State Government Victoria

Department of Transport

WAURN PONDS TRAIN MAINTENANCE AND STABLING FACILITY

FINAL REPORT

23 DECEMBER 2010

PREPARED BY

coffey rail

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Revision	Description of Changes	Prepared	Checked	Date
0	Final Report	Allan Hoy	Peter Kwan	23/12/2010

CONTENTS

ATTACHMENTS:

EXECUTIVE SUMMARY

Introduction

The Department of Transport (DOT) engaged Coffey Rail (CR) to undertake a feasibility engineering assessment and cost estimate for a Train Stabling and Maintenance Facility of a proposed site located beyond the level crossing at Reservoir Road and Bogans Lane, Waurn Ponds (88.678km) and extending in the Down direction parallel to the railway for approximately 1,700 metres to Pettavel Road. CR is required to advise generally in regard to the suitability of the site for a potential train stabling and maintenance facility and prepare a conceptual layout for an ultimate development.

CR is to recommend an appropriate total footprint for the site to be acquired, sufficient to provide adequate capacity for long term usage and further expansion. The sizing of the site is to consider adequate separation from future development both south and north of the facility, including bunding and tree planting along the boundary to minimise noise and lighting intrusion to adjoining properties.

The layout is to be based on standard clearance requirements as a minimum, including provision for future overhead electrification.

Separate conceptual layouts and cost estimates are required for Stage 1 development in accordance with the staging requirements provided to CR by DOT on 13 December 2010, and the ultimate layout delivered to DOT as a draft on 3 December 2010.

Site Suitability

The proposed site identified by DOT was not accessible to CR for close inspection; however, a drive past was undertaken to establish, as best as possible, suitability of the site for the purpose intended.

The site is bounded by Bogans Lane PCR 88.678km to the east, Pettavel Road PCR 90.409km to the west and the railway Geelong – Warnambool line on the north.

The topography of the site generally follows the grade of the railway line. The railway line rises from Bogans Lane PCR at approximately 0.6% grade to mid-length of the site and falls approximately at the same grade to Pettavel Road PCR, forming a hump of about 5m high in the middle of the site. The site will be levelled for the construction of the proposed facility.

A private access road runs across the site and the main line at about 90km which will require to be closed.

A 200m wide strip of land will need to be acquired for the proposed facility, giving a total land acquisition requirement of 34.7Ha.

Site photographs are provided below.

Reservoir Road Level Crossing at the East end of facility site.

Crossing to be upgraded to boom barriers

Looking East to West from near Reservoir Road – Facility site

Looking East to West – Approximate location of turnout access to the facility

Looking North to South – Facility site

Key Requirements of the Brief

DOT proposed that the new facility be constructed and operated in conjunction with the intended acquisition of a new fleet of high capacity (HC) Diesel Multiple Units (DMU'S), primarily for Geelong line operation. The new DMU's are intended to operate as permanently coupled 4-car consists, with two consists coupled to form 8-car trains during peak periods. Specific key functional requirements at the new facility include:

- Maintenance, servicing and stabling facilities, together with a base for maintenance staff and on-train staff, i.e. drivers and conductors;
- External train wash;
- No provision for locomotive-hauled rolling stock;
- All HC DMU maintenance (other than heavy repairs), including unit exchange of all modular components;
- On-site inventory of appropriate components and consumable items;
- All routine servicing, including external and internal cleaning, fuelling, toilet extraction, etc;
- Stage 1 capacity to accommodate stabling for 8 x 8-car sets of VLocity DMU's or equivalent, either on 4 or 8 parallel tracks or a combination thereof, depending upon site suitability and an ultimate capacity for 24 x 8-car sets, preferably in 24 parallel tracks;
- Maintenance Workshop facility for Stage 1 to have provision for 3 service bays, with just two initially required to accommodate 2 x 4-car DMU's in parallel; however, the footprint of the facility is to provide for ultimate future expansion to 5 bays to accommodate up to 5 x 8-car DMU's or EMU's in parallel;
- A dedicated track for an under-floor wheel re-profiling facility in the vicinity of the workshop facility;
- A depot administration building, staff amenities and car parking, initially sized to accommodate 30 drivers, 20 conductors and supervisory staff plus 15 maintenance staff but with a footprint capable of being extended to accommodate up to three times that number;
- Access to the site by a single main line turnout, facing in the Down direction, immediately beyond the level crossing at 88.678km;
- A secondary (emergency) main line access at the Down end of the site;
- Local signal control of any movements within the depot precinct that do not impinge upon the main running line;
- Secure fencing of the entire site including remote controlled entrance gates at the two access points off the main line, interlocked with the signalling system;
- Pathways, lighting, security systems and all required services to meet current standards;

- Appropriate road access and internal roads; and
- Separation of the site from other developments on the south and north sides by appropriate bunding and tree planting.

Main Line Signalling

- Extension of the CTC system and appropriate signalling from Marshall to the Waurn Ponds facility, including future provision for a major station and crossing loop in the approximate vicinity of the 84km Marker Post and which provides Stage 1 headways for follow-on movements in each direction between Waurn Ponds and Marshall of about 8 minutes (if possible) keeping in mind an ultimate minimum 4 minute headway;
- Signalling of the Waurn Ponds cement siding (separable incremental cost required); and
- Upgrading of level crossing protection at 88.678km to boom barrier protection and appropriate integration with the signalling system.

The detailed DOT Brief and variations agreed between Coffey Rail and DOT are included as Appendix 4.

Staging of the Works

Stage 1 of the project is designed to provide just the essentials for servicing and stabling, including:

- Maintenance workshop building with provision for 3 service bays, but only 2 will be accessible at this stage, together with a materials store and facilities for 15 maintenance staff;
- Track #1 - bypass track;
- Track #2 - train fuelling and servicing track to accommodate 2 x 8-car trains (no external car wash);
- Fuel storage;
- Train stabling for 8 x 8-car trains;
- Single track access between the main line and facility;
- Minimum facilities for operations management and on-train staff, i.e. drivers and conductors, to accommodate 50 people;
- Access roads, lighting, staff car parking, security fencing, dam for water storage and limited bunding and tree planting;
- Main line signalling designed for a follow on headway of between 4 and 8 minutes; and
- Local signal control of train movements within the facility.

