickel	Moderate
Arsenic	Low
Cadmium	Low

5.3 Preliminary Contamination Assessment

Potential site specific contamination risks are assessed and presented below. A conceptual model includes possible sources, pathways and receptors; which are defined below.

A source is a substance which is in, on or under the land and which has the potential to cause harm or to cause pollution of controlled waters.

A pathway is a route or means by which a receptor can be exposed to or affected by a contaminant.

A receptor is something that could be adversely affected by a contaminant. It can be a living organism, group of organisms, an ecological system or human controlled waters. It can also be a property which is in a listed category or could be harmed by a contaminant.

5.3.1 Potential contamination sources

Potential contamination may arise from the different sources on site. Presence of boilers and associated fuel leakages may be responsible for hydrocarbon presence within the ground. Electricity plant rooms may be responsible for PCB (Polychlorinated biphenyl) pollution.

Historical uses of the site or surrounding area may provide contamination sources. Typical historical use of the site and surrounding area which may cause contamination issues include railway lines, gasworks, industrial use, Breweries and Chemical Works.

Many bombs that were dropped during the Second World War blitz did not explode on impact. Bomb detonators don't deteriorate and the explosives do not become inert with time. The ministry of defence has published maps indicating the extent of damage to buildings during the raids and the possible locations of Unexploded Ordnance (UXO) in Central London. A detailed UXO risk assessment was undertaken by 1st Line Defence (DA3587-00) and there is no evidence to suggest that UXO's are present at the site but if present they would consequently present a health and safety risk and also a contamination risk, as described as follows:

- Heavy metal (Copper, Zinc etc.) Contamination from the bomb's casing.
- Organic aromatics (Toluene, Nitrosamine, daughter products etc.) Contamination from the degradation of the explosive charge.
- Heavy metal (Lead, Mercury) contamination from the degradation of the detonator charge.

Bombs during the wars were also responsible for heavy contamination as they broke several pipes and conduits when exploding. A Second World War bomb damage map indicates that the row of terraces along St Thomas Street suffered minor damage but that the row of buildings in King's Head yard suffered slightly more damage, although not structural. The buildings along King's Head yard were demolished and replaced by New city court. At the time of writing this report, it is unknown if any of the pipes and conduits in the surrounding area were damaged.

The site is not located within a radon affected area, as less than 1% of homes are above the action level. No radon protective measures are necessary for the proposed development.

Few asbestos surveys have been completed by:

- John F. Hunt Associates for Contrakt Ltd on 2017/07/11 report no 140137. The survey included first to fourth floor of New City Court office building. The surveyed areas were assessed to be between Risk Rating E (No asbestos detected) and Risk Rating C (Low Risk Material). However there were areas which were not possible to be inspected and they should be considered to contain asbestos unless proven otherwise.
- Bureau Veritas UK Limited. The survey was carried out on the 27th of January for the lift shafts of New City Court. From the summary of the findings the report states 'All available areas of the lift shaft and pit were surveyed but there were material or voids encountered that could not be inspected. No Items were sampled or presumed'
- Bureau Veritas UK Limited on 25/06/2008 report no ZGAX712. In the marked up plans the survey shows the areas which were inspected and reveals where the asbestos was identified.
- Quantum Compliance on the 26/03/18. The survey, carried out in specific areas only, didn't identify any asbestos containing material

5.3.2 Contamination migration

If potentially polluting activities have taken place historically at a site, the hazard to human and/or environmental receptors will be increased if significant pathways are, or were historically present on or beneath the site along which contaminants can preferentially migrate. Pathways can be anthropogenic (artificial) or natural.

Other sources of contamination are outlined by the results Envirocheck Search, contained in Section 4.2.

5.3.3 Receptors

The potential receptors identified could be one of the following categories:

Humans : Construction site workers, future site users, visitors and maintenance staff.

Property : Foundations, basement structure and services

Controlled Waters :

- Principle Aquifer : Upper Chalk and Thanet Sands
- River Thames and Docks (located close to the site)

5.3.4 Potential natural pathways

The Envirocheck Superficial Aquifer map in Figure 5.1 indicates that the site is underlain by Secondary A Aquifer, which is likely to be associated with near surface river terrace deposits.

The potential for significant contamination migration through the terrace deposits is considered to be moderate. This may provide a possible pathway for contaminants to reach the River Thames.

The underlying London Clay and Lambeth Group should act as an impermeable barrier below the site to prevent the deeper penetration of contaminants into the Chalk and Thanet Sands Aquifers.

Any waterproofed basements and the surrounding hard standing areas surrounding the development can be used to demonstrate a breakage in the pollutant linkages. This can limit contact with non-organic pollutants that do not readily volatise such as arsenic, lead, copper, nickel and some PAH.

5.3.5 Potential Anthropogenic Pathways

Anthropogenic pathways for contaminant migration can be present in the form of soakaways, land drains, etc. Leaking surface water or foul drainage pipes and permeable backfill to the trenches containing services could also act as preferential pathways for potential contaminant migration.

Given the age of the existing building on site and the drainage systems used at the time, it is unlikely that soakaways and other ground infiltration systems will be present at the site. Also the nature of the site (comprising solely of buildings) and surrounding area (comprising of buildings or either tarmac or paved areas), also suggests ground infiltration systems are not present.

Surface water and foul water are carried from the site in the public sewage and highway drainage systems. A CCTV has been carried to survey in 2017 and includes all the sewers within the site up to the public sewers.

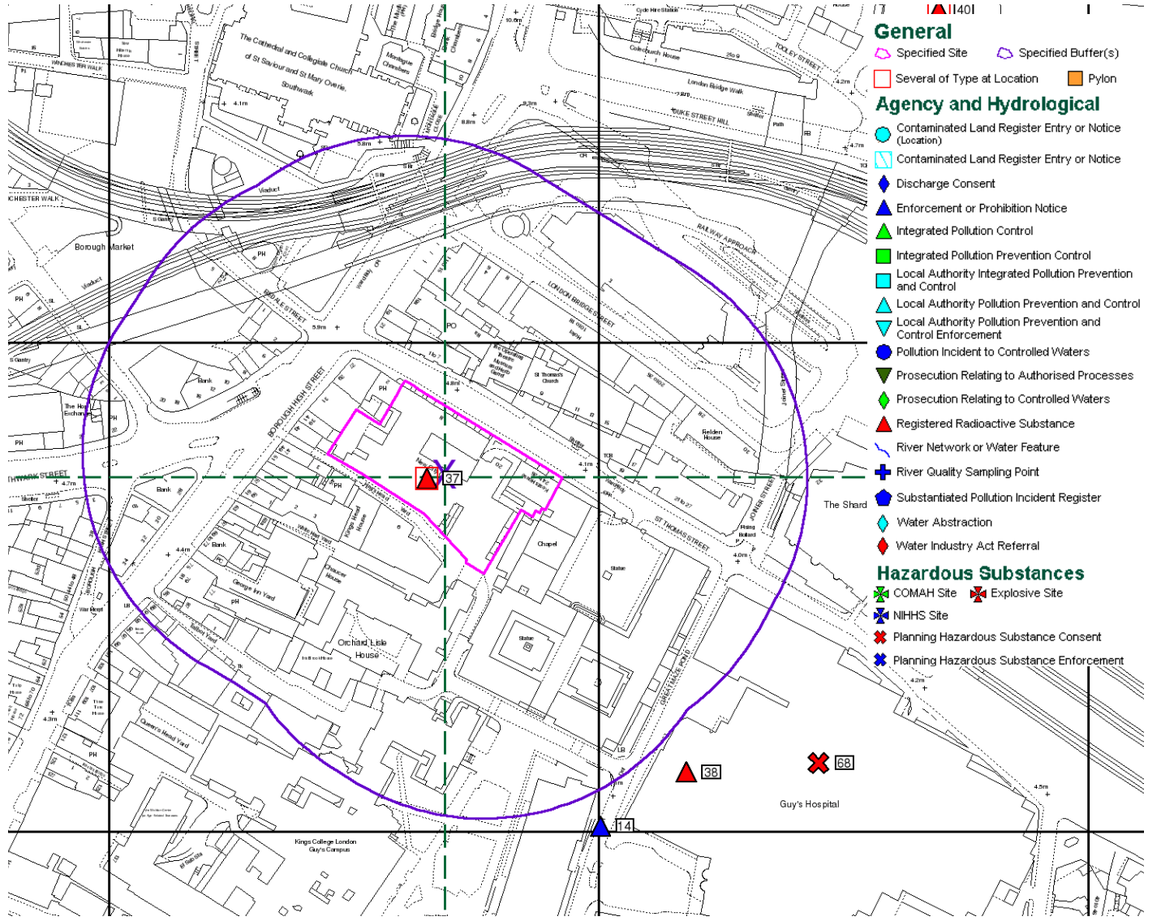


Figure 5.1 Site sensitivity Map

6 Site Constraints

6.1 Statutory Searches

Numerous services are known to be present on the site and in the surrounding roads and pavements. The statutory services search was carried out as part of the desk study to locate potential underground obstructions and surrounding utility assets. Based on this information, a site constraints drawing was produced and can be found in Appendix 1.
It is noted that the information provided by the relevant statutory bodies is approximate and more detailed investigations involving GPR targeted trial trenches may be undertaken prior to commencing ground works, to verify locations where critical.

6.2 Thames Water Assets

The Thames Water Asset Map in Fig. 6.1 shows the existing public sewers in the vicinity of the site. Running along King's Head Yard, on the southern boundary of the site, there is a sewer connecting to a combined Borough High Street sewer, which may lie in close proximity to the proposed development. On the northern boundary along St. Thomas Street there is a main public sewer believed to be in concrete. Finally, on the east side, running from South to North, under the existing basement of Keats House there is a 300mm cast iron sewer. The existing 250mm RC basement slab is suspended between pile caps, notched to allow for the sewer to run underneath. The sewer runs from a manhole located on the South side (manhole 39) underneath the building, goes through the manhole situated in the lightwell in front of the building on the north side and discharges into the sewer along St Thomas Street.

A CCTV survey has been carried out for all pipes running across the site. The survey shows that the pipe underneath the basement is currently in use.

The east sewer is proposed to be diverted under section 185 agreement from manhole 39 (upstream manhole) closer to Coneybeare House, running along the party wall and then will be reconnected to the existing manhole located in the lightwell. Refer to Appendix 7 for the proposal of sewer diversion.

6.3 TfL Structures (LUL Tunnels and Station)

There are several TfL constraints below ground and around the site, as noted below:

- Westbound Jubilee Tunnel and London Bridge Station
- Northern Line
- Compensation Grouting
- LUL Vent

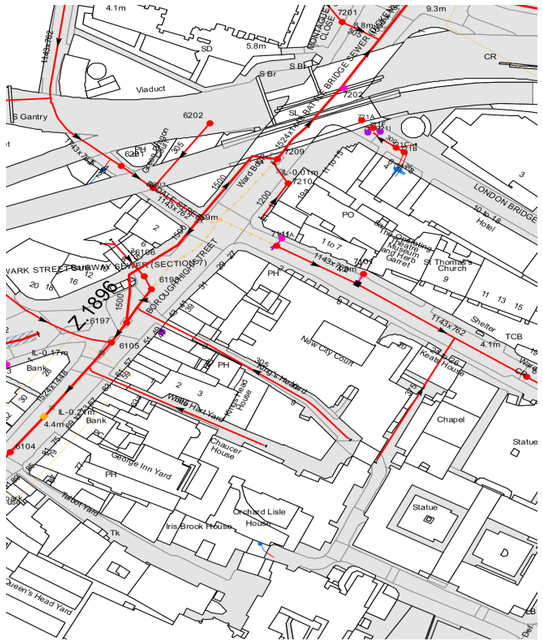


Figure 6.1 Thames Water sewer network

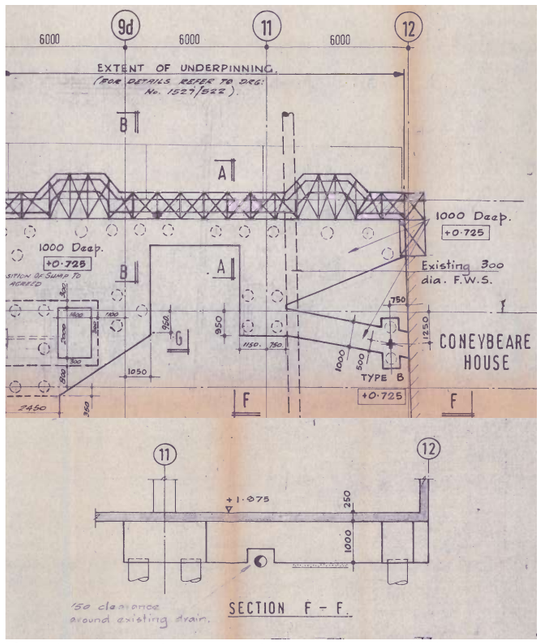


Figure 6.2 Sewer location below Keats House as shown on Engineer's plan section F-F

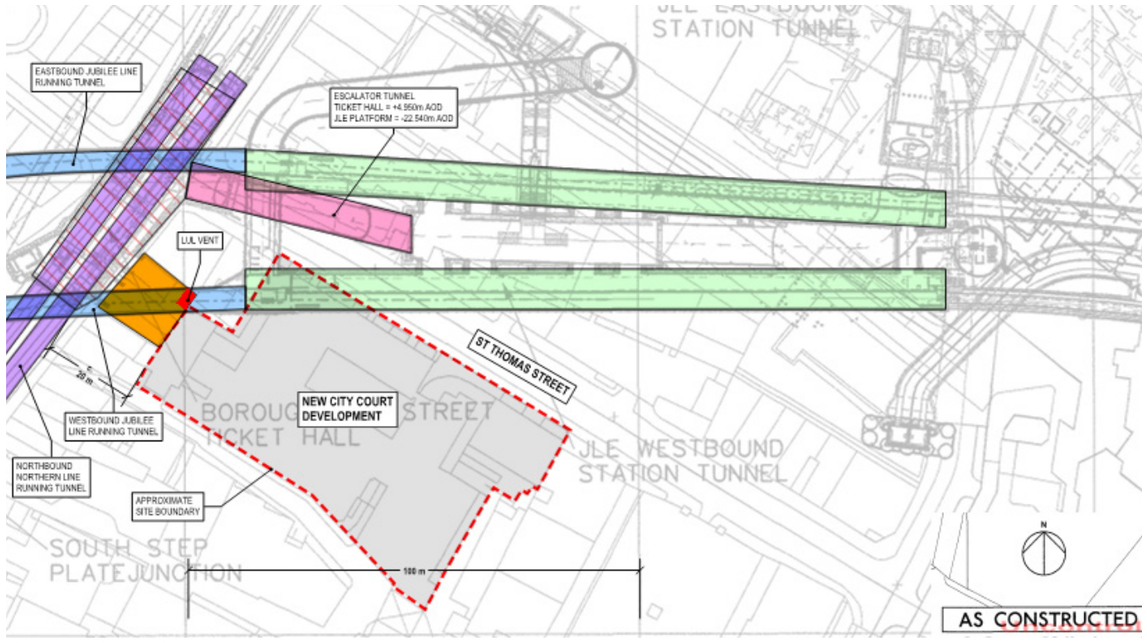


Figure 6.3 TfL assets information

Westbound Jubilee Tunnel and London Bridge Station

Passing underneath the Northwest corner of the site is the westbound tunnel of the Jubilee line. The diameter of the tunnel is approximately 8.7 m (outer diameter) and 27 m below the surface of St Thomas Street (to centre of tunnel). The tunnel sits within the London clay layer. The new tunnels were built with a diameter of 4.35m , whereas the existing tunnels were previously 3.85m.

The Jubilee Line Extension (JLE) was one of London's biggest engineering projects to date and cost over 3.5 billion, constructed in 1994. At London Bridge, the JLE underground station forms part of a complex transport interchange, which includes the existing northern Line of the underground, the national/suburban rail network and local bus termini. The station consists of the enlarged tunnel and includes numerous shafts and connecting adits. The tunnel extension created 6 new stations and 5 existing stations were enlarged or rebuilt. There are currently 63 7-car trains servicing the Jubilee line, with a capacity able to seat 100+ seated and standing. The maximum speed is 62mph (100Km/hr), with 630 vault electrification.

The JLE joins Central and East London and crosses the Thames river four times. It consists of a 16km extension including 12km of 4.5m diameter twin tunnels. The tunnel was bored using New Austrian Tunnelling Method (NATM) as well as precast segmental linings in cast iron and concrete. The tunnel was constructed using sprayed concrete lining (SCL) technique. As with excavation geometry, the thickness of the shotcrete temporary lining was dictated by the tunnel diameter. It varied between 150mm to 400mm. All shotcrete sections were reinforced with mesh reinforcement and lattice girder arches, comprising 12mm to 16mm reinforcing bars. A volume of approximately 100000m³ of ground was removed during tunnelling and innovative settlement prevention methods, such as compensation grouting, were specified for use in the conjunction with the tunnel excavation. The tunnel was bored around 1994 and completed in December 1999 in time for the millennium and associated celebrations.

A correlation survey was done by Plowman Craven to verify the location of the Westbound Jubilee line tunnel. The survey was included in the relevant drawings and analysis.

Nothbound Northern Tunnel

Passing 20m away in plan from the west boundary of the development is the Northbound northern tunnel.

As per archive information the tunnel is believed to be in a segmental cast iron with an assumed external diameter of 4.0m, running roughly at 22m below ground.

Compensation Grouting

As part of the strategy to control ground movements below the surrounding buildings whilst the Jubilee line tunnel was bored compensation grouting was installed and performance limits were specified for this when it was installed in the gravel and London clay layers during the extension.

A plan layout showing the extent of installation of the TAMs is shown in Fig 6.5.

The TAMs are located primarily below the terraces on St Thomas Street, therefore, they are unlikely to have any bearing on the foundations for the main development, however the effect of the TAMs on the local distribution of the tower and settlements should be taken into consideration. The TAMs below NCC were installed at a level of approximately 6m below the interface between terrace gravels and london clay.

When installing the TAMs at London Bridge station, disused tunnels were used to gain access to the desired elevation between the tunnels and the foundations of the overlying structures. The elevations of these existing tunnels determined the level of the grouting horizon and the TAMs were installed as deep as 7m below the top of the London Clay, although the preferred elevation was 3-5m higher. The installation of TAMs from tunnels allowed parallel arrays and a constant spacing of 2m was adopted under major landmarks such as Big Ben. Along St. Thomas street a service tunnel below the road, lined with precast concrete bolted segments, was used to distribute a parallel array beneath the existing terrace houses in an array approximately 50m long. The grouting to be implemented was decided on a day-to-day basis and uniform injection quantities and spacings were adopted. The JLE contract required real time monitoring of both the ground and structure movements in all areas where there was compensation grouting and electrolevels were used, however traditional survey methods were preferred which meant a high frequency of readings were recorded, every two hours at critical stages of the construction.

Over the London Bridge station an area approximately 12100m², 163 TAMs were installed at a length of 4700m. One of the main areas of concern for settlements was the Chapter House chapel on the North side of St. Thomas street. Settlements in excess of 110mm were recorded in the middle of the chapel. the monitoring below St. Thomas street terraces included precision levelling and crack monitoring. The Compensation grouting protective measures controlled ground settlements such that the maximum building movements recorded were less than 35mm in this area.

The southern extent of the TAMs would need to be determined as they may affect the potential for piling in this area. The proposed site does therefore highlight a potential risk that must be considered.

The proposed pile foundation suggests to pile through the layers of grouting which is thought to be 200mm thick.

LUL Vent

On the West site boundary there is a large vent which has been confirmed by LUL to be the back of the London Bridge Area managers office over the Borough High Street Entrance.

The louvres on the vent are the escalator extract outlets and inlet grilles to and from the Borough High Street ticket hall that had to be fire separated from the rest of the structure.

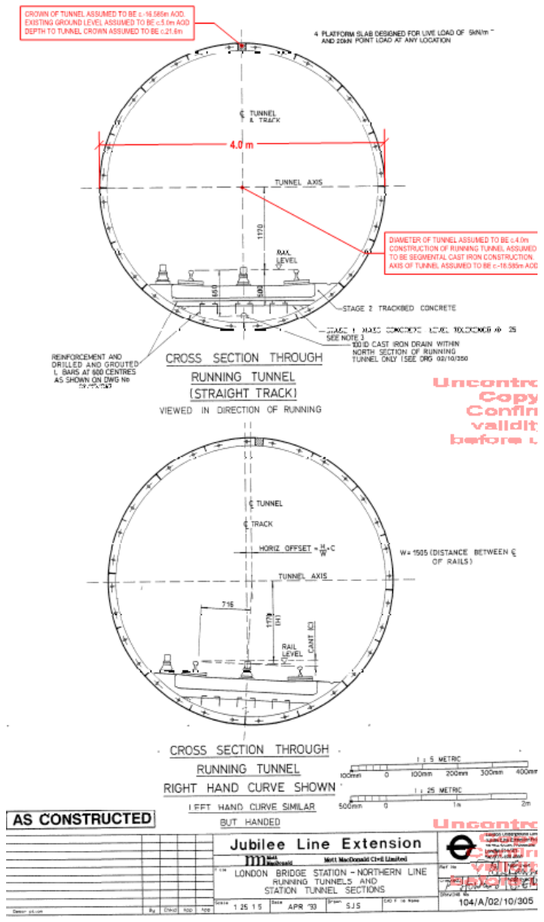


Figure 6.4 Northern Line Tunnel

Figure 6.6 LUL Vent

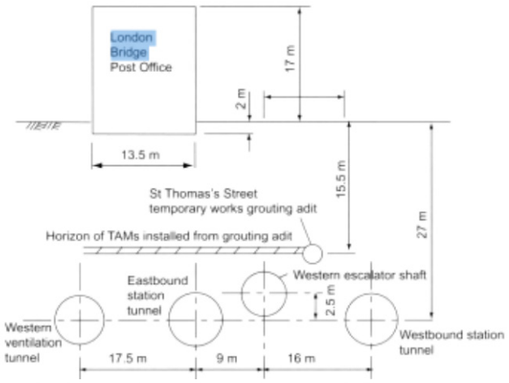


Figure 6.7 Compensation grouting - section through St. Thomas street

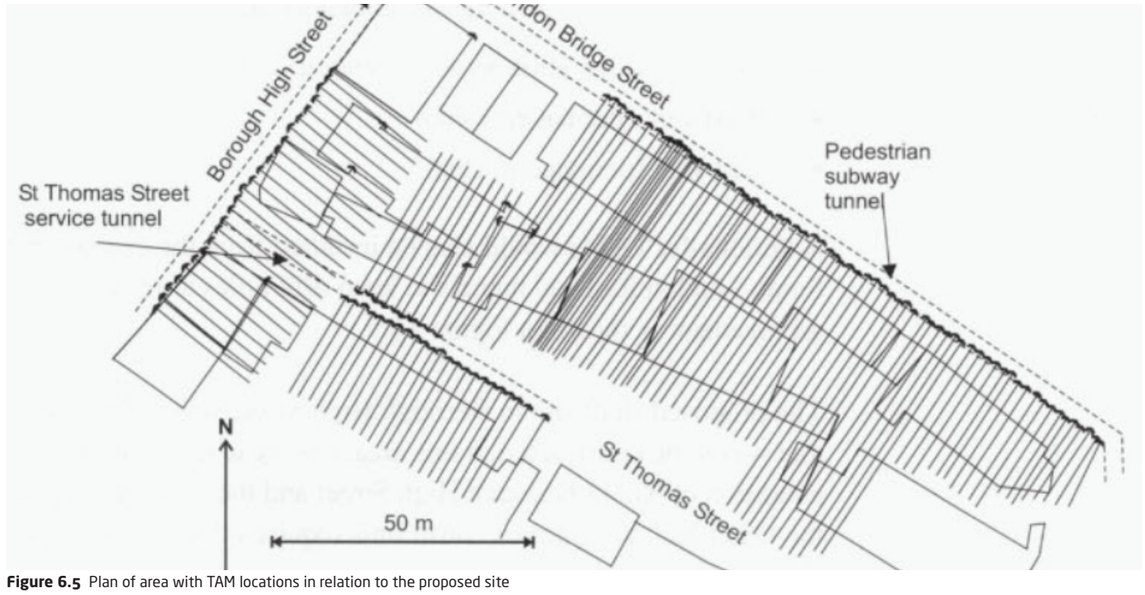


Figure 6.5 Plan of area with TAM locations in relation to the proposed site

6.4 Highways

The proximity of the proposed basement to the adjacent highways on the South side in the interface with King's Head Yard, will require an Approval in Principle (AIP) document for the permanent support of the highways in the following stages. Our analysis for the basement construction and the foundations follow the guidances provided.

6.5 Utilities

A utility report has been purchased from Landmark Envirocheck. The package of information received provides useful information concerning statutory utilities in and adjacent to the site.

Given the previous and current site uses, it is unlikely that there will be any major utilities crossing the site, unless reported within this report.

The archive drawings also show an existing electrical substation located in the SW corner of the site. This is positioned over two floors from basement to ground.

6.6 Underground Structures

Existing foundations and services are likely to be found associated with the site's historical use but it is likely that they have been removed during previous excavations of the existing basement.

It is necessary that previous and existing building plans are studied in detail to assess the extent of the existing buried foundations. From archival information it can be seen that the New City Court is founded on a series of pile caps with 450mm diameter piles each with a capacity of load of approximately 70 tonnes. From a preliminary design assessment the piles are approximately 15-20m deep and founded on the London clay.

The record drawings show that mass concrete was used in the temporary works strategy for the building built in the 1980's. Mass concrete was also used for the facade retention scheme and on visiting the vaults these could be found left inside the masonry vaults in front of Keats House. This would suggest that the mass concrete blocks, which are large in size are likely to have been left in the ground and would need to be removed when excavating the proposed basement.

There is also a cellar along King's Head yard belonging to The King's Head public house which can be seen in the Site constraints drawing, in Appendix 1.

6.7 Unexploded Bombs

London was heavily bombed during World War II and therefore the risk of finding unexploded bombs is relatively high. Extensive maps of London are available which highlight areas where bomb hits occurred. From the map indicated in Fig 6.9 the proposed site for this development has not suffered any direct bomb strikes. This would appear to be corroborated by the historic maps which show no extensive new buildings post World War II and that there is currently an existing new building occupying the site.

A detailed UXO Risk assessment Report ; DA3587-00 highlights the site to be at low risk, with a small area of medium risk in the western section of the site area, which is adjacent to the St. Thomas Street buildings and the NCC courtyard.

6.8 Archaeology

London, as a Roman city, has a rich and illustrious archaeological history. The area falls within Southwark Council's designation of an archaeological priority zone suggesting that there are possibilities of archaeological finds in the area. During the Roman times the course of the Thames was markedly different from its current constrained channel. As the map shown in Figure 6.10 indicates, during Roman times the site was actually on an islet, with the river running a course around this islet. The map indicates that during this time, the west end the site was approximately 1 m above OD and the east end of the site was just 0.5 m above OD.

In 1982-3, an archaeological 'rescue' excavation took place on the site prior to construction of the existing New City Court building after which the area was machined down to formation level for the construction of the existing basement. Significant multi-period remains were recorded including pits with Iron Age pottery, and evidence of at least seven Roman buildings. A possible medieval chapel likely to have been associated with St Thomas' Hospital was recorded, along with post-medieval buildings, and human remains associated with the burial ground of the Hospital which extended across 30-40% of the south-east of the site. The burials were removed - without archaeological recording - by a graveyard clearance contractor, although it is possible that occasional disarticulated bone is still present, especially around the south-eastern edges of the site. However, given the depth of the basement, except for beneath the terrace of listed buildings and the facade of Keats House, is it unlikely that there is any surviving archaeology in the site other than very deeply cut features such as timber piles or wells.

It is recommended that any geotechnical pits that are excavated for engineering purposes should be closely monitored by a competent archaeological organisation. This will likely involve exploratory works during the geotechnical investigations. Based on the findings, further invstigation may be required during the initial phases of construction.

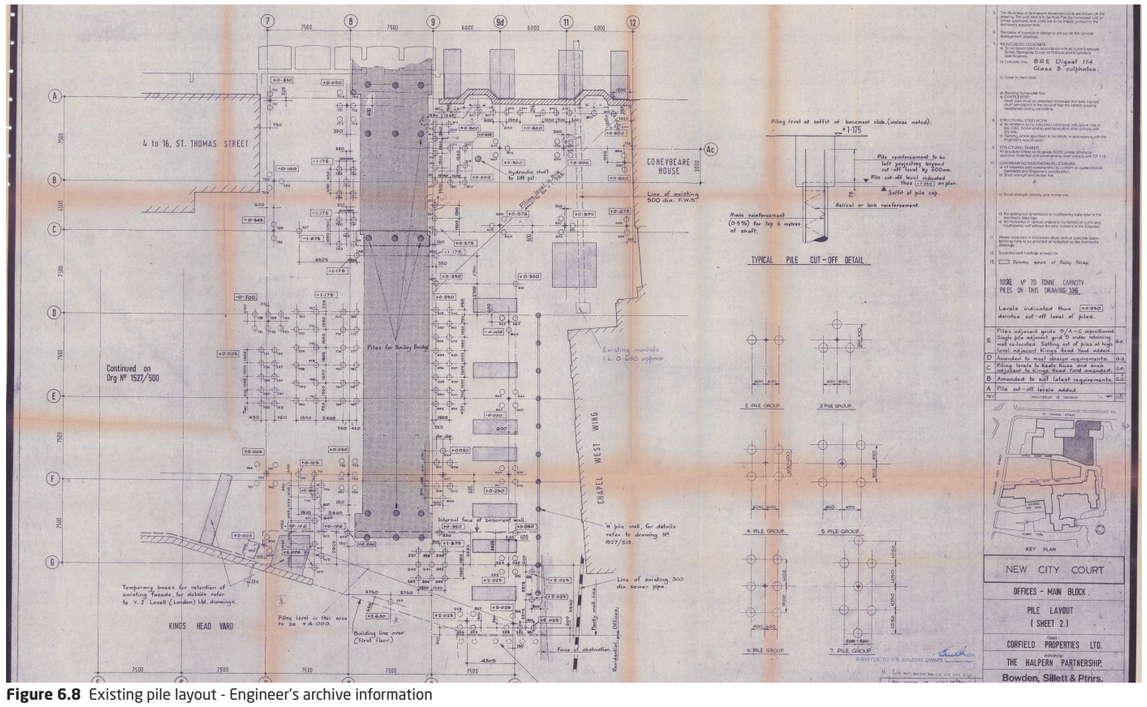


Figure 6.8 Existing pile layout - Engineer's archive information

Figure 6.9 Unexploded ordnance bombs

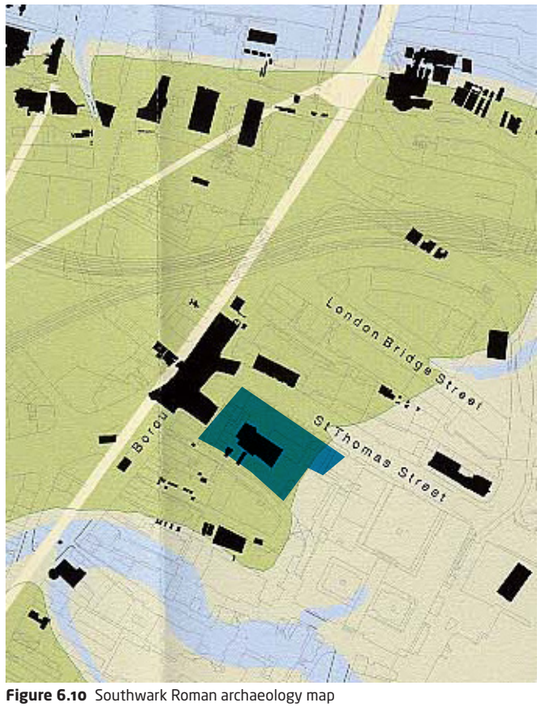


Figure 6.10 Southwark Roman archaeology map

7 Form and Condition of the Existing Structure

7.1 Introduction

The following section is based on the available record Information and has been corroborated where possible by site inspections and limited fabric survey. As the building is still operational, it has not been possible to gain access to all areas during site visits.

The site is occupied by different buildings constructed during different periods and now all connected to form one larger building mass (Fig 7.1). The northern part of the site includes numbers 4-16 St Thomas street. To the northeast is Keats House and at number 20 St Thomas Street is the existing New City Court (NCC) office buidling, which extends behind 4-16 St Thomas Street to the southern extent of the site. Much of the information presented focuses around the construction of the office building in around 1984. As part of this work, a new structural frame was placed within Keats House with the existing facade retained. The facade facing King's Head Yard was partialy retained but most of it was rebuilt with some alterations. Along the St. Thomas Street boundary there are underlying masonry constructed vaults beneath the pavement, within GPE ownership.

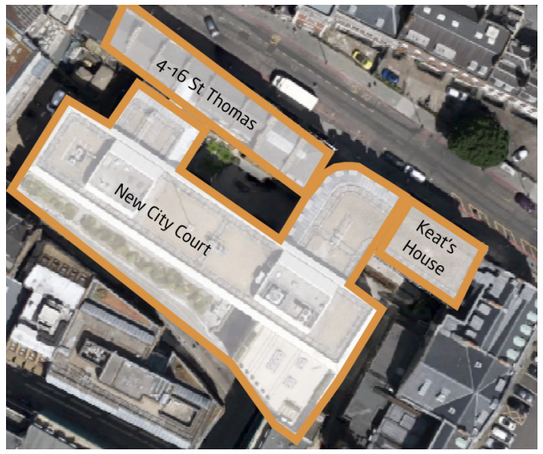


Figure 7.1 Aerial view of site showing designation of the buildings

7.2 St Thomas Street

Numbers 4-16 St Thomas Street are a row of 5-storey masonry brick terraces. Built in early 19th century as housing, they have since been converted to offices as part of the redevelopment of the adjacent NCC office building. The buildings and attached railings located on the pavement secluding the lowered ground floor access are grade II listed. For this reason these are to be retained as part of the new development. The current buildings are approximately 12m in height, 42m long by 10m wide.

Since the early 19th Century, the buildings have experienced several alterations, except for the front facade to St. Thomas street that have remained almost unchanged. These alterations were mainly done in the 80's together with the construction of NCC office building, and comprised of new floor joists and a basement slab, an extension of the back face towards NCC from level B1 to level 2, installation of steel and RC lintels to allow for openings in spine walls and the construction of a new 200mm blockwork wall with brick facade to the rear of these terraces, as well as other minor alterations. Previously, 2 storeys were added to no. 16 and, in the 1930's the gap between no. 8 and 10 was filled in.

Superstructure

From historic records and archive information from the Architects, 'The Halpern Partnership', it can be determined that the existing facade consists of loadbearing yellow brick masonry and stone. The internal structure of the main walls are also mainly load bearing masonry, supporting the 4 storey upper floors. The floors consist of timber on joists supported off the main wall supports. There are areas of the terraces which during the 1980's have been demolished and re-constructed with new masonry/ blockwork walls. Existing drawings show the rear facade/ supporting wall of the terraces to have been re-built, which included new internal partitions and possibly new floors that have been added. Drawing 2058-ST20 shows No.10 to have all new internal structure, with only the facade to be kept as the original structure.

Figure 7.2 St. Thomas Street Facade - 1930's gap infilled between no. 8 and 10

Foundations

Drawings available from the time of the office renovation construction from the Engineers, 'Bowden, Sillet & Partners', indicate the foundations to be corbelled brickwork strip footings. The rear footings were underpinned using various combinations of brickwork and mass concrete, during the 1980s conversion. The depth could not be determined from the existing drawings and a survey will be required to obtain this information.

Strengthening of the foundations was performed during the construction of the office building, as noted in the archive structural drawings.

Vaults

The vaults within the terrace house section appear to be made of masonry bricks which are vaulted beneath the pavement, extending approximately 1.6m at No. 4 St. Thomas Street and 2.6m infront of no.s 6-16. This could perhaps suggest there was an obstruction or sewer within the road limiting the depth in this location. However there is no record evidence to support this.

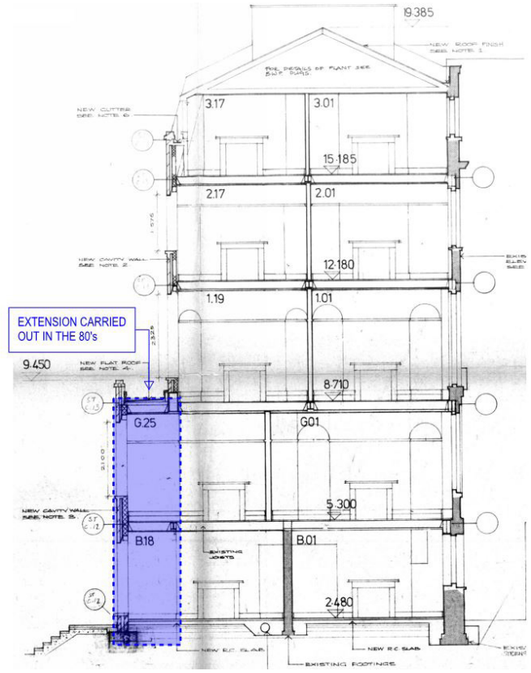


Figure 7.3 St Thomas street section

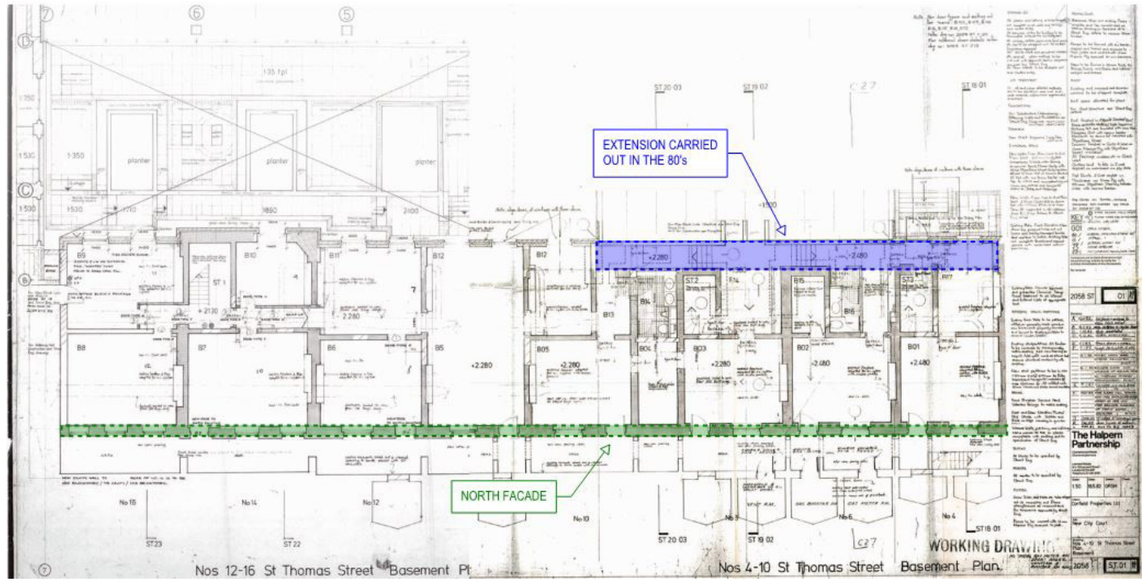


Figure 7.4 St. Thomas street building existing archive drawing

7.3 Keats House

Keats House is located to the east of 4-16 St Thomas Street. The imposing 4-storey red brick building, built in 1863 at the request of Guy's Hospital, has no listed status. The building is named after the late poet John Keats, who although did not live there, lodged for a short while at 8 St Thomas Street where a commemorative London Heritage blue plaque is located.

Facade Strategy

The facade is deemed a positive contribution to the Borough High Street Conservation Area and will therefore be dismantled and rebuild as part of the new development. Refer to the structural statement report included in the planning documents and the relevant appendix for PAYE's report on the viability of Keats House facade dismantling and rebuild.

Today, all that is left of the original building is the retained facade behind which sits a reinforced concrete frame constructed as part of the existing NCC office building development.

Due to the existing stonework and construction of the facade it is believed to be loadbearing at basement level.

Superstructure

The building has 4-storeys and 1 level of basement/ lowered ground accessed from the street level and internally.

The main frame is reinforced concrete constructed as part of the existing NCC office building. The superstructure consists of 500mm square reinforced concrete columns supporting 250mm flat RC slabs. The eastern party wall of Keats House is also shown to be constructed from reinforced concrete.

Vaults

There are 6 vaults believed to be located in front of Keats House. The central smaller vault has access to it, however the larger vaults had been previously closed up with a masonry skin and they were only able to be inspected through a small vent opening. On visiting it was found that 4 of the 6 vaults contained large entities of mass concrete. These are believed to have been used as part of the 1980's facade retention scheme when the office building was previously built and have been left there and closed within the vaults.

Foundations

The Foundations to the main superstructure are approximately 450 diameter piles as part of the main existing development. The facade foundations appear to have been underpinned as noted on the architectural archive drawing 1527-503 (Fig 7.6). Drawing 1527-522 is not available however on drawing 1527-501, it is shown that 4 large mass concrete blocks as mentioned in vaults above have been used to underpin the facade retention in the 1980's.

7.4 Existing NCC Office Building

The existing development is a reinforced concrete frame building completed in the 1980s. The building is 6-storeys including a partial single storey basement. The architects of the project were The Halpern Partnership, now known as Formation Architects. The consulting engineer was James R. Briggs and Associates, who appear to have been renamed in 1994 as DIS Industrial Consultants Limited.

Superstructure

The archive structural and architectural drawings available show that the building is constructed from reinforced concrete columns and flat slabs. The columns are generally 500 mm x 500 mm square and flat slabs 250 mm thick concrete and finished with 75 mm of screed. Structural walls are shown to be 200 mm thick. Whilst the grid varies it is generally between 7-8m. There appears to be RC upstands of 130mm thick x 950mm high approximately surrounding the perimeter.

Retained facades

The portion of the building facing King's Head Yard includes two different retained facades. Most of the retained facade is made of stone extending along King's Head Yard. The remaining retained facade is made of brick and is located in the southeast corner, adjacent to Guy's Hospital masonry arch entrance.The new framing for the New City Court development is installed adjacent to the retained facades. The retained facade is supported by corbels projecting out of the wall.

In addition to the complete retention of the terraces along St Thomas Street, two facades were retained as part of the office development: Keats House (section 7.3) and along the boundary of New City Court to King's Head Yard on the south of the site. This also shows that there were existing lightwells along Kings Head yard previously, now filled in.

Foundations

The building sits on a series of piles and pile caps. The pile caps vary from 900mm to 1200mm thick with 450mm diameter piles located in groups of six below the columns and 16 approximately below the Core walls. From preliminary calculations the piles are approximately 15-20m deep, extending into the london clay, terminating about 3m above the crown of the westbound station tunnel. There are mass concrete blocks differing in length and size along the Kings Head Yard perimeter, as part of the facade retention strategy. However, the depth of these are unknown at this stage.

Figure 7.5 Keats House facade

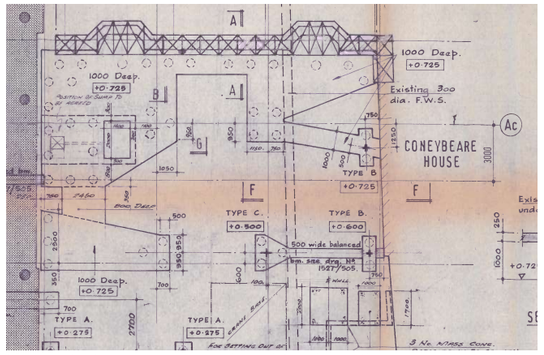


Figure 7.6 Record drawing showing existing foundations

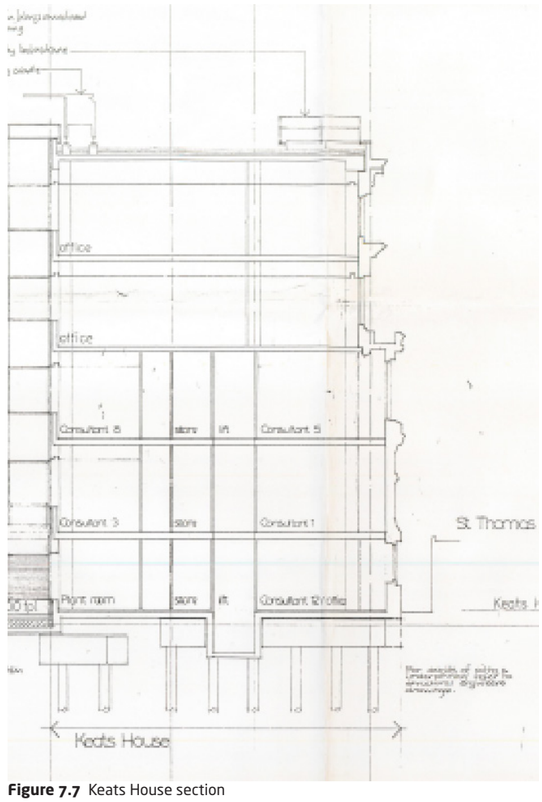


Figure 7.7 Keats House section

Figure 7.8 New City Court facade to St. Thomas street

8 Proposed Structure

8.1 Overview

The project comprises the construction of a 37 storey tower on the south side, adjacent to King's Head Yard, after the demolition of the existing New City Court office building.

Keats House, a smaller building located in the northeast corner, will be recreated, with the construction of a new internal structure intended to reflect the Venetian style of its facade.

The expansion of the existing level of basement and the construction of a second level across the whole site is proposed to accommodate extensive cycle parking and gym facilities, in addition to servicing and plantrooms.

Additionally the scheme will create a public space at the ground floor as part of the redevelopment project, providing an enhanced entrance from St. Thomas Street to New City Court, and a direct passage from Borough High Street to New City Court through London Bridge Underground Station is also part of the project.

Finally, the project proposes to retain and refurbish the existing terrace houses located along St. Thomas Street (no. 4 to 16), following special requirements for listed buildings (Grade II).

8.2 Deconstruction and Demolition

Overview

The demolition works are related to:

- the office building of New City Court which was built in the early 1980's;
- the structure forming Keats House erected at the same time;
- The extension of the Georgian Terrace from number 4 to number 12 which was carried as part of the developments in the 1980's.

The front facade of Keats House will be carefully dismantled and reconstructed approximately 4m to the right (west) to improve the circulation of pedestrians and vehicles as part of the proposed redevelopment of the New City Court site.

General Considerations

The demolition works will need to consider:

- Site constraints - Ability to access and manoeuvre in and around the site. Specific consideration will need to be given to tower cranes i.e. location, over sailing, jib length, collapse radii etc. Please refer to the AKTII site constraint plan.
- Public Safety - Demolition produces large amounts of debris and dust. The existing structure would need to be clad in scaffolding and monoflex sheeting (debris netting) and consideration would also need to be given to crash decks where demolition poses a high risk to the public.
- Integrity of retained and adjacent structures - Demolition generally produces varying degrees of vibration depending on choice of demolition technique. Full consideration needs to be given to adjoining structures and site retained structures such that damage does not occur as a result of excessive vibration. It may even be necessary to utilise differing demolition techniques in areas of high risk.
- Noise - Demolition operations generally generate a great deal of noise and consideration will need to be given to surrounding environment. Restrictions may also be placed on operating hours especially given proximity to Guy's Hospital and the other buildings which are part of the hospital such as Coneybare House and the structures belonging to King's College.
- Protection of the infrastructure such as the sewer running underneath Keats House, which is supposed to be diverted before of the works for the construction of the new basement.

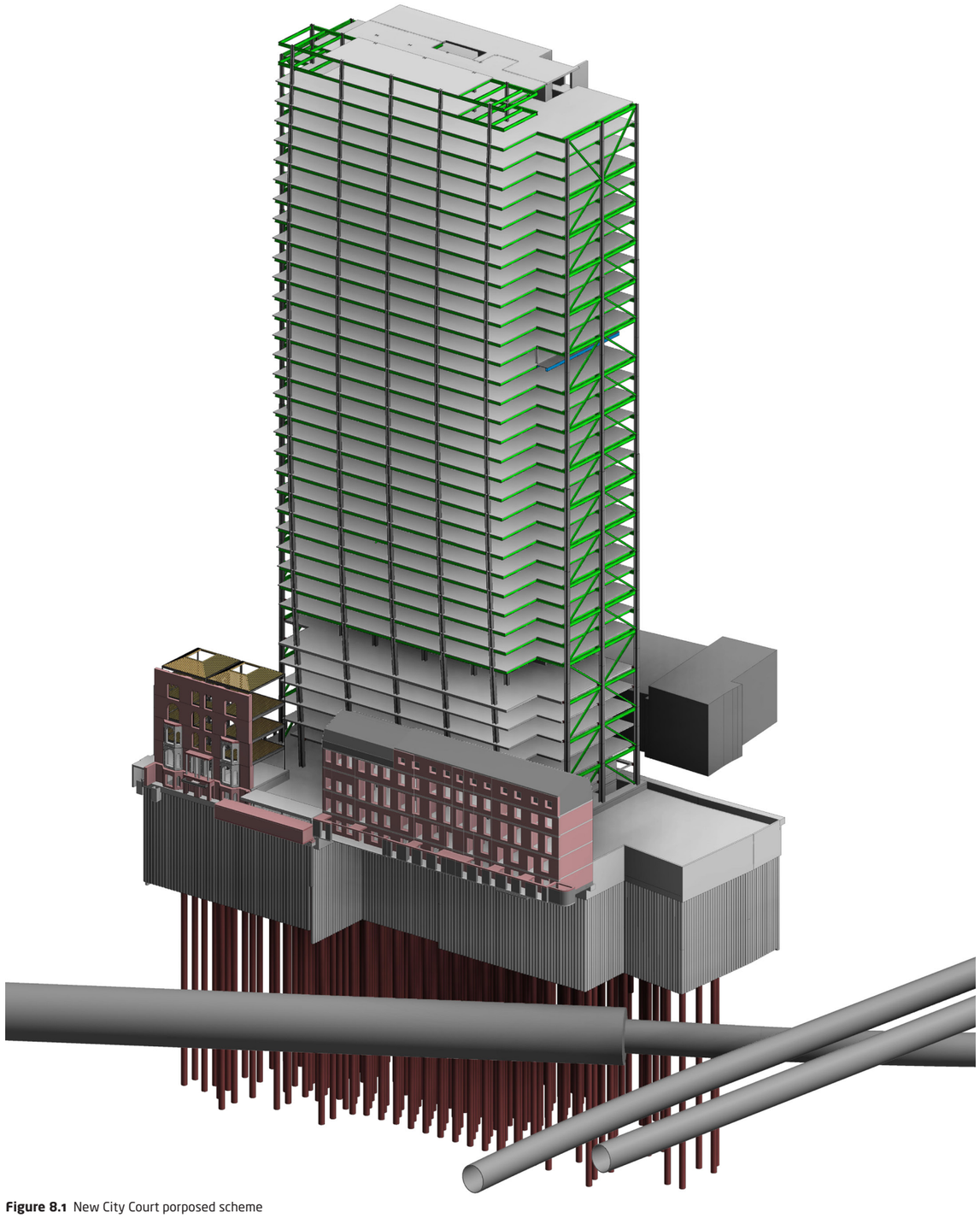


Figure 8.1 New City Court porposed scheme

8.3 Basement Construction

Structural solutions for basement construction have been investigated according to site information available at present. Preliminary information about ground conditions and related design parameters have been determined based on the findings of the previous site investigations, desk study and record searches.

Further investigations, including geotechnical and environmental, will be required in the next stages to determine the final design of the basement.

The proposed substructure encompasses the construction of two basement levels B1 and B2 repectively at -0.150m (SSL) and -4.65m (SSL). These levels are intended to provide plant room and cycle storage space.

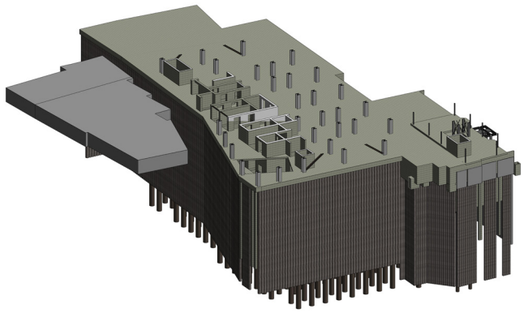


Figure 8.2 Proposed basement 3D view

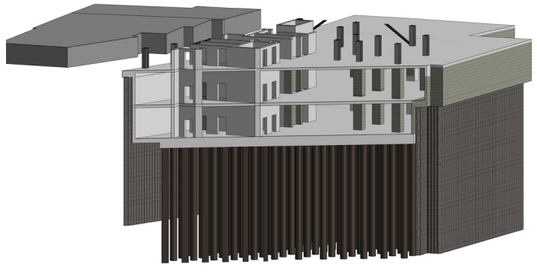


Figure 8.3 Proposed basement section

8.4 Underpinning

AKT II has carried out extensive researches on the structures of the buildings adjacent to the development.

The construction of the new basement will require the underpinning of most of the foundations which are currently sitting above the proposed B1 level. Please refer to figure 8.4 showing the preliminary extension of those works. The underpinning will also include the original foundations along the south face of the Georgian Terrace.

The proposed B2 level will be formed using secant piles which will be designed to support the surcharge loads from the existing building. the construction of the new basement will require a careful design of the temporary works to allow for the excavation.

Figure 8.4 Underpinning extent along St. Thomas Houses

8.5 Retaining Walls

The New City Court development encompasses the demolition of the existing office basement level and the construction of an additional basement, to provide 2 basement levels on the proposed scheme. The typical depth of excavation beneath the existing basement level will be approximately 7.5m for the proposed 2 storey basement.

The formation of the new basement will be achieved with the use of a secant piled wall which is the most suitable solution in terms of cost/effective width, construction sequence, adjacent buildings and other site constraints, as well as programme.

This secant piled wall is an inherent stiff construction, conducive to a robust temporary works scheme. The interlocking construction provides resistance to the penetration of water into the excavation during the temporary condition and limits the risk of washing fines from under the adjacent structures. The piling line is set such that adequate clearance to the adjacent structures is maintained with typical minimum clearance of 1200mm from the centre line of the pile to the adjacent high-level obstruction.

The secant piled wall proposed to date will be designed to support the surcharge load from the adjacent buildings and/or roads, soil surcharge and water pressure.

Generally, a 600mm diameter secant piled wall has been adopted all around the perimeter. There are however some localised areas, on the east side of Keats House and on the southeast corner, where the proposed retaining wall will be a 450mm diameter mini-pile contiguous wall to interlock with existing 450mm diameter piles located in the perimeter.

