

Design Guidelines for the Upgrade and Construction of New and Existing Train Stabling Yards and Turnback Sidings



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Guideline Sponsor (GGM Service Delivery)	Name: Rob Mason	Signature:	
GM Station Operations	Name: Anthony Eid	Signature:	
GM Train Presentation Services	Name: Brett Inchley	Signature:	
GM Train Crewing	Name: Ian Hill	Signature:	
GM Operations	Name: Kevin Wright	Signature:	
GGM Asset Mngment	Name: Gary Seabury	Signature:	

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1 Introduction

1.1 Background

This document replaces the RailCorp's 'Design Guidelines for the Upgrade and Construction of New and Existing Train Stabling Yards and Turnback Sidings (Draft Version 0.3 September 2005).

Over the coming years RailCorp seeks to carry out substantial renewal and expansion of its assets to provide a safe travelling environment for its customers and a safe working environment for its Staff and contractors. This document seeks to provide guidance to those involved in “Major” works at new **and existing** locations which are being upgraded to meet current standards and best practice configurations.

This document may be used to provide guidance by those involved in “Minor” works or repairs at an existing location but it is not a requirement to bring existing locations up to the requirements of this document during these works.

The guidelines set out in this document are not retrospective in their application. These guidelines are to be applied for future development of stabling yards and sidings including major upgrades and modifications.

As a requirement Safe Working Method Statements (SWMS) should be in place to ensure the safety of all staff working in stabling yards and sidings. SMWS should be reviewed and revised where necessary for existing yards that are upgraded or modified.

During the design and development stages of a project all stakeholders must be consulted to confirm their requirements. The [Check Sheets](#) provided in this document must also be completed in consultation with the RailCorp Project Development and Rail Development Units.

When a user requirement or standard can not be satisfied then the procedure for obtaining a waiver for a non compliance must be adhered to. Standards dictated by legislation must be fully implemented.

1.2 Purpose

These guidelines set out in this document seek to ensure that the user requirements of all stakeholders are addressed in the design and construction of train stabling yards and sidings.

The guidelines will ensure that all works to construct new or upgrade stabling yards and sidings will meet RailCorp objectives for safety, reliability, capacity, availability and maintainability.

This is a functional Guideline; it is not a Standard in itself. Reference is made to the relevant standards and legislation where appropriate.



Upgraded Sidings 2 & 3 in
Blacktown Stabling Yard

The guidelines within this document outline the requirements for the design and construction of train stabling facilities within the RailCorp Network and are intended to be used for:

- all stabling facilities other than maintenance facilities, including turnback sidings and shunting necks.
- planning the layout and requirements for new facilities and applied where reasonably practicable when modernising existing yards.

It is acknowledged that variations in rolling stock design, operating patterns and site constraints do not permit a totally standard approach to the design of associated stabling facilities. These guidelines should therefore be sensibly applied maintaining as far as reasonably practicable the standards and principles mentioned.

When a user requirement or standard can not be satisfied then the procedure for obtaining a waiver for a non compliance must be adhered to. Standards dictated by legislation must be fully implemented.

Waiver Procedure reference Civil Track Standard [C 2106](#) Transit Space - Clause 3.3 "Infringement Notification and Records".

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1.3 Stakeholders

The following RailCorp stakeholders have been consulted in the development of this document:

- Train Crewing (Train Services Group)
- Train Operations (Train Services Group)
- Station Operations (Train Services Group)
- Train Presentation Services (Customer Services Group)
- Security Services (Customer Services Group)
- Safety & Environment (Corporate)
- Rolling Stock Group (Infrastructure)
- Track Design (Infrastructure)
- Electrification Design (Infrastructure)
- Signalling Design (Infrastructure)
- Buildings and Sidings (Infrastructure Maintenance)

It is recognised that as standards and requirements become updated there may be a need to revisit and revise the guidelines. Modification to the guidelines will be undertaken in a manner that will ensure relevant stakeholders are consulted and changes are agreed in accordance with the procedure outlined in this document and the RailCorp [Configuration Management Plan](#).

Due to the large number of stakeholders associated with stabling yards and sidings the guidelines within this document should be reviewed and updated every two years to maintain integrity. GGM RailCorp is the nominated sponsor for this document and stakeholder consultation is required in the review process. Refer to Section 10.

1.4 Definitions

Train Stabling Yards – A stabling Yard is defined as a siding or group of sidings that are used for the storage, inspection and cleaning of the RailCorp fleet. This includes turnback sidings and excludes train maintenance facilities.

Track Centres – the distance between tracks from track centreline to track centreline at rail level.

Trainstops – A trainstop is a signalling mechanical device installed on the outside of the rail that will trip a train's trip cock if it passes a red signal or enters an unauthorised area. The trainstop will apply the train's emergency brakes in order to prevent a potential collision with another train.

Timed trainstops – A timed trainstop is a trainstop designed to check the speed of a train. The track circuit will identify the train. If the train is exceeding the speed limit it will reach the trainstop before the trainstop arm has time to suppress, tripping the train's trip cock and applying the brakes.

Fixed trainstops – A fabricated steel frame acting as a trainstop in the up position.

Illuminance – The luminous flux density at a surface. The SI unit of illuminance is the lux, which is equal to one lumen per square metre (lm/m²).

Fan – The shunting neck area of a yard where the sidings fan out from the arrival/departure roads.

Bunding – used in terms of storage facilities. A bund is an impervious embankment of earth or a brick wall which may form part or all of the perimeter of a compound that is provided to retain liquid.

Blocks – an operational term used to describe 4-car sets. An 8-car train generally consists of two blocks.

Block Reversal – the operation of swapping around blocks in a stabling yard. Reversing the blocks is often done when a car in an 8-car set is defective.

Division/Amalgamation – the procedure of breaking/joining train sets.

OHW – abbreviation for traction overhead wiring.

Points – term for the switch points at catch point, turnout or crossover locations.

2 Occupational Health & Safety

The [RailCorp Safety Management System \(SMS\)](#) must be adhered to in the design and construction of stabling yards. It includes the following documents:

- Safety Policies
- System Safety Framework
- System safety Standards
- System Safety Manual (SSM)
- Group Safety Manuals
- Procedures and work instructions including Safe Working Method Statements

Particular attention is to be given to complying with the requirements for the following legislation, Codes and Australian Standards: www.legislation.nsw.gov.au

- Occupational Health & Safety Act 2000
- Rail Safety Act 2002
- WorkCover of NSW Codes of Practices
- Local Council Requirements

AS4292 Railway Safety Management:

- AS4292.1 General and Interstate Requirements
- AS4292.2 Track, Civil and Electrical Infrastructure
- AS4292.3 Rolling Stock
- AS4292.4 Signalling and Telecommunications Systems and Equipment
- AS4292.5 Operational Systems
- AS4292.6 Railway Interface with Other Infrastructure

2.1 Risk Management

Risk management is an inherent and cognisant element of design. All stakeholders shall be consulted throughout the design and assessment stages which are to be conducted in accordance with AS/NZS 4360:2004; the RailCorp Safety Management System and [RailCorp Safety Risk Management Framework](#) and [RailCorp Business Risk Management Framework](#).

2.2 Safeworking

The existing [RailCorp Network Rules and Network Procedures](#) shall apply for personnel working within a Stabling Facility within the rail corridor and for the construction of new yards and upgrades to existing yards.

Stabling yards and sidings are considered to be work zones that have different working requirements and procedures to the main line operating environment. The design of the rail infrastructure in a yard or siding is to consider access requirements for rail safety workers with the aim of minimising the risk to workers whilst supporting the operational requirements of the rail network.

The designers, constructors and maintainers should consider access to equipment for inspection, maintenance and condition monitoring to provide early warning of failure.

2.3 Signage

General operational and safety signage will be identified and fitted where required **throughout** the site for all personnel using the site, not just at entry points. The following references should be referred to when selecting and developing appropriate signage for the site:



- [RailCorp Engineering Standards:](#)
- [RailCorp Network Rules NSG604](#)
- [Australian Standards i.e. AS1319; AS1742 and AS2293](#)

Signage should be provided for but not limited to the following:

- Track i.e. clearance points; narrow track centres etc.
- Signalling i.e. catchpoints, points, trainstops, telephones etc.
- Electrification i.e. high voltage, switches, clearances, structure labels, underground cables etc.
- OH&S i.e. walkway safe areas, Shower & Eye wash points, decanting facilities, evacuation points & other danger zones
- Security i.e. public warning signs, security patrols, CCTV signage etc

2.4 Fire and Emergency Management

All stabling yards are to have the appropriate fire fighting equipment and a fully documented emergency evacuation plan in accordance with relevant RailCorp and Australian standards to protect workers and infrastructure in the event of a fire.

2.5 Conformity with Acts, Regulations, Ordinances and Standards

Except where the User requirements require a higher standard, all work will be undertaken in accordance with the provisions of all relevant Acts, regulations, codes, rules, including, but not limited to, the standards listed below in the following general order of precedence:

1. [RailCorp Standards](#) & [RailCorp Engineering Design Procedures \(EDCP01\)](#)
2. RTA Publications
3. AUSTROADS
4. Australian Standards
5. Standards Australia handbooks and
6. Other Standards
7. RailCorp Operating Manuals e.g. Train Operating Conditions Manual (TOC)

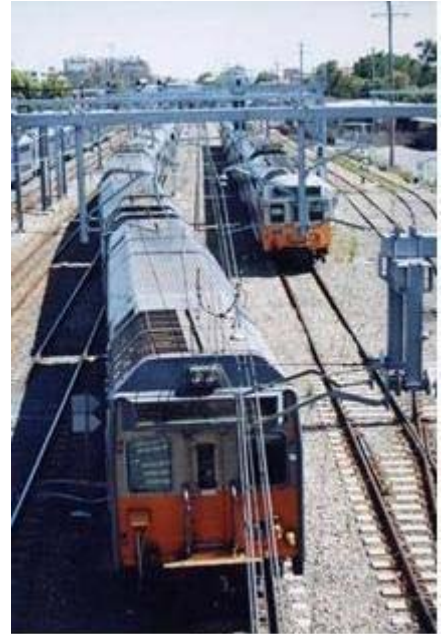
Particular attention is to be given to complying with the requirements for:

- Fire and Life Safety - a performance based approach is required to satisfy RailCorp standards and guidelines. NFPA130 and the Building Code of Australia (BCA) shall be followed.

[\[RailCorp standard TS34100301SP Tunnel Fire Safety for new Passenger Railway Tunnels\]](#)

3 Operational Requirements

The essential operational requirement of a train stabling facility is to provide for the efficient and reliable stabling and deployment of trains to meet the operational and presentation requirements of RailCorp. Stabling yards and sidings must be flexible and adaptable in terms of the working that can be adopted to cater for unplanned or emergency working situations.



Whilst acknowledging the legislative requirements of addressing environmental issues, it is imperative that all new yards should be available for operational use 24 hours a day without any restrictive curfews.

Ideally the stabling yard will be double ended with the arrival and departure roads having adequate length for a train to be signalled to a point clear of the main running lines. The layout should be designed to allow free movement of trains within the yard without affecting main lines and conflicting with yard shunting.

Signal design for all new yards should be flexible enough to allow signalled shunting routes catering for 'block' reversals of multiple unit trains. Wherever practicable these shunting movements should be able to be conducted without the need to occupy the running lines.

Sidings are to be of a sufficient length to stable the maximum length of rolling stock that the route will be servicing. For example, yards on intercity lines must cater for intercity V Sets. There is to be enough capacity to stable multiples of 8-car sets. Refer to Section 4 and Figure 3.

Typical maximum lengths of RailCorp rolling stock currently in operation are:

- 192m for an 8-car Double Deck Intercity train
- 163m for an 8-car Double Deck Suburban train

Refer to the [RailCorp Train Operating Conditions \(TOC\) Manual Section 10](#) for Locomotive & Rolling Stock data.

The track standard should be capable of accommodating loaded freight wagons and locomotives. In emergency situations when it is required to detach a wagon or locomotive the preferred location for such a "mark-off" would be in a stabling yard clear of the running lines. This operational requirement is also associated with the need to provide ready road access to effect repairs to such rolling stock.

The crew amenity building is to be located as close as practicable to the stabling sidings to minimise the amount of time required for crew to reach a 'stand by' train ready to depart. Whilst the location of the crew amenity building is important from an access point of view it also has operational implications.

All stabling yard facilities are to have CCTV coverage throughout for both train operations and security.

Consideration needs to be given to the reliability of infrastructure employed in stabling yards. The yard layout shall also be designed to achieve the availability target and minimise the impact of a failure in the yard.

For operational flexibility alternative routes both in and out of the yard should be provided so that a single point or failure does not isolate the entire yard.

Point mechanisms should be consistent with other mechanisms within the general area. If points require manual operation it is important that station staff and crews are able to operate them.

When modifying existing stabling yards designers and developers should consider the Working Timetable early in the project development phase as it is designed to provide cyclic rosters for each train set. The Stabling Plan is a document related to the Working Timetable that details which train stables in what siding at each location and what run that train is to form on the following day. Failure to adhere to this Stabling Plan can result in a train getting out of its cyclic roster and not visiting its parent Maintenance Centre at the required periodicity.

4 Functionality & Configuration

The essential functional requirement of train stabling yards and sidings is to be a safe and efficient work place. Stabling yards are considered to be work zones with safe working requirements and procedures relevant to the risks and functions undertaken in the yard.

All stabling yards and sidings must provide for the following functions:

- Internal train cleaning performed by train presentation staff (includes minor graffiti removal)
- Bottom preparation inspections of trains performed by train crew
- Division/Amalgamation of trains performed by train crew
- Minor Maintenance performed by mobile maintenance teams

Other functions that may be carried out in a yard are:

- Decanting of sewage tanks
- External washing

Stabling facilities should be designed and configured to meet the stabling requirements of RailCorp as outlined in this document including minimum safe working standards.

Each site will have its own constraints and specific requirements which will need to be addressed by designers and developers when configuring a yard.

When designing the layout of a yard it is a RailCorp requirement to have all tracks co-planar (at the same level) or groups of tracks co-planar. Section 6.1 provided more information on track geometry.

Refer to Figure 1 for a typical layout plan indicating some of the requirements for stabling yards.

[Figure 1: Typical Stabling Yard Layout Plan \(Attachment 1\)](#)

Where the arrival and departure roads connect with the main lines parallel working is desired for operational reasons. For instance, a cross over between the main lines should be located between the arrival and departure roads so an exiting train will not hold up a train entering the yard.

Refer to Figure 2 for a typical cross section through a stabling yard.

