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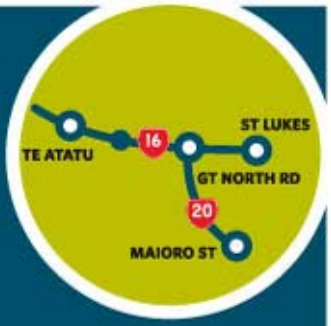
Western Ring Route – Waterview Connection



DRAFT Site Specific Construction Environmental Management Plan – Construction Yard 7

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Overview

Construction Yard 7 is proposed to be located within the Oakley Creek Esplanade Reserve (Waterview Glades) on the eastern side of Great North Road. The construction yard will primarily be used to support the cut and cover construction of the Great North Road underpass (which runs through part of the yard itself), and provide initial access for the driven tunnel works until the cut and cover construction has been completed such that access can then be provided from Construction Yard 6 (Waterview Reserve).

The Board of Inquiry has raised concerns about the operation of Construction Yard 7, particularly in relation to the location of the yard within a steep area and directly adjacent to Oakley Creek, a highly sensitive waterway. It has suggested that the proposed management of this area be reviewed and consideration given to whether any further conditions are required to ensure that the sensitivities of the site are acknowledged and appropriate mitigation is put in place during construction. It has been suggested that schematic plans, including cross sections be prepared, that are indicative of how this land will be accessed and where retention works and mitigation works are likely to be placed[1].

This DRAFT Site Specific Construction Environmental Management Plan (SSCEMP)[2] has been prepared for Construction Yard 7 to provide an indicative framework to the Board of Inquiry on:

- How construction works are likely to be undertaken in this area;
- How environmental issues will be identified; and
- How these issues will be managed in accordance with the conditions of designation and resource consents and the environmental management plans required by the conditions.

Drawings to support the DRAFT SSCEMP are provided[3] to demonstrate the different stages of construction that are likely to take place, and the mitigation measures that will be put in place to manage the potential effects on the environment.

In preparing the DRAFT SSCEMP (Construction Yard 7), specific consideration has been given to the sensitivities of the site and receiving environment, the activities that will occur on the site, the proposed conditions of designation and resource consent, and whether there is a need for further conditions to be developed to manage potential effects on the environment. This process has shown that there are appropriate requirements in place, in both the conditions of designation and resource consent and in the environmental management plans prepared as part of the application, to effectively manage the activities that will occur within Construction Yard 7 in a safe and environmentally sound way.

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1 Board of Inquiry Waterview Connection Proposal, Transcription of Hearing Day 16 Friday 25 March 2011, Pages 1837 and 1838.

2 This DRAFT SSCEMP is not intended as the FINAL SSCEMP for Construction Yard 7. That would be completed by the contractor.

3 Drawing 20.1.11-3-D-N-912-301 to 305 (Rev A) that show the proposed staging of the works, and Drawing 20.1.11-3-D-N-912-306 Rev A that provides cross sections of the site during construction works.

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Drawing 20.1.11-3-D-N-912-302 Rev A	Construction Yard 7 Stage 2, Phase 1
Drawing 20.1.11-3-D-N-912-303 Rev A	Construction Yard 7 Stage 2, Phase 2
Drawing 20.1.11-3-D-N-912-304 Rev A	Construction Yard 7 Stage 2, Phase 3
Drawing 20.1.11-3-D-N-912-305 Rev A	Construction Yard 7 Stage 3
Drawing 20.1.11-3-D-N-912-306 Rev A	Construction Yard 7 Cross Sections
Drawing 20.1.11-3-D-L-810-229 Rev A	Urban design and Landscape Plans Sheet 229
Drawing 20.1.11-3-D-EN-740-204 Rev B	Erosion and Sediment Control Bentonite Plant General Layout

Glossary of Terms and Acronyms[4]

AEE	Waterview Connection Project Assessment of Environmental Effects Report (August 2010)
Amenity Tree	A tree or trees that contribute significantly to amenity, taking into account its form, size, health, ecological or historical significance (a preliminary list of these trees is provided in Appendix E.7 of the AEE).
ASMP	Archaeological Site Management Plan
CAQMP	Construction Air Quality Management Plan
CEMP	Construction Environmental Management Plan.
CESCP	Contractors Erosion and Sediment Control plan. This will be prepared by the contractor.
CNVMP	Construction Noise and Vibration Management Plan
CTMP	Construction Traffic Management Plan
Cut and Cover	A method of construction for tunnels, where a trench is excavated and roofed over.
Driven tunnel	Method(s) of construction for tunnels which is trenchless and driven horizontally.
ECOMP	Ecological Management Plan
ESCP	Erosion and Sediment Control Plan, prepared as part of the AEE.
Great North Road Underpass	The section of the tunnels, which goes underneath Great North Road.
Master CEMP	The main construction environmental management plan for all construction works across the Project, to be completed by the contractor. Contains the main procedures for environmental management, including key roles and responsibilities, stakeholder management, training, complaints procedures. environmental risk register, emergency response procedures and environmental monitoring requirements. A complete copy of the conditions of designation and resource consent will be appended to the Master CEMP.
Northern Portal	The northern entrance to the tunnel, located in Waterview Reserve.
NZHPT	New Zealand Historic Places Trust
NZTA	New Zealand Transport Agency
Oakley Creek Esplanade Reserve (Waterview Glades)	An Auckland City reserve of approximately 9ha located between Great North Road and Unitec.
SEMP	Settlement Effects Management Plan

[4] A full list of acronyms and glossary of terms is located within the Master CEMP.

Glossary of Terms and Acronyms[4]

SSCEMP (Construction Yard 7)	Site Specific Construction Environmental Management Plan for Construction Yard 7 (presently in draft)
SSNMP	Site Specific Noise Management Plan
SSTMP	Site Specific Traffic Management Plan
STEM	Standard Tree Evaluation Method
UDL Plans	Urban Design and Landscape Plans
TSMP	Temporary Stormwater Management Plan
Traffic Management Project Governance Group (TMPGG)	A group established from members from each of the key stakeholders (including NZTA, Auckland Motorway Alliance, Auckland Council, Auckland Transport and police) which will monitor Project progress and identify issues in relation to traffic management to be resolved on a regular basis.

1. Purpose of this DRAFT Plan

1.1 Objectives

This DRAFT Site Specific Construction Environmental Management Plan (SSCEMP) has been prepared to manage the construction activities that will be undertaken in Construction Yard 7 (the Yard), located within Oakley Creek Reserve Esplanade (Waterview Glades) (refer Drawing 20.1.11-3-D-N-912-301 Rev A), for the Waterview Connection Project.

Construction Yard 7 will be the main yard for construction of the Great North Road underpass (cut and cover tunnel) and will provide initial[5] access for the driven tunnel from the northern end. The main activities are described in detail in Section 2 of this report.

This DRAFT SSCEMP (Construction Yard 7) provides information specific to Construction Yard 7 and should be read in conjunction with the Master CEMP submitted with the application.

1.2 Designation and Resource Consent Conditions

The DRAFT SSCEMP (Construction Yard 7) has been prepared in accordance with the proposed designation and resource consent requirements (dated 25 March 2011). A complete set of the conditions for the Waterview Connection Project is located in the Master CEMP[6]. Of particular relevance to the preparation and implementation of this SSCEMP are the following conditions[7]:

- Condition DC.3
- Condition DC.4
- Condition CEMP.1
- Condition CEMP.2
- Condition CEMP.3
- Condition CEMP.6
- Condition CEMP.7

[5] Once the Great North Road underpass is excavated to carriageway level, access to the driven tunnels will be from Construction Yard 6 in Waterview Reserve and Construction Yard 7 will no longer be required for access. This is described in Section 3.

[6] Reference in this DRAFT SSCEMP (Construction Yard 7) is made to the 25 March 2011 NZTA proposed conditions (the "red set"). The conditions once finalised will be an appendix to the Master CEMP.

[7] As per the board Direction of 6 and 7th of May, provision in conditions for site specific CEMPs is likely to be forthcoming.

1.3 Roles and Responsibilities

The Roles and Responsibilities for ensuring environmental management and compliance of the Waterview Connection Project are set out in the Master CEMP. Specifically in relation to the construction and operation of Construction Yard 7, the following key roles are defined[8]:

	Name	Contact Details
NZTA		
Project Manager		
Environmental Manager		
Community Liaison Person		
XXX		
Contractor		
Project Manager		
Construction Manager		
Environmental Manager		
Site Supervisor		
XXX		
Specialists		
Project Arborist		
Project Archaeologist		
Acoustic and Vibration Specialist		
Building surveyor(s) (chartered engineer)		
XXX		
Regulatory Authority		
Compliance Officer		
Pollution Hotline		
XXXX		

1.4 Training and Induction

A copy of the DRAFT SSCEMP (Construction Yard 7) will be kept on the site at all times (in accordance with Condition CEMP.5).

All personnel working within Construction Yard 7, including all visitors and sub-contractors to the site, shall be inducted on the requirements of the DRAFT SSCEMP (Construction Yard 7) prior to commencing work on the site.

[8] To be completed in the final SSCEMP (Construction Yard 7) once the contractor has been determined.

Regular toolbox sessions shall be undertaken on all aspects of this plan, at least on a monthly basis as per the training requirements of the Master CEMP (Section 3.2).

Where any changes to the environmental procedures and management requirements of the DRAFT SSCEMP (Construction Yard 7) are required, the Environmental Manager shall ensure that all personnel are informed.

1.5 Review

The DRAFT SSCEMP (Construction Yard 7) will be reviewed on an annual basis or as a result of a material change to the Project, in accordance with Condition CEMP.12. A summary of the review process will be recorded and maintained by NZTA.

If, following the review process, the DRAFT SSCEMP (Construction Yard 7) requires updating, any material change proposed will be submitted to the Auckland Council for approval at least 10 working days prior to the proposed changes taking effect in accordance with Condition CEMP.13.

A register of approved changes to the DRAFT SSCEMP (Construction Yard 7) will be maintained in the Master CEMP.

2. Description of Activities in Construction Yard 7

2.1 Purpose and Activities of Construction Yard 7

The primary purposes of the Yard are:

1. To provide access for the tunnel excavation equipment and personnel to the driven tunnels from the northern end; and
2. In association with Construction Yard 6 (located in Waterview Reserve), to enable construction of the Great North Road underpass (the cut and cover section of the tunnel) between the northern end of the driven tunnel and the northern tunnel portals.

The site will be used to manage daily access to and from the 24hr/day tunnel excavation operations for personnel, excavation material, and tunnel lining operations and will provide a location for the temporary storage and management of spoil and other waste material generated during construction activities[9]. Part of the construction yard will also be required for trench for the Great North Road underpass.

Drawing 20.1.11-3-D-N-912-301 shows an indicative layout of the site following site establishment. Limited parking (approximately 5 spaces) will be provided to service a small Yard office. Formalised areas for equipment parking and storage and material laydown, and a bentonite plant will be provided on suitable flat topography around the Yard office within the site compound. A dual purpose sediment retention and

[9] This may include spoil, tunnel dewatering, runoff, general construction waste etc.

construction stormwater pond will be located in the south east of the site (SRP 7A/CD 7B), which will discharge treated stormwater to Oakley Creek.

