Appendix - 4

Discussion Paper - Selection of preferred option(s)

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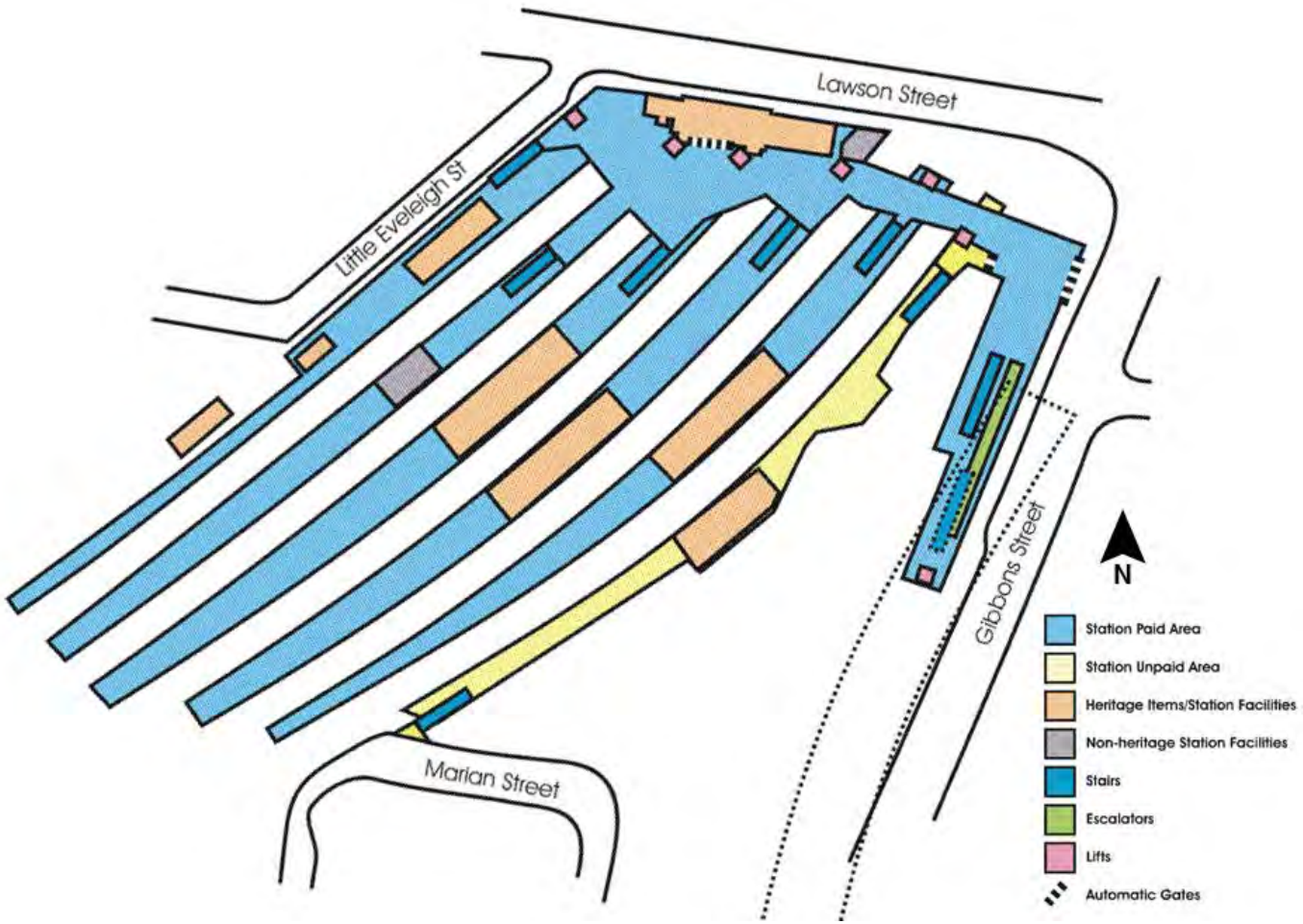

Figure 1.1: Option 1
(Redfern Station Upgrade Options, RailCorp, Mar 2004)

1. REVIEW OF DESIGN OPTIONS

1.1 CONCEPT DESIGN OPTIONS

A range of concept design options, including those developed prior to the commencement of this study, were reviewed in a workshop with the Project Coordination Group on 18th August 2006.

Options generated prior to this study include:

1. Upgrade existing access by introducing new lifts and making the concourse a bit bigger (Figure 1.1)
2. Plaza and development over the northern end of the station between Gibbons and Little Eveleigh Streets (Figure 1.2)
3. Central concourse at the southern end of the station, continued use of the existing concourse and pedestrian connection to Little Eveleigh Street (Figure 1.3)
4. Central concourse at the southern end and a pedestrian connection to North Eveleigh site (Figure 1.4)
5. Southern & northern entrances and southern connection to North Eveleigh site (Figure 1.5)

Further options, developed in this study, include:

6. Combination of options 3 & 5, with a northern entrance at the end of Redfern Street (Figure 1.6)
7. A wider central concourse and stairs/escalators on both sides of it (Figure 1.7)
8. Wider central concourse, no northern stairs to platforms and a plaza (Figure 1.8)
9. New central concourse parallel to Lawson Street with no northern stairs (Figure 1.9)

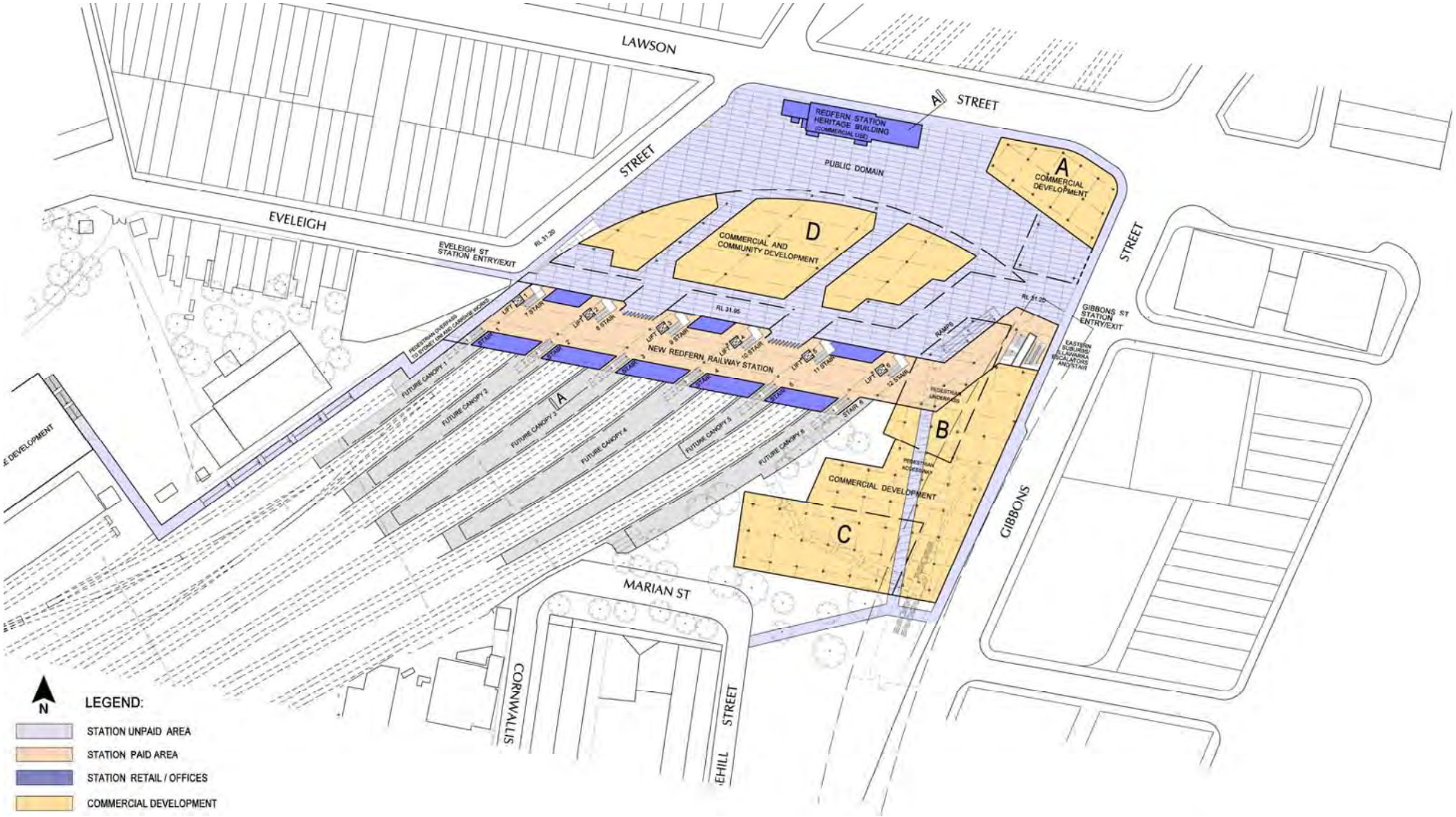

Figure 1.2: Option 2
(Redfern Station Design Development, Stafford Moore Architects, Jan 2004)

Figure 1.3: Option 3
(Redfern Station Design Development, Stafford Moore Architects, Jan 2004)

Figure 1.4: Option 4
(Redfern Station Design Development, Stafford Moore Architects, Jan 2004)

