4. CORRIDOR DESCRIPTION

This Chapter provides a description of the proposed SSFL corridor, based on the proposed concept design (Draft Final Southern Sydney Freight Line Concept Design Report, Connell Wagner, 2005).

A more detailed description of the proposed SSFL at each directly affected station precinct is provided in Chapter 6.

4.1 Proposed alignment

The proposed alignment and significant features of the SSFL are shown on Figure 4.1. The proposal comprises the construction and operation of a new 30 kilometre bi-directional, non-electrified and dedicated freight line from south of Macarthur Railway Station to east of Sefton Park Junction. The SSFL would be located adjacent to the RailCorp passenger network and within the existing rail corridor for most of its length.

The proposed alignment includes two crossings of the RailCorp network. These crossings, at Glenfield and Sefton Park Junction, would be grade-separated so that the SSFL would be able to run independently of RailCorp passenger trains and avoid train conflicts.

With the exception of the two grade-separated crossings of the RailCorp network, the SSFL would have a very similar vertical alignment to the existing RailCorp tracks in the rail corridor. This means the SSFL would be generally positioned at the same height in the corridor as the RailCorp tracks. Due to the required clearances for bridge structures, many bridges along the alignment (either under or over the rail corridor) predetermine the vertical alignment of the SSFL.

Some minor changes in the vertical and horizontal alignment would be expected, however, as the detailed design is developed, and detailed survey and geotechnical data becomes available. The features of the proposed alignment in the southern section of the SSFL (between Macarthur and Glenfield) and northern section (Glenfield to Sefton), are summarised below in Table 4.1.

Table 4.1 Features of the proposed alignment

Section of corridor	Features of the proposed alignment
Southern: Macarthur to Glenfield	The SSFL would diverge from ARTC's Main South Line to the western side of the rail corridor just north of the Hume Highway overpass. Between Macarthur and Ingleburn Railway Station, the SSFL would be aligned on the western side of RailCorp's rail corridor. At the southern end of Campbelltown Yard and northern end of the Campbelltown Railway Station, the alignment needs to avoid the planned future works by RailCorp to upgrade the stabling sidings. As a result of this planning constraint, the SSFL would encroach into adjoining private and public property at these locations requiring property acquisition. At Leumeah and Minto Railway Stations the SSFL would be located on the western side of the existing stations and would affect station access, buildings, facilities, car parking and interchange facilities (see Chapter 6). The SSFL would connect to the southern end of the existing freight passing loop (constructed in 1995) at Ingleburn Railway Station. Between Ingleburn Railway Station and Glenfield Junction no new construction work is proposed as the existing non-electrified freight passing loop would become part of the SSFL.

Section of corridor	Features of the proposed alignment
Northern: Glenfield to Sefton	The SSFL, including a proposed 2 kilometre passing loop, would be connected to the northern end of the existing freight passing loop at Glenfield Junction on the western side of the rail corridor. A grade separated crossing, known as the Glenfield flyover, would be constructed to allow the SSFL and the 2 kilometre passing loop to cross over the RailCorp tracks from the western side of the rail corridor to the eastern side, north of Glenfield Junction. The design of the southern and northern approach ramps to the flyover needs to meet the required grade and curvature limitations of the track, while aligning the crossing point at a suitable location. As a result of these design constraints, the SSFL would encroach into adjoining private and public property at this location requiring property acquisition and de-gazettal of a portion of Leacock Regional Park from the national park estate. Between the Glenfield flyover and Cabramatta Railway Station, the SSFL would be constructed on the eastern side of the rail corridor. Between Casula and Liverpool Railway Stations the rail corridor is relatively narrower. Due to the location of the corridor on the Georges River embankment and the slope of the land and also to accommodate RailCorp's proposed upgrade of the Liverpool Stabling Yard and construction of an additional platform at Liverpool Railway Station, the SSFL would encroach into adjoining public property. The SSFL would exit the Main South Line rail corridor at Riverpark Drive and then proceed along the western boundary of Lighthorse Park. The SSFL would re-enter the Main South Line rail corridor at Liverpool Hospital approximately 200 metres north of the Elizabeth Street railway crossing. North of the Liverpool Railway Station, the SSFL would be aligned on the eastern side of the rail corridor at the top of a steep bank of the Georges River, between the station and the existing level crossing at Liverpool Hospital. The SSFL would be constructed on a piled slab structure along the top of the steep river bank, as shown in Figure 4.2. The structure would act to support the SSFL so that the top of the slope of the river bank is not used to support the new track. North of Cabramatta it would follow the southern side of the rail corridor through to Sefton Park Junction where it would connect via a deep cutting underneath the Bankstown Line to the Metropolitan Goods Line. The SSFL would be located on the eastern side of the Casula, Warwick Farm and Cabramatta Railway Stations and southern side of Sefton Railway Station, which would affect station access, buildings, facilities, car parking and interchange facilities (see Chapter 6). The SSFL would connect with the RailCorp network at Casula (for freight services that need access to the SSFL coming from western Sydney via Granville and Cabramatta) and at Leightonfield Yard to service sidings in this location.