Details of the erosion and sediment controls and construction stormwater management are described in further detail in Sections 4.8 and 4.9.

Drawings 20.1.11-3-D-N-912-301 to 305 show the changes to the Yard through the various stages of works, as the cut and cover section is constructed and the driven tunnel works commences.

Once the Great North Road Underpass excavation has been completed (which at its northern extent finishes in Construction Yard 6 (in Waterview Reserve)), tunnel access will no longer be required from Construction Yard 7, and the majority of the Construction Yard 7 activities will be transferred to Construction Yard 6, or cease. At this stage, Construction Yard 7 will be reduced in size, the remaining use being as a storage area for plant and equipment as required.

Drawing 20.1.11-3-D-N-912-305 shows the Yard following partial rehabilitation of the site, and Drawing 20.1.11-3-D-L-810-229 shows the concept landscape plan following full rehabilitation. The final contours of the site are shown on the cross sections shown in Drawing 20.1.11-3-D-N-912-306.

2.2 Staging of works associated with Yard activities

2.2.1 Construction Duration

The works associated with the Yard activities will be untaken in four main stages;

- Stage 1 – Site establishment and enabling works (approximately 6 months)
- Stage 2 – Driven Tunnel and Underpass construction (approximately 24 months)
- Stage 3 – Yard rationalisation (approximately 2 months)
- Stage 4 – Full Yard rehabilitation (approximately 6 months)

Overall, the works within Construction Yard 7 are anticipated to take approximately 38 months.

2.2.2 Stage 1 – Site establishment and enabling works

The Conditions of Consent require the following works (some outside the Yard boundaries) to be completed prior to construction commencing in Construction Yard 7:

- ✓ *Obtained any necessary road opening notices and completed and gained approval for relevant SSTMPs (Section 4.5)*
- ✓ *Resolved/ agreed access to Auckland Council reserve and 1510 Great North Road*
- ✓ *Undertaken riparian planting of Oakley Creek (Section 4.10)*
- ✓ *Formed new section of Oakley Creek Walkway (Section 4.6)*
- ✓ *Undertaken any noise and vibration modelling to identify mitigation requirements, and if required temporarily relocated residents of 1510 Great North Road (Section 4.2)*
- ✓ *Had pre construction meeting with Auckland Council to confirm erosion and sediment controls (Section 4.8)*

- ✓ *Undertaken STEM assessment of existing amenity trees and confirmed protection and/or removal requirements (Section 4.10)*

Stage 1 is anticipated to occur over an approximate 6 month period. The works include the establishment of the Yard complex and driven tunnel access and a small part of the Great North Road underpass (approximately 40m) within 1510 Great North Road. These works are necessary in order to complete surface works within the property of 1510 Great North Road in a timely manner (within 6 months) and allow the construction yard boundary fence to be retracted to the property boundary. The main cut and cover construction of the Great North Road underpass will be undertaken in Stage 2. Drawing 20.1.11-3-D-N-912-301 shows the activities to be undertaken during Stage 1.

2.2.2.1 Stage 1 Work Hours

All works during Stage 1 will be undertaken during the daytime (6.30 am to 7pm Monday to Saturday and 8 am to 3pm Sunday).

2.2.2.2 Stage 1 Construction Activities

As required by Condition OS.11, prior to the occupation of Construction Yard 7 the new section of the pedestrian/ cycleway link to Oakley Creek walkway from Great North Road, south of the BP station will be constructed (refer Section 4.6).

Then the site access from Great North Road will be established. This will include obtaining any necessary approvals from Auckland Transport (Refer Section 4.5).

A perimeter fence will then be erected around the site. The fence will comprise 17mm plywood hoarding of at least 2m in height to provide noise mitigation, and be in the location shown on Drawing 20.1.11-3-D-N-912-301.

At the same time, the identified archaeological area (R11/34 as shown on Drawing 20.1.11-3-D-N-912-301) will be fenced for protection from the site works, in conjunction with the qualified archaeologist (refer Section 4.11).

Once the site is fenced and prior to any earthworks, the erosion and sediment controls will be installed, including the dual purpose sediment retention pond (SRP7A) (which, once the site is established becomes the stormwater pond for construction CD7B), dirty water diversion channels, super silt fences and silt fences. A stabilised grass area will be maintained between the Yard boundary and the active work area to provide a buffer between the Yard and Oakley Creek. Further details are provided in Section 4.8.

The site will then be cleared and earthworked to create the level platforms on the site. Some amenity trees will require removal (refer Section 4.10).

Once the site platform is established, the Yard office and storage/ parking areas will be formed. It is anticipated that the site offices will be limited to one site office and ablution block, with parking to a maximum

of 6 spaces, with the main offices, storage area and parking areas located in Construction Yard 6 in Waterview Reserve.

The access road through the site will then be extended down to Chainage 3820 to where access for the driven tunnel works will be provided. The access road will have a paved surface and the camber will fall inward so that runoff can be captured and directed to the dual purpose pond (SRP-7A). A dirty water diversion channel will be placed directly to the west of the access road allowing runoff to be safely directed to the sediment retention pond (SRP 7A). An access track with a stabilised metal surface from the road to the pond forebay will be established to enable maintenance activities to be undertaken with ease and during wet weather.

During Stage 1, Herdman Street will be temporarily diverted to the north to remove the live road from the underpass construction area. This is discussed further in Section 4.5.

2.2.2.3 Stage 1 – Cut and cover works in 1510 Great North Road

As noted earlier, a small section (approximately 40m) of the Great North Road underpass from approximately Chainage 3780 to 3820 will be undertaken, to enable surface works within the property of 1510 Great North Road to be completed within a timely manner.

Construction of the underpass within this area will be undertaken in the same way as described in Stage 2 (refer Section 2.2.3.3). Once this section of the underpass is completed, the tunnel access cavity will be excavated at approximately Chainage 3820 to provide for the removal of tunnel excavation material via the Yard access road.

A number of services are located within 1510 Great North Road, including power, sewer and stormwater lines and a stormwater pond. Prior to any construction activities being undertaken measures will be put in place to ensure these services are either protected or relocated so that they operational throughout construction (refer Section 4.13).

Following completion of the surface works within 1510 Great North Road, the site will be reinstated and the Yard boundary fence pulled back to the boundary of 1510 Great North Road and Waterview Glades (as shown on Drawing 20.1.11-3-D-N-912-302 Rev A). No further surface works will be required in the property of 1510 Great North Road.

2.2.3 Stage 2 – Driven Tunnel and Underpass Construction

Before to commencing Stage 2, the following need to be completed:

- ✓ *Obtained any necessary road opening notices and completed and gained approval for all relevant SSTMPs (Section 4.5)*
- ✓ *Identified, agreed and undertaken all necessary temporary and permanent service relocations along Great North Road (Section 4.13)*
- ✓ *Confirmed location of the bentonite plant (in either Construction Yard 6 or 7) (Section 4.8)*

Stage 2 includes two main construction activities that will be undertaken within, and supported by the Yard, and is anticipated to occur over a 24 month period, namely:

1. Commencement of the driven tunnels construction.
2. Construction of the Great North Road underpass by cut and cover technique.

2.2.3.1 Stage 2 Work Hours

The works during Stage 2 will be undertaken as follows:

- The driven tunnels will be undertaken 24 hours a day, 7 days a week.
- Construction of the Great North Road underpass will be undertaken during the daytime, 6.30am to 7pm Monday to Saturday, and 8am to 3pm Sunday.

2.2.3.2 Stage 2 - Driven Tunnels

The tunnel access cavity developed during Stage 1 will be used as access for the driven tunnels from the northern end. Although the excavation of the driven tunnels work will occur outside of the Yard, the Yard will provide for tunnel access including for the removal of excavated material and the formation of temporary and permanent tunnel lining.

The driven tunnels will be excavated by a roadheader, with material transported offsite. It is anticipated that approximately 10 trucks/day will be required to remove spoil generated during excavation of the driven tunnels.

Excavation will first commence on the southbound tunnel. Once the learning curve from the works on the southbound tunnel has been completed (expected to be in the order of 3 months) a second roadheader will start excavation works on the cross passage to provide access to the northbound tunnel, and excavation of the northbound tunnel will commence, such that both tunnels will be excavated concurrently.

Access to the driven tunnel via Construction Yard 7 will only be required until excavation of the cut and cover tunnel is completed. Then access will be provided from Construction Yard 6 via the cut and cover tunnel.

The ventilation compressors and transformers will be located within the Yard directly adjacent to the entrance of the driven tunnels, to supply the tunnels with electricity and air, until the excavation of the cut and cover tunnel is complete. The ventilation compressors and transformers will be recessed beneath the Underpass. Once the Underpass Structure is complete and access via Yard 7 is closed, the compressors and transformers will be relocated to Construction Yard 6.

Any groundwater from the tunnel will be collected in the treatment tanks located within the portal of the tunnels, and pumped to the dual purpose pond (CD7B) for further treatment, prior to discharge to Oakley Creek. Further detail of water treatment is located in Section 4.9.

2.2.3.3 Stage 2 - Cut and Cover Construction

The formation of the Great North Road Underpass structure will be undertaken over four Phases, with construction activities undertaken during the daytime 6.30am to 7pm Monday to Saturday, and 8am to 3pm Sunday.

- Phase 1 – Formation of the Underpass Structure from Chainage 3820 to Chainage 4150
- Phase 2 – Formation of the Underpass Structure from Chainage 4150 to the Northern Portals
- Phase 3 – Bulk excavation of earth within the Underpass Structure
- Phase 4 – Completion of the Underpass.

Phases 1 and 2 will be undertaken from Construction Yard 7. Phase 3 will be undertaken from both Construction Yard 7 and Construction Yard 6 (Waterview Reserve). Drawings 20.1.11-3-D-N-912-302 to 304 show the main activities being undertaken within Phases 1 to 3.

Phase 4, which comprises the completion of the Underpass, will be undertaken once the driven tunnel is complete and will be completed from Construction Yard 6 (Waterview Reserve).

The Chainage 4150 has been chosen as the transition point between Phases 1 and 2 as this enables the temporary westward diversion of Great North Road to remain in place for as long as possible. Once the underpass structure has been formed to Chainage 4150, Great North Road will be split around the construction area for Phase 2 of the underpass construction (as shown on Drawing 20.1.11-3-D-N-912-303 Rev A).

2.2.3.4 Stage 2, Phase 1 – Chainage 3820 to Chainage 4150

Phase 1 involves the construction of the diaphragm walls which form the edges of the Underpass structure. The diaphragm walls will be excavated in 5-8 m long trenches and backfilled with reinforced concrete. Two rows of diaphragm walls will extend over the full length of the cut and cover tunnel with a central row of piles in the combined tunnel box to support the tunnel roof. The central row of piles will also provide separation between the two traffic flow directions.