Stage 2 – Ultimate represents the ultimate facility, including:

- An expanded Maintenance Workshop to accommodate 5 x 8-car trains in parallel;
- Facilities and amenities within the Workshop building to include sign-on and supervisor areas, canteen, toilets, showers, lockers, etc., for approximately 45 administrative and maintainer staff (The canteen will be available to both maintenance and operations staff);
- Car parking for 50 cars and 10 motor cycles in the vicinity of the workshop for maintenance personnel and visitors;
- Additional tracks for fuelling and servicing and internal heavy cleaning;
- Expanded train stabling to accommodate a total 24 x 8-car trains in separate tracks;
- An external train wash facility;
- An under-floor wheel profiling facility;
- Extended bunding and tree planting; and
- Operations administration building to accommodate 150 shift workers with facilities to include:
    - Offices for operations administrative personnel;
    - Sign on areas, locker and ablution amenities, as well as kitchen, meal and standby facilities for on-train crew, i.e., drivers and conductors;
    - Train crew administration;
    - Training and meeting rooms; and
    - Car-parking, lighting, CCTV, public address and security.

Cost Estimates

Coffey Rail is required to provide a preliminary cost estimate for a Stage 1 development of the site, including appropriate contingency allowances at pre-design stage, together with an all inclusive estimate for the ultimate development of the facility.

Stage 1:

Stage 2:

Deleted - Confidential

The cost estimate does not include land acquisition.

The Cost Estimate assumptions are provided in Section 6.

The detailed cost estimates are included as Appendix 1.

1. GENERAL REQUIREMENTS

1.1. The Site

The proposed site identified by DOT was not accessible to CR for close inspection; however, a drive past was undertaken to establish, as best as possible, suitability of the site for the purpose intended.

The site is bounded by Bogans Lane PCR 88.678km to the east, Pettavel Road PCR 90.409km to the west and the railway Geelong – Warnambool line on the north.

The topography of the site generally follows the grade of the railway line. The railway line rises from Bogans Lane PCR at approximately 0.6% grade to mid-length of the site and falls approximately at the same grade to Pettavel Road PCR, forming a hump of about 5m high in the middle of the site.

A private access road runs across the site and the main line at about 90km.

The Warrnambool Line essentially forms the current boundary of the Marshall-Grovedale-Waurn Ponds residential area, with farmland to the south, which is a designated residential growth area for Geelong.

1.2. Design

The Maintenance facility and related buildings will be designed and constructed compliant with applicable local building codes and to suit environmental conditions; building services will adhere to international standards and requirements. Coffey Rail has extensive experience in design and operation of depots and considers that the documents prepared and delivered to DOT reflect this expertise.

The conceptual layout of the stabling facility has been developed using as a reference the VRIOGS Metropolitan Electric Train Stabling Design Guidelines, together with the functional requirements provided in the project brief and/or agreed in discussion with DOT at a meeting on Friday 26 November 2010.

1.3. Design Standards

1.1.1. General

The concept layout has been developed in consideration of the following standards:

- AS4292 Railway Safety Management;
- Victorian Rail Industry Operators Group Standards, VRIOGS; and
- PTC Heavy Rail Track Design Standards 1997.

In particular, the stabling layout has been designed based on VRIOGS 004.13 – 200X Metropolitan Electric Train Stabling.

1.1.2. Track and Civil

Track Centres

Track centres are In accordance with the above stabling standard and meet the requirements for:

- Operation of battery trucks between tracks;
- 4.75m minimum track centres have been adopted, which is believed to provide sufficient clearance to raise the DMU side skirt on one side;
- Between each second pair of tracks, track centres of 6.3m have been adopted to allow for placement of light poles and clearances to raise DMU side skirts on two adjacent vehicles; and
- Track centres are adequate to accommodate electrical structures if required.

Trackwork

The assumed track components comprise:

- 50 kg/m rail on concrete sleepers;
- 1 in 7.52 turnouts in the yard; and
- 1 in 9 turnout(s) on the main line.

1.4. Facility Specification

The ultimate facility conceptual layout has been developed and sized in accordance with DOT's specification requirements provided in the Brief and with some significant changes agreed during development of the facility layout. These include:

- Stabling sidings and tracks based on a VLocity car length of 25.255 m (202m for 8-car train);
- A Maintenance Workshop where all HC DMU maintenance (other than heavy repairs), including unit exchange of all modular components will be undertaken. The WS facility will include:
    - A Maintenance annex that provides for a small component clean repair room, adequate area for component and consumable items inventory with fork lift access, and maintenance staff facilities and amenities.
    - Servicing bays to accommodate 5 x 8-car trains in parallel with full width overhead cranes:
        - One bay will have an in-floor 4-car, jacking system,
        - One bay will be elevated above a full-width pit with fork lift access,
        - One bay will be flat with track laid flush to the floor surface,
        - Use of the remaining two bays will be identified at a later stage.

- Provision in the proximity of the Workshop for a Under-Floor Wheel Profiling facility;
- Servicing facilities, desirably in series layout to process incoming trains prior to entering stabling, to provide external washing and concurrent fuelling of 4 vehicles;
- A bypass track for trains entering stabling not requiring external washing or fuelling;
- A separate 8-car length track and covered platform set up with appropriate equipment for heavy periodic internal cleaning;
- Train stabling sidings to accommodate 24 x 8-car trains, all of which are to permit maintenance vehicle access between each pair of tracks;
- A fuel storage facility with 1 Megalitre of diesel capacity i.e. about three weeks supply;
- Site road access adequate for B-double access to maintenance and fuelling facilities and for approximate 3-tonne capacity vehicles between pairs of stabling tracks;
- Separate maintenance and on-train staff facilities and amenities, including sign-on and supervisor area, meal room, toilets, showers, lockers, etc. for train drivers and conductors initially sized to accommodate 30 drivers, 20 conductors and supervisory staff plus 15 maintenance staff with a footprint capable of being extended to accommodate up to three times that number;
- Access to the site by a single main line turnout, facing in the Down direction, immediately beyond the level crossing at 88.678km;
- A second access to the site between the main line and train stabling sidings;
- Local signal control of all train movements within the depot precinct that do not impinge upon the main running line;
- Secure fencing of the entire site including remote controlled entrance gates at the two access points off the main line, interlocked with the signalling system;
- Pathways, full site lighting, security systems, CCTV, public address and all required services to meet current standards;
- Appropriate road access and internal roads;
- Separation of the site from other developments on the south and north sides by appropriate bunding and tree planting; and
- Roof design to maximise rain water harvesting.