[Figure 2: Typical Stabling Yard Cross Section \(Attachment 2\)](#)

Siding length will vary for Suburban and Intercity trains. The diagram below shows the typical length that should be allowed for from the departure signal to the end of the track. This siding length will vary depending on the following:

- The length of track required beyond the buffer for train over run protection. This will depend on factors such as train speed, train mass and gradient of the track.
- The maximum train length
- The number of trains to be stabled in the siding
- The number of 4m amalgamation zones between 4-car 'blocks'

The minimum siding length from the departure signal would be in the order of 200m for a single 8-car Suburban set with a 4m amalgamation zone and 20m of over run track as indicated [Figure 3 - Typical Siding Length](#).

The length of the siding should allow for future amalgamation zones (4m) at every fourth car coupling location.

When configuring a yard every effort should be made to avoid having yards or sidings separated by running lines or groups of running lines.

Across track walkways are to be located at the ends of the sidings and between 8-car sets. They are not required at the amalgamation points. A minimum 5m is required between 8-car trains in a siding.

Refer to Attachment 3 Check Sheet which is to be completed in consultation with the RailCorp Projects and Rail Development units using the guidelines within this document as the base requirements.

It is essential that users complete and signoff on the Check Sheets provided for the specific requirements for: (1) Network Planning; (2) Operations and (3) Maintenance.

[Check Sheets \(Attachment 3\)](#)

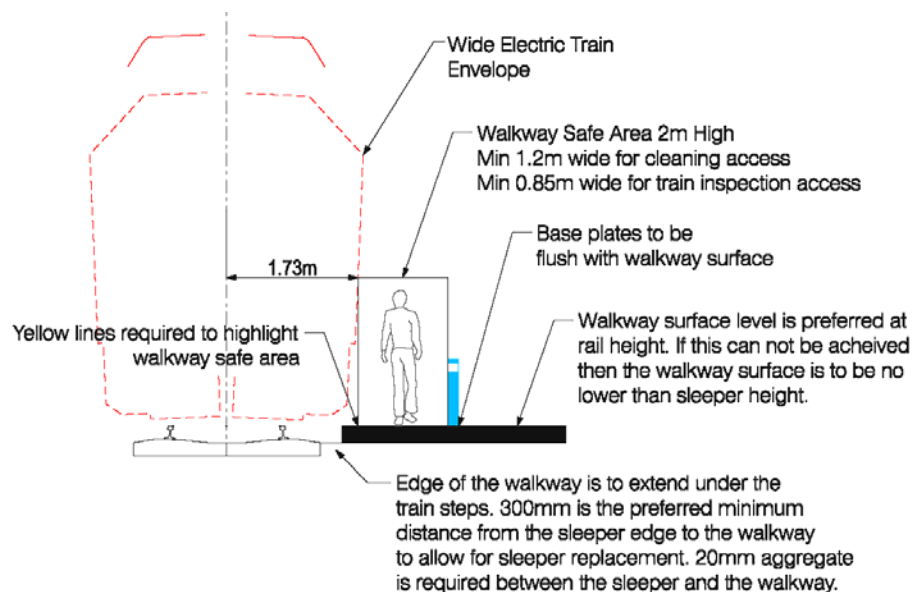
5 General User Requirements

When modifying an existing yard, non compliances must be identified and brought to the Asset Managers attention. Where feasible, non compliances should be upgraded to standard or improved. In no circumstance shall a non compliance be worsened.

Designers are to minimise the number of obstacles in stabling yards and sidings. For example, overhead wiring portal structures should be considered over PP masts.

5.1 Access Requirements

5.1.1 Walkways



Walkways are to be provided for the safe passage of staff and equipment around stabling yards and sidings.

The requirements for walkways are as follows:

- sealed walkways are to be constructed on **both** sides of sidings and extend the full length of the siding where trains are to be stabled.
- walkways are to be provided to all areas where access is required. Walkways outside stabling areas that provide access from one location to another must satisfy the standard safety clearance of 3m from the nearest running rail.
- **the safe walking area for walkways in a yard is to be delineated by yellow lines and signage. The safe area is the area clear of trains. The yellow lines must be painted on the**

walkway surface in line with the train's kinematic outline which is 1.73m from the track centreline for maximum wide electric rolling stock on straight track. For curved track this will increase and the kinematic outline is to be calculated.

- Within the safe area a clear pathway on one side of the lighting/structures is required for the safe passage of staff. For walkways catering for cleaning staff the clear pathway width is to be a minimum 1.2m wide. For walkways catering for train crew only performing train bottom preparation inspections a minimum clear pathway width of 850mm is required. Note: the clear pathway for the passage of staff must be inside the safe area delineated by the yellow lines.
- The safe area between the yellow lines is to be clearly sign posted throughout the yard.
- All walkways are to be free from trip hazards. Steps in the walkway are not desirable.
- the walkway surface level within the stabling yard is preferred to be at top of rail level to reduce the stepping distance to the train. If this can not be achieved then the walkway surface level must be no lower than the top of the adjacent sleeper.
- A minimum 300mm is required between the edge of the sleeper and the walkway. The gap between the sleeper and the walkway is to be filled with 20mm aggregate.
- walkways adjacent to sidings are to be constructed from a hard wearing slip resistant material such as concrete. Designers are to consider surfaces suitable for icy conditions. Rubber tends not to be a suitable surface in these conditions.
- across track walkways can be constructed from timber, however the walking surface must be a hard wearing slip resistant surface. Pre-coated heavy duty skid resistant panels with aggregate bonded into the wearing surface should be considered. Refer to [DecoGrip](#) or equivalent supplier for a range of durable slip resistant surface products. Across track walkways are to be a minimum 1.2m wide.
- other infrastructure near or on walkways such as drainage pit lids and structure base plates shall be constructed level (flush) with the surface of the walkway to prevent them from being a trip hazard.
- all walkways are to be graded to prevent ponding of water.
- across track walkways are to be located clear of the points of crossovers or turnouts and in the vicinity of buffer stops they are to be located behind the buffer stops.

5.1.2 Staff Crossings

Staff crossings over main lines are undesirable and every effort must be made to avoid using them. If main lines divide the yard then safe and accessible grade separated crossings are to be provided. (Specifications & standards for 'Public Pedestrian Level Crossings, see Civil Engineering [TS. 27.000.3.02 SP](#)) Note: Only use for Pedestrian Level Xings not staff Xings.

5.1.3 Safety Barriers

Safety barriers may be required between sidings or main lines and sidings to protect staff. **This is to be assessed on its merits for each site.** Barriers that extend long distances can reduce

refuge space and cause trapping hazards for staff on both sides of the barrier, therefore gaps or access points should be incorporated into the barrier. See Figure 9.

5.1.4 Train Division/Amalgamation Points

Amalgamation points may be required in stabling yards for the division and amalgamation of 8-car sets into 4-car 'blocks'.

Allowance shall be made in the overall siding length for 4m wide amalgamation zones for every 8-car train.

The amalgamation areas shall be well lit with dedicated lighting on both sides of the train. Consideration needs to be given to the various types of rolling stock that will be stabled in the yard.



5.1.5 Road Rail Vehicle Access (Hi Rail)

All stabling yards are to have an access location for road rail vehicles. Providing this access will prevent walkways and other infrastructure from being damaged in the stabling yard. It is desirable to have the road rail access location **outside** the area where trains will be stabled.

Rubber panels similar to those used for level crossings are preferred for the access ramp.

5.1.6 Road Access

Road access to yard is important to allow access for inspectors, emergency, services, cranes etc.

Road access is also required to the civil storage and construction area for heavy vehicles such as front end loaders.

Protected road access is to be provided for rubbish collection and deliveries to storage facilities. Areas that need external access shall be safe from the train lines and protected by a suitable barrier. The location of barriers is to comply with RailCorp Engineering Standard [C2104](#). Access must not allow external delivery vehicles to encroach on the running railway line whilst moving or carrying out their normal operations.

5.1.7 Car Park

A car parking area is required for all users of the stabling facility with a suitable access road. The car park shall have capacity to cater for maximum staff numbers at the facility. The design of the

car park shall conform to the RailCorp Security functional requirements and should be positioned so that it is adjacent (as much as possible) to the working areas.

5.2 Lighting

Lighting installation shall take into account the special requirements of the railway environment, which can be harsh in terms of deterioration and difficult in terms of access to maintain the equipment.

The effective maintenance of lighting is essential to its continuing efficiency. Lighting designs shall permit simple, safe and effective maintenance, avoiding the need for special equipment, track possessions and isolations of electrification.



The requirements for lighting in stabling yards and sidings are as follows:

- lighting designs are to be undertaken in accordance with the [AS1158 series](#).
- light dependent resistors (LDR) are to be used to turn lights on and off.
- designers should consider energy saving measures when designing the lighting for a yard or siding.
- all walkways in a stabling yard shall have lighting. Lighting supports shall be located so as to not encroach on the clear passage of the walkway.
- lighting shall be designed for the case when trains are stabled in all sidings with their lights off.
- lighting should be provided in areas where personnel require a higher level of vision. For instance, in the vicinity of cleaning stations and for the inspection of train bogeys if required.
- lights higher than 2m shall be supported on fold down columns to allow for easy maintenance. The position of lights shall be designed such that, when raising and lowering columns, clearances shall adhere to those given in [C2104](#). Lighting shall be capable of being lowered and lifted without an overhead wiring isolation.
- all lighting shall be double insulated and adhere to the RailCorp electrical standards series EP12 for earthing and bonding.
- **for perimeter walkways and walkways between stabled trains the desirable maintained illuminance for CCTV is between 50 and 85lux, measured at rail level. Without CCTV the recommended minimum of 35 lux is to be maintained. This is equivalent to the lux level stated in AS1158.3 for lighting category P12-lighting level for impaired vision in public car parks.**
- all lighting is to be designed to minimise the number of lighting columns and light spill to surrounding areas including the adjacent railway and neighbouring properties.
- base plates for all lighting shall have the top of the footing baseplate level with the walkway surface to avoid being a trip hazard.

- lighting shall be positioned so as to not conflict with train driver sighting and readability of railway signals. Lamps that emit colour or change colour with temperature shall not be used.
- additional lighting is required in train amalgamation areas. The location of amalgamation lighting shall cater for the varying lengths of rolling stock.
- all lights in a stabling yard shall be numbered for easy identification for maintenance purposes.

For further security lighting requirements refer to the [RailCorp Exterior Lighting Functional Specification](#).

5.3 Staff Amenities

All staff amenities shall meet the [NSW WorkCover Code of Practice](#) for Workplace Amenities.

Staff amenities in a stabling yard can be shared by train crew and train presentation staff. Other occasional users may include infrastructure and maintenance staff. Approval and consultation between Divisions within RailCorp is required for shared amenities.

Generally the facility is to incorporate the following:

1. Staff amenities building
2. Facilities located along the walkways throughout the yard
3. Car parking and site access

The amenities provided for a yard is dependent on the number of train cars that will be stabled at the facility. For large stabling facilities more than one set of amenities may be required.

The amenities building is to be centrally located and as close as practicable to the stabled trains to maximise accessibility and minimise walking distances.

Refer to Figure 4 (on next page) for a typical layout plan for amenities.

When designing a layout consideration must be given to human behaviour. Designs are to incorporate measures to dissuade unauthorised crossing of tracks.

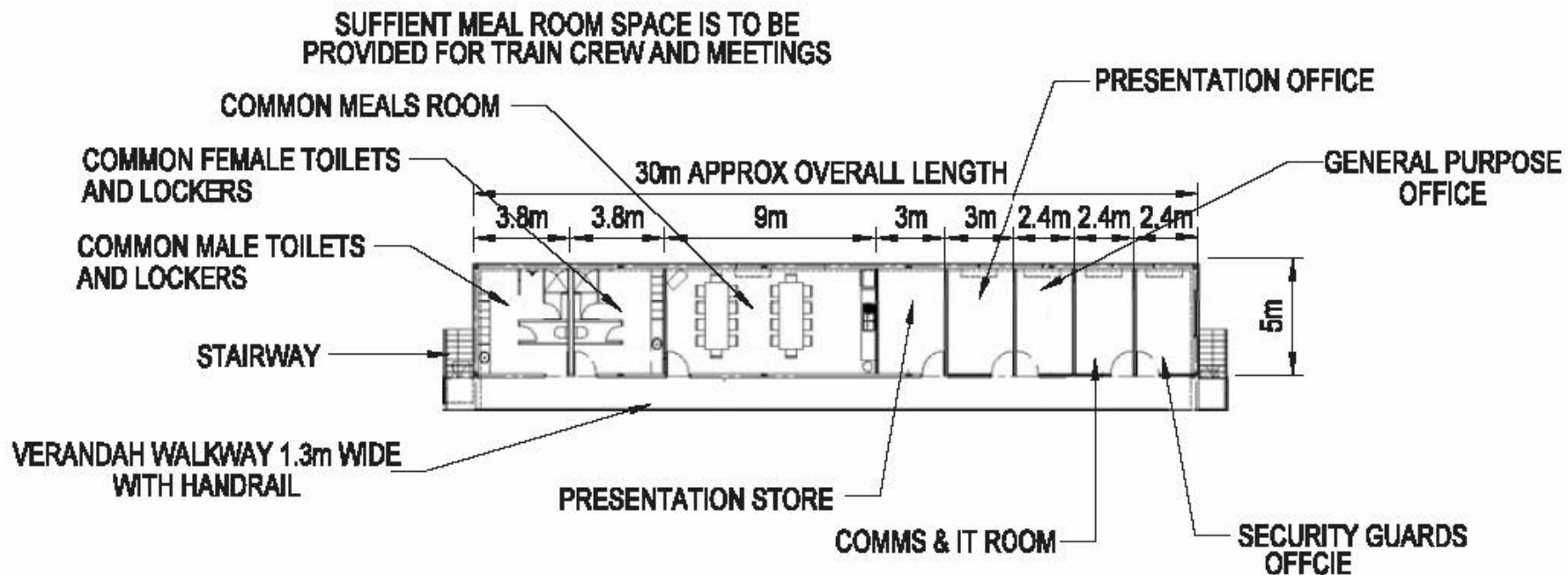
Toilet facilities shall be strategically located in the yard for accessibility.

Sign on locations are to be provided in a safe area with a safe walking route.

Refer to user requirements section for further details required for amenities.

**TYPICAL (SHARED) AMENITIES BLOCK
DIMENSIONS SHOWN ARE APPROXIMATE**

**THIS IS AN EXAMPLE ONLY.
THE AMENITIES BLOCK WILL BE ARCHITECTURALLY DESIGNED FOR EACH SITE TO SUIT THE REQUIREMENTS.**



**FIGURE 4
DESIGN GUIDELINES FOR TRAIN STABLING YARDS**

5.4 Storage

Storage facilities are to be provided in a convenient location for cleaning equipment and chemicals. Storage of chemicals must meet appropriate OH&S and environmental requirements for safe storage and handling. This is to include a bunded area.

Reference should be made to the [NSW WorkCover Code of Practice](#) for safe handling and storage of chemicals.