During construction of the diaphragm walls bentonite will be required. This will be prepared on site using a small bentonite plant located within the site compound of Construction Yard 7 (refer Drawing 20.1.11-3-D-N-912-302 Rev A), and comprising a series of bentonite slurry storage tanks with an open settling tank adjacent, a series of pumps and generators and a network of pipes capable of pumping the bentonite slurry to any point along the cut and cover tunnel alignment as it is required. The bentonite plant will be fully contained to allow runoff to be collected and undergo primary treatment, prior to further treatment in the dual purpose pond, and discharge to Oakley Creek. Further details of the bentonite plant are provided in Section 4.8, with the general layout of the bentonite plant shown on Drawing 20.1.11-3-D-EN-740-204 Rev B.

Once the diaphragm wall(s) have been constructed the top 3 - 5m of earth will be excavated, the spoil loaded directly onto trucks and taken offsite for disposal. A crane will be used to place the precast concrete roof sections, leaving sufficient distance beneath the Underpass roof to provide continual access for removal of excavation spoil during Phase 3.

At approximate Chainage 3930 where construction of underpass structure widens to include both north and south bound lanes, a temporary diversion of Great North Road will be required, as shown on Drawing 20.1.11-3-D-N-912-302. Great North Road will be aligned further to the west and out of the underpass construction area up to Chainage 4150. For a short period while the underpass is being constructed adjacent to the Yard 7 site access, temporary Site Access will be provided opposite Alford Street.

There are a number of services located within Great North Road. These will require relocation prior to construction works. Relocation of services will be undertaken in consultation with the service provider, and where possible the relocation will be permanent.

2.2.3.5 Stage 2, Phase 2 – Chainage 4150 to Northern Portals

Once Phase 1 is complete, another temporary diversion of Great North Road will be constructed to split the north and southbound lanes around the Phase 2 Underpass construction works, as shown on Drawing 20.1.11-3-D-N-912-303. The remainder of the cut and cover tunnel will then be undertaken using the same construction process described in Phase 1.

2.2.3.6 Stage 2, Phase 3 – Bulk excavation within the Underpass

At this point in the construction staging, the use of Construction Yard 7 is limited to providing access for the Driven Tunnel works only. While the remainder of the excavation works for the Great North Road underpass will also occur during this phase, access to the underpass will be via the Northern Portals and Construction Yard 6 in Waterview Park.

Great North Road and Herdman Street will be shifted back to the pre-construction alignments and all temporary traffic diversion measures will be removed with the exception of the temporary lights at the Yard 7 access off Great North Road.

2.2.3.7 Stage 2, Phase 4 – Completion of the Underpass

As noted above, completion of the underpass, including placing the concrete floor, placing the wall anchors, drainage and waterproofing, will be undertaken at a later stage once the driven tunnels are complete. This work will be undertaken with access via Construction Yard 6 in Waterview Reserve.

2.2.4 Stage 3 – Yard rationalisation

Before commencing Stage 3, the following needs to be completed:

- ✓ *Confirm ongoing use and activities of the Yard*
- ✓ *Held pre construction meeting with Auckland Council to confirm changes to erosion and sediment controls as a result of yard rationalisation (Section 4.8)*
- ✓ *Completed and obtain approval of the Oakley Creek Esplanade (Waterview Glades) Open Space Restoration Plan (Section 9.2)*

Once the underpass has been excavated to the design carriageway level, all access and servicing of the driven tunnel excavation will occur from Construction Yard 6 (Waterview Reserve). This will allow the tunnel access from Construction Yard 7 to be closed and a large area of that Yard to be rehabilitated.

The construction activities serviced and/or accessed from the Yard will only take approximately 30 months (Stage 1 and Stage 2 described previously). However, the wider construction activities including completion of the driven tunnels, completion of the cut and cover tunnels, construction of the ventilation buildings and stacks, and construction of the Great North Road interchange will take approximately 5 years.

Therefore, the Yard will be retained, but rationalised, to provide for equipment/ plant storage. This will include withdrawing the Yard boundaries to the suitable flat areas in the northern area of the Yard (as shown on Drawing 20.1.11-3-D-N-912-303). The staff office and ablution block will be removed, along with the bentonite plant and other redundant features. The areas no longer required outside the site boundary will be rehabilitated[10], although the dual purpose pond will be retained to continue to provide treatment for construction stormwater and groundwater dewatering.

2.2.4.1 Stage 3 Work Hours

All works during Stage 3 will be undertaken during the daytime (6.30 am to 7pm Monday to Saturday and 8 am to 3pm Sunday).

2.2.5 Stage 4 – Yard restoration

Before commencing Stage 4, the following needs to be completed:

- ✓ *Completed and obtain approval of the Oakley Creek Esplanade (Waterview Glades) Open Space Restoration Plan (Section 9.2)*
- ✓ *Obtained any necessary road opening notices and completed and gained approval for all SSTMPs (Section 4.5)*
- ✓ *Held pre construction meeting with Auckland Council to confirm removal of erosion and sediment controls (Section 4.8)*

Once the Yard is no longer required, all contractors plant and equipment will be removed and the Yard will be completely reinstated as shown on Drawing 20.1.11-3-D-L-810-229 and detailed in Section 9. It is anticipated this will take approximately 6 months.

2.2.5.1 Stage 4 Work Hours

All works during Stage 4 will be undertaken during the daytime (6.30 am to 7pm Monday to Saturday and 8 am to 3pm Sunday).

3. Environmental Constraints and Sensitivities

3.1 Location and Topography

Construction Yard 7 is situated to the east of Great North Road and largely contained within the Oakley Creek Esplanade Reserve (Waterview Glades). The location of Yard is shown in Drawing 20.1.11-3-D-N-912-301. Construction Yard 6 in Waterview Reserve is located approximately 150m to the north.

[10] During Stage 3, those areas no longer required and outside the retracted site boundary will be rehabilitated in accordance with the Oakley Creek Esplanade Reserve (Waterview Glades) Open Space Restoration Plan (refer Section 9).

The western boundary follows the edge of the Great North Road carriageway to the location of the northbound driven tunnel portal (approximate Chainage 3920) where it steps eastward and continues parallel to Great North Road to the location of the southbound driven tunnel portal (approximate Chainage 3780). The eastern boundary generally follows the proposed designation line along the western edge of the Oakley Creek then rising up to meet the Great North Road carriageway at approximate Chainage 4100.

The southern extent of the Yard Boundary is determined by a 15m offset from the location of the northern extent of the driven tunnels. The eastern boundary departs from the proposed designation line at the point where the boundary needs to 'climb' the slope to ensure diversion of site runoff can be directed via gravity to the indicative construction stormwater / sediment retention pond, which is located in the lowest area of the Yard.

The topography of the Yard is relatively steep, dropping by about 12m from the platform near Great North Road, to the entrance of the tunnel portals at the southern extent of the Yard boundary.

3.2 Vegetation and Ecology

There is little vegetation within the site of Construction Yard 7, although the site is in close proximity to riparian vegetation along Oakley Creek. This bush is primarily exotic and provides some riparian benefits to this lower part of Oakley Creek[11].

There are eight identified Amenity Trees[12] within the Yard boundary, as shown on Drawing 20.1.11-3-D-N-912-301. These comprise four pohutakawa, two manuka, a lemonwood and a puriri tree.

Oakley Creek is located along the eastern boundary of the Yard. Oakley Creek is considered to be predominantly of low ecological value.[13]

3.3 Sensitive Receptors

Sensitive receptors in close proximity to Construction Yard 7 include local residents and educational facilities. Residential properties within close proximity to the Yard include:

- The UNITEC residential complex is located at 1510 Great North Road directly adjacent the Yard on its southern boundary. Part of the surface works is required in 1510 Great North Road.
- Residential properties along the western side of Great North Road, and the intersection of Alford Street and Oakley Avenue. A number of these properties are located within the surface designation, and are required to be removed to provide room for the temporary Great North Road diversion.

[11] Technical Report G.6 Assessment of Freshwater Ecological Effects.

[12] As identified in the Schedule of Amenity Trees Appendix E.7 of the Waterview Connection AEE. As described in Section 4.10, a STEM assessment will be undertaken of all trees on the site to confirm their status as amenity trees or otherwise.

[13] Technical Report G.6 Assessment of Freshwater Ecological Effects.

Education facilities in close proximity to the Yard include:

- Waterview Primary School located to the west on Oakley Avenue.
- Waterview Kindergarten, currently located on the western side of Great North Road, however this will be relocated to Oakley Avenue adjacent to Waterview Primary School prior to any construction works adjoining the site; and
- UNITEC, located to the east, with the nearest buildings approximately 150m to the south east.

There are two business located near the Yard. The BP service station is located approximately 150m to the north of the Yard on the eastern side of Great North Road. The Waterview Superette is located on the corner of Alford Street and Great North Road. Both businesses will continue to remain open during construction and access to them will be maintained.

3.4 Traffic

The Yard is located on Great North Road, which is defined as a strategic route within the Auckland District Plan, and is considered to have the same characteristics and form as a regional arterial road. Great North Road is a particularly busy road carrying 48,2000 vehicles per day (2006)[14]. Four lanes of traffic are provided and there is a speed limit of 50km/hr with on street parking restricted. Direct access is provided to the BP station via the hatched median along this section.

3.5 Pedestrian and Cycling Linkages

A shared pedestrian/ cycle way runs along the eastern side of Great North Road, for approximately two thirds of Great North Road between the Great North Road Interchange and the intersection with Blockhouse Bay Road. A pedestrian cycle way is also located along the western side of Great North Road.

A linkage exists to the Oakley Creek Walkway near the southern corner of Yard 7 and this connects to the Unitec site to the east and links southward to Phyllis Reserve.

3.6 Noise and Vibration

Sensitive noise and vibration receptors within the immediate vicinity of the Yard include the residences along the western side of Great North Road and at the corner of Oakley Avenue, and the student accommodation at 1510 Great North Road. Ambient noise and vibration levels within this area are largely generated by traffic on Great North Road.

[14] Technical Report G.18 Assessment of Transport Effects Report

3.7 Heritage Features

Only one recorded site (R11/2383, a hole or curring in the stream bank) is located within the construction yard as shown on Drawing 20.1.11-3-D-N-912-301. This feature is considered to be in good condition, and may relate to either early European or pre-European occupation.

3.8 Services

A number of services are located within Great North Road, including sewer, water, stormwater, gas, power and communications that will require protection or relocation prior to works commencing (as discussed in Section 4.13). There are also a number of services located within the property of 1510 Great North Road, including sewer, stormwater and power lines, and a stormwater pond located in the northeastern corner of the site and as shown on Drawing 20.1.11-3-D-N-912-301Rev A.

4. Environmental Management during Construction

This section of the report provides specific environmental mitigation and management requirements that will be put in place during construction activities within and associated with Construction Yard 7. Further reference should be made to the specific requirements of the designation and consent conditions, and the measures set out in the Master CEMP.

4.1 Environmental Risk Register

An Environmental Risk Register for Construction Yard 7 is provided in Appendix B[15].

