

The Printworks, High Road West

Structural Survey (Existing Buildings)

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0049225

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1 Executive Summary

This structural survey report has been prepared by Buro Happold on behalf of Goodsynd Tottenham Limited in support of the planning application for the redevelopment of 819-829 High Road (The Printworks) within the London Borough of Haringey.

The proposed development is a purpose built student accommodation and supporting flexible commercial, business and service uses, hard and soft landscaping, parking, and associated works. Within the existing plot is a row of terrace houses with various extensions as well as a large double storey warehouse structure. Terrace units 819-827 are to be retained and remodelled, and the rest of the existing structure demolished.

A site survey of existing terrace unit 819-829 on High Road, Tottenham, N17 8ER was carried out on 19th April 2021. The purpose was to identify structural damage or defects that may need rectification and to assess constraints that may limit the development of the buildings (subject to the limitations of the survey).

Access to all terraced retail units was available, as well as 9 of the 11 flats on the upper floors. Access to much of the building extensions behind the terrace units was either restricted or not available. The survey was non-intrusive, limited to what could be seen visually and thus excludes much of the structure hidden under finishes.

Within the limits of the survey, no significant cracking, excessive movement, signs of distress or deterioration in the primary structure were identified to suggest that the buildings are structurally unsound. On this basis, where the use of the building will be unchanged and where load paths will not be significantly altered, the existing structure is expected to be sufficient. It would be prudent to make allowance for small repairs works, as part of redevelopment of the retained buildings, such as repointing of masonry and replacement of some floor joists. It is assumed that, as part of the works, all finishes will be removed and replaced, temporarily exposing the structure beneath for further structural surveys and verification of the structural condition.

Alterations to the existing buildings, such as the removal of load bearing walls or the change to habitable space in the unit 819-821 roof, are likely to be possible but are subject to further, more detailed structural surveys (including trial pits to foundations) of existing walls, transfer frames and footings to establish geometry, build up, material and condition of the existing structure. Where loads increase or load path change, allowance should be made for strengthening of the existing structure, in particular to foundations.

2 Purpose and Scope

This structural survey report has been prepared by Buro Happold on behalf of the applicant in support of the planning application for the redevelopment of 819-829 High Road (The Printworks) within the London Borough of Haringey.

2.1 Development Description

The proposed development is a purpose built student accommodation and supporting flexible commercial, business and service uses, hard and soft landscaping, parking, and associated works. Within the existing plot is a row of terrace houses with various extensions as well as a large double storey warehouse structure. Terrace units 819-827 are to be retained and remodelled, and the rest of the existing structure demolished.

Full planning application for the demolition of existing buildings and structures to the rear of 819-829 High Road; the demolition of 829 High Road; and redevelopment for purpose-built student accommodation (Sui Generis) and supporting flexible commercial, business and service uses (Class E), hard and soft landscaping, parking, and associated works. To include the change of use of 819-827 High Road to student accommodation (Sui Generis) and commercial, business and service (Class E) uses.

2.2 Scope of Structural Survey

A site survey of existing terrace unit 819-829 on High Road, Tottenham, N17 8ER was carried out on 19th April 2021. The purpose was to identify structural damage or defects that may need rectification and to assess constraints that may limit the development of the buildings (subject to the limitations of the survey).

Access to all terraced retail units was available, as well as 9 of the 11 flats on the upper floors. Access to much of the building extensions behind the terrace units was either restricted or not available.

The survey was non-intrusive and so was limited to what could be seen visually. Internally, the vast majority of the structural is covered by flooring, wall linings and ceilings and so was not directly visible. As discussed in more detail below, intrusive surveys will be required before any major alterations can be made.

The follow report describes the structural findings and recommendations.

2.3 Status

Final submission for the updated Printworks planning application and its change to a student residential accommodation. Where applicable, new development is based on architect's model and drawings provided on 20/07/23.

3 Background

3.1 History

Buildings 819 to 829 (odd numbered) are terrace buildings along High Road, Tottenham, N17 8ER.

Units 819 and 821 are three storey buildings, built in the early 18th century and are Grade II Listed. Units 823, 825, 827 and 829 were built later, in the 19th century, and are locally listed. All terrace buildings currently accommodate retail units at ground floor and residential flats on the floor above. Photos from 1908 show the shop fronts in a very similar form to the current façade.

Units 819, 821, 827 and 829 have extension wings to the rear, typically built in the early to mid 20th century. A large two storey industrial warehouse, formerly housing the printworks, extends to the rear of the plot; this was likewise added in the 20th century. Today the warehouse is used as commercial space with front of house access through units 819 and 821.



Figure 3-1 - Drone footage of existing terrace units 819-829 and extensions/warehouse behind

3.3 Current Structural Form

3.3.1 Terrace Superstructure

The existing terrace buildings are built of load bearing brick masonry walls with timber joist floors. The thickness and brickwork pattern of the walls indicate that the walls are two bricks thick. Roofs are likely to be timber trusses and/or purlins/rafters.