Main Line Signalling

- Extension of the CTC system and appropriate signalling from Marshall to the Waurn Ponds facility, including future provision for a major station and crossing loop in the approximate vicinity of the 84km Marker Post and which provides 4 minute follow on headways in each direction between Waurn Ponds and Marshall;
- Signalling of the Waurn Ponds cement siding (separable incremental cost required); and

- Upgrading of level crossing protection at 88.678km to boom barrier protection and appropriate integration with the signalling system.

The detailed DOT Brief and variations agreed between Coffey Rail and DOT are included as Appendix 4.

2. OPERATIONS AND MAINTENANCE PHILOSOPHY

2.1. Facility Layout

The objective when developing the overall track and facility layout was to minimise the movement of trains within the facility area for servicing, cleaning and maintenance purposes.

The track layout allows for trains entering the depot after service to be serviced (fuelling and toilet extraction) and washed (according to schedule) prior to stabling. Three tracks are provided for servicing. A service island is provided (1 track either side) to simultaneously service 2 x 8-car trains with water and fuel supply and sewage removal. The service island is proposed to be covered for all-weather operation. One of the island tracks leads through the train wash, while the other track provides a by-pass of the train wash.

The third service track has a covered platform and is intended for manual washing and interior special cleaning purposes.

All three servicing tracks are through tracks allowing for maximum operations flexibility.

In addition to the servicing tracks, the layout provides for:

- A bypass track allowing trains to proceed to and from stabling without passing through the service and/or train washing track;
- Train stabling to accommodate a total 24 x 8-car trains (no train servicing is planned in the stabling sidings);
- Trains shunting to and from the workshop and stabling facilities to proceed without interference with line operation;
- Efficient access between the stabling tracks and Workshop;
- Minimum number of road and foot crossings;
- Dual access between the facility and the main line to facilitate train movements during both normal and degraded operations; and
- Local signal control for all train movements within the facility.

2.2. Maintenance Workshop

The Maintenance Workshop building footprint allows for expansion to accommodate 5 x 8-car trains in parallel, together with a warehouse (store) facility and an administration area with all staff facilities and amenities. Refer to Section 1.4 and 2.7 for details.

2.3. Signalling and Control

The existing CTC system is extended from Marshall to the Waurn Ponds Train Maintenance and Stabling Facility with remote control provided from either Geelong or Centrol to facilitate smooth and safe access and exit between the Warrnambool main line and the facility.

The signalling layout provides for 4 minute follow-on movements between Marshall and Waurn Ponds. Refer to Section 5.1 for staging details.

The Waurn Ponds cement siding is signalled.

There is provision for the level crossing protection at 88.678km to be upgraded to boom barrier protection and be appropriately integrated with the signalling system.

Two separate access points are provided between the main line and the facility. The second access is arranged to provide flexibility in the event of point failure, derailment, etc. to ensure, as far as practicable, that accessibility between the train stabling tracks and the main line is not compromised.

All train movements, between the main line and facility are expected to be planned and coordinated by the Train Controller at Geelong or Centrol and the Depot Operations Supervisor. Train movements within the depot will be planned and co-ordinated by the Depot Operations Supervisor and Maintenance Supervisor, as appropriate.

2.4. Communications

Communications allowed for include:

- CCTV;
- Security and access control;
- Public address in specific areas;
- Phones and computer systems; and
- Alarms.

2.5. Lighting

Flood lighting is intended throughout the facility to provide both security of the asset and safety of personnel. The lighting should be designed with suitable cut-offs, screening and glare suppression to minimise impact on adjacent land use and be arranged in such a way that it can be sectionalised and controlled for most effective and efficient use.

2.6. Operations Administration and Train Crew Facilities

Operations administration personnel, local signalling control and train crew (drivers and conductors) are accommodated together in a building in the vicinity of the stabling sidings. The actual location should consider minimising walking times for train crews. The building may be a single or multi level structure and include provision for offices for operations administrative personnel, training and meeting rooms, train crew administration and sign on areas, locker and

ablution amenities, as well as kitchen, meal and standby facilities. Initially, this facility will accommodate 50 personnel, with future requirements for 150.

2.7. Maintenance Administration and Staff Facilities

Maintenance administrative and maintenance personnel are accommodated within the Workshop building. Facilities and amenities will include offices for maintenance administrative personnel, training and meeting rooms, maintenance staff sign on areas, locker and ablution amenities, toilets, as well as a general canteen and meal facility for use by both maintenance and operations staff. Initially, maintenance facilities will accommodate 15 personnel, with future requirements for 50.

2.8. Mechanical Services

Mechanical services allowed for include:

- General lighting and power;
- Water and fire services;
- Sewerage and train toilet eduction system; and
- Diesel fuel service pumps.

2.9. Road Vehicle Movements within the Depot

The main access gate to the site is provided at the east end of the facility and all entries and exits, including staff and all deliveries by service vehicles, should be routed through this entrance gate. An emergency access / exit gate is provided at the western end of the site for use by emergency vehicles, if required.

The road layout is designed to limit the need to cross tracks.

Appropriate access is provided for emergency vehicles to the workshop, stabling tracks and main parts of the facility.

Adequate parking space for cars and two wheeled vehicles is provided for both maintenance and operations staff and visitors. Parking has been located, such to minimise walking time between work points.

Visitors and administrative personnel should be directed to the administrative area and the dedicated car park after checking, identification and registration at the main access gate.

2.10. Pedestrian Movements within the Depot

At a later stage of design, adequate access and pedestrian footpaths should be provided to minimise the amount of walking required, and to provide for personnel safety.

3. SAFETY AND SECURITY ARRANGEMENTS

Safety and security should be given the highest reasonable level of attention to protect maintenance and operating staff from any hazards that may exist throughout the facility. Reasonable security measures should be provided to protect the physical asset from fire, theft and intrusion. A safety plan should be developed later to identify and mitigate identified hazards, in line with the Operator's Safety Management and Security Plan.

