Attachment A7

Planning Stage Structural Report

Planning Stage Structural Report

150 Day Street

Prepared for UOL / 20th March 2025

Issue: Revision 2

221199 SAAA

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1.0 Project Description

The planning proposal for the existing Park Royal Hotel at 150 Day Street, Sydney (**the site**), involves an ambitious upgrade and expansion of the existing hotel. This project aims to enhance the existing hotel offering while introducing a new, distinct hotel experience above the current structure, enabling the coexistence of the existing Park Royal and a new Pan Pacific Hotel on the same site. Strategically positioned at the edge of the City of Sydney, the development reinforces the city's entry into Darling Harbour by maintaining and emphasising the city wall characteristic of this prominent location.

The project is defined by 3 key principles – maximising adaptive reuse (setting a benchmark for future developments in Sydney), energising the Sydney visitor economy, and significantly enhancing the greening of both the public realm and the skyline, in alignment with the City of Sydney's sustainability goals. Achieving this vision involves expanding the existing core to support the new hotel above, employing a 'strip to structure' approach from ground to Level 02 to facilitate amenity upgrades, lightly refurbishing existing hotel rooms, and comprehensively upgrading all building services. This initiative aims to establish a contemporary hotel destination while setting a new standard for sustainable urban redevelopment.

To achieve the intended outcomes, this planning proposal seeks to amend the *Sydney Local Environmental Plan 2012* (the **LEP**) by inserting a new site-specific clause for the subject site under Part 6 Division 5 Site specific provisions to:

- allow a maximum building height of 85 metres,
- permit a maximum floor space ratio of 13.5:1 for hotel and associated land uses,
- restrict use to employment/hotel use and not residential accommodation or serviced apartments.

The Planning Proposal is supported by a site-specific Development Control Plan (**DCP**) and reference design scheme, prepared by Hassell. Key elements of the site specific DCP and reference design include:

- Renovation of existing 2 level basement and existing 11 storey hotel, with the addition of a new 11 storey hotel above (including a transfer floor between the two structures), and a rooftop plant floor resulting:
    - Two hotel brand offerings – Park Royal Hotel (3.5 star) and Pan Pacific Hotel (5 star)
    - 490-540 hotel keys with gross floor area of ~30,000m^2
    - Upgrade existing infrastructure and services (including new lift core),
    - New and upgraded hotel facilities (including lobby, dining areas, meeting rooms, ball room, gymnasium, bar and restaurants, and pool).
    - Removal existing Porte Cochere and exit ramp resulting in single vehicle entry/exit ramp from Day Street to be used by valet only.
- Ground floor public domain, public art and landscaping design, and
- Significant greening and landscaping of western façade.

2.0 Introduction

TTW has been engaged to provide structural engineering consulting services in assistance of the planning proposal for the Park Royal Hotel at 150 Day Street Sydney.

This project involves the ambitious addition of up to 11 storeys of new hotel, plan and amenity space above the existing hotel. We have aimed to maximise the extent of retained structure by strengthening key components to facilitate the additional storeys above. By maximising the adaptive reuse opportunities in this structure, we hope to set a benchmark for future developments in Sydney in alignment with the City of Sydney's sustainability goals. Figure 1, produced by Hassell, shows an indicative section of the proposed building additions.

TTW has carried out structural reviews of the existing structure in order to define the key opportunities, requirements and risks associated with the project aims. Our reviews have focussed on structural strengthening of required structural elements so that the existing structure can be fundamentally retained and reused with associated benefits to sustainability. Existing columns, footings and core-walls must be strengthened in order to support the increased weight from the new additions. However, the existing floor slabs can generally be maintained, with substantial environmental benefits from reducing the requirement to demolition and rebuild these elements.

We have used our experience in similar adaptive reuse projects to propose efficiencies in construction methodology that could be utilised while carrying out these works. The efficiencies include the sequencing of strengthening works and core-construction, and the opportunities present in the construction of the additional storeys.

This report, and the associated drawing mark-ups in the appendices, have been produced in order to communicate these items, with a particular emphasis on retention, strengthening, constructability and safety.

The marked-up set of documentation in Appendix A is intended to be referred to while reading this report.

Figure 1: Proposed Building Cross-Section

3.0 Existing Structure History

The Park Royal Hotel at 150 Day Street is located within the City of Sydney local government area. It is bound by Day Street to the west, Bathurst Street to the south and Sands Street to the east, with the Druitt Street Western Distributor on-ramp and the westbound Cross City Tunnel exist to the north. The southern part of the site is adjacent to the eastbound Cross City Tunnel under Bathurst Street. Refer to Figure 2.

Figure 2: Location of 150 Day Street

The existing building is a reinforced and post-tensioned concrete structure and is 11 storeys high, with two-storeys of basement.

Lateral stability of the existing structure is provided by a reinforced concrete lift core. Floors are typically constructed as a system of flat-plate concrete elements with drop panels. The lower storeys of the structure (levels B1-L3) are constructed using conventionally reinforced concrete. The upper storeys of the structure (L4 and above) are constructed using post-tensioned concrete.

Concrete columns provide vertical loads-paths throughout the building, with transfer structures limited to two areas: above the existing entry at Ground Floor; and above the exiting ballroom at L2 South.

The building is founded on shallow pad footings, bearing directly onto sandstone.

The existing structure was designed in 1988 by Taylor Thomson Whitting (TTW Project Reference 88151). Some structural modifications were carried out in 1996, also designed by Taylor Thomson Whitting (TTW Reference 96311). These 1996 works were limited to the addition of a new steel roof, and the modification of L11 into a habitable space.

As the base-build engineer on the project, TTW has access to the original drawings and specifications for the project which have been reviewed throughout the planning works.

As part of the proposed new works, the steel roof added in 1996 is to be removed, and additional storeys added above this floor.

4.0 Geotechnical Parameters

The original structural design was based on contemporary geotechnical advice from Douglas Partners. The site is underlain by Hawkesbury sandstone at shallow depth, and all existing footings are founded within the sandstone.

There exists a fault zone through the site, as highlighted in yellow on Figure 3 below. Existing footings within this zone have been designed for a reduced allowable bearing capacity of 1500kPa.

In the original 1988 building design, all footings outside of the fault zone were designed for geotechnical allowable bearing pressures of 3500kPa.

Figure 3: Existing Foundation Plan Showing Fault Zone

New investigations have been carried out by Douglas in December 2024 (as described in report *231572.00.R.002.Rev0*) which re-assessed the foundation conditions below the existing building footings. Six boreholes were drilled at existing foundation locations in order to assess the strength of the existing rock.

Based on a combination of rock strengths assessed on site and defects present, Douglas Partners have provided updated allowable bearing capacities for the foundation material encountered on site. Douglas Partners have advised that typically an Allowable Bearing Capacity of 5000kPa can be assumed, with 1500kPa capacity maintained in the fault zone as per the 1988 design.

Douglas Partners recommend that each footing subject to uncreased loading are to be individually investigated to confirm the bearing capacity of the foundation material.

Douglas Partners also recommend that a detailed monitoring plan be developed for the redevelopment works prior to any additional loading of the existing columns.

TTW have utilised these updated allowable bearing pressures in our design in order to minimize the required foundation strengthening while allowing for the increased loads of the additional storeys above.

5.0 Strengthening Methodology

5.1 Columns

The structural capacity of the existing concrete columns on the building have been analysed using the original structural documentation. The existing columns have been designed relatively efficiently and are close to their full-strength utilisation under current loading conditions.

In order to carry out the proposed structural additions to the building, strengthening of all columns in the existing structure is to be allowed for.

TTW has considered alternate options to concrete strengthening for internal and external columns. These approaches have been considered with a focus on constructability and spatial arrangements within the structure. For all column strengthening, in-depth analysis of differential settlement, creep and strain-compatibility of existing and new concrete elements will be carried out as a component of the detailed design of the project.

5.1.1Internal Columns- Structural Solutions

For typical internal columns, TTW has designed a reinforced concrete jacketing solution to strengthen the columns to withstand the additional load from the proposed extensions.

In general, a 150mm thick reinforced concrete jacket on all side of the existing concrete elements will provide adequate additional strength. Coordination with Hassell and LCI has been carried out throughout the Planning Stage with these dimensions. Refer to Figure 4 for indicative structural requirements for strengthening of internal columns.

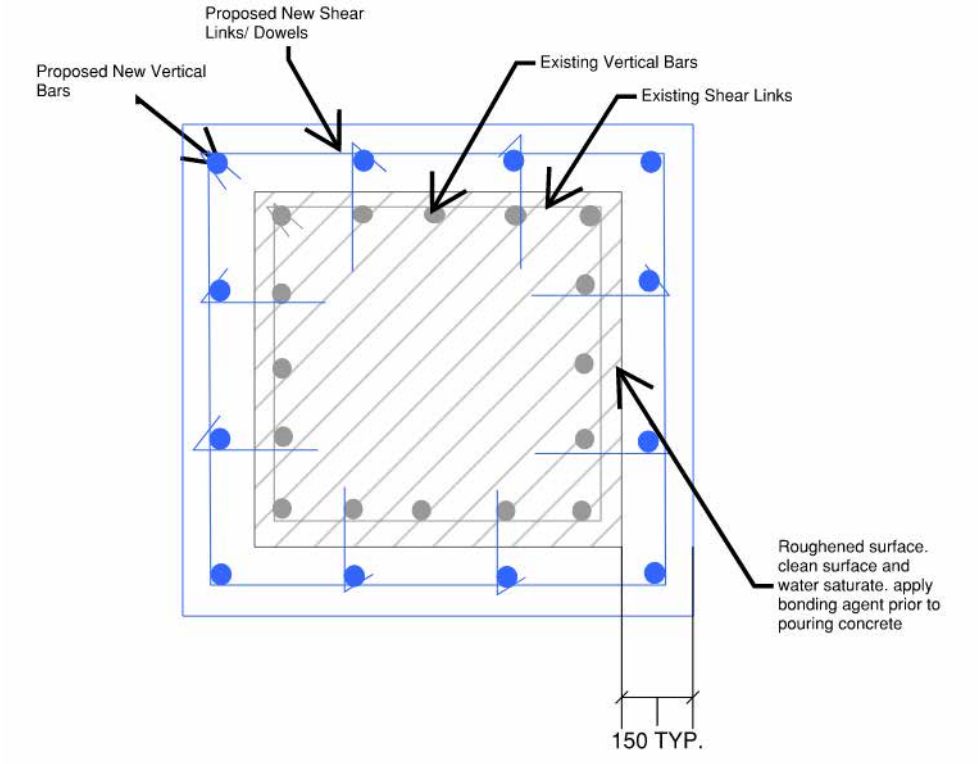

Figure 4: Internal Column Strengthening Strategy

At the higher levels of the existing structure, a modified solution has been considered in order to minimise disruption into existing hotel rooms. This solution is to limit strengthening to either side of the existing columns and contain the strengthening entirely within the existing wall-zone between rooms. See Figure 5.

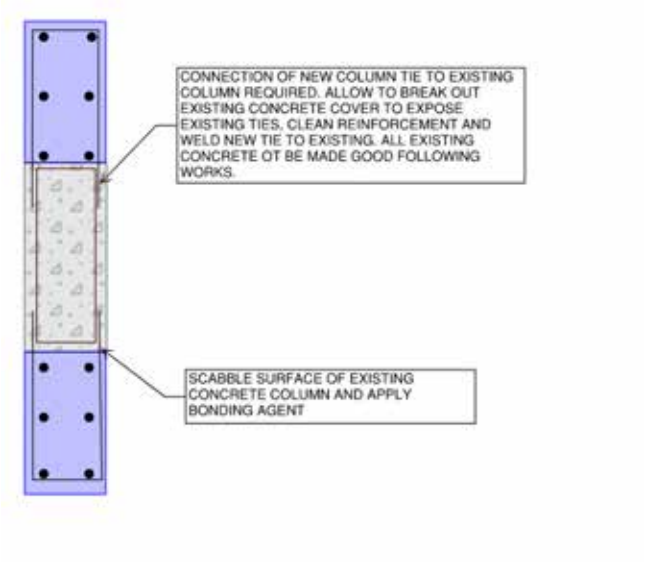

Figure 5: Column Strengthening of Internal Columns at Hotel Rooms

5.1.2 Perimeter Columns- Strengthening Solutions

For perimeter columns, a jacketing solution will not be possible due to clashes with the façade and shoring wall structure.

For this reason, perimeter columns are proposed to be strengthened by the addition of a return wall as indicated in figure 6. This return wall is intended to fit within the existing non-structural hotel wall at upper levels, minimising the impact of strengthening on the existing spatial layout of hotel rooms.

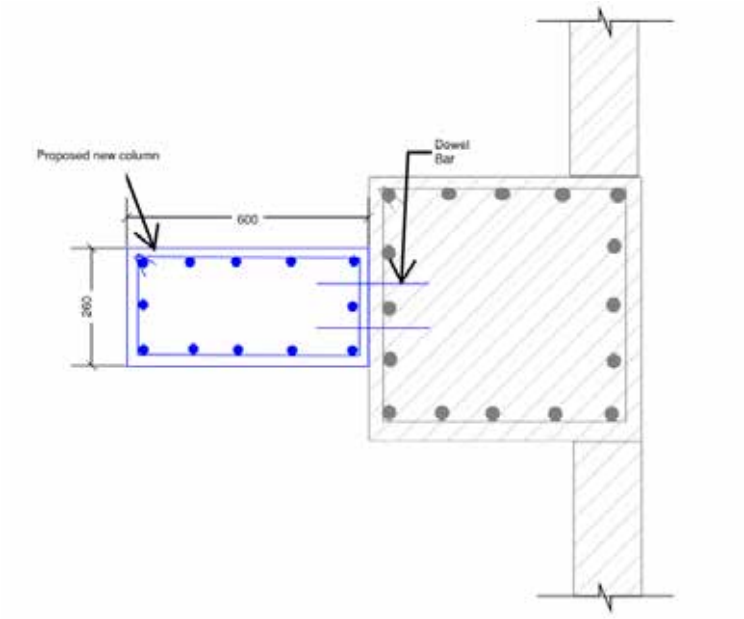

Figure 6: Column Strengthening of Perimeter Columns

5.2 Footings

The additional weight imposed by the proposed building extension will add additional loading into the existing foundations. We have analysed the existing footing capacity in order to ascertain the structural strengthening requirements.

Based on the geotechnical investigations carried out by Douglas Partners in 2024 (*231572.00.R.002.Rev0),* foundation material is typically stronger than previously allowed for in the existing design. See section 3 of this report for more information.

Utilising these increase allowable bearing pressures, we are able to limit the amount of foundation strengthening to only the footings shown in yellow on figure 7:

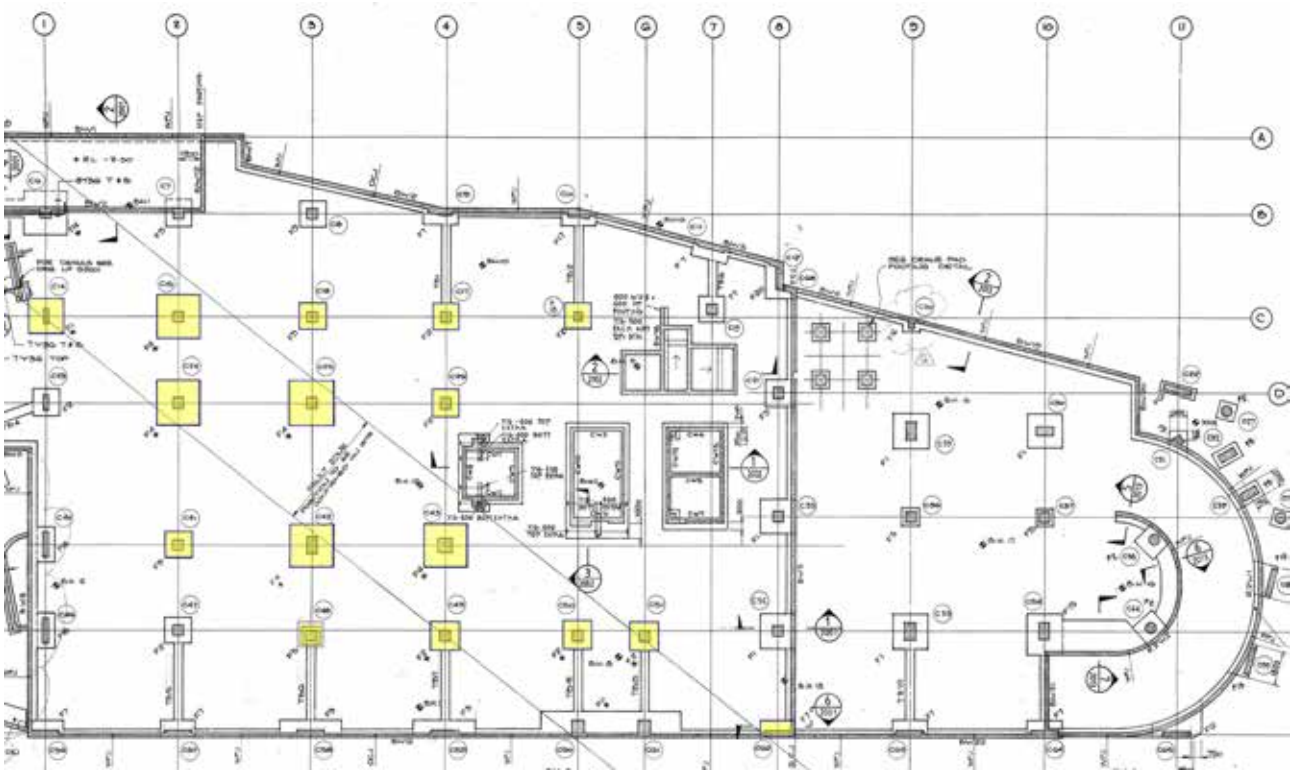

Figure 7:Extent of Foundation Strengthening required

As noted in the Douglas Partners report, there remains a risk of variability in strength under each specific footing, and it is recommended that investigations of founding material beneath all footings is carried out prior to construction works progressing to manage this risk.

Other risks associated with these works include differential settlement of foundations subject to existing and new loads. Monitoring of existing levels is to take place during construction works to compare measured values against theoretical settlements calculated by TTW and the Geotechnical Engineer.

5.2.1 Internal Footings

In order to achieve efficiencies in construction program and cost, foundation strengthening is recommended to be carried out by the addition of new concrete elements above the basement slab as shown in figure 8. This new concrete element provides a larger surface area of concrete to bear into the founding material and provides associated increases in strength.

The key benefit of this strategy is that requirements for propping, jacking, excavating and underpinning of existing footings can be minimised. This will lead to associated benefit to safety, program and cost.

The spatial requirements for this strengthening solution have been coordinated with Hassell and LCI throughout the Planning Stage of Works to ensure that this strategy is feasible and allows for coordination with services and parking requirements.

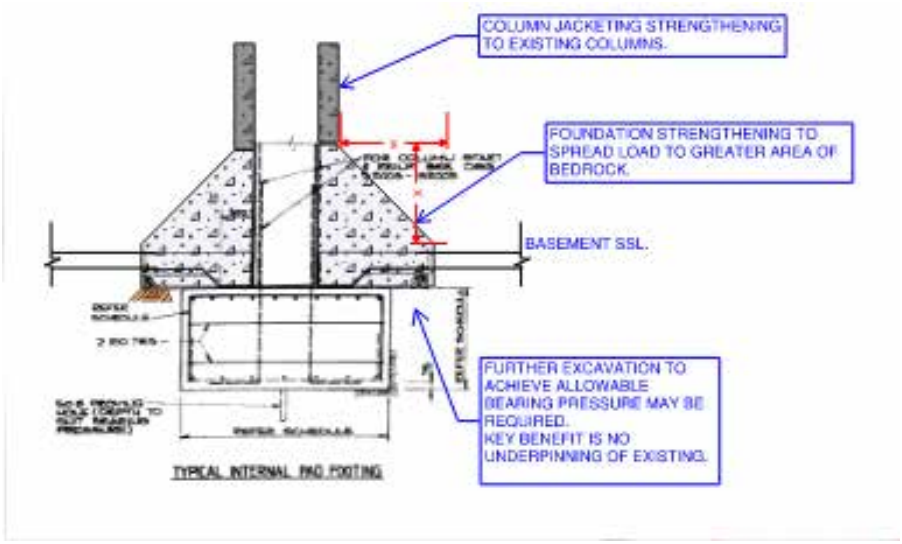

Figure 8: Indicate Footing Strengthening Solution

5.3 Structural Core

The increased structural height and mass, along with increased requirements for earthquake resistance since the original building design will require that the lateral stability system of the building be substantially strengthened. This will be achieved by increasing the number of concrete cores throughout the building.

Our proposed strategy for core strengthening and construction has been designed with a focus on minimising demolition and increasing construction efficiency.

In particular, the construction sequence of the strengthened and rebuilt cores can take place in such a way as to minimise or eliminate the requirement for temporary lateral bracing to be provided by ensuring that the required permanent structure is present at any given time.

The existing structure is stabilised by three lift-core boxes, highlighted in yellow onto the existing structural plans in figure 9.

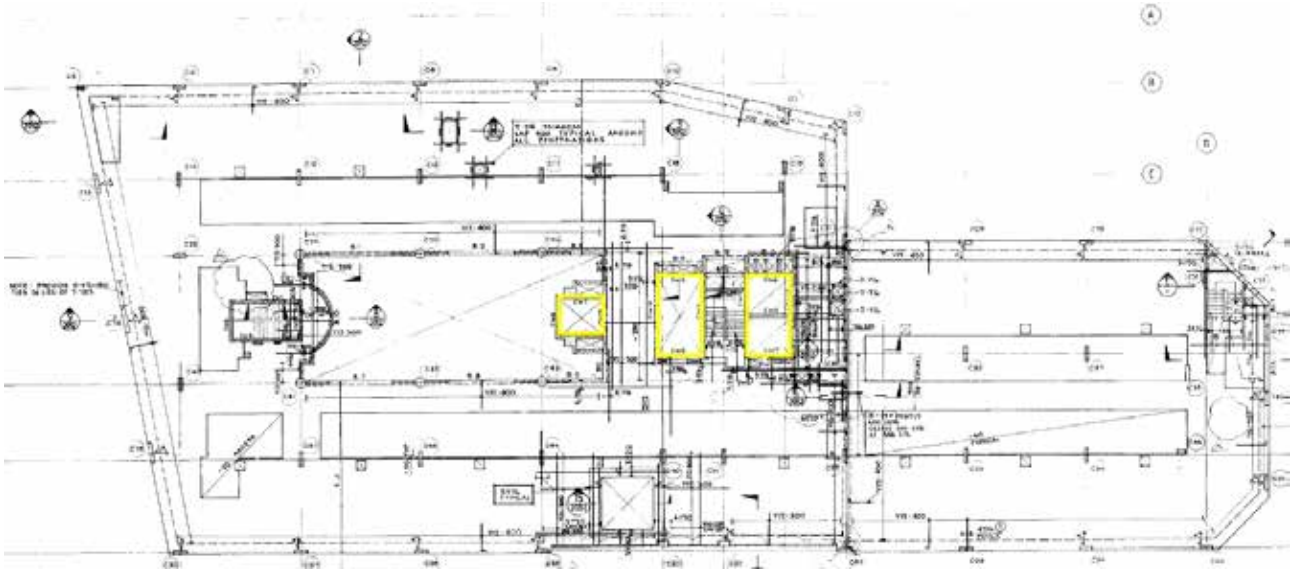

Figure 9: Existing Lateral Support System

The adaptive reuse strategy for the building involves the expansion of this lateral support system to include five lift core boxes as shown in figures 10 and 11. This new system includes new cores (nominated as A, B and E in Figure 10), and retained strengthened cores (nominated as C and D).

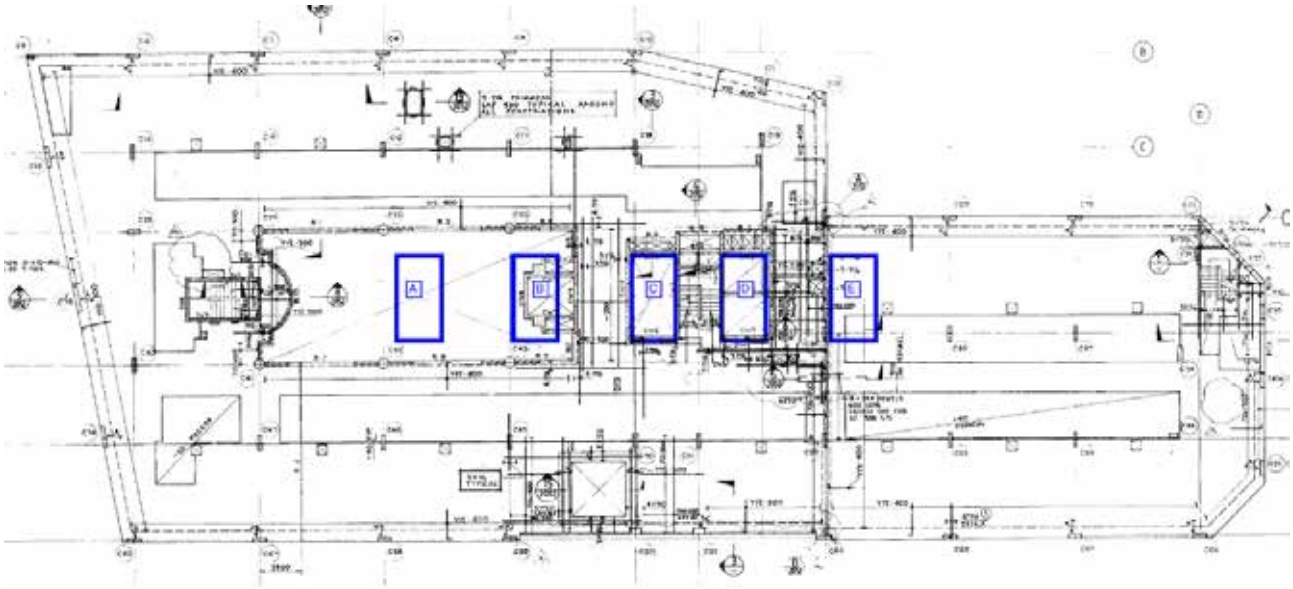

Figure 10: Layout of New Cores overlayed on existing building plan

Figure 11: Layout of New Cores over new floor layout

The location of these cores has been carefully reviewed and coordinated with Hassell to maximise retained structure and minimise temporary works required during construction. Specific benefits to each core location and specification which have been considered are:

5.4 Core A:

The location of this core is within the existing atrium space. This allows for a simplified construction methodology which reduces demolition or impact on the existing post-tensioning layout at upper levels.