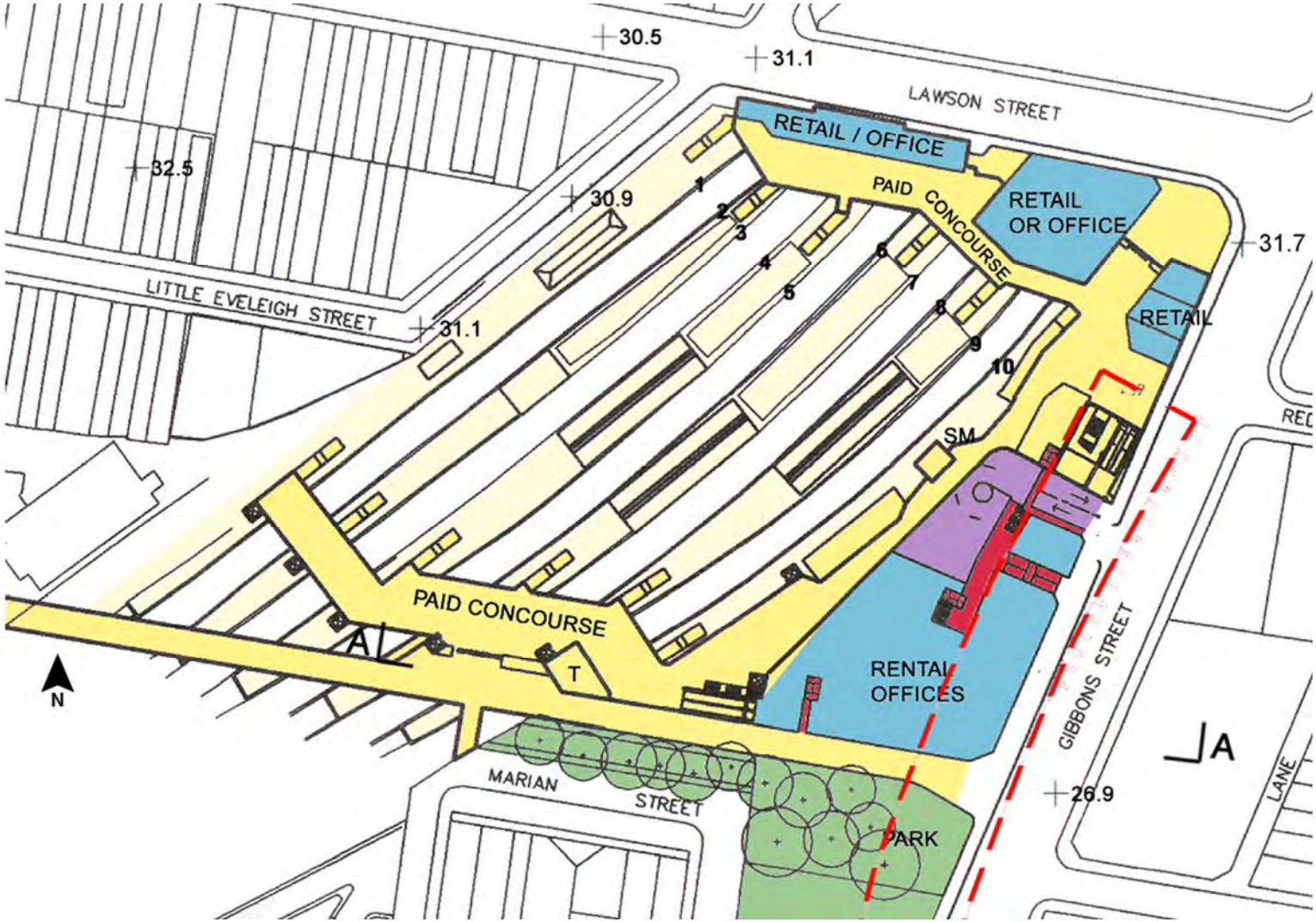

Figure 1.5: Option 5
(Development study for Redfern station, JTCW, Jun 2003)

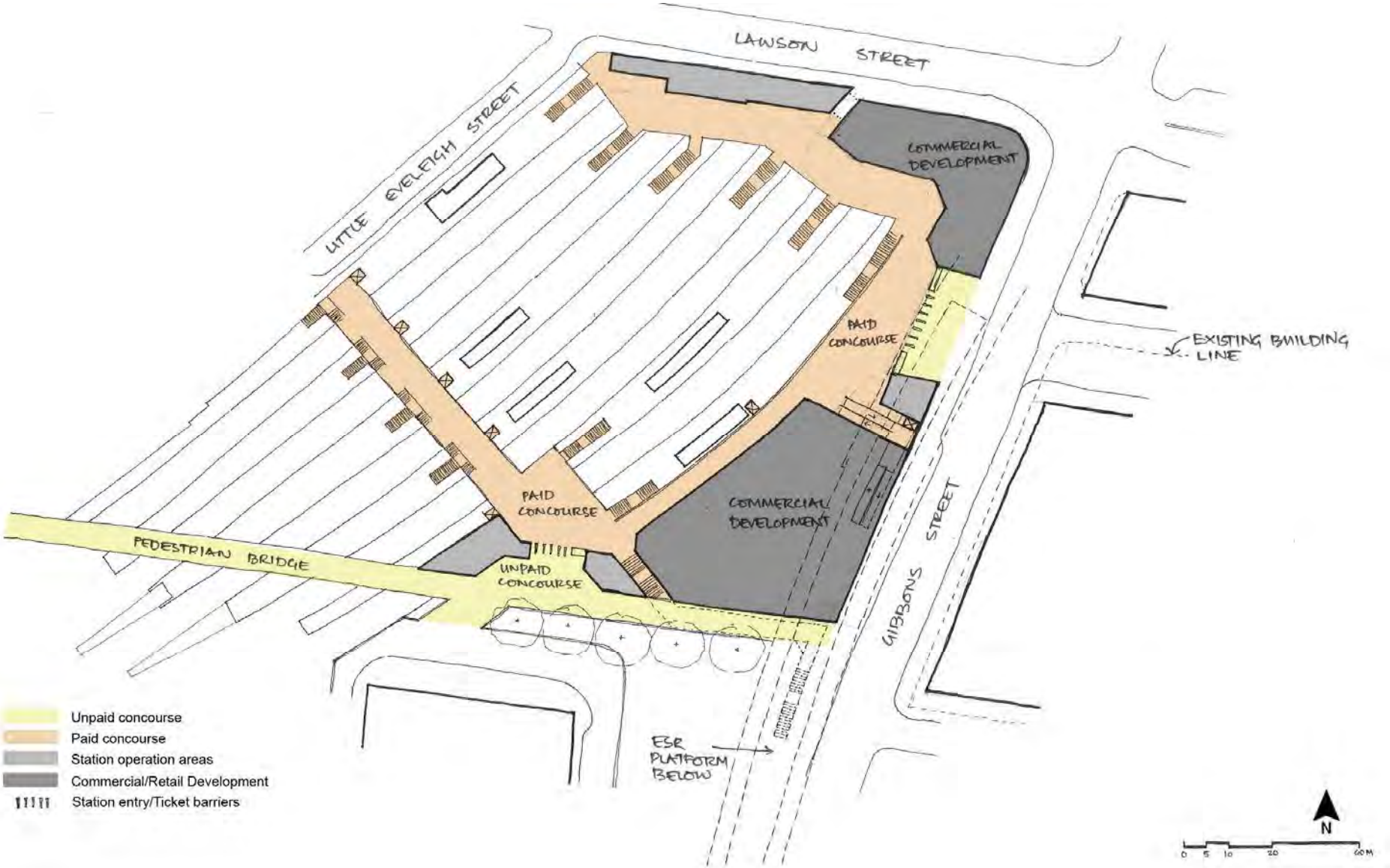

Figure 1.6: Option 6
(New option, combination of Option 3 & 5)

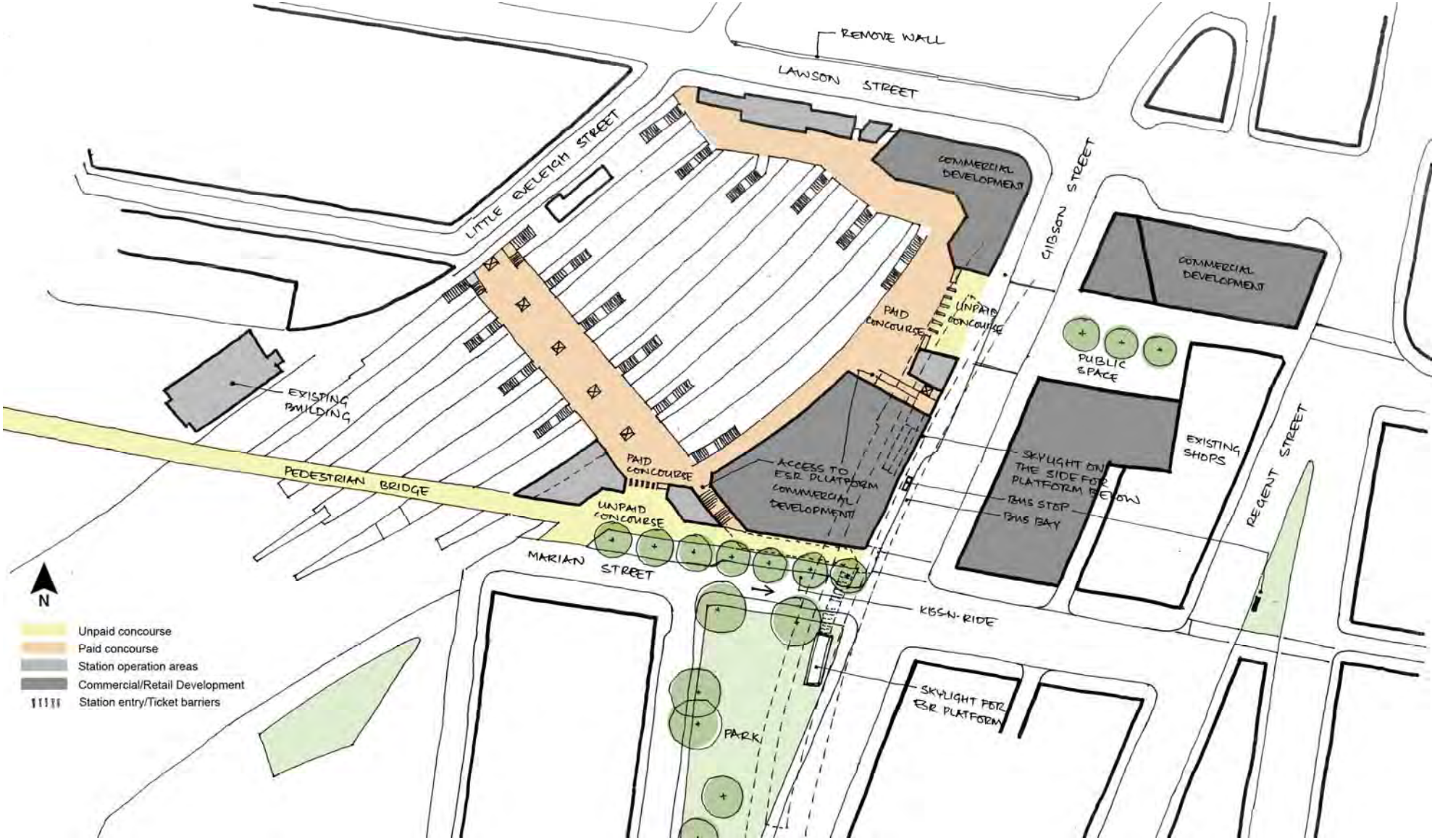

Figure 1.7: Option 7
(New option)

Figure 1.8 – Option 8
(New option)

Figure 1.9: Option 9
(New option)

The advantages and disadvantages of the above options were discussed during the workshop. The main advantages and disadvantages identified for each of the options are listed below:

OPTIONS	***ADVANTAGES***	***DISADVANTAGES***
Option – 1	• Is the lowest cost "do minimum option". • Retain the heritage buildings on the platform and concourse.	• Forecourt and station entry at Gibbons Street has not been resolved. • Difficult to construct while keeping the station functioning. • Does not provide for a pedestrian link between North Eveleigh and Redfern. • Poor pedestrian link to ATP.
Option – 2	• Provides areas for a future commercial development. • Retains booking office building at Lawson Street. • Provides additional public domain/open space.	• Covers in the order of 50% of the surface platforms, which has potential to create an emergency evacuation problem, as these platforms would have to be considered underground platforms and compliant with NFPA 130. • Very expensive and not cost effective. • Pedestrian connection to North Eveleigh not satisfactory. • Does not provide a satisfactory connection to ATP. • All heritage buildings on the platform are removed.
Option – 3	• Addresses the current access and circulation issues to some extent. • Heritage buildings on the platforms and concourse retained.	• Fails to provide access to North Eveleigh • Large area of paid concourse difficult to manage. • Layout of the new concourse very fragmented and unclear. • The new stairs point towards the narrow end of the platform which is not ideal for good distribution of people on the platforms. • L-shaped stairs to the platforms not suitable for efficient movement. • Poor interface with Illawarra Relief Public space on corner of Lawson and Gibbons Street in poor position.
Option – 4	• Same as Option-3Meets circulation and connectivity requirements.	• Same as Option-3. • Connection to North Eveleigh site poor.
Option – 5	• Heritage buildings on the concourse and platforms retained.	• Station entrance at the corner of Lawson Street and Gibbons Street not ideal. • No unpaid concourse connection between Marian Street and Lawson Street corner. The lifts from the

OPTIONS	*ADVANTAGES*	*DISADVANTAGES*
		new concourse do not meet the current platform clearance requirements.
Option – 6	• No access from Lawson Street – a pedestrian safety benefit. • All heritage buildings retained except for the store building on platform 1Provides good connection to ATP. • Direct presence of station entry along Gibbons and Redfern Street.	• New stair pointing towards the narrow end of the platforms which is not desirable. • No public space at the end of Redfern Street as required by the Redfern-Waterloo Built Environment Plan. • Large area of paid concourse makes it difficult to manage and staff.
Option – 7	• Maximum capacity option with 3 sets of stairs landing on each platform. • Marian Street connected to Gibbons Street with new Kiss-'n-Ride facilities. • Heritage building on the concourse and platform 1 retained. • Provides improved station entrance to the east and to ATP.	• The public space at the Gibbons Street entrance across may be overshadowed by the commercial development located at the corner of Lawson Street and Gibbons Street. • Large area of paid concourse makes it difficult to staff and manage. • Does not provide for a civic space as per the Redfern-Waterloo Built Environment Plan.
Option – 8	• New public plaza at the station entrance on Gibbons Street. • Maintenance and security issues would need to be considered.	• Access to the Platforms 2 & 3 from the university side becomes too long as there is no station entry at the western side. • Only one set of stairs to Platform 1. • University bus drop off point would need to be considered. • Poses security and surveillance problems on the northern section of the station. • Only the heritage building on Lawson Street and platform 1 are retained.
Option – 9	• New central concourse parallel to Lawson Street provides adequate clearances for stairs/escalators on all the platforms. • Paid concourse very compact and easy to manage.	• Access to the platforms from the North Eveleigh site too circuitous. • Pedestrian bridge separate from the paid concourse. • Only the heritage building on Lawson Street and platform 1 are retained. • Poses security issues on the pedestrian bridge.

Options 1 to 5 were developed prior to this study and do not generally meet the current objectives and user requirements, so have not been considered further.

With regards to Options 6 to 9:

- Option 6 is the only option that retains the existing heritage buildings and shelters on the platforms.
- Options 7 and 8 meet most of the objectives, but remove all heritage platform buildings except on Platform 1. They also provide a new southern concourse parallel to the OHW stanchions.
- Option 7 has large areas of paid concourse as the stairs on the northern end are retained.[2]
- Option 8 creates a better interface at the Gibbons Street entrance as it creates a public plaza.
- Option 9 provides a new concourse parallel to Lawson Street and also has the best passenger distribution on platforms compared to any other option.

The above options were presented to the PCG in an Options Review Workshop held on 22 Aug 2007. It was decided at the workshop to develop Options 6, 8 and 9 to be presented at the External Stakeholder workshop on 01 Sep 2007. After the stakeholder workshop these options were further developed and renamed Option A, B and C presented in this report.

All the three design options assume the catenaries would be lowered and the system depth reduced to enable a new concourse to be at the same level as the existing concourse and facilitate east-west pedestrian connections.

[2] Pedestrian modelling undertaken as part of the development of the options has revealed that two sets of stairs is sufficient to meet future patronage demand and F&LS requirements. Refer Part B – Engineering report.

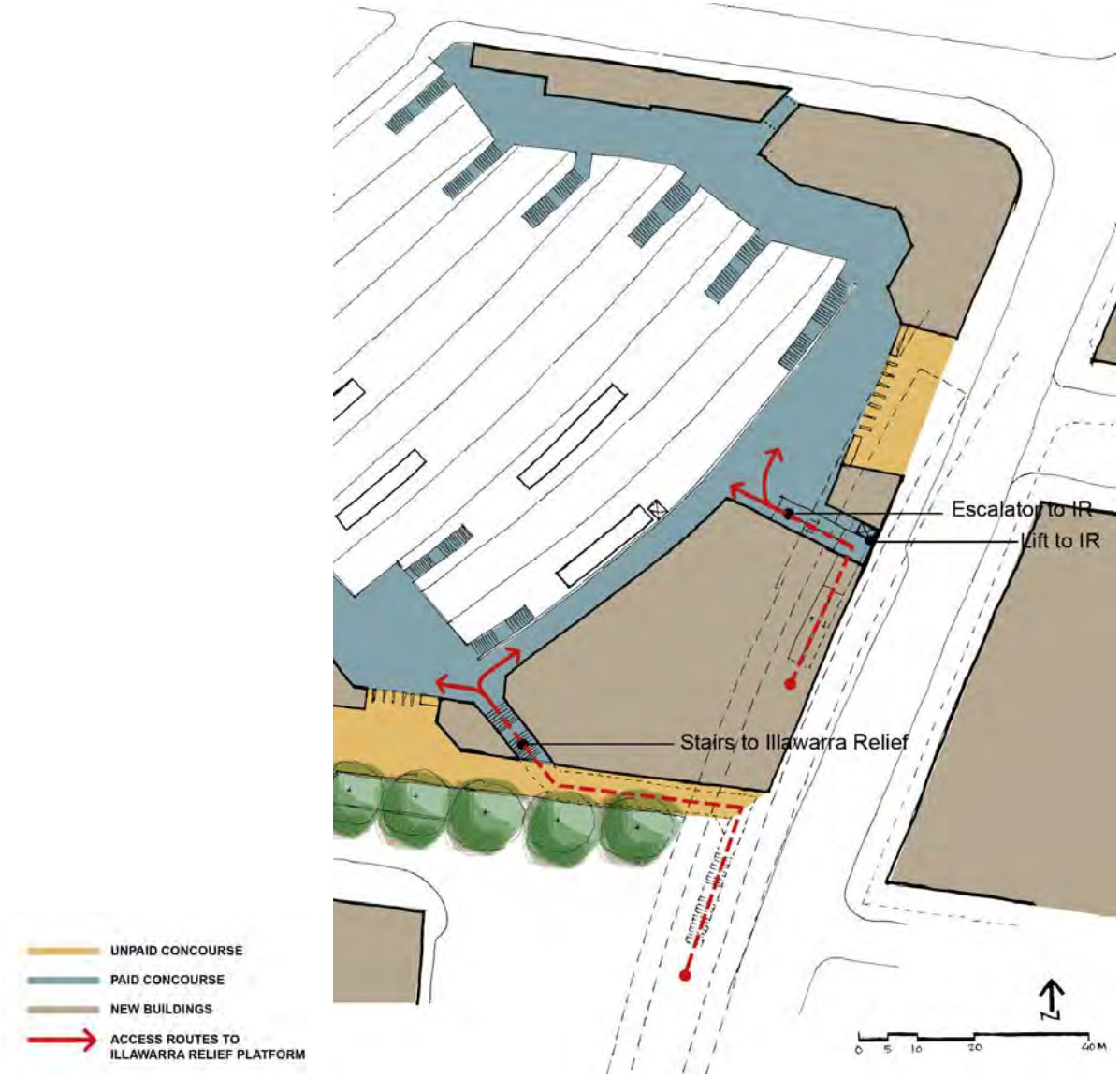

Figure 1.10: Access to Illawarra Relief Option – IR 1

1.2 OPTIONS FOR ACCESS TO ILLAWARRA RELIEF

During the course of the study, four options were developed for the provision of access to and from the Illawarra Relief platforms 11 and 12. These options were derived as a result of various station layouts and dependent upon the size and location of the paid concourse. Hence the station layout in each option is different.

These options are discussed below:

Option – IR 1

Access from the northern end of the station would be provided by a new set of escalators and access from the southern end would be provided by a new set of stairs going down from the southern entrance as shown in Figure 1.10.

As the access to the Illawarra Relief needs to be from the paid concourse, this option does not provide an at-grade unpaid link through the station between North Eveleigh site and Gibbons Street. Also the paid concourse would become very large and would be difficult to manage and staff.

As detailed in Section 2, this layout is used as part of Option A to provide access to Platforms 11/12.

Option – IR 2

A set of barriers on the north and south of the concourse would provide access to the station. A set of stair and escalators east of the barriers would provide access to the Illawarra Relief as shown in Figure 1.11.

As the access to the Illawarra Relief needs to be from the paid concourse, this option would not provide an at-grade unpaid link through the Station between the North Eveleigh site and Gibbons Street. Also the access to the station from North Eveleigh site and Darlington would become very long.

