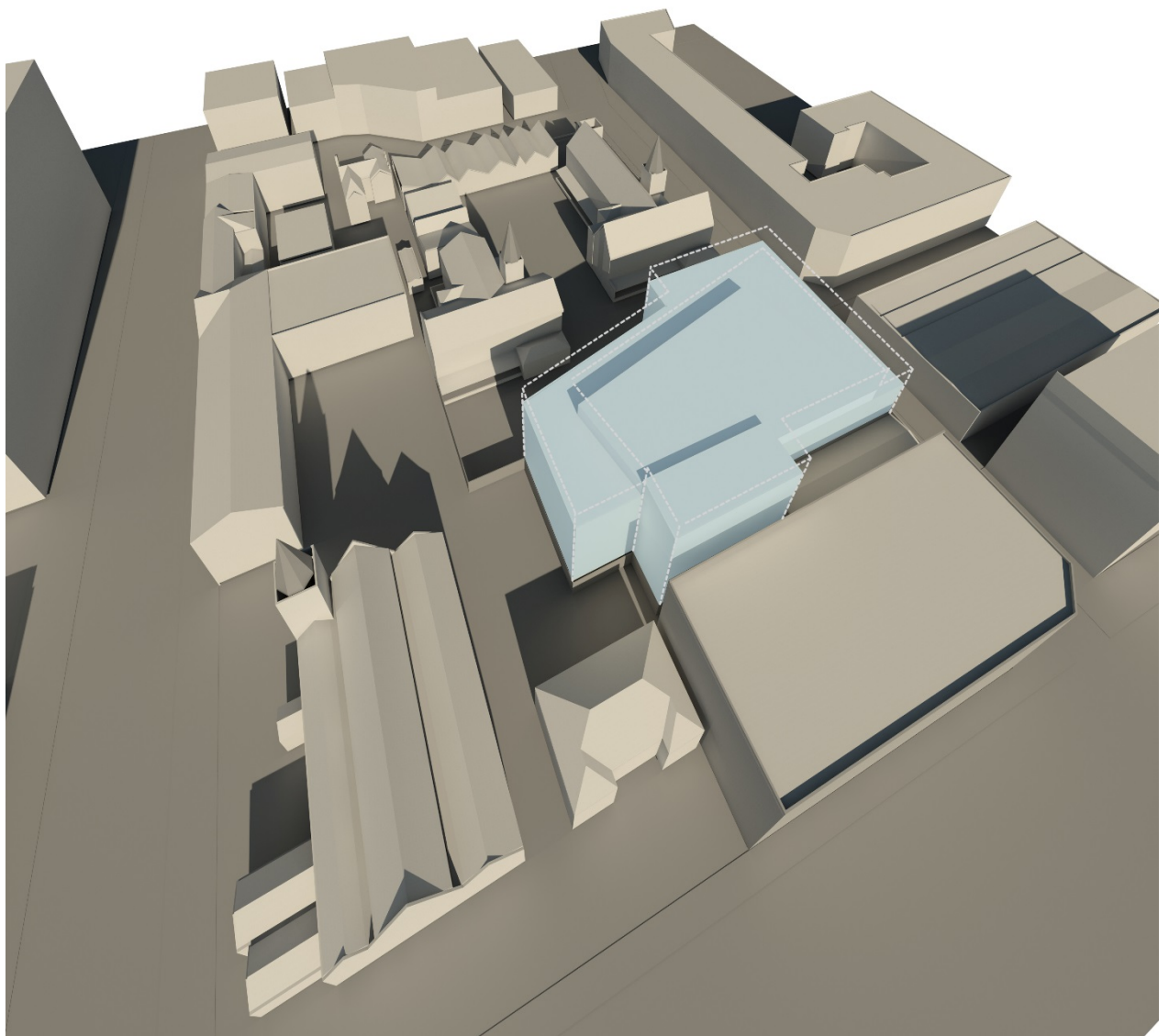


**UNIVERSITY OF TECHNOLOGY SYDNEY**  
**BLACKFRIARS RESEARCH BUILDING STAGE 1 DA /**  
**ARCHITECTURAL REPORT**  
*OCTOBER 2015 / REVISION C*



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## REPORT ISSUE REGISTER

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<b>REV. NO.</b>	<b>ISSUE DATE</b>	<b>ISSUED BY</b>	<b>CHECKED BY</b>	<b>DETAILS</b>
<b>A</b>	23.08.15	Mark O'Dwyer	Luca Cicoli	Issued for preliminary review by project team
<b>B</b>	Not issued	Mark O'Dwyer	Luca Cicoli	
<b>C</b>	8.10.15	UTS		Revisions made directly by the client

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## 1.0 INTRODUCTION

*This is a report has been prepared by H2o architects for the University of Technology Sydney for a new research building the University's Blackfriars site. This report proposes a development envelope arising out of the site's constraints and opportunities. A concept for an indicative building within the Envelope is also characterised in this report.*

## 2.0 SITE CONTEXT

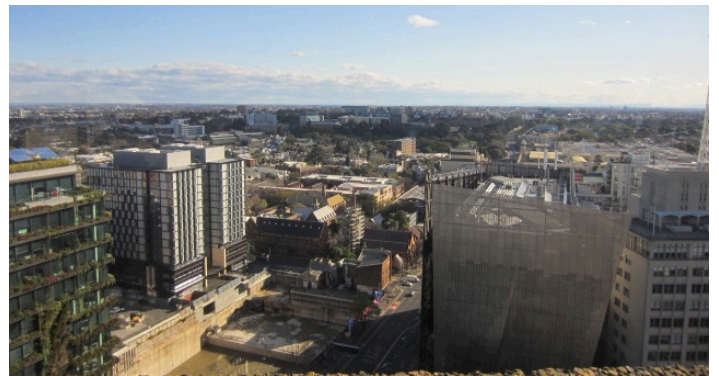
*The site for the UTS Blackfriars Research Facility is located south west of the main city campus in Chippendale. The site fronts Buckland and Blackfriars Streets and has the University of Notre Dame Australia to the north and east sides. The proposed new building within the site is on the northern portion of the block, north of UTS Buildings CB22 and CB25.*