3.1. Safety Aspects

Adequate, safe personnel access routes are provided to enable safe and efficient movement within the facility for normal operations and for emergency evacuation. Such access routes include routes between stabled trains, routes adjacent to tracks and cross-track walkways and rail/road crossing protection.

After due risk assessment, areas where there is potential danger to personnel should be fenced off, or guardrails and warning signs erected as necessary in accordance with applicable safety standards.

A Fire Alarm System should be installed, and fire fighting and emergency equipment provided at appropriate locations throughout the depot.

3.2. Security Measures

The entire facility compound is completely fenced. Road access is provided by a single entrance only. All entries and exits, including pedestrians and deliveries by service vehicles, should proceed through this entrance gate, controlled by well trained security guards.

Flood lighting is proposed within the compound for the following areas:

- Remote controlled entrance gate on both train arrival tracks, interlocked with the signalling system;
- Perimeter fencing;
- Stabling tracks;
- Servicing tracks;
- Fuel storage area;
- Outdoor storage areas;
- Road and rail apron areas at workshop entrances;
- Workshop store;
- Level crossings; and
- Security checkpoints.

Intrusion alarms for key areas are recommended; CCTV is proposed with surveillance covering the perimeter fencing, gates, fuel storage area, stabling sidings, and the entrances to the workshop facility, amenities buildings, equipment storage sheds and service facilities.

4. ENVIRONMENTAL

The site is reasonably flat and open. Clear separation from future developments on the south and north side is recommended. The objective is to minimise any noise and lighting impact on adjoining developments. Bunding and tree planting around the facility boundary is proposed and included in the cost estimate for both Stage 1 and the ultimate layouts.

5. STAGING OF THE WORKS

5.1. Stage 1

Stage 1 of the project is designed to provide just the essentials for servicing and stabling, including:

- Train stabling for 8 x 8-car trains;
- First stage construction of the maintenance workshop building with provision for 3 service bays, but only 2 will be accessible for start of Stage 1, together with a materials store and facilities for 15 maintenance staff;
- Track #1 - Bypass track;
- Track #2 - Train fuelling and servicing track to accommodate 2 x 8-car trains (no external car wash);
- Single track access between the main line and facility;
- Minimised operations administrative and on-train staff facilities, i.e. drivers and conductors to accommodate 50 people;
- Access roads, staff car parking, security fencing, dam for water storage, and bunding and tree planting, appropriate to Stage 1;
- Fuel storage facility (40% of ultimate);
- The existing CTC system extended from Marshall to the Waurn Ponds Train Maintenance and Stabling Facility with remote control of the main line access to and from the facility;
- The running time between Marshall station and the Waurn Ponds facility is estimated at 6.5 minutes. The headway for follow-on train movements is 4 minutes for the ultimate scheme and keeping in mind the proposed intermediate station (Armstrong Creek) an

extension to say 5 minutes would result in minimum cost savings. Hence, the follow-on headway for Stage 1 has been left at 4 minutes.

- Signalling of the existing Waurn Ponds cement siding;
- Upgrading of Reservoir Road level crossing to boom barrier protection; and
- Local signal control of train movements within the facility;

5.2. Stage 2 - Ultimate

Stage 2 of the project is designed to represent the ultimate facility; this stage will include:

- Expanded train stabling to accommodate an additional 16 x 8-car trains (making total of 24 x 8-car trains, with further expansion possible);
- Expanded maintenance workshop to accommodate 5 x 8-car trains in parallel, as well as maintenance staff requirements for approximately 45 administrative and maintenance personnel. Facilities and amenities will likely be provided within the Workshop to include sign-on and supervisor areas, canteen, toilets, showers, lockers, etc. Car parking will be provided for approximately 50 cars to accommodate maintenance staff and visitors.
- Additional tracks for fuelling and servicing and internal heavy cleaning;
- External train wash facility;
- Underfloor wheel profiling facility;
- Offices for operations administrative personnel, training and meeting rooms, train crew administration and sign on areas, locker and ablution amenities, as well as kitchen, meal and standby facilities. Initially, this facility is to accommodate requirements for 150 people, with adequate supporting infrastructure, car parking, security, etc.
- Second access between the main line and the facility;
- Extended fuel storage capability; and
- Extended bunding and tree planting of the facility boundary.

6. COST ESTIMATE ASSUMPTIONS

6.1. General

6.1.1. Earthworks and Drainage

Assumptions: The earthworks and drainage costs allow for the conditions that are likely to be encountered in the area. It is assumed that the selected area will be naturally well-drained and not swampy. The existing ground condition is suitable for construction of the proposed facility.

Earthworks: The Waurn Ponds soils are limestone derived and are well suited to cropping, which is the predominant vegetation. After removal of topsoil, the soil is expected to be

suitable for use as structural fill associated with levelling of the site. It is estimated that the cut and fill requirement of the site can be roughly balanced.

Drainage: The basis for the estimate is to provide:

- Open catch drains at top of batters;
- Open table drains at the toe of batters;
- Track subsurface drainage every second track;
- Kerb and channel on access roads and car parks if the fall requires. At this stage we have assumed kerb and channel on the edge of road and car park pavements; and
- An underground, piped, stormwater drainage system.

All drainage, other than from roofs, will be fed into stormwater drainage system. Allowance has been made for underground pipes along both long sides of the depot, a retention basin and sullage separation pit. Runoff from roofs is proposed to be collected in rainwater tanks for use in toilets and nearby gardens.

Excavation for stormwater drainage pipes could encounter calcareous material and the unit rate per metre of pipe has been raised in consideration of such conditions occurring below the nominal cut surface for the general yard.

6.1.2. Trackwork

Trackwork costs have been based on the use of new materials for ballast, sleepers, rail and turnouts. Some cost savings could be made if serviceable materials are available for use, instead of new.

The track estimates should be reasonably accurate and the 30% contingency should be a generous allowance for possible changes in the track layout, track lengths and turnout requirements.

6.1.3. Maintenance Facilities and Amenities

The maintenance facilities and amenities costs have been based on costs of previous similar facilities, including Dudley Street depot, Nowergup Depot (WA), Craigieburn Stabling Facility, Cranbourne Stabling Facility and South Dynon Carwash Facility. The use of index adjusted rates from Dudley Street, which was an unexpectedly expensive project, should result in a conservative estimate for the Geelong Depot facilities.