4.2 Noise and Vibration

The following noise and vibration conditions are relevant to the works within Construction Yard 7:

- Condition CNV.1
- Condition CNV.2
- Condition CNV.4
- Condition CNV.10
- Condition CNV.11
- Condition CNV.12
- Condition CNV.13

Construction noise and vibration will be managed in accordance with the procedures set out in the Construction Noise and Vibration Management Plan (CNVMP), in accordance with Condition CNV.1.

[15] As with this DRAFT SSCEMP for Construction Yard 7, this register is an example only, and would be completed by the Contractors Environmental Manager as part of the final SSCEMP, in accordance with Section 2.2 of the Master CEMP, and regularly reviewed throughout the construction works within Construction Yard 7.

The construction within Construction Yard 7 requires some noisy activities, which also have the potential to generate elevated vibration levels. This includes:

- Piling for the diaphragm walls;
- Excavation; and
- Road realignment and resurfacing.

Therefore, the following specific mitigation measures will be implemented:

1. A suitably qualified Acoustic and Vibration Specialist will be appointed prior to construction activities being undertaken, to predict potential noise and vibration levels that may be generated during the cut and cover construction and driven tunnel works beneath 1510 Great North Road (in accordance with Condition CNV.10).
2. If noise or vibration levels are predicted to be elevated above the criteria set out in Condition CNV.2 and CNV.4, the Acoustic Specialist will develop a Site Specific Noise Management Plan (SSNMP) in accordance with Condition CNV.1 (ix).
3. Following Steps 1 and 2, consultation will be undertaken with receivers within 100m of the construction activities prior to any construction being undertaken. This will include residents within the student accommodation within 1510 Great North, and residents along the western side of Great North Road. They will be made aware of the complaints procedure (as set out in Chapter 10 of the CNVMP and Section 3.6.3 of the Master CEMP), and provided the 24 hour phone number of the Community Liaison Person.
4. A perimeter fence will be constructed around the boundary of the Yard. This will comprise a 17mm ply solid hoarding at least 2m in height to provide noise mitigation. This will be erected prior to any construction activities being undertaken.
5. Construction works associated with the Great North Road underpass construction will be restricted to 6.30 am to 7pm Monday to Saturday and 8 am to 3pm Sunday, except where the Great North Road tie-ins[16] are required, which will be undertaken at night to minimise the impact on traffic.
6. The construction of the underpass will be undertaken 'top down', such that once the diaphragm walls are in place the top of the cut and cover will be placed as soon as possible. All other excavation works will be undertaken within the cut and cover box, to shield noise.
7. The compressors and ventilation fans for the driven tunnel works will be located within the deep cut adjacent to the tunnel access cavity, to minimise potential noise.

Other specific mitigation measures may be required, including temporary relocation. This will be identified by the Acoustic and Vibration Specialist prior to construction activities commencing, and any necessary relocation undertaken in accordance with Conditions CNV.10 – CNV.12. Any relocation required for the residents of 1510 Great North Road will will not be undertaken in the period between 10 working days prior to any Unitec examinations and the completion of those examinations, in accordance with CNV.12.

[16] The temporary diversion of Great North Road will need to be 'tied-in' to the existing Great North Road. In order to minimise impacts on traffic this will be undertaken at night. In addition, when Great North Road is returned to its original alignment this will also require each end to be 'tied-in' which will be undertaken at night.

If monitoring, as set out in Section 5, indicates that noise or vibration levels exceed the criteria set out in Condition CNV.2 and CNV.4, all works will cease and the Acoustic and Vibration Specialist will review the existing mitigation measures being undertaken, and additional measures will be put in place if required.

4.3 Air Quality

The following air quality conditions are relevant to the works within Construction Yard 7:

- Condition AQ.1
- Condition AQ.3
- Condition AQ.4

The main potential air quality issues relate to dust generated during earthworks or construction activities, and emissions from contractor vehicles and plant. Air quality will be managed in accordance with the procedures set out in the Construction Air Quality Management Plan (CAQMP), in accordance with Condition AQ.1, and in particular:

1. The Yard compound will be stabilised with hardfill as quickly as possible during site establishment, with open areas kept to a minimum at any one time (see Section 4.8.2).
2. A speed limit of 10km/hour will be set for all vehicles on the site, to minimise potential for dust generation.
3. A wheel wash will be located at the entrance of the site (in accordance with Condition AQ.4). All vehicles will be required to use the wheel wash prior to existing the site.
4. All contractor vehicles and plant will be maintained in good working order to minimise the potential for emissions.
5. Dust levels will be monitored daily, as set out in Section 5.2 below. If required, the contractor will dampen down areas (in accordance with Condition AQ.4).

4.4 Settlement

The following settlement condition is considered relevant to works within Construction Yard 7:

- Condition S.1

The key potential settlement issues in relation to works within Construction Yard 7 include:

- Potential settlement of any remaining residential properties along Great North Road, including the Waterview Superette, associated with installing the diaphragm walls for the underpass.
- Potential settlement associated with the driven tunnel beneath 1510 Great North Road.

Settlement will be managed through the Settlement Effects Management Plan (SEMP), in accordance with Condition S.1, primarily via the monitoring programme detailed in Section 5.3. This will identify the need for any contingency measures, which will be undertaken (if required) in accordance with the measures set out in the SEMP.

4.5 Traffic

The following traffic conditions are considered relevant to works within Construction Yard 7:

- Condition TT.2
- Condition TT.3
- Condition TT.4
- Condition TT.6
- Condition TT.8
- Condition TT.9

Traffic will be managed through the Construction Traffic Management Plan (CTMP) submitted with this application, and through the Site Specific Traffic Management Plans (SSTMPs), required to be prepared and approved through the Traffic Management Project Governance Group (TMPGG) at various stages in accordance with Condition TT.2.

The works will require the temporary diversion of both Herdman Street and Great North Road at various stages during the cut and cover construction. As a result the following potential issues are likely to arise:

- Short term congestion.
- Extended peak traffic spreading, particularly in the afternoon.
- Speed reduction for vehicular road users, and potentially increased traffic journeys during this time.
- Some disruption to bus stop services due to temporary relocations.
- Disruption to existing pedestrian/cycleway routes.

The following table provides an indication of the likely traffic management required. Further details will be set out in the various SSTMPs (in accordance with Condition TT.3, 6, 8 and 9).

Stage	Main Element of Works	Probable Traffic Management and Control
Stage 1 – Enabling works (refer Drawing 20.1.11-3-D-N-912-301 Rev A)		
1	Contractors pre warn installation	SSTMPs
2	Temporary traffic management deployment	Night activity to install closures.
3	Construction of the new temporary Herdman Street North signalised intersection	SSTMPs. Some night activity.
	Installation of a new signalised intersection at Oakley Avenue	SSTMPs. Shoulder closures and some night activity.
4	Installation of Construction Yard 7	Construction within Yard.
5	Commissioning of both new signalised controls and decommissioning of Herdman Street signals	SSTMPs. Minimal impact. Selected timing.
6	Installation of site compound, access road and stormwater treatment	Construction within Yard.
Stage 2 Phase 1A – Construction of temporary Great North Road (refer Drawing 20.1.11-3-D-N-912-302 Rev A)		
1	Contractors pre warn installation	SSTMPs.
2	Temporary traffic management deployment	Night activity to install closures.
3	Provisions for pedestrians and cyclists, temporary road construction west of Great North Road and installation of temporary bus facilities	SSTMPs for access to site from Alford Street to Herdman Street.
4	Installation of relocation of Oakley Avenue temporary signals	SSTMPs. Shoulder closures and some night activity.
5	Installation of additional temporary access to Yard 7 at Alford Street signals	Within construction area.
6	Construction of 'tie-ins' north and south of temporary alignment	SSTMPs. Night closures.
7	Commissioning of modifications to Alford Street and Oakley Avenue signals	SSTMPs. Minimal impact. Selected timing.

Stage 2 Phase 1B – Western temporary traffic route (refer Drawing 20.1.11-3-D-N-912-302 Rev A)		
1	Contractors pre warn installation	SSTMPs.
2	Commissioning of shifted Oakley Avenue signalised intersection	SSTMPs. Minimal impact. Selected Timings.
3	Opening of western temporary route to traffic	SSTMPs.
4	Relocation of Construction Yard 7 fenced construction area	SSTMP's. Should closures.
5	Construction of cut and cover tunnel (partial)	Within construction area.
Stage 2 Phase 2A – Temporary bifurcation of Great North Road (refer Drawing 20.1.11-3-D-N-912-303 Rev A)		
1	Temporary two lane road construction	Within existing construction area
2	Temporary and permanent Great North Road re construction over cut and cover tunnel	Within existing construction area
3	Installation of temporary bus facilities	SSTMPs. Shoulder closures.
4	Extension of northbound lanes to temporary link with Herdman Street	Within existing construction area
5	Construction of access to remaining non constructed cut and cover site	Within existing construction area
6	Modifications to Herman, Oakley and Alford signalised installations installed	SSTMPs. Night closures.
7	Construction of 'tie-ins' north and south of temporary alignment	SSTMPs. Night closures.
Stage 2 Phase 2B – Temporary bifurcation of Great North Road (refer Drawing 20.1.11-3-D-N-912-303 Rev A)		
1	Contractors pre warn installation	SSTMPs
2	Commissioning of modifications for Herdman Street, Oakley avenue and Alford Street signalised intersections	SSTMPS. Minimal impact. Selected timings.
3	Opening of bifurcation temporary route to traffic	SSTMPs. Night Closures.
4	Site access to remaining cut and cover tunnel opened	SSTMPS.
5	Construction of cut and cover tunnel (partial)	Within existing construction area
6	Reconstruction of Great North Road	Within existing construction area
7	Reconstruction of the Herman Street signalised intersection	Within existing construction area
8	Construction of 'tie-ins'	SSTMPs. Night closures.
Stage 2 Phase 3 – Reinstatement of Great North Road (refer Drawing 20.1.11-3-D-N-912-304 Rev A)		
1	Contractors pre warn installation	SSTMPS
2	Deployment of SSTMPs for the staged opening of traffic	SSTMPS. Night closures.
3	Commissioning of bus facilities and provisions for pedestrians and cyclists	SSTMPs. Minimal impact. Selected timing.

4.6 Pedestrian/ Cycleway

The following pedestrian/ cycleway conditions are considered relevant to works within Construction Yard 7:

- Condition TT.6
- Condition OS.11

Pedestrian and cycleway access will be managed through the Construction Traffic Management Plan (CTMP) and the Site Specific Traffic Management Plans (SSTMPs) that will be prepared for each stage of the works, as described in Section 4.5 above (in accordance with Condition TT.6).

During construction it will be important to maintain a safe pedestrian/ cycle way route along Great North Road at all times. During the cut and cover construction, the existing pedestrian/ cycleway along the eastern side of Great North Road will be temporarily closed. Pedestrians and cyclists will be diverted to the western side of Great North Road with appropriate signage and barriers, using the existing and new crossing points.

In accordance with Condition OS.11, a formalised pedestrian/ cycleway will be constructed along the north eastern boundary of the Yard from Great North Road connecting to the existing Oakley Creek walkway. This is shown on Drawing 20.1.11-3-D-N-912-301. This will be constructed at least 20 days prior to the occupation of the Construction Yard 7, in consultation and agreement with Auckland Council.