Shop fronts to 825, 827 and 829 at ground floor have been formed with iron/steel pillars and, it is presumed, iron or steel lintels. The shop front of 821 is set forward on the first floor masonry façade; it is presumed that the masonry wall is carried by a structural beam.



Figure 3-2 - a) pillar forming shop front to Unit 823, b) inset of Unit 821's first floor façade relative to ground floor shop front

Some open spaces at ground floor, particularly in units 819 and 829, lead to the belief that internal load bearing walls have been removed at ground floor by the use of steel transfer frames. These transfer systems are hidden within partitions, but it is assumed that they are formed in a similar fashion to the shop fronts.

Masonry walls form shear walls which provide lateral stability. Suspended floors act as diaphragms between the walls. Where walls have already been transferred out, there will be greater reliance on the remaining walls within and at the back of the existing structure. Possible layout of load bearing walls is presented in Appendix A.

3.3.3 Terrace Basement

Photos of the front on the buildings from 1908 show railings set forth from unit 819 with a lightwell; this suggests a basement level. Access to a basement to unit 819 was found; further investigation by others suggest that this has approximately 1600mm head height, although the extents of it on plan remain unknown. The basement retaining walls appear to be brickwork and a continuation of the load bearing walls above. This cellar level is not currently in use and the lightwell in front of the building appears to have been filled in and paved over.



Figure 3-3 – a) Unit 819 communal hall leading to basement access, b) view of basement from ground floor access

Entrance to similar such basement in other units was not identified, however the potential for other units to house similar recesses should not be excluded.

3.3.5 Extensions and Other Buildings

The extensions to the rear of terrace units 819, 821 827 and 829 also appear to consist of load bearing masonry, timber joist and floors acting as diaphragms and timber trusses and/or purlins rafters.

The large industrial warehouse to the rear of Plots 819-821 is a two-storey building with a gable roof. The walls are brickwork masonry, but patches of varying brick type suggest that the building has been remodelled over its lifetime including the lifting of the roof above its original level. It is hypothesised that the addition of the first floor is likewise a modification to the original building to increase useable area. The structural form of the roof is hidden and so unknown. The most likely form of construction is a cold or hot formed steel truss bearing onto the masonry; this is based on its span but an absence of any signs of columns that would form a portal frame.

A smaller flat roofed extension on the north side of the warehouse is assumed to be more recent, as are a series of steel framed plant decks and escape stairs.



Figure 3-4 - Drone view from North-West, showing warehouse with smaller extension and steel frames in the foreground

3.3.6 Foundations

It is not possible to inspect foundations for any of the buildings until trial pits are excavated, however buildings of this type can generally be expected to have unsubstantial footings, often only a nominal masonry thickening.

3.5 Proposed Development

The development of the Printworks area includes the proposed demolition of much of the structure to the rear of the site, and the demolition of 829. The terraced units 819 to 827 would be retained and remodelled. New low-rise student residential flats with some commercial area at ground floor are to be built on the plot behind the existing terrace units.



Figure 3-5 - Overlay of drone footage on RLB, showing extent of proposed demolition

4 Existing Condition and Remediation

4.1 Structural Integrity

No significant cracking, excessive movement, signs of distress or deterioration in the primary structure were identified to suggest that the buildings are structurally unsound.

Some crack lines in finishes indicate deflection of floor or roof members relative to the load bearing walls. Deflections can also be perceived in other places, for example over the window line in the figure below. Deflections of this nature would be expected of this form and period of construction and are not of cause for concern with regards to structural integrity.



Figure 4-1 – a) Hall of Unit 823 with superficial cracking in finishes, b) perceived deflections over window line in Unit 819 Flat 3



Figure 4-2 -Superficial cracking in finishes in Unit 812 b) Landing and c) Flat C

It is assumed that, as part of the works, finishes such as flooring, ceilings and wall plaster will be removed and replaced, temporarily exposing the structure beneath. At such time it can be verified that cracks do not exist in the load bearing structure behind.

4.2 Disrepair

Localised disrepair could be seen in some areas. As shown in the example photos below, this includes weathering of mortar, movements in brickwork, and damage for installation of services.



Figure 4-3 – a) localised cracking of brickwork to parapet of Unit 829, b) damage around drilling for conduits in hallway of Unit 821

4.3 Damp

On the whole, no widespread signs of rising damp were identified which would cause concern with regards to structural integrity, although it is noted that the internal face of walls at ground floor were hidden by internal fit out. Loose plaster in a cupboard of the entrance of Unit 823 and various ceiling stains could be as a result of damp.

Anecdotal signs of water ingress at top floor ceiling level was acknowledged, although roofs have been replaced within the last few years and the tenants suggested that this was no longer an issue.