Source: Connell Wagner, 2005

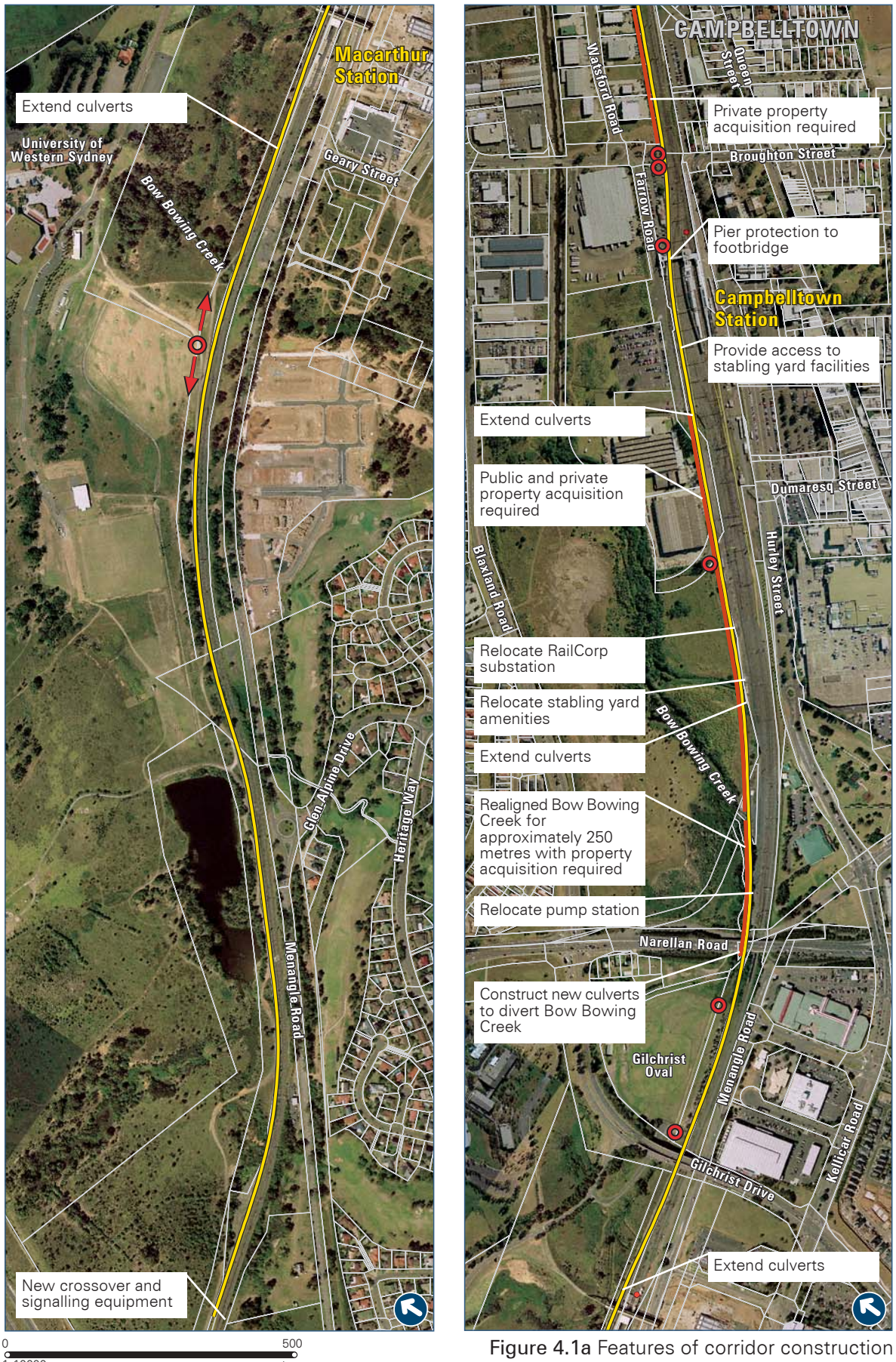


Figure 4.1a Features of corridor construction

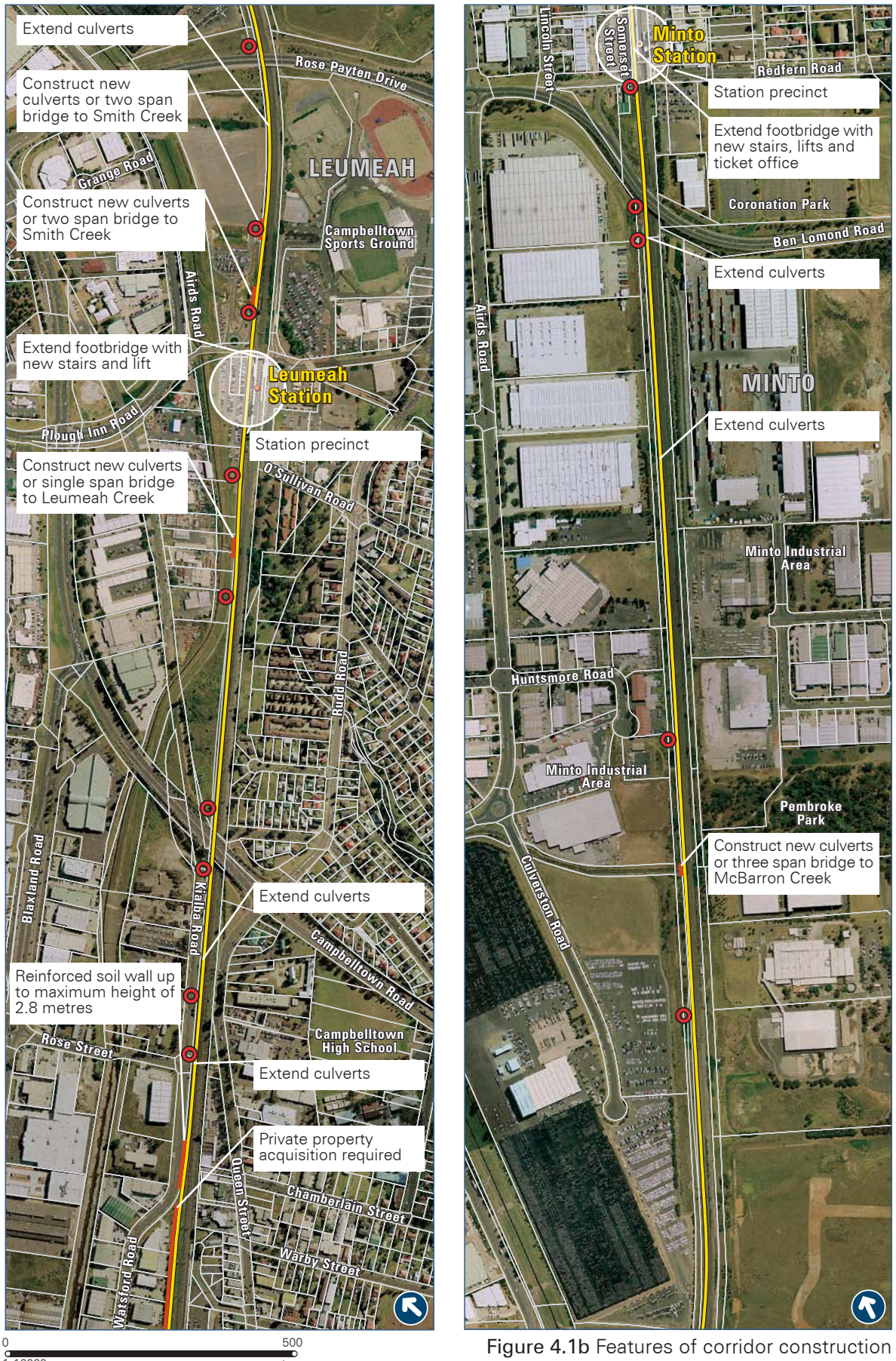


Figure 4.1b Features of corridor construction

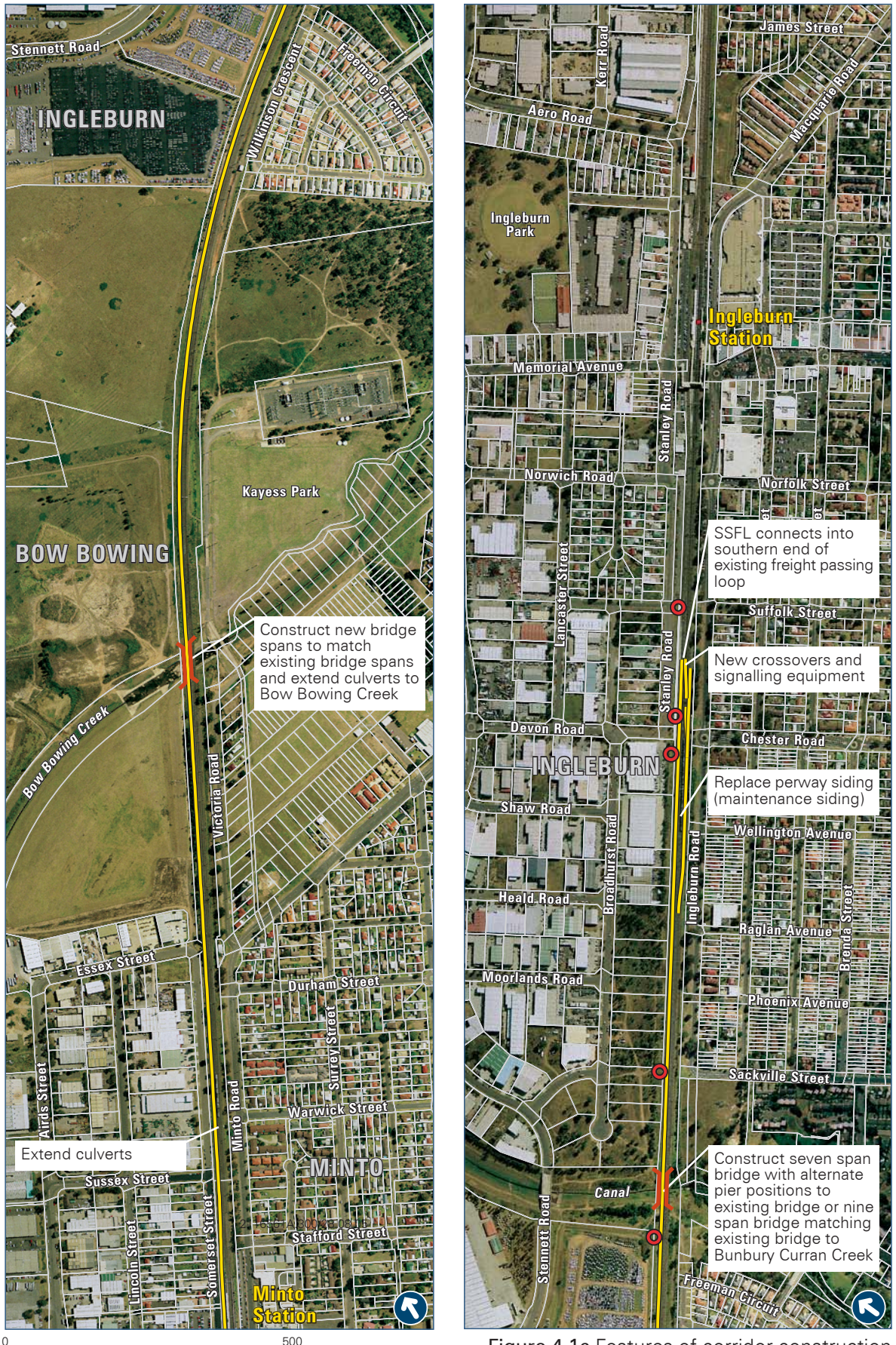


Figure 4.1c Features of corridor construction

Figure 4.1d Features of corridor construction

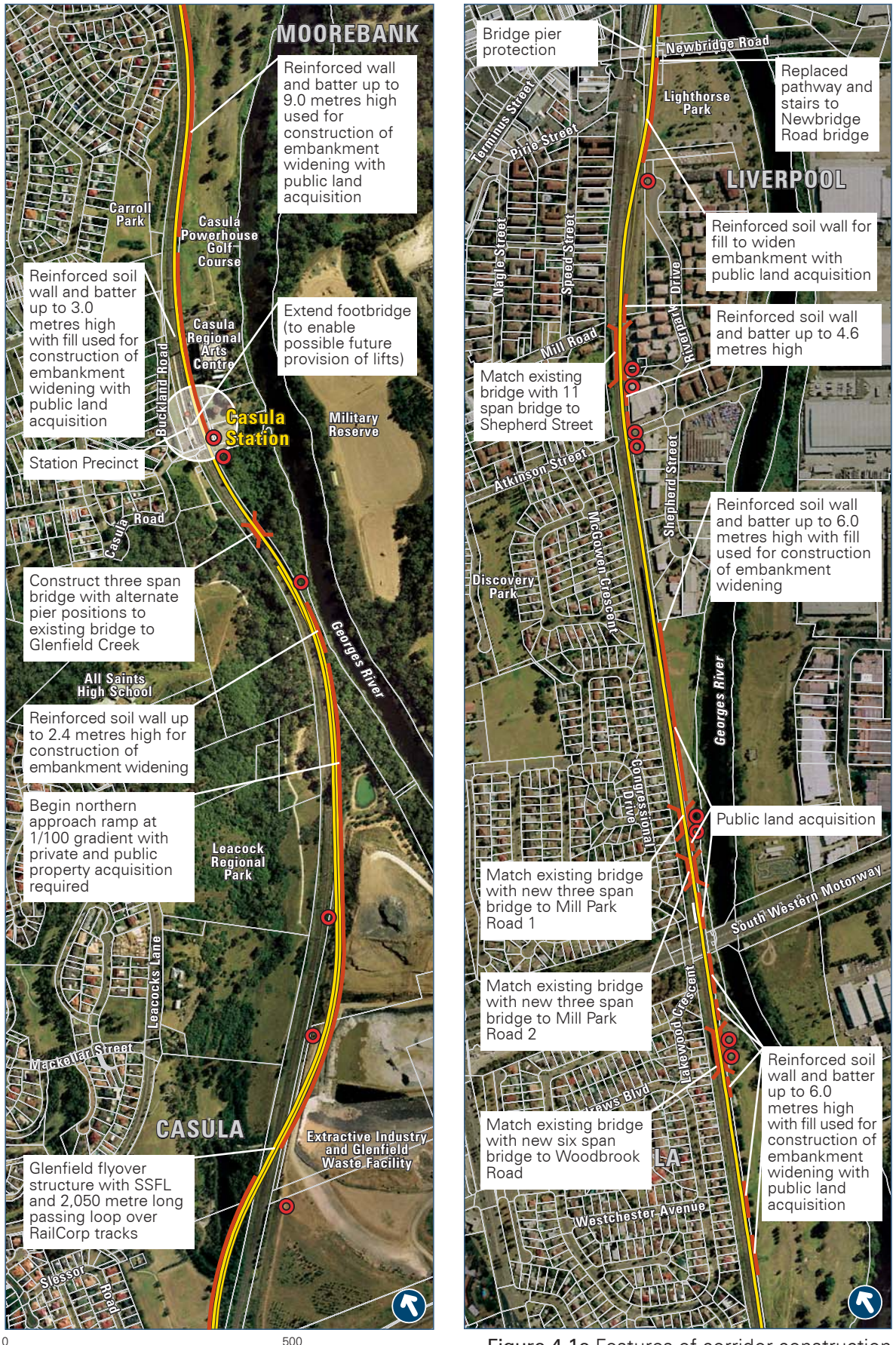


Figure 4.1e Features of corridor construction

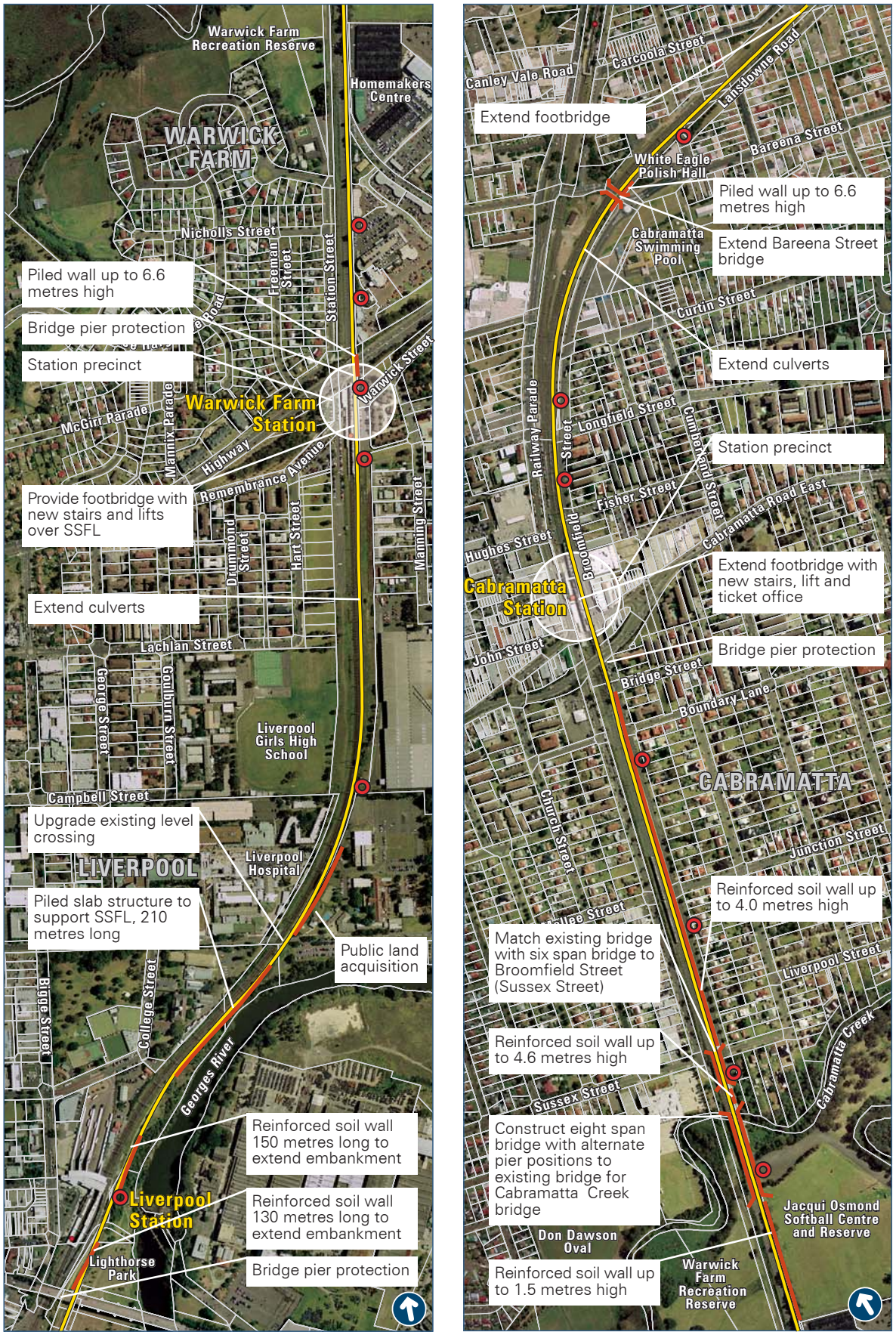


Figure 4.1f Features of corridor construction

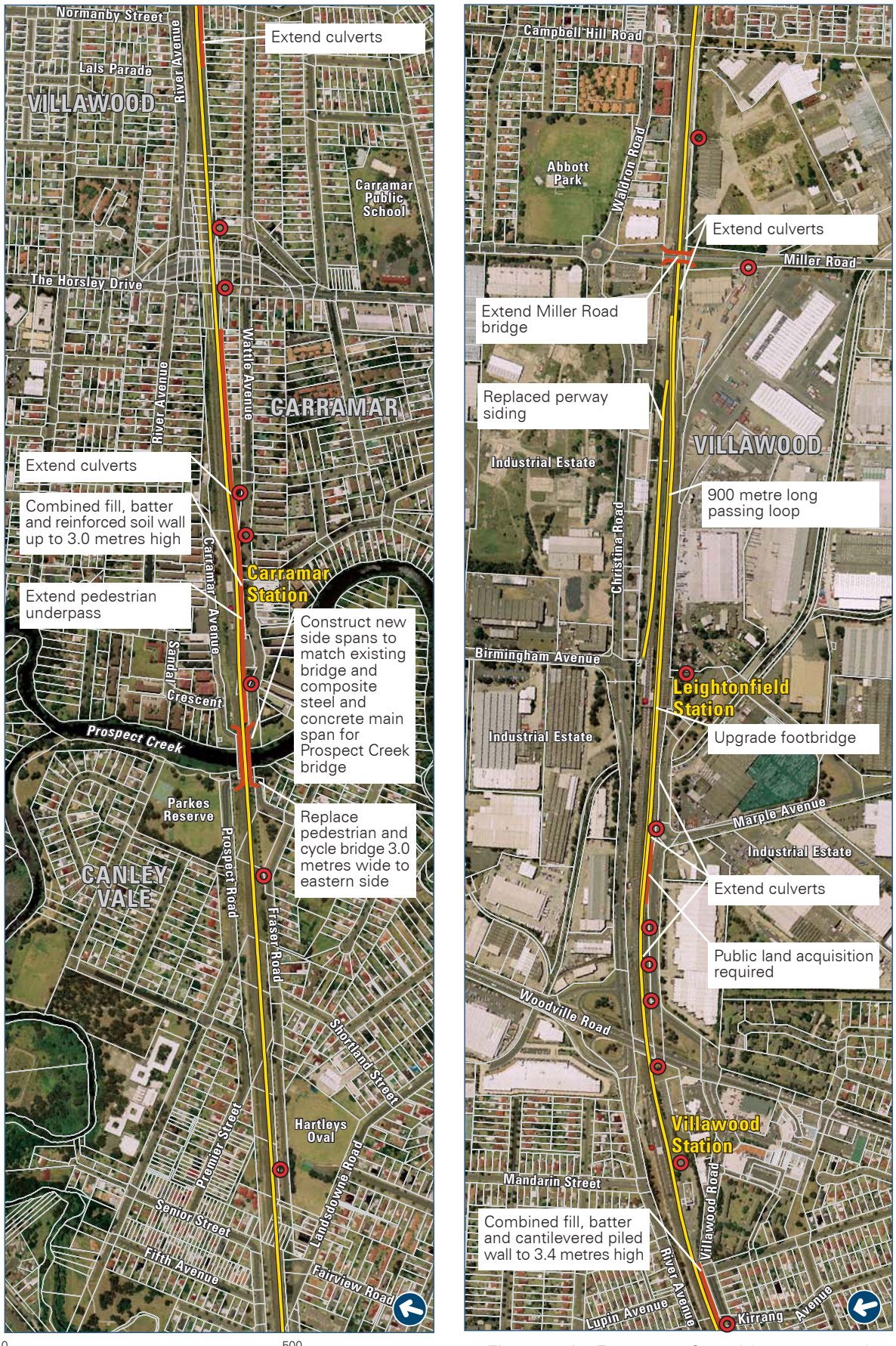


Figure 4.1g Features of corridor construction

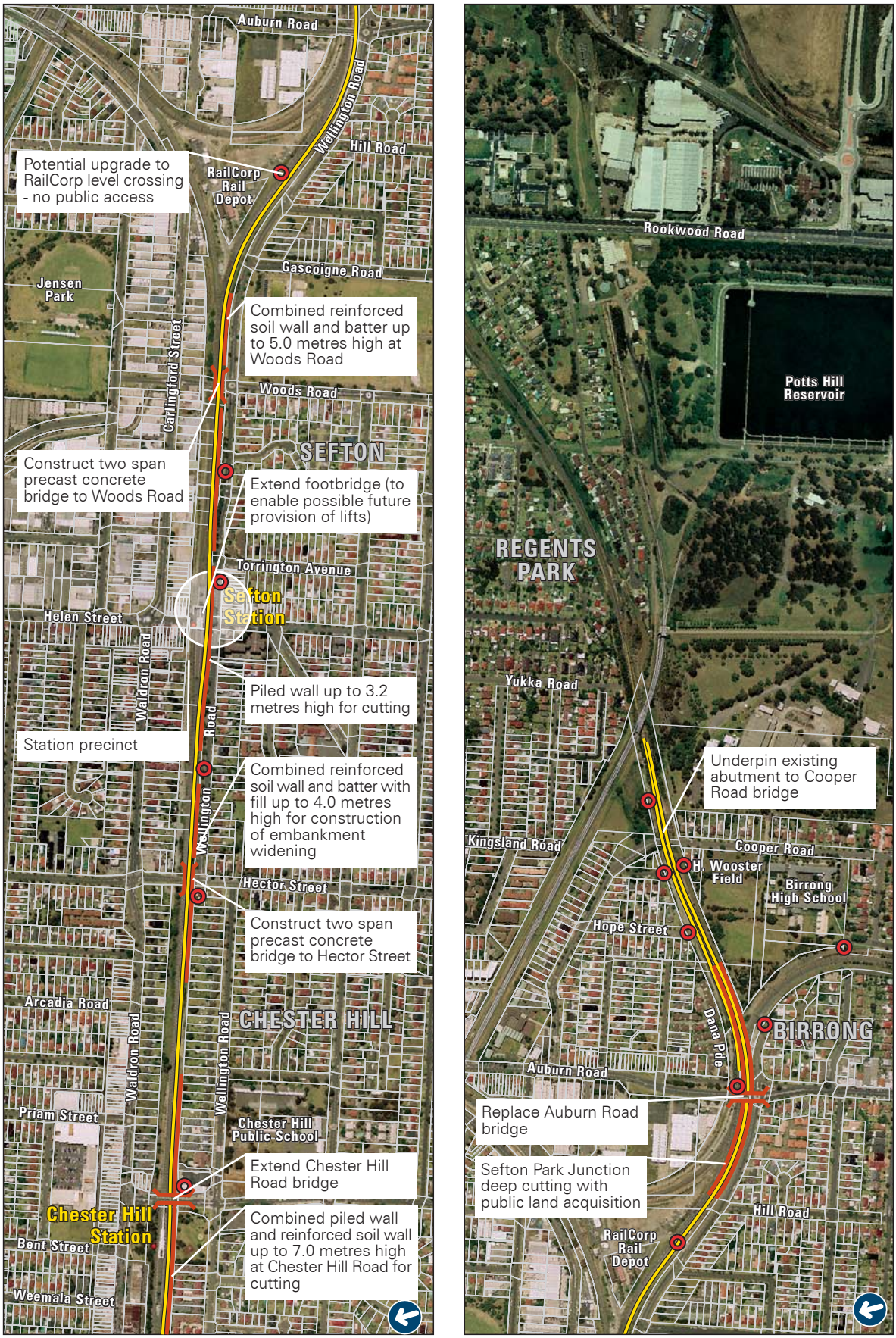


Figure 4.1h Features of corridor construction

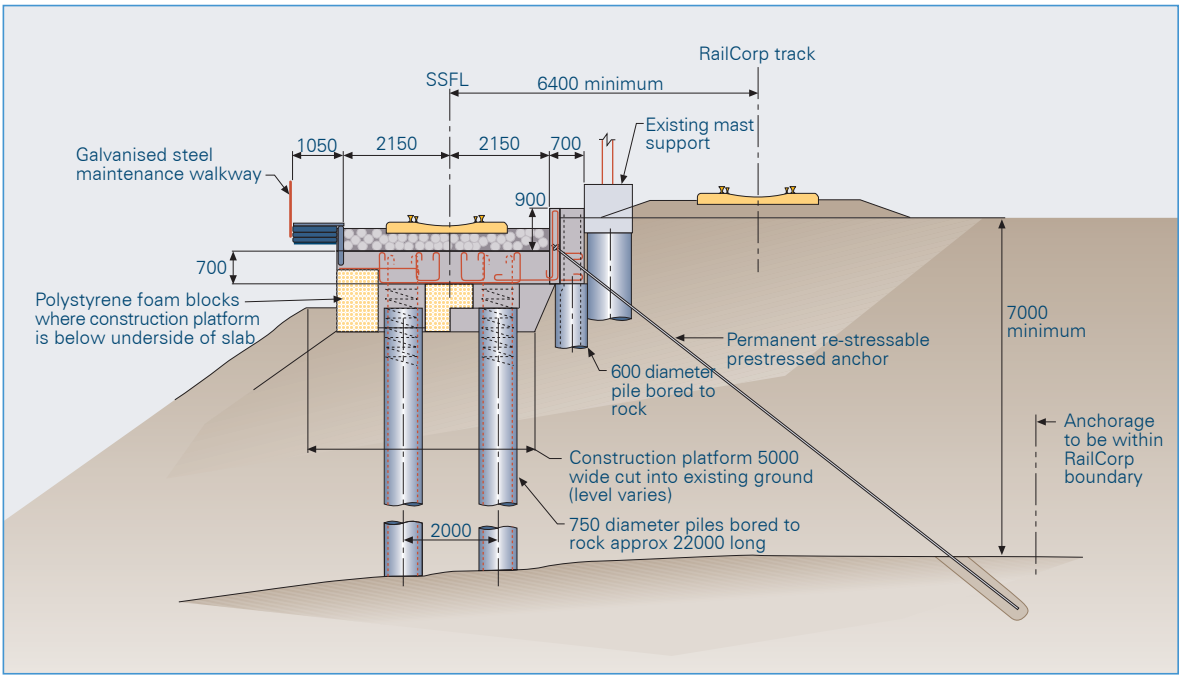


Figure 4.2 Piled slab structure, Georges River

4.2 Rail corridor requirements

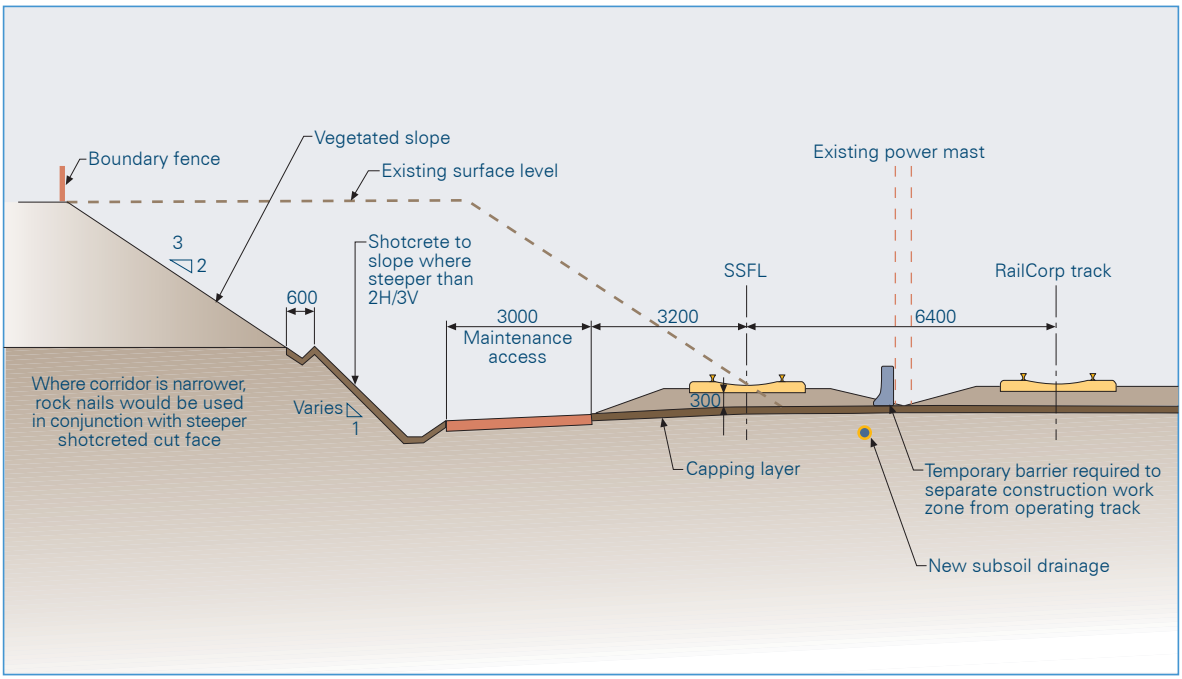
The SSFL would be located within the existing rail corridor for most of the distance from Macarthur to Sefton Park Junction. The SSFL would be managed by ARTC, although RailCorp would continue to own the corridor. ARTC would have an agreement with RailCorp that provides for its occupation within the corridor. Many existing RailCorp structures, buildings, services and utilities are located in the path of the proposed SSFL and would require relocation. There are also minimum vertical and horizontal clearances that apply to the design of the SSFL for transit of freight trains on this track. The SSFL would also comply with RailCorp standards for interface work on and over the RailCorp tracks (e.g. for track connections and the Glenfield flyover clearance).

The minimum vertical clearance for the SSFL is 4.80 metres. However, a higher clearance of 5.65 metres is proposed to preserve the opportunity for ARTC to electrify the SSFL in the future if the need arose.

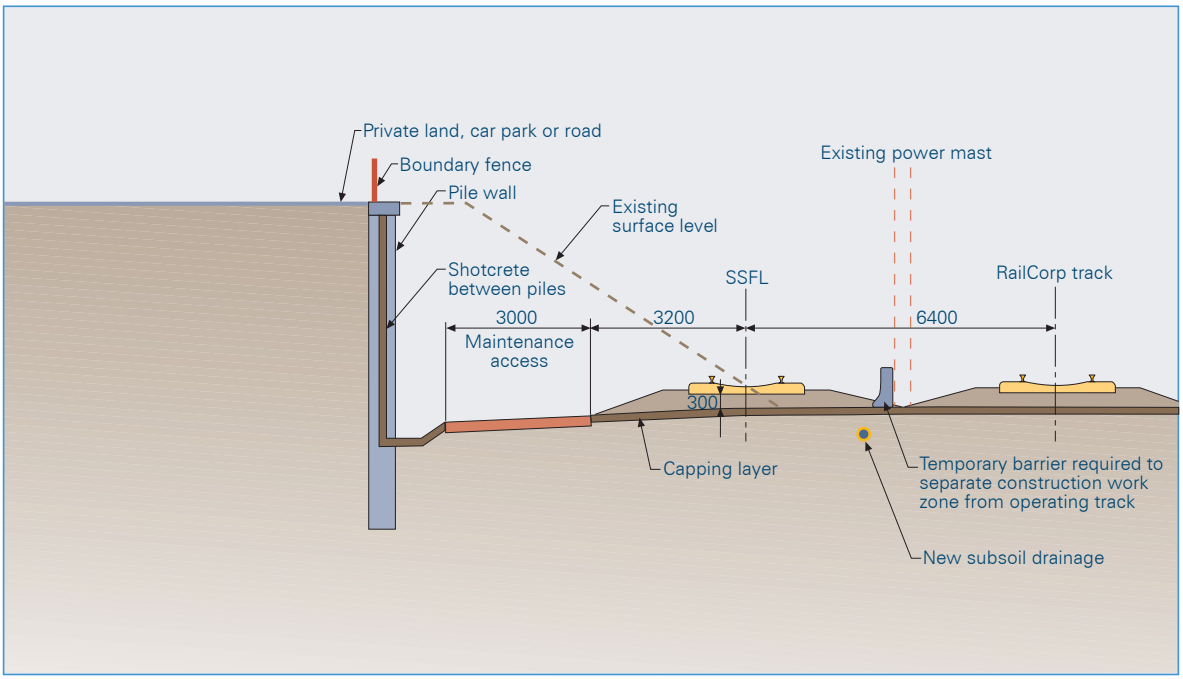
