6 Site Constraints

6.1 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. Utilities associated with the use of the buildings as a Bank will be present on site. It is recommended that ‘as-built’ utility information is confirmed with trial pits where necessary to supplement the GPR investigation undertaken previously and reduce any risks associated with demolition construction.

6.2 Underground structures

The existing basement extends to a level of approximately 3.5m-4.0m below ground level.

Given the previous and current site uses, there may be unrecorded buried foundations or structures. If present the most likely source of these would be the terraces demolished when the cinema was first constructed. A series of pavement vaults were constructed that still remain in part along Kings Road.

Based on currently obtained records there are no other foreseeable underground structures present on the site.

Bomb damage map legend

- Total destruction
- Damage beyond repair
- Seriously damage, doubtfuf if repairable
- Seriously damage, but repairable at cost
- General blast damage, not structural
- Blast damage, minor in nature
- Clearance areas
- V1 or V2 flying bomb

Many bombs that were dropped during the Second World War blitz did not explode on impact. Some are problematic as they are non-ferrous, and so require more sophisticated and expensive detection techniques. Bomb detonators don’t deteriorate and the explosives do not become inert with time. If unexploded bombs were still present on site they would consequently present a health and safety risk and also a contamination risk.

The Ministry of Defence has published maps indicating the extent of damage to buildings during the raids and in Central London, which is displayed in Figure 6.2. It indicates that the site was damaged during the Second World War at the North Western corner on Chelsea Manor Street. The damage appears severe but limited in range and is in the area now redeveloped as Friese-Green House. The map shows buildings immediately surrounding the site had between minor and serious damage. Around 150m South East of the site is an area where many buildings were total destructed or damaged beyond repair.

Allied and German records stated that 10% of all bombs and 35% of incendiary devices did not explode and lie buried in the ground. However, relatively few of these remain undiscovered. V1 and V2 flying rockets where thin cased flying bombs exploding on impact. German V1 and V2 bombs offer a low risk. Many other forms of bomb were dropped and some are far more problematic as they are non-ferrous, and so require more sophisticated and expensive detection techniques. Bomb detonators generally do not deteriorate and the explosives generally do not become inert with time.

Bombs may also travel laterally after impact depending on the geology of the site and other factors. Generally, bombs in London have penetrated between 6 and 10m in the local geology with a lateral offset of 2 to 3m (generally one third of the penetration depth).

Bombs during the wars were also responsible for heavy pollution as they broke several pipes and conduits when exploding. For example, the groundwater was highly contaminated during this period.
6.4 Lost rivers

The River Thames is located 500m to the South of the site. The majority of the natural tributary rivers of the River Thames have been culverted or infilled as development of the city has progressed.

An extract from Barton (1992) in Figure 6.4, indicates that there are no lost rivers in the near vicinity.

There are no scour hollows (also termed drift filled hollows) in the vicinity of the site. Scour hollow or drift-filled hollows are cavities filled with weak materials.

6.5 Transport for London and underground infrastructure

The London Underground Limited (LUL) Piccadilly, District and Circle lines run at approximately 1km distance North of the site, refer to figure 6.5. There are no other LUL assets close to the site.

The whole site lies between the safeguarding zone limits for the Chelsea Hackney line (Crossrail 2), refer to figure 6.6.

There is an operating bus stop immediately outside the front of the Cinema on Kings Road.

There are no post office tunnels running in the vicinity of the site.

6.6 Trees

There is a large tree outside the bank at 226 Kings Road and post office at 232 Kings Road.
7 Form and Condition of the Existing Structure

7.1 Form of existing structure

The following understanding of the form and construction of the existing structures is based upon limited archive information, observations of the structure from site visits, measured survey drawings and our knowledge and experience of buildings of this type and age.

The site comprise of three buildings of varying heights, summarised in the following:

1. A four storey Bank Building situated at the corner of Kings Road and Chelsea Manor Street constructed in 1909. Originally built divided internally into two properties on all levels.

2. A three storey Townhouse is linked to the north of and constructed at the same time of the Bank Building and is slightly set back from Chelsea Manor Street. This building was constructed in the style of a Georgian townhouse.

3. A two storey modern infill building to the north of the Townhouse building, constructed in 1993 and set back from Chelsea Manor Street behind a masonry boundary wall.

