



Section C Cost and Constructability

Cost and Constructability Report



*Imagine
Create*

Redfern Station Redevelopment

Cost and Constructability Report

July, 2009



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Cost and Constructability Report

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Executive Summary

This Cost and Constructability report has been prepared by Bovis Lend Lease Consulting (BLLC) for the Redfern Station Redevelopment – revised concept design. The report supports the business case for the revised concept design.

Background

The Redfern Waterloo Authority (RWA) released a Built Environment Plan for the precinct in August 2006 with the upgrade of Redfern Station as a key element. As part of the BEP, the upgrade should provide an opportunity to improve connectivity to the town centre, the University of Sydney and the Australian Technology Park.

RailCorp and RWA have been working co-operatively on a number of options for the redevelopment of Redfern Station and this has resulted in the concept design by Jackson Teece (2007) of a preferred option: "option C – full station redevelopment". This option C provides a new elevated concourse above the centre of the platforms and allows for easier passenger flow through the station and population of the concourse. It includes an unpaid pedestrian access across the rail line for non-rail users in line with the overall station concourse structure and a commercial development in the zone surrounded by Platform 10, Gibbons and Marian Streets.

On this option C, Tenix Projects prepared a cost and constructability report covering construction methods, construction programme and cost plan for the full station redevelopment. The outcome of that report showed that the concept design did not satisfy the business case in relation to value for money. (refer to appendix F, Peer review of Tenix Projects, for more details about this option C and the other options).

Revised Concept Design

In order to optimise the proposed Redfern Station redevelopment RailCorp initiated a review of the Jackson Teece concept design option C, which has now been redesigned to a proposed revised concept design with the aim to optimise the redevelopment including the concourse alignment and separate the station redevelopment works from the proposed commercial development.

BLLC coordinated this design process and has developed a construction methodology in order to facilitate a staged approach for the redevelopment works. This resulted in reduced costs for the new station and shortened the construction programme.

Besides a new elevated concourse above the centre of the platforms, the proposed revised concept design provides three options for the unpaid pedestrian and cycle access:

1. An on-grade access perpendicular to the railway tracks close the southern end of the platforms;
2. An elevated concourse suspended in the roof structure above the proposed station concourse; and
3. An on-grade access parallel to the proposed station concourse. Note the cost of this structure will be similar to that of Option 1.

Construction methodology

As many of the station upgrade works can only be safely and effectively be undertaken during track possessions, the programme of works is heavily dependent on RailCorp's possession regime. In order to get the most efficient programme the sequence of works need to be carefully planned. An indicative start date of July 2011 for construction works has been adopted for the programme.

As an alternative to the standard weekend possessions, BLLC proposes a preferred possession regime designed to reduce the cost and programme of the station redevelopment by bringing forward the



commissioning of the concourse. This preferred possession regime requires, among other, typical possession closedowns between Christmas and New Year. Note that an earlier construction start is required to achieve these outcomes.

Cost plan

For the station redevelopment and the three options for the unpaid pedestrian and cycle bridge, cost estimates have been prepared. It is estimated that the concourse suspended above the proposed station concourse (option 2) will cost approximately [redacted] more than the on-grade versions of access - perpendicular to the railway tracks (option 1) or parallel to the concourse (option 3). Option 2 will also add approximately one month to the project duration. This is due to the additional structural steel and façade required for the concourse as well as the additional lifts and stairs required at each end of the unpaid access.

Savings using preferred possession regime are in the order of [redacted] direct costs and [redacted] including indirect costs. The costs and duration of the proposed revised concept design (option 1) are summarised in the following table:

Development Options	Cost (2009 Dollars)	Duration
Revised C	[redacted]	34 months
Revised C (Alt Possn Regime)	[redacted]	29 months

*Project Management and Facilities cost reduced proportionately to time and subcontractor direct costs reduced by 2% for improved efficiency – Note that possessions costs increase by [redacted]

The Tenix Projects cost and duration of the previous option C is summarised in the following table:

Development Options	Cost (2009 Dollars)	Duration
Jackson Teece option C	[redacted]	47 months

*The figures have been adjusted to include current rates and items Bovis Lend Lease Consulting feels were not included in the Tenix Projects cost plan such as additional worksite protection and fire rating to beams in the ESR.

Conclusion

The proposed revised concept design, developed by BLLC, Cox Richardsen and Arup, and construction methodology developed by BLLC, has resulted in reduced costs and construction durations compared to the previous concept design from Jackson Teece.

In order for construction to start no later than early 2011 it is critical that RailCorp adopts the preferred possession regime and follows the indicative timeframes outlined in chapter 7 – *Way Forward* of this report.



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1. Introduction

1.1 Background

RailCorp is progressing the Concept Development planning for Redfern Station to Project Definition stage. This cost and constructability report forms part of that progression.

The Redfern Waterloo Authority (RWA) released a Built Environment Plan for the precinct in August 2006 with the upgrade of Redfern Station a key element. As part of the BEP, the upgrade provides the opportunity to improve connectivity to the town centre, the University of Sydney and the Australian Technology Park.

RailCorp and RWA have been working co-operatively on a number of options for the redevelopment of Redfern Station and this has resulted in the concept design by Jackson Teece of a preferred option: "option C – full station redevelopment". This option achieved the best outcomes in relation to the long term planning needs for the station upgrade, the user requirements, and improved safety and security compared to the other options developed in the previous concept design. Option C provides a new elevated concourse above the centre of the platforms and allows for easier passenger flow through the station and population of the concourse. It includes an unpaid pedestrian access across the rail line for non-rail users in line with the overall station concourse structure and a commercial development in the zone surrounded by Platform 10, Gibbons and Marian Streets.

This commercial development added significant scope and ultimately cost to the redevelopment of Redfern Station. The proposed revised concept design has been redesigned to allow for separate staging of the commercial development from the station upgrade works.

The proposed revised concept design reconfigures the alignment of the elevated concourse above the platforms to improve the connectivity and interface with Platforms 11 and 12 in the Eastern Suburbs Railway and to minimise the impact on existing overhead wiring structures. The proposed revised concept design also provides three options for the unpaid pedestrian and cycle access:

1. An on-grade access perpendicular to the railway tracks close the southern end of the platforms;
2. A passageway suspended in the roof structure above the elevated concourse.
3. An on-grade access parallel to the proposed station concourse. Note the cost of this structure will be similar to that of Option 1.

RailCorp also previously engaged Tenix Projects to analyse the previous concept design options for the Redfern Station Redevelopment and report on the cost, constructability and programme. This report includes a peer review of the Tenix Projects report (Refer to Appendix A).

For consistency and comparison purposes, BLLC have generally used the same headings of the Tenix Projects Cost, Constructability and Programming Review Report – Revision 3 dated 3 April 2007.

1.2 Purpose

The purpose of this report is to undertake a cost and constructability analysis of the proposed revised concept design of the Redfern Station Redevelopment with the aim to identify cost and time savings.

1.3 Key Assumptions and approach

1.3.1 Programme

- In the interest of safety, cost and time, a significant amount of station upgrade works will need to be undertaken during weekend track possessions.
- Only certain tracks are "closed" on weekend track possessions to permit infrastructure work to be undertaken and RailCorp Train Planning manage which tracks are in possession through a system of "configurations". Redfern is impacted by a number of configurations, each with a different number of tracks in possession.

Configuration No.	Tracks in possession
1	<ul style="list-style-type: none"> ▪ Up and Down Illawarra ▪ Up and Down Illawarra Relief
1A	<ul style="list-style-type: none"> ▪ Up and Down Illawarra Local ▪ Up and Down Illawarra ▪ Up and Down Illawarra Relief
3	<ul style="list-style-type: none"> ▪ Up and Down Main ▪ Up and Down Suburban
4	<ul style="list-style-type: none"> ▪ Up and Down Local ▪ Up and Down Illawarra Local
8	<ul style="list-style-type: none"> ▪ Up and Down Suburban
15	<ul style="list-style-type: none"> ▪ Up and Down Suburban ▪ Up and Down Local ▪ Up and Down Illawarra Local

- RailCorp's possession regime has been used to develop a baseline construction programme based on a commencement date of July 2011. This programme has then been reviewed to identify potential time savings by proposing additional possessions and new extended possessions during low patronage periods such as Christmas/New Year and early January.

- The programme has been based on the following RailCorp Weekend and Closedown Possession Programmes:

- 2010/2011 Draft 3
- 2011/2012 Draft 5
- 2012/2013 Version 3
- 2013/2014 Version 1
- 2014/2015 Version 1

- It is assumed that all of the possessions applicable to Redfern Station will be available to the project. Furthermore, certain possession configurations will require track vehicle (hi-rail) access to platforms via Central Station and Erskineville/MacDonaldtown access points. It is also assumed that these routes to the station will not be significantly inhibited by other works such as routine maintenance and other capital works projects.

- Where possession configurations result in one side of an island platform being in possession and the adjacent platform is operational, it is assumed that trains will not stop at the adjacent platform thus excluding passengers and station staff from the whole island platform.

- Where possession configurations permit access to more than one platform, it is assumed that there will be sufficient resources and equipment available to work in more than one area for identical tasks.



- A reasonable amount of work has been proposed to be undertaken in each possession without creating excessive risk of a late hand back at the end of a possession.
- The revised design has been optimised to reduce the impact on rail systems such as overhead wiring and signals. However, modifications to the existing system are unavoidable and will require the services of specialised resources. It is assumed that these specialised resources will be available when required.
- While not detailed in this report, it is assumed that with adequate notification, Midnight to Dawn possessions with power out can be arranged if required.
- It is assumed that the migration of station operation facilities such as platform control rooms and ticket offices do not require a track possession and can be undertaken on weekends.
- It is assumed that no major service routes will be impacted by the redevelopment.
- It is assumed that modifications to the staging of the works will not be required for special events during construction.

1.3.2 Cost

- Costs are presented in 2009 dollars.
- The costing of the project is based upon RailCorp awarding a design and construct contract to a capable contractor. However, RailCorp may also consider other delivery methods such as Design only - Build only, Alliance or Managing Contractor. In considering each method, RailCorp should be mindful of the impact on design timelines, internal resources required and the time associated with tender and award of the various procurement methods.
- For Design Only – Build Only (Principal Detailed Design by RailCorp), the total cost for design will remain the same as for Design and Construct as will the durations for the activities. The only difference will be when the contracts start.
- The proposed revised concept design essentially excludes any development scope other than showing potential development footprints and ensuring the station upgrade works will not significantly inhibit any future development. Thus, the station upgrade can be undertaken independent of multiple future developments without additional cost to RailCorp.
- Due to the redesign, the cost plan makes no allowance for any commercial development or enabling works as it is understood that these will be the responsibility of the developer. Notwithstanding this, Bovis Lend Lease Consulting estimates a gross cost of \$112M for a 20,000m² net lettable area building including allowances for working in proximity to the rail corridor would be required by the developer.
- The cost plan makes no allowance for any retail development but Bovis Lend Lease Consulting estimates a gross cost of \$5.2M for the retail area would be required by developers.
- For the purpose of calculating alternate transport, trackwork marketing and possession management costs, 42% of the construction costs are considered to be associated with works undertaken during possessions.
- The cost plan only allows for an internal strip out of the existing RailCorp heritage offices on Lawson Street.



- The area above the void that is the disused Southern Suburbs line bounded by the ESR, Platform 10 and the existing steel grillage has been identified as a potential retail zone at street level. No allowance for any improvement in this area has been made in the cost plan.
- Bovis Lend Lease Consulting has identified costs associated with works that could be considered non-capital and therefore should be excluded from the station upgrade budget.
- An allowance has been made for alternate transport, trackwork marketing and possession management based on RailCorp's Alternate Transport & Trackwork Marketing – Recovery of Costs from Capital Projects and External Parties Process – Version 4.2 August 2008 and the indicative costs provided by RailCorp's Possession Budgets and Communications Co-ordinator.
- Although an allowance has been made for fire-rating the beams, until further investigations are undertaken, no allowance has been made for remedial works to the steel beams supporting the roof above the Illawarra Relief.

1.3.3 Constructability

It is assumed that areas of the platforms can be temporarily hoarded off to permit construction of concourse and unpaid footbridge piles, pile caps, columns and headstocks during normal working hours. Similar hoardings will be required for demolition and construction works on Platform 11/12 in the Eastern Suburbs Railway. Each stage should be subjected to pedestrian modelling analysis during the design phase. It is envisaged that timber hoardings on platforms similar to those used on other recent projects such as North Sydney Station Upgrade, Hornsby Platform 5, Epping and Parramatta Transport Interchange will suffice.

It is assumed that RailCorp will permit asphalt hi-rail access ramps to be installed across the Main Lines to the south of the platforms and another across the Illawarra, Illawarra Local and Local Lines to the North of the Station to permit hi-rail access from North Eveleigh and the Sydney Signal Box respectively during non-operating times. These ramps will enable hi-rail access to each island platform.

The station upgrading works will require materials handling areas, site accommodation for the project team and track access points. It is assumed that:

- the construction site offices and amenities can be located in the former signals depot located above the ESR;
- the carpark area above the ESR and Southern Suburbs lines can be used as a storage area for plant and materials;
- The park between Gibbons and Rosehill Streets is available for station and construction parking during construction;
- Access to the tracks can be gained from outside the Sydney Signal Box and from the area in North Eveleigh

It is assumed that access to the void between Platforms 10 and 11 can be gained via the Sydney Signal Box and the disused Down Southern Suburbs tunnel.

Based on the likelihood of the project proceeding, it is recommended that preliminary works such as the following are commissioned as soon as possible to facilitate planning approval and enable the designers to make informed decisions in relation to substrata and services quantities and locations.

- Existing services investigation (Detailed Services Search and Dial Before You Dig)
- Geotechnical investigation
- Hazardous Materials Survey (Note that a hazardous materials survey of Redfern Station may have already been carried out)
- Structural integrity investigation including confirmation of member sizes shown in 1970s drawings

- Boundary survey
- Heritage Impact Study
- Acoustic and vibration analysis
- Development study
- Traffic Impact Study
- Environmental review
- Fill validation

1.4 References

The following documents were referenced in the development of this report:

Ref No.	Description
1	Tenix Projects Cost, Constructability and Programming Review Report – Revision 3 dated 3 April 2007
2	Tenix Projects Review and Clarification to Report 10618TR001 Revision 03 Dated 3 rd April 2007
3	RailCorp document SAM-AMP-005 "Alternate Transport & Trackwork Marketing Recovery of Costs from Capital Projects and External Party Process – Version 4.2 (August 2008)
4	RailCorp Weekend and Closedown Possession Programmes – 2010/2011 Draft 3
5	RailCorp Weekend and Closedown Possession Programmes – 2011/2012 Draft 5
6	RailCorp Weekend and Closedown Possession Programmes – 2012/2013 Version 3
7	RailCorp Weekend and Closedown Possession Programmes – 2013/2014 Version 1
8	RailCorp Weekend and Closedown Possession Programmes – 2014/2015 Version 1

2. Construction Methodology

2.1 Introduction

The construction methodology has been developed in consideration of the restricted access to platforms and tracks. A number of assumptions have been made as outlined above and are critical to the realisation of the construction methodology.

As a general rule it is more effective and safer to undertake construction works in the rail environment during track possessions when train services are suspended and power to the OHW is isolated. However, the limited number and relatively short duration of track possessions, can lead to prolonged project durations and intensive work schedules increasing the risk of delayed handback and train operation disruption. Therefore, works undertaken during normal working hours must be considered to mitigate against project prolongation and disruptions to train operations following a possession.

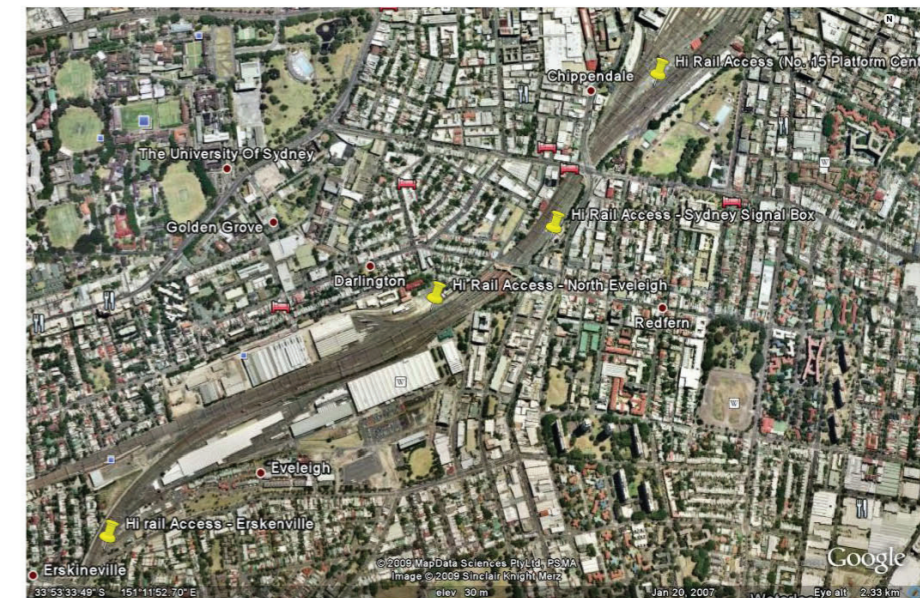
The key to undertaking works during normal working hours in a rail environment is separation of the works from passengers, station staff and railway systems (eg OHW) through protective hoardings. Once in place, hoardings provide an area where construction activities can be safely undertaken with minimal impact on station operations.

The existing concourse and station facilities at the city end of the station will remain operational during the construction works on and above the platforms. After the new concourse has been commissioned the existing concourse will be decommissioned. Therefore, there is essentially only one stage for the works to the surface platforms with the sequence of works described in the construction programme.

For the Illawarra Relief, staging is critical to maintaining adequate access and egress to and from the platforms. The staging is outlined in Section 2.6 below.

2.2 Construction Access to Surface Platforms

It is envisaged that personnel access to the surface platforms will be via the existing stairs at the city end of the platform. Equipment and materials deliveries to central surface platforms would be via hi-rails during out of hours on weekend and night time possessions from hi-rail access points at Central Station, Erskineville and Eveleigh (see image below). The removal of excavated and excess materials would also be via hi-rail vehicles at these times.



Google Earth Image – Hi Rail Access Points

Concrete for platform structures could be delivered via concrete pump lines through PVC sleeves beneath the rails at the country end of the platforms or alternatively at night via concrete pumps lines from the corner of Lawson and Gibbons Streets down the existing stairs at the city end of the platforms.

Work areas on platforms would be surrounded by hoardings with secure doors and gates for personnel, materials and equipment access.

RailCorp should expect some reduced level of amenity during construction including reduced shelter on platforms when the heritage buildings and awnings are being demolished.

The majority of work on the western end of the new concourse will be behind Platform1, especially once the existing building in Little Eveleigh Street is demolished. Access to this area will be via Little Eveleigh Street and Eveleigh Workshops. It is envisaged that the new landing will also serve as a crange platform for the installation of precast concrete deck elements.

On the eastern end of the concourse, the majority of the work will be behind the retaining wall on Platform 10 with access via the existing carpark area off Marian Street. It is envisaged that the area behind the retaining wall on Platform 10 will serve as the crange platform for the installation of precast concrete deck elements.

2.3 Early Works

Early works would include services relocation and protection and the demolition of the existing building on Little Eveleigh Street.

2.4 Surface Platforms Construction Sequence

The construction sequence for the new concourse and unpaid pedestrian and cycle bridge in Option 1 are very similar and are outlined in the indicative programme. The main difference is that the narrower platform width at the proposed location of the unpaid pedestrian and cycle bridge prevents some of the substructure works being undertaken during normal working hours. It has therefore been assumed that these works can only be undertaken during possessions; however, working in these areas at night could be explored further by the construction contractor.

The construction sequence on platforms would be as follows:

- Relocate services and station operation equipment such as SPIs, Emergency Help Points, Precise Clocks (possession);
- Extend Platform 3 only to facilitate construction of egress stairs;
- Demolish existing buildings and awnings (possession – refer to Fig 2 below);
- Erect hoardings(dayworks);
- Construct piles, pile caps, stair landings, awning foundations control room foundations, columns and headstocks (dayworks except for unpaid footbridge where narrow platforms do not permit);
- Construct control rooms (these could be modular units built offsite and delivered to site during a possession);
- Due to the risk of platform subsidence, the excavation of lift pits have been scheduled during possessions;
- Construct new egress stairs (possession and dayworks - Platform 2/3 only)
- Erect platform awnings (possession);
- Demolish existing stairs to concourse (possession – Platform 2/3 only)
- Re-profile platform surface for Level Access (possession).

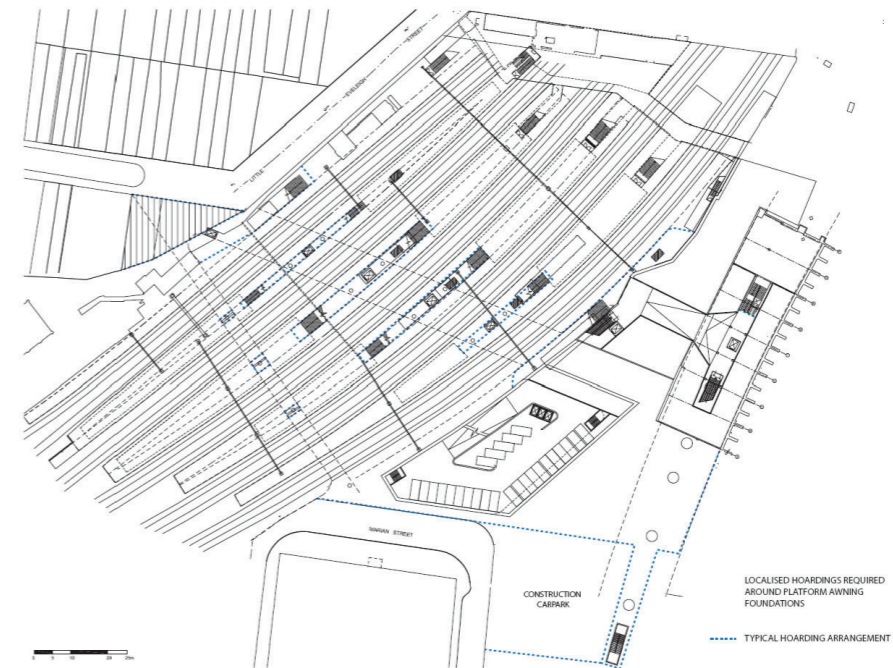


Figure 1 - Indicative hoarding arrangement to platforms

The hoardings at street level are expected to be erected for the majority of the project duration whilst the hoardings on the platforms are expected to be erected for the duration of the substructure works to the concourse (see Fig 1). Localised hoardings will be required around other substructure works such as footings for the awning structure.

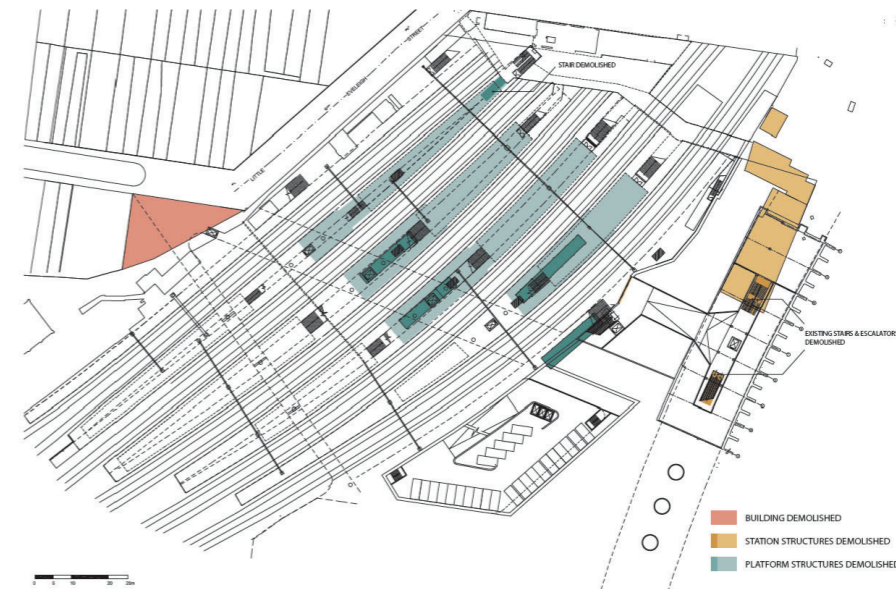


Figure 2 - Structures to be demolished

2.5 Illawarra Relief and Void between Platforms 10 and 11

Platforms 11 & 12 are serviced by the Up and Down Illawarra Relief lines which form part of the Eastern Suburbs Railway (ESR) and are located to the east of Platform 10. The reduced level of Platform 11 & 12 is approximately 6m below the surface platforms. There is an intermediate concourse level in between the ground level and platform level. In between Platforms 10 and 11 is the corridor for proposed Southern Suburbs Railway which was never progressed. Although tunnels were constructed at the Northern end of Redfern Station and some structural steel was erected for the station building, essentially a void has been left in this area (refer to Image 1 and Image 2 below).



Image 1 – Void between Platform 10 and Eastern Suburbs Railway looking towards Sydney



Image 2 – Google Earth view of void between Platform 10 and the Eastern Suburbs Railway

It is envisaged that the existing steel grillage erected for the Southern Suburbs Railway will be utilised for the link between the new concourse and Platforms 11 & 12 as well as extending the covered area on grade with the concourse. This will ensure that the station upgrade works will not significantly inhibit any future development with that the void bounded by the retaining wall along Platform 10, the Southern Suburbs tunnels, the ESR and the existing steel grillage remaining unimproved until such commercial or retail development is undertaken.

The existing steel shows signs of corrosion and requires closer inspection by a structural engineer as to its integrity. It is assumed that it can be remediated to a condition suitable for supporting the link between Platforms 10 & 11 as well as extending the covered area on grade with the concourse.

In addition to the link between Platforms 10 & 11, there are substantial works to be undertaken in the ESR station building. In order to maintain station operations, the works the ESR need to be staged. The staging has been included in Figure 3 and is outlined as follows:

1. Erect hoardings and construct new emergency egress route at southern end of platforms (dayworks with access from above ESR);
2. Construct smoke exhaust vents (dayworks with access from above ESR);
3. Hoard off existing stairs and demolish (dayworks and nightworks);
4. Build new escalators in void left from demolished stairs (possession);
5. Close and remove existing escalators (possession) – Note that substantial time savings may be gained if this activity is not dependent on the opening of the new concourse and passengers access/egress the new escalators via Platform 10;
6. Construct new city end stair and lift in void left by escalators (dayworks and nightworks);
7. Resurface platforms to provide Level Access (possession);
8. Fill stair and escalator voids in ground level slab (dayworks and nightworks);
9. Demolish exiting roof structure to ground level (dayworks);

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- 10. Waterproof ground level slab (dayworks);
- 11. Landscaping (dayworks).



Figure 3 - Construction Staging of the ESR

Additional station staff is recommended as long as RailCorp identifies a risk exists to direct passengers following major configuration changes and any areas of congestion generated by construction works. Note that on the North Sydney Station Upgrade project, the Station Manager arranged and controlled the additional staff. It is assumed that the cost of providing additional staff is included in the client costs.