The Unit 819 basement was not accessible, but it could be assumed that this suffers damp, being an abandoned below ground space. Further investigation by others show that the timber stairs leading to the basement were rotting.

4.4 Remediation

It would be prudent to make allowance for the following as part of redevelopment of the retained buildings, noting that site survey was unintrusive and so the main structure was often not visible.

- Repointing of masonry
- Localised rebuilding of parapets and/or chimneys to match existing
- Cementitious repair of local damage to masonry walls
- Replacement of localised joists and other timber floor members
- Treatment of timbers for damp
- Replacement of stairs to unit 819 basement, or otherwise barring the entrance to the basement

All repairs would be subject to discussion with the heritage consultant.

It is assumed that, as part of the works, all finishes such as flooring, ceilings and wall plaster will be removed and replaced, temporarily exposing the structure beneath for further structural surveys.

5 Minor Alterations

As part of the development, minor alterations will be required. "Minor alterations" are considered to be those where the functional use of spaces will remain the same (ie ground floor = retail/commercial, upper floors = residential) and load paths through the structure are not changed, but where the layout of spaces will develop.

The structural integrity of the buildings will be deemed sufficient on the basis that the buildings have been carrying similar loading throughout their history and that, from what can be seen, the structure is in good condition with no obvious signs of deterioration, distress, excessive movement, crack etc.

Internal partition walls can be removed to suit room layouts, provided that they are not load bearing. For rearrangement of load-bearing walls, see Section 6. Where internal partitions are to be added, these should be lightweight (ie stud and plaster board, not blockwork) and may require trimmer joists to suit.

Smaller openings through load bearing walls to form doorways, corridors and openings can be achieved by the use of lintels. Where spans are standard, precast concrete lintels can be used. Trial pits may be required at ground floor to ascertain the depth of wall below the opening and ensure the footings will not be unduly affected by a slight concentration of load.

The changes include the repositioning of stairs access to the upper floors. Where openings are being formed in stairs to accommodate the new layouts, trimmer joist will need to be provided to suit.

6 Changes to Structure

The following works either constitute as changes in use of space or a significant impact on the primary structure and therefore warrant further structural assessment.

6.1 Removal of load bearing walls at ground floor or first floor

The architectural layouts include the removal of a number of load bearing walls at ground floor. These larger openings will require framing with steel beams forming lintels and intermittent columns. Depending on the overall number of shear walls remaining, it may be necessary to use the steel frames as moment frames to provide lateral stability. Trial pits will be required at ground floor to ascertain the depth of wall below the openings and ensure the footings will not be unduly affected by a concentration of load. If necessary, spreader beams may be required under the new columns, and/or strengthening of the foundations by underpinning and/or local replacement.

6.2 Plot 819 and 821 habitable roof

The proposed design changes the roof over 819 and 821 from the existing flat roof, to a twin pitch shape that is more aligned with the original structure. The proposals use the space under the roof to create a third floor of residential space. A load take down estimates that the extra floor of habitable space will increase loads on the existing structure walls and footings by about 20%. Going forward, the change in use of space will require further structural assessment to assess the impact of this increase in load, including:

- Detailed structural surveys (including trial pits to foundations) of existing walls, transfer frames and footings to establish geometry, build up, material and condition of the existing structure.
- Using this information, assessment of load bearing capacity of existing structure and ground.

The existing masonry walls that were viewable on site appear to be robust and in reasonable condition. Preliminary calculations suggest that the existing load bearing walls will have sufficient strength to carry the additional load and significant strengthening to the walls is unlikely to be required. This assessment should be verified pending detailed surveys as noted above.

The capacity of the existing transfers is difficult to judge until such time as they are exposed. In the event that the existing capacity is deemed to be insufficient to carry the additional loads, strengthening would be required. On the assumption that the existing transfer frames are steel sections, this strengthening works may include stiffener plates welded on site to existing.

The footings of the existing structure are most likely to require strengthening, since buildings of this type often lack a footing detail to spread load. Underpinning of the existing foundations will likely be required to prevent the risk of settlement. This would be carried out in a hit and miss programme.

Should widespread strengthening to walls, transfers and/or footings be required, it will be necessary to weigh up the advantages of this additional habitable space against the cost and impact of the intervention.

7 Impact of New Printworks Buildings

7.1 Low Rise Superstructure

The Printworks development includes new, purpose-built commercial area to the rear of the terrace units. The new buildings are low (typically single storey), which will help reduce possible impact on the existing structure.

As far as possible the weight of the structure near existing buildings should be minimised. Comments on loading are shown in the table below.

Table 7—1 Roof loading categories

	Solid roof above commercial space	Feature roof light
Imposed loading	Residential access to balconies OR MEP plant kit may be required, such as air handling units. Target imposed load of 2.5kPa.	Maintenance access only
Superimposed loading	Use lightweight build up and finishes	Use lightweight build up and finishes is possible. Use of ETFE cushions instead of glazing is being considered.
Dead load	Minimise the self-weight of the roof by using eg metal deck on cold rolled purlins and steel frame, or timber deck on timber joists on steel frame.	Minimise the self-weight of the roof by using timber frame.
Roof span	First column row is about 3m from existing structure.	First column row is about 3m from existing structure.