The form and construction of the Bank and Townhouse buildings are not known but from site observations and knowledge of buildings of this type and age it is believed that the form is a steel frame construction with masonry facade and infill walls.

The floor structure is believed to comprise of a solid ground bearing concrete slab and timber upper floors and roof.

Due to access it has not been possible to conduct site investigation works to investigate the form of construction, but the little archive information found shows that the brickwork walls have brick corbelled foundations on a strip footing, which can be seen on figure 7.3.

The modern Infill building construction is a reinforced concrete frame with masonry infill walls and masonry facade to match the existing Bank and Townhouse building.

7.2 Condition of existing structure

The Bank and Townhouse buildings appear to be in good condition for their age and type. They both have had significant alterations made when the infill building was constructed as an extension of the existing and amendments were made to the internal layouts.

From site observations made the existing buildings appear to be in good condition and there are no obvious signs of distress or evidence of any significant settlement.

However it is the nature that existing buildings do contain structural defects some of which tend to be hidden and may not be obvious.
8 Proposed Alterations and Key Issues

8.1 Proposed alterations

The alterations to the existing structure proposed:

- Partial demolition to the Bank and Townhouse buildings, to include facade retention, and demolition of the infill building.
- Deepening of the existing basement to the Bank and Townhouse buildings.
- Infilling of the existing building vaults along the Kings Road which lie outside of the site boundary to ensure that they remain stable.
- Extension of the existing basement on the site up to the boundary walls of the surrounding basement.
- Construction of new four and three storey structures incorporating the retained Bank and Townhouse building structure.
- Construction of a new 4 storey building in the location of the Infill building.

At this stage in the design only preliminary information relating to the ground conditions is available gathered from the results of the desk study and record searches. A site specific geotechnical investigation and fabric survey will be undertaken in the subsequent stages of design to confirm the ground conditions, existing construction and foundations of the retained structure and adjacent building and the parameters for the foundation design.

8.2 Key structural engineering issues in the design of the basement

8.2.1 Effect of the basement construction on the adjacent properties

Figure 8.3 shows a section through the proposed new structure and its relationship to the existing adjacent buildings.

The adjacent building along the western and northern site boundary is understood to contain a single basement level around the perimeter, the exact level of which is unknown. The level and foundation details will need to be confirmed from site investigations to determine the influence of the proposed works.

As the existing basement level under the Bank and Townhouse buildings is being deepened it is assumed that these works will have an influence on the adjacent properties structure and underpinning of the existing foundations will be required. The extent of these works will need to be confirmed following site investigations.

The construction of the new basement in the location of the Infill building is also to be constructed against the adjacent properties on two elevations and will require the same details as for the Bank and Townhouse buildings. Where the new basement elevation is to be constructed against Chelsea Manor Street it is proposed that a secant piled embedded retaining wall is provided in order to limit ground movements.

The Bank building basement contains pavement vaults situated along the Kings Road facade, which stretch out some 3-4m beneath the road. As these lie outside of the site boundary they cannot be incorporated into the proposed building design and will require infilling to ensure that they remain stable.
**8.2.2 Effect of the basement construction on the retained building elements**

The proposed scheme consists of retaining the façade to the existing Bank and Townhouse buildings and the existing basement retaining walls around the perimeter, except to the Northern end where this will be removed to allow the basement to be extended. The extent and indicative proposals for the façade retention are shown in figure 8.4 and 8.5, which provides guidance. Fabric investigations are required to determine the construction of the existing building and retained façade to enable a development of the temporary works design which will be developed by the contractor. The retained façade will require temporary propping which will aid construction but is subject to approval from RBKC. The retaining basement walls will require temporary propping during demolition and construction. The new structure is to be tied into and provide support to the existing.

**8.2.3 Effect of the proposed basement on groundwater**

Groundwater levels are subjected to variations caused by changes in local drainage conditions and also by seasonal effects. There is a perched water table which sits on the top of the impermeable London Clay at a depth of between 5.00m and 5.70m below ground level based on information from historical borehole records from BGS. It should be noted that perched water levels can vary seasonally and are prone to rapid changes through heavy rain events on permeable surfaces, accidental events (such as burst water mains) and due to the large park area around St. Lukes to the north. There is the potential for rapid changes in the perched water level. The proposed new basement construction is located in between existing basements therefore it is not expected to cause a disruption to the natural perched water flow.