Based on our experience on recent projects and in the interest of cost, time and safety, Bovis Lend Lease Consulting proposes that RailCorp consider closing Platforms 11 & 12 in the ESR but allowing trains to run to timetable for up to three months to permit the structural and services works required to reconfigure the stairs, escalators and lift. We consider the inconvenience of this proposal to be reasonable considering the relative proximity of Redfern Station to Central Station. Closing the ESR to passengers at Redfern Station would require passengers to transfer at other stations such as Central and Sydenham which would need to be subject to passenger modelling due to the expected increased patronage. Note that this proposal has not been considered in the programme or cost plan for this report.

Hoarding would separate the work areas from the operating rail lines creating increased production as a result of not having to cater for passengers and station systems on a daily basis. It should be noted that whilst such an arrangement will not reduce the overall duration of the project, it will reduce the timeframe of works within the ESR and the need to use the new fire egress stairs as a station exit, thus saving costs, increasing safety and reducing project risk.

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Advantages and Disadvantages of closing Platforms 11 & 12 are summarised in the following table:

Advantages	Disadvantages
Cost savings	Inconvenience to passengers
Improved safety	Increased patronage at adjoining stations
Reduced project risk	Station and on-train communications required
Greater productivity leading to reduced duration of construction impact	No passenger egress available in case of an emergency
Reduced amount of hoarding as there are no passengers to protect	
Station systems such as smoke detectors can be isolated thus permitting work on a 24 hour basis	
Works areas only need to be cleaned for construction purposes and not for operational conditions	
No need to use new emergency egress stairs as a station access point	
Temporary lighting required for construction purposes and not for operational conditions	

The existing beams supporting the roof of the ESR are exposed and some are displaying signs of corrosion (refer to Image 3 below). Further investigation is required to determine the extent of the corrosion and to develop remediation requirements. Until further investigations are undertaken, no allowance has been made for remedial works. In addition to remedial works, the beams will require fire-rating to comply with fire and life safety requirements. As the beams extend across the tracks and OHW, the remedial and fire-rating work will need to be carried out during weekend possessions.



Image 3 - Deterioration of beams supporting ESR roof

2.6 Sequence and Methodology Issues

Based on our experience on recent projects and in the interest of cost, time and safety, Bovis Lend Lease Consulting proposes that RailCorp consider closing each of the platforms but allowing trains to run to timetable during the construction of the piles (using a mini piling rig such as the one shown in Image 4 below) and the pile caps for approximately two weeks per island platform. We consider the inconvenience of this proposal to be reasonable considering the relative proximity of Redfern Station to Central Station. Closing each platform to passengers at Redfern Station would require passengers to transfer at other stations such as Central and Sydenham which would need to be subject to passenger modelling due to the expected increased patronage. Hoarding would separate the work areas from the operating rail lines creating increased production as a result of not having to cater for passengers and station systems on a daily basis. Note that this proposal has not been considered in the programme or cost plan for this report.



Image 3 – Mini piling rig

Configuration 1A possessions enable the precast planks spanning between Platform 7 to 10 to be safely installed above the tracks with no trains and the OHW isolated. Similarly Configuration 3 possessions enable the precast planks spanning between Platform 1 to 4 to be safely installed above the tracks with no trains and the OHW isolated. There is however, no possession configuration that allows the precast concrete planks spanning between Platforms 5 & 6 to be installed using a crane reaching across tracks under possession with the OHW isolated and the train services suspended. Therefore, Bovis Lend Lease proposes that these precast planks be installed during a configuration 4 or 15 possession by skating them into position on the previously installed sections (Platform 1 to 4 or Platform 7 to 10) before lifting them into position using a crane that is restricting to only luffing above the previously installed sections as shown in Figure 4 below. In other words, the previously installed section of the concourse would act as a barrier between the live tracks and the crane.

Alternatively, and if midnight to dawn possessions with OHW power out can be arranged for the Up and Down Local tracks between Platforms 5 & 6, the planks could be installed during the nights of

Configuration 1A and/or Configuration 3 possessions. Furthermore, if the precast planks for the unpaid pedestrian and cycle bridge are to be installed on the same possession, the location of the crane could be positioned such that it can safely reach both structures thus saving on crane and crane platform costs.



Figure 4 – Possible 450T crane positions showing main boom reach (Note that a local crane contractor was consulted and advised that a 4m heavy duty fly can be added to the main boom if required to increase reach capacity without significantly compromising lifting capacity)

Platform 3 only will need to be extended to facilitate the construction of the new egress stairs at the northern end of Platform 2/3. It was considered too onerous to relocate Signal SY457M on the Down Main to facilitate extending Platform 2 and the stairs at the northern end of the platform can be configured such that they cantilever over Platform 2.

For Platforms 1 to 10, the emergency egress will be impacted by construction hoardings on platforms but the vertical transfer elements will be no worse than existing. The final configuration improves emergency egress by centralising the egress routes along the platforms and retaining the existing stairs to platform (except for Platform 2/3) for emergency use only.

Emergency egress to Platforms 11 & 12 will also be impacted by construction hoardings. The new emergency egress stairs will be narrower than the existing stairs to the platform and these will be used during the demolition of the existing stairs thus impacting emergency egress. Emergency egress for the final configuration will be improved with an additional vertical transfer element.

The station upgrade works are likely to have the following impacts on traffic:

- Road closures would be required in Little Eveleigh Street to facilitate scaffold erection/dismantling for the demolition of the existing building as well as for crane of the concourse precast concrete elements and roof structure;
- Road closures would be required in Marian Street for the construction of the unpaid footbridge;
- The proposed exhaust locations for the ESR ventilation in the revised concept design have been positioned such that they do not require road closures of Gibbons Street. However, it is



likely that the footpath on Gibbons Street will be affected during construction works as well as the road during the demolition of the ESR station box roof structure;

- In order to assist planning approval, it is recommended that RailCorp commission a Traffic Impact Study for the conversion of Little Eveleigh Street to pedestrian only access.

With many activities required to be undertaken outside of normal working hours, noise will be the major environmental factor. Any environmental conditions resulting from the REF should be commensurate with station operations and not normal construction industry conditions where work is usually performed during daylight hours.

The station upgrade works are likely to impact on the flora in Little Eveleigh Street, on Gibbons Street and in the carpark area between Platform 10 and Gibbons St.

An allowance for property condition surveys has been included in the cost plan. Some noise and vibration monitoring is also likely to be required and an allowance has also been made for this in the cost plan.

We note that the heritage buildings on Platforms 4 through 10 will need to be demolished to facilitate construction of the concourse and stairs.

3 Programme

3.1 Introduction

In the interest of safety, cost and time, a significant amount of redevelopment works will need to be undertaken during weekend track possessions. This has a significant impact on the programme.

The programme is divided into the following headings:

- Project Milestones for design, construction and commissioning;
- Procurement of tenders;
- Design including approvals;
- Possessions; and
- Construction

3.2 Possession requirements

Meetings were held in late 2008 with RailCorp's Track Possession Manager and BLLC where it was advised that 5 day closedowns for Configuration 1A and Configuration 3 possessions over the Christmas - New Year period would benefit construction and result in cost savings. The 5 day closedowns would also provide an ideal timeframe to modify platform copings to Level Access requirements. RailCorp gave their in principle agreement to these arrangements.

BLLC also advised during the meetings that long term possessions of Platforms 1 and 10 would enable the significant amount of works at the end of the concourse and unpaid pedestrian and cycle bridge to be carried out faster and more safely. RailCorp advised that possession of Platforms 1 and 10 is possible with trains not stopping at those platforms. RailCorp gave their in principle agreement to these arrangements.

3.3 Main Findings

The duration for construction is 34 months from award of contract. Bovis Lend Lease Consulting has developed a programme based on the possessions available and by undertaking dayworks behind hoardings.



An alternative possession programme, reducing the overall duration to 29 months has been developed based on the following conditions:

1. Services identification and location are undertaken during the design phase;
2. Construction on site starts in April 2011;
3. 5 day closedowns are provided for a Configuration 3 possession at Christmas 2011; and
4. 5 day closedowns are provided for a Configuration 1A possession at Christmas 2012;

We note that RailCorp gave their in principle agreement to 5 day closedowns at Christmas during the meeting in late November 2008 (Refer to Appendix B).

4 Station Upgrade Costs

4.1 Introduction

Bovis Lend Lease Consulting has developed a high level cost plan for the proposed revised concept design prepared by Cox/Arup.

Options costed include an unpaid pedestrian and cycle bridge at the southern end of platforms on grade vs elevated unpaid concourse above new concourse. A third option is an on grade, unpaid pedestrian and cycle bridge parallel to the paid concourse. The cost of this third option will be of the same order as the first option.

It is estimated that the concourse suspended above the proposed station concourse will cost approximately [redacted] more than the on-grade access perpendicular to the railway tracks close the southern end of the platforms and add approximately 1 month to the project duration. This is due to the additional structural steel and façade required for the concourse as well as the additional lifts and stairs required at each end.

Savings for preferred possession regime are the order of [redacted] direct costs and [redacted] including indirect costs. The Project Management and Facilities cost was reduced proportionately to the reduction in time from 34 to 29 months and subcontractor direct costs were reduced by 2% for improved efficiency – Note that possessions costs increase by \$326,000 due to extended possessions at Christmas.

4.2 Direct Costs

Direct costs for the works taking into account the degree of difficulty of working in a live rail environment have been priced with allowances added for undertaking the works out of hours and during possessions.

Possession support costs (eg hi-rails) have been included as a separate item as have penalty rates for working on possessions and out of normal hours.

4.3 Contractors Indirect Costs

Bovis Lend Lease Consulting has undertaken a review of the allowances made by Tenix Projects in their report and found them to be reasonable for use at concept phase. Therefore, these allowances will be applied to the direct costs in the cost plan with the exception of the D&C Contractors Project Management and Facilities allowance for which an allowance similar to that on recent projects shall be used.

11. Subcontractor Indirects – This has been factored into the direct cost rates.
12. D&C Contractors Contingency to manage Subcontractors – 10% contingency of the total direct costs to cover the risks in managing the subcontractors.

13. D&C Contractors Project Management and Facilities – The cost is based on a construction team similar to that used on similar recent projects for the durations shown in the programme.
14. D&C Contractors Design – The design costs is 5% of the total direct cost plus Contractors contingency to manage subcontractors.
15. D&C Contractors Design Verification - 2% of the total direct cost plus Contractors contingency to manage subcontractors.
16. D&C Contractors Overhead and Profit – 12% on top of all of the above. The Direct Costs added to the Indirect Costs form the Construction Cost

4.4 Client Costs

Similar to the Indirect Cost allowances, Bovis Lend Lease Consulting has undertaken a review of the Client Costs allowances made by Tenix Projects in their report and found them to be reasonable for use at concept phase. Therefore, these allowances will be applied to the Target Budget costs in the cost plan.

- C1. Design Development – 5% has been allowed for to manage any cost implications from client directions concerning design and construction methodology.
- C2. Construction Contingency – 5% has been allowed for to manage any cost implications from client directions concerning construction methodology. These contingencies, added to the Construction Cost, form the Target Budget.
- C3. EIS/REF, Survey, Geotechnical Investigations and Concept Design - 1.5% of the Target Budget
- C4. Client Project Management Team – 5% of the Target Budget
- C5. Possession Costs – These costs have been developed using RailCorp document SAM-AMP-005 "Alternate Transport & Trackwork Marketing Recovery of Costs from Capital Projects and External Party Process" – Version 4.2 (August 2008). The percentage of project works undertaken during possessions has been estimated at 44%. This percentage of the Construction Cost, divided amongst the total number of possessions available over the project duration gives an average amount per possession.
- C6. Client Project Contingency – 10% is allowed for the impact of external influences on the project such as the proposed new rail corridor immediately to the west of the station as well as changes to legislation and the requirements of external stakeholders.

4.5 Non-Capital Costs

The following are considered to be Non-capital costs

- NC1 Land and Property Acquisition Costs – Building on Little Eveleigh Street already required. No further land acquisition costs are anticipated given that the works are within RailCorp boundaries.
- NC2 Legal and Marketing Costs – 0% (minor if any)
- NC3 Financing Cost – 0% (RailCorp to apply)
- NC4 Initial Maintenance Costs

NC5 Station Ticket Gates

NC6 Ticket Vending Machines

4.6 Area Specific Assumptions

The following assumptions have been made for the specific areas of work:

4.6.1 Platform 1 to 10

No.	Assumption
1	Access to the country end of Platform 1 for materials handling can be gained from Eveleigh Workshops
2	An asphalt hi-rail access ramp can be installed across the Main Lines to the south of the platforms thus permitting access from North Eveleigh and another across the Illawarra, Illawarra Local and Local Lines to the North of the Station to permit hi-rail access from the Sydney Signal Box during non-operating times
3	The only impact on signals is the SY455 which can be relocated to the underside of the new concourse at the time of installation of the concourse
4	OHW supports can be relocated to the new concourse or unpaid footbridge at the time of installation
5	Assume that all platform edges are raised, tiled and topped with AC to the centre of the platform
6	Platform canopies will extend on Platform 8/9 only until the minimum platform width is 5.4m wide
7	Foundations for the western abutments of the concourse and unpaid footbridge will not impact on the proposed rail corridor
8	Only the existing stairs on Platform 2/3 are demolished and replaced with a switchback stair to the existing concourse
9	RailCorp will permit a mobile crane to operate using sections of the new concourse to act as a barrier between the crane and live tracks.
10	Hoardings can be erected on platforms
11	Shelter will be diminished during construction

4.6.2 Platform 10 to 12

No.	Assumption
1	Site Amenities can be located in the former signals depot
2	The former signals depot can be fitted out for station BOH requirements including cleaners room, staff toilets, staff change rooms, staff locker rooms as the construction site amenities demobilise
3	The carpark area above the ESR and Southern Suburbs lines can be used as a storage area for plant and materials
4	The existing finishes to the ESR platforms and intermediate concourse are to be upgraded
5	The existing transformers do not need to be upgraded
6	The park between Gibbons and Rosehill Streets is available for station and construction parking during construction
7	Columns to station box do not require strengthening for impact loads
8	Construction hoardings in the ESR will be painted with intumescent paint



5 Development Costs

The station upgrade works have been configured such that they do not significantly inhibit multiple future developments at any given time. Notwithstanding this, Bovis Lend Lease Consulting estimates a gross cost of [REDACTED] for a 20,000m2 net lettable area building including allowances for working in proximity to the rail corridor would be required by the developer.

The cost plan makes no allowance for any retail development but Bovis Lend Lease Consulting estimates a gross cost of [REDACTED] for the retail area would be required by developers.

6 Cost Summary

A summary of the costs is provided in the table below:

Development Options	Cost (2009 Dollars)	Duration
Revised C	[REDACTED]	34 months
Revised C (Alt Possn Regime)	[REDACTED]	29 months

^AProject Management and Facilities cost reduced proportionately to time and subcontractor direct costs reduced by 2% for improved efficiency – Note that possessions costs increase by [REDACTED]

As the figures are in 2009 dollars, RailCorp will need to consider making allowances to take into account the actual start dates and factor in escalation up to and during the design and construction phases.

7 Conclusion

The Jackson Teece concept design has been redesigned to a proposed revised concept design and allows for separate staging of the commercial development from the station upgrade works ultimately providing cost and time savings to RailCorp.

The proposed revised concept design and construction methodology have resulted in reduced costs and durations compared to previous concepts.

8 Way Forward

In order for construction to start no later than early 2011 it is critical that RailCorp adopts the preferred possession regime and obtains the following in the indicative timeframes:

Action	Obtain	Indicative Timeframe
Procurement methodology	Prior to tendering	2 nd Quarter 2009
Funding	Prior to tendering	3 rd Quarter 2009
Define User Requirements	Prior to detail design	3 rd Quarter 2009
Commence preliminary works*	Prior to detail design	3 rd Quarter 2009
Planning approval	Prior to executing construction contract	4 th Quarter 2010
Construction Start ^A	All of the above	2 nd Quarter 2011
Construction Finish ^A	All of the above	3 rd Quarter 2013

* Preliminary works include:

- Existing services investigation (Detailed Services Search and Dial Before You Dig) during design phase
- Geotechnical investigation
- Hazardous Materials Survey (Note that a hazardous materials survey of Redfern Station may have already been carried out)



- Structural integrity investigation including confirmation of member sizes shown in 1970s drawings
 - Boundary survey
 - Heritage Impact Study
 - Acoustic and vibration analysis
 - Development study
 - Traffic Impact Study
 - Fill validation
 - Environmental review
- ^ARevised C (Alt Possn Regime)



Appendix A

Redfern Station Redevelopment – Meeting Minutes – 12 November 2008



Meeting Minutes

RPMM Document ID: RPMM-100-MM-0001; Release Date: 22 May 2008

Redfern Station Redevelopment Meeting 2

Coordinator/Chair	Rex Gunton		
Date and Time	12 November 2008		
Location	18 Lee Street, Level 4		
Next Meeting	Tbc		
Meeting Objective	Agree possessions schedule for Redfern Station Redevelopment		
Attendees			
Rex Gunton (RG)	Ray Beasley (RB)	Melissa Iverach (MI)	Andrew Quarmby (AQ)
Andrew Quarmby (AQ)	Karlijn Klauer (KK)	Serge Chetner (SC)	
Invited Guests			
Apologies			

1 Meeting Outcomes

1.1 Review Actions from Previous Meetings

Meeting with Melissa Iverach established.

Availability of the 5 day track possession during Christmas from 2013. Bear in mind that other projects might want to lock in the same possessions...

1.2 Matters Arising

- MI asks RB what is needed to get approval for the proposed possessions regime. RB points out the current situation is that we need CEO approval for these things.
- The impacts of the possessions to the clients and the station are the main item where approvals or declines are based on. MI will investigate the impacts on our proposal.
- Two options will be discussed: one based on standard weekend possessions and one based on the proposed possessions regime. For these two options we need costs & benefits/grieve.
- The number one questions to answer are:
 - Why so long (5 days over Christmas or 26 weeks for tracks 1 & 10)?
 - Why this period (Christmas)?
 - What is the scope?
 - What are the long term benefits?

Minutes_Redfern_20081112_Possessions.doc
Last saved: 12-Nov-08
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- Why knock down all the buildings on the platforms prior to construction?
- MI agrees to work together on this proposal to get a clear understanding of the impacts and costs, both positive and negative and therefore agrees to our approach.

1.3 Discussion

- Assumed during the meeting, as a starting point, is that demolition works will commence circa June 2011 followed by actual construction commencing circa February 2012.
- Below possessions proposal will be detailed out further by AQ for MI and RB to be able to understand the impacts involved:
 - Config 3 (platforms 1-4) > 5 day possession (track & platform)
 - Config 1A > 5 day possession (track & platform)
 - Platform 10 > closed for a long period of time (platform only)
 - Platform 1 > closed for a long period of time (platform only)
 - Config 4 > to get spoil train in while demolishing buildings on platforms.
- NB1: None of these possessions need to happen simultaneously
- NB2: weekend possessions will be optimised in addition
- Ray points out to take into account that all bussing costs will have to be picked up.

1.4 Key Decisions

- Ongoing contact and communication with the possessions team will move this project forward gaining an understanding of impacts and costs involved.
- Additional meetings will be required once the engineering- & architectural consultants are on board, possibly with the attendance of people like Dave Spiteri.

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Appendix B

Proposed revised concept design – Programme based on current RailCorp possession regime



Redfern Station Redevelopment



Appendix C

Proposed revised concept design – Programme based on preferred RailCorp possession regime

Redfern Station Redevelopment



Redfern Station Redevelopment



Appendix D


Proposed revised concept design – Cost Plan Option 1 – Unpaid bridge on grade

**Redfern Railway Station
BLL Cost Plan - Option C1 (Unpaid Bridge)**

BLL Ref		Tenix Ref	DIRECT COSTS		TOTAL COST
COST PLAN SUMMARY					
Project Number:		118027		Bovis Lend Lease	
Project Name:		Redfern Station Redevelopment			
Option Name:		Option C1 (New Concourse with Unpaid Bridge)			
Revision Date:		7 May 2009			
D 1	I	Platforms 1-10 - Modifications & New Concourse Works			
D 2	II	Illawarra Relief Platforms 11 & 12 - Upgrading Works			
D 3	III	Direct Costs Overtime Payment			
D 4	IV	Possession Support Costs			
DIRECT COST					A
INDIRECT COSTS					
Subcontractor					
11	IC 1.1	Subcontractor Indirect			Included in Direct Costs 0%
					Sub-total
D&C Contractor					
12	IC 2.1	D&C Contractor's contingency to manage s/c			10%
					Trade Cost
13	IC 2.2	D&C Contractor Project Management & Facilities			% Direct Costs 30%
14	IC 2.3	D&C Contractor Design			% of Trade Cost 5%
15	IC 2.4	D&C Contractor Design Verification			% of Trade Cost 2%
					Sub-total
16	IC 2.5	D&C Contractor Head Office Overhead and Profit			12%
					INDIRECT COST
					B
CONSTRUCTION COST (D&C Contract) ex GST					
CLIENT COSTS					
Client Directed Contingencies to Manage Works Under Contract					
C 1	IC 3.1	Design development contingency			% of Construction Cost 5%
C 2	IC 3.2	Construction contingency			% of Construction Cost 5%
					Target Budget
C 3	CC 1	EIS, Survey, Preliminary Geotechnical Investigation & Concept Design			1.5%
					Sub-total
C 4	CC 2	Client Project Management Team			5%
C 5	CC 3	Possessions cost			Refer Attached
					Sub-total
C 6	CC 10	Client Project Contingency			10%
					CLIENT COSTS
					C
TOTAL CAPITAL COST ex GST as at May 2009					
NON CAPITAL COSTS					
Non Capital Expenditure					
NC 1	CC 4	Land and property acquisition costs - EXCLUDED			
NC 2	CC 5	Legal and marketing costs - EXCLUDED			
NC 3	CC 6	Financing Cost - EXCLUDED			
Maintenance Expenditure					
NC 4	CC 7	Initial Maintenance Cost - EXCLUDED			
NC 5	CC 8	Station Ticket Gates - allow for 6 New @ \$250,000/gate plus relocating 7 existing gates @ \$40,000/gate			
NC 6	CC 9	Ticket Vending Machines (TVMs) - allow for relocating existing TVMs & 1 new @ \$75,000/No			
					NON CAPITAL COSTS
					D
TOTAL PROJECT COST ex GST as at May 2009					

Redfern Railway Station BLL Cost Plan - Option C1 (Unpaid Bridge)


DIRECT WORKS ELEMENTAL BREAK DOWN (Summary) - OPTION C1



ITEM	DESCRIPTION	TOTAL PRICE
I	SECTION 1: MODIFICATION TO PLATFORMS 1-10 AND NEW CONCOURSE	
DC1	Enabling and Temporary Works	
DC2	Demolition Works	
DC3	Platform 1-10 Modification Works	
DC4	Modification Works to Existing Concourse	
DC5	New Elevated Concourse & Staircases	
DC6	OHV Works (including relocation works)	
DC7	HV Electrical Works & Traction Power	
DC8	Signalling and Communications (including relocation works)	
DC9	Station Comms Works (PL 1-10 & Concourse)	
DC10	External Works and Landscaping works	
DC11	Protection Works	
	Sub-total	
II	SECTION 2: EXISTING ILLAWARRA RELIEF PLATFORMS (11&12) UPGRADING WORKS	
DC1	Enabling and Temporary Works	
DC2	Demolition Works	
DC3	IR Platform Modification Works	
DC4	OHV Works (including relocation works)	
DC5	HV Electrical Works & Traction Power	
DC6	Station Comms Modification Works (PL 11 & 12)	
DC7	Signalling and Communications (including relocation works)	
DC8	External Works and Landscaping works - priced separately	
DC9 Si	Protection Works	
	Sub-total	
	Direct Cost Subtotal ex GST	A

Redfern Railway Station BLL Cost Plan - Option C1 (Unpaid Bridge)

Possession Contribution Calculator



	Possession Works	Construction Works	
Construction Costs (enter figure from cost plan)	Platforms 1-10 IR Possession Costs		
Indirect Costs (enter figure from cost plan)			
Construction Cost			
Percentage carried on possession		42%	
Total cost of the project/Activity	(a)		
Total No of possessions (from programme)	(b)		
Average Project/Activity value per possession	(c)=(a)/(b)		
Routine and Major Periodic Maintenance Spending from Alt Transport & Trackwork Marketing Recovery of Cost from External Parties Process - Version 4.2 (Aug 2008)			
Configuration No.	Amount	No. of Possns	Total
Configuration 1		7	
Configuration 1A		3	
Configuration 3		9	
Configuration 4		7	
Configuration 8		11	
Configuration 15		6	
RailCorp Configuration Average over 68 possessions		43	
Total average spend (RailCorp + Redfern) assuming no other projects		(d)	
% Contribution of Capital projects and or External Party to Alternate Transport and Trackwork Marketing		(e)=(c)/(d)	27%
Alternate Transport and Trackwork Marketing Cost (Carmen Morrison - RailCorp - 30 Apr 2009)			
Configuration No.	Amount	No. of Possns	Total
Configuration 1		7	
Configuration 1A		3	
Configuration 3		9	
Configuration 4		7	
Configuration 8		11	
Configuration 15		6	
Configuration Average		43	
Contribution (Average per possession)		(g)=(e)/(f)	
No. of Possessions			
Total Project Contribution			

Redfern Railway Station
BLL Cost Plan - Option C1 (Unpaid Bridge)

Overtime Penalty								
Week-end Track Possessions								
No of Tracks per Possession	Track Configuration	No of Possessions over 34 Mth Program	No of Platforms per Possession	No of Platform Possessions	Total	Config IR Platforms		
Single	8	11	2	22	22			
Double	1	7	4	28		11&12		
	3	9	4	36				
	4	7	4	28	92			
Triple	1A	3	6	18		11&12		
	15	6	6	36	54			
Total		43		168	168			
Week-end Costs								
EO Labour Costs for Possession Works								
		No of Platform Possessions	Av No of Workers per Possession per Platform	No of Shifts per Possession	No of Hrs per Shift	EO Rate per Hour \$	Cost \$	Total Cost \$
Single Possession		22	7	3.5	12			
Double Possession		92	7	3.5	12			
Triple Possession		54	7	3.5	12			
Total		168						
	No of Weeks	No of Nights per week	No	No of Shifts per Possession	No of Hrs per Shift	EO Rate per Hour \$	Cost \$	
Single Possession	52	5	7	1	8			
Week Day Costs								
Single Possession	52	5	7	1	8			
TOTAL - INDIRECT COSTS								

Redfern Railway Station
BLL Cost Plan - Option C1 (Unpaid Bridge)