6.1.4. Fuel Storage

It is noted that the storage at South Dynon comprises two 550,000 litre tanks; however the tanks are huge and would be difficult to screen or set below ground level, with maintenance vehicle access.

The concept layout and estimated cost of the fuel storage facility are based on ten 100,000 litre tanks, each say 6.5 m diameter and 3.5 m high (height to diameter ratio yet to be optimised).

Consideration should be given to setting the fuel storage below ground level for safety and aesthetic reasons.

A suitable configuration needs to be resolved.

6.2. Estimated Costs

The cost estimates are included as Appendix 1.

Total estimated cost for development of Stage 1 (including DOT standard on-costs) is Deleted - Confidential million.

Total estimated cost for the Ultimate extension (including DOT standard on-costs) is Deleted - Confidential million.

The cost estimate does not include land acquisition.

APPENDIX 1

Cost Estimates

PREPARED BY: COFFEY RAIL PTY LTD
DATE: 22 December 2010
PLANS: 21779-R-0002
SCOPE: Stage 1

PROJECT: Geelong - New Rollingstock Facility Feasibility Study

ORDER OF COST ESTIMATE

DESCRIPTION	UNIT	QUANTITY	RATE	ITEM COST	CONTINGENCY %	CONTINGENCY $	TOTAL ITEM COST	COMMENTS
STAGE 1								
Earthworks								
Light clearing and stockpile	sqm							
Cut to fill	cum							
FCR Capping layer 150mm	sqm							
Additional landscaping	Item							
Perimeter earth mounds, 3m high	cum							
Drainage								
Stormwater	m							600 mm dia RCP
Retention basin	Item							
Sullage separation pit	Item							
Rainwater Storage	Item							
Kerb & Channel on access and car parks	m							
Side entry pits, grated pits, junction pits	No.							
Pipe connections to main drainage	m							
Trackwork								
Supply and install 1 in 7.52 turnouts	No.							
Supply and install 1 in 9 turnouts	No.							
Construct new stabling track	m							50kg track
Track Drainage (Subsurface drain)	m							150mm dia slotted PVC including pits
Steel Buffer Stop	No.							
Facilities								
Train crew amenities and cleaners' store	sqm							
Covered Platform	m							
Fuel Point	No.							
Fuel Tanks	No.							0.4 ML capacity
Concrete slab for fuel tanks	cum							30 m x 65 m x 0.5 m
Fire protection equipment at Fuel Storage	Item							
Maintenance Facility								
Maintenance Building	Item							
Cooling & ventilation	Item							
Gas	Item							
Water	Item							
Compressed air	Item							
Fire Services	Item							
Vacuum System	Item							
Communications	Item							
Lifting jacks	Item							
Cranes	Item							
Miscellaneous equipment	Item							
Drains	Item							
Office furniture	Item							
Lighting & Power	Item							

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PREPARED BY: COFFEY RAIL PTY LTD
DATE: 22 December 2010
PLANS: 21779-R-0002
SCOPE: Stage 1

PROJECT: Geelong - New Rollingstock Facility
Feasibility Study

ORDER OF COST ESTIMATE

DESCRIPTION	UNIT	QUANTITY	RATE	ITEM COST	CONTINGENCY %	CONTINGENCY $	TOTAL ITEM COST	COMMENTS
Civil Works								
Security fencing with Tiger tape wire	m							Allow for gates
Footpath	sqm							40mm thick asphalt
Train gate	No.							Exclude interlocking
Acces Roads, Hardstanding, Vehicle Parking								
Access Road	sqm							
Loading, handling area	sqm							
Car parking	sqm							
Mechanical Services								
Yard lighting	No.							
Fire services	Item							
CCTV system	Item							
Electricity supply	Item							
Signalling (Marshall - Waurn Ponds)								Including cement siding
ML Signals	No.							Exclude 2 signals and 2 points at Armstrong Creek
ML Points	No.							
Dwarf Signal	No.							
Level Crossing Protection Upgrade	No.							Reservoir Rd
Control and Indications VDU and Telemetry	No.							
Signalling (Yard)								
Dwarf Signal	No.							
Interlock gates	No.							
Siding Points	No.							
MISCELLANEOUS								
Land Acquisition	sqm							
Services relocation	No.							Nominal
De-contamination	No.							Nominal
Environmental Works	No.							Nominal
Traffic Mitigation Works	No.							Nominal
Total Direct Cost								
On Costs								
Design Cost & Project Management								
Contractor's On costs								
Contractor overheads and margin								
Lessee/Operator PM (minor role)								
Other Authority/Agency Consultee charges								
Project Insurance								
DOT PM (major role)								

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PREPARED BY: COFFEY RAIL PTY LTD
DATE: 22 December 2010
PLANS: 21779-R-0002
SCOPE: Stage 1

PROJECT: Geelong - New Rollingstock Facility
Feasibility Study

ORDER OF COST ESTIMATE

DESCRIPTION	UNIT	QUANTITY	RATE	ITEM COST	CONTINGENCY %	CONTINGENCY $	TOTAL ITEM COST	COMMENTS
Total On Cost								
TOTAL CONSTRUCTION COST								
Risk Adjustment								
Unplanned / Out of Scope Risks								
Escalation Risk								
Total Project Risk Adjusted Cost							Deleted - Confidential	
DOT Corporate Levy								Deleted - Confidential
DOT Project Development Levy								
TOTAL PROJECT COST								At 2010 cost

PREPARED BY: COFFEY RAIL PTY LTD
DATE: 22 December 2010
PLANS: 21779-R-0001
SCOPE: Stage 2