It is intended that this core be constructed first, to provide a system of temporary lateral stability prior to any existing core being modified or demolished.

This core must be tied into the surrounding concrete structure to ensure that lateral diaphragm forces are transferred. This will be achieved through a combination of breaking back the existing concrete edge around the atrium to tie in new structure, and a system of steel and composite concrete flooring which will be used to frame out the other areas of the atrium infill.

5.5 Core B:

The location of this core is also within the existing atrium space, however the construction of this core will require the demolition of the existing single-lift core in this location. It is intended that demolition of the existing core is delayed until new cores at A and E are constructed to ensure structural stability of the existing building at all times. The new core will be tied into the existing structure in order to transfer lateral diaphragm forces by breaking back the existing concrete slabs by approximately 1.0m and leaving the existing reinforcement exposed. New reinforcement is to be lapped into the existing reinforcement to provide a permanent load-path into the lateral support structure.

5.6 Cores C and D:

These existing cores are to be strengthened in order to increase their capacity to the new requirements imposed by the increased building height and mass. Strengthening these cores, as opposed to demolishing and rebuilding, has been considered in order to limit the amount of demolition of the existing structure and provide benefits to cost and program.

The strengthening strategy for these walls requires that:

1. Back-propping is installed around the perimeter at which the slab is to be broken back to.
2. The existing slabs around the walls are to be broken back for 1.0m beyond the location of the new walls.
3. Existing reinforcement must be maintained at the broken-out slab such that the new reinforcement for the wall can be tied in for structural continuity
4. A new concrete jacket, approximately 350mm thick, is to be cast against all perimeters of the existing wall.

See Figure 12 below. Appendix A of this report also provides more in-depth information of the requirements and locations of this strengthening strategy.

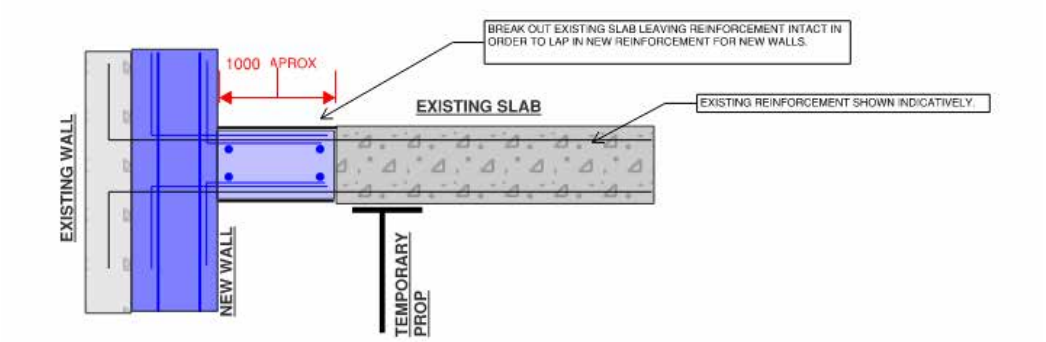

Figure 12: Existing Wall Strengthening Strategy

5.7 Core E:

This location of this new core has been optimised to stabilise the southern portion of the building and be founded at the upper level of the basement.

The location of this core will require demolition of a void in the slab, at levels 4 and above. Slabs are to be broken back beyond the extent of the new wall to allow for connection of the slab to the new wall as described for cores C and D.

In this particular location, forming the void in the slab will require truncation of the existing post-tensioned reinforcement. Truncation of the existing post tensioning system may require strengthening of slabs adjacent to the new penetration. See annotations in Appendix A for more information on these requirements.

6.0 Rebuilt Areas of Structure

In order to achieve the required performance of the updated architectural design, various portions of the existing structural will require some degree of strengthening, or demolition and re-construction.

An extensive discussion of the requirements for these areas is annotated onto the drawing in Appendix A and should be referred to.

Specific areas for which some degree of modification, including demolition and rebuild include:

1. Ground Floor North- New Substation
   Substantial changes to the existing structure are required to provide the requirements of the substation. These requirements include substantially higher loading capacities, increased Fire Rating Level, and specific spatial layouts to comply with Ausgrid Requirements.
2. Ground Floor West and South- modification of structure is required to achieve new levels, either through the addition of toppings or the demolition and rebuild of slabs at lower levels.

3. Level 2 North West- Modification of existing stepped slab to reduce structural slab level to consistent level for the rest of the structure
4. Level 3 South- Potential modification to transfer beams in order to allow for removal of a column in the Ballroom

7.0 Building Extension: Floor Options

TTW has considered a variety of structural solutions for the construction of the proposed additional storeys. These structural solutions include:

1. Post-Tensioned Concrete Flat-Plate

2. Reinforced Concrete Flat-Plate

3. Composite Steel/Concrete Solutions

Appendix A and B contain sizes and information for each of these schemes intended for high-level costing and spatial planning purposes.

We understand that the client's priority for the project is to minimise the structural zone for the project. Because of this, we have progressed the design through planning phase assuming a flat-plate post-tensioned concrete solution will be used. This solution has key benefits in reduced structural depth and allows for full structural integration into the existing concrete core and column structure.

A timber solution for the building extension has also been considered at this stage and has been considered sub-optimal at this stage of design. It has been considered that the required size of timber elements will not lead to a feasible outcome when considered in the context of the spatial requirements of the project. We note that here may be opportunities to use structural timber in combination with a modified column grid, or in a hybrid steel/timber or concrete/timber system as the design progresses.

8.0 Building Extension: Specific Spaces

Refer to Appendix A for detailed requirements for specific spaces and elements in the new building extension.

Notably:

1. L11 is to provide transfer structures for the column gride in order to allow for a modified column grid in the new building extension.
   Transfer structures have been designed and coordinated to transfer columns in one direction (north south) through the use of structural trusses, or other deep elements on the perimeter.
   We note that opportunities existing to minimise or remove transfer structures by lining up columns for the new building extension directly above the existing column locations. This opportunity has been discussed with the client and not progressed at this stage so as to allow for greater flexibility to room sizes in the new expansion.
2. There are specific structural requirements for support and isolations at the proposed Pool and Gym areas. Refer to the annotated plans for additional information on these areas.
3. The current architectural scheme proposes deep cantilevering planter boxes at the north-west perimeter of the new structure. We have provided a structural solution utilising upstand beams concealed within non-structural walls to support these heavy cantilevered loads. Refer to annotated plans for additional information on this solution.

9.0 Construction Considerations

One of the main considerations in the design of the 150 Day Street works has been the construction and buildability aspects of the structure. The site is heavily constrained on all sides and has a relatively small floor plate for working within.

9.1 Minimise of temporary works

Due to the significant nature of some of the proposed interventions, incorporating the temporary works within the structural design would be of benefit to the project. By integrating any temporary works into the final structure, the design will generally have a higher degree of robustness and resilience in addition to avoiding double ups in the amount of structure required to deliver the project. In particular, we believe that the integration of a construction deck at L11 with the permanent structure for this area will achieve this goal on this particular project. This deck will allow for the safe construction of the proposed additional storeys, and by integrating it into the permanent structure it will also provide the increased load capacity to allow for the planter, gym and plant space currently proposed in the architectural design.

9.2 Maximise use of the existing structure

The existing structure has a high degree of structural integrity. Maximising the amount of structure that is being retained is a good approach from sustainability, heritage and economical perspective.

Our structural strengthening solutions as discussed in this report have been considered in this context.

9.3 Craneage and access

Craneage and access are important considerations in the design of the structure and access into the building. Due to the retention of the existing floor structures, the removal of demolition material and the installation of new structure should be considered around access.

It may be optimal to construct a temporary crane grillage above the existing structure in order to provide crane access throughout the construction of the project.

It is envisioned that a crane grillage would connect to existing columns, and the strengthening of those columns would incorporate the load requirements from the crane. The grillage would also form part of the integrated construction deck as described in section 8.1 of this report.

10.0 Existing Fire Rating

TTW has carried out a preliminary review of the intrinsic FRL of the existing structure.

Typically, the existing reinforced and post-tensioned slabs will achieve an FRL of at least 90/90/90 when assessed with reference to the modern NCC and Concrete Structures Code.

Existing load-bearing structural walls and columns in the structure will generally be strengthened or replaced as part of the structural works required to support the proposed additions, in which case the required FRL for those elements will be achieved as part of those works.

It may be possible to justify a higher FRL in some cases by carrying out a detailed thermodynamic analysis of the existing structure as allowed by AS3600:2018- 5.3(b). It may also be possible to justify a lower required FRL through a Fire Engineering Assessment.

As noted in the MetroBC report (*Existing Conditions & Concept Review BCA Report*, October 2024, page 8) “unless the Development Consent requires an upgrade of the existing building there is no current requirement to investigate and determine if the FRL’s comply with the BCA requirements”.

Noting the above, we understand that requirement for an upgrade could be triggered by the change of use of a specific area of the building. We have carried out an initial review of the existing FRLs of the existing structure in order to provide a base-line achievable level of Fire Resistance. Depending on the requirements provided in the specific Development Consent Conditions, more detailed studies could be carried out, including critical review of FRLs required through a Fire Engineering Assessment.

11.0 BCA and Legislative Requirements Items

11.1 BCA Report Notes

MetroBC has prepared a BCA report on the Existing Conditions and Concept Design dated October 2024.

As it pertains to structural concerns, this report has highlighted the following key criteria:

1. The report highlights various changes in use of areas of the existing building. Changes of use may be associated with different requirements of fire-rating of a structure and be a trigger for structural upgrades for compliance.
   Of particular note is the addition of a substation at the ground floor. The implications of this are discussed in the annotated plans in Appendix A.
2. It is noted the FRL required for fire-isolated stairs serving the tower levels is 180/120/120 if loadbearing and -/120/120 if non-loadbearing. Typically, the fire stairs in question will be new-built structure which will be designed to achieve the required FRL. At this stage of design, these fire-stairs are anticipated to be non-load bearing elements, constructed with column and beam systems, with masonry infill walls to achieve the required insulation and integrity requirements.
3. It is noted that unless the Development Consent requires an upgrade of the existing building there is no current requirement to investigate and determine if the FRL's comply with the BCA requirements. As per section 9.3 of this report, TTW has carried out a review of the achievable existing FRLs based on the existing structural documentation. The Consent Conditions for the project must be carefully reviewed with reference to this potential requirement

11.2 Authority Approvals

Due to the location of the site, it is anticipated that a number of public and private stakeholders will require consultation during the design stages of the project. These stakeholders are likely to include:

1. Transport for New South Wales (TfNSW)
2. Sydney Water
3. The City of Sydney
4. Transurban (in regard to the Cross City Tunnel)

Transport for New South Wales (TfNSW)

We are aware that initial consultation with TfNSW has taken place in a meeting attended by Hassell and Mecone in early February 2025.

It was discussed in this meeting that TfNSW has previously compulsorily acquired the strata of rock at the south end of site for the Cross City Tunnel. The current architectural scheme includes increasing loads of columns which are founded in this rock strata. Concerns have been raised by TfNSW regarding the impact of modifying the loads or existing condition of structure over this portion of the site.

Based on our previous experience with building above or near tunnel assets within the CBD, we anticipate that structural and geotechnical analysis will be required in order to manage the risk of modification the structure near the TfNSW asset to the satisfaction of the stakeholder.

The analysis would require coordination of TTW with a highly skilled geotechnical engineer to model the existing rock and determine the impact of the increased column loads. It would typically also be required to carry out a dilapidation survey of the tunnel before and after works as well as undertake monitoring during construction.

TfNSW should be consulted to confirm if they are comfortable to follow this approach in this particular instance.

Sydney Water Asset

Information retrieved through a Dial Before You Dig request has highlighted that a Sydney Water Sewer Asset is present in the southern portion of the site. This is indicated as a 300DIA Vitrified Clay Sewer Pipe.

This asset is highlighted in yellow on Figure 13 below.

Figure 13: Location of Sydney Water Asset

Sydney Water has a number of requirements and limitations when there is new construction occurring above or around their assets. A Special Engineering Assessment may be required by Sydney Water to carry out the proposed works on the site. This assessment would be required to ascertain the impact of construction works and modifications of existing foundation loads on the existing sewer. Sydney Water must be consulted with regard to the requirements for a Special Engineering Assessment on this particular project.

TTW has a specialist team which is able to carry out this assessment to the requirements of Sydney Water and is able to carry out the engineering components of this assessment if this is a requirement on this project.

City of Sydney Stormwater Asset

Information retrieved through a Dial Before You Dig request, as well as a site inspection, has shown that there is an existing stormwater conduit present in the northern portion of the site.

City of Sydney must be consulted with regard to any specific requirements for protection of this asset during construction works and allowance for future access if required.

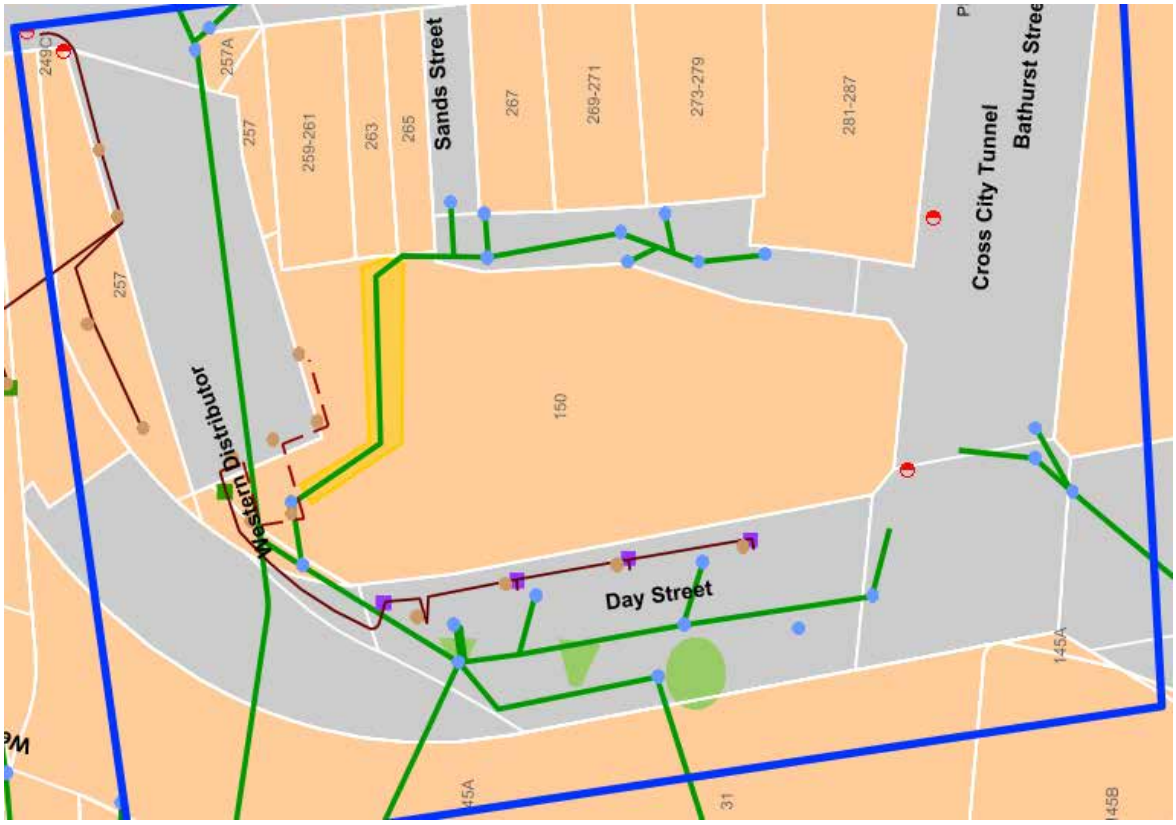

Figure 14: City of Sydney Stormwater Asset

Regulatory Requirements

11.3 Consent Conditions

There are a number of regulatory requirements which may be triggered by extensive building upgrades such as those proposed. The information presented below is not intended to be an exhaustive review of all requirements but is intended to prompt discussion with a certifier regarding specific requirements for works.

11.4 General Compliance with NCC2022

Many aspects of the existing structure are unlikely to comply with the modern NCC. Specific requirements for reinforcement detailing, cover and minimum design forces have changed since the structure was built in the 1970s. It will not be feasible to comply with any requirements for general upgrades of the structure to comply with NCA2022. Consultations with a PCA will be required early in the design process to propose appropriate and achievable consent conditions for the expected works which may allow for a performance solution to be achieved for the existing structure.

The general intention of the structural solution is to not modify the existing floor plates unless necessitated in order to transfer loads into new cores. We will carry out structural checks for strength and serviceability on the existing retained structures, but due to modified requirements and specifications in the NCC since the time of construction, it will not be possible to re-certify existing structural elements to modern design codes. The specific requirements for certification, and negotiation on consent conditions will be required as the project progresses to ensure that a reasonable result is achieved which allows for the majority of existing structural components to be retained.

11.5 Upgrading Building Structure for Earthquake Actions

In this project, we have progressed with a design based on strengthening the lateral stability system by the construction of new structural cores which are designed to withstand the lateral wind and earthquake loads required by modern design codes.

Structures built at the time of 150 Day Street were generally not designed with an appreciation for earthquake loads. A building upgrade for the structure to comply with modern design standards may generally triggered because of one or multiple factors below:

Legislation

Under the EP&A Act, changes of use or substantive changes to the building can trigger the requirement for upgrade or compliance with the NCC. This requirement is best worked through early in the design process with the private certifier to ensure an overall certification framework is established for a project.

Approval Authority

The approval authority may require compliance with parts or all of the NCC as part of the approval conditions. The requirements for these upgrades can in many instances be discussed with the Authority depending on the types of work being undertaken.

Client Decision

Client may wish to understand the level of building performance and life safety. In the event that a building does not require any upgrade from a statutory or certification, it may be decided that a minimum level of performance is required. Following an initial structural assessment on the building which would gain an understanding of overall performance – a partial or full upgrade program of works could be developed based on the specific performance requirements agreed upon.

It is vital to determine the expected outcome from upgrade at the early stage of project in order to satisfy any one of the factors above. If none of abovementioned factors triggers upgrade of building structure and the structure can remain as is with existing building not being certified as part of the works.

11.6 Confirmation of Fire Rating Period of Existing Structure

We have carried out a review of the existing fire-rating of the structure as a desk-top study based on the existing drawings. We note that certifiable confirmation of the existing fire-rating levels requires a very detailed site investigation to confirm the exact construction methodologies which were followed at the time of construction.

Depending on specific consent conditions and requirements for certification, it may be required to assess and certify that the existing structure has appropriate fire rating levels in compliance with the NCC. A PCA should be consulted early in the design process to confirm what extent of works may trigger a requirement to certify the existing fire-rating of the structure.

Certification of the fire rating period of the existing structure will generally require extensive investigation of all structural elements. As the primary structural framing of the upper levels of the tower is structural steel beams, it is assumed that these have some fire protection in the form of fire-rated cladding, vermiculite fire-spray or concrete encasement. The extent, build up and condition of fire rating would need to be confirmed across the full extent of the structure to certify the existing fire-rating level.

In addition, the thickness and condition of existing concrete elements would need to be investigated to assess the current fire rating level of the structure.

Rectification details to structural steelwork and concrete elements may be required depending on the result of investigative works.

Recommended Structural Investigations

In order to provide certainty of the existing structural integrity, there are a number of additional investigations which we propose are required in order to verify the analysis to date, provide further design input to future stages of a design scheme and to provide assurance of the existing structural capacity.

These investigations include:

1. Radar scanning throughout the suspended floors of the structure in order to confirm the depth of the existing concrete floor slabs as a due diligence check that the structure has been built in accordance with existing documentation.
2. A general visual inspection of the superstructure behind finishes and cladding to provide assurance that there are no discrepancies to the structural layout in comparison of the existing documentation. We note that TTW have access to the original structural design documentation and have verified this to a high-level degree based on site visits and surveys conducted to date.
3. A general condition survey of the structure. Further details on this item are provided below.
4. Testing of concrete at a number of locations throughout the building, including multiple instances at core walls, floor slabs, existing columns and slabs. Further details on concrete testing are provided below.
5. Survey of condition and deflection of existing structural components.
6. Geotechnical investigations as discussed elsewhere in this report.

11.7 Concrete Tests

We recommend performing concrete tests on existing structure in respect to the following two aspects:

1. In-situ concrete compressive strength
2. Concrete tests, such as chloride ion content and depth of carbonation, to evaluate corrosion status of existing concrete reinforcement.

11.7.2. Concrete Compressive Strength Test

The 28-day characteristic concrete compressive strength is specified for design purpose. However, the in-situ concrete strength will continue grow after 28 days from casting. Other factors, such as different mix design, supplied by different plants, ambient condition etc, would also lead to variation in concrete strength and it is generally higher than the specified 28 days strength. Therefore, we will recommend performing tests on existing structure to determine the in-situ concrete strength, in particular columns and walls. Strengthening works may be reduced in quantity or even avoid if existing structure is shown to have a higher design strength.

11.7.3. Reinforcement Corrosion Condition

Commercial buildings generally have 50 years of design life. 150 Day Street was constructed in 1989 and its concrete structure, especially the parts expose to atmospheric environment, may be showing some signs of corrosion. The following tests will allow us to understand the current reinforcement condition and evaluate if structure is exposed to any risk of reinforcement corrosion or concrete damage in near future.

Carbonation of concrete is a cause of reinforcement corrosion. New concrete has high pH value which reacts with the bare steel reinforcement to form an oxide film to protect the reinforcement from corrosion. If the reinforcement cover is sufficient, the reinforcement will remain in uncarbonated concrete for the life of building. However, the carbonation of concrete reduces pH in concrete which allows reinforcement to corrode.

Chloride ions are a major cause of reinforcement corrosion, particularly in areas where the structure is exposed to a marine environment. If the chloride content at the depth of reinforcement exceeds a figure of 0-.06% by weight of concrete, corrosion of the reinforcement is likely to commence. Chloride penetration is a time related process and establishing a chloride profile can allow forward predictions of future chloride ion penetration to be undertaken.

Sulphate attack on concrete is when sulphate enters concrete and combines with components of the cement paste and begins destroying the paste that holds the concrete together. New crystal compound forms as result of this chemical reaction and occupies void within concrete, which ultimately cracks and breakdown concrete micro-structure and leads to loss strength in concrete structure or corrosion in reinforcement.

11.8 Existing Building Condition Survey

It is also recommended to carry out building condition survey and remediate any defect as required when able. Laboratory and field tests are recommended to evaluate current building condition and forecast any risk may lead to deterioration.

We suggest undertaking a building structure condition survey after removal of all finishes to identify any structural defect and provide remediate as required.

Prepared by
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Authorised By
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Managing Director

P:\2022\2211\221199\Reports\TTW\Structural\RPT250320.1 150 Day Street- Planning Stage Structural Report.TTW r2.docx

Appendix A

Structural Review of Architectural Set

EXISTING STRUCTURAL SYSTEM:
CONVENTIONALLY REINFORCED CONCRETE SLAB ON GROUND

ALLOW FOR EXCAVATION AND NEW FOOTING AT EACH LOCATION SHOWN DOTTED. AT THESE LOCATIONS, EXISTING FOOTING WILL LIKELY REQUIRE EXTENSION TO PROVIDE BASE TO STRENGTHENED PERIMETER COLUMN.

FOOTING TO BE ENTIRELY BELOW EXISTING BASEMENT SSL TO NOT INTERRUPT EXISTING PLENUM AND DRAINAGE.
SEE COLUMN STRENGTHENING DETAILS IN THIS REVIEW SET FOR MORE INFORMATION.
INTENTION AT THESE AREAS IS THAT BACK-PROPPING, JACKING AND UNDERPINNING BE MINIMISED AND ELMINATED IF POSSIBLE.