The ideal location for a cleaning storage shed is mid way in the yard (equidistant walking distance from each end of the yard). Protected road access to the storage facilities is required for deliveries. For large yards there may be a need for more than one storage facility strategically placed.

Storage space is also required for spare parts needed for maintenance of yard assets. Depending on the availability of land it would be desirable to have a civil construction area to allow temporary stock piling of materials and construction of track components for replacement.

Note: *All non compliances require an application to be submitted to RailCorp for approval. Refer to the Waiver Process.*

6 Design Requirements

Note: Designs must be carried out in accordance with the [RailCorp Engineering Design Control Plan \(EDCP01\)](#).

6.1 Track

6.1.1 Track Centres

Track centres are determined by the standard clearances to structures (including equipment) and the amount of room required between stabled trains to safely undertake the required functions. Ultimately the aim is to optimise use of the available space whilst satisfying the clearances stipulated in RailCorp Engineering Standard [C2104](#) for Structure Gauge. Track centres are to be adjusted for curved track.

Under the current standards the **waiver process** must be adhered to with a **site specific risk assessment** to justify any non conformances. For infringement of transit space standards the procedure and process identified in [C2106](#) shall be adhered to.

Track centres are generally selected for the following functions:

- cleaning and train inspection
- train inspection only

For cleaning functions 5.9m track centres between sidings is adequate. This provides a safe area of 2.44m wide between trains with a 1.2m wide clear pathway past structures and equipment. A 470mm zone is available in which structures and equipment can be installed. This zone could be reduced depending on the structures and equipment to be accommodated between the stabled trains. A risk assessment process must be followed to decide track centre width.

Refer to Figure 5 for 5.9m Track Centres.



Undesirable narrow track centres at Gosford Yard

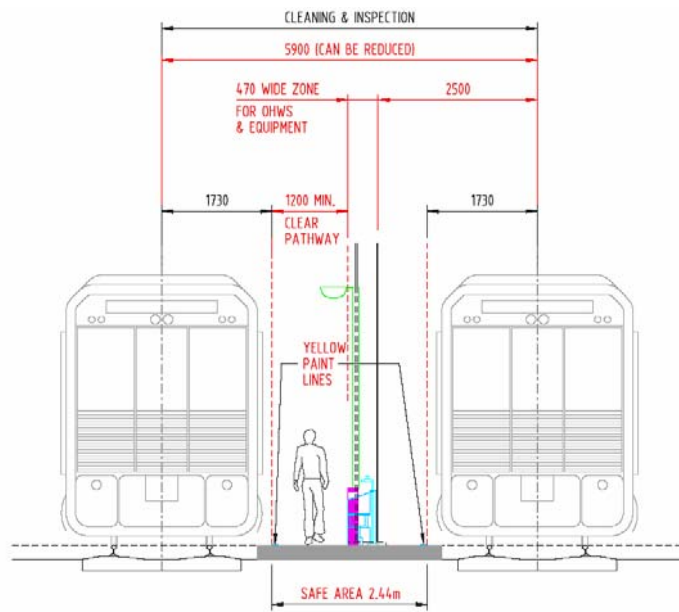


Figure 5: 5.9m Track Centres

In accordance with [C2104](#) the minimum track centres between sidings for inspections is 5.2m. See Figure 6.

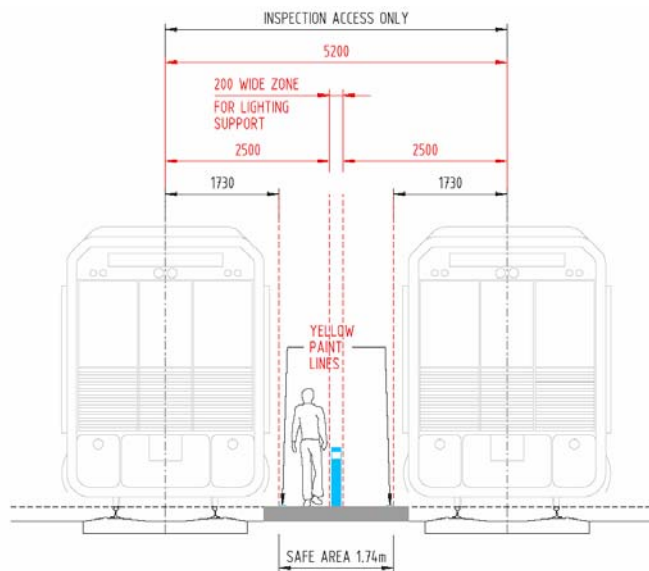


Figure 6: 5.2m Track Centres

Track Centres of 5m and above are suited to train inspections. Less than 5m is not suited for other than "walk through". Where existing situations may be in conflict with this stipulation, a Risk Assessment process must be carried out in support of lodgement for any Waiver status .

If isolated structures are introduced such as lighting bollards the 2.5m standard clearance will not be achieved. See Figure 7.

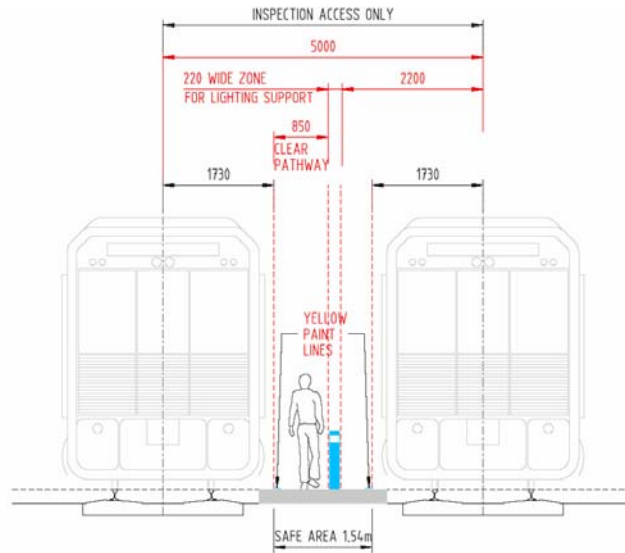


Figure 7: 5.0m Track Centres

The minimum track centres between a main line and a siding is 8.1m if a solid continuous fence separates the two tracks. A 5m clearance is required by [C2104](#) from the main line to a continuous structure. For a siding 3m is required from a siding to a continuous structure.

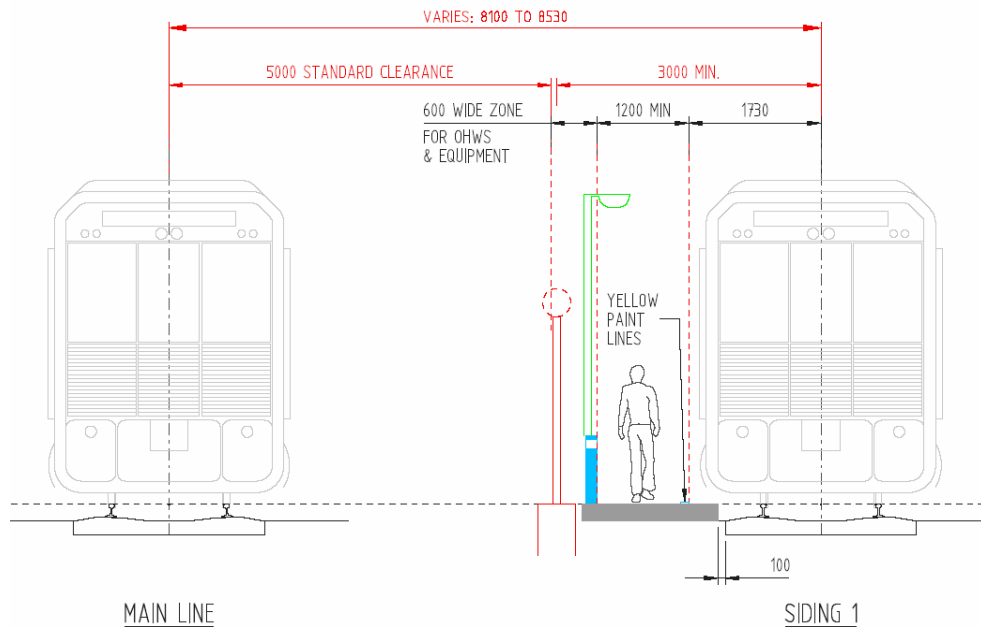


Figure 8: Main Line to Siding Centres

If road access is not required adjacent to the main line then designers are to consider replacing continuous fences between the main line and the siding with a non continuous barrier to reduce the 5m clearance to 3.5m. For instance, a 1m high Monowills barrier fence (or similar) with alternate panels replaced with a span of chain as illustrated below in Figure 9.

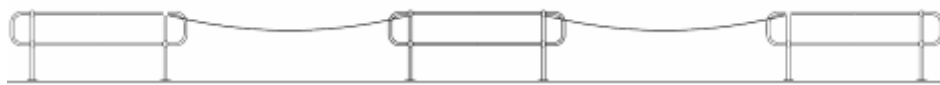


Figure 9: Barrier between main line and sidings

Track centres can be a minimum 4m between sidings for the stabling of trains only. At 4m track centres **no access** is allowed down the sides of the train. This is in accordance with [C2104](#) Section 5, "Track Centres".

Warning Signs must be erected for track centres of 4000mm or less in accordance with Civil Standard [C2111](#) "Track Centre Clearance Signs".

6.1.2 Track geometry

Refer to RailCorp Standard [TS3202](#) Basic Siding Track Design Standards and [TS3101](#) Track Standards Construction for the track geometry requirements in yards and sidings.

For turnouts in sidings refer to RailCorp Standard [TS3502](#). Standard Conventional 1 in 8.25 turnouts as a minimum are preferred. Tangential turnouts may be required for key turnouts to ensure reliability. Diamonds and slips are not to be used. Scissors are undesirable but can be used where space is an issue.

6.1.3 Track Levels

All tracks in stabling yards are to be designed co-planer (to the same level) which would require pump and sump drainage to be installed below ground. Sump level should be installed at a minimum of 650mm below rail. A ballast cage should be installed from the sump to the walkway level. The advantages of having the tracks co-planer is that full width walkways are more easily accommodated and across track walkways will be level across the yard.

Earthworks, formation and drainage are to be designed and constructed in accordance with Standard [TS3421](#) General Standards for formation & Earthworks. Other draft standards that should be referred to are:

- [ESV001](#) Earthworks & Formation
- [ESV002](#) Track Drainage

6.1.4 Track Class & Materials

Sidings are to be designed and constructed in accordance with RailCorp Standard [TS3101](#) and draft engineering standard [ESC200](#) Track System.

Class 1C is the desired minimum class for new sidings for reliability and to reduce future maintenance costs. 60kg rail is preferred with concrete sleepers and a minimum of 250mm of ballast under the sleeper. The materials for a yard or siding should be considered in terms of reliability and compatibility with other infrastructure. Spares may need to be held on site in case of failure and should be considered as part of the initial project and provided for as part of the project.

6.1.5 Car Markers

Car markers shall be provided to assist the drivers in stopping the trains at the correct stabling point. Markers are to be in accordance with RailCorp standards. The preferred type of car marker is the pole mounted type for improved visibility.

The 8-car marker in front of buffer stops should be illuminated to assist train drivers in stopping at the correct location.

6.1.6 Clearance Point

The clearance point in the vicinity of the yard throat should be highlighted by painting the top of the nearest sleeper yellow. The clearance point between trains occurs where the clearance between trains is 1m. If this point occurs between sleepers the mark shall be placed on the sleeper where the clearance is greater than 1m.

6.1.7 Catch Points

Refer to Technical Standard [TS3504](#) for the standard requirements for catch point design and signalling design standard [SC 011301 14 SP](#).

Catch points shall be provided on the exit roads of yards and sidings entering the main line. Catch points will protect the main lines from run-away trains. Catch points are an added safety measure to be installed in conjunction with trainstops.



Catch point in an undesirable location

Catch points are to be located to ensure that a derailed vehicle is not directed into or onto any structure, particularly overbridges, overhead wiring masts, transmission line poles, earthworks or over an embankment or directly into a retaining wall. Each site needs to be risk assessed in detail as part of the RailCorp Safety Management Framework.

Catch points are preferred but derailers can be used where space is an issue. Derailers are not to be used for six wheel bogies as re-railing can occur.

6.2 Signalling

RailCorp signalling design [principles \[SC 001301 SP Series\]](#) shall be adhered to for designing signalling in stabling yards and sidings.

The types and lengths of rolling stock to be berthed in a yard will determine the signal locations and the number of describer berths will determine the number of signalled routes required.



Signal sighting is assessed for every project; however allowance should be made for signal sighting in the general design.

In determining clear standing lengths where a number of trains are to be berthed on a single road the following distances should be considered:

- 5m minimum clearance shall be allowed for between each 8-car train;
- 4m minimum clearance shall be allowed for at every division (amalgamation) point i.e. every 4 cars.
- 5m minimum clearance from the end of a train for a pole mounted departure Signal or 8m minimum to a ground level signal.
- 5m minimum clearance from the face of the buffer stop end of the train.

Where structure gauge and general layout permits, pole mounted signals shall be utilised to improve signal sighting.

Refer to Figure 3 for Typical Siding Lengths.

6.2.1 Track Circuits

The RailCorp preference is to have the entire stabling yard track circuited in order for signallers to be able to determine where trains have been stabled. Train berths within the yard shall be broken up into separate track circuits to describe the length of train stabled in a siding. Track circuits are to be established for 4-car sets ('blocks'). Each separate circuit is to have an individual train describer berth.

For signalling design the following information is to be provided:

- the end location of the train in the siding
- the block joint locations between stabled trains sets (ie between 4 & 8-car sets)
- maximum length of an 8-car set to be berthed in the siding and the distances between sets to permit accurate location of the track circuit joints

6.2.2 Overlaps

Generally signalling overlaps are **not required** in train stabling yards. However, on lengthy arrival and departure roads a risk based approach should be used to evaluate if overlaps are beneficial where the speed of the train may be higher. Refer to signalling Standard [SC 001301 04 SP](#).

6.2.3 Points

All points in stabling yards are to be operated with motorised points. Manually operated 'Thornley' levers are only to be used for auxiliary sidings or other storage areas not normally accessed. Refer to signalling Standard [JSC 011301 14 SPI](#).

6.2.4 Signal Sighting

Where structure gauge and general layout permits, pole mounted signals shall be utilised to improve signal sighting. For ground mounted signals the vertical alignment of the track and other obstructions shall be considered in the design. Signals shall be in accordance [with SC 00 13 01 01 SP](#).

A minimum 5m clearance from the end of a train is required for a pole mounted departure signal or 8m to a ground level signal.

6.2.5 Trainstops

If it is feasible all signals should be protected by a trainstop. However as a minimum the main exit road shall be protected by trainstops at the signal.

RailCorp policy is to have no suppressed trainstops in a stabling yard.