PROJECT: Geelong - New Rollingstock Facility
Feasibility Study

ORDER OF COST ESTIMATE

DESCRIPTION	UNIT	QUANTITY	RATE	ITEM COST	CONTINGENCY %	CONTINGENCY $	TOTAL ITEM COST	COMMENTS
STAGE 2								
Earthworks								
Light clearing and stockpile	sqm							
Cut to fill	cum							
FCR Capping layer 150mm	sqm							
Additional landscaping	Item							
Perimeter earth mounds, 3m high	cum							
Drainage								
Kerb & Channel on access and car parks	m							
Side entry pits, grated pits, junction pits	No.							
Pipe connections to main drainage	m							
Trackwork								
Supply and install 1 in 7.52 turnouts	No.							
Supply and install 1 in 9 turnouts	No.							
Construct new stabling track	m							50kg track
Track Drainage (Subsurface drain)	m							150mm dia slotted PVC including pits
Steel Buffer Stop	No.							
Facilities								
Train crew amenities and cleaners' store	sqm							
Fuel Point	No.							
Fuel Tanks	No.			Deleted - Confidential				0.6 ML capacity
Concrete slab for fuel tanks	cum							30 m x 65 m x 0.5 m
Fire protection equipment at Fuel Storage	Item							
Train Wash								
Wash plant	Item							
Wash plant building	Item							70m long x 8m wide
Wheel Lathe								
Wheel Lathe	Item							
Wheel lathe building	Item							70m long x 8m wide
Civil Works								
Footpath	sqm							40mm thick asphalt
Train gate	No.							Exclude interlocking
Acces Roads, Hardstanding, Vehicle Parking								
Access Road	sqm							
Loading, handling area	sqm							
Car parking	sqm							
Mechanical Services								
Yard lighting	No.							
Fire services	Item							

PREPARED BY: COFFEY RAIL PTY LTD
DATE: 22 December 2010
PLANS: 21779-R-0001
SCOPE: Stage 2

PROJECT: Geelong - New Rollingstock Facility
Feasibility Study

ORDER OF COST ESTIMATE

DESCRIPTION	UNIT	QUANTITY	RATE	ITEM COST	CONTINGENCY %	CONTINGENCY $	TOTAL ITEM COST	COMMENTS
CCTV system	Item							
Electricity supply	Item							
Signalling (Marshall - Waurn Ponds)								Including cement siding
ML Signals	No.							Exclude 2 signals and 2 points at Armstrong Creek
ML Points	No.							
Control and Indications VDU and Telemetry	No.							
Signalling (Yard)								
Dwarf Signal	No.							
Interlock gates	No.							
Siding Points	No.							
MISCELLANEOUS								
Land Acquisition	sqm							
Services relocation	No.							Nominal
De-contamination	No.							Nominal
Environmental Works	No.							Nominal
Traffic Mitigation Works	No.							Nominal
Total Direct Cost								
On Costs								
Design Cost & Project Management								
Contractor's On costs								
Contractor overheads and margin								
Lessee/Operator PM (minor role)								
Other Authority/Agency Consultee charges								
Project Insurance								
DOT PM (major role)								
Total On Cost								
TOTAL CONSTRUCTION COST								
Risk Adjustment								
Unplanned / Out of Scope Risks								
Escalation Risk								
Total Project Risk Adjusted Cost								
DOT Corporate Levy								
DOT Project Development Levy								
TOTAL PROJECT COST								At 2010 cost

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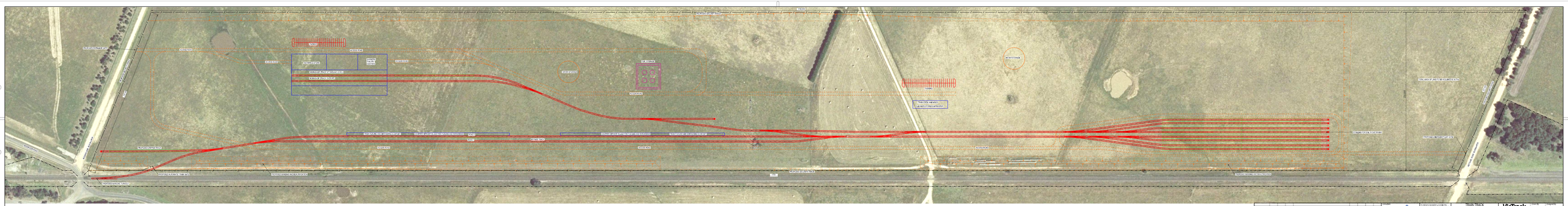
APPENDIX 2

Civil Drawings



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PRELIMINARY DRAWING
FOR DISCUSSION PURPOSES ONLY

DRAFT

Revised By	In Serv	Rev.	Date	Description	Designed	Checked	Ind. Rev.	Approv.
COFFEY RAIL		P1	21/12/10	PRELIMINARY ISSUE	R.J.B.			

<REDRAWN & REVISED. SUPERSEDES PLAN No. REV. DATED / / .>

Consultant
coffey rail

Franchisee / Lessee
State Government Victoria
Department of Transport

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TRAIN TRACK
WAURN PONDS
PROPOSED TRAIN MAINTENANCE
AND STABLING FACILITY
STAGE 1

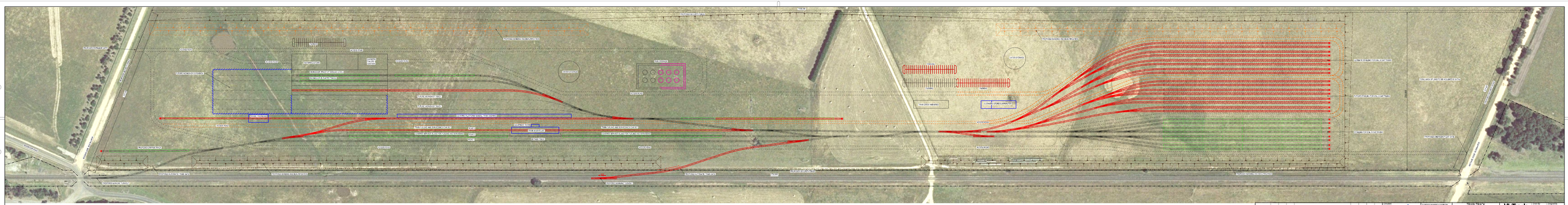
Up Location	Down Location	Datum
East. North. ID#	East. North. ID#	<MGA Z55>

VicTrack ACCESS

File Name <Enter the CAD file name>
Sheet No. <01> of <01>
In Serv.
Scale 1:1000
Sheet Size A3 LONG

Drawn By R.J.B.	Designed By R.J.B.
Checked By	Ind. Review
Approved	Approval Date
Drawing Number 21779-R-0002	Revision P1

:\21779\R-RAILWAY TRACK\21779-R-0002_P1.dgn
21/12/2010 9:18:50 AM



ULTIMATE TRACK LAYOUT 🟥
STAGE 1 TRACK LAYOUT ═

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PRELIMINARY DRAWING
FOR DISCUSSION PURPOSES ONLY

DRAFT

Revised By	In Serv	Rev.	Date	Description	Designed	Checked	Ind. Rev.	Approv.
COFFEY RAIL		P2	21/12/10	SECOND PRELIMINARY ISSUE	RJB			
COFFEY RAIL		P1		PRELIMINARY ISSUE	R.J.B.			