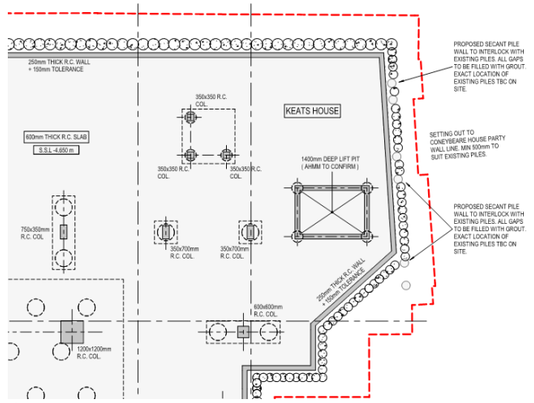


Figure 8.5 450mm Secant piled wall on the east side of Keats House; interlocking detail between existing piles and proposed secant piled wall

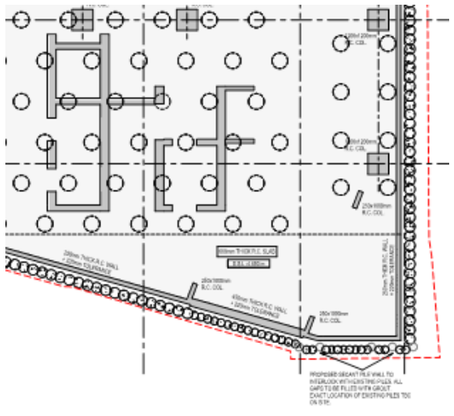


Figure 8.6 450mm Secant piled wall on the south side of NCC; interlocking detail between existing piles and proposed secant piled wall

8.6 Foundations

Given the magnitude of the vertical loads applied, together with the anticipated ground conditions, the proposed foundations consists of a piled raft right below the main tower with a 1350mm thick raft spreading the load onto 900mm diameter CFA piles through London Clay until the Lambeth layer, to achieve the desired bearing capacity/limit settlements of underlying strata. For the remaining area outside the tower footprint the main option is a suspended slab between pile caps that support the columns under either the public realm or Keats House.

The current proposed foundation will be subjected to confirmation in the next stages after review of the ground investigation results as well as the construction sequence, maximum CFA pile depth and diameter with the appointed contractor.

Ground heave will occur in the underlying thick layer of clay due to the unloading of the existing building demolition and the excavation of the additional proposed basement.

Heave can be considered as divided in two parts:

- The short-term heave (the more relevant), which for such big sites usually occurs during excavation/construction and therefore does not represent generally an issue in terms of foundation design or impact on the structure itself, but may have an impact in terms of movements on the surrounding assets.
- The long-term heave, which occurs over the life of the building and, as a consequence, the structure has to be designed to accommodate it through the collapsible clayboard.

A more detailed assessment of the impact of heave movements will be undertaken in the next stages.

An indicative proposed foundation layout is shown in figure 8.8.

It should be noted that, as referred in chapter 6, there are several existing RC piles (450mm diameter) across the site and further to additional surveys on site to confirm the actual position of these existing piles (taken as per archive drawings to date), it is expected that some of the proposed piles will need to be relocated to avoid clashes.

The compensation grouting mentioned in chapter 6 was also considered and advice has been taken from piling contractors to make sure that the CFA rig would be capable to drill through the grouting without an impact on the programme.

8.7 Waterproofing

BS 8102 Protection of structures against water from the ground identifies three specific methods of water-resisting construction:

- Tanked Protection
- Structurally Integral Protection
- Drained Protection

It is expected that most of the areas within the basement will be designed to achieve a grade 2 waterproofing degree, however it is likely that some areas will be classified as grade 3 depending on the intended use.

All waterproofing systems carry a degree of risk, therefore the final solution will be determined with the client based on area usage vs risk.

Existing areas of basement (existing perimeter walls or underpinning) will require treatment internally. The options avilable are an internal membrane system, new RC lining wall, drained cavity or a combination of these. It is also likely that these areas will require local repair where there has been historic water ingress.

The basement waterproofing design will proceed in accordance with BS 8102 (1990) in the following stages.

8.8 Assumed Construction Sequences

Outline construction sequences related to the formation of the basement as assumed in the development of the permanent works design to date are indicated on the next page as well as in Appendix 5. The sequence will be improved further in the next stages of design and coordinated with the Contractor once appointed.

The expansion of the existing basement will require different excavation/retaining wall solutions depending on the constraint, which could be the site boundary, face of adjacent building, existing foundations, surrounding services and others as highlighted in chapter 6. The additional basement level will be formed based on a secant pile wall around which will be installed either from the existing B1 level on the north and west sides, or from the ground floor on the south and east sides, where a berm is to be made as part of the temporary works.

The existing basement level is also a constraint and temporary works will need to be considered to allow for the demolition of the GF and B1 slabs. The existing basement wall may need to be kept in some areas.

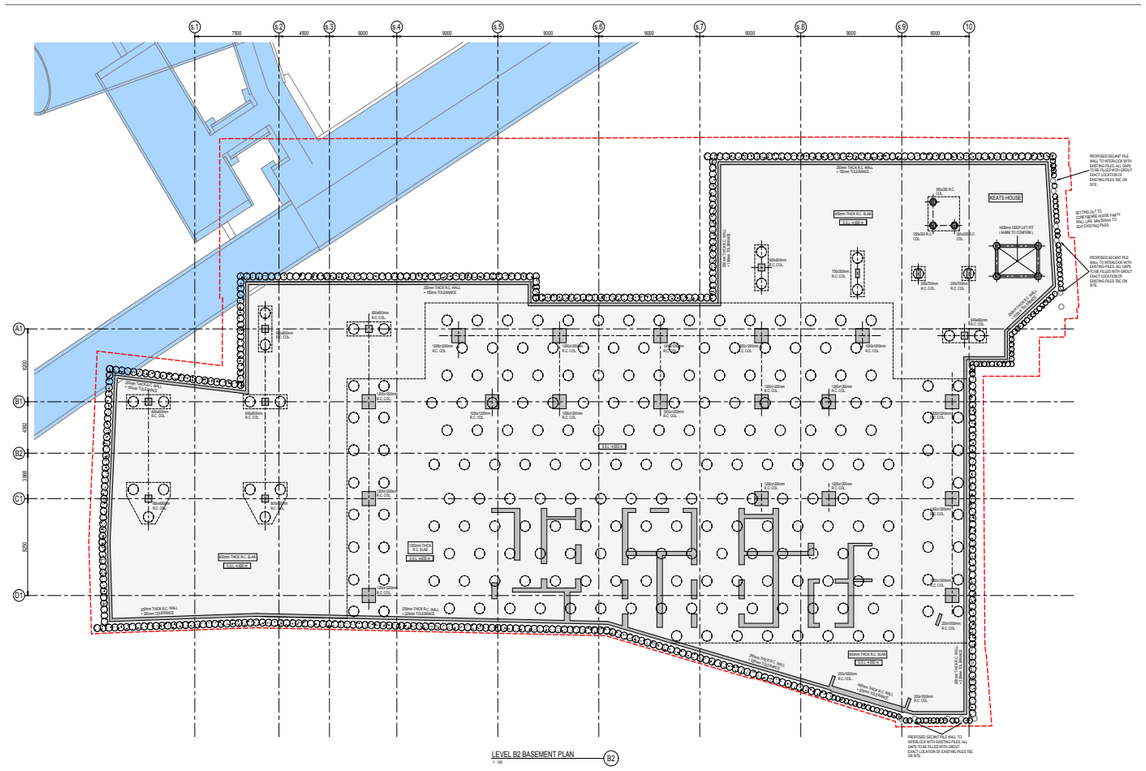


Figure 8.7 Indicative proposed pile layout

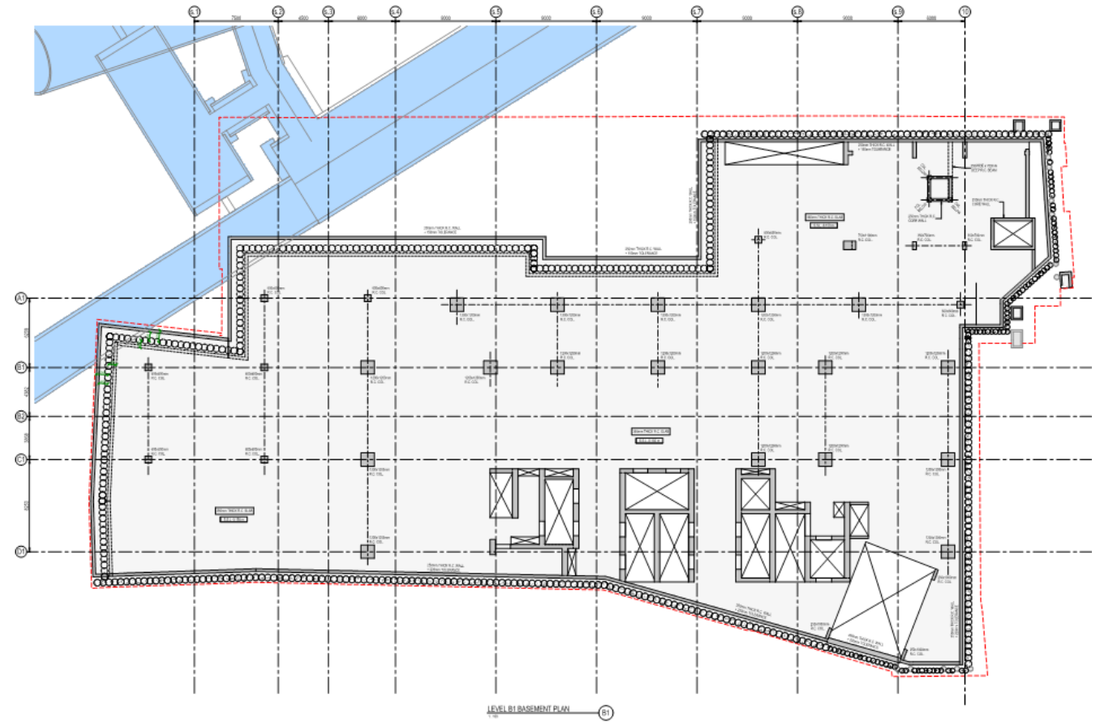
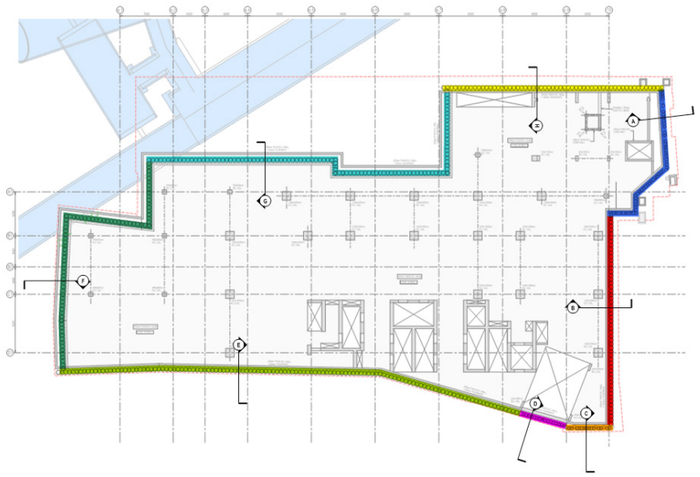
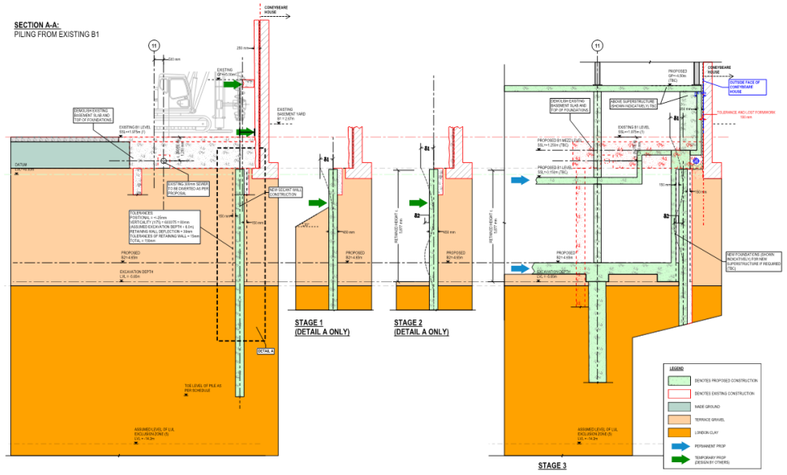
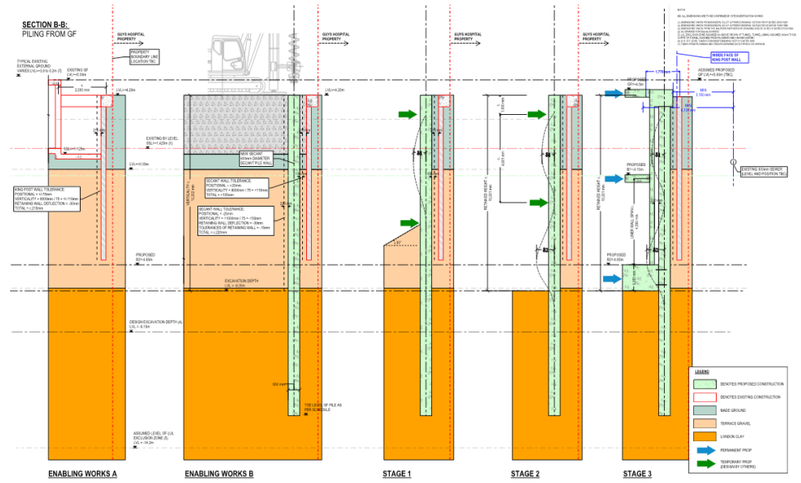


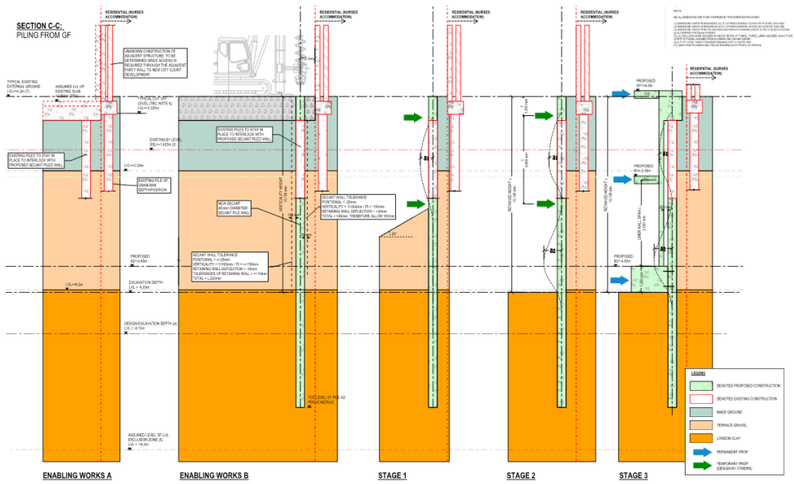
Figure 8.8 Indicative proposed B1 basement level

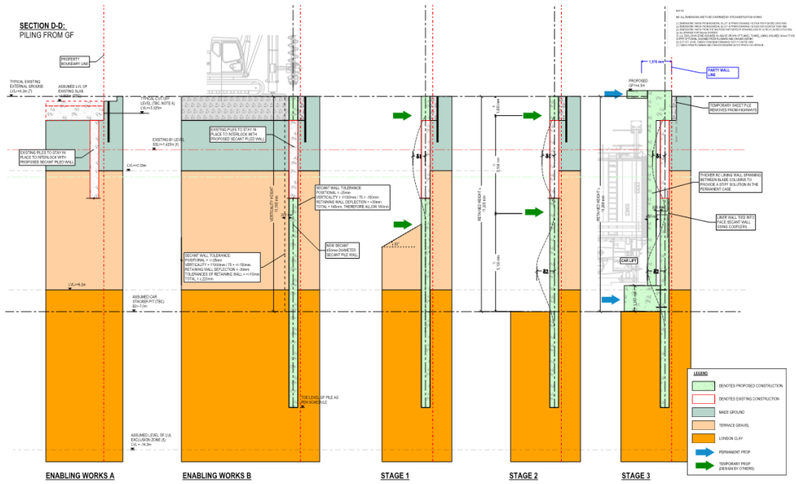
Retaining wall construction sequence

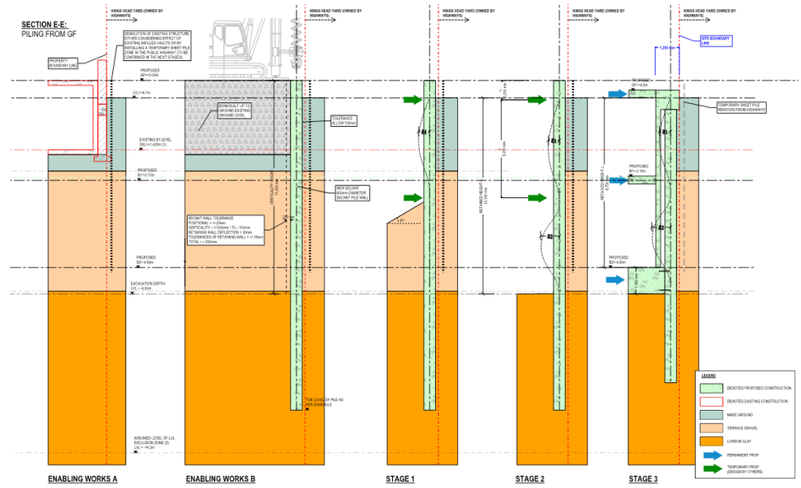


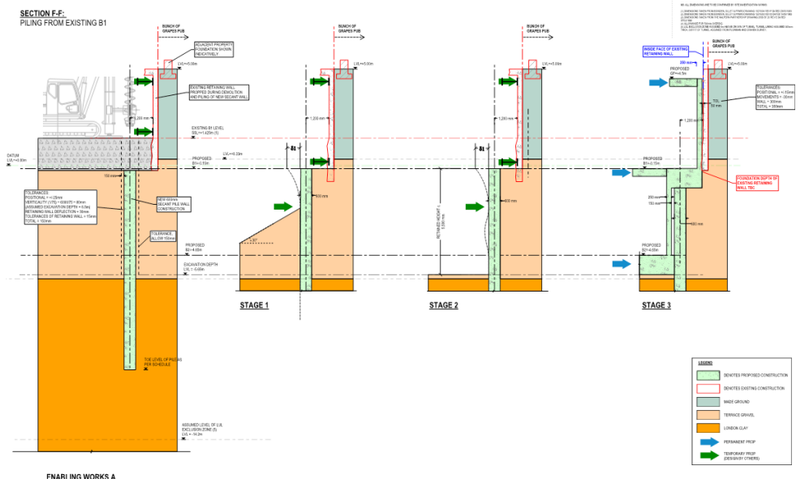


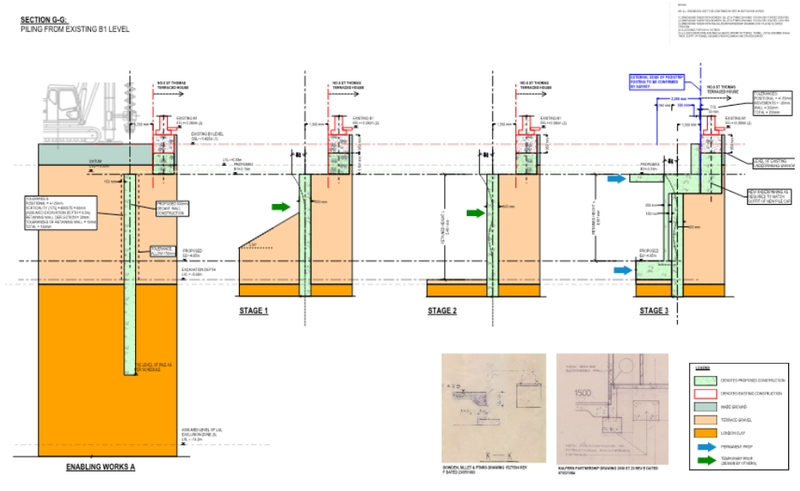


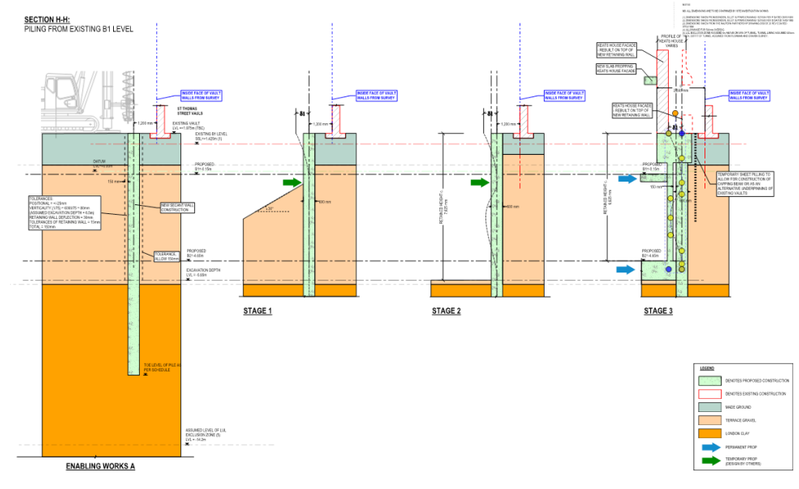












9 Design Standards

Since March 2010 Eurocodes and their associated National Annexes (providing country-specific design parameters), have superseded British Standards as the principle design codes for structural elements in the United Kingdom. Reference will be made to British Standards and other technical guidance where topics are not adequately addressed in the Eurocodes. It is of note that while no longer current, the superseded British Standards generally remain cited within UK Building Regulations.

The following codes and design guides will be used principally in preparing the structural design for the project. For the sake of brevity National Annexes are not listed:

Eurocode 0: Basis of structural design

BS EN 1990:2002

Eurocode 1: Actions on structures

BS EN 1991-1-1:2002, BS EN 1991-1-2:2002, BS EN 1991-1-3:2003, BS EN 1991-1-4:2005, BS EN 1991-1-5:2003, BS EN 1991-1-6:2005 and BS EN 1991-1-7:2006, (BS EN 1991-3:2006)

Eurocode 2: Design of concrete structures

BS EN 1992-1-1:2004 and BS EN 1992-1-2:2004, (BS EN 1992-3:2006)

Eurocode 3: Design of steel structures

BS EN 1993-1-1:2005, BS EN 1993-1-3:2006, BS EN 1993-1-4:2006, BS EN 1993-1-5:2006, BS EN 1993-1-7:2007, BS EN 1993-1-8:2005, BS EN 1993-1-10:2005, BS EN 1993-1-11:2006, BS EN 1993-5:2007 and BS EN 1993-6:2007

Eurocode 7: Geotechnical design

BS EN 1997-1:2004, BS EN 1997-2:2007

BS8102 2009 Protection of below ground structures against water from the ground

SCI P354 Design of floors for vibration: A new approach

BS6472-1:2008 Evaluation of human exposure to vibration in buildings

The Concrete Centre: A design guide for footfall induced vibration of structures

CIRIA C580 Embedded retaining walls – guidance for economic design

Building Regulations: all relevant sections, including Approved documents A & B concerning structure and fire safety

The assessment of existing structures shall generally follow the principles outlined in the iStructE publication entitled "The Appraisal of Existing Structures".

10 Impact Assessment

The impact assessment will be carried out in stages appropriate to the current level of of design. At this stage, there are a number of assumptions that require validation in subsequent design stages, further to additional investigations. Comprehensive calculation packages will be prepared by AKT II for Building Control approval at the relevant stage of design.

The following section gives an outline of these assumption and the process which will be followed in order to gain necessary Third Party approvals.

10.1 Analysis and Process

10.1.1 Data and Assumptions

The key information required to finalise the design can be broken into the following sub-categories. The current assumptions within each category are defined below.

Form and Loads

The building has gone a coordination process within the design team which has resulted in the proposed layout and height. The usage of the various floors has been also coordinated and fixed.

Construction Sequence

The construction phasing is considered in the assessment of time dependant effects. At this stage, a realistic construction sequence has been assumed, however it will require confirmation together with the appointed contractor in further stages.

Ground Conditions

At the date of this report an initial picture of the ground conditions has been made based on deskstudy of adjacent boreholes and available literature. However a site investigation will need to be carried out in further stages in order to confirm the design assumptions.

Third Party Assets

At time of writing, the location of Third Party assets has been assumed according to statutory information received.

As dialogue continues with Third Parties, assumptions relating to location, fabric and condition of adjacent/underground structures may change. All these assumptions are subjected to final acceptance and approval by the Third Party involved.

Fabric Survey

A fabric survey is to be carried out to establish the form and condition of the existing basement. This will allow an understanding of the structural scheme of the existing basement to be retained in some areas as well as an assessment of the extent and weight of existing foundations on site to be either removed or avoided, which needs to be acounted for by the contractors in terms of cost and risks.

10.1.2 Initial Modelling

Based on the design at planning, initial modelling has been completed. Once the form and contruction has been finalised via the award of planning permission further modelling of the impacts on adjacent strctures and assets will be carried out.

The aim of this initial modelling is to establish the likely magnitude of the impact on any surrounding structures as well as assets, and provide values which can be used as a basis for the initial discussions with the parties to be notified of the works.

The initial assessment of ground movements will typically comprise the following analysis types, adressing both vertical and horizontal movements:

- Review of predicted ground movements against empirical derivations case study data (eg CIRIA C580 data). The results will be assessed against relevant acdeptance criteria in order to secure the formal approvals for the works to be undertaken. Any resulting requirements with regard to the Contractors' methodology will be detailed and enforced through the project specifications and preliminaries.
- Elastic halfspace model (fig.10.1) to assess vertical ground movements below and adjacent to the excavation in both short-term and long-term conditions.

The results of this preliminary but still rigorous analysis have been the base for the 'Damage Criteria Assessment' on the adjacent buildings and on the infrastructures such as Thames Water, LUL, Highways and SGN gas.

The Assessment demonstrates that the settlements and movements caused by the new development during construction and after completion will not cause damage to the those assets.

This analysis will undergo more detailied studies which will form the base of the Approvals to be submitted to the utility companies whose assets are close to the site such as Thames Water, SGN Gas, Highways Division of the London Borough of Soputhwark and London Underground.

However a monitoring regime will be put in place before the works commence and will last for a period after the completion of the project to make sure the limits on the movements and of the settlements are not exceeded. This process will be discussed and agreed with the utility companies above mentioned and with the party wall surveyors.

10.1.3 Detailed Modelling

Where detailed analysis is considered necessary, the initial calculations will be expanded upon through more rigorous analytical processes.

The key elements of this stage will consist of elastic plane-strain 2D section cut analysis for assessment of lateral and vertical ground movements in regions adjacent to the excavation. A full 3D analysis of the ground may be required in some cases.

The requirements of the analysis are varied depending on the approvals process of the asset in consideration, and the scope will be discussed and agreed with the relevant parties as necessary.

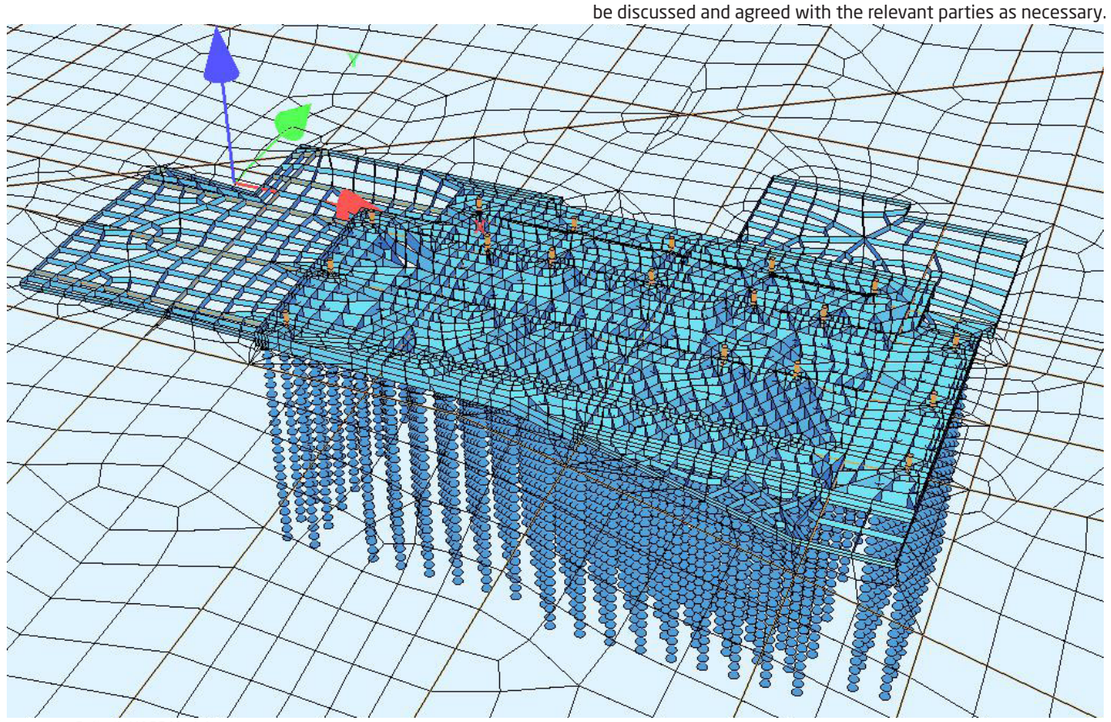


Figure 10.1 Sofistik HASE Model

10.2 Basement Impact Assessment

Following the outcome of the analysis described in the previous section, and appropriate consulation with Third Partires, the following aspectes will be consequently addressed.

10.2.1 Impact on Adjacent Buildings

The impact of the proposed development on the adjacent buildings is to be assessed and approvals secured via party wall awards where required.

A package of relevant drawings, calculations and reports will be prepared to be reviewed by the adjacent owners appointed structural engineer and relevant third parties.

Assumed temporary works designs shall be prepared prior to the Contractor completing the final design.

10.2.2 Damage Criteria Assessment

Halfspace modelling to assess ground movements was devloped at this stage and will be revised and combined with those resulting from the retaining wall analysis as appropriate in order to develop predicted vertical and lateral ground movement contouring. This contouring shall be used to assess the impact on the adjacent buildings. At this stage, as a preliminary check, the impact on the adjacent buildings was analysed based on the halfspace model only and can be found in Appendix 4.

It is proposed to use the classification of visible damage to walls scheme as outlined in CIRIA C760 with reference to Burland et al, 1977, Boscardin and Cording, 1989; and Burland, 2001 (Figure 10.3). Subject to the approval of adjacent owners' party wall surveyor and relevant LBC, Damage Category 1 (very slight) and Category 2 (slight) shall be assumed acceptable.

Vertical and horizontal ground movements calculations will be reviewed and combined in the next stage.

10.2.3 Surveys and Monitoring

A regime of surveys and monitoring of the surrounding building, third party assets, proposed/existing retaining walls and adjacent pavements may need to be implemented depending on the results of the movement analysis and the condition of assets.

Appropriate green, amber and red trigger levels shall be set with reference to relevant CIRIA guidance documents on the observational methodology.

The scope of monitoring is likely to include the following:

- Movement monitoring of party walls via targets surveyed using electronic levels.
- Vibration monitoring using transducers placed on the foundations of the adjacent buildings .
- Crack monitoring via the use of graduated tell-tales.
- Movement monitoring of retaining wall/capping beams via targets surveyed using electronic levels.
- Monitoring of adjacent pavement levels via studs surveyed using electronic levels.
- Monitoring of retaining wall movements via use of Inclinometers cast in secant piles.
- Potential use of extensometer bored in place to monitor heave movements in clay.

Category of damage	Description of typical damage (ease of repair is underlined)	Approximate crack width (mm)	Limiting tensile strain ε_{lim} (per cent)
0 Negligible	Hairline cracks of less than about 0.1 mm are classed as negligible.	< 0.1	0.0–0.05
1 Very slight	Fine cracks that can easily be treated during normal decoration. Perhaps isolated slight fracture in building. Cracks in external brickwork visible on inspection.	< 1	0.05–0.075
2 Slight	Cracks easily filled. Redecoration probably required. Several slight fractures showing inside of building. Cracks are visible externally and some repointing may be required externally to ensure weathertightness. Doors and windows may stick slightly.	< 5	0.075–0.15
3 Moderate	The cracks require some opening up and can be patched by a mason. Recurrent cracks can be masked by suitable linings. Repointing of external brickwork and possibly a small amount of brickwork to be replaced. Doors and windows sticking. Service pipes may fracture. Weathertightness often impaired.	5–15 or a number of cracks > 3	0.15–0.3
4 Severe	Extensive repair work involving breaking-out and replacing sections of walls, especially over doors and windows. Windows and frames distorted, floor sloping noticeably. Walls leaning or bulging noticeably, some loss of bearing in beams. Service pipes disrupted.	15–25 but also depends on number of cracks	> 0.3
5 Very severe	This requires a major repair involving partial or complete rebuilding. Beams lose bearings, walls lean badly and require shoring. Windows broken with distortion. Danger of instability.	usually > 25 but depends on number of cracks.	

Figure 10.3 Ciria C580 damage criteria for ground movements

Figure 10.2 Adjacent buildings behaviour due to settlement plot of NCC development

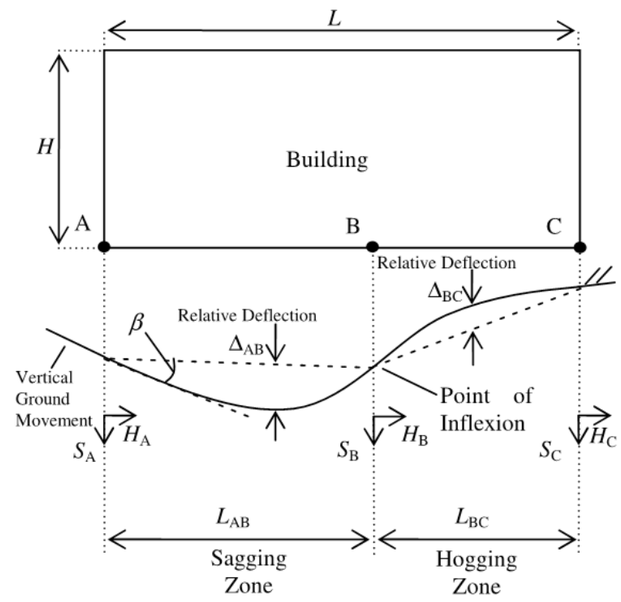


Figure 10.4 Burland parameters for adjacent buildings subjected to ground movements

10.3 London Underground (LUL)

As mentioned in chapter 6, there are some LUL tunnels such as the Northern Line and the Westbound Jubilee Line, as well as London Bridge Station nearby the proposed development which requires earlier discussions with LUL and preliminary ground movements assessments.

At this stage several conversations have been conducted with LUL in order to understand the impact of New City Court onto LUL structures. Also, a preliminary ground movement assessment was completed based on an halfspace model and can be found in Appendix 8. The results appear to be within the limits normally accepted by LUL based on the tunnel/station construction materials anticipated from archive information.

However the results will be reviewed by LUL and further analysis may be required in subsequent stages as well as condition surveys to ensure that the structures are not affected by the proposed development.

The discussions will progress with LUL for the next stage to ensure that any changes to the proposed scheme in terms of loading, ground conditions or construction sequence can be captured.

10.4 Thames Water

At this date, discussions have already been carried out with Thames Water to undertstand the requirements in terms of ground movements limits for surrounding assets as well as the potential for sewer diversions, under Section 185 of the Water Industry Act 1991.

A preliminary analysis has been done to assess the movements of the surrounding sewers highlighted in the chapter 6, based on an halfspace model. The results can be found in Appendix 6 and they show that the most affected sewer appears to be the one on the east side that runs below the existing basement of Keats House, although this appears to be within the limits stated by Thames Water for a 300mm cast iron sewer.

However is proposed the diversion of the sewer close to Coneybeare House. The proposal for the diversion shown in Appendix 7 has already been issued to Thames Water. The proposal will form part of the Section 185.

10.5 Highways

Contact with Highways Division of the London Boruogh of Southwark have already been made, as the basement will be done adjacent to King's Head Yard.

In the preliminary analysis, an allowance of 10kN/m² has been assumed as a surcharge from adjacent roads.

Not major issues are anticipated in terms of ground movements, although, depending on the construction sequence and temporary works that will be further reviewed together with the appointed contractor, the potential extent of works that require agreement with Highways Division will be further discussed.

10.6 SGN Gas

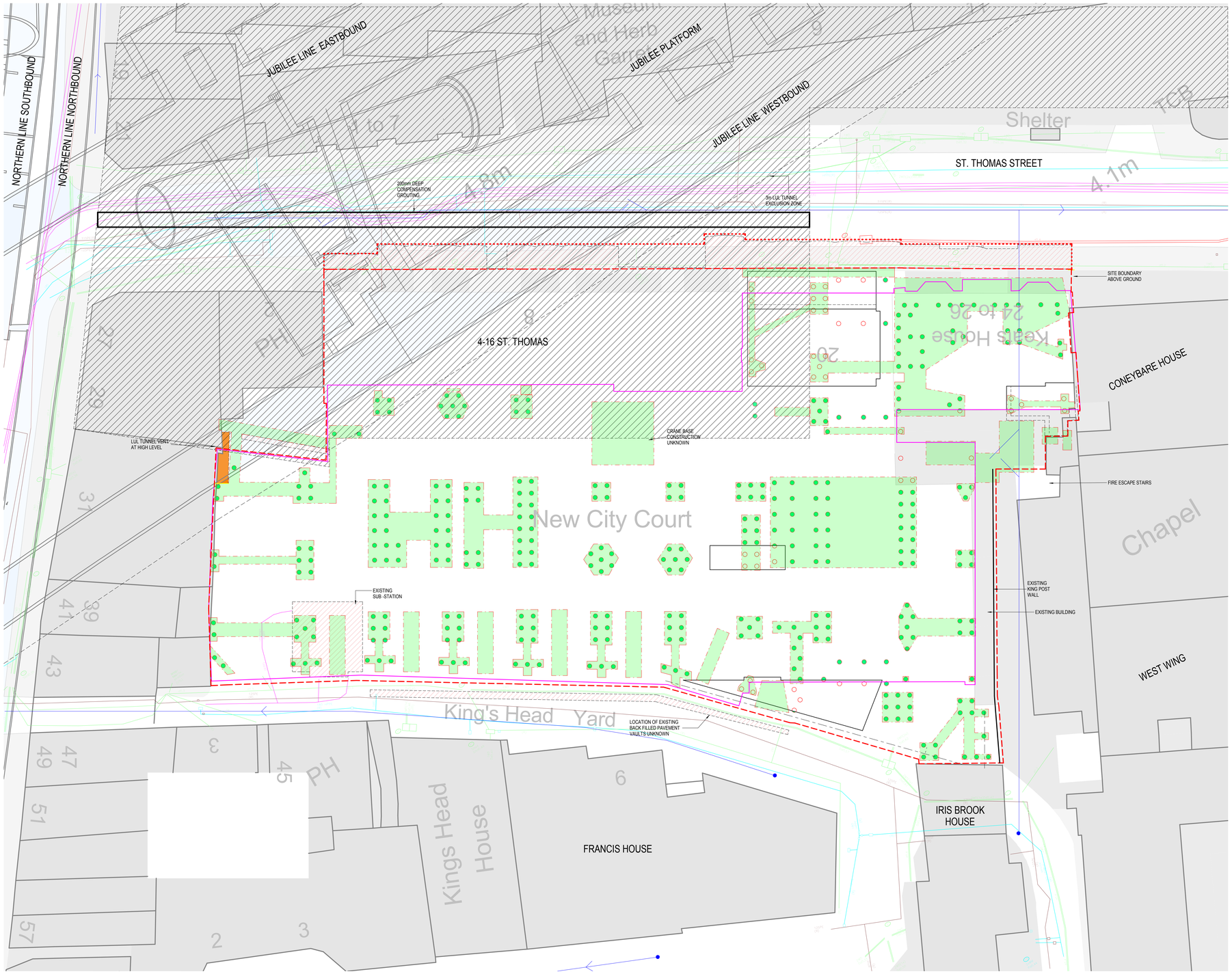
SGN Gas assets have been identified below St. Thomas Street at north and King's Head Yard at the south.

Preliminary analysis to the assets was undertaken based on the halfspace model. Although the movements appear to be minimal, SGN Gas will provide the acceptance limits for the assets based on the construction materials and further reviews will be undertaken.

Conversations with SGN Gas will progress for the next stage to ensure that any changes to the proposed scheme in terms of loading, ground conditions or construction sequence can be captured.

Appendix 1

Site Constraints



SITE CONSTRAINS PLAN

1 : 150

0 2 4 6 8 10 m

SCALE 1:200

INFORMATION TRACKER			
SITE & SURROUNDING AREA			
FILE NAME :-	3572ZT-01A PROV4 (FULL) LU		
ORIGIN :-	PCA SURVEY	ISSUED DATE :-	12.10.2016
TITLE :-	TOPO SURVEY		
EXISTING STRUCTURE			
FILE NAME :-	VARIOUS		
ORIGIN :-	THE HALPERN PARTNERSHIP	ISSUED DATE :-	23.05.2016
TITLE :-	VARIOUS		
UTILITIES & SERVICES			
FILE NAME :-	3572ZT-01A (FULL) OS		
ORIGIN :-	AHMM	ISSUED DATE :-	21.07.2017
TITLE :-	3572ZT-01A (FULL) OS		
LUL LONDON BRIDGE STATION			
FILE NAME :-	14032_LULSTATIONBOX_LU AND OS_PLANS_1st FLOOR LEVEL		
ORIGIN :-	AHMM	ISSUED DATE :-	28.17.2017
TITLE :-	14032_LULSTATIONBOX_LU AND OS_PLANS_1st FLOOR LEVEL		
FILE NAME :-	14032_LULSTATIONBOX_LU AND OS_PLANS_GROUND LEVEL		
ORIGIN :-	AHMM	ISSUED DATE :-	28.17.2017
TITLE :-	14032_LULSTATIONBOX_LU AND OS_PLANS_GROUND LEVEL		
FILE NAME :-	14032_LULSTATIONBOX_LU AND OS_PLANS_TICKET HALL LEVEL		
ORIGIN :-	AHMM	ISSUED DATE :-	28.17.2017
TITLE :-	14032_LULSTATIONBOX_LU AND OS_PLANS_TICKET HALL LEVEL		
LUL JUBILEE LINE TUNNEL			
FILE NAME :-	3572ZT-01A (FULL) OS		
ORIGIN :-	AHMM	ISSUED DATE :-	21.07.2017
TITLE :-	3572ZT-01A (FULL) OS		
LUL NORTHERN LINE TUNNEL			
FILE NAME :-	LONDON BRIDGE LUL STATION		
ORIGIN :-	LUL	ISSUED DATE :-	22.07.2017
TITLE :-	LONDON BRIDGE LUL STATION		

EXISTING BUILDING PLANS ARE TAKEN FROM 'PLOWMAN CRAVEN' SURVEY DRAWINGS ISSUED 24.07.2017.

NOTES

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS & ENGINEERS DRAWINGS & THE SPECIFICATIONS.
2. NO DIMENSIONS ARE TO BE SCALED FROM THIS DRAWING.
3. NORTHERN LINE RUNNING TUNNEL PLAN POSITION TAKEN FROM XXX DRAWING DATED XXX. DIAMETER AND DEPTH EXTRAPOLATED FROM ARCHIVE DRAWING WESTON WILLIAMSON 104/A/02/40/207 REV C DATED 1955.
4. LOCATION OF COMPENSATION GROUTING TAKEN FROM CIRIA BUILDING RESPONSE TO TUNNELLING VOLUME 2 DATED 2001. FIGURE 32.4 & DEPTH FROM FIGURE 32.3 5.
5. SITE BOUNDARY POSITION TAKEN FROM XXX-XXX. SURVEY INFORMATION TAKEN FROM XXX-XXX.

- REFER TO ARCHIVE DRAWING FOR INFO ABOUT THE EXISTING BUILDING IN THE DEMISE
- REFER TO SKETCHES 3948-SK-114 TITLE BUILDING IN INTERFACES FOR INTERFACES WITH OF ADJACENT BUILDING HIGHWAYS AND RED ROUTES
- 3948-SK-196 TITLE NEIGHBOURING BUILDINGS FOR FURTHER INFORMATION ABOUT ADJACENT BUILDING

EXISTING STRUCTURE NOTE

EXISTING STRUCTURE ARE SHOWN INDICATIVELY AND ARE DRAWN ON THE BASIS OF EXISTING AND AVAILABLE RECORD INFORMATION. THE CONTRACTOR REMAINS RESPONSIBLE FOR CONFIRMING ALL THE DETAILS AND EXTENT OF THE EXISTING STRUCTURE AS REQUIRED TO CONSTRUCT THE PROPOSED BUILDING OR WHERE INDICATED TO ALLOW DESIGN OF THE PERMANENT WORKS TO BE COMPLETED IT SHOULD BE NOTED THAT SETTING OUT WHERE RELIANT ON THE CONFIRMED POSITION ON LEVEL OF THE EXISTING STRUCTURE MAY BE SUBJECT TO CHANGE REFER TO ARCHITECTS GRID DRAWINGS FOR FURTHER DETAILS.

LEGEND

- DENOTES SITE BOUNDARY BELOW GROUND FLOOR T.B.C.
- DENOTES SITE BOUNDARY ABOVE GROUND FLOOR T.B.C.
- VERIZON
- TELECOMMUNICATIONS
- THAMES WATER - SEWER
- THAMES WATER - ABANDONED SEWER
- THAMES WATER - MAIN WATER
- GAS MAIN
- UKPN (EXTRA HIGH VOLTAGE CABLES)
- 3m EXCLUSION ZONE
- LUL TUNNEL BELOW
- EXISTING VAULTS UNDER PAVEMENT
- DENOTES LARGE VENT
- EXISTING CONCRETE BASE
- DENOTES INDICATIVE EXTENTS OF TAMs (COMPENSATION GROUTING)
- EXISTING PILES

REV	DATE	DESCRIPTION	CHKD
P0.1	07.11.18	DRAFT STAGE 2 ISSUE	NC

WHERE DIGITAL MODELS/FILES ARE ISSUED, THESE ARE PROVIDED FOR INFORMATION ONLY TO ASSIST OTHER PARTIES DEVELOP THEIR DESIGN/DRAWINGS/DOCUMENTATION. THIS INFORMATION IS OUTSIDE OUR CONTRACTED SCOPE OF SERVICES AND AKT II ACCEPT NO RESPONSIBILITY OR LIABILITY FOR ANY ERRORS CONTAINED WITHIN DIGITAL DATA SUPPLIED.

THE CONTRACTOR SHALL DERIVE ALL INFORMATION PROVIDED BY AKT II UNDER OUR CONTRACT WHICH IS REQUIRED FOR THE PURPOSES OF CONSTRUCTION ONLY FROM FIGURED DIMENSIONS. WITH RESPECT TO DESIGN COORDINATION AND DIMENSIONAL SETTING OUT

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W www.akt-uk.com

GREAT PORTLAND ESTATES PLC

CLIENT

NEW CITY COURT

PROJECT

SITE CONSTRAINTS PLAN

TITLE

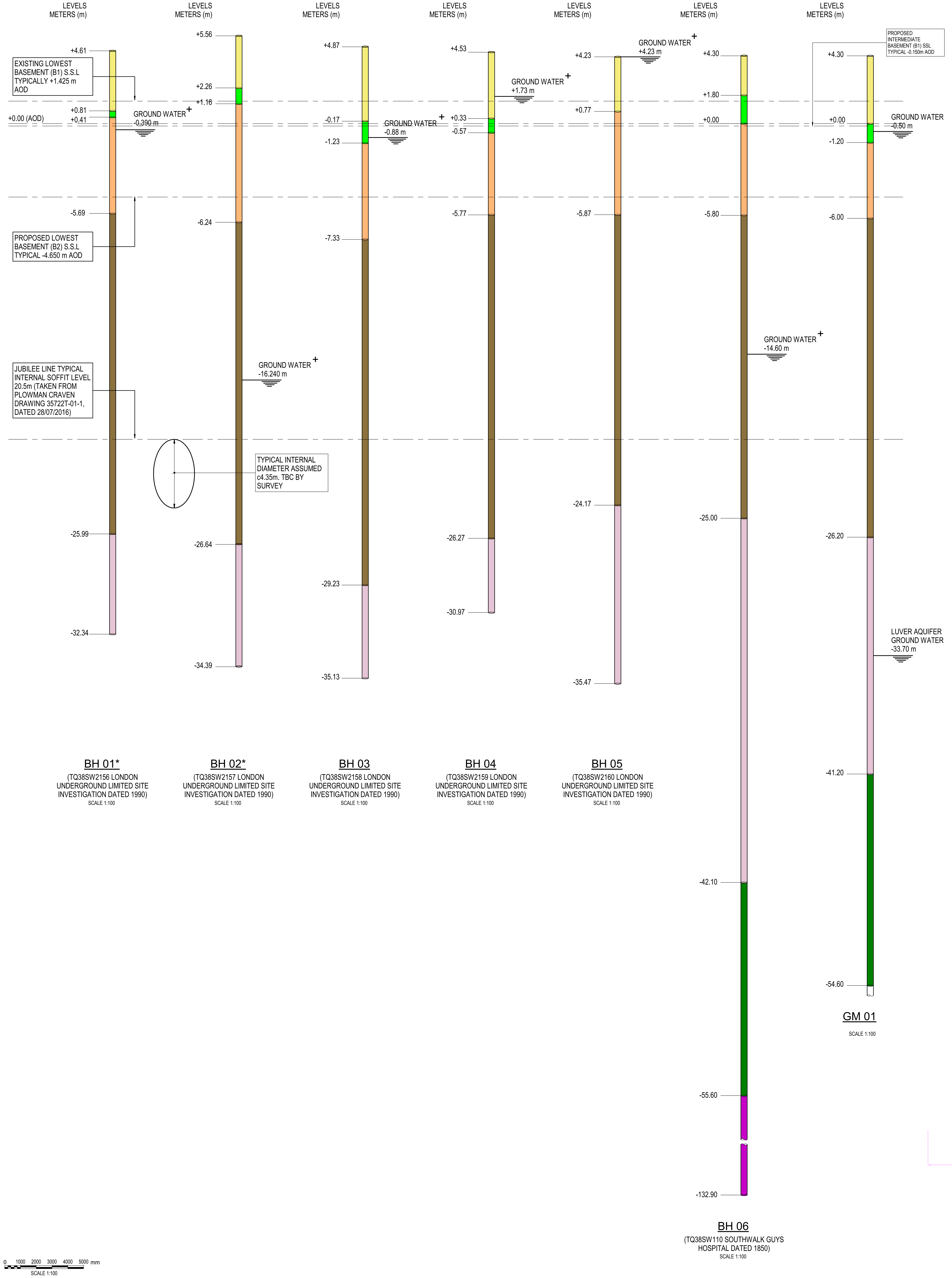
DM	SEP 2018	A0
DRAWN	DATE	SHEET SIZE
3948	STAGE 2	S0
PROJECT NO.	PROJECT STAGE	SUITABILITY CODE

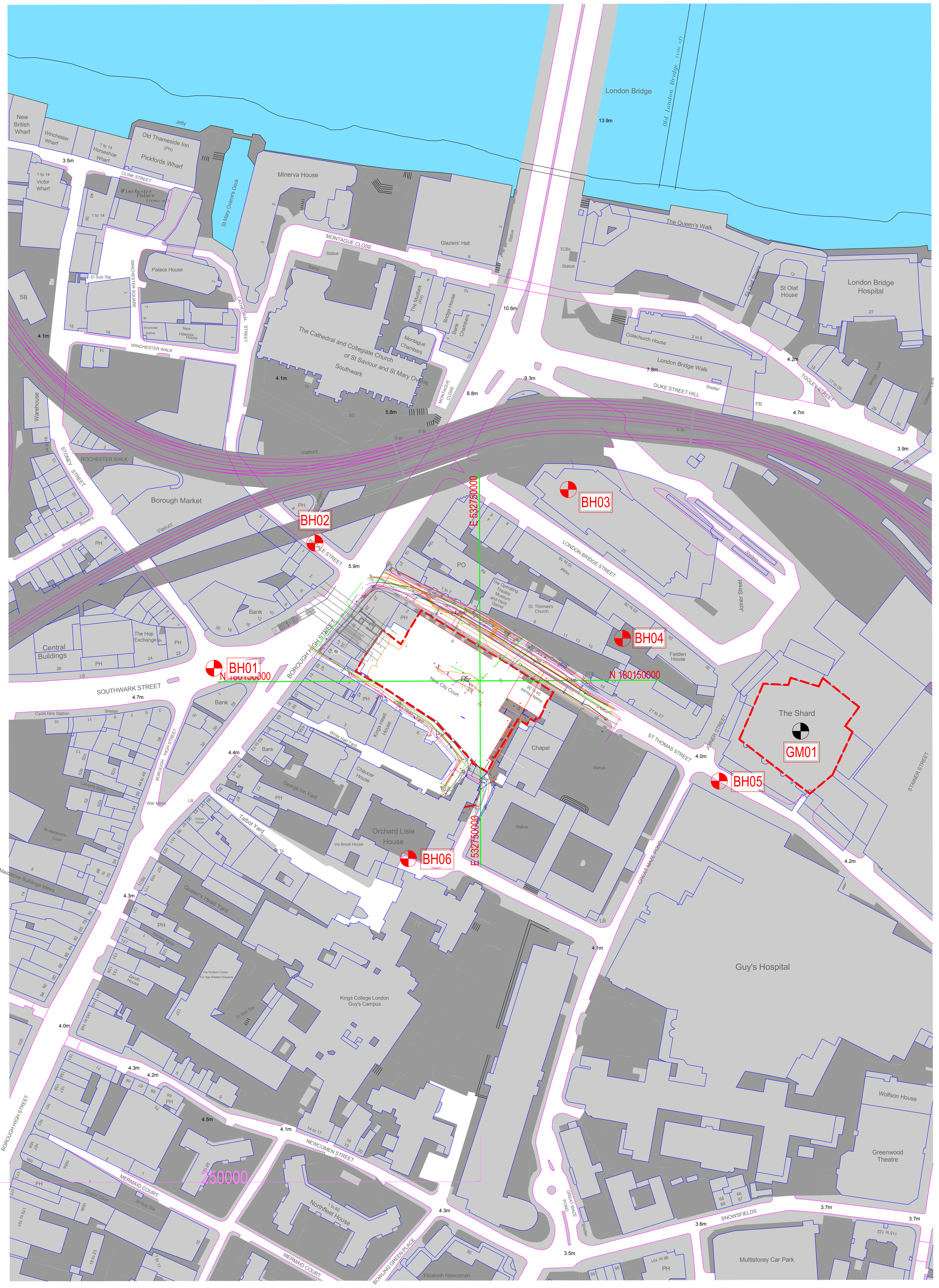
PROJECT NO.	ORIGINATOR	ZONE	LEVEL	TYPE	ROLE	DRAWING No.	REVISION
						3948-AKT-XX-XX-DR-S-00400	P01

DRAFT

Appendix 2

Ground Conditions





KEY PLAN

1 : 1000

NOTES

1. THIS DRAWING TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS AND ENGINEERS DRAWINGS & THE SPECIFICATIONS.
2. NO DIMENSIONS ARE TO BE SCALED FROM THIS DRAWING.