4.7 Construction Lighting

The following lighting conditions are considered relevant to works within Construction Yard 7:

- Condition L.2
- Condition L.3

As the Yard will be required to be operational at night to support the driven tunnel works, lighting will be required. The location of lighting for Construction yard 7 is indicatively shown on Drawing 20.1.11-3-D-N-912-301. The construction lighting will comprise a number of 70W H.P.S. luminaires on 8m poles. This will be established during the Stage 1 works, to specifically provide lighting along the site access road and for the site compound area.

As per Condition L.2, prior to construction, the lighting plan will be reviewed by an independent lighting specialist and provided to Auckland Council at least 10 days prior to any night time works commencing.

4.8 Erosion and Sediment Control

The following erosion and sediment control conditions are considered relevant in relation to Construction Yard 7:

- Condition E.1
- Condition E.2
- Condition E.3
- Condition E.4
- Condition E.5
- Condition E.6
- Condition E.7
- Condition E.8
- Condition E.9
- Condition E.10
- Condition E.11
- Condition E.12
- Condition E.13
- Condition E.14
- Condition E.15
- Condition E.16
- Condition E.17
- Condition E.18
- Condition E.19
- Condition E.20
- Condition E.21
- Condition E.22
- Condition E.23

4.8.1 Erosion and Sediment Controls

Erosion and sediment generation will be managed through the procedures set out in the Erosion and Sediment Control Plan (ESCP) provided with the application and the conditions E.1 to E.23.

Specific erosion and sediment control measures for Construction Yard 7 are shown on Drawing 20.1.11-3-D-N-912-301. These will remain in place throughout construction until the Yard is completely rehabilitated, although will be retracted slightly during Phase 3 as the Yard is rationalised (refer Drawing 20.1.11-3-D-N-912-301). The specific measures include:

1. A pre-construction meeting will be held with Auckland Council (in accordance with Condition E.2) to confirm and approve the sediment and erosion control plan for the Yard (Contractors Erosion and Sediment Control Plan (CESCP) prepared in accordance with Condition E.5).
2. Super silt fences will be installed around the site as shown on Drawing 20.1.11-3-D-N-912-301 (in accordance with Condition E.13).
3. A sediment retention pond (SRP7A) will be constructed in the south eastern corner of the site to treat construction runoff prior to discharge to Oakley Creek. This is a dual purpose pond which, once the site is established and stabilised, will be converted into a stormwater treatment pond (CD7B). A secondary access track will be established to Pond SRP7A from the access road, which will be formed by a stabilised metal surface and provide access for routine maintenance of the pond.
4. During construction of Pond SRP7A, super silt fences will be installed below the work area, to protect Oakley Creek from any sediment laden discharge from this activity (in accordance with Condition E.13).
5. Dirty water diversion channels will be established to direct sediment laden runoff to Pond SRP7A. The external edge of the access road through the Yard will assist in forming a diversion channel to direct sediment laden runoff to Pond SRP7A. Where contours do not allow the appropriate grade to Pond SRP7A, then super silt fences will be utilised to treat these small areas.
6. Chemical treatment for Pond SRP7A (in accordance with Conditions E.16 and E.17) will also be provided by either automated rainfall activated systems. Manual batch dosing will be provided as a back up as necessary.
7. A grass buffer zone will be maintained between the Construction yard 7 boundaries and the work areas. This will also act as a buffer between the Yard and Oakley Creek.
8. As the Yard is being established any open areas will be kept to a minimum, with the Yard stripped of topsoil, contoured and hardfill placed as soon as possible.

Once earthwork activities to complete the Yard are complete, the site will be stabilised (in accordance with Condition E.20) to form gravel hardstand areas in working areas, with mulch and geotextile used to stabilise cut and fill slopes. At this time, the erosion and sediment controls will be modified to function as temporary stormwater management from the operating construction yard as detailed in Section 5.8.

Following completion of the cut and cover construction (Stage 2), most of the Yard will no longer be required, but will be rationalised in Stage 3 to provide a potential storage area for plant and equipment for other construction activities. The boundary of the Yard will be pulled back as shown on Drawing 20.1.11-3-D-N-912-305, and the supersilt and silt fences will similarly be pulled back. The sediment retention/ stormwater pond (SRP7A/CD7B) will remain in place, and all sediment runoff directed to the pond for treatment. The Auckland Council will be notified prior to any erosion or sediment controls being removed in accordance with Condition E.15.

4.8.2 Bentonite Plant

Bentonite is required for the construction of diaphragm walls for the Great North Road underpass during the Stage 2 works. A bentonite plant will be located on site and potentially located within Construction Yard 7[17]. If located within Construction Yard 7 it will be located within the site compound, as shown on Drawing 20.1.11-3-D-N-912-301.

The bentonite plant will be within fully self-contained yard allowing any stormwater runoff to be collected and undergo full primary treatment, prior to further treatment in Pond CD7B and discharge to Oakley Creek. The bentonite yard will consist of an area where dry bentonite clay is stored. The clay will be mixed in a formal mixer and then transferred to the storage tanks as a bentonite slurry. From these bentonite tanks the slurry is pumped to the pile and wall construction area associated with the cut and cover tunnel operation. As the excavations increase in depth, further bentonite slurry is added, and as the piles and walls are constructed, excess bentonite is pumped back to the bentonite yard. Within this process there is a certain amount of bentonite that will no longer be suitable for use. This will be pumped to the bentonite pond where it can settle and then discharge away from the bentonite yard to the construction yard control measures for further polishing treatment. Any bentonite slurry that remains will be disposed of offsite and while it is expected, based on previous bentonite operations, that this material can be considered as cleanfill, it will be tested prior to disposal to a cleanfill site. An important aspect of the bentonite plant is that it is based on a fully recycled system with no planned discharge expected from the process, such that any potential discharges are limited to stormwater runoff from the yard itself. As the bentonite yard is fully contained, this means that any accidental discharges of bentonite can be readily contained and treated, such that with the additional protection provided by of the Construction Yard 7 erosion and sediment controls (including Pond CD7B), there is unlikely to be any untreated discharge to Oakley Creek from the bentonite plant.

The proposed layout of the bentonite plant is shown on Drawing 20.1.11-3-D-EN-740-204.

The bentonite plant yard area will be a maximum of 2500m^2 in area. A decanting earth bund will be established to control any surface water runoff from the plant. The decanting earth bund will discharge through a diversion bund which will be placed around the perimeter of the plant, containing runoff upto the 1% AEP flows. A raised vehicle access will be provided through the bund as the only ingress and egress point from the bentonite plant area.

4.9 Construction Stormwater

The following stormwater conditions are considered relevant to the operation of Construction Yard 7:

- Condition SW.1
- Condition SW.2
- Condition SW.3
- Condition SW.4
- Condition SW.5
- Condition SW.6

[17] The exact location of the bentonite plant will be confirmed by the contractor, but may be located either within Construction Yard 6 or Construction Yard 7.

- Condition SW.8
- Condition SW.9
- Condition SW.10

Stormwater during construction will be managed in accordance with the conditions and the Temporary Stormwater Management Plan (TSMP) lodged with the application. Specifically, with respect to the activities within Construction Yard 7, the following temporary stormwater management measures will be put in place:

- In association with the pre-construction meeting held with Auckland Council in relation to Erosion and Sediment Controls (as described in 5.7.2), the temporary stormwater management measures will also be discussed and confirmed (in accordance with Condition SW.5).
- Once the stormwater management measures have been constructed, a post construction meeting will be held with Auckland Council to confirm the measures have been constructed in accordance with the measures agreed (in accordance with Condition SW.8)
- All stormwater generated during construction from the Yard will be collected and treated in the temporary stormwater pond (CD7B) located in the south east corner of the site and discharged into Oakley Creek. Pond CD7B will be formed from the sediment retention pond (SRP7A), with minor modifications (to meet the treatment requirements of Condition SW.1).
- Pond CD7B has been designed to allow extra capacity for treated groundwater from the tunnel construction, which will be diverted to Pond CD7B for additional polishing, prior to discharge to Oakley Creek. The tunnel groundwater is treated within the tunnel portal itself and then discharged, with automated pH and turbidity pumping levels, to Pond CD7B.
- Stormwater generated during cut and cover construction of the underpass will be collected and treated in the temporary stormwater pond located in Construction Yard 6 (Waterview Reserve).
- The discharge pipe from Pond CD78 shall be designed with appropriate energy dissipation and/or erosion protection measures (such as rip-rap) to minimize potential for bed scour or bank erosion (condition SW.10).
- Pond CD7B will remain in place until Construction Yard 7 is completely demobilised and impervious surfaces (including gravel) removed and the area reinstated.

4.10 Vegetation and Amenity Trees

The following conditions are considered relevant for the works within Construction Yard 7:

- Condition CEMP.6 (o) and (p)
- Condition OS.11 (b)
- Condition STW.20
- Condition STW.24

4.10.1 Amenity Trees

A number of amenity trees are located within Construction Yard 7. Prior to commencement of works a Project Arborist will be appointed, who will be responsible for undertaking a STEM assessment of all trees on the site, in accordance with Condition CEMP.6 (o), to confirm their quality and identify opportunities for protection and potential relocation.

If it is possible to retain any trees these will be protected by appropriate fencing as directed by the Project Arborist. If during the course of the works the trees require removal, the Project Arborist shall be contacted to identify potential opportunities for relocation (in accordance with Condition CEMP.6 (p)).

The Project Arborist will record any amenity trees requiring removal and, as part of the Oakley Creek Esplanade Reserve (Waterview Glades) Open Space Restoration Plan, will recommend appropriate species to replace these trees following completion of the works. This is described further in Section 9.

4.10.2 Riparian Margins

Condition OS.11 requires the riparian margins of Oakley Creek to be planted at least 20 working days prior to occupation for construction of the Oakley Creek Esplanade Reserve. The concept landscape plan (Drawing 20.1.11-3-D-L-810-229 Rev A) and planting schedules provide guidance on the riparian planting to be undertaken. The riparian planting will form part of the Streamworks Environmental Management Plan (SWEMP) required by Condition STW.20. Given the need to undertake this planting prior to construction, the SWEMP will be prepared in stages as the work along Oakley Creek progresses, and areas become available for restoration and planting.

The following steps will be undertaken:

- A detailed riparian margin planting plan will be developed by an appropriately qualified ecologist. This will be prepared in accordance with the requirements of Condition STW.20.
- Input and agreement shall be sought from the Auckland Council on the final riparian margin planting plan in accordance with Condition OS.11 and approval sought in accordance with condition STW.20.
- Once the plan is agreed, the riparian planting shall be undertaken by an appropriately qualified landscape architect or ecologist, and within three months of the planting written confirmation provided to demonstrate the planting has been undertaken in accordance with STW.24.