If the approach road has a significantly higher speed than the yard it is desirable to consider a timed trainstop to check the incoming speed of a train on the approach. Consideration shall be given to any adverse impact on main line services from trains entering the yard at lower speeds than would otherwise be the case.



Refer to signalling Standards [Time Releases SC001301 09 SP](#) and [Trainstops SC001301 15 SP](#).

6.2.6 Telecommunications

The requirement is to have a telephone at every signal; however this can be rationalized where signals are close together. The minimum requirement is to have a telephone at each point end and every 8-cars on both sides of the yard.

6.3 Electrification

6.3.1 Electric Power

In general the RailCorp electric power system within stabling yards shall comply with all the [EP series](#) of standards and specifications.

6.3.2 Power Study

A 1500V power supply study should be undertaken to determine the additional load a new or upgraded stabling yard will place on the existing power system.

The power study should calculate the maximum load due to predicted worst train operation and climatic condition combinations.

The following power loads shall be taken into account:

- Standing loads for auxiliaries of parked train sets
- Loads required for rolling stock movement within the yard
- loads for train preparation

Once the load requirements are determined the capacity of the associated substations; 1500V feeders and overhead wiring that supply the stabling yard and sidings is to be established.

The voltage drop and overhead wiring protection settings are to be checked.

6.3.3 1500V Sectioning

Requirements relating to work on trains and maintenance of overhead wiring shall be considered when designing the 1500V sectioning.



It is desirable to have the following in stabling yards:

- At least two sources of supply to the overhead wiring
- Sufficient sectioning and or rail connection switches to allow individual sidings or groups of sidings to be separately isolated and or rail connected

The selection of auto or manual switching arrangements will be specified by RailCorp.

The 1500V sectioning of the overhead wiring in a stabling yard must be confirmed by RailCorp before the design of the overhead wiring.

6.3.4 Overhead Wiring

The design and construction of all new overhead wiring shall comply with [EP 08 00 00 01 SP](#).

The conductor systems available for use in train stabling yards and sidings are (Refer to RailCorp Standard [EP 08 00 00 16 SP](#)):

- RailCorp overhead wiring System 9 (Preferred): Regulated; Single 270mm² Catenary; Single Contact 193mm² (T/w = 550)
- RailCorp overhead wiring System 2: Regulated; Single 270mm² Catenary with Twin Contact 137mm² (T/w = 588)

The system selected shall be capable of carrying the maximum loads predicted in the power study.

6.3.5 Level Crossings

The minimum contact height over level crossings for general use is 5.4 m above rail level. A height gauge should be fitted on both side of the crossing. Refer to RailCorp Standard [EP 08 00 00 12 SP](#).

The overhead wiring contact wire height at restricted vehicle level crossings (i.e. crossing not to be used by the Public) shall be a minimum height of 1.0 m above the sign posted maximum vehicle height permitted.

A minimum contact wire height is not specified for staff level crossings, however the wire must be above 4.57m in order to run trains and this is sufficient for pedestrian safety.

6.3.6 Overhead wiring support structures position

Portal structures are preferred over planted masts to reduce the number of obstacles in the yard. Using portal structures may allow track centres to be reduced.

Overhead wiring structures are to be positioned clear of catch points and the end of tracks to avoid damage in the advent of a run away train.

In complex track locations with a risk of derailment check rails or containment structures should be considered to protect structures.

6.3.7 High Voltage Aerials

Refer to RailCorp Standard series [EP10](#).

The design and construction of new high voltage aerials in the vicinity of electric train stabling yards shall comply with [EP 10 01 00 06 SP](#).

Generally high voltage aerials shall not cross over stabling yards and in particular staff amenities.

The electrical clearance from stabling yard overhead wiring structures to high voltage aerials running parallel to the stabling yard shall comply with ESAA publication HB C(b)1-1999, "Guidelines for Design and Maintenance of Overhead Distribution and Transmission Lines"- Table 9.1. From ESSA C (b)1 the following clearances shall be used:

- OHW Portal Structures - Clearance B (Vertical) and C (Horizontal)
- OHW Masts - Clearance D (Vertical) and C (Horizontal)

6.3.8 Earthing, Bonding and Electrolysis

Refer to RailCorp Standard series [EP12](#).

All overhead wiring structures within 3.5 m of the centre line of an electric train stabling yard track shall be bonded to rail via a spark gap.

All Metallic Fencing in the vicinity of a electric train stabling to comply with RailCorp Civil Standard [C 4501](#).

Metallic troughing and piping within 2.0 m of overhead wiring structures shall have insulated joints installed 2.0 m before and after the overhead wiring structures.

Design Guidelines for the Upgrade & Construction of New & Existing Train Stabling Yards and Turnback Sidings



6.3.9 Low Voltage

The design and construction of new low voltage in the vicinity of electric train stabling yards shall comply with [EP 17](#) series of standards and specifications and State Rail Authority of NSW Service and Installation Rules (July 1989).

Low voltage installations on RailCorp property do not use the MEN earthing system, refer to [EP 12](#) series of standards and specifications for details.

Underground low voltage cable arrangements shall comply with AS 4799 – 2000 and RailCorp Drawing No. EL0024639.

Underground low voltage cables that pass under tracks shall be enclosed in a Category A system to AS/NZS 3000 and shall be installed at least 2.0 m below the top of the rail. Elsewhere, low voltage underground cables shall be installed at least 1.0 m below ground level.

6.3.10 High Voltage & Traction Cables

The design and construction of new high voltage aerials in the vicinity of electric train stabling yards shall comply with [EP 20](#) series of standards and specifications.

Underground high voltage and traction cable arrangements shall comply with AS 4799 – 2000 and RailCorp Drawing No. EL0024639.

Underground high voltage and traction cables that pass under tracks shall be enclosed in a Category A system to AS/NZS 3000 and shall be installed at least 2.0 m below the top of the rail.

Elsewhere, high voltage and traction underground cables shall be installed at least 1.0 m below ground level.

6.4 Communications

The following communication services are to be provided to meet operational and emergency requirements in stabling yards:



- Provision shall be made for all signal, emergency and yard telephones. This shall include accommodation for communications including data networks, CCTV Radio, and associated telecommunications apparatus, if required, and all ducting and cabling, distribution frames and associated equipment.
- Depending on proximity to other communications infrastructure the requirement for equipment accommodation may be minimal. Where a local radio system has to be provided a suitable antenna location will be required.
- Administration telephones, fax services and RailCorp WAN (IntraNet) are required for staff amenities, offices and work areas (where applicable). At least one administrative telephone must be able to be configured for access to the public telephone network.
- At least one emergency telephone in the siding location must be designated as an emergency phone with direct connection to the local signaller / station and Rail Management Centre. A notice should be attached so that any person wishing to report an emergency can use the phone.
- Train Radio (MetroNet) shall be provided for all tracks throughout the yard.
- The Yard shall be provided with a local radio system providing person to person (talkthrough) and connection to the amenities office / signal box throughout all areas of the yard (and station if applicable) between all customer services, train services and infrastructure maintenance personnel working in the yard environment.
- If required for train shunting a separate shunting radio channel is to be provided with bleep facility.
- An assessment shall be made for the need to provide enhancement of the GRN (Government Radio Network) for emergency services coverage, this will normally only be justified when the yard presents a risk over and above the normal rail environment e.g. is located close to an external hazard like gas pipeline, bulk fuel storage. Agreements shall be sought from the GRN Management Unit and Emergency services on the need for enhancements.
- Space for CCTV and network apparatus will be required in the apparatus accommodation. Local monitoring of the CCTV shall be provided where considered beneficial if the yard is in close proximity with the Station.
- Provision shall be made for access control and alarm / security monitoring systems. Assessment shall be made to determine the need for perimeter monitoring control.

6.5 Buffer Stops

Buffer stops are required for dead end sidings. The design requires mitigating measures for buffer stops and over-run protection.

If risk and space permit then friction buffer stops are the preferred type as they minimise the damage to the train and potential injury to the driver. Friction buffer stops require more room for the over run track.

Subject to a risk assessment the minimum type of buffer stop to be considered for stabling yards is the Department of Railways NSW Way and Works Branch Fixed Type 204-88 as shown in the adjacent photograph.



RailCorp Fixed Buffer Stop Type 204-88

This timber stop structure has low resistance to train impact and functions principally as a train stopping point marker and not as an impact barrier.

Buffer stops at train buffer height are preferred to aid with driver visibility.

Timbers secured on top of the rail head must not be used as a buffer stop solution.

The buffer stop light should be supported independently from the buffer stop and be located as near as possible to the buffer stop on the track centreline. Positioning the light too far from the buffer stop creates a deception for drivers bringing a train to a stop.



(Rawie Friction Buffer Stop)

A buffer stop is to provide a risk mitigation for train overrun of its stopping point. This mitigation relates to train approach speed - and design consideration for design speed, fixed train stops, track distance, friction buffer stop, and clear runoff length and space all apply.

An important consideration for designers is the distance required for the train to come to a stop maintaining adequate room to the buffer stop. Refer to the Configuration & Functionality Section for typical siding lengths.

Where a friction buffer stop is under consideration then the matters of positioning of its light and the issues of traction return and rail insulated joint needed must be evaluated by Design sources since the "overrun" length of siding track now comes into play whenever train contact occurs.

6.6 Security

The RailCorp's function requirements for security shall be referred to for stabling yards and sidings. The following [functional requirements for security](#) are restricted documents and need to be requested from the RailCorp Security Division:

- Part A: Fencing
- Part B: Exterior Lighting
- Part C: CCTV
- Part D: Perimeter Access Control

The security elements that are designed for existing and new yards must be validated by the RailCorp Security Division prior to design acceptance and construction.

6.6.1 General Features

Stabling Yards shall incorporate the following features:

- The design of the security for stabling yards is to maximise public and staff safety and minimise the opportunity for crime to occur.
- Design must be robust and minimize risk of vandalism.
- Other security measures including CCTV coverage, optic beams etc.
- Clear lines of sight to be maximised.
- Small office (or office space within the staff Amenities Building) for security guard.

6.6.2 Security Design (General)

- The level of vandal and intruder resistance shall be a major aspect of the design.
- The design shall eliminate any hidden spaces, gaps, recesses and voids that provide opportunity for the concealment of persons or suspicious items.
- All installations, fixtures and fittings including, ventilation, plant, pipes and lighting systems shall be designed to prevent access to the top, sides, back and under the equipment or infrastructure. There are to be no positions to hide or lodge an unwanted object and to maximise the effectiveness of stabling yard/facility surveillance.
- Horizontal surfaces shall be avoided or sloped when unavoidable.
- The design must incorporate features that allow staff to be able to prior validate persons seeking to gain access to the amenities building / yard office such as (but not limited to) stand alone voice/video intercom systems, door viewing holes/panels etc.
- Internal doors within the staffed area of the Amenities Building shall incorporate viewing panels that provide visibility of the alternate side of the door.
- The design shall provide physical security of all building windows from forced entry (eg. Security screens).

- Provide building materials, surfaces and finishes that resist vandalism and increase the effort required for vandalism to occur.
- The area is prone to high levels of vandalism. Sound barriers and retaining walls must be graffiti proof. Select building materials, surfaces and finishes that facilitate rapid repair and remediation removal of graffiti and be compatible with cleaning techniques, equipment and solvents currently used by RailCorp.
- Provide suitable signs to identify safety features, security way finding etc (eg. No trespass / unauthorised access, danger- moving trains, footwear, eyewear, eyewash/ shower points etc.)
- Provide numbering of facility rooms with no description as to function, unless required for staff, contractors or to meet OH&S Regulations or other statutory requirements.
- Provide a dedicated, climate controlled electronic equipment room for the centralized installation of head and equipment associated with the CCTV, IAS, EAC and other electronic systems installed at the facility.
- the dedicated electronic equipment room design must be large enough in size to accommodate additional equipment and/or future expansion.
- Provide separate HVAC and temperature controls for the electronic equipment robust door dust seals to optimise electronic systems reliability and life.
- Provided vegetation and gardens should be selected to minimise horticultural maintenance and maintain sightlines.
- Landscaping shall specify hardy, drought resistant, low set, ground covering plant varieties. Height of mature ground cover vegetation should be no greater than 900mm.
- The planting of trees that become very tall shall be reconciled with lighting and CCTV design to ensure vegetation does not obscure lighting and CCTV when mature and that shadowing (ie bright & dark lit patches) are avoided particularly along pedestrian paths, external building and facility approached included along all fence lines.

6.6.3 Electronic Access Control System (EACS)

Provide and integrated electronic access control system (EACS) that eliminates wherever possible the need for a keyed locking interface.

6.6.4 Boundary Security

Provision shall be made for a boundary fence that clearly encloses and delineates the Stabling Yard complex.

The design of the security fence must be:

- Installed as close as possible to the minimum structure clearance



- Very difficult to climb or deliberately penetrate.
- Robustly constructed and highly durable with a nominal life cycle of 25 years
- Close profile welded mesh aperture (4mm wire diameter) and steel post/rail construction a minimum of 2.4 meters in height, fitted with an additional 600mm high anti-climb topping comprising of concertina or flat loop short barb tape. Steel materials are to be treated to provide a high level of resistance to corrosion by galvanizing with an additional powder coated finish where specified or equivalent. All Metallic Fencing in the vicinity of a electric train stabling to comply with RailCorp Civil Standard [C4501 Metallic Lineside Fencing in Electrified Areas](#) .
- Finished in a manner that facilitates both passive and active surveillance (preferably black powder coated or similar)
- Designed with a lockable pedestrian and vehicle gates incorporating robust top and bottom serviceable bearing hinge points
- Fitted with a concrete plinth under and along the entire length of the perimeter fence.
- All gates to have uniform locks
- Able to allow for the functional integration of electronic access control (EAC) systems.
- Designed to facilitate or minimise the time and cost required to repair, remove, install and refit new fence panels
- Compliant with all relevant RailCorp Infrastructure Standards

6.6.5 Carpark Security

The design shall provide:

- a sealed car park that is, kerbed, guttered, appropriately drained, lighting to suit security levels and monitored by CCTV
- security access and separate dedicated points for vehicle entry and exit
- dedicated pedestrian and vehicles electronic access control
- security fence separating the car park from the operational facility

Car park minimum lighting level of:

- 20 lux open spaces (note: this is not in accordance with AS11583, see page 21 section 5.2 dot point No.2 under "The requirements for lighting") Hence AS11583 takes precedence.
- 50 lux covered areas
- 150 lux pathways
- Provide reflective (white) line markings indicating directional traffic/roadway rules, car parking space and pedestrian crossings
- Provide traffic calming devices within the car park, at entrance and exit roadway points
- Provide protection of track/infrastructure, pedestrian circulation paths from errant vehicles such as the strategic placement of guard rails, barriers, bollards, high concrete kerbing etc.
- Provide Car park signs including, speed limit, and directional and security signs

6.6.6 CCTV

The design will provide the following for CCTV coverage of the stabling yard and siding:



- surveillance throughout the entire stabling yard complex that is fully integrated with existing RailCorp existing CCTV system for control and monitoring
- capable of being operated by local security personnel and remotely monitored via the Group Remote Monitoring Location (GRML) and the Security Communications Centre (SCC) located in the Rail Management Centre (RMC)
- deliver good definition in all areas with high resolution and colour accuracy in all diverse environmental conditions anticipated throughout the stabling yard facility

The CCTV system design shall as a minimum provide surveillance coverage of the following areas:

- Facility perimeter fence
- Facility entry and exits
- Car park entry/exit
- Building entry/exit
- Parallel to stabled trains
- In between stabled trains/stabling roads
- Other Confined spaces
- Each CCTV camera must be covered by the surveillance of another camera
- Provide CCTV cameras in robust, vandal and environment resistant housings.
- The CCTV system must possess the ability to identify any person representing from head to toe, not less than 100 percent of picture height
- The CCTV system shall record data in compliance with the evidentiary requirements of the NSW [Evidence Act](#) , with full PAL frame resolution and picture quality comprising a minimum pixel resolution of 704 Horizontal x 576 Vertical.

