3.6 **ESD Commitments - Ratings**

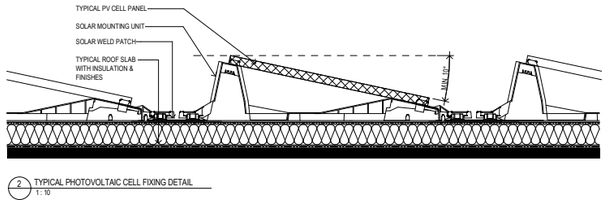
City of Sydney Item:

The main plan set are lacking in several aspects of documentation notation:

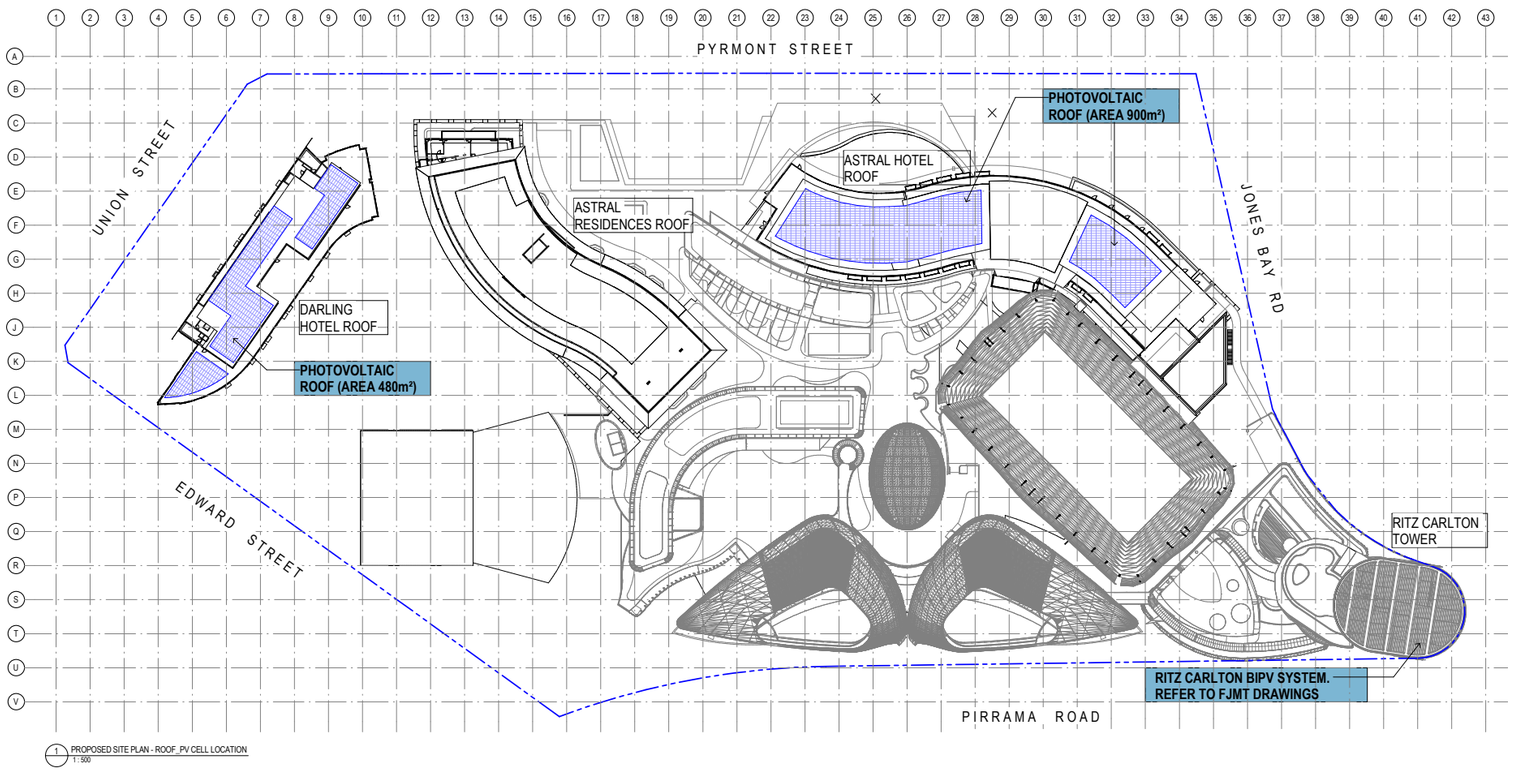
- No NatHERS stamping on main plan set;
- No NatHERS thermal comfort summary block;
- No BASIX Specification Block summarising BASIX commitments;
- No reference to size of solar system proposed to be put on MUEF roof. The BASIX Certificate (page 29) states '165 kilowatt peak'. Can this sized system actually be located on the roof? Where else is solar panels proposed? Will they be in shade from the tower? The plans need to state the system size as it is a BASIX commitment.

Updated plan set with Stamps and commitments are provided as an appendices to this document.

Building integrated photovoltaics are provided on the fixed shading louvre through specific locations on the tower facade. Supplementary information the BIPV can been found in the subsequent section 3.7 Facades, Facade Building Integrated Photovoltaics (BIPV). Site wide PV locations can be found on drawing **AS1500 PROPOSED SITE PLAN PV CELL** (shown below)



Typical Roof mounted Photovoltaic details



Roof Plan locating Photovoltaic System and details

BASIX Commitments	
Element	Material / Parameter
Construction and Insulation Details	
Floors	Concrete suspended slab
Exposed floors	Slab floors above open and/or non-conditioned space. R1.0 added insulation to soffit or within cavity
External walls	Aluminium composite panel cladding MEDIUM wall colour R2.0 added insulation
Party walls	Cast concrete, plasterboard lined
Internal partition walls	Lightweight cavity stud, plasterboard lining
Ceilings/Roof	Any exposed roof sections: MEDIUM roof colour R3.0 added insulation
Floor coverings	•Kitchen - tile floors •Entry,Living/Dining - carpet •Bedrooms, Study, Hall - carpet •Wet areas - tiles
Window coverings	Holland blinds (by occupant)
Shading	All shade louvres, eaves, balconies, balustrades, wall extensions/wing walls and window reveals as shown on plans and elevations.
Exhaust Fans	Provision for exhaust fans - 1 per kitchen, laundry, bathroom and ensuite. 150x150 opening, sealed.
Downlights	No downlights. Downlights if fitted are to be sealed, with approved non-ventilated downlight covers, allowing for continuous installation of insulation over the fitting without resultant penetrations in the insulation or air transfer to ceiling cavity. An IC-4 fitting rating should be sought in accordance with AS/NZS 60598.2.2.
Glazing Details	
All Dwellings, all façade glazing	Double glazed w/Argon, aluminium frame windows, low-e performance glass Whole of window system performance parameters: •Fixed external façade glazing: U=2.0, SHGC=0.31 •Operable external façade glazing: U=2.5, SHGC=0.25
Note on colours and solar absorptance (SA) - LIGHT: SA < 0.48, MEDIUM: SA 0.48 - 0.6, DARK: SA > 0.7 Any substitution of building construction materials needs to ensure required total R-value of the construction meets or exceeds that of the constructions and added insulation described above. Any substitution of glazing needs to ensure required U-value and SHGC of the glazing system matches that described above. Insulation must be installed in accordance with the thermal construction requirements of part J1.2 of the NCC Downlights have not been modelled	