4.11 Archaeology

The following conditions are considered relevant to Construction Yard 7:

- Condition ARCH.1
- Condition ARCH.2
- Condition ARCH.3
- Condition ARCH.4
- Condition ARCH.8

All works shall be undertaken in accordance with the Archaeological Site Management Plan (August 2010) (in accordance with condition ARCH.1).

Specifically in relation to Construction Yard 7, the following measures shall be undertaken:

- Prior to any excavation works commencing, the location of recorded archaeological site R11/2383 shall be confirmed by the Project Archaeologist, and fenced off to protect it from any damage prior to any excavation works (in accordance with Condition ARCH.4)

- Given the location of the Yard, there is potential for unknown archaeological remains to be uncovered during excavation works. Therefore, a qualified archaeologist shall monitor all excavation works to establish if any subsurface remains are present, and to record any that may be exposed (in accordance with Condition ARCH.2). In addition, given the location of the site within an area of pre-European occupation, Ngati Whatua will be invited to also monitor the excavation works.
- If any remains are disturbed during construction, all works shall cease and the Accidental Discovery Protocols set out in Section 5.3 of the Archaeological Site Management Plan shall be implemented (in accordance with Condition ARCH.3).

4.12 Waste Management

The following condition is considered relevant to the works within Construction Yard 7:

- Condition CEMP.11

A Waste Management Plan will be developed by the contractor across the complete construction site in accordance with Section 3.4.11.1 of the Master CEMP. This will be prepared and submitted to the Auckland Council prior to construction commencing in accordance with Condition CEMP.11.

Specifically in relation to activities within Construction Yard 7, the following will waste management procedures will apply:

- Within the site compound a number of bins will be set up to manage different waste streams including steel, wood, paper and general waste.
- The bins will be monitored daily by the Environmental Manager/ site foreman to ensure the right waste material is being discarded into the right bins, and emptied at least once a week or as required.
- All construction workers, including visitors to the Yard, will be inducted on the Waste Management Plan, and specific waste management requirements for the Yard.

4.13 Services

The following condition in relation to services is relevant to the works within Construction Yard 7:

- Condition CEMP.16

A number of existing services are located both within Great North Road and Herdman Street, which will require either protection or temporary or permanent diversion to undertake the cut and cover construction of the Great North Road underpass. In addition, works are required within the property of 1510 Great North Road, which has a number of existing services including power, sewer and stormwater lines and a stormwater pond. Construction will be required to be undertaken so as to avoid, or minimise, disruption to these services by working with the service providers and/or property owners in accordance with Condition CEMP.16.

Specifically in relation to the works within Construction Yard 7, the following measures will be undertaken:

1. The contractor will contact all infrastructure service network providers and the property owners of 1510 Great North Road, to confirm the location of services.

2. Where the exact location of the services is unable to be determined, the contractor will work with the service provider and/or property owner of 1510 Great North Road to undertake initial investigations to locate the services.
3. The contractor will develop, in conjunction and agreement with the service providers a methodology for relocating or protecting the services. Where possible, the services will be permanently relocated, alternatively they will be temporarily relocated during the construction work, then relocated back to their original alignment.
4. If any additional consents are required to relocate the services (either temporarily or permanently), the contractor will be responsible for identifying and obtaining these consents.

In relation to the services within 1510 Great North Road, consultation will be undertaken with the property owner and/or service provider on the proposed methodology for either protecting or relocating the services during construction to ensure that there is minimal disruption to services.

As noted previously, the stormwater dry pond located at 1510 Great North Road is in the construction footprint (refer Drawings 20.1.11-3-D-N-912-301) that allows for construction around the perimeter of the cut and cover tunnel. If the stormwater pond needs to be replaced during construction it will be replaced by a temporary stormwater management device designed to achieve the same level of stormwater treatment. The temporary stormwater management device is likely to consist of a buried prefabricated container. The volume of a 12m long prefabricated container is 69 m^3, which is in excess of the required minimum volume for the stormwater pond of 40.7 m3 (based on the designs held of Auckland Council's property file). After construction of the tunnels a permanent stormwater treatment device will be re-established after approval from Auckland Council[18].

5. Environmental Monitoring

5.1 Noise and Vibration Monitoring

The following noise and vibration conditions are considered to apply to works being undertaken in Construction Yard 7:

- Condition CNV.2
- Condition CNV.4

[18] By provision of temporary treatment and reinstatement of a permanent stormwater treatment device, the obligation of the owners of 1510 Great North Road to their existing resource consents for stormwater treatment will continue to be met. The responsibility of NZTA to maintain private services during and after construction is a requirement of condition CEMP.16.

Noise and vibration monitoring shall be undertaken in accordance with the requirements of Section 9 of the Construction Noise and Vibration Management Plan (CNVMP) (prepared in accordance with condition CNV.1). Specifically with respect to the activities being undertaken in Construction Yard 7 the following shall apply:

1. An Acoustic and Vibration Specialist (s) shall be appointed to undertake noise and vibration monitoring prior to, during and following completion of the construction activities.
2. Noise monitoring shall be undertaken generally in accordance with the requirements of NZS 6801:2008 "Acoustics – Measurement of Environmental Sound", NZS 6802:2008 "Acoustics – Assessment of Noise" and NZS 6802:1999 "Acoustic – Construction Noise" (in accordance with Condition CNV.2).
3. Vibration monitoring shall be undertaken generally in accordance with DIN 4150-3:1999 (in accordance with Condition CNV.4).
4. Monitoring shall be undertaken at the intervals specified in Sections 9.1 and 9.2 of the CNVMP, including monthly intervals, when required for particularly noisy or critical phases of construction, and when any complaints are received.
5. The appropriate locations for monitoring noise and vibration shall be established by the Acoustic and Vibration Specialist (s) prior to any construction activities occurring and the exact nature of the activities determined.

5.2 Air Quality Monitoring

The following conditions set out the requirements for air quality monitoring:

- Condition AQ.10
- Condition AQ.11
- Condition AQ.12
- Condition AQ.13
- Condition AQ.14

Air quality monitoring shall be undertaken in accordance with Section 3 of the CAQMP (prepared in accordance with Condition AQ.1). Specifically in relation to Construction Yard 7 this will include:

1. Daily visual inspections of the site and in particular all open areas, and Great North Road in the vicinity of the Yard to monitor dust deposits and the need for contingency measures (such as dampening down, road sweeper etc.) (in accordance with Condition AQ.10)
2. Weekly inspections of the wheel wash located at the egress of the Yard, to ensure it is operating effectively.
3. Daily visual inspection shall also be undertaken of all construction vehicles on the site to ensure no visible emissions (in accordance with AQ.10). A monthly check of all vehicle logs will be undertaken to ensure servicing and maintenance checks are undertaken and any additional maintenance that has been required has been carried out.

5.3 Settlement Monitoring

The following settlement monitoring conditions are considered relevant to Construction Yard 7:

- Condition S.2
- Condition S.3
- Condition S.4
- Condition S.5
- Condition S.7
- Condition S.8
- Condition S.9
- Condition S.10
- Condition S.11
- Condition S.12
- Condition S.14
- Condition S.15

Settlement will be managed primarily through an extensive monitoring programme, which is required by Conditions S.2 – S.17 and set out in the SEMP. In relation to the works within Construction Yard 7, the following specific monitoring will be undertaken:

- Building Surveys of 1510 Great North Road, the BP service station, the Waterview Superette and any other buildings identified as at risk (in accordance with Condition S.2) prior to, during and following completion of the tunnel, in accordance with Condition S.8 and S.12.
- Monthly visual inspections of these buildings will be undertaken during active construction (in accordance with Condition S.10).
- Monthly level and/or wall inclination surveys on the two buildings at 1510 Great North Road during active construction of the driven tunnels (in accordance with Condition S.11).
- Settlement monitoring of the retaining walls for the Great North Road underpass, in accordance with Condition S.14.

5.4 Traffic Monitoring

The following traffic monitoring conditions are relevant to the activities being undertaken in Construction Yard 7:

- Condition TT.10
- Condition TT.11

Traffic monitoring will be set out in the SSTMPs that will be prepared to facilitate the different stages of works that will be undertaken within Construction Yard 7 as described under Section 4.5. Key aspects of the monitoring will include:

- Monitoring the traffic levels on Great North Road to determine whether the speeds and volumes are as expected (in accordance with Condition TT.10) and to identify the need for further mitigation measures (in accordance with Condition TT.11).

5.5 Construction Lighting Monitoring

Monitoring requirements for construction lighting is set out in Section 3.4.10.3 of the Master CEMP. Specifically, in relation to Construction yard 7 which will require lighting to facilitate 24 hour working, the following monitoring will be undertaken:

- Monitoring will be undertaken every 2 months, or following a complaint from an adjacent resident.
- Visual tests will be undertaken to check the luminaires have not been re-aimed inappropriately.

- The location of the lights within the Yard will be checked to confirm they conform to the approved lighting plan.

5.6 Erosion and Sediment Control Monitoring

The following conditions set out requirements for monitoring erosion and sediment controls, and for monitoring the freshwater receiving environments:

- Condition E.1
- Condition F.1
- Condition F.2
- Condition F.3
- Condition F.4
- Condition F.5
- Condition F.6

Monitoring of the erosion and sediment controls within Construction Yard 7 shall be undertaken in accordance with Technical Report G.22 Erosion and Sediment Control Plan (in accordance with Condition E.1) and the Ecological Management Plan (ECOMP) (in accordance with Condition F.1). Specifically in relation to Construction yard 7 this includes:

- Daily visual inspections of the Yard to ensure erosion and sediment controls are intact and working properly.
- Daily visual inspections of the Oakley Creek (receiving environment) at the point of discharge from Pond SRP-7A, particularly prior to and following a rainfall event. If there is any noticeable change in water clarity from that previous to the rainfall event as a result of the earthworks activity, the erosion and sediment control measures implemented and changes made as necessary.
- Taking photographic records of the discharge outlet pre construction, during construction and after construction.
- Monitoring via the automated pH and turbidity meter from the tunnel dewatering to ensure that a turbidity of 50 NTU or higher and/or a pH of greater than 7.5 will not be discharged into Oakley Creek. In the event that this trigger is reached, the pump will automatically be shut down. This will allow further treatment to be made prior to discharge.
- Flocculation monitoring to ensure the chemical treatment of Pond SRP-7 is working appropriately. Monitoring will be undertaken of the discharge and receiving environment pH levels at weekly intervals and during nominated storm events. In addition periodic checks will be undertaken of the final discharge of suspended solids concentration, particularly during storm flows.
- Freshwater habitat monitoring will also be undertaken in accordance with Conditions F.1- F6 and the ECOMP.

5.7 Stormwater Monitoring

The following condition set out requirements for monitoring stormwater treatment devices during construction:

- Condition SW.7

Monitoring requirements for stormwater treatment devices is set out in Section 4.3 of the TSMP. As a minimum all devices will be checked on a monthly basis or following a severe storm to ensure they are working correctly, and determine the need for any maintenance (in accordance with Condition SW.7).

5.8 Vegetation and Amenity Tree Monitoring

The following condition set out requirements for maintaining any landscaping undertaken as part of the construction works:

- Condition LV.4

All landscaping, including the relocation and protection of amenity trees, shall be monitored and maintained in accordance with Condition LV.4 and Section 3.4.10.1 of the CEMP.