LEGEND

- MADE GROUND
- ALLUVIUM
- TERRACE GRAVEL
- CLAY
- LAMBETH GROUP
- THANET SANDS
- CHALK
- BGS BOREHOLES
- GROUND MODEL TAKEN FROM 'PILE TEST AT THE SHARD LONDON BRIDGE, GROUND ENGINEERING, JANUARY 2012, STRATA LEVELS WEST OF FAULT'.

NOTES

* BOREHOLE ALSO DISCUSSED IN CIRIA SPECIAL PUBLICATION 200 "BUILDING RESPONSE TO TUNNELLING, VOLUME 2, 2001".

\+ WATER LEVELS TAKEN AS THE HIGHEST RECORDED FROM WATER LEVEL OBSERVATIONS DURING BORING.

REV	DATE	DESCRIPTION	CHKD
P0 1	NYI	DRAFT STAGE 2 ISSUE	NC

akt II

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GREAT PORTLAND ESTATES PLC

CLIENT

NEW CITY COURT

PROJECT

TOWER
BOREHOLE LOGS

TITLE

DRAWN	DATE	SHEET SIZE
DM	SEP' 2018	A0

PROJECT No.	PROJECT STAGE	SUITABILITY CODE
3948	STAGE 2	S0

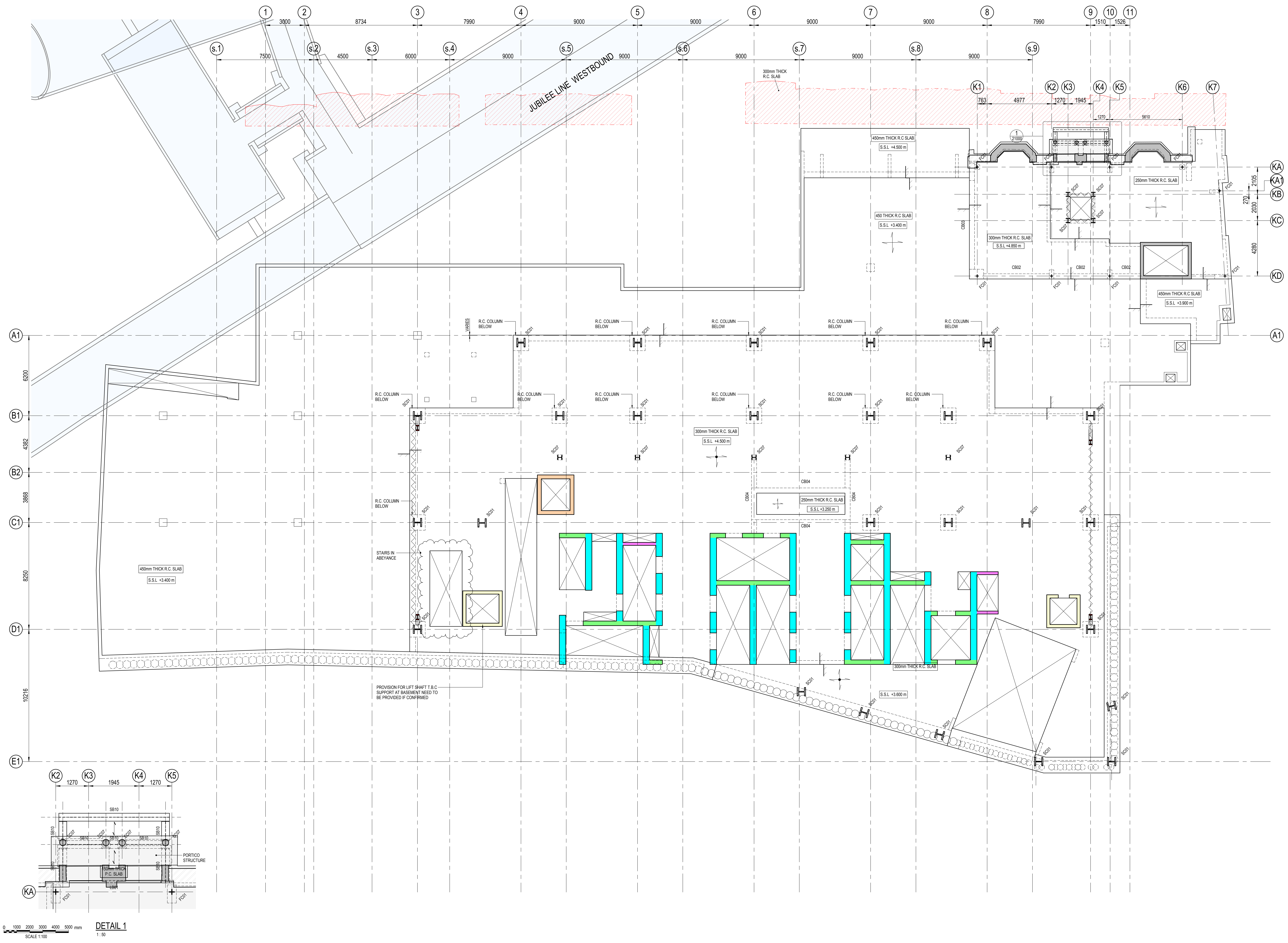
PROJECT ID ORIGINATOR ZONE LEVEL TYPE ROLE DRAWING No. REVISION

3948-AKT-XX-XX-DR-S-00450 P01

DRAFT

Appendix 3

Proposed Basement



LEVEL SCHEDULE	
Name	Elevation
LEVEL 36	117375 mm
LEVEL 35	114325 mm
LEVEL 34	111275 mm
LEVEL 33	108225 mm
LEVEL 32	105175 mm
LEVEL 31	102125 mm
LEVEL 30	99075 mm
LEVEL 29	96025 mm
LEVEL 28	92975 mm
LEVEL 27	89925 mm
LEVEL 26	86875 mm
LEVEL 25	83825 mm
LEVEL 24	80775 mm
LEVEL 23	77725 mm
LEVEL 22	74675 mm
LEVEL 21	71625 mm
LEVEL 20	68575 mm
LEVEL 19	65525 mm
LEVEL 18	62475 mm
LEVEL 17	59425 mm
LEVEL 16	56375 mm
LEVEL 15	53325 mm
LEVEL 14	50275 mm
LEVEL 13	47225 mm
LEVEL 12	44175 mm
LEVEL 11	41125 mm
LEVEL 10	38075 mm
LEVEL 09	35025 mm
LEVEL 08	31975 mm
LEVEL 07	28925 mm
LEVEL 06	25875 mm
LEVEL 05	22825 mm
KH LEVEL RF (RIDGE)	21109 mm
KH ROOF LEVEL	19875 mm
LEVEL 04	19775 mm
LEVEL 03	16725 mm
KH LEVEL 03	15460 mm
LEVEL 02	13675 mm
KH LEVEL 02	12015 mm
LEVEL 01	10625 mm
KH LEVEL 01	8565 mm
LEVEL 00M	7575 mm
GROUND LEVEL	4500 mm
KH GROUND LEVEL	4500 mm
LEVEL B1M	1250 mm
KH LEVEL B1	150 mm
LEVEL B1	-150 mm
LEVEL B2	-4650 mm
KH LEVEL B2	-4650 mm

NOTES

1. NO DIMENSIONS SHOULD BE SCALED FROM THIS DRAWING.
2. ALL DIMENSIONS IN MILLIMETRES U.N.O.
3. ALL GRID LINES AND SETTING OUT TBC
4. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS & MEP ENGINEERS DRAWINGS AND SPECIFICATIONS.
5. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE LATEST GENERAL ARRANGEMENT DRAWINGS AND DETAILS, AS WELL AS RELEVANT SKETCHES, REPORTS AND CALCULATIONS.
6. ALL DIMENSIONS IN MILLIMETRES U.N.O
7. GRID SETTING OUT TO ARCHITECT'S DETAILS.
8. RC GRADE:
   RC FOUNDATIONS (RAFT & PILES) C35/45
   RC PILE CAPS C35/45
   RC SLABS C35/45
   RC COLUMNS C50/60
   RC WALLS C80/95 & C60/75, AS NOTED ON DRG
9. STEELWORK GRADE: S355
10. STEEL REINFORCEMENT GRADE: H500
11. ALL ELEMENTS OF EXISTING STRUCTURE ARE INFERRED FROM LIMITED RECORD INFORMATION AND SITE SURVEY.
12. FURTHER COORDINATION REQUIRED FOR ALL SERVICES PENETRATION.
13. OPENINGS IN CORE WALLS IN ABEYANCE – FURTHER COORDINATION REQUIRED.
14. LOCATION OF STEPS IN GROUND FLOOR SLABS IN ABEYANCE.

EXISTING STRUCTURE NOTE

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LEGEND

- 130mm COMPOSITE SLAB / 140 PRECAST SLAB
- 300mm x 100mm TIMBER JOISTS @ 400mm , 15mm PLYWOOD PANEL ON THE TOP
- 150mm x 100mm TIMBER JOISTS, WITH 15mm PLYWOOD PANEL ON THE TOP
- 250mm THICK P.T. SLAB
- 225mm THICK R.C. SLAB
- 300mm THICK R.C. SLAB
- EXO - SKELETON BRACING
- 500mm R.C THICK WALL
- 400mm R.C THICK WALL
- 350mm R.C THICK WALL
- 300mm R.C THICK WALL
- 250mm R.C THICK WALL
- 225mm R.C THICK WALL

STRUCTURAL COLUMN SCHEDULE	
REF.	SECTION SIZE
	250mm DIA. R.C. COL
CC01	1200x1200mm R.C. COL.
CC02	350x400mm R.C. COL.
CC03	350x700mm R.C. COL.
CC04	600x600mm R.C. COL.
CC05	225x1817mm R.C. COL.-WIDTH T.B.C.
CC07	250x1000mm R.C. COL.
CC08	350x350 R.C. COL.
CC09	750x350mm R.C. COL
CC10	750x1100mm R.C. COL.
CC11	400x400 R.C. COL.
FC01	200x200x20
SC01	650 x 650 - 90tf 60tw
SC02	600 x 600 - 80tf 50tw
SC03	600 x 600 - 70tf 45tw
SC04	500 x 500 - 60tf 40tw
SC05	UKC356x406x467
SC06	UC305x305x97
SC07	UC203x203x86
SC08	UB254x102x22
SC09	UC254x254x107

STRUCTURAL FRAMING SCHEDULE	
REF.	SECTION SIZE
CB01	350WIDE x 700mm DEEP R.C. BEAM
CB02	400 WIDE x 650mm DEEP R.C. BEAM
CB03	400 WIDE x 750mm DEEP R.C. BEAM
CB04	400 WIDE x 1500mm DEEP R.C. BEAM
CB05	300WIDE x 600mm DEEP R.C. BEAM
LB01	L75x75x8
RB01	52mm
SB01	190x500 STEEL BEAM
SB02	315x550 STEEL BEAM
SB03	200x500 STEEL BEAM
SB04	155x500 STEEL BEAM
SB05	250x500 STEEL BEAM
SB06	RHS500x300x12.5
SB07	RHS350x150x16
SB08	250x250 STEEL VERTICAL BRACING
SB09	UC152x152x23
SB10	UC152x152x30
SB11	UKB457x191x106
SB12	UKB457x191x133
SB13	UKC254x254x107 STUB
SB14	UB356x171x67
SB16	UB254x102x22

REV	DATE	DESCRIPTION	CHKD
P0 1	07.11.18	DRAFT STAGE 2 ISSUE	NC

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E info@akt-uk.com
W www.akt-uk.com

CLIENT: GREAT PORTLAND ESTATES PLC

PROJECT: NEW CITY COURT

TITLE: TOWER GENERAL ARRANGEMENT LEVEL 00

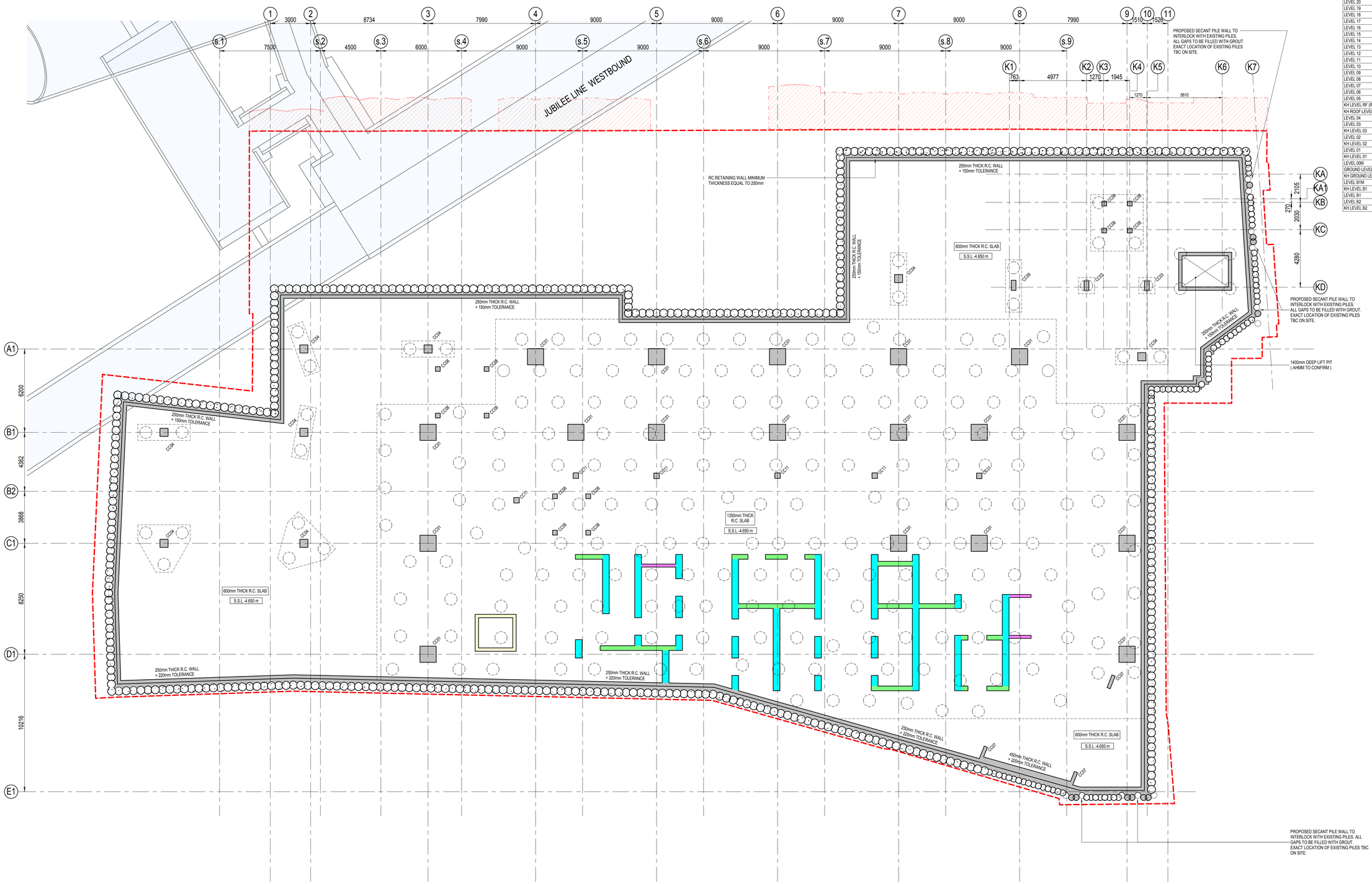
DRAWN	DATE	SHEET SIZE
SB	SEP' 2018	A0

PROJECT No.	PROJECT STAGE	SUITABILITY CODE
3948	STAGE 2	S0

PROJECT ID ORIGINATOR ZONE LEVEL TYPE ROLE DRAWING No.: 3948-AKT-XX-00-DR-S-21000

REVISION: P01

DRAFT



LEVEL SCHEDULE	
Name	Elevation
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LEVEL B1	-150 mm
LEVEL B2	-4650 mm
KH LEVEL B2	-4650 mm

NOTES

1. NO DIMENSIONS SHOULD BE SCALED FROM THIS DRAWING.
2. ALL DIMENSIONS IN MILLIMETRES U.N.O.
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7. GRID SETTING OUT TO ARCHITECT'S DETAILS.
8. RC GRADE:
   RC FOUNDATIONS (RAFT & PILES) C35/45
   RC PILE CAPS C35/45
   RC SLABS C35/45
   RC COLUMNS C50/60
   RC WALLS C80/95 & C60/75, AS NOTED ON DRG
9. STEELWORK GRADE: S355
10. STEEL REINFORCEMENT GRADE: H500
11. ALL ELEMENTS OF EXISTING STRUCTURE ARE INFERRED FROM LIMITED RECORD INFORMATION AND SITE SURVEY.
12. FURTHER COORDINATION REQUIRED FOR ALL SERVICES PENETRATION.
13. OPENINGS IN CORE WALLS IN ABEYANCE – FURTHER COORDINATION REQUIRED.
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STRUCTURAL COLUMN SCHEDULE	
REF.	SECTION SIZE
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CC07	250x1000mm R.C. COL.
CC08	350x350 R.C. COL.
CC09	750x350mm R.C. COL
CC10	750x1100mm R.C. COL.
CC11	400x400 R.C. COL.
FC01	200x200x20
SC01	650 x 650 - 90lf 60w
SC02	600 x 600 - 80lf 50w
SC03	600 x 600 - 70lf 45w
SC04	500 x 500 - 60lf 40w
SC05	UKC356x406x467
SC06	UC305x305x97
SC07	UC203x203x86
SC08	UB254x102x22
SC09	UC254x254x107

STRUCTURAL FRAMING SCHEDULE	
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SB05	250x500 STEEL BEAM
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SB12	UKB457x191x133
SB13	UKC254x254x107 STUB
SB14	UB356x171x67
SB16	UB254x102x22

REV	DATE	DESCRIPTION	ORIG
P0.1	07.11.18	DRAFT STAGE 2 ISSUE	NC

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W www.akt-uk.com

GREAT PORTLAND ESTATES PLC

CLIENT

NEW CITY COURT

PROJECT

TOWER
GENERAL ARRANGEMENT
BASEMENT LEVEL B2

TITLE

SB	SEP 2018	A0
DRAWN	DATE	SHEET SIZE
3948	STAGE 2	S0
PROJECT No.	PROJECT STAGE	SUITABILITY CODE

PROJECT ID ORIGINATOR ZONE LEVEL TYPE ROLE DRAWING No. REVISION

3948-AKT-XX-B2-DR-S-20980 P01

DRAFT

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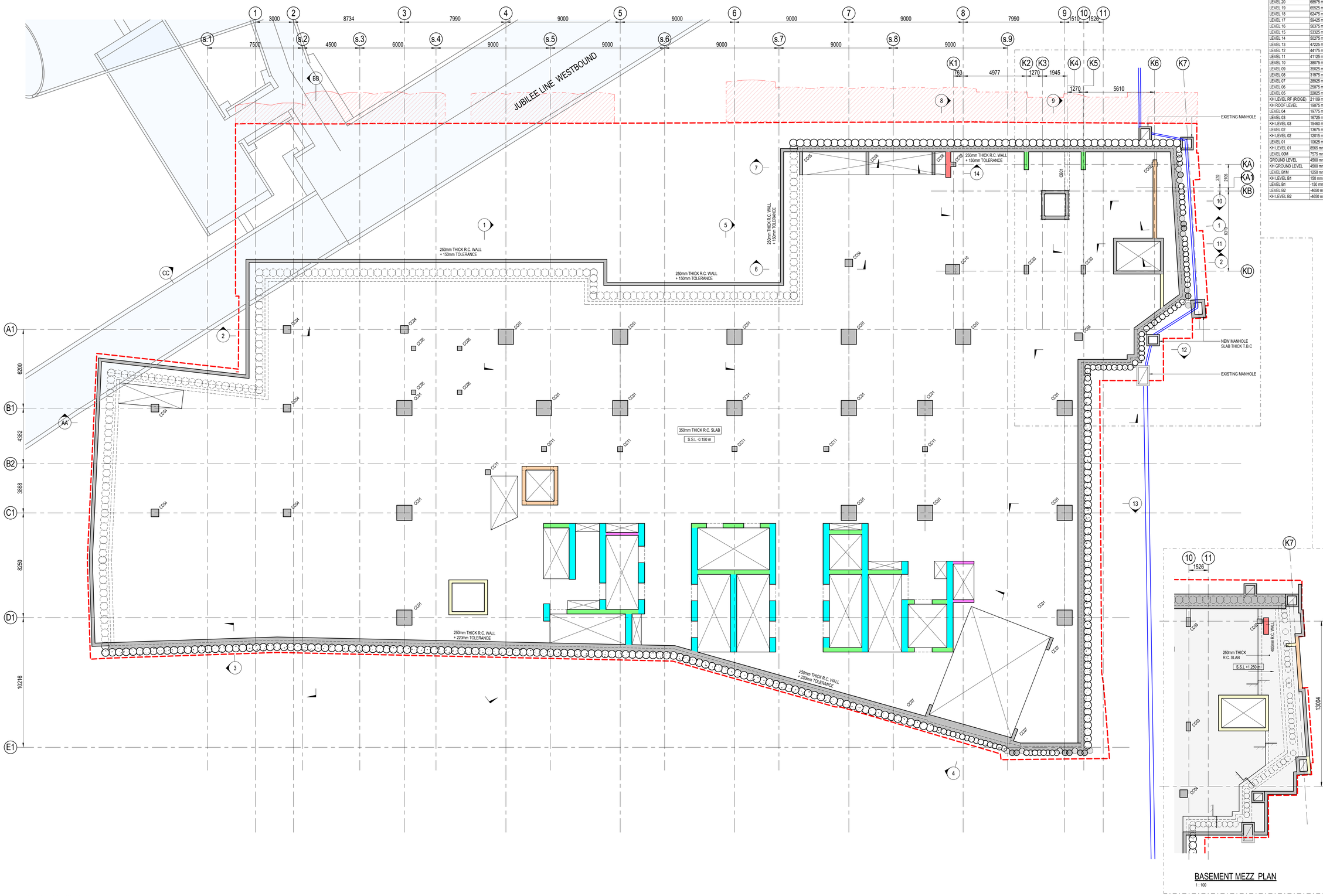
SCALE 1:100



LEVEL SCHEDULE

Name	Elevation
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LEVEL 02	13675 mm
KH LEVEL 02	12015 mm
LEVEL 01	10625 mm
KH LEVEL 01	8565 mm
LEVEL 00M	7575 mm
GROUND LEVEL	4500 mm
KH GROUND LEVEL	4500 mm
LEVEL B1M	1250 mm
KH LEVEL B1	150 mm
LEVEL B1	-150 mm
LEVEL B2	-4650 mm
KH LEVEL B2	-4650 mm

NOTES

1. NO DIMENSIONS SHOULD BE SCALED FROM THIS DRAWING.
2. ALL DIMENSIONS IN MILLIMETRES U.N.O.
3. ALL GRID LINES AND SETTING OUT TBC
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6. ALL DIMENSIONS IN MILLIMETRES U.N.O
7. GRID SETTING OUT TO ARCHITECT'S DETAILS.
8. RC GRADE:
   RC FOUNDATIONS (RAFT & PILES) C35/45
   RC PILE CAPS C35/45
   RC SLABS C35/45
   RC COLUMNS C50/60
   RC WALLS C80/95 & C60/75, AS NOTED ON DRG
9. STEELWORK GRADE: S355
10. STEEL REINFORCEMENT GRADE: H500
11. ALL ELEMENTS OF EXISTING STRUCTURE ARE INFERRED FROM LIMITED RECORD INFORMATION AND SITE SURVEY.
12. FURTHER COORDINATION REQUIRED FOR ALL SERVICES PENETRATION.
13. OPENINGS IN CORE WALLS IN ABEYANCE – FURTHER COORDINATION REQUIRED.
14. LOCATION OF STEPS IN GROUND FLOOR SLABS IN ABEYANCE.

EXISTING STRUCTURE NOTE

EXISTING STRUCTURE ARE SHOWN INDICATIVELY AND ARE DRAWN ON THE BASIS OF EXISTING AND AVAILABLE RECORD INFORMATION. THE CONTRACTOR REMAINS RESPONSIBLE FOR CONFIRMING ALL THE DETAILS AND EXTENT OF THE EXISTING STRUCTURE AS REQUIRED TO CONSTRUCT THE PROPOSED BUILDING OR WHERE INDICATED TO ALLOW DESIGN OF THE PERMANENT WORKS TO BE COMPLETED IT SHOULD BE NOTED THAT SETTING OUT WHERE RELIANT ON THE CONFIRMED POSITION OR LEVEL OF THE EXISTING STRUCTURE MAY BE SUBJECT TO CHANGE REFER TO ARCHITECTS GRID DRAWINGS FOR FURTHER DETAILS.

LEGEND

- 130mm COMPOSITE SLAB / 140 PRECAST SLAB
- 300mm x 100mm TIMBER JOISTS @ 400mm , 15mm PLYWOOD PANEL ON THE TOP
- 150mm x 100mm TIMBER JOISTS, WITH 15mm PLYWOOD PANEL ON THE TOP
- 250mm THICK P.T. SLAB
- 225mm THICK R.C. SLAB
- 300mm THICK R.C. SLAB
- EXO - SKELETON BRACING
- 500mm R.C THICK WALL
- 400mm R.C THICK WALL
- 350mm R.C THICK WALL
- 300mm R.C THICK WALL
- 250mm R.C THICK WALL
- 225mm R.C THICK WALL

STRUCTURAL COLUMN SCHEDULE

REF.	SECTION SIZE
CC01	1200x1200mm R.C. COL.
CC02	350x400mm R.C. COL.
CC03	350x700mm R.C. COL.
CC04	600x600mm R.C. COL.
CC05	225x1817mm R.C. COL.-WIDTH T.B.C.
CC07	250x1000mm R.C. COL.
CC08	350x350 R.C. COL.
CC09	750x350mm R.C. COL.
CC10	750x1100mm R.C. COL.
CC11	400x400 R.C. COL.
FC01	200x200x20
SC01	650 x 650 - 90lf 60tw
SC02	600 x 600 - 80lf 50tw
SC03	600 x 600 - 70lf 45tw
SC04	500 x 500 - 60lf 40tw
SC05	UKC356x406x467
SC06	UC305x305x97
SC07	UC203x203x86
SC08	UB254x102x22
SC09	UC254x254x107

STRUCTURAL FRAMING SCHEDULE

REF.	SECTION SIZE
CB01	350WIDE x 700mm DEEP R.C. BEAM
CB02	400 WIDE x 650mm DEEP R.C. BEAM
CB03	400 WIDE x 750mm DEEP R.C. BEAM
CB04	400 WIDE x 1500mm DEEP R.C. BEAM
CB05	300WIDE x 600mm DEEP R.C. BEAM
LB01	L75X75x8
RB01	52mm
SB01	190x500 STEEL BEAM
SB02	315x550 STEEL BEAM
SB03	200x500 STEEL BEAM
SB04	155x500 STEEL BEAM
SB05	250x500 STEEL BEAM
SB06	RHS500x300x12.5
SB07	RHS350x150x16
SB08	250x250 STEEL VERTICAL BRACING
SB09	UC152x152x23
SB10	UC152x152x30
SB11	UKB457x191x106
SB12	UKB457x191x133
SB13	UKC254x254x107 STUB
SB14	UB356x171x67
SB16	UB254x102x22

BASEMENT MEZZ PLAN
1 : 100

0 1000 2000 3000 4000 5000 mm
SCALE 1:100

DRAFT

REV	DATE	DESCRIPTION	CHKD
P0.1	07.11.18	DRAFT STAGE 2 ISSUE	NC

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White Collar Factory,
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GREAT PORTLAND ESTATES PLC

CLIENT

NEW CITY COURT

PROJECT

TOWER
GENERAL ARRANGEMENT
BASEMENT LEVEL B1

TITLE

SB	SEP 2018	A0
DRAWN	DATE	SHEET SIZE
3948	STAGE 2	S0
PROJECT No.	PROJECT STAGE	SUITABILITY CODE

PROJECT ID ORIGINATOR ZONE LEVEL TYPE ROLE DRAWING No. REVISION

3948-AKT-XX-B1-DR-S-20990 P01

Appendix 4

Ground Movement Assessment

EXCAVATION LEVELS

NOTES

01) XXX

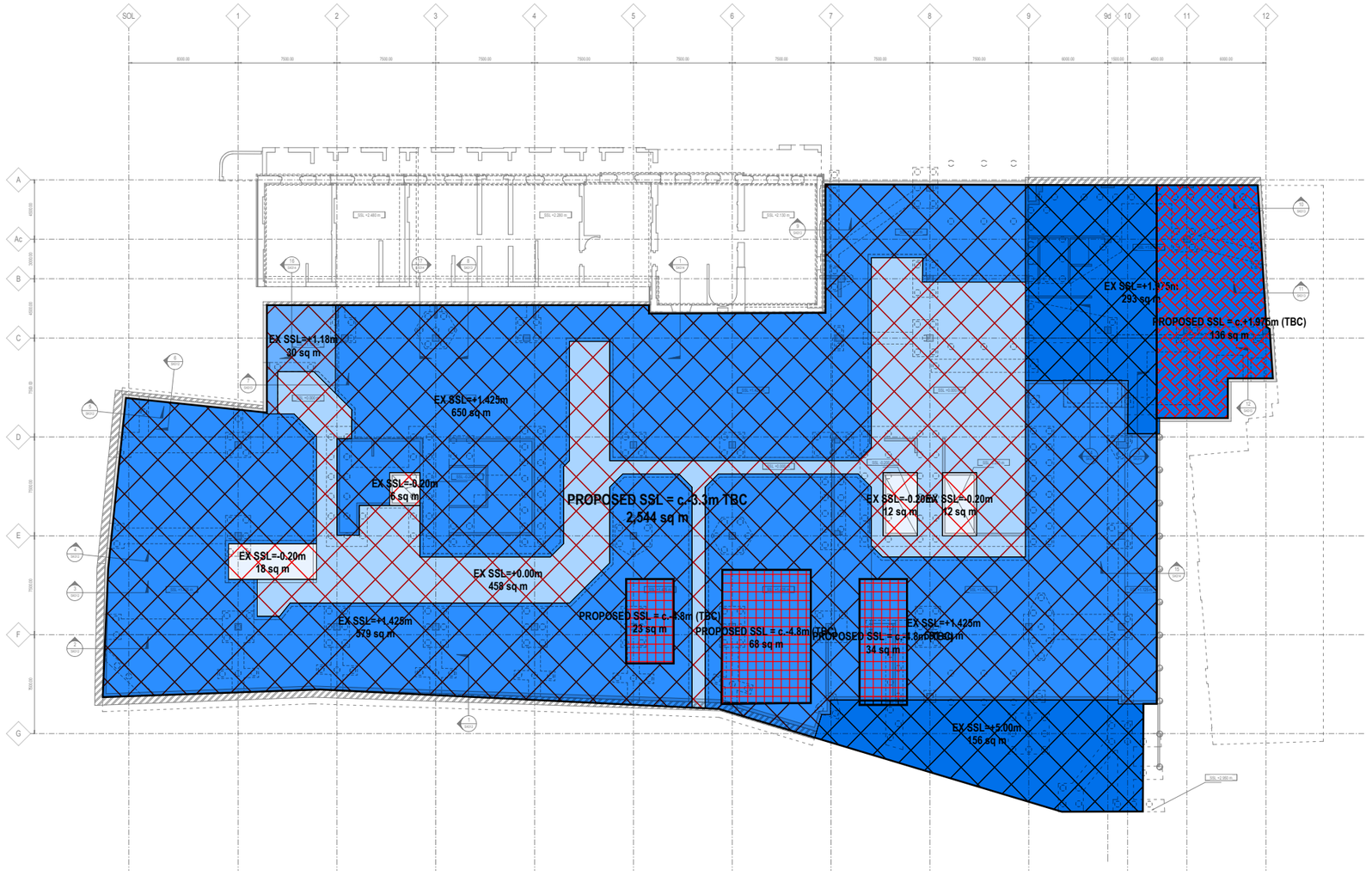


FIG 1.1: EXISTING B1 PLAN INDICATING EXISTING AND PROPOSED SSL LEVEL CHANGES (SCALE 1:400 @ A3)

ESTIMATED AREAS FOR EXISTING AND PROPOSED SSL

Description	Quantity	Unit
EX SSL=-0.20m	49	sq m
EX SSL=+0.00m	458	sq m
EX SSL=+1.18m	30	sq m
EX SSL=+1.425m	1,821	sq m
EX SSL=+1.975m	293	sq m
EX SSL=+5.00m	156	sq m
PROPOSED SSL = c.-3.3m TBC	2,544	sq m
PROPOSED SSL = c.-4.8m (TBC)	126	sq m
PROPOSED SSL = c.+1.975m (TBC)	136	sq m

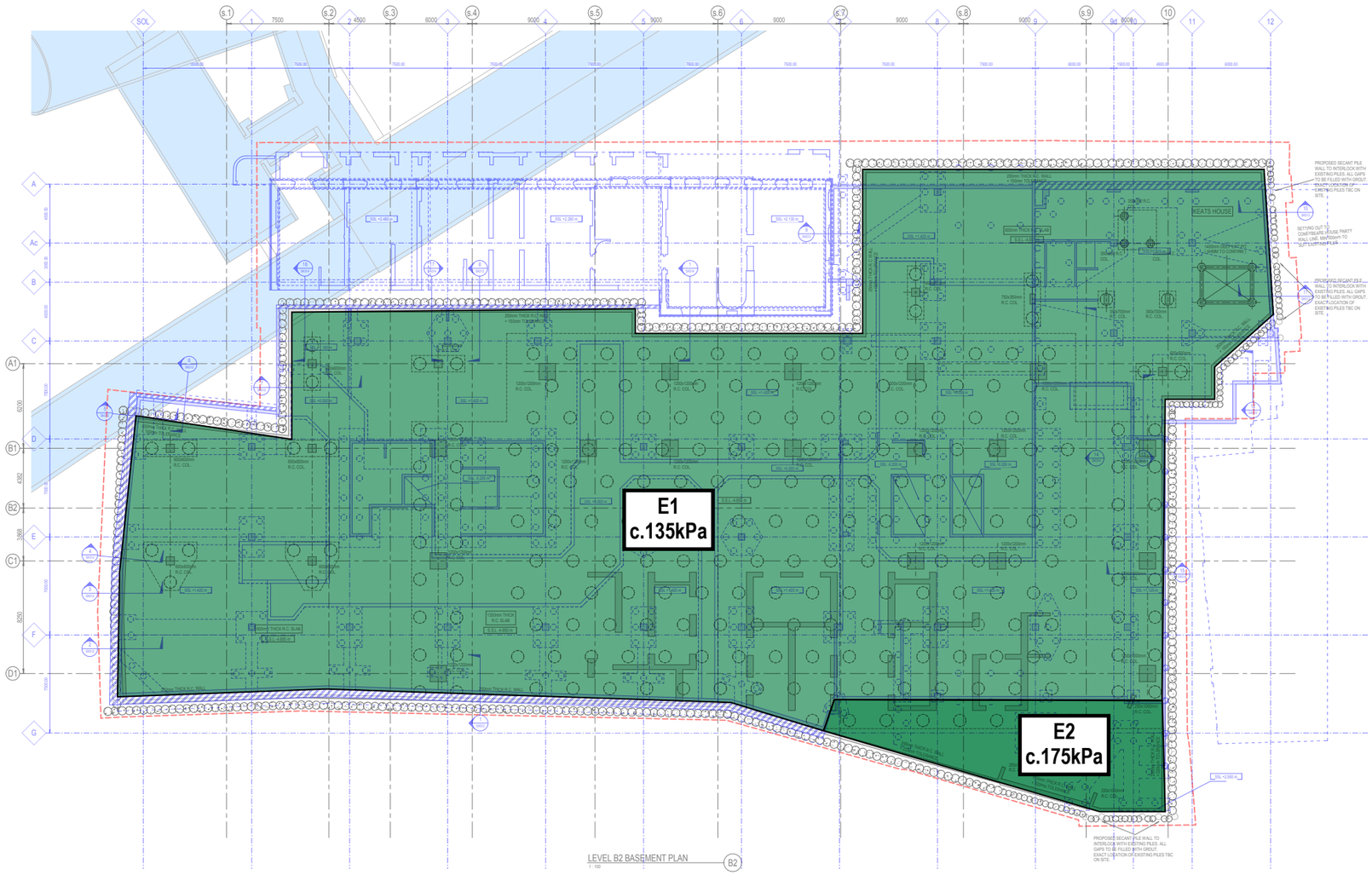
AVERAGE EXISTING SSL = +1.45m AOD
AVERAGE PROPOSED SSL = -3.15m AOD

REV	DATE	DESCRIPTION	BY	CHECKED
P1	19/09/2017	FOR DISCUSSION	RP	NC

akt II

PROJECT NEW CITY COURT		TITLE FOUNDATION LOADING ASSUMPTIONS	
DATE 19/09/2017	SCALE 1:400 @ A3	CAD FILENAME -	STATUS FOR DISCUSSION
DRAWN RP	CHECKED NC	PROJECT No. 3948	DRAWING No. 3948-SK-144 (SHEET 01 OF 06)	REV P1

EXCAVATION UN-LOADING



REV P1 DATE 19/09/2017 DESCRIPTION FOR DISCUSSION BY RP CHECKED NC

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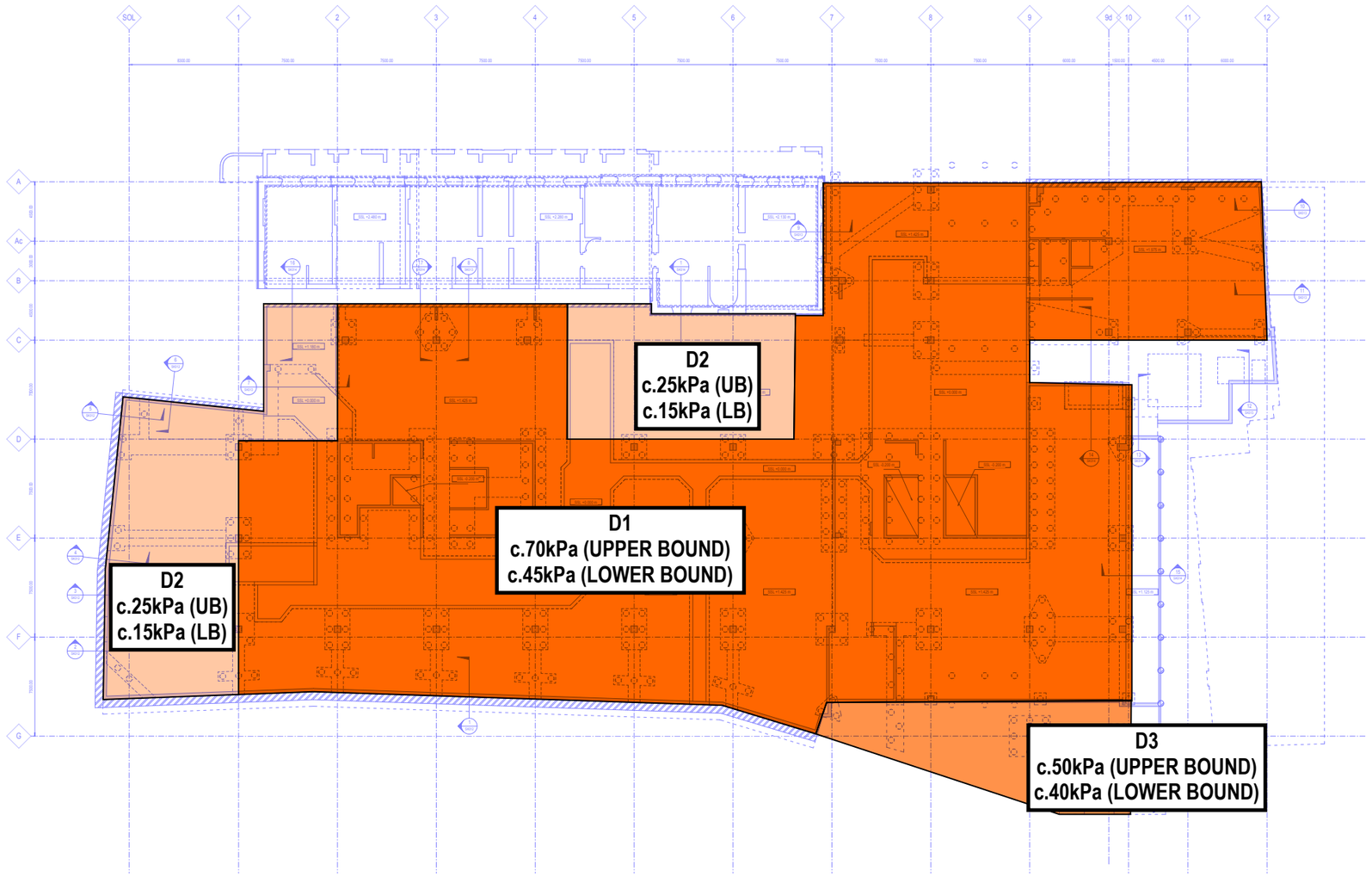
PROJECT NEW CITY COURT | TITLE FOUNDATION LOADING ASSUMPTIONS

DATE 19/09/2017 | SCALE 1:400 @ A3 | CAD FILENAME - | STATUS FOR DISCUSSION

DRAWN RP | CHECKED NC | PROJECT No. 3948 | DRAWING No. 3948-SK-144 (SHEET 02 OF 06) | REV P1

DEMOLITION UN-LOADING



REV	DATE	DESCRIPTION	BY	CHECKED
P1	19/09/2017	FOR DISCUSSION	RP	NC

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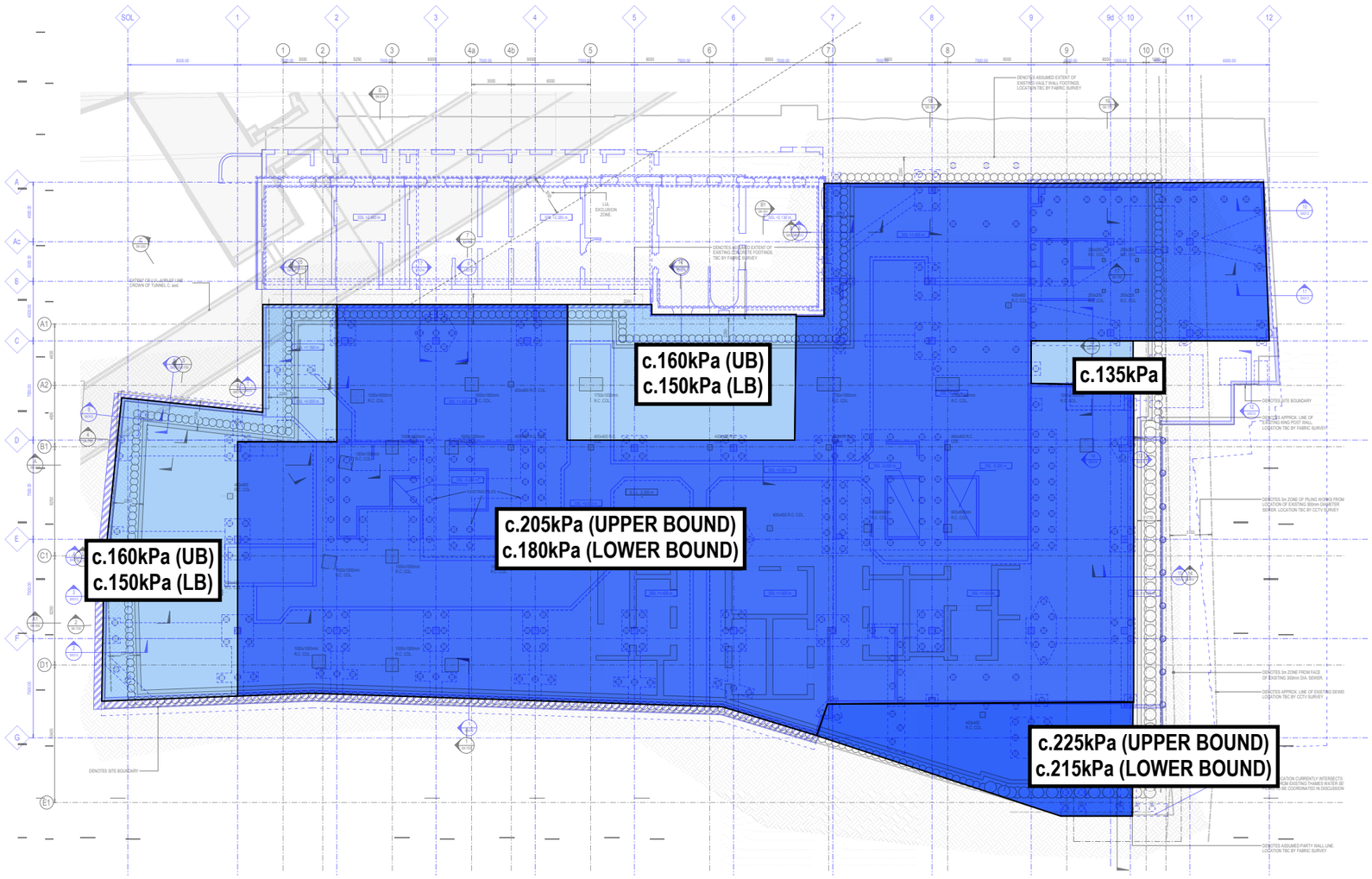
PROJECT NEW CITY COURT		TITLE FOUNDATION LOADING ASSUMPTIONS	
DATE 19/09/2017	SCALE 1:400 @ A3	CAD FILENAME -	STATUS FOR DISCUSSION
DRAWN RP	CHECKED NC	PROJECT No. 3948	DRAWING No. 3948-SK-144 (SHEET 03 OF 06)	REV P1

TOTAL UN-LOADING

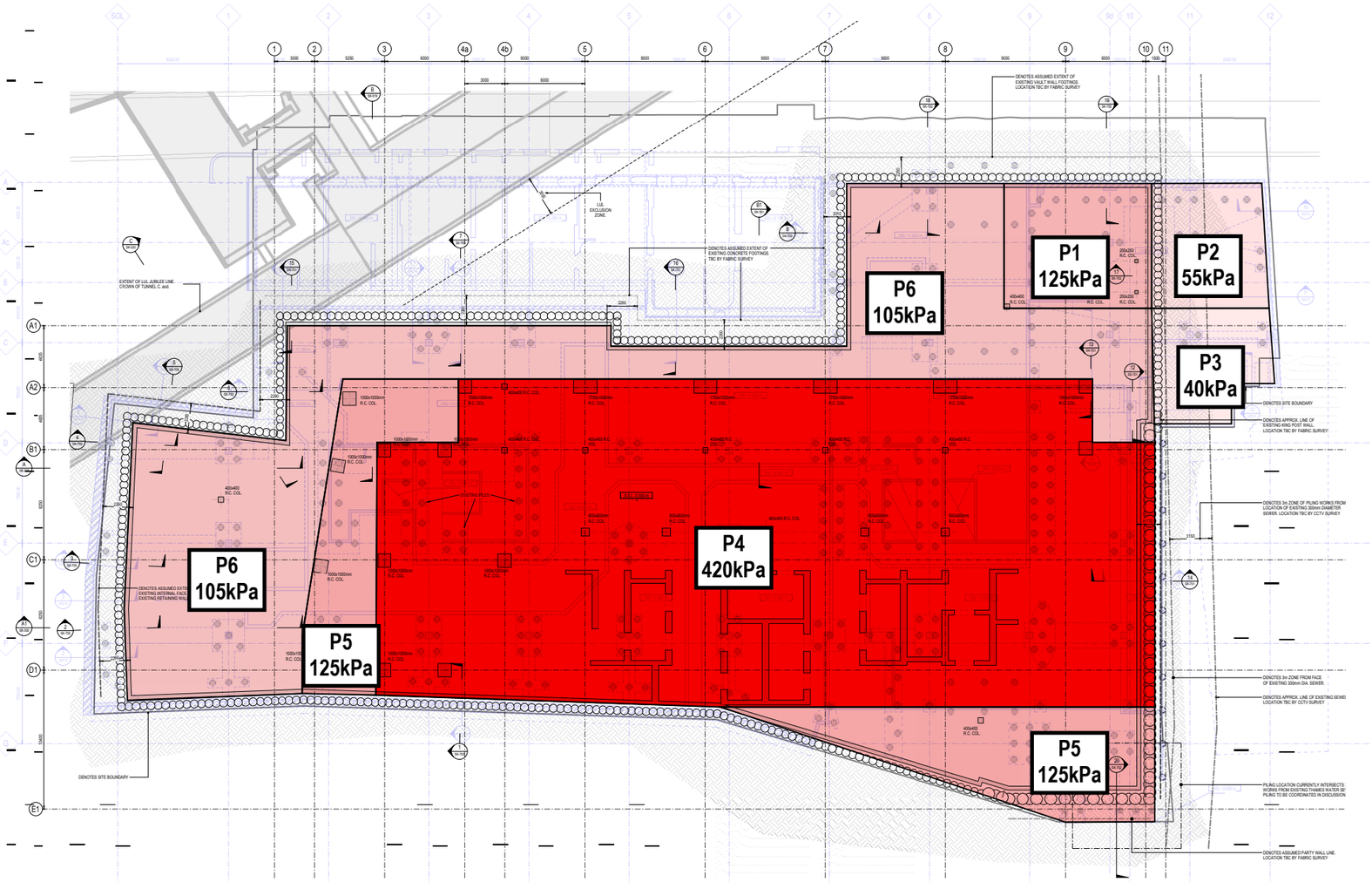


REV	DATE	DESCRIPTION	BY	CHECKED
P1	19/09/2017	FOR DISCUSSION	RP	NC

akt II

PROJECT NEW CITY COURT		TITLE FOUNDATION LOADING ASSUMPTIONS	
DATE 19/09/2017	SCALE 1:400 @ A3	CAD FILENAME -	STATUS FOR DISCUSSION
DRAWN RP	CHECKED NC	PROJECT No. 3948	DRAWING No. 3948-SK-144 (SHEET 04 OF 06)	REV P1

PROPOSED QUASI-PERMANENT RE-LOADING
(ALL UP LOADS)

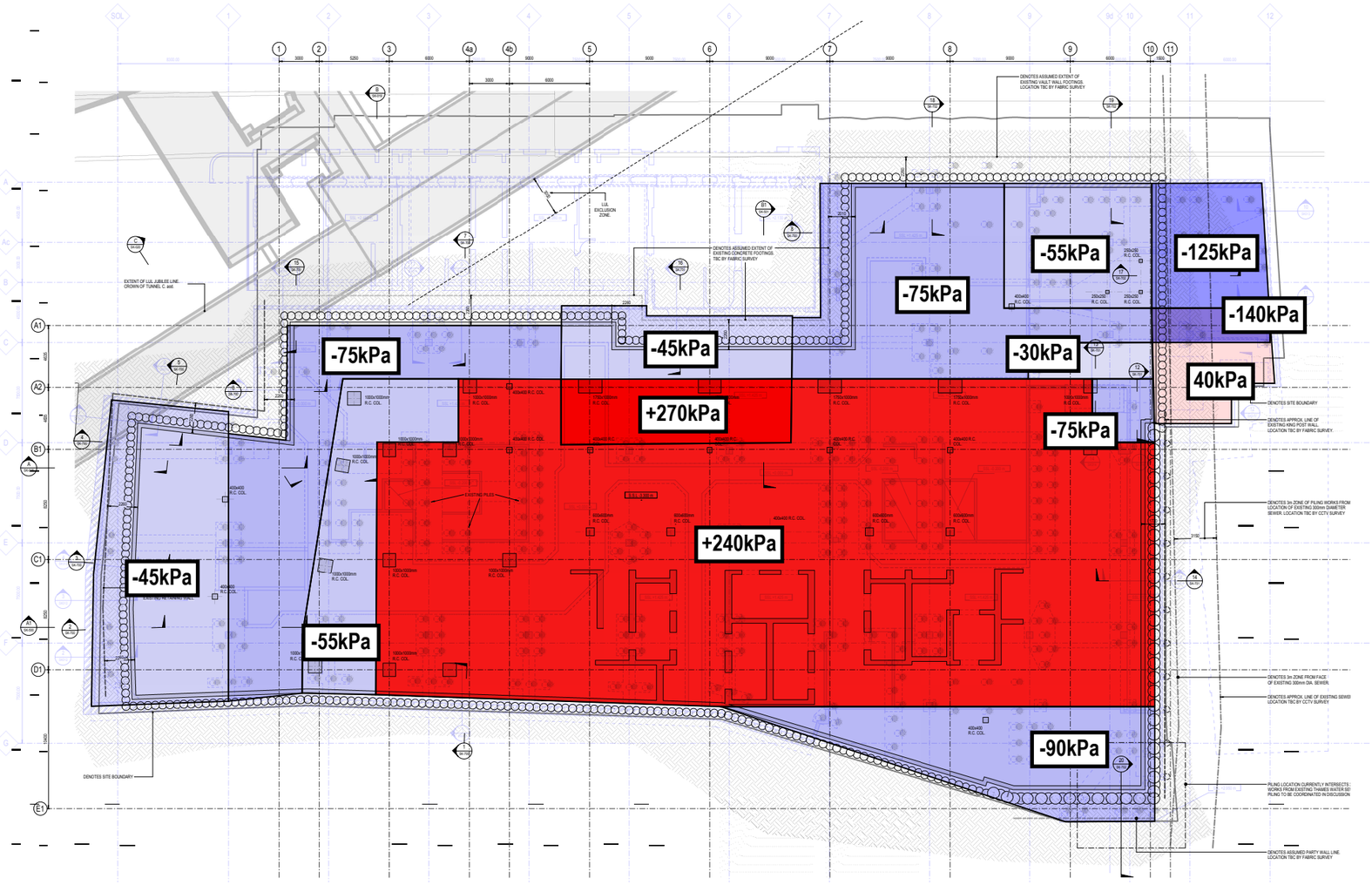


REV	DATE	DESCRIPTION	BY	CHECKED
P1	19/09/2017	FOR DISCUSSION	RP	NC

akt II

PROJECT NEW CITY COURT			TITLE FOUNDATION LOADING ASSUMPTIONS
DATE 19/09/2017	SCALE 1:400 @ A3	CAD FILENAME -	STATUS FOR DISCUSSION
DRAWN RP / CHECKED NC	PROJECT No. 3948	DRAWING No. 3948-SK-144 (SHEET 05 OF 06)	REV P1