BASIX Commitments	
Element	Parameter
Dwellings - Water	
Landscaping	No individual landscaping
Swimming pool / spa	No individual swimming pool / spa
Alternative water source	No alternative water source for any individual dwelling
Fixtures	All Showerheads 3 Star (>7.5 but <=9L/min) All toilet flushing systems 4 star All kitchen taps 5 star All bathroom taps 6 star No HW recirculation or diversion
Appliances	All clothes washers 3 star All dishwashers 3 star
Dwellings - Energy	
Hot Water	Central Hot Water system
Bathroom ventilation system	Each Bathroom - motorised damper into central duct + VSD Operational control - interlocked to light
Kitchen ventilation system	Each Kitchen - motorised damper into cental duct + VSD Operational Control - manual switch on/off
Laundry ventilation system	Each Laundry - motorised damper into central duct + VSD Operational control - manual on / timer off
Cooling	Living areas and bedroom areas - central cooling system
Heating	Living areas and bedroom areas - central heating system
Common Area and Central Systems/Facilities - Water	
Fixtures and Appliances	All Showerheads 3 Star (>6 but <=7.5L/min) All toilet flushing systems 5 star All taps 6 star No common laundry facility
Central Systems	Central Rainwater Tank - size: 1000L - collect from run off from at least 600sqm of roof area of buildings in the development - connection to irrigation of 90sqm of common landscaped area Pool - Volume 441kLs Fire sprinkler system - configuration so that test water is contained within the fire sprinkler system for re-use, rather than disposed
Common Area and Central Systems/Facilities - Energy	
Common area ventilation system	Gym - System type: air conditioning - Efficiency measure: time clock or BMS controlled Car stacker cabins and valet corridor - System type: ventilation (supply + exhaust) - Efficiency measure: carbon monoxide monitor + VSD Storage cages B3 B4 - System type: no mechanical ventilation Residence corridor, residential lift lobby, hallways - System type: air conditioning - Efficiency measure: time clock or BMS controlled
Common area lighting system	Gym - Lighting system type: flourescent - Lighting efficiency measure: time clocks - Lighting control system: no Car stacker cabins and valet corridor - Lighting system type: light-emitting diode - Lighting efficiency measure: motion sensors - Lighting control system: no Lift car - Lighting system type: light-emitting diode - Lighting efficiency measure: connect to lift call button - Lighting control system: no Storage cages B3 B4, residence corridor, residential lift lobby, hallways - Lighting system type: light-emitting diode - Lighting efficiency measure: motion sensors - Lighting control system: no
Central energy systems	Central hot water system: gas fired boiler with piping internal to building with R0.45 (~20mm) insulation Central cooling system: chilled water fan coil units, electric driven compressor, cooling towers, COP > 4.5 Central heating system: fan coil + heated water, gas boiler Lift: gearless traction with VVVF motor Pool: gas heating source Alternative energy supply: 165kW peak photovoltaic system Other: Building management system to be installed, active power factor correction to be installed

BASIX commitments

3.7 **Facades**

Department of Planning Item:

Confirm what measures will be employed to ensure the quality/appearance of the proposed tower glazing, and other proposed material, will be maintained throughout the detailed design development of the project.

Typical Towers Facades

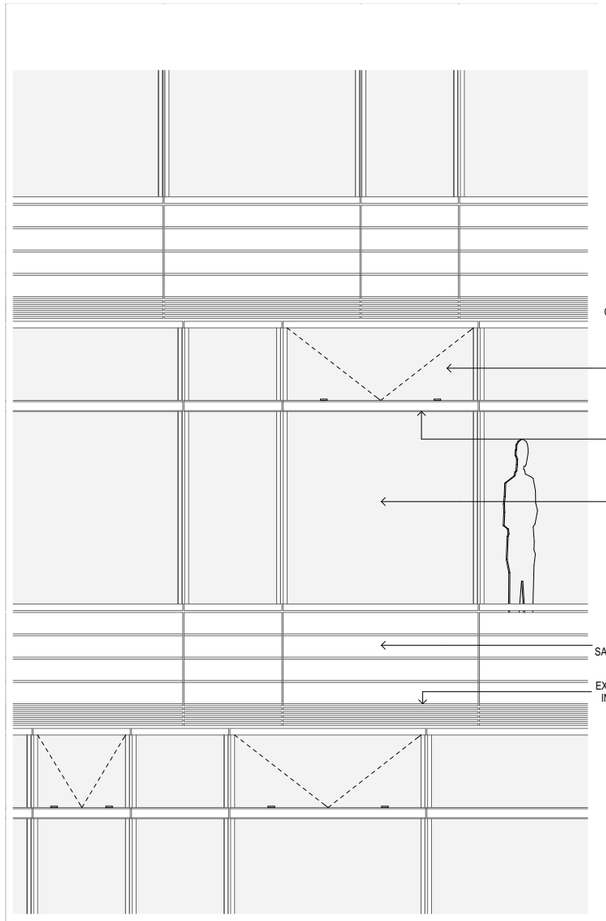
The Architectural Design Statement as included in the submission for MP08_0098 MOD 13 included extensive and detailed description of the various facade systems as proposed. As part of the Response to Submissions, a number of new architectural drawings as related to the tower facade have been included in the Architectural Drawing Set, such that these drawings and the facade systems described therein become part of any approval.

An example drawing is included to the right and on the following page.

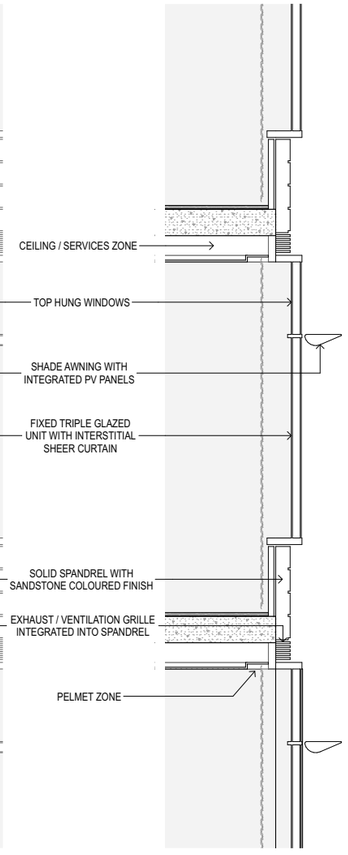
The facade design will be developed in accordance with the intent of these drawings and the visualisations included in the Architectural Design Statement. Final system selections and materials will be reviewed and refined via a Visual Prototype as is industry standard for a large, high quality projects such as is proposed.

Quality and appearance are two of a number of performance attributes all of which are closely interlinked. Whilst many are attributes can be defined through measurable criteria, for example the visible light transmission characteristics for glass, quality and appearance are only defined by comparison to real physical examples.

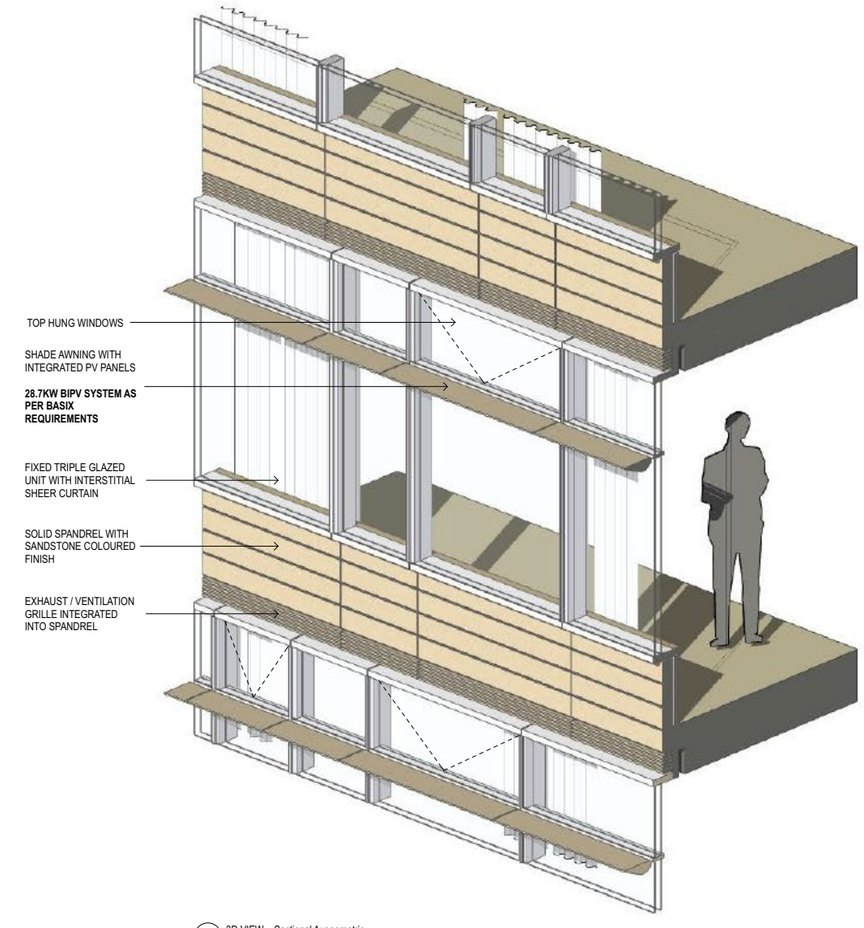
As the design is developed, we will continue to refine all the performance attributes and compile reference component/assembly parts. These will be incorporated in the construction documents (drawings, specifications and reference samples) and will therefore be the basis for assessing/ demonstrating compliance of the constructed product with the design intent.