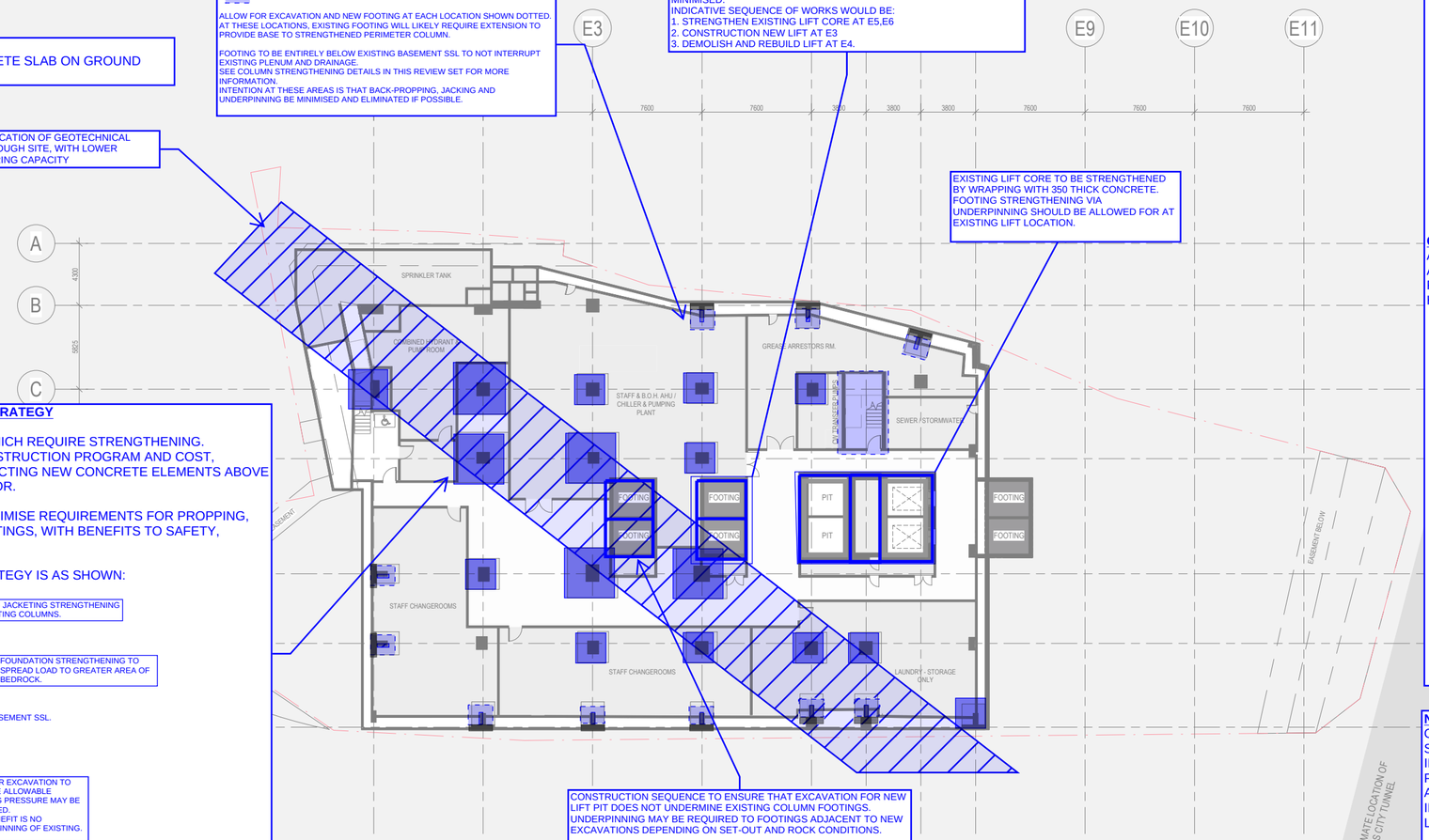
NOTE REGARDING SEQUENCING OF LIFT DEMOLITION AND REBUILD

EXISTING SINGLE-LIFT AT THIS LOCATION TO BE DEMOLISHED AND REPLACED BY NEW LIFT.
DEMOLITION TO BE SEQUENCED SUCH THAT GLOBAL STRUCTURAL STABILITY IS MAINTAINED AND TEMPORARY STABILITY BRACING IS MINIMISED.
INDICATIVE SEQUENCE OF WORKS WOULD BE:
1. STRENGTHEN EXISTING LIFT CORE AT E5,E6
2. CONSTRUCTION NEW LIFT AT E3
3. DEMOLISH AND REBUILD LIFT AT E4.

APPROXIMATE LOCATION OF GEOTECHNICAL FAULT ZONE THROUGH SITE, WITH LOWER ALLOWABLE BEARING CAPACITY

APPROXIMATE LOCATION OF CROSS CITY TUNNEL.
DEPTH AND LOCATION TO BE CONFIRMED, ALLOW FOR CONSULTATION WITH STAKEHOLDERS TO DISCUSS IMPLICATIONS OF ADDITIONAL STOREYS ON FOUNDATION FORCES.

EXISTING LIFT CORE TO BE STRENGTHENED BY WRAPPING WITH 350 THICK CONCRETE. FOOTING STRENGTHENING VIA UNDERPINNING SHOULD BE ALLOWED FOR AT EXISTING LIFT LOCATION.



CONSTRUCTION SEQUENCE TO ENSURE THAT EXCAVATION FOR NEW LIFT PIT DOES NOT UNDERMINE EXISTING COLUMN FOOTINGS. UNDERPINNING MAY BE REQUIRED TO FOOTINGS ADJACENT TO NEW EXCAVATIONS DEPENDING ON SET-OUT AND ROCK CONDITIONS.

EXCAVATIONS IN FAULT AFFECTED SANDSTONE REQUIRE TEMPORARY BATTERS OF 0.75(H):1(V).

UNSUPPORTED EXCAVATIONS IN ROCK WILL REQUIRE GEOTECHNICAL INSPECTIONS AT 1.5m DROPS IN EXCAVATION.

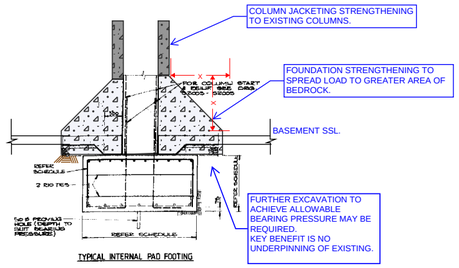
APPROXIMATE LOCATION OF CROSS CITY TUNNEL.
DEPTH AND LOCATION TO BE CONFIRMED, ALLOW FOR CONSULTATION WITH STAKEHOLDERS TO DISCUSS IMPLICATIONS OF ADDITIONAL STOREYS ON FOUNDATION FORCES.

INTERNAL FOUNDATION STRENGTHENING STRATEGY

BLUE MARK-UP INDICATES FOUNDATIONS WHICH REQUIRE STRENGTHENING.
IN ORDER TO ACHIEVE EFFICIENCIES IN CONSTRUCTION PROGRAM AND COST, FOUNDATION STRENGTHENING BY CONSTRUCTING NEW CONCRETE ELEMENTS ABOVE THE BASEMENT SLAB HAS BEEN ALLOWED FOR.

THE INTENTION OF THIS STRATEGY IS TO MINIMISE REQUIREMENTS FOR PROPPING, JACKING AND UNDERPINNING EXISTING FOOTINGS, WITH BENEFITS TO SAFETY, PROGRAM AND COST.

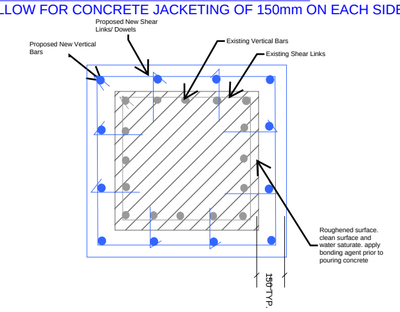
INDICATIVE FOOTING STRENGTHENING STRATEGY IS AS SHOWN:



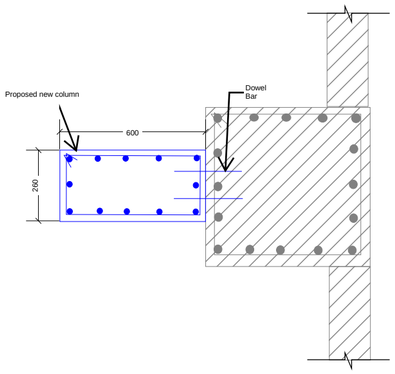
NOTE REGARDING COLUMN STRENGTHENING:

ALL EXISTING COLUMNS MUST BE STRENGTHENED IN ORDER TO RESIST THE WEIGHT OF ADDITIONAL STOREYS ABOVE.

GENERAL STRATEGY AT INTERNAL COLUMNS:
ALLOW FOR CONCRETE JACKETING OF 150mm ON EACH SIDE.



GENERAL STRATEGY AT PERIMETER COLUMNS:
ALLOW FOR INTERNAL RETURN COLUMN ON INSIDE FACE. NEW LOADS FROM ADDITIONAL STOREYS TO LOAD DIRECTLY INTO THESE EXTENSIONS.
PLAN GEOMETRY OF STRENGTHENED SECTION MAY BE MODIFIED, AT TYPICAL HOTEL FLOOR INTENTION IS FOR COLUMN TO FIT WITHIN HOTEL WALL.



NOTE REGARDING FOUNDATION STRENGTH:
ORIGINAL STRUCTURAL DESIGN WAS BASED ON TYPICAL ALLOWABLE BEARING STRENGTH OF 3500kPA, AND 1500kPa IN FAULT ZONE.
INVESTIGATIONS IN 2024 INDICATE THAT 5000kPa ALLOWABLE BEARING PRESSURE OUTSIDE OF FAULT ZONE IS ACHIEVABLE.
ALTHOUGH THE LOADS ONTO THE FOUNDATIONS ARE SUBSTANTIALLY INCREASED BY THE ADDITIONAL STOREYS ON THE BUILDING, THIS ADDITIONAL LOAD CAN GENERALLY BE ALLOWED FOR WITH THE INCREASED CAPACITY, UNO.

ITEMS TO CONSIDER THROUGHOUT DESIGN AND CONSTRUCTION PROCESS:
1. INVESTIGATIONS UNDER EACH FOOTING WITH ADDITIONAL LOADING MUST BE UNDERTAKEN TO ENSURE THERE ARE NO FAULTS WHICH WOULD LIMIT THE ALLOWABLE BEARING CAPACITY.
2. MONITORING OF DEFLECTION AND SETTLEMENT MUST TAKE PLACE DURING CONSTRUCTION IN ORDER TO ENSURE THAT BUILDING MOVEMENTS DO NOT EXCEED EXPECTED TOLERANCES.

Job Name : 150 DAY STREET
Sketch Title: PLANNING STAGE STRUCTURAL REVIEW R2
Date: 20/3/25
By: NF
Job Number: 221199
Sketch No. : SK250320.1

1 / RS_020 BASEMENT 02 PLAN
1 : 200

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1:200
0m 2m 4m 6m 8m

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REV	DESCRIPTION	DATE
A	Planning Proposal - DRAFT	19/12/24
B	Planning Proposal	28/03/25

CLIENT
UOL

PROJECT
150 Day Street - Park Royal Darling Harbour

STATUS

DRAWING TITLE
BASEMENT 02 PLAN

REVIEWED AC
SCALE @ A1 1 : 200
APPROVED AK
PROJECT NO. 016185
DRAWING NO. RS_098
REV NO. B

EXISTING STRUCTURAL SYSTEM:
CONVENTIONALLY REINFORCED FLAT SLAB WITH DROP PANELS
EXISTING FRL AT LEAST 90/90/90
EXISTING LIVE LOAD CAPACITY 3kPa, 5kPa IN EXISTING PLANT ROOMS

SOUTHERN PORTION IS SLAB ON GROUND AS INDICATED.

APPROXIMATE LOCATION OF CROSS CITY TUNNEL.
DEPTH AND LOCATION TO BE CONFIRMED, ALLOW FOR CONSULTATION WITH STAKEHOLDERS TO DISCUSS IMPLICATIONS OF ADDITIONAL STOREYS ON FOUNDATION FORCES.

EXISTING STRUCTURAL CAPACITY TO BE REVIEWED AGAINST WEIGHTS OF PLANT EQUIPMENT IN THESE ZONES.
HEAVY PLANT MAY NEED OT BE LOCATED CLOSE TO COLUMNS, OR STRUCTURE MAY REQUIRE STRENGTHENING FOR SUBSTANTIAL LOAD INCREASES.

ALLOW FOR EXCAVATION AND NEW FOOTING AT EACH LOCATION SHOWN DOTTED. AT THESE LOCATIONS, EXISTING FOOTING WILL LIKELY REQUIRE EXTENSION TO PROVIDE BASE TO STRENGTHENED PERIMETER COLUMN.

FOOTING TO BE ENTIRELY BELOW EXISTING BASEMENT SSL TO NOT INTERRUPT EXISTING PLENUM AND DRAINAGE.
SEE COLUMN STRENGTHENING DETAILS IN THIS REVIEW SET FOR MORE INFORMATION.
INTENTION AT THESE AREAS IS THAT BACK-PROPPING, JACKING AND UNDERPINNING BE MINIMISED AND ELIMINATED IF POSSIBLE.

NEW EXCAVATION AND STRUCTURAL CORE-WALLS FOR NEW LIFT.
SEE NOTES ON B2 FOR COMMENTS ON SEQUENCING AND METHODOLOGY.

EXISTING CORE DEMOLISHED AND REBUILT

EXISTING CORE RETAINED AND STRENGTHENED

SEE GENERAL STRATEGY FOR PERIMETER COLUMN STRENGTHENING NOTED ON B2 PLAN.

NOTE: STRENGTHENING NOT REQUIRED TO INTERNAL COLUMN FOUNDATIONS AT B1 FOLLOWING 2024 GEOTECHNICAL INVESTIGATIONS.

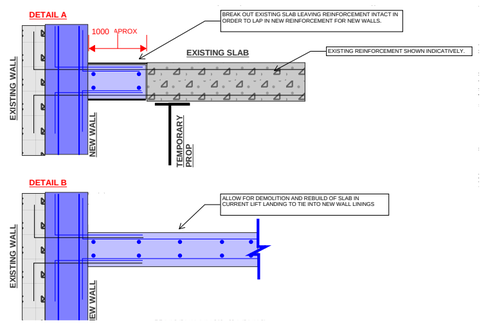
SOUTHERN PORTION OF EXISTING B1 STRUCTURE BEARS DIRECTLY ON GROUND.

APPROXIMATE LOCATION OF SYDNEY WATER SEWER PIPE (300DIA VITRIFIED CLAY) AS IDENTIFIED IN DIAL BEFORE YOU DIG PLAN.
SEE TTW PLANNING STAGE REPORT FOR COMMENTARY ON IMPLICATIONS AND POTENTIAL REQUIREMENTS FOR A SYDNEY WATER SPECIAL ENGINEERING ASSESSMENT OF THIS ASSET.

APPROXIMATE LOCATION OF CROSS CITY TUNNEL.
DEPTH AND LOCATION TO BE CONFIRMED, ALLOW FOR CONSULTATION WITH STAKEHOLDERS TO DISCUSS IMPLICATIONS OF ADDITIONAL STOREYS ON FOUNDATION FORCES.

CORE-WALL CONSTRUCTION AND STRENGTHENING STRATEGY

AT LOCATION OF NEW LIFTS CORES, STRENGTHENED LIFT CORE WALLS, OR NEW VOIDS FOR STAIRS, ALLOW FOR:
1. BREAK OUT OF EXISTING REINFORCED CONCRETE SLAB FOR APPROX 1.0m BEYOND THE LOCATION OF NEW WALL OR STRENGTHENED WALL.
2. EXISTING REINFORCEMENT MUST BE MAINTAINED AT BROKEN OUT SLAB SUCH THAT NEW REINFORCEMENT FOR WALL CAN BE TIED IN FOR STRUCTURAL CONTINUITY.
3. TEMPORARY BACK-PROPPING TO FOUNDATION LEVEL REQUIRED PRIOR TO ANY DEMOLITION.



1 RS_020 BASEMENT B01 PLAN
1 : 200

Job Name : 150 DAY STREET
Sketch Title: PLANNING STAGE STRUCTURAL REVIEW R2
Date: 20/3/25
By: NF
Job Number: 221199
Sketch No. : SK250320.1

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1:200
0m 2m 4m 6m 8m

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A	Planning Proposal - DRAFT	19/12/24
B	Planning Proposal	28/03/25

CLIENT
UOL

PROJECT
150 Day Street - Park Royal Darling Harbour

STATUS

DRAWING TITLE
BASEMENT 01 PLAN

REVIEWED AC
SCALE @ A1 1 : 200
APPROVED AK
PROJECT NO. 016185
DRAWING NO. RS_099
REV NO. B

Sussex Street

EXISTING STRUCTURAL SYSTEM:
CONVENTIONALLY REINFORCED FLAT SLAB WITH DROP PANELS
EXISTING FRL AT LEAST 90/90/90
EXISTING LIVE LOAD CAPACITY 5kPA

SUBSTATION CONSTRUCTION METHODOLOGY NOTE

ALLOW FOR DEMOLITION AND RECONSTRUCTION OF AREA FOR NEW SUBSTATION. AREA MUST BE REBUILT TO ALLOW FOR:
1. SUBSTANTIAL INCREASE IN REQUIRED STRENGTH CAPACITY. TYPICAL STRENGTH REQUIRED AT SUBSTATION IS 10kPa LIVE LOAD AND 5kPa SDL.
2. VERY SPECIFIC SLAB AND PIT LEVELS ARE REQUIRED FOR THE CABLE RUNS AND ENTRY POINTS INTO THE SUBSTATION.
3. FIRE RATING OF 240MINS IS REQUIRED TO SUBSTATION BASE SLAB, WALLS AND ROOF. THIS WILL REQUIRE REBUILT GROUND FLOOR SLAB, AND INSTALLATION OF A NEW CONCRETE "CEILING" ABOVE GROUND FLOOR, OR STRENGTHEN L1 SLAB ABOVE.

DEMOLITION OF EXISTING SLAB REQUIRES CONSIDERATION AND ALLOWANCE FOR:
1. INTERNAL TEMPORARY PROPPING OF SHORING WALL ALONG SITE PERIMETER TO MAINTAIN STABILITY WHEN SLAB REMOVED.
2. OVER-BREAK OF EXISTING STRUCTURE BEYOND SUBSTATION EXTENT AS SHOWN. EXISTING REINFORCEMENT TO BE EXPOSED AND NEW REINFORCEMENT TO BE TIED-IN TO PROVIDE STRUCTURAL CONTINUITY.
3. TEMPORARY PROPPING AT DEMOLITION PERIMETER TO BE PROVIDED.
4. TEMPORARY BRACING AT COLUMN LOCATIONS WITHIN DEMOLITION EXTENT TO BE PROVIDED TO ENSURE STABILITY WHEN SLAB REMOVED.

NOTE THAT EXISTING STRUCTURAL CAPACITY ALLOWS FOR 5.0kPa LIVE LOAD. THIS IS TYPICAL ADEQUATE FOR STORAGE AREAS AND MEDIUM RIGID VEHICLES.
SPECIFIC USES OF THIS SPACE TO BE ASSESSED DURING DETAILED DESIGN TO REVIEW WHETHER ANY ADDITIONAL STRENGTHENING IS REQUIRED.

SEE NOTE ON B2 AND B1 PLAN REGARDING SEQUENCING OF CORE RE-BUILD, AND CONSTRUCTION REQUIREMENTS TO TIE INTO EXISTING STRUCTURE.
ALLOW FOR DEMOLITION OF 1.0m OF SLAB AROUND NEW CORES AND STRENGTHENED WALLS WITH EXISTING REINFORCEMENT MAINTAINED..
PROVIDE TEMPORARY PROPPING AT ALL SLAB EDGES AROUND DEMOLITION.

MODIFICATIONS TO SLAB WILL BE REQUIRED TO FACILITATE NEW VOIDS FOR STAIR PENETRATIONS. SPECIFIC REQUIREMENTS TO BE REVIEWED IN DETAILED DESIGN STAGE, ALLOW FOR TEMPORARY SUPPORT AROUND ALL TEMPORARY PENETRATIONS.

EXISTING CORE RETAINED AND STRENGTHENED

EXISTING BUILDING JOINT

SEE GENERAL STRATEGY FOR PERIMETER COLUMN STRENGTHENING NOTED ON B2 PLAN.

COLUMNS HAVE BEEN BROUGHT DOWN THROUGH PREVIOUS OPEN SPACE IN ORDER TO AVOID OVERLOADING AND STRENGTHENING EXISTING TRANSFER BEAM AT L1 WHEN NEW LOADS FROM ADDITIONAL STOREYS IS ADDED.
SPECIFIC DETAIL AT INTERFACE WITH L1 TO BE ASSESSED IN DETAILED DESIGN.

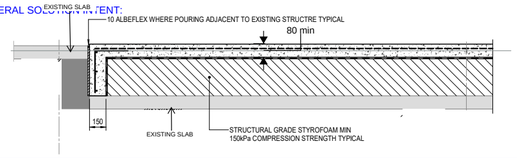
SLAB LEVEL BUILD-UP NOTE

EXISTING STRUCTURAL SLAB HAS A STEP AT THIS LOCATION AT INTERFACE OF DROP-OFF AREA.
GENERAL STRATEGY IS TO BUILD UP LEVEL OF EXISTING EXTERNAL AREA TO MATCH INTERNAL LEVEL.
STRUCTURAL LOAD INCREASE TO BE MINIMISED BY BUILD-UP USING POLYSTYRENE VOID FORMER AND 80mm THICK TOPPING SLAB.

WHERE EXISTING STRUCTURE LEVEL MUST BE DECREASED, OR STRENGTH CAPACITY IS FOUND TO BE INADEQUATE, DEMOLITION AND REBUILD OF SLAB REQUIRED AS PER NOTE ON SOUTHERN SIDE AND SUBSTATION OF GROUND FLOOR. IN PARTICULAR, NOTE REQUIREMENTS FOR TEMPORARY SUPPORT OF PERIMETER RETAINING WALLS DURING DEMOLITION WORKS.

IN-DEPTH STRUCTURAL REVIEWS OF EXISTING CAPACITY AND CURRENT FINISHED TO DRIVE-WAY TO ASSESS IMPACT OF NEW BUILD-UP AND ANY REQUIREMENT FOR STRENGTHENING.

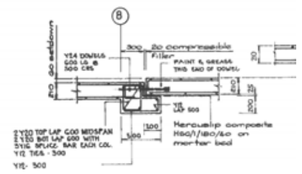
GENERAL SOLUTION INTENT:



NOTE REGARDING BUILDING JOINT:

THERE IS AN EXITING BUILDING JOINT AT GRID 8 WHICH STRUCTURALLY SEPARATES THE STRUCTURE TO THE NORTH AND SOUTH OF THIS LINE FROM THE BASE TO THE TOP OF THE EXISTING STRUCTURE.
STEEL PLATES WILL BE USED TO TIE TOGETHER THE STRUCTURE ACROSS THIS JOINT AT ALL FLOORS SO THAT THE BUILDING BEHAVES ROBUSTLY AS A SINGLE STRUCTURAL ELEMENT.

DETAIL FROM ORIGINAL STRUCTURAL DOCUMENTATION:



STEPPING CONCRETE REBUILD CONSTRUCTION NOTE

EXISTING SLAB IN THIS ZONE HAS A VARIETY OF LEVELS SEPARATED BY STEPS AND FOLDS IN THE STRUCTURAL SLAB. IN ADDITION, THE EXISTING SLAB DOES NOT HAVE THE STRENGTH CAPACITY FOR HEAVY LANDSCAPE LOADING.

GENERAL STRATEGY TO FORM A CONSISTENT FINISH LEVEL IS TO:
1. DEFINE THE NEW LEVEL AS ONE OF THE EXISTING LEVELS IN THIS ZONE.
2. DEMOLISH PORTIONS OF EXISTING CONCRETE AT HIGHER LEVEL AND REBUILD AT LOWER LEVEL.

IN-DEPTH STRUCTURAL REVIEW OF EXISTING CAPACITY AND FINISHED REQUIRED IN ORDER TO ASSESS IMPACT OF NEW BUILD-UP AND CONSIDER ANY STRENGTHENING REQUIRED.
WHERE DEMOLITION REQUIRED, ALLOW FOR TEMPORARY PROPPING AT ALL FREE EDGES, AND DEMOLISH 1.0m PAST EXTENT OF REQUIRED LEVEL TO EXPOSE EXISTING REINFORCEMENT AND PERMIT TYING IN THE NEW STRUCTURE.
SEE NOTE ON SUBSTATION AT NORTH END OF GROUND FLOOR SLAB FOR DISCUSSION OF REQUIREMENTS DURING DEMOLITION. IN PARTICULAR, NOTE REQUIREMENTS FOR TEMPORARY SUPPORT OF PERIMETER RETAINING WALLS DURING DEMOLITION WORKS.

SEE GENERAL SOLUTION INTENT AT WESTERN SIDE OF GROUND FLOOR SLAB.

Job Name : 150 DAY STREET
Sketch Title: PLANNING STAGE STRUCTURAL REVIEW R2
Date: 20/3/25
By: NF
Job Number: 221199
Sketch No. : SK250320.1

1 GROUND FLOOR L00 PLAN
RS_020 1 : 200

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1:200 0m 2m 4m 6m 8m

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UOL

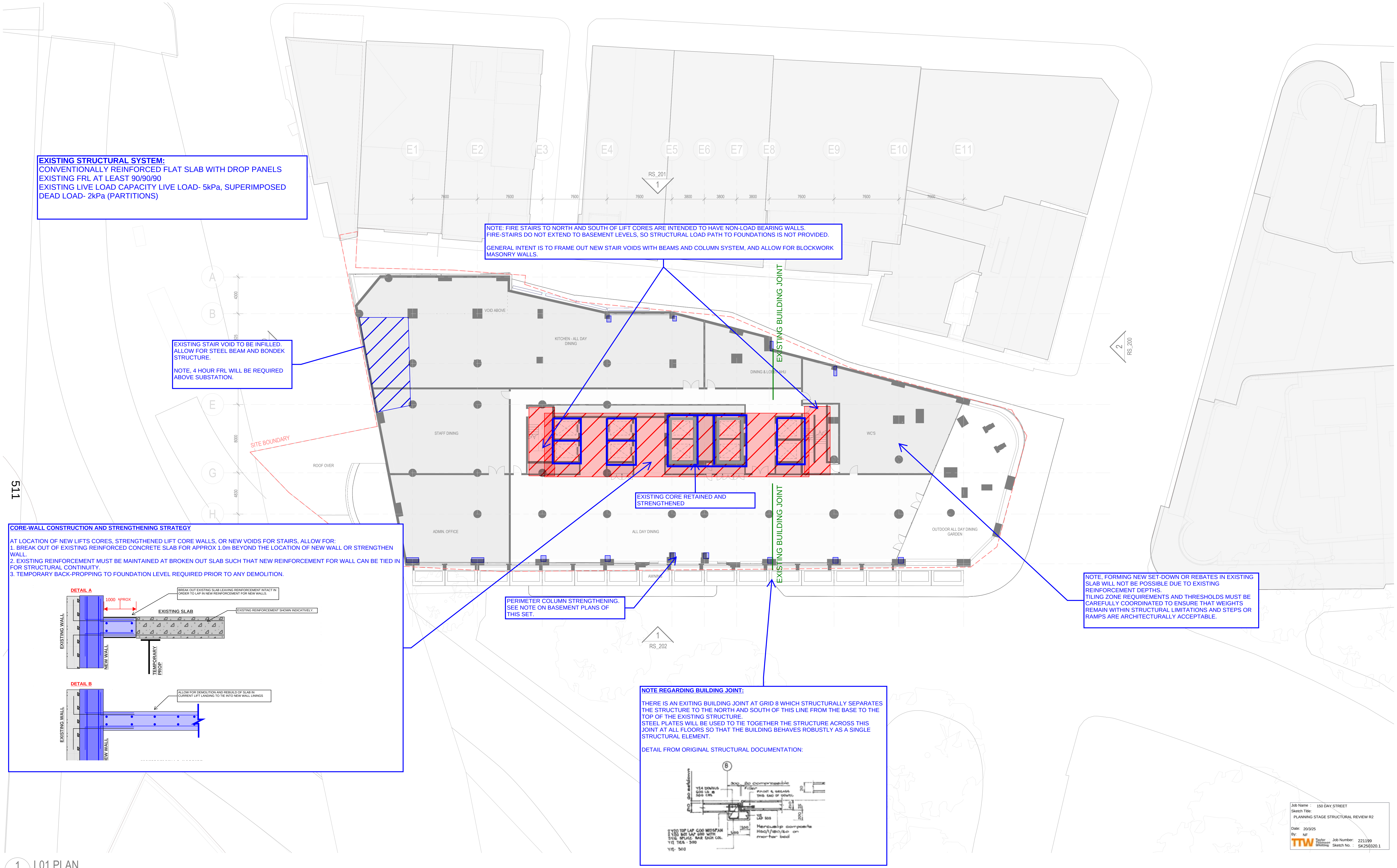
PROJECT
150 Day Street - Park Royal Darling Harbour

STATUS

DRAWING TITLE
GROUND FLOOR PLAN

REVIEWED AC
SCALE @ A1 1 : 200
APPROVED AK
PROJECT NO. 016185
DRAWING NO. RS_100
REV NO. B

510



1 L01 PLAN
RS_020 1 : 200

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PROJECT
150 Day Street - Park Royal Darling Harbour

STATUS

DRAWING TITLE
LEVEL 01 PLAN

REVIEWED
AC

SCALE @ A1
1 : 200

APPROVED
AK

PROJECT NO.
016185

DRAWING NO.
RS_101

REV NO.
B

EXISTING STRUCTURAL SYSTEM:
CONVENTIONALLY REINFORCED FLAT SLAB WITH DROP PANELS
EXISTING FRL AT LEAST 90/90/90
EXISTING LIVE LOAD CAPACITY LIVE LOAD- 5kPa, SUPERIMPOSED DEAD LOAD- 2kPa (PARTITIONS)

SEE REQUIREMENTS NOTED ON LOWER LEVEL PLANS FOR STRUCTURAL IMPLICATIONS AND PROPOSED METHODOLOGY OF CORE-REBUILD.