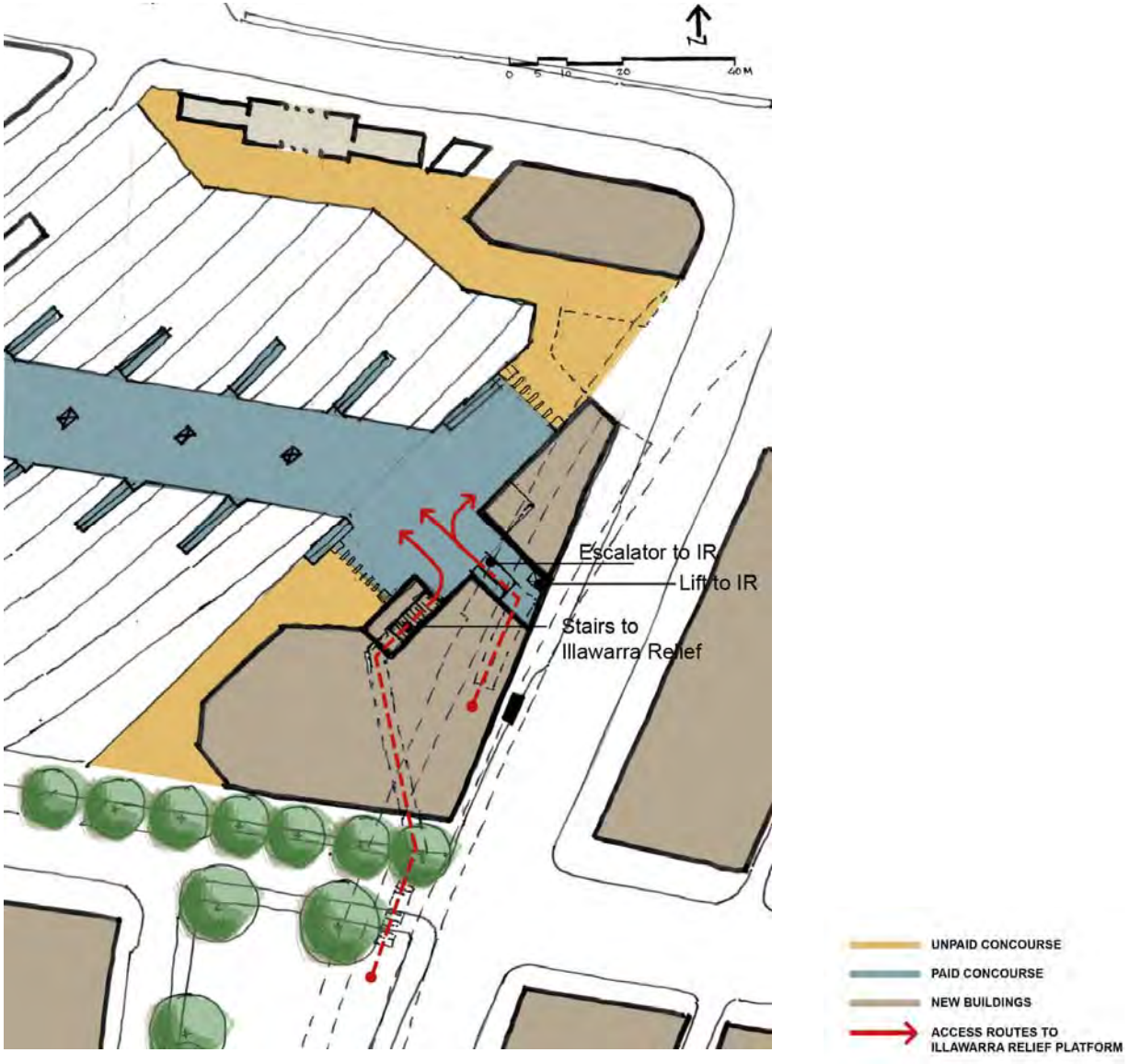

Figure 1.11: Access to Illawarra Relief Option – IR 2

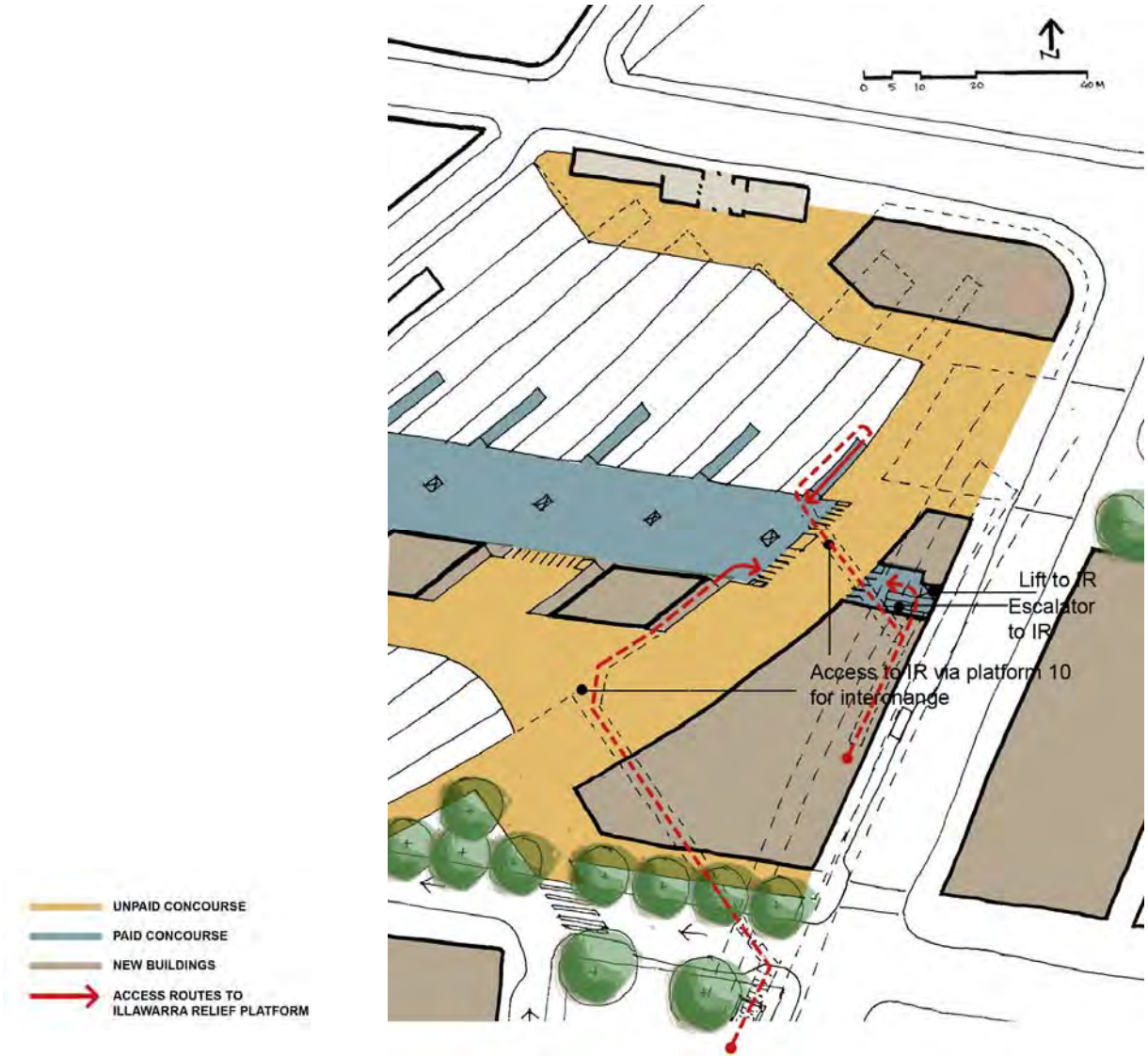

Figure 1.12: Access to Illawarra Relief Option – IR 3

Option – IR 3

This option is a variation of Option IR 2. There would be two access points to the Illawarra Relief, one via a set of barriers on the northern end and the second from platform 10 via a set of stairs on the southern end, as shown in Figure 1.12.

Having a separate barrier for the Illawarra Relief access at the concourse level would allow for an unpaid at-grade connection from the North Eveleigh site to Gibbons Street. This would increase the number of entrances to be staffed and would require passengers interchanging between lines to cross the unpaid concourse and pass through barriers twice.

Option – IR 4

In this Option, as shown on Figures 1.13 & 1.14, access to the Illawarra Relief, Platforms 11/12, would be provided through a passage at Platform 10 level that would be reached by stairs and a lift from the main paid concourse. Stairs and escalators and a lift from this passage would deliver people to the centre of Platform 11/12.

Platform 10 would be wider than at present and the stairs serving it have been designed to provide for the extra demand from the Illawarra Relief. As shown, a screen and signage at the end of the tunnel would be provided to direct people to the stairs and not emerge on Platform 10. It would also be possible to provide additional stairs or escalators adjacent to Platform 10 in the future.

Options IR 1 and IR 2 would provide direct access to Platforms 11/12 from the paid concourse but would not provide an at-grade connection through the station between the North Eveleigh site and Gibbons Street. Option IR 3 provides the at-grade link but still provides direct access to Platforms 11/12. The access in this case is unsatisfactory as discussed earlier and people need to go in and out of the barrier for interchange purpose.

Option IR 4, providing access to Platform 11/12 through Platform 10, is the best solution if the unpaid link between North Eveleigh and Gibbons Street is desired through the station.

Variations of access Option IR 4 to Illawarra Relief are incorporated into the overall station design Options B and C, discussed in Chapter 2, which provide unpaid links between the North Eveleigh site and Gibbons Street.