1 ELEVATION Typical Elevation
1:20

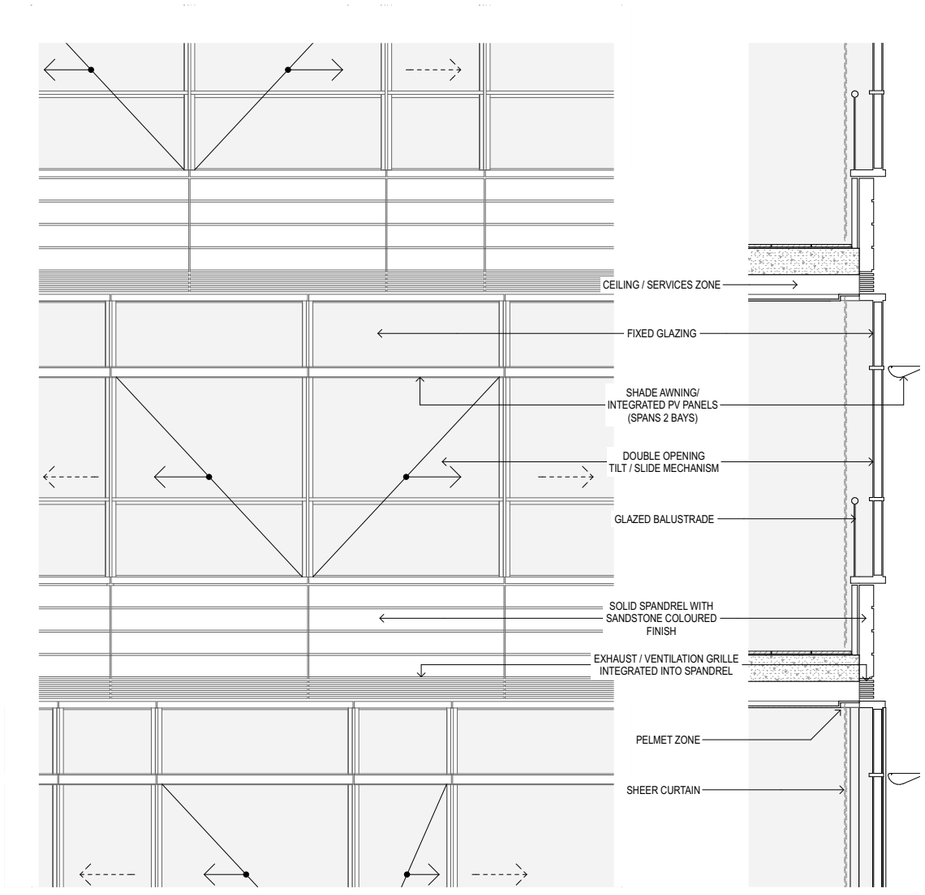


2 SECTION Typical Section
1:20



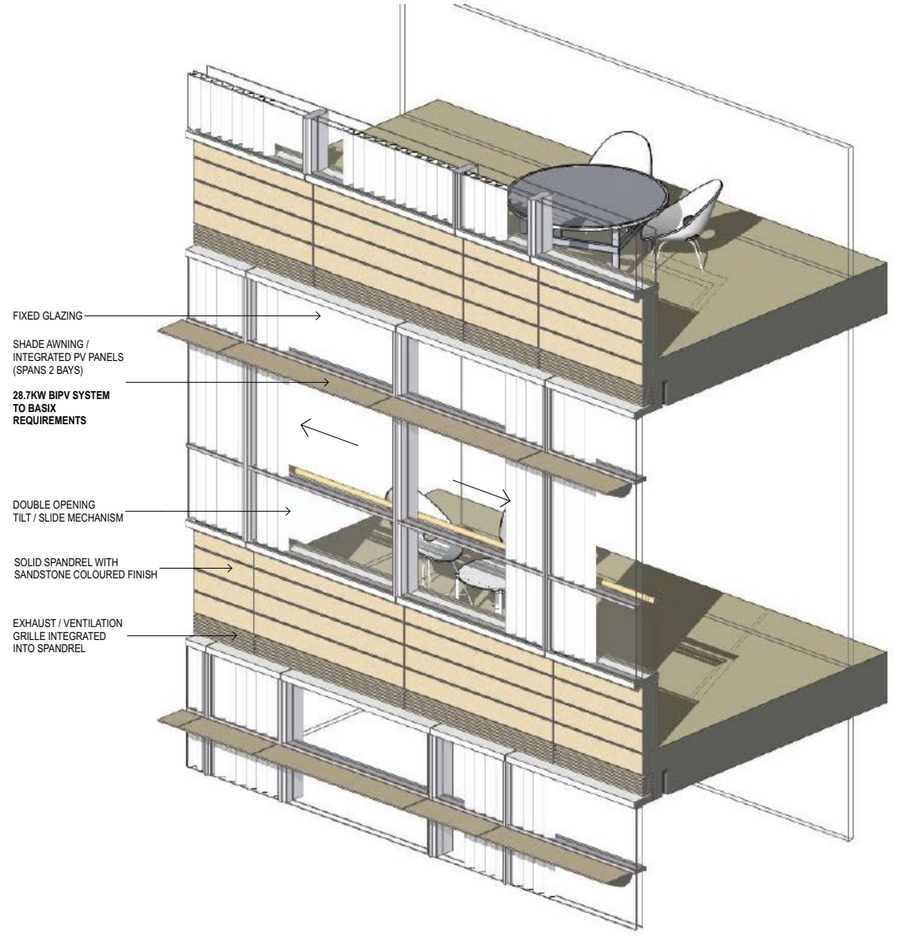
3 3D VIEW Sectional Axonometric
1:20

AF8300 Typical Tower Facade Details



1 ELEVATION Typical Elevation
1:20

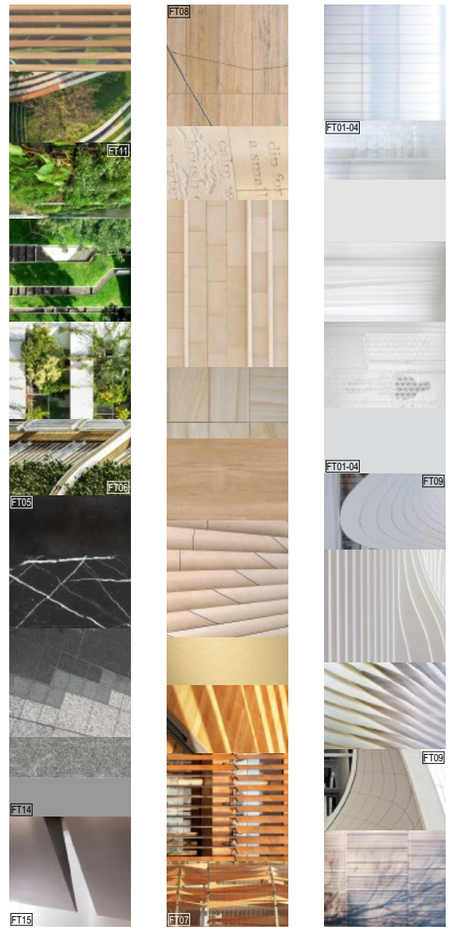
2 SECTION Typical section
1:20



3 3D VIEW Sectional Axonometric
1:20

DA01 2/11/15
rev date

AF8300 Typical Winter Garden Tower Facade Details



Revised Materials board with Facade tags

Facade Operability & Appearance

Department of Planning Item:

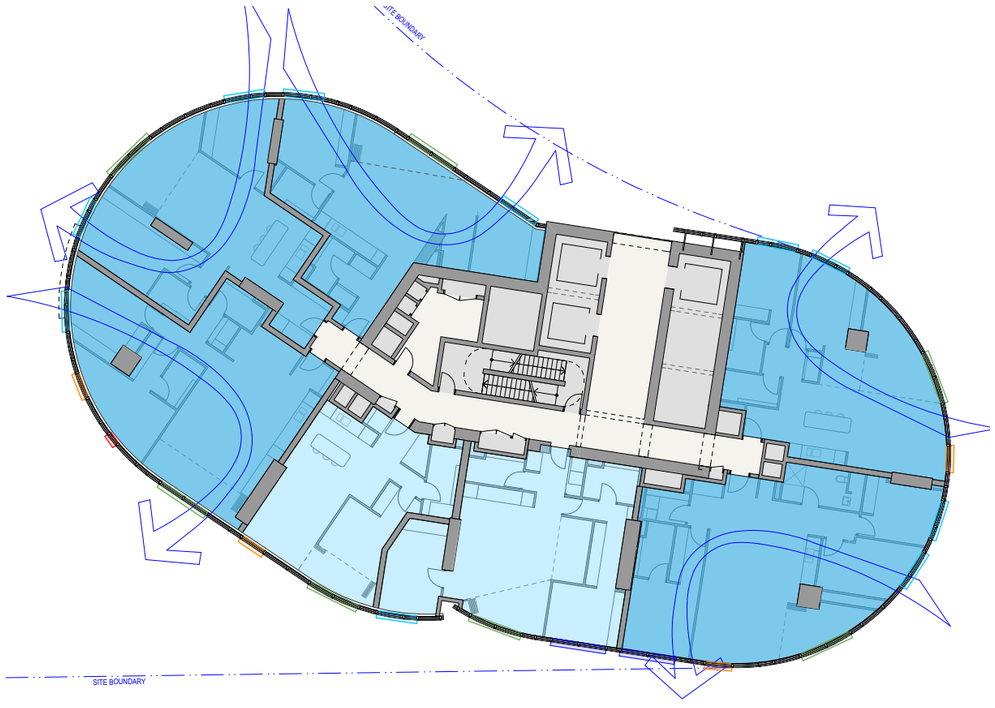
Confirm the location and design of operable windows to apartments and winter gardens within the tower. Update the perspective images of the tower where any necessary revision to the design of the glazing has a material impact on the appearance of the building.

Response:

The operable elements of the façade are shown on the drawings. There are two types; top hung operable windows and sliding wintergarden wall panels.

The top hung windows are conventional windows that have a separate frame within the grid of the curtain wall panels. Externally, as a consequence of the flush glazing (structural silicone) proposed, their presence will be largely veiled by the reflectivity of the surface.

The sliding panels are proposed to be on a 'tilt-and-slide' mechanism which will deliver the flush appearance of the remainder of the façade. The framing, will again be veiled by the flush glazing.



Facade Operability - Typical Residential Level 30-38

Wintergarden Operable Facade

1.5 Modules - 1400x1000 + 700x1000mm

2 Modules - 1400x1000 + 1400x1000mm

Awning Windows

0.5 Modules - 700x400mm

1 Module - 1400x400mm

1.5 Modules - 1400x400 + 700x400mm

2 Modules - 1400x400 + 1400x400mm

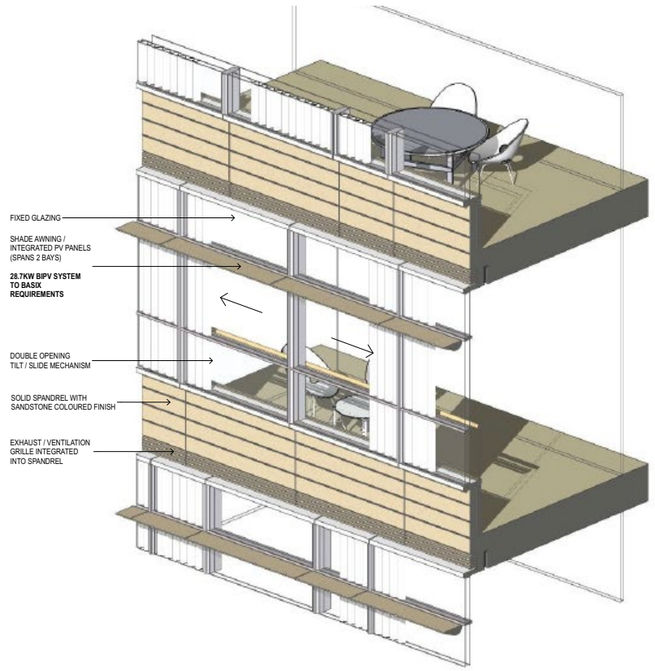
Facade Operability Legend

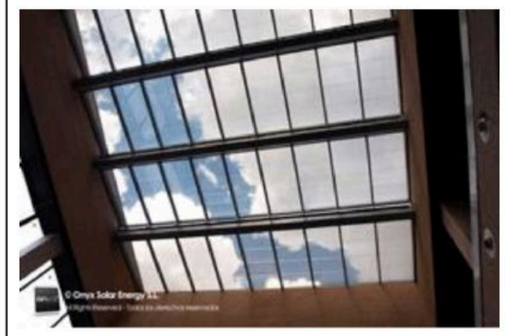
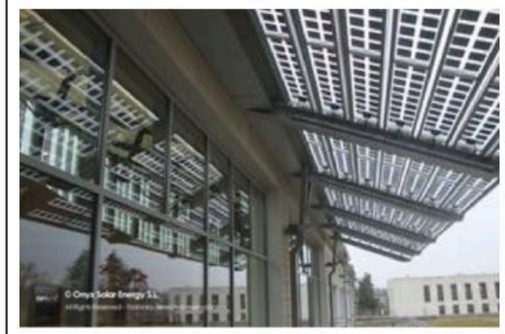
Photomontage - Northern

Facade Building Integrated Photovoltaics (BIPV)

As the solar panel industry matures, the range of integration options continues to expand and already includes both narrow format and flexible transparent products. Performance however remains a function of orientation so the optimal locations remain the nominally horizontal upper surfaces of the sunshades. Whilst studies are ongoing in this regard, the consultant team has undertaken sufficient work to ensure that the technology is available to achieve the targets as committed.

Suppliers for BIPV include Onyx - who provides numerous format systems in a varying technologies.



Product Type	Appearance
Amorphous Silicon PV Glass	
Crystalline Silicon PV Glass	
Traditional Solar Photovoltaic Panels	

Types of BIPV Systems and

Locations of Louvres on Facde

Location of Louvre & PV's

3.8 **Acoustics - Residential Amenity / Ventilation**

City of Sydney Item :

The Noise Impact Assessment states that all residential windows will need to remain closed with mechanical ventilation relied upon to meet required internal noise levels. This solution does not comply with Objective 4B-1 in the ADG requiring all habitable rooms to be naturally ventilated.

Response:

The apartments have been designed for outside air compliance via natural ventilation under the requirements of the NCC and ADG through a combination of ducted façade louvers and trickle vents in the spandrel which will both include appropriate acoustic treatment in the event of excessive external noise levels.

City of Sydney's draft document "**Alternative natural ventilation of apartments in noisy environments"** notes:

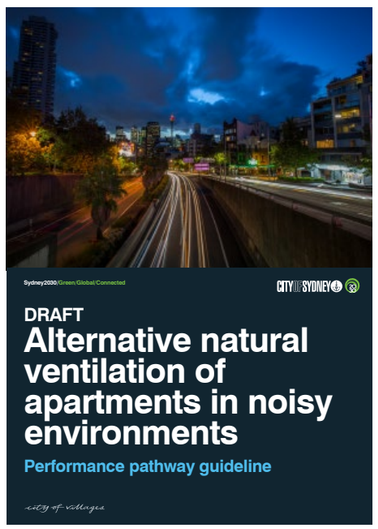
In noisy or hostile environments the Apartment Design Guide states that the impacts of external noise and pollution are minimised through the careful siting and layout of buildings. In a limited number of situations this may not be possible.

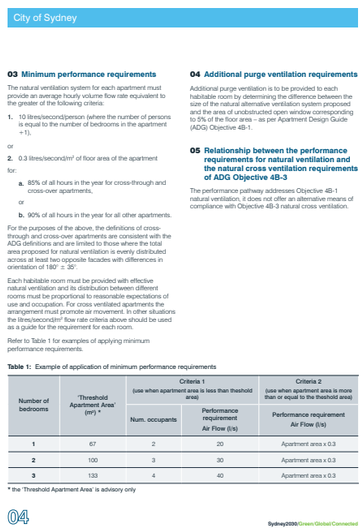
In these limited situations the performance pathway described in this guideline should

be used to confirm the adequacy of natural ventilation proposals in apartment buildings that do not meet the prescriptive requirements of the Apartment Design Guide (ADG) Objective 4B-1, which requires an 'effective openable area'* consistent with 5% of the floor area served be provided to each habitable room.

The aim of this performance pathway is to provide greater clarity to applicants on the minimum levels of natural ventilation that are acceptable in residential developments.

As noted on the architectural drawings and as noted in the mechanical report, the spandrel panels within the facade allow provision for grilles to provide for such a performance pathway.




City of Sydney

03 Minimum performance requirements

The natural ventilation system for each apartment must provide an average hourly volume flow rate equivalent to the greater of the following criteria:

1. 10 litres/second/person (where the number of persons is equal to the number of bedrooms in the apartment + 1).

or

2. 0.3 litres/second/m² of floor area of the apartment

for:

a. 85% of all hours in the year for cross-through and cross-over apartments,

or

b. 90% of all hours in the year for all other apartments.