**8.2.4 Effect of heave on the proposed basement**

The unloading and reloading of the existing sub-soils has the potential to influence a wide area and the amount of heave settlement needs to be predicted over time to provide assurances that neighbouring properties, highways and utilities will not be impaired.

Due to the amount of overburden removed to form the new basement, there is scope to provide a balanced foundation whereby the weight of the building is compensated by the weight of the soil removed limiting the changing stress within the ground in the permanent condition. A raft foundation has been proposed which will spread the building loading over the largest possible area reducing the contact pressure at the interface with the soil while maintaining a great inherent capacity to limit differential settlement. This assessment will need to be informed by geotechnical investigation which is to be carried out at a subsequent design stage.

**8.2.5 Effect of groundwater on the proposed basement**

As discussed in section 4.2.3 historic borehole records from BGS indicated that there is a perched water table at a depth of between 5.00m and 5.70m. These records will need to be verified by site specific monitoring. The existing basement walls do not display any indication of water ingress. The extended basement construction is proposed to be a combination of underpinning the existing foundations to the retained basement retaining walls, and adjacent properties structure if required, and a new embedded retaining wall along side part of Chelsea Manor Street. It is proposed that the new basement retaining wall construction be a secant piled wall to prevent water in the soil from washing the sands and gravels into the basement excavation during construction which will also limit ground movements.

The historic ground water information shows the ground water level to be lower than the proposed basement level therefore underpinning is an appropriate construction method for extending the depth of the existing basement as is a raft foundation for the new substructure.

**8.2.4 Effect of the proposed basement on the existing trees**

There is a single tree adjacent to the site located on the Kings to the south of the existing vaults. As the new basement construction is to the North of the site the tree root will not be affect by this, however the design for the proposed external temporary propping for the façade retention will require coordinating around the existing tree position by the contractor.

**8.2.5 Site access**

The main site access is likely to be provided from Chelsea Manor Street. A separate construction traffic assessment has been conducted by WYG, refer to this report for details.

---

Fig. 8.4 Proposed ground floor plan showing extent of retained façade

Fig. 8.5 Proposed cross section showing indicative proposal for the façade retention
8.3 Form of the new basement construction

The existing buildings on the site are to be removed with the exception of the Bank and Townhouse building facade and existing basement retaining walls, which will both require temporary propping throughout demolition and construction of the substructure.

The existing basement level under the Bank and Townhouse is to be deepened which will require underpinning to the existing retained foundations and to the existing neighbouring foundations, if confirmed necessary from site investigations.

Where the new basement is extended North a new retaining wall is to be constructed against Chelsea Manor Street. It is proposed that a secant piled embedded retaining wall is provided.

A reinforced concrete raft foundation and ground floor slab construction will restrain the existing retaining walls and new piled wall, creating a stiff concrete box which will resist the horizontal hydrostatic and earth pressures through the diaphragm action of the slabs and layout of the structural walls.

8.4 Sequence of construction assumed in the design of the proposed works

The proposed sequence of the construction assumed in the design of the basement extensions can be summarised as follows:

- Erect the facade retention temporary support to the Bank and Townhouse buildings along the Kings Road and Chelsea Manor Street.
- Demolish the existing sections of buildings to be removed providing temporary propping at ground floor level to the retained basement retaining walls.
- Form the new secant piled embedded retaining wall.
- Install temporary props then excavate the new basement area down to existing basement level of adjacent properties.
- Construct underpinning to the existing retained foundations and to the existing neighbouring foundations if required, around the perimeter in a hit and miss sequence.
- Excavate basement down to new foundation level and construct reinforced concrete basement raft.
- Construct reinforced concrete vertical structure between basement and ground floor.
- Construct ground floor slab, then remove props.
- Construct remaining building.
Conclusion

This document presents the preliminary basement impact assessment based on the information currently available that responds to the items raised in the RBKC subterranean development SPD.

The design philosophy and strategy set out will form the basis for the detailed analysis and assessment work that will be required to develop detailed construction drawings and supporting calculations during the subsequent design stages as information relating to the ground conditions at the site and fabric of the building are established.

Method statements for the excavations, construction sequence and temporary works will ultimately be developed by the Contractor.