6.6.7 Lighting

Lighting must be designed to provide high intensity security lighting throughout the stabling yard complex.

The lighting design shall as a minimum provide illumination of the following areas:

- Facility perimeter fence
- Facility entry and exits points
- Car park entry/exit
- Facility walkways & access paths
- Stairs

- Building entry/exit
- Building perimeter
- Parallel to stabled trains
- In between stabled trains/ stabling roads
- Other Confined spaces
- Lighting level around and in between stabled trains shall be no less than 85 lux
- Lighting fixtures shall be robust, vandal and environmentally resistant
- Lighting must be installed with consideration for:
 - Minimising glare on information signs
 - The operational effectiveness of CCTV cameras –maintenance accessibility
 - Lighting design must ensure that light sources enable the distinction between stabling yard/ facility lighting and train signal lights
 - White lighting shall be used in all applications

6.6.8 Security and Alarm Systems

All Security systems and fire alarm systems must be fully integrated into existing RailCorp alarm systems.

6.6.9 Long Line Public Address

Provide a long line public address system throughout the stabling yard complex that enables announcements to be made from the Group Remote Monitoring Location (GRML) and the Security Communications Centre (SCC) located in the Rail Management Centre (RMC).

6.6.10 Intruder Alarm System (IAS)

Provide an Intruder Alarm System (IAS) capable of being locally operated and remotely monitored by the Security Communications Centre (SCC) in the Rail Management Centre (RMC).

The IAS shall provide duress alarm facilities in staff occupied areas and detection of building perimeter ingress/egress doors, main storage, plant and electronic equipment rooms.

6.7 Train Crewing

Facilities are required to provide safe access to stabled trains, and to carry out train preparation functions.

The stabled trains will require a full preparation prior to entering service. Train preparation procedures require a 'top prep' and 'bottom prep'. The 'top prep' is an internal inspection of the train only and 'bottom prep' requires the driver to walk around the train, and carry out a visual inspection of the exterior of the whole of the train. Careful consideration must be given to the configuration of the infrastructure to ensure 'bottom prep' may be safely completed in the yard environment.

Staff amenities and sign on points are to be located conveniently to minimise walking distances to stabled trains and discourage the use of unauthorised walking routes. Consideration must be given to human factors when locating facilities.

Train crew facilities are traditionally provided separate to those of other staff such as train presentation. However RailCorp's strategy is for shared or combined facilities specifically for crewing and presentation services staff. Hence consultation between user groups and sign offs on Scope of Works is required.

6.7.1 Amenities

Train crew facilities are to be considered per site and according to the following tables:

(Note: Table D is mandatory)

A FIRST AID BOX must be provided at all Amenities Facilities locations. The equipment must be in accordance with OH&S regulations for the type of establishment and the number of employee users. It would generally best be located in the kitchen area in an easily visible, clearly marked accessible cupboard.

Table A – Personal Needs Facility
--

- | | |
|--|---|
| <ul style="list-style-type: none"> ○ Unisex toilet ○ Male/female toilets ○ Hot/cold water basin ○ Hot water urn ○ Lighting Internal/External ○ Communications (telephone, network ports) | <ul style="list-style-type: none"> ○ Exhaust fan ○ Paper towel dispenser ○ Bi lock entry ○ Shared or combined facility Y/N ○ Signage |
|--|---|

Table B – Standby Facility

- Unisex toilets
- Male/female toilets – air lock
- Lighting
- Hot & cold water basin
- Hot water urn
- Communications (telephone, network ports)
- Table chairs
- Microwave
- Clock – digital
- Exhaust fans
- Air conditioning
- Comfortable seating
- Supervisor facilities
- Notice boards
- Water cooler
- Security – bi lock
- Griller
- Signage

Table C – Primary Mealroom Facility

- Unisex toilets
- Male/female toilets – air lock
- Lighting
- Hot & cold water basin
- Hot water urn
- Communications (telephone, network ports)
- Table chairs
- Microwave
- Clock – digital
- Exhaust fans
- Air conditioning
- Comfortable seating
- Supervisor facilities
- Notice boards
- Security – bi lock
- Griller
- Fridge
- Toaster
- Television and Aerial
- Signage
- Public telephone
- Water cooler or Ice machine

Table D – Supervision – Requirements (Mandatory)

- Table/chairs (desk)
- Communications – IT/telephones
- Lighting
- Fax
- P.C – TLS
- Jug
- Air conditioner
- Secure facilities
- Cleaning arrangements
- Shelving for Operational documents cupboard
- CCTV – Monitor relief points
- Digital clock

Table E – Cleaning & Service Agreement Arrangements

- 48 hours
- 24 hours
- 12 hours
- 6 hours
- Service agreement Fleet Maintenance
- Service agreement CSG stations
- Contractor arrangements
- Removal of rubbish
- Floors
- Surfaces
- Toilets
- Replacement

6.8 Train Presentation Services

Stabled trains are cleaned in accordance with RailCorp standards and procedures set by the Presentation Services Section of the Customer Services Group.

RailCorp standards for cleaning stabled trains require:

1. Internal cleaning of all trains overnight:

Internal cleaning is a manual cleaning process undertaken using buckets, mops and hand cleaning techniques. Generally small quantities of water and chemicals are used.

Waste water from work locations is required to be disposed of via sinks connected to the piped waste water system.

2. External cleaning of graffiti as required:

External cleaning is required for the removal of small areas of graffiti. The graffiti is removed by hand by coating the affected area with a chemical agent and washing off with water. Hoses are not used in this procedure.

Substantial graffiti damage will be treated in a maintenance facility that has an appropriate waste water collection system.

6.8.1 Rubbish Disposal

Commercial rubbish disposal bins are to be provided for the disposal of rubbish collected from the stabled trains. The bins are to be located near to the stabling facility in a protected enclosure that does not require a contractor vehicle to enter the yard. The enclosures are to provide for heavy vehicle access for the delivery and recovery of bins. The location of the bins and crash barriers should be considered in the design of the enclosure. **Measures should be in place to prevent bins from being pushed or dropped onto railway tracks.**

Large yards may require more than one rubbish collection compound.

Disposal and drainage of chemicals must comply with environmental requirements.

6.8.2 Cleaning Stations

Cleaning stations including sinks are required along one side of a train and located at intervals no greater than two carriage lengths. Refer to Figure 10 below for a layout of cleaning sinks.

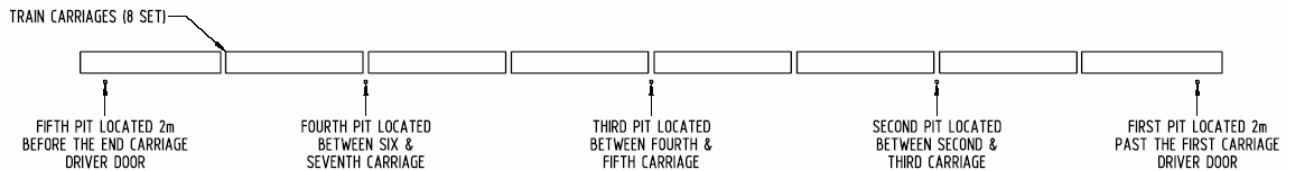


Figure 10: Layout of cleaning stations

Above ground cleaning stations are preferred for ergonomic reasons over in ground sinks. Above ground sinks must be positioned clear of the walkway clear passage and satisfy the structure gauge clearances. Taps suitable for filling cleaning buckets are to be provided at each station. Overflow from the tap shall be directed to the waste water collection pits. Taps should automatically turn off if unattended. Refer to Figure 11 for a drawing of an above ground sink.

For in ground sinks the ground level around the cleaning pits should be graded up slightly to prevent rainfall runoff entering the pit. Grates should not be allowed to be lifted beyond 50 degrees.

Cleaning stations are required to have: lighting over the station, waste water disposal, water access and drainage.

Sinks are to be connected to the piped waste water system.

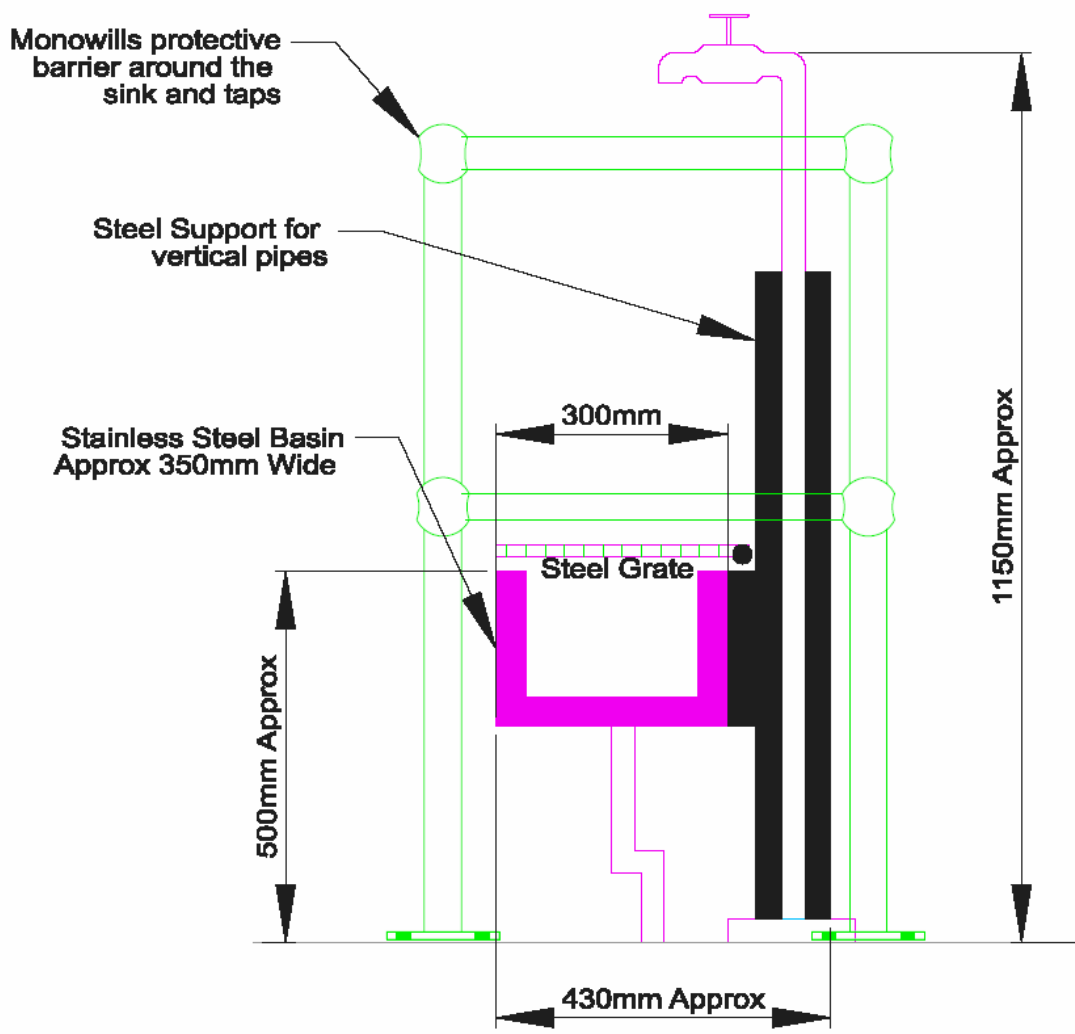


Figure 11: Above Ground Sink

6.8.3 240V Power Supply

Power (240 Volt) supply points are not required throughout the yard. Stand alone power points in the yard would pose a large safety risk particularly if they are located near water supply locations. Other safety hazards are power cords being laid across tracks and located at head height when taken from the ground to the train door level.

Power is only required for vacuuming trains that have carpeted floors i.e. 'V' Sets. In this case power should be sourced from on board the train.

6.8.4 OH&S Showers and Eye Wash

Showers and eyes wash for chemical spills are to be strategically located such that a person has to go no more than four carriage lengths to reach them. Showers and eye wash do not need to be provided on every siding, they can be placed at the ends of the siding or to the side of the yard.

Refer to [Figure 1\(Attachment 1\)](#) - typical yard layout plan.

Showers and eye wash are to be located under lighting and positioned to avoid obstructing the walkway safe zone and satisfy the structure gauge clearance.

Emergency Showers and Eye Wash equipment is a proprietary item supplied by safety equipment suppliers such as Enware.



Typical Enware Emergency Shower and Eye Wash (Penrith yard)

6.8.5 Train Decanting Facilities and Equipment



Broadmeadow Decanting Facility



Gosford Decanting Facility

Decanting facilities are used for the purpose of emptying effluent and refuse from Interurban trains which are fitted with controlled emission toilet systems for long haul travel. The fully self contained tanks need to be emptied regularly. As a minimum they are emptied once daily.

Due to their nature decant facilities require warning signs indicating the appropriate safety measures that are to be taken. Especially if work is required in a confined space.

The decanting facilities include a pumping mechanism to draw effluent out of the train tank system for storage in the decant facility vacuum tank. The effluent and refuse can then be expelled from the tank at a suitable time for discharge into the main sewer or industrial waste system.

As sewer systems generally become heavily loaded by residential waste throughout the day, decanting tanks should automatically flush into the sewer system. Typically this is done between midnight and dawn ensuring the system is not overloaded. Tanks can be emptied during the day however Council and Community approval is required. This operation is automatic by a timer opening a valve located at the outlet pipe of the vacuum tank. The tank is de-pressurised by an automatically operated valve in the plant room then the effluent is released to sewer via gravity, to the local sewage treatment plant.

Bunding must be provided to ensure that a leakage can be captured and mitigated from reaching the surrounding environment. All the pipes surrounding the vacuum tank, must be fully constrained within the bunding.