<REDRAWN & REVISED. SUPERSEDES PLAN No. REV. DATED / / .>

Consultant
coffey rail

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TRAIN TRACK
WAURN PONDS
PROPOSED TRAIN MAINTENANCE AND STABLING FACILITY ULTIMATE LAYOUT

Up Location	Down Location	Datum
East.	East.	<MGA Z55>
North.	North.	
ID#	ID#	

VicTrack ACCESS

File Name <Enter the CAD file name>
Sheet No. <01> of <01>
In Serv.
Scale 1:1000
Sheet Size A3 LONG

Drawn By R.J.B.	Designed By R.J.B.
Checked By	Ind. Review
Approved	Approval Date

Drawing Number 21779-R-0001
Revision P2

21/12/2010 9:20:32 AM
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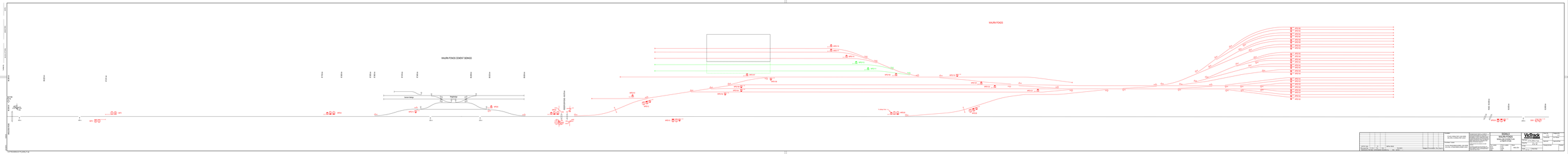
APPENDIX 3

Signalling Drawings



22/12/2010 16:06:59

J:\21779\G-SIGNALS\21779_G0002_P1.dgn

COFFEY RAIL		P1		INITIAL ISSUE				
Revised By	In Serv	Rev.	Date	Description	Designed	Checked	Ind. Rev.	Approv.

<REDRAWN & REVISED. SUPERSEDES DRAWING No. REV. DATED / / .>

Consultant

<PLACE CONSULTANT LOGO HERE
ON LEVEL X-CONSULTANT LOGO>

Franchisee / Lessee

<PLACE FRANCHISEE/LESSEE LOGO HERE
ON LEVEL X-FRANCHISEE-LESSEE LOGO>

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SIGNALS
WAURN PONDS
SIGNALLING SCHEME PLAN
ULTIMATE STAGE

Up Location	Down Location	Datum
East. North. ID#	East. North. ID#	<MGA Z55>

VicTrack
ACCESS

File Name 21779_G0002_P1.dgn

Sheet No. 2 of 2

In Serv.

Scale <N.T.S.>

Sheet Size

Drawn By C.G.	Designed By C.G.
Checked By	Ind. Review
Approved	Approval Date
Drawing Number	Revision

Revised By	In Serv	Rev.	Date	Description	Designed	Checked	Ind. Rev.	Approv.
COFFEY RAIL		P1		INITIAL ISSUE				

<REDRAWN & REVISED. SUPERSEDES DRAWING No. REV. DATED / / .>

Consultant
<PLACE CONSULTANT LOGO HERE ON LEVEL X-CONSULTANT LOGO>

Franchisee / Lessee
<PLACE FRANCHISEE/LESSEE LOGO HERE ON LEVEL X-FRANCHISEE-LESSEE LOGO>

SIGNALS

MARSHALL - ARMSTRONG CREEK

SIGNALLING SCHEME PLAN
STAGE 1 AND ULTIMATE

Up Location
East.
North.
ID#

Down Location
East.
North.
ID#

Datum <MGA Z55>

VicTrack ACCESS

File Name <Enter the CAD file name>
Sheet No. 1 of 2
In Serv.
Scale <N.T.S.>
Sheet Size

Drawn By C.G.
Designed By <A.B.C.>
Checked By
Ind. Review
Approved
Approval Date
Drawing Number
Revision

APPENDIX 4

DOT Brief and Variations

Department of Transport – Public Transport Division

Draft Consultancy Brief for a Preliminary Engineering Assessment and Cost Estimate for a Waurn Ponds Stabling and Maintenance Facility

Background

DOT has for some time been examining options for the future construction of a train stabling and maintenance facility in the general vicinity of Waurn Ponds. Previous studies have centred on property owned by the Boral Group (Blue Circle Southern Cement) to the north of the main Melbourne-Warrnambool railway at Waurn Ponds however the likely costs of land remediation and civil works on that site have now ruled it out as a practical option.

An alternative site has now been identified involving private land to the south of the railway commencing immediately beyond the level crossing at Reservoir Road and Bogans Lane, Waurn Ponds (88.678km) and extending in the Down direction parallel to the railway for approximately 1,700 metres to Pettavel Road. The site could have a potential width of around 300 metres or approximately 50ha. It is emphasised that, as private land, any work in the vicinity cannot include access to the site at this time.

Consultancy brief

The consultant is requested to undertake the following work:

- Advise generally in regard to the suitability of the site for a potential train stabling and maintenance facility based on a generalised local knowledge of the area's geology and other site information that can be obtained without site access.
- Prepare a conceptual layout for an ultimate development on the site to provide the same level of facility and functionality as was previously prepared for the Boral site.
- Recommend an appropriate total footprint for the site to be acquired that will provide adequate capacity for long term usage and further expansion if needed beyond that previously considered for the Boral site. The extent of any such possible further expansion will be separately discussed with the consultant.
- Provide for standard clearance requirements as a minimum including provision for future electrification.
- Provide a preliminary cost estimate for a Stage 1 development of the site including appropriate contingency allowances at pre-design stage with provision for:
    - all required civil and track works
    - capacity to stable up to 8 x 8-car sets of VLocity DMU's or equivalent, either on 4 or 8 parallel tracks or a combination thereof, depending upon site suitability
    - fuelling and de-watering facilities
    - a maintenance facility to initially accommodate 2 x 4-car DMU's in parallel (cost for civil, signalling, track and site services only, i.e. not for the shed) but with a footprint for future expansion that would ultimately accommodate up to 4 x 8-car DMU's or EMU's.
    - access to the site by a single main line turnout, facing in the Down direction, immediately beyond the level crossing at 88.678km.