NET LOADING
(PROPOSED + TOTAL LOWER-BOUND UNLOADING)

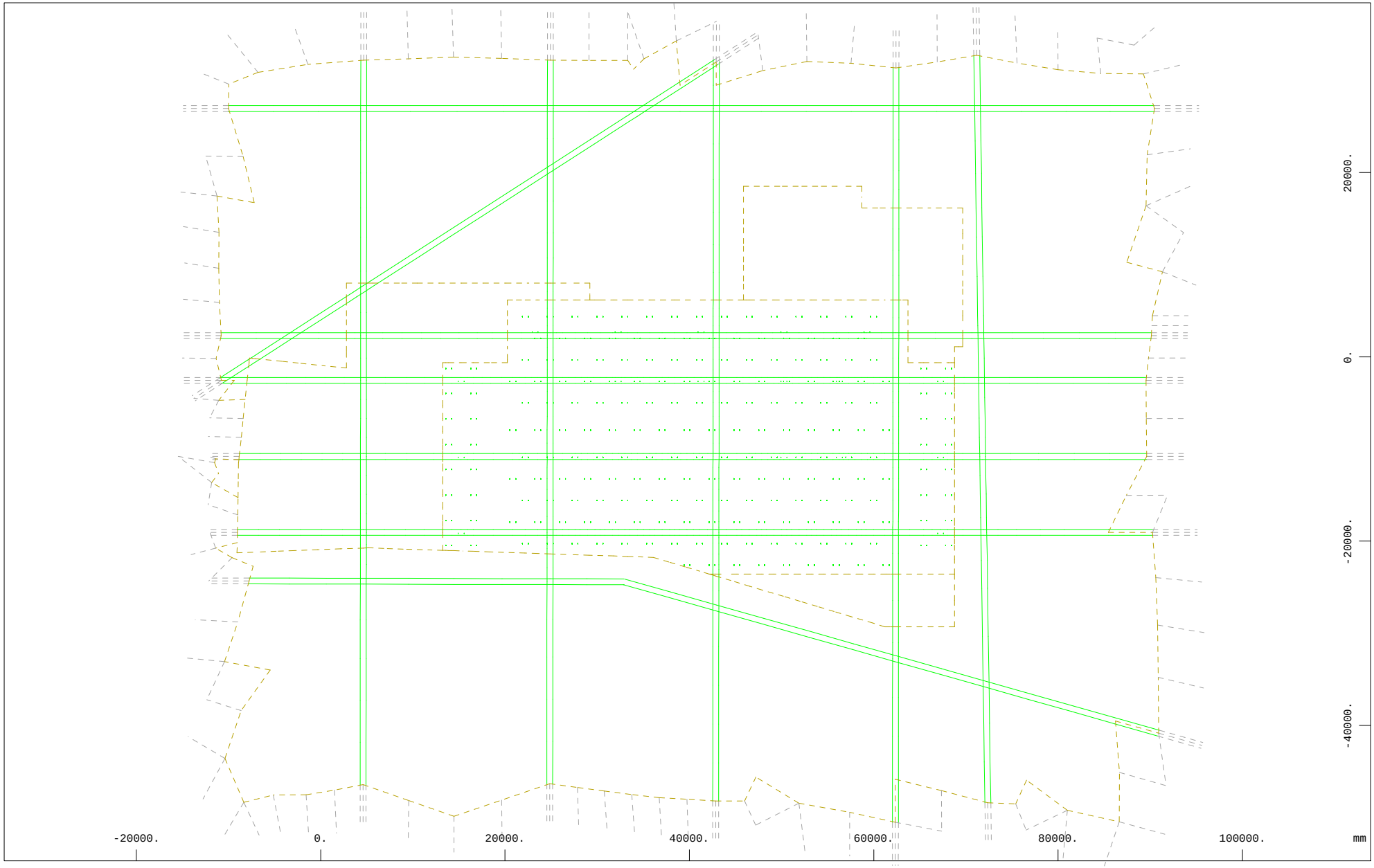


REV	DATE	DESCRIPTION	BY	CHECKED
P1	19/09/2017	FOR DISCUSSION	RP	NC

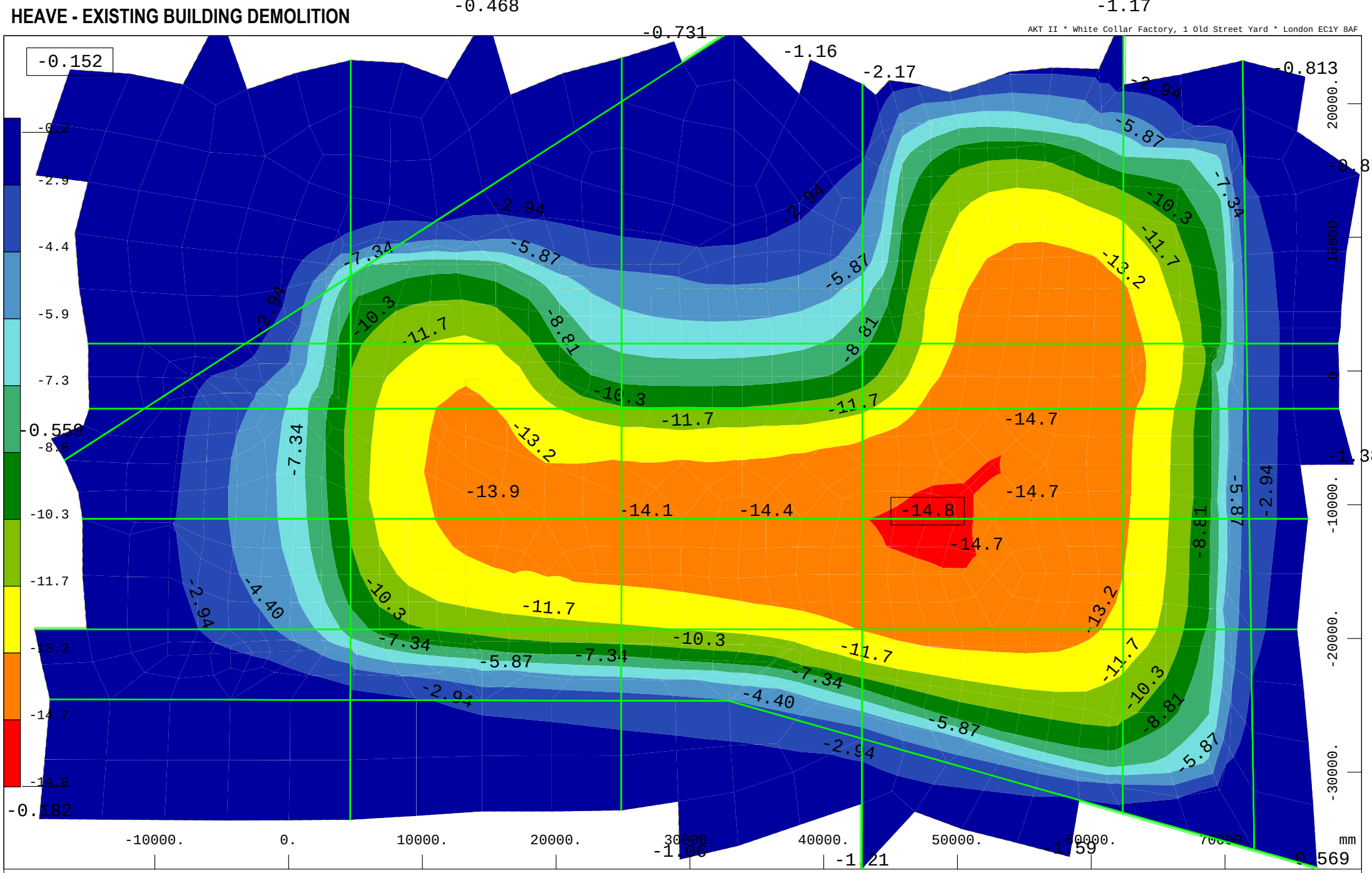
akt II

PROJECT NEW CITY COURT			TITLE FOUNDATION LOADING ASSUMPTIONS
DATE 19/09/2017	SCALE 1:400 @ A3	CAD FILENAME -	STATUS FOR DISCUSSION
DRAWN RP	CHECKED NC	PROJECT No. 3948	DRAWING No. 3948-SK-144 (SHEET 06 OF 06) REV P1

SOFISTIK HASE MODEL



HEAVE - EXISTING BUILDING DEMOLITION

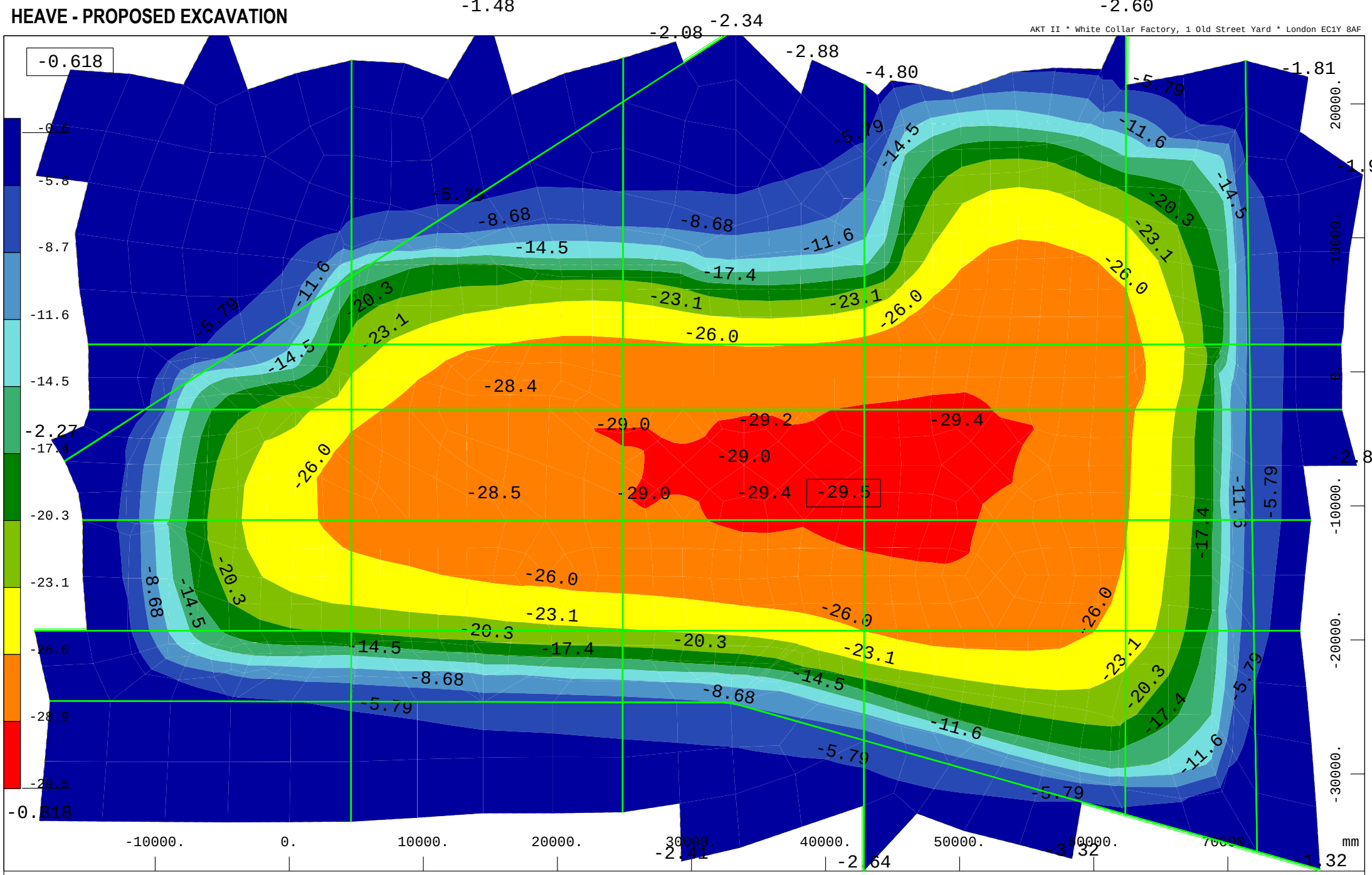


Sector of system Beam Elements,Quadrilateral Elements

M 1 : 250

Nodal displacement in global Z in Node ⬡, Loadcase 6001 of LC 201 Depth Z 0.00 m , from -14.8 to -0.152

HEAVE - PROPOSED EXCAVATION

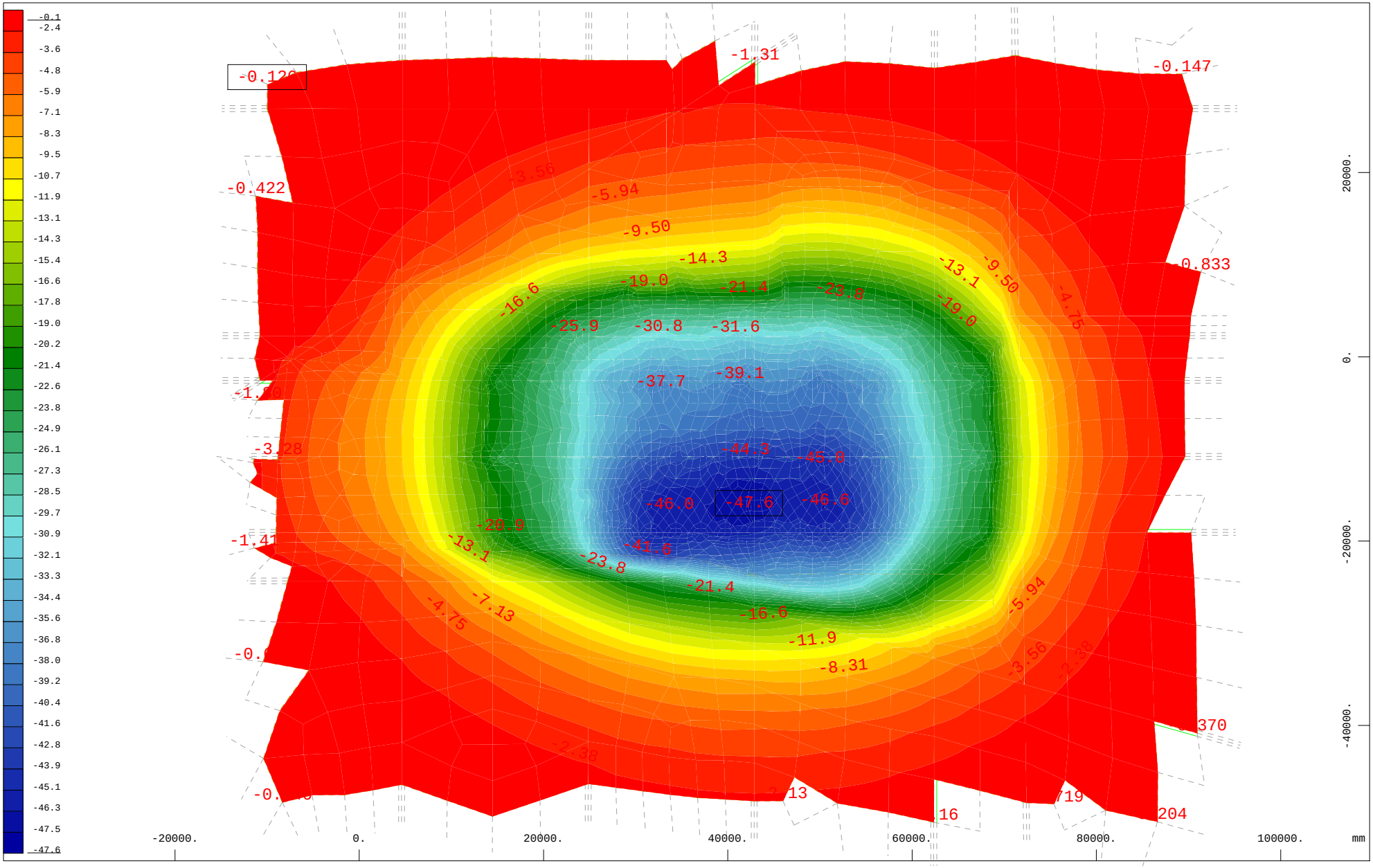


Sector of system Beam Elements,Quadrilateral Elements

Nodal displacement in global Z in Node ⬡, Loadcase 7001 of LC 301 Depth Z 0.00 m , from -29.5 to -0.618

M 1 : 250

SETTLEMENT PLOTS | SHORT-TERM | B2 LEVEL



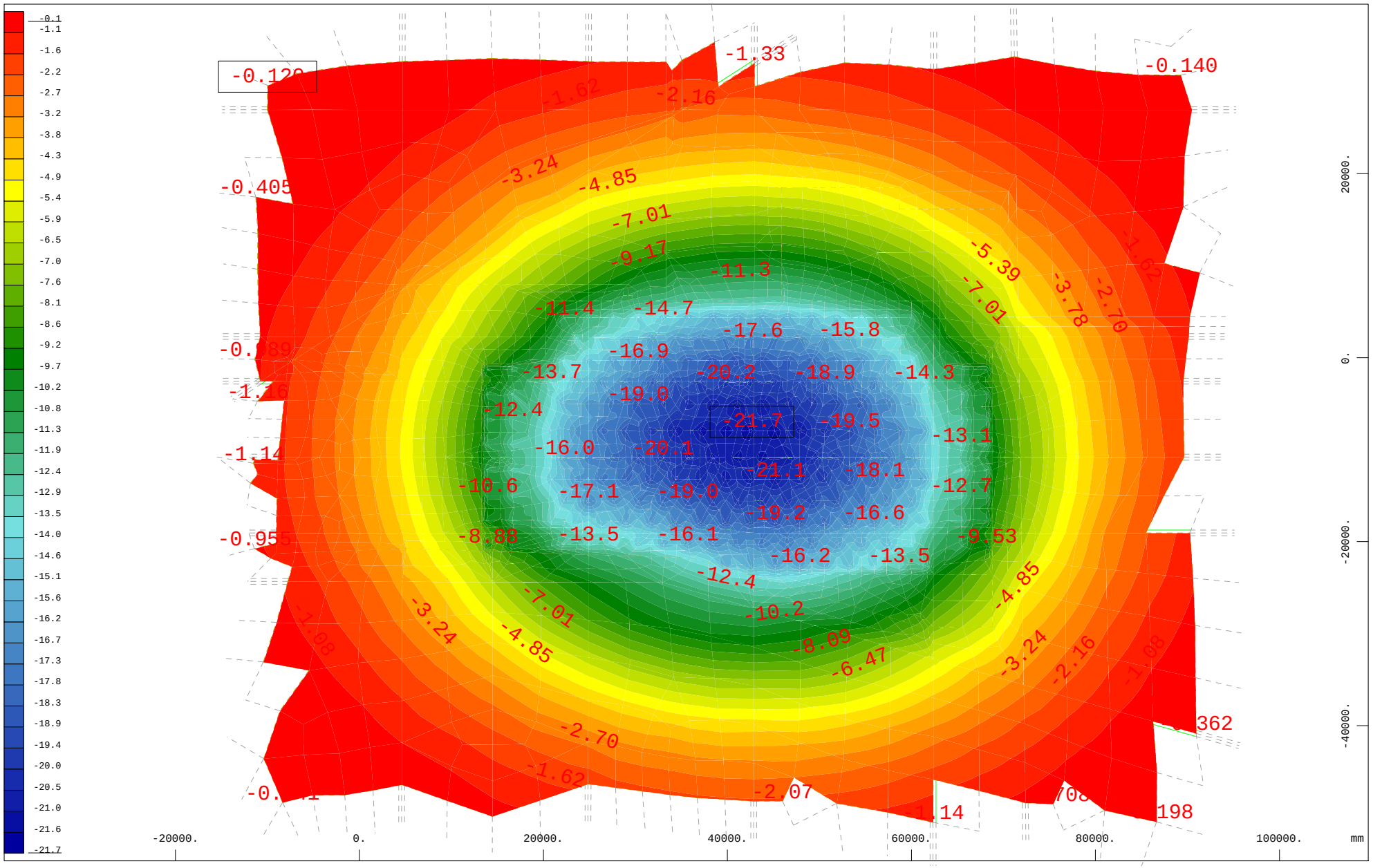
Y
Z—X

Sector of system

Nodal displacement in global Z in Node ◯, Loadcase 5001 of LC 101 Depth Z 0.00 m , from -47.6 to -0.126 step 1.19 mm

M 1 : 568

SETTLEMENT PLOTS | SHORT-TERM | PILE TOE LEVEL

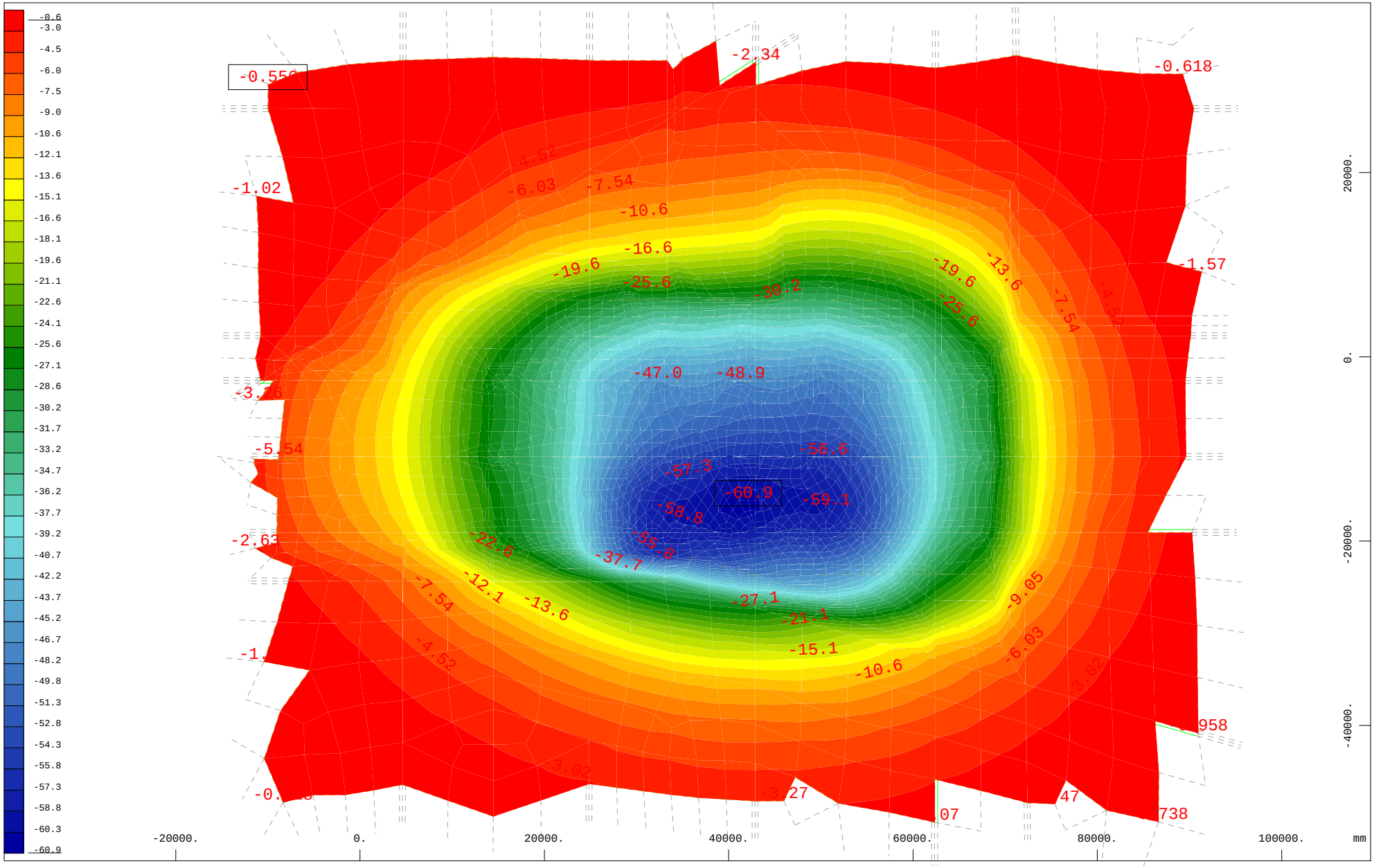


Sector of system

Nodal displacement in global Z in Node ◯, Loadcase 5006 of LC 101 Depth Z -25.00 m , from -21.7 to -0.120 step 0.539 mm

M 1 : 568

SETTLEMENT PLOTS | LONG-TERM | B2 LEVEL



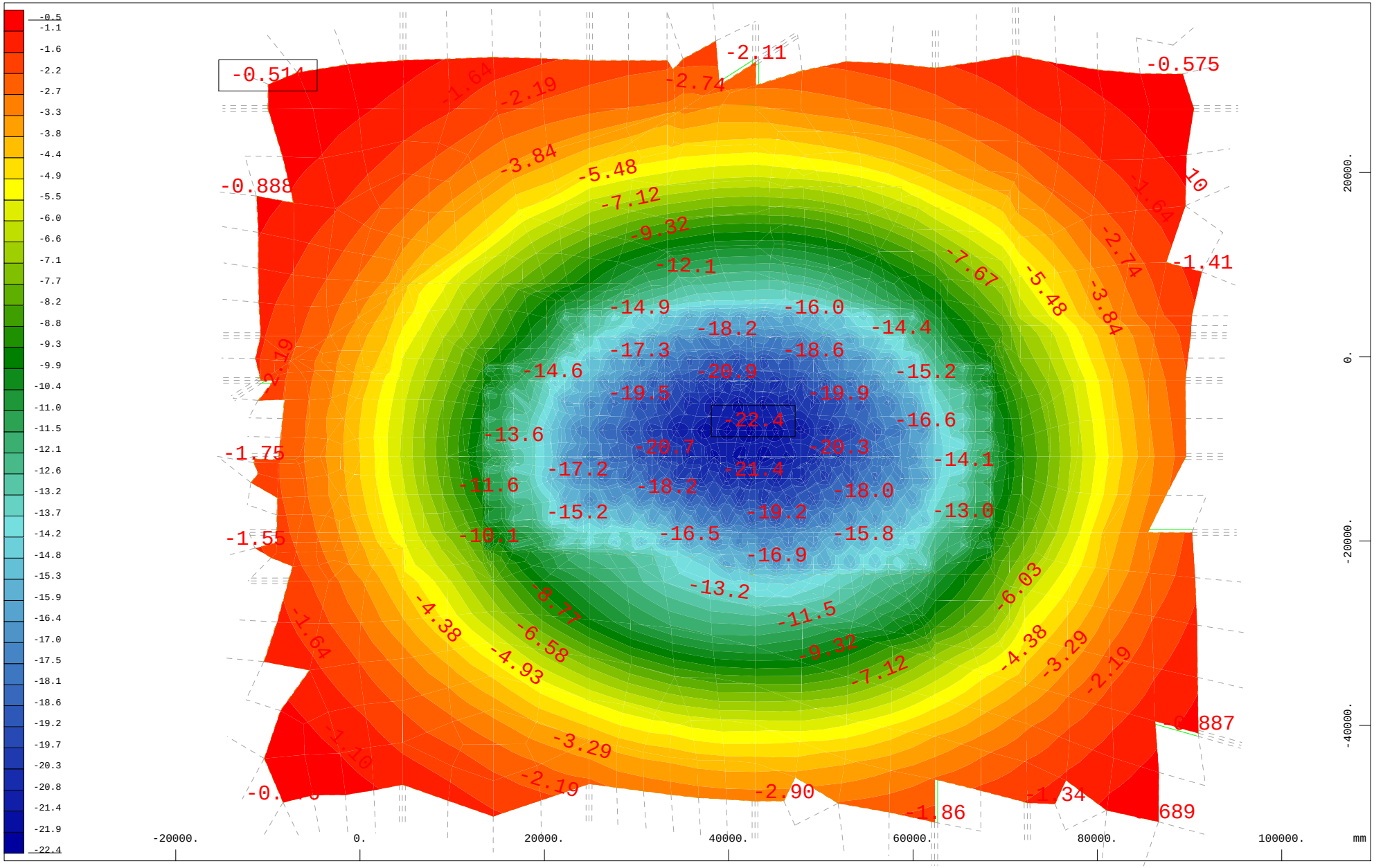
Y
Z—X

Sector of system

Nodal displacement in global Z in Node ◯, Loadcase 8001 of LC 401 Depth Z 0.00 m , from -60.9 to -0.556 step 1.51 mm

M 1 : 568

SETTLEMENT PLOTS | LONG-TERM | PILE TOE LEVEL

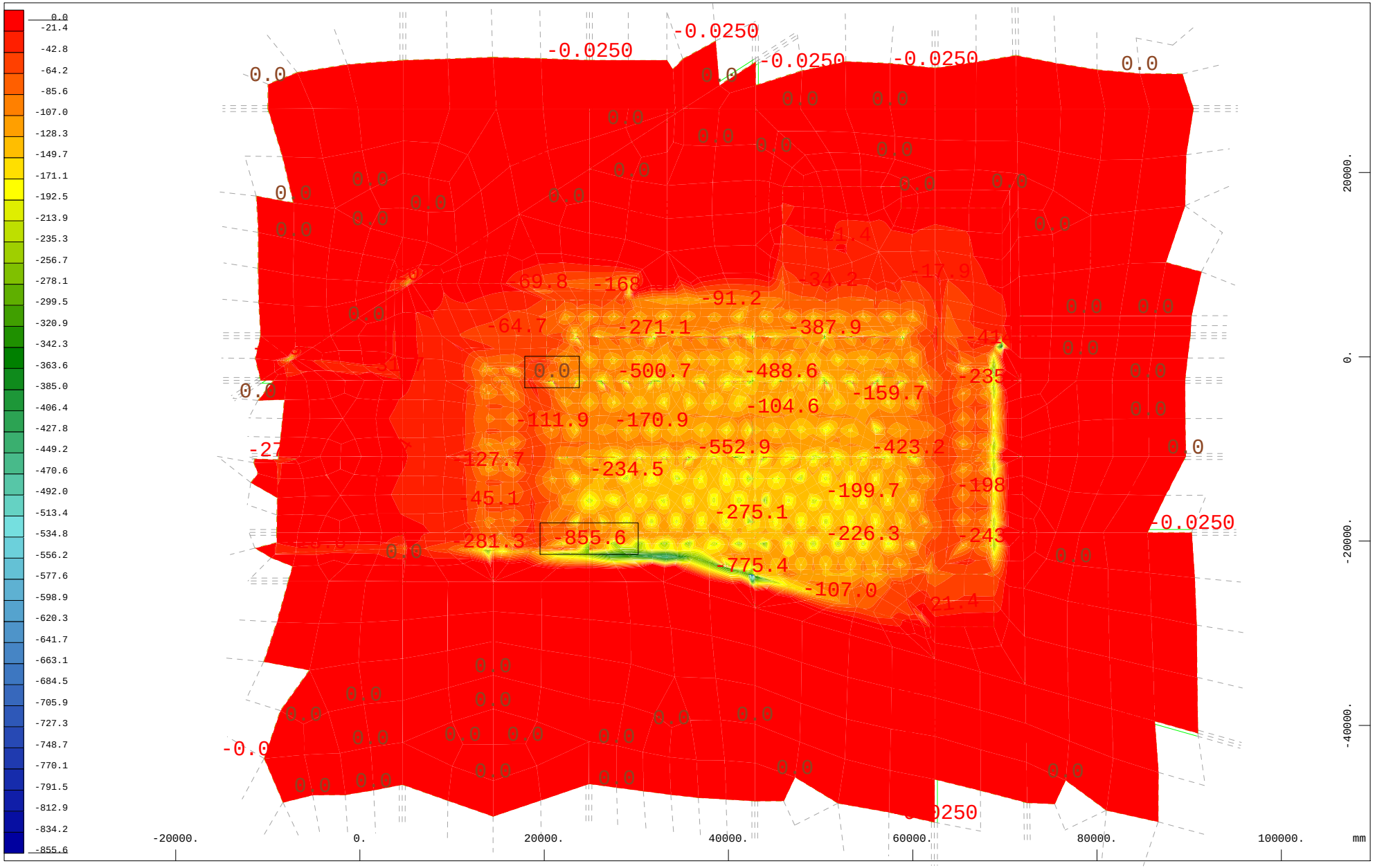


Sector of system

Nodal displacement in global Z in Node ◯, Loadcase 8006 of LC 401 Depth Z -25.00 m , from -22.4 to -0.514 step 0.548 mm

M 1 : 568

VERTICAL STRESSES | SHORT-TERM | B2 LEVEL

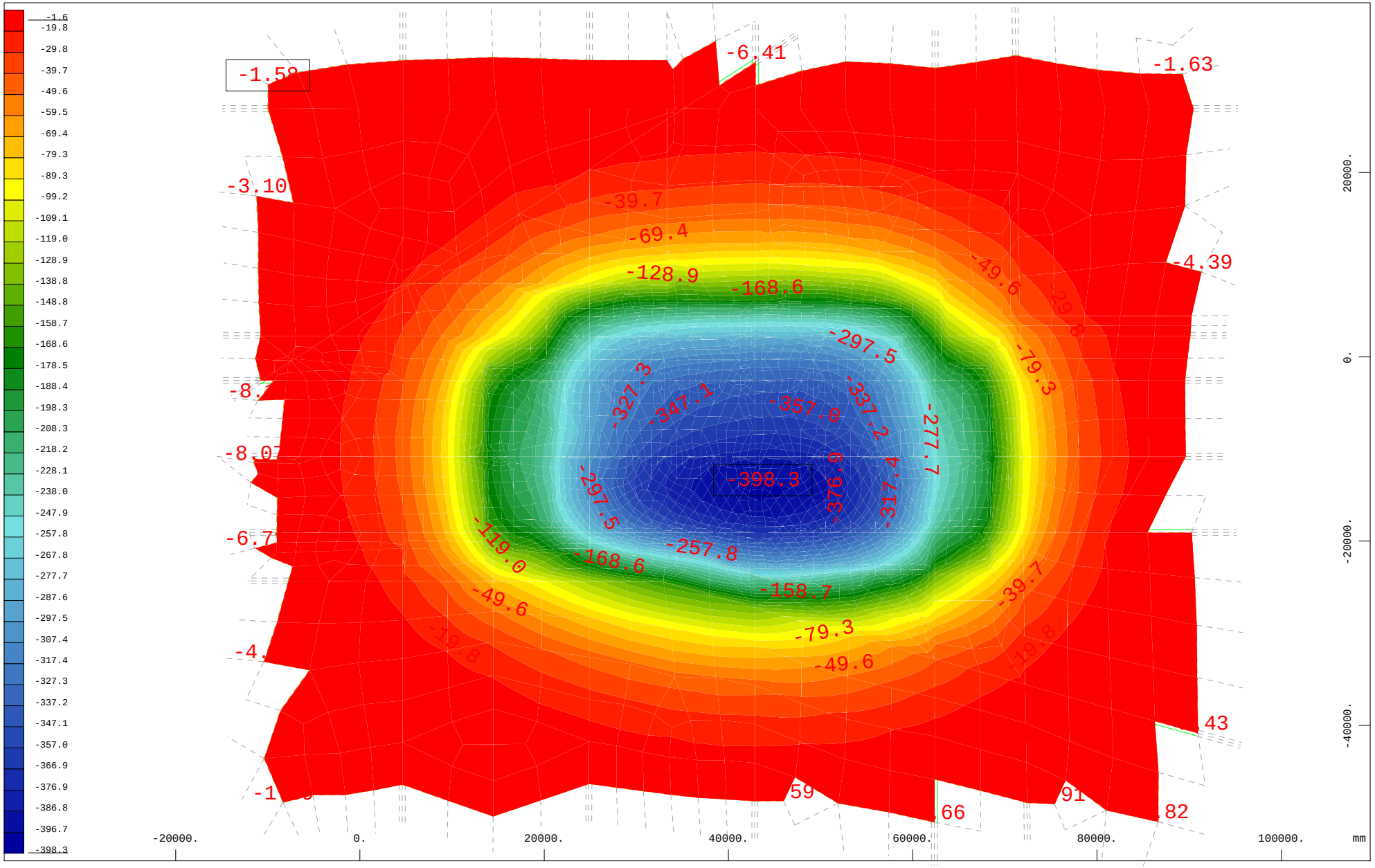


Y
Z—X

Sector of system
Bedding stress in Node ◯, Loadcase 5001 of LC 101 Depth Z 0.00 m , from -855.6 to 0 step 21.4 kN/m2

M 1 : 568

VERTICAL STRESSES | SHORT-TERM | PILE TOE LEVEL



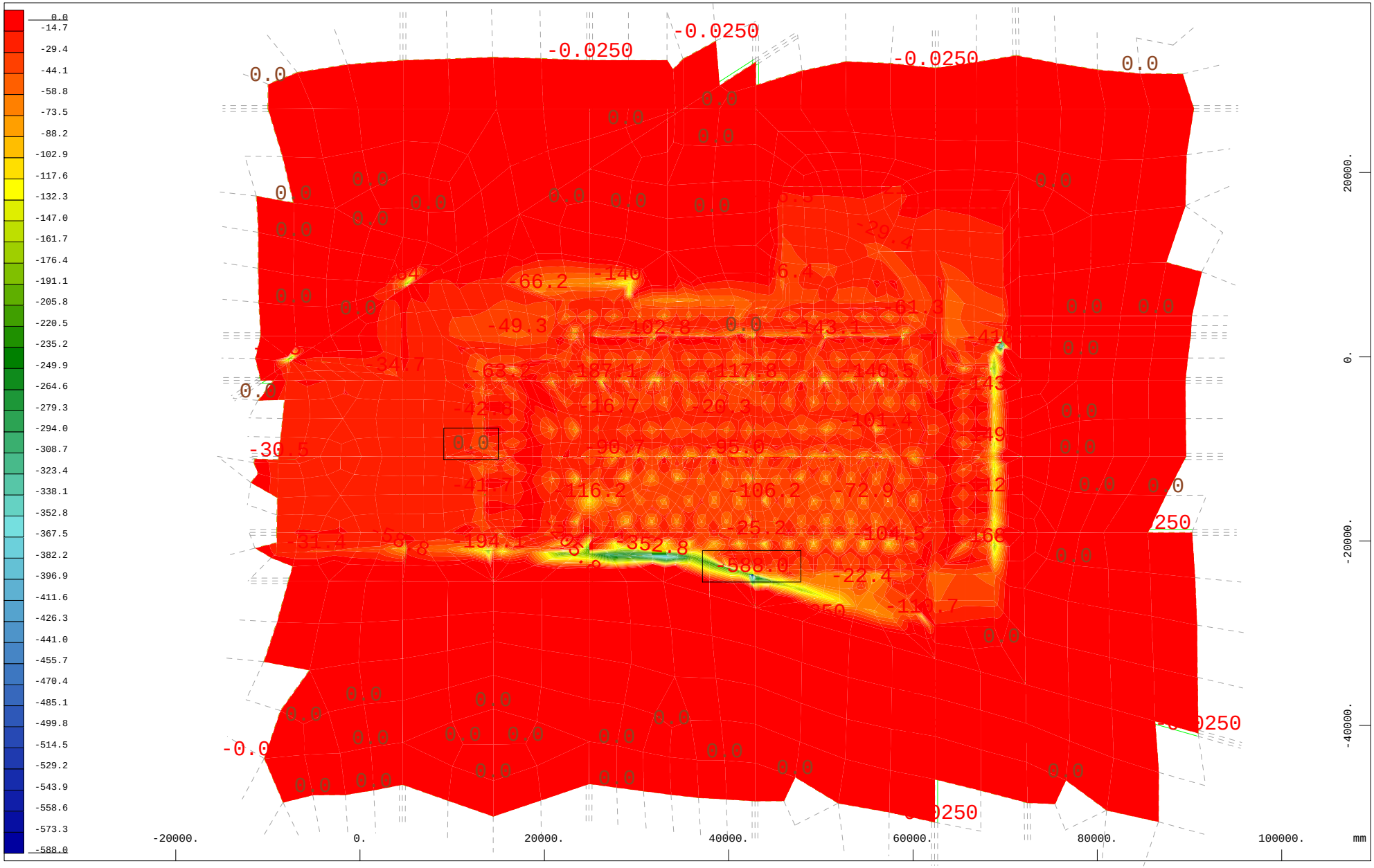
Y
Z—X

Sector of system

Bedding stress in Node ◯, Loadcase 5006 of LC 101 Depth Z -25.00 m , from -398.3 to -1.58 step 9.92 kN/m2

M 1 : 568

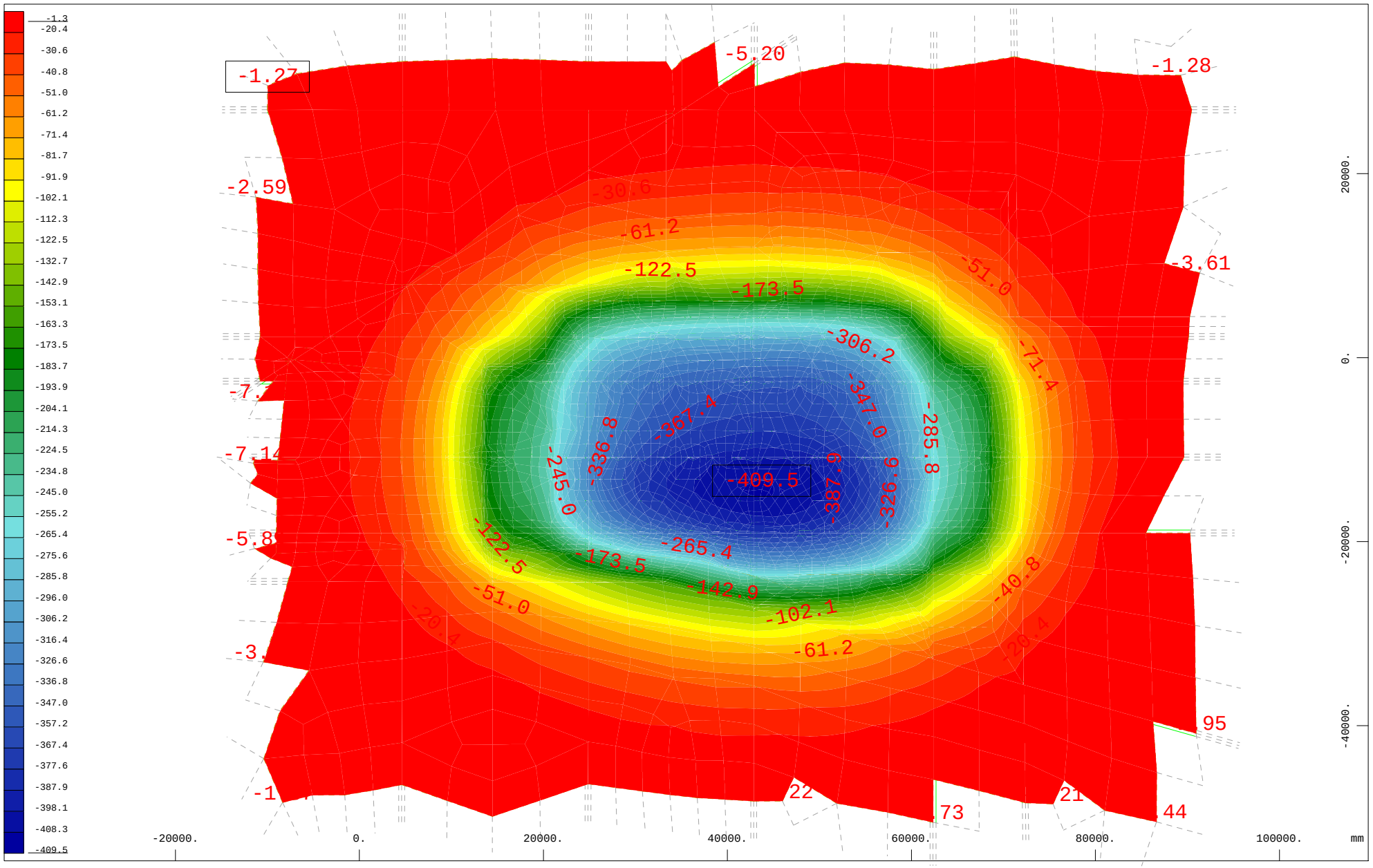
VERTICAL STRESSES | LONG-TERM | B2 LEVEL



Y
Z X Sector of system
Bedding stress in Node ◯, Loadcase 8001 of LC 401 Depth Z 0.00 m , from -588.0 to 0 step 14.7 kN/m2

M 1 : 568

VERTICAL STRESSES | LONG-TERM | PILE TOE LEVEL



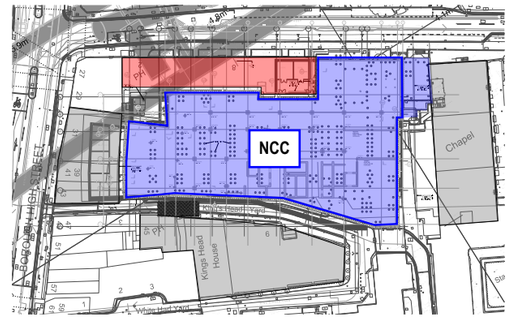
Y
Z X Sector of system

Bedding stress in Node ◯, Loadcase 8006 of LC 401 Depth Z -25.00 m , from -409.5 to -1.27 step 10.2 kN/m2

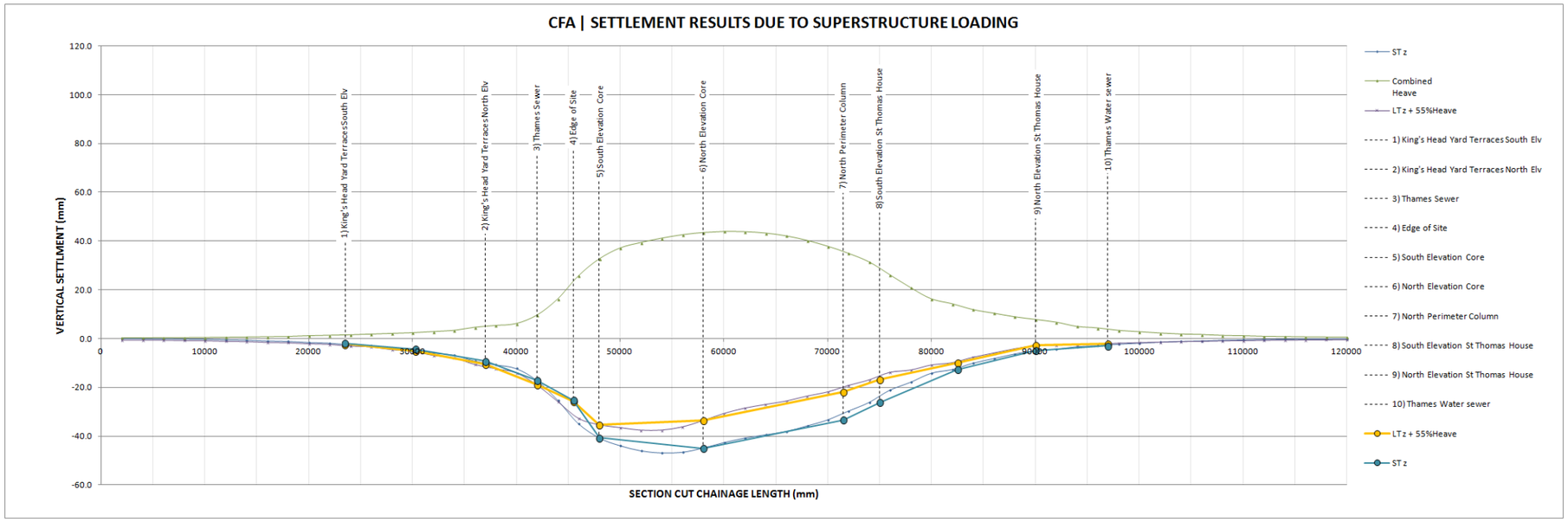
M 1 : 568

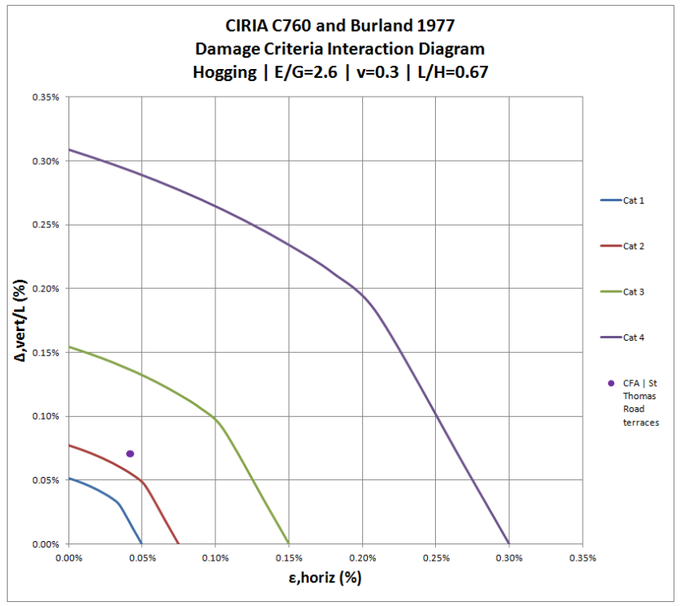
DAMAGE IMPACT ASSESSMENT | ST THOMAS STREET TERRACES

CFA | PILING FROM B1 LEVEL



KEY PLAN





					Gradients Extracted from FEM Halfspace Analysis										Damage Assessment Parameters						
DESCRIPTION	Gridline Section	Reference Points	Plan Length	Half Plan Length	ST z		LT z + 55%Heave		Height of Building (if applicable)	Depth of Excavation	Near face of building to retaining wall	Far face of building to retaining wall	Center of building to retaining wall	Horizontal strain across the building (δH1-δH2)/L	Vertical strain across the building (δVtot/L)		Critical Behaviour	Assumed poissons ratio		Damage Category
			L	1/2 L	1st Half Building	2nd Half Building	1st Half Building	2nd Half Building	H	E	D1	D2	D3	εHtot	εVtot	L/H	Hog/Sag	v	E/G	
			(m)	(m)	mm/mm	mm/mm	mm/mm	mm/mm	(m)	(m)	(m)	(m)	(m)	(%)	(%)					
CFA | St Thomas Road terraces	GL 7	8-8a-9	10	5.00	560	970	1060	1080	15	6.3	3.50	9	6	0.04%	0.07%	0.7	Hogging	0.3	2.6	2

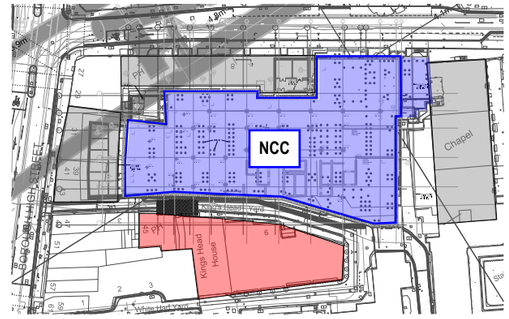
REV	DATE	DESCRIPTION	BY	CHECKED
P1	21/09/2018	FOR DISCUSSION	PM	NC

akt II

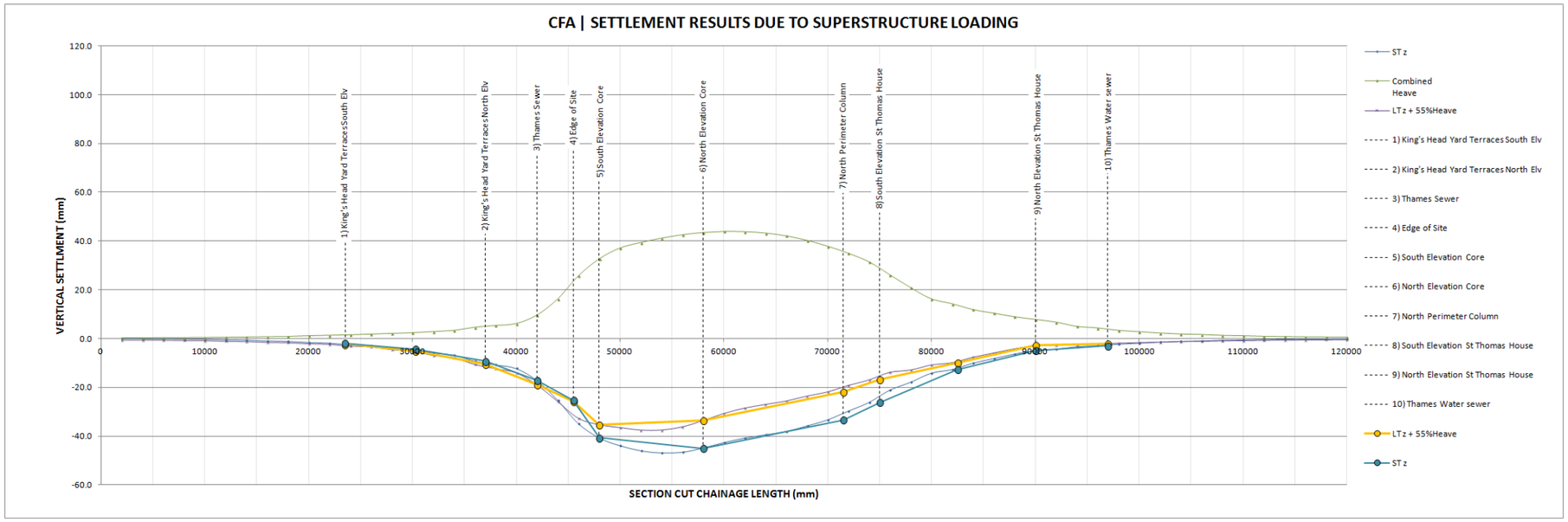
PROJECT NEW CITY COURT		TITLE DAMAGE IMPACT ASSESSMENT - ST THOMAS STREET TERRACES	
DATE 21/09/2018	SCALE -	CAD FILENAME -	STATUS FOR DISCUSSION
DRAWN PM	CHECKED NC	PROJECT No. 3948	DRAWING No. 3948-SK-194 (SHEET 01 OF 04)
REV P1			