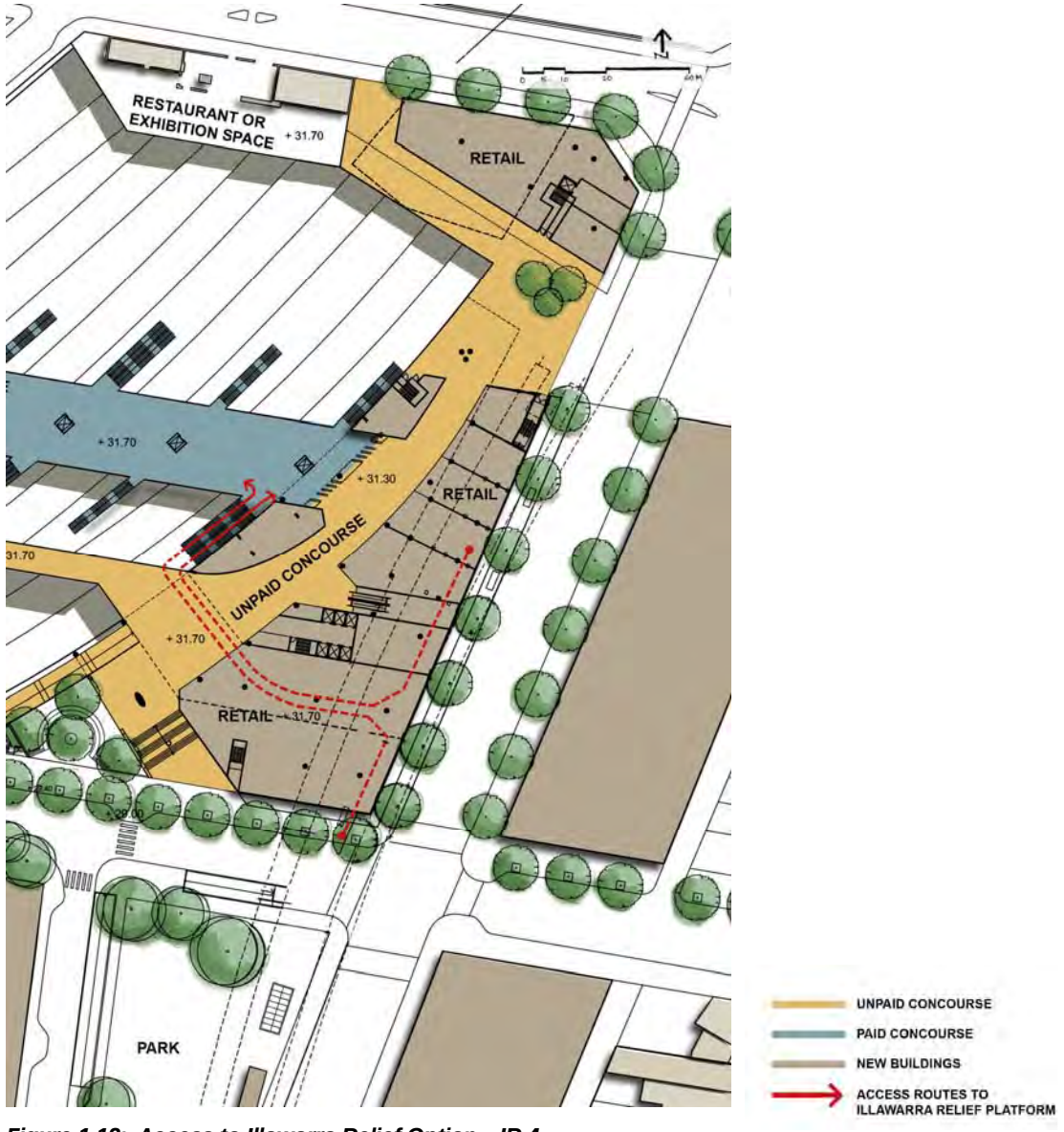

Figure 1.13: Access to Illawarra Relief Option – IR 4

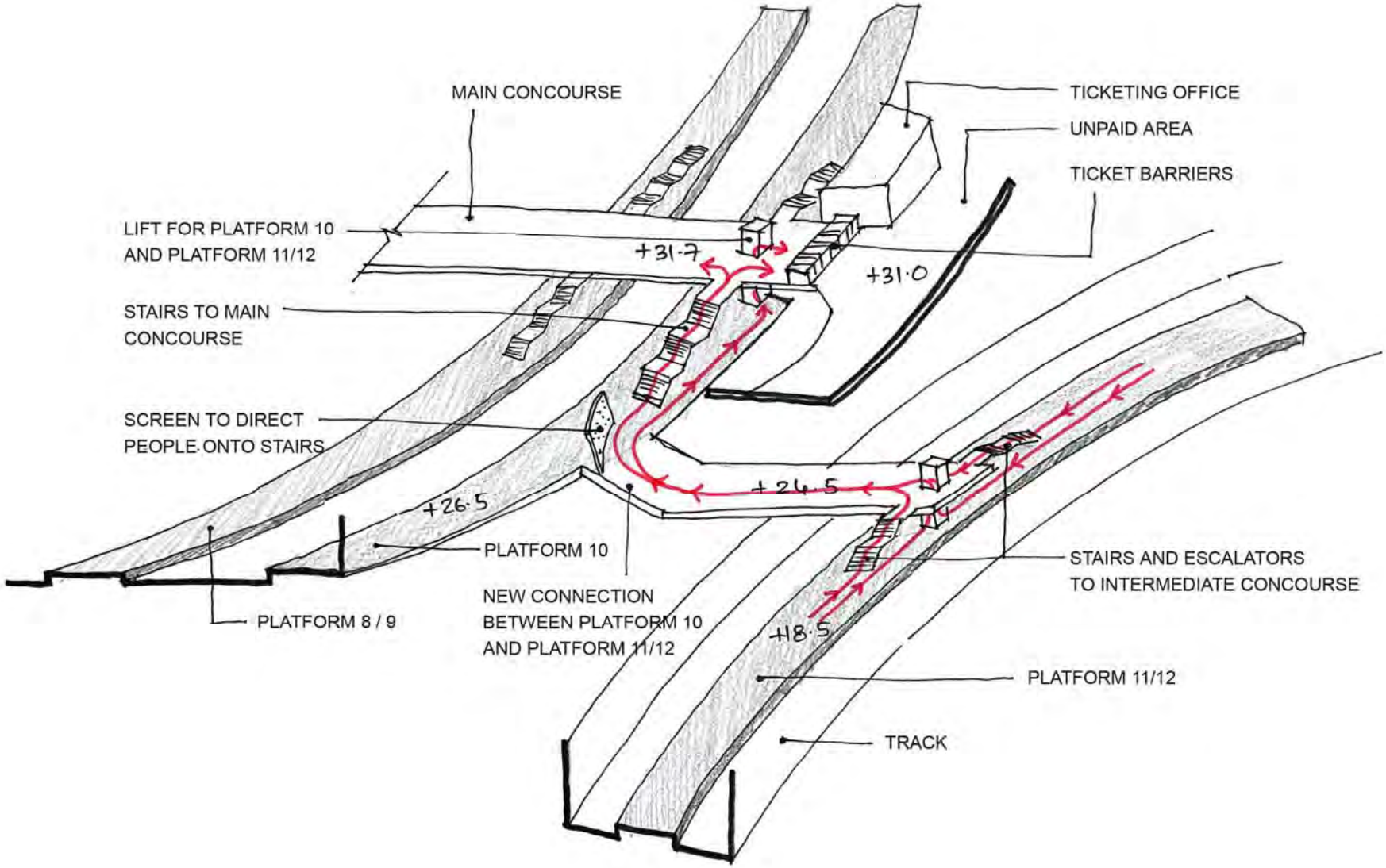

Figure 1.14: Access to Illawarra Relief Option IR-4 Perspective

2. DEVELOPMENT OF DESIGN OPTIONS A, B AND C

As indicated in Section 1.1, Options 6, 8 and 9 (renamed A,B & C) have been further developed, taking into account the comments received at the External Stakeholder Workshop held on 1 Sep 2006.

Option A – New southern concourse, retaining northern concourse and stairs. Retaining shelters on the platforms and booking office on Lawson Street. No civic space on Gibbons Street.

Option B – New southern concourse parallel to the OHW stanchions. Heritage building on Platform 1 and booking office on Lawson Street retained. New civic space along Gibbons Street with some heritage buildings retained.

Option C – New central concourse parallel to Lawson Street. Heritage building on Platform 1 and booking office on Lawson Street retained. New civic space along Gibbons Street.

The proposed commercial development, building services, engineering and fire escape provisions would be constant in all options.

Development Opportunity

The proposed development opportunity above the station on Gibbons Street and the design intent remain the same in all the three options. Artist's impression of the relationship between the proposed building and station are shown in Appendix 2. The proposed building would meet the height and FSR requirements of the SEPP (Major Projects) 2005, with a 4/5-storey high podium and 14-storey high tower. There would be two levels of car park in the basement with space for a total of 140 to 160 cars. Currently there are no parking standards on this site. As a result the City of Sydney parking standards have been used. These require 1 car space per 125sqm of commercial floor area. The proposed development would provide approximately 80 car spaces less than the City of Sydney requirement, however, given the site's close proximity to the Station a lesser amount could be justified. It would be possible to provide additional car spaces by extending the parking under the park to the south, however this may not be commercially viable.

Building services & engineering

Building service requirements for the new station and the proposed development will generally be similar for these options. This issue is discussed further in Part B – Engineering report.

Structural design

The conceptual structural design for the concourse and the proposed development in all three options would be similar as all options have a concourse crossing the tracks. The details of structural design and considerations specific to Option C have been attached as Appendix 1 in Part B – Engineering report..

Fire Life and Safety

All the three options have two sets of stairs from each surface platform. For the Illawarra Relief there would be two fire stairs at each end of the platform plus a similar number of stairs and escalator. Part B - Engineering Report Section 3 details fire and safety requirements for Option C but it would be possible to achieve a similar performance for Option B. Option A will perform less as the southern stairs on the surface platforms will be narrow due to platform clearance requirements.

User requirements and Station Design guide

All three options generally comply with the user requirements and Station Design Guidelines. Options B and C meet all the RailCorp user requirements in terms of capacity and station performance. Option A under performs in these respects. The options have different impacts on heritage buildings that have been highlighted in the description of each of them.

A statement of compliance with the user requirements and Station Design Guidelines is presented in Chapter 4.

Whilst constructability is still being assessed by others, none of the three options would appear to have significant advantages in terms of constructability as all require the overhead wiring to be reconfigured, the building of a new concourse over the tracks, and significant structural works in the Illawarra Relief Station box.

2.1 OPTION A

This option is based on retaining existing heritage buildings/shelters on the platforms while still achieving the broader design objectives for the future use of the station and the broader renewal of Redfern. Retaining the heritage platform buildings is a significant constraint that inhibits planning of the station to accommodate future growth of passenger and other pedestrian movements. The concept has also been designed to minimise impacts on stanchions and overhead wiring, another significant planning constraint (Figure 2.2 Option A)

Concourse & Station entry

Option A retains the existing northern concourse and stairs and proposes a new concourse towards the southern end of the station. The new southern concourse would be parallel to the overhead wiring stanchions and has been positioned to retain the existing heritage structures on the platforms. There is a stair and an elevator per platform from the southern concourse. The new stairs would be oriented towards the narrow end of the platform to retain the existing platform buildings and hence are narrow to meet the clearance requirements on the platforms and hence limit future capacity.

As the northern concourse would be retained for station operation there would be a possibility of retaining the existing station entry on Lawson Street. A new station entrance is proposed along Gibbons Street (opposite Redfern Street) and on Marian Street to provide more direct connections to ATP and Redfern Town Centre. This option proposes three entrances to the station. As the existing entry to the station has been retained there are three entrances to the station.

OHW & Signalling

This option seeks to minimise the impact on OHW and signalling by positioning the concourse at a right angle to the tracks and parallel to the existing stanchions. Only one row of stanchions and catenaries would have to be modified and lowered to accommodate the new concourse. One stanchion on Platform 8/9 would have to be modified to accommodate the new stairs. (Refer Figure 2.2).

Signal SY455 is not directly affected by the new concourse but might need re-organising due to signal sighting issues, which needs to be reviewed by RailCorp technical staff.

Pedestrian circulation

A pedestrian bridge parallel to Marian Street would connect the North Eveleigh site and Darlington (including the University of Sydney) to the Redfern Town Centre.

Access to Illawarra Relief

Access to Illawarra Relief would be as in Option IR-1, as described in Section 1.2.

Heritage

This option would retain all the existing platform heritage buildings, except the store building on platform 1. The booking office on Lawson Street and ventilation stacks on Platform 1 are also retained. Some of the masonry wall on the Lawson Street overbridge is removed to allow for street access to the proposed building on the corner of Lawson and Gibbons Streets. Part of the wall would be retained and incorporated into the proposed building.

Retail potential at the concourse level

There is a limited retail potential at the concourse level due to the large paid concourse. There would be some retail potential along Gibbons Street and Marian Street.

Station operation areas

There would be limited space for station operation areas near the entrance, hence they are located alongside the paid concourse connecting the Marian Street entry and Gibbons Street entry.

Interface areas

Due to a connected northern and southern paid concourse, there is not enough space to provide a civic space at the end of Redfern Street as detailed in the Redfern-Waterloo Built Environment Plan.