For the purposes of the above, the definitions of cross-through and cross-over apartments are consistent with the ADG definitions and are limited to those where the total area proposed for natural ventilation is evenly distributed across at least two opposite facades with differences in orientation of 180° ± 35°.

Each habitable room must be provided with effective natural ventilation and its distribution between different rooms must be proportional to reasonable expectations of use and occupation. For cross ventilated apartments the arrangement must promote air movement. In other situations the litres/second/m² flow rate criteria above should be used as a guide for the requirement for each room.

Refer to Table 1 for examples of applying minimum performance requirements.

04 Additional purge ventilation requirements

Additional purge ventilation is to be provided to each habitable room by determining the difference between the size of the natural alternative ventilation system proposed and the area of unobstructed open window corresponding to 5% of the floor area – as per Apartment Design Guide (ADG) Objective 4B-1.

05 Relationship between the performance requirements for natural ventilation and the natural cross ventilation requirements of ADG Objective 4B-3

The performance pathway addresses Objective 4B-1 natural ventilation, it does not offer an alternative means of compliance with Objective 4B-3 natural cross ventilation.

Table 1: Example of application of minimum performance requirements

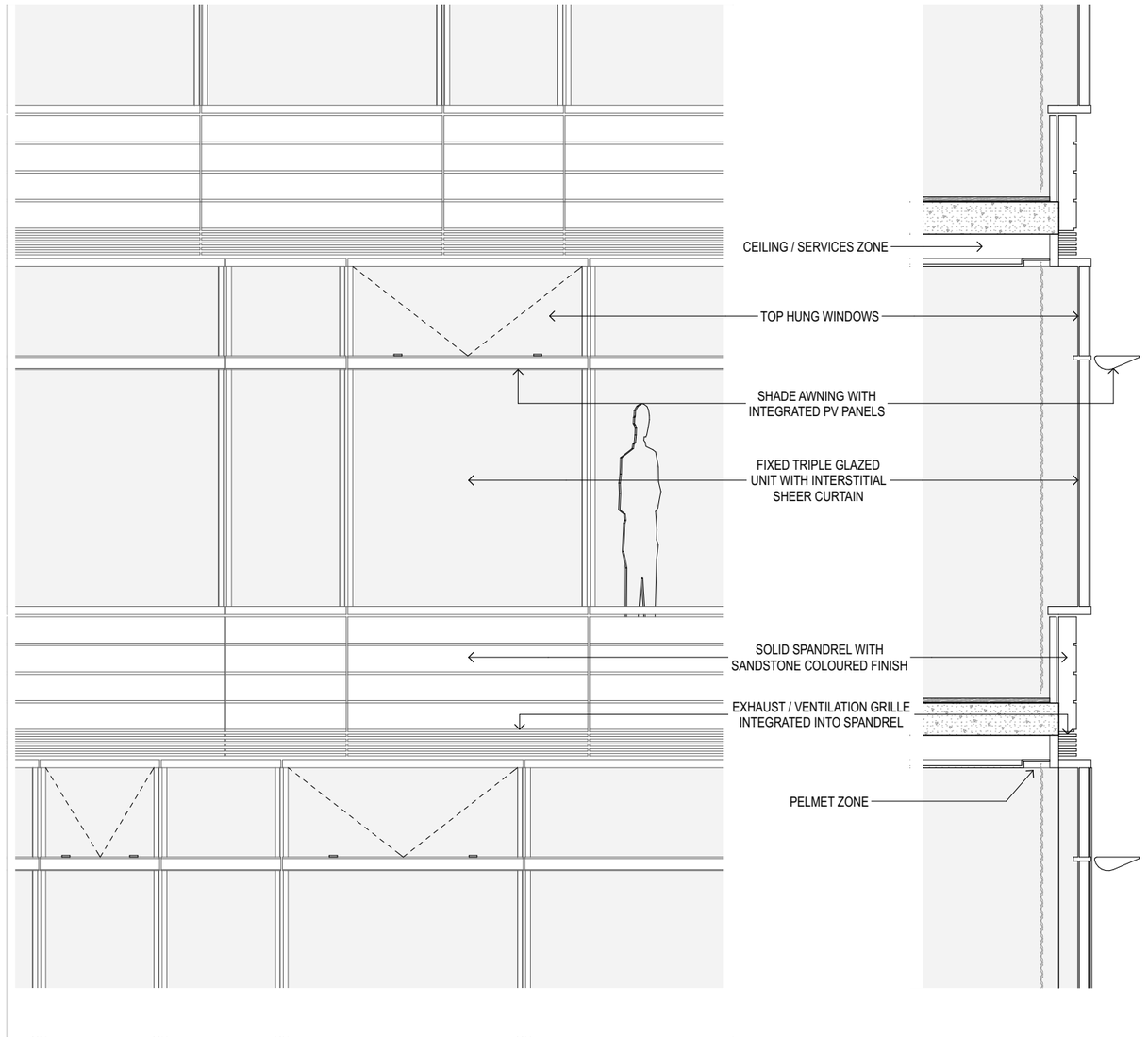
Number of bedrooms	'Threshold Apartment Area' (m²) *	Criteria 1 (use when apartment area is less than theshold area)		Criteria 2 (use when apartment area is more than or equal to the theshold area)
		Num. occupants	Performance requirement Air Flow (l/s)	Performance requirement Air Flow (l/s)
1	67	2	20	Apartment area x 0.3
2	100	3	30	Apartment area x 0.3
3	133	4	40	Apartment area x 0.3

* the 'Threshold Apartment Area' is advisory only

04

Sydney2030/Green/Global/Connected

CoS Draft Document - Alternative Natural ventilation of apartments in noisy environments



Typical Tower Facade Detail - highlighting spandrel grille for attenuated ducted ventilation and trickle vents

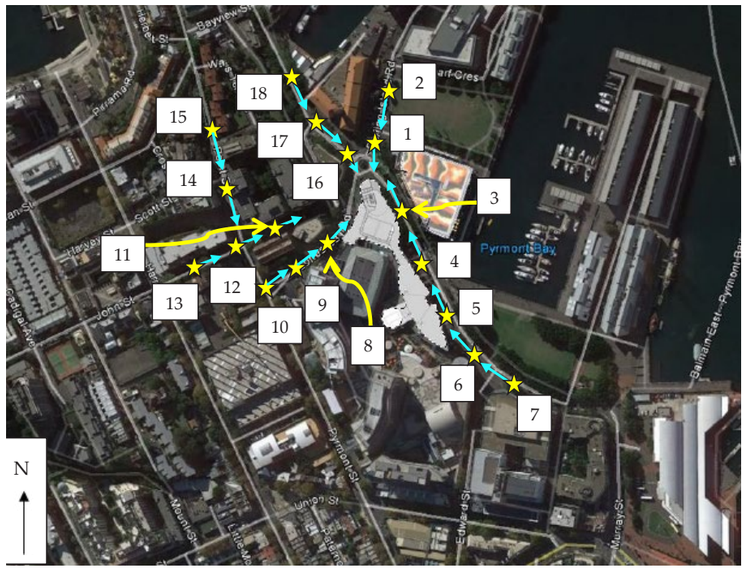
3.9 **Reflectivity**

Generally, light reflectivity from building materials used on facades must not exceed 20%. Further as part of the Environmental Assessment Requirements for the project an analysis is to be undertaken of the potential solar glare from the building. This has been carried out and a report, 'Solar Reflectivity Assessment of The Star', dated June 2017 was prepared by CPP, a recognised specialist in this field.