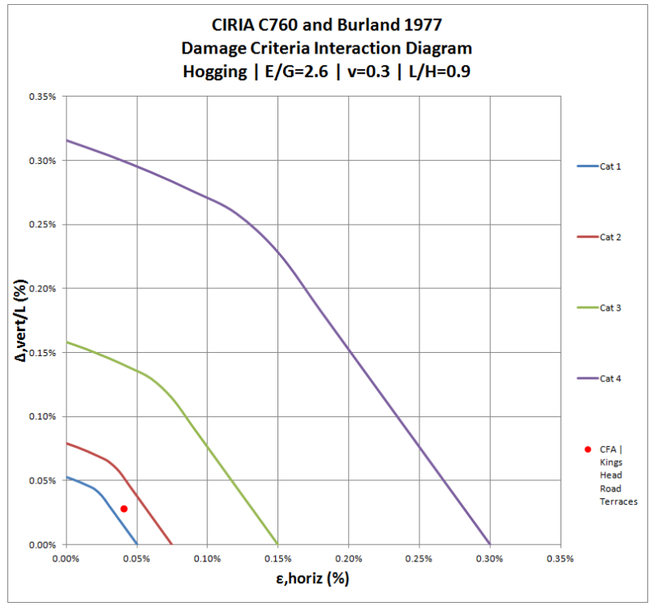
DAMAGE IMPACT ASSESSMENT | KING'S HEAD HOUSE

CFA | PILING FROM B1 LEVEL



KEY PLAN





					Gradients Extracted from FEM Halfspace Analysis										Damage Assessment Parameters					
DESCRIPTION	Gridline Section	Reference Points	Plan Length	Half Plan Length	ST z		LT z + 55%Heave		Height of Building (if applicable)	Depth of Excavation	Near face of building to retaining wall	Far face of building to retaining wall	Center of building to retaining wall	Horizontal strain across the building (δH1-δH2)/L	Vertical strain across the building (δVtot/L)		Critical Behaviour	Assumedpoissons ratio		Damage Category
			L	1/2 L	1st Half Building	2nd Half Building	1st Half Building	2nd Half Building	H	E	D1	D2	D3	εHtot	εVtot	L/H	Hog/Sag	v	E/G	
			(m)	(m)	mm/mm	mm/mm	mm/mm	mm/mm	(m)	(m)	(m)	(m)	(m)	(%)	(%)					
CFA | Kings Head Road Terraces	GL 7	1-1a-2	13.5	6.75	2690	1400	2420	1240	15	10	8.50	22	15	0.04%	0.03%	0.9	Hogging	0.3	2.6	1

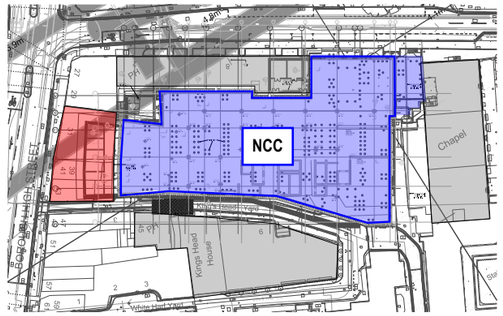
REV	DATE	DESCRIPTION	BY	CHECKED
P1	21/09/2018	FOR DISCUSSION	PM	NC

akt II

PROJECT NEW CITY COURT		TITLE DAMAGE IMPACT ASSESSMENT - KING'S HEAD HOUSE	
DATE 21/09/2018	SCALE -	CAD FILENAME -	STATUS FOR DISCUSSION
DRAWN PM / CHECKED NC	PROJECT No. 3948	DRAWING No. 3948-SK-194 (SHEET 02 OF 04)	REV P1

DAMAGE IMPACT ASSESSMENT | LUL TICKET HALL

CFA | PILING FROM B1 LEVEL



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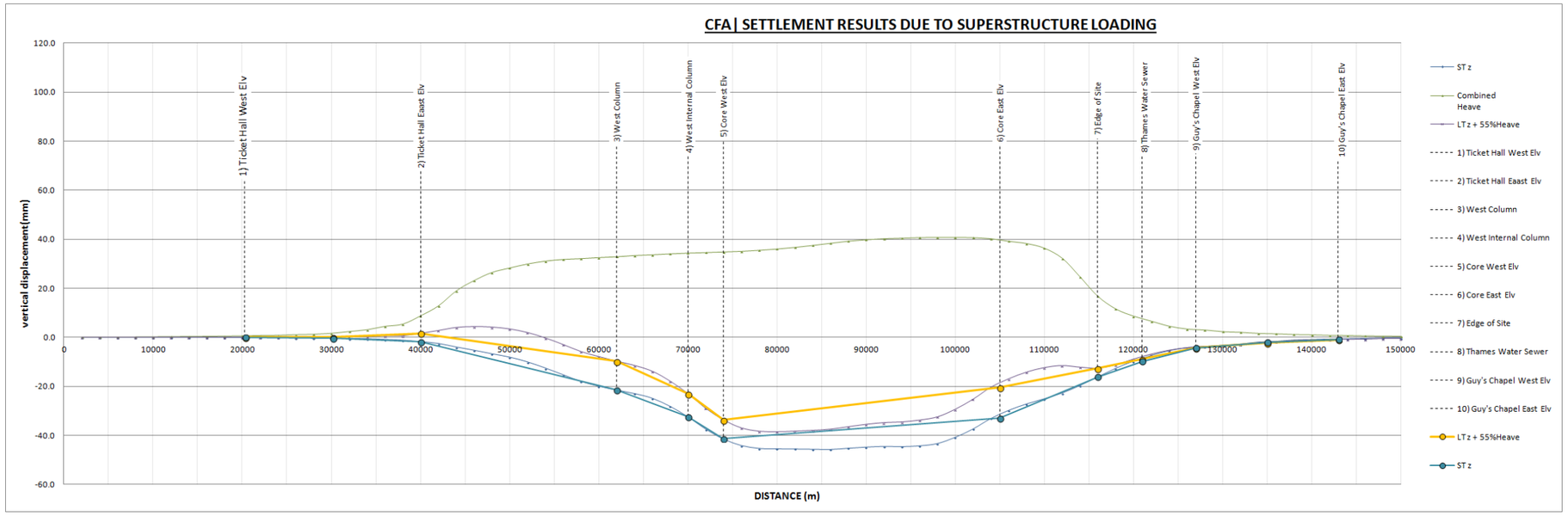
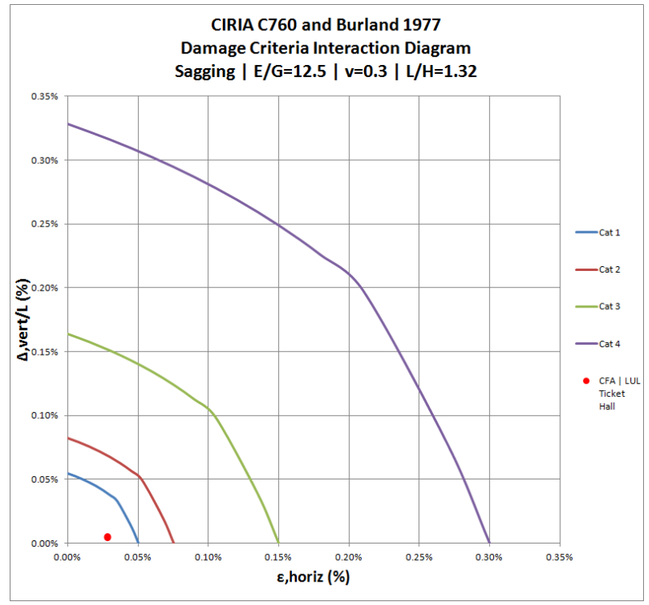




					Gradients Extracted from FEM Halfspace Analysis										Damage Assessment Parameters						
DESCRIPTION	Gridline Section	Reference Points	Plan Length	Half Plan Length	ST z		LT z + 55%Heave		Height of Building (if applicable)	Depth of Excavation	Near face of building to retaining wall	Far face of building to retaining wall	Center of building to retaining wall	Horizontal strain across the building (δH1-δH2)/L	Vertical strain across the building (δVtot/L)		Critical Behaviour	Assumedpoissons ratio		Damage Category
			L	1/2 L	1st Half Building	2nd Half Building	1st Half Building	2nd Half Building	H	E	D1	D2	D3	εHtot	εVtot	L/H	Hog/Sag	v	E/G	
			(m)	(m)	mm/mm	mm/mm	mm/mm	mm/mm	(m)	(m)	(m)	(m)	(m)	(%)	(%)					
CFA | LUL Ticket Hall	GL D1	1-1a-2	19.85	9.93	32770	6680	607400	6280	15	6.3	3.00	23	8	0.03%	0.00%	1.3	Sagging	0.3	12.5	0

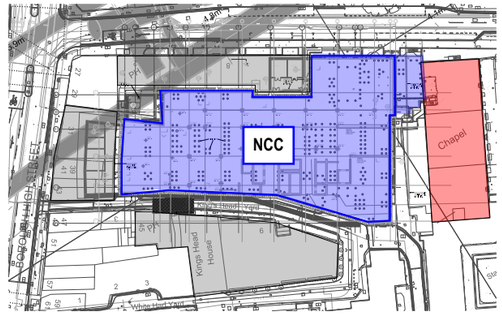
REV	DATE	DESCRIPTION	BY	CHECKED
P1	21/09/2018	FOR DISCUSSION	PM	NC

akt II

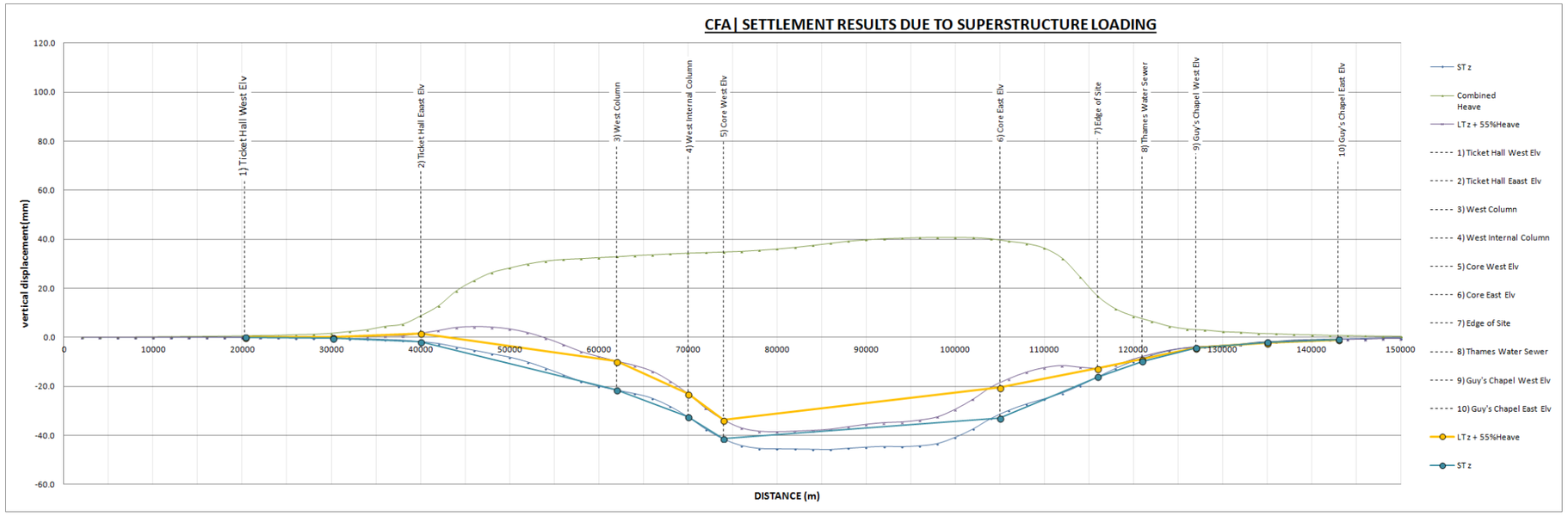
PROJECT NEW CITY COURT		TITLE DAMAGE IMPACT ASSESSMENT - LUL TICKET HALL	
DATE 21/09/2018	SCALE -	CAD FILENAME -	STATUS FOR DISCUSSION
DRAWN PM	CHECKED NC	PROJECT No. 3948	DRAWING No. 3948-SK-194 (SHEET 03 OF 04)
REV P1			

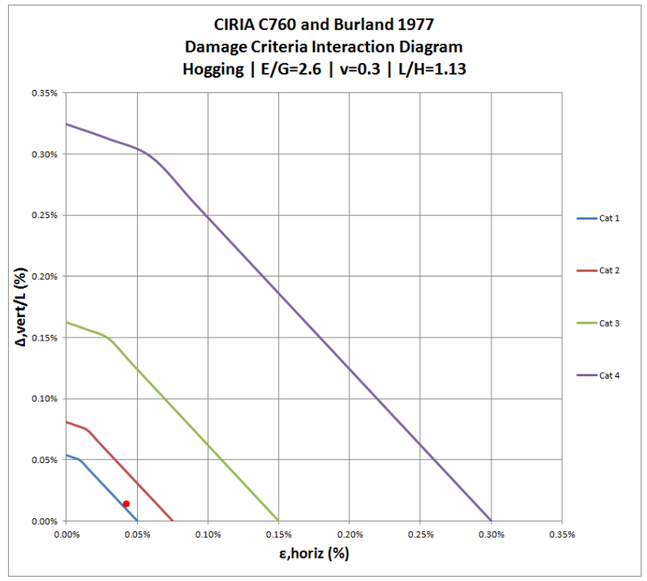
DAMAGE IMPACT ASSESSMENT | GUY'S CHAPEL

CFA | PILING FROM B1 LEVEL



KEY PLAN





					Gradients Extracted from FEM Halfspace Analysis										Damage Assessment Parameters						
DESCRIPTION	Grid line Section	Reference Points	Plan Length	Half Plan Length	ST z		LT z + 55%Heave		Height of Building (if applicable)	Depth of Excavation	Near face of building to retaining wall	Far face of building to retaining wall	Center of building to retaining wall	Horizontal strain across the building (δH1-δH2)/L	Vertical strain across the building (δVtot/L)		Critical Behaviour	Assumed poisons ratio		Damage Category
			L	1/2 L	1st Half Building	2nd Half Building	1st Half Building	2nd Half Building	H	E	D1	D2	D3	εHtot	εVtot	L/H	Hog/Sag	v	E/G	
			(m)	(m)	mm/mm	mm/mm	mm/mm	mm/mm	(m)	(m)	(m)	(m)	(m)	(%)	(%)					
CFA | Guys Hospital Chapel	GL D1	9-9a-10	17.0	8.50	3570	4600	3840	4870	15	13	11.00	28	20	0.04%	0.01%	1.1	Hogging	0.3	2.6	1

REV P1 DATE 21/09/2018 DESCRIPTION FOR DISCUSSION BY PM CHECKED NC

akt II

PROJECT NEW CITY COURT | TITLE DAMAGE IMPACT ASSESSMENT - GUY'S CHAPEL

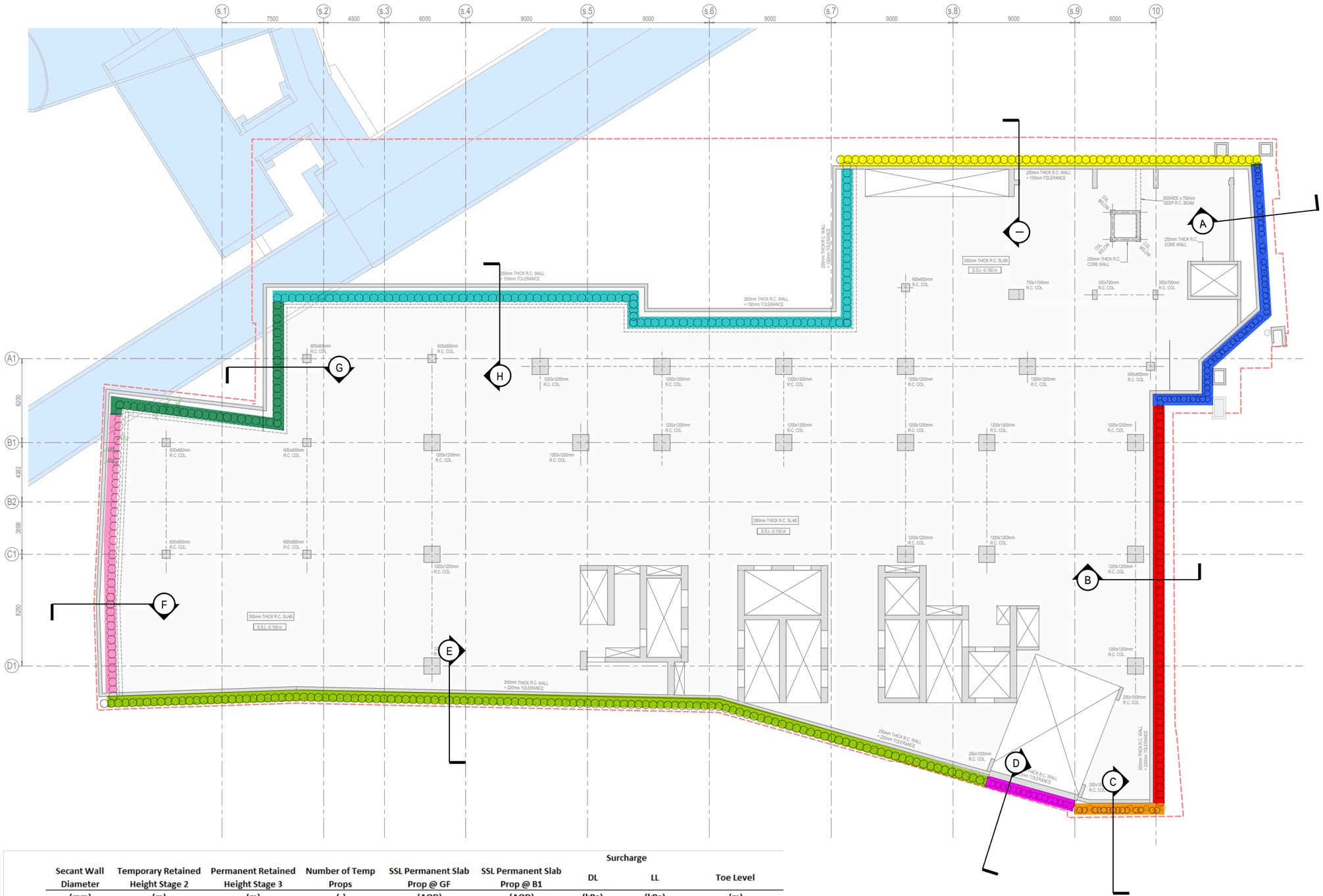
DATE 21/09/2018 | SCALE - | CAD FILENAME - | STATUS FOR DISCUSSION

DRAWN PM | CHECKED NC | PROJECT No. 3948 | DRAWING No. 3948-SK-194 (SHEET 04 OF 04) | REV P1

Appendix 5

Retaining Wall Sequence

KEY PLAN OF RETAINING WALL INTERFACES



NOTES

NB: ALL DIMENSIONS ARE TO BE CONFIRMED BY SITE INVESTIGATION WORKS:

(1) DIMENSIONS TAKEN FROM BOWDEN, SILLET & PTNRS DRAWING 1527/504 REV F DATED 23/05/1983
(2) DIMENSIONS TAKEN FROM BOWDEN, SILLET & PTNRS DRAWING 1527/502 REV D DATED 14/05/1983
(3) DIMENSIONS TAKEN FROM THE HALPERN PARTNERSHIP DRAWING 2058 ST.20 REV E DATED 07/03/1984
(4) ALLOWANCE FOR 500mm OVERDIG
(5) LUL EXCLUSION ZONE ASSUMED 6m ABOVE CROWN OF TUNNEL. TUNNEL LINING ASSUMED 300mm THICK.
SOFFIT OF TUNNEL ASSUMED FROM PLOWMAN AND CRAVEN SURVEY.
(6) CUT OFF LEVEL TAKEN FROM BS&P DRAWING 1527/111 DATED 1983
(7) TAKEN FROM PLOWMAN AND CRAVEN DRAWING 35722T PROV5 OS VERSION.
(8) DIMENSIONS TAKEN FROM BOWDEN, SILLET & PTNRS DRAWING 1527/503

P5

UNDERPINNING REQUIRED AT:
A,F,H

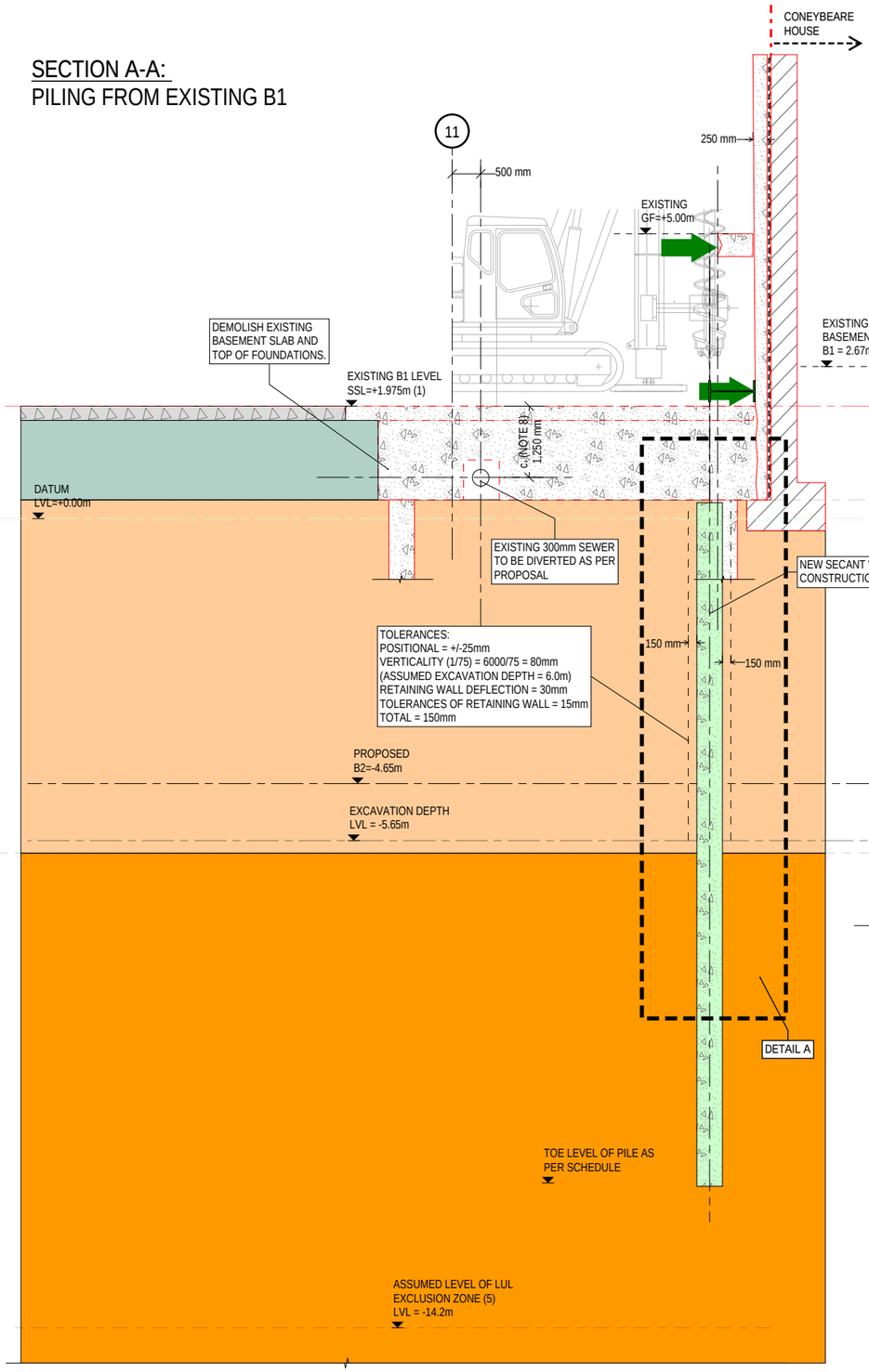
	Secant Wall Diameter (mm)	Temporary Retained Height Stage 2 (m)	Permanent Retained Height Stage 3 (m)	Number of Temp Props (-)	SSL Permanent Slab Prop @ GF (AOD)	SSL Permanent Slab Prop @ B1 (AOD)	Surcharge DL (kPa)	Surcharge LL (kPa)	Toe Level (m)
A	450	5.9	4.9	2	+4.5	+1.25	37.5	17.5	-12
B	600	10.2	8.85	2	+4.5	-0.15	-	5	-13.5
C	450	10.2	8.85	2	+4.5	-0.15	-	10	-13.5
D	450	11.2	10	2	+4.5	Unpropped	-	10	-14.5
E	600	7.5	6.5	2	+4.5	-0.15	45	10	-13.5
F	600	5.5	4.5	1	+4.5	-0.15	37.5	17.5	-12
G	600	5.5	4.5	1	+4.5	-0.15	90	5	-12
H	600	5.5	4.5	1	+4.5	-0.15	73.5	17.5	-12
J	600	7.6	6.6	1	+4.5	-0.15	45	10	-13.5

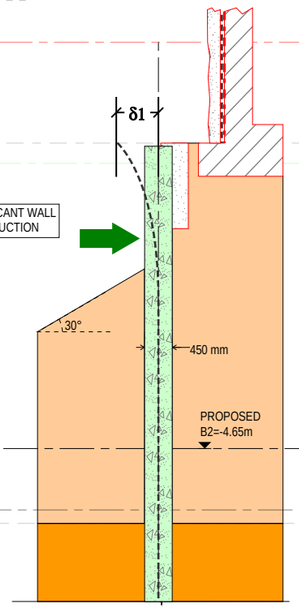
REV P5 DATE 27/11/2018 DESCRIPTION FOR DISCUSSION BY PM CHECKED NC

akt II

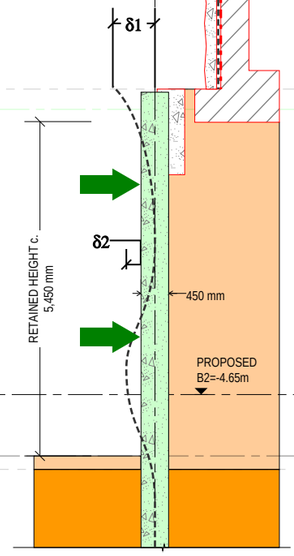
PROJECT NEW CITY COURT
TITLE RETAINING WALL SEQUENCE
DATE 27/11/2018
SCALE 1:300 @ A3
CAD FILENAME -
STATUS FOR DISCUSSION
DRAWN RP
CHECKED NC
PROJECT No. 3948
DRAWING No. 3948-SK-132 (SHEET 01 OF 09)
REV P5

SECTION A-A:
PILING FROM EXISTING B1

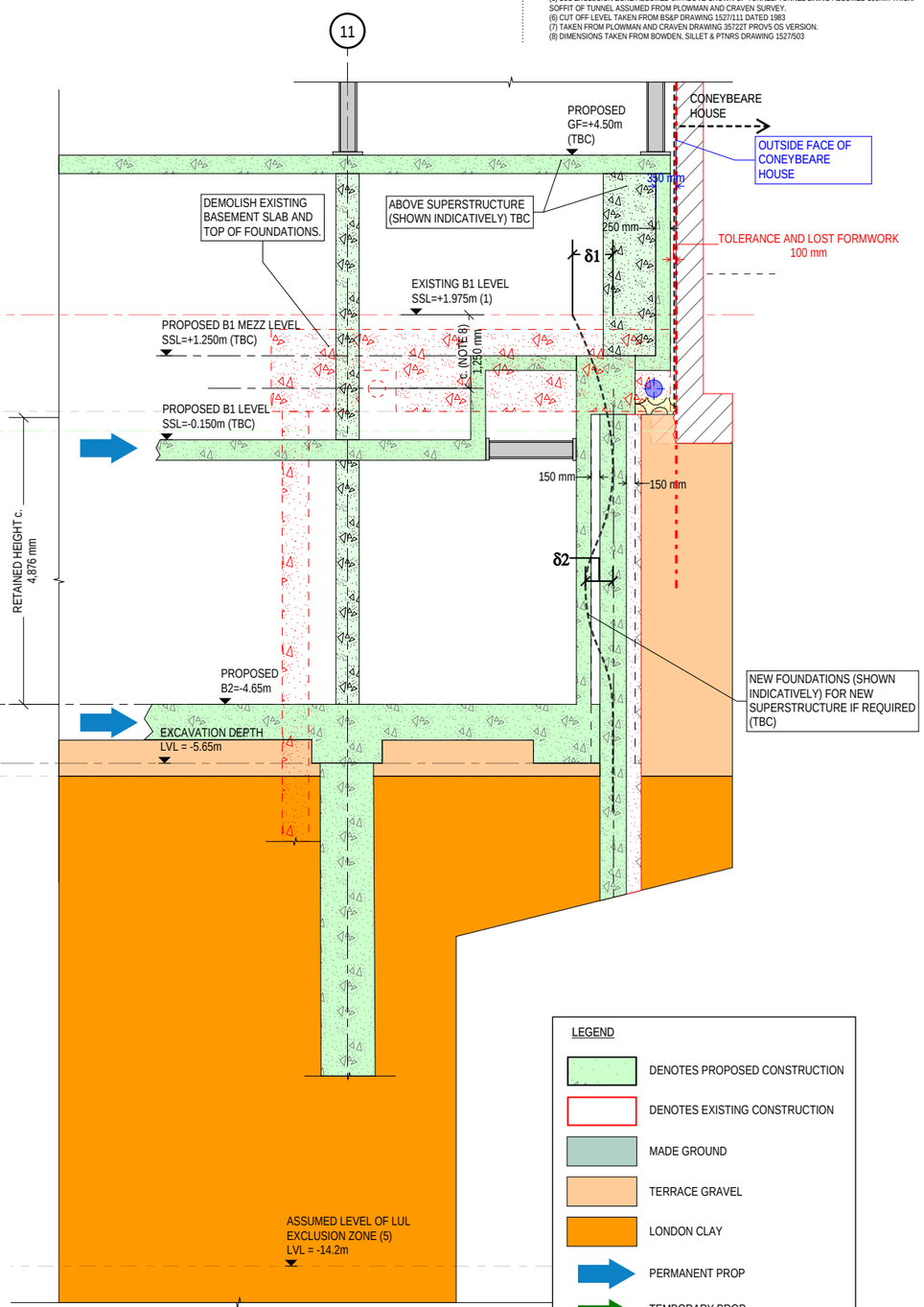




STAGE 1
(DETAIL A ONLY)



STAGE 2
(DETAIL A ONLY)



STAGE 3

NOTES

NB: ALL DIMENSIONS ARE TO BE CONFIRMED BY SITE INVESTIGATION WORKS:

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(2) DIMENSIONS TAKEN FROM BOWDEN, SILLET & PTNRS DRAWING 1527/502 REV D DATED 14/05/1983
(3) DIMENSIONS TAKEN FROM THE HALPERN PARTNERSHIP DRAWING 2058 ST.20 REV E DATED 07/03/1984
(4) ALLOWANCE FOR 500mm OVERDIG
(5) LUL EXCLUSION ZONE ASSUMED 6m ABOVE CROWN OF TUNNEL. TUNNEL LINING ASSUMED 300mm THICK. SOFFIT OF TUNNEL ASSUMED FROM PLOWMAN AND CRAVEN SURVEY.
(6) CUT OFF LEVEL TAKEN FROM BS&P DRAWING 1527/111 DATED 1983
(7) TAKEN FROM PLOWMAN AND CRAVEN DRAWING 35722T PROV5 OS VERSION.
(8) DIMENSIONS TAKEN FROM BOWDEN, SILLET & PTNRS DRAWING 1527/503

LEGEND

- DENOTES PROPOSED CONSTRUCTION
- DENOTES EXISTING CONSTRUCTION
- MADE GROUND
- TERRACE GRAVEL
- LONDON CLAY
- PERMANENT PROP
- TEMPORARY PROP (DESIGN BY OTHERS)

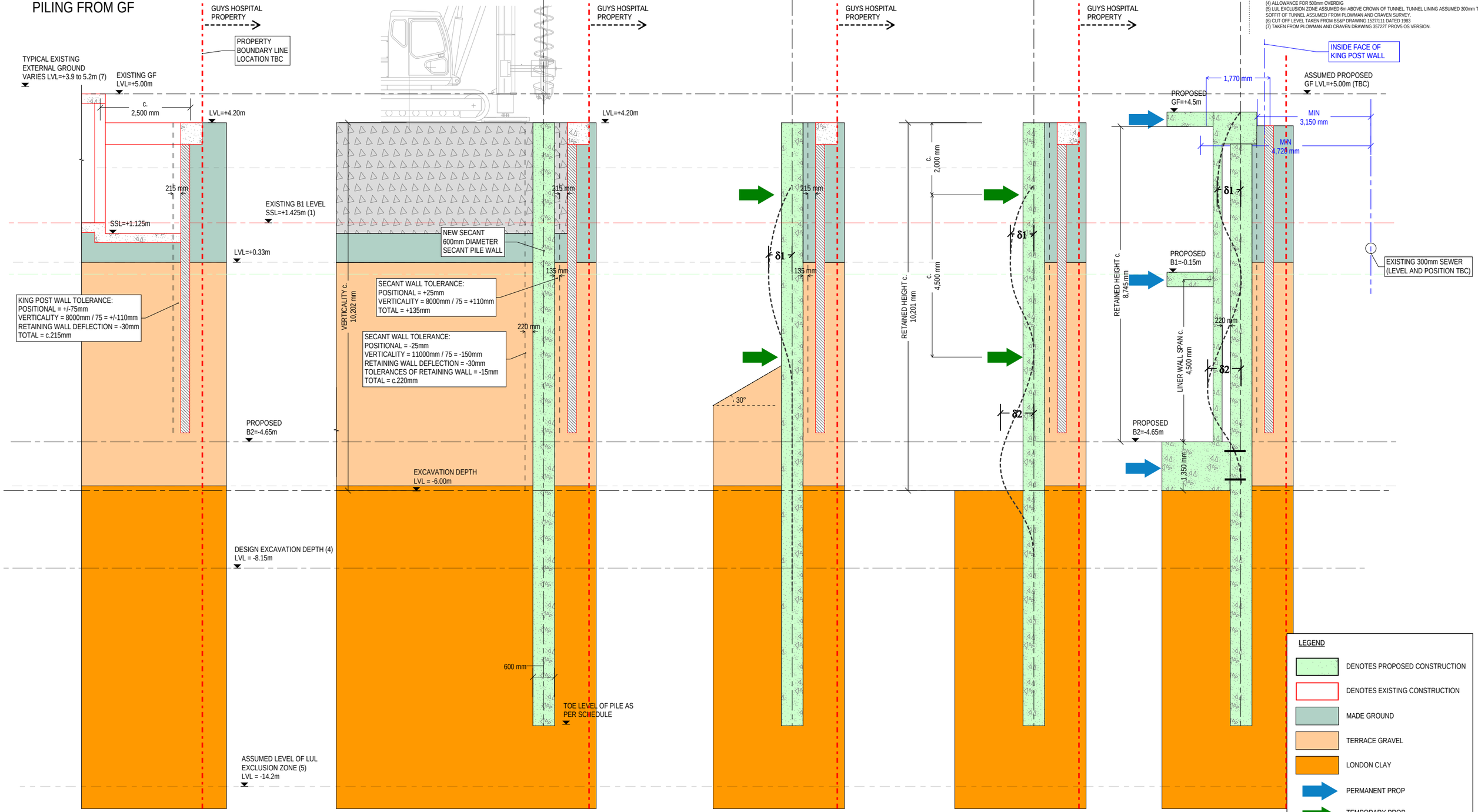
ENABLING WORKS A

REV	DATE	DESCRIPTION	BY	CHECKED
P5	27/11/2018	FOR DISCUSSION	PM	NC

akt II

PROJECT NEW CITY COURT		TITLE RETAINING WALL SEQUENCE	
DATE 27/11/2018	SCALE 1:100 @ A3	CAD FILENAME -	STATUS FOR DISCUSSION
DRAWN RP	CHECKED NC	PROJECT No. 3948	DRAWING No. 3948-SK-132 (SHEET 02 OF 09)	REV P5

SECTION B-B:
PILING FROM GF



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(4) ALLOWANCE FOR 500mm OVERDIG
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(7) TAKEN FROM PLOWMAN AND CRAVEN DRAWING 35722T PROV5 OS VERSION.

LEGEND

- DENOTES PROPOSED CONSTRUCTION
- DENOTES EXISTING CONSTRUCTION
- MADE GROUND
- TERRACE GRAVEL
- LONDON CLAY
- PERMANENT PROP
- TEMPORARY PROP (DESIGN BY OTHERS)

REV	DATE	DESCRIPTION	BY	CHECKED
P5	27/11/2018	FOR DISCUSSION	PM	NC

akt II

PROJECT NEW CITY COURT		TITLE RETAINING WALL SEQUENCE	
DATE 27/11/2018	SCALE 1:100 @ A3	CAD FILENAME -	STATUS FOR DISCUSSION
DRAWN RP	CHECKED NC	PROJECT No. 3948	DRAWING No. 3948-SK-132 (SHEET 03 OF 09)	REV P5

SECTION C-C:
PILING FROM GF

RESIDENTIAL (NURSES ACCOMMODATION)

UNKNOWN CONSTRUCTION OF ADJACENT STRUCTURE. TO BE DETERMINED SINCE ACCESS IS REQUIRED THROUGH THE ADJACENT PARTY WALL TO NEW CITY COURT DEVELOPMENT.

750 mm

TYPICAL EXISTING EXTERNAL GROUND LVL=+4.2m (7)

ASSUMED LVL OF EXISTING SLAB +3.950m (TBC)

TYPICAL CUT OFF LEVEL (TBC, NOTE 6) LVL=+3.325m

EXISTING B1 LEVEL SSL=+1.425m (1)

EXISTING PILES TO STAY IN PLACE TO INTERLOCK WITH PROPOSED SECANT PILED WALL

LVL=+0.33m

EXISTING PILE OF UNKNOWN DEPTH/POSITION

NEW SECANT 450mm DIAMETER SECANT PILE WALL

VERTICALITY HEIGHT 10,199 mm

220 mm

150 mm

SECANT WALL TOLERANCE:
POSITIONAL = -25mm
VERTICALITY = 11000mm / 75 = -150mm
RETAINING WALL DEFLECTION = +30mm
TOTAL = 145mm, THEREFORE ALLOW 150mm

SECANT WALL TOLERANCE:
POSITIONAL = +/-25mm
VERTICALITY = 11000mm / 75 = +/-150mm
RETAINING WALL DEFLECTION = -30mm
TOLERANCES OF RETAINING WALL = +/-15mm
TOTAL = c.220mm

PROPOSED B2=-4.65m

LVL=+6.2m

EXCAVATION DEPTH LVL = -6.00m

DESIGN EXCAVATION DEPTH (4) LVL = -8.15m

TOE LEVEL OF PILE AS PER SCHEDULE

ASSUMED LEVEL OF LUL EXCLUSION ZONE (5) LVL = -14.2m

ENABLING WORKS A

ENABLING WORKS B

RESIDENTIAL (NURSES ACCOMMODATION)

δ1

30°

STAGE 1

RESIDENTIAL (NURSES ACCOMMODATION)

c. 2,000 mm

c. 4,500 mm

RETAINED HEIGHT c. 10,199 mm

δ1

δ2

STAGE 2

RESIDENTIAL (NURSES ACCOMMODATION)

PROPOSED GF=+4.5m

RETAINED HEIGHT c. 8,850 mm

δ1

PROPOSED B1=-0.15m

LINER WALL SPAN c. 4,500 mm

220 mm

δ2

PROPOSED B2=-4.65m

1,350 mm

STAGE 3

NOTES

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LEGEND

- DENOTES PROPOSED CONSTRUCTION
- DENOTES EXISTING CONSTRUCTION
- MADE GROUND
- TERRACE GRAVEL
- LONDON CLAY
- PERMANENT PROP
- TEMPORARY PROP (DESIGN BY OTHERS)

REV	DATE	DESCRIPTION	BY	CHECKED
P5	27/11/2018	FOR DISCUSSION	PM	NC

akt II

PROJECT NEW CITY COURT		TITLE RETAINING WALL SEQUENCE	
DATE 27/11/2018	SCALE 1:100 @ A3	CAD FILENAME -	STATUS FOR DISCUSSION
DRAWN RP	CHECKED NC	PROJECT No. 3948	DRAWING No. 3948-SK-132 (SHEET 04 OF 09)	REV P5

SECTION D-D:
PILING FROM GF

NOTES

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(1) DIMENSIONS TAKEN FROM BOWDEN, SILLET & PTNRS DRAWING 1527/504 REV F DATED 23/05/1983
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(6) CUT OFF LEVEL TAKEN FROM BS&P DRAWING 1527/111 DATED 1983
(7) TAKEN FROM PLOWMAN AND CRAVEN DRAWING 35722T PROV5 OS VERSION.

PROPERTY BOUNDARY LINE

TYPICAL EXISTING EXTERNAL GROUND LVL=+4.2m (7)

ASSUMED LVL OF EXISTING SLAB +3.950m (TBC)

TYPICAL CUT OFF LEVEL (TBC, NOTE 6) LVL=+3.325m

EXISTING B1 LEVEL SSL=+1.425m (1)

EXISTING PILES TO STAY IN PLACE TO INTERLOCK WITH PROPOSED SECANT PILED WALL

LVL=+0.33m

LVL=+6.2m

ASSUMED CAR STACKER PIT (TBC) B2=-7.0m

ASSUMED LEVEL OF LUL EXCLUSION ZONE (5) LVL = -14.2m

EXISTING PILES TO STAY IN PLACE TO INTERLOCK WITH PROPOSED SECANT PILED WALL

VERTICALITY HEIGHT 11,195 mm

220 mm

SECANT WALL TOLERANCE:
POSITIONAL = -25mm
VERTICALITY = 11000mm / 75 = -150mm
RETAINING WALL DEFLECTION = +30mm
TOTAL = 145mm, THEREFORE ALLOW 150mm

NEW SECANT 450mm DIAMETER SECANT PILE WALL

SECANT WALL TOLERANCE:
POSITIONAL = +/-25mm
VERTICALITY = 11000mm / 75 = +/-150mm
RETAINING WALL DEFLECTION = -30mm
TOLERANCES OF RETAINING WALL = +/-15mm
TOTAL = c.220mm

TOE LEVEL OF PILE AS PER SCHEDULE

δ1

30°

RETAINED HEIGHT c. 11,200 mm

c. 2,000 mm

c. 4,500 mm

c. 4,688 mm

δ1

δ2

1,570 mm

PARTY WALL LINE

PROPOSED GF=+4.5m

TEMPORARY SHEET PILE REMOVED FROM HIGHWAYS

RETAINED HEIGHT c. 9,849 mm

THICKER RC LINING WALL SPANNING BETWEEN BLADE COLUMNS TO PROVIDE A STIFF SOLUTION IN THE PERMANENT CASE

220 mm

450 mm

LINER WALL TIED INTO FACE SECANT WALL USING COUPLERS.

CAR LIFT

1,350 mm

ENABLING WORKS A

ENABLING WORKS B

STAGE 1

STAGE 2

STAGE 3

LEGEND

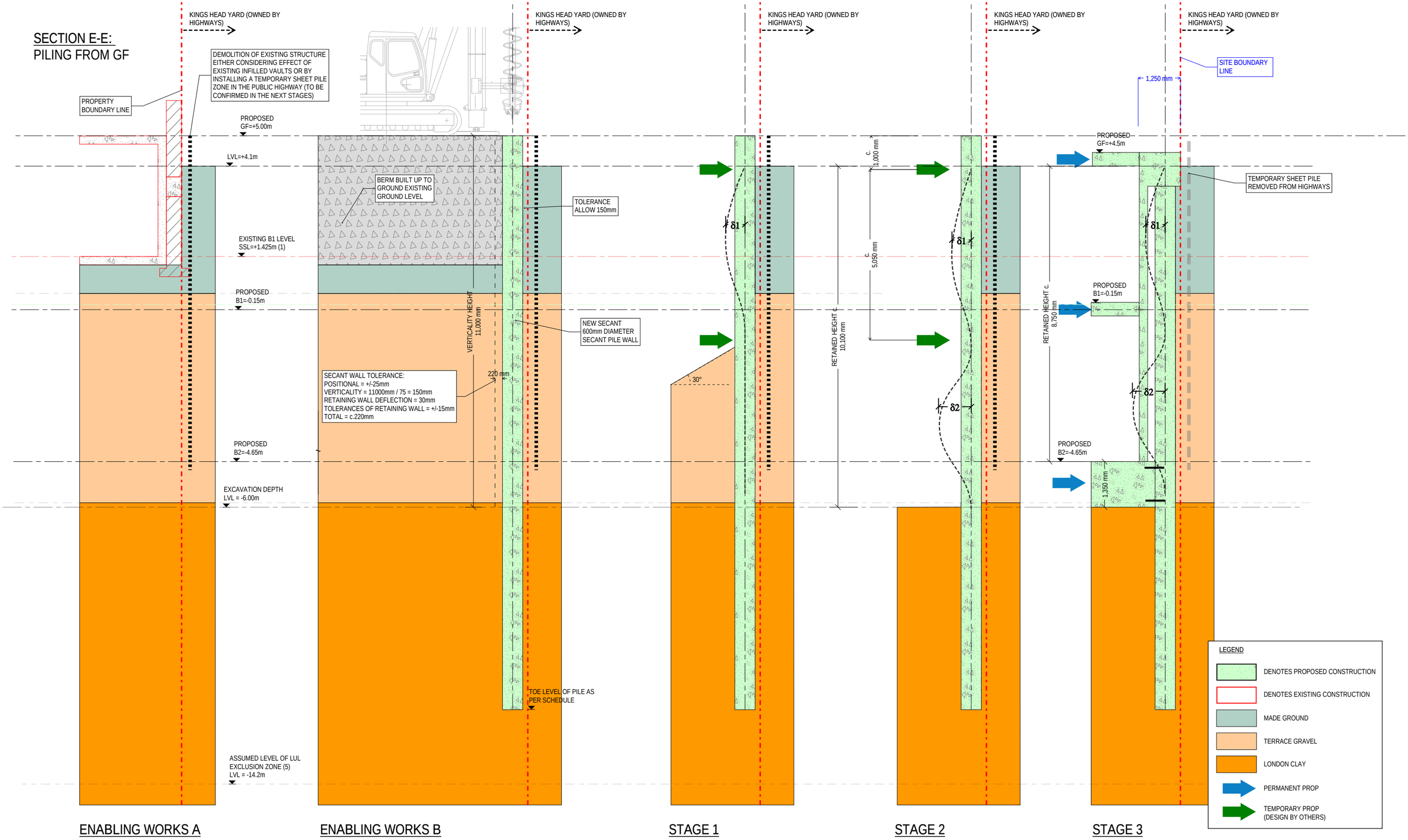
- DENOTES PROPOSED CONSTRUCTION
- DENOTES EXISTING CONSTRUCTION
- MADE GROUND
- TERRACE GRAVEL
- LONDON CLAY
- PERMANENT PROP
- TEMPORARY PROP (DESIGN BY OTHERS)

REV	DATE	DESCRIPTION	BY	CHECKED
P5	27/11/2018	FOR DISCUSSION	PM	NC

akt II

PROJECT NEW CITY COURT			TITLE RETAINING WALL SEQUENCE
DATE 27/11/2018	SCALE 1:100 @ A3	CAD FILENAME -	STATUS FOR DISCUSSION
DRAWN RP	CHECKED NC	PROJECT No. 3948	DRAWING No. 3948-SK-132 (SHEET 05 OF 09)	REV P5

SECTION E-E:
PILING FROM GF



ENABLING WORKS A

ENABLING WORKS B

STAGE 1

STAGE 2

STAGE 3

REV	DATE	DESCRIPTION	BY	CHECKED
P5	27/11/2018	FOR DISCUSSION	PM	NC

akt II

PROJECT NEW CITY COURT		TITLE RETAINING WALL SEQUENCE	
DATE 27/11/2018	SCALE 1:100 @ A3	CAD FILENAME -	STATUS FOR DISCUSSION
DRAWN RP	CHECKED NC	PROJECT No. 3948	DRAWING No. 3948-SK-132 (SHEET 06 OF 09)	REV P5

SECTION F-F:
PILING FROM EXISTING B1

NOTES

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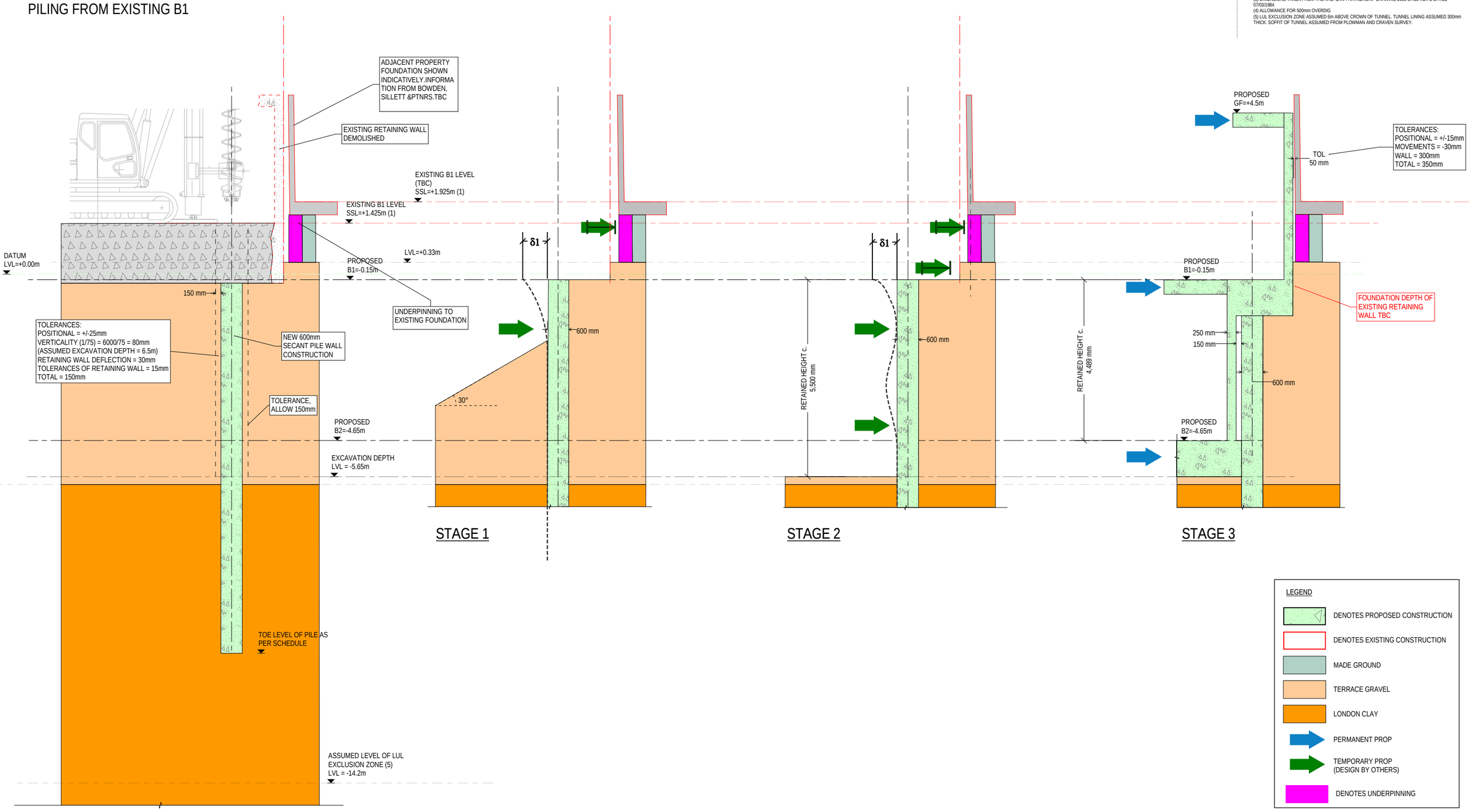

ENABLING WORKS A

REV	DATE	DESCRIPTION	BY	CHECKED
P5	27/11/2018	FOR DISCUSSION	PM	NC

akt II

PROJECT NEW CITY COURT		TITLE RETAINING WALL SEQUENCE	
DATE 27/11/2018	SCALE 1:100 @ A3	CAD FILENAME -	STATUS FOR DISCUSSION
DRAWN RP	CHECKED NC	PROJECT No. 3948	DRAWING No. 3948-SK-132 (SHEET 07 OF 09)	REV P5