It would be good use of materials to support the new roof on the existing structure. An assessment using assumptions on existing loading has been carried out and falls into two categories:

- Where existing terraces have an existing rear structure to be demolished (819, 821, 827), the new roof is likely to cause loading on existing walls to increase by about 10%.
- Where existing terraces have no rear structure (823, 825), the new roof is likely to cause loading on existing walls to increase by about 20-25%.

The existing masonry walls that were viewable on site appear to be robust and in reasonable condition. Preliminary calculations suggest that the existing masonry walls should be capable of carrying this additional load and that the new roof could span onto existing wall. The position of the first row of new columns is paramount to this philosophy; the new columns are close enough to the existing structure to limit the area of roof that the existing wall will need to carry, but far away enough such that the new foundation do no over bear the existing.

The footings of the existing structure are likely to require strengthening, since buildings of this type often lack a footing detail to spread load. Underpinning of the existing foundations will likely be required to prevent the risk of settlement. This would be carried out in a hit and miss programme.

Going forward, the change increase in loading on existing walls will require further structural assessment including:

- Detailed structural surveys (including trial pits to foundations) of existing walls, transfer frames and footings to establish geometry, build up, material and condition of the existing structure.

- Using this information, assessment of load bearing capacity of existing structure and ground.

Should widespread strengthening to walls, transfers and/or footings be required, it will be necessary to weigh up the advantages of using the additional structure against the alternative possibility of forming a new column/wall line, or cantilevering the new roof.

Movements in the existing buildings should be monitored throughout the construction programme.