REMOVING EXISTING COLUMN FROM THIS LOCATION IS POSSIBLE, BUT WILL REQUIRE SUBSTANTIAL STRUCTURAL WORKS AT LEVEL ABOVE.
A NEW STRUCTURAL TRANSFER BEAM WOULD BE REQUIRED AT L3, SPANNING FROM (E11,E) TO (E11,H).
THE DEPTH OF THIS BEAM WOULD BE AT LEAST 1200mm, WHICH WOULD MATCH THE EXISTING TRANSFER BEAMS ON GRIDS E9 AND E10 AT LEVEL 3.

REQUIREMENTS FOR THIS WOULD INCLUDE AND NOT BE LIMITED TO:

1. TEMPORARY PROPPING REQUIRED TO SUPPORT COLUMN, INCLUDING SIGNIFICANT TEMPORARY STEELWORK TO FOUNDATION. HYDRAULIC JACKING UP OF COLUMN REQUIRED TO LIFT OFF EXISTING SUPPORT PRIOR TO DEMOLITION OF COLUMN BELOW.
2. DEMOLITION OF COLUMN AT L2.
3. DEMOLITION OF PORTION OF SLAB AT L3 FOR NEW TRANSFER BEAM TO BE BUILT. TEMPORARY PROPPING OF SLAB AROUND TEMPORARY PENETRATION AT L3 REQUIRED PRIOR TO DEMOLITION.
4. CONSTRUCTION OF NEW TRANSFER BEAM, TO BE TIED INTO EXISTING L3 STRUCTURE.

EXISTING STAIR VOID TO BE INFILLED.
NOMINALLY ALLOW FOR STEEL BEAM AND BONDEK SOLUTION.

3no. EXISTING COLUMNS IN THIS LOCATION MAY BE REMOVED.
COLUMNS SUPPORT FIRE STAIR CURRENTLY WHICH IS REMOVED IN PROPOSED SCHEME.

THIS PORTION OF EXISTING SLAB IS STEPPED TO A HIGHER SSL.
THIS PORTION OF STRUCTURE COULD BE LOWERED TO THE SAME SSL AS THE REST OF L1 BY FOLLOWING THE METHODOLOGY OF:
1. PROVIDE TEMPORARY PROPPING AROUND THE EDGE OF THE AREA OF TEMPORARY DEMOLITION.
2. PROVIDE BRACING TO TEMPORARILY STABILISE THE COLUMNS AT THE LEVEL OF THE L1 SLAB.
3. REVIEW FACADE SUPPORT IMPLICATIONS
4. DEMOLITION EXTENT TO EXTEND PAST EXISTING STEP, WITH EXISTING REINFORCEMENT EXPOSED FOR 1.0m LENGTH TO TIE IN NEW REINFORCEMENT.
5. NEW CONCRETE STRUCTURE TO BE CAST TO REQUIRED LEVEL.

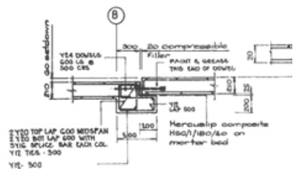
EXISTING CORE RETAINED AND STRENGTHENED

PERIMETER COLUMN STRENGTHENING. SEE NOTE ON BASEMENT PLANS OF THIS SET.

NOTE REGARDING BUILDING JOINT:

THERE IS AN EXITING BUILDING JOINT AT GRID 8 WHICH STRUCTURALLY SEPARATES THE STRUCTURE TO THE NORTH AND SOUTH OF THIS LINE FROM THE BASE TO THE TOP OF THE EXISTING STRUCTURE.
STEEL PLATES WILL BE USED TO TIE TOGETHER THE STRUCTURE ACROSS THIS JOINT AT ALL FLOORS SO THAT THE BUILDING BEHAVES ROBUSTLY AS A SINGLE STRUCTURAL ELEMENT.

DETAIL FROM ORIGINAL STRUCTURAL DOCUMENTATION:



Job Name : 150 DAY STREET
Sketch Title: PLANNING STAGE STRUCTURAL REVIEW R2
Date: 20/3/25
By: NF
TTW Taylor Thomson Whitting
Job Number: 221199
Sketch No. : SK250320.1

1 / RS_020 — L02 PLAN
1 : 200

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Glenn Scott 6842
Ross de la Motte 7398

REFERENCE

NORTH

1:200
0m 2m 4m 6m 8m

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REV	DESCRIPTION	DATE
A	Planning Proposal - DRAFT	19/12/24
B	Planning Proposal	28/03/25

CLIENT
UOL

PROJECT
150 Day Street - Park Royal Darling Harbour

STATUS

DRAWING TITLE
LEVEL 02 PLAN

REVIEWED
AC

SCALE @ A1
1 : 200

APPROVED
AK

PROJECT NO.
016185

DRAWING NO.
RS_102

REV NO.
B

EXISTING STRUCTURAL SYSTEM:
CONVENTIONALLY REINFORCED FLAT SLAB WITH DROP PANELS
EXISTING FRL AT LEAST 90/90/90
EXISTING LIVE LOAD CAPACITY LIVE LOAD- 2kPa IN ROOMS, 4kPa IN CORRIDORS,
SUPERIMPOSED DEAD LOAD- 1kPa (PARTITIONS)

SEE REQUIREMENTS NOTED ON LOWER LEVEL PLANS FOR STRUCTURAL IMPLICATIONS AND PROPOSED METHODOLOGY OF CORE-REBUILD.

EXISTING FIRE STAIR AND ATRIUM VOID IN FILLED WITH STRUCTURAL STEEL BEAMS AND BONDEK IN ARRANGEMENT SHOWN.

GENERAL SOLUTION TO INFILL EXISTING STAIR VOIDS WITH BONDEK AND STRUCTURAL STEEL FRAMING.

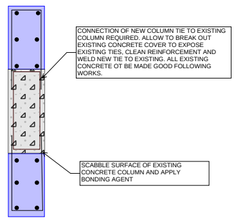
SEE NOTE ON LEVEL 2 PLAN REGARDING WHAT WOULD BE REQUIRED IN TERMS OF BUILDING A NEW TRANSFER BEAM TO REMOVE COLUMN AT L2.

EXISTING BUILDING JOINT

EXISTING CORE RETAINED AND STRENGTHENED

ALL EXISTING COLUMNS ARE TO BE STRENGTHENED, EXTENT SHOWN HERE INDICATIVELY ONLY, REFER TO ORIGINAL STRUCTURAL DRAWINGS TO ESTIMATE QUANTUM OF WORKS FOR COSTING.

TYPICAL COLUMN STRENGTHENING SOLUTION TO ALL COLUMNS AT HOTEL FLOORS,
INTERNAL COLUMN STRENGTHENING:

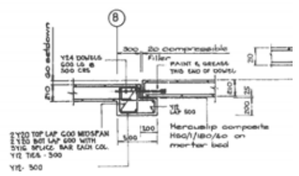


PERIMETER COLUMN STRENGTHENING
GENERAL INTENT OF WORKS AS PER NOTES ON B2 SHEET OF THIS SET.

NOTE REGARDING BUILDING JOINT:

THERE IS AN EXITING BUILDING JOINT AT GRID 8 WHICH STRUCTURALLY SEPARATES THE STRUCTURE TO THE NORTH AND SOUTH OF THIS LINE FROM THE BASE TO THE TOP OF THE EXISTING STRUCTURE.
STEEL PLATES WILL BE USED TO TIE TOGETHER THE STRUCTURE ACROSS THIS JOINT AT ALL FLOORS SO THAT THE BUILDING BEHAVES ROBUSTLY AS A SINGLE STRUCTURAL ELEMENT.

DETAIL FROM ORIGINAL STRUCTURAL DOCUMENTATION:



Job Name : 150 DAY STREET
Sketch Title: PLANNING STAGE STRUCTURAL REVIEW R2
Date: 20/3/25
By: NF
Job Number: 221199
Sketch No. : SK250320.1

1 RS_020 L03 PLAN
1 : 200

513

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CLIENT
UOL

PROJECT
150 Day Street - Park Royal Darling Harbour

STATUS

DRAWING TITLE
LEVEL 03 PLAN

REVIEWED AC
SCALE @ A1 1 : 200
APPROVED AK
PROJECT NO. 016185
DRAWING NO. RS_103
REV NO. B

STRUCTURAL REQUIREMENTS AT L04-L10 ARE SIMILAR

EXISTING STRUCTURAL SYSTEM:
POST-TENSIONED CONCRETE STRUCTURE
EXISTING FRL AT LEAST 90/90/90
EXISTING LIVE LOAD CAPACITY LIVE LOAD- 2kPa
SUPERIMPOSED DEAD LOAD- 2kPa (PARTITIONS)

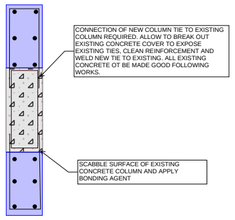
SEE REQUIREMENTS NOTED ON LOWER LEVEL PLANS FOR STRUCTURAL IMPLICATIONS AND PROPOSED METHODOLOGY OF CORE-REBUILD.

EXISTING FIRE STAIR AND ATRIUM VOID IN FILLED WITH STRUCTURAL STEEL BEAMS AND BONDEK IN ARRANGEMENT SHOWN.

GENERAL SOLUTION TO INFILL EXISTING STAIR VOIDS WITH BONDEK AND STRUCTURAL STEEL FRAMING.

ALL EXISTING COLUMNS ARE TO BE STRENGTHENED, EXTENT SHOWN HERE INDICATIVELY ONLY, REFER TO ORIGINAL STRUCTURAL DRAWINGS TO ESTIMATE QUANTUM OF WORKS FOR COSTING.

TYPICAL COLUMN STRENGTHENING SOLUTION TO ALL COLUMNS AT HOTEL FLOORS,
INTERNAL COLUMN STRENGTHENING:



PERIMETER COLUMN STRENGTHENING
GENERAL INTENT OF WORKS AS PER NOTES ON B2 SHEET OF THIS SET.

EXISTING CORE RETAINED AND STRENGTHENED

NOTE: NEW RISER VOIDS AT CENTRAL LIFT CORE MUST BE COORDINATED AROUND EXISTING POST-TENSIONING LAYOUT.

YELLOW HIGHLIGHTED ZONE INDICATES LOCATION WHERE STRENGTHENING MAY BE REQUIRED DUE TO TRUNCATION OF POST-TENSIONING REINFORCEMENT. STRENGTHENING OPTIONS INCLUDE STRUCTURAL STEELWORK AND CARBON-FIBRE SOLUTIONS.

NOTE ON REQUIREMENTS FOR TRUNCATING EXISTING POST-TENSIONING.

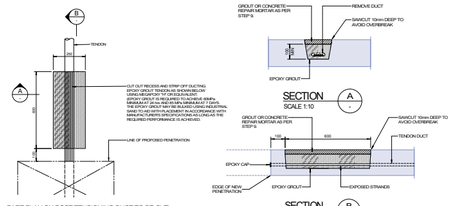
FOR NEW LIFT AND STAIR SOUTH OF GRID E8 IN PARTICULAR.

TRUNCATION OF EXISTING POST-TENSIONING WILL BE REQUIRED TO FORM NEW OPENING FOR LIFT AND STAIR VOID. DETAILED ANALYSIS REQUIRED AT NEXT DESIGN STAGE IN ORDER TO ASSESS ANY ADDITIONAL STRENGTHENING IN ADJACENT SLAB WHICH MAY BE REQUIRED TO FACILITATE THIS TRUNCATION.

TYPICAL REQUIREMENT FOR PT TRUNCATION SHOWN BELOW, THESE ARE PROVIDED FOR GENERAL INFORMATION ONLY AND WILL BE UPDATED FOR THE SPECIFIC REQUIREMENTS OF THIS PROJECT.

PROCEDURE FOR CUTTING NEW SLAB PENETRATION

1. Mark out area of slab to be removed.
2. Precisely locate slab tendons in area of penetration by locating the tendon staples on the underside of the slab or by GPR scanning. Contact the Engineer to arrange inspection.
3. For each tendon to be cut, carefully remove a 600 long by 250 wide strip of concrete from above and around the tendon 100mm from the penetration. DO NOT CUT ANY REINFORCEMENT. Strip off the ducting and clean out the existing grout.
4. Epoxy grout infill the strip as per details A and B using Megapoxy 'H' or equivalent in accordance with Manufacturers instructions. Allow sufficient time for the epoxy to cure. Epoxy grout to achieve at least 60 MPa in 24 hrs and 85 MPa in 7 days.
5. Install a propped platform just below the area to be demolished to retain debris.
6. Core drill the corners of the penetration to eliminate the need for overcutting and then cut the penetration using a diamond saw.
7. Cut the slab into manageable chunks and remove them.
8. Remove the platform and props.
9. Infill top portion of strip with 3:1 sand:cement grout or 'Renderoc HB' for internal applications and 'Renderoc HB40 Plus' for external applications or areas with no applied finishes. Infill is to be finished flush with surrounding concrete surface.
10. Epoxy paint exposed strands to prevent corrosion.



1 RS_020 — L04 PLAN
1 : 200

514

Job Name :	150 DAY STREET
Sketch Title:	PLANNING STAGE STRUCTURAL REVIEW R2
Date:	20/3/25
By:	NF
Job Number:	221199
Sketch No. :	SK250320.1

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REFERENCE

NORTH

1:200
0m 2m 4m 6m 8m

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REV	DESCRIPTION	DATE
A	Planning Proposal - DRAFT	19/12/24
B	Planning Proposal	28/03/25

CLIENT
UOL

PROJECT
150 Day Street - Park Royal Darling Harbour

STATUS

DRAWING TITLE
LEVEL 04 PLAN

REVIEWED
AC

SCALE @ A1
1 : 200

APPROVED
AK

PROJECT NO.
016185

DRAWING NO.
RS_104

REV NO.
B

ALLOW FOR STRENGTHENING TO EXISTING L11 STRUCTURE TO FACILITATE CHANGE OF USE. STRENGTHENING MAY BE ACHIEVED BY A GRILLAGE OF BEAMS ABOVE THE EXISTING SLAB (HIDDEN WITHIN AN ACCESS FLOOR) TO SUPPORT THE WEIGHTS OF PLANT, LANDSCAPE AND POOL LOADS.
THIS STRENGTHENING COULD BE INCORPORATED INTO A CONSTRUCTION CRASH DECK WHICH WOULD BE INSTALLED TO ALLOW FOR CONSTRUCTION OF THE ADDITIONAL STOREYS WHILE ACCESS IS MAINTAINED BELOW FOR MODIFICATION AND FIT-OUT WORKS,

EXISTING CONCRETE TOPPINGS MUST BE REMOVED FROM THIS SLAB TO MINIMISE EXISTING WEIGHT PRIOR TO NEW WORKS TAKING PLACE.
RENOVATION WORKS IN THE 1990s INCLUDED ADDITION OF NEW TOPPINGS WHICH HAVE REDUCED AVAILABLE STRUCTURAL CAPACITY BELOW ORIGINAL DESIGN INTENT.

EXISTING STRUCTURAL SYSTEM:
POST-TENSIONED CONCRETE STRUCTURE
EXISTING FRL AT LEAST 90/90/90
EXISTING LIVE LOAD CAPACITY LIVE LOAD- 3kPa TYPICALLY, 7.5kPa IN EXISTING PLANT-ROOM.

NOTE ON HEAVY PLANT EQUIPMENT

HEAVY PLANT WILL REQUIRE STEEL GRILLAGE AT LOW LEVEL FOR STRUCTURAL SUPPORT IN ORDER NOT TO OVERLOAD EXISTING SLAB.
GENERAL INTENTION IS TO PROVE AND ACCESS FLOOR OVER LOW-LEVEL STEEL BEAM GRILLAGES.

STRUCTURAL REVIEW ON EIGHTS OF PLANT, INCLUDING PLINTHS, MUST BE CARRIED OUT TO EXISTING STRUCTURE IS NOT OVERLOADED.
HEAVY PLANT SHOULD BE LOCATED CLOSE TO STRUCTURAL SUPPORTS (COLUMNS) AND LIGHT-WEIGHT PLINTHS SPECIFIED TO MINIMISE STRENGTHENING REQUIREMENTS.

AT BUILDING PERIMETER, COLUMN TRANSFER COULD BE ACHIEVED BY TRUSSES, OR BY DEEP STRUCTURE, POTENTIALLY HIDDEN WITHIN THE DEPTH OF THE PROPOSED PLANTER BEDS.

ALLOW FOR 1200WB455 TO TRANSFER LOADS FOR INDICATIVE COSTING.

SEE REQUIREMENTS NOTED ON LOWER LEVEL PLANS FOR STRUCTURAL IMPLICATIONS AND PROPOSED METHODOLOGY OF CORE-REBUILD.

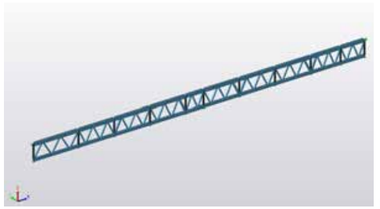
GENERAL STRUCTURAL SOLUTION TO PROVIDE FULL STOREY STEEL TRUSSES TO TRANSFER COLUMN LOADS AT THIS STOREY.

TRUSSES TO BE ARRANGED IN NORTH-SOUTH ORIENTATION OVER EXISTING COLUMN GRID LOCATIONS AS INDICATED.

LOWER STEEL-TONNAGE SOLUTIONS WILL BE ACHIEVED WITH IRREGULAR WARREN TRUSSES WHICH DIRECTLY TRANSFER COLUMN LOADS BY DIAGONALS AT EXACT REQUIRED LOCATIONS.
NOMINALLY, AN IRREGULAR TRUSS WITH OPTIMISED GEOMETRY WILL REQUIRE APPROXIMATELY HALF THE STEEL TONNAGE OF A REGULAR TRUSS.

OPTION 1: OPTIMISED IRREGULAR TRUSS
TOTAL STEEL WEIGHT FOR COSTING, APPROXIMATELY 450kg/m

OPTION 2: NON-OPTIMISED REGULAR TRUSS
TOTAL STEEL WEIGHT FOR COSTING, APPROXIMATELY 1100kg/m



NOTE ON DEEP PLANTER ZONE AND INTEGRATED TEMPORARY WORKS DECK AT L11

INCLUSION OF DEEP PLANTER ZONE AT L11 WILL REQUIRE EXTENSIVE STRENGTHENING OF EXISTING STRUCTURE DUE TO INCREASED WEIGHT.

AS WE WILL BE BUILDING ABOVE THE EXISTING HOTEL FROM THIS FLOOR, THERE WILL BE EFFICIENCIES IN INCORPORATING THIS STRENGTHENING INTO A CRASH-DECK AND CONSTRUCTION PLATFORM WHICH WILL ALLOW FOR SAFE CONSTRUCTION ABOVE THE EXISTING STRUCTURE.

NOTE ON PROPOSED USE OF GYM AREA

GENERALLY ALLOW FOR SUB-FLOOR OR ACCESS FLOOR WITHIN GYM AREA TO MINIMISE IMPACT OF VIBRATION PROPAGATION THROUGH STRUCTURE.
SOME DEGREE OF STRUCTURAL STRENGTHENING LIKELY REQUIRED IN GYM AREA IN ORDER TO INCREASE EXISTING CAPACITY TO REQUIRED LEVEL. EXTENT OF STRENGTHENING TO BE ADVISED FOLLOWING DETAILED INVESTIGATION OF EXISTING CAPACITY AND WEIGHTS OF EXISTING FINISHES.

AT BUILDING PERIMETER, COLUMN TRANSFER COULD BE ACHIEVED BY TRUSSES, OR BY DEEP STRUCTURE, POTENTIALLY HIDDEN WITHIN THE DEPTH OF THE PROPOSED PLANTER BEDS.

ALLOW FOR 1200WB455 TO TRANSFER LOADS FOR INDICATIVE COSTING.

NOTE ON REQUIREMENTS FOR TRUNCATING EXISTING POST-TENSIONING.

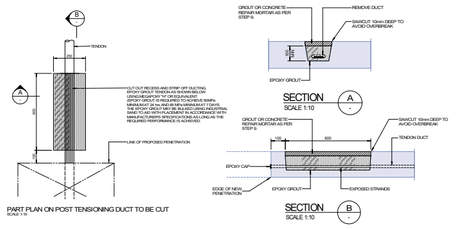
FOR NEW LIFT AND STAIR SOUTH OF GRID E8 IN PARTICULAR.

TRUNCATION OF EXISTING POST-TENSIONING WILL BE REQUIRED TO FORM NEW OPENING FOR LIFT AND STAIR VOID.
DETAILED ANALYSIS REQUIRED AT NEXT DESIGN STAGE IN ORDER TO ASSESS ANY ADDITIONAL STRENGTHENING IN ADJACENT SLAB WHICH MAY BE REQUIRED TO FACILITATE THIS TRUNCATION.

TYPICAL REQUIREMENT FOR PT TRUNCATION SHOWN BELOW. THESE ARE PROVIDED FOR GENERAL INFORMATION ONLY AND WILL BE UPDATED FOR THE SPECIFIC REQUIREMENTS OF THIS PROJECT.

PROCEDURE FOR CUTTING
NEW SLAB PENETRATION

1. Mark out area of slab to be removed.
2. Precisely locate slab tendons in area of penetration by locating the tendon staples on the underside of the slab or by GPR scanning. Contact the Engineer to arrange inspection.
3. For each tendon to be cut, carefully remove a 600 long by 250 wide strip of concrete from above and around the tendon 100mm from the penetration. DO NOT CUT ANY REINFORCEMENT. Strip off the ducting and clean out the existing grout.
4. Epoxy grout infill the strip as per details A and B using Megapoxy 'H' or equivalent in accordance with Manufacturers instructions. Allow sufficient time for the epoxy to cure. Epoxy grout to achieve at least 6 MPa in 24 hrs and 85 MPa in 7 days.
5. Install a propped platform just below the area to be demolished to retain debris.
6. Core drill the corners of the penetration to eliminate the need for overcutting and then cut the penetration using a diamond saw.
7. Cut the slab into manageable chunks and remove them.
8. Remove the platform and props.
9. Infill top portion of strip with 3:1 sand:cement grout or 'Renderoc HB' for internal applications and 'Renderoc HB40 Plus' for external applications or areas with no applied finishes. Infill is to be finished flush with surrounding concrete surface.
10. Epoxy paint exposed strands to prevent corrosion.



PART PLAN ON POST TENSIONING DUCT TO BE CUT
SCALE 1:10

NOTE ON POOL SUPPORT

POOL MUST SIT ON BEARERS OVER SUPPORTING STRUCTURE TO ENSURE THAT VIBRATION IS NOT PROPAGATED THROUGH TO THE GLOBAL STRUCTURE.
THERE ARE A NUMBER OF SOLUTIONS TO ACHIEVE THIS, HOWEVER WE BELIEVE A REASONABLE SOLUTION IN THIS CASE WOULD INVOLVE DWARF WALLS WITH BEARER SUPPORTS AS SHOWN IN INDICATIVE DETAILS BEARINGS AND BEARING SUPPORTS SPECIFIED BY SPECIALIST CONSULTANTS AND SUPPLIERS.

STRUCTURAL REQUIREMENTS TO SUPPORT WEIGHT OF POOL PLANT MUST BE REVIEWED IN DETAIL WITH INPUT FROM A POOL CONSULTANT.
IN GENERAL, WE WOULD EXPECT THAT A POOL CONSULTANT BE ENGAGED IN ORDER TO PROVIDE SPECIALIST ADVICE REGARDING PLANT, SPATIAL LAYOUTS AND REQUIREMENTS FOR BALANCE TANKS.

YELLOW HIGHLIGHTED ZONE INDICATES LOCATION WHERE STRENGTHENING MAY BE REQUIRED DUE TO TRUNCATION OF REINFORCEMENT.
STRENGTHENING OPTIONS INCLUDE STRUCTURAL STEELWORK AND CARBON-FIBRE SOLUTIONS.