The type of masonry brick or block used for containment will have a direct impact on how long the contaminant can be contained within the bund. Certain bricks and blocks are less porous than others, therefore the type of wall should be determined at the detailed design stage. For bunds it is preferred to have a concrete reinforced base with solid masonry brick walls. **Where possible collection sumps should be connected to sewer.** Collection sumps that are not connected to sewer system must have pumps supplied.

The floor must provide sufficient fall to the collection sump located at the low point of the bund. This will enable the flow of rainwater or tank leaks within the bund to the sump and enable the

sump and bund to be easily cleaned out during maintenance. The collection sump should have a silt trap at the base and act as a location for a pump (if required) or a connection point via a drainage line.

The size of the collection sump should be large enough to contain a submersible pump to ensure that at any stage a pump can extract the contents contained within the bund. The exact size of the collection sump should be determined at the detail design stage. The minimum dimensions of the collection sump should be 650x650x650mm to cater for drainage lines, pumps or both.

Rainfall plays a heavy factor in the design of bunds. A cover over the bunded area is preferred however If there is no cover then allowance must be made to increase the size and volume of the bund to cater for rainfall filling the bund.

Clear access is required to the decanting facility and an emergency shower and eye wash should be provided.



Decanting equipment between Gosford Yard Sidings

Localised decant points along the stabling sidings do not contain or store effluent. They are only used as the point of contact between train toilet system and the vacuum tank. Static decanting equipment between sidings should be strategically located to suit the types of rolling stock to be stabled at the facility i.e. V and G Sets.

Decanting equipment should be positioned between sidings clear of the walkway safe areas. The location of decanting equipment must not require hoses to be laid across tracks to reach stabled trains as shown in the photograph above. Yard designers must also consider mobile decanting access requirements and service agreements in the case of equipment failure.

Refer to [Figure 12](#) for a typical layout of a decanting facility.

6.8.6 Cleaning Amenities

See [Section 6.7.1](#) for Train Presentation amenities requirements. The requirements for Train Presentation amenities are equivalent to the requirements for Train Crewing amenities. Also refer to [Section 5.3](#) for further requirements for amenities.

It should be noted that a cleaners store is required including a cleaners sink with hot and cold water, services for a washing machine, and an area for safe storage of chemicals and cleaning equipment. This area must be bunded. Refer to [Section 5.4](#) for storage requirements.

Note: All non compliances require an application to be submitted to RailCorp for approval. Refer to the Waiver Process.

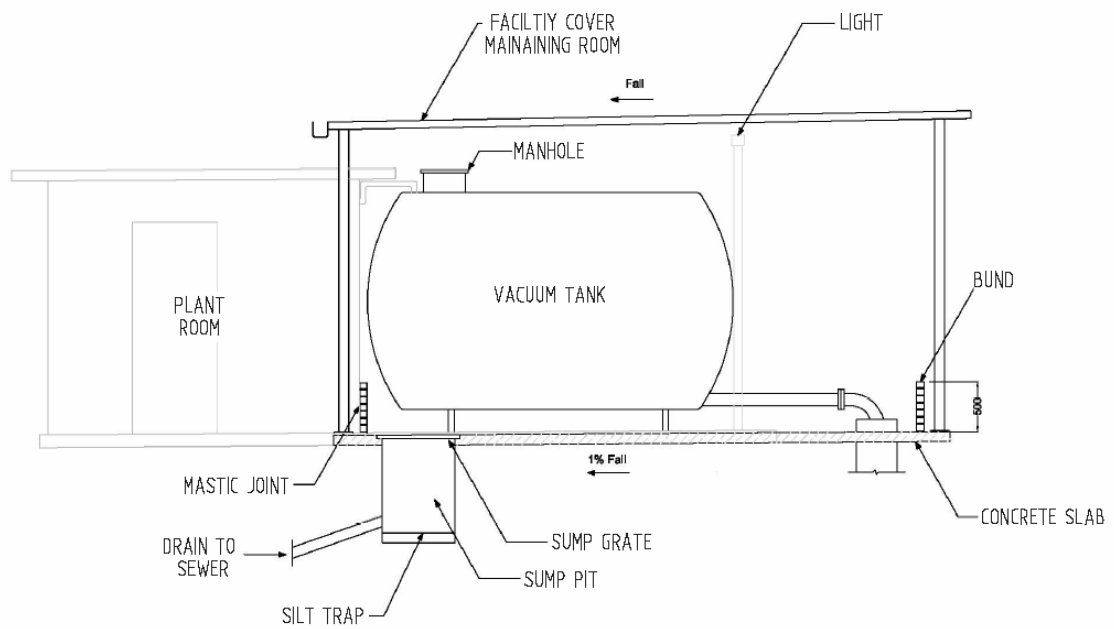
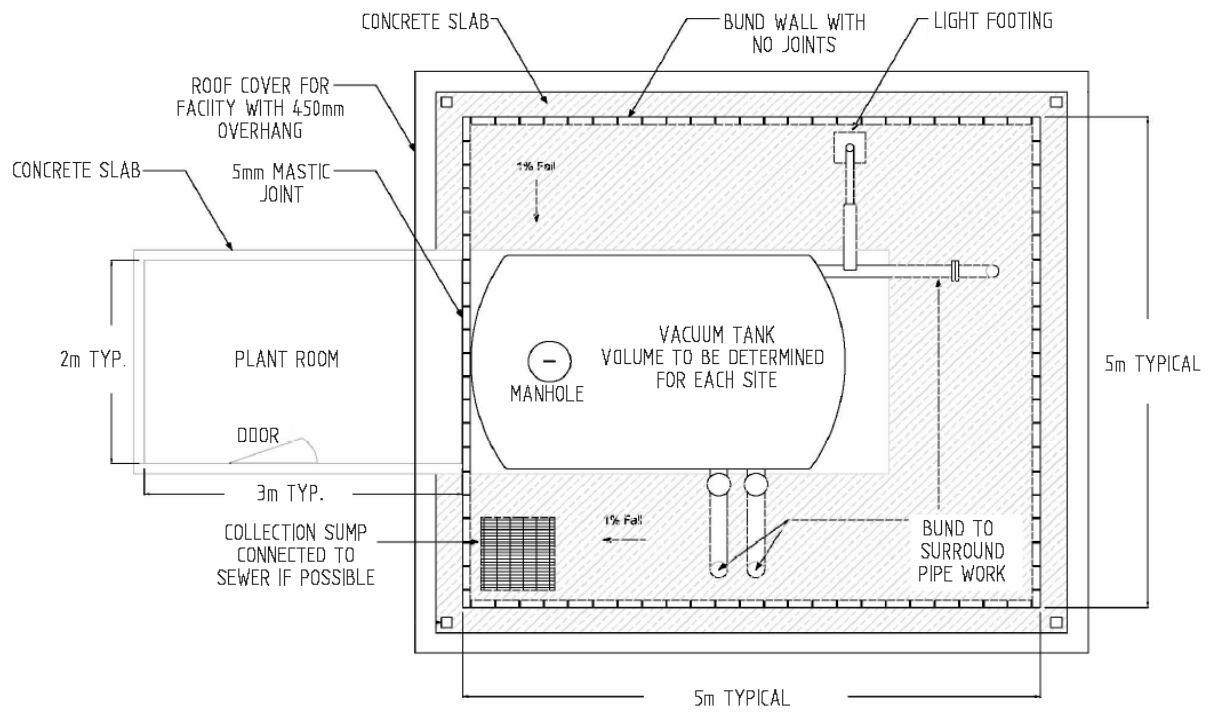


Figure 12 – Typical Layout of a Decanting Facility

7 Yard Maintenance

Stabling yards and sidings must be designed and constructed in accordance with the [RailCorp Engineering Design Control Plan \(EDCP01\)](#) so that they can be maintained effectively, safely and with minimum whole of life cycle costs. All planned maintenance must be undertaken without adversely effecting the normal operations of the rail network subject to approved operations and maintenance policies and practices.



The design and specification of equipment, materials and workmanship for assets in the yard should consider, as a minimum, the factors set out below:

- The operating an climatic environment where the asset is physically located
- The restricted access during normal operations
- Track possession opportunities for planned maintenance
- The simplicity of design, where practicable, minimising the number of component parts
- Minimizing the requirement for maintenance. Designers must consider the recurrent cost of maintenance.
- Planned maintenance points to be safely accessible during normal operations
- Reliable and readily available off the shelf commercial components and parts
- Compatibility of proposed design solutions with other materials and equipment used in the network
- Impact on existing training, tools and equipment, support systems and spares

All yard assets should be registered in a RailCorp Asset register with an allocated budget for maintenance, hence the RailCorp Asset Management Strategy for Yards & Sidings [and Technical Maintenance plans](#) [TS0001MP] must be adhered to when designing, upgrading or constructing new yards or sidings.

8 Environmental

The design, construction and operation of stabling yards must comply with legislation, Department of Planning, [Environmental Protection Authority \(EPA\)](#), local Council and RailCorp requirements, as well as the RailCorp Regional Environmental Management Plan.

As part of the planning process for developing new stabling yards, or modifying existing stabling yards, an Environmental Impact Assessment (EIA) must be completed in accordance with the requirements of RailCorp Environmental Impact Manual. The purpose of the EIA is to:

- identify, understand and assess the likely impacts of proposed activities on the environment;
- make decisions about proposed activities in an environmentally informed manner, assuming an assessment of environmental impact is undertaken competently; and
- assist in demonstrating due diligence.

The EIA must address construction, operational and decommissioning impacts.

When developing the project, the designer must take into the account the following basic environmental requirements, as well as any recommendations from the EIA.

See also the [Environmental Impact Assessment \(EIA\) Framework](#).

8.1 Community Relations

During the design, development and implementation stages, the Project Manager shall liaise with the RailCorp Community Relations Manager to ensure that the community is informed of the project and the designer is aware of any potential issues relating the project that may influence the neighbourhood.

8.2 Noise Control

The designer shall ensure that the project meets the requirements of the EPA Industrial Noise Policy and the RailCorp Environment Protection Licence 12208.

When considering noise impacts, the designer shall take into account the following noise sources including, but not limited to:

- construction activities,
- shunting operations,
- train arrivals and departures,
- arrival and departure of train crews and cleaning staff,
- compressor, air conditioner and generator sets of stabled carriages,

- telephones and public address systems, and
- testing and operation of warning devices such as horns and train mounted public address systems.

If the stabling yard is expected to stable diesel locomotives or rail maintenance equipment, then the designer shall then take into consideration the varying conditions experienced with these types of equipment.

Where it is determined that the installation cannot achieve the standard established by these requirements, the designer shall consider alternative designs or the inclusion of acoustic barriers to protect the community.

8.3 Lighting Management

Light pollution from light spill and glare may have an adverse impact on the community if the lighting is not correctly designed and installed. When developing the project the designer shall ensure that the stabling yard lighting does not impact on the community.

Where practical, all yard lighting shall be low level lighting such as bollard-mounted lights. All security lighting shall be installed in such a manner that lights are not directed at neighbouring properties, or reflect of train bodies into residential areas.

Any warning lights such as strobes shall be positioned so that they are only visible from within RailCorp properties.

8.4 Water Management

As part of the design of the stabling yard, the designer must take into consideration the separate flows of stormwater and wastewater. No waste water or water contaminated with pollutants shall be discharged to the stormwater system.

No external cleaning of trains with water shall be permitted without the provision of wastewater recovery and treatment systems as approved by the local water authority.

Where possible, the designer shall include options for rainwater recovery and use on site to minimise the use of potable water for flushing of toilets, irrigation of landscaped areas and dust suppression.

All rainwater reuse systems shall be designed and installed in accordance with the requirements of the local water authority to prevent backflow of rainwater into the potable water systems.

All drains shall be labelled in accordance with the RailCorp environmental standard of:

- Stormwater inlet surrounds shall be painted blue with label "Stormwater Only – No Pollutants" in letters at least 80mm high,
- Wastewater drain surrounds shall be painted yellow with no label.

During construction and operation the designer and project manager shall ensure all drains are protected from ingress of sediment by implementation of erosion and sediment controls.

8.5 Waste Water Management

The designer shall ensure that all cleaning stations and wastewater systems are designed and installed in accordance with the requirements of the local water authority and that appropriate trade waste disposal agreements are obtained prior to the site being operational.

No wastewater shall be discharged into stormwater systems.

8.6 Effluent decanting

All effluent decanting facilities must be designed to meet the requirements of the local water authority and EPA. All pumping stations and holding tanks must be covered and bunded in accordance with the EPA Bunding Requirements.

<http://www.environment.nsw.gov.au/mao/bundingspill.htm>

The designer shall liaise with the local authority during the design phase to ensure that all local requirements are included in the design and that appropriate trade waste disposal agreements for disposal of effluent are obtained prior to the site being operational.

8.7 Site Access

When designing the site access, the designer shall consider the potential impacts on the community during all stages of construction and operation of the stabling yard. Where possible all access shall be from existing access points and not from residential streets. All vehicular access points shall be constructed to the minimum requirements of the local council.

Construction traffic shall only access the site during daylight hours, unless special notification has been given to the effected residents.

8.8 Contaminated Land Management

The designer shall liaise with the RailCorp Environmental Projects Unit to determine the presence of potentially contaminated soils. If contamination is expected, the designer shall include the Environmental Projects Unit's requirements in the final design.

8.9 Landscaping

Where security arrangements permit them, arboreal screens and landscaped areas shall be provided to screen the site from the community as well as blend with any existing streetscape. All plants used within the landscaped areas shall be indigenous drought tolerant plants.

Landscaping shall be low maintenance and where practical used for reducing areas that could potentially generate dust.

Irrigation of landscaped areas must be by use of rainwater captured on the site.

8.10 Waste Management

In developing the project, the designer shall include facilities for the secure storage and handling of passenger wastes from train cleaning as well as operational wastes generated by the site.

Each facility must have provision for waste separation, storage and handling facilities. These facilities may not be required initially, but the designer must make allowance for their future installation.

8.11 Construction Waste Management

All construction waste shall be managed in accordance with the requirements of the NSW Government's Waste Reduction and Purchasing Policy.

8.12 Emergency Preparedness

The stabling yard shall be provided with as a minimum 1 x 240 litre capacity general purpose environmental spill kit for each stabling road. The spill kits shall be positioned adjacent to the site crew/presentation facilities shed.

8.13 Storage and disposal of chemicals

The designer shall ensure that storage and handling facilities are provided for all cleaning chemicals including empty containers. The storage facilities shall be designed and installed in accordance with appropriate Australian Standards and the chemical manufacturers written material safety data sheets. The facility shall include provision for the safe storage of the material safety data sheets.