- provision for emergency main line access at the Down end of the site from at least one siding track will be considered as a possible option (separable cost required)
- extension of the CTC system and appropriate signalling from Marshall to Waurn Ponds including future provision for a major station and crossing loop in the approximate vicinity of the 84km MP and which provides for minimum 4 minute headways for follow-on movements in each direction between Waurn Ponds and Marshall.
- signalling of the Waurn Ponds cement siding (separable incremental cost required).
- local signal control of any movements within the depot precinct that do not impinge upon the main running line.
- upgrading of level crossing protection at 88.678km to boom barrier protection and appropriate integration with the signalling system.
- provision of a depot administration building, staff amenities and car parking, initially sized to accommodate 30 drivers, 20 conductors and supervisory staff plus 15 maintenance staff but with a footprint capable of being extended to accommodate up to three times that number.
- provision of secure fencing of the entire site including a remote controlled entrance gate on the main arrival track interlocked with the signalling system.
- provision of pathways, lighting, security systems and all required services to meet current standards.
- provision of appropriate road access.

- Advise regarding any known risk factors or other relevant matters that should be considered at this stage.

It is not envisaged that the facility will need to cater for locomotive-hauled rolling stock at any stage.

Weekly progress meetings (documented by the consultant) with nominated DOT representative/s are to be arranged from the date of project initiation until supply of the draft final report.

A preliminary draft report setting all available information at that stage is required no later than 2 weeks from engagement.

A final draft report is required no later than four weeks after engagement.

From: Chris.Banger@transport.vic.gov.au
Sent: Monday, 29 November 2010 10:45 AM
To: Allan Hoy
Subject: Re: Waurn Ponds

Hello Allan,

I spoke with the planner involved with Armstrong Creek (Graeme Vellacott) and apparently they don't have the type of detail we require, but he did say the following:

Armstrong Creek will be an island platform.
A crossing loop will be provided at Armstrong Creek with the island platform between the two tracks.
The signalling system between Marshall and Armstrong Creek should be capable of accommodating trains every 30 minutes in each direction, except in the peak period, where the frequency should be 15 minutes in the peak direction only.
It will probably be necessary to make some modifications at Marshall to enable trains to cross at this point, i.e. a second platform and footbridge.

I hope this helps.

Kind Regards

Chris Banger

From: Chris.Banger@transport.vic.gov.au
Sent: Monday, 29 November 2010 3:40 PM
To: Allan Hoy
Subject: Fw: Waurn Ponds

Hello Allan,

Your right!!

Please proceed with the 5 roads as outlined in John's email.

Kind Regards

Chris Banger

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----- Forwarded by Chris Banger/CORE/DOI on 29/11/10 03:38 PM -----

John Hearsch/CORE/DOI
29/11/10 03:37 PM

To: Chris Banger/CORE/DOI@DOI
cc:
Subject: Re: Waurn Ponds(Document link: Chris Banger)

Chris

At the meeting with Allan I thought we had said to provide for an ultimate 5 roads x 8-car length (not 4), with 3 x 4-car length provided initially.

In terms of the required building footprint I think this would be advisable, even if the 5th road is not within the main building outline but provided as an add-on annex at a later date. This would probably fit with the brief you have provided to Worley.

Regards
John

Chris Banger/CORE/DOI
29/11/10 03:18 PM

To: Allan Hoy <Allan_Hoy@coffey.com>
cc: John Hearsch/CORE/DOI@VICGOV1
Subject: Re: Waurn Ponds(Document link: John Hearsch)

Hello Allan,

I agree with points 2, 3 and 4, and the second half of point 1, i.e. the capability to expand the maintenance facility out to 8 cars.

However, I thought that we only wanted 4 tracks for the maintenance facility. I will need to check with John on this one.

Kind Regards

Chris Banger

Deleted - Confidential

Allan Hoy
<Allan_Hoy@coffey
.com>

29/11/10 02:23 PM

To
"Chris.Banger@transport.vic.gov.au"
<Chris.Banger@transport.vic.gov.au>
cc

Subject
Waurn Ponds

Hi Chris,

At our meeting on Friday 26 November 2010, we discussed and agreed a couple of important changes to the DOT brief, which I believe should be recorded. Specifically these are:

1) The maintenance facility footprint will provide for future expansion to ultimately accommodate up to 5 x 8 – car DMUs or EMUs (previously 4). Further, the footprint will allow for future extension of the maintenance facility to accommodate full length 8–car DMUs or EMUs (not 4-car units in parallel).
2) The layout will ultimately accommodate 24 x 8-car trains in single track sidings - three fans, each of eight tracks. 8 x 8-car trains will be accommodated as Stage 1.
3) A second main line access at the Down end of the stabling facility (emergency) is not required. Instead, a second main line access will be provided between the Up end of the stabling tracks and Down end of the servicing tracks.
4) The land to be acquired (determined by Coffey Rail) will include allowance for all internal road traffic, as well as bunding and tree planting along the south and north boundaries.

Please confirm that this is also your understanding of our discussion. In the meantime, Coffey Rail is preparing drawings based on the DOT brief and the above direction.

Regards,

Allan

ALLAN HOY
Principal, Operations
Coffey Rail
Level 2, 60 Collins St Melbourne Victoria 3000 Australia T Deleted - Confidential F (+61) 3 9650 7622 Deleted - Confidential coffey.com

From: Chris.Banger@transport.vic.gov.au
Sent: Monday, 29 November 2010 3:43 PM
To: Allan Hoy
Subject: Variation to Waurn Ponds Study

Hello Allan,

Could you please indicate if Coffey could do the following:

Prepare a conceptual design of the train maintenance building at Waurn Ponds (As per our previous email).
Prepare a cost of the building.

Kind Regards

Chris Banger
DOT

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