The preferred minimum horizontal clearance from the centreline of the SSFL to existing structures is 3.5 metres. This clearance takes into account freight train and long wagon geometries, the sway of trains around a curve, and possible track movement. An absolute minimum clearance to existing structures of 3 metres would be provided where the SSFL passes close to the back of the platform and pedestrian footbridge structures (for instance, at Minto and Cabramatta Railway Stations). A minimum horizontal clearance of 6.4 metres between the centrelines of the SSFL and the closest RailCorp track would apply to ensure the operational independence between the two networks. In some instances, where the rail corridor is narrow and constrained, a narrower clearance to the RailCorp tracks may be required.

The SSFL would have operational independence from the RailCorp passenger network, including maintenance of the SSFL by ARTC and network control by ARTC of trains on this line. A 3 metre wide maintenance access track is proposed along the route of the SSFL wherever it is feasible and practical to be provided, this also applies to the passing loop (maintenance vehicles must be able to access the loop if a train with mechanical problems is parked in the loop). In some locations, a maintenance access track would not be provided due to lack of room (e.g. where the rail corridor is narrower and the SSFL is near the corridor boundary, at approaches to some bridge structures, across bridge structures, and at all of the stations along the route). Access from the public road network to the maintenance access track would be provided by existing, relocated and new gates to the rail corridor.

The typical formation of the SSFL corridor in the different topographic environments along the route (embankments and cuttings), including maintenance access tracks and proposed clearances, is shown in the series of typical cross-sections in Figure 4.3.

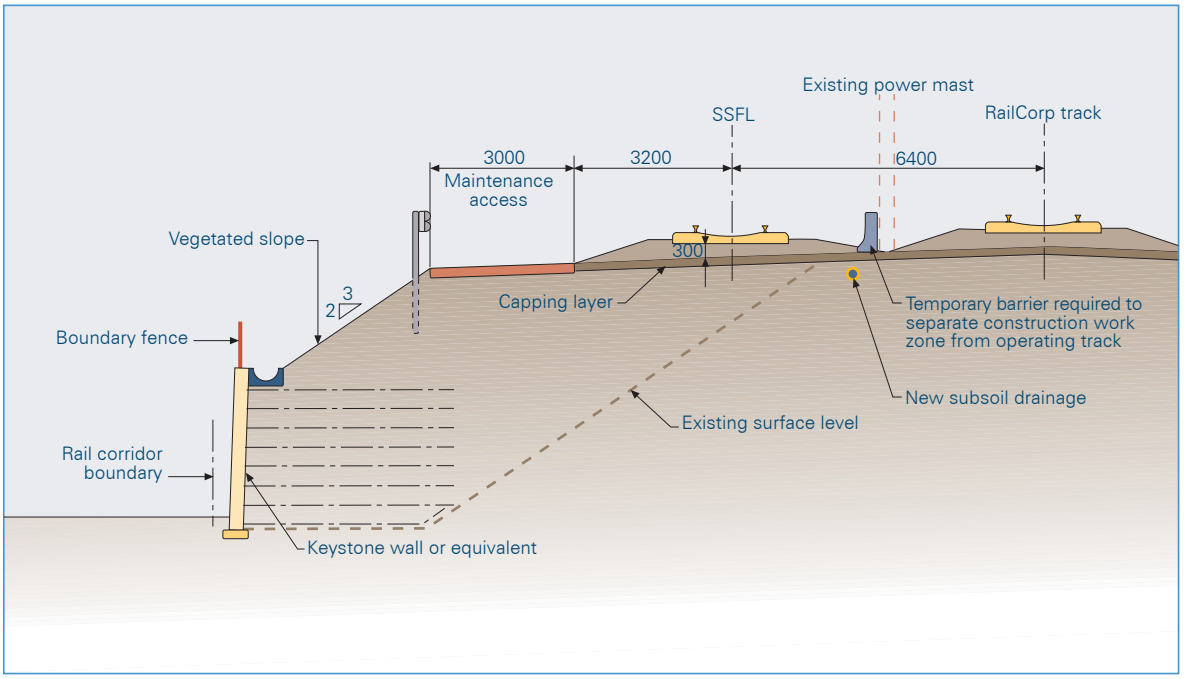


Batter slope (typical section at cutting)