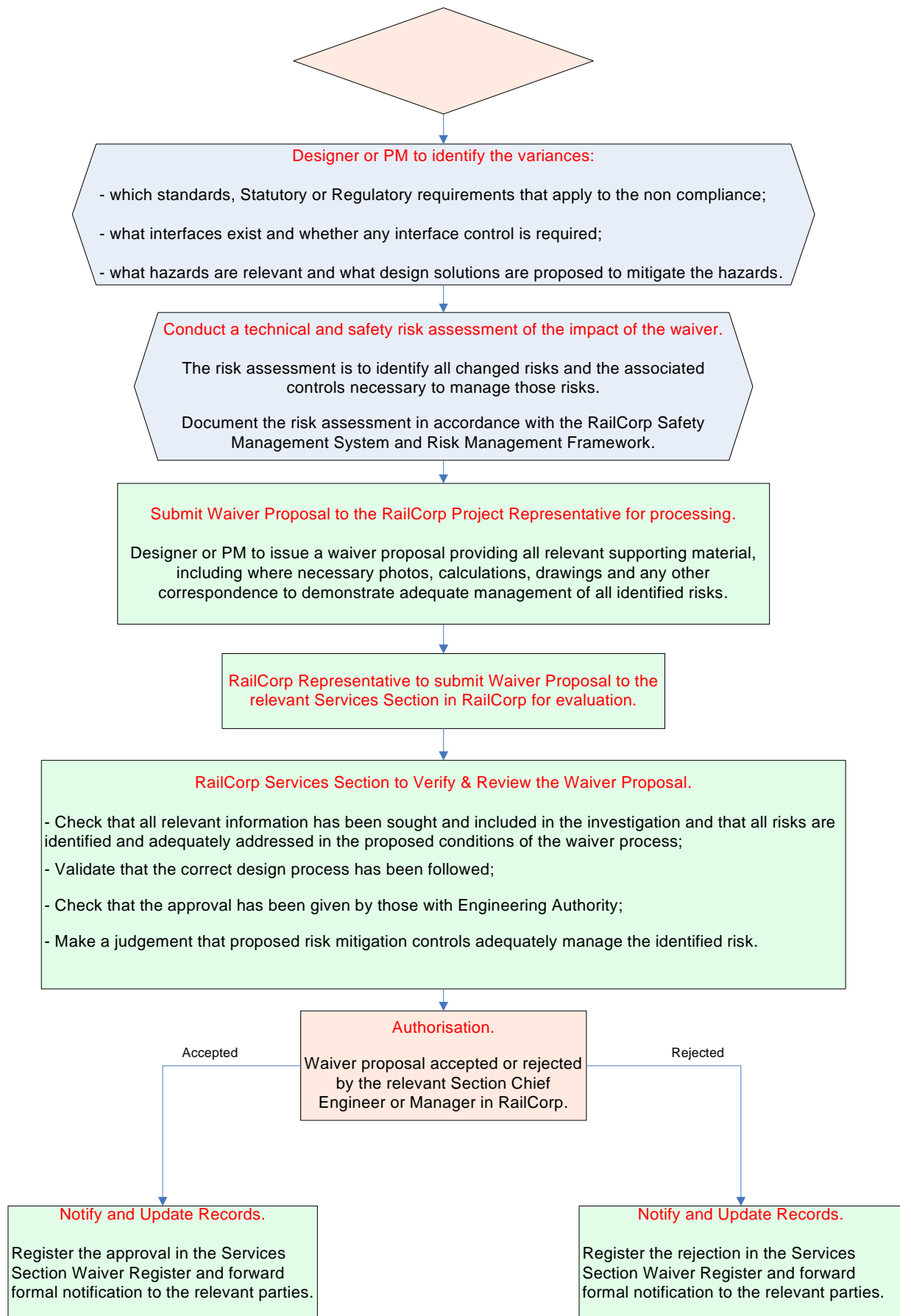
8.14 Environmental Management Plan

As part of the construction and operation processes for modifying existing stabling yards, or developing new stabling yards,

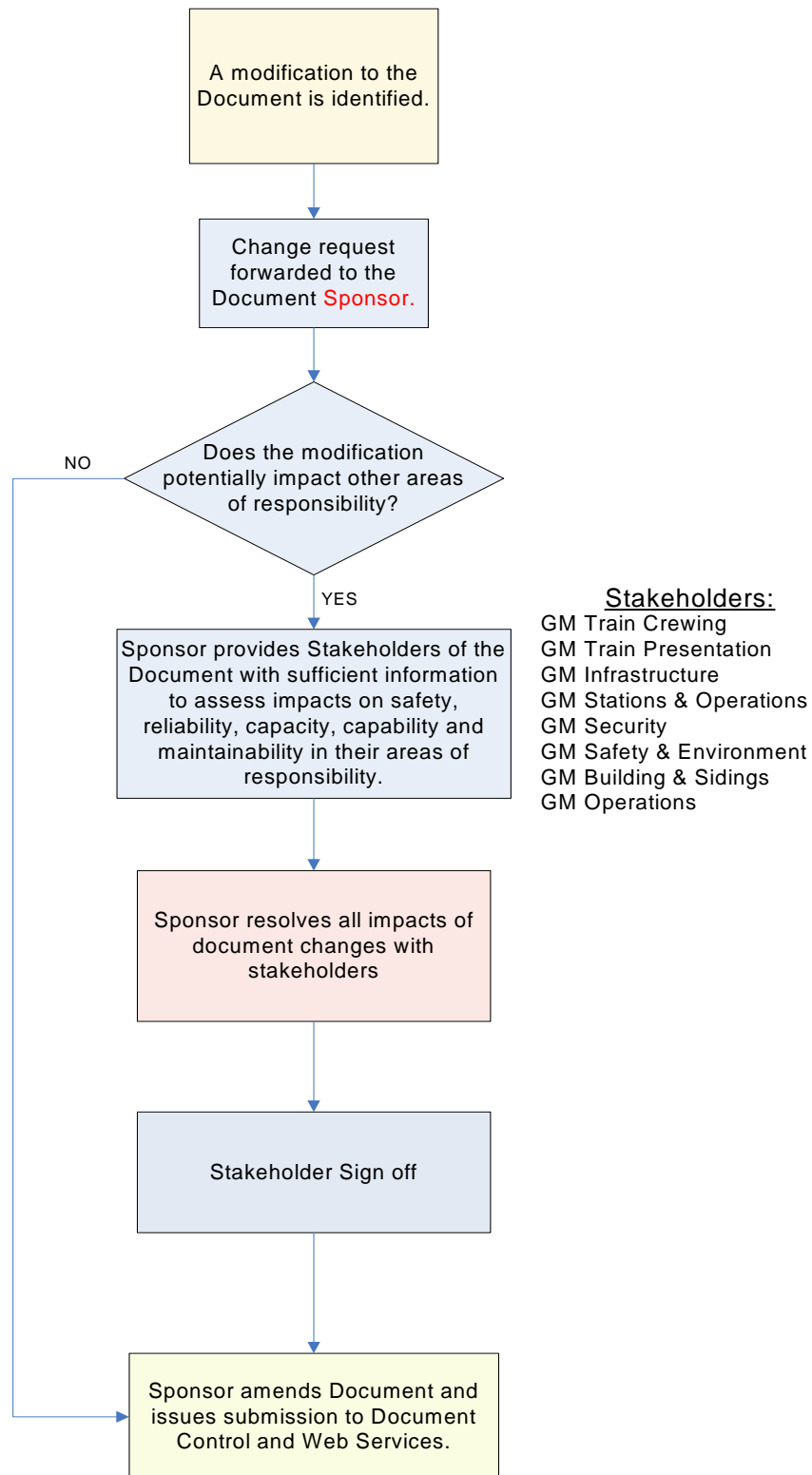
The Project Manager shall ensure that environmental management plans are developed and implemented for all modified or new stabling yards in accordance with guidelines developed by [NSW Government Construction Agency Coordination Committee](#). Two environmental management plans shall be developed - one to cover the construction of the stabling yard, the other to cover the operational phase of the stabling yard. The designer shall liaise with the operational group environment unit on the development of the operational environmental management plan.

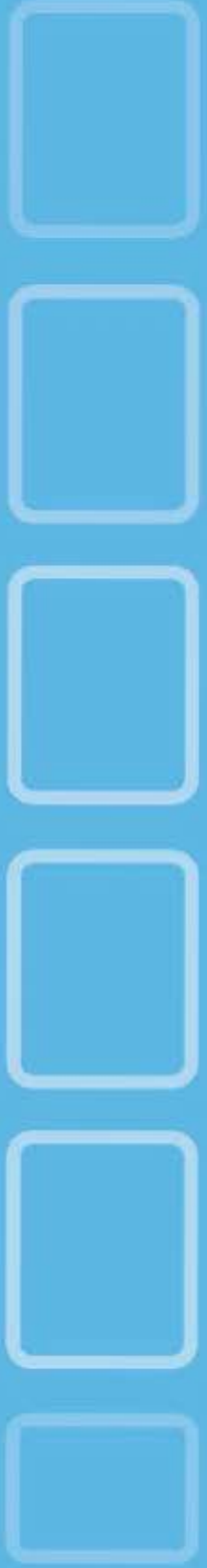
Note: All non compliances require an application to be submitted to RailCorp for approval. Refer to the Waiver Process.

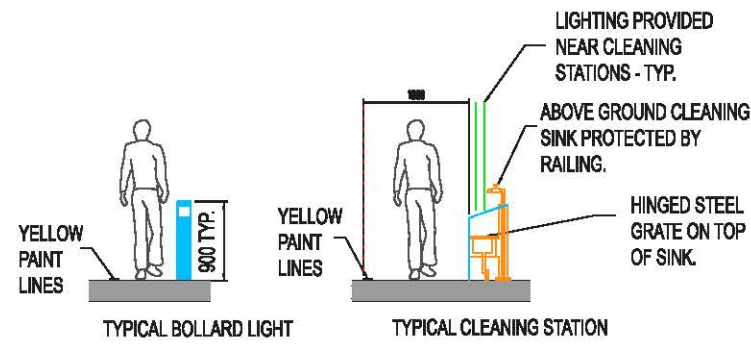
9 Process for Waivers



10 Process for Making Changes to the Guidelines



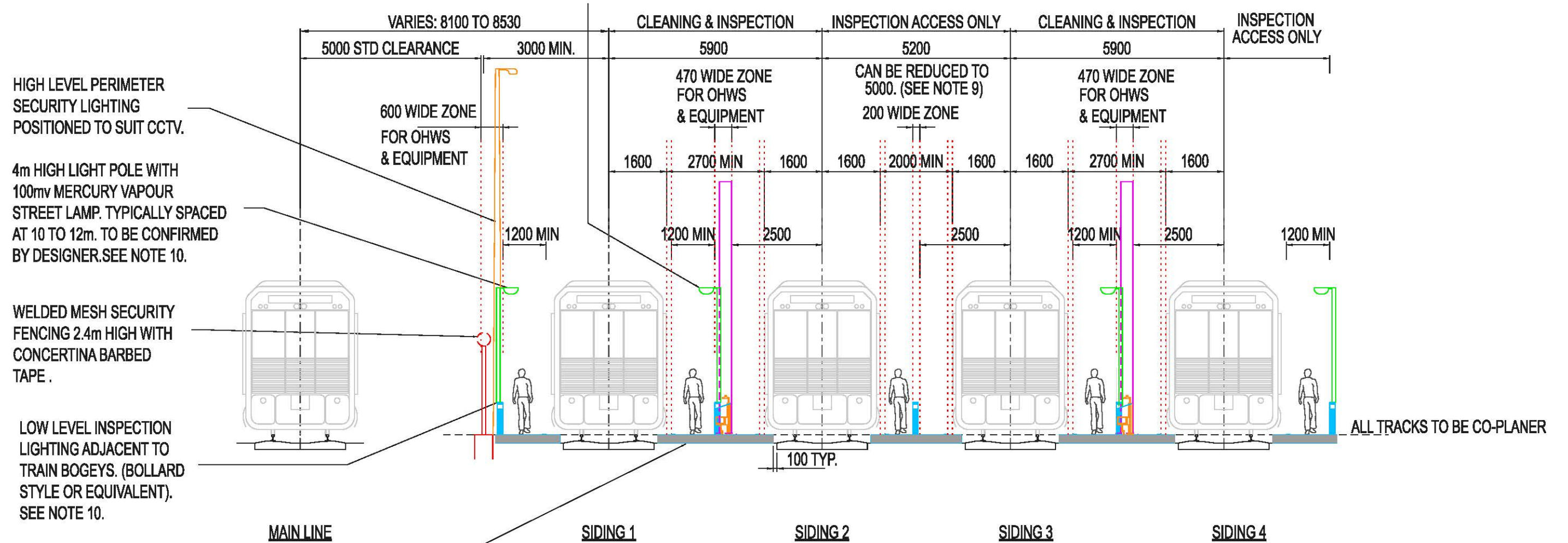




NOTES:

- 1 ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE SHOWN.
- 2 TRACK CENTRES AT 5.9m PROVIDE A 470mm ZONE FOR SUPPORT STRUCTURES & EQUIPMENT.
- 3 MINIMUM CLEAR PASSAGE ON A WALKWAY USED FOR CLEANING IS 1.20m. FOR INSPECTION ACCESS THE CLEAR PASSAGE ON A WALKWAY CAN BE REDUCED TO 850mm.
- 4 WALKWAY SAFE AREA IS 2m HIGH.
- 5 THE WALKWAY SAFE AREA IS 1.73m OFFSET FROM TRACK CENTRELINE (ON THE TRAIN KINEMATIC ENVELOPE).
- 6 MINIMUM STRUCTURE CLEARANCE OF 2.50m TO STRUCTURES AS PER C2104.
- 7 CLEARANCES AND TRACK CENTRES SHOWN ARE FOR STRAIGHT TRACK ONLY AND SHALL BE INCREASED TO ALLOW FOR CURVE EFFECTS ON CURVED TRACK.
- 8 UNDER SPECIAL CIRCUMSTANCES THE STANDARD CLEARANCE OF 2.5m TO A NON-CONTINUOUS STRUCTURE CAN BE REDUCED TO ACHIEVE A REDUCED TRACK SEPARATION. THE WAIVER PROCESS MUST BE ADHERED TO WITH A RISK ASSESSMENT TO JUSTIFY THE NON CONFORMING CLEARANCE.
- 9 FOR WALKWAY LIGHTING BOLLARD LAMPS CAN REPLACE THE 4m POLE LIGHTING. IN THIS CASE THE TYPICAL SPACING IS 8m. TO BE CONFIRMED BY LIGHTING DESIGNER.
- 10 ALL WALKWAYS SURFACES ARE TO BE LEVEL WITH THE TOP OF THE ADJACENT RAIL.

POLE MOUNTED LIGHTS
MAY NOT BE REQUIRED
IF LOW LEVEL LIGHTING
IS PROVIDED. TBC BY
LIGHTING DESIGNER.