1 RS_020 L11 PLAN - TRANSFER FLOOR 1 : 200

Job Name : 150 DAY STREET
Sketch Title: PLANNING STAGE STRUCTURAL REVIEW R2
Date: 20/3/25
By: NF
TTW Taylor Thomson Whitting Job Number: 221199 Sketch No. : SK250320.1

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REFERENCE

NORTH

1:200
0m 2m 4m 6m 8m

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CLIENT
UOL

PROJECT
150 Day Street - Park Royal Darling Harbour

STATUS

DRAWING TITLE
LEVEL 11 PLAN TRANSFER FLOOR

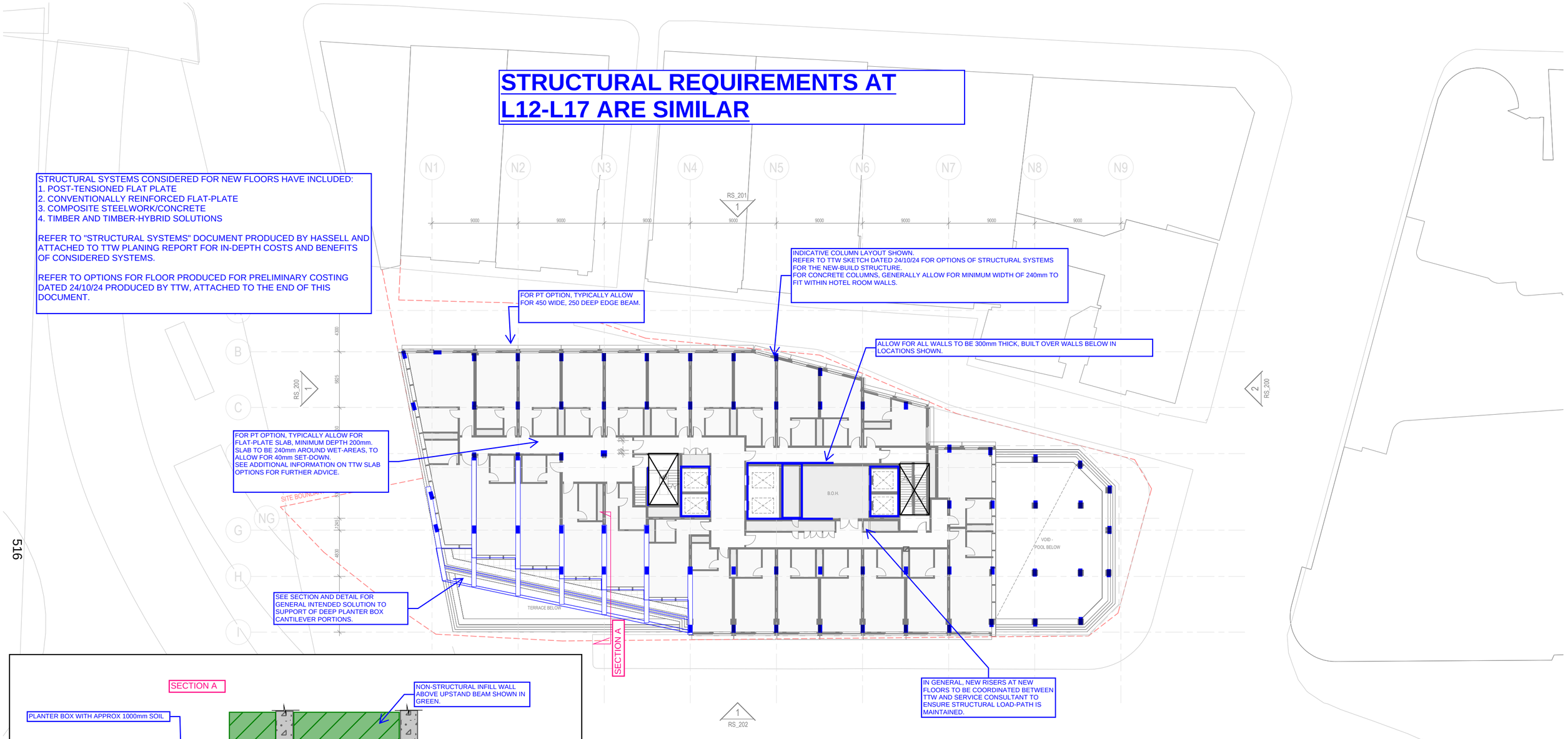
REVIEWED AC
SCALE @ A1 1 : 200
APPROVED AK
PROJECT NO. 016185
DRAWING NO. RS_111
REV NO. B

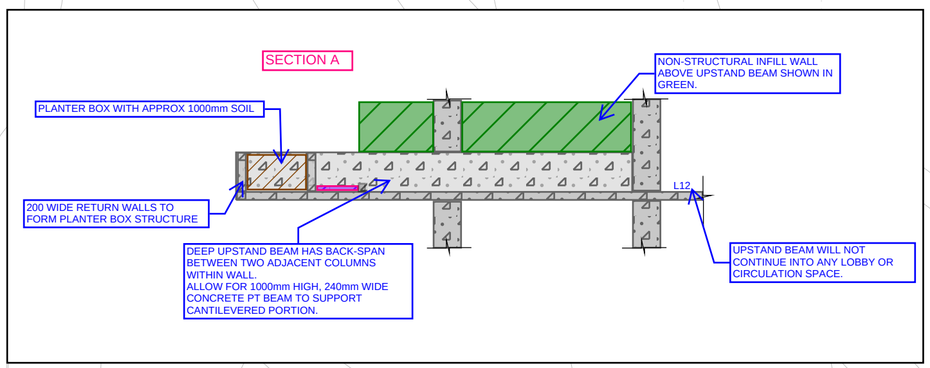
STRUCTURAL REQUIREMENTS AT L12-L17 ARE SIMILAR

STRUCTURAL SYSTEMS CONSIDERED FOR NEW FLOORS HAVE INCLUDED:
1. POST-TENSIONED FLAT PLATE
2. CONVENTIONALLY REINFORCED FLAT-PLATE
3. COMPOSITE STEELWORK/CONCRETE
4. TIMBER AND TIMBER-HYBRID SOLUTIONS

REFER TO "STRUCTURAL SYSTEMS" DOCUMENT PRODUCED BY HASSELL AND ATTACHED TO TTW PLANING REPORT FOR IN-DEPTH COSTS AND BENEFITS OF CONSIDERED SYSTEMS.

REFER TO OPTIONS FOR FLOOR PRODUCED FOR PRELIMINARY COSTING DATED 24/10/24 PRODUCED BY TTW, ATTACHED TO THE END OF THIS DOCUMENT.





Job Name : 150 DAY STREET
Sketch Title: PLANNING STAGE STRUCTURAL REVIEW R2
Date: 20/3/25
By: NF
TTW Taylor Thomson Whitting
Job Number: 221199
Sketch No. : SK250320.1

1 L12 PLAN
RS_200 1 : 200

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0m 2m 4m 6m 8m

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B	Planning Proposal	28/03/25

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UOL

PROJECT
150 Day Street - Park Royal Darling Harbour

STATUS

DRAWING TITLE
LEVEL 12 PLAN

REVIEWED
AC

SCALE @ A1
1 : 200

APPROVED
AK

PROJECT NO.
016185

DRAWING NO.
RS_112

REV NO.
B

STRUCTURAL SYSTEMS CONSIDERED FOR NEW FLOORS HAVE INCLUDED:
1. POST-TENSIONED FLAT PLATE
2. CONVENTIONALLY REINFORCED FLAT-PLATE
3. COMPOSITE STEELWORK/CONCRETE
4. TIMBER AND TIMBER-HYBRID SOLUTIONS

REFER TO "STRUCTURAL SYSTEMS" DOCUMENT PRODUCED BY HASSELL AND ATTACHED TO TTW PLANING REPORT FOR IN-DEPTH COSTS AND BENEFITS OF CONSIDERED SYSTEMS.

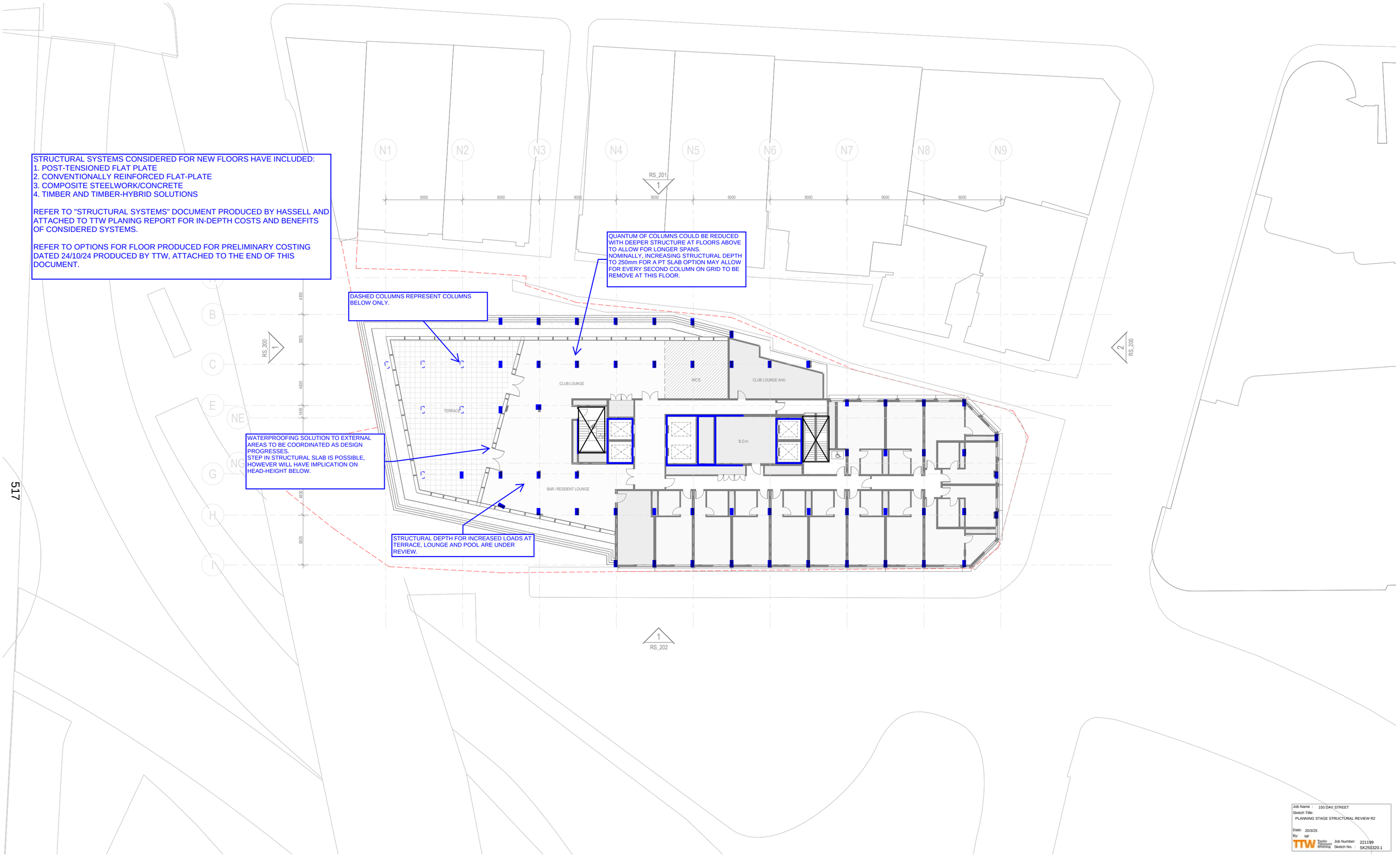
REFER TO OPTIONS FOR FLOOR PRODUCED FOR PRELIMINARY COSTING DATED 24/10/24 PRODUCED BY TTW, ATTACHED TO THE END OF THIS DOCUMENT.

DASHED COLUMNS REPRESENT COLUMNS BELOW ONLY.

QUANTUM OF COLUMNS COULD BE REDUCED WITH DEEPER STRUCTURE AT FLOORS ABOVE TO ALLOW FOR LONGER SPANS.
NOMINALLY, INCREASING STRUCTURAL DEPTH TO 250mm FOR A PT SLAB OPTION MAY ALLOW FOR EVERY SECOND COLUMN ON GRID TO BE REMOVE AT THIS FLOOR.

WATERPROOFING SOLUTION TO EXTERNAL AREAS TO BE COORDINATED AS DESIGN PROGRESSES.
STEP IN STRUCTURAL SLAB IS POSSIBLE, HOWEVER WILL HAVE IMPLICATION ON HEAD-HEIGHT BELOW.

STRUCTURAL DEPTH FOR INCREASED LOADS AT TERRACE, LOUNGE AND POOL ARE UNDER REVIEW.



517

1 L18 PLAN
RS_200 1 : 200

Job Name : 150 DAY STREET
Sketch Title: PLANNING STAGE STRUCTURAL REVIEW R2
Date: 20/3/25
By: NF
TTW Taylor Thomson Whitting
Job Number: 221199
Sketch No. : SK250320.1

CONSULTANT
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sydney@hassellstudio.com
Nominated Architects NSW:
Tony Grist 5350
Glenn Scott 6842
Ross de la Motte 7398

REFERENCE

NORTH

1:200
0m 2m 4m 6m 8m

NOTES
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REV	DESCRIPTION	DATE
A	Planning Proposal - DRAFT	19/12/24
B	Planning Proposal	28/03/25

CLIENT
UOL

PROJECT
150 Day Street - Park Royal Darling Harbour

STATUS

DRAWING TITLE
LEVEL 18 PLAN - HOTEL AMENITY

REVIEWED
AC

SCALE @ A1
1 : 200

APPROVED
AK

PROJECT NO.
016185

DRAWING NO.
RS_118

REV NO.
B

STRUCTURAL SYSTEMS CONSIDERED FOR NEW FLOORS HAVE INCLUDED:
1. POST-TENSIONED FLAT PLATE
2. CONVENTIONALLY REINFORCED FLAT-PLATE
3. COMPOSITE STEELWORK/CONCRETE
4. TIMBER AND TIMBER-HYBRID SOLUTIONS

REFER TO "STRUCTURAL SYSTEMS" DOCUMENT PRODUCED BY HASSELL AND ATTACHED TO TTW PLANING REPORT FOR IN-DEPTH COSTS AND BENEFITS OF CONSIDERED SYSTEMS.

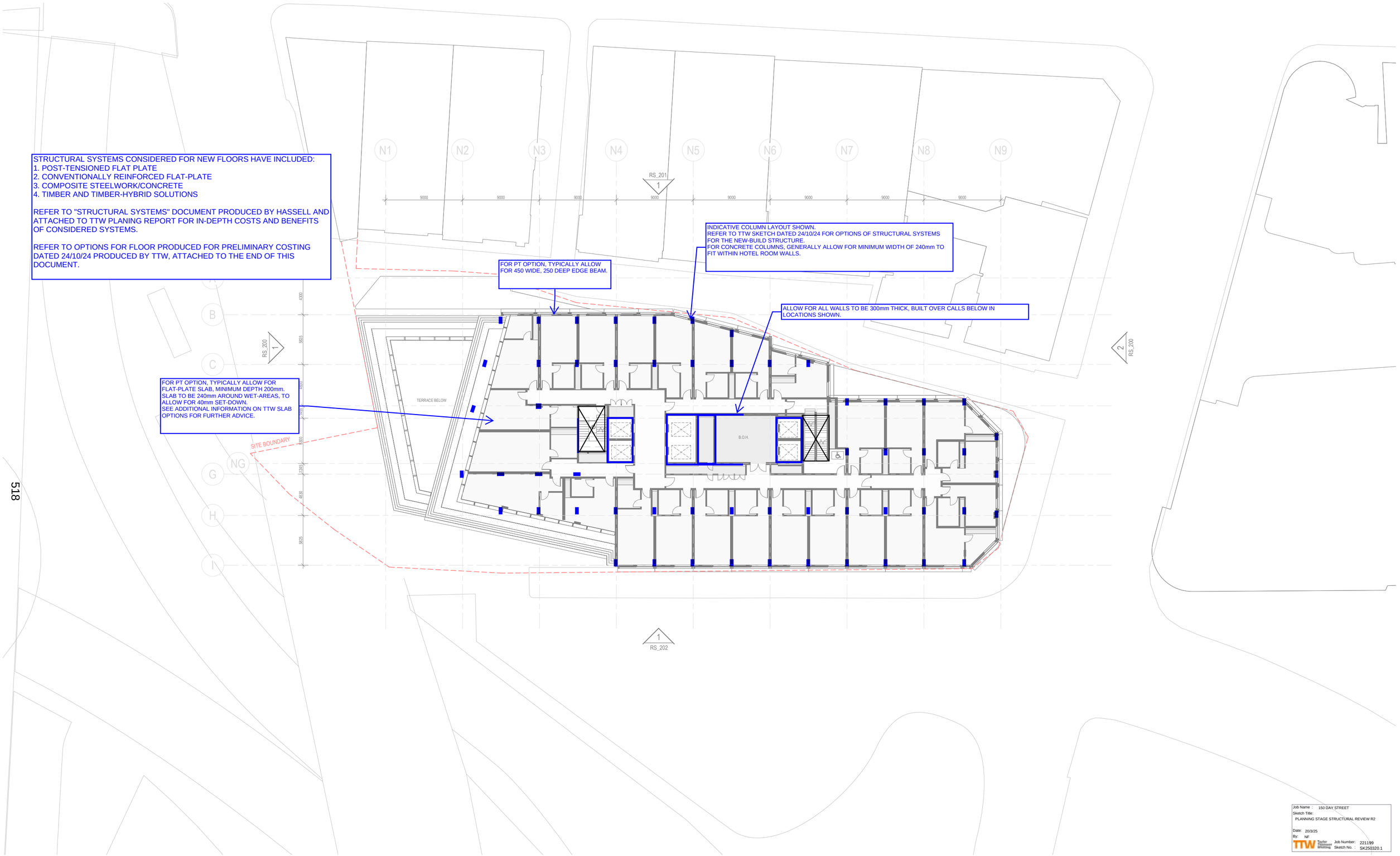
REFER TO OPTIONS FOR FLOOR PRODUCED FOR PRELIMINARY COSTING DATED 24/10/24 PRODUCED BY TTW, ATTACHED TO THE END OF THIS DOCUMENT.

FOR PT OPTION, TYPICALLY ALLOW FOR 450 WIDE, 250 DEEP EDGE BEAM.

INDICATIVE COLUMN LAYOUT SHOWN.
REFER TO TTW SKETCH DATED 24/10/24 FOR OPTIONS OF STRUCTURAL SYSTEMS FOR THE NEW-BUILD STRUCTURE.
FOR CONCRETE COLUMNS, GENERALLY ALLOW FOR MINIMUM WIDTH OF 240mm TO FIT WITHIN HOTEL ROOM WALLS.

ALLOW FOR ALL WALLS TO BE 300mm THICK, BUILT OVER CALLS BELOW IN LOCATIONS SHOWN.

FOR PT OPTION, TYPICALLY ALLOW FOR FLAT-PLATE SLAB, MINIMUM DEPTH 200mm. SLAB TO BE 240mm AROUND WET-AREAS, TO ALLOW FOR 40mm SET-DOWN.
SEE ADDITIONAL INFORMATION ON TTW SLAB OPTIONS FOR FURTHER ADVICE.



518

1 L19 PLAN
RS_200 1 : 200

Job Name : 150 DAY STREET
Sketch Title: PLANNING STAGE STRUCTURAL REVIEW R2
Date: 20/3/25
By: NF
TTW Taylor Thomson Whitting
Job Number: 221199
Sketch No. : SK250320.1

CONSULTANT
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Nominated Architects NSW:
Tony Grist 5350
Glenn Scott 6842
Ross de la Motte 7398

REFERENCE

NORTH

1:200
0m 2m 4m 6m 8m

NOTES
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REV	DESCRIPTION	DATE
A	Planning Proposal - DRAFT	19/12/24
B	Planning Proposal	28/03/25

CLIENT
UOL

PROJECT
150 Day Street - Park Royal Darling Harbour

STATUS

DRAWING TITLE
LEVEL 19 PLAN

REVIEWED
AC

SCALE @ A1
1 : 200

APPROVED
AK

PROJECT NO.
016185

DRAWING NO.
RS_119

REV NO.
B

STRUCTURAL SYSTEMS CONSIDERED FOR NEW FLOORS HAVE INCLUDED:
1. POST-TENSIONED FLAT PLATE
2. CONVENTIONALLY REINFORCED FLAT-PLATE
3. COMPOSITE STEELWORK/CONCRETE
4. TIMBER AND TIMBER-HYBRID SOLUTIONS

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FOR PT OPTION, TYPICALLY ALLOW FOR 450 WIDE, 250 DEEP EDGE BEAM.

INDICATIVE COLUMN LAYOUT SHOWN.
REFER TO TTW SKETCH DATED 24/10/24 FOR OPTIONS OF STRUCTURAL SYSTEMS FOR THE NEW-BUILD STRUCTURE.
FOR CONCRETE COLUMNS, GENERALLY ALLOW FOR MINIMUM WIDTH OF 240mm TO FIT WITHIN HOTEL ROOM WALLS.

ALLOW FOR ALL WALLS TO BE 300mm THICK, BUILT OVER CALLS BELOW IN LOCATIONS SHOWN.

FOR PT OPTION, TYPICALLY ALLOW FOR FLAT-PLATE SLAB, MINIMUM DEPTH 200mm.
SLAB TO BE 240mm AROUND WET-AREAS, TO ALLOW FOR 40mm SET-DOWN.
SEE ADDITIONAL INFORMATION ON TTW SLAB OPTIONS FOR FURTHER ADVICE.

N1 N2 N3 N4 N5 N6 N7 N8 N9
9000 9000 9000 9000 9000 9000 9000 9000
RS_201 1
A B C E NE G NG H I
4300 825 4850 2245 4830 825
RS_200 1
2 RS_200
SITE BOUNDARY
BALCONY BELOW
B.O.H.
1 RS_202

519

Job Name : 150 DAY STREET
Sketch Title: PLANNING STAGE STRUCTURAL REVIEW R2
Date: 20/3/25
By: NF
TTW Taylor Thomson Whitting
Job Number: 221199
Sketch No. : SK250320.1

1 L20 PLAN
RS_200 1 : 200

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Nominated Architects NSW:
Tony Grist 5350
Glenn Scott 6842
Ross de la Motte 7398

REFERENCE

NORTH

1:200
0m 2m 4m 6m 8m

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REV	DESCRIPTION	DATE
A	Planning Proposal - DRAFT	19/12/24
B	Planning Proposal	28/03/25

CLIENT
UOL

PROJECT
150 Day Street - Park Royal Darling Harbour

STATUS

DRAWING TITLE
LEVEL 20 PLAN

REVIEWED
AC

SCALE @ A1
1 : 200

APPROVED
AK

PROJECT NO.
016185

DRAWING NO.
RS_120

REV NO.
B

STRUCTURAL SYSTEMS CONSIDERED FOR NEW FLOORS HAVE INCLUDED:
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2. CONVENTIONALLY REINFORCED FLAT-PLATE
3. COMPOSITE STEELWORK/CONCRETE
4. TIMBER AND TIMBER-HYBRID SOLUTIONS

REFER TO "STRUCTURAL SYSTEMS" DOCUMENT PRODUCED BY HASSELL AND ATTACHED TO TTW PLANING REPORT FOR IN-DEPTH COSTS AND BENEFITS OF CONSIDERED SYSTEMS.

FOR PT OPTION, TYPICALLY ALLOW FOR FLAT-PLATE SLAB, MINIMUM DEPTH 240mm. SLAB TO BE 280mm AROUND WET-AREAS, TO ALLOW FOR 40mm SET-DOWN. DEEPER SLAB PROVIDED TO ALLOW FOR HEAVIER LOADS IN RESTAURANT SPACE.

INDICATIVE COLUMN LAYOUT SHOWN.
REFER TO TTW SKETCH DATED 24/10/24 FOR OPTIONS OF STRUCTURAL SYSTEMS FOR THE NEW-BUILD STRUCTURE.

COLUMNS MAY BE REDUCED AT THIS FLOOR. PRIMARY IMPLICATION WILL BE DEEPER STRUCTURE AT PLANT SUPPORT FLOOR ABOVE DUE TO INCREASED SPAN.

SET-DOWNS IN SLAB MUST BE CONSIDERED AS DESIGN PROGRESSES TO ENSURE IMPLICATIONS ON HEAD-HEIGHT OF SPACE BELOW ARE CONSIDERED.

ALLOW FOR ALL WALLS TO BE 300mm THICK, BUILT OVER CALLS BELOW IN LOCATIONS SHOWN.

WATERPROOFING SOLUTION TO EXTERNAL AREAS TO BE COORDINATED AS DESIGN PROGRESSES.
STEP IN STRUCTURAL SLAB IS POSSIBLE, HOWEVER WILL HAVE IMPLICATION ON HEAD-HEIGHT BELOW.

N1 N2 N3 N4 N5 N6 N7 N8 N9

9000 9000 9000 9000 9000 9000 9000 9000

A B C E NE G NG H I

4300 5825 4850 1455 3300 2265 4830 5925

SITE BOUNDARY

BALCONY BELOW

RESTAURANT - TERRACE

B.O.H.