*This location is currently occupied by a single storey, sheet clad metal roofed childcare facility, with external play spaces. A small single storey hall is located behind the Child Care facility. Neither of these buildings are significant.*

*The immediate precinct adjacent to the site is mixed and varied in usage, setback, building heights and materials. North east and east of the site, recent development at Central Park and the UTS City Campus, has resulted in several significant buildings that are more than ten storeys in height. This is in contrast to the areas west and south of the site that are predominantly three storeys and below.*



**Fig.1.** UTS Blackfriars Site with Main Campus UTS Campus in the background and CB25 in the foreground



**Fig.2.** UTS Blackfriars Site viewed from the northeast, from the main UTS Campus



**Fig.3.** UTS Blackfriars Site looking northwest to towards the proposal site



**Fig.4.** View toward site from the corner of Broadway and Abercrombie Street beside UTS CB11 / FEIT Building

### 3.0 SITE CONSTRAINTS

The UTS Blackfriars Research Facility has the following site constraints:

- The Blackfriars site is a heritage item and in a Heritage Conservation Area). Heritage significant structures include the pair of two storey former girls and boys school buildings built in 1865 and now known as UTS Buildings CB22 and CB25 and the surrounding palisade fence. .
- The site is likely to contain significant archaeological remains
- Large introduced exotic and native indigenous trees front the site at Buckland Street, mostly having medium retention value.
- Introduced exotics that are weeds and an introduced indigenous tree are located north of Building CB25, all with low retention values or a recommendation to be removed.
- A new single storey childcare centre has been approved for the southern end of the site fronting Blackfriars Street.
- The existing main entry for vehicles and pedestrians is currently from the south, directly off Blackfriars Street. This entry will be closed when the new Child Care Facility is constructed in this location.
- The site levels in the centre of the site are more than a metre higher than the levels in Buckland Street, creating equitable access issues.