CONCRETE WALKWAY WITH
MINIMUM 1.2m CLEAR PASSAGE
HIGHLIGHTED WITH YELLOW
PAINT LINES.
TOP OF WALKWAY SURFACE
TO BE AT TOP OF RAIL LEVEL
TYP.

FIGURE 2.
FUNCTIONAL GUIDELINES FOR STABLING YARDS & SIDINGS (ATTACHMENT 2)
TYPICAL CROSS SECTION - TRACK CENTRES

Minimum Siding Length for Dead End Stabling Yard Sidings

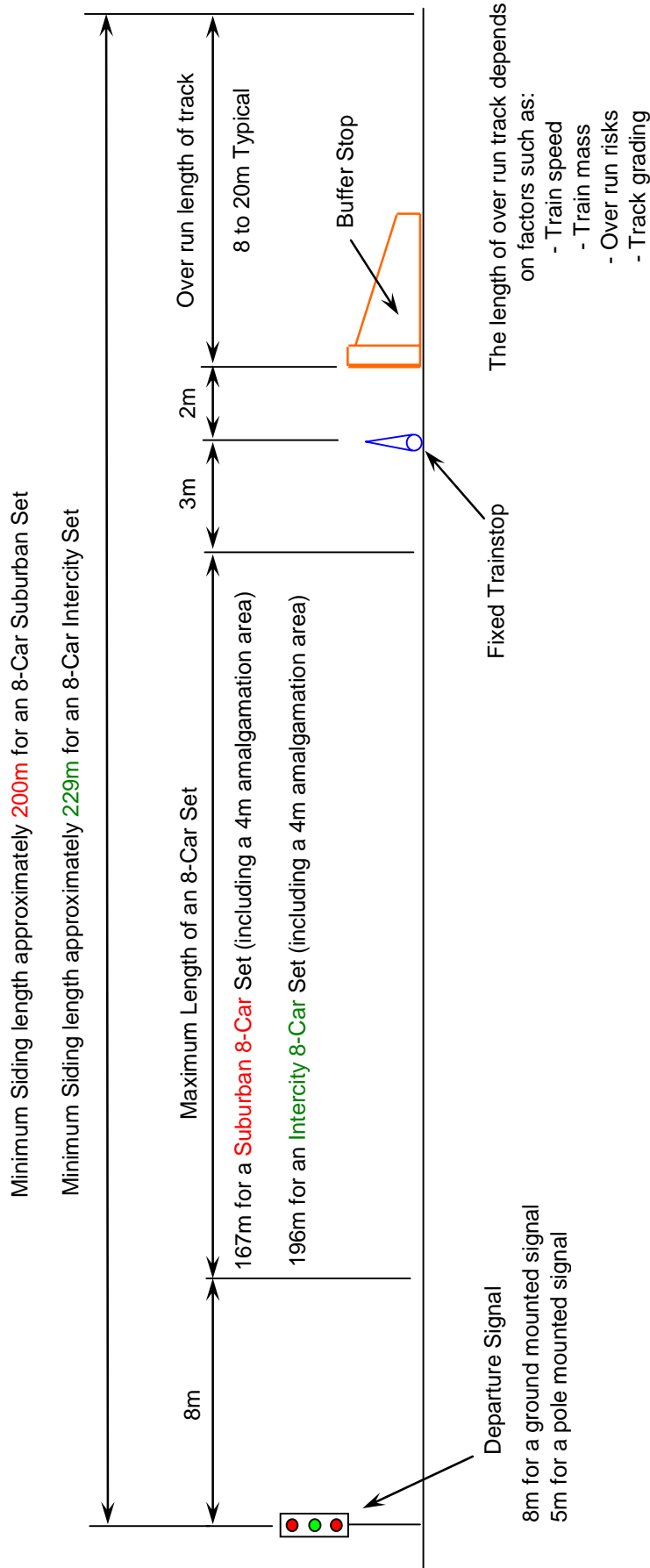


Figure 3.0
Functional Guidelines for Train Stabling Yards

Attachment 3 – Functional Guidelines for Train Stabling Yards and Sidings

Check Sheet for Specific Infrastructure Requirements - Network Planning



The following check sheet is to be completed in consultation with the RailCorp Project Development Section using the Stabling Yard & Sidings Functional Guidelines as the base requirements.

Ref.	Item	Comments
1.0	Site Constraints	
1.1	Ideal location of Stabling Facility (from network perspective)	
1.2	Alternative location which would meet network requirements	
1.3	Area of available land	
1.4	Approximate dimensions of available land (A x B)	
1.5	Will staff be required to cross running lines	
1.6	Other known constraints	
2.0	Stabling Capacity	
2.1	Number of Trains to be stabled	
2.2	Types of Train sets using facility (including special requirements)	
2.3	Number of train movements to be accommodated during peak	

2.4	Total Train movements per day	
2.5	Level of Arrival and Departure flexibility required	
3.0	Workforce and associated amenity	
3.1	No of staff other than Operations and Passenger Fleet Maintenance using facility	
4.0	Train Cleaning Requirements	
4.1	Are decant facilities required	
4.2	Is external train washing a requirement of the facility	
5.0	Track & Civil Infrastructure	
5.1	The stabling facility will be designed and constructed in accordance with RailCorp Standards for a Class 2 siding, Are there any other constraints to be imposed on the track & civil infrastructure which are specific to this facility.	
6.0	Electrical Infrastructure	
6.1	The stabling facility will be designed and constructed in accordance with RailCorp Standards. Are there any other constraints to be imposed on the electrical infrastructure which are specific to this facility.	
7.0	Signalling and telecommunications systems & equipment	
7.1	The stabling facility will be designed and constructed in accordance with RailCorp Standards. Are there any other constraints to be imposed on the Signalling and telecommunications systems & equipment which are specific	

	to this facility	
8.0	Other interface matters	
8.1	Fire Control and protection	
8.2	Access control and protection (Site Security)	
8.3	Level crossing protection	
8.4	Operational signage	
8.5	Noise Attenuation (Near Neighbours)	
8.6	Light Attenuation (Near Neighbours)	
8.7	Light Attenuation (Running Lines)	
9.0	RailCorp Functional Specification Stabling Yards	
9.1	Detail any required deviations from the functional specifications for Walkways	
9.2	Detail and required deviations from the functional specification for Lighting	
9.3	Detail and required deviations from the functional specifications for Fresh Water Supply & Wastewater Collection	

9.4	Detail and required deviations from the functional specifications for staff Amenity	
9.5	Detail and required deviations from the functional specifications for Refuse Disposal	
10.0	Support Documentation	
	The attached documents have been commissioned or produced and form part of the Client Brief	
9.0	Additional Requirements	

Check Sheet for Specific Infrastructure Requirements - Operations



The following check sheet is to be completed in consultation with the RailCorp Operations Section using the Stabling Yard & Sidings Functional Guidelines as the base requirements.

Ref.	Item	Comments
1.0	Stabling Capacity	
1.15	Level of Arrival & Departure flexibility required	
2.0	Workforce and associated amenity	
2.1	No. of Train Crew staff using stabling facility	
2.2	Proximity to other amenity (Eg Station Facility)	
2.3	Is amenity a Category A,B or C Messing Facility	
3.0	Track & Civil Infrastructure	
3.1	The stabling facility will be designed and constructed in accordance with RailCorp Standards. Are there any other constraints to be imposed on the electrical infrastructure which are specific to this facility	
4.0	Electrical Infrastructure	
4.1	The stabling facility will be designed and constructed in accordance with RailCorp Standards. Are there any other constraints to be imposed on the electrical infrastructure which are specific to this facility	
5.0	Signalling and Telecommunications systems & equipment	

5.1	The stabling facility will be designed and constructed in accordance with RailCorp Standards, Are there any other constraints to be imposed on the signalling and telecommunications systems & equipment which are specific to this facility	
6.0	Other interface matters	
6.1	Fire control and protection	
6.2	Access control and protection (Site Security)	
6.3	Level crossing protection	
6.4	Operational signage	
6.5	Noise Attenuation (Near Neighbours)	
6.6	Light Attenuation (Near Neighbours)	
6.7	Light Attenuation (Running Lines)	
7.0	RailCorp Functional Specification Stabling Yards	
7.1	Detail and required deviations from the functional specification for Walkways	
7.2	Detail and required deviations from the functional specification for Lighting	

7.3	Detail any required deviations from the functional specification for Fresh Water Supply & wastewater Collection	
7.4	Detail and required deviations from the functional specification for Staff Amenity	
7.5	Detail any required deviations from the functional specification for Fencing	
7.6	Detail any required deviations from the functional specification for Refuse Disposal	
8.0	Support Documentation	
	The attached documents have been commissioned or produced and from part of the Client Brief.	
9.0	Additional Requirements	



Ref.	Item	Comments
1.0	Stabling Capacity	
1.15	Level of Arrival & Departure flexibility required	
2.0	Workforce and associated amenity	
2.1	No. of Train Crew staff using stabling facility	
2.2	Proximity to other amenity (Eg Station Facility)	
2.3	Is amenity a Primary or Secondary Meal Room	
3.0	Track & Civil Infrastructure	
3.1	The stabling facility will be designed and constructed in accordance with RIC Standards. Are there any other constraints to be imposed on the electrical infrastructure which are specific to this facility	
4.0	Electrical Infrastructure	
4.1	The stabling facility will be designed and constructed in accordance with RIC Standards. Are there any other constraints to be imposed on the electrical infrastructure which are specific to this facility	
5.0	Signalling and Telecommunications systems & equipment	
5.1	The stabling facility will be designed and constructed in accordance with RIC Standards, Are there any other constraints to be imposed on the signalling and telecommunications systems & equipment which are specific	

	to this facility	
6.0	Other interface matters	
6.1	Fire control and protection	
6.2	Access control and protection (Site Security)	
6.3	Level crossing protection	
6.4	Operational signage	
6.5	Noise Attenuation (Near Neighbours)	
6.6	Light Attenuation (Near Neighbours)	
6.7	Light Attenuation (Running Lines)	
7.0	SRA Functional Specification Stabling Yards	
7.1	Detail and required deviations from the functional specification for Walkways	
7.2	Detail and required deviations from the functional specification for Lighting	
7.3	Detail any required deviations from the functional specification for Fresh Water Supply & wastewater Collection	

7.4	Detail and required deviations from the functional specification for Staff Amenity	
7.5	Detail any required deviations form the functional specification for Fencing	
7.6	Detail any required deviations from the functional specification for Refuse Disposal	
8.0	Support Documentation	
	The attached documents have been commissioned or produced and from part of the Client Brief.	
9.0	Additional Requirements	
1.0	Stabling Capacity	
1.15	Level of Arrival & Departure flexibility required	
2.0	Workforce and associated amenity	
2.1	No of PFM staff using stabling facility	
2.2	Does the facility need to provide amenity for contract staff (Eg Security etc.)	
3.0	Cleaning and Maintenance Activity	
	Is there any additional or varied cleaning or maintenance to be carried out over and above the level of functionality detailed in the Guideline Document	

	Define amended requirements to accommodate any additional or varied functionality (Eg Vehicle access to carry out discrete maintenance activities on limited basis)	
4.0	Track & Civil Infrastructure	
4.1	The stabling facility will be designed and constructed in accordance with RIC Standards for a Class2 siding. Are there any other constraints to be imposed on the track & civil infrastructure which are specific to this facility	
5.0	Electrical Infrastructure	
5.1	The stabling facility will be designed and constructed in accordance with RIC Standards. Are there any other electrical infrastructure which re specific to this facility	
6.0	Signalling and Telecommunications systems & equipment	
6.1	The stabling facility will be designed and constructed in accordance with RIC Standards. Are there any other constraints to be imposed on the Signalling and telecommunications systems & equipment which are specific to this facility	
7.0	Other interface matters	
7.1	Fire control and protection	
7.2	Access control and protection (Site Security)	
7.3	Level crossing protection	
7.4	Operational signage	

7.5	Noise Attenuation (Near Neighbours)	
7.6	Light Attenuation (Near Neighbours)	
7.7	Light Attenuation (Running Lines)	
8.0	Sra Functional Specification Stabling Yards	
8.1	Detail any required deviations form the functional specifications for Walkways	
8.2	Detail any required deviations from the functional specification for Lighting	
8.3	Detail and required deviations from the functional specification for Fresh Water Supply & Wastewater Collection	
8.4	Detail and required deviations from the functional specification for Staff Amenity	
8.5	Detail any required deviations from the functional specification for Fencing	
8.6	Detail any required deviations from the functional specification for Refuse Disposal	
9.0	Support Documentation	
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10.0	Additional Requirements	
Check Sheet for Specific Infrastructure Requirements - Passenger Fleet Maintenance <div style="float: right; text-align: right;"> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>   RailCorp </div>		
<p>The following check sheet is to be completed in consultation with the RailCorp PFM using the Stabling Yard & Sidings Functional Guidelines as the base requirements.</p>		
Ref.	Item	Comments
1.0	Stabling Capacity	
1.15	Level of Arrival & Departure flexibility required	
2.0	Workforce and associated amenity	
2.1	No of PFM staff using stabling facility	
2.2	Does the facility need to provide amenity for contract staff (Eg Security etc.)	
3.0	Cleaning and Maintenance Activity	
	Is there any additional or varied cleaning or maintenance to be carried out over and above the level of functionality detailed in the Guideline Document	
	Define amended requirements to accommodate any additional or varied functionality (Eg Vehicle access to carry out discrete maintenance activities on limited basis)	
4.0	Track & Civil Infrastructure	
4.1	The stabling facility will be designed and constructed in accordance with RailCorp Standards for a Class2 siding. Are there any other constraints to be imposed on the track & civil infrastructure which are specific to this facility	

5.0	Electrical Infrastructure	
5.1	The stabling facility will be designed and constructed in accordance with RailCorp Standards. Are there any other electrical infrastructure which are specific to this facility	
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7.6	Light Attenuation (Near Neighbours)	
7.7	Light Attenuation (Running Lines)	
8.0	RailCorp Functional Specification Stabling Yards	

8.1	Detail any required deviations from the functional specifications for Walkways	
8.2	Detail any required deviations from the functional specification for Lighting	
8.3	Detail and required deviations from the functional specification for Fresh Water Supply & Wastewater Collection	
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9.0	Support Documentation	
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10.0	Additional Requirements	

Document Status

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Document Control

This is a controlled document and will be reviewed annually and updated as changes are made to the User requirements.			
Version	Prepared by	Reviewed by	Date
Draft 1	Halcrow	RailCorp	22/8/2005
Draft 2	Halcrow	RailCorp	13/9/2005

Summary of Amendments

Version	Amendment
Draft 1	First Draft for initial comments
Draft 2	Draft for RailCorp Review

Distribution

Controlled Copy	Name	Position	Organisation
Adobe PDF Version	Dianne Rillos	Senior Project Development Manager	RailCorp