5.9 Archaeological Monitoring

The following conditions set out the requirements for archaeological monitoring within Construction Yard 7:

- Condition ARCH.1

Archaeological monitoring will be undertaken in accordance with Section 6 of the ASMP. As detailed in Section 4.11 above, specifically all excavation works within Construction Yard 7 will be monitored by the Project Archaeologist (in accordance with Condition ARCH.1.

6. Communications

6.1 Communication Plan

A communication plan shall be prepared prior to construction activities within Construction Yard 7 in accordance with Condition PI.2 and the communications plan in the Master CEMP.

In particular, the communication plan for Construction Yard 7 will include:

1. Contact details for the Yard, and specifically the name of the Community Liaison person and 24 hour telephone number.
2. Notices of key construction stages and their timing
3. Notices of temporary road diversions and pedestrian/cycleway diversions, the alternative routes provided, and how long they will be diverted for.
4. Notices of night works, when they will be occurring and how long they will be occurring for.

5. Emergency and incident response procedures, who to contact and what the process is that will be followed.
6. The restoration plan for the site, following completion of the Project.

6.2 Key Stakeholders

Key stakeholders in relation to the activities being undertaken in Construction Yard 7 include:

- Residents along the western side of Great North Road opposite the Yard, and at 1510 Great North Road on the eastern side.
- Traffic users of Great North Road.
- Pedestrian and cyclists using Great North Road.
- Waterview Kindergarten
- Waterview School
- Ngati Whatua
- Friends of Oakley Creek
- Auckland Council (as both landowners and regulators)
- Service providers
- Auckland Transport
- Community Liaison Group (Waterview)
- Education Liaison Group

6.3 Complaints Procedures

All complaints will be handled in accordance with Condition PI.4 and the complaints procedures set out in 3.6.3 of the Master CEMP.

7. Emergency and Incident Response

Emergency and incident response will be undertaken in accordance with the procedures set out in 3.5 of the Master CEMP. In relation to the works being undertaken within Construction Yard 7, potential emergency or incidents may include, but not be limited to, the following:

- Fuel or other chemical spill entering Oakley Creek.
- Untreated stormwater or sediment laden discharges entering Oakley Creek (e.g. by failure of the dual purpose pond or failure of the dirty water diversions).
- Discharge from bentonite process entering Oakley Creek.
- Slip from the site works blocking the public walkway along Oakley Creek.
- Truck overturning with excavated spoil, entering Oakley Creek.
- Truck spilling excavated spoil onto the public roads.
- Settlement caused by construction activities causing cracks in adjacent buildings or elevated settlement in adjacent roads.
- Construction generated noise or vibration greater than predicted from modelling, affecting adjacent residents.

- Unearthing unknown archaeological sites or human remains.
- Unintentional damage to the archaeological site R11/2383.
- Unintentional damage to any amenity tree that has been identified on site as being able to be protected during the works.
- Untreated groundwater from tunnel dewatering entering Oakley Creek (e.g. from failure of the groundwater treatment system).

If an emergency or incident occurs, the contractor shall respond in accordance with the procedures set out in 3.5 of the Master CEMP. This will include:

- Ceasing works immediately.
- Cordoning off the area as appropriate (e.g. if a slip onto the Oakley walkway or oil spill) to make the area safe, and minimise any further environmental damage.
- Contacting the site manager and appropriate experts (e.g. Project Archaeologist, Project Arborist, Acoustic Specialist).
- Contacting other relevant agencies if required (such as NZHTP or Auckland Council).
- For a spill, immediately using the spill kits that will be used on site.
- Contacting adjacent property owners and other relevant bodies (such as Friends of Oakley Creek in the event of a spill) to inform them of the incident.
- Identifying and implementing appropriate contingency measures.
- Completing the necessary reporting requirements.
- Following up with adjacent residents, regulatory agencies and other bodies on what contingency measures have been undertaken.

8. Reporting

Reporting requirements are set out in Section 4.2 of the Master CEMP. Specific reporting requirements in relation to each environmental aspect are also set out in each of the specific Environmental Management Plan that has been developed and the conditions of designation and consent. This is summarised in the following.

8.1 General Reporting Requirements

Reporting requirements are set out in Section 4.2 of the Master CEMP. All monitoring records will be kept on site at all times and made available to the Auckland Council for review in accordance with Condition RC.2.

8.2 Noise and Vibration

Noise and vibration reporting requirements are set out in Section 9.4 of the CVNMP. This specifically requires any noise, vibration or building condition survey to be summarised in a report, and submitted to the environmental Manager within one week of the assessment.

All monitoring records shall be kept at the site office of Construction Yard 7, and made available upon request.

8.3 Air Quality

Air quality reporting requirements are set out in Conditions AQ.15 to AQ.19, and in Section 7 of the AQMP. Specifically the following reporting in relation to air quality will be undertaken for Construction Yard 7:

- A log book of all monitoring undertaken, including daily visual assessments and any contingency measures required (such as dampening down areas) shall be maintained and kept on the site at all times.
- A log book of all complaints received in relation to the site shall be maintained and kept on the site at all times.

8.4 Settlement

Settlement reporting requirements are set out in Conditions S.6 and S.13 of the conditions, and Section 3.5 of the SEMP. Specifically, settlement monitoring reports will be prepared:

- Prior to the commencement of construction,
- At monthly intervals throughout the construction period, and
- Following the completion of construction, following each round of settlement monitoring undertaken (i.e. monthly and then 6-monthly when monitoring is reduced pursuant to Condition S.5).

Building condition reports will be prepared prior to and post construction. These will be forward to the respective property owner within 15 days of completion.

8.5 Traffic

Section 6 of the CTMP sets out the reporting requirements in relation to traffic monitoring. All monitoring results collected in relation to Section 5.4 will be forwarded to the Traffic Management Project Governance Group on a quarterly basis.

8.6 Erosion and Sediment Control

Reporting requirements in relation to erosion and sediment controls are set out in Condition E.1, E.4, E.15, E.18 and E.19. Specifically, the reporting requirements include:

- Informing the Auckland Council in writing 10 days prior to construction activities occurring.
- Providing a schedule of construction activities prior to construction activities occurring, updated every 3 months.
- Once the erosion and sediment controls are in place, written confirmation from an appropriately qualified engineer will be provided to the Auckland Council confirming they are in place.

8.7 Archaeology

Section 7 of the ASMP sets out specific reporting requirements in relation to archaeology. This includes compiling all monitoring results and providing archaeological progress reports to NZTA and NZHPT on a 6

monthly basis. Specific reporting requirements to NZHPT are set out in the event of modifying an archaeological site.

9. Yard Restoration and Rehabilitation

9.1 Relevant Conditions

The following conditions are considered relevant in relation to the restoration and rehabilitation of Construction Yard 7:

- Condition OS.2
- Condition OS.3
- Condition OS.4
- Condition OS.7
- Condition LV.4
- Condition LV.8
- Condition LV.10
- Condition V.16

9.2 Open Space Restoration Plan

Drawing No. 20.1.11-3-D-L-810-229 Rev A sets out the concept landscape plan for the restoration of Oakley Creek Esplanade Reserve (Waterview Glades) following completion of construction activities, and once the Yard is no longer required.

Using this concept plan, an Open Space Restoration Plan will be prepared for the Oakley Creek Esplanade Reserve (Waterview Glades), in accordance with Conditions OS.2, OS.3, OS.4 and OS.7. In preparing the Open Space Restoration Plan, consultation will be undertaken with the Auckland Council, iwi, the Community Liaison Group, NZHPT, Friends of Oakley Creek and other relevant users identified by Auckland Council (in accordance with Condition OS.3).

The Open Space Restoration Plan is required to be will be prepared and submitted to Auckland Council at least 12 months prior to the Yard being rehabilitated. As it is proposed to rationalise the Yard in Stage 3 (refer to Section 2.2.4), the Open Space Restoration Plan will be prepared 12 months prior to commencement of this phase, to allow those parts of the yard no longer required to be rehabilitated for public use.

9.2.1 Key aspects of Yard restoration and rehabilitation

As noted above, Drawing No. 20.1.11-3-D-L-810-229 Rev A sets out the concept landscape plan for the restoration of Oakley Creek Esplanade Reserve (Waterview Glades).

In accordance with this plan and the conditions set out in Section 10.1 above, key aspects of the restoration activities include:

- Reshaping the area so that the existing contours are restored, except for minor modifications:
    - The area around the cycleway between Alford Street and Oakley Avenue is to be slightly raised to avoid retaining walls/ fencing that currently exist;
    - The grassed banks at around chainage 4000 will be recontoured to cover the underpass structure at this point (refer to Drawing 20.1.11-3-D-N-912-306 Rev A).
- Once the area has been reshaped it will be regrassed, and 3 replacement seats will be reinstated within the reserve in accordance with Condition OS.4, and as agreed with the Auckland Council.
- Once the area is stabilised all remaining erosion and sediment controls, including the dual purpose sediment retention pond, will be removed.
- Replacement planting will then be undertaken in accordance with the concept plan and the planting schedules. This will be undertaken within the first planting season following completion of the construction works (as required by Condition LV.4). Planting will be maintained for a period of 10 years.
- Where any amenity trees have been removed as a result of the works within the Yard, these will be replaced with appropriate species in accordance with the Project Arborist and in agreement with Auckland Council.
- Any bus stops affected by the Great North Road diversion works will be reinstated.
- A new 1.8m wide all weather path will be formed from Great North Road around the northern section of the Construction Yard 7 boundary to join in with the existing Oakley Creek walkway. This will be constructed prior to occupation of Construction Yard 7, as noted above in Section 4.6.
- A 15m wide strip of riparian planting will be undertaken along the western edge of Oakley Creek as required by Condition OS.7.