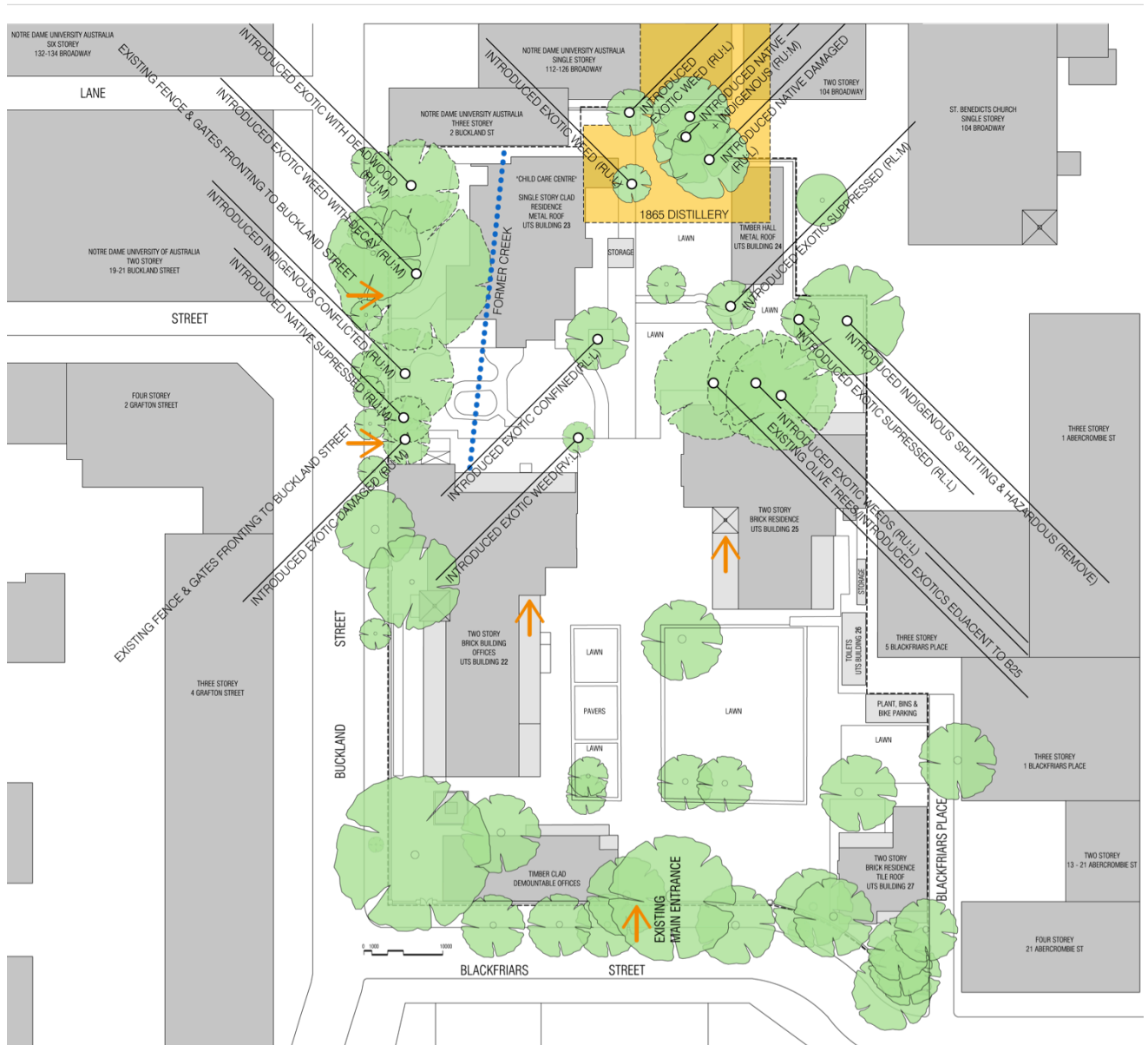


Fig.5. UTS Blackfriars Research Facility Constraints

## 4.0 SITE OPPORTUNITIES

The UTS Blackfriars Research Facility has the following site opportunities:

- Opportunity to improve the visibility of the ground level activities of the facility by removing most of the fence and the trees fronting Buckland Street
- Opportunity to create a consolidated site entry between Building CB22 and the facility with improved disability access that accommodates the complex levels of the site, while allowing common access to the centre of the site.
- The former services station at the corner of Buckland Street and Broadway is currently a single storey structure occupied by a café for the University of Notre Dame Australia, but has a LEP permissible height of eighteen metres that translates to five storeys suggesting a future built form illustrated here that is higher.
- Existing neighbouring buildings on the site and to the north and south of the site and the buildings opposite on the west side of Buckland Street, built on the street alignment, creating a context for the proposed building to be flush to the street and respond to dominant form of the conservation area built on the street alignment.
- Opportunity to respond to the context of the site's heritage items with a built form that reinforces and interprets the 'cloistered' nature of the site's spaces by providing a built edge to the site's significant interior open spaces and connection to the street.
- Opportunity to vary the curtilage setbacks to CB22 and CB25, to allow a built form that better responds to the predominant urban streetscape rhythm, frames views into the site and establishes a built edge to contain the site's internal spaces, and improve the amenity and characteristics of the intervening spaces and resulting courts.
- Opportunity to create a taller building that rebalances the sites development potential in order to minimise impacts on surrounding uses and establish an appropriate height for a built form in the changed height context of Broadway.