Possession Support Costs								
Week-end Track Possessions								
No of Tracks per Possession	Track Configuration	No of Possessions over 34 Mth Program	No of PO's per Possession	No of Platform Possessions	IR Platforms			
Single	8	11	2	22				
Double	1	7	2	14	11&12			
	3	9	2	18				
	4	7	4	28				
Triple	1A	3	2	6	11&12			
	15	6	4	24				
Total		43		112				
Week-end Costs (Out of Hours)								
Hi-Rail Costs								
Hi-rail Equipment		No of Possessions over 34 Mth Program	No of Vehicles	No of Platform Possessions	No of Shifts	Rate/ 10 Hr Shift	Cost \$	Total Cost \$
Hi-rail with Flat-top		43	3		4			
Hi-rail with Tipper		43	3		3			
Hi-rail with Cherry picker		43	3		3			
Day-makers, radios, water coolers etc		43						
Possession Officers								
Hi-rail Loading Point	1 per Possession	43			5			
Junction Officer	1 per platform			112	5			
Protection Officer	1 per platform			112	5			
Protection Co-ordinator	1 per Possession	43			5			
	No of Weeks	No of Nights per week	No	No of Platform Possessions	No of Shifts	Rate/ 8 Hr Shift	Cost \$	
Hi-rail with Flat-top / Tipper	52	5	1		1			
Protection Officer	52	5	2		1			
Week Day Costs (Out of Hours)								
Hi-rail with Flat-top / Tipper	52	5	1		1			
Protection Officer	52	5	2		1			
	No of Weeks	No of Days per week	No	No of Platform Possessions	No of Shifts	Rate/ 10 Hr Shift	Cost \$	
Protection Officer	148	5	2		1			
Week Day Costs (Normal Hours)								
Possession Officers								
Protection Officer	148	5	2		1			
TOTAL - POSSESSION SUPPORT COSTS								

Redfern Railway Station BLL Cost Plan - Option C1 (Unpaid Bridge)



Description	Qty	Unit	Rate	Total Cost
Option C1 - New Concourse with Unpaid Bridge				
1 Enabling and Temporary Works				
1.1 Civil Works				
1.1.1 Demolition works - see section 2				
1.1.2 Temporary Access and Worksite				
Temporary worksite to Little Eveleigh St site Prepare worksite for new concourse abutment	1	Item		
Temporary access to PL 10 crane access- incl above				
Temporary worksite in Park between Rosehill, Marian & Gibbons Streets				
Clear the work site area	1,680	m2		
Asphalt paving for office, storage and vehicular access areas	1,160	m2		
Wash down facilities	2	No		
Traffic management	1	Item		
Allow for RailCorp & Police staff temporary parking facilities for 25 Cars including lighting and signs	625	m2		
Allow for Contractor temporary parking facilities for 25 Cars including lighting and signs	625	m2		
Reinstatement of existing park				
Remove carpark and re-instate landscaping	1250	m2		
Allow for making good stormwater drainage works & kerbs	1	Item		
Temporary access to Crane near PL 10				
Hardstanding	208	m2		
Traffic management	1	Item		
Temporary track access for Hi-rails				
Access to Platforms 1, 2&3	1	Item		
Access to Platforms 4/5, 6/7, 8/9 & 10	1	Item		
1.1.3 Temporary Fencing and Hoarding				
Temporary site hoarding, 1800mm high	300	m		
Temporary chain link fence fixed to Jersey barrier along live track	50	m		
Temporary Fencing - allow	100	m		
1.1.4 Temporary drainage				
Allow for temp drainage & connections	1	Item		
1.1.7 Temporary crane platforms				
Crane working platform for Platform 1 side				
Assume new structure at 125 Little Everleigh Street is available as the Crane Platform				
Allow for temporary propping	1	Item		
Crane working platform for Platform 10 side (Concourse & Unpaid Bridge)				
Allow for piling mob & demob	1	Item		
Piling/pier; assume 500 dia	160	m		
1.1.8 Modifications to control rooms on platforms				
Allow for modifications to staff rooms & train control	5	No		
1.2 OHW Relocations - included in OHW works				
1.3 Signalling Relocations - included in signalling works				

Redfern Railway Station BLL Cost Plan - Option C1 (Unpaid Bridge)



Description	Qty	Unit	Rate	Total Cost
1.4 Utilities Diversions				
Relocate existing HV power cables on Lt. Eveleigh St for crane access	1	Item		
Allowance for any other services diversion	1	Item		
DC1 Total - Enabling and Temporary Works				
2 Demolition Works				
2.1 Demolition of existing platforms canopies				
Demolition	2,100	m2		
2.2 Demolition of existing staircases				
Demolition including disposal off site	39	m2		
2.3 Removal of existing miscellaneous items (per Platform)				
Allow for removal of furniture	10	No		
Allow for removal of affected lights	10	No		
2.4 Removal of existing building at 125 Little Everleigh Street				
Class B Hoarding to perimeter	80	m		
Demolition of Timber & Masonry warehouse building	1279	m2		
2.5 Removal of existing Platform Buildings				
Demolition of Timber & Masonry platform buildings	276	m2		
2.6 Platform 11 / 12 Link @ Mezz to Platform 10				
Demolish existing retaining wall approx 1000 thick between Platform 10 and Void	123	m3		
2.7 Removal of Hazardous Waste				
Removal of Hazardous Waste EXCLUDED				Excluded
DC2 Total - Demolition Works				
3 Platform 1-10 Modification Works				
3.1 Platform Extension				
Structural works for PL3 extension by approx. 8m	23	m2		
3.2 Platform 11 / 12 Link @ Mezz to Platform 10				
Prepare opening in retaining wall for Glazed screen	34	m		
3.3 Platform level raising				
Remove existing bitumen paving and re-grade to new profile	5,111	m2		
Platform re-surfacing with bitumen	5,111	m2		
300mm wide coping to platform edge	1,663	m		
100mm wide safety line to platform edge	1,663	m		
300mm wide tactile to platform edge	1,663	m		
Stormwater drain	1,663	m		
Allow for sumps every 10m	140	No		
Allow for discharging water into track drainage system (4 No per platform)	40	No		
3.4 Platform canopy fitout				
Hoarding to workface	630	m		
300 dia pile 3m deep @ 5000 centres to canopy foundation	41	No		
New canopies incl furniture & fixtures	2,052	m2		
Allow for station control rooms including wash down, toilet and comms facilities	5	No		
Allowance for crane	8	No		
3.5 Platform mechanical works				
Allow for air-conditioning for staff office on platforms	5	no		
Allow for pressurised discharge system for sewage and waster water from platforms to nearest discharge point	5	no		

Redfern Railway Station BLL Cost Plan - Option C1 (Unpaid Bridge)



	Description	Q'ty	Unit	Rate	Total Cost
3.6 Platform electrical works					
	Upgrade of cabling to Fire Life Safety requirements (per platform)	10	No		
	Platform canopy lighting	2,052	m2		
	Platform stair lighting	772	m2		
	Platform lighting under new Concourse	600	m2		
	Platform lighting under new Unpaid Bridge	160	m2		
	Lighting poles to open platforms	10	No		
DC3 Total - Platform 1-10 Modification Works					
4 Modification Works to Existing Concourse					
4.1 New Fire Egress to Existing Concourse					
	Fire Egress - Demolition and structural alterations to existing Concourse for new fire egress stair	1	Item		
	Fire Egress - Allow for structural repairs	1	Item		
	Fire Egress - Fire egress stair included in staircases		Note		
	Fire Egress - Masonry wall to fire egress	564	m2		
	Fire Egress - Signage and sundry	253	m2		
	Fire Egress - Gated enclosure to base of fire egress stairs	6	No		
	Fire Egress - Gated enclosure to fire egress exit to street	2	No		
	Fire Egress - Emergency lighting	253	No		
DC4 Total - Modification Works to Existing Concourse					
5 New Elevated Concourse & Staircases					
5.1 Foundations					
	Concourse - Column footing with 3 piles and pile cap	10	No		
	Concourse - Contiguous pile wall in Little Eveleigh Street	22	m2		
	Concourse - Strip footing to Little Eveleigh Street	10	m		
	Concourse - 300 thick retaining wall on top of footing	60	m2		
	Concourse - Allow for monitoring and protection of engine dive & other structures	1	Item		
	Unpaid Bridge - Column Footing with 3 piles and pile cap	4	No		
	Unpaid Bridge - Pad footing	1	No		
	Unpaid Bridge - 300 thick retaining wall on top of footing	9	m2		
	125 Little Eveleigh Street - Foundations for new suspended structure at GF incl demo Basement GS and mg.	12	No		
	Stair footing with 2 piles and pile cap	10	No		
	Concourse - Lift pit complete	6	No		
	Platform 11/12 Link - Lift pit complete	1	No		

Redfern Railway Station BLL Cost Plan - Option C1 (Unpaid Bridge)



	Description	Q'ty	Unit	Rate	Total Cost
5.2 Structure					
	Concourse - Hoarding to workface	520	m		
	Concourse - Column 1000 diameter	10	No		
	Concourse - Headstock - 600 x 600 headstock beam	29	m		
	Concourse - Headstock - 800 x 1000 headstock beam	165	m		
	Concourse - Headstock - 1200 x 1000 headstock beam	40	m		
	Concourse - 600 x 600 precast concrete plank deck	1200	m2		
	Concourse - 150 topping slab over precast concrete plank deck	1200	m2		
	Concourse - 150 ground slab on grade	101	m2		
	Concourse - Lift structure (Platform to top lift shaft)	680	m2		
	Concourse - Allow for craneage (450 t)	3	No		
	Unpaid Bridge - Hoarding to workface	120	m		
	Unpaid Bridge - Column 750 diameter	4	No		
	Unpaid Bridge - Headstock - 900 x 900 headstock beam	9	m		
	Unpaid Bridge - Headstock - 1000 x 900 headstock beam	5	m		
	Unpaid Bridge - Headstock - 1000 x 1200 headstock beam	5	m		
	Unpaid Bridge - 600 x 600 precast concrete plank deck	182	m2		
	Unpaid Bridge - 2100mm wide x 1200 deep Super T precast concrete beam deck	46	m		
	Unpaid Bridge - 150 topping slab over precast concrete plank deck	273	m2		
	Unpaid Bridge - 250mm thick insitu cantilevered launching slab	69	m2		
	Unpaid Bridge - Allow for craneage (450 t)	2	No		
	125 Little Eveleigh Street - New suspended structure at GF	334	m2		
	Platform 11/12 Link - Hoarding to workface	100	m		
	Platform 11/12 Link @ Mezz - Treat existing structural steelwork	540	m2		
	Platform 11/12 Link @ Mezz - Sundry Steelwork to make up levels	540	m2		
	Platform 11/12 Link @ Mezz - Bondek & 150 thick Suspended slab	370	m2		
	Platform 11/12 Link @ Mezz - Bondek & 275 thick Suspended slab	172	m2		
	Platform 11/12 Link @ Concourse - Treat existing structural steelwork	440	m2		
	Platform 11/12 Link @ Concourse - Sundry Steelwork to make up levels	440	m2		
	Platform 11/12 Link @ Concourse - Bondek & 150 thick Suspended slab	440	m2		
	Platform 11/12 Link - Escalator Landing 150mm thick	5	m2		
	Platform 11/12 Link - Lift structure Gnd to Mezz - 9mR	50	m2		
	Platform 11/12 Link - Lift structure (Mezz to top lift shaft)	63	m2		
	Platform 11/12 Link - Escalator housing pit complete (2 No)	2	No		
	Platform 11/12 Link - Allow for craneage	10	Days		
	Stairs - Steel stair stringer & framing	10	No		
	Stairs - Precast treads & risers	1119	m		
	Stairs - Landing 150mm thick	128	m2		
5.3 Roof Structure & Ceiling Linings					
	Concourse - Raked & tiered metal roof & structure	1694	m2		
	Concourse - Flat metal roof & structure	440	m2		
	Concourse - Luxalon Multi-panel soffit & wall lining incl sub-frame	2134	m2		
	Concourse - Raked & tiered glazed roof & structure	287	m2		
	Unpaid Bridge - Security screen and structure 75m long x 10m girth	750	m2		
	125 Little Eveleigh Street - Metal roof & structure	140	m2		
	125 Little Eveleigh Street - Glazed roof & structure	274	m2		
	Platform 11/12 Link - Metal roof & structure	430	m2		
	Platform 11/12 Link - Luxalon Multi-panel soffit lining incl sub-frame	54	m2		
	Platform 11/12 Link (Mezzanine) - Luxalon Multi-panel soffit lining incl sub-frame	207	m2		
	Stairs - Concrete roof structure & membrane finishes	772	m2		
	Stairs - Luxalon Multi-panel soffit lining incl sub-frame	772	m2		

Redfern Railway Station
BLL Cost Plan - Option C1 (Unpaid Bridge)



	Description	Qty	Unit	Rate	Total Cost
5.4 Façade					
	Concourse - Glazed balustrades 2100mm high	174	m		
	Concourse - Glazed curtain walling	110	m2		
	Concourse - Metal wall cladding & structure	712	m2		
	Concourse - Luxalon Multi-panel soffit & wall lining incl sub-frame	712	m2		
	Concourse - Façade Masonry wall	173	m2		
	Concourse - Shopfront	119	m2		
	Concourse - Lift cladding (Platform to top lift shaft)	680	m2		
	Concourse - SS column cladding cop to 2200mm high	69	m2		
	Unpaid Bridge - SS balustrade 1100mm high	235	m		
	Unpaid Bridge - SS balustrade cop 1100mm high	11	m		
	Unpaid Bridge - SS column cladding cop to 2200mm high	16	m2		
	125 Little Everleigh Street - Façade Masonry wall	52	m2		
	125 Little Everleigh Street - Shopfront	65	m2		
	Platform 11/12 Link (Mezzanine) - Façade Masonry wall	362	m2		
	Platform 11/12 Link (Mezzanine) - Glazed curtain walling	28	m2		
	Platform 11/12 Link - Lift cladding Gnd to Mezz - 9mR	50	m2		
	Platform 11/12 Link - Lift cladding (Mezz to top lift shaft)	63	m2		
	Platform 11/12 Link - Escalator lining to sides & soffit rise 5.35m	56	m2		
	Stairs - Glazed raking balustrades 1100mm high	283	m		
	Stairs - Masonry wall under egress stairs incl tiling	417	m2		
5.5 Building Fitout Works					
	Concourse - Urbanstone paving	1341	m2		
	Concourse - Sundry works	1320	m2		
	Unpaid Bridge - Urbanstone paving	380	m2		
	Unpaid Bridge - EO Urbanstone paving for steps	74	m		
	Unpaid Bridge - Urbanstone paving on and incl ramp on grade	73	m2		
	Unpaid Bridge - Urbanstone paving on and incl steps on grade	37	m2		
	Unpaid Bridge - EO Urbanstone paving for steps	74	m		
	Unpaid Bridge - Sundry works	380	m2		
	125 Little Everleigh Street - Urbanstone paving on & incl waterproof membrane	243	m2		
	125 Little Everleigh Street - EO Urbanstone paving for steps	90	m		
	125 Little Everleigh Street - Sundry works	243	m2		
	125 Little Everleigh Street - Fitout to ticketing offices and office facilities including services	130	m2		
	Platform 11/12 Link (Mezzanine) - Urbanstone paving	204	m2		
	Platform 11/12 Link - Urbanstone paving on & incl ground slab on substrate over waterproof membrane to suspended slab	67	m2		
	Platform 11/12 Link (Mezzanine) - Fitout to Station back of house	228	m2		
	Platform 11/12 Link - Fitout to ticketing offices and office facilities including services	156	m2		
	Platform 11/12 Link - Fitout to staff showers, lockers and lunchrooms including services	21	m2		
	Platform 11/12 Link - Internal masonry walls	275	m2		
	Platform 11/12 Link (Mezzanine) - Wall tiling	370	m2		
	Wayfinding Signage				
	Concourse - Wayfinder Signage	1	Item		
	Platforms - Wayfinder Signage	10	No		
5.6 Hydraulic Services					
	Allow for hydraulics & plumbing	1	Item		
	Allow for hydraulics, waste water, sewage & plumbing connections to existing	1	Item		

Redfern Railway Station
BLL Cost Plan - Option C1 (Unpaid Bridge)



	Description	Qty	Unit	Rate	Total Cost
5.7 Electrical works					
	Allow for temporary electrical	1	Item		
	Concourse - Lighting including distribution boards, light fittings and luminaires	3,230	m2		
	Unpaid Bridge - Lighting including distribution boards, light fittings and luminaires	380	m2		
	External Works - Lighting including distribution boards, light fittings and luminaires	1,037	m2		
	Provisions for 6 No lifts & 2 No escalators	1	Item		
5.8 Mechanical Services					
	Allow for air-conditioning (staff)	535	m2		
5.9 Fire Services					
	Allow for fire protection	3,230	m2		
5.10 Vertical Transportation					
	Concourse - Disabled Lift	6	No		
	Platform 11/12 Link - Disabled Lift	1	No		
	Escalator rising 5.35m (RL26.25 to RL31.60)	2	No		
	Allowance for crane (for lifts & escalators)	9	Item		
DC5 Total - New Elevated Concourse & Staircases					
6 OHW Works (including relocation works)					
	OHW Structures - Wiring adjustments (per Possession)	6	No		
	Allow for modifying OHW structures	8	No		
	New OHW cable supports underneath new slab	20	No		
	Removal of redundant OHW structures	9	No		
	Making good of platforms	12	Item		
	Testing & commissioning (Number of times)	6	No		
DC6 Total - OHW Works (including relocation works)					
7 HV Electrical Works & Traction Power					
7.1 Traction power - not required					Note
7.2 Power for PL 1-10 & concourse					Note
	Existing station capacity is sufficient if escalators are not required for each platform				
7.3 PL 11 & 12 switch room relocations (if required) included in IR works					Note
7.4 Power for new development - included in the commercial development section					Note
DC7 Total - HV Electrical Works & Traction Power					

Redfern Railway Station BLL Cost Plan - Option C1 (Unpaid Bridge)



	Description	Q'ty	Unit	Rate	Total Cost
8	Signalling and Communications (including relocation works)				
	Temporary signal gantry structure to house signal for Down Main Line	1	No		
	New signal	1	No		
	Allow for new cabling	1	Item		
	Allow for modifications to existing track circuit	1	Item		
	Removal of existing gantry	1	Item		
	Removal of temporary gantry	1	Item		
	Relocation of signalling & comms cables mounted on PL 1 retaining wall including				
	troughing & 2 kV power cables	250	m		
	Ditto, mounted on PL10	250	m		
	Allow for disconnections and reconnections	1	Item		
	Testing & commissioning	1	Item		
DC8	Total - Signalling and Communications (including relocation works)				
9	Station Comms Works (PL 1-10 & Concourse) (NSSU Prorata \$3.5m to \$4.5m - Use \$4.0m) Station Passenger Information (SPI)				
	Train describer system				
	Control room & racks	1	Item		
	CCTV's and help points				
	Telephones, PA system and other communications				
DC9	Total - Station Comms Works (PL 1-10 & Concourse)				
10	External Works and Landscaping works - priced separately				
10.1	External Works				
	External Works - Urbanstone paving on and incl slab on grade	1037	m2		
	External Works - Sundry works, bollards etc	1037	m2		
	External Works - Re-grade park to new levels	2834	m2		
	External Works - Soft Landscaping to Park	1664	m2		
	External Works - Feature trees	5	No		
	External Works - Allow for hard landscape to Park	1664	m2		
	External Works - Footpath to Gibbons Street (No Service pit adjustments or relocations)	228	m2		
DC10	Total - External Works and Landscaping works - priced separately				
11	Protection Works				
	Included in Possession Works		Note		
DC11	Total - Protection Works				
Total					

Redfern Railway Station BLL Cost Plan - Option C1 (Unpaid Bridge)



	Description	Q'ty	Unit	Rate	Total Cost
Option C1 - Illawarra Relief Platforms Upgrading Works					
1	Enabling and Temporary Works				
1.1	Civil Works				
	Demolition works - see section 2				
	Temporary Access and Worksite - included in Main Works (PL 1-10 & Concourse Works)				
1.1.1	Temporary Fencing and Hoarding				
	Temporary site hoarding, 2400mm high	200	m		
	Temporary Fencing - allow	50	m		
1.2	Utilities Diversions				
	Allowance for in ground services diversion	1	Item		
DC1	Enabling and Temporary Works				
2	Demolition Works				
2.1	Demolition of part of existing concourse				
	Demolition of concourse entrance awning	1	Item		
2.2	Demolition of existing roof level				
	Allow for temporary hoarding	80	m		
	Demolition - Allow for catch deck	70	m2		
	Demolition - Concrete roof structure	363	m2		
	Demolition - Concrete concourse structure	363	m2		
	Excavation and disposal of soil off site	200	m3		
2.2	Demolition of existing platform for new escalator pit and lift pit				
	Demolition	1	Item		
	Allow for waste to tip	1	Item		
2.3	Demolition of internal structures				
3.3	Platform level raising				
	Remove existing tiled paving and re-grade to new profile	1,389	m2		
	Allow for removal by spoil train	2	No		
	Remove existing tiled paving (Mezzanine)	125	m2		
	Stormwater drain	341	m		
	Allow for sumps every 10m	28	No		
	Allow for discharging water into track drainage system (4 No per platform)	8	No		
	Allow for demolition of existing blade wall/column for new fire egress stair South	2	No		
	Allow for demolition of staircase rising 6720mm	1	No		
	Allow for removal of pair escalators rising 12870mm	2	No		
	Allow for demolition of internal walls	1	Item		
	Allow for hacking existing wall finishes to receive new finishes	1	Item		
	Allow for protection work during demolition	1	Item		
DC2	Demolition Works				

Redfern Railway Station BLL Cost Plan - Option C1 (Unpaid Bridge)




Description	Qty	Unit	Rate	Total Cost
3 IR Platform Modification Works				
3.1 Supports and strengthening existing columns No allowance for strengthening and / or concrete encasing existing columns for impact loading				
				Note
3.1 Fire rate structural steel roof framing to Platforms 11 & 12 Allow for 2 Hr vermiculite fire spray to exposed steel beams Note: Excludes rectification of existing steelwork damaged by water ingress Note: Excludes removal and replacement of roof membrane and spot and finishes of Platform roof	2890	m2		
				Note
3.2 Modification to existing slab at 26.40-28.5 for new roof Allow for sealing staircase & escalator voids	70	m2		
3.3 New internal structures Allow for structural alterations for lifts, escalators and stairs	1	No		
Allow for lift pits	1	No		
Lift structure (Platform to top lift shaft)	118	m2		
Lift cladding (Platform to top lift shaft)	118	m2		
Allow for escalator pits	2	No		
Escalator lining to sides & soffit rise 5.35m	56	m2		
Allow for new passenger staircase	1	No		
Allow for new fire escape staircase to park	1	No		
Re-work vent shafts & service risers	2	No		
3.4 New Smoke Exhaust / Skylights Skylight Structure to Park	7	No		
Allow for roof glazing	210	m2		
Note: Smoke exhaust system (naturally ventilated through skylight)				Note
3.5 Internal finishes & fitouts Platform re-surfacing with wearing slab and Urbanstone paving	955	m2		
300mm wide coping to platform edge	341	m		
100mm wide safety line to platform edge	341	m		
300mm wide tactile to platform edge	341	m		
Refurb existing toilets and locker facilities	1	Item		
Allow for new wall finish	1,700	m2		
Allow for new finishes and fixtures to lift lobby and pedestrian link at Mezzanine level	1	Item		
Allow for new finishes and fixtures to lift lobby at Platform level	1	Item		
Allow for new control room including wash down, toilet and comms facilities	1	No		
Wayfinding Signage Concourse - Wayfinder Signage	1	Item		
Platforms - Wayfinder Signage	2	No		
3.6 Hydraulic Services Allow for hydraulics & plumbing	1	Item		
Allow for hydraulics, waste water, sewage & plumbing connections to existing	1	Item		
Allow removal of PVC piping	1	Item		
3.7 Electrical works Allow for temporary electrical	1	Item		
Upgrade of cabling to Fire Life Safety requirements	1	Item		
Modify lighting to platforms	1389	m2		
Allow for new lighting to Mezzanine	150	m2		
Provisions for lifts & 2 No escalators	1	Item		
3.8 Mechanical Services Allow for air-conditioning for staff office and back of house	1	Item		

Redfern Railway Station BLL Cost Plan - Option C1 (Unpaid Bridge)




Description	Qty	Unit	Rate	Total Cost
3.9 Fire Services Modifications to fire protection including smoke detectors, EWIS and sprinklers to escalators	1,389	m2		
3.10 Vertical Transportation Disabled Lift	1	No		
Escalator rising 6.72m	2	No		
Allowance for crane (for lifts & escalators)	3	Item		
DC3 IR Platform Modification Works				
4 OHW Works (including relocation works) OHW works not required				Note
DC4 OHW Works (including relocation works)				
5 HV Electrical Works & Traction Power 5.1 Traction power - not required				
5.2 PL 11 & 12 switch room relocations works Not required				Note
DC5 HV Electrical Works & Traction Power				
6 Signalling and Communications (including relocation works) No new works required				
DC6 Signalling and Communications (including relocation works)				
7 Station Comms Modification Works (PL 11 & 12) Station Passenger Information (SPI) CCTV's and help points Telephones, PA system and other communications	1	Item		
DC7 Station Comms Modification Works (PL 11 & 12)				
8 External Works and Landscaping works - priced separately				
DC8 External Works and Landscaping works - priced separately				
9 Protection Works Included in Possession works				Note
DC9 Protection Works				
Total				


Redfern Railway Station
BLL Cost Plan - Option C1 (Unpaid Bridge)

COST PLAN SUMMARY			
Project Number:	118027		
Project Name:	Redfern Station Redevelopment		
Option Name:	Option C - Retail Development Works		
Revision Date:	7 May 2009		
			
BLL Ref	Tenx Ref	DIRECT COSTS	TOTAL COST
C1	I	Dry Goods Retail Development to Gibbons Street	
C2	II	Refurbishment of Existing Station Building for Dry Goods Retail	
DIRECT COST A			
INDIRECT COSTS			
Subcontractor			
I1	IC 1.1	Subcontractor Indirect	Included 0.0%
Sub-total			
D&C Contractor			
I2	IC 2.1	D&C Contractor's contingency to manage s/c	Included 0.0%
Sub-total			
I3	IC 2.2	D&C Contractor Project Management & Facilities	Included 0.0%
I4	IC 2.3	D&C Contractor Design	Included 0.0%
I5	IC 2.4	D&C Contractor Design Verification	Included 0.0%
Sub-total			
I6	IC 2.5	D&C Contractor Head Office Overhead and Profit - Included	Included 0.0%
INDIRECT COST B			
CONSTRUCTION COST (D&C Contract) ex GST			
CLIENT COSTS			
Client Directed Contingencies to Manage Works Under Contract			
C1	IC 3.1	Design development contingency	% of Construction Cost 2.5%
C2	IC 3.2	Construction contingency	% of Construction Cost 2.5%
Target Budget			
C3	CC 1	EIS, Survey, Preliminary Geotechnical Investigation & Concept Design	1.0% of Target budget 1.0%
Sub-total			
C4	CC 2	Client Project Management Team	2.5% of Target budget plus CC1 2.5%
Sub-total			
C6	CC 10	Client Project Contingency	5% of Target budget + CC1 to 9 5.0%
CLIENT COSTS C			
TOTAL DEVELOPMENT COST ex GST as at May 2009			
NON CAPITAL COSTS			
Non Capital Expenditure			
NC1	CC 4	Land and property acquisition costs - EXCLUDED	
NC2	CC 5	Legal and marketing costs - EXCLUDED	
NC3	CC 6	Financing Cost - EXCLUDED	
NON CAPITAL COSTS D			
TOTAL PROJECT COST ex GST as at May 2009			