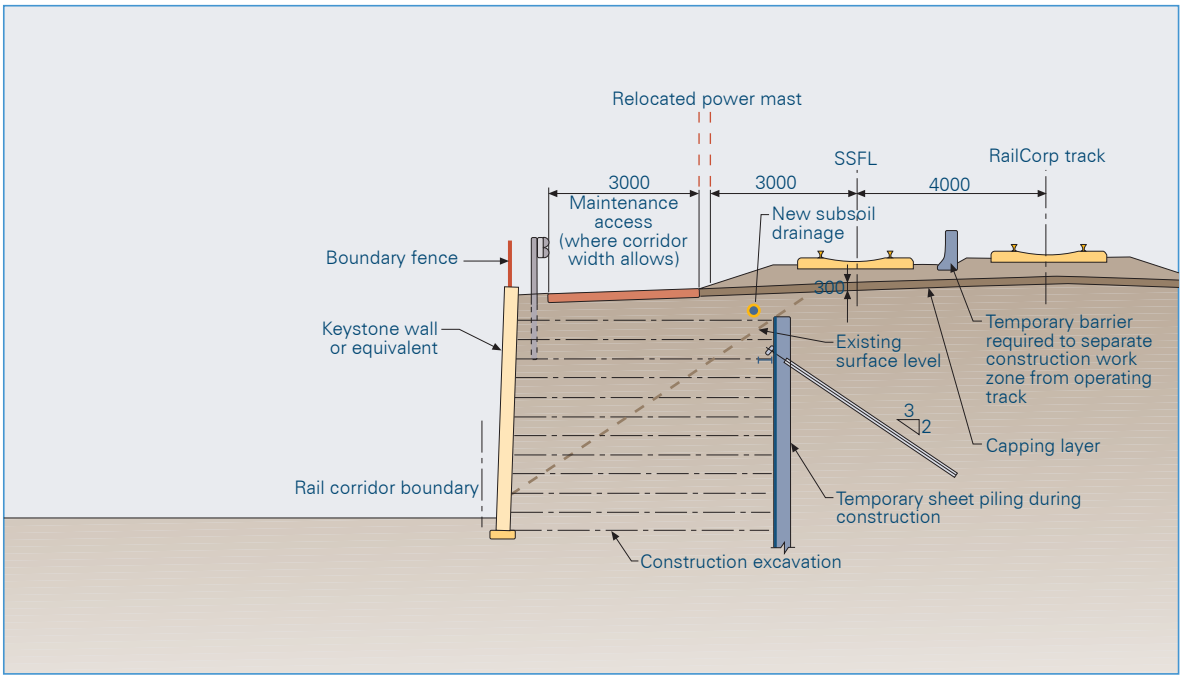
Piled retaining wall (typical section at cutting with tight corridor constraints)

Figure 4.3a Typical cross sections



0 5000 millimetres

Reinforced soil wall (typical section at embankment)



0 5000 millimetres

Reinforced soil wall (typical section at embankment with tight corridor constraints)

Figure 4.3b Typical cross sections

4.2.1 Earthworks requirements

Table 4.2 details the approximate earthworks volumes divided into the main work sections of the SSFL alignment. The scale of the earthworks and retaining walls required for each of the main work sections are detailed in Table 4.3.

Table 4.2 Approximate cut and fill volumes

Likely work section	Imported fill (cubic metres)	Excavation - cut material used as fill (cubic metres)	Excavation - excess cut material and unsuitable material for fill (cubic metres)
Southern			
Macarthur to Ingleburn Railway Stations	67,700	13,740	6,870
Ingleburn Railway Station to Glenfield Junction	No new construction work is proposed in this section as the existing non-electrified freight passing loop would become part of the SSFL.		
Northern			
Glenfield Junction to Warwick Farm Railway Station (including the Glenfield flyover)	168,190	13,555	6,775
Warwick Farm to Cabramatta Railway Stations	13,700	2,915	1,460
Prospect Creek bridge	Included in adjacent sections		
Cabramatta Railway Station to Woods Road, Sefton (excluding Prospect Creek bridge)	3,710	31,145	22,065
Woods Road, Sefton to Sefton Park Junction deep cutting	0	0	60,250
Total	**253,300**	**61,355**	**97,420**

Source: Connell Wagner, 2005

Table 4.3 Scale of earthworks and retaining walls

Likely work section	Earthworks and retaining walls
Southern	
Macarthur to Ingleburn Railway Stations	As the SSFL is on a low embankment through most of the length of this section, only limited embankments and cuttings would be required.
Ingleburn Railway Station to Glenfield Junction	No new construction work is proposed in this section as the existing non-electrified freight passing loop would become part of the SSFL.
Northern	
Glenfield Junction to Warwick Farm Railway Station (including the Glenfield flyover)	The Glenfield flyover would require a significant quantity of imported fill to construct the approach ramps for the Glenfield flyover. Between Casula and Liverpool Railway Stations, the proposed alignment of the SSFL on the eastern side of the corridor would require the importation of large volumes of fill in order to extend the embankment adjacent to the Georges River. This embankment extension would be necessary to provide the required width for the SSFL formation. This would most likely be achieved by construction of a combined batter slope and retaining structure extending up to 10 metres into the adjoining Council owned former golf course and up to 25 metres at its widest point into the adjoining Lighthorse Park. The embankment height would be up to 6 metres in height.

Likely work section	Earthworks and retaining walls
Warwick Farm to Cabramatta Railway Stations	In this section the terrain is relatively flat, with the exception of the crossing to Cabramatta Creek. A few short sections would require widening of the cuttings or embankments.
Prospect Creek bridge	Small scale embankment construction would be required for the bridge approaches.
Cabramatta Railway Station to Woods Road, Sefton (excluding Prospect Creek bridge)	South of Leightonfield Railway Station the cutting at Bareena Street road bridge would require widening. North of Leightonfield Railway Station the topography undulates and between Hector Street and Woods Road the existing formation would require: • construction of retaining walls (where appropriate) • widening of sections of low embankment or cuttings of up to 7 metres in height
Woods Road, Sefton to Sefton Park Junction deep cutting	The deep cutting at Sefton Park Junction with excavated faces would be stabilised with rock nails and piles. This section of the SSFL route has a large volume of cut.

Source: Connell Wagner, 2005

4.2.2 Construction of connections to sidings and freight terminals

The proposed alignment of the SSFL affects existing connections to sidings and freight terminals, which would need to be re-established as part of the SSFL. These are described in Table 4.4.

Table 4.4 Construction of sidings and connections to freight terminals

Section of corridor	Required siding and/or connection
Southern: Macarthur to Glenfield	The SSFL connection to the ARTC controlled Main South Line to the south of Macarthur would effectively shorten the existing bi-directional section of track that allows for a train to be held south of Macarthur and to pass another on the adjacent track. This capability would be retained by extending the bi-directional track and installing new crossovers at Glenlee. RailCorp plans to extend the existing stabling facilities south of Campbelltown Railway Station, and the SSFL alignment has been set far enough west to fit around these future plans. New access to this stabling yard from RailCorp land to the west of the SSFL would be required. A perway siding (which is a short maintenance siding used to park on-rail maintenance plant, e.g. a tamper or ballast regulator) would be needed to replace the existing siding on the Up side of the corridor at Ingleburn, which would be cut off by the SSFL. The replacement perway siding would be constructed at Ingleburn on the Down side of the corridor south of the Ingleburn Railway Station. An existing freight terminal at Minto (the Macarthur Intermodal Shipping Terminal) has a siding on the Down (eastern) side of the RailCorp corridor. This would be directly accessible from the SSFL via existing crossovers at Ingleburn and not, therefore, require a connection to be provided as part of the project.
Northern: Glenfield to Sefton	A new perway siding would be needed to replace an existing siding on the southern side of Liverpool Railway Station that would be cut off by the SSFL. The replacement perway siding is proposed as part of the SSFL at Leightonfield on the Up side of the corridor. RailCorp plans to upgrade the existing train stabling facilities at the yard south of Liverpool Railway Station. The SSFL alignment has been designed to allow for this future project by locating the alignment of the SSFL on the far eastern side of the stabling yard. An underpass would need to be constructed as part of the SSFL to allow access to this stabling yard from the RailCorp land to the east of the SSFL. This underpass is proposed as part of the SSFL. A crossing loop between the SSFL and RailCorp's network is required at Leightonfield, to accommodate interstate and country passenger services and freight trains that would need to leave the SSFL and join the RailCorp's Main South tracks. A crossing loop is created by placing a long length of track within the crossover, between the tracks. Connections from the SSFL to the existing Road Sea Rail freight terminal at Leightonfield, at both ends of the terminal, would be provided to replace the existing connections that would be cut off by the SSFL.

Source: Connell Wagner, 2005

4.2.3 Drainage and culvert structures

The concept design for the provision of stormwater drainage for the SSFL was prepared considering issues of track drainage, local catchments and larger catchments. The concept design of the SSFL has been developed on the basis that the SSFL will not increase the risk of flooding.

Track drainage would be provided through the standard arrangement of slotted pipes or fin drains under the formation between the SSFL and the RailCorp tracks, with connections to any outlets from existing cross track drainage. The new drains running along the alignment would be located on the SSFL side of the existing RailCorp masts.

Local catchment drains that cross the alignment would typically be extended to cross under the SSFL. However, the design flow for these would be assessed prior to detailed design, and where calculated flows (to achieve the design standard of Annual Recurrence Interval of 1/100 years) require a larger culvert area, the additional culvert areas would be constructed next to the continuation of the existing culverts. This would allow the design flow to be accommodated as and when an upgrade to the RailCorp culvert is constructed. The new culvert would extend from the end of the existing culvert to a new headwall that is 4.25 metres clear of the centreline of the SSFL for locations where there is no maintenance access track, and 6.2 metres clear of the centreline of the SSFL where there is a maintenance track.

The SSFL would pass over a number of watercourses that are accommodated in culverts under the existing RailCorp tracks. New culverts would be required to carry flows under the SSFL. The new culverts would need to align with the existing ones so that floating debris does not jam between the two culverts. The new culverts would also need to match or exceed the headroom of the existing culverts. The stream bed between the existing and new culverts would be lined with a concrete slab. There are 14 locations where minor culverts (or single pipes or groups of conduits) would need to be extended.

The locations and details of the major new culverts are outlined in Table 4.5 and are also shown on Figure 4.1.

Table 4.5 Construction of major culverts

Location	Existing structure	Construction
Leumeah Creek	Low height four cell short span brick arch culvert	Match hydraulic area with either reinforced concrete box culverts or a single span bridge of 9.7 metres
Smith Creek 2	Low height eight cell short span brick arch culvert	Match hydraulic area with either reinforced concrete box culverts or a two span bridge of 9.6 metres each
Smith Creek 1	Low height five cell short span brick arch culvert	Match hydraulic area with either reinforced concrete box culverts or a two span bridge of 7.4 and 5 metres
McBarron Creek	Low height five cell short span brick arch culvert	Match hydraulic area with either reinforced concrete box culverts or a three span bridge of spans 7.5, 3.75 and 7.5 metres

Source: Connell Wagner, 2005

The culvert extension under Narellan Road would be a more complicated drainage crossing. In this location, Bow Bowing Creek runs parallel to the railway corridor and meanders close to the existing RailCorp tracks at the crossing under the Narellan Road bridge. The proposed SSFL alignment runs along the creek alignment at this point. It is proposed that the creek would be diverted for less than 50 metres and run in a new culvert under the SSFL at this location. The diversion is an adjustment to a previously engineered channel. To the north of Narellan Road for a distance of approximately 250 metres, the creek would be realigned with gabion walls. The flood capacity would not be reduced or flood levels increased.

Between Campbelltown and Glenfield Junction the terrain is flatter and more prone to flooding. The SSFL runs along the flood plain of Bow Bowing Creek and Bunbury Curran Creek, with crossings of tributaries to these creeks. The crossings of the SSFL would be designed to have no drainage or flooding effect on any of these watercourses.

The SSFL would displace a drainage gully running parallel to the rail corridor north of the Cambridge Avenue road bridge at Glenfield Junction. The gully would be reformed for a distance of approximately 900 metres with an adequate and assured flow capacity.

The route of the SSFL runs parallel to the Georges River and does not cross it. The embankment would need to be made between 4 to 6.5 metres wider. The SSFL would not produce a significant decrease in the flood flow area of the river or significantly affect the backwater volume of the Georges River.

Both Prospect and Cabramatta Creeks have been modelled in flood studies carried out for Liverpool and Fairfield City Councils (Bewsher Consulting, 2004). The respective creek bed levels are at Prospect Creek an elevation of 1.3 metres Australian Height Datum and at Cabramatta Creek an elevation of 1.23 metres Australian Height Datum. The proposed top of the rail levels are 8.54 metres Australian Height Datum and 8.48 metres Australian Height Datum respectively and are therefore both above the 100 year flood levels of 6.60 metres Australian Height Datum at Prospect Creek and 6.80 metres Australian Height Datum at Cabramatta Creek.

4.2.4 Glenfield flyover

The Glenfield flyover is required to bring the SSFL from the western side of the RailCorp corridor to the eastern side.

The length of the flyover would be designed to pass over three lines: RailCorp's Up and Down Main South Lines (two electrified tracks), and a potential future Down relief freight track on the eastern side (This future track is not part of this proposal). The width of the flyover would cater for two tracks: the SSFL (single track line) and the passing loop (see **Section 3.5.3**). The approach ramps to the flyover would have 1/100 gradients to ensure that freight trains using the loop can stop and start again. A consequence of this gradient each approach ramp is over 500 metres in length.

Each flyover approach ramp would extend beyond the existing corridor boundary to accommodate the minimum 600 metre radius curvature of the SSFL track and to ensure the constructability of the bridging structure. The flyover would encroach into properties on the eastern and western sides of the rail corridor in this vicinity. This impact is unavoidable as it is necessary to ensure that the 1/100 gradient is achieved for the passing loop operations. The existing RailCorp tracks would be unaffected. The proposed flyover design and extent of impact on adjacent properties is illustrated in Figure 4.4.