RESTAURANT - LEASED SPACE

RS_201 1

RS_200 1

2 RS_200

1 RS_202

520

Job Name : 150 DAY STREET
Sketch Title: PLANNING STAGE STRUCTURAL REVIEW R2
Date: 20/3/25
By: NF
Job Number: 221199
Sketch No. : SK250320.1

1 RS_200 L21 PLAN
1 : 200

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Nominated Architects NSW:
Tony Grist 5350
Glenn Scott 6842
Ross de la Motte 7398

REFERENCE

NORTH

1:200
0m 2m 4m 6m 8m

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REV	DESCRIPTION	DATE
A	Planning Proposal - DRAFT	19/12/24
B	Planning Proposal	28/03/25

CLIENT
UOL

PROJECT
150 Day Street - Park Royal Darling Harbour

STATUS

DRAWING TITLE
LEVEL 21 PLAN - RESTAURANT

REVIEWED
AC

SCALE @ A1
1 : 200

APPROVED
AK

PROJECT NO.
016185

DRAWING NO.
RS_121

REV NO.
B

STRUCTURAL SYSTEMS CONSIDERED FOR NEW FLOORS HAVE INCLUDED:
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2. CONVENTIONALLY REINFORCED FLAT-PLATE
3. COMPOSITE STEELWORK/CONCRETE
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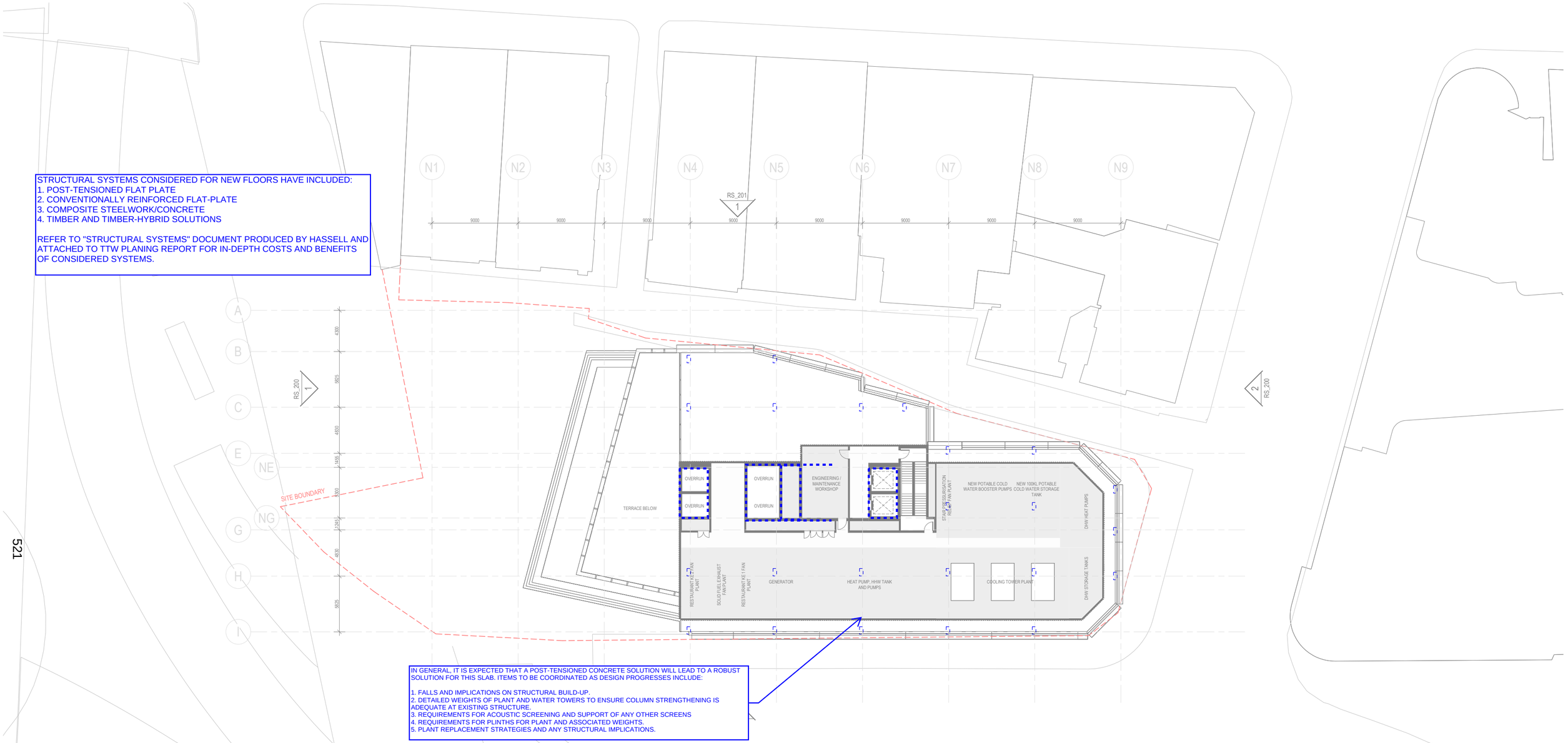

IN GENERAL, IT IS EXPECTED THAT A POST-TENSIONED CONCRETE SOLUTION WILL LEAD TO A ROBUST SOLUTION FOR THIS SLAB. ITEMS TO BE COORDINATED AS DESIGN PROGRESSES INCLUDE:

1. FALLS AND IMPLICATIONS ON STRUCTURAL BUILD-UP.
2. DETAILED WEIGHTS OF PLANT AND WATER TOWERS TO ENSURE COLUMN STRENGTHENING IS ADEQUATE AT EXISTING STRUCTURE.
3. REQUIREMENTS FOR ACOUSTIC SCREENING AND SUPPORT OF ANY OTHER SCREENS
4. REQUIREMENTS FOR PLINTHS FOR PLANT AND ASSOCIATED WEIGHTS.
5. PLANT REPLACEMENT STRATEGIES AND ANY STRUCTURAL IMPLICATIONS.

521

Job Name : 150 DAY STREET
Sketch Title: PLANNING STAGE STRUCTURAL REVIEW R2
Date: 20/3/25
By: NF
Job Number: 221199
Sketch No. : SK250320.1

1 RS_200 L22 PLAN - PLANT
1 : 200

CONSULTANT
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sydney@hassellstudio.com
Nominated Architects NSW:
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REFERENCE

NORTH

1:200
0m 2m 4m 6m 8m

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REV	DESCRIPTION	DATE
A	Planning Proposal - DRAFT	19/12/24
B	Planning Proposal	28/03/25

CLIENT
UOL

PROJECT
150 Day Street - Park Royal Darling Harbour

STATUS

DRAWING TITLE
LEVEL 22 PLAN - PLANT

REVIEWED
AC

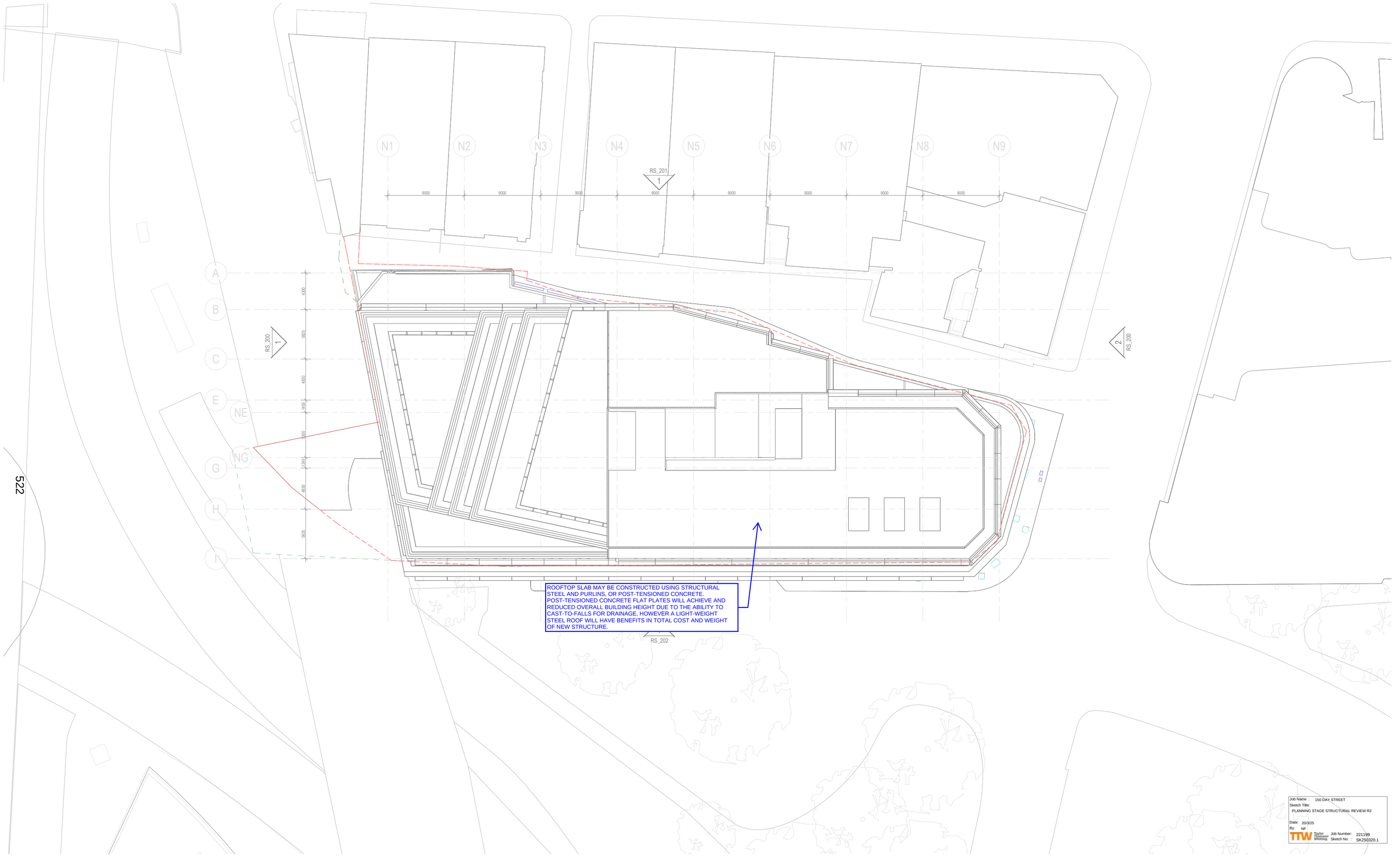
APPROVED
AK

DRAWING NO.
RS_122

SCALE @ A1
1 : 200

PROJECT NO.
016185

REV NO.
B



Job Name : 150 DAY STREET
Sketch Title: PLANNING STAGE STRUCTURAL REVIEW R2
Date: 20/3/25
By: NF
TTW Taylor Thomson Whitting
Job Number: 221199
Sketch No. : SK250320.1

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sydney@hassellstudio.com
Nominated Architects NSW:
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REFERENCE

NORTH

1:200
0m 2m 4m 6m 8m

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REV	DESCRIPTION	DATE
A	Planning Proposal - DRAFT	19/12/24
B	Planning Proposal	28/03/25

CLIENT
UOL

PROJECT
150 Day Street - Park Royal Darling Harbour

STATUS

DRAWING TITLE
LEVEL 23 PLAN - ROOFPLAN

REVIEWED
AC

SCALE @ A1
1 : 200

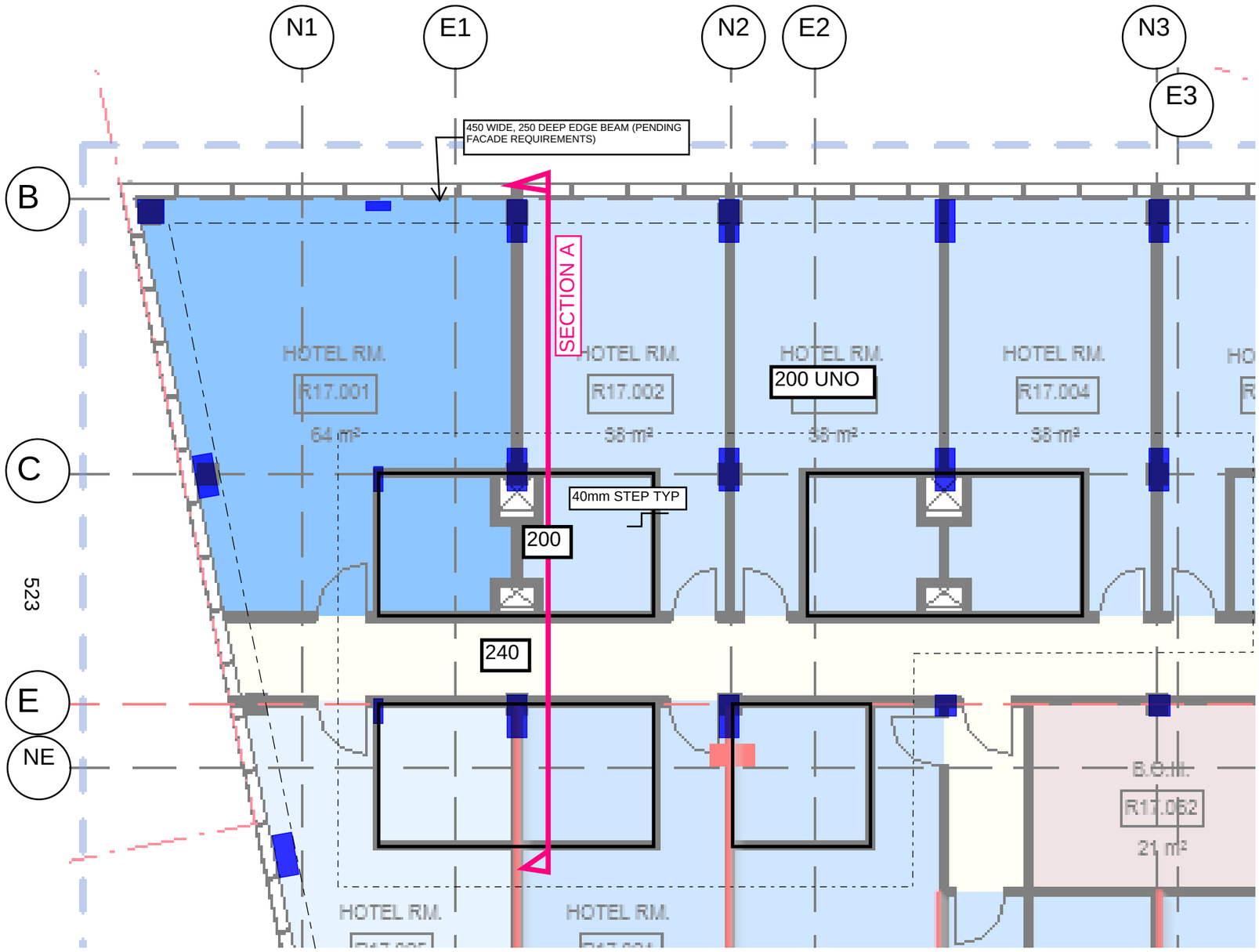
APPROVED
AK

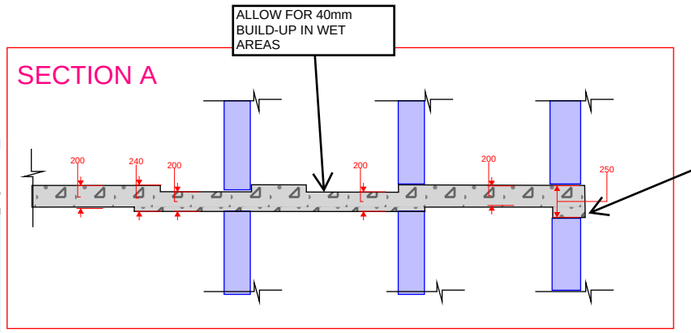
PROJECT NO.
016185

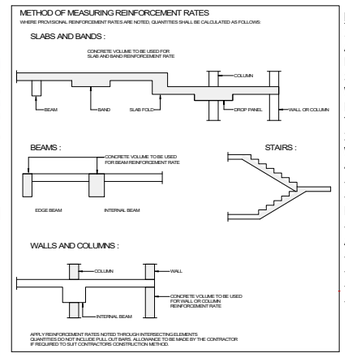
DRAWING NO.
RS_123

REV NO.
B

OPTION 1: POST-TENSIONED FLAT PLATE







REINFORCEMENT RATES NOTES:

1. MEASURED QUANTITIES ARE APPROXIMATE AND FOR INFORMATION ONLY. RATES ARE PROVIDED TO ALLOW FOR HIGH-LEVEL COSTING DURING PLANNING STAGE AND MUST BE INTERPRETED IN THE CONTEXT OF COMPARISON BETWEEN ALTERNATE SCHEMES. ACTUAL QUANTITIES MAY VARY AS DETAILED DESIGN IS DEVELOPED AND WHILST ALL REASONABLE EFFORTS WILL BE UNDERTAKEN TO MAINTAIN AFC REINFORCEMENT +-20% OF THESE QUANTITIES, IT IS NOT POSSIBLE TO GUARANTEE THESE ESTIMATES.
2. NO ALLOWANCE HAS BEEN MADE FOR POST-TENSIONING AND REINFORCEMENT WASTAGE.
4. NOT INCLUDED IN THE PROVIDED RATES ARE THE FOLLOWING:
- SAFETY MESH
-REINFORCEMENT REQUIRED BY BUILDER SUCH AS ADDITIONAL SUPPORT REINFORCEMENT
-ROLLING MARGINS (TYPICALLY ALLOW FOR 10% ADDITIONAL FOR ROLLING MARGINS AND WASTAGE)
-POST TENSIONING PAN AND ANTI-BURST REINFORCEMENT
-SLAB TO CORE CONNECTIONS
-CONSTRUCTION AND TEMPORARY MOVEMENT JOINTS
-HOBS, UP-STANDS AND PLINTHS

DESIGN PARAMETERS FOR PRELIMINARY COSTING PURPOSES

Design Loading: SDL=1.5kPa TYP. 2.5kPa in Bathrooms
LL=2.0kPa in Hotel Rooms
LL=4.0kPa in Corridors, Stairs, Landings

Concrete Strength: f'c=40MPa
Allow for Reinforcement Rates of: 5kg/m2 PT + 65kg/m3 RC
Note: RC rate includes requirement of 15kg/m3 for Diaphragm Reinforcement in accordance with requirements of AS3600:2018

Larger Quantities of Reinforcement will be required at Plant Floors, Function Areas, External Terraces and Rooftops

For Preliminary Costing Purposes, Allow for Column Design of Either:

1. 750X260 RECTANGULAR COLUMN. f'c=65MPa. 250kg/m3 REBAR RATE
2. 400x400 SQUARE COLUMN. f'c=65MPa. 250kg/m3 REBAR RATE
3. 450 DIA CIRCULAR COLUMN. f'c=65MPa. 240kg/m3 REBAR RATE

COLUMN SIZES WILL BE REFINED AS A FUNCTION OF LOCATION IN PLAN AND HEIGHT OF BUILDING THROUGHOUT DESIGN.

PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION

Rev	Description	Sketch	Date
P1	PRELIMINARY ISSUE	NF	24.10.24

Architect/Client: **HASSELL/UOL**

Engineer: TTW www.ttwengineers.com

Project: **150 DAY STREET**

Sketch Subject: **SRUCTURAL SCHEMES FOR PRELIMINARY COSTING**

Scale : A3: **1:100 (APPROX)**

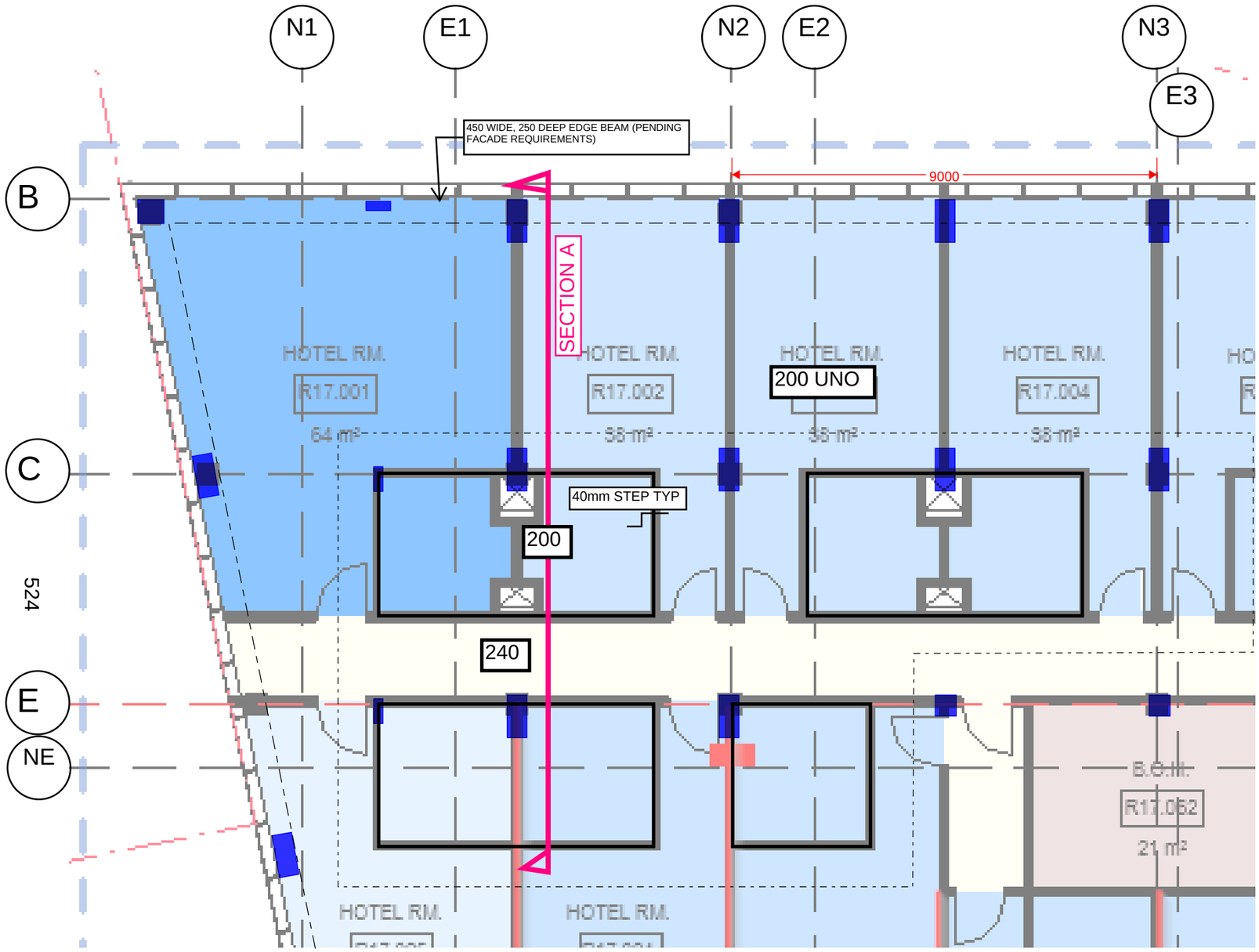
Sketched: **NF**

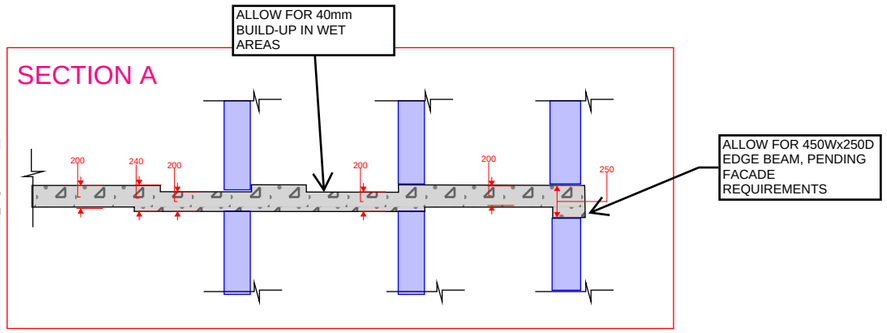
Project No: **221199**

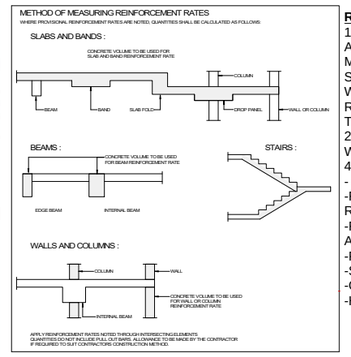
Sketch No: **SK241024.2**

Revision: **P1**

OPTION 2: CONVENTIONALLY REINFORCED FLAT PLATE







REINFORCEMENT RATES NOTES:

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2. NO ALLOWANCE HAS BEEN MADE FOR POST-TENSIONING AND REINFORCEMENT WASTAGE.
4. NOT INCLUDED IN THE PROVIDED RATES ARE THE FOLLOWING:
- SAFETY MESH
-REINFORCEMENT REQUIRED BY BUILDER SUCH AS ADDITIONAL SUPPORT REINFORCEMENT
-ROLLING MARGINS (TYPICALLY ALLOW FOR 10% ADDITIONAL FOR ROLLING MARGINS AND WASTAGE)
-POST TENSIONING PAN AND ANTI-BURST REINFORCEMENT
-SLAB TO CORE CONNECTIONS
-CONSTRUCTION AND TEMPORARY MOVEMENT JOINTS
-HOBS, UP-STANDS AND PLINTHS

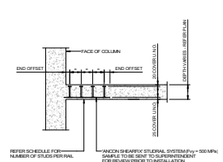
DESIGN PARAMETERS FOR PRELIMINARY COSTING PURPOSES

Design Loading: SDL=1.5kPa TYP. 2.5kPa in Bathrooms
LL=2.0kPa in Hotel Rooms
LL=4.0kPa in Corridors, Stairs, Landings

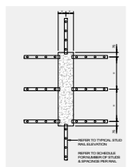
Concrete Strength: f'c=40MPa
Allow for Reinforcement Rates of: 130kg/m3
Note: RC rate includes requirement of 15kg/m3 for Diaphragm Reinforcement in accordance with requirements of AS3600:2018

Larger Quantities of Reinforcement will be required at Plant Floors, Function Areas, External Terraces and Rooftops

Note: Punching Shear Reinforcement will be required at approximately 50% of column locations for 200mm RC Flat Plate.
For costing purposes, allow for Ancon Studrails to indicative detail below.



TYPICAL STUDRAIL ELEVATION UNO



STUDRAIL SCHEDULE				
TYPE	STUD dia	NUMBER OF STUDS PER RAIL	END OFFSET	COMMENT
SR1	16mm	4 STUDS AT 100 CENTRES	95mm	

For Preliminary Costing Purposes, Allow for Column Design of Either:

1. 750X260 RECTANGULAR COLUMN. f'c=65MPa. 250kg/m3 REBAR RATE
2. 400x400 SQUARE COLUMN. f'c=65MPa. 250kg/m3 REBAR RATE
3. 450 DIA CIRCULAR COLUMN. f'c=65MPa. 240kg/m3 REBAR RATE

COLUMN SIZES WILL BE REFINED AS A FUNCTION OF LOCATION IN PLAN AND HEIGHT OF BUILDING THROUGHOUT DESIGN.

PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION

Rev	Description	Sketch	Date
P1	PRELIMINARY ISSUE	NF	24.10.24

Architect/Client
HASSELL/UOL

Engineer
TTW
www.ttwengineers.com

Project
150 DAY STREET

Sketch Subject
SRUCTURAL SCHEMES FOR PRELIMINARY COSTING

Scale : A3
1:100 (APPROX)

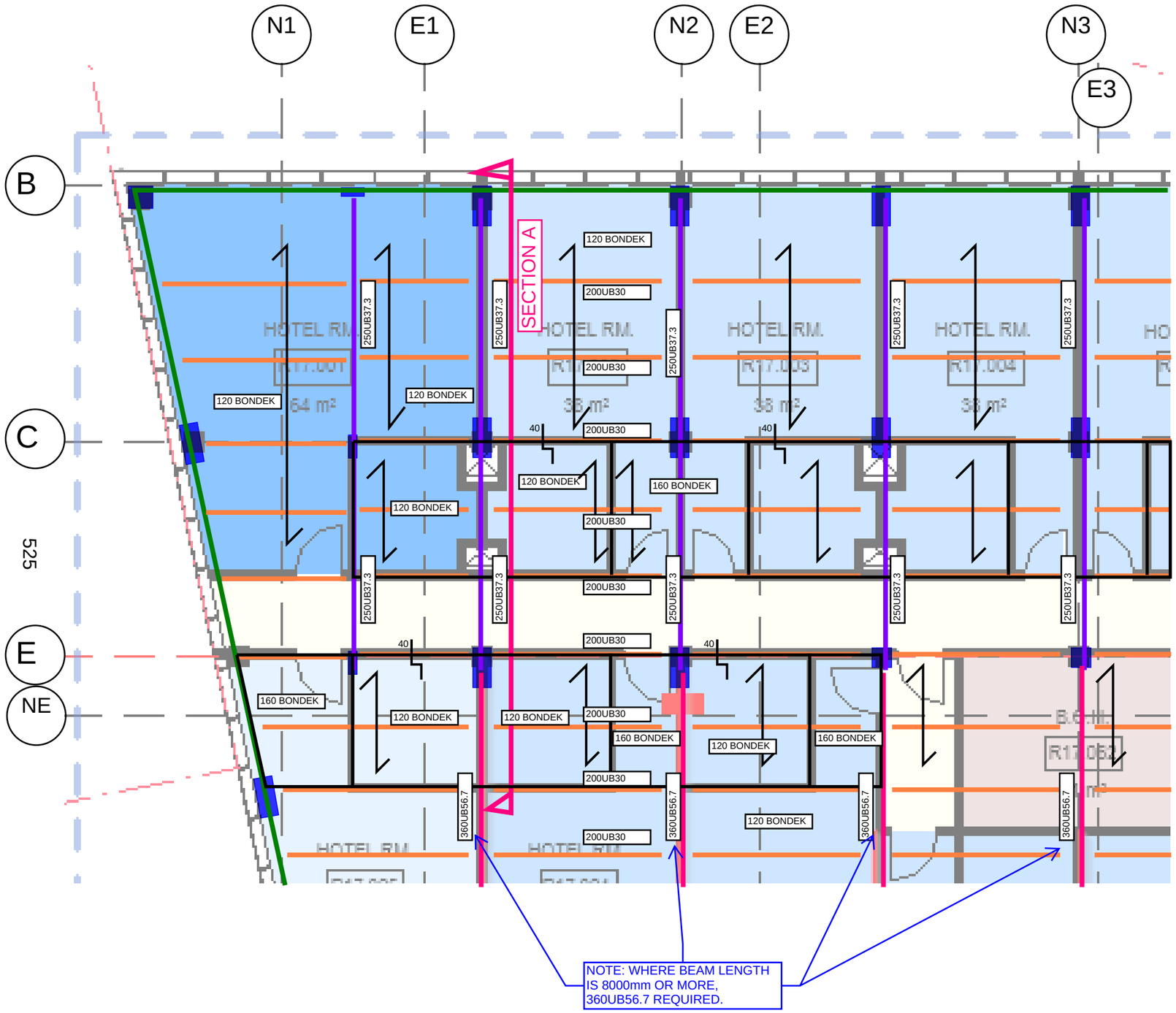
Sketched
NF

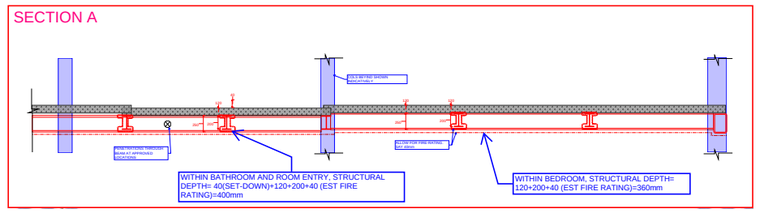
Project No
221199

Sketch No
SK241024.2

Revision
P1

OPTION 3: COMPOSITE STEEL/CONCRETE UTILISING BONDEK





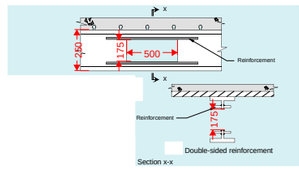
Information Provided for Preliminary Costing and Spatial Planning Purposes.

MEASURED QUANTITIES ARE APPROXIMATE AND FOR INFORMATION ONLY. RATES ARE PROVIDED TO ALLOW FOR HIGH-LEVEL COSTING DURING PLANNING STAGE AND MUST BE INTERPRETED IN THE CONTEXT OF COMPARISON BETWEEN ALTERNATE SCHEMES. ACTUAL QUANTITIES MAY VARY AS DETAILED DESIGN IS DEVELOPED AND WHILST ALL REASONABLE EFFORTS WILL BE UNDERTAKEN TO MAINTAIN AFC REINFORCEMENT +-20% OF THESE QUANTITIES, IT IS NOT POSSIBLE TO GUARANTEE THESE ESTIMATES.

Notes:
1. Bondek Slab to use concrete strength f'c=32MPa
2. Allow for Reinforcement Rate of 65kg/m3 in Composite Slab.
3. Allow for fire rating to all steelwork. Allow for Columns to be clad in Fire-rated board (Fyrcheck or similar). Allow for beams to be coated in Vermiculite fire spray. Fire Protection Strategy to be confirmed and specified by Architect.
4. Architect to advise of limitations on slab depth for acoustic purposes.
5. Allow for shear studs to all beams as shown below
6. Bondek to have BMT 1.0mm
7. For costing purposes allow for Column Sizes of:
-SHS 300x300x12.5 (at bottom 3 storeys)
-SHS 250x250x12.5 (3 to 6 storeys)
-SHS 200x200x10 (6 Storeys and above)
COLUMN SIZES WILL BE REFINED AS A FUNCTION OF LOCATION IN PLAN AND HEIGHT OF BUILDING THROUGHOUT DESIGN.

8. Penetrations allowable through Steelwork members as indicated below.
9. ALL MEMBER SIZES SUBJECT TO ONGOING DESIGN DEVELOPMENT AND COORDINATION.
10. Allow for Precambering of all steelwork.

PENETRATION IF 250UB BEAM USED



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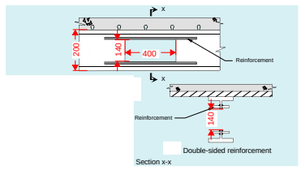

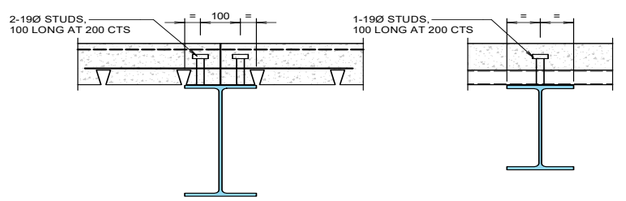

TYPICAL SHEAR STUD DETAILS
SCALE 1:10

PRELIMINARY
NOT TO BE USED FOR CONSTRUCTION

Rev	Description	Sketch	Date
P1	PRELIMINARY ISSUE	NF	24.10.24

Architect/Client
HASSELL/UOL

Engineer
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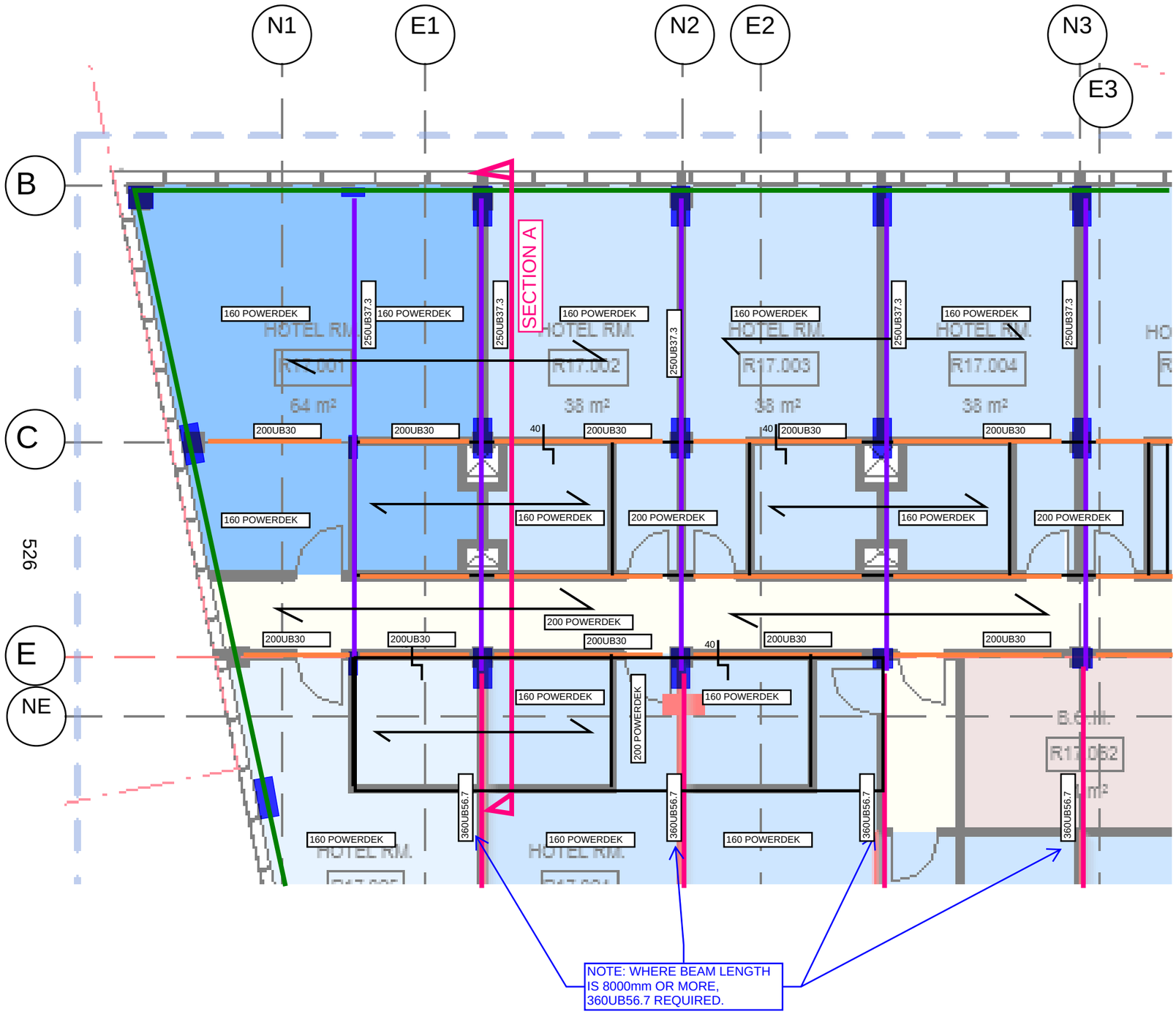
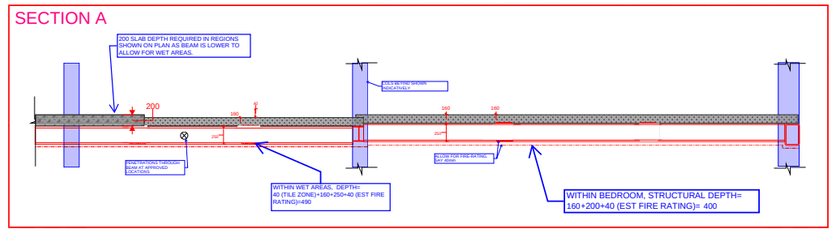
OPTION 4: COMPOSITE STEEL/CONCRETE UTILISING POWERDEK





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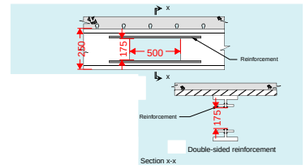
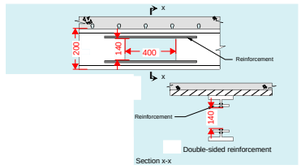
Notes:
1. PowerDek Slab to use concrete strength f'c=32MPa
2. Allow for Reinforcement Rate of 55kg/m3 in Composite Slab.
3. Allow for fire rating to all steelwork. Allow for Columns to be clad in Fire-rated board (Fyrcheck or similar). Allow for beams to be coated in Vermiculite fire spray. Fire Protection Strategy to be confirmed and specified by Architect.
4. Architect to advise of limitations on slab depth for acoustic purposes.
5. Allow for shear studs to all beams as shown below
6. Powerdek specification to be Powerdek100/1.5BMT
7. For costing purposes allow for Column Sizes of:
-SHS 300x300x12.5 (at bottom 3 storeys)
-SHS 250x250x12.5 (3 to 6 storeys)
-SHS 200x200x10 (6 Storeys and above)
COLUMN SIZES WILL BE REFINED AS A FUNCTION OF LOCATION IN PLAN AND HEIGHT OF BUILDING THROUGHOUT DESIGN.

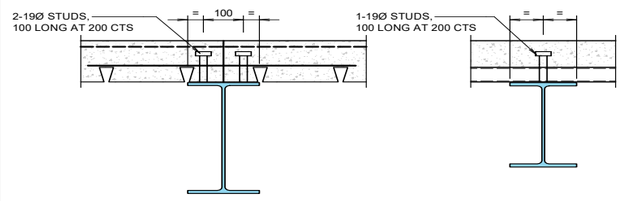
8. Penetrations allowable through Steelwork members as indicated below.
9. ALL MEMBER SIZES SUBJECT TO ONGOING DESIGN DEVELOPMENT AND COORDINATION.
10. Allow for Precambering of all steelwork.

PENETRATION IF 250UB BEAM USED



PENETRATION IF 200UB BEAM USED





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Appendix B

Additional Storey Structural Schemes

Hassell

150 DAY ST
STRUCTURE

528

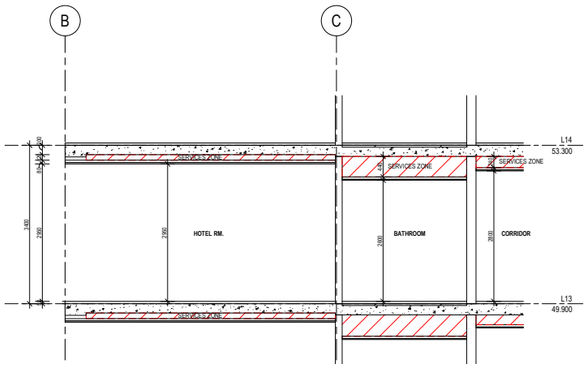
016185
Day Street

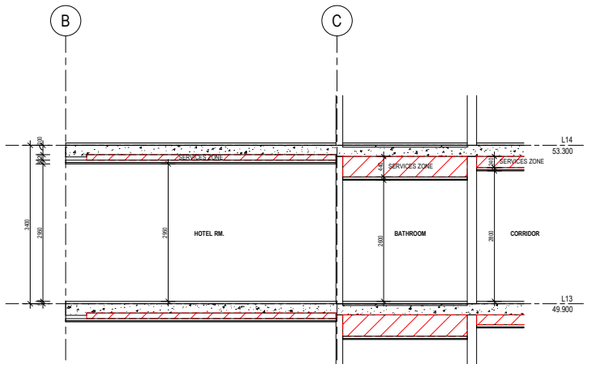
Prepared for
UOL

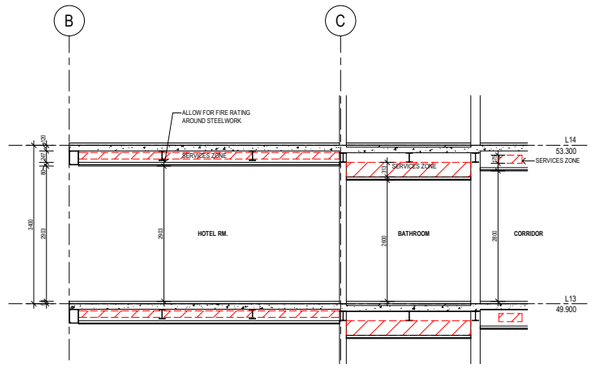
November, 2024

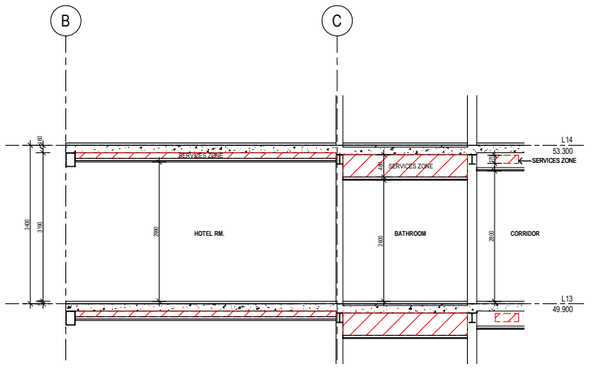
STRUCTURAL SYSTEMS

STRUCTURAL OPTIONS OVERVIEW









OPTION 1:
POST-TENSIONED FLAT PLATE

- Lowest cost
- Familiar system in Sydney
- Reduced embodied carbon (Less reinforcement placement, thin slab, smaller columns)
- Optimised floor to floor height: 2.95m
- Construction programme: Less efficient, Formwork propping restricts fitout to lower floors below

OPTION 2:
CONVENTIONALLY REINFORCED FLAT PLATE

- As per option 01; but
- More material required in reinforcement

OPTION 3:
COMPOSITE STEEL/CONCRETE UTILISING BONDEK

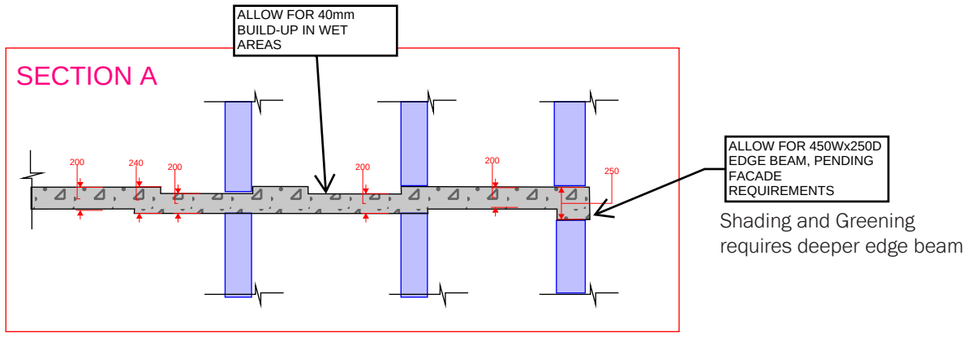
- Construction programme: More efficient - no propping enables fitout to lower floors as structure is installed
- Services coordination required through secondary beams
- Steel frame in the pool environment is not ideal
- Expensive fire rating work
- Lower ceiling heights due to deeper beams

OPTION 4:
COMPOSITE STEEL/CONCRETE UTILISING POWERDEK

- As per option 03; and
- reduced secondary structure due to the increased span of powerdek slab
- Beams within walls have a lower top of steel

OPTION 1: POST-TENSIONED FLAT PLATE

Floor to ceiling height preferred	**- 2.95m (2.90m if a consistent soffit profile is by the builder)**
Structural grid	**- 4.5m (every hotel room)**
Hotel room wall thickness (impacts area)	**- 260mm due to blade width**
Room Layout	**- columns integrated into walls**
	- Setdowns may result in contractor preference to minimise formwork and build a deeper slab
Embodied carbon	**- Low; However minimal deconstruction option**
Ease/Speed of Construction	**- Construction programme: Less efficient, Formwork propping restricts fitout to lower floors below;**
Required FRL between floors:	**Typical hotel rooms: FRL120**
	Plant: FRL240
	This option: 200mm concrete is FRL120
Acoustic Performance:	**RW 50 or greater for floors is required in a hotel (200mm concrete achieves this value)**



DESIGN PARAMETERS FOR PRELIMINARY COSTING PURPOSES
Design Loading: SDL=1.5kPa TYP. 2.5kPa in Bathrooms
LL=2.0kPa in Hotel Rooms
LL=4.0kPa in Corridors, Stairs, Landings

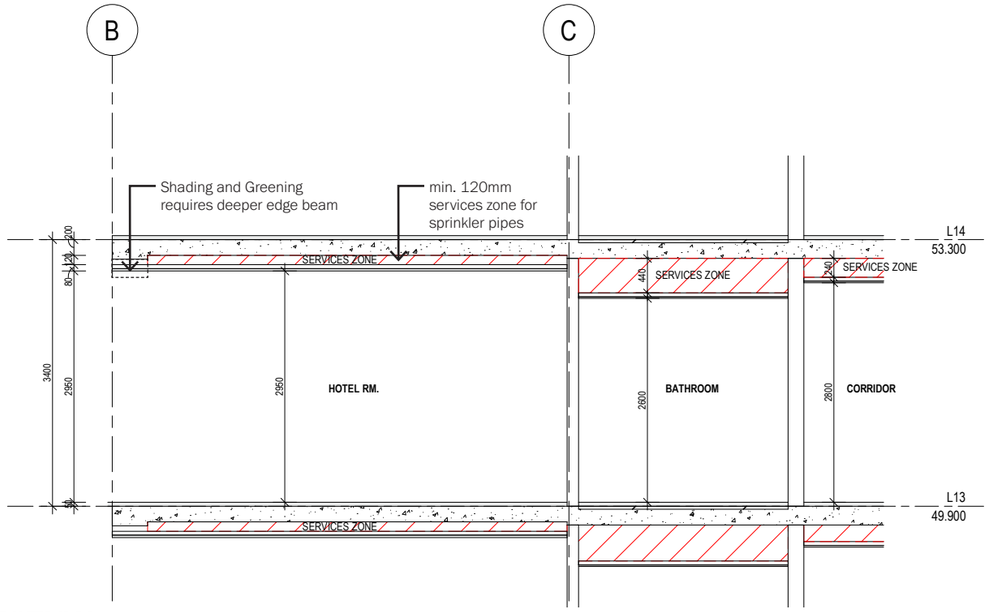
Concrete Strength: f'c=40MPa
Allow for Reinforcement Rates of: 5kg/m2 PT + 65kg/m3 RC
Note: RC rate includes requirement of 15kg/m3 for Diaphragm Reinforcement in accordance with requirements of AS3600:2018

Larger Quantities of Reinforcement will be required at Plant Floors, Function Areas, External Terraces and Rooftops

For Preliminary Costing Purposes, Allow for Column Design of Either:

1. 750X260 RECTANGULAR COLUMN. f'c=65MPa. 250kg/m3 REBAR RATE
2. 400x400 SQUARE COLUMN. f'c=65MPa. 250kg/m3 REBAR RATE
3. 450 DIA CIRCULAR COLUMN. f'c=65MPa. 240kg/m3 REBAR RATE

COLUMN SIZES WILL BE REFINED AS A FUNCTION OF LOCATION IN PLAN AND HEIGHT OF BUILDING THROUGHOUT DESIGN.



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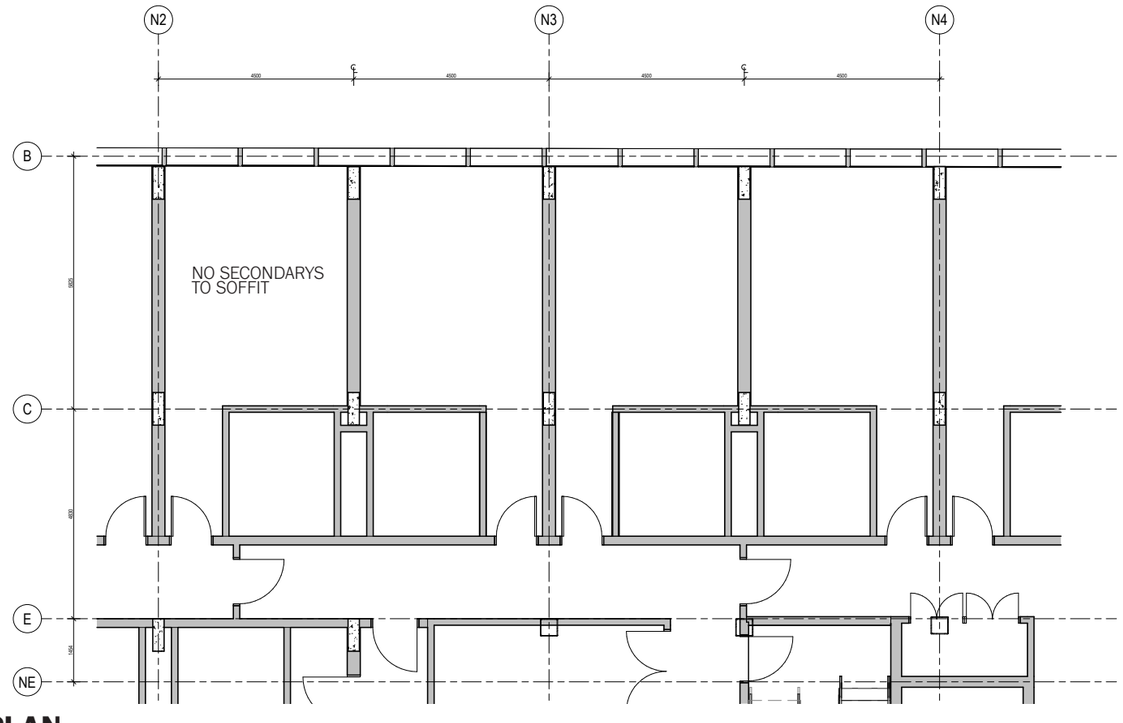
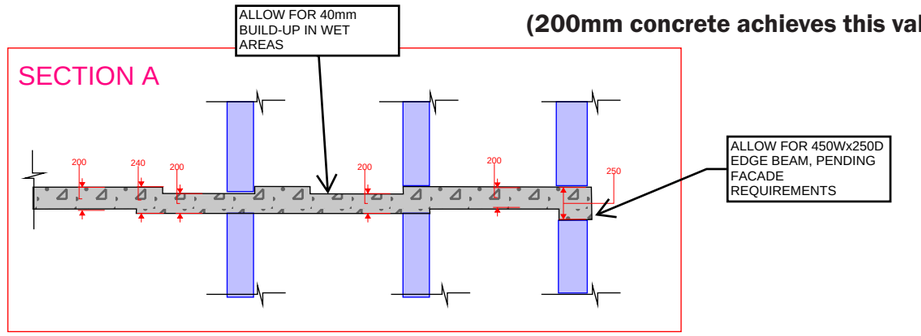


PLAN

OPTION 2: CONVENTIONALLY REINFORCED FLAT PLATE

Floor to ceiling height	**- 2.95m (2.9 if a consistent soffit profile is preferred by the builder)**
Structural grid	**- 4.5m (every hotel room)**
Hotel room wall thickness (impacts area)	**- 260mm due to blade width**
Room Layout	**- columns integrated into walls**
	- Setdowns may result in contractor preference to minimise formwork and build a deeper slab
Embodied carbon	**- Low; However minimal deconstruction option**
Ease/Speed of Construction	**- Construction programme: Less efficient, Formwork propping restricts fitout to lower floors below; additional labour and material required for reinforcement**
Required FRL between floors:	**Typical hotel rooms: FRL120**
	Plant: FRL240
	This option: 200mm concrete is FRL120
Acoustic Performance:	**RW 50 or greater for floors is required in a hotel (200mm concrete achieves this value)**

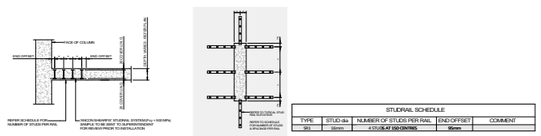


DESIGN PARAMETERS FOR PRELIMINARY COSTING PURPOSES
Design Loading: SDL=1.5kPa TYP. 2.5kPa in Bathrooms
LL=2.0kPa in Hotel Rooms
LL=4.0kPa in Corridors, Stairs, Landings

Concrete Strength: f'c=40MPa
Allow for Reinforcement Rates of: 130kg/m3
Note: RC rate includes requirement of 15kg/m3 for Diaphragm Reinforcement in accordance with requirements of AS3600:2018

Larger Quantities of Reinforcement will be required at Plant Floors, Function Areas, External Terraces and Rooftops

Note: Punching Shear Reinforcement will be required at approximately 50% of column locations for 200mm RC Flat Plate.
For costing purposes, allow for Ancon Studrails to indicative detail below.