SECTION G-G:
PILING FROM EXISTING B1

NOTES

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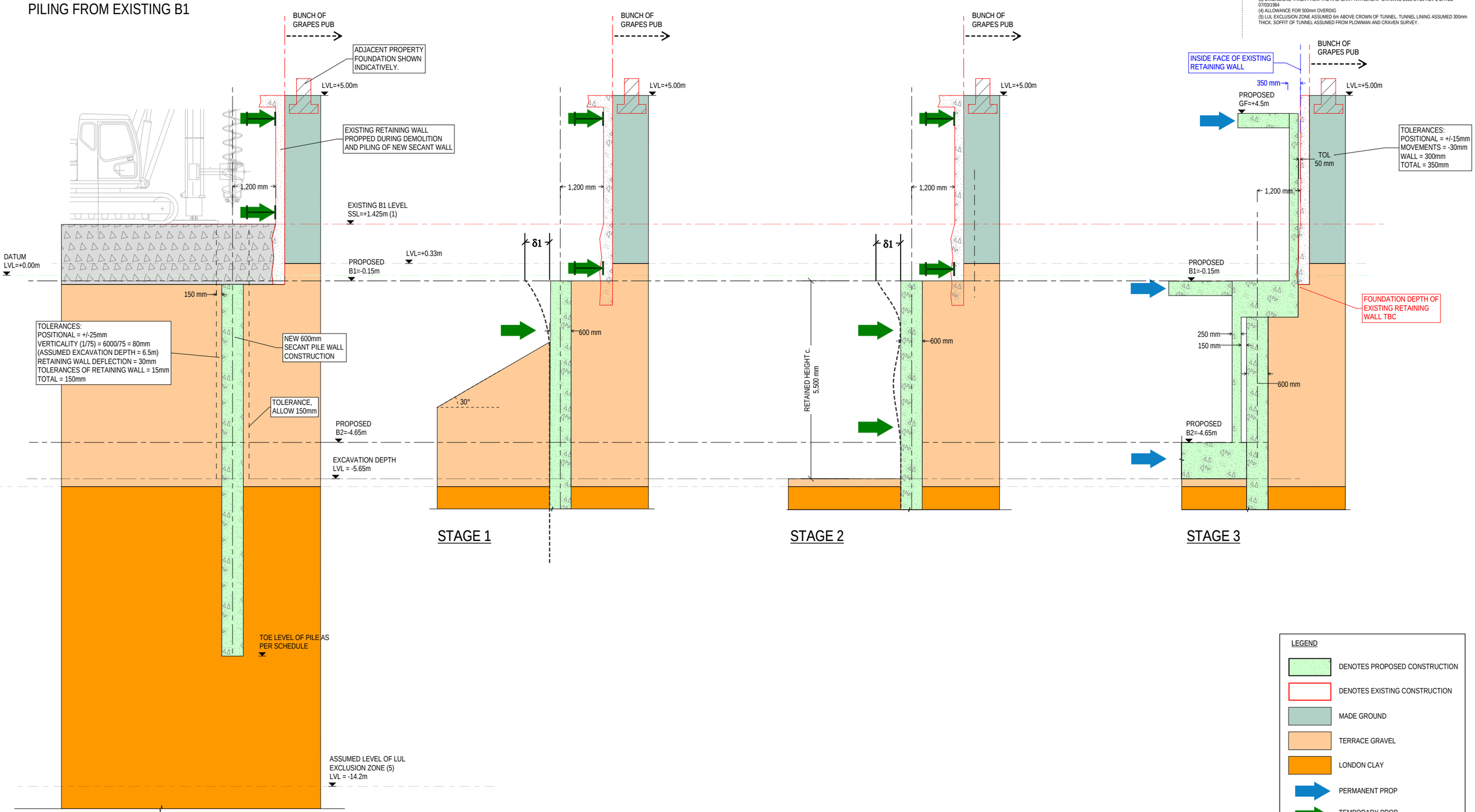

STAGE 1

STAGE 2

STAGE 3

LEGEND

- DENOTES PROPOSED CONSTRUCTION
- DENOTES EXISTING CONSTRUCTION
- MADE GROUND
- TERRACE GRAVEL
- LONDON CLAY
- PERMANENT PROP
- TEMPORARY PROP (DESIGN BY OTHERS)

ENABLING WORKS A

REV	DATE	DESCRIPTION	BY	CHECKED
P5	27/11/2018	FOR DISCUSSION	PM	NC

akt II

PROJECT NEW CITY COURT		TITLE RETAINING WALL SEQUENCE	
DATE 27/11/2018	SCALE 1:100 @ A3	CAD FILENAME -	STATUS FOR DISCUSSION
DRAWN RP	CHECKED NC	PROJECT No. 3948	DRAWING No. 3948-SK-132 (SHEET 07 OF 09)	REV P5

SECTION H-H:
PILING FROM EXISTING B1 LEVEL

NOTES

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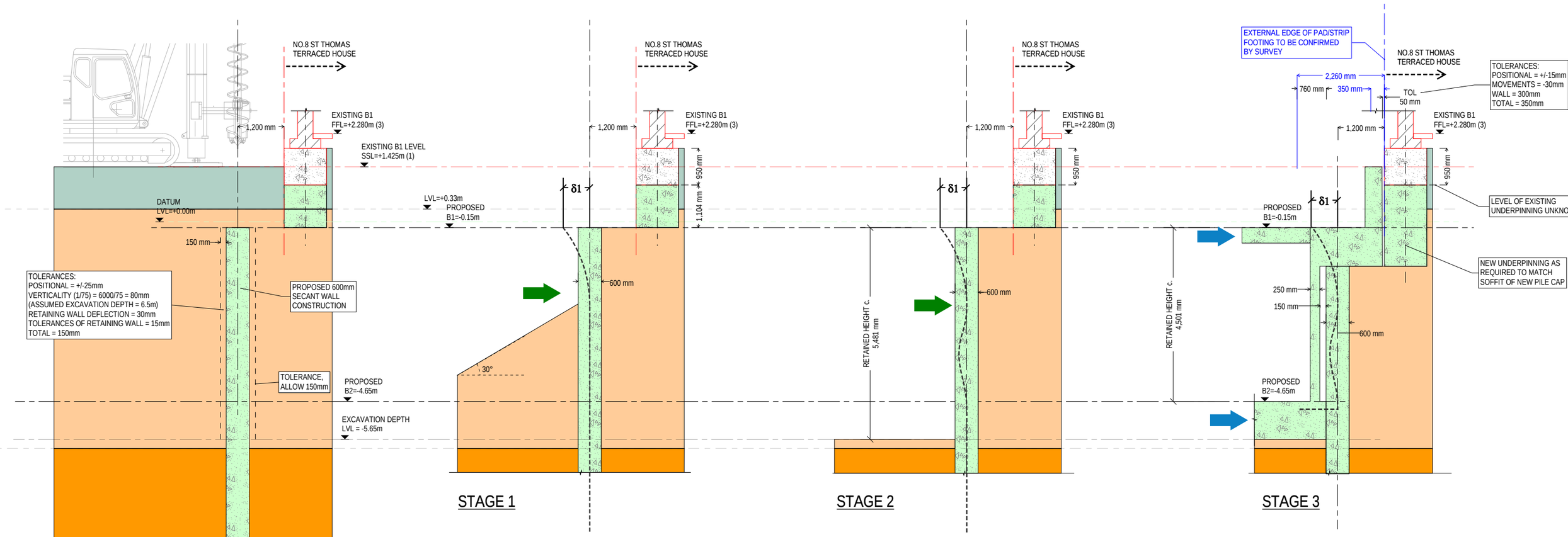
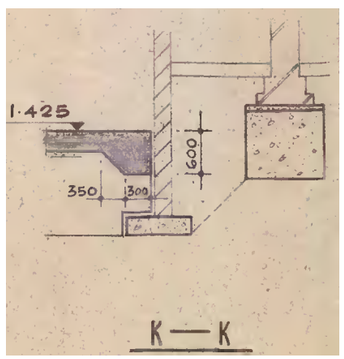
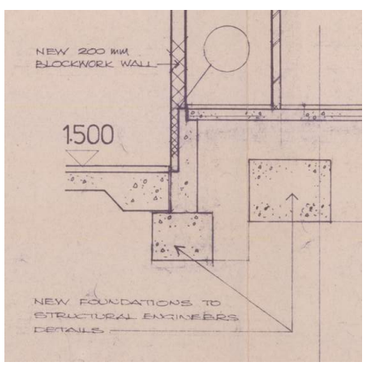


FIG 1.1: SECTION A-A: PROPOSED SECTION OF THE BASEMENT

ENABLING WORKS A



BOWDEN, SILLET & PTNRS DRAWING 1527/504 REV F DATED 23/05/1983



HALPERN PARTNERSHIP DRAWING 2058 ST.20 REV E DATED 07/03/1984

LEGEND

- DENOTES PROPOSED CONSTRUCTION
- DENOTES EXISTING CONSTRUCTION
- MADE GROUND
- TERRACE GRAVEL
- LONDON CLAY
- PERMANENT PROP
- TEMPORARY PROP (DESIGN BY OTHERS)

REV	DATE	DESCRIPTION	BY	CHECKED
P5	27/11/2018	FOR DISCUSSION	PM	NC

akt II

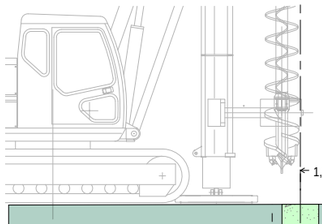
PROJECT NEW CITY COURT		TITLE RETAINING WALL SEQUENCE	
DATE 27/11/2018	SCALE 1:100 @ A3	CAD FILENAME -	STATUS FOR DISCUSSION
DRAWN RP	CHECKED NC	PROJECT No. 3948	DRAWING No. 3948-SK-132 (SHEET 08 OF 09)	REV P5

SECTION I-I:
PILING FROM EXISTING B1 LEVEL

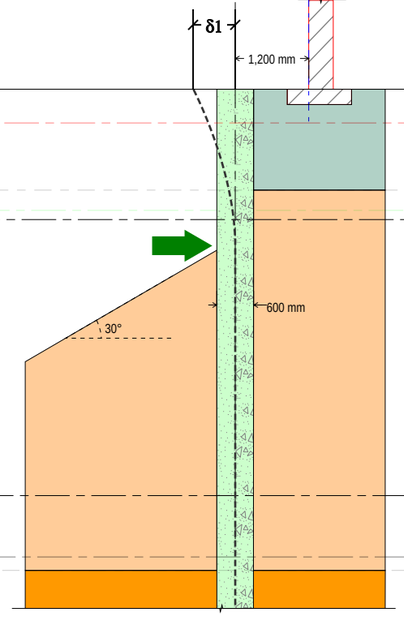
NOTES

NB: ALL DIMENSIONS ARE TO BE CONFIRMED BY SITE INVESTIGATION WORKS:

(1) DIMENSIONS TAKEN FROM BOWDEN, SILLET & PTNRS DRAWING 1527/504 REV F DATED 23/05/1983
(2) DIMENSIONS TAKEN FROM BOWDEN, SILLET & PTNRS DRAWING 1527/502 REV D DATED 14/05/1983
(3) DIMENSIONS TAKEN FROM THE HALPERN PARTNERSHIP DRAWING 2058 ST.20 REV E DATED 07/03/1984
(4) ALLOWANCE FOR 500mm OVERDIG
(5) LUL EXCLUSION ZONE ASSUMED 6m ABOVE CROWN OF TUNNEL. TUNNEL LINING ASSUMED 300mm THCK. SOFFIT OF TUNNEL ASSUMED FROM PLOWMAN AND CRAVEN SURVEY.

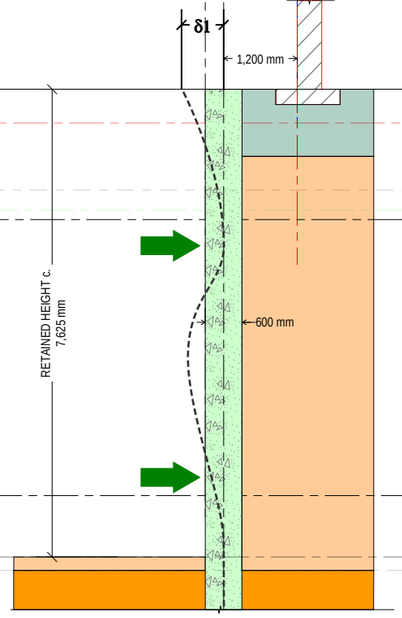


INSIDE FACE OF VAULT WALLS FROM SURVEY
ST THOMAS STREET VAULS
1,200 mm
EXISTING VAULT LVL =+1.975m (TBC)
EXISTING B1 LEVEL SSL=+1.425m (1)
DATUM LVL=+0.00m
PROPOSED B1=-0.15m
150 mm
TOLERANCES:
POSITIONAL = +/-25mm
VERTICALITY (1/75) = 6000/75 = 80mm
(ASSUMED EXCAVATION DEPTH = 6.5m)
RETAINING WALL DEFLECTION = 30mm
TOLERANCES OF RETAINING WALL = 15mm
TOTAL = 150mm
NEW SECANT WALL CONSTRUCTION
TOLERANCE, ALLOW 150mm
PROPOSED B2=-4.65m
EXCAVATION DEPTH LVL = -5.65m
TOE LEVEL OF PILE AS PER SCHEDULE
ASSUMED LEVEL OF LUL EXCLUSION ZONE (5) LVL = -14.2m



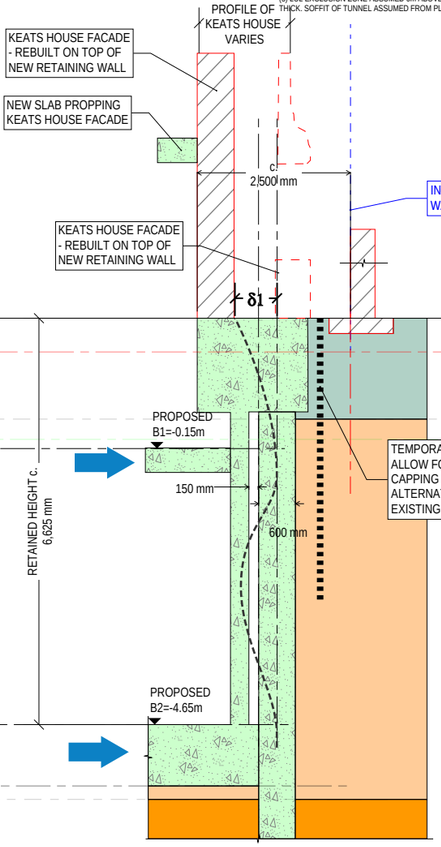
INSIDE FACE OF VAULT WALLS FROM SURVEY
δ1
1,200 mm
600 mm
30°

STAGE 1



INSIDE FACE OF VAULT WALLS FROM SURVEY
δ1
1,200 mm
600 mm
RETAINED HEIGHT c. 7.625 mm

STAGE 2



PROFILE OF KEATS HOUSE VARIES
KEATS HOUSE FACADE - REBUILT ON TOP OF NEW RETAINING WALL
NEW SLAB PROPPING KEATS HOUSE FACADE
c. 2,500 mm
INSIDE FACE OF VAULT WALLS FROM SURVEY
KEATS HOUSE FACADE - REBUILT ON TOP OF NEW RETAINING WALL
δ1
PROPOSED B1=-0.15m
150 mm
600 mm
RETAINED HEIGHT c. 6.625 mm
TEMPORARY SHEET PILLING TO ALLOW FOR CONSTRUCTION OF CAPPING BEAM OR AS AN ALTERNATIVE UNDERPINNING OF EXISTING VAULTS
PROPOSED B2=-4.65m

STAGE 3

LEGEND

- DENOTES PROPOSED CONSTRUCTION
- DENOTES EXISTING CONSTRUCTION
- MADE GROUND
- TERRACE GRAVEL
- LONDON CLAY
- PERMANENT PROP
- TEMPORARY PROP (DESIGN BY OTHERS)

FIG 1.1: SECTION A-A: PROPOSED SECTION OF THE BASEMENT

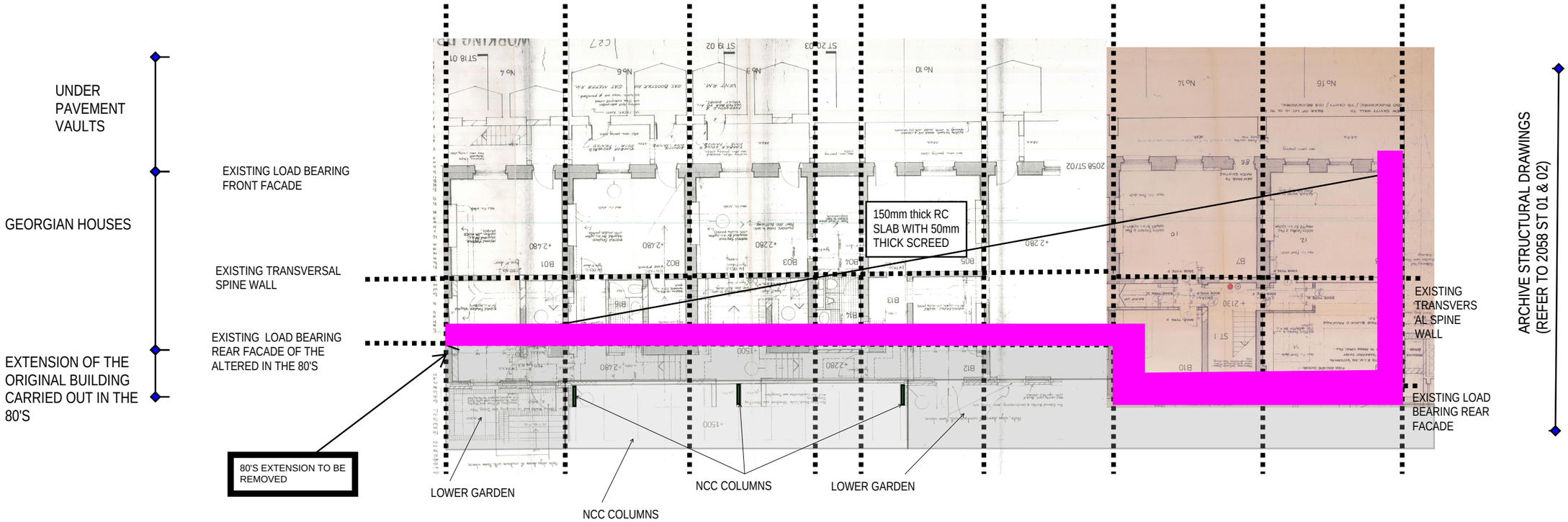
ENABLING WORKS A

REV	DATE	DESCRIPTION	BY	CHECKED
P4	12/11/2018	FOR DISCUSSION	PM	NC

akt II

PROJECT NEW CITY COURT		TITLE RETAINING WALL SEQUENCE	
DATE 12/11/2018	SCALE 1:100 @ A3	CAD FILENAME -	STATUS FOR DISCUSSION
DRAWN RP	CHECKED NC	PROJECT No. 3948	DRAWING No. 3948-SK-132 (SHEET 09 OF 09)	REV P4

NCC | THE GEORGIAN HOUSES - EXTENT OF UNDERPINNING



FOR DEPTH OF UNDERPINNING REFER TO 3948-SK-186
UNDERPINNING TO BE TEMPORARY PROP AS SHOWN INDICATIVELY ON SKETCH 3948-SK-186

REV	DATE	DESCRIPTION	BY	CHECKED

akt II

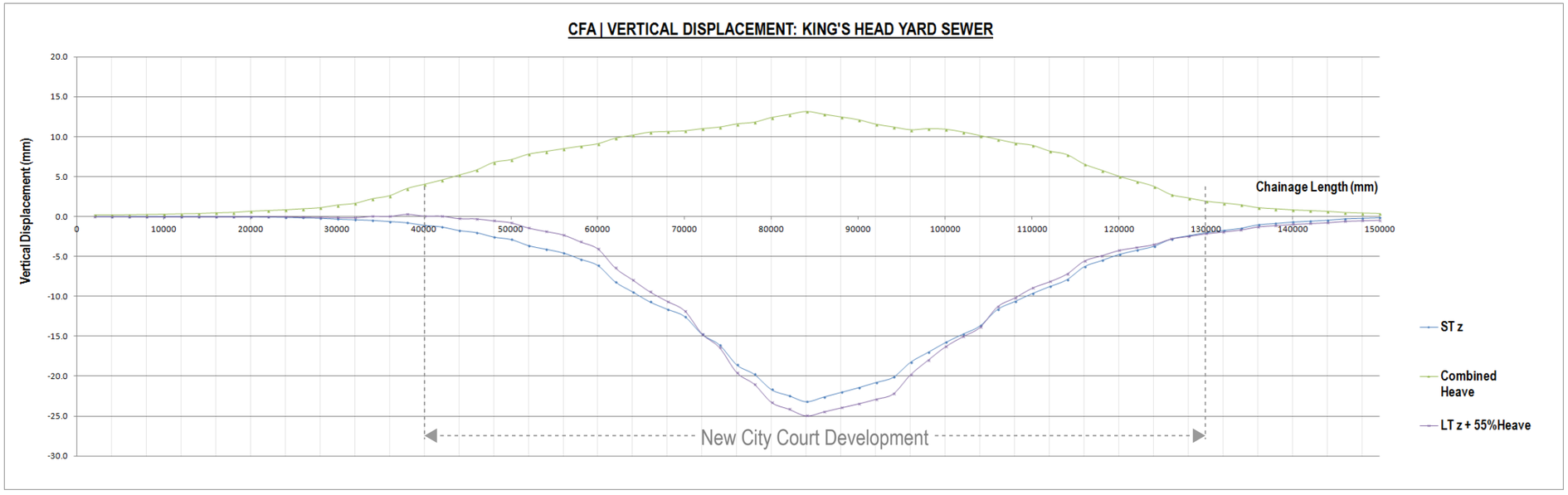
PROJECT	NEW CITY COURT			TITLE	NCC | THE GEORGIAN HOUSES - EXTENT OF UNDERPINNING		
DATE	16/08/2018	SCALE	NTS	CAD FILENAME	-	STATUS	FOR DISCUSSION
DRAWN	PM	CHECKED	NC	PROJECT No.	3948	DRAWING No.	3948-SK-186 (SHEET 01 OF 01)
REV	P1						

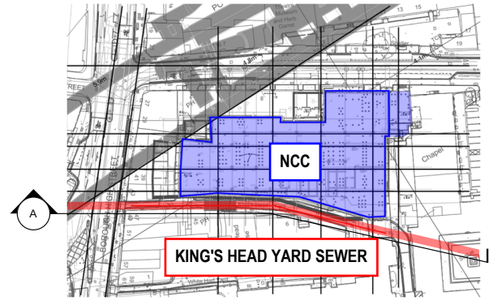
Appendix 6

Thames Water Assets

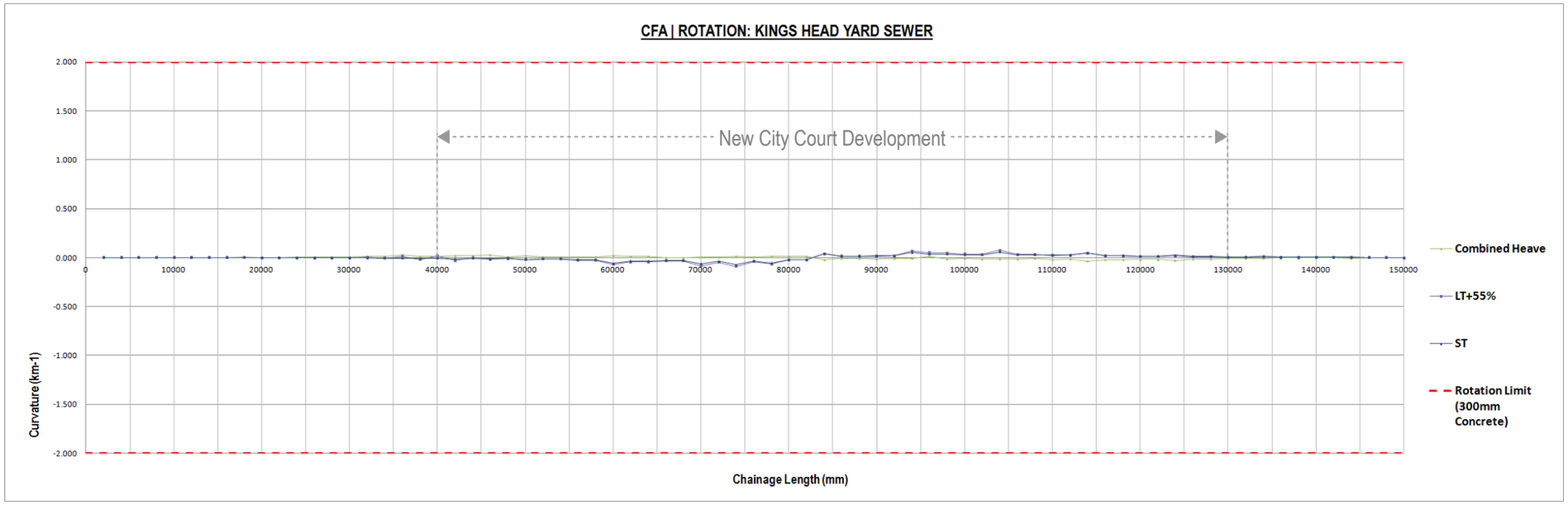
TW ASSETS ANALYSIS | KING'S HEAD YARD SEWER - SOUTH

CFA - PILING FROM B1 LEVEL





KEY PLAN

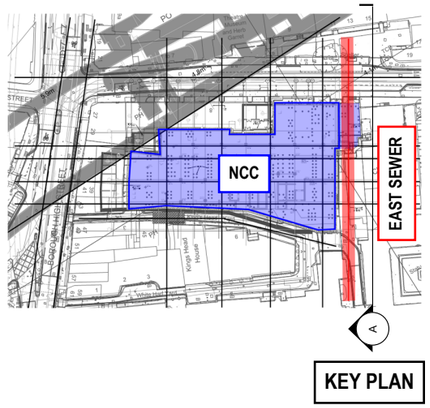


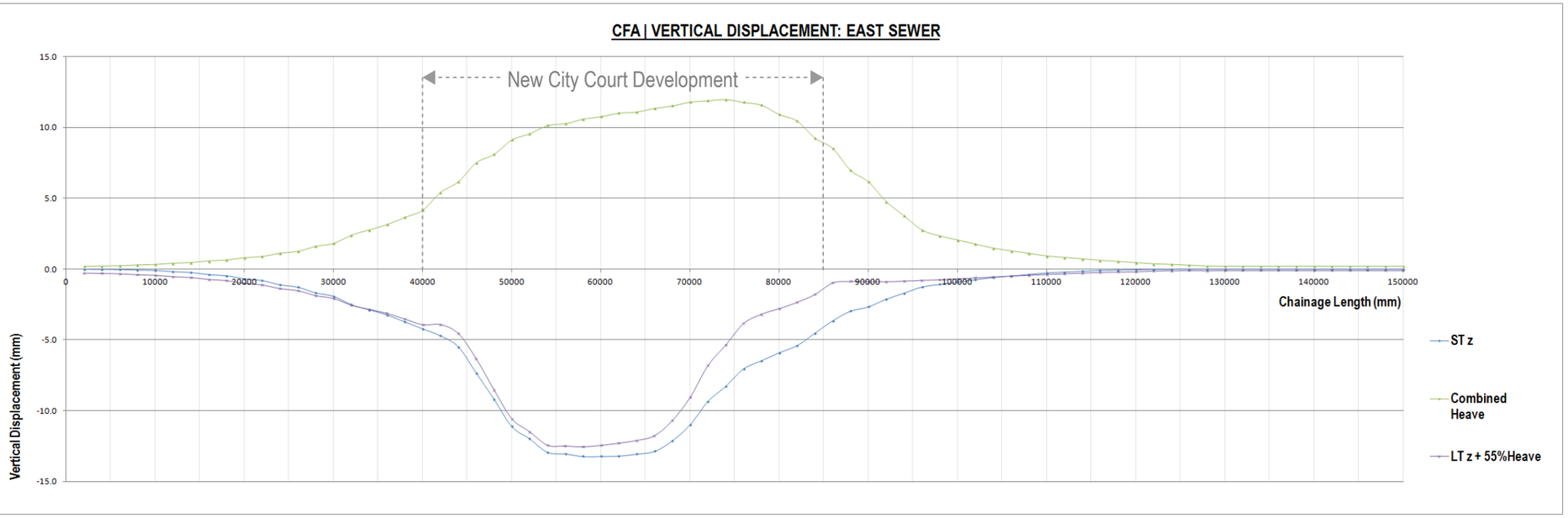
REV	DATE	DESCRIPTION	BY	CHECKED
P1	20/09/2018	FOR DISCUSSION	PM	NC

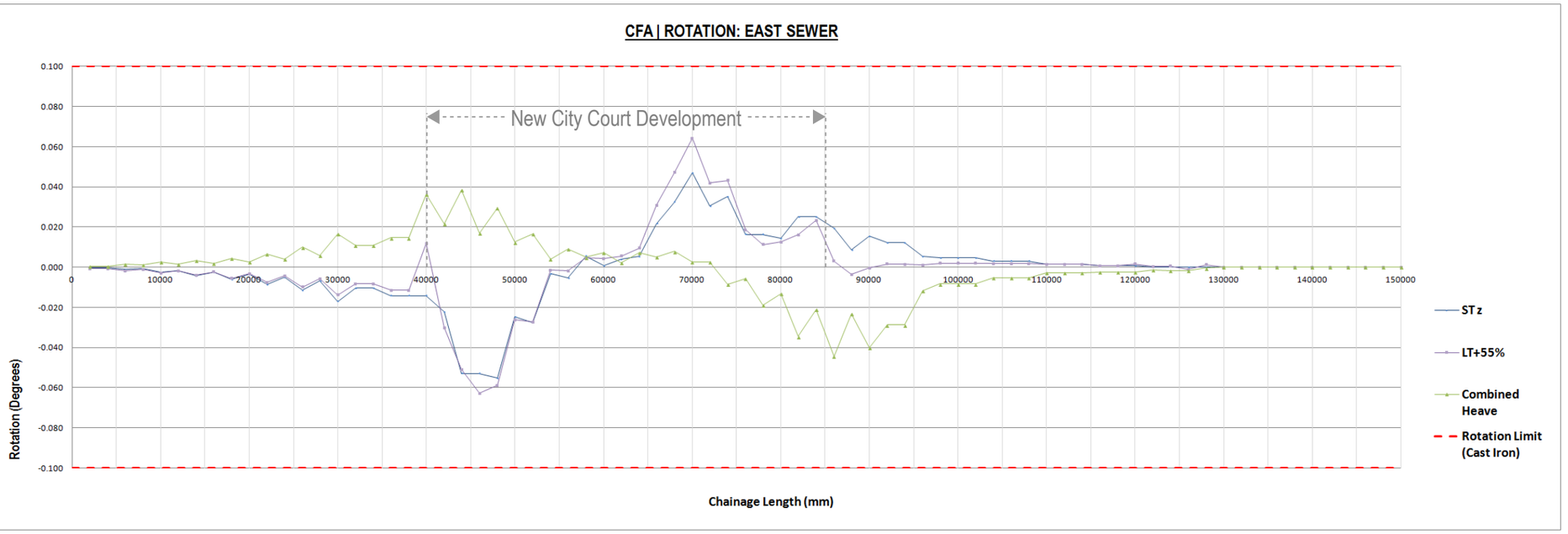
akt II

PROJECT NEW CITY COURT		TITLE TW ASSETS ANALYSIS - KING'S HEAD YARD SEWER	
DATE 20/09/2018	SCALE -	CAD FILENAME -	STATUS FOR DISCUSSION
DRAWN PM	CHECKED NC	PROJECT No. 3948	DRAWING No. 3948-SK-193 (SHEET 01 OF 03)	REV P1

TW ASSETS ANALYSIS | EAST SEWER
CFA - PILING FROM B1 LEVEL







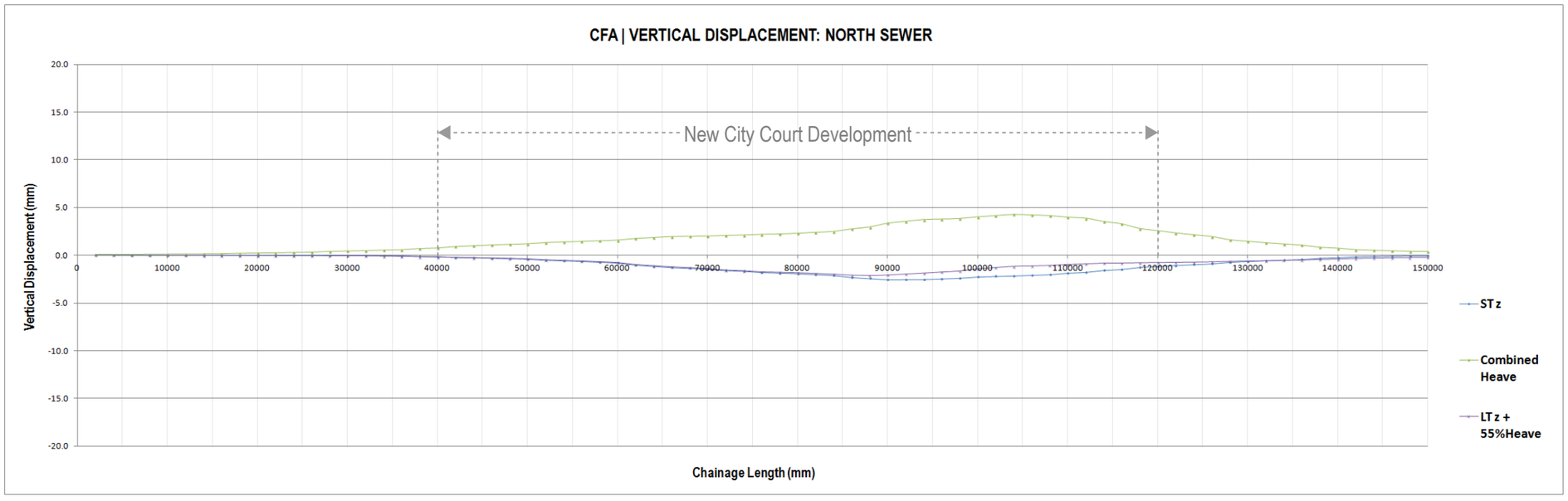
REV	DATE	DESCRIPTION	BY	CHECKED
P1	20/09/2018	FOR DISCUSSION	PM	NC

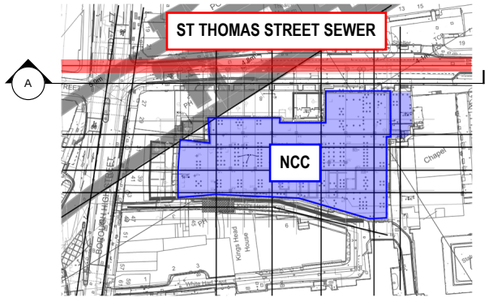
akt II

PROJECT NEW CITY COURT		TITLE TW ASSETS ANALYSIS - EAST SEWER	
DATE 20/09/2018	SCALE -	CAD FILENAME -	STATUS FOR DISCUSSION
DRAWN PM / CHECKED NC	PROJECT No. 3948	DRAWING No. 3948-SK-193 (SHEET 02 OF 03)	REV P1

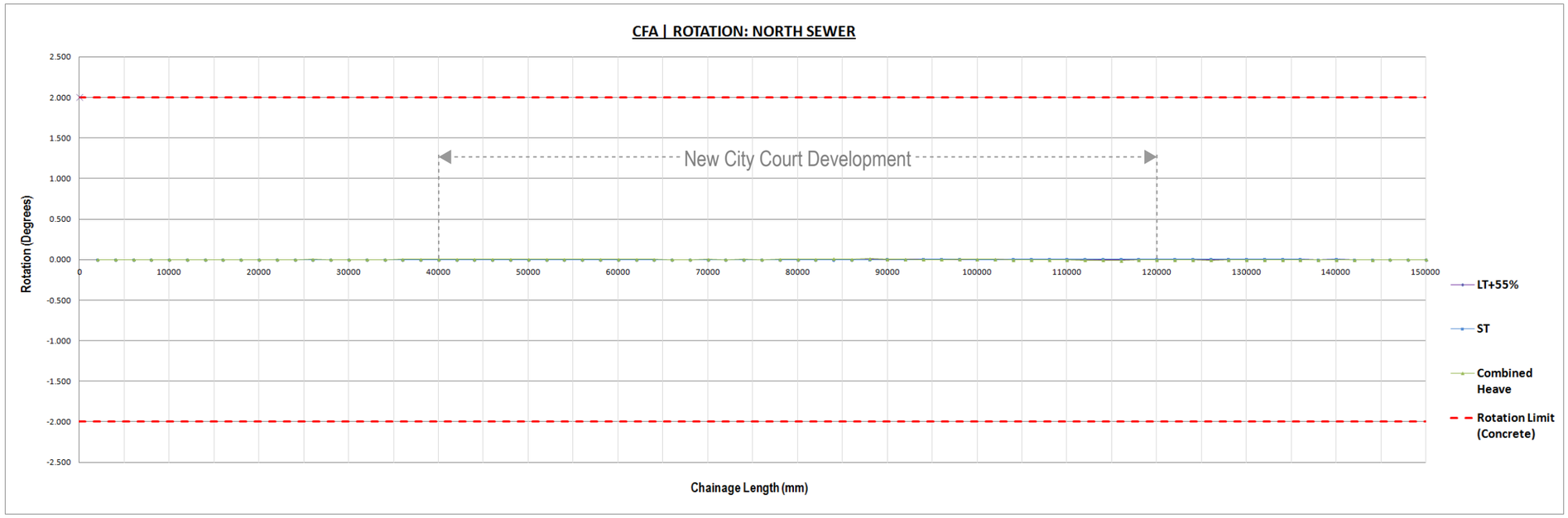
TW ASSETS ANALYSIS | ST THOMAS STREET SEWER - NORTH

CFA - PILING FROM B1 LEVEL





KEY PLAN



REV	DATE	DESCRIPTION	BY	CHECKED
P1	20/09/2018	FOR DISCUSSION	PM	NC

PROJECT NEW CITY COURT		TITLE TW ASSETS ANALYSIS - ST THOMAS STREET SEWER	
DATE 20/09/2018	SCALE -	CAD FILENAME -	STATUS FOR DISCUSSION
DRAWN PM	CHECKED NC	PROJECT No. 3948	DRAWING No. 3948-SK-193 (SHEET 03 OF 03)	REV P1

Appendix 7

Proposal of sewer diversion under Keats House

New City Court

Proposal of Sewer Diversion under Keats House

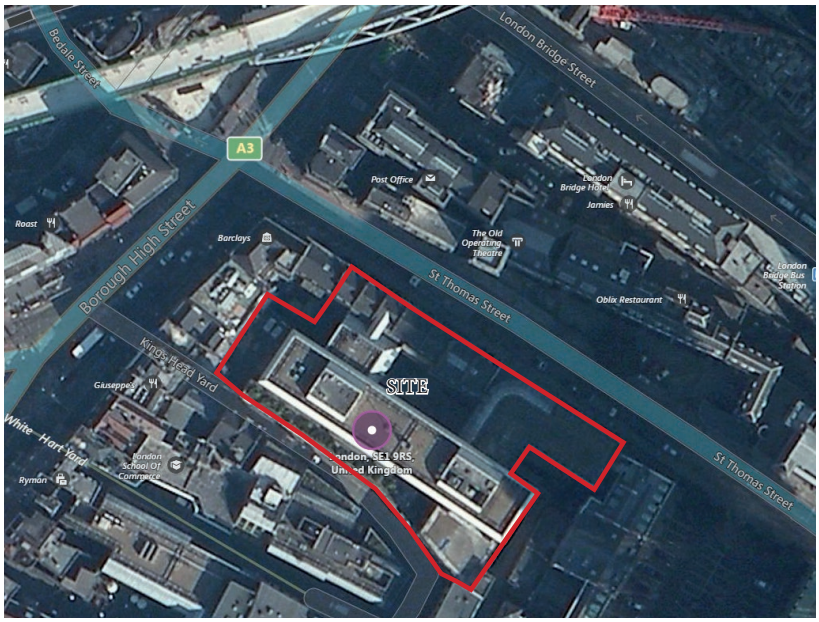
Consulting Structural and Civil Engineers

INTRODUCTION

The site to be redeveloped is located in the borough of Southwark in the London Bridge area. The site boundary lies directly along the South side of St. Thomas Street, between the cross roads of London Bridge Street, East; and Borough High Street, West. It is located adjacent to the Guys' Hospital accommodation and King College Guys' Campus buildings. The Site is bordered by Kings Head Yard, South.

The project proposes to retain and refurbish the existing Georgian terrace houses located from to St. Thomas Street; to demolish New City Court, an existing 6 storey high office block with one level basement in order to build a 35 storey high building; to dismantle the facade on Keats House and reconstructing it approximately 3 meters away from the adjacent building called Coneybare house with a new frame behind it.

The new basement will span throughout the whole site (except under the Gerogian Houses) and will be 2 storey deep. It will replace the existing basement which is 1 storey deep



Site Location

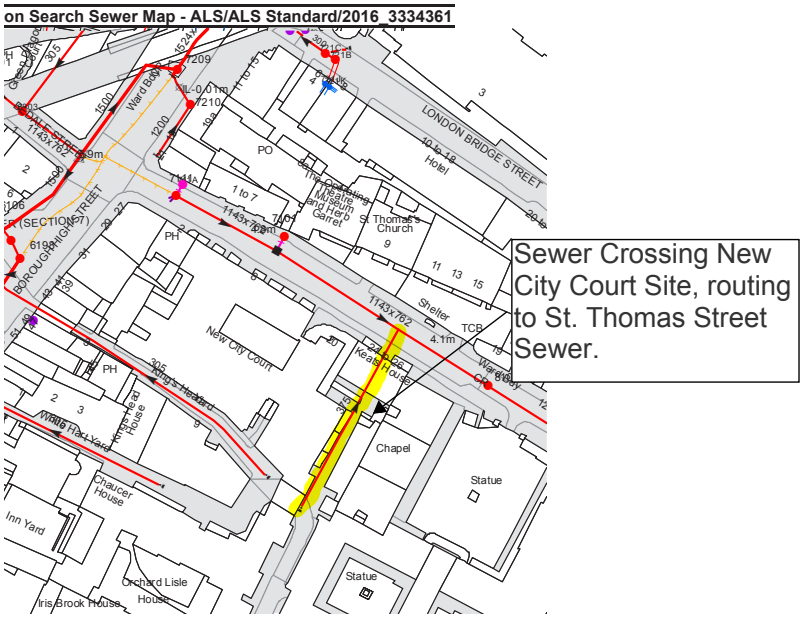
Site Description

EXISTING CONDITION

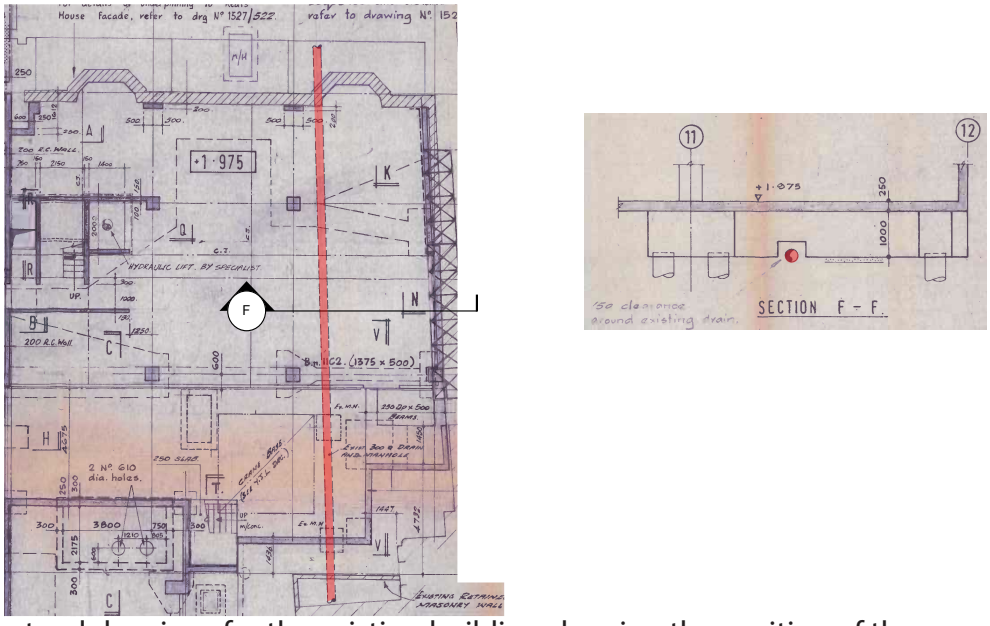
Under the basement of Keats House a 300mm diameter Thames Water sewer runs from the South to the North side, discharging into the main sewer located in St Thomas Street. The current basement slab is 250mm thick RC slab. A notch in the pile caps has been constructed in the previous scheme to allow for the sewer to run underneath.

The sewer runs from a manhole located on the South of building (manhole 39) underneath the building, goes through the manhole situated in the lightwell in front of the building on the north side and discharges into the sewer along St Thomas Street. Three sewers are discharging into the upstream manhole.

A CCTV survey has been carried out for the all pipes running across the site. The survey shows that the pipe underneath the basement is currently in use.`



Existing Sewer Location

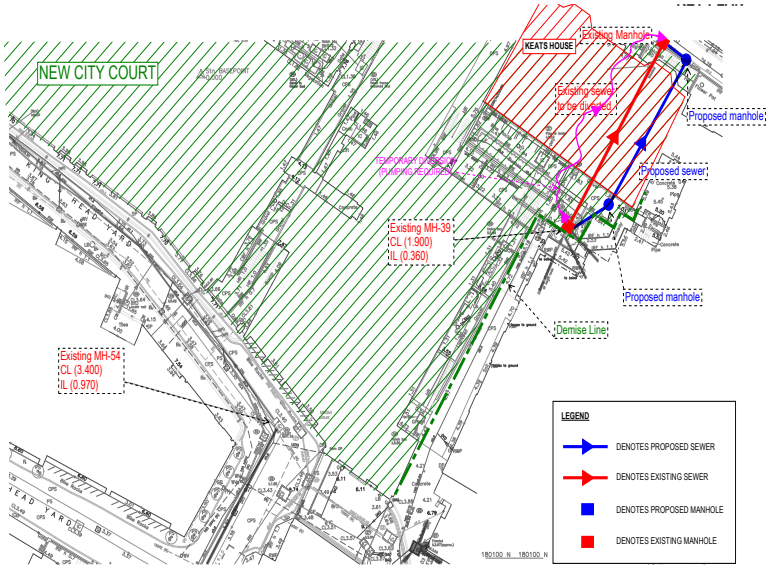


Structural drawings for the existing building showing the position of the sewer

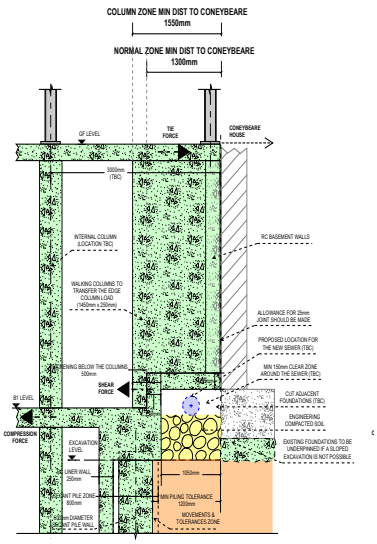
CURRENT PROPOSAL

The sewer is proposed to be diverted under section 185 agreement from manhole 39 (upstream manhole) closer to ConeyBare House, it will run along the party wall and then will be reconnected to the existing manhole located in the lightwell.

The new sewer will be positioned along a corridor which will be approximately 1000mm wide, between the existing party wall and the proposed new structure. The ground floor slab of the new scheme will be cantilever on top of the pipe.



Existing Sewer Diversion



Detail of the sewer in the new location along the party wall

ACCESSIBILITY

Three new inspection manholes will be constructed. Two of them will be on the South side of Keats House and one on the North.

The South side manholes will be available for inspection at ground floor. The existing manhole 39 is currently accessible from the lower garden which is at +1.850 m AOD. It will be then extended up to the proposed ground level to be accessible for inspection.

The North side manhole will be accessible from the pavement level of the lightwell as per the existing arrangement.

Access hatches may be provided in the slab to allow for inspection of the sewee along the segment from the south side to the north side of Keats House

SEQUENCE OF WORKS

An outline for the proposed sequence of works is shown in the following pages.

The internal structural frame of Keats House will be demolished down to the existing basement level. The front facade to St. Thomas street wil be carefully dismantled and then rebuild after the sewer diversion and basement construction as part of the proposed development. Before proceeding with the removal of the basement slab on top the sewer a temporary diversion will be provided to avoid any damage to TW asset. A pump will be installed in the existing South manhole to divert the flow into a rising main. Once the secant piled wall and the excavation of the basement are completed, the installation of the permanent sewer will start together with the construction of the 3 new manholes.

GROUND MOVEMENTS AND MONITORING

A preliminary assessment of the settlement due to the newdevelopment has been carried for different facing and shows that the sewer is located at sufficient distance from the main tower to experience small movements.

More detailed analysis will be carried out in the next stages and submitted to Thames Water as part of the approval process.

During the construction a monitoring regime of the movements of the secant walls will be monitored and a traffic light system will be implemented in accordance with Thames Water guidelines.