Appendix A Extract from Structural Sketchbook

A.1 SKS 0004 r05 Modification to Printworks 819-829

819 - 829 Level 00

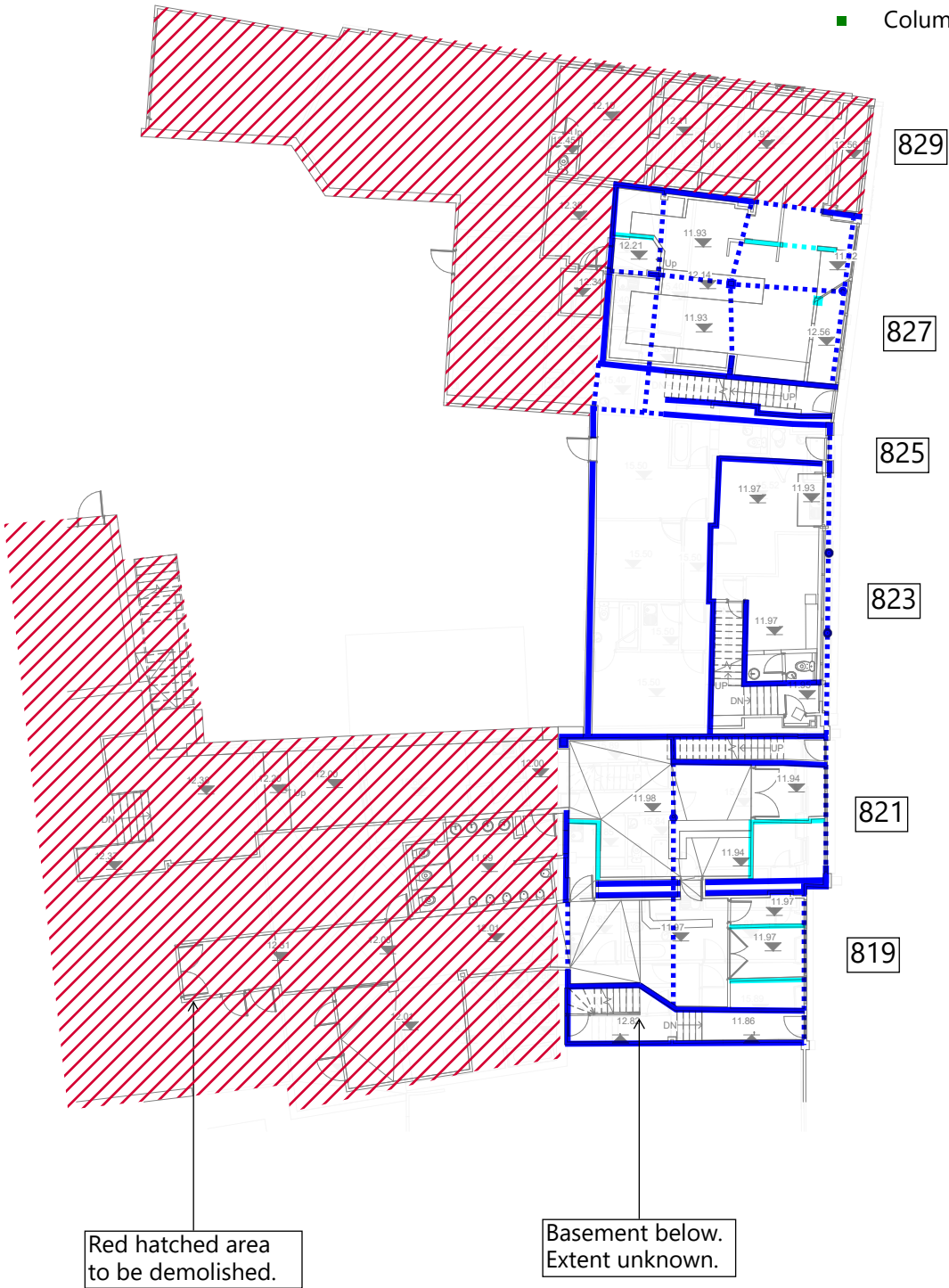
Load bearing walls

KEY

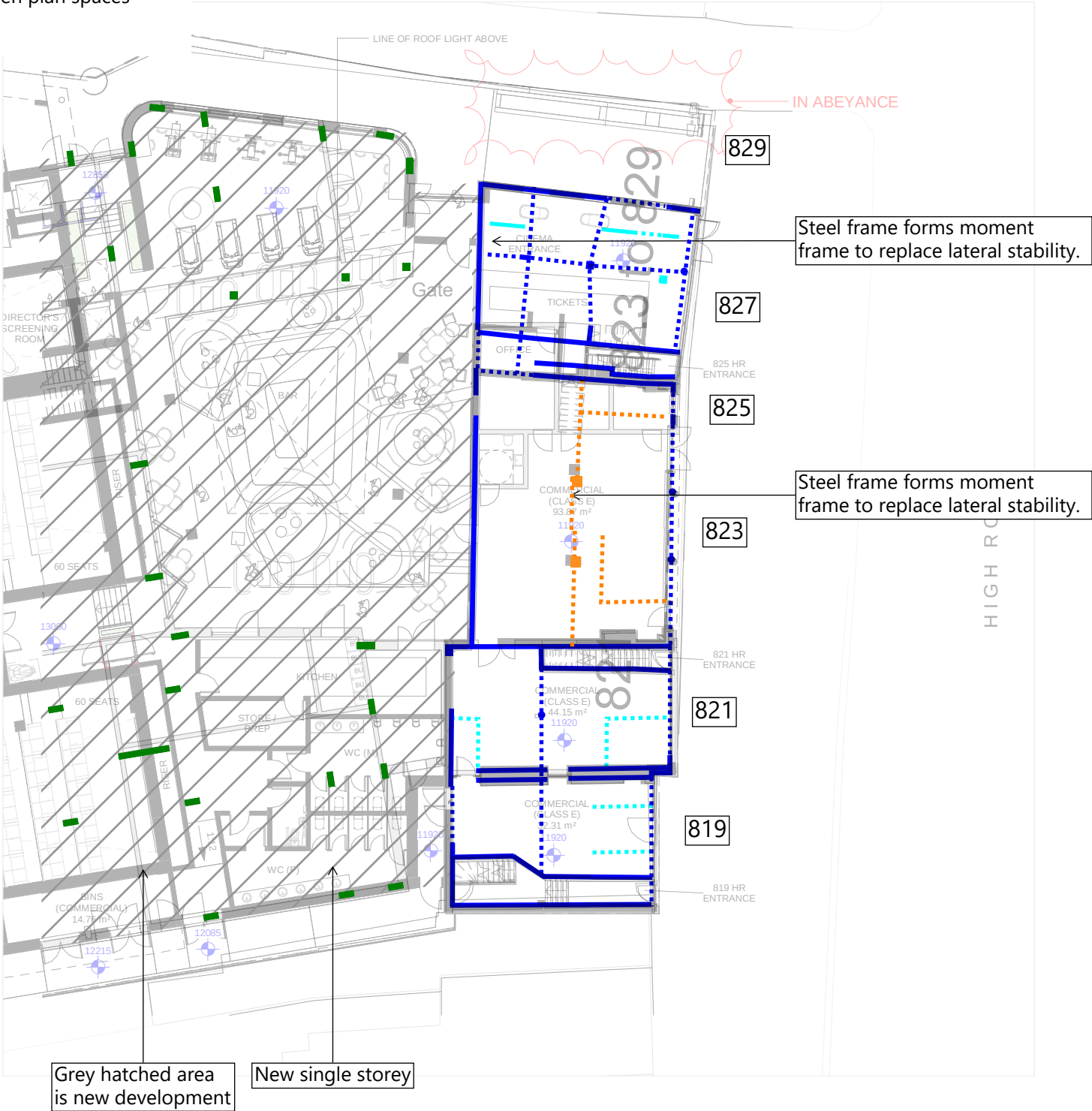
- Possible position of existing load bearing walls at Level 00.
- Possible position of existing transfer systems.
- Existing partitions walls, presumed to be non-load bearing
- New intervention with steel frames, intermittent columns and foundation strengthening to achieve open plan spaces
- Columns positions of new development

Backgrounds: F3 Level 00 general arrangements (received 22/06/21) and point cloud survey of units 821-829 (received 06/07/21).