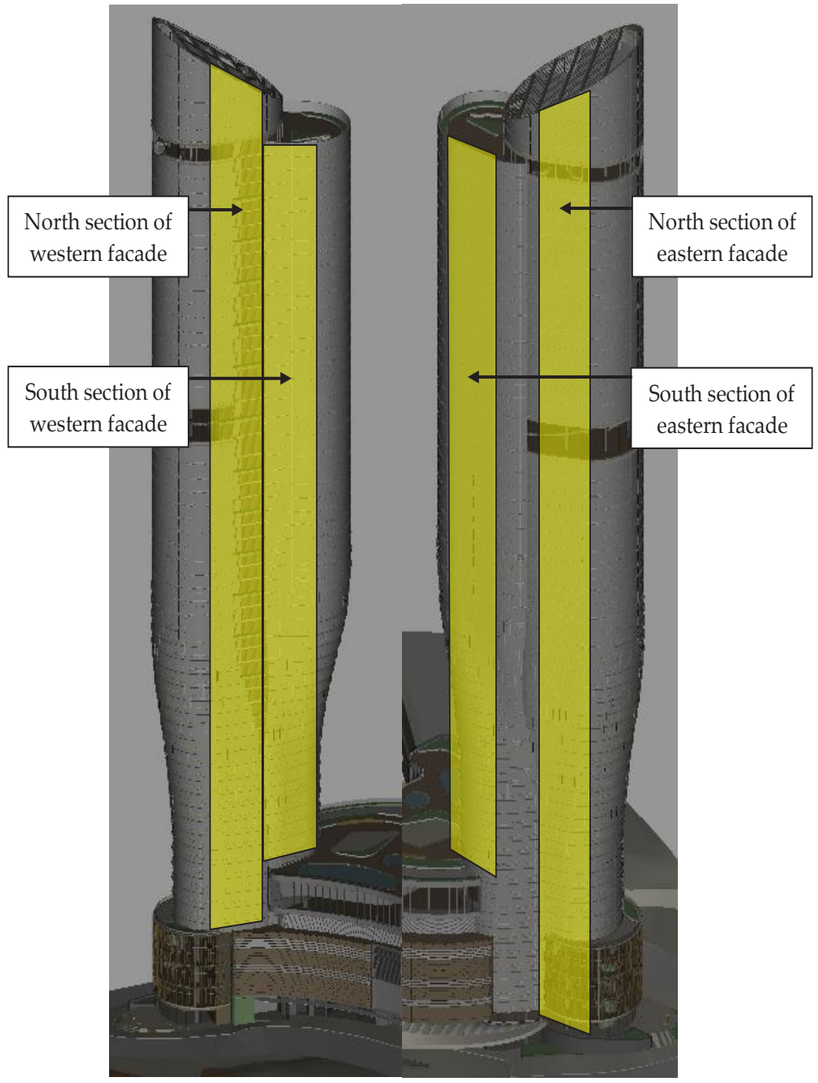
The methodology involves identifying critical locations around the site where reflected light could impact adversely on pedestrians or traffic and then analysing its intensity. Eighteen locations were identified and in four cases, vehicles moving in a specific direction would experience high levels of glare albeit for a short period of time in the late afternoon. Closer examination demonstrated that this could be eliminated by reducing the reflectivity of the façade materials.

The report concluded the tower development as currently configured will not produce significant disability glare on vehicles travelling toward the development along the adjacent public roadways. For the podium, the external glazing reflectivity coefficient should limited to 10%, and 12-15% to the north and west respectively.

Whilst Sydney DCP 2012, General Provisions, Section 3.2.7 nominates that *"light reflectivity from building materials used on facades must not exceed 20%"* the submission commits to reflectivity coefficients in the range of 12-15% for the podium's western façade and glazing to the tower. Additionally, the divergent nature of the solar reflections from the convex surfaces of the tower are less substantial than specular solar reflections from flat surfaces since divergent solar reflections are not concentrated in one direction and do not last over a long period of time. Refer Solar Reflectivity Assessment for further details.



Investigated reflectivity impact locations for pedestrian and vehicles



Flat Tower Facade facade sections as modelling for reflectivity assessment (western facade)

4.0 Design Development

This section outlines design changes and developments to the architectural portion of the submission. Developments have occurred due to submissions, design refinements and continued work of the design and consultant team.

4.1 Neighbourhood Centre

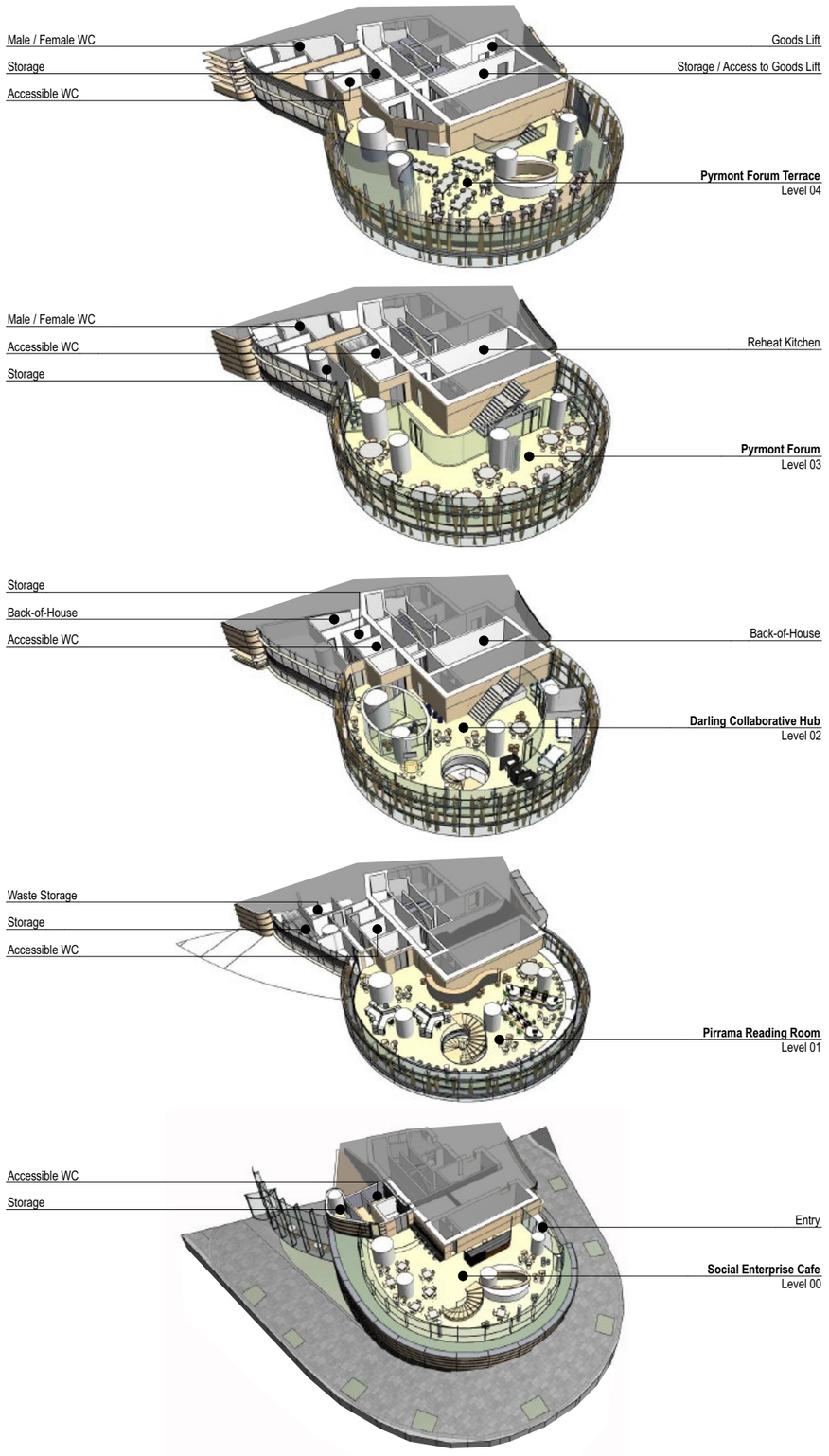
The City has raised concerns with the level of detail in planning, arrangement and functionality of the Neighbourhood Centre proposal. Through continued design development and communication with the City and the Department, a set of developed plans have been provided to convey the proposed use, layout and functionality of the space.

The updated plans have been prepared following two meetings with City of Sydney, dated 02 October and 12 October. In addition to the above, a benchmarking exercise was undertaken comparing the plan areas as proposed to those of Surry Hills Library and Community Centre which has a footprint of approximately 300sqm as compared to a range of 250 sqm approx GFA (Level 00) to 380 sqm approx GFA (Level 04) for the proposed Neighbourhood Centre.