Connection to ATP and Darlington (including the University of Sydney) is via Marian Street entrance

A pedestrian bridge parallel to Marian Street, which connects to Wilson Street, provides a link between the Redfern Town Centre and the North Eveleigh site, as well as improved east-west connection over the railway corridor. This would require stairs and ramp or elevator at its western end.

A development at the corner of Lawson Street and Gibbons Street is proposed to activate this corner.

Figure 2.1: Option A - Concourse Level Plan

Figure 2.2: Option A - Impact on OHW

2.2 OPTION B

Long term planning needs for the station upgrade have been put ahead of retaining all the heritage buildings in this option but the planning has still been compromised by minimising, as far as possible, the impact on the stanchions and catenaries by placing the new concourse parallel to the support structure of the catenaries. (Figure 2.3)

Concourse & Station entry

Option B proposes a new southern concourse that is parallel to the overhead wiring stanchions. The concourse has been moved further north than in Option A so as to provide two set of stairs and elevator from the concourse. A small concourse north of the proposed concourse has been provided to access Platform 8/9 and Platform 10, as these platforms are very narrow at their southern end. The existing stairs to the northern concourse are removed making it superfluous to station needs.

Two station entrances are proposed, one along Gibbons Street from a civic space opposite Redfern Street at the northern end of the station, and another from the unpaid pedestrian concourse near Marian Street at the southern end.

OHW & Signalling

Similar to Option A the main concourse in Option B would be positioned perpendicular to the tracks and parallel to the existing stanchions to minimise the impact on OHW. But it is moved further north in order to have two sets of stairs for each platform from the central concourse. Only one row of stanchions will have to be modified and catenaries lowered to accommodate the new central concourse. The small northern concourse will impact on stanchions and catenaries on Platform 8/9 and Platform 10 would have to be modified to accommodate new stairs. One stanchion on the southern end of Platform 2/3 and Platform 1 would have to be modified due to the proposed pedestrian bridge. Refer Figure 2.4 for the impact on OHW wiring.

Signal SY455 would not directly affect the new concourse or pedestrian bridge, but might need re-organising due to signal sighting issues, which need to be reviewed by RailCorp technical staff.

Pedestrian circulation

A pedestrian bridge connecting the North Eveleigh site and the Redfern Town Centre would run parallel to the concourse for half the length and then connect to the North Eveleigh site. An at-grade pedestrian connection would also be provided at the end of the bridge at Marian Street. An unpaid pedestrian access east of the existing station entrance would provide connection between Lawson Street and the new civic space on Gibbons Street.

Access to Illawarra Relief

Access to the Illawarra Relief is a variation of Option IR-4. A set of stairs going to platform 10 connects to an intermediate concourse, which provides access to Platform 11/12. There would be separate stairs providing access to Platform 10 and Platform 11/12 which run in opposite directions for better platform distribution. Hence the intermediate concourse could be separated from platform 10 if required. This entrance is further south than the current entry and provides better distribution of people on the platforms stairs and escalators on both side of the intermediate concourse. Platform 10 has been widened significantly which would allow for more people from the Illawarra Relief. New Fire and emergency egress stairs have been provided both at the north and south end of Platform 11/12.

Heritage

This option retains the booking office on Lawson Street, and office and ventilation stack on Platform 1. The Electrical Workshop building roof will have be modified due to the location of the pedestrian bridge. Some of the masonry wall on the Lawson Street overbridge is removed to allow for street access to the proposed building on the corner of Lawson and Gibbons Streets. Part of the wall is retained and incorporated into the proposed building.

The existing station entry and booking office will not be a part of the station operation and could have other uses such as a restaurant or an exhibition space.

Retail potential at the concourse level

There is an opportunity to locate two levels of retail on Gibbons Street. At the concourse level there is the potential for retail along the unpaid pedestrian concourse and a lower level of retail along Marian and Gibbon Streets. A supermarket could be located at the southern end of the development accessible from the unpaid concourse and Gibbons Street.

There could also be retail outlets and cafes in the building at the corner of Lawson Street and Gibbons Street.

Station operation areas

There is not enough space to provide all the station operation areas near the paid concourse and hence some of them would have to be located near the unpaid concourse connecting Marian Street and Gibbons Street. This would cut down on the valuable retail area and would not be ideal for station management.

Interface areas

A civic space as detailed in the Redfern-Waterloo Built Environment Plan along Gibbons Street marks the northern entrance of the station. It would also provide an unpaid at-grade connection to Marian and Lawson Streets.

Connection to the ATP would be through Marian Street along a footpath at the corner of the Water Tower Apartment. The road at the corner would be narrowed to allow for a proper footpath connecting the ATP. A complying ramp provides disabled access to the concourse level from Marian Street.

The proposed pedestrian bridge would connect to Wilson Street providing improved connection to the North Eveleigh site and Darlington (including the University of Sydney).

A new three storey development at the corner of Lawson Street and Gibbons Street has been set back to provide for a wide footpath and trees. Retail and cafes should be encouraged on the ground floor to improve safety and surveillance along Gibbons and Lawson Streets.

Figure 2.3: Option B - Concourse Level Plan

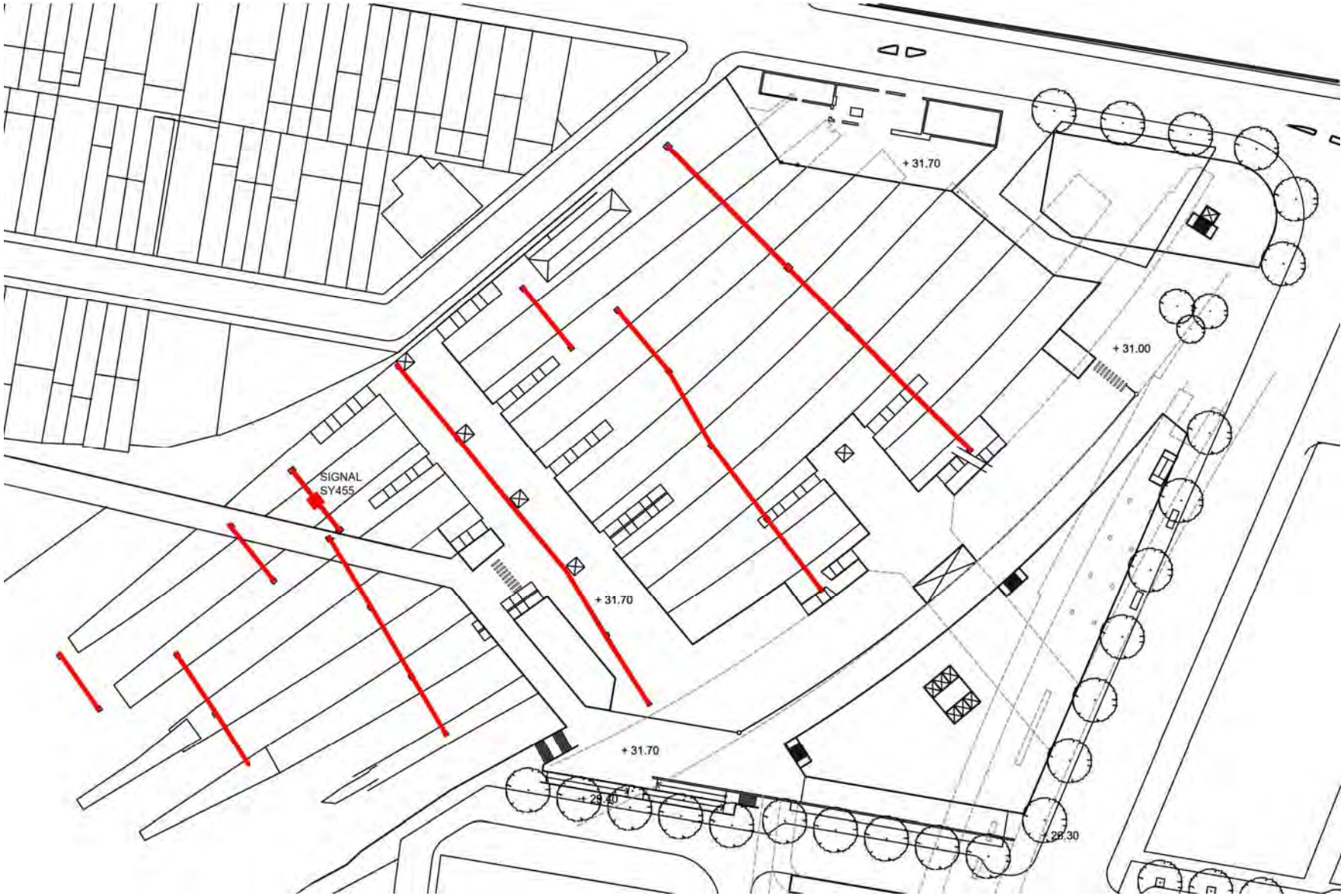

Figure 2.4: Option B - Impact on OHW

2.3 OPTION C

This option best meets the long term planning and design objectives and safety and comfort criteria. Only the significant heritage buildings are retained and there is a major impact on OHW. (Figure 2.5).

Concourse & Station entry

Option C proposes a more centrally located new concourse that is parallel to Lawson Street. The concourse has been positioned in a manner to allow for maximum utilisation of the platform width. There are two sets of stairs and a lift for each platform from this central concourse. The existing stairs on the northern concourse are removed.

The proposed entrances to the station are from the:

1. North via a new civic space on Gibbons Street
2. South via Marian Street
3. West via the pedestrian bridge from Wilson Street.

There are two sets of barriers, one located on the east of the concourse accessed through the unpaid concourse connecting Marian and Gibbons Street and the second located to the west of the concourse, accessed from the pedestrian bridge.

OHW & Signalling

As this option is designed to provide maximum efficiency in terms of pedestrian circulation and platform distribution the main concourse runs diagonally across the tracks and OHW stanchions. Hence two rows of stanchions would have to be removed and catenaries modified to accommodate the new concourse.

Signal SY455 is affected by the new pedestrian bridge and would have to be reconfigured. Refer Figure 2.6 for the impact on OHW and signalling.

Pedestrian circulation

A pedestrian bridge parallel to the new concourse would connect the North Eveleigh site (and Wilson Street) to the Redfern Town Centre. The unpaid concourse would provide an at-grade pedestrian connection between Gibbons and Marian Streets and provide a direct connection to the new pedestrian bridge. An unpaid pedestrian access east of the existing station entrance provides connection between Lawson Street and the new civic space on Gibbons Street.