The layout of existing load bearing walls is working assumption based on typical floor plans and likely structure identified on site visit. Not to scale.



Mark up of existing layout

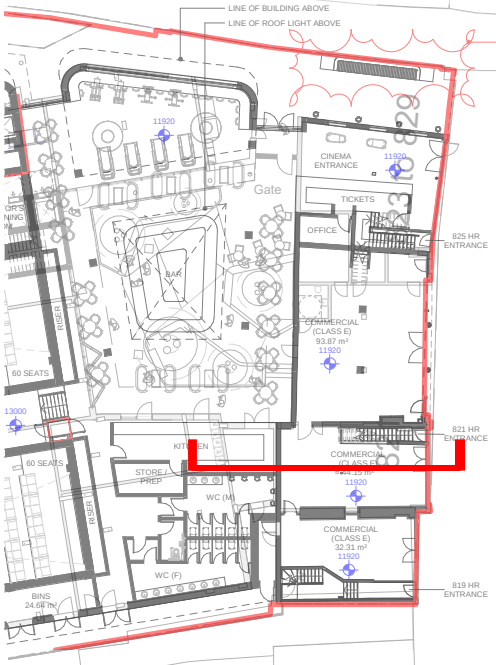
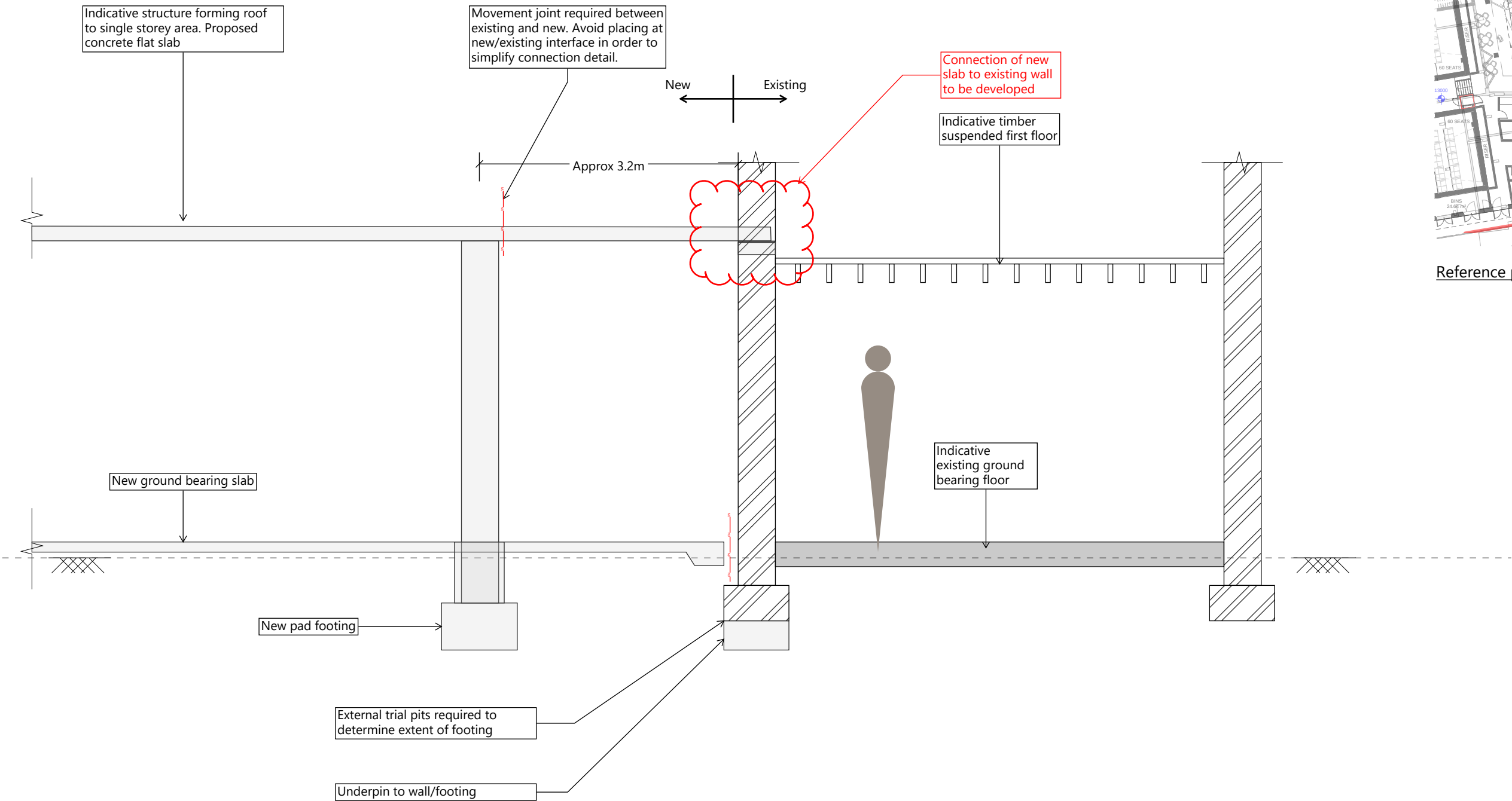