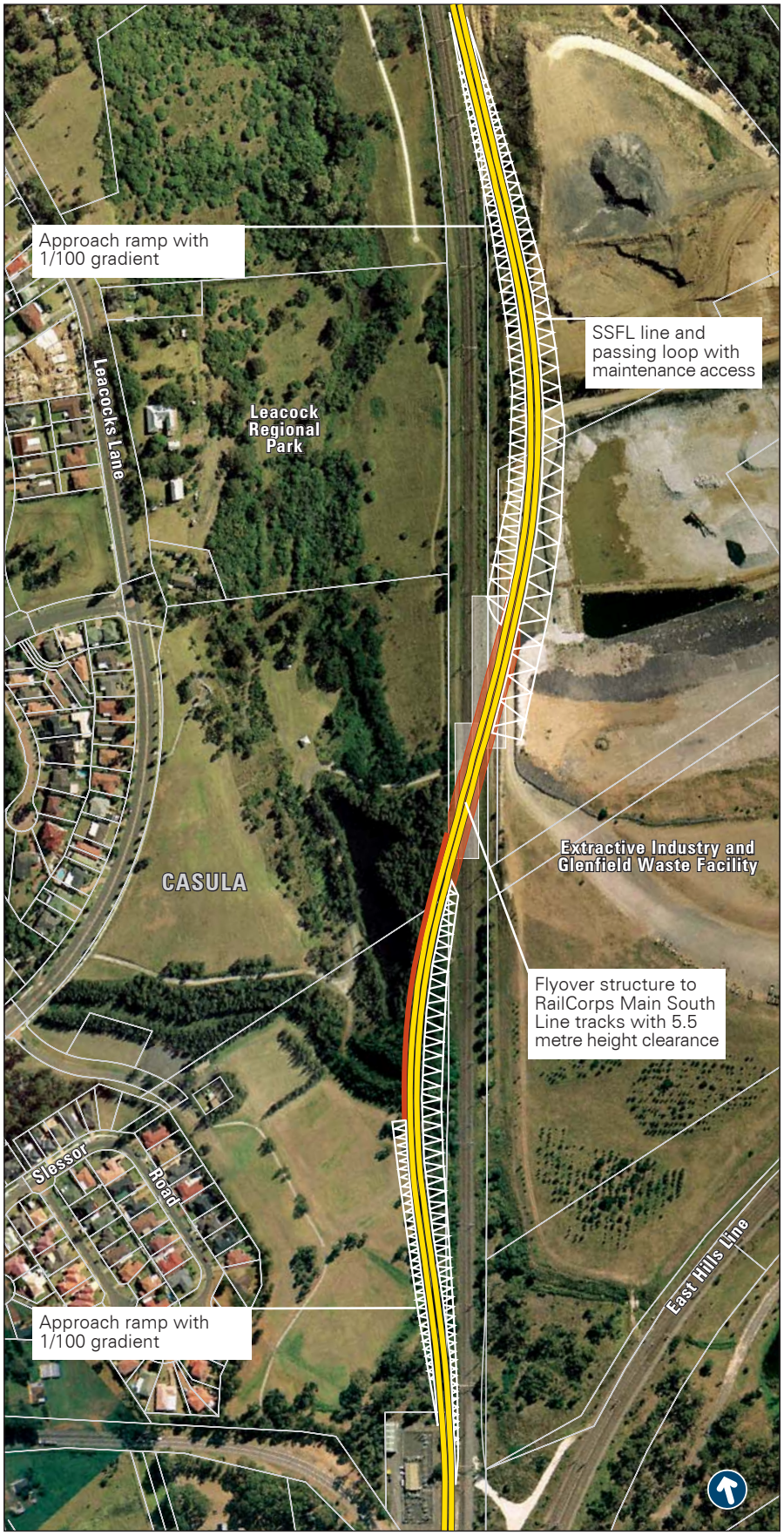


Figure 4.4 Glenfield flyover

4.2.5 Sefton Park Junction deep cutting

A grade-separated crossing of the Sefton Park Junction is required to bring the SSFL under the existing Bankstown Line so it can continue its alignment eastwards and connect with the Metropolitan Goods Line, while avoiding passenger and freight train conflicts. A continuous deep cutting and underpass would be required to take the alignment of the SSFL under the Bankstown Line with a new rail bridge. Most of the underpass would be located in an approach cutting on each side of the Bankstown Line. The deepest section (up to 13 metres deep) would be located adjacent to Wellington Road and Tewin Road. The available corridor width requires that the cutting has steep sides as shown in Figure 4.5.

The cutting would require the rebuilding of the Auburn Road bridge as the cutting would undermine the existing bridge abutment. An alternative construction technique would be to drive a tunnel for approximately 140 metres under Auburn Road. A short section of tunnel may prove uneconomic to construct given the large amount of open cutting required anyway. This decision to build a tunnel in deep cutting would be reviewed at detail design scope.

The cutting wall would be constructed with a piled wall to retain the residual clay at the site and to support a traffic barrier and any overhanging sections of footpath. A rock nailed and shotcreted slope would be provided below the wall. The piled wall would be braced with anchors into the rock. The side of the cutting wall opposite the adjacent roads and next to the Bankstown Line would require a piled wall that would also be anchored into the rock.

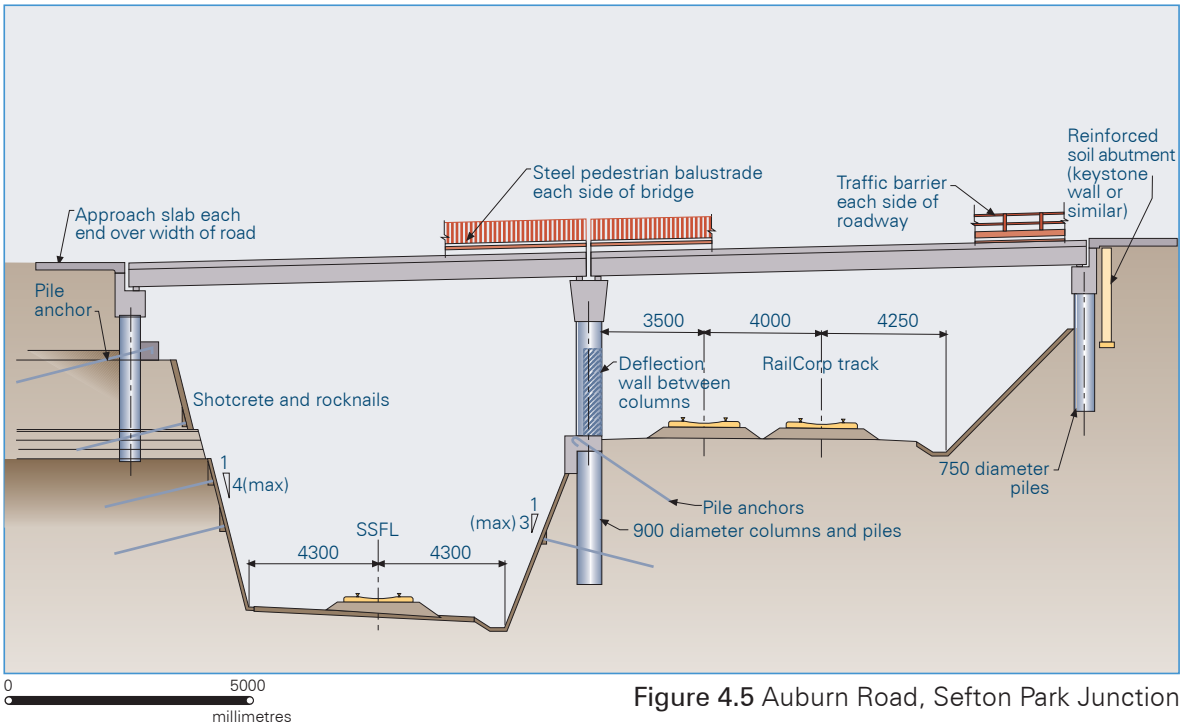


Figure 4.5 Auburn Road, Sefton Park Junction

4.3 Public crossings

Numerous public crossings of the rail corridor would be affected by the SSFL and require upgrading to ensure public connectivity across the corridor is maintained. No public crossings would be removed or closed as part of the operation of the SSFL. A summary of the proposed public crossing works is provided below and shown in Figure 4.1.

4.3.1 Pedestrian footbridges

Pedestrian footbridges that would require upgrading as part of the SSFL are outlined in Table 4.6.

Table 4.6 Proposed pedestrian footbridge upgrades

Location	Existing structure	Construction
Leumeah Railway Station	Concrete piers, steel spans with concrete deck	Extend bridge over the SSFL, together with new stairs and one new lift at the western end.
Minto Railway Station	All concrete construction	Remove existing stairs, ramp and ticket office at western end of the bridge. Extend bridge over the SSFL and replace with new stairs, two new lifts and a new ticket office over the SSFL track.
Casula Railway Station	Steel stair structure with concrete span and stairs Base of existing stair structure is concrete encased	Extend existing bridge over the SSFL Relocate stairs to Casula Road at the eastern end of the bridge. Possible future provision of new lifts.
Warwick Farm Railway Station	Not Applicable	New pedestrian footbridge to cross the SSFL, with two new sets of stairs and two new lifts. Provision exists for the possible future extension of the bridge over the RailCorp tracks and a new lift on the Up platform side by RailCorp.
Cabramatta Railway Station	Existing bridge has ramps and lifts to each platform	Extend existing bridge over the SSFL, replace existing ticket office with a new one over the SSFL and provide stairs and new lift to Broomfield Street.
Fourth Avenue, Canley Vale	Modern precast concrete bridge with a single span over the railway and two span stair structures at each end	Remove southern stairs and construct an additional span to extend bridge over the SSFL with new stairs provided.
Leightonfield Railway Station	Light steel trestle and continuous beam structure across the South Main and adjacent siding tracks	Construct a new span to replace the demolished section over the SSFL, provide a new pier on the north side of the SSFL and a deflection barrier around the existing pier on the south side of the SSFL.
Sefton Railway Station	Light steel trestle and beam structure with a single span across the railway	Construct additional span to cross the SSFL with relocated stair at the southern end of the bridge Possible future provision of new lifts.

Source: Connell Wagner, 2005

The existing pedestrian footbridge at Campbelltown Railway Station requires minor upgrading with impact protection barriers constructed around the pier at the western end of the bridge. The existing pedestrian footbridges at Macarthur, Ingleburn and Glenfield Railway Stations would not require upgrading as part of the SSFL.

4.3.2 Pedestrian underpasses

The only pedestrian underpass that would be affected by the SSFL is located at Carramar Railway Station. The SSFL would need to be slightly higher in vertical alignment than the neighbouring RailCorp tracks at this location to ensure an adequate head height for the pedestrian access into the underpass. This would also result in minor regrading of the southern approach ramp to the underpass.

4.3.3 Road bridges

There are four locations where major works would be required to existing road bridges as a result of the SSFL, as outlined in Table 4.7. Three of these would involve the creation of an additional bridge span, while one is likely to involve the construction of a whole new bridge.

Table 4.7 Proposed road bridge upgrades

Location	Existing structure	Likely construction technique
Bareena Street	Single concrete span with brick retaining abutments	Additional span required on southern end of existing bridge. Transform existing abutment into a pier, construct a new abutment structure contiguous with a retaining wall to the new cutting on each side of the bridge, and construct a new span over the SSFL.
Miller Road	Single concrete span with brick retaining abutments	Additional span required on southern end of existing bridge. Transform existing abutment into a pier, construct a new abutment structure contiguous with a retaining wall to the new cutting on each side of the bridge, and construct a new span over the SSFL.
Chester Hill Road	Single concrete span with brick retaining abutments	Additional span required on southern end of existing bridge. Transform existing abutment into a pier, construct a new abutment structure contiguous with a retaining wall to the new cutting on each side of the bridge, and construct a new span over the SSFL.
Auburn Road[1]	Single concrete span with brick retaining abutments	Demolish existing bridge and construct a new bridge structure in its place with two spans of concrete construction. Construction would require Auburn Road to be closed for a period of approximately 6 months with traffic diversions.

Source: Connell Wagner, 2005
Note 1: Assuming deep cutting rather than tunnel, see **Section 3.5.4**

Strengthening of existing road bridges is required at Cooper Road, Birrong to underpin the existing bridge abutment, and at Hume Highway, Warwick Farm; Newbridge Road, Liverpool and Cabramatta Road East, Cabramatta to provide impact protection barriers to bridge piers.

There are no road bridges located south of Glenfield that would require upgrading as part of the SSFL. The SSFL would be easily accommodated within the existing pier locations for these road bridges.

4.3.4 Rail bridges over roads and creeks

A number of rail bridges over roads and creeks would be required for the SSFL. Bridge works for the SSFL would include one of three types:

- Where the positions of the existing RailCorp bridge piers are matched for each span of the new bridge to provide a short span structure with a minimum structure depth, preserving the available height for headroom or hydraulic capacity under the bridge (see Figure 4.6).
- Where a new bridge design is determined by the underside level of the new bridge and cannot be lower than that of the existing RailCorp bridge, either to maintain road clearance or hydraulic capacity under the bridge (see Figure 4.7).
- Where a new bridge is constructed to avoid impact with a waterway, by adopting a long span over the waterway, with piers on the side spans matching the positions of existing piers at either every pier, or every second, or every third pier position (see Figure 4.8).

Proposed rail bridges over roads are outlined in Table 4.8.