Redfern Railway Station
BLL Cost Plan - Option C1 (Unpaid Bridge)

		Description	Q'ty	Unit	Rate	Total Cost
						
Option C: Gross Floor Area Based Construction Cost Estimate for Retail Development Works						
II	Dry Goods Retail Development to Gibbons Street					
		Single level retail on ground	623	m2		
		Single level retail over existing Illawarra Relief Station Box	212	m2		
		Single level retail in Void between Platform 10 and existing Illawarra Relief Station Box	570	m2		
		Fitout Retail to new infill structure	197	m2		
		Extra Over for Railcorp Interface considerations	1802	m2		
Sub-total						
II	Refurbishing Existing Station Building for Dry Goods Retail					
	Internal fitout					
		Extg Station Building - Gut out and fitout base for dry goods retail	350	m2		
Sub-total						
Total Construction Cost						

Redfern Railway Station
BLL Cost Plan - Option C1 (Unpaid Bridge)

COST PLAN SUMMARY			
Project Number:	118027		
Project Name:	Redfern Station Redevelopment		
Option Name:	Option C - Commercial Development Works		
Revision Date:	7 May 2009		
			
BLL Ref	Tenix Ref	DIRECT COSTS	TOTAL COST
C-1	I	Commercial Development	
DIRECT COST			A
INDIRECT COSTS			
Subcontractor			
11	IC 1.1	Subcontractor Indirect	Included 0.0%
Sub-total			0.0%
D&C Contractor			
12	IC 2.1	D&C Contractor's contingency to manage s/c	Included 0.0%
Sub-total			0.0%
13	IC 2.2	D&C Contractor Project Management & Facilities	Included 0.0%
14	IC 2.3	D&C Contractor Design	Included 0.0%
15	IC 2.4	D&C Contractor Design Verification	Included 0.0%
Sub-total			0.0%
16	IC 2.5	D&C Contractor Head Office Overhead and Profit - Included	Included 0.0%
INDIRECT COST			B
CONSTRUCTION COST (D&C Contract) ex GST			
CLIENT COSTS			
Client Directed Contingencies to Manage Works Under Contract			
C-1	IC 3.1	Design development contingency	% of Construction Cost 2.5%
C-2	IC 3.2	Construction contingency	% of Construction Cost 2.5%
Target Budget			
C-3	CC 1	EIS, Survey, Preliminary Geotechnical Investigation & Concept Design	1.0% of Target budget 1.0%
Sub-total			2.5%
C-4	CC 2	Client Project Management Team	2.5% of Target budget plus CC1 2.5%
Sub-total			5.0%
C-6	CC 10	Client Project Contingency	5% of Target budget + CC1 to 9 5.0%
CLIENT COSTS			C
TOTAL DEVELOPMENT COST ex GST as at May 2009			
NON CAPITAL COSTS			
Non Capital Expenditure			
NC 1	CC 4	Land and property acquisition costs - EXCLUDED	
NC 2	CC 5	Legal and marketing costs - EXCLUDED	
NC 3	CC 6	Financing Cost - EXCLUDED	
NON CAPITAL COSTS			D
TOTAL PROJECT COST ex GST as at May 2009			

Redfern Railway Station
BLL Cost Plan - Option C1 (Unpaid Bridge)

				Description	Q'ty	Unit	Rate	Total Cost
Option C: Gross Floor Area Based Construction Cost Estimate for Commercial Development Works								
1	Commercial Development							
	20 Storey Office Tower including 2 No Basement carpark							
	Floor Areas							
	Gross Cost per m2 NLA Greenfields site (Dec 2008)	20000	m2					
	Update cost to May 2009	0%	%					
	Extra Over for Railcorp Interface considerations	20000	m2					
	Sub-total	30,800	m2					
Total Construction Cost								

Redfern Station Redevelopment




Appendix E

Proposed revised concept design – Cost Plan Option 2 – Elevated unpaid concourse above new concourse

Redfern Station Redevelopment



Redfern Railway Station
BLL Cost Plan - Option C2 (Elevated Unpaid Concourse)

COST PLAN SUMMARY			
Project Number:	118027		
Project Name:	Redfern Station Redevelopment		
Option Name:	Option C2 (New Concourse with Elevated Unpaid Concourse)		
Revision Date:	4 May 2009		
BLL Ref	Tenix Ref	DIRECT COSTS	TOTAL COST
D 1	I	Platforms 1-10 - Modifications & New Concourse Works	
D 2	II	Illawarra Relief Platforms 11 & 12 - Upgrading Works	
D 3	III	Direct Costs Overtime Payment	
D 4	IV	Possession Support Costs	
DIRECT COST			A
INDIRECT COSTS			
Subcontractor			
11	IC 1.1	Subcontractor Indirect	Included in Direct Costs 0%
Sub-total			
D&C Contractor			
12	IC 2.1	D&C Contractor's contingency to manage s/c	Trade Cost 10%
Trade Cost			
13	IC 2.2	D&C Contractor Project Management & Facilities	% Direct Costs 30%
14	IC 2.3	D&C Contractor Design	% of Trade Cost 5%
15	IC 2.4	D&C Contractor Design Verification	% of Trade Cost 2%
Sub-total			
16	IC 2.5	D&C Contractor Head Office Overhead and Profit	12%
INDIRECT COST			B
CONSTRUCTION COST (D&C Contract) ex GST			
CLIENT COSTS			
Client Directed Contingencies to Manage Works Under Contract			
C 1	IC 3.1	Design development contingency	% of Construction Cost 5%
C 2	IC 3.2	Construction contingency	% of Construction Cost 5%
Target Budget			
C 3	CC 1	EIS, Survey, Preliminary Geotechnical Investigation & Concept Design	1.5%
Sub-total			
C 4	CC 2	Client Project Management Team	5%
C 5	CC 3	Possessions cost	Refer Attached
Sub-total			
C 6	CC 10	Client Project Contingency	10%
CLIENT COSTS			C
TOTAL CAPITAL COST ex GST as at May 2009			
NON CAPITAL COSTS			
Non Capital Expenditure			
NC 1	CC 4	Land and property acquisition costs - EXCLUDED	
NC 2	CC 5	Legal and marketing costs - EXCLUDED	
NC 3	CC 6	Financing Cost - EXCLUDED	
Maintenance Expenditure			
NC 4	CC 7	Initial Maintenance Cost - EXCLUDED	
NC 5	CC 8	Station Ticket Gates - allow for 6 New @ \$250,000/gate plus relocating 7 existing gates @ \$40,000/gate	
NC 6	CC 9	Ticket Vending Machines (TVMs) - allow for relocating existing TVMs & 1 new @ \$75,000/No	
NON CAPITAL COSTS			D
TOTAL PROJECT COST ex GST as at May 2009			

Redfern Railway Station
BLL Cost Plan - Option C2 (Elevated Unpaid Concourse)

DIRECT WORKS ELEMENTAL BREAK DOWN (Summary) - OPTION C2		
ITEM	DESCRIPTION	TOTAL PRICE
I	SECTION 1: MODIFICATION TO PLATFORMS 1-10 AND NEW CONCOURSE	
DC1	Enabling and Temporary Works	
DC2	Demolition Works	
DC3	Platform 1-10 Modification Works	
DC4	Modification Works to Existing Concourse	
DC5	New Elevated Concourse & Staircases	
DC6	OHV Works (including relocation works)	
DC7	HV Electrical Works & Traction Power	
DC8	Signalling and Communications (including relocation works)	
DC9	Station Comms Works (PL 1-10 & Concourse)	
DC10	External Works and Landscaping works	
DC11	Protection Works	
Sub-total		
II	SECTION 2: EXISTING ILLAWARRA RELIEF PLATFORMS (11&12) UPGRADING WORKS	
DC1	Enabling and Temporary Works	
DC2	Demolition Works	
DC3	IR Platform Modification Works	
DC4	OHV Works (including relocation works)	
DC5	HV Electrical Works & Traction Power	
DC6	Station Comms Modification Works (PL 11 & 12)	
DC7	Signalling and Communications (including relocation works)	
DC8	External Works and Landscaping works - priced separately	
DC9	Protection Works	
Sub-total		
Direct Cost Subtotal ex GST		A

Redfern Railway Station BLL Cost Plan - Option C2 (Elevated Unpaid Concourse)

Possession Contribution Calculator		Construction Works	
Construction Costs (enter figure from cost plan)		[REDACTED]	
Indirect Costs (enter figure from cost plan)		[REDACTED]	
Construction Cost		[REDACTED]	
Percentage carried on possession		42%	
Total cost of the project/Activity	(a)	[REDACTED]	
Total No of possessions (from programme)	(b)	43	
Average Project/Activity value per possession	(c)=(a)/(b)	[REDACTED]	
Routine and Major Periodic Maintenance Spending from Alt Transport & Trackwork Marketing Recovery of Cost from External Parties Process - Version 4.2 (Aug 2008)			
Configuration No.	Amount	No. of Possns	Total
Configuration 1	\$3,260,000.00	7	[REDACTED]
Configuration 1A	\$3,260,000.00	3	
Configuration 3	\$2,210,000.00	9	
Configuration 4	\$3,330,000.00	7	
Configuration 8	\$1,510,000.00	11	
Configuration 15	\$2,100,000.00	6	
RailCorp Configuration Average over 46 possessions		43	
Total average spend (RailCorp + Redfern) assuming no other projects		(d)	[REDACTED]
% Contribution of Capital projects and or External Party to Alternate Transport and Trackwork Marketing		(e)=(c)/(d)	27%
Alternate Transport and Trackwork Marketing Cost (Carmen Morrison - RailCorp - 30 Apr 2009)			
Configuration No.	Amount	No. of Possns	Total
Configuration 1	\$999,982.00	7	[REDACTED]
Configuration 1A	\$1,160,782.00	3	
Configuration 3	\$361,782.00	9	
Configuration 4	\$640,980.00	7	
Configuration 8	\$427,382.00	11	
Configuration 15	\$498,492.00	6	
Configuration Average		43	
Contribution (Average per possession)		(g)=(e)x(f)	[REDACTED]
No. of Possessions			43
Total Project Contribution			[REDACTED]

Redfern Railway Station BLL Cost Plan - Option C2 (Elevated Unpaid Concourse)

Overtime Penalty							
Week-end Track Possessions							
No of Tracks per Possession	Track Configuration	No of Possessions over 34 Mth Program	No of Platforms per Possession	No of Platform Possessions	Total	Config IR Platforms	
Single	8	11	2	22	22		
Double	1	7	4	28		11&12	
	3	9	4	36			
	4	7	4	28	92		
Triple	1A	3	6	18		11&12	
	15	6	6	36	54		
Total		43		168	168		
Week-end Costs							
EO Labour Costs for Possession Works							
	No of Platform Possessions	Av No of Workers per Possession per Platform	No of Shifts per Possession	No of Hrs per Shift	EO Rate per Hour \$	Cost \$	Total Cost \$
Single Possession	22	7	3.5	12			[REDACTED]
Double Possession	92	7	3.5	12			
Triple Possession	54	7	3.5	12			
Total	168						
	No of Weeks	No of Nights per week	No	No of Shifts per Possession	No of Hrs per Shift	EO Rate per Hour \$	Cost \$
Single Possession	52	5	7	1	8		[REDACTED]
TOTAL - INDIRECT COSTS							

Redfern Railway Station
BLL Cost Plan - Option C2 (Elevated Unpaid Concourse)


Possession Support Costs							Bovis Lend Lease	
Week-end Track Possessions								
No of Tracks per Possession	Track Configuration	No of Possessions over 34 Mth Program	No of PO's per Possession	No of Platform Possessions	IR Platforms			
Single	8	11	2	22				
Double	1 3 4	7 9 7	2 2 4	14 18 28	11&12			
Triple	1A 15	3 6	2 4	6 24	11&12			
Total		43		112				
Week-end Costs (Out of Hours)								
Hi-Rail Costs								
Hi-rail Equipment		No of Possessions over 34 Mth Program	No of Vehicles	No of Platform Possessions	No of Shifts	Rate/ 10 Hr Shift	Cost \$	Total Cost \$
Hi-rail with Flat-top		43	3		4			
Hi-rail with Tipper		43	3		3			
Hi-rail with Cherry picker		43	3		3			
Day-makers, radios, water coolers etc		43						
Possession Officers								
Hi-rail Loading Point	1 per Possession	43			5			
Junction Officer	1 per platform			112	5			
Protection Officer	1 per platform			112	5			
Protection Co-ordinator	1 per Possession	43			5			
		No of Weeks	No of Nights per week	No	No of Platform Possessions	No of Shifts	Rate/ 8 Hr Shift	Cost \$
Week Day Costs (Out of Hours)								
Hi-rail with Flat-top / Tipper		52	5	1		1		
Possession Officers								
Protection Officer		52	5	2		1		
		No of Weeks	No of Days per week	No	No of Platform Possessions	No of Shifts	Rate/ 10 Hr Shift	Cost \$
Week Day Costs (Normal Hours)								
Possession Officers								
Protection Officer		148	5	2		1		
TOTAL - POSSESSION SUPPORT COSTS								

Redfern Railway Station
BLL Cost Plan - Option C2 (Elevated Unpaid Concourse)




Description	Q'ty	Unit	Rate	Total Cost
Option C2 -New Concourse with Elevated Unpaid Concourse				
1 Enabling and Temporary Works				
1.1 Civil Works				
1.1.1 Demolition works - see section 2				
1.1.2 Temporary Access and Worksite				
Temporary worksite to Little Eveleigh St site Prepare worksite for new concourse abutment	1	Item		
Temporary access to PL 10 crane access- incl above				
Temporary worksite in Park between Rosehill, Marian & Gibbons Streets				
Clear the work site area	1,680	m2		
Asphalt paving for office, storage and vehicular access areas	1,160	m2		
Wash down facilities	2	No		
Traffic management	1	Item		
Allow for RailCorp & Police staff temporary parking facilities for 25 Cars including lighting and signs	625	m2		
Allow for Contractor temporary parking facilities for 25 Cars including lighting and signs	625	m2		
Reinstatement of existing park				
Remove carpark and re-instate landscaping	1250	m2		
Allow for making good stormwater drainage works & kerbs	1	Item		
Temporary access to Crane near PL 10				
Hardstanding	208	m2		
Traffic management	1	Item		
Temporary track access for Hi-rails				
Access to Platforms 1, 2&3	1	Item		
Access to Platforms 4/5, 6/7, 8/9 & 10	1	Item		
1.1.3 Temporary Fencing and Hoarding				
Temporary site hoarding, 1800mm high	300	m		
Temporary chain link fence fixed to Jersey barrier along live track	50	m		
Temporary Fencing - allow	100	m		
1.1.4 Temporary drainage				
Allow for temp drainage & connections	1	Item		
1.1.7 Temporary crane platforms				
Crane working platform for Platform 1 side				
Assume new structure at 125 Little Everleigh Street is available as the Crane Platform				
Allow for temporary propping	1	Item		
Crane working platform for Platform 10 side (Concourse & Unpaid Bridge)				
Allow for piling mob & demob	1	Item		
Piling/bier; assume 500 dia	160	m		
1.1.8 Modifications to control rooms on platforms				
Allow for modifications to staff rooms & train control	5	No		

Redfern Railway Station BLL Cost Plan - Option C2 (Elevated Unpaid Concourse)

		Description	Q'ty	Unit	Rate	Total Cost
1.2		OHW Relocations - included in OHW works				
1.3		Signalling Relocations - included in signalling works				
1.4		Utilities Diversions				
		Relocate existing HV power cables on Lt. Eveleigh St for crane access	1	Item		
		Allowance for any other services diversion	1	Item		
DC1		Total - Enabling and Temporary Works				
2 Demolition Works						
2.1		Demolition of existing platforms canopies				
		Demolition	2,100	m2		
2.2		Demolition of existing staircases				
		Demolition including disposal off site	39	m2		
2.3		Removal of existing miscellaneous items (per Platform)				
		Allow for removal of furniture	10	No		
		Allow for removal of affected lights	10	No		
2.4		Removal of existing building at 125 Little Everleigh Street				
		Class B Hoarding to perimeter	80	m		
		Demolition of Timber & Masonry warehouse building	1279	m2		
2.5		Removal of existing Platform Buildings				
		Demolition of Timber & Masonry platform buildings	276	m2		
2.6		Platform 11 / 12 Link @ Mezz to Platform 10				
		Demolish existing retaining wall approx 1000 thick between Platform 10 and Void	123	m3		
2.7		Removal of Hazardous Waste				
		Removal of Hazardous Waste EXCLUDED				
DC2		Total - Demolition Works				
3 Platform 1-10 Modification Works						
3.1		Platform Extension				
		Structural works for PL3 extension by approx. 8m	23	m2		
3.2		Platform 11 / 12 Link @ Mezz to Platform 10				
		Prepare opening in retaining wall for Glazed screen	34	m		
3.3		Platform level raising				
		Remove existing bitumen paving and re-grade to new profile	5,111	m2		
		Platform re-surfacing with bitumen	5,111	m2		
		300mm wide coping to platform edge	1,663	m		
		100mm wide safety line to platform edge	1,663	m		
		300mm wide tactile to platform edge	1,663	m		
		Stormwater drain	1,663	m		
		Allow for surps every 10m	140	No		
		Allow for discharging water into track drainage system (4 No per platform)	40	No		
3.4		Platform canopy fitout				
		Hoarding to workface	630	m		
		300 dia pile 3m deep @ 5000 centres to canopy foundation	41	No		
		New canopies incl furniture & fixtures	2,052	m2		
		Allow for station control rooms including wash down, toilet and comms facilities	5	No		
		Allowance for crane	8	No		

Redfern Railway Station BLL Cost Plan - Option C2 (Elevated Unpaid Concourse)

		Description	Q'ty	Unit	Rate	Total Cost
3.5		Platform mechanical works				
		Allow for air-conditioning for staff office on platforms	5	no		
		Allow for pressurised discharge system for sewage and waste water from platforms to nearest discharge point	5	no		
3.6		Platform electrical works				
		Upgrade of cabling to Fire Life Safety requirements (per platform)	10	No		
		Platform canopy lighting	2,052	m2		
		Platform stair lighting	772	m2		
		Platform lighting under new Concourse	600	m2		
		Platform lighting under new Unpaid Bridge	160	m2		
		Lighting poles to open platforms	10	No		
DC3		Total - Platform 1-10 Modification Works				
4 Modification Works to Existing Concourse						
4.1		New Fire Egress to Existing Concourse				
		Fire Egress - Demolition and structural alterations to existing Concourse for new fire egress stair	1	Item		
		Fire Egress - Allow for structural repairs	1	Item		
		Fire Egress - Fire egress stair included in staircases		Note		
		Fire Egress - Masonry wall to fire egress	564	m2		
		Fire Egress - Signage and sundry	253	m2		
		Fire Egress - Gated enclosure to base of fire egress stairs	6	No		
		Fire Egress - Gated enclosure to fire egress exit to street	2	No		
		Fire Egress - Emergency lighting	253	No		
DC4		Total - Modification Works to Existing Concourse				
5 New Elevated Concourse & Staircases						
5.1		Foundations				
		Concourse - Column footing with 3 piles and pile cap	10	No		
		Concourse - Contiguous pile wall in Little Eveleigh Street	22	m2		
		Concourse - Strip footing to Little Eveleigh Street	10	m		
		Concourse - 300 thick retaining wall on top of footing	60	m2		
		Concourse - Allow for monitoring and protection of engine dive & other structures	1	Item		
		Unpaid Bridge - Column Footing with 3 piles and pile cap	0	No		
		Unpaid Bridge - Pad footing	0	No		
		Unpaid Bridge - 300 thick retaining wall on top of footing	0	m2		
		Unpaid Concourse - Lift pit complete	2	No		
		125 Little Everleigh Street - Foundations for new suspended structure at GF incl demo Basement GS and mg.	12	No		
		Stair footing with 2 piles and pile cap	10	No		
		Concourse - Lift pit complete	6	No		
		Platform 11/12 Link - Lift pit complete	1	No		

Redfern Railway Station BLL Cost Plan - Option C2 (Elevated Unpaid Concourse)




Description	Q'ty	Unit	Rate	Total Cost
5.2 Structure				
Concourse - Hoarding to workface	520	m		
Concourse - Column 1000 diameter	10	No		
Concourse - Headstock - 800 x 600 headstock beam	29	m		
Concourse - Headstock - 800 x 1000 headstock beam	165	m		
Concourse - Headstock - 1200 x 1000 headstock beam	40	m		
Concourse - 600 x 600 precast concrete plank deck	1200	m2		
Concourse - 150 topping slab over precast concrete plank deck	1200	m2		
Concourse - 150 ground slab on grade	101	m2		
Concourse - Lift structure (Platform to top lift shaft)	680	m2		
Concourse - Allow for craneage (450 t)	3	No		
Unpaid Bridge - Hoarding to workface	0	m		
Unpaid Bridge - Column 750 diameter	0	No		
Unpaid Bridge - Headstock - 900 x 900 headstock beam	0	m		
Unpaid Bridge - Headstock - 1000 x 900 headstock beam	0	m		
Unpaid Bridge - Headstock - 1000 x 1200 headstock beam	0	m		
Unpaid Concourse - 200 x 200 precast concrete plank deck	457	m2		
Unpaid Bridge - 2100mm wide x 1200 deep Super T1 precast concrete beam deck	0	m		
Unpaid Concourse - 60 topping slab over precast concrete plank deck	457	m2		
Unpaid Bridge - 250mm thick insitu cantilevered launching slab	0	m2		
Unpaid Concourse - Allow for craneage	3	Days		
Unpaid Concourse - Lift structure (Concourse to top lift shaft)	119	m2		
125 Little Everleigh Street - New suspended structure at GF	334	m2		
Platform 11/12 Link - Hoarding to workface	100	m		
Platform 11/12 Link @ Mezz - Treat existing structural steelwork	540	m2		
Platform 11/12 Link @ Mezz - Sundry Steelwork to make up levels	540	m2		
Platform 11/12 Link @ Mezz - Bondek & 150 thick Suspended slab	370	m2		
Platform 11/12 Link @ Mezz - Bondek & 275 thick Suspended slab	172	m2		
Platform 11/12 Link @ Concourse - Treat existing structural steelwork	440	m2		
Platform 11/12 Link @ Concourse - Sundry Steelwork to make up levels	440	m2		
Platform 11/12 Link @ Concourse - Bondek & 150 thick Suspended slab	440	m2		
Platform 11/12 Link - Escalator Landing 150mm thick	5	m2		
Platform 11/12 Link - Lift structure Gnd to Mezz - 9mR	50	m2		
Platform 11/12 Link - Lift structure (Mezz to top lift shaft)	63	m2		
Platform 11/12 Link - Escalator housing pit complete (2 No)	2	No		
Platform 11/12 Link - Allow for craneage	10	Days		
Stairs - Steel stair stringer & framing	10	No		
Stairs - Precast treads & risers	119	m		
Stairs - Landing 150mm thick	128	m2		
Unpaid Concourse Stairs - Steel stair stringer & framing	2	No		
Unpaid Concourse Stairs - Precast treads & risers	93	m		
Unpaid Concourse Stairs - Landing 150mm thick	8	m2		

Redfern Railway Station BLL Cost Plan - Option C2 (Elevated Unpaid Concourse)




Description	Q'ty	Unit	Rate	Total Cost
5.3 Roof Structure & Ceiling Linings				
Concourse - Raked & tiered metal roof & structure	1694	m2		
Concourse - Flat metal roof & structure	440	m2		
Concourse - Luxalon Multi-panel soffit & wall lining incl sub-frame	2134	m2		
Concourse - Raked & tiered glazed roof & structure	287	m2		
Unpaid Bridge - Security screen and structure 75m long x 10m girth	0	m2		
Unpaid Concourse - EO Concourse Structure for Hung Unpaid Concourse SS frame	457	m2		
Unpaid Concourse - Luxalon Multi-panel soffit & wall lining incl sub-frame	457	m2		
125 Little Everleigh Street - Metal roof & structure	140	m2		
125 Little Everleigh Street - Glazed roof & structure	274	m2		
Platform 11/12 Link - Metal roof & structure	430	m2		
Platform 11/12 Link - Luxalon Multi-panel soffit lining incl sub-frame	54	m2		
Platform 11/12 Link (Mezzanine) - Luxalon Multi-panel soffit lining incl sub-frame	207	m2		
Stairs - Concrete roof structure & membrane finishes	772	m2		
Stairs - Luxalon Multi-panel soffit lining incl sub-frame	772	m2		
5.4 Façade				
Concourse - Glazed balustrades 2100mm high	174	m		
Concourse - Glazed curtain walling	110	m2		
Concourse - Metal wall cladding & structure	712	m2		
Concourse - Luxalon Multi-panel soffit & wall lining incl sub-frame	712	m2		
Concourse - Façade Masonry wall	173	m2		
Concourse - Shopfront	119	m2		
Concourse - Lift cladding (Platform to top lift shaft)	680	m2		
Concourse - SS column cladding cop to 2200mm high	69	m2		
Unpaid Bridge - SS balustrade 1100mm high	0	m		
Unpaid Bridge - SS balustrade cop 1100mm high	0	m		
Unpaid Bridge - SS column cladding cop to 2200mm high	0	m2		
Unpaid Concourse - SS balustrade 1800mm high	372	m		
Unpaid Concourse - Lift cladding (Concourse to top lift shaft)	119	m2		
125 Little Everleigh Street - Façade Masonry wall	52	m2		
125 Little Everleigh Street - Shopfront	65	m2		
Platform 11/12 Link (Mezzanine) - Façade Masonry wall	362	m2		
Platform 11/12 Link (Mezzanine) - Glazed curtain walling	28	m2		
Platform 11/12 Link - Lift cladding Gnd to Mezz - 9mR	50	m2		
Platform 11/12 Link - Lift cladding (Mezz to top lift shaft)	63	m2		
Platform 11/12 Link - Escalator lining to sides & soffit rise 5.35m	56	m2		
Stairs - Glazed raking balustrades 1100mm high	283	m		
Stairs - Masonry wall under egress stairs incl tiling	417	m2		
Unpaid Concourse Stairs - Glazed raking balustrades 1100mm high	50	m		
Unpaid Concourse Stairs - Masonry wall under egress stairs incl tiling	72	m2		

Redfern Railway Station BLL Cost Plan - Option C2 (Elevated Unpaid Concourse)