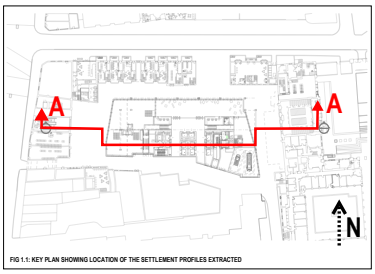
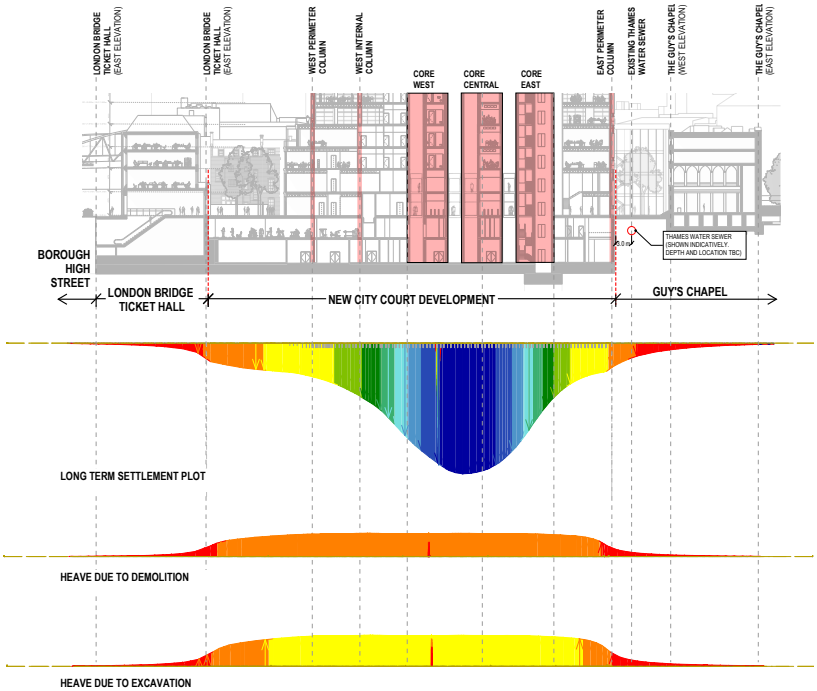


FIG 1.1: KEY PLAN SHOWING LOCATION OF THE SETTLEMENT PROFILES EXTRACTED



Preliminary settlement plots

KEATS HOUSE | BASEMENT CONSTRUCTION STRATEGY
EXISTING CONDITIONS

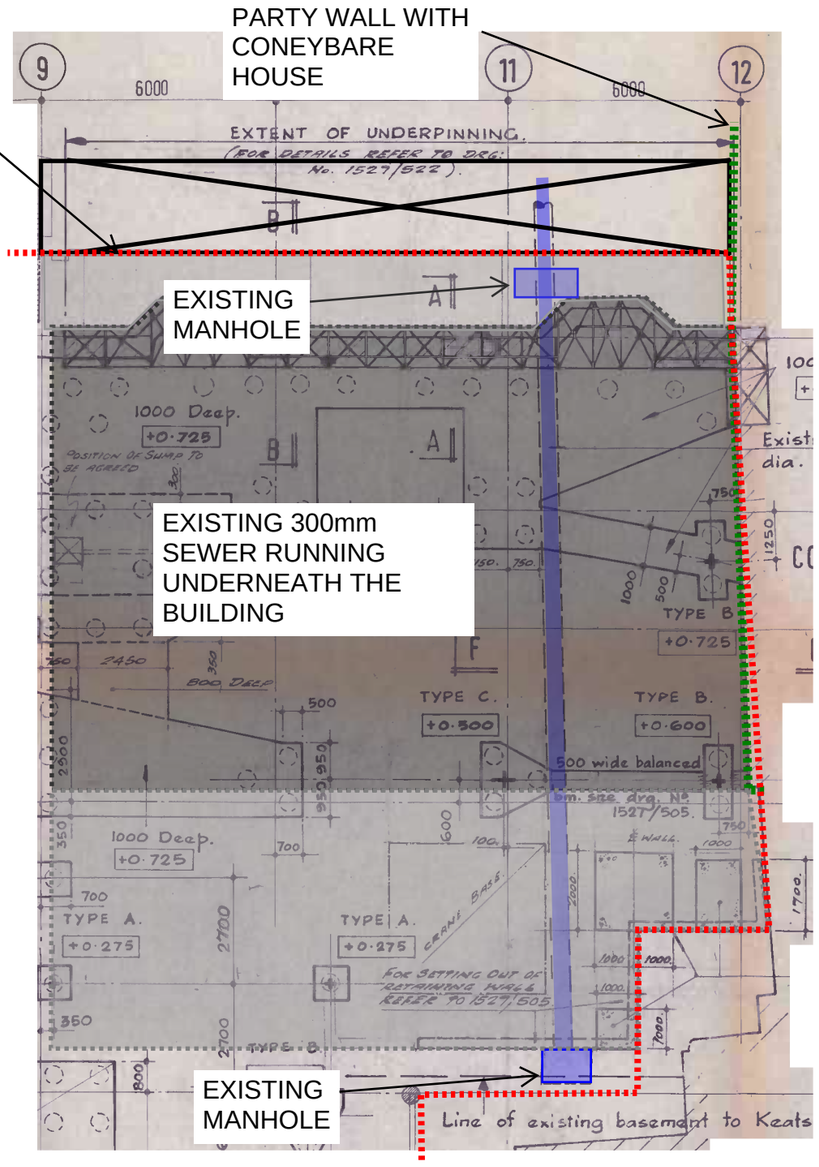
SITE BOUNDARY

EXISTING PAVEMENT VAULTS

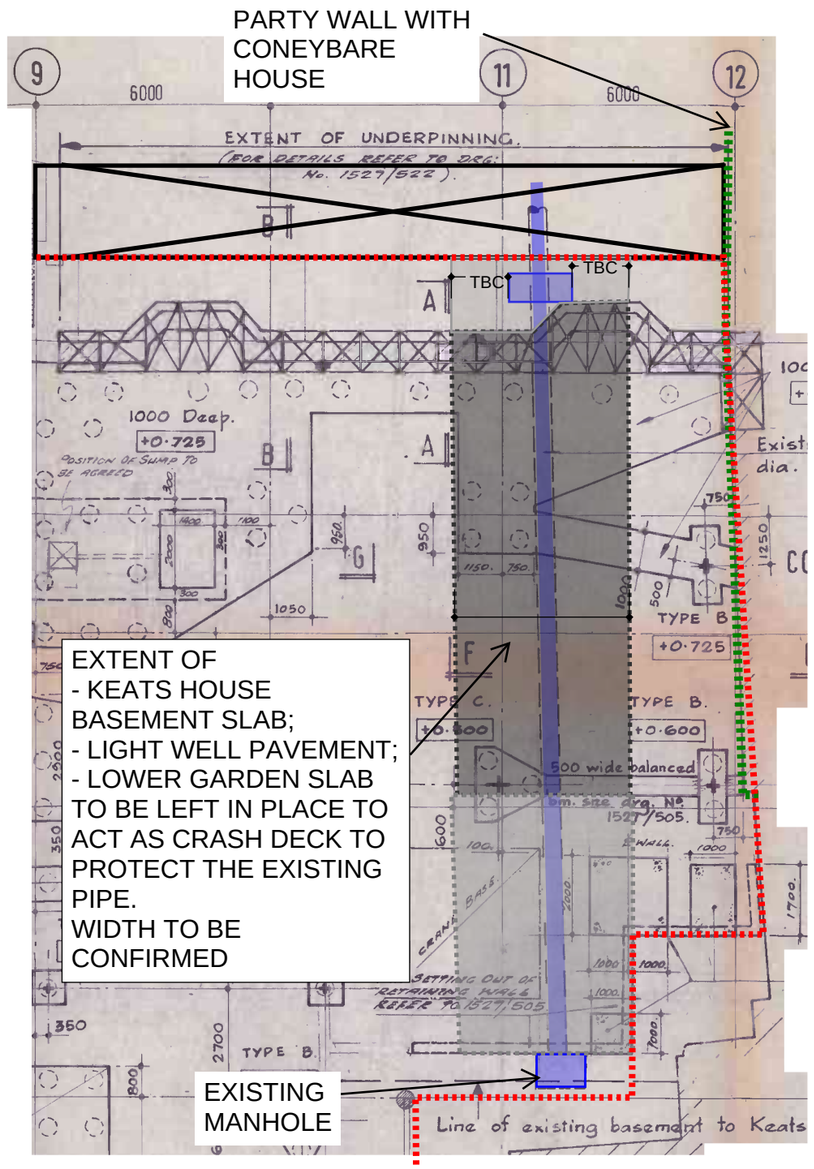
EXISTING LIGHTWELL

EXTENT OF KEATS HOUSE EXISTING BASEMENT

EXTENT OF THE EXISTING LOWER GROUND SLAB



Step 1
Demolition of Keats House down to basement



Step 2
Partial removal of the basement slab

REV	DATE	DESCRIPTION	BY	CHECKED

akt II

PROJECT NEW CITY COURT		TITLE KEATS HOUSE | BASEMENT STRATEGY	
DATE 14/09/2018	SCALE AS SHOWN	CAD FILENAME -	STATUS FOR DISCUSSION
DRAWN PM / CHECKED NC	PROJECT No. 3948	DRAWING No. 3948-SK-187	REV P1

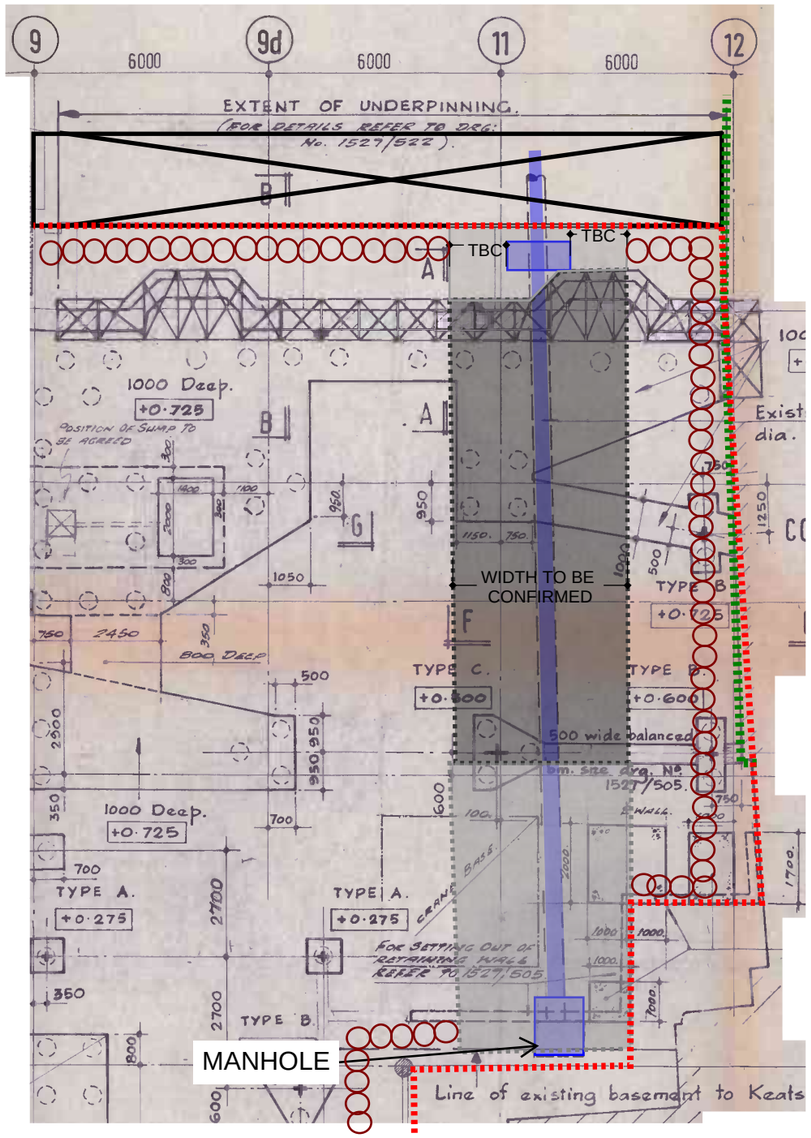
KEATS HOUSE | BASEMENT CONSTRUCTION STRATEGY

EXISTING PAVEMENT VAULTS

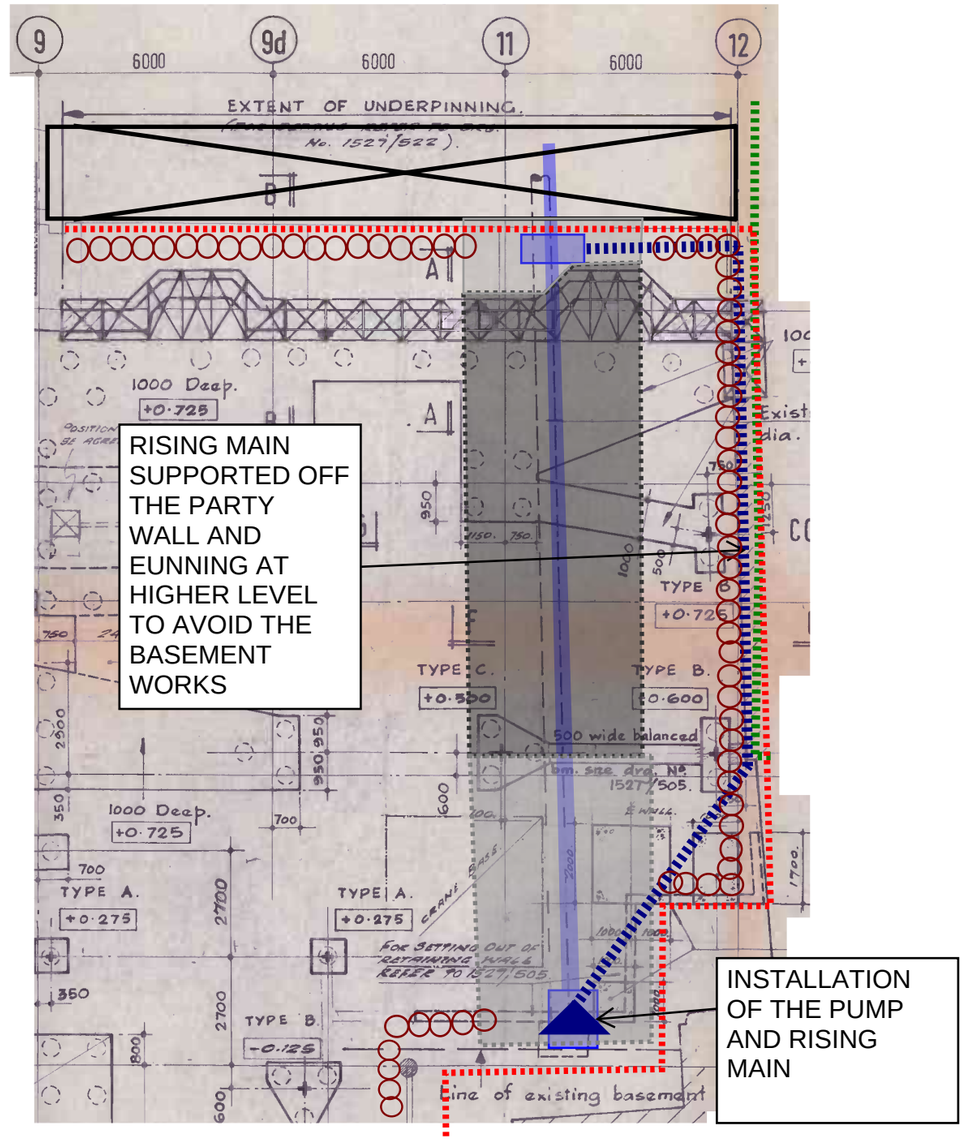
EXISTING LIGHTWELL

EXTENT OF KEATS HOUSE EXISTING BASEMENT

EXTENT OF THE EXISTING LOWER GROUND SLB



Step 3
Secant pile installation (at enough distance from the manhole)



Step 4
Temporary diversion of the sewer

REV	DATE	DESCRIPTION	BY	CHECKED

akt II

PROJECT NEW CITY COURT		TITLE KEATS HOUSE | BASEMENT STRATEGY	
DATE 14/09/2018	SCALE AS SHOWN	CAD FILENAME -	STATUS FOR DISCUSSION
DRAWN PM	CHECKED NC	PROJECT No. 3948	DRAWING No. 3948-SK-187	REV P1

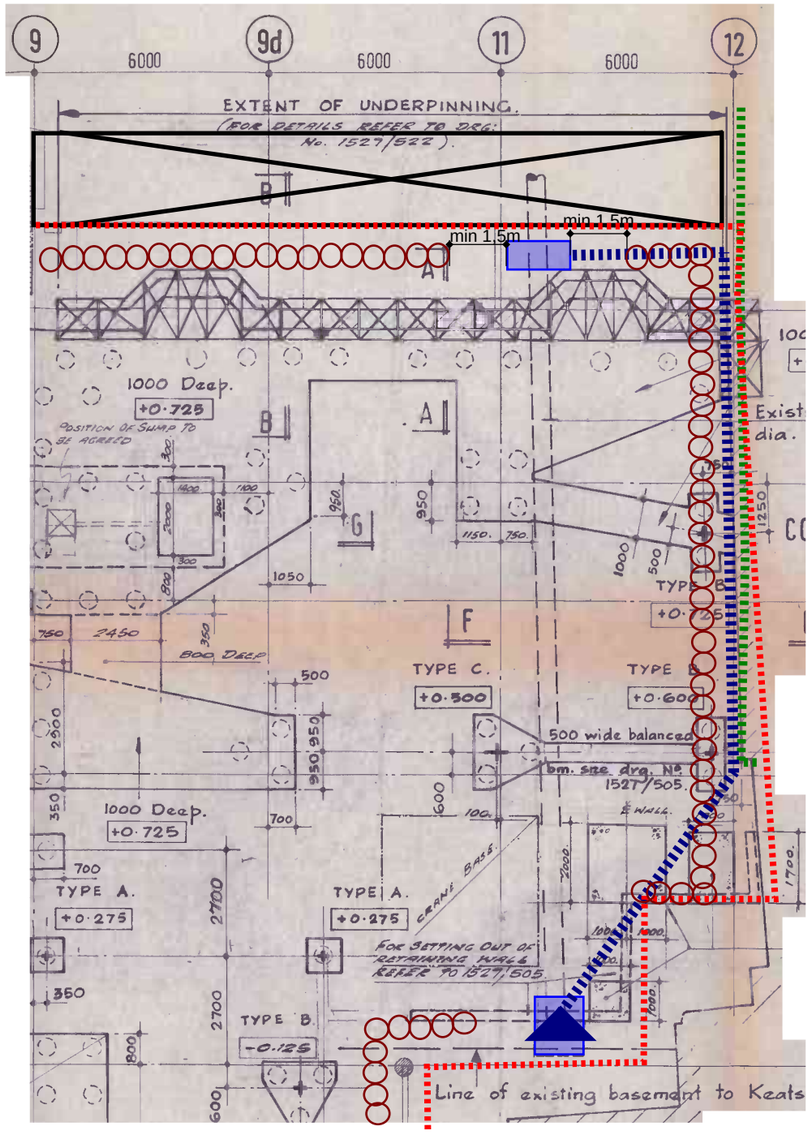
KEATS HOUSE | BASEMENT CONSTRUCTION STRATEGY

EXISTING PAVEMENT VAULTS

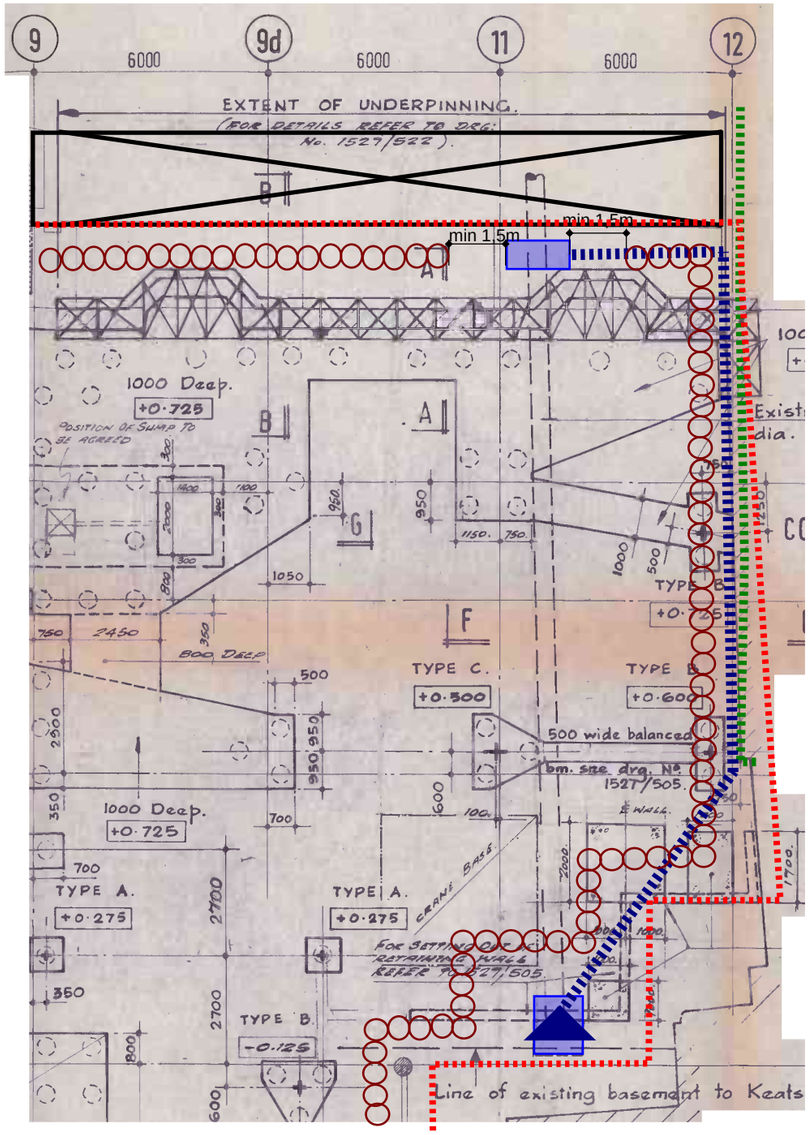
EXISTING LIGHTWELL

EXTENT OF KEATS HOUSE EXISTING BASEMENT

EXTENT OF THE EXISTING LOWER GROUND SLB



Step 5
Removal of the remaining slabs and of the existing sewer



Step 6
Completion of secant piled wall

REV	DATE	DESCRIPTION	BY	CHECKED

akt II

PROJECT NEW CITY COURT		TITLE KEATS HOUSE | BASEMENT STRATEGY	
DATE 14/09//2018	SCALE AS SHOWN	CAD FILENAME -	STATUS FOR DISCUSSION
DRAWN PM / CHECKED NC	PROJECT No. 3948	DRAWING No. 3948-SK-187	REV P1

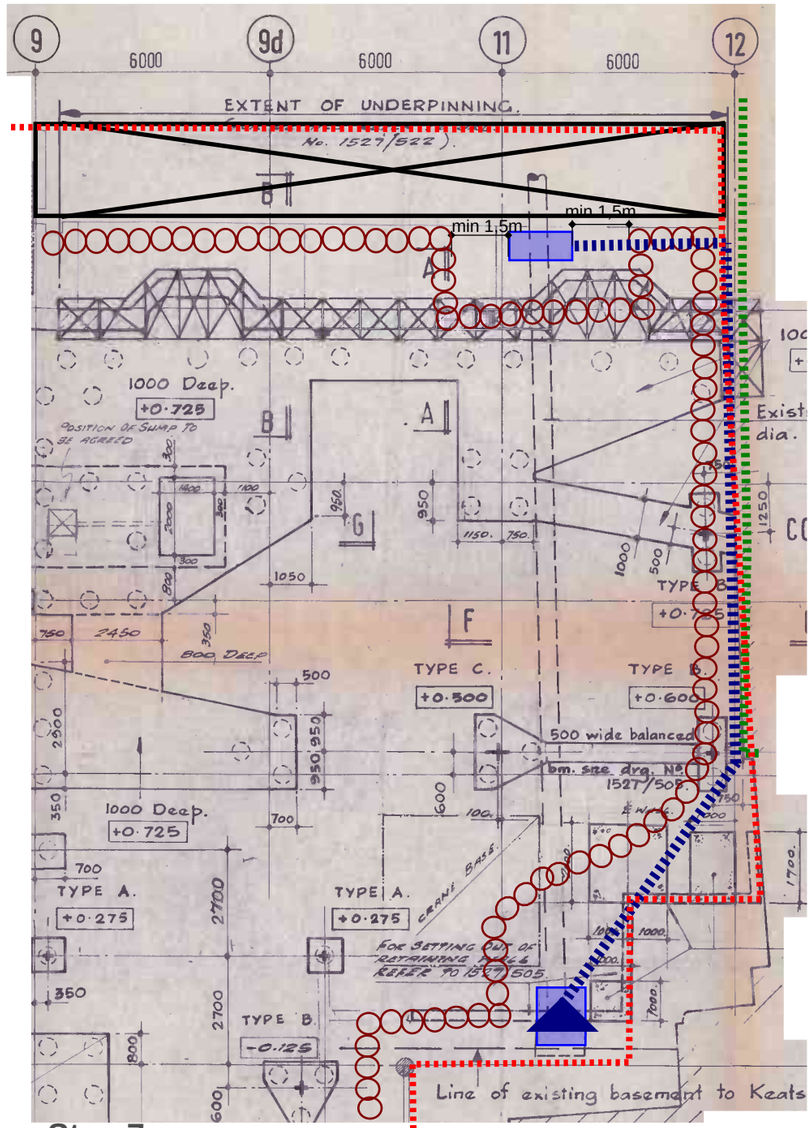
KEATS HOUSE | BASEMENT CONSTRUCTION STRATEGY

EXISTING PAVEMENT VAULTS

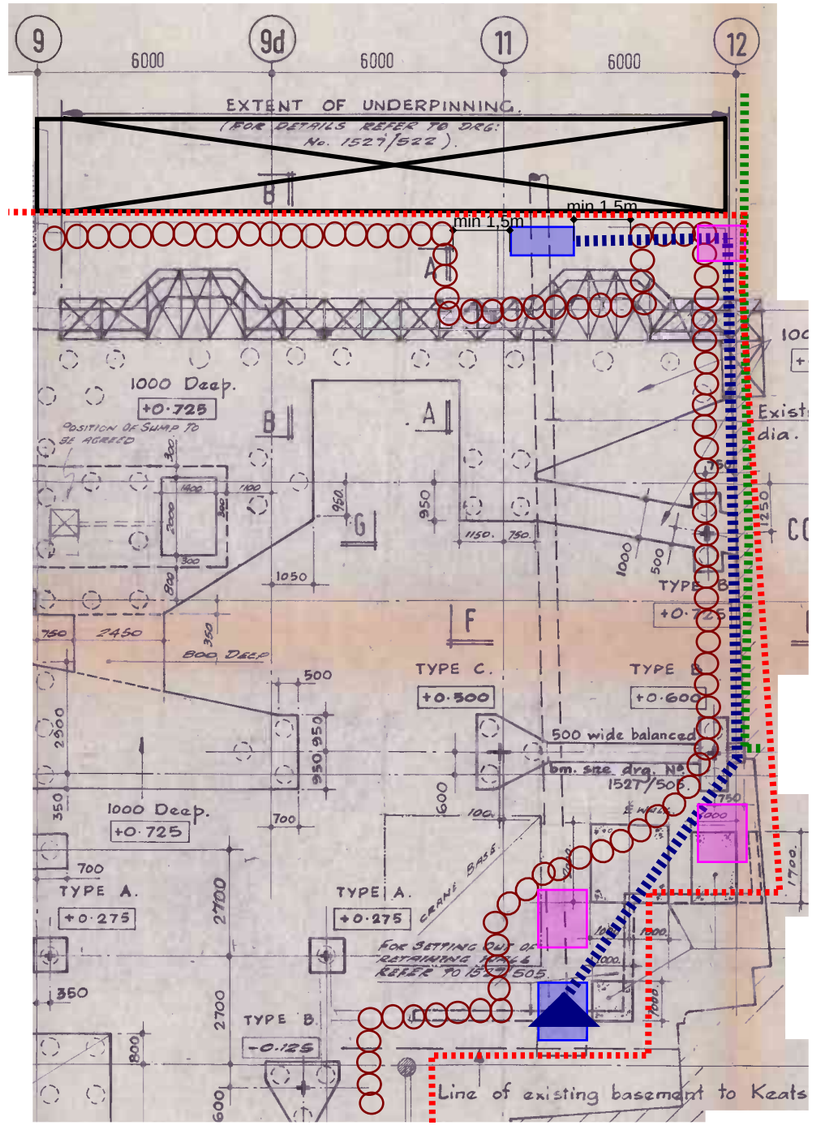
EXISTING LIGHTWELL

EXTENT OF KEATS HOUSE EXISTING BASEMENT

EXTENT OF THE EXISTING LOWER GROUND SLB



Step 7
Start of the basement excavation and cut off the piles to allow for casting of the capping beam



Step 8
Installation of the capping beam and of the manholes

REV	DATE	DESCRIPTION	BY	CHECKED

akt II

PROJECT NEW CITY COURT		TITLE KEATS HOUSE | BASEMENT STRATEGY	
DATE 14/09/2018	SCALE AS SHOWN	CAD FILENAME -	STATUS FOR DISCUSSION
DRAWN PM	CHECKED NC	PROJECT No. 3948	DRAWING No. 3948-SK-187	REV P1

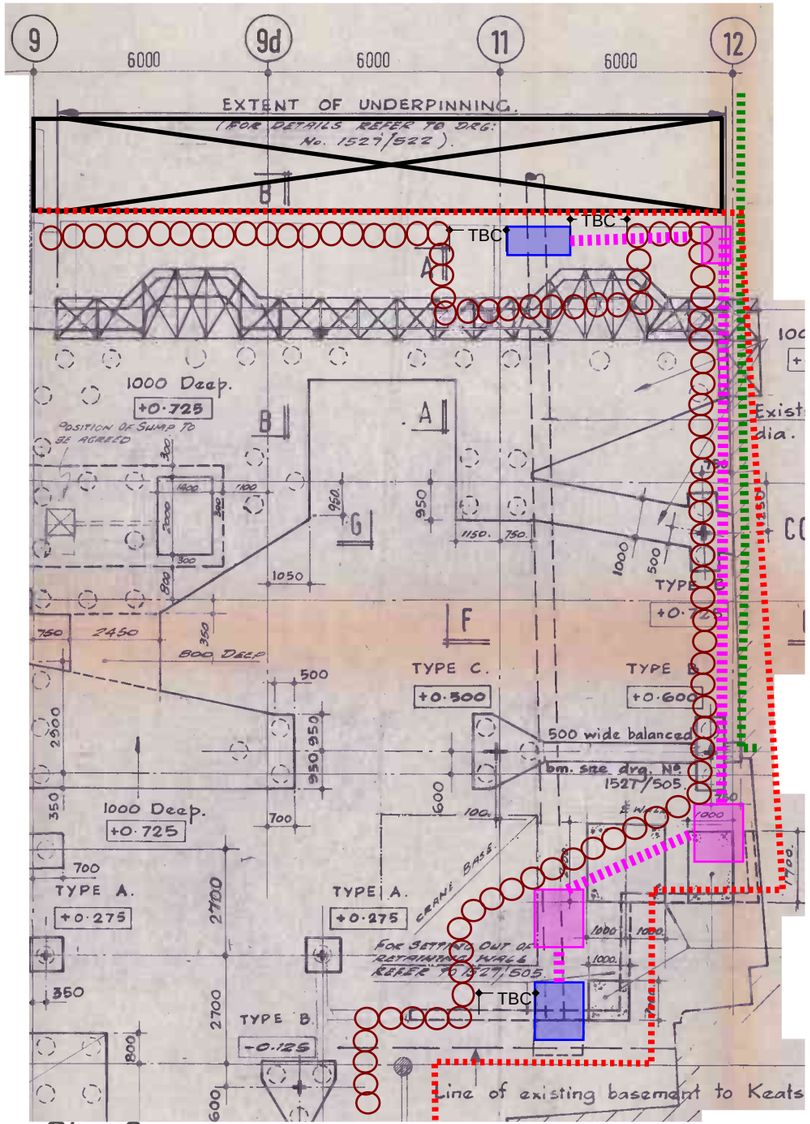
KEATS HOUSE | BASEMENT CONSTRUCTION STRATEGY

EXISTING PAVEMENT VAULTS

EXISTING LIGHTWELL

EXTENT OF KEATS HOUSE EXISTING BASEMENT

EXTENT OF THE EXISTING LOWER GROUND SLB

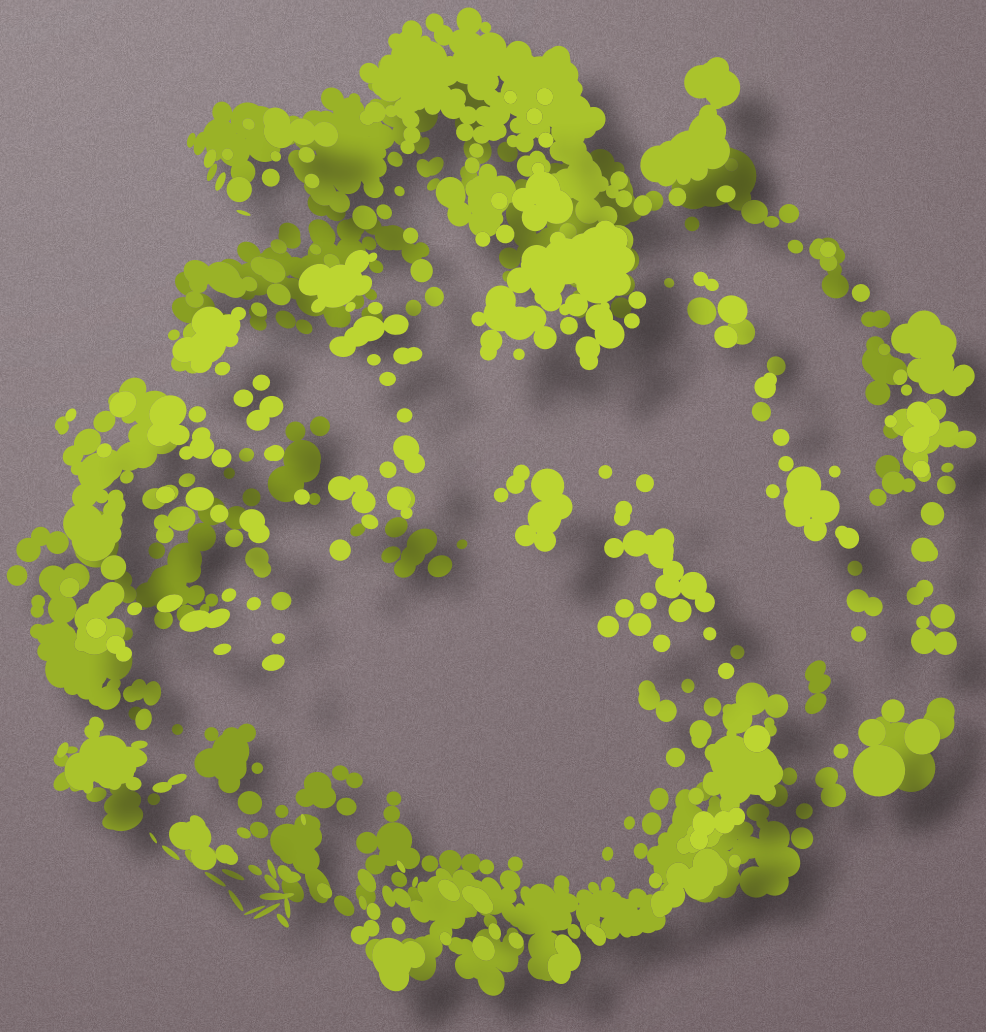


Step 9
Installation of the new sewer

REV	DATE	DESCRIPTION	BY	CHECKED

akt II

PROJECT NEW CITY COURT		TITLE KEATS HOUSE | BASEMENT STRATEGY	
DATE 14/09/2018	SCALE AS SHOWN	CAD FILENAME -	STATUS FOR DISCUSSION
DRAWN PM	CHECKED NC	PROJECT No. 3948	DRAWING No. 3948-SK-187	REV P1



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info@akt-uk.com

Appendix 8

London Underground Assets

SUMMARY OF INFORMATION ON TFL ASSETS

SUMMARY OF ASSETS

BOROUGH HIGH STATION AT STREET LEVEL (+5.28m AOD) **---> REFER TO SHEET 04**

BOROUGH HIGH STATION AT TICKET HALL LEVEL (-2.00m AOD)

JUBILEE LINE ESCALATOR TUNNEL

Tunnel	Tunnel Direction	Construction	Assumed Internal Diameter (m)	Assumed External Diameter (m)	Crown level of tunnel	Existing Ground Level	Approx Depth Below Ground
Jubilee Line Running Tunnel	London Bridge <-> Southwark Westbound and Eastbound	Assumed 350mm thick RC tunnel (Ref1&2)	4.3m Wide 4.1m High (Ref1&2)	5.0m Wide 4.8m High (Ref1&2)	Internal crown level = c.-21m AOD (Ref 3)	c.+5.0m,	c.26m
Jubilee Line Station Tunnel	Westbound Platform	Segmental Cast Iron	7.7m diameter (Ref4)	8.0m (Ref5)	Internal crown level = c.-17.65m AOD (Ref 3)	c.+4.7m,	c.22m
Northern Line Running Tunnel	Borough -> London Bridge Northbound	Segmental Cast Iron	3.7m diameter (Ref6)	4.0m diameter (Ref6)	External crown of tunnel = c.-16.585 AOD (Ref6)	c.+5.0m	c22m

(1) Ref 104-B-05-12-601-0
(2) Ref 104-B-05-12-601-0
(3) PLOWMAN AND CRAVEN SURVEY DRAWING 35722T-01-1 REV A, DATED 28 JULY 2016
(4) 104--a--01--10--206-a
(5) 104--a--00--12--706-a
(6) 104--a--02--10--305-a

NOTES

01) XXX

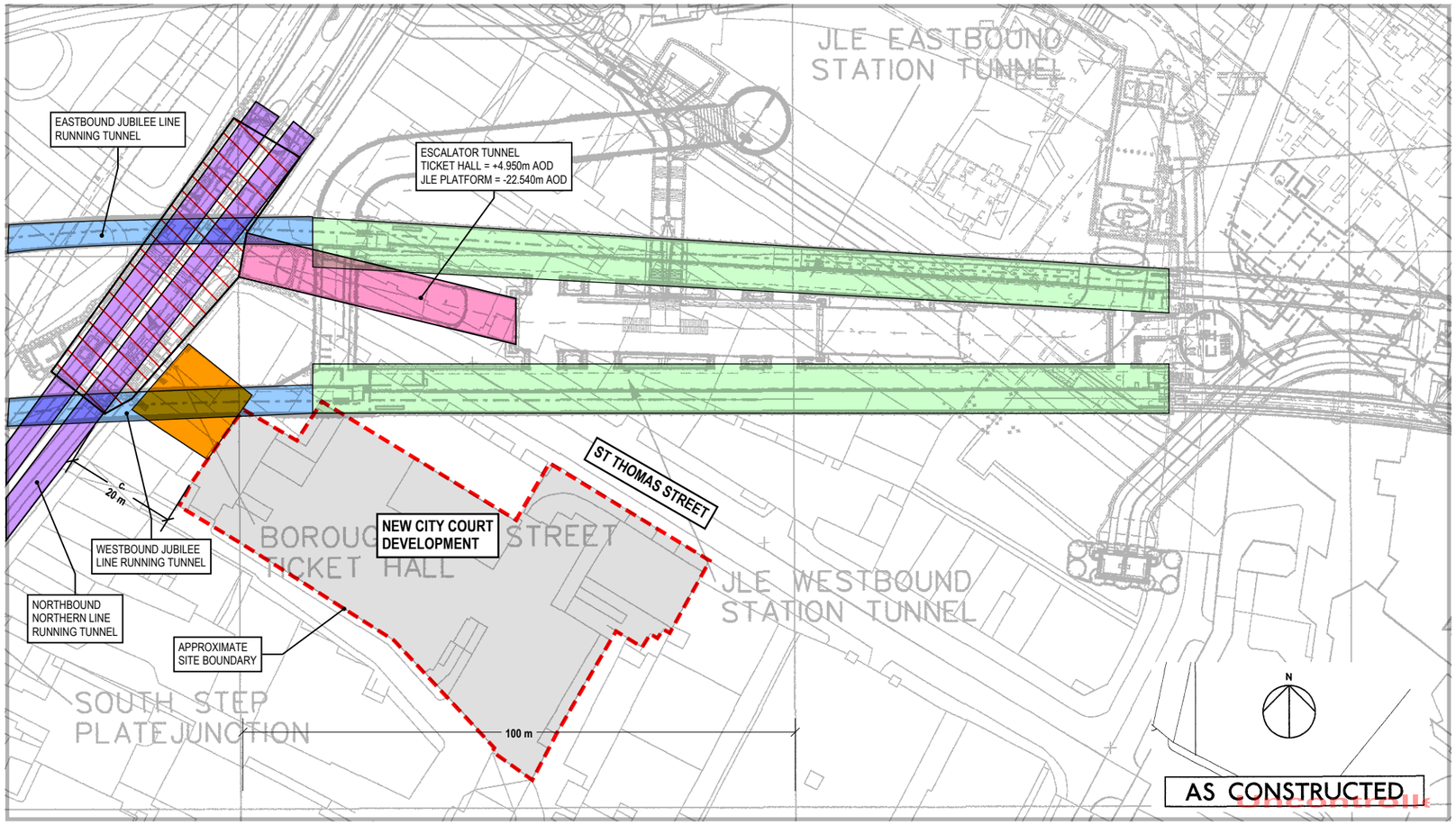

FIG 1.2: LONDON BRIDGE STATION GENERAL LAYOUT
REFERENCE 104--a--00--10--200-a (SCALE 1:1000)

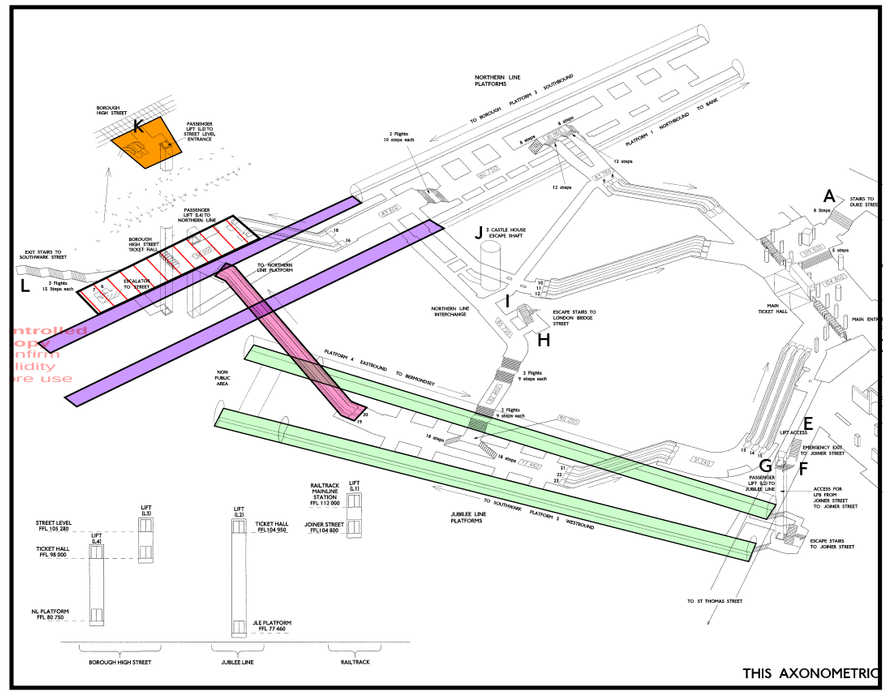

FIG 1.1: TFL DRAWING 104--a--00--17--001-a-Key Plan of Assets

REV	DATE	DESCRIPTION	BY	CHECKED
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JUBILEE LINE INFORMATION

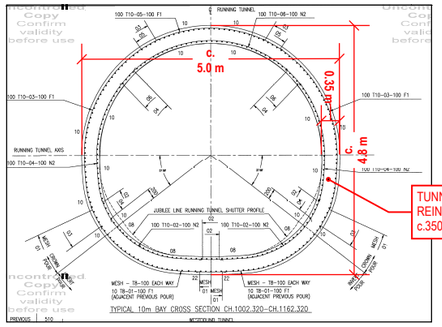


FIG 1.1: WESTBOUND RUNNING TUNNEL SECTION. EXTRACTS FROM LUL DRAWING 104-B-05-12-601-0

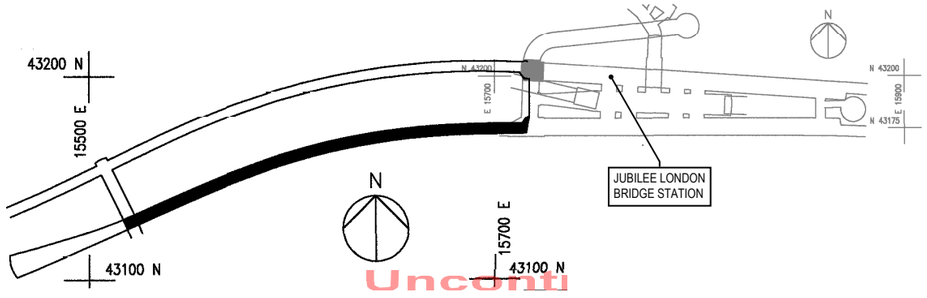


FIG 1.1A EXTRACTS FROM LUL DRAWING 104-B-05-12-601-0 SPLICED WITH 104--b--01--12--613-0 TO SHOW LOCATION OF STATION

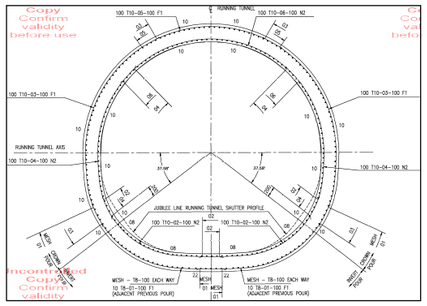


FIG 1.2 EASTBOUND RUNNING TUNNEL SECTION. EXTRACTS FROM LUL DRAWING 104-B-05-12-602-0

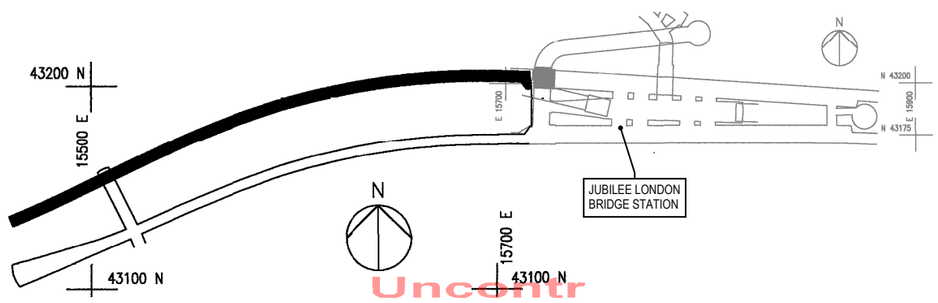
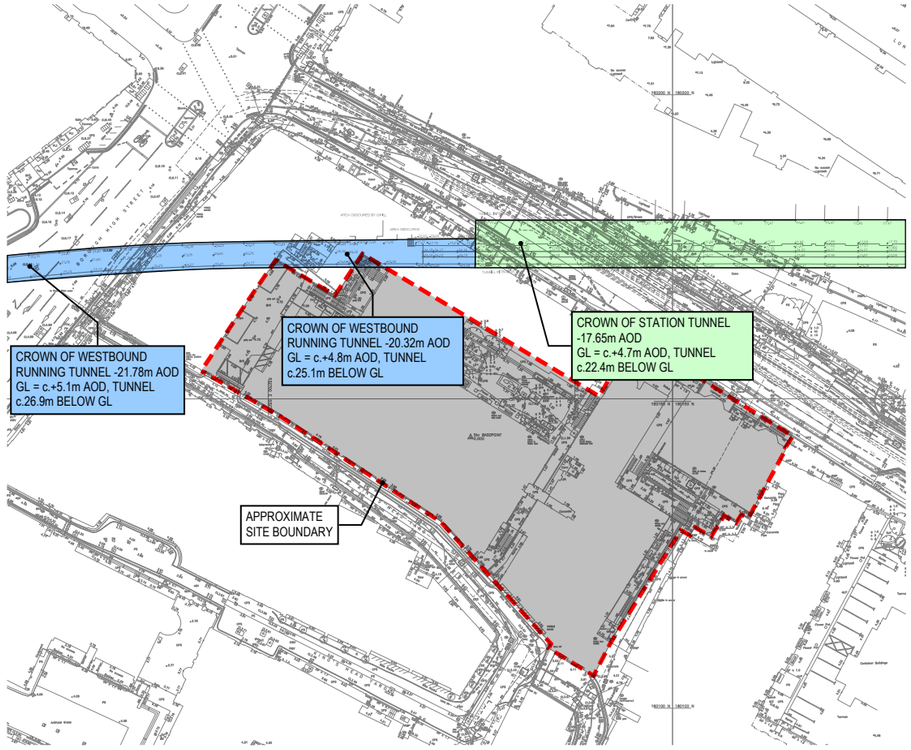


FIG 1.2A EXTRACTS FROM LUL DRAWING 104-B-05-12-602-0 SPLICED WITH 104--b--01--12--613-0 TO SHOW LOCATION OF STATION



CORRELATION SURVEY TAKEN FROM PLOWMAN AND CRAVEN SURVEY DRAWING 35722T-01-1 REV A, DATED 28 JULY 2016

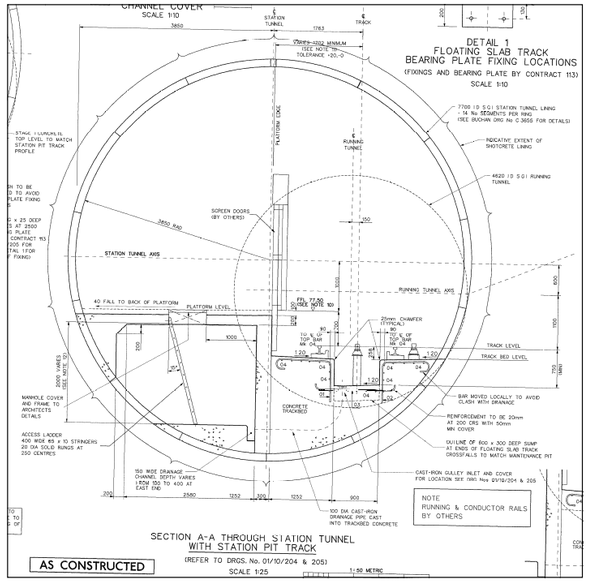


FIG 1.3: EXTRACTS FROM LUL DRAWING 104--a--01--10--206-a London Bridge Stn

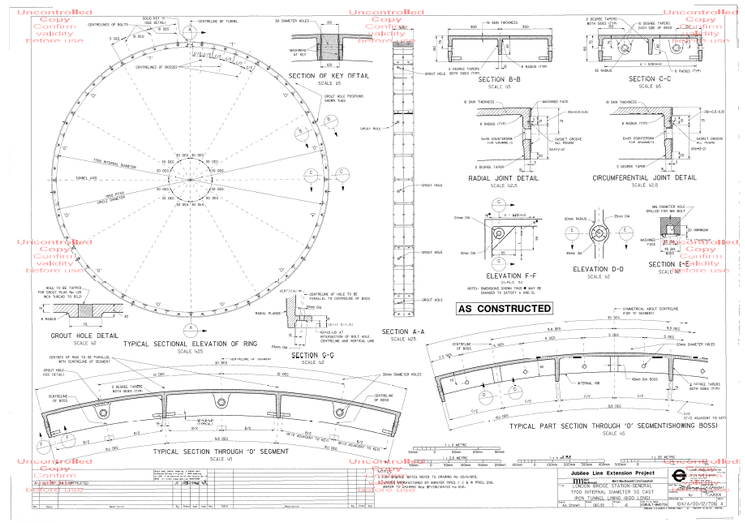


FIG 1.4: DETAILS OF STATION LINING DRAWING 104--a--00--12--706-a

NOTES

01) XXX

REV	DATE	DESCRIPTION	BY	CHECKED
P1	14/09/2017	FOR DISCUSSION	RP	-

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DATE 14/09/2017	SCALE -	CAD FILENAME -	STATUS FOR DISCUSSION
DRAWN RP	CHECKED -	PROJECT No. 3948	DRAWING No. 3948-SK-137 (SHEET 02 OF 04)
			REV P1

NORTHERN LINE INFORMATION

NOTES

01) XXX

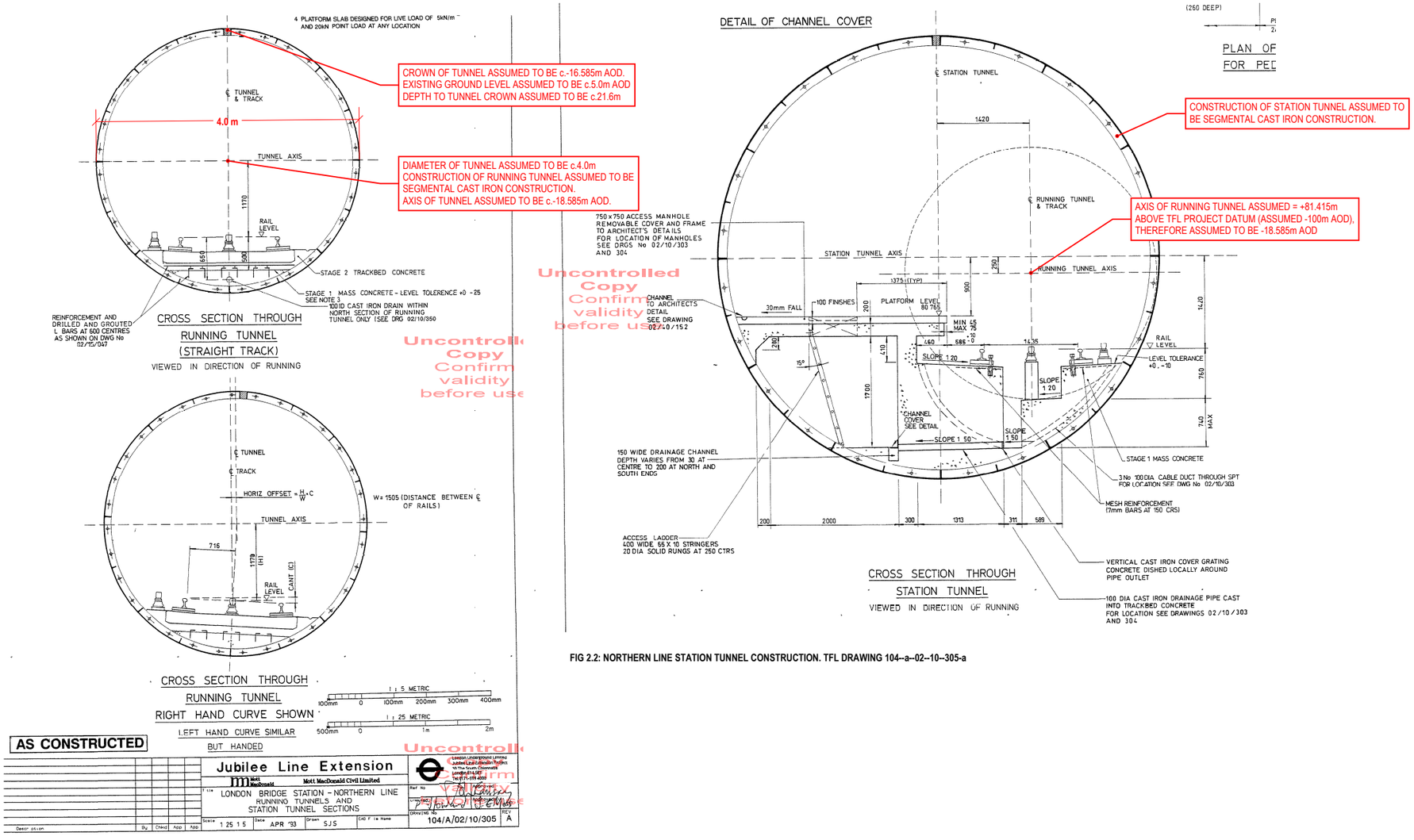

FIG 2.1: NORTHERN LINE RUNNING TUNNEL CONSTRUCTION. TFL DRAWING 104--a--02--10--305-a

FIG 2.2: NORTHERN LINE STATION TUNNEL CONSTRUCTION. TFL DRAWING 104--a--02--10--305-a

REV P1 DATE 14/09/2017 DESCRIPTION FOR DISCUSSION BY RP CHECKED -

PROJECT NEW CITY COURT		TITLE SUMMARY OF INFORMATION OF TFL ASSETS	
DATE 14/09/2017	SCALE -	CAD FILENAME -	STATUS FOR DISCUSSION
DRAWN RP	CHECKED -	PROJECT No. 3948	DRAWING No. 3948-SK-137 (SHEET 03 OF 04) REV P1