APPENDIX A – Drawings

LEGEND

- PROPOSED CONSTRUCTON FOOTPRINT
- PROPOSED CONSTRUCTION SUBSURFACE
- AREA OF CUT AND COVER PHASE OF CONSTRUCTION
- AREA OF COMPLETED CUT AND COVER
- AREA OF CUT AND COVER NOT STARTED
- TEMPORARY ROAD DIVERSION
- INDICATIVE CONSTRUCTION STORMWATER / SEDIMENT RETENTION PONDS
- SITE COMPOUND: SITE OFFICE, PARKING, WASTE MANAGEMENT, STORAGE, BENTONITE PLANT
- TUNNEL ACCESS CAVITY
- DRIVEN TUNNEL
- CONSTRUCTION YARD FENCE (17mm PLY SOLID HOARDING, 2m HEIGHT)
- SUPER SILT FENCE
- DIRTY WATER DIVERSION BUND
- RETAINING WALL
- EXISTING WALKWAY
- NEW WALKWAY TO BE CONSTRUCTED
- ARCHAEOLOGIGAL SITE WITH FENCE AROUND
- AMENITY TREE
- AMENITY TREE LIKELY TO REQUIRE REMOVAL
- TUNNEL WATER TREATMENT PLANT
- CHEMICAL TREATMENT PLANT
- TUNNEL POWER SUPPLY
- TUNNEL CONSTRUCTION VENTILATION FANS
- VEHICLE WHEEL WASH
- LIGHT POLE (70w, HSP)
- ROCK OUTLET PROTECTION
- PRIVATE STORMWATER POND

OAKLEY CREEK
NEW SIGNALISED INTERSECTION
R11/2383
SRP-7A
SITE COMPOUND
CONSTRUCTION YARD 7
1510 GREAT NORTH ROAD
CONSTRUCTION YARD 6
HERDMAN STREET
TUNNEL CROSS PASSAGE
NEW SIGNALISED INTERSECTION
EXISTING SIGNALISED INTERSECTION
OAKLEY AVENUE
ALFORD STREET
ALVERSTON STREET
FIR STREET
DAVENTRY STREET

A3 SCALE 1:2000
A1 SCALE 1:1000
0 10 20 30 40 60 80 100 (m)

FOR INFORMATION
NOT FOR CONSTRUCTION

No.	Revision	By	Chk	Appd	Date
B	ISSUED FOR DC.1 A/RC.3 COMPLIANCE	JRH			01.09.11
A	FOR INFORMATION	JRH			-

Drawing Originator: Beca

Original Scale (A1) 1:1000
Reduced Scale (A3) 1:2000

Designer	BM
Reviewer	AL
Drafting Checked	JRH
Consultant Approval	AL
Received by Beca	-

NZ TRANSPORT AGENCY WAKA KOTAHI

Project: WATERVIEW CONNECTION PROJECT SH16 / SH20

Title: CONSTRUCTION YARD 7 STAGE 1 ENABLING WORKS

Base level: MSL AUCK. VERT. DATUM 1946
Grid Reference: MT EDEN 2000
Originator No.
Project No. 20.1.11-3-D-N-912-301
Rev. B

DO NOT SCALE

IF IN DOUBT ASK.

LEGEND

- PROPOSED CONSTRUCTON FOOTPRINT
- PROPOSED CONSTRUCTION SUBSURFACE
- AREA OF CUT AND COVER PHASE OF CONSTRUCTION
- AREA OF COMPLETED CUT AND COVER
- AREA OF CUT AND COVER NOT STARTED
- TEMPORARY ROAD DIVERSION
- INDICATIVE CONSTRUCTION STORMWATER / SEDIMENT RETENTION PONDS
- SITE COMPOUND: SITE OFFICE, PARKING, WASTE MANAGEMENT, STORAGE, BENTONITE PLANT
- TUNNEL ACCESS CAVITY
- DRIVEN TUNNEL
- CONSTRUCTION YARD FENCE (17mm PLY SOLID HOARDING, 2m HEIGHT)
- SUPER SILT FENCE
- DIRTY WATER DIVERSION BUND
- RETAINING WALL
- EXISTING WALKWAY
- NEW WALKWAY TO BE CONSTRUCTED
- ARCHAEOLOGIGAL SITE WITH FENCE AROUND
- AMENITY TREE
- AMENITY TREE LIKELY TO REQUIRE REMOVAL
- TUNNEL WATER TREATMENT PLANT
- CHEMICAL TREATMENT PLANT
- TUNNEL POWER SUPPLY
- TUNNEL CONSTRUCTION VENTILATION FANS
- VEHICLE WHEEL WASH
- LIGHT POLE (70w, HSP)
- ROCK OUTLET PROTECTION
- PRIVATE STORMWATER POND

OAKLEY CREEK

NEW SIGNALISED INTERSECTION

R11/2383

CD-7B

SITE COMPOUND

CONSTRUCTION YARD 7

TEMPORARY YARD 7 ACCESS OVER CUT AND COVER

1510 GREAT NORTH ROAD

CONSTRUCTION YARD 6

TEMPORARY BUS STOP

NEW SIGNALISED INTERSECTION

EXISTING SIGNALISED INTERSECTION

YARD FENCE RETRACTED TO PROPERTY BOUNDARY

HERDMAN STREET

DAVENTRY STREET

OAKLEY AVENUE

ALFORD STREET

ALVERSTON STREET

FIR STREET

A3 SCALE 1:2000
A1 SCALE 1:1000
0 10 20 30 40 60 80 100 (m)

FOR INFORMATION
NOT FOR CONSTRUCTION

No.	Revision	By	Chk	Appd	Date
B	ISSUED FOR DC.1A/RC.3 COMPLIANCE	JRH			01.09.11
A	FOR INFORMATION	JRH			-

Drawing Originator: Beca

Original Scale (A1) 1:1000
Reduced Scale (A3) 1:2000

Designer	BM
Reviewer	AL
Drafting Checked	JRH
Consultant Approval	AL
Received by Beca	-

NZ TRANSPORT AGENCY WAKA KOTAHI

Project: WATERVIEW CONNECTION PROJECT SH16 / SH20

Title: CONSTRUCTION YARD 7 STAGE 2 PHASE 1

Base level: MSL AUCK. VERT. DATUM 1946
Grid Reference: MT EDEN 2000
Originator No.
Project No. 20.1.11-3-D-N-912-302 Rev. B

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LEGEND

- PROPOSED CONSTRUCTON FOOTPRINT
- PROPOSED CONSTRUCTION SUBSURFACE
- AREA OF CUT AND COVER PHASE OF CONSTRUCTION
- AREA OF COMPLETED CUT AND COVER
- AREA OF CUT AND COVER NOT STARTED
- TEMPORARY ROAD DIVERSION
- INDICATIVE CONSTRUCTION STORMWATER / SEDIMENT RETENTION PONDS
- SITE COMPOUND: SITE OFFICE, PARKING, WASTE MANAGEMENT, STORAGE, BENTONITE PLANT
- TUNNEL ACCESS CAVITY
- DRIVEN TUNNEL
- CONSTRUCTION YARD FENCE (17mm PLY SOLID HOARDING, 2m HEIGHT)
- SUPER SILT FENCE
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- ARCHAEOLOGIGAL SITE WITH FENCE AROUND
- AMENITY TREE
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- CHEMICAL TREATMENT PLANT
- TUNNEL POWER SUPPLY
- TUNNEL CONSTRUCTION VENTILATION FANS
- VEHICLE WHEEL WASH
- LIGHT POLE (70w, HSP)
- ROCK OUTLET PROTECTION
- PRIVATE STORMWATER POND

OAKLEY CREEK

NEW SIGNALISED INTERSECTION

R11/2383

CD-7B

SITE COMPOUND

CONSTRUCTION YARD 7

CONSTRUCTION YARD 6

1510 GREAT NORTH ROAD

NEW SIGNALISED INTERSECTION

HERMARI STREET

OAKLEY AVENUE

ALFORD STREET

ALVERSTON STREET

FIR STREET

DAVENTRY STREET

A3 SCALE 1:2000
A1 SCALE 1:1000
0 10 20 30 40 60 80 100 (m)

FOR INFORMATION
NOT FOR CONSTRUCTION

No.	Revision	By	Chk	Appd	Date
A	FOR INFORMATION	JRH			-

Drawing Originator: Beca

Original Scale (A1) 1:1000
Reduced Scale (A3) 1:2000

Designer	BM
Reviewer	AL
Drafting Checked	JRH
Consultant Approval	AL
Received by Beca	-

NZ TRANSPORT AGENCY WAKA KOTAHI

Project: WATERVIEW CONNECTION PROJECT SH16 / SH20

Title: CONSTRUCTION YARD 7 STAGE 2 PHASE 2

Base level: MSL AUCK. VERT. DATUM 1946
Grid Reference: MT EDEN 2000
Originator No.
Project No. 20.1.11-3-D-N-912-303
Rev. A

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LEGEND

- PROPOSED CONSTRUCTON FOOTPRINT
- PROPOSED CONSTRUCTION SUBSURFACE
- AREA OF CUT AND COVER PHASE OF CONSTRUCTION
- AREA OF COMPLETED CUT AND COVER
- AREA OF CUT AND COVER NOT STARTED
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- INDICATIVE CONSTRUCTION STORMWATER / SEDIMENT RETENTION PONDS
- SITE COMPOUND: SITE OFFICE, PARKING, WASTE MANAGEMENT, STORAGE, BENTONITE PLANT
- TUNNEL ACCESS CAVITY
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- VEHICLE WHEEL WASH
- LIGHT POLE (70w, HSP)
- ROCK OUTLET PROTECTION
- PRIVATE STORMWATER POND

OAKLEY CREEK

R11/2383

CD-TBL

SITE COMPOUND

CONSTRUCTION YARD 7

CONSTRUCTION YARD 6

BUS BAY

1510 GREAT NORTH ROAD

HERDMAN STREET

OAKLEY AVENUE

ALFORD STREET

ALVERSTON STREET

FIR STREET

DAVENTRY STREET

4200 4150 4100 4000 3900 3820 3800 3780 3700

A3 SCALE 1:2000
A1 SCALE 1:1000
0 10 20 30 40 60 80 100 (m)

FOR INFORMATION
NOT FOR CONSTRUCTION

No.	Revision	By	Chk	Appd	Date
B	ISSUED FOR DC.1A/RC.3 COMPLIANCE	JRH			01.09.11
A	FOR INFORMATION	JRH			-

Drawing Originator: Beca

Original Scale (A1) 1:1000
Reduced Scale (A3) 1:2000

Designer	BM
Reviewer	AL
Drafting Checked	JRH
Consultant Approval	AL
Received by Beca	-

NZ TRANSPORT AGENCY WAKA KOTAHI

Project: WATERVIEW CONNECTION PROJECT SH16 / SH20

Title: CONSTRUCTION YARD 7 STAGE 2 PHASE 3

Base level: MSL AUCK. VERT. DATUM 1946
Grid Reference: MT EDEN 2000
Originator No.
Project No. 20.1.11-3-D-N-912-304
Rev. B

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LEGEND

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- TUNNEL CONSTRUCTION VENTILATION FANS
- VEHICLE WHEEL WASH
- LIGHT POLE (70w, HSP)
- ROCK OUTLET PROTECTION
- PRIVATE STORMWATER POND

OAKLEY CREEK
R11/2383
CD - BL
SITE COMPOUND
CONSTRUCTION YARD 7
CONSTRUCTION YARD 6
1510 GREAT NORTH ROAD
HERDMAN STREET
OAKLEY AVENUE
ALFORD STREET
ALVERSTON STREET
FIR STREET
DAVENTRY STREET
ROAD

A3 SCALE 1:2000
A1 SCALE 1:1000
0 10 20 30 40 60 80 100 (m)

FOR INFORMATION
NOT FOR CONSTRUCTION

No.	Revision	By	Chk	Appd	Date
B	ISSUED FOR DC.1A/RC.3 COMPLIANCE	JRH			01.09.11
A	FOR INFORMATION	JRH			-

Drawing Originator: Beca

Original Scale (A1) 1:1000	
Reduced Scale (A3) 1:2000	
Designer	BM
Reviewer	AL
Drafting Checked	JRH
Consultant Approval	AL