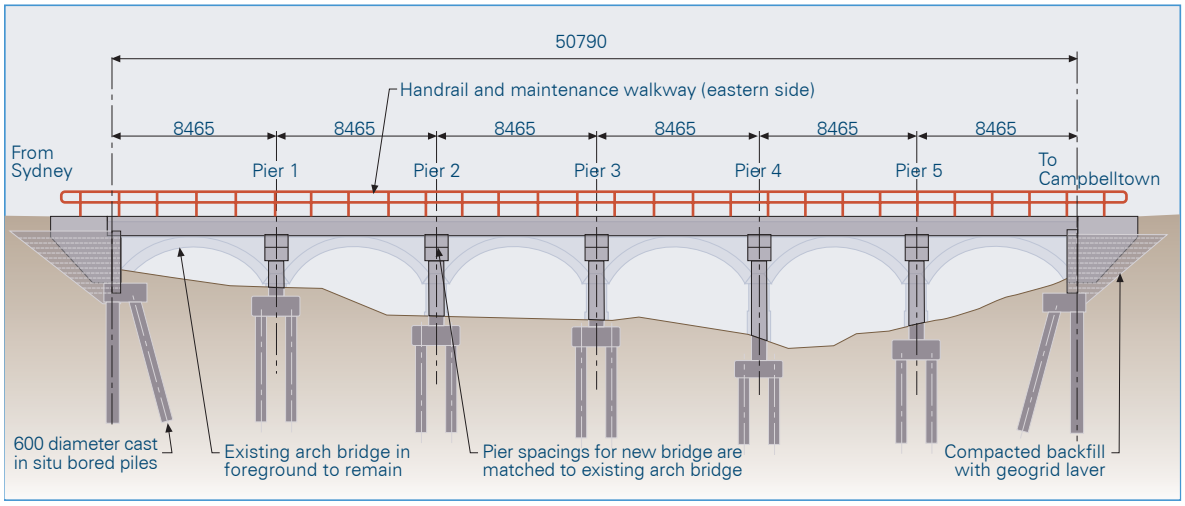


Figure 4.6 Woodbrook Road bridge

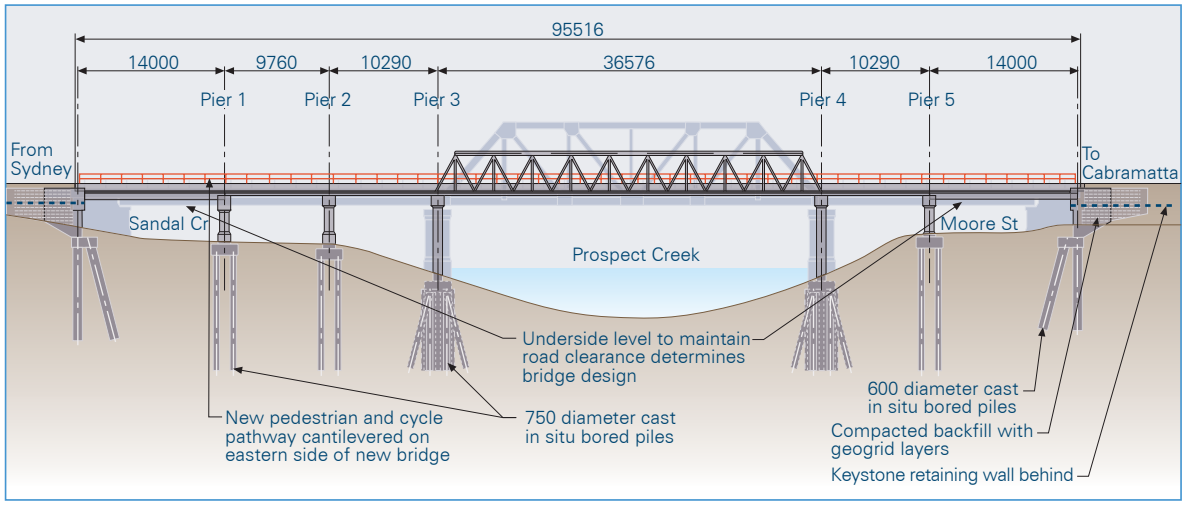


Figure 4.7 Prospect Creek bridge

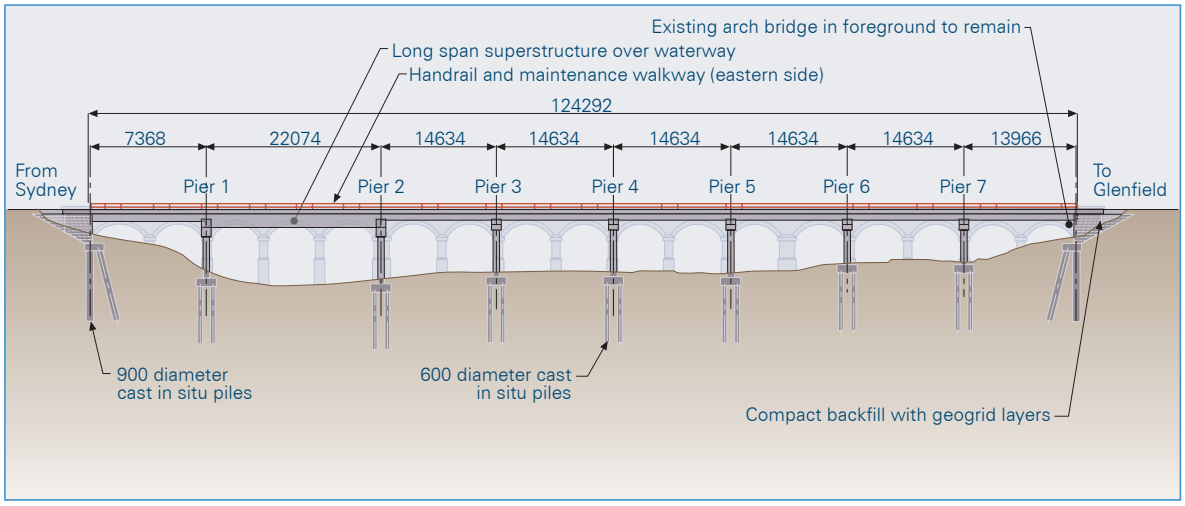


Figure 4.8 Cabramatta Creek bridge

Table 4.8 Proposed rail bridges over roads

Location	Existing structure	Construction
Woodbrook Road	Low height six span brick arch bridge with low headroom	Match existing structure with six span concrete viaduct (see Figure 4.6).
Shepherd Street	High set bridge with steel girder transom deck on concrete piers adjacent to high set 11 span brick arch bridge with corresponding pier locations	Match existing structure with concrete viaduct, matching pier positions at every pier position, or every second or third pier position. The clearance over Shepherd Street must not be less than the midspan clearance of the existing two adjacent bridges.
Broomfield Street (Sussex Street)	Low height six span brick arch bridge which is a low headroom minor road underpass	Match existing structure with six span concrete viaduct
Moore Street/Sandal Crescent (Prospect Creek)	Steel transom deck, three approach spans on south side (14 metre, 9.7 metres and 10.2 metre span), 36.576 metre main through truss span, two approach spans on the north side (10.29 metre and 14 metre span), with 1.4 metre wide footbridge cantilevered off east side	Construct new spans with ballast top construction using pretensioned concrete deck units for the side spans A welded steel pony truss would be used for the main span across Prospect Creek (see Figure 4.7) The existing bridge clearance over Moore Street and Sandal Crescent on each bank must be maintained Construct a new 1.8 metre wide pedestrian footbridge to the eastern side of the new rail bridge
Hector Street	Single span steel girder bridge with transom deck	Construct two span precast concrete bridge, with a 15 metre main span, 7.5 metre side span and a single 900 diameter column pier behind a barrier located along the western kerb of the road
Woods Road	Single span concrete deck units with ballast deck of similar design to Hector Street	Construct two span precast concrete bridge, with a 15 metre main span, 7.5 metre side span and a single 900 millimetre diameter column pier behind a barrier located along the western kerb of the road

Source: Connell Wagner, 2005

There are no rail bridges over roads located south of Glenfield that would be required as part of the SSFL.

There are multiple creek crossings to the SSFL route that require new rail bridges to be constructed. These are outlined in Table 4.9.

Table 4.9 Proposed rail bridges over creeks

Location	Existing structure	Construction
Bunbury Curran Creek	Low and high-set nine span brick arch bridge	An arrangement of spans (north to south) of 12, 25, 4 x 8.467 and 12 metres This arrangement would have low height piers for all the shorter spans
Glenfield Creek	High-set five span brick arch bridge	An arrangement of spans (north to south) of 8.65, 25 and 8.65 metres This arrangement would have low height piers throughout
Mill Park Road 1	Low height twin bridge drainage structure, with steel girder transom deck on concrete piers next to three span brick arch bridge	Match existing structure with three span concrete viaduct

Location	Existing structure	Construction
Mill Park Road 2	Low height three span brick arch bridge (drainage structure)	Match existing structure with three span concrete viaduct
Cabramatta Creek	High set 17 span brick arch bridge	An arrangement using pier positions on the approach spans that match alternate pier positions on the existing bridge, with spans (north to south) of 7.4, 22.1, 14.9, 2 x 14.2, 15.6, 14.2 and 14 metres (see Figure 4.8) The approach spans have a typical pier height of 6 metres, which favours longer spans than those on the existing bridge

Source: Connell Wagner, 2005

4.3.5 Level crossings

There are three level crossings located along the northern section of the proposed SSFL route.

An existing level crossing (for vehicles and pedestrians) at the southern end of Casula Railway Station provides access to the Casula Powerhouse Regional Arts Centre. The SSFL would create an additional track that must be crossed by vehicles using the crossing. The NSW Ministry of Transport is in discussions with Liverpool City Council regarding the proposed Casula Powerhouse Regional Arts Centre development and the provision of road access (on the east side of the railway corridor) from Liverpool to the arts centre. RailCorp has agreed that in the event of the closure of the Casula level crossing, the crossing will revert to a locked gate emergency crossing for use by emergency services during times of bushfire and floods.

Another level crossing at Elizabeth Street serves the Liverpool Hospital. This crossing is regularly used by pedestrians and vehicles accessing the hospital, including patients crossing between the hospital grounds. Liverpool Hospital level crossing boom gates will operate at increased intervals and dwell times with the introduction of the freight train operations on the SSFL track in December 2008. Liverpool Hospital management have been informed accordingly. RailCorp will coordinate with the Liverpool Hospital Stage 2 Upgrade planning authorities for the provision of an alternative means of access between east and west sides of the hospital grounds prior to the ultimate closure of the level crossing. Whilst this crossing remains open, it is critical to ensure the safe movement of vehicles and pedestrians in this relatively busy location.

Another level crossing exists at Sefton Park Junction, providing RailCorp staff with access to depots, an electrical substation and heavy equipment storage areas. No public access is provided at this location. The SSFL would create an additional track crossing on the southern side of the existing RailCorp tracks. RailCorp is reviewing long-term options for the site, including alternate access and closure of the crossing and the introduction of additional controls for the operation of the crossing.

4.4 Services and utilities

RailCorp signalling, power and communication cables are located in the rail corridor, both above-ground and underground. In some locations, existing RailCorp cables and utility services (including signal huts and electrical installations) are in the path of the SSFL. RailCorp's agreement would be required to either relocate or protect these services as appropriate (see Figure 4.9).

The above-ground signalling and power services would need to be relocated away from the alignment of the SSFL. Adjustments to the overhead wiring masts for the electrified tracks would be required in some locations, particularly near stations where the SSFL would come closer to the RailCorp tracks.

The relocation of the above-ground RailCorp powerlines and masts for the overhead wiring within the corridor would be undertaken using the following criteria where practicable:

- selecting a location and route within the railway corridor
- avoiding areas of native vegetation for the pole locations, over which the lines would be suspended and for the construction access
- avoiding placement on the side of the corridor where there are sensitive land uses, if possible, including child care centres and schools
- avoiding pole locations in riparian zones to watercourses
- avoiding pole locations that compromise visual amenity and sight lines from residences adjoining the railway corridor by placing the poles at common property boundaries (and not in front of windows).

There are also a number of non-RailCorp services and utilities running underground across the SSFL alignment. These primarily include power and Telstra cables, and high pressure gas lines (with the largest major gas main crossing the alignment just north of Glenfield). These services and utilities would be protected or relocated in consultation with RailCorp.

All services and utilities located within the corridor would be identified by detailed survey at the detailed design stage of the project and consultation would occur with the service and utility providers.

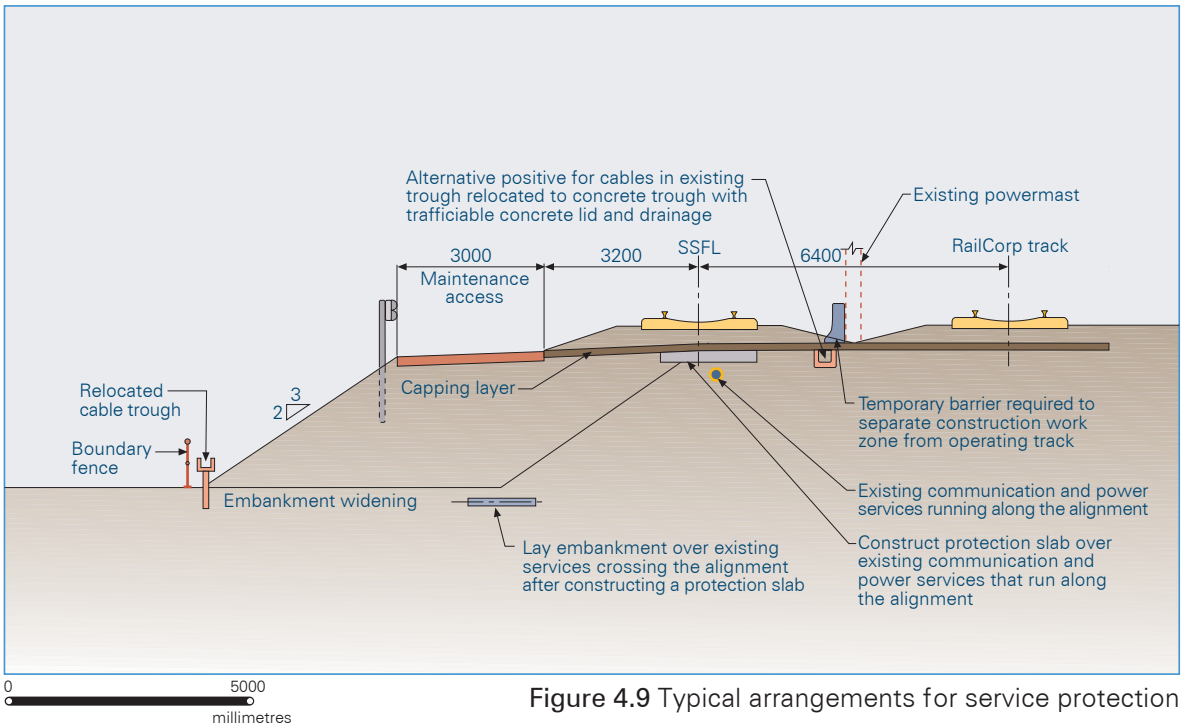


Figure 4.9 Typical arrangements for service protection

4.5 Urban and landscape design

4.5.1 Corridor

Urban and landscape design concept strategies for various localities along the proposed SSFL are detailed in Table 4.10 and Figure 4.10. Specific urban and landscape design concept strategies for Lighthorse Park are detailed in Section 4.5.2 and Figure 4.11.

Table 4.10 Locality concept strategies

Locality	Design objective	Concept strategy (numbers refer to Figure 4.10)
Locality A: Macarthur to Minto	Reinforce the local character as viewed along the rail corridor, which is urban at the railway stations and semi-rural in between stations.	A(i) South of Macarthur Railway Station – extend Indigenous vegetation plantings from Bow Bowing Creek, along the western side of the rail corridor to link vegetation communities. A(ii) Gilchrist Oval – extend Indigenous plantings along the creek line and rail corridor for visual screening. Liaise with Council regarding the possibility of landscaped earthmounds or informal terraces. A(iii) Campbelltown Railway Station – formal hard/soft landscaping along western side of precinct to enhance edges to car parking area. A(iv) Leumeah Railway Station – formal hard/soft landscaping along western side of precinct to create precinct character. Further north, provide an avenue of cultural plantings to enhance the boundary between the overflow car parking area and the rail corridor. A(v) McBarron Creek crossing – extend Indigenous plantings from Pembroke Park. A(vi) Minto Railway Station – formal hard/soft landscaping along western side of precinct to create precinct character.
Locality B: Minto to Glenfield	Reinforce the local rural character as viewed along the rail corridor and to reduce impacts on affected residential areas.	B(i) For dwellings fronting the western side of Somerset Street – liaise with residents to provide visual screening to the rail corridor and noise barriers (e.g. cultural planting). B(ii) Bow Bowing Creek crossing – extend Indigenous vegetation plantings along creek line to restore the vegetation community. Liaise with Council to extend planting along creek. B(iii) Bow Bowing Canal/Creek crossing – extend Indigenous vegetation plantings along the rail corridor to consolidate the vegetation community. B(iv) Dwellings on Stanley Road – provide partial screening vegetation (e.g. additional trees) to integrate with existing trees and noise barriers. B(v) Kennett Park – provide Indigenous vegetation plantings at the crossing to enhance creek character. B(vi) Hurlstone Agricultural High School – provide visual screening the rail corridor (e.g. an avenue of trees). B(vii) Glenfield Road, Glenfield Junction – extend Indigenous vegetation plantings along western side of rail corridor to reinforce local character.

Locality	Design objective	Concept strategy (numbers refer to Figure 4.10)
Locality C: Casula to Warwick Farm	Reinstate/restore the affected areas of natural bushland and river bank ecology along the rail corridor and to reduce impacts on affected residential areas.	C(i) Leacock Regional Park – restore areas disturbed by the Glenfield flyover construction works with Indigenous vegetation plantings. Restore the sandmining area adjacent to the northern approach of the flyover, with Indigenous vegetation. Liaise with Council regarding the landscaping strategy, including the possibility of earth mounding in the sandmining area as a locality marker. C(ii) Glenfield flyover, north of Glenfield Junction – extend Indigenous vegetation plantings along western side of rail corridor to consolidate the vegetation community and to mitigate the visual impact of the southern approach to proposed flyover. C(iii) Riverbanks of Georges River – restore areas disturbed by construction works, with riparian vegetation plantings. C(iv) Casula Regional Arts Centre – liaise with Council to provide appropriate visual screening (e.g. line of cultural plantings combined with noise barrier). C(v) Lighthorse Park - liaise with Council to provide appropriate formal hard and soft landscaping. C(vi) North of Liverpool Railway Station, where construction would affect the riverbank – consider aesthetics of new/ retaining structures, and/or restoration of riparian ecology including aquatic plants in shallows. C(vii) Liverpool Hospital – investigate extent of visual screening required (e.g. well detailed solid fencing panels in conjunction with raised plant beds). C(viii) Warwick Farm Railway Station – provide formal hard/soft landscaping as part of the precinct works.
Locality D: Cabramatta to Villawood	Reinforce the local character as viewed along the rail corridor and to reduce impacts on affected residential areas.	D(i) Cabramatta Creek crossing – extend Indigenous vegetation plantings along the rail corridor. D(ii) Cabramatta Railway Station – provide formal hard/soft landscaping along the eastern side of the precinct. D(iii) Broomfield Street/ Lansdowne Road – provide avenue planting and/or a series of feature plant beds along the rail corridor as a partial screen and to emphasise the local character (landform). Consider the area around the Bareena Street road bridge as a gateway. D(iv) Prospect Creek crossing – extend Indigenous vegetation plantings along creek. D(v) Wattle Avenue dwellings adjacent to the eastern side of the RailCorp corridor would have their backyards to the corridor – investigate extent of visual screening required (e.g. screen fencing and/or vegetation plantings) in combination with noise barriers in selected areas. D(vi) Villawood Railway Station to Woodville Road – provide rail corridor hard and soft landscaping to emphasise Woodville Road as a gateway. Coordinate with Council.