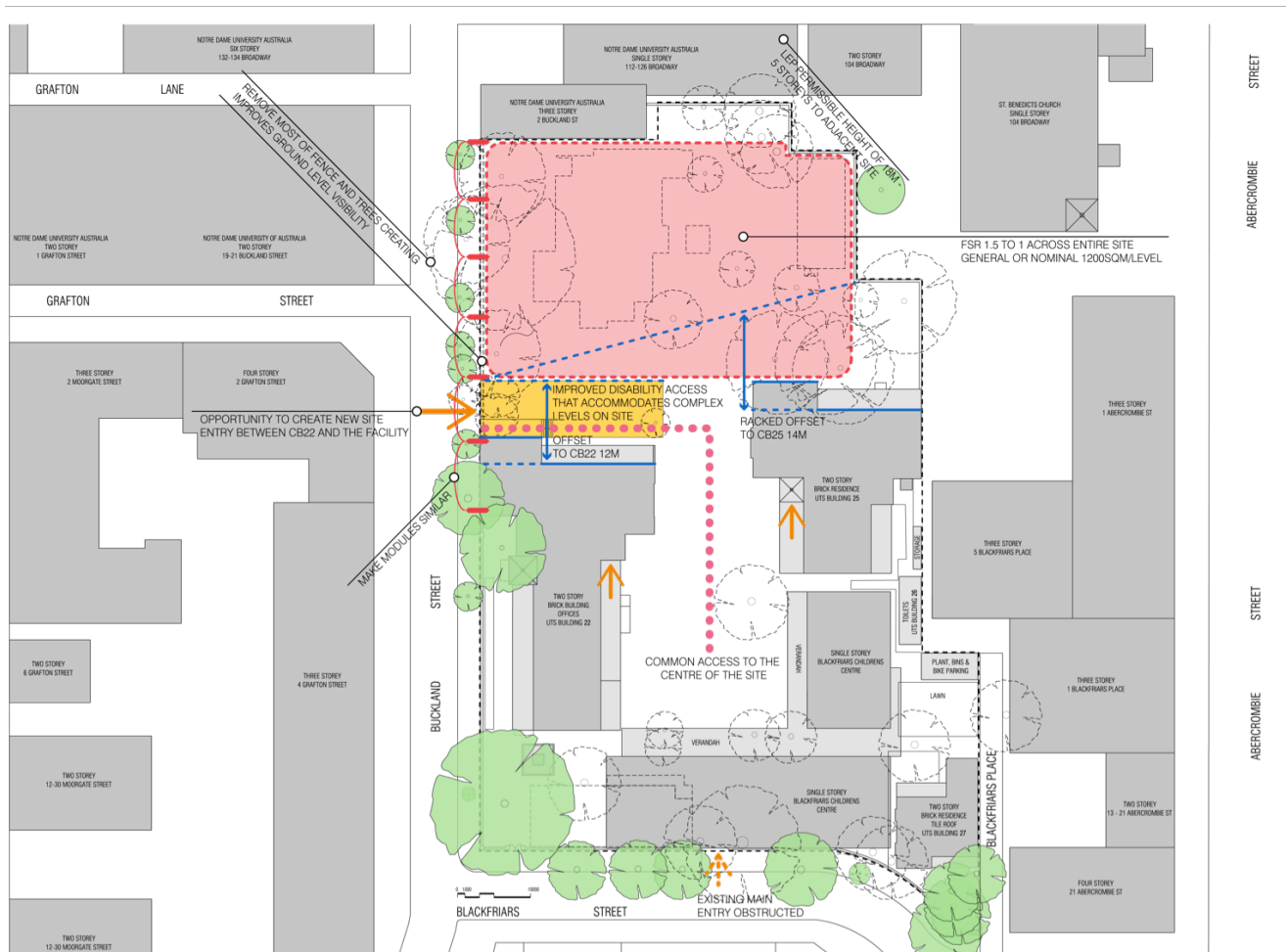


Fig.6. UTS Blackfriars Research Facility Opportunities

## 5.0 FUNCTIONAL BRIEF

The UTS Blackfriars Research Facility will be a new building for research in innovative Engineering programs, including the emerging areas of Robotics, Advanced Manufacturing, Advanced Analytics, Big Data & Networking, Creative Digital, Health Manufacturing including Medical Devices and Prototyping.

The building area required is 6225sqm with an FSR of 1.5 to 1 across the entire site, generating the following detailed functional brief:

NO.	LOCATION	PROGRAM ME	SPACE	AREA	COMMENTS
1	Ground	Common	Airlock	10	Building access through access controlled auto door(s), with entry matting flooring
2	Ground	Common	Foyer with Brag Space	135	For introduction to the workings of the building, Including display and instruction panels, with meeting tables
3	Ground	Common	Reception	20	To manage visitor introduction to building and security
4	Ground	Common	Core toilets, lift, circulation	(120)	Lifts, lobby and toilets
5	Ground	Engineering Research Group	Showcase Innovation Space	600	Flexible space to showcase innovative research, weather sealed, delivery door minimum opening of 3000mm high x 3500mm wide, glazed walls to all adjacent occupied areas including to Buckland Street. Double heights space.
6	Ground	Engineering Research Group	Exchange Collaborative Hub	120	For building occupants and visitors (especially those using the Showcase Innovation Space) to collaborate in a variety of interaction and meeting modes.
7	Level 1 Mezzanine	Common	Core toilets, lift, circulation	(120)	Lifts, lobby and toilets
8	Level 1 / Mezzanine	Common	Meeting Room	60	Flexible meeting space for visitors overlooking Showcase Innovation Space
9	Level 1 / Mezzanine	Engineering Research Group	Flexible Research Space	440	Flexible planning and services to support research opportunities
NO.	LOCATION	PROGRAM ME	SPACE	AREA	COMMENTS
10	Level 2	Research Group 2	Flexible Collaborative Hub	160	Space for researchers and visitors to collaborate in a variety of interaction and meeting modes, including meeting table, lounge seating and high stool / bench with tea / coffee point and video conference facilities
11	Level 2	Research Group 2	Flexible Work Space	1000	Open plan area for 100 x workpoints for research staff to undertake quiet desk based work tasks. Floor to be flexible for configuration into other future research options

<b>12</b>	<b>Level 2</b>	<b>Common</b>	<b>Core toilets, lift, circulation</b>	<b>(120)</b>	<b>Lifts, lobby and toilets</b>
<b>13</b>	<b>Level 3</b>	<b>Research Group 3</b>	<b>Flexible Collaborative Hub</b>	<b>160</b>	<b>Space for researchers and visitors to collaborate in a variety of interaction and meeting modes</b>
<b>14</b>	<b>Level 3</b>	<b>Research Group 3</b>	<b>Flexible Work Space</b>	<b>1000</b>	<b>Open plan area for 100 x workpoints for research staff to undertake quiet desk based work tasks. Floor to be flexible for configuration into other future research options</b>
<b>15</b>	<b>Level 3</b>	<b>Common</b>	<b>Core toilets, lift, circulation</b>	<b>(120)</b>	<b>Lifts, lobby and toilets</b>
<b>16</b>	<b>Level 4</b>	<b>Research Group 4</b>	<b>Flexible Collaborative Hub</b>	<b>160</b>	<b>Space for researchers and visitors to collaborate in a variety of interaction and meeting modes</b>
<b>17</b>	<b>Level 4</b>	<b>Research Group 4</b>	<b>Flexible Work Space</b>	<b>1000</b>	<b>Open plan area for 100 x workpoints for research staff to undertake quiet desk based work tasks. Floor to be flexible for configuration into other future research options</b>
<b>18</b>	<b>Level 4</b>	<b>Common</b>	<b>Core toilets, lift, circulation</b>	<b>(120)</b>	<b>Lifts, lobby and toilets</b>
<b>19</b>	<b>Level 5</b>	<b>Research Group 5</b>	<b>Flexible Collaborative Hub</b>	<b>160</b>	<b>Space for researchers and visitors to collaborate in a variety of interaction and meeting modes</b>
<b>20</b>	<b>Level 5</b>	<b>Research Group 5</b>	<b>Flexible Work Space</b>	<b>1000</b>	<b>Open plan area for 100 x workpoints for research staff to undertake quiet desk based work tasks. Floor to be flexible for configuration into other future research options</b>
<b>21</b>	<b>Level 5</b>	<b>Common</b>	<b>Core toilets, lift, circulation</b>	<b>(120)</b>	<b>Lifts, lobby and toilets</b>
<b>22</b>	<b>Roof</b>	<b>Common</b>	<b>Open Roof Plant &amp; Lift Over-run</b>	<b>(600)</b>	<b>Plant area to suit the operation of the building</b>
<b>TOTAL</b>				<b>6,225 sqm</b>	<b>Sydney LEP 2012 definition Gross Floor Area</b>
<b>TOTAL BUILDING AREA</b>				<b>7,565 sqm</b>	<b>Total estimated Building Area</b>

## 6.0 ENVELOPE DESIGN STATEMENT

### 6.1 DESIGN STATEMENT INTENT

The following sections relate the design statements for the UTS Blackfriars Research Facility building envelope.