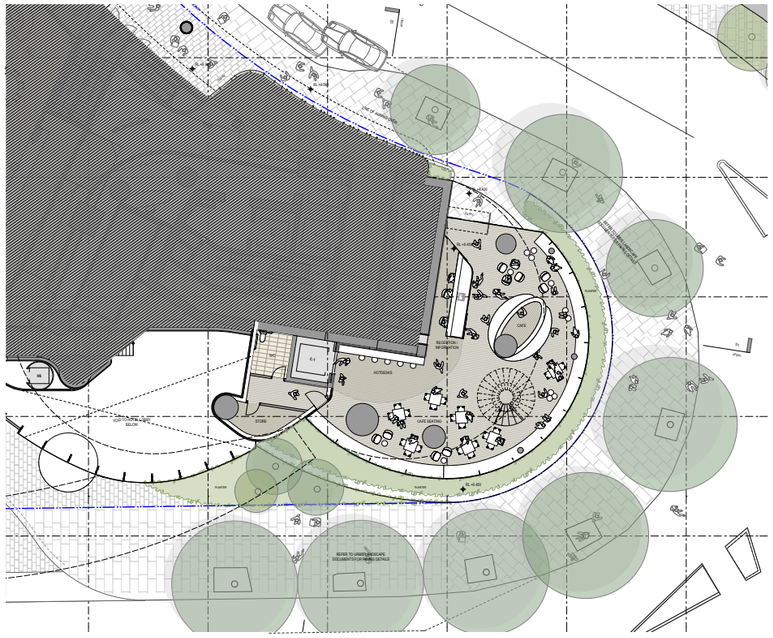
In response to feedback received during the City of Sydney meetings the following amendments have been made:

- Connection to the mains good lift (which in turn connects to the loading dock) was provided at Level 04. From here, goods are transferred to the dedicated Neighbourhood Centre goods lift.
- A reheat kitchen facility is provided at Level 03 with the blind lift lobby, i.e.: below the goods lift lobby as provided at Level 04 (see above).
- Internal walls and fixed furniture are shown to facilitate the nominated functions.
- The vertical circulation strategy was reworked to allow for more flexible planning for Levels 03 and 04,ie: the spiral stairs is replaced by a linear stair.
- Storage areas and amenities have been planned to ensure appropriate functionality.
- Level 00 shows a cafe serve very area as appropriate for the Social Enterprise cafe as proposed.
- An accessible WC is shown at Level 00.
- L02 spaces are now serviced with kitchenettes as appropriate for use as a Collaborative Hub.

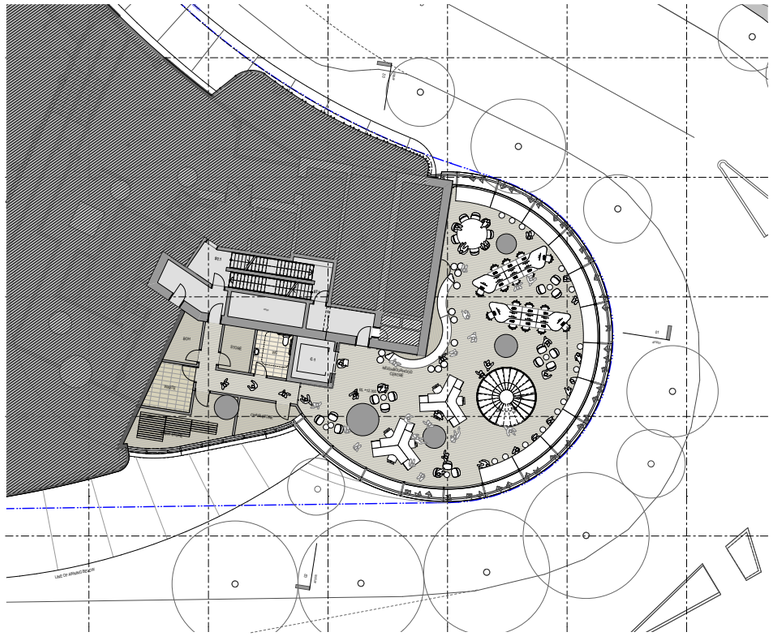
The following pages include updated plan and 3d diagrams for each level.



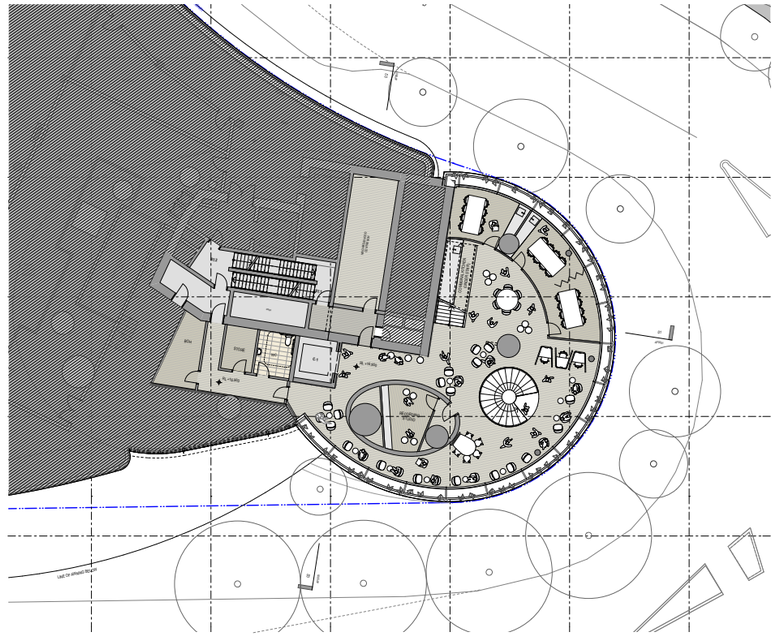
Neighbourhood Centre Exploded Perspective - Layout, function and use



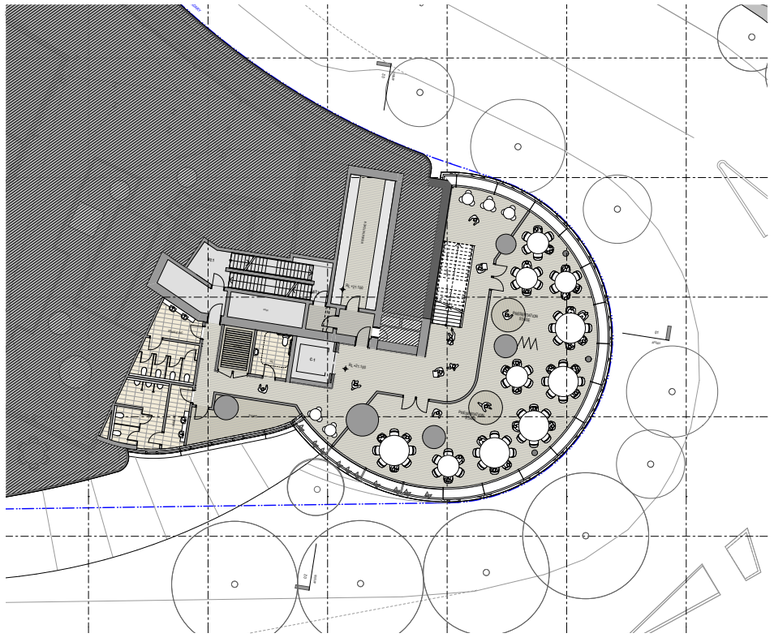
L00 - Social Enterprise Cafe [Neighbourhood Centre Developed Plans]



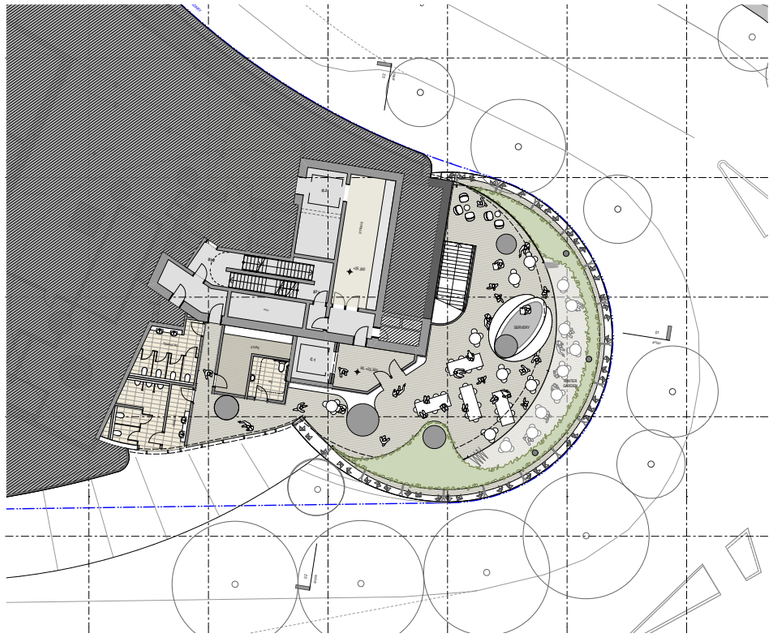
L01 - Pirrama Reading Room [Neighbourhood Centre Developed Plans]