Mark up of remodelled layout

BURO HAPPOLD	Project: THFC High Road West	Project Number: 0049225	Status: S2 - For Information		
	Sketch Title: Modifications to Printworks 819-829	Sketch Number: SKS-0004	Date: 07/07/2023	Initials: APD	Revision: 05

Section - Interface to new structure

Not to scale

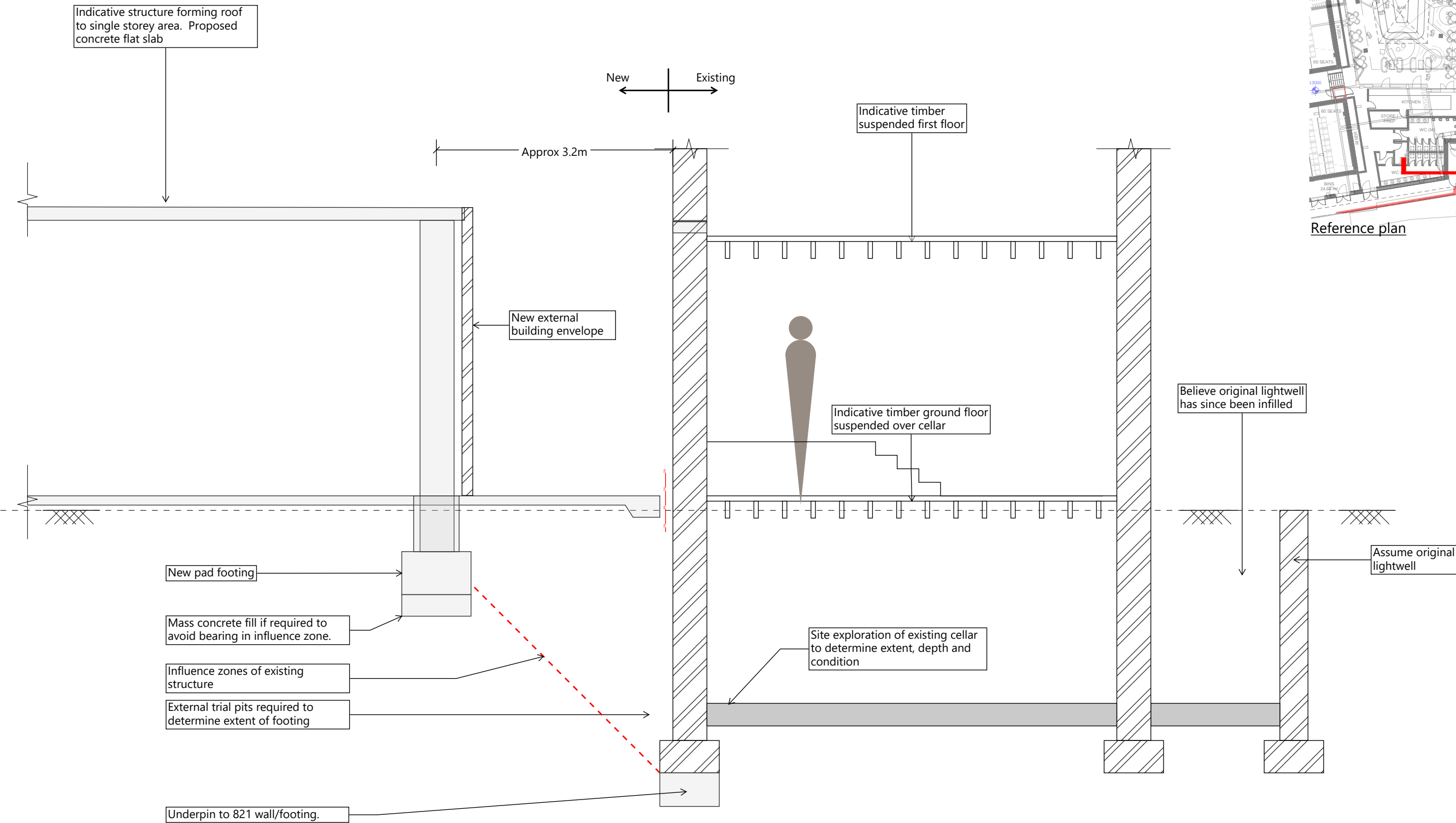


Reference plan

BURO HAPPOLD	Project: THFC High Road West		Project Number: 0049225		Status: S2 - For Information		
	Sketch Title: Modifications to Printworks 819-829		Sketch Number: SKS-0004		Date: 07/07/2023	Initials: APD	Revision: 05