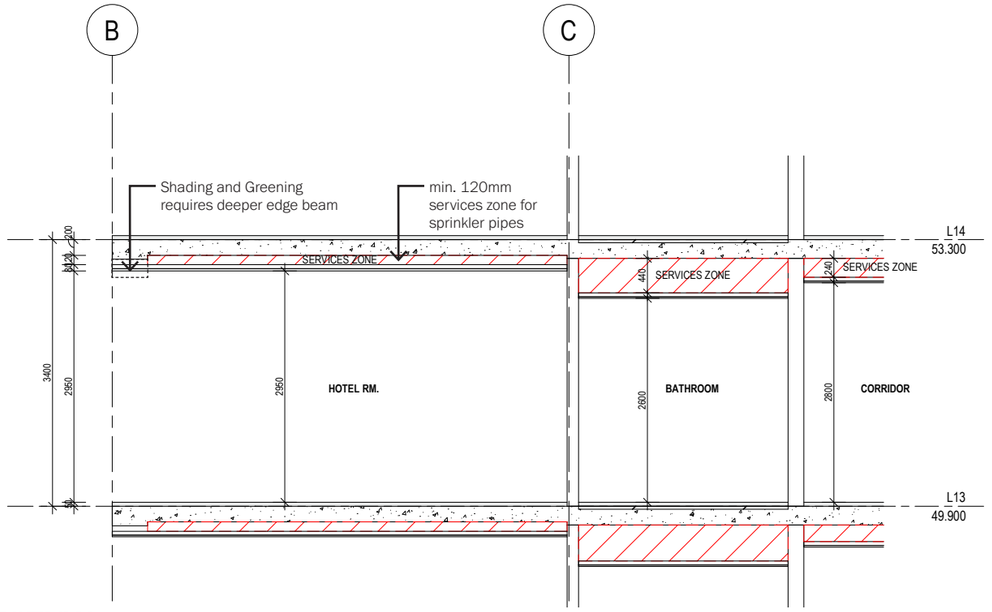


TYPICAL STUDRAIL ELEVATION UNO

For Preliminary Costing Purposes, Allow for Column Design of Either:

1. 750X260 RECTANGULAR COLUMN. f'c=65MPa. 250kg/m3 REBAR RATE
2. 400x400 SQUARE COLUMN. f'c=65MPa. 250kg/m3 REBAR RATE
3. 450 DIA CIRCULAR COLUMN. f'c=65MPa. 240kg/m3 REBAR RATE

COLUMN SIZES WILL BE REFINED AS A FUNCTION OF LOCATION IN PLAN AND HEIGHT OF BUILDING THROUGHOUT DESIGN.



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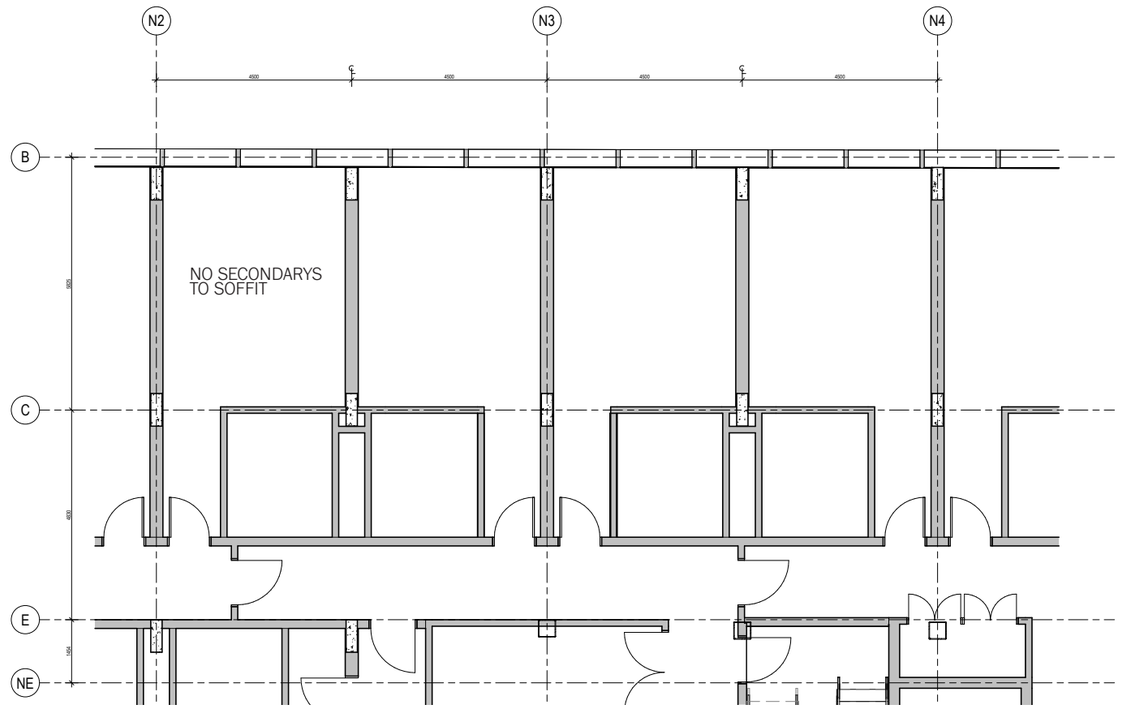


PLAN

OPTION 3: COMPOSITE STEEL/CONCRETE UTILISING BONDEK

Floor to ceiling height - 2.9m

Structural grid - 4.5m every hotel room

Hotel room wall thickness (impacts area) - 350mm due to box section

Room Layout

- Head height (can penetrate beams but still deeper)
- Services coordination through beams (particularly in a D&C process)
- Setdown of wet areas means beam is below the slab but then stays consistent at that level
- Steel in the pool environment is an issue and further impacts head height over amenity floors

Embodied carbon - High; Deconstructible

Ease/Speed of Construction

- Speed of construction, minimised propping requirements, can commence fitout below as moving upwardsRequired FRL between floors

Typical hotel rooms:

FRL90

Plant: FRL240

This option: 120mm concrete floor is FRL120

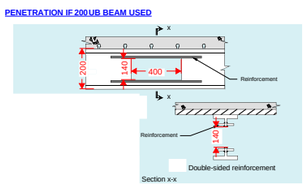
Steelwork needs to be clad or sprayed

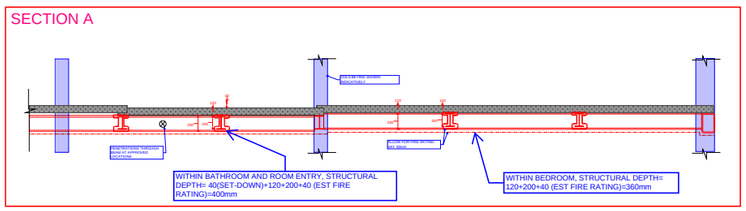
200 columns with fyrechek = 250mm walls
(two layers of 16mm fyrechek + acoustic insulation)

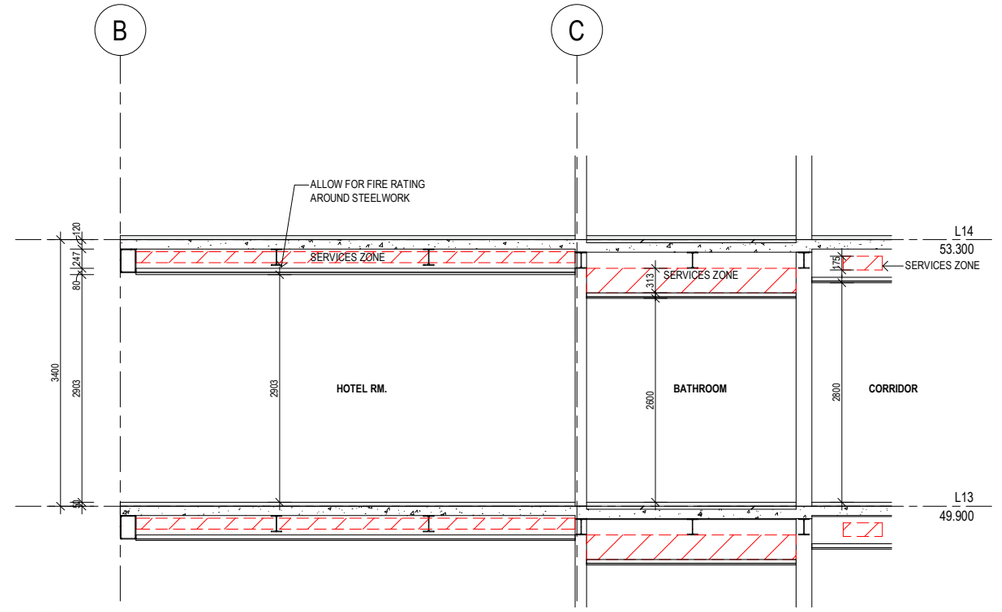
Acoustic Performance:

Floors: RW 50 or greater for floors is required in a hotel - this would not be achieved in this buildup and insulation between beams would be required

Walls:
RW + CTR 50 or greater;
Typical Build Up (can be hebel or double stud):
Hebel option: 13mm PB, 28-35 Furing Channel (with glasswool ins), 75mm hebel, 35mm air gap, 64stud with ins, 13mm PB = 200
typically allow for 225







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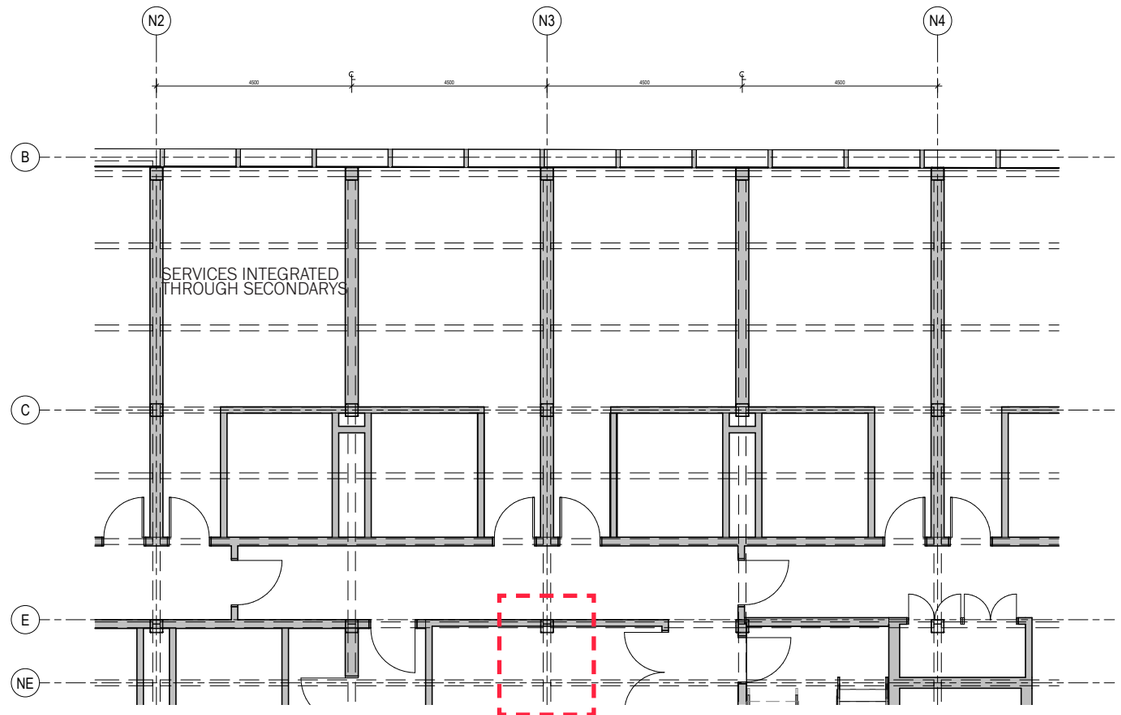


PLAN

PROBLEM: WHERE NO HOTEL ROOMS, DEEPER BEAM = LIMITS FLEXIBILITY AND CEILING HEIGHTS WHEN NOT FOLLOWING ROOM GRID

OPTION 4: COMPOSITE STEEL/CONCRETE UTILISING POWERDEK

Floor to ceiling height - 2.95m (concrete slab is deeper than option 3)

Structural grid - 4.5m every hotel room

Hotel room wall thickness (impacts area) - 350mm due to box section

Room Layout

- Head height (can penetrate beams but still deeper)
- Services coordination through beams (particularly in a D&C process)
- Setdown of wet areas means beam is below the slab but then stays consistent at that level
- Steel in the pool environment is an issue and further impacts head height over amenity floors

Embodied carbon - High; Deconstructible
(less secondary structure than the bondek option 3)

Ease/Speed of Construction

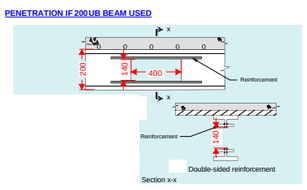
- Speed of construction, minimised secondary steel and also minimised propping requirements, can commence fitout below as moving upwardsRequired FRL between floors

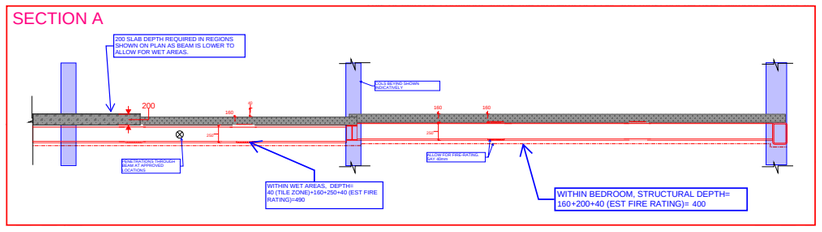
Typical hotel rooms: FRL90
Plant: FRL240
This option: 120mm concrete floor is FRL120
Steelwork needs to be clad or sprayed
200 columns with fyrechek = 250mm walls
(two layers of 16mm fyrechek + acoustic insulation)

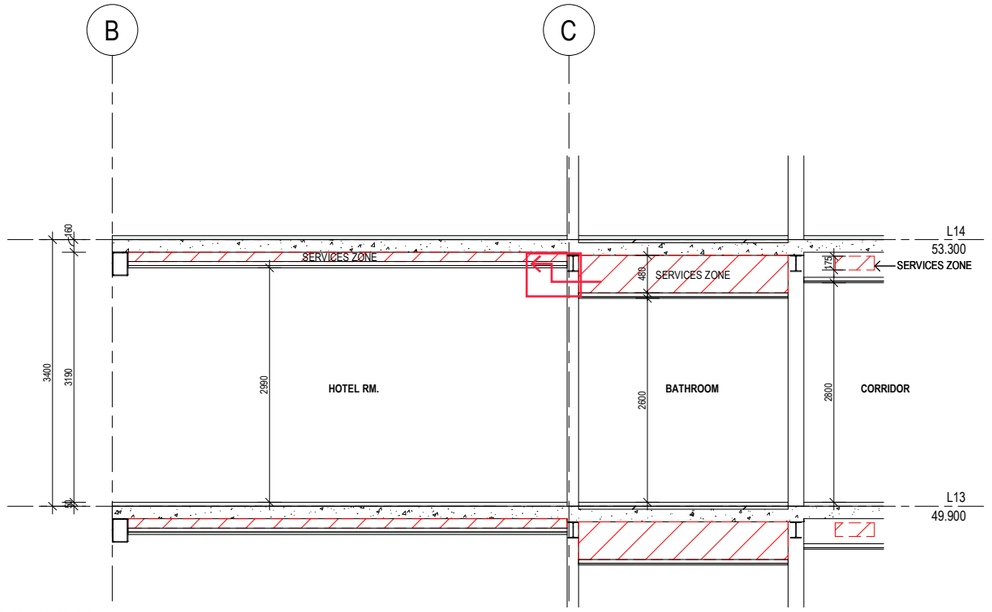
Acoustic Performance:

Floors: RW 50 or greater for floors is required in a hotel - this would not be achieved in this buildup and insulation between beams would be required

Walls:
RW + CTR 50 or greater;
Typical Build Up (can be hebel or double stud):
Hebel option: 13mm PB, 28-35 Furing Channel (with glasswool ins), 75mm hebel, 35mm air gap, 64stud with ins, 13mm PB = 200
typically allow for 225







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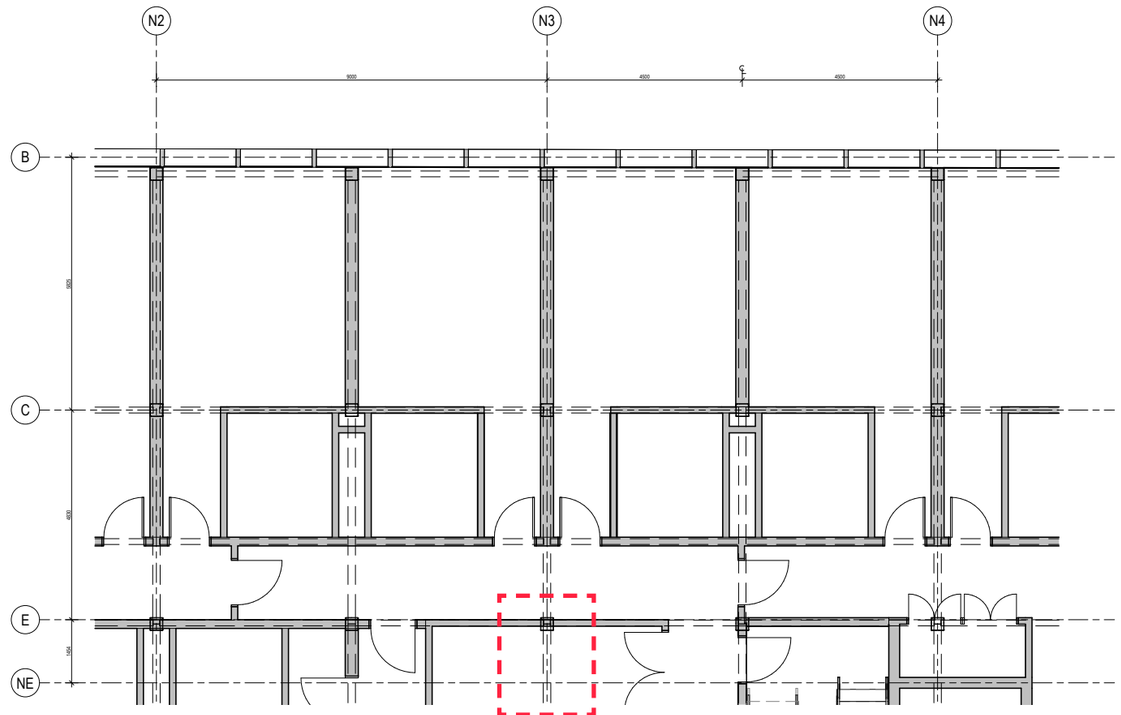


PLAN

PROBLEM: WHERE NO HOTEL ROOMS, DEEPER BEAM = LIMITS FLEXIBILITY AND CEILING HEIGHTS WHEN NOT FOLLOWING ROOM GRID

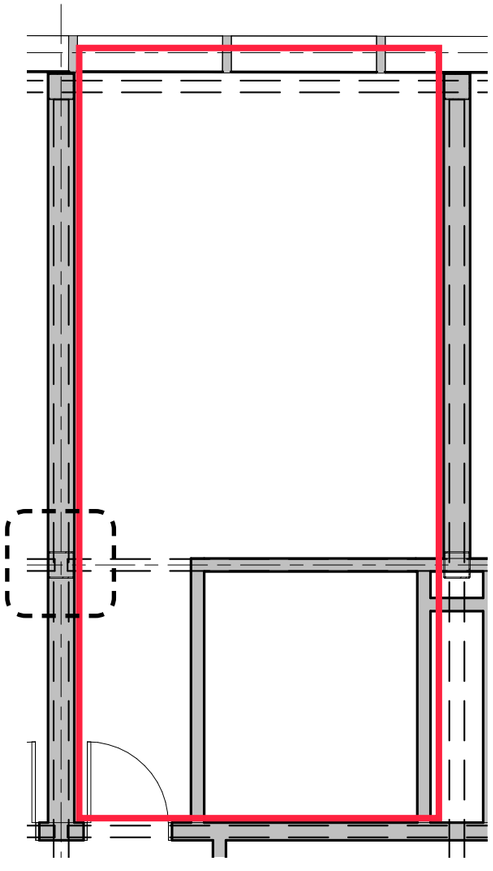
ROOM LAYOUT OPTIONS

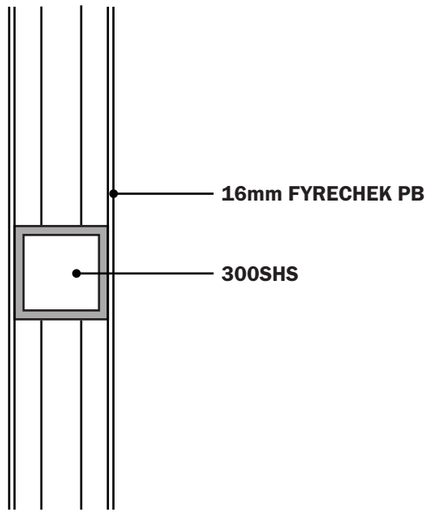
Walls Typical Hotel Buildup:

- **RW + CTR 50 or greater**
- **Can be hebel or double stud**
- **Hebel option: 13mm PB, 28-35 Furing Channel (with glasswool ins), 75mm hebel, 35mm air gap, 64stud with ins, 13mm PB = 200**
- **Typically allow for 225**

COLUMNS INTEGRATED INTO WALLS

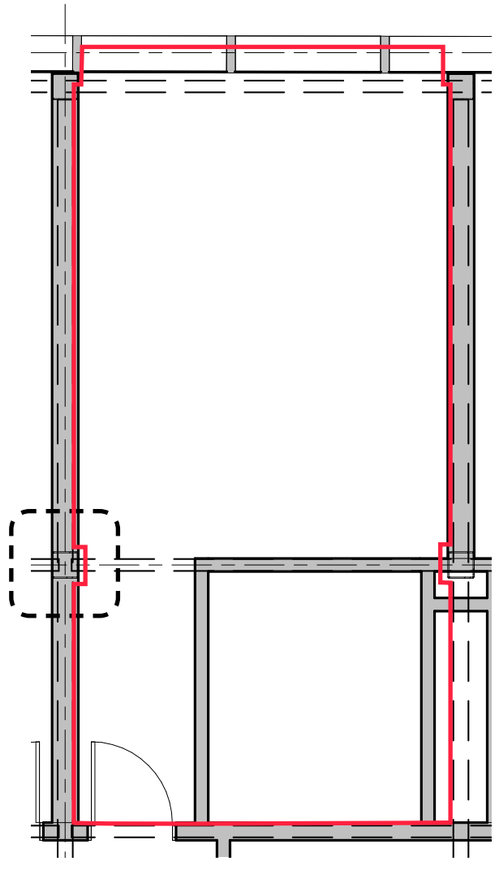
535

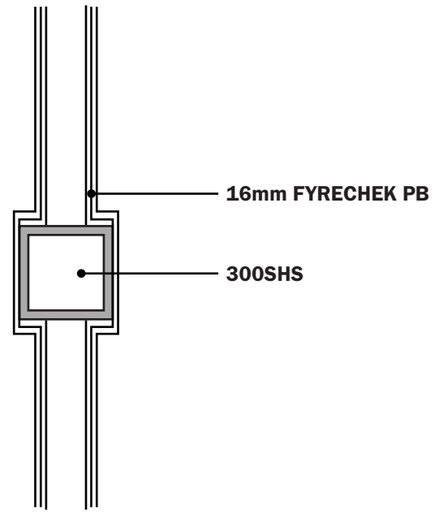




350mm WALL BUILD UP

WALL LOCALISE COLUMNS





250mm WALL BUILD UP