### 6.2 SETBACK & SITING

The setback and siting of the UTS Blackfriars Research Facility building envelope has been designed to:

- **Respond to the street alignments of adjacent buildings**, especially the three storey University of Notre Dame Australia building north of the site at 2 Buckland Street that is flush to the street and the two storey UTS Building CB22 that is also flush to the street immediately south of the site. The existing neighbouring buildings on the west side of Buckland Street are also flush to the street. This creates a context for the proposed building to be flush to the street.
- **Allow for the building to be built to the internal boundaries** to the north and east, accommodating the walls bounding the site by abutting these walls and replacing any support piers with new supports as part of the works.
- **Respond to the heritage curtilage of the site's significant buildings**, by achieving appropriate setbacks from the former boys' and girls' school buildings of UTS Building CB22 and Building CB25, located to the south. The setback from CB22 can be closer than the setback for CB25, to create a stronger urban edge to Buckland Street and provide a space for a new site entry. The setback from CB22 should also retain the vista to CB25, by not intruding beyond the alignment of the northern face of UTS Building CB25. Setback distances have been developed in close consultation with the heritage specialist advisors for the project  
The offset to CB22 can be relatively close, due to Buckland Street being an urban edge to the site, with a context of buildings flush to the street and having continuous facades with few gaps. The rhythm of the offset to CB22 should relate to the rhythm of the street and influence the rhythm of the façade for the proposed building. A setback of 11 metres from the main two storey facade of CB22 is provided.  
The offset to CB25 should be greater, to ensure the amenity and characteristics of the intervening spaces and resulting courts, within the site. A splayed setback will assist this approach and reduce the impact of visual bulk, in addition to reducing overshadowing. The offset of the building from the main two storey facade of CB25 should be no less than the existing 13.1 metre separation for the court between CB22 and CB25. In this context, a minimum offset of 13.6 metres for the distance for the building from the main two storey facade of CB25, would be acceptable.
- The southern portion of the existing palisade fence to be retained as part of a new site entry from Buckland Street, adjacent to CB22.
- Activate the ground level by having the building entry from the central plaza created between the facility and buildings CB22 and CB25, as this allows better resolution of site levels and activates the entire site. Delivery and waste collection can also be from this plaza accessed after hours from Buckland Street, avoiding the need for vehicle entry portals on the street frontage.

### 6.3 HEIGHT, BULK & FORM

The height and bulk of the UTS Blackfriars Research Facility building envelope has been designed to achieve:

- A height, bulk and form that still retains the importance and presence for St Benedicts Church located east of the site and the former boys' and girls' school buildings at UTS Building CB22 and Building CB25, both located to the south.
- A form that is not excessively bulky for key vistas from the external spaces of the court between UTS buildings CB22 and CB25, also from University of Notre Dame Australia court located east of the site, plus from Buckland Street.
- A form that results in a better distribution for the site's development potential with the retention of only a single storey childcare centre on the south of the site and a higher form at the north of the site.
- A form that responds well to the neighbouring context, including the potential development site for the University of Notre Dame Australia at 112-126 Broadway and the existing six storey plus sky sign across Buckland Street from the site and located at 128-140 Broadway.

- A built form that is in keeping with the transition in heights from the high rise blocks to the north and east of the site, to the lower heights of blocks to the south of the site
- Ground floor levels of the facility that relate to the levels of the existing UTS Buildings CB22 and CB25, to allow for future integration of these buildings into the facility and improved accessibility across the site.
- An Envelope of six storeys plus rooftop plant and lift overruns that minimises impacts on adjacent properties and provides for a high quality build form addressing the context.
- If a substation is required for the site, due to the demand of the facility, it can be located with the plant and services compound forming part of the new UTS Child Care Facility and accessed from Blackfriars Place.

#### **6.4 EXTERNAL FACADES, MATERIALS & COLOURS**

*The external facades, materials and colours of the UTS Blackfriars Research Facility will be determined at the next stage of development (detailed design). The design of the envelope has envisaged that the final building will have:*

- A strong relationship with the facades, materials and colours of the immediate context and adjacent buildings. This relationship could be a similar contemporary mass type material, or a contemporary, opposite of mass material like glass or metal that creates this relationship with the context, by being the reverse of the materials in the context.
- The facades and materials, particularly at the lower levels, should assist the visibility of the internal operations of the facility and help activate the streetscape.
- Careful design solutions in relation to boundary walls that could include solid boundary walls, or walls with openings that have appropriate fire safety solutions and or easements for light and air to enable view sharing to the adjacent St Benedicts Church and University of Notre Dame Australia Ethics Building at 104 Broadway.

#### **6.5 SOLAR ACCESS & OVERSHADOWING**

*The solar access and overshadowing of the UTS Blackfriars Research Facility building envelope has been designed to:*

- Contain additional overshadowing to the external spaces on the site between the proposed building and the existing buildings of CB22 and CB25 within acceptable limits.
- Limit additional overshadowing to the windows of the residential buildings on the west side of Buckland Street to ensure adequate levels of residential amenity are maintained.
- Ensure any additional overshadowing of the existing external court yard for the University of Notre Dame Australia located east of the site and beside St Benedict's Church does not occur at the significant lunchtime period.