		Description	Q'ty	Unit	Rate	Total Cost
5.5	Building Fitout Works					
	Concourse - Urbanstone paving	1341	m2			
	Concourse - Sundry works	1320	m2			
	Unpaid Concourse - Urbanstone paving	457	m2			
	Unpaid Concourse - EO Urbanstone paving for steps	93	m			
	Unpaid Bridge - Urbanstone paving on and incl ramp on grade	0	m2			
	Unpaid Bridge - Urbanstone paving on and incl steps on grade	0	m2			
	Unpaid Concourse - Sundry works	457	m2			
	125 Little Everleigh Street - Urbanstone paving on & incl waterproof membrane	243	m2			
	125 Little Everleigh Street - EO Urbanstone paving for steps	90	m			
	125 Little Everleigh Street - Sundry works	243	m2			
	125 Little Everleigh Street - Fitout to ticketing offices and office facilities including services	130	m2			
	Platform 11/12 Link (Mezzanine) - Urbanstone paving	204	m2			
	Platform 11/12 Link - Urbanstone paving on & incl ground slab on substrate over waterproof membrane to suspended slab	67	m2			
	Platform 11/12 Link (Mezzanine) - Fitout to Station back of house	228	m2			
	Platform 11/12 Link - Fitout to ticketing offices and office facilities including services	156	m2			
	Platform 11/12 Link - Fitout to staff showers, lockers and lunchrooms including services	21	m2			
	Platform 11/12 Link - Internal masonry walls	275	m2			
	Platform 11/12 Link (Mezzanine) - Wall tiling	370	m2			
	Wayfinding Signage					
	Concourse - Wayfinder Signage	1	Item			
	Platforms - Wayfinder Signage	10	No			
5.6	Hydraulic Services					
	Allow for hydraulics & plumbing	1	Item			
	Allow for hydraulics, waste water, sewage & plumbing connections to existing	1	Item			
5.7	Electrical works					
	Allow for temporary electrical	1	Item			
	Concourse - Lighting including distribution boards, light fittings and luminaires	3,230	m2			
	Unpaid Concourse - Lighting including distribution boards, light fittings and luminaires	457	m2			
	External Works - Lighting including distribution boards, light fittings and luminaires	1,037	m2			
	Provisions for 6 No lifts & 2 No escalators	1	Item			
	Unpaid Concourse - Provision for 2 No Additional lifts	2	No			
5.8	Mechanical Services					
	Allow for air-conditioning (staff)	535	m2			
5.9	Fire Services					
	Allow for fire protection	3,230	m2			
5.10	Vertical Transportation					
	Concourse - Disabled Lift	6	No			
	Unpaid Concourse - Disabled Lift	2	No			
	Platform 11/12 Link - Disabled Lift	1	No			
	Escalator rising 5.35m (RL26.25 to RL31.60)	2	No			
	Allowance for crane (for lifts & escalators)	9	Item			
	Unpaid Concourse - Allowance for crane (for lifts)	2	Item			
DC5	Total - New Elevated Concourse & Staircases					

Redfern Railway Station BLL Cost Plan - Option C2 (Elevated Unpaid Concourse)

		Description	Q'ty	Unit	Rate	Total Cost
6	OHW Works (including relocation works)					
	OHW Structures - Wiring adjustments (per Possession)	6	No			
	Allow for modifying OHW structures	8	No			
	New OHW cable supports underneath new slab	20	No			
	Removal of redundant OHW structures	9	No			
	Making good of platforms	12	Item			
	Testing & commissioning (Number of times)	6	No			
DC6	Total - OHW Works (including relocation works)					
7	HV Electrical Works & Traction Power					
7.1	Traction power - not required				Note	
7.2	Power for PL 1-10 & concourse				Note	
	Existing station capacity is sufficient if escalators are not required for each platform				Note	
7.3	PL 11 & 12 switch room relocations (if required) included in IR works				Note	
7.4	Power for new development - included in the commercial development section				Note	
DC7	Total - HV Electrical Works & Traction Power					
8	Signalling and Communications (including relocation works)					
	Temporary signal gantry structure to house signal for Down Main Line	1	No			
	New signal	1	No			
	Allow for new cabling	1	Item			
	Allow for modifications to existing track circuit	1	Item			
	Removal of existing gantry	1	Item			
	Removal of temporary gantry	1	Item			
	Relocation of signalling & comms cables mounted on PL 1 retaining wall including troughing & 2 kV power cables	250	m			
	Ditto, mounted on PL10	250	m			
	Allow for disconnections and reconnections	1	Item			
	Testing & commissioning	1	Item			
DC8	Total - Signalling and Communications (including relocation works)					
9	Station Comms Works (PL 1-10 & Concourse)					
	(NSSU Prorata \$3.5m to \$4.5m - Use \$4.0m)					
	Station Passenger Information (SPI)					
	Train describer system	1	Item			
	Control room & racks					
	CCTV's and help points					
	Telephones, PA system and other communications					
DC9	Total - Station Comms Works (PL 1-10 & Concourse)					

Redfern Railway Station
BLL Cost Plan - Option C2 (Elevated Unpaid Concourse)



Description	Q'ty	Unit	Rate	Total Cost
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10 External Works and Landscaping works - priced separately

10.1 External Works

External Works - Urbanstone paving on and incl slab on grade	1037	m2		
External Works - Sundry works, bollards etc	1037	m2		
External Works - Re-grade park to new levels	2834	m2		
External Works - Soft Landscaping to Park	1664	m2		
External Works - Feature trees	5	No		
External Works - Allow for hard landscape to Park	1664	m2		
External Works - Footpath to Gibbons Street (No Service pit adjustments or relocations)	228	m2		



DC10 Total - External Works and Landscaping works - priced separately

11 Protection Works

Included in Possession Works Note

DC11 Total - Protection Works



Total

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Redfern Railway Station
BLL Cost Plan - Option C2 (Elevated Unpaid Concourse)



Description	Q'ty	Unit	Rate	Total Cost
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Option C: Redfern Station IR Platforms Upgrading Works

1 Enabling and Temporary Works

1.1 Civil Works
 Demolition works - see section 2

Temporary Access and Worksite - included in Main Works (PL 1-10 & Concourse Works)

1.1.1

1.1.2 Temporary Fencing and Hoarding

Temporary site hoarding, 2400mm high	200	m		
Temporary Fencing - allow	50	m		

1.2 Utilities Diversions

Allowance for in ground services diversion	1	Item		
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DC1 Enabling and Temporary Works

2 Demolition Works

2.1 Demolition of part of existing concourse

Demolition of concourse entrance awning	1	Item		
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2.2 Demolition of existing roof level

Allow for temporary hoarding	80	m		
Demolition - Allow for catch deck	70	m2		
Demolition - Concrete roof structure	363	m2		
Demolition - Concrete concourse structure	363	m2		
Excavation and disposal of soil off site	200	m3		

2.2 Demolition of existing platform for new escalator pit and lift pit

Demolition	1	Item		
Allow for waste to tip	1	Item		

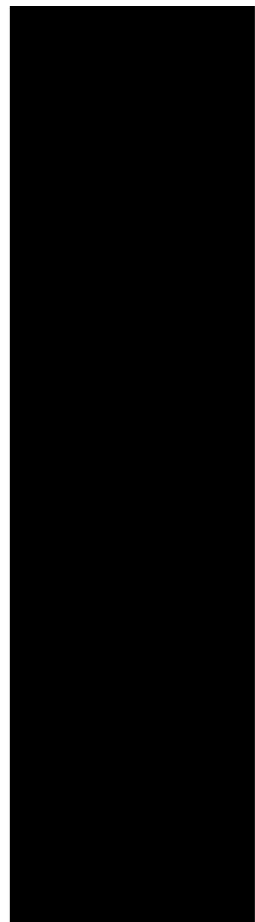
2.3 Demolition of internal structures

3.3 Platform level raising


Remove existing tiled paving and re-grade to new profile	1,389	m2		
Allow for removal by spoil train	2	No		
Remove existing tiled paving (Mezzanine)	125	m2		
Stormwater drain	341	m		
Allow for sumps every 10m	28	No		
Allow for discharging water into track drainage system (4 No per platform)	8	No		

Allow for demolition of existing blade wall/column for new fire egress stair South	2	No		
Allow for demolition of staircase rising 6720mm	1	No		
Allow for removal of pair escalators rising 12870mm	2	No		
Allow for demolition of internal walls	1	Item		
Allow for hacking existing wall finishes to receive new finishes	1	Item		
Allow for protection work during demolition	1	Item		


DC2 Demolition Works



Redfern Railway Station BLL Cost Plan - Option C2 (Elevated Unpaid Concourse)

		Description	Q'ty	Unit	Rate	Total Cost
3 IR Platform Modification Works						
3.1	Supports and strengthening existing columns No allowance for strengthening and / or concrete encasing existing columns for impact loading					
		Note				
3.1	Fire rate structural steel roof framing to Platforms 11 & 12 Allow for 2 Hr vermiculite fire spray to exposed steel beams Note: Excludes rectification of existing steelwork damaged by water ingress Note: Excludes removal and replacement of roof membrane and spoil and finishes of Platform roof		2890	m2		
		Note				
3.2	Modification to existing slab at 26.40-28.5 for new roof Allow for sealing staircase & escalator voids		70	m2		
3.3	New internal structures Allow for structural alterations for lifts, escalators and stairs Allow for lift pits Lift structure (Platform to top lift shaft) Lift cladding (Platform to top lift shaft) Allow for escalator pits Escalator lining to sides & soffit rise 5.35m Allow for new passenger staircase Allow for new fire escape staircase to park Re-work vent shafts & service risers		1 1 118 118 2 56 1 1 2	No No m2 m2 No m2 No No No		
3.4	New Smoke Exhaust / Skylights Skylight Structure to Park Allow for roof glazing Note: Smoke exhaust system (naturally ventilated through skylight)		7 210	No m2		
		Note				
3.5	Internal finishes & fitouts Platform re-surfacing with wearing slab and Urbanstone paving 300mm wide coping to platform edge 100mm wide safety line to platform edge 300mm wide tactile to platform edge Refurb existing toilets and locker facilities Allow for new wall finish Allow for new finishes and fixtures to lift lobby and pedestrian link at Mezzanine level Allow for new finishes and fixtures to lift lobby at Platform level Allow for new control room including wash down, toilet and comms facilities		955 341 341 341 1 1,700 1 1 1	m2 m m m Item m2 Item Item No		
	Wayfinding Signage Concourse - Wayfinder Signage Platforms - Wayfinder Signage		1 2	Item No		
3.6	Hydraulic Services Allow for hydraulics & plumbing Allow for hydraulics, waste water, sewage & plumbing connections to existing Allow removal of PVC piping		1 1 1	Item Item Item		
3.7	Electrical works Allow for temporary electrical Upgrade of cabling to Fire Life Safety requirements Modify lighting to platforms Allow for new lighting to Mezzanine Provisions for lifts & 2 No escalators		1 1 1389 150 1	Item Item m2 m2 Item		

Redfern Railway Station BLL Cost Plan - Option C2 (Elevated Unpaid Concourse)

		Description	Q'ty	Unit	Rate	Total Cost
3.8	Mechanical Services Allow for air-conditioning for staff office and back of house		1	Item		
3.9	Fire Services Modifications to fire protection including smoke detectors, EWIS and sprinklers to escalators		1,389	m2		
3.10	Vertical Transportation Disabled Lift Escalator rising 6.72m Allowance for crane (for lifts & escalators)		1 2 3	No No Item		
DC3 IR Platform Modification Works						
4	OHW Works (including relocation works) OHW works not required					
		Note				
DC4 OHW Works (including relocation works)						
5	HV Electrical Works & Traction Power 5.1 Traction power - not required					
5.2	PL 11 & 12 switch room relocations works Not required					
		Note				
DC5 HV Electrical Works & Traction Power						
6	Signalling and Communications (including relocation works) No new works required					
DC6 Signalling and Communications (including relocation works)						
7	Station Comms Modification Works (PL 11 & 12) Station Passenger Information (SPI) CCTV's and help points Telephones, PA system and other communications		1	Item		
DC7 Station Comms Modification Works (PL 11 & 12)						
8	External Works and Landscaping works - priced separately					
DC8 External Works and Landscaping works - priced separately						
9	Protection Works Included in Possession works					
		Note				
DC9 Protection Works						
Total						

Redfern Station Redevelopment



Appendix F

Peer Review of Tenix Projects Cost, Constructability and Programming Review dated 3 April 2007 and Review and Clarification dated 28 Feb 2008

Redfern Station Redevelopment





Imagine
Create

Redfern Station Redevelopment

Peer Review of Tenix Projects Cost, Constructability and Programming Review dated 3 April 2007 and Review and Clarification dated 28 February 2008

Document Control

Peer Review of Tenix Projects Cost, Constructability and Programming Review dated 3 April 2007 and Review and Clarification dated 28 February 2008

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Revision 1

8 May 2009

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Executive Summary

This Peer Review report has been prepared by Bovis Lend Lease Consulting (BLLC) for the Redfern Station Redevelopment. This report reviews the costs, programme and construction methodology developed by Tenix Projects based on the three redevelopment options proposed by Jackson Teece.

Jackson Teece was the architect previously engaged by RailCorp for the Redfern Station Redevelopment and they developed a number of options for consideration. Three of these options C, D and E representing varying degrees of satisfying the design brief were further considered by RailCorp with "Option C - full station redevelopment" being the preferred option.

As many of the redevelopment works can only be safely and effectively undertaken during track possessions, the programme of works is heavily dependent on RailCorp's possession regime. Bovis Lend Lease Consulting is of the opinion that the construction sequence and durations used by Tenix projects in developing the programme are generally consistent with working in a live rail environment. Similarly, the cost plans developed by Tenix Projects are generally consistent with the restrictions experienced in undertaking works in an operating railway station, however Bovis Lend Lease Consulting is of the opinion that insufficient allowance was made for worksite protection.

Notwithstanding the above, Bovis Lend Lease Consulting consider varying some of the construction methodologies adopted by Tenix Projects would result in time, cost, reliability and safety benefits. Significant variances include:

- Removing the need to install catch decks above the Up and Down Main (Platforms 1 & 2) and Illawarra Lines (Platforms 9 & 10) by using the previously erected structure as a barrier between the lifting operation and the live tracks;
- Using hi-rail vehicles to delivery and remove plant and materials from platforms thus removing the need to construct a temporary construction access bridge; and
- Instead of an extended closedown of the Illawarra Relief, only close the platforms, permitting trains to travel through but not stop at Redfern Station during the reconfiguration of the vertical transfer elements (If the full development above the station is to occur then it is likely that an extended closedown will be required to facilitate installation of the transfer structure).

The results of the review are summarised in the following table:

Development Options	Cost (2009 Dollars) - Tenix	Cost (2009 Dollars) - BLLC	Duration – Tenix	Duration - BLLC
C			47 months	47 months
D			24 months	24 months
E			36 months	36 months

*The figures have been adjusted to include current rates and items Bovis Lend Lease Consulting feels were not included in the Tenix Projects cost plan such as additional worksite protection and fire rating to beams in the ESR. Furthermore, we consider an escalation rate of 0% to be appropriate for the period between June 2008 and May 2009 and this has been applied to the values presented by Tenix Projects in their Review and Clarification report dated 28 February 2008 bringing the figures up to 2009 (Today's) dollars.

As the figures are in 2009 dollars, RailCorp will need to consider making allowances to take into account the actual start dates and factor in escalation up to and during the design and construction phases.



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1. Introduction

RailCorp is progressing the Concept Development planning for Redfern Station to Project Definition stage. RailCorp previously engaged Tenix Projects to analyse the concept design options for the Redfern Station Redevelopment and report on the cost, constructability and programme. This report is a peer review of the Tenix Projects report programmes and cost plans that aims to identify any safety issues and potential cost and time savings.

For consistency and comparison purposes, BLLC have generally used the same headings of the Tenix Projects Cost, Constructability and Programming Review Report – Revision 3 dated 3 April 2007.

1.1. Background

The background surrounding the redevelopment has not changed.

1.2. Purpose

The purpose of the report is to provide an independent review of the Tenix Projects cost, constructability and programming review.

1.3. Key Assumptions and approach

1.3.1. Programme

- The programme has been based on RailCorp's Weekend and Closedown Possession programmes at the time of the Tenix report. For an indicative construction start date of July 2011 the following RailCorp Weekend and Closedown Possession Programmes are now applicable:
 - 2011/2012 Draft 5
 - 2012/2013 Version 3
 - 2013/2014 Version 1
 - 2014/2015 Version 1
- The amount of work proposed in each possession appears reasonable.
- Bovis Lend Lease Consulting acknowledges that extended closedowns of the Illawarra Relief are desirable and would construction productivity; however they do not consider extended closedowns to be necessary.
- Tenix Projects have identified lack of RailCorp resources for OHW, signals and sub station works as a risk to the project. With adequate planning we do not consider this to be a significant risk.
- The configuration change process will depend on whether the project is managed internally or by another party such as TIDC. Whatever the process, configuration change approval will be based on RailCorp's acceptance of approved for construction drawings.



1.3.2. Cost

- It is reasonable that costs are presented at 2007 prices.
- The costing of the project was based upon a contract structure and approach similar to that used by TIDC on Clearways projects. However, RailCorp may also consider other delivery methods such as Design only - Build only, Alliance or Managing Contractor. In considering each method, RailCorp should be mindful of the impact on design timelines, internal resources required and the time associated with tender and award of the various procurement methods.
- Bovis Lend Lease Consulting agrees that works interfacing with the operating rail environment would be undertaken by a contractor engaged by RailCorp and any development works between Platform 10 and Gibbons Street would be the responsibility of a developer.
- Tenix Projects note that cost and time advantages may be obtained if the project was delivered on an Alliance basis. Following review of the programme, we question whether any time advantages could be obtained in an Alliance contract. However, cost advantages could be realised if an appropriate incentive and pain/gain structure is implemented. We note that establishing an Alliance can be time consuming.

1.3.3. Constructability

- Tenix Projects base their construction methodology on the ability to lift across live tracks and platforms subject to temporary catch decks being in place and a risk assessment undertaken with RailCorp. Bovis Lend Lease Consulting agrees in principle with this methodology but without the temporary catch decks, using previously installed deck sections as a barrier between the crane and the operating tracks.
- Bovis Lend Lease Consulting agrees that the North Eveleigh site could be used as a worksite.

1.4. References

No comment.



2. Construction Methodology

2.1. Introduction

Bovis Lend Lease Consulting has reviewed the construction methodologies proposed by Tenix Projects and whilst they are generally consistent with working in a live rail environment we would consider varying some of the construction methodologies to save on time and cost as well as improving safety and reliability. Significant variances include:

- Removing the need to install catch decks above the Up and Down Main (Platforms 1 & 2) and Illawarra Lines (Platforms 9 & 10) by using the previously erected structure as a barrier between the lifting operation and the live tracks;
- Using hi-rail vehicles to delivery and remove plant and materials from platforms thus removing the need to construct a temporary construction access bridge;
- Reducing the time taken and inconvenience of removing spoil from the demolition of the platform buildings during the week by undertaking the activity during possession;
- Constructing lift pits on the platforms during possessions only to avoid any subsidence issues with the platform surface during station operations; and
- Carrying out the vertical transfer works to the Illawarra Relief only during the possessions available and during the day instead of requiring an extended closedown. Notwithstanding this, only closing the platforms, permitting trains to travel through but not stop at Redfern Station during the reconfiguration of the vertical transfer elements only would greatly benefit construction.

In terms of the peer review of the report, Bovis Lend Lease Consulting agrees with the commentary included in the introduction in relation to independent worksites, Option C requiring a more defined sequence and the impact of start dates relative to the RailCorp Weekend Possession Programme applicable during the construction phase.

2.2. Construction Access to Surface Platforms

Option C

Bovis Lend Lease Consulting does not see the construction access bridge to be a viable option considering:

- Possessions are required for the construction of the bridge when permanent works can be carried out at the same time;
- Access to platforms will be restricted during peak periods;
- Materials and equipment can be delivered to platforms out of operating hours;
- Hoists have a limited capacity for materials and equipment;
- It is likely to impact signal sightings;
- Concrete for platform structures could be delivered via concrete pump lines through PVC sleeves beneath the rails at the country end of the platforms or alternatively at night via concrete pumps lines from the corner of Lawson and Gibbons Streets down the existing stairs at the city end of the platforms (or via booms during possessions).

Bovis Lend Lease Consulting considers using hi-rail trucks during non-operating times as a viable alternative to the construction access bridge.

Option D & E

Bovis Lend Lease Consulting agrees that the scale of works for these options is relatively small and that a construction access bridge is not necessary. We agree that cranes would be required to hoist material and machinery to platforms. However, we also consider hi-rail trucks to be a viable alternative to cranes especially for larger machinery and materials. Without further investigation, we question whether the

excavation of the lift pits at the end of the platforms can be safely and effectively undertaken outside of possessions.

2.3. Early Works

Early works would be required if the construction access bridge was required but Bovis Lend Lease Consulting does not see it as a viable option.

2.4. Surface Platforms Construction Sequence

Bovis Lend Lease Consulting generally agrees with the construction sequence proposed by Tenix Projects. However, we suggest that the demolition of the building on the platforms be undertaken during possessions due to the piece meal approach required if it is demolished during the day. Furthermore, we consider that the pier headstock structures could be constructed during the day with the falsework erected and dismantled during possessions.

2.5. Illawarra Relief and Void between Platforms 10 and 11

Bovis Lend Lease Consulting agrees that this will be the most active work zone at the beginning of the project.

We agree that the park adjacent to Gibbons Street would be taken over as a worksite and staging area.

Bovis Lend Lease Consulting understand that Tenix Projects based the crane capacity on a 400T mobile crane and suggest that using a larger crane such as a 450T mobile crane is likely to provide alternative crane platform locations that do not require as significant structural support.

2.6. Sequence and Methodology Issues

Option C

Bovis Lend Lease Consulting agree that any major re-work of the Illawarra Relief Box would include extensive work in the road reserve and that the RTA would not allow less than 3 trafficable lanes at any one time.

We agree that the demolition works on Platform 1 and 10, including the part demolition of the retaining wall on Platform 10 could be undertaken behind hoardings at any time except for the awning of the Platform 10 which would need to be carried out during possession due to its proximity to the OHW.

Perimeter contiguous piling is an option for the interface with Platform 10 and the Marian Street boundary in conjunction with demolition of the old superstructure.

We agree that a section of the Intermediate Concourse roof would need to be demolished in addition to local areas for the northern and southern fire stairs and a strip where the skylight is located.

Bovis Lend Lease Consulting does not consider the temporary construction access bridge to be a viable option as described above.

Bovis Lend Lease Consulting agrees in principle with the use of catch decks over the tracks between Platforms 1 and 2 and the tracks between Platforms 9 and 10 but is of the opinion that previously installed deck sections over these tracks can act as a barrier between the crane and the operating tracks. Alternatively, and if midnight to dawn possessions with OHW power out can be arranged for the Up and Down Local tracks between Platforms 5 & 6, the planks could be installed during the nights of Configuration 1A and/or Configuration 3 possessions.

Bovis Lend Lease Consulting agrees that the construction of the permanent structures will require strict control of crane operations with respect to adjacent live rail operations and that the basic approach is feasible.

The chosen locations of the new vertical transport and access concourse, fire stairs and skylights appear to be feasible for construction sequence and structural reasons. We agree with basic philosophy to maintain adequate vertical transfer elements during construction and the intended routes proposed via the new concourse link and Platform 10.

Options D & E

Bovis Lend Lease Consulting agree that the major activities in these options are possession dependent and consider the phasing of the major activities shown in Figures 27 to 35 to be reasonable.

We note that the proposed extension of platform 2/3 may impact on the sighting of Signal SY457M.

Tenix Projects appear to rely heavily on the use of cranes and whilst we consider them to be appropriate in some instances, consideration should be given to the use of hi-rail vehicles for delivery and removal of machinery and materials to platforms.

3. Programme

3.1. Introduction

Bovis Lend Lease Consulting have reviewed the programmes and found the construction sequence and durations used by Tenix Projects in developing them to be generally consistent with working in a live rail environment. We note that the programme of works is heavily dependent on RailCorp's possession regime and that any change to the commencement of works on site is likely to affect the overall duration of the project.

In reviewing the report, Bovis Lend Lease Consulting agree that works is highly dependent on RailCorp's Possession Programme and consider it reasonable that construction would commence as soon as approvals are in place on the basis of a Design and Construct or Management Contract delivery model, assuming that the main contract is based on a signed off Concept Design by the stakeholders.

If a Design Only Build Only delivery model is used, the design would need to reach Approved for Construction status prior to commencing construction.

Bovis Lend Lease Consulting consider the 7 months from contract award to any substantial construction works occurring for each option to be reasonable during which time design and other approvals will be sought.

3.2. Possession requirements

Bovis Lend Lease Consulting do not consider that in addition to the normal scheduled possessions, extended shut downs will be required for major structural works to be undertaken to the Illawarra Relief for installation of new fire stairs and other vertical access. Whilst extended shut downs would be beneficial in terms of time, cost and safety, we are of the opinion that the works could, if necessary, be carried out within the available possessions and work during normal hours with hoarding separating work zones from operational zones.



If the full development above the station is to occur then it is likely that an extended closedown will be required to facilitate installation of the transfer structure. We agree that extended shutdowns of around 4 weeks would most likely have to occur over the Christmas New Year period.

Having the adjacent live platforms during Configuration 1, 3, 4, 8 and 15 possessions non-stop at Redfern increasing the work area and avoiding mixing passengers and construction work would be extremely beneficial.

3.3. Main Findings

3.3.1. Option D

The duration for Option D is 24 months from award of contract. Bovis Lend Lease Consulting has reviewed the programme developed by Tenix Projects and found it to be reasonable. With the majority of the work being possession dependent there is little room for improvement in relation to the overall duration. We note that the duration will be determined by the possession regime applicable at the time construction commences and therefore may fluctuate depending on possession availability.

3.3.2. Option E

The duration for Option E is 36 months from contract award. Bovis Lend Lease Consulting has reviewed the programme developed by Tenix Projects and found it to be reasonable. With the majority of the work being possession dependent there is little room for improvement in relation to the overall duration. We note that the duration will be determined by the possession regime applicable at the time construction commences and therefore may fluctuate depending on possession availability.

3.3.3. Option C

The duration for construction is 47 months from contract award. Bovis Lend Lease Consulting has reviewed the programme developed by Tenix Projects and found it to be reasonable. We note that the duration will be determined by the possession regime applicable at the time construction commences and therefore may fluctuate depending on possession availability.

4. Station Upgrade Costs

4.1. Introduction

Bovis Lend Lease Consulting has reviewed the cost plans for Option C, D & E and made adjustments to determine the value of the works in 2009 terms. Rates have been adjusted based on current market value and actual costs for similar activities experienced on recent projects and allowances have been made for items that we feel did not adequately cover the scope such as worksite protection and fire-rating to the beams in the ESR.

4.2. Direct Costs

It is reasonable that Tenix Projects have priced the works on activities given the level of architectural detail available and the preliminary nature of the options. Tenix Projects claim that the rates applied are higher than would be expected for a standard building type project as they take into account the degree of difficulty of working in a rail environment. Whilst Bovis Lend Lease Consulting agrees with the application of higher rates, in many cases it was difficult to assess how Tenix Projects valued some work activities due to the lack of detailed construction methodology and pricing calculations.