Access to Illawarra Relief

Access to the Illawarra Relief is as for Option IR 4 which has been discussed in Section 1.2. A wide stair on the south of the concourse would provide connection to the intermediate concourse tunnel at platform level, which connects to Platform 11/12. There is a screen at the end of the tunnel to direct people toward the stairs and prevent them from going directly on to Platform 10. It would, however, be possible to separate the intermediate concourse from Platform 10 with a glass barrier in the future and to provide a separate stair for Illawarra Relief if required. Two up only escalators and two stairs provide access to Platform 11/12 from a centrally located intermediate concourse. New Fire and emergency egress stairs have been provided both at the north and south end of Platform 11/12.

Heritage

This option retains the booking office on Lawson Street and the office and ventilation stack on Platform 1. Some of the masonry wall on the Lawson Street overbridge would be removed to allow for street access to the proposed building on the corner of Lawson and Gibbons Streets. Part of the wall is retained and incorporated into the proposed building. The Electrical Workshop building roof would have to be modified due to the location of the pedestrian bridge and the existing station entry and booking office would not be a part of the station operation and could have other uses such as a restaurant or an exhibition space.

Retail potential at the concourse level

There could be an opportunity to provide retail on the Gibbons Street frontage. At the concourse level there would also be the potential for retail along the unpaid pedestrian concourse and a lower level of retail along Marian and Gibbons Streets. A supermarket could be located at the southern end of the development accessible from the unpaid concourse and Gibbons Street.

There could also be retail outlets and cafes in the building at the corner of Lawson Street and Gibbons Street.

Station operation areas

All the station's operational areas are located between the space connecting the paid concourse and the unpaid concourse. This would enhance the efficiency of station management and allow full retail potential on the unpaid concourse.

Interface areas

A civic space, as detailed in the Redfern-Waterloo Built Environment Plan, along Gibbons Street would mark the entrance to the station. It would also provide unpaid at-grade connection to Marian Street and Lawson Street.

Connection to ATP is from Marian and Cornwallis Streets. Marian and Cornwallis Streets could be closed to traffic to allow for a safer pedestrian environment around the Station entrance.

The proposed pedestrian bridge could connect to Wilson Street, providing improved connection to the North Eveleigh site and Darlington (including the University of Sydney).

A new 3 storey development at the corner of Lawson and Gibbons Streets has been set back to provide for a wide footpath and trees. Retail and cafes should be encouraged on the ground floor to improve safety and surveillance along Gibbons and Lawson Streets.

Figure 2.5: Option C - Concourse Level Plan

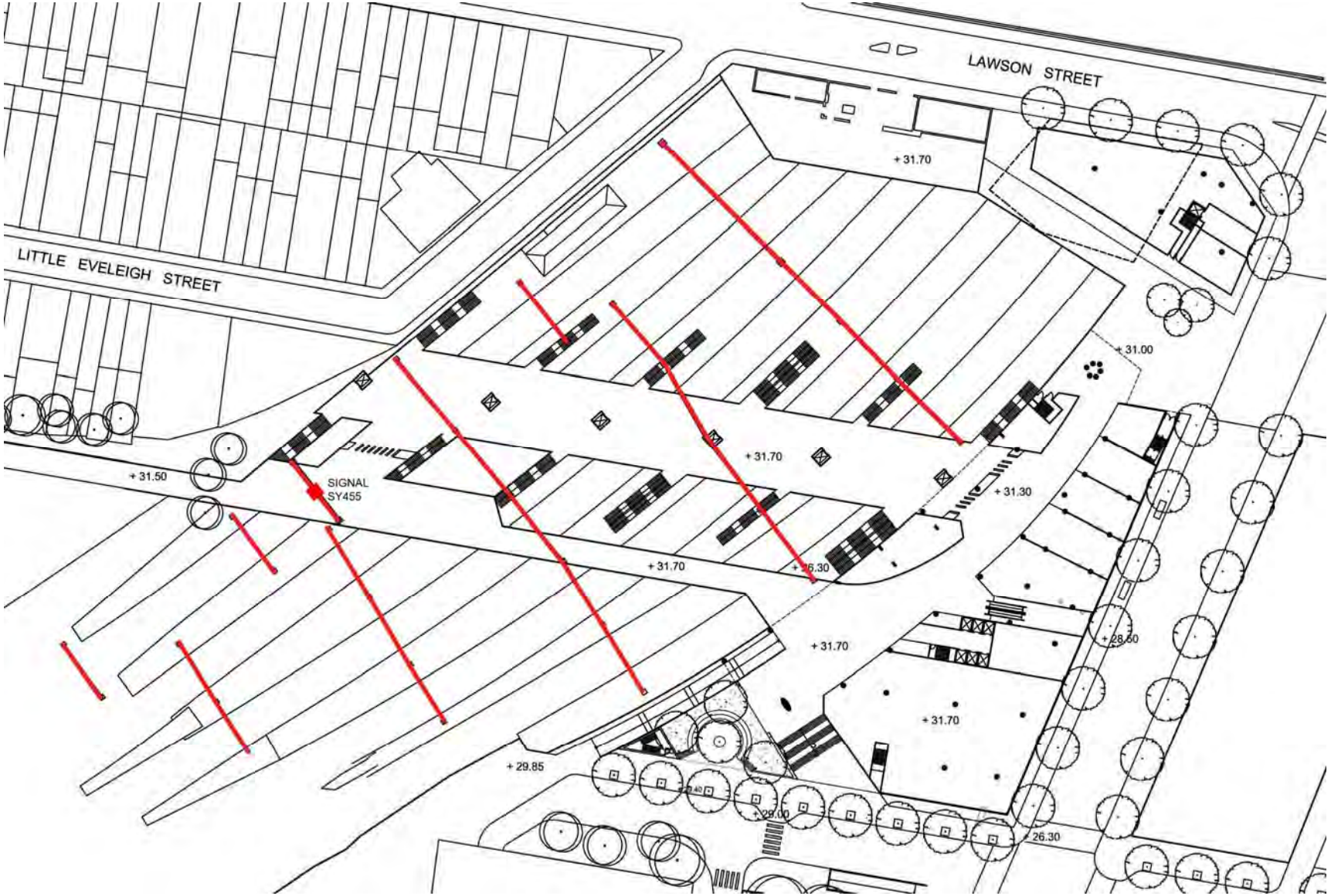

Figure 2.6: Option C - Impact on OHW

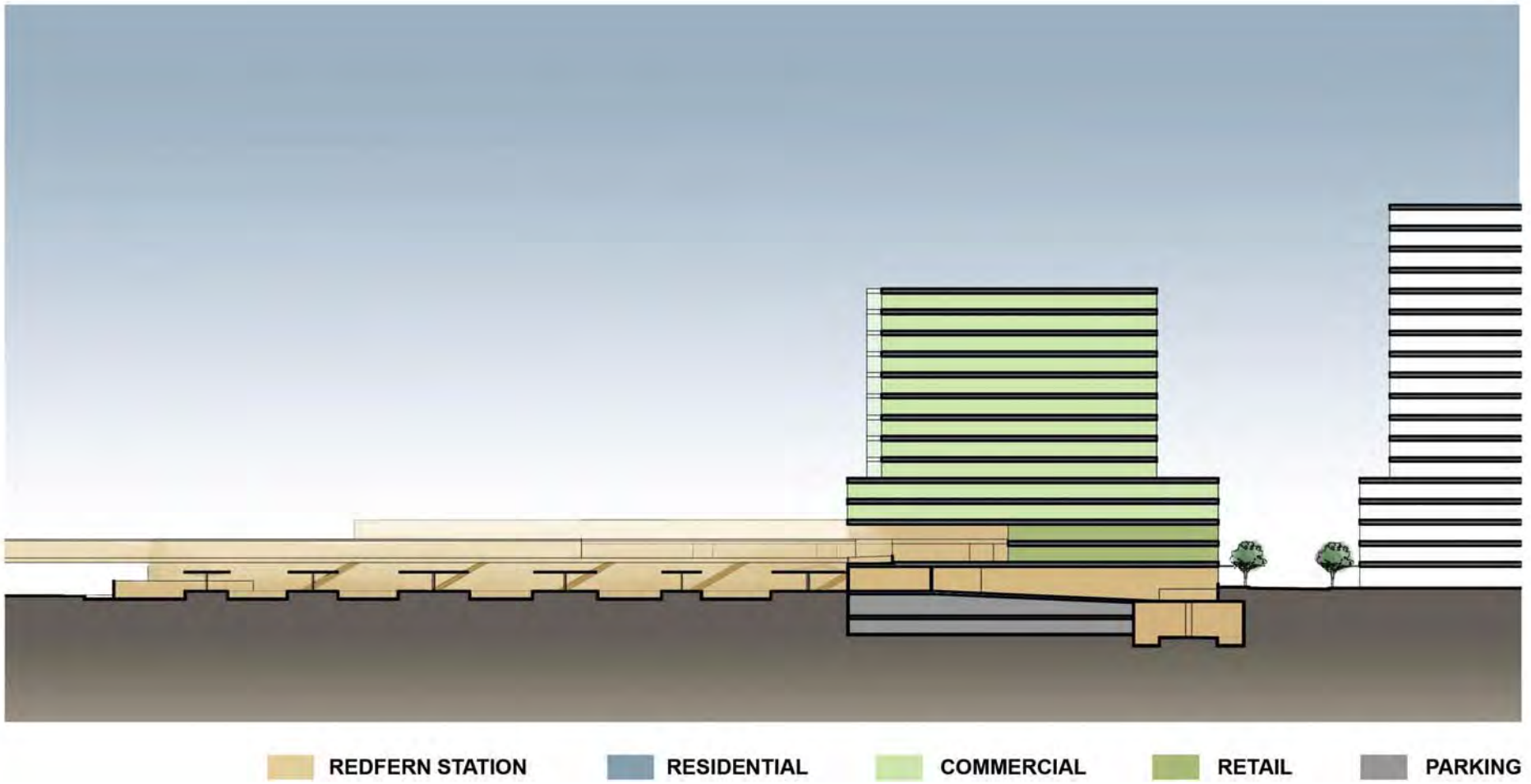

Figure 2.7: Section AA

3. ASSESSMENT OF THE OPTIONS

3.1 ASSESSMENT CRITERIA

The three options have been assessed against the design criteria derived from the design objectives noted in Section 1 of this report. In summary these options improve station function and bring benefit to Redfern.

Station function & operation

- Pedestrian capacity & flow
- Safety and security including emergency egress
- Comfort of station environment
- Ease of station management
- Disabled access (DDA compliance)
- Good rail to rail interchange, including Illawarra Relief

Benefit to Redfern

- Image of station
- Heritage conservation
- Quality of pedestrian and cycle connections
- Quality of interface between Redfern Station and its surrounds
- Development opportunities

The design options have only been assessed against architectural and station operation criteria and not against either value for money or buildability (including interruptions during construction or impact on the platforms) as these tasks follow on after the issue of this Paper. As mentioned in Section 2, engineering and fire life and safety are common to all the options.