#### **6.6 INCORPORATING ARCHAEOLOGY**

*The response to archaeology of the UTS Blackfriars Research Facility will be determined in the next stage of development (building design). The design of the envelope has envisaged that the final building will incorporate the archaeology of the site for the UTS Blackfriars Research Facility by:*

- locating new building structure to minimise the impact of the foundations of the 1824/25 distillery in the north eastern part of the site.
- In the next stage of development, the area of the former distillery should be reviewed to confirm the situation and then use this information to confirm if the core and lift shaft can be located in the position shown in the Study or moved to the west against the southern wall of 2 Buckland Street.
- If a basement is constructed for the facility, it should mostly avoid the foundations of the main building of the 1824/25 distillery, if these foundations are found to still be present below the ground.
- The foundations of the main building for this 1824/25 distillery and the former creek running slightly west of the distillery could be used as features or inform the design of the ground level of the facility, or for a basement if it was constructed.

## 7.0 ENVELOPE PROPOSAL

The Envelope has been designed to address the constraints and opportunities of the site, while generating a form with acceptable impacts on the context.

The envelope has been designed to contain a building which has a gross floor area of 6225 sqm as defined by the LEP.

The overall area contained by the Envelope is deliberately larger than the 6225sqm. This is because it contains:

- Additional area for necessary floor space not within the LEP definition (eg wall thicknesses, storage, vertical circulation etc)
- Additional space for the articulation of the final building design within the envelope.

The reason for proposing a building envelope that is a loose fit rather than a tight fit is to allow for the next stage of the development to achieve a very high architectural design quality and response. Some of these potentials for the next stage of development were explored as options through the process used to arrive at extent of the Envelope. These options explored included:

- A lower built form that was at the minimum recommended setback for curtilage.
- A high built form that was set back further from the heritage items
- Setbacks from Buckland Street
- Lift cores against the northern boundary, either against the southern wall of 2 Buckland Street or in the indent behind the University of Notre Dame Australia Building at 112-126 Broadway.
- Setbacks from the northern or eastern boundaries and using the resulting space as a light court or landscaped area.
- An indented building form that responded to the alignment of the internal 'quadrangle' between CB22 and CB25.
- Creating a basement to the section of the building fronting Buckland Street.

Because the proposed envelope is a 'loose fit' and the final building will be constrained by the maximum floor space within this envelope, the impacts of the final building will be significantly less than those of the envelope. To illustrate the reduced impacts, an indicative building study was prepared showing a more detailed hypothetical building that fits within the envelope and with a gross floor area of 6225