4.3. Contractors Indirect and Client Costs

4.3.1. Contractor's Indirect Costs

Bovis Lend Lease Consulting has undertaken a review of the allowances made by Tenix Projects in their report and generally found them to be reasonable for use at concept phase with the exception of the Subcontractor Indirects allowance of 18% given that these costs are usually included in subcontractor rates. We note that Tenix Projects do not provide a description what they consider to be included in subcontractor indirect costs but we assume they include at least:

- Overheads
- Profit
- Site establishment
- Supervision
- Contingency

IC1.1 Subcontractor Indirects – Tenix Projects allowed 18% based on similar cost estimates provided for TIDC and RailCorp. Bovis Lend Lease Consulting considers this allowance to be reasonable.

IC1.1 D&C Contractors Contingency to manage Subcontractors – 10% contingency of the total direct costs plus the subcontractor indirects to cover the risks in managing the subcontractors. Bovis Lend Lease Consulting considers this allowance to be reasonable.

IC2.2 D&C Contractors Project Management and Facilities – The construction teams proposed by Tenix Projects for each option are reasonable.

IC2.3 D&C Contractors Design – The design costs is 5% of the total direct cost plus Subcontractor indirects and Contractors contingency to manage subcontractors. Bovis Lend Lease Consulting considers this allowance to be reasonable.

IC2.4 D&C Contractors Design Verification - 2% of the total direct cost plus Subcontractor indirects and Contractors contingency to manage subcontractors. Bovis Lend Lease Consulting considers this allowance to be reasonable.

IC2.5 D&C Contractors Overhead and Profit – 12% on top of all of the above. Bovis Lend Lease Consulting considers this allowance to be reasonable.

IC3.1 & IC3.2 Design Development and Construction Contingency – 10% has been allowed for to manage any cost implications from client directions concerning design and construction methodology. Bovis Lend Lease Consulting considers this allowance to be reasonable.

These contingencies added to the Construction Cost form the Target Budget.

4.3.2. Client Costs

Similar to the Indirect Cost allowances, Bovis Lend Lease Consulting has undertaken a review of the Client Costs allowances made by Tenix Projects in their report and found them to be reasonable for use at concept phase. Therefore, these allowances will be applied to the Target Budget costs in the cost plan.

CC1 EIS/REF. Survey, Geotechnical Investigations and Concept Design - Between 1.5 & 3% of the Target Budget. Bovis Lend Lease Consulting considers these allowances to be reasonable.

CC2 Client Project Management Team – 5% of the Target Budget. Bovis Lend Lease Consulting considers this allowance to be reasonable.

CC3 Possession Costs – Tenix Projects allowances for alternate transport, trackwork marketing and possession management appear reasonable.

CC4 Land and Property Acquisition Costs – Tenix Projects made no allowance on the basis that the majority of the works and worksites fall within RailCorp property. Bovis Lend Lease Consulting notes that RailCorp have since acquired No 125-127 Little Eveleigh Street.

CC5 Legal and Marketing Costs – 0% (minor if any). Bovis Lend Lease Consulting considers this allowance to be reasonable.

CC6 Financing Cost – 0% (RailCorp to apply). Bovis Lend Lease Consulting agrees that it is for RailCorp to apply.

CC7 & CC8 RailCorp Supplied Items – Allowances have been made for items such as Station Ticket Gates, and Ticket Vending Machines. Bovis Lend Lease Consulting considers these allowances to be reasonable.

CC9 Initial Maintenance Costs – Tenix Projects did not make an allowance as specific advice as to the requirement and magnitude of this allowance was not available at the time. Bovis Lend Lease Consulting considers it appropriate for RailCorp to determine the value of this allowance.

CC10 Client Project Contingency – 10% is allowed for the impact of external influences on the project such as changes to legislation and the requirements of external stakeholders. Bovis Lend Lease Consulting considers this allowance to be reasonable especially with the proposed new rail corridor immediately to the west of the station.

4.4. Area Specific Assumptions

Tenix Projects made a number of assumptions related to temporary works, construction methodology, power capacity, rail systems and finishes which Bovis Lend Lease Consulting consider to be reasonable.

4.5. Cost Estimate Summaries

4.5.1. Station upgrade for Option D

Based on the limited information available, especially in terms of the detail of Tenix Project's intended construction methodology, Bovis Lend Lease Consulting has reviewed the cost plan and excluding insufficient allowance for worksite protection officers, found it to be reasonable for 2007 prices. Whilst it is not clear in the supplementary report, it appears that an additional 15% has been added for escalation to bring the prices up to 2008 dollars.

We note that the Tenix Projects cost plan appears to have allowed for twin escalators to the new concourse over Platform 2/3 when the design shows one. Furthermore, it appears the cost for the escalators was not included in the summation of the costs. Bovis Lend Lease Consulting has made the necessary adjustments.

Tenix Projects reported \$33.9M for Option D in June 2008. Making adjustments to the rates where appropriate and including allowances for worksite protection and fire-rating, brings the Total Project Cost to \$39.0M in 2008 dollars. Applying 0% escalation results in the cost remaining at \$39.0M in 2009 dollars (Refer to Appendix A).

4.5.2. Station upgrade for Option E

Based on the limited information available, especially in terms of the detail of Tenix Project's intended construction methodology, Bovis Lend Lease Consulting has reviewed the station upgrading section of the cost plan and excluding insufficient allowance for worksite protection officers, found it to be reasonable for 2007 prices. The WT Partnership costing for the unpaid pedestrian bridge has been added and whilst it is not clear in the supplementary report, it appears that an additional 6.5% has been added for escalation to bring the prices up to 2008 dollars.

We note that the Tenix Projects cost plan appears not to have included \$58,200 of piling in the summation of the costs. Bovis Lend Lease Consulting has made the necessary adjustments.

Tenix Project reported \$98.8M in June 2008. Assuming that the development enabling works are reasonable, making adjustments to the rates where appropriate and including allowances for worksite protection and fire-rating, brings the Total Project Cost to \$104.5M in 2008 dollars. Applying 0% escalation results in the cost remaining at \$104.5M in 2009 dollars (Refer to Appendix B).

4.5.3. Station upgrade for Option C

Based on the limited information available, especially in terms of the detail of Tenix Project's intended construction methodology, Bovis Lend Lease Consulting has reviewed the station upgrading section of the cost plan and excluding insufficient allowance for a hoist operator, fire-rating and protection officers, found it to be reasonable for 2007 prices. Whilst it is not clear in the supplementary report, it appears that an additional 15% has been added for escalation to bring the prices up to 2008 dollars.

Tenix Project reported \$220.0M in June 2008. Assuming that the development enabling works are reasonable, making adjustments to the rates where appropriate and including allowances for a hoist operator, worksite protection and fire-rating, brings the Total Project Cost to \$234.7M in 2008 dollars. Applying 0% escalation results in the cost remaining at \$234.7M in 2009 dollars (Refer to Appendix C).

4.5.4. Consideration of raising the central concourse for Option C

Bovis Lend Lease Consulting agrees with the Tenix Projects assessment of the impact of raising the central concourse for Option C. Namely that the change would be approximately cost neutral and that raising the concourse would result in significant problems in relation to access at either side of the station.

5. Development Costs

Bovis Lend Lease Consulting agrees that in the event a developer progresses with the commercial development, the development enabling works must be undertaken by a RailCorp Contractor as they have a direct interface with the operational railway. We also agree that the works up to and above RL31.70 would be undertaken by a commercial development contractor.

Redfern Station Redevelopment



5.1. Development enabling works

Tenix Projects note that the enabling works will be undertaken at the same time as the station upgrade works thereby the associated on costs such as the project management team and facilities only allow for the elements specifically related to those works.

Tenix Projects also make a number of specific assumptions for Option C only in relation to retaining the basement excavation and the demolition of the Platform 10 retaining wall to facilitate construction of the bored pile wall for the carpark.

Bovis Lend Lease Consulting found the assumptions to be reasonable.

5.1.1. Enabling works for Option E development scheme

Bovis Lend Lease Consulting has reviewed the cost plan based on the limited information available and found it to be reasonable for 2007 prices. We would make an allowance for management and real-time monitoring of the Illawarra Relief tracks during the piling works.

We note that a significant amount of potentially contaminated spoil from track reconditionings has been dumped in the southern suburbs rail tunnels (possibly after Tenix Projects undertook their site inspection) and its removal will now need to be factored into any works in this area.

5.1.2. Enabling works for Option C development scheme

Bovis Lend Lease Consulting has reviewed the cost plan based on the limited information available and found it to be reasonable for 2007 prices. We would make an allowance for management and real-time monitoring of the Illawarra Relief tracks during the piling works.

We note that a significant amount of potentially contaminated spoil from track reconditionings has been dumped in the southern suburbs rail tunnels (possibly after Tenix Projects undertook their site inspection) and its removal will now need to be factored into any works in this area.

5.2. Development works up to 31.7m level

Bovis Lend Lease Consulting has reviewed the cost plan based on the limited information available and found it to be reasonable for 2007 prices.

Tenix Projects also make a number of specific assumptions for Options C & E in relation to retaining the basement excavation along Marian Street, the upper floor limit for the estimate and that only structural works are considered for the building at the corner of Lawson and Gibbons Street.

Bovis Lend Lease Consulting found the assumptions to be reasonable.

5.2.1. Development works up to 31.7m level for Option E scheme

Bovis Lend Lease Consulting has reviewed the cost plan based on the limited information available and found it to be reasonable for 2007 prices. We would make an allowance for management and real-time monitoring of the Illawarra Relief tracks during the piling works.

5.2.2. Development works up to 31.7m level for Option C scheme

Redfern Station Redevelopment



Bovis Lend Lease Consulting has reviewed the cost plan based on the limited information available and found it to be reasonable for 2007 prices. We would make an allowance for management and real-time monitoring of the Illawarra Relief tracks during the piling works.

5.3. Commercial Development above 31.7m level

Tenix Projects have used typical industry rates per square metre for commercial high rise development. They also see the location and use of cranes over the live rail corridor as significant constraints. Bovis Lend Lease Consulting agrees that these constraints will be significant.

5.3.1. Commercial development above 31.7m for Option E scheme

Bovis Lend Lease Consulting has reviewed the cost plan based on the limited information available and found it to be reasonable for 2007 prices.

5.3.2. Commercial development above 31.7m for Option C scheme

Bovis Lend Lease Consulting has reviewed the cost plan based on the limited information available and found it to be reasonable for 2007 prices.

6. Cost Summary

A summary of the total project costs for the three options (including BLLC adjustments to station upgrade works) is provided below:

Development Phases	Options					
	D (\$M) Tenix	D (\$M) BLLC	E (\$M) Tenix	E (\$M) BLLC	C (\$M) Tenix	C (\$M) BLLC
Station Upgrade						
Development Enabling Works						
Development Works up to RL31.7m						
Development Costs	Excluded	Excluded	Excluded	Excluded	Excluded	Excluded
Total Cost						

7. Analysis of Options

Constructability assessments of the three options defined by Jackson Teece have been undertaken.

7.1. Review against assessment criteria

The Tenix Projects brief included a review of assessment criteria and issues of interest for the cost constructability and programming study which have been reviewed by Bovis Lend Lease Consulting and are presented below.

7.1.1. Staging Plans

Bovis Lend Lease Consulting generally agrees with the staging plans provided by Tenix Projects for each of the options reflecting the construction sequence.

7.1.2. Platform Closures Required

Bovis Lend Lease Consulting disagrees that closing platforms would not have any overall great affect on cost or programme. Closing platforms enables work to be carried out more effectively and safely as there is no interface with passengers. Being able to effectively carry out works during operational times significantly reduces time risks, especially when the works are critical to possession dependent works thus providing more surety of the programme activities. Whilst the end date of the programme may not move as a result of critical path works being possession dependent, being able to undertake activities with platforms closed will be quicker, thus reducing the project management team requirements which will ultimately lead to cost savings.

Long term possessions of Platforms 1 and 10 would enable the significant amount of works at end of the concourse and unpaid pedestrian and cycle bridge to be carried out more effectively and safely. Similarly, closing each of the island platforms during substructure works as well as Platforms 11 and 12 in the ESR for vertical transfer element reconfigurations would enable works to be carried out more effectively and safely.

Bovis Lend Lease Consulting agrees that closing the adjacent platform side to customers to allow for increased work areas in possessions would be beneficial.

Bovis Lend Lease Consulting is of the opinion that the platforms and lines of the Illawarra Relief need to be closed for an extended duration for the transfer structure required for the development only.

7.1.3. Traffic Impacts

Bovis Lend Lease Consulting agrees that Option C has the potential for major traffic impact upon Gibbons Street during development enabling works. We also suggest that the disused Down Southern Suburbs tunnel via the Sydney Signal Box be explored as a possible access/egress point if and when the enabling works take place.

We agree that Lawson Street will need to be blocked during some possessions for Options D & E. However, the use of hi-rail trucks to deliver plant and equipment and remove material may reduce this requirement and should be explored.

Road closures would be required in Little Eveleigh Street to facilitate delivery and crange of the concourse precast concrete elements.

We agree that traffic routes and coordination of deliveries will be important to minimise the impacts along local roads.

7.1.4. Proposed Storage Areas and Worksites

Tenix Projects have identified an area in North Eveleigh for station operations and local police station parking during construction of the main commercial building. Whilst this is feasible, Bovis Lend Lease Consulting suggest exploring alternative parking arrangements such as with the adjacent Redfern RSL Club or dedicating a section of the proposed worksite area between Rosehill and Gibbons Street.

We agree that the North Eveleigh area should be retained for use by the project and that the area will need to be coordinated for track access with the City District (formerly City Region)

We agree that the location and arrangement of access and egress points from worksites will need to be carefully considered to maximise flexibility and minimise impact upon road users/pedestrians.

7.1.5. Impact on Fruin Level of Service for Each Stage of the Staging Plans

Bovis Lend Lease Consulting agree that the staging works will not impact on available staircase widths or accessibility to escalators, but the available circulation space will be constricted on Platform 2/3 and the existing concourse during the option D & E works. We also expect some constrictions on circulation space and staging during the works in the Illawarra Relief.

We agree that all platforms will be impacted during Option C works and each option should be subjected to pedestrian modelling analysis during the design phase.

7.1.6. Impact on Emergency Egress

Bovis Lend Lease Consulting agrees that for Option C, the permanent arrangements for emergency egress will be improved for the surface platforms as the travel distances are reduced when compared to the current end loaded platforms and that during construction the existing arrangements will be maintained until the new concourse is commissioned. We note that the emergency egress will be further improved if the existing stairs are maintained in addition to the new concourse.

We agree that in the Illawarra Relief, the new emergency egress stairs from the southern end of the platforms would need to be provided prior to the removal of any existing facilities to mitigate any temporary shortfall.

We agree that for Option D & E, the existing emergency egress routes are maintained for the surface platforms and that the addition of the egress stairs from the southern end of the platforms in the Illawarra Relief will improve emergency egress.

7.1.7. Impact on Other Stations

Bovis Lend Lease Consulting agrees that there will be minimal impact on other stations other than for possible customers that choose to alight at earlier stations.

We agree that there will be impacts on other stations during possessions but as these usually occur during low patronage periods the effects are likely to be insignificant. If some platforms are closed for an extended period to facilitate works, we recommend pedestrian modelling be undertaken at other stations to assess the safety implications of any additional patronage.

7.1.8. Number of Train Journeys Affected – Trains and Passengers

Bovis Lend Lease Consulting notes that the Tenix Projects proposal of an extended shutdown of the Illawarra Relief would have significant impact on train journeys and passengers and further analysis would be required if this proposal is adopted.

7.1.9. Cost of Additional Public Transport

Bovis Lend Lease Consulting agrees that the cost of additional public transport will relate to possession replacement services and that the proportion of cost allocated to the project is dependent upon other works occurring during the same possessions.

7.1.10. Number of Additional Staff Required

Bovis Lend Lease Consulting agrees that additional staff would not be required other than immediately following any major changes in the station configuration (e.g. new access to the Illawarra Relief off Platform 10 or commissioning the new concourse). Additional staff is likely to be required during these periods to assist and direct customers.



7.1.11. Outline of any Additional Staff Training Required

Bovis Lend Lease Consulting agrees that staff training and briefing will be required during the staged works and prior to commissioning of the new or amended facilities on all options, especially Option C.

7.1.12. Public Transport Impact

Bovis Lend Lease Consulting agrees public transport services will be impacted by road closures to Gibbons and Lawson Streets.

7.1.13. Environmental Factors and REF

Bovis Lend Lease Consulting agrees that the principal factors for environmental assessment are likely to relate to disruption, noise and traffic during the construction phase. Essentially the new facility is provided within an established rail and transport corridor and no change of use is occurring. The period over which the works will be undertaken given the possession constraints will create the need for additional mitigation measures and consultation with residents particularly for night or weekend works.

Tenix Projects note that it is likely that a Community Liaison Group would need to be established similar to that operating for the MacDonaltdown Stabling project. Bovis Lend Lease Consulting understands a Community Liaison Group was specifically established for the MacDonaltdown Stabling project due to the history between the active community in Burren Street and RailCorp. We therefore recommend consulting with RailCorp to determine if managing the Redfern community will require a Community Liaison Group or can simply be managed with community notifications.

7.1.14. Heritage or Archaeological Impacts

Bovis Lend Lease Consulting agrees that for the Option D the heritage impacts are minimal and are generally related to working in proximity of significant structures. We also agree that for Option C & E there are significant impacts upon level 2 structures on the surface platforms as heritage buildings on Platforms 4/5 to 8/9 are required to be removed and the acceptability of this needs to be reviewed by RailCorp through a Heritage impact statement or similar.

7.1.15. Land Acquisition Required

Bovis Lend Lease Consulting agrees that it is believed that RailCorp own all land required for the permanent works and Occupation licences or similar may be required for the worksites in the park area. We recommend undertaking a boundary survey to confirm property boundaries. We note that the building at 125-127 Little Eveleigh Street has already been acquired.

7.1.16. Impact on Adjoining Leaseholders

Bovis Lend Lease Consulting agrees that the principal impacts would be disruption during the construction phase. We recommend property condition surveys of the properties in proximity to Redfern Station are undertaken prior to construction. Some noise and vibration monitoring is also likely to be required during the construction phase.

7.1.17. Details of Proposed Construction Methods and Staging

Bovis Lend Lease Consulting agrees that temporary configuration changes would need to be addressed through the CCR process within RailCorp to ensure that all relevant parties have been consulted and informed of the changes. As the CCR process is primarily related to changes to infrastructure we



believe a separate forum such as Network Asset Integration (NAI) will be required to manage changes to station operations.

7.1.18. Outline of Major Risks Associated With Each Options Programme

Tenix Projects lists the following as principal program risks:

1. Planning approval periods prior to project commencement
2. RailCorp design approval periods
3. Availability of rail industry specialist resources (eg OHW and Signals) given the level of rail capital works planned over the next 5 years
4. Availability of possessions being restricted by other major capital works such that all required possessions are not available to this project
5. Availability of special closedowns over the Christmas Period for the Illawarra Relief
6. Lead period for specialist equipment e.g. lifts and escalators

Bovis Lend Lease Consulting acknowledges the risks identified by Tenix Projects and believe that:

- Item 1 can be mitigated by well defined and prompt submission;
- Item 2 can be mitigated by compliant designs and robust design management;
- Items 3, 5 and 6 can be mitigated by adequate planning; and
- Item 4 can be mitigated by published awareness of other works and possession coordination;

7.1.19. Impact Upon Railway Systems

Bovis Lend Lease Consulting considers the impacts outlined in the table below to be reasonable.

Railway System	Option D	Option E	Option C
Signalling	Some impact related to signals at city end of platforms and interaction with new lifts.	Some impact related to signals at city end of platforms and interaction with new lifts. Southern escape stair may affect signalling infrastructure at Country end of platforms	Major impact to signal SY455 due to clash with new concourse. Sighting to other signals may be affected by new concourse structure
Communications	Likely to be minimal other than disturbance during construction	Likely to be minimal other than disturbance during construction	Major relocation to new concourse
Overhead Wiring	Minor impact – requires new OHW portal at City end of platform 1 and 2 due to impact of platform 2/3 elevated access walkway. Centenary should not be affected as could be re-supported at same location as existing.	Moderate impact – in addition to new portal as Option D will also need reprofiling of OHW under extended concourse.	Major impact – It is likely that the entire OHW system through the platforms will need to be re-supported and reprofiled to allow for the new concourse location.
Passenger systems	Minor impact other than	Minor impact other than	New installation within



(CCTV, PA, SPI, help points etc.)	for new elevated walkway on platform 2/3	for new elevated walkway on platform 2/3	central concourse and significant disruption to Illawarra Relief systems
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8. Conclusion

Bovis Lend Lease Consulting has reviewed the construction methodologies, cost plans and programmes developed by Tenix Projects with particular focus on the station upgrade works for the preferred Option C and found them to be generally consistent with working in a rail environment. Although the Tenix Projects approach is feasible, we consider varying some of the construction methodologies adopted by them would result in time, cost, reliability and safety benefits.

Significant variances include:

- Removing the need to install catch decks above the Up and Down Main (Platforms 1 & 2) and Illawarra Lines (Platforms 9 & 10) by using the previously erected structure as a barrier between the lifting operation and the live tracks;
- Using hi-rail vehicles to delivery and remove plant and materials from platforms thus removing the need to construct a temporary construction access bridge; and
- Instead of an extended closedown of the Illawarra Relief, only close the platforms, permitting trains to travel through but not stop at Redfern Station during the reconfiguration of the vertical transfer elements (if the full development above the station is to occur then it is likely that an extended closedown will be required to facilitate installation of the transfer structure).



Appendix A

Tenix Projects Cost Plan - Option D (Station Upgrading Works)

Redfern Railway Station Tenix Cost Plan Peer Review

COST PLAN SUMMARY (Option D - Easy Access and F & LS)			
Project Number:	10618		
Project Name:	Redfern Station Redevelopment (Option D)		
Revision No:	Revision 1		
Revision Date:	29 - March - 2007		
Review Date:	7 - May - 2009		
DC	DIRECT COSTS		TOTAL COST
I SECTION 1: MODIFICATION TO PLATFORMS 1-10 AND EXISTING CONCOURSE			
II SECTION 2: MODIFICATION TO EXISTING ILLAWARRA RELIEF PLATFORMS (11&12)			
DIRECT COST SUBTOTAL ex GST			
INDIRECT COSTS			
IC1	Subcontractor		
IC 1.1	Subcontractor Indirect	18% of Total Direct	18.0%
Sub-total			
IC2	D&C Contractor		
IC 2.1	D&C Contractor's contingency to manage s/c	10 % of Total Direct plus IC 1.1	10.0%
Sub-total			
IC 2.2	D&C Contractor Project Management & Facilities		28.0%
IC 2.3	D&C Contractor Design	5% of DC + IC 1.1 + IC 2.1	5.0%
IC 2.4	D&C Contractor Design Verification	2% of DC + IC 1.1 + IC 2.1	2.0%
Sub-total			
IC 2.5	D&C Contractor Head Office Overhead and Profit - Included	12% of All Above	12.0%
INDIRECT COST SUBTOTAL ex GST			
CONSTRUCTION COST (D&C Contract) ex GST			
CLIENT COSTS			
IC3	Client Directed Contingencies to Manage Works Under Contract		
IC 3.1	Design development contingency	5% of Total Construction Cost	5.0%
IC 3.2	Construction contingency	5% of Total Construction Cost	5.0%
TARGET BUDGET (D&C Contract) ex GST			
Client Costs			
CC 1	EIS, Survey, Preliminary Geotechnical Investigation & Concept Design	3.0% of Target budget	3.0%
Sub-total			
CC2	Client Project Management Team	5% of Target budget plus CC1	5.0%
CC 3	Possessions cost	Adjusted as per Option C	
CC 4	Land and property acquisition costs - EXCLUDED		
CC 5	Legal and marketing costs - EXCLUDED		
CC 6	Financing Cost - EXCLUDED		
CC 7	Supply and installation of station Ticket Gates - Not applicable		
CC 8	Supply and installation of Ticket Vending Machines (TVM's) - not applicable		
CC 9	Initial Maintenance Cost - EXCLUDED		
Sub-total			
CC 10	Client Project Contingency	10% of Target budget + CC1 to 9	10.0%
TOTAL CLIENT COSTS			
TOTAL PROJECT COST ex GST			
Escalation			
Update Estimate from April 2007 to June 2008		Tenix Report 28.02.08	15.0%
Update Estimate from June 2008 to May 2009			0.0%
TOTAL PROJECT COST ex GST as at May 2009			

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DIRECT WORKS ELEMENTAL BREAK DOWN (Summary) - OPTION D		
ITEM	DESCRIPTION	TOTAL PRICE
I SECTION 1: MODIFICATION TO PLATFORMS 1-10 AND EXISTING CONCOURSE		
DC1	Demolition Works Enabling and Temporary Works	
DC2	Demolition Works Enabling and Temporary Works	
DC3	Platform 1-10 Modification Works	
DC4	Modification Works to Existing Concourse and Installation of New Lifts	
DC5	OHW Modification Works	
DC6	HV Electrical Works	
DC7	Signalling and Communications (including relocation works)	
DC8	Protection Works	
Sub-total		
II PLATFORMS (11&12) SECTION 2: MODIFICATION TO EXISTING ILLAWARRA RELIEF		
DC1	Enabling and Temporary Works	
DC2	Platform 11 & 12 Modification Works and New Lift Installation	
DC3	Protection Works	
Sub-total		
Direct Cost Subtotal ex GST		

Redfern Railway Station Tenix Cost Plan Peer Review

Option D: Redfern Station Concourse & Platform 1-10 Works

DIRECT COSTS

WBS	Description	Q'ty	Unit	Rate	Total Cost
1 Enabling and Temporary Works					
1.1	Civil Works				
1.1.1	Demolition works - see section 2				
1.1.2	Temporary Access and Worksite				
	<i>North Eveleigh Temporary worksite</i>				
	Clear the work site area	1,160	m2		
	Asphalt paving for office, storage and vehicular access areas - use existing hardstanding				
	Allow for RailCorp staff temporary parking facilities including lighting and signs	15	No		
	Wash down facilities	1	No		
	Traffic management	1	Item		
1.1.3	Temporary Fencing and Hoarding				
	Temporary site hoarding; 1800mm high	400	m		
	Temporary chain link fence fixed to Jersey barrier along live track	50	m		
	Temporary Fencing - allow	100	m		
1.1.4	Temporary drainage				
	Allow for temp drainage & connections	1	Item		
1.1.5	Temporary crash deck - not required				
1.1.6	Temporary construction access bridge - not required				
1.1.7	Temporary crane platforms - not required				
1.1.8	Temporary control rooms on platforms 2/3				
	Allow for temporary staff rooms & train control	1	No		
1.2	OHW Relocations - included in OHW works				
1.3	Signalling Relocations - included in signalling works				
1.4	Utilities Diversions				
	Relocate existing HV power cables on Lt. Eveleigh St for crane access	1	Item		
	Allow for diversion of services mounted on Platform 1 & 10 retaining walls due to new lift installation and for platform extensions	1	Item		
DC1 Enabling and Temporary Works					
2 Demolition Works					
2.1	Demolition of existing platform 2/3 canopy				
	Demolition	520	m2		
	Allow for disposal off site	390	t		
	Allow for cranes	4	Day		
2.2	Demolition of existing staircases				
	Demolition of staircases on PL 2/3, 4/5 & 6/7 including disposal off site (assuming realignment of existing staircases on PL 4/5 & 6/7 would require new staircases)	3	No		
2.3	Removal of existing miscellaneous items				
	Allow for removal of affected furniture & fencing	1	Item		
	Allow for removal of affected lights	1	Item		
DC2 Demolition Works					