Section - Interface to new structure, with 819 basement

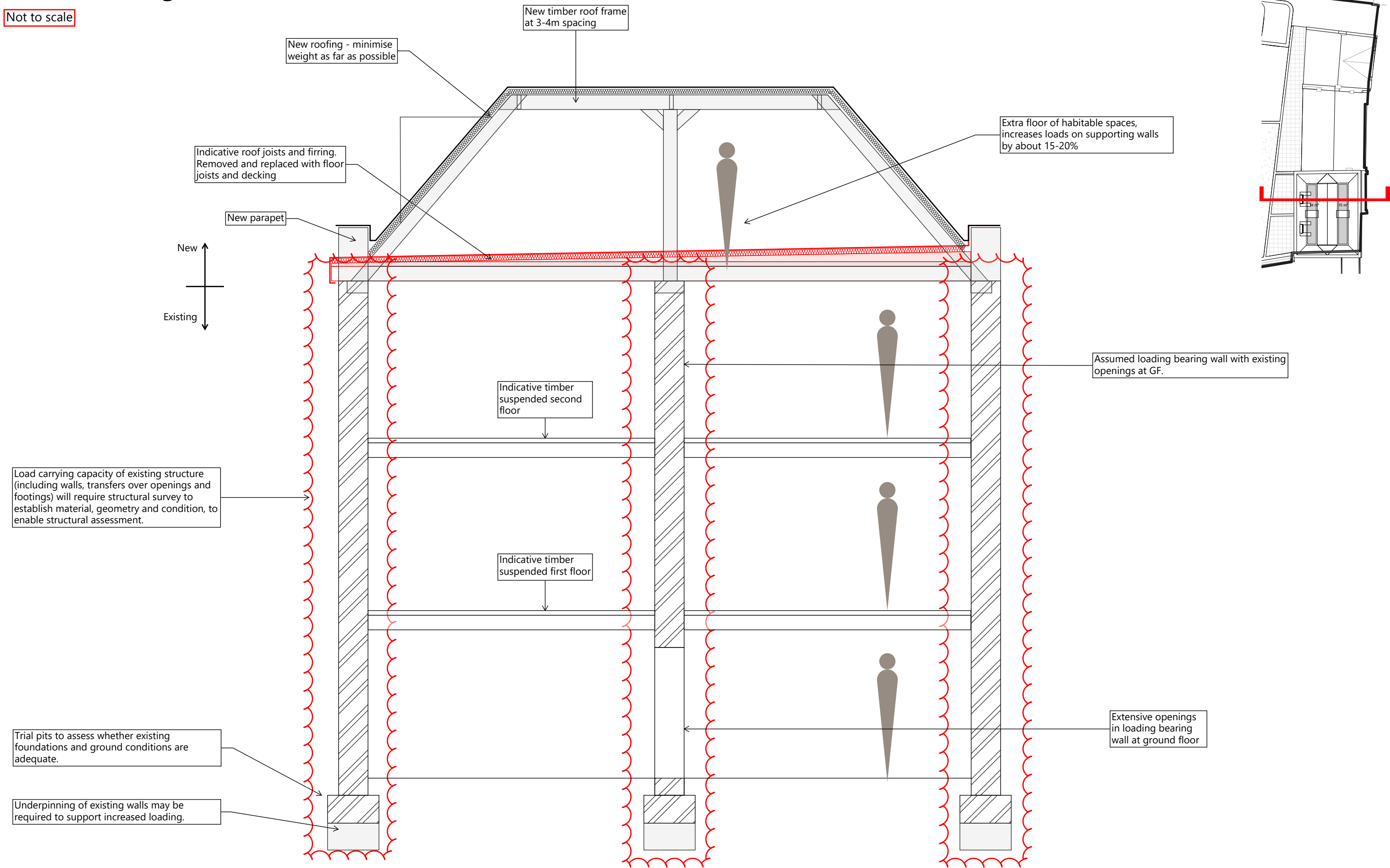
Not to scale



	Project: THFC High Road West	Project Number: 0049225	Status: S2 - For Information		
	Sketch Title: Modifications to Printworks 819-829	Sketch Number: SKS-0004	Date: 07/07/2023	Initials: APD	Revision: 05

Section through 819 & 821 Roof

Not to scale



	Project: THFC High Road West	Project Number: 0049225	Status: S2 - For Information		
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