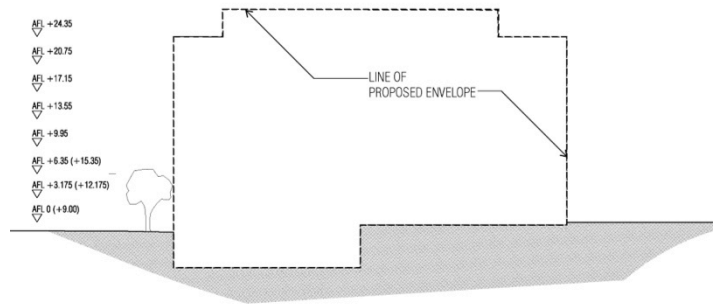


Fig. 7. UTS Blackfriars Research Facility Section of Envelope

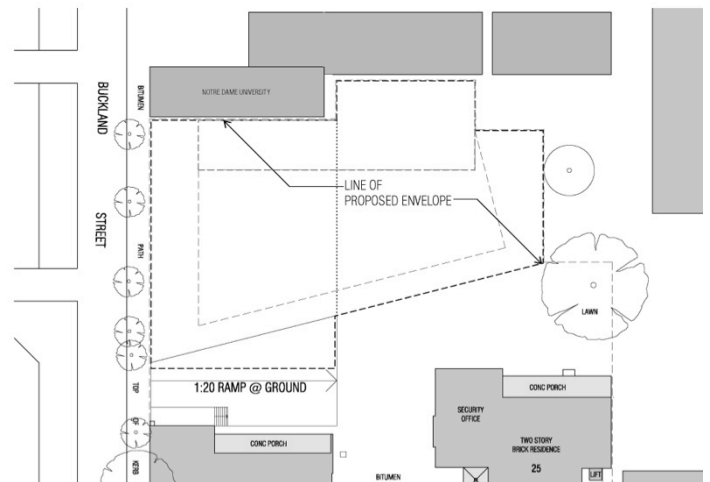


Fig. 8. UTS Blackfriars Research Facility Plan of Envelope

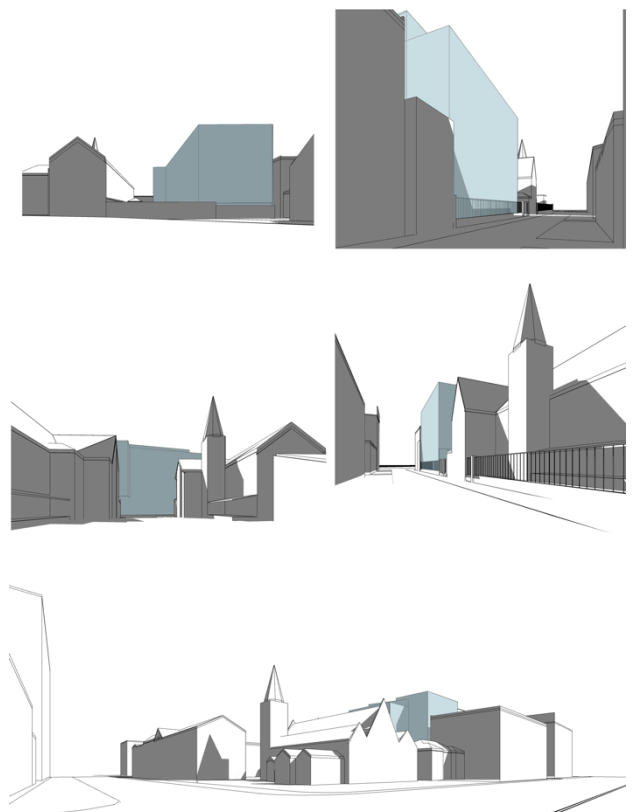


Fig. 9. UTS Blackfriars Research viewed from the existing context

square metres. This indicative study shows a building that has lower built form and minimum setbacks for curtilage to model one of several potential final building designs. This Study is further explained in the full set of architectural drawings.

## 7.1 ENVELOPE FEATURES

The proposed envelope for the UTS Blackfriars Research Facility includes the following features:

- 24.35 metres height from ground level, including plant and lift cores, and potential for a basement below.
- 32.4 metre frontage to Buckland Street.
- 51.1 metres length from west to east.
- 1280 square metre maximum footprint for a typical level
- A minimum setback of 0m (no setback) to the northern and eastern boundaries abutting the University of Notre Dame Australia.
- A minimum setback of 0m (no setback) to the street frontage (western boundary) on Buckland Street.
- A minimum setback of 11.1 metres from the main two storey facade of UTS Building CB22 (which aligns the southern face of the proposed envelope, with the northern face of UTS Building CB25)
- A step in the southern face of the proposed envelope that corresponds to the 13.1 metre quadrangle separation between UTS Buildings CB22 and CB25.
- A raking setback to the southern face of the proposed envelope with a minimum dimension of 13.6 metres from the main two storey facade of UTS Building CB25.
- A maximum gross floor area (as defined by the Sydney LEP 2012) for a building within the envelope of 6,225 square metres.