Redfern Railway Station Tenix Cost Plan Peer Review

WBS	Description	Q'ty	Unit	Rate	Total Cost
3 Platform 1-10 Modification Works					
3.1	Platform extension				
	Structural works for PL 2/3, 4/5 & 6/7 extensions	107	m2		
	Allow for modification of existing vent shafts affected by PL 2/3 extension; including part demolition and provision of side opening underneath new platform	1	Item		
	Allowance for crane (250t)	1	Item		
	Allow for traffic management	1	Item		
	Finishes for the extended platforms:				
	Bituminous paving; 40mm AC10	107	m2		
	Tactile paving	10	m2		
	Coping tiles to edge of platform	17	m2		
	Yellow line marking to platform	1	Item		
3.2	New elevated structure above Platform 2/3				
	Allow for local demolition works for foundation	1	Item		
	Allow for temporary hoarding	1	Item		
	Piling works:				
	Mob & Demob	1	Item		
	Piling (assume 600mm)	128	m		
	Columns & pile cap/footing	10	m3		
	Head stocks	18	m3		
	Precast concrete floor panels	275	m2		
	In situ concrete topping including floating finish	275	m2		
	Precast concrete wall panels	330	m2		
	Allow for steel columns and roofing steel structures	11,646	kg		
	Allow for connection plates & bolts	1	Item		
	Allow for metal roofing including rain water disposal	385	m2		
	Allow for staircase roofing and steel work	33	m2		
	Allow for new escalator pit including piling	1	Item		
	Allow for platform & existing concourse making good works	1	Item		
	New precast staircase to landing	1	No		
	New precast staircase to platform	1	No		
	Allow for crane	1	Item		
	Allow for traffic management	1	Item		
3.3	Realignment of existing staircases on PL 4/5 & 6/7				
	Allow for new staircase (assuming realignment of existing staircases on PL 4/5 & 6/7 would require new staircases)	2	No		
	Canopy and metal works to stairs including structural steel works and roof plumbing	160	m2		
	Allow for making good of PL 4/5 & 6/7 affected by new staircase installation including connection to existing canopy	1	Item		
3.4	Platform level works				
	Platform level raising & resurfacing with hardener including signs - not required for the Option D				
	New easy access ramp for Lift 1	14	m3		
	Platform 2/3 finishes, fitout and fittings and making good works on other platforms				
3.5	Allow for new benches on PL 2/3	6	No		
	Allow for new station control room on PL 2/3 including wash down and comms facilities	1	No		
	Stainless steel handrails for new staircase and new ramp (to retaining wall side)	151	m		
	Heavy duty balustrade for new staircases	86	m		
	Stainless steel guard rails for escalator opening and ramp	50	m		
	New Palisade fencing to modified platform ends	45	m		
	Allow for new signs	1	Item		

Redfern Railway Station Tenix Cost Plan Peer Review

WBS	Description	Q'ty	Unit	Rate	Total Cost
3.6	Platform electrical works				
	Platform 2/3 canopy & elevated structure lighting including distribution boards, light fittings and luminaires	1	Item		
	Lighting poles with outreach arms to new lift areas and extended platforms	7	No		
	Allow for lighting to new staircases	1	Item		
	Allow for CCTV's to elevated structures	1	Item		
3.7	Platform 2/3 mechanical works				
	Allow for fire alarm to elevated structures	1	Item		
	Allow for new escalator (Single Only)	1	No		
DC3	Platform 1-10 Modification Works				
	<i>Modification Works to Existing Concourse and Installation of New Lifts</i>				
4	Lifts				
4.1	Demolition of existing staircase - included in Item 2				
4.2	Demolitions and forming openings				
	Allow for trimming retaining wall in between PL 1 and Lt Eveleigh St to accommodate lift	1	Item		
	Allow for local platform demolition for Lift No 2 & 5	1	Item		
	Allow for forming openings on existing concourse slab for Lift No 2,3 & 4	1	Item		
	Allow for forming openings on existing metal cladding and balustrade for Lift No 1 and 5	1	Item		
	Allow for local demolition of Platform 10 retaining wall and tunnel roof for Lift No 6 including temp support during demolition	1	Item		
	Forming opening on existing concourse roof for new lifts 2,3 & 4	1	Item		
	Removal of steel column supporting existing concourse for Lift No 3 installation	1	Item		
4.3	Structural works and strengthening works				
	Allow for new steel column to replace affected column including foundation works near Lift No 3 including connections	1	No		
	Allow for strengthening of existing steel beams and slab affected by new openings for Lift No 2,3 & 4	3	No		
	Allow for strengthening of existing tunnel roof and walls supporting building next to Lift No 6	1	Item		
	Extending footbridge above Platform 8/9 for Lift No 5	1	Item		
	New lift pits and lift structure	6	No		
	Allowance for crane	1	Item		
	Allowance for traffic management	1	Item		
4.4	Making good and fitout works				
	Allow for minor modification to internal partitions and relocations	1	Item		
	Allow for forming new station office partitions and finishes	1	Item		
	Allow for reconfiguring existing toilet to form new easy access toilet and refurbishing normal toilets	1	Item		
	Allow for temporary toilets during reconfiguration works	1	Item		
	Allow for making good works for affected roofing, floors and cladding	1	Item		
	Heavy duty balustrade for extended foot bridge	13	m		
	Cladding to lifts	6	No		
	Allow for new signs	1	Item		
	Allowance for crane	1	Item		
	Allowance for traffic management	1	Item		

Redfern Railway Station Tenix Cost Plan Peer Review

WBS	Description	Q'ty	Unit	Rate	Total Cost
4.5	Mechanical works				
	Allow for improvements to existing concourse fire protection	1	Item		
	Lift cars	6	No		
	Allow EO cost for dual access doors	2	No		
	Allowance for crane (for lifts)	1	Item		
	Allowance for traffic management	1	Item		
4.6	Electrical works				
	Allow for modifications/making good to lighting including distribution boards, light fittings and luminaires	1	Item		
	Provisions for new lifts	1	Item		
	Allow for additional PA system	1	Item		
4.7	Communication works				
	Allow for relocating existing station passenger information (SPI) display units	1	Item		
	Allow for additional CCTV's to lift & staircase locations	1	Item		
	Allow for help points to lifts	1	Item		
	<i>Modification Works to Existing Concourse and Installation of New Lifts</i>				
DC4	Lifts				
5	OHW Modification Works				
	New OHW portal beams including 4 No mast droppers; app 30m long	2	No		
	Extension to existing OHW portal affected by PL 2/3 extension including removal of redundant column	1	No		
	Removal of redundant OHW structures	3	No		
	Allow for disconnection, reconnection & testing	1	Item		
DC5	OHW Modification Works				
6	HV Electrical Works				
6.1	Traction power - not required				
6.2	Power for PL 1-10 & concourse				
	Allow for 2 No 750 KVA substations installed in IR building including transformers, switchboards and raised floor for cabling (assuming feeder is 33kV)	1	Item		
	Allow for removal of existing transformers & facilities	1	Item		
6.3	PL 11&12 switch room relocations (if required) included in IR works				
DC6	HV Electrical Works				

Redfern Railway Station Tenix Cost Plan Peer Review

WBS	Description	Q'ty	Unit	Rate	Total Cost
7	Signalling and Communications (including relocation works)				
	Relocate existing signals and train stops for Platforms 5 & 7 including extended cabling	2	No		
	Relocate existing signals and train stops for Platforms 2/3 including extended cabling and tuning circuits	1	No		
	Allow for local diversion of signalling & comms cables mounted on PL 1 & 10 retaining wall including troughing	1	Item		
	Allow for disconnections and reconnections	1	Item		
	Allow for testing	1	Item		
DC7	Signalling and Communications (including relocation works)				
8	Protection Works				
	Allow for safe working				
	Possession works	1,200	hrs		
	Non-possession works	4,000	hrs		
	Adjust for Possession Works & Day Shift				
DC8	Protection Works				
Total					

Redfern Railway Station Tenix Cost Plan Peer Review

WBS	Description	Q'ty	Unit	Rate	Total Cost
Option D: Redfern Station Illawarra Relief Platforms (11&12) Modification Works					
1	Enabling and Temporary Works				
1.1.1	Temporary Access and Worksite - included in Main Works (PL 1-10 & Concourse Works)				
1.1.2	Temporary Fencing and Hoarding				
	Temporary site hoarding; 1800mm high	220	m		
	Temporary Fencing - allow	50	m		
DC1	Enabling and Temporary Works				
2	Platform 11 & 12 Modification Works and New Lift Installation				
2.1	Demolitions and forming openings				
	Local demolition of existing roof for new fire stair:				
	Allow for temporary hoarding	76	m		
	Excavation and disposal of soil off site	250	m3		
	Demolition	1	Item		
	Allow for temporary support during demolition & construction	1	Item		
	Allow for waste to tip	1	Item		
	Allow for traffic management	1	Item		
	Demolition of existing platform for new lift pit:				
	Demolition	1	Item		
	Allow for waste to tip	1	Item		
	Allow for forming openings on existing concourse & intermediate concourse slabs for new lifts	1	Item		
	Forming opening on existing concourse roof for new lift	1	Item		
2.2	Structural works and strengthening works				
	Allow for strengthening of existing concourse and intermediate concourse slabs affected by new lift installation	1	Item		
	Allow for strengthening of roof slab opening for new fire stair	1	Item		
	New lift pits and lift structure	2	No		
	Allow for new fire escape staircase	1	No		
	Allowance for crane	1	Item		
	Allowance for traffic management	1	Item		
	Fire rate structural steel roof framing to Platforms 11 & 12				
	Allow for 2 Hr vermiculite fire spray to exposed steel beams	2890	m2		
	Hi-rail with Flat Top	24	No		
	Hi-rail with cherry picker	16	No		
	Note: Excludes rectification of existing steelwork damaged by water ingress				Note
	Note: Excludes removal and replacement of roof membrane and spoil and finishes of Platform roof				Note
2.3	Making good and fitout works				
	Allow for making good of affected platform and concourse slabs	1	Item		
	Allow for making good works for affected roofing	1	Item		
	Cladding to lifts	2	No		
	Allow for additional control/announcement system for lifts	1	Item		
	Allow for glass enclosure to lift lobby	48	m2		
	Allowance for crane	1	Item		
	Allowance for traffic management	1	Item		

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WBS	Description	Qty	Unit	Rate	Total Cost
2.4	Mechanical works				
	Lift cars	2	No		
	Allow EO cost for dual access doors	1	No		
	Allowance for crane (for lifts)	1	Item		
	Allowance for traffic management	1	Item		
2.5	Electrical works				
	Allow for modifications/making good to lighting	1	Item		
	Making good for affected fire alarm system	1	Item		
	Upgrading switchboard for new lifts	1	Item		
2.6	Communication works				
	Allow for additional CCTV's to lift locations	1	Item		
	Allow for help points to lifts	1	Item		
	Additional costs for Fire Egress Stair to Park				
DC2	<i>Platform 11 & 12 Modification Works and New Lift Installation</i>				
3	Protection Works				
	Allow for safe working				
	Possession works	400	hrs		
	Non-possession works	1,200	hrs		
DC3	<i>Protection Works</i>				
Total					



Appendix B

Tenix Projects Cost Plan - Option E (Station Upgrading Works)

Redfern Railway Station Tenix Cost Plan Peer Review

COST PLAN SUMMARY (Option E: Upgrade/Interface Works in Addition to Option D - Station Works Only)			
Project Number:	10618		
Project Name:	Redfern Station Redevelopment (Option E)		
Revision No:	Revision 1		
Revision Date:	29 - March - 2007		
Review Date:	7 - May - 2009		
DC DIRECT COSTS			
			TOTAL COST
I SECTION 1: MODIFICATION TO PLATFORMS 1-10 AND EXISTING CONCOURSE			
II SECTION 2: NEW FIRE ESCAPE BRIDGE AND WALKWAY			
III SECTION 3: MODIFICATION TO EXISTING ILLAWARRA RELIEF PLATFORMS (11&12)			
DIRECT COST SUBTOTAL ex GST			
INDIRECT COSTS			
IC 1	Subcontractor		
IC 1.1	Subcontractor Indirect	18% of Total Direct	18.0%
Sub-total			
IC 2	D&C Contractor		
IC 2.1	D&C Contractor's contingency to manage s/c	10 % of Total Direct plus IC 1.1	10.0%
Sub-total			
IC 2.2	D&C Contractor Project Management & Facilities		23.9%
IC 2.3	D&C Contractor Design	5% of DC + IC 1.1 + IC 2.1	5.0%
IC 2.4	D&C Contractor Design Verification	2% of DC + IC 1.1 + IC 2.1	2.0%
Sub-total			
IC 2.5	D&C Contractor Head Office Overhead and Profit - Included	12% of All Above	12.0%
INDIRECT COST SUBTOTAL ex GST			
CONSTRUCTION COST (D&C Contract) ex GST			
CLIENT COSTS			
IC 3	Client Directed Contingencies to Manage Works Under Contract		
IC 3.1	Design development contingency	5% of Total Construction Cost	5.0%
IC 3.2	Construction contingency	5% of Total Construction Cost	5.0%
TARGET BUDGET (D&C Contract) ex GST			
Client Costs			
CC 1	EIS, Survey, Preliminary Geotechnical Investigation & Concept Design	2.0% of Target budget	2.0%
Sub-total			
CC 2	Client Project Management Team	5% of Target budget plus CC 1	5.0%
CC 3	Possessions cost - included in Station Works	Adjusted as per Option C	
CC 4	Land and property acquisition costs - EXCLUDED		
CC 5	Legal and marketing costs - EXCLUDED		
CC 6	Financing Cost - EXCLUDED		
CC 7	Station Ticket Gates - allow for additional 6 New to IR Entrance @ \$250,000/gate		
CC 8	Ticket Vending Machines (TVM's) - allow for 1 No new ticket vending machine to IR Entrance		
CC 9	Initial Maintenance Cost - EXCLUDED		
Sub-total			
CC 10	Client Project Contingency	10% of Target budget + CC 1 to 9	10.0%
TOTAL CLIENT COSTS			
TOTAL PROJECT COST ex GST			
Escalation			
Update Estimate from April 2007 to June 2008		Tenix Report 28.02.08	6.5%
Update Estimate from June 2008 to May 2009			0.0%
TOTAL PROJECT COST ex GST as at May 2009			

Redfern Railway Station Tenix Cost Plan Peer Review

DIRECT WORKS ELEMENTAL BREAK DOWN (Summary) - OPTION E		
ITEM	DESCRIPTION	TOTAL PRICE
I SECTION 1: MODIFICATION TO PLATFORMS 1-10 AND EXISTING CONCOURSE		
DC1	Enabling and Temporary Works	
DC2	Demolition Works	
DC3	Platform 1-10 Modification Works	
DC4	Modification Works to Existing Concourse and Installation of New Lifts	
DC5	OHV Modification Works	
DC6	HV Electrical Works	
DC7	Signalling and Communications (including relocation works)	
DC8	Protection Works	
Sub-total		
II SECTION 2: NEW FIRE ESCAPE BRIDGE AND WALKWAY		
DC1	Enabling and Temporary Works	
DC2	New Walkway along Platform 10	
DC3	New unpaid footbridge	
DC4	Protection Works	
Sub-total		
III SECTION 3: MODIFICATION TO EXISTING ILLAWARRA RELIEF PLATFORMS (11&12)		
DC1	Enabling and Temporary Works	
DC2	Platform 11 & 12 Modification Works and New Lift Installation	
DC3	Protection Works	
Sub-total		
Direct Cost Subtotal ex GST		

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Option E: Redfern Station Concourse & Platform 1-10 Works

DIRECT COSTS

WBS	Description	Q'ty	Unit	Rate	Total Cost
1	Enabling and Temporary Works				
1.1	Civil Works				
1.1.1	Demolition works - see section 2				
1.1.2	Temporary Access and Worksite				
	Temporary worksite to Little Eveleigh St site				
	Clear the work site area	1,160	m2		
	Asphalt paving for office, storage and vehicular access areas - use existing hardstanding				
	Allow for RailCorp staff temporary parking facilities including lighting and signs	15	No		
	Wash down facilities	1	No		
	Traffic management	1	Item		
1.1.3	Temporary Fencing and Hoarding				
	Temporary site hoarding: 1800mm high	625	m		
	Temporary chain link fence fixed to Jersey barrier along live track	50	m		
	Temporary Fencing - allow	100	m		
1.1.4	Temporary drainage				
	Allow for temp drainage & connections	1	Item		
1.1.5	Temporary crash deck - not required				
1.1.6	Temporary construction access bridge - not required				
1.1.7	Temporary crane platforms - not required				
1.1.8	Temporary control rooms on platforms 2/3, 4/5, 6/7 & 8/9				
	Allow for temporary staff rooms & train control	4	No		
1.2	OHW Relocations - included in OHW works				
1.3	Signalling Relocations - included in signalling works				
1.4	Utilities Diversions				
	Relocate existing HV power cables on Lt. Eveleigh St for crane access	1	Item		
	Allow for diversion of services mounted on Platform 1 & 10 retaining walls due to new lift installation and for platform extensions	1	Item		
DC1	Enabling and Temporary Works				
2	Demolition Works				
2.1	Demolition of existing platforms 2/3, 4/5, 6/7 & 8/9 canopy				
	Demolition	1,535	m2		
	Allow for disposal off site	1,400	t		
	Allow for cranes	10	Day		
2.2	Demolition of existing staircases				
	Demolition of staircases on PL 1, 2/3, 4/5 & 6/7 including disposal off site (assuming shifting existing staircases on PL 1, 4/5 & 6/7 would require new staircases)	4	No		

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WBS Description Q'ty Unit Rate Total Cost

2.3	Removal of existing miscellaneous items				
	Removal of existing concourse metal/glass cladding for extension	1	Item		
	Removal of existing roofing	1	Item		
	Allow for removal of affected furniture & fencing	1	Item		
	Allow for removal of affected lights	1	Item		
DC2	Demolition Works				
3	Platform 1-10 Modification Works				
3.1	Platform extension				
	Structural works for PL 2/3, 4/5 & 6/7 extensions	110	m2		
	Allow for modification of existing vent shafts affected by PL 2/3 extension;	1	Item		
	including part demolition and provision of side opening underneath new platform				
	Allowance for crane (250t)	1	Item		
	Allow for traffic management	1	Item		
	Finishes for the extended platforms:				
	Bituminous paving: 40mm AC10	110	m2		
	Tactile paving	10	m2		
	Coping tiles to edge of platform	17	m2		
	Yellow line marking to platform	1	Item		
3.2	New elevated structure above Platform 2/3				
	Allow for local demolition works for foundation	1	Item		
	Allow for temporary hoarding	1	Item		
	Piling works:				
	Mob & Demob	1	Item		
	Piling (assume 600mm)	128	m		
	Columns & pile cap/footing	10	m3		
	Head stocks	18	m3		
	Precast concrete floor panels	250	m2		
	Insitu concrete topping including floating finish	250	m2		
	Precast concrete wall panels	300	m2		
	Allow for steel columns and roofing steel structures	10,938	kg		
	Allow for connection plates & bolts	1	Item		
	Allow for metal roofing including rain water disposal	350	m2		
	Allow for staircase roofing and steel work	33	m2		
	Allow for new escalator pit	1	Item		
	Allow for platform & existing concourse making good works	1	Item		
	New precast staircase to landing	1	No		
	New precast staircase to platform	1	No		
	Allow for crane	1	Item		
	Allow for traffic management	1	Item		
3.3	Shifting existing staircases on PL 1, 4/5 & 6/7				
	Allow for new staircases (assuming shifting existing staircases on PL 1, 4/5 & 6/7 would require new staircases)	3	No		
	Canopy and metal works to stairs including structural steel works and roof plumbing	240	m2		
	Allow for making good of PL 1, 4/5 & 6/7 affected by new staircase installation including connection to the canopies	1	Item		
3.4	Platform level works				
	Platform level raising & resurfacing with hardener incl signs - not required for this option				
	New easy access ramp for Lift 1	14	m3		

Redfern Railway Station Tenix Cost Plan Peer Review

WBS	Description	Q'ty	Unit	Rate	Total Cost
Platform 2/3, 4/5, 6/7 & 8/9 finishes, fitout and fittings and making good works on other platforms					
3.5	Making good of platforms affected by canopy replacement:				
	Bituminous paving: 40mm AC10	240	m2		
	Allow for miscellaneous marking	1	Item		
	New full length platform canopies on Platform 2/3, 4/5, 6/7 & 8/9 including furniture and fittings	2985	m2		
	Allow for new station control rooms on PL 2/3, 4/5, 6/7 & 8/9 including fitout and comms facilities	4	No		
	Allow for new station staff meals room including facilities; assume 10x10m size	100	m2		
	Stainless steel handrails for new staircases and new ramp (to retaining wall side)	183	m		
	Heavy duty balustrade for new staircases	118	m		
	Stainless steel guard rails for escalator opening and ramp	50	m		
	New Palisade fencing to modified platform ends	45	m		
	Allow for new signs	1	Item		
3.6	Platform electrical works				
	New canopies on PL 2/3, 4/5, 6/7 & 8/9 and elevated structure lighting including distribution boards, light fittings and luminaires	1	Item		
	Lighting poles with outreach arms to new lift areas and extended platforms	7	No		
	Allow for lightings to new staircases	1	Item		
	Allow for CCTV's to elevated structure and new canopy areas	1	Item		
3.7	Platform 2/3 mechanical works				
	Allow for fire alarm to elevated structure	1	Item		
	Allow for new escalator	1	No		
DC3 Platform 1-10 Modification Works					
<i>Modification Works to Existing Concourse and Installation of New Lifts</i>					
4	New Lifts				
4.1	Demolition of existing staircase - included in Item 2				
4.2	Demolitions and forming openings				
	Allow for trimming retaining wall in between PL 1 and Lt Eveleigh St to accommodate lift	1	Item		
	Allow for local platform demolition for Lift No 2 & 5	1	Item		
	Allow for forming openings on existing concourse slab for Lift No 2,3 & 4	1	Item		
	Allow for forming openings on existing metal cladding and balustrade for Lift No 1 and 5	1	Item		
	Allow for local demolition of Platform 10 retaining wall and tunnel roof for Lift No 6 including temp support during demolition	1	Item		
	Forming opening on existing concourse roof for new lifts 2,3 & 4	1	Item		
	Removal of steel column supporting existing concourse for Lift No 3 installation	1	Item		

Redfern Railway Station Tenix Cost Plan Peer Review

WBS	Description	Q'ty	Unit	Rate	Total Cost
4.3	Structural works and strengthening works				
	New steel column and footing near Lift No 3 including connections	1	No		
	Allow for strengthening of existing steel beams and slab affected by new openings for Lift No 2,3 & 4	3	No		
	Allow for strengthening of existing tunnel roof and walls supporting building next to Lift No 6	1	Item		
	Extending existing concourse slab	1	Item		
	Extending footbridge above Platform 8/9 for Lift No 5	1	Item		
	Allow for roof framing over extended concourse and modifying roof frame over existing concourse	1	Item		
	New lift pits and lift structure	6	No		
	Allowance for crane	1	Item		
	Allowance for traffic management	1	Item		
	Fire rate structural steel roof framing to Platforms 11 & 12				
	Allow for 2 Hr vermiculite fire spray to exposed steel beams	2890	m2		
	Hi-rail with Flat Top	24	No		
	Hi-rail with cherry picker	16	No		
	Note: Excludes rectification of existing steelwork damaged by water ingress				Note
	Note: Excludes removal and replacement of roof membrane and spoil and finishes of Platform roof				Note
4.4	Finishes, fitout and making good works				
	Allow for minor modification to internal partitions and relocations	1	Item		
	Allow for new station office partitions and finishes	1	Item		
	Allow for reconfiguring existing toilet to form new easy access toilet and refurbishing normal toilets	1	Item		
	Allow for temporary toilets during toilet reconfiguration works	1	Item		
	Allow for making good works for affected cladding	1	Item		
	Allow for new glass cladding with metal grill to extended concourse	44	m		
	Allow for new roofing over existing and extended concourse including roof plumbing and rain water disposal	1,200	m2		
	Heavy duty balustrade for extended foot bridge	13	m		
	Cladding to lifts	6	No		
	Allowance for crane	1	Item		
	Allowance for traffic management	1	Item		
4.5	Mechanical works				
	Allow for improvements to existing concourse fire protection and fire protection to extended areas	1	Item		
	Lift cars	6	No		
	Allow EO cost for dual access doors	2	No		
	Allowance for crane (for lifts)	1	Item		
	Allowance for traffic management	1	Item		
4.6	Electrical works				
	Allow for modifications and new lighting including distribution boards, light fittings and luminaires	1	Item		
	Provisions for new lifts	1	Item		
	Allow for additional PA system and modification to existing	1	Item		
4.7	Communication works				
	Allow for relocating existing station passenger information (SPI) display units	1	Item		
	Allow for additional CCTV's to lift & staircase locations	1	Item		
	Allow for help points to lifts	1	Item		
<i>Modification Works to Existing Concourse and Installation of New Lifts</i>					
DC4					

Redfern Railway Station

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WBS	Description	Q'ty	Unit	Rate	Total Cost
5	<i>OHW Modification Works</i>				
	New OHW portal beams including 4 No mast droppers; app 30m long	2	No		
	Extension to existing OHW portal affected by PL 2/3 extension including removal of redundant column	1	No		
	Removal of redundant OHW structures	3	No		
	Allow for re-profiling OHW (assume no temporary removal is required)	1	Item		
	Allow for disconnection, reconnection & testing	1	Item		
DC5	<i>OHW Modification Works</i>				
6	<i>HV Electrical Works</i>				
6.1	Traction power - not required				
6.2	Power for PL 1-10 & concourse				
	Allow for 2 No 750 KVA substations installed in IR building including transformers, switchboards and raised floor for cabling (assuming feeder is 33kV)	1	Item		
	Allow for removal of existing transformers & facilities	1	Item		
6.3	PL 11&12 switch room relocations (if required) included in IR works				
DC6	<i>HV Electrical Works</i>				
7	<i>Signalling and Communications (including relocation works)</i>				
	Relocate existing signals and train stops for Platforms 5 & 7 including extended cabling	2	No		
	Relocate existing signals and train stops for Platforms 2/3 including extended cabling and tuning circuits	1	No		
	Allow for local diversion of signalling & comms cables mounted on PL 1 & 10 retaining wall including troughing	1	Item		
	Allow for disconnections and reconnections	1	Item		
	Allow for testing	1	Item		
DC7	<i>Signalling and Communications (including relocation works)</i>				
8	<i>Protection Works</i>				
	Allow for safe working				
	Possession works	1,400	hrs		
	Non-possession works	4,000	hrs		
	Adjust for Possession Works & Day Shift				
DC8	<i>Protection Works</i>				
Total					