L02 - Darling Collaboration Hub [Neighbourhood Centre Developed Plans]



L03 - Pyrmont Forum [Neighbourhood Centre Developed Plans]



L04 - Pyrmont Forum Terrace [Neighbourhood Centre Developed Plans]

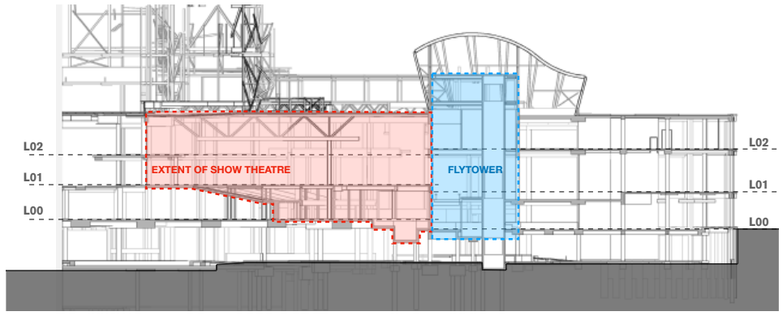
4.2 **Legacy Items & Structure - Sports Bar Demolition**

As part of ongoing design development work, SEGL have decided to demolish the exiting Sports Bar and rebuilt this as part of the Modification 13 works. This allows for an improved construction methodology and improved internal planning. The Architectural Drawings have been updated to reflect this change. No additional GFA has been created. The works can be summarised as follows:

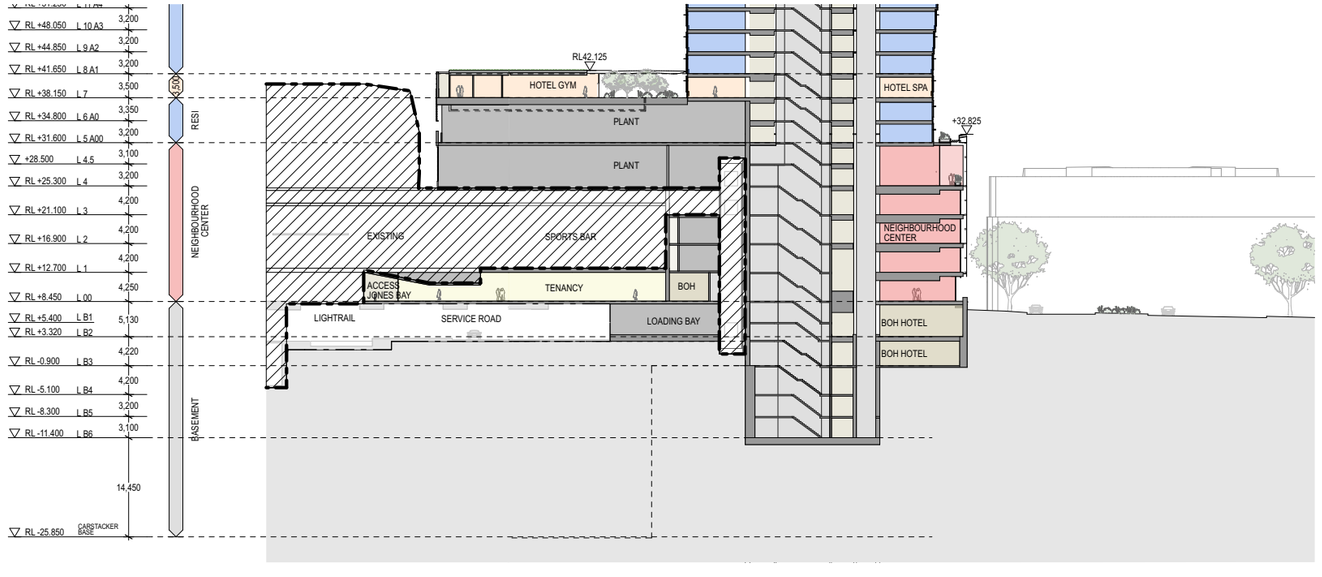
Demolition of the legacy Lyric Theatre sloping seating slab and associated elements (directly below the L1 Sports Bar area) and the non structural L3 green roof and associated elements (directly above the Sports Bar) have simplified the temporary propping of the existing structure; and will improve the safety and productivity of demolition works in the zone.

The removal of this redundant structure has resulted in the following design developments and refinements:

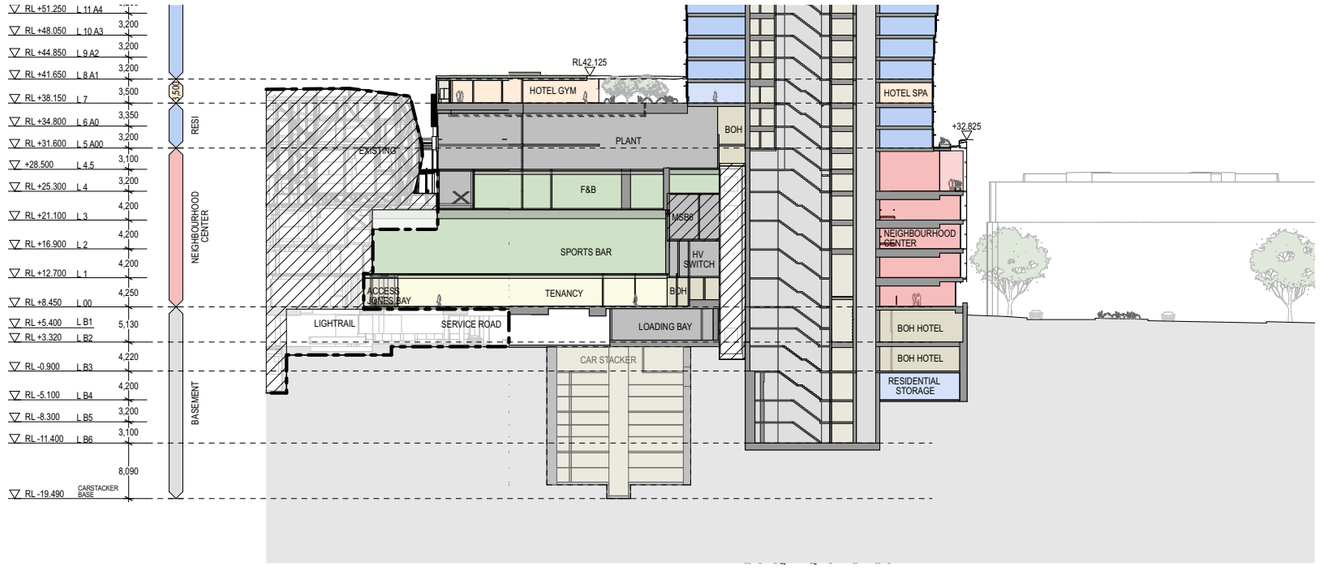
- The removal of the green roof and a deep slab and truss zone has presented the opportunity to introduce a new Level 3 floor by adjusting the RLs of the plantroom levels above.
- The introduction of new area in Level 3 has been off set by
- Deletion of a proposed but now redundant void infill slab on Level 2;
- Deletion of a proposed but now redundant VIP link on Level 5; and
- By rearranging of circulation space and back of house areas.
- The above has resulted in a nett decrease of 41m2 of GFA for Mod13 (48,840 m2 exhibited proposed reduced to 48,799 m2 GFA now proposed)
- The removal of the structural elements has also enabled an overall special rearrangement of the podium rearrangement from to the car stacker to Level 5
- A more regular shaped basement carstacker footprint by removing a now redundant sandstone pier due to reduced structural dead loads;
- A new link connecting the hotel and residential ground lobbies to Level 00 Restaurant Street;
- An improved f&b outlet on Level 00 (directly below the now demolished sloping slab) with low height 2.6 m ceiling zones now raised to 3.5 m
- A rebuilt Sports Bar on Level 1 with fewer columns within the public space
- A new f&b and associated area on Level 3 with possible connection to Sports Bar below and/or Sovereign on the same level (Level 3)
- Back of house areas in the podium levels with improved arrangement and size to support the adjacent front of house areas
- Plant room, mezzanine and void areas on Level 4 to 6 with improved arrangement, size and flexibility.



Existing structural section highlighting show theatre structural aspects



Formal Lodgment Section 01 - Showing existing legacy structure and Sports Bar



Revised Section 01 - Showing reconfigured L00 Tenancy, Sports Bar, L03 new F&B and revised BOH spaces