Locality	Design objective	Concept strategy (numbers refer to Figure 4.10)
Locality E: Leightonfield to Sefton	Reinforce the local character as viewed along the rail corridor and to reduce impacts on affected residential areas.	E(i) Wellington Road west, dwellings adjacent to the eastern side of the RailCorp corridor would have their backyards to the corridor – investigate extent of visual screening required (e.g. screen fencing and/or vegetation plantings). E(ii) Auburn Road – design the new road overbridge as a gateway marker. Construction works for the underpass may affect the Wellington Road footpath and road alignments, consequently design the new footpaths and road alignments to enhance the local context (e.g. incorporate low key landscaping, which enhances the roadway without being a visual distraction for drivers).

Source: Based on **Volume 2, Technical Paper 5**

The proposed approach for landscape treatments is detailed in **Section 6.3.4** of **Volume 2**, **Technical Paper 5**. The treatments prescribe a broad-scale approach and require more detailed landscape planning and design, including consultation with local councils. Treatments would generally be restricted to the rail corridor and adjacent reserve areas including cut slopes and fill embankments. In a number of areas, however, it would be appropriate to extend treatments to link Indigenous vegetation communities and open space corridors.

Three basic landscape treatments are proposed to mitigate the visual impacts of the proposed SSFL. These include:

- Woodland/forest (Cumberland Plain Woodland)
- Rural woodland (Cumberland Plain Woodland)
- Riparian forest (Sydney Coastal River Flat Forest)
- cultural planting.

Figure 4.10a Proposed urban and landscape design and noise barriers

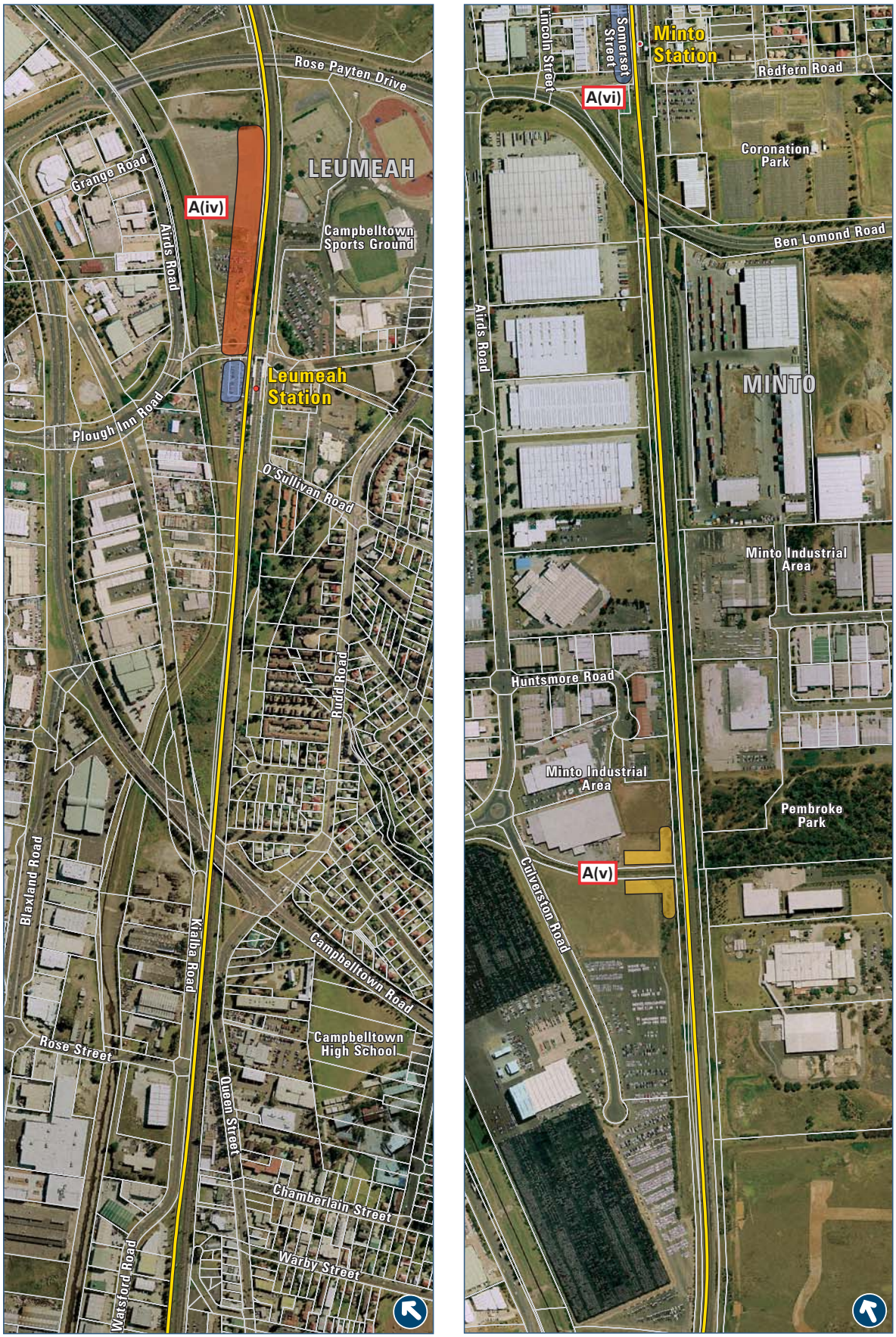


Figure 4.10b Proposed urban and landscape design and noise barriers

Figure 4.10c Proposed urban and landscape design and noise barriers

Proposed track
A(i) Locality concept strategy
Indigenous vegetation and planting
Formal hard and soft landscaping
Visual screening
Vegetation visual screen
Noise barrier
4.0m Noise barrier height

Figure 4.10d Proposed urban and landscape design and noise barriers

Proposed track
A(i) Locality concept strategy
Indigenous vegetation and planting
Formal hard and soft landscaping
Visual screening
Vegetation visual screen

Figure 4.10e Proposed urban and landscape design and noise barriers

Proposed track
A(i) Locality concept strategy
Indigenous vegetation and planting
Formal hard and soft landscaping
Visual screening
Vegetation visual screen
Noise barrier
4.0m Noise barrier height

0 500
1:10000 metres

Figure 4.10f Proposed urban and landscape design and noise barriers

Proposed track
A(i) Locality concept strategy
Indigenous vegetation and planting
Formal hard and soft landscaping
Visual screening
Vegetation visual screen
Noise barrier
4.0m Noise barrier height

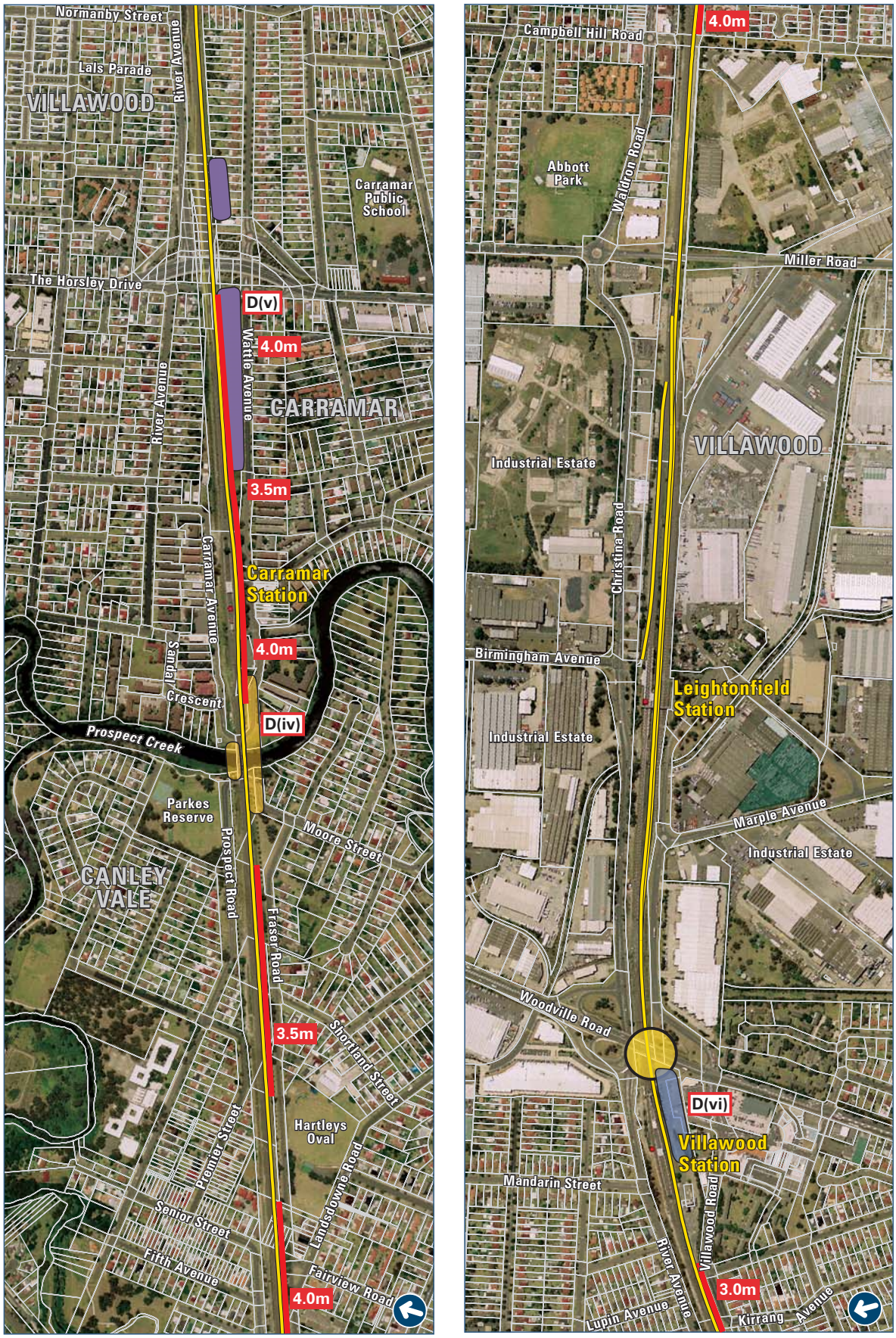


Figure 4.10g Proposed urban and landscape design and noise barriers

Proposed track
A(i) Locality concept strategy
Indigenous vegetation and planting
Formal hard and soft landscaping
Visual screening
Vegetation visual screen
Noise barrier
4.0m Noise barrier height

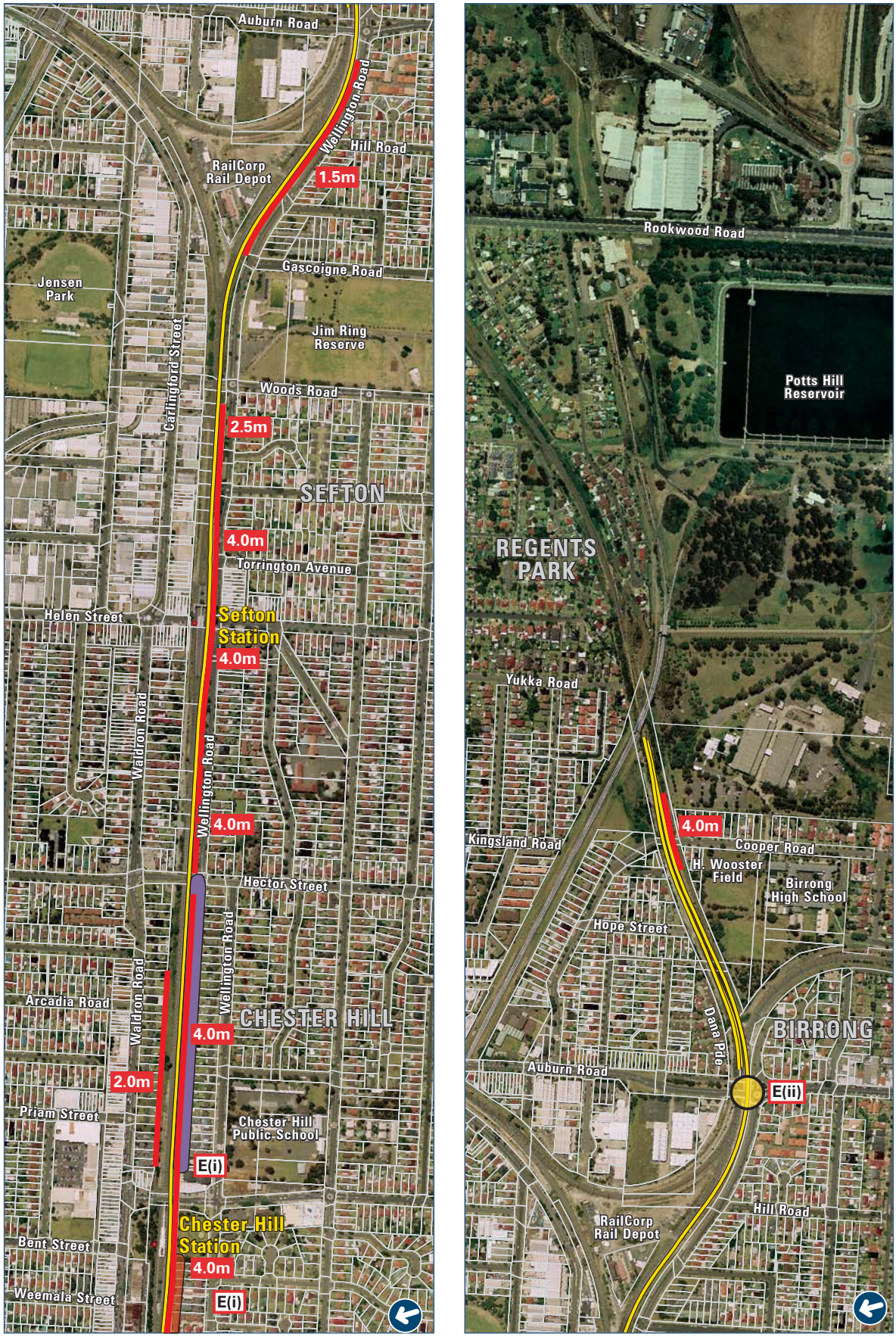


Figure 4.10h Proposed urban and landscape design and noise barriers

- Proposed track
- A(i) Locality concept strategy
- Indigenous vegetation and planting
- Formal hard and soft landscaping
- Visual screening
- Vegetation visual screen
- Noise barrier
- 4.0m Noise barrier height