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WBS	Description	Q'ty	Unit	Rate	Total Cost
Option E: Unpaid Footbridge and Walkway Along Platform 10					
<i>DIRECT COSTS</i>					
1	<i>Enabling and Temporary Works</i>				
	Temporary Access and Worksite - included in Main Works (PL 1-10 & Concourse Works)				
1.1.1					
1.1.2	Temporary Fencing and Hoarding				
	Temporary site hoarding; 1800mm high	270	m		
	Temporary Fencing - allow	100	m		
DC1	<i>Enabling and Temporary Works</i>				
2	<i>New Walkway along Platform 10</i>				
2.1	Demolitions and forming openings				
	Part demolition of existing steel work	1	Item		
	Allow for traffic management	1	Item		
2.2	Structural works				
	Allow for piling works:				
	Mob & demob	1	Item		
	Piling 600mm dia	128	m		
	Allow for traffic management	1	Item		
	Allow for capping beams, beams and suspended slab	139	m3		
	Allow for slab/ramp at grade including excavation & hardcore	350	m2		
	Allow for making good/strengthening of existing retaining wall along platform 10	1	Item		
2.3	New finishes and fittings				
	Allow for non-slip ceramic tiling	820	m2		
	Allow for stainless steel guard rails	280	m		
2.4	Electrical works				
	Lighting (assume lighting poles with small outreach arms)	14	No		
2.5	Communication works				
	Allow for CCTV's fixed to light poles	1	Item		
2.6	Adjust for Tenix 2nd Report Adjustment	1	Item		
DC2	<i>New Walkway along Platform 10</i>				
3	<i>New unpaid footbridge</i>				
3.1	Demolitions and forming openings				
	Part demolition of existing roads	1	Item		
	Allow for traffic management	1	Item		
3.2	Structural works				
	Allow for new ramp at both ends	240	m2		
	Allow for stair	50	m2		
	New bridge over railway including foundation works	475	m2		
3.3	New finishes and fittings				
	Allow for monolithic finishes to new bridge and ramps	765	m2		
	Allow for gal metal balustrades to footbridge	170	m		
	Allow for guard rails to ramp	20	m		

Redfern Railway Station Tenix Cost Plan Peer Review

WBS	Description	Q'ty	Unit	Rate	Total Cost
3.4	Electrical works Lighting (assume lighting poles with small outreach arms)	12	No		
3.5	WTP Estimate Adjust for WTP Cost Plan adopted in 2nd report	1	Item		
DC3	<i>New unpaid footbridge</i>				
4	Protection Works				
	Allow for safe working				
	Possession works	360	hrs		
	Non-possession works	720	hrs		
DC4	<i>Protection Works</i>				
Total					

Redfern Railway Station Tenix Cost Plan Peer Review

WBS	Description	Q'ty	Unit	Rate	Total Cost
Option E: Redfern Station Illawarra Relief Platforms (11&12) Upgrading Works					
1	<i>Enabling and Temporary Works</i>				
1.1.2	Temporary Fencing and Hoarding Temporary site hoarding; 1800mm high Temporary Fencing - allow	220 50	m m		
DC1	<i>Enabling and Temporary Works</i>				
2	Platform 11 & 12 Modification Works and New Lift Installation				
2.1	Demolitions and forming openings Local demolition of existing roof for new fire stair:				
	Allow for temporary hoarding	76	m		
	Excavation and disposal of soil off site	250	m3		
	Demolition	1	Item		
	Allow for temporary support during demolition & construction	1	Item		
	Allow for waste to tip	1	Item		
	Allow for traffic management	1	Item		
	Local demolition of existing wall at IR station entrance:				
	Allow for temporary hoarding	25	m		
	Demolition	1	Item		
	Allow for waste to tip	1	Item		
	Allow for traffic management	1	Item		
	Demolition of existing platform for new lift pit:				
	Demolition	1	Item		
	Allow for waste to tip	1	Item		
	slabs for new lifts	1	Item		
	Forming opening on existing concourse roof for new lift	1	Item		
2.2	Structural works and strengthening works				
	Allow for strengthening of existing concourse and intermediate concourse slabs affected by new lift installation	1	Item		
	Allow for strengthening of roof slab opening for new fire stair	1	Item		
	New lift pits and lift structure	2	No		
	Allow for new fire escape staircase	1	No		
	Allow for new floor slab, foundation & roof structure works to extended IR station entrance (entrance to new walkway)	204	m2		
	Allow for modification to existing structures at IR station entrance to facilitate entrance reconfigurations	1	Item		
	Allowance for crane	1	Item		
	Allowance for traffic management	1	Item		
	Fire rate structural steel roof framing to Platforms 11 & 12				
	Allow for 2 Hr vermiculite fire spray to exposed steel beams	2890	m2		
	Hi-rail with with Flat Top	24	No		
	Hi-rail with cherry picker	16	No		
	Note: Excludes rectification of existing steelwork damaged by water ingress		Note		
	Note: Excludes removal and replacement of roof membrane and spoil and finishes of Platform roof		Note		

Redfern Railway Station Tenix Cost Plan Peer Review

WBS	Description	Q'ty	Unit	Rate	Total Cost
2.3	New finishes, making good and fitout works				
	Allow for making good of affected platform and concourse slabs	1	Item		
	Allow for making good works for affected roofing	1	Item		
	Cladding to lifts	2	No		
	Allow for glass enclosure to lift lobby	48	m2		
	Allow for roofing and roof plumbing works to extended IR station entrance (entrance to new walkway)	234	m2		
	Allow for modification/new to existing roofing IR station entrance to facilitate entrance reconfigurations including connection to existing	270	m2		
	Allow for the reconfiguration of fitout works	1	Item		
	Allow for builder's work to receive new ticket gates	1	Item		
	Allowance for crane	1	Item		
	Allowance for traffic management	1	Item		
2.4	Mechanical works				
	Lift cars	2	No		
	Allow EO cost for dual access doors	1	No		
	Allowance for crane (for lifts)	1	Item		
	Allowance for traffic management	1	Item		
	Allow for air-conditioning works to reconfigured station entry	1	Item		
2.5	Electrical works				
	Allow for modifications/making good to lighting	1	Item		
	Making good for affected fire alarm system	1	Item		
	Upgrading switchboard for new lifts	1	Item		
	Allow for lighting to reconfigured station entrance	1	Item		
	Allow for relocation of existing TVM's and station comms items	1	Item		
2.6	Communication works				
	Allow for additional CCTV's to lift locations and reconfigured station entrance	1	Item		
	Allow for help points to lifts	1	Item		
	Additional costs for Fire Egress Stair to Park				
DC2	<i>Platform 11 & 12 Modification Works and New Lift Installation</i>				
3	Protection Works				
	Allow for safe working				
	Possession works	560	hrs		
	Non-possession works	1,400	hrs		
DC3	<i>Protection Works</i>				
Total					



Appendix C

Tenix Projects Cost Plan - Option C (Station Upgrading Works)

Redfern Railway Station Tenix Cost Plan Peer Review

COST PLAN SUMMARY (OPTION C: Full Station Redevelopment - Station Works Only)			
Project Number:	10618		
Project Name:	Redfern Station Redevelopment (Option C)		
Revision No:	Revision 2		
Revision Date:	29 - March - 2007		
Review Date:	7 - May - 2009		
DIRECT COSTS			TOTAL COST
DC	I SECTION 1: PLATFORMS 1-10 MODIFICATION & NEW CONCOURSE WORKS		
	II SECTION 2: ILLAWARRA RELIEF PLATFORMS (11&12) UPGRADING WORKS		
DIRECT COST SUBTOTAL ex GST			
INDIRECT COSTS			
IC1	Subcontractor		
IC1.1	Subcontractor Indirect	18% of Total Direct	18%
Sub-total			
IC2	D&C Contractor		
IC2.1	D&C Contractor's contingency to manage s/c	10% of Total Direct plus IC 1.1	10%
Sub-total			
IC2.2	D&C Contractor Project Management & Facilities		30%
IC2.3	D&C Contractor Design	5% of DC + IC 1.1 + IC 2.1	5%
IC2.4	D&C Contractor Design Verification	2% of DC + IC 1.1 + IC 2.1	2%
Sub-total			
IC2.5	D&C Contractor Head Office Overhead and Profit	12% of All Above	12%
INDIRECT COST SUBTOTAL ex GST			
CONSTRUCTION COST (D&C Contract) ex GST			
CLIENT COSTS			
IC3	Client Directed Contingencies to Manage Works Under Contract		
IC3.1	Design development contingency	5% of Total Construction Cost	5%
IC3.2	Construction contingency	5% of Total Construction Cost	5%
TARGET BUDGET (D&C Contract) ex GST			
Client Costs			
CC1	EIS, Survey, Preliminary Geotechnical Investigation & Concept Design	1.5% of Target budget	1.5%
Sub-total			
CC2	Client Project Management Team	5% of Target budget plus CC1	5%
CC3	Possessions cost	Refer attached	
CC4	Land and property acquisition costs - EXCLUDED		
CC5	Legal and marketing costs - EXCLUDED		
CC6	Financing Cost - EXCLUDED		
CC7	Initial Maintenance Cost - EXCLUDED		
CC8	Station Ticket Gates - allow for 6 New @ \$250,000/gate plus relocating 7 existing gates @ \$40,000/gate		
CC9	Ticket Vending Machines (TVM's) - allow for relocating existing TVM's & 1 new @ \$75,000/No		
Sub-total			
CC10	Client Project Contingency	10% of Target budget + CC1 to 9	10%
TOTAL CLIENT COSTS			
TOTAL PROJECT COST ex GST as at April 2007			
Escalation			
Update Estimate from April 2007 to June 2008		Tenix Report 28.02.08	15.0%
Update Estimate from June 2008 to May 2009			0.0%
TOTAL PROJECT COST ex GST as at May 2009			

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DIRECT WORKS ELEMENTAL BREAK DOWN (Summary) - OPTION C		
ITEM	DESCRIPTION	TOTAL PRICE
I SECTION 1: MODIFICATION TO PLATFORMS 1-10 AND NEW CONCOURSE		
DC1	Enabling and Temporary Works	
DC2	Demolition Works	
DC3	Platform 1-10 Modification Works	
DC4	Modification Works to Existing Concourse	
DC5	New Elevated Concourse & Staircases	
DC6	OHV Works (including relocation works)	
DC7	HV Electrical Works & Traction Power	
DC8	Signalling and Communications (including relocation works)	
DC9	Station Comms Works (PL 1-10 & Concourse)	
DC10	External Works and Landscaping works - priced separately	
DC11	Protection Works	
Sub-total		
II SECTION 2: EXISTING ILLAWARRA RELIEF PLATFORMS (11&12) UPGRADING WORKS		
DC1	Enabling and Temporary Works	
DC2	Demolition Works	
DC3	IR Platform Modification Works	
DC4	OHV Works (including relocation works)	
DC5	HV Electrical Works & Traction Power	
DC6	Signalling and Communications (including relocation works)	
DC7	Signalling and Communications (including relocation works)	
DC8	External Works and Landscaping works - priced separately	
DC9	Protection Works	
Sub-total		
Direct Cost Subtotal ex GST		

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Possession Contribution Calculator		
Construction Costs (enter figure from cost plan)		
Indirect Costs (enter figure from cost plan)		
Construction Cost		
Percentage carried on possession		
Total cost of the project/Activity	(a)	
Total No of possessions (from programme)	(b)	
Average Project/Activity value per possession	(c)=(a)/(b)	
Routine and Major Periodic Maintenance Spending from Alt Transport & Track Recovery of Cost from External Parties Process - Version 4.2 (Aug		
Configuration No.	Amount	No. of Possns
Configuration 1	\$3,260,000	14
Configuration 1A	\$3,260,000	2
Configuration 3	\$2,210,000	16
Configuration 4	\$3,330,000	13
Configuration 8	\$1,510,000	16
Configuration 15	\$2,100,000	7
RailCorp Configuration Average over 68 possessions		68
Total average spend (RailCorp + Redfern) assuming no other projects		
	(d)	
% Contribution of Capital projects and or External Party to Alternate Transport and Trackwork Marketing		
	(e)=(c)/(d)	
Alternate Transport and Trackwork Marketing Cost (Carmen Morrison - RailC		
Configuration No.	Amount	No. of Possns
Configuration 1	\$999,982	14
Configuration 1A	\$1,160,782	2
Configuration 3	\$361,782	16
Configuration 4	\$640,980	13
Configuration 8	\$427,382	16
Configuration 15	\$498,492	7
Configuration Average		68
Contribution (Average per possession)		
No. of Possessions	(g)=(e)x(f)	
Total Project Contribution		

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Protection Officers Costs						
Week-end Possessions (Out of Hours)						
Possession Officers	Average No of Officers	No of Possessions	No of Shifts	Rate/ 10 Hr Shift	Cost \$	Total \$
Protection Officer	2	68	4			
Protection Co-ordinator	1	68	4			
Week Day Costs (Normal Hours - Infrequent weeknight requirements included)						
Possession Officers	Average No of Officers	No of Weeks	No of Days per week	No of Shifts	Rate/ 10 Hr Shift	Cost \$
Protection Officer	2	204	5	1		
TOTAL - POSSESSION COSTS						

Redfern Railway Station Tenix Cost Plan Peer Review

Option C: Redfern Station New Concourse & Platform 1-10 Works

DIRECT COSTS

WBS	Description	Q'ty	Unit	Rate	Total Cost
1	Enabling and Temporary Works				
1.1	Civil Works				
1.1.1	Demolition works - see section 2				
1.1.2	Temporary Access and Worksite				
	Temporary worksite to Little Eveleigh St site				
	Clear the work site area	1,160	m2		
	Asphalt paving for office, storage and vehicular access areas	1,160	m2		
	Allow for RailCorp staff temporary parking facilities including lighting and signs	15	No		
	Wash down facilities	1	No		
	Traffic management	1	Item		
	Temporary access to PL 10 crane access- incl above				
	Temporary worksite to Rosehill & Gibbons St				
	Clear the work site area	1,680	m2		
	Asphalt paving for office, storage and vehicular access areas	1,160	m2		
	Wash down facilities	2	No		
	Traffic management	1	Item		
	Reinstatement of existing park				
	Allow for landscaping	1	Item		
	Allow for making good stormwater drainage works & kerbs	1	Item		
	Temporary access to Crane near PL 10				
	Hardstanding	208	m2		
	Traffic management	1	Item		
1.1.3	Temporary Fencing and Hoarding				
	Temporary site hoarding, 1800mm high	400	m		
	Temporary chain link fence fixed to Jersey barrier along live track	50	m		
	Temporary Fencing - allow	100	m		
1.1.4	Temporary drainage				
	Allow for temp drainage & connections	1	Item		
1.1.5	Temporary crash deck				
	Platform 9/10 side				
	Allow for temp footings/base supports	38	No		
	Allow for vertical member supports, bracing and deck	1,350	m2		
	Allow for removal	1,351	m2		
	Hoarding for works	120	m		
	Platform 1/2 side				
	Allow for temp footings/base supports	30	No		
	Allow for vertical member supports, bracing and deck	1,470	m2		
	Allow for removal	1,471	m2		
	Hoarding for works	112	m		
	Allowance for crane (Erect & Dismantle)	6	Day		

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WBS	Description	Q'ty	Unit	Rate	Total Cost
1.1.6	Temporary construction access bridge				
	Temp hoists:				
	Install & dismantle	5	No		
	Hire charges (5 hoists x 118 weeks Av)	592	Weeks		
	Maintenance (5 hoists x 118 weeks Av)	140	Monthly		
	Hoist Driver (1 hoist driver x 118 weeks Av)	118	Weeks		
	Temp Bridge:				
	Allow for footings, vertical member supports, bracing and deck	225	m2		
	Allow for removal	225	m2		
	Hoarding for works	220	m		
	Allowance for crane (Erect & Dismantle)	12	Day		
1.1.7	Temporary crane platforms				
	Crane working platform for Platform 1 side (75m2)				
	Allow for piling mob & demob	1	Item		
	Piling / pier; assume 500 dia	144	m		
	Allow for HD platform	75	m2		
	Allow for removal	1	Item		
	Allow for monitoring and protection of engine dive & other structures	1	Item		
	Crane working platform for Platform 10 side				
	Assume Carpark floor is available as the Crane Platform				
	Allow for temporary propping of car park slab for Crane loading	1	Item		
	Allow for temporary ramp	1	Item		
	Allowance for crane (Erect & Dismantle)	10	Day		
1.1.8	Temporary control rooms on platforms				
	Allow for temporary staff rooms & train control	10	No		
1.2	OHW Relocations - included in OHW works				
1.3	Signalling Relocations - included in signalling works				
1.4	Utilities Diversions				
	Relocate existing HV power cables on Lt. Eveleigh St for crane access	1	Item		
	Allowance for any other services diversion	1	Item		
DC1	Enabling and Temporary Works				
2	Demolition Works				
2.1	Demolition of existing platforms canopies				
	Demolition	2,100	m2		
	Allow for disposal off site	1,575	t		
	Allow for cranes	10	Day		
2.2	Demolition of existing staircases				
	Demolition including disposal off site	8	No		
2.3	Removal of existing miscellaneous items				
	Allow for removal of furniture	1	Item		
	Allow for removal of affected lights	1	Item		
DC2	Demolition Works				

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WBS	Description	Q'ty	Unit	Rate	Total Cost
3	Platform 1-10 Modification Works				
3.1	Platform Extension Structural works for PL8 /9 extension (app. By 13m)	104	m2		
3.2	Platform level raising Platform level raising & resurfacing with hardener incl signs	7,480	m2		
	Scupper drain (assume 200mm wide & 100mm deep with galvanised grating)	1,020	m		
	Allow for sumps	26	No		
	Allow for discharging water into track drainage system	12	No		
3.3	Platform canopy fitout New canopies incl furniture & fixtures - 4 island platforms (use SWRL) Ditto side platforms Allow for station control rooms including wash down, toilet and comms facilities	4,480 1,600 10	m2 m2 No		
	Allowance for crane (250t)	1	Item		
	Allowance for traffic management	1	Item		
3.4	Platform mechanical works Allow for air-conditioning for staff office on platforms Allow for fire protection to canopies (use SWRL) Allow for pressurised discharge system for sewage and waste water from platforms to nearest discharge point	1 1 1	Item Item Item		
3.5	Platform electrical works Platform canopy lighting including distribution boards, light fittings and luminaires	1	Item		
DC3	Platform 1-10 Modification Works				
4	Modification Works to Existing Concourse				
4.1	Demolition of existing staircases - Included in Item 2				
4.2	Removal of internal fitouts and roof Demolition Traffic management	900 1	m2 Item		
4.3	Making good affected parts Allow for structural repairs	1	Item		
DC4	Modification Works to Existing Concourse				

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WBS	Description	Q'ty	Unit	Rate	Total Cost
5	New Elevated Concourse & Staircases				
5.1	Structures New concourse paid & unpaid buildings (use Lidcombe pre-tender) New staircases; 2m wide Ditto; 2.5m wide Ditto; 3m wide Lift pit & structure Allowance for crane (for concourse & staircases) Allowance for traffic management	2,988 5 9 2 6 1 1	m2 No No No No Item Item		
5.2	Building Fitout Works New concourse paid & unpaid buildings roofing, fitout & finishes including toilets (use SWRL) Allow for staff internal fitouts New staircase roofing & fixtures - included in canopy works Stainless steel balustrades to staircases Stainless steel handrail fixed to wall Stainless steel divider balustrade fixed to centre of staircase Lift cladding Allowance for crane Allowance for traffic management	2,988 1 384 48 240 6 1 1	m2 Item m m m No Item Item		
5.3	Mechanical works Allow for air-conditioning (staff) Allow for fire protection Allow for hydraulics & plumbing Allow for hydraulics, waste water, sewage & plumbing connections to existing Lift cars Allowance for crane (for lifts)	1 1 1 1 6 1	Item Item Item Item No Item		
5.4	Electrical works Lighting including distribution boards, light fittings and luminaires Provisions for lifts, TVM's, gates etc	1 1	Item Item		
DC5	New Elevated Concourse & Staircases				
6	OHW Works (including relocation works) Temporary/permanent OHW Structures; avg 12m wide Allow for relocating temporary structures New OHW cable supports underneath new slab Temporary /permanent OHW cabling Removal of redundant OHW structures Making good of platforms Testing & commissioning	8 1 24 1,750 11 1 1	No Item No m No Item Item		
DC6	OHW Works (including relocation works)				

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WBS	Description	Q'ty	Unit	Rate	Total Cost
7	<i>HV Electrical Works & Traction Power</i>				
7.1	Traction power - not required				
7.2	Power for PL 1-10 & concourse Allow for 2 No 750 KVA substations installed in IR building including transformers, switchboards and raised floor for cabling (assuming feeder is 33kV) Allow for removal of existing transformers & facilities	1 1	Item Item		
7.3	PL 11&12 switch room relocations (if required) included in IR works				
7.4	Power for new development - included in the commercial development section				
DC7	<i>HV Electrical Works & Traction Power</i>				
8	<i>Signalling and Communications (including relocation works)</i>				
	Temporary signal gantry structure to house signal for Down Main Line	1	No		
	New signal	1	No		
	Allow for new cabling	1	Item		
	Allow for modifications to existing track circuit	1	Item		
	Removal of existing gantry	1	Item		
	Removal of temporary gantry	1	Item		
	Relocation of signalling & comms cables mounted on PL 1 retaining wall including troughing & 2 kV power cables	250	m		
	Ditto; mounted on PL10	250	m		
	Allow for disconnections and reconnections	1	Item		
	Testing & commissioning	1	Item		
DC8	<i>Signalling and Communications (including relocation works)</i>				
9	<i>Station Comms Works (PL 1-10 & Concourse)</i> Use SWRL: Station Passenger Information (SPI) Train describer system Control room & racks CCTV's and help points Telephones, PA system and other communications	1	Item		
DC9	<i>Station Comms Works (PL 1-10 & Concourse)</i>				
10	<i>External Works and Landscaping works - priced separately</i>				
DC10	<i>External Works and Landscaping works - priced separately</i>				
11	<i>Protection Works</i> Allow for safe working Poss works Non-poss works Adjust for Protection Officers (Total \$2,101,200)	1,200 3,000	hrs hrs		
DC11	<i>Protection Works</i>	1	Item		
Total					

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WBS	Description	Q'ty	Unit	Rate	Total Cost
Option C: Redfern Station IR Platforms Upgrading Works					
1	<i>Enabling and Temporary Works</i>				
1.1	Civil Works Demolition works - see section 2				
1.1.1	Temporary Access and Worksite - included in Main Works (PL 1-10 & Concourse Works)				
1.1.2	Temporary Fencing and Hoarding Temporary site hoarding; 1800mm high Temporary Fencing - allow	220 50	m m		
1.2	Utilities Diversions Allowance for in ground services diversion	1	Item		
DC1	<i>Enabling and Temporary Works</i>				
2	<i>Demolition Works</i>				
2.1	Demolition of part of existing concourse Demolition of concourse entrance buildings Allow for waste to tip Allow for traffic management	1 1 1	Item Item Item		
2.2	Demolition of existing roof level Demolition Allow for temporary hoarding Excavation and disposal of soil off site Allow for temporary support during demolition & construction Demolition Allow for waste to tip Allow for traffic management	1 118 200 1 1 1 1	Item m m3 Item Item Item Item		
2.2	Demolition of existing platform for new escalator pit and lift pit Demolition Allow for waste to tip	1 1	Item Item		
2.3	Demolition of internal structures Allow for demolition of existing blade wall / column Allow for demolition of staircase Allow for removal of escalators Allow for demolition of internal walls Allow for hacking existing floor & wall finishes to receive new finishes Allow for waste to tip Allow for protection work during demolition	1 1 1 1 1 1 1	Item Item Item Item Item Item Item		
2.4	Platform level raising Remove existing tiled paving and re-grade to new profile Allow for removal by spoil train Remove existing tiled paving (Mezzanine) Stormwater drain Allow for sumps every 10m Allow for discharging water into track drainage system (4 No per platform)	1,389 2 125 341 28 8	m2 No m2 m No No		
DC2	<i>Demolition Works</i>				

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WBS	Description	Q'ty	Unit	Rate	Total Cost
3	IR Platform Modification Works				
3.1	Supports and strengthening existing columns Provision for supporting existing roof and strengthening columns Note: details for supporting and strengthening roof and columns are yet to be confirmed	1	Item		
	Fire rate structural steel roof framing to Platforms 11 & 12 Allow for 2 Hr vermiculite fire spray to exposed steel beams	2890	m2		
	Hi-rail with Flat Top	24	No		
	Hi-rail with cherry picker	16	No		
	Note: Excludes rectification of existing steelwork damaged by water ingress Note: Excludes removal and replacement of roof membrane and spoil and finishes of Platform roof		Note		
3.2	Modification to roof slab at 26.40-28.5 Allow for sealing staircase & escalator voids Allow for new pedestrian link & lift lobby (above PL 11&12) Allow for new walls & columns	105 224 32	m3 m2 m3		
3.3	New internal structures Allow for lift structure & finishes Allow for escalator pits Allow for new passenger staircase Allow for new fire escape staircase Allow for new fire escape staircase to Park incl structural works Allow for vent shafts & service risers Platform level raising	1 2 2 1 1 2 1,615	No No No No No No m2		
3.4	New Skylight Allow for skylight structure over platform Allow for glazing (based on Eastern Underground station study) Allow for smoke control	1 144 1	No m2 Item		
3.5	Internal finishes & fitouts Allow for new floor finish Allow for new wall finish Allow for new finishes and fixtures to lift lobby and pedestrian link Allow for new control room including wash down, toilet and comms facilities	2,200 1,700 1 1	m2 m2 Item No		
3.6	Platform mechanical works Lift car Allow for new escalators Allow for modification to station ventilation system Allow for air-conditioning for staff office on platforms Making good for affected fire alarm system Allow for pressurised discharge system for sewage and waster water from platform to nearest discharge point	1 2 1 1 1 1	No No Item Item Item Item		
3.7	Platform electrical works Allow for new lighting to platforms and lift lobby	1	Item		
DC3	IR Platform Modification Works				
4	OHW Works (including relocation works) New OHW portals bolted to walls; avg 6m wide New fixed to new columns OHW cabling Testing & commissioning	4 4 40 1	No No m Item		
DC4	OHW Works (including relocation works)				

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WBS	Description	Q'ty	Unit	Rate	Total Cost
5	HV Electrical Works & Traction Power				
5.1	Traction power - not required				
5.2	PL 11&12 switch room relocations works Allow (Note: upgrading substation for development works included in development works)	1	Item		
DC5	HV Electrical Works & Traction Power				
6	Signalling and Communications (including relocation works) No new works required				
DC6	Signalling and Communications (including relocation works)				
7	Station Comms Modification Works (PL 11 & 12) Use SWRL: 50% of Glenfield Station works Station Passenger Information (SPI) CCTVs and help points Telephones, PA system and other communications	1	Item		
DC7	Signalling and Communications (including relocation works)				
8	External Works and Landscaping works - priced separately				
DC8	External Works and Landscaping works - priced separately				
9	Protection Works Allow for safe working Poss works Non-poss works	560 2,000	hrs hrs		
DC9	Protection Works				
Total					