3.2 ASSESSMENT OF OPTIONS

The assessment of three options discussed in Section 2 against the design criteria is shown below:

	CRITERIA	OPTIONS		
		A	B	C
		New concourse with minimal impact on existing buildings	New concourse parallel to stanchions	New concourse parallel to Lawson Street
	Station function			
1	Pedestrian capacity & flow			
2	Safety and security			
3	Comfort of station environment; pleasant			
4	Ease of station management			
5	Provides disabled access (DDA compliance)			
6	Good rail to rail interchange, including Illawarra Relief			
7	Satisfaction of user requirements (see Appendix 1)			
8	Fire and life safety			
	Benefit to Redfern			
7	Image of station			
8	Heritage conservation			
9	Quality of pedestrian and cycle connections			
10	Quality of interface between the station and surroundings			
11	Commercial development opportunity at the station			

Table 3.1 – Assessment of options

Legend

Best performer

Satisfactory

Worst performer

The following text should be read in conjunction with Figures 2.1 to 2.5 and Table 3.1 that rank their performance against the 11 criteria cited in Section 1.

STATION FUNCTION AND QUALITY OF ENVIRONMENT

1. ***Pedestrian capacity and flow:*** Option C provides the most direct access to all platforms from a compact paid concourse. The two barriers are located to provide good access from the three primary passenger arrival directions and direct access to the unpaid concourse from The ATP, the North Eveleigh site, Darlington (including the University of Sydney), Redfern Town Centre and Lawson Street. Option B would also work, however, the circulation is not as clear. As noted above, the retention of the existing buildings on the platforms in Option A would severely restrict passenger movement on platforms and the station's overall capacity.

2. ***Safety and security:*** Option C is superior to A and B because the paid and unpaid concourses are easy to supervise from a central location and sight lines are better for safety and surveillance. The unpaid concourse in B and C would both have active retail edges, which would make them safer than A.

3. ***Station comfort:*** B and C provide a civic space along Gibbons Street and retail edge to the unpaid concourse that cannot be provided in A. C provides the clearest circulation and minimum walking distances to/through the Station and to the surrounds.

4. ***Ease of station management:*** The compact layout of C would make C easier to manage than either A or B. B is superior to A in this respect, as the paid concourse is smaller and would be easier to supervise.

5. ***Disabled Access:*** Although this would be provided by all options, it is only available at the southern concourse in option A. In Option B, the provision of complying access from ATP requires the use of "zigzag" ramps, which are avoided in Option C.

6. ***Rail-to-Rail interchange:*** Option B performs the worst in this respect because of the need to walk for substantial distances to gain access to platforms 8 and 9 from all other platforms. The legibility and ease of transfer between platforms in Option C are superior to both A and B.

BENEFITS TO REDFERN

1. ***Image of station:*** Option A is inferior in this respect due to the poor outcome achieved between the retained existing platform buildings and the new stairs, concourse and lifts. The more direct and compact plan of Option C will convey a clearer image than the more complex layout of Option A. All options can provide a more positive urban design context for the station and vastly improve the public environment of the Station and surrounds.

2. ***Heritage conservation:*** Option A is superior in this respect, as the existing platform buildings are retained, as well as the booking office on Lawson Street. However, it can be seen that the retention of buildings on the platforms would severely compromise the capacity and performance of the Station. Options B and C retain the booking office on Lawson Street as well as some buildings on Platform 1.

3. ***Quality of pedestrian and cycle connections provided:*** The configuration of Option C provides excellent level connections in all directions providing legible connections to Redfern Town Centre, ATP and the North Eveleigh site. It also provides easier and more generous access between the ATP and the station concourses. Option A would require stairs and an elevator at the western end of the unpaid concourse bridge. In Option B the east-west pedestrian route is a less direct route and difficult to navigate.

4. ***Quality of the interface between the station and its context:*** Options B and C provide development along Gibbons Street and are consistent with the strategies outlined in the Redfern-Waterloo Built Environment Plan. Option A does not provide a civic space along Gibbons Street, whilst the civic space is provided in Options B and C. Option C is superior to Option B as it provides a substantially better space opposite the Water Tower Apartments along Marian Street. Both B and C provide retail frontages to both Gibbons Street and the unpaid concourse. This cannot be the case with Option A.

5. ***Commercial development opportunities:*** All options provide approximately the same quantity of development floor area along Gibbons Street. The net lettable area for the development site would be approximately 37,000m^2 with approximately 140 to 160 car parking spaces in two levels of basement. Options B and C are superior in that almost double the amount of retail space can be provided with frontages to both the unpaid concourse and Gibbons Street.

4. NON-COMPLIANCE WITH THE USER REQUIREMENTS

NO.		*OPTION - A*	*OPTION - B*	*OPTION - C*
3.1	***Station and Surrounds***			
3.1.1	General	Has a significant impact on station operation during construction and does not provide for emergency vehicle parking.	Has a significant impact on station operation during construction and does not provide for emergency vehicle parking.	Complies with all general requirements except has a significant impact on station operation during construction.
3.1.2	Way Finding, Information, Advertising and Queuing	Provides new way finding systems, signage and addresses all the queuing issues at booking offices and ticketing areas.	Provides new way finding systems, signage and addresses all the queuing issues at booking offices and ticketing areas.	Provides new way finding systems, signage and addresses all the queuing issues at booking offices and ticketing areas.
3.1.3	Platform	Complies with all the requirements except for width adjacent to station buildings and, possibly, platform levels and cross falls.	Complies with all the requirements.	Complies with all the requirements.
3.1.4	Concourse	Complies with all the requirements except the paid concourse is very big and would add to maintenance and management cost.	Complies with all the requirements.	Complies with all the requirements.
3.1.5	Disability Discrimination Act – Disabled Access	Existing station shelters on Platforms 1,4,5,6,7,8 obstruct accessible path and do not comply with DDA requirements.	Complies with all the DDA requirements except existing station shelters on Platforms 1 obstruct accessible path and do not comply with DDA requirements.	Complies with all the DDA requirements except existing station shelters on Platforms 1 obstruct accessible path and do not comply with DDA requirements.
3.1.6	Vertical Transport	Complies with all the requirements.	Provides centre loading on all platforms and meets all the requirements.	Provides centre loading on all platforms and meets all the requirements.
3.1.7	Ticketing	Complies with all the requirements.	Complies with all the requirements.	Complies with all the requirements.
3.1.8	Public level-Street level RWA	Does not provide a civic space along Gibbons Street and at-grade connection from North Eveleigh site to Gibbons Street.	Complies with all RWA requirements.	Complies with all RWA requirements.
3.2	***Conceptual – Safety, Security, Building Services, Heritage***			
3.2.1	Safety	Complies with safety requirements. For details see F&LS section.	Complies with safety requirements. For details see F&LS section.	Complies with safety requirements. For details see F&LS section.
3.2.2	Security	Does not consider blast impact.	Does not consider blast impact.	Does not consider blast impact.

NO.		OPTION - A	OPTION - B	OPTION - C
3.2.3	Heritage	Store building on Platform 1 not retained.	Store building and booking office on Platform 1 not retained.	Store building and booking office on Platform 1 not retained.
3.3	***Rail Infrastructure***			
3.3.1	General	The option would meet the requirement. More detailed work is required to fully assess the impact and extent of the requirement.	The option would meet the requirement. More detailed work is required to fully assess the impact and extent of the requirement.	The option would meet the requirement. More detailed work is required to fully assess the impact and extent of the requirement.
3.3.2	Track and ROW	The option would meet the requirement. More detailed work is required to fully assess the impact and extent of the requirement.	The option would meet the requirement. More detailed work is required to fully assess the impact and extent of the requirement.	The option would meet the requirement. More detailed work is required to fully assess the impact and extent of the requirement.
3.3.3	Bridge Structures	The option would meet the requirement. More detailed work is required to fully assess the impact and extent of the requirement.	The option would meet the requirement. More detailed work is required to fully assess the impact and extent of the requirement.	The option would meet the requirement. More detailed work is required to fully assess the impact and extent of the requirement.
3.3.4	Electrolysis, earthing and bonding	The option would meet the requirement Further investigations are required to assess compliance.	The option would meet the requirement Further investigations are required to assess compliance.	The option would meet the requirement Further investigations are required to assess compliance.
3.3.5	Pier and Column Protection Requirements	New paid and unpaid concourse and the wall between the IR tunnel and the car park comply with the requirements.	New paid and unpaid concourse and the wall between the IR tunnel and the car park comply with the requirements.	New paid and unpaid concourse and the wall between the IR tunnel and the car park comply with the requirements.
3.3.6	Signalling and control Systems	Signal SY455 is not directly affected but might have signal sighting issues.	Signal SY455 needs to be reconfigured.	Signal SY455 needs to be reconfigured.
3.3.7	Power	Additional areas for electrical installations can be located in the vicinity of the development site.	Additional areas for electrical installations can be located in the vicinity of the development site.	Additional areas for electrical installations can be located in the vicinity of the development site.
3.3.8	High Voltage	No service search has been carried out.	No service search has been carried out.	No service search has been carried out.
3.3.9	1500v Overhead Wiring system	OHW needs to be reconfigured because of the new concourse.	OHW needs to be reconfigured because of the new concourse.	OHW needs to be reconfigured because of the new concourse.
3.4	***Maintainability***	Complies with all the requirements.	Complies with all the requirements.	Complies with all the requirements.
3.5	***Environment and Quality***			

NO.		OPTION - A	OPTION - B	OPTION - C
3.5.1	Environment	Complies with all the requirements.	Complies with all the requirements.	Complies with all the requirements.
3.5.2	Quality	Complies with all the requirements.	Complies with all the requirements.	Complies with all the requirements.
3.6	Interface with other rail projects	Complies with all the requirements.	Complies with all the requirements.	Complies with all the requirements.

5. CONCLUSION

From the assessment of the possible options it can be seen that Option A, as a result of the retention of the existing platform buildings on all the platforms, does not perform very satisfactorily against the assessment criteria outlined in Section 3. Options B and C perform much better against all the assessment criteria as the removal of the platform buildings improves the capacity and performance of the Station.

Option C meets the assessment criteria for the station function and benefit to Redfern to a higher level than Option B, but Option B may have a slightly lower capital cost because the concourse is parallel to the OHW stanchions and hence causes less disruption to the relocation and lowering of the existing overhead wiring. The difference in terms of number of stanchions affected would not appear to be significant and hence the cost difference may not be significant but the implementation time to make the changes prior to building the concourse may be longer, depending upon RailCorp's available design and construction resources.

Various alternatives have been considered for the connection to the Illawarra Relief line that were not satisfactory and hence connection through Platform 10 is considered to be the best solution.

Option C addresses all the assessment criteria and is therefore recommended as the preferred option. There are a number of possible variations within this preferred option that will need to be considered in later stages of design development.

Cost and Constructability report prepared by Tenix parallel to the Discussion paper will prompt a review of the options. Any suggestions from Tenix on making the designs more efficient will be incorporated into the next stage of the project.