4.5.2 Lighthorse Park, Liverpool

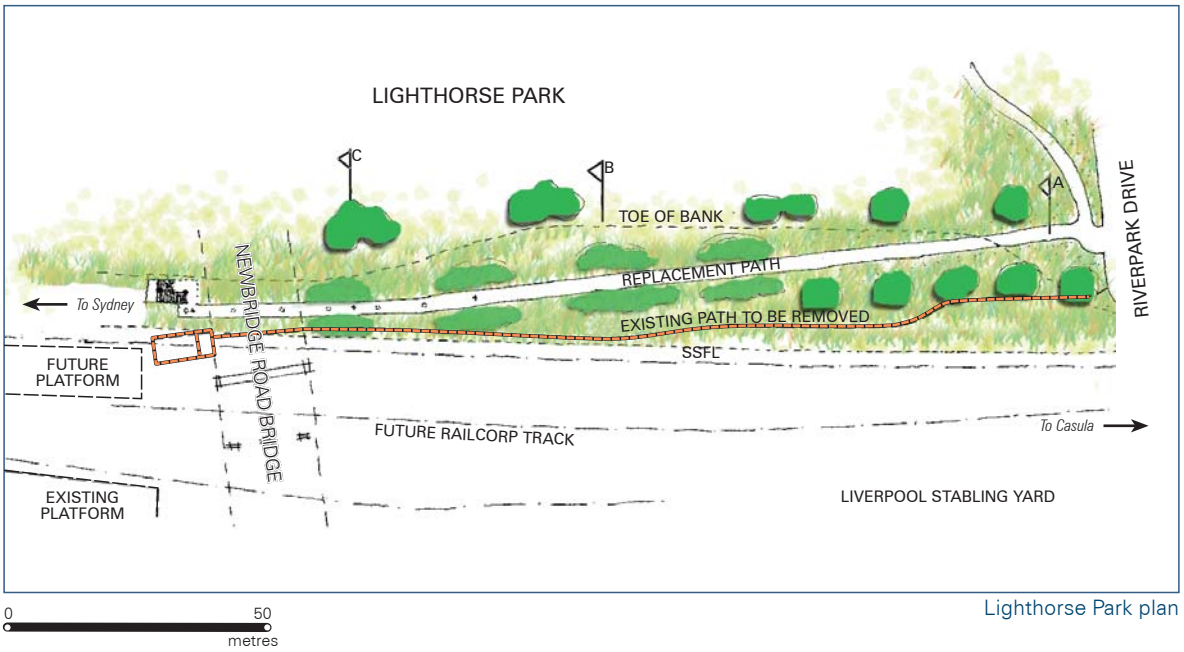
Lighthorse Park is located between the rail corridor and Georges River at the northern end of Riverpark Drive, Liverpool. Liverpool Railway Station is located to the north-west of the park. Newbridge Road bridges over the rail corridor, Lighthorse Park and the Georges River.

As part of the Rail Clearways Program, the NSW Government proposes the future upgrading of the existing Liverpool Stabling Yard. A new platform is also proposed at Liverpool Railway Station. The existing rail corridor embankment would need to be widened to accommodate the SSFL. However, the rail corridor at Lighthorse Park is not quite wide enough to accommodate both the proposed upgrading of the stabling yard and the SSFL. Therefore, to provide for the future upgrading of the stabling yard, the SSFL would require the acquisition of a strip of Lighthorse Park (less than 25 metres at the widest point) between Riverpark Drive and Liverpool Railway Station (see Table 4.11). The proposed SSFL alignment would pass under Newbridge Road where the existing pedestrian pathway, ramp and stairs are located (see Figure 4.11). The pathway provides a connection between the residential areas south of Lighthorse Park and Liverpool town centre and Liverpool Railway Station. The pathway is on an embankment on the southern side of the Newbridge Road bridge. Underneath the bridge, the pathway is on an elevated ramp that leads to stairs up to the Newbridge Road footpath.

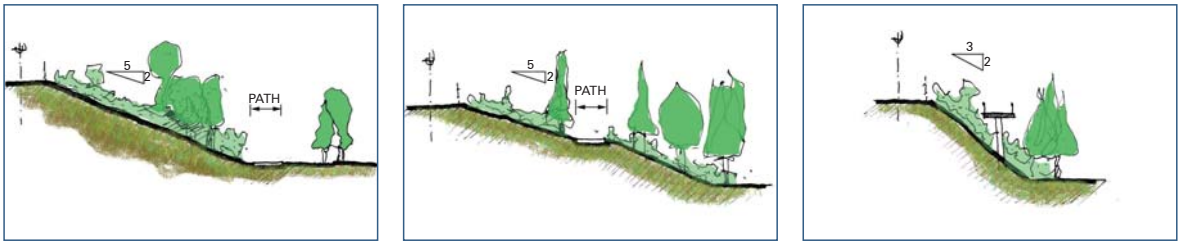
The pathway, ramp and stairs would be relocated further to the east beyond the strip of Lighthorse Park that is proposed for acquisition (see Figure 4.11).

Various design alternatives were considered for the relocation of the pathway, ramp and stairs including construction of batters at various gradients and a tiered embankment. A wide earth batter is preferred because it enables the construction of a gentle sloping pathway (gradient 1:24) without handrails or landings and was therefore more accessible than the other steeper design alternatives. The absence of a handrail also provides optimal access to the park and also visual integration with the park. The wide batter also enables landscaping with large trees and low shrubs and groundcovers so as to provide both shade and natural surveillance. This is an optimal landscaping outcome in terms of Crime Prevention Through Environmental Design Principles.

The design of the relocated pathway would be consistent with a proposal by Liverpool City Council for the construction of a cycleway along the western edge of the Main South Line rail corridor between Casula and Liverpool Railway Station. The design would enable the future construction of this cycleway (see Figure 4.11). The design is also considered compatible with Liverpool City Council's (2002) Plan of Management for the future upgrade of Lighthorse Park because it would provide improved physical and visual integration with the park.



Lighthorse Park plan



Section A

Section B

Section C

Figure 4.11 Proposed works at Lighthorse Park

4.6 Noise attenuation

Noise attenuation would be provided along the proposed SSFL route where this is considered to comprise 'reasonable and feasible' noise mitigation in accordance with the approach described in **Section 11.2.2**. Approximately 7.5 kilometres of noise barriers are proposed of heights ranging from 1.5 metres up to 4 metres, with most barriers between 3 and 4 metres in height. The proposed approximate location and height of permanent noise barriers along the proposed SSFL is shown in Figure 4.10.

Detailed calculations of barrier length and height would form part of the detailed design for the project. Some refinement would be expected during this detailed design phase and following further consultation with the affected communities.

A limit of 4 metres to the barrier heights was adopted, due to the adverse amenity and visual impacts, and construction difficulties and costs associated with taller structures. All barriers would need to be absorptive on the inside face to prevent an increase in noise on the opposite side of the corridor due to reflections.

Barriers would be located approximately 5 metres from the nearest track where the track is at grade, or on the top of a cutting where the track is in cut. Heights shown on Figure 4.10 are above rail level where the track is at grade or on fill, and above-ground level where it is in cut.

Noise barriers along the corridor would be designed with materials and finishes to minimise graffiti. Where the corridor width and formation allows, landscaping would also be used in front of the barriers to minimise the opportunity for graffiti. The exact type and/or combination of barrier and treatments would be determined at the detailed design stage in consultation with the directly affected residences.

4.7 Property acquisition

Public and private property acquisition is required along the railway corridor at selected locations. These locations are outlined in Table 4.11.

Table 4.11 Property acquisition

Locality	Location	Requirement
South of Campbelltown Railway Station		
Public land – Campbelltown City Council	South of Narellan Road bridge	Accommodate the SSFL formation, avoid piers to the Narellan Road bridge and provide a suitable track alignment to minimise impacts to Bow Bowing Creek. A portion of land (less than 10 metres in width) would be required to the north eastern corner of Gilchrist Park.
Public land – Narellan Road (former road)	North of Narellan Road bridge	Avoid RailCorp's future works to upgrade the stabling yard south of the Station. A rectangular portion of land (less than 20 metres by 15 metres) would be required for acquisition.
Public land – Bow Bowing Creek	North of Narellan Road bridge	Avoid RailCorp's future works to upgrade the stabling yard south of the station. A strip of land (less than 5 metres in width) would be required along a short stretch of Bow Bowing Creek.
Public land – Campbelltown City Council	Between Bow Bowing Creek and Farrow Road	Avoid RailCorp's future works to upgrade the stabling yard south of the station. A strip of land (less than 30 metres at its widest point and extending approximately 450 metres) would be required for acquisition.
Public land – Farrow Road	South of Campbelltown Railway Station	Avoid RailCorp's future works to upgrade the stabling yard south of the Station. A strip of land approximately 20 metres in width along Farrow Road, with the alignment of Farrow Road altered to the west.
Private land – No. 8 and 10 Farrow Road	South of Campbelltown Railway Station on Farrow Road	Avoid RailCorp's future works to upgrade the stabling yard south of the station. A strip of land would be required from the two industrial properties fronting Farrow Road with the width determined by the realignment of Farrow Road to the west through the front setback of the properties.
North of Campbelltown Railway Station		
Public land – Badgally Road	North of Campbelltown Railway Station	Avoid RailCorp's future works to upgrade the stabling yard north of the station. A strip of land less than 8 metres in width would be required along eastern boundary, currently used for commuter car parking
Private land – RailCorp easement to rear of No. 2, 4, 6, 8, 10, 12 and 14 Watsford Road	North of Campbelltown Railway Station on Watsford Road	Avoid RailCorp's future works to extend the tracks for the Station platforms to the north of the station. A strip of land less than 8 metres in width would be required along the rear of each identified property relating to the current RailCorp easement for the 33 kilovolt power line.
Public land – Campbelltown Road	Campbelltown Road bridge	Accommodate the SSFL formation and avoid piers to Campbelltown Road bridge. A portion of land would be required underneath the bridge.
Between Glenfield and Casula Railway Stations		
Public – disused road reserve	North of Cambridge Avenue bridge	Accommodate the passing loop for the SSFL operations. A small portion of land, less than 8 metres in width, would be required.

Locality	Location	Requirement
Public land – Liverpool City Council and State of New South Wales (Leacock Regional Park)	South of Glenfield flyover	Accommodate the southern approach ramp for the Glenfield flyover structure. Approximately 1.3 hectares of land would be required along the south eastern boundary of park, approximately 50 metres in width at the widest point.
Private land – Glenfield Waste Facility	North of Glenfield flyover	Accommodate the northern approach ramp for the Glenfield flyover structure. Land would be required along the western boundary of the landfill facility, approximately 50 metres in width at the widest point.
Public land – Commonwealth of Australia (Department of Defence)	North of Glenfield flyover to south of Casula Railway Station	Accommodate the northern approach ramp for the Glenfield flyover structure, the northern end of the passing loop and a widened embankment for the SSFL formation. A strip of land, approximately 8 metres in width at the widest point to the south of the parcel, would be required along western boundary.
Between Casula and Liverpool Railway Stations		
Public land – Liverpool City Council (former golf course and Mill Park)	North of Casula Railway Station	Accommodate the widened embankment for the SSFL formation. A strip of land less than 10 metres in width at the widest point (with an average of less than 8 metres) would be required along the majority of the western boundary of the riverfront park area and Mill Park.
Public land – Liverpool City Council, Roads and Traffic Authority, and Crown land (Lighthorse Park)	Lighthorse Park, between Riverpark Drive and Liverpool Railway Station	Accommodate the SSFL and avoid RailCorp's future works to upgrade the stabling yard south of Liverpool Railway Station and construct a new platform at the Station. A strip of land (less than 25 metres at its widest point and extending approximately 420 metres) would be required along the western boundary of the park as far south as Riverpark Drive.
Liverpool Hospital		
Public land – South West Area Health Service	Liverpool Hospital, on the eastern side of the Main South Line rail corridor and to the north of the Elizabeth Street level crossing	Accommodate the SSFL and avoid RailCorp's future works to construct a new platform at Liverpool Railway Station and associated new railway track. A strip of land (approximately 3.5 metres at its widest point and extending approximately 200 metres) would be required along the hospital's boundary with the eastern side of the rail corridor.
Leightonfield Railway Station		
Public land – Llewellyn Avenue	Leightonfield Railway Station, near the Marple Avenue intersection	Accommodate the western connection into the Leightonfield yard. A strip of land less than 8 metres in width would be required along the road reserve.
Auburn Road Bridge		
Public land – Wellington Road	Auburn Road, Birrong	Accommodate the Sefton Park Junction underpass and realignment of the Auburn Road bridge. A strip of land less than 4 metres in width would be required along the Wellington Road reserve.

Source: Connell Wagner, 2005

A linear parcel of land located to the north of the Hume Highway overpass (where the SSFL commences) is owned by the Department of Planning. The parcel has an easement for railway purposes along the boundary with the RailCorp corridor. The land is not expected to be acquired, but used for the proposed SSFL in accordance with the easement.

The portions of land outlined above have been identified on the basis of the concept design for the SSFL. Land acquisition proposals may be subject to change during the detailed design process. The exact property impact to each allotment would be determined following detailed design and property survey.

The preferred method of acquiring the required property over privately held land is for ARTC to negotiate purchase directly with the existing owner. Failing successful purchase negotiations, compulsory acquisition of the land would be undertaken by RailCorp on behalf of ARTC. Acquisition of property within public roads and reserves would be undertaken by compulsory acquisition. The compulsory acquisition process would be in accordance with the *Land Acquisition (Just Terms Compensation) Act 1991*. The main statutory steps in the compulsory acquisition process are as follows:

- Formal notice under Section 12 (the proposed acquisition notice or PAN) is provided to all owners of the land, persons with a registered interest, caveators and lawful occupiers of the land and any person who has, to RailCorp's actual knowledge, an interest in the land. This notice must be served between 90 to 120 days before the date that the acquisition is notified in the Government Gazette unless circumstances as described in Section 13 justify a shorter period.
- The acquisition occurs under Section 19 when notification is published in the Government Gazette, declaring that the land is acquired by compulsory process. The Governor must approve this notice.
- Under Section 20 once the notification is published in the Government Gazette the acquired land vests in the acquiring authority (which in this case is RailCorp, acting on behalf of ARTC), free of all estates, interests, rusts, restrictions, dedications, reservations, easements, rights charges, rates and contracts.
- A person whose interest has been acquired may have a right to compensation under the Act. Sections 54 to 61 contain the provisions for the payment of compensation to affected landowners. Compensation includes the market value of the interest acquired as well as any special value of the land to the interest holder, any loss attributable to severance, and loss attributed to disturbance, solatium and any increase or decrease of the value of the balance of the land as a result of the pubic purpose for which the land was acquired.

The acquisition of the land within Leacock Regional Park would require an additional process involving an Act of Parliament to de-gazette the land from the National Park estate.