BOROUGH HIGH STREET TICKET HALL STATION

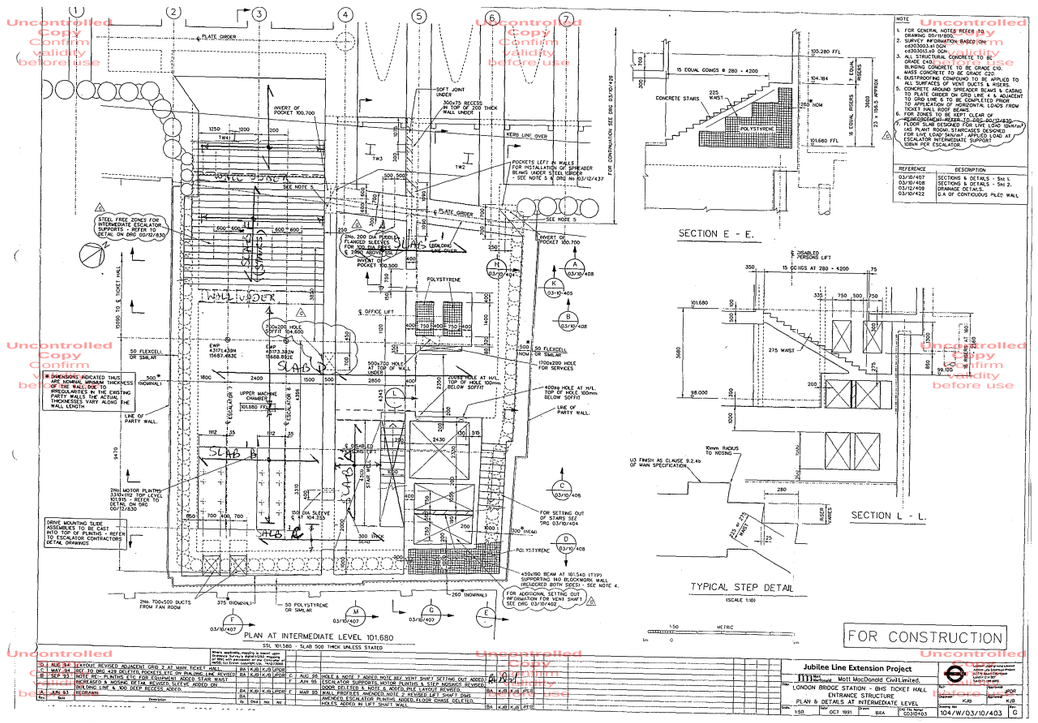

FIG 3.1: INTERMEDIATE FLOOR LEVEL

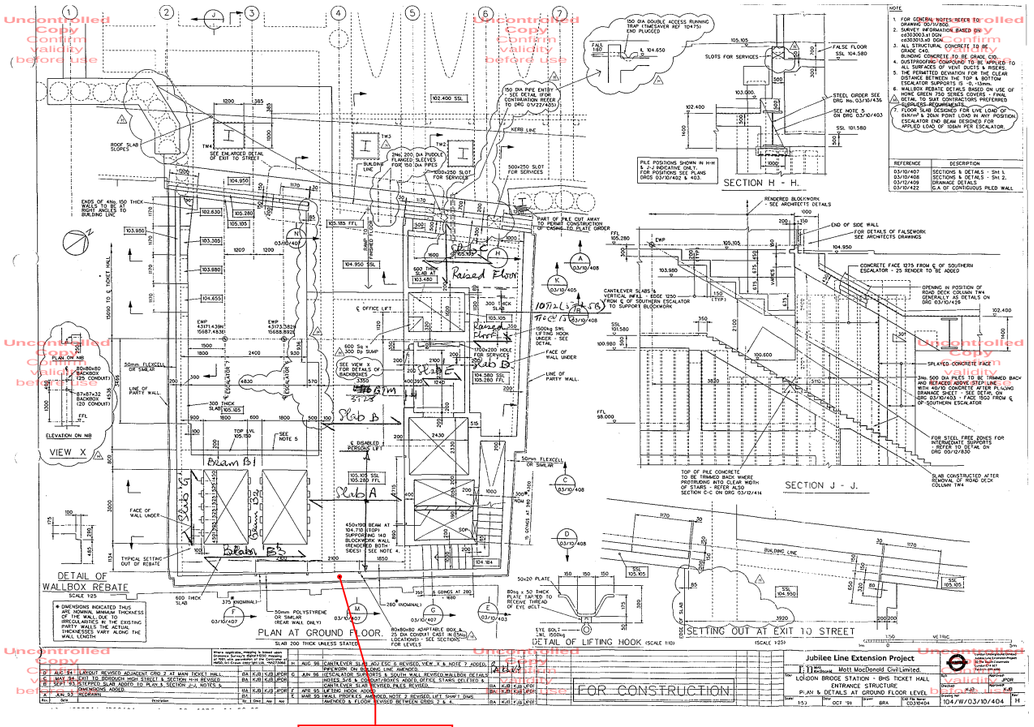

FIG 3.2: GROUND FLOOR LEVEL

DRAWING INDICATES 260 to 375mm THICK RC WALL

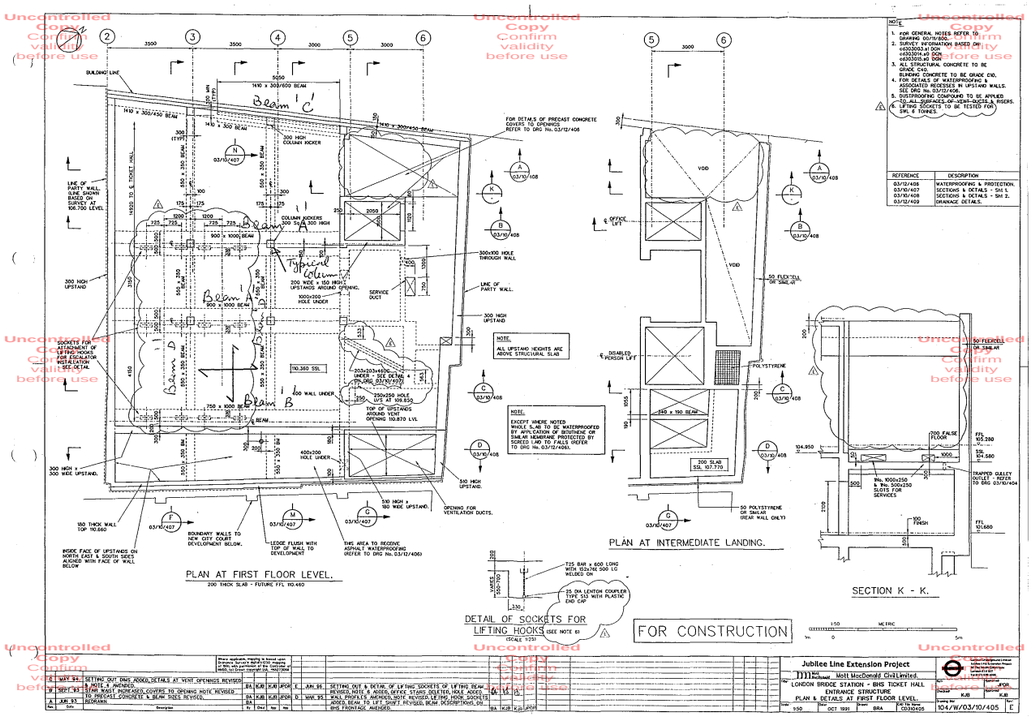

FIG 3.3: FIRST FLOOR LEVEL

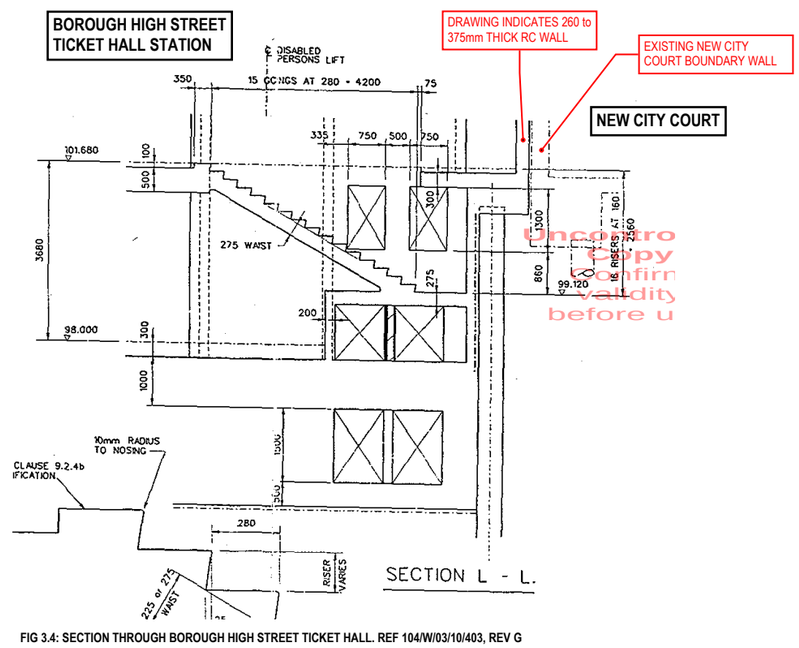

FIG 3.4: SECTION THROUGH BOROUGH HIGH STREET TICKET HALL. REF 104/W/03/10/403, REV G

NOTES

01) XXX

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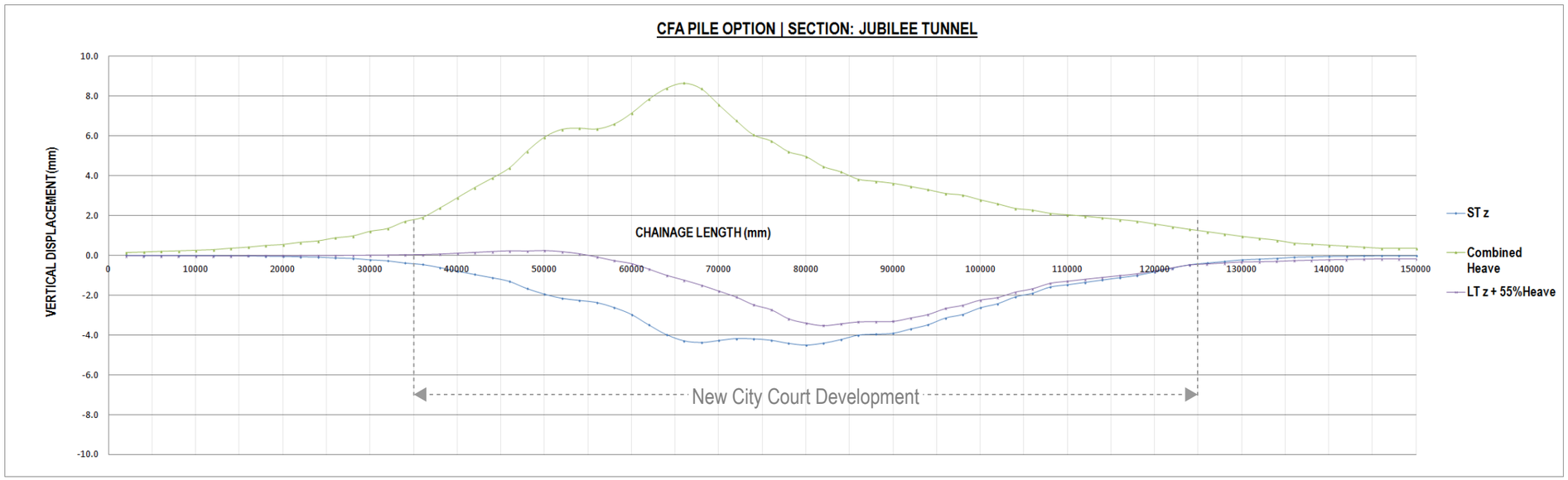
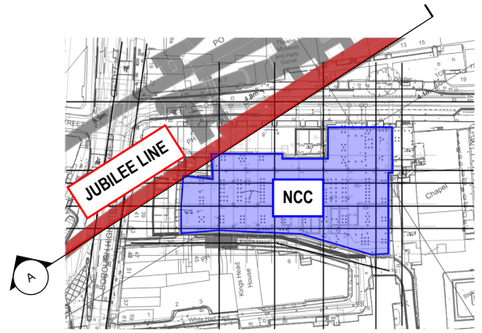
PROJECT NEW CITY COURT		TITLE SUMMARY OF INFORMATION OF TFL ASSETS	
DATE 14/09/2017	SCALE -	CAD FILENAME -	STATUS FOR DISCUSSION
DRAWN RP	CHECKED -	PROJECT No. 3948	DRAWING No. 3948-SK-137 (SHEET 04 OF 04)
			REV P1

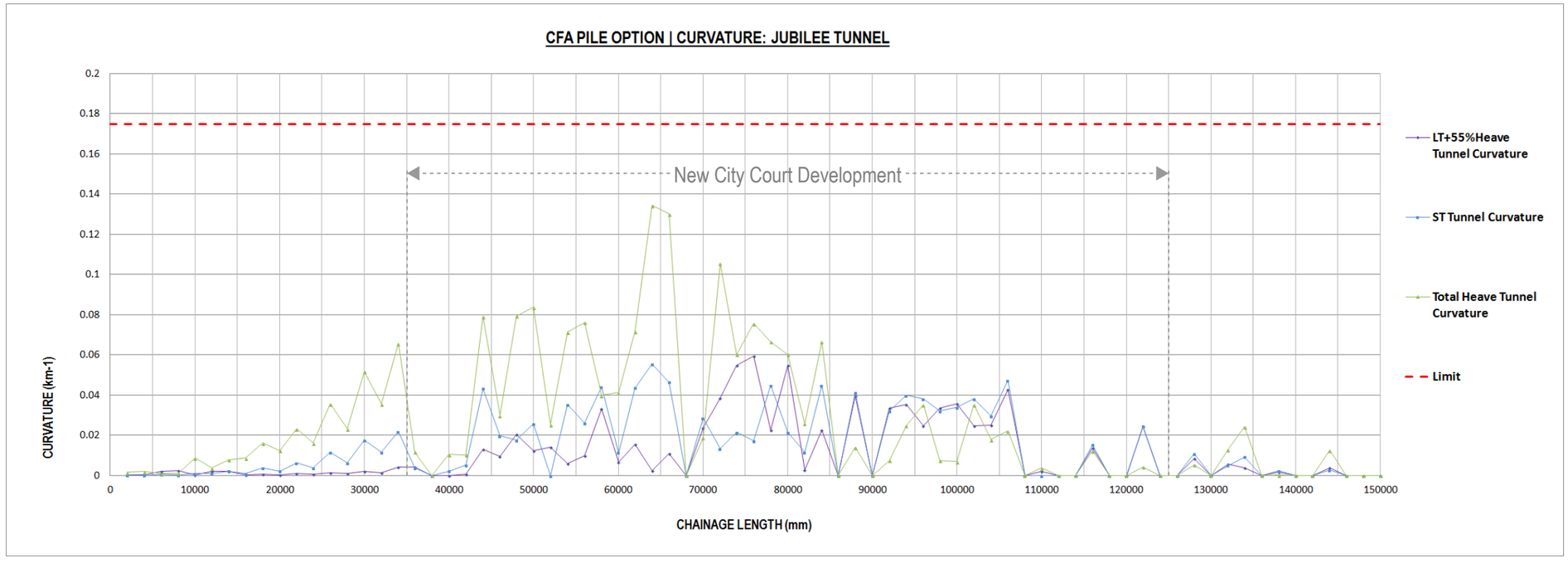
LUL TUNNEL ANALYSIS | WESTBOUND JUBILEE LINE

CFA - PILING FROM B1 LEVEL





KEY PLAN

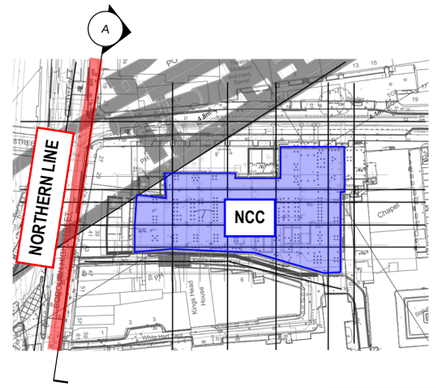


REV	DATE	DESCRIPTION	BY	CHECKED
P1	16/02/2018	FOR DISCUSSION	PM	NC

akt II

PROJECT NEW CITY COURT		TITLE LUL TUNNEL ANALYSIS - JUBILEE LINE	
DATE 16/02/2018	SCALE -	CAD FILENAME -	STATUS FOR DISCUSSION
DRAWN PM / CHECKED NC	PROJECT No. 3948	DRAWING No. 3948-SK-192 (SHEET 01 OF 02)	REV P1

LUL TUNNEL ANALYSIS | NORTHERN LINE
CFA - PILING FROM B1 LEVEL



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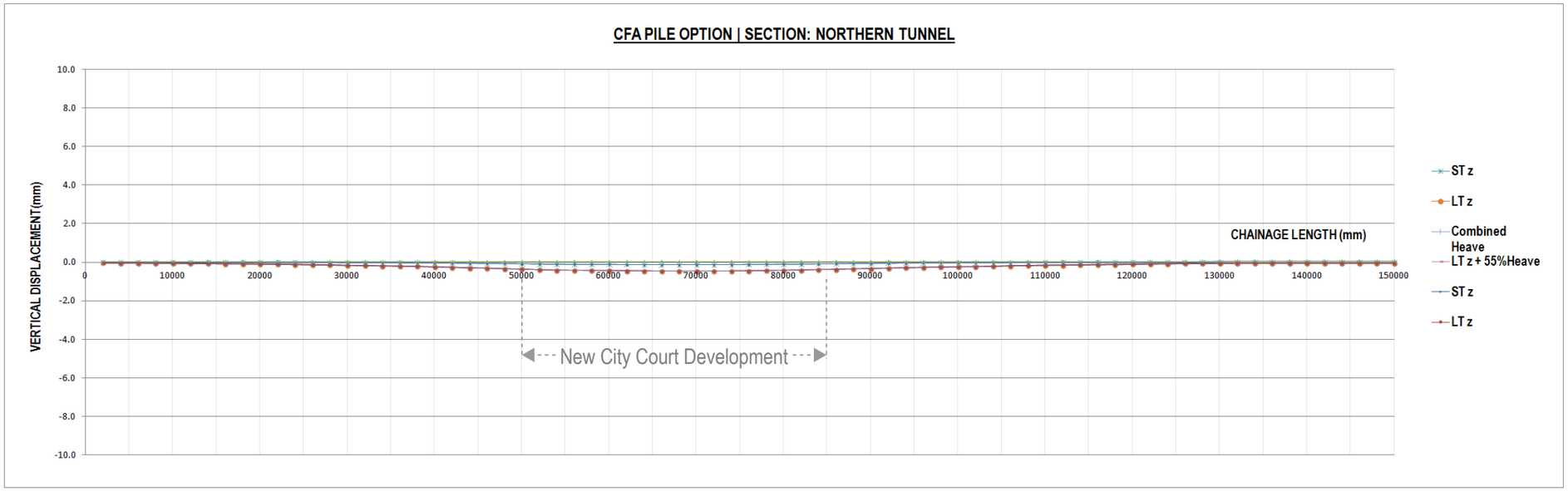
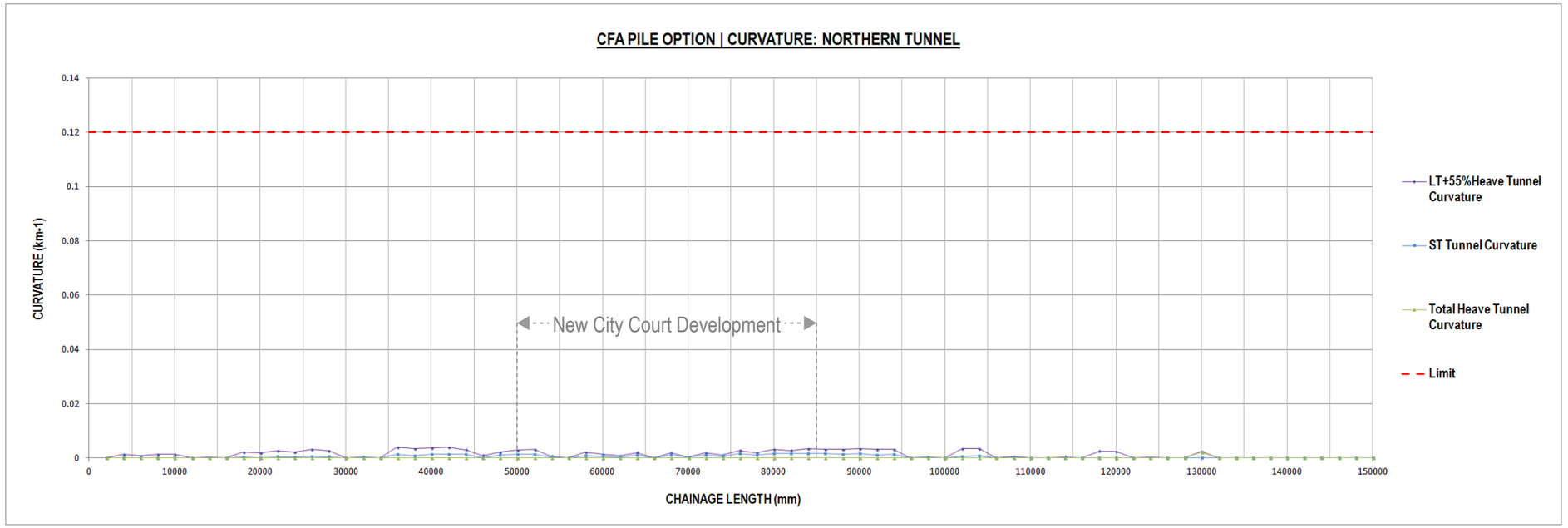


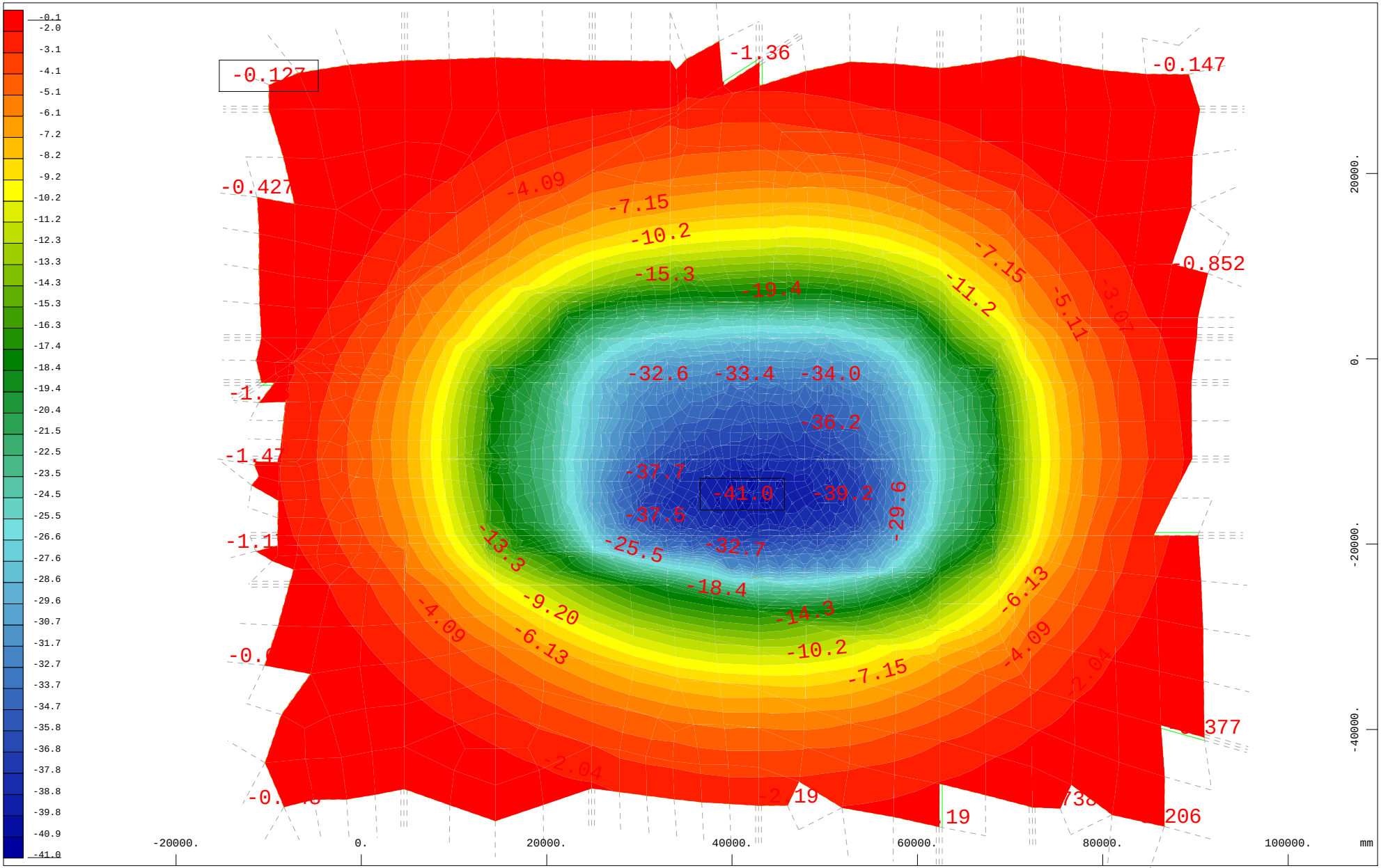


REV	DATE	DESCRIPTION	BY	CHECKED
P1	16/02/2018	FOR DISCUSSION	PM	NC

akt II

PROJECT NEW CITY COURT		TITLE LUL TUNNEL ANALYSIS - NORTHERN LINE	
DATE 16/02/2018	SCALE -	CAD FILENAME -	STATUS FOR DISCUSSION
DRAWN PM / CHECKED NC	PROJECT No. 3948	DRAWING No. 3948-SK-192 (SHEET 02 OF 02)	REV P1

SETTLEMENT PLOTS | SHORT-TERM | TUNNEL LEVEL (SOFFIT)



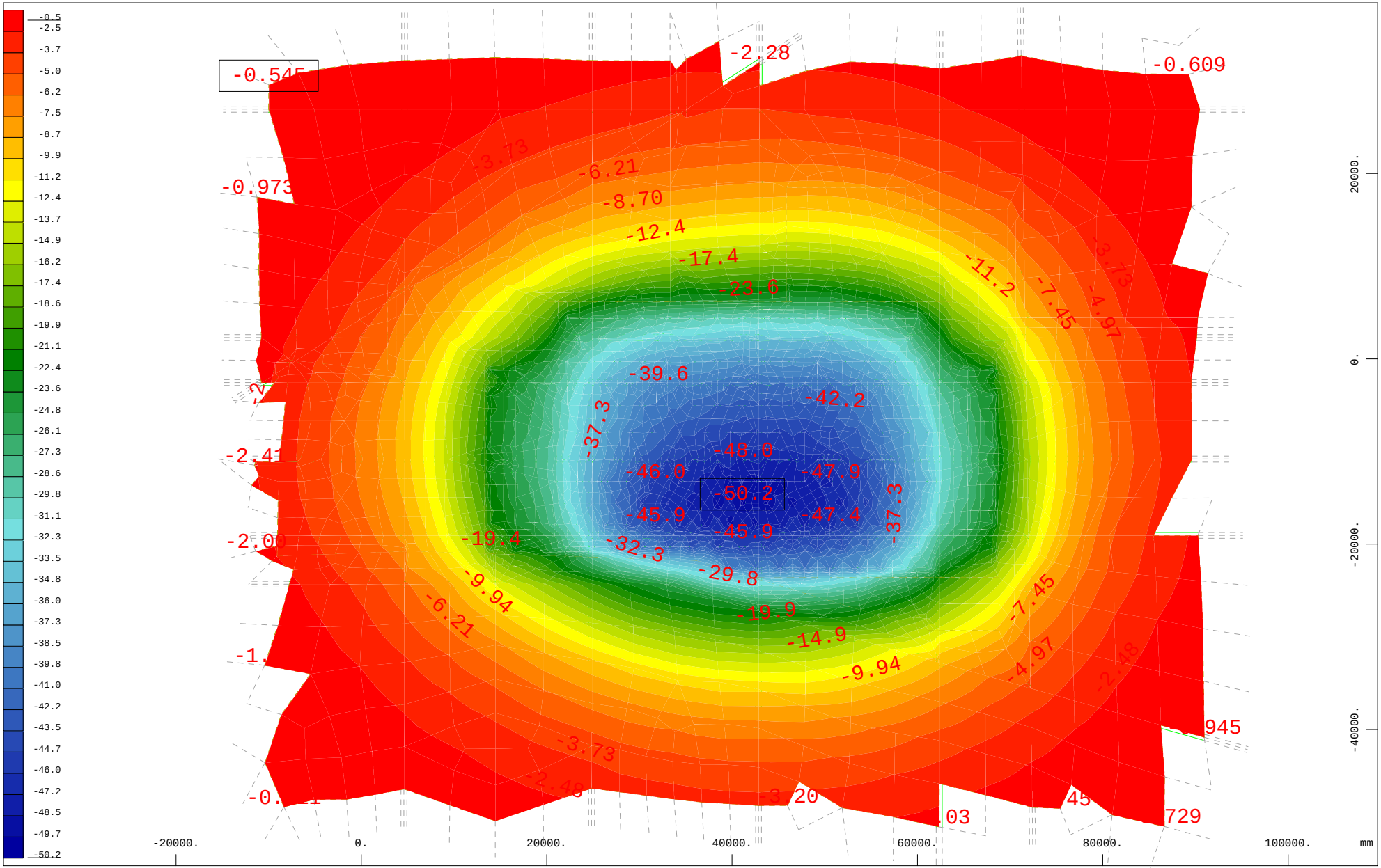
Y
Z—X

Sector of system

Nodal displacement in global Z in Node ◯, Loadcase 5004 of LC 101 Depth Z -15.00 m , from -41.0 to -0.127 step 1.02 mm

M 1 : 568

SETTLEMENT PLOTS | LONG-TERM | TUNNEL LEVEL (SOFFIT)

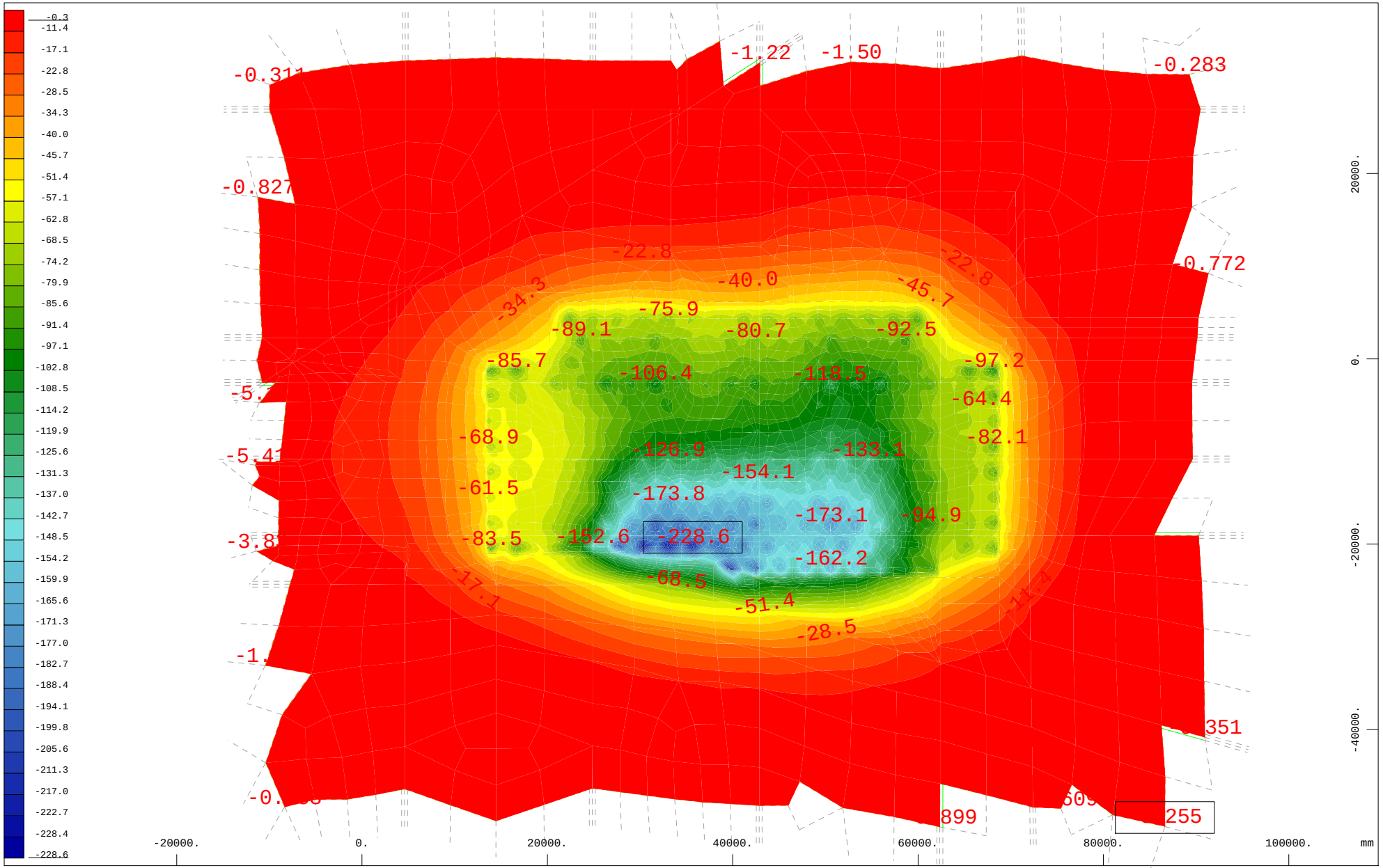


Y
Z X Sector of system

Nodal displacement in global Z in Node ◯, Loadcase 8004 of LC 401 Depth Z -15.00 m , from -50.2 to -0.545 step 1.24 mm

M 1 : 568

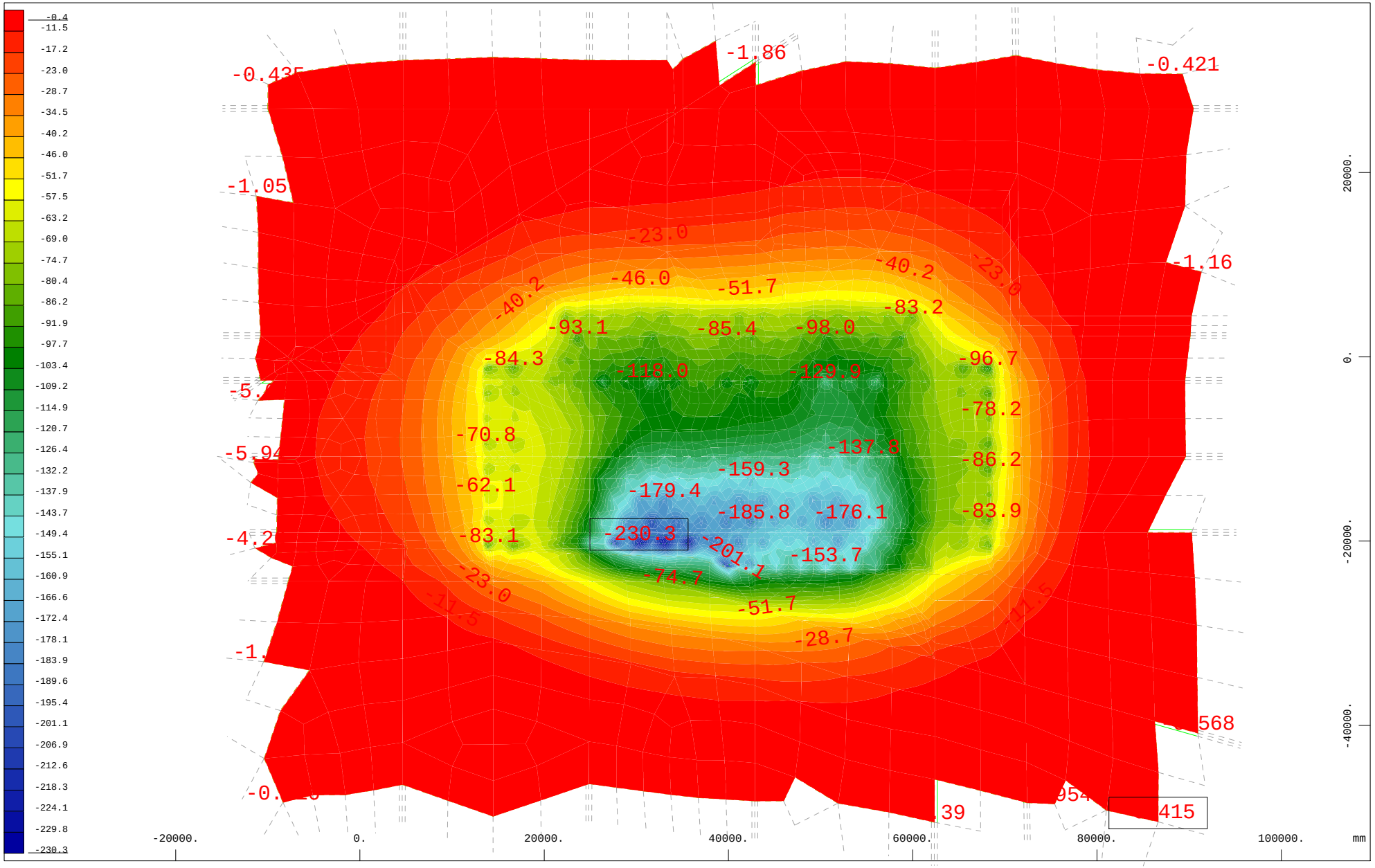
VERTICAL STRESSES | SHORT-TERM | TUNNEL LEVEL (SOFFIT)



Y
Z X Sector of system
Bedding stress in Node ◯, Loadcase 8004 of LC 401 Depth Z -15.00 m , from -228.6 to -0.255 step 5.71 kN/m2

M 1 : 568

VERTICAL STRESSES | LONG-TERM | TUNNEL LEVEL (SOFFIT)



Y
Z X

Sector of system

Bedding stress in Node ◯, Loadcase 5004 of LC 101 Depth Z -15.00 m , from -230.3 to -0.415 step 5.75 kN/m2

M 1 : 568

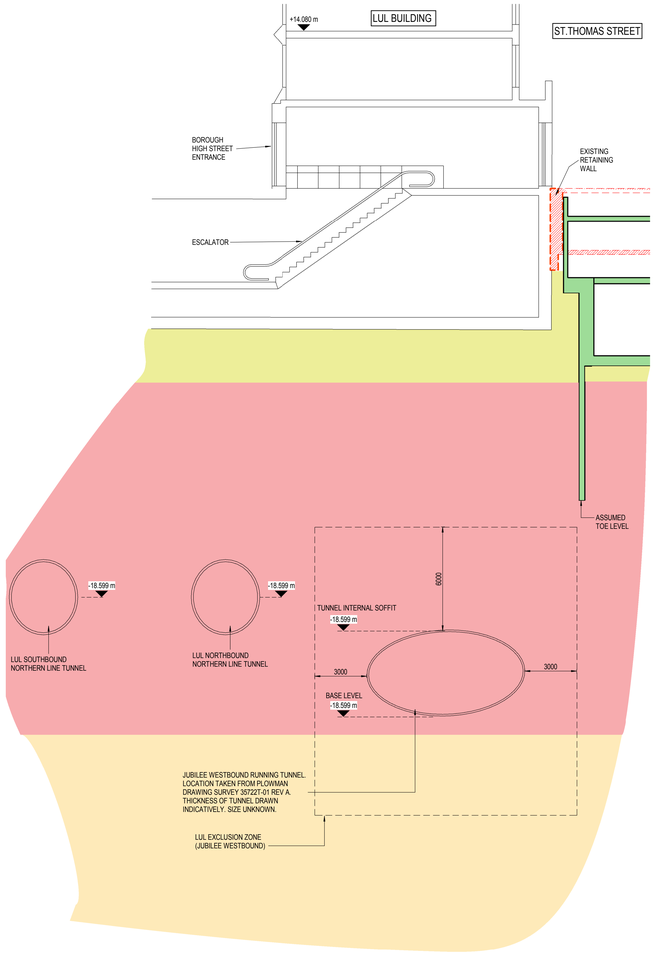
NOTES

1. THIS DRAWING IS TO BE READ IN CONJUNCTION WITH ALL RELEVANT ARCHITECTS & ENGINEERS DRAWINGS & THE SPECIFICATIONS.
2. NO DIMENSIONS ARE TO BE SCALED FROM THIS DRAWING.
3. NORTHERN LINE RUNNING TUNNEL PLAN POSITION TAKEN FROM XXX DRAWING DATED XXX. DIAMETER AND DEPTH EXTRAPOLATED FROM ARCHIVE DRAWING: WESTON WILLIAMSON 104/A/02/40/207 REV C DATED 1995.
4. LOCATION OF COMPENSATION GROUTING TAKEN FROM CIRIA BUILDING RESPONSE TO TUNNELLING VOLUME 2 DATED 2001, FIGURE 32.4 & DEPTH FROM FIGURE 32.3 S.
5. SITE BOUNDARY POSITION TAKEN FROM XXX-XXX. SURVEY INFORMATION TAKEN FROM XXX-XXX.

LEGEND

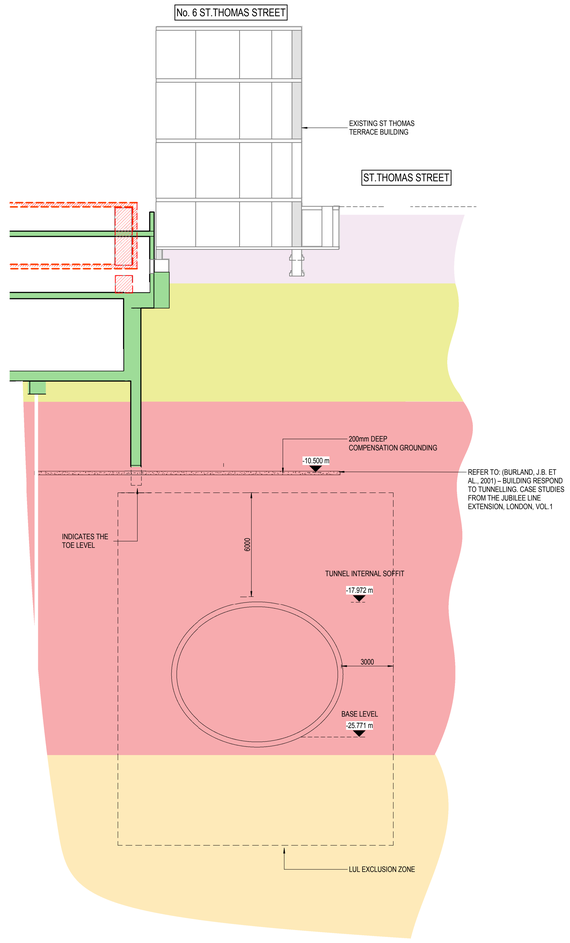
- MADE GROUND
- TERRACE GRAVEL
- CLAY
- LAMBETH GROUP
- DENOTES EXISTING STRUCTURE

SOIL PROFILE INDICATIVE BASED ON DRAWING 3948-AKT-XX-XX-DR-S-00480 TO BE CONFIRMED BY GEOTECHNICAL INVESTIGATION.



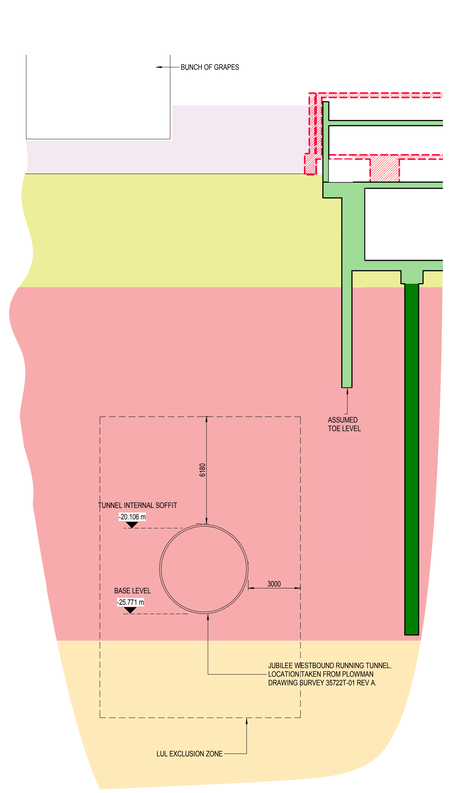
SECTION A-A

1 : 125



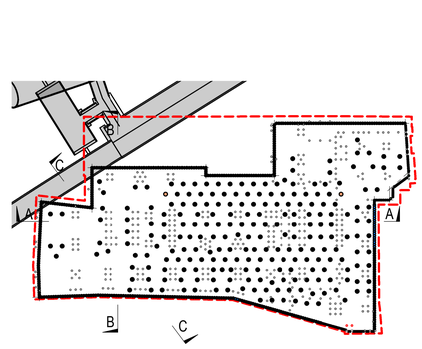
SECTION B-B

1 : 125



SECTION C-C

1 : 125



KEY PLAN

1 : 500

0 1000 2000 3000 4000 5000 mm

SCALE 1:100

REV	DATE	DESCRIPTION	CHKD
P2 1	07.11.18	DRAFT STAGE 2 ISSUE	NC

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GREAT PORTLAND ESTATES PLC

CLIENT

NEW CITY COURT

PROJECT

SITE CONSTRAINTS SECTIONS

TITLE

SB	SEP 2018	A0
DRAWN	DATE	SHEET SIZE
3948	STAGE 2	S0
PROJECT No.	PROJECT STAGE	SUITABILITY CODE

PROJECT ID ORIGINATOR ZONE LEVEL TYPE ROLE DRAWING No. REVISION

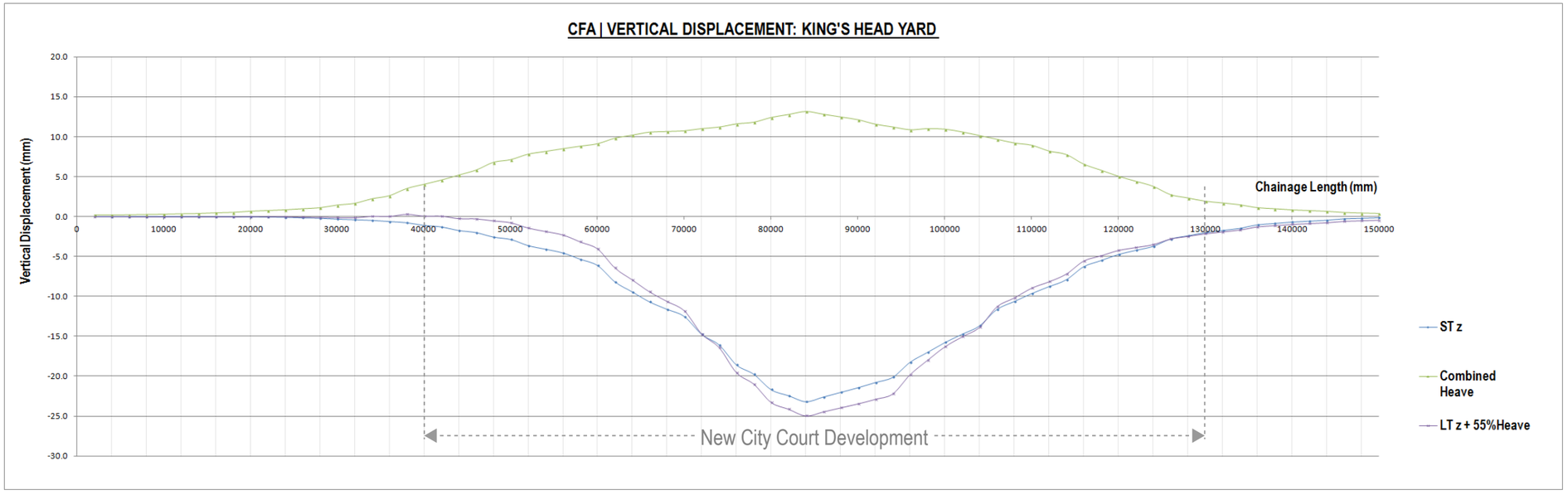
DRAFT 3948-AKT-XX-XX-DR-S-00410 P01

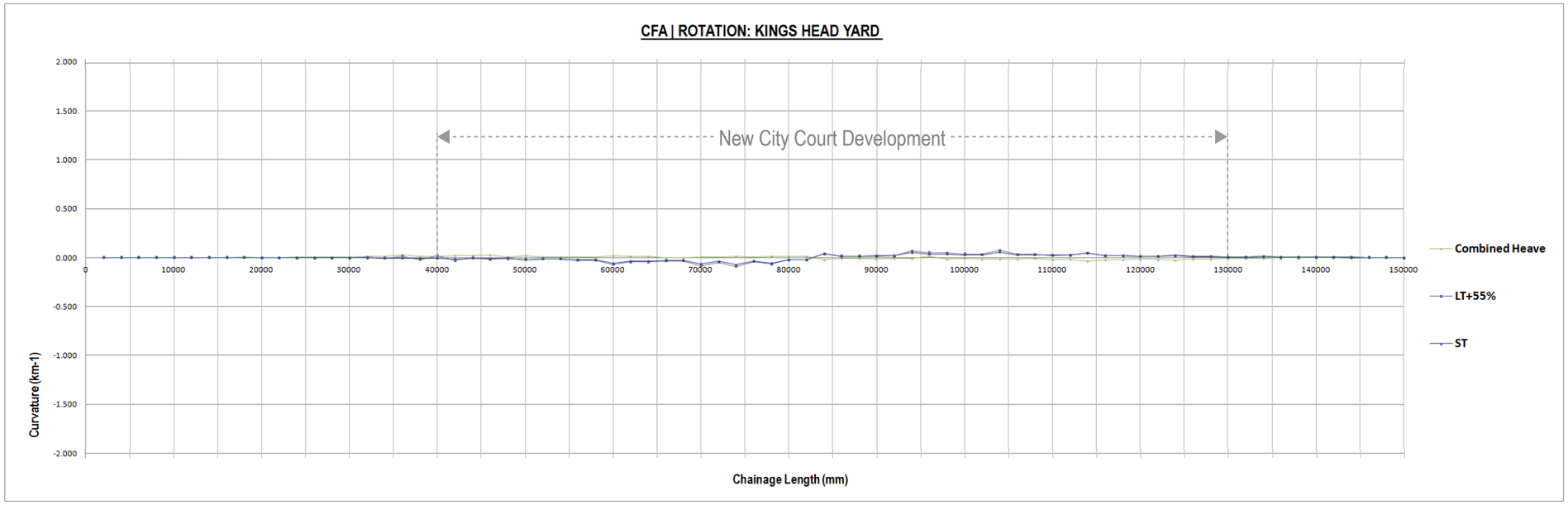
Appendix 9

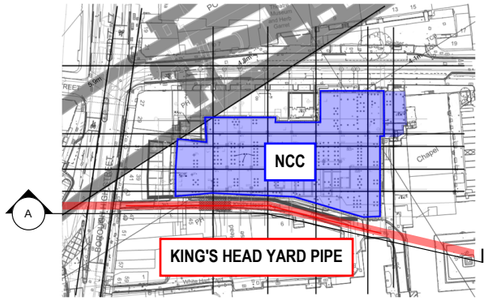
SGN Gas Assets

SGN GAS ASSETS ANALYSIS | KING'S HEAD YARD - SOUTH

CFA - PILING FROM B1 LEVEL







KEY PLAN

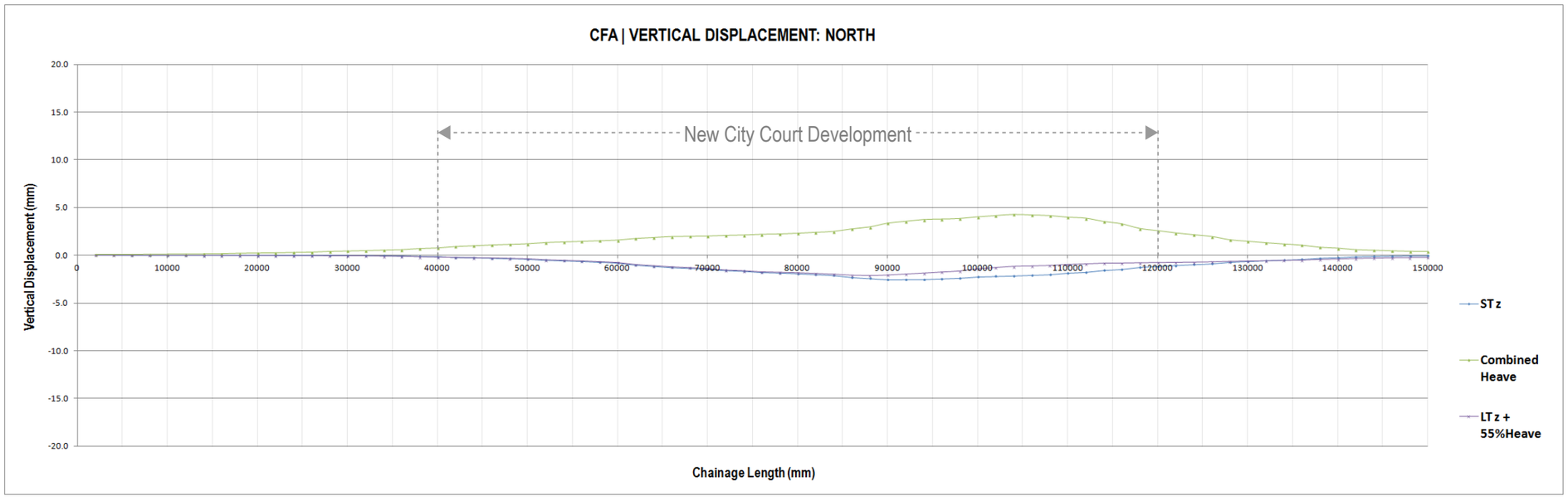
REV	DATE	DESCRIPTION	BY	CHECKED
P1	19/10/2018	FOR DISCUSSION	PM	NC

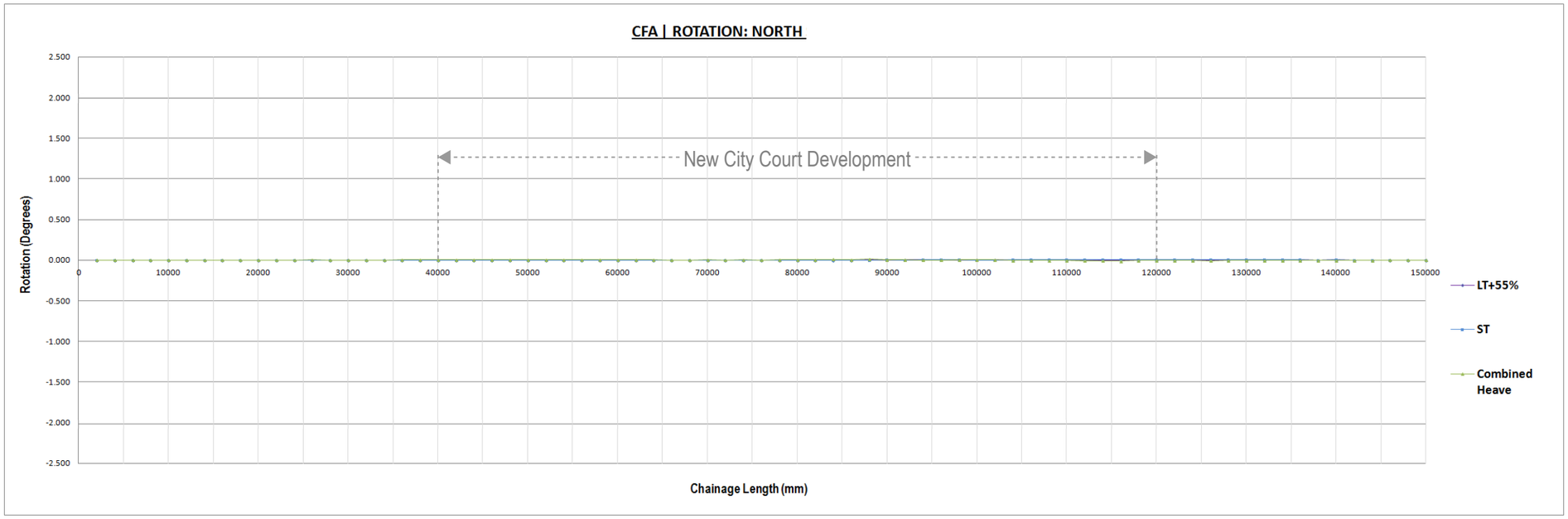
akt II

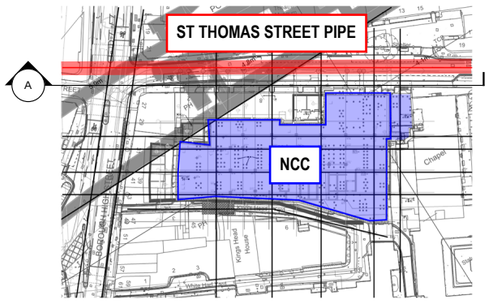
PROJECT NEW CITY COURT		TITLE SGN GAS ASSETS ANALYSIS - KING'S HEAD YARD	
DATE 19/10/2018	SCALE -	CAD FILENAME -	STATUS FOR DISCUSSION
DRAWN PM	CHECKED NC	PROJECT No. 3948	DRAWING No. 3948-SK-202 (SHEET 01 OF 02)	REV P1

SGN GAS ASSETS ANALYSIS | ST THOMAS STREET - NORTH

CFA - PILING FROM B1 LEVEL







KEY PLAN

REV	DATE	DESCRIPTION	BY	CHECKED
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akt II

PROJECT NEW CITY COURT			TITLE SGN GAS ASSETS ANALYSIS - ST. THOMAS STREET
DATE 19/10/2018	SCALE -	CAD FILENAME -	STATUS FOR DISCUSSION
DRAWN PM	CHECKED NC	PROJECT No. 3948	DRAWING No. 3948-SK-202 (SHEET 02 OF 02) / REV P1