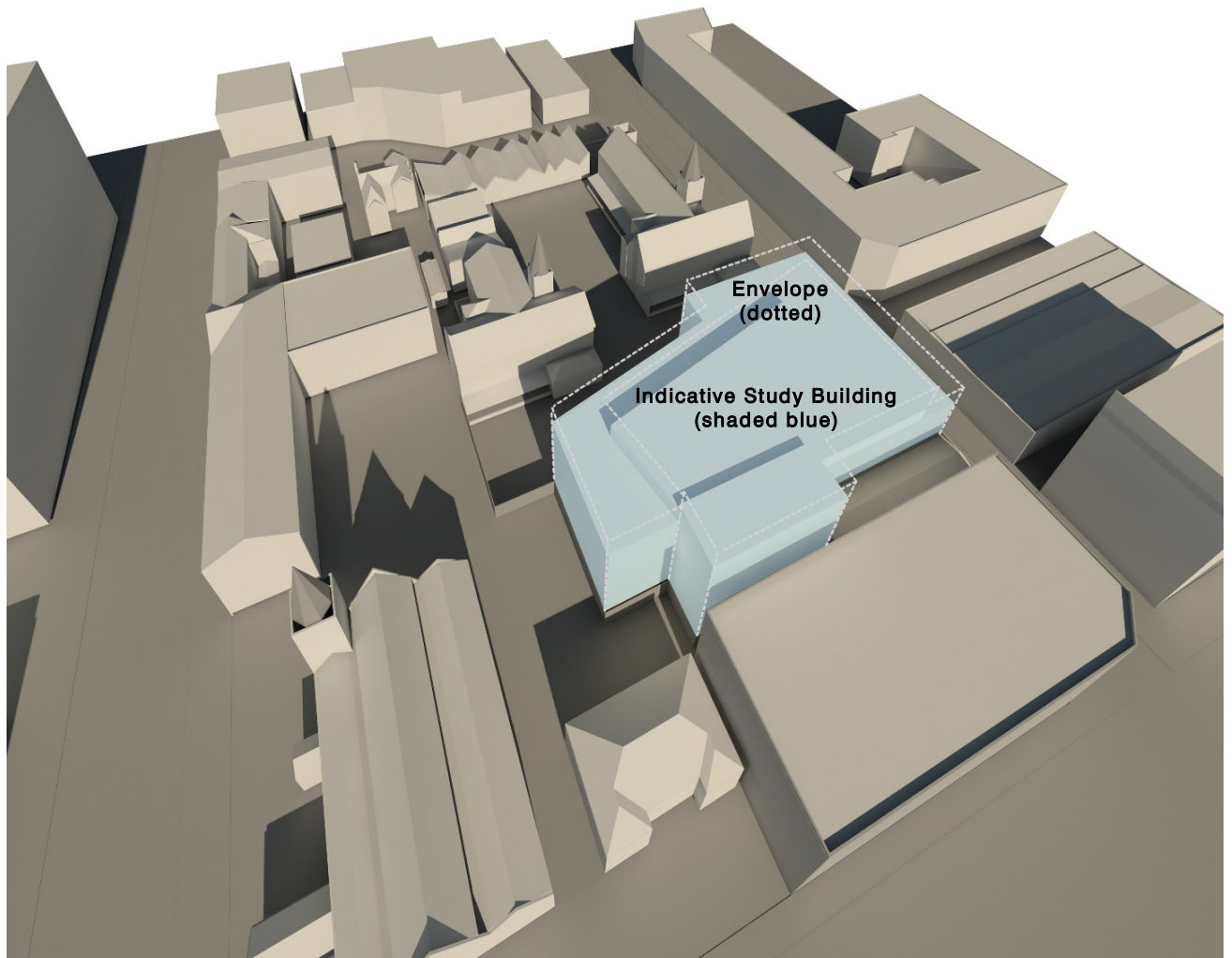


Fig.10. UTS Blackfriars Research Facility view from the north

## 8.0 ENVIRONMENTAL SUSTAINABILITY

### 8.1 ENVIRONMENTAL SUSTAINABILITY FEATURES

*The UTS Environmental Sustainability Policy includes the University's commitment to ensure that its institutional practices emphasize "that UTS demonstrates and promotes the achievement of sustainable futures embracing ecological, economic and social aspects of human existence". The UTS Environmental Sustainability Policy can be viewed at [www.gsu.uts.edu.au/policies/sustainability.html](http://www.gsu.uts.edu.au/policies/sustainability.html). A central requirement for the UTS Blackfriars Research Facility is to promote environmentally sustainable development in the built environment, with an emphasis on practical and affordable, integrated sustainable design features, that maximize use of natural light and fresh air linked to mechanical and electrical systems tailored to a size and operation that suits the real needs, demands and operation of the facility.*

*The full extent of sustainability features to be incorporated will be determined at the next stage of the development (building design).*

### 8.2 ENVIRONMENTAL SUSTAINABILITY OPPORTUNITIES

*The detailed design of the UTS Blackfriars Research Facility will consider measures to improve environmental performance and management including:*

- Planning the building usage with a focus on increased space utilization, allowing future flexibility and low energy reconfiguration.*
- Design to respond to all basic 'passive' sustainable initiatives - orientation, glazing, sun protection, cross ventilation, insulation and thermal mass issues*
- Designing the internals to optimise the usage of low energy and low off gassing materials, including recycled and recyclable materials.*
- Where possible design circulation spaces to avoid using air conditioning.*
- Aiming to reduce running costs and maintenance costs for UTS by concentrating on the incorporation of practical and affordable, integrated sustainable design features that maximise the use of natural light and fresh air linked to mechanical and electrical systems.*
- Integration of convergent technology, waste minimization strategies, central vacuum integration, design through life cycle cost analysis, maximization of occupant / staff controls of light and air movement, minimization of building and operation costs with appropriate material selection, integration of services in building automation systems, materials selection for environmental soundness and length of life span, paired with design for an understanding of the requirements of ongoing facilities management.*
- Project completion, commissioning, defect resolution and handover have always been contentious and fraught areas for constructing facilities and are now the next frontier for delivering environmentally sustainable designs. Most projects are not commissioned or defects resolved properly and as a consequence, are not handed over or operated properly. Too many facilities have been handed over and occupied with the subcontractors claiming systems are operational, only for occupants to discover this is not the case. The occupants are keen to occupy the facility, while the contractor and the consultant are typically keen to move on, so commissioning is often not properly reviewed or made operational. Establishing a separate series of meetings to specially manage commissioning and defect completion in advance of the actual completion of the facility, then continuing these meetings until well after completion and occupancy, is the backbone for managing commissioning, defect completion and the successful handover of facilities with the operation of sustainable features.*
- Encourage the Construction Contractor and services consultants to unite the flow of information for operational components that link the operation of sustainable features, including building automation systems, information technology and security.*
- Design to respond to all requirements of the BCA particularly in responding to Section J.*
- Design to maximise opportunities for 'active sustainable initiatives, including water collection, solar collection, solar hot water, low energy light fitting selection, material selection.*
- Design to minimise need for air conditioning, including the incorporation of building shading.*

### **8.3 ENVIRONMENTAL SUSTAINABILITY TARGETS & CONSUMPTION**

*The detailed design of the UTS Blackfriars Research Facility will address producing quantifiable reduction of energy consumption in relation to comparable facilities and at least meet the following targets:*

<i>Targeted facility greenhouse gas emissions (tCO<sub>2</sub>-e/GFA):</i>	<i>0.15 or below</i>
<i>Targeted energy consumption (GJ/m<sup>2</sup> of GFA):</i>	<i>0.87 or below</i>
<i>Targeted water use (kilolitres per EFTPL):</i>	<i>8.20 or below</i>
<i>Targeted waste to landfill (kg per EFTPL):</i>	<i>30.22 or below</i>
<i>Targeted recycling (as combined % of recycling and general waste to landfill):</i>	<i>31.5 or more</i>

### **8.4 ENVIRONMENTAL SUSTAINABILITY WATER SENSITIVE DESIGN**

*Reducing water consumption and protecting water quality are key objectives in the sustainable design of the UTS Blackfriars Research Facility. Water consumption should endeavor to not exceed the ability to provide the facilities own ability to provide water from the building fabric and processes within the facility.*

*The detailed design of the UTS Blackfriars Research Facility will address water being collected, used, purified, and reused on-site, including:*

- Water catchment from the building's roof and reuse of the resulting water.*
- Recycling of water used for the mechanical systems of the building.*
- Recycling of water used for the processes operating in the building.*
- Designing for dual plumbing that recycles water for the toilet flushing.*
- Waste-water minimisation by utilising water conserving fixtures such as ultra-low flush toilets and low-flow shower heads.*
- Point of use water treatment and heating to improve both water quality and energy efficiency while reducing the amount of water in circulation.*
- Non-sewage and greywater usage for on-site demands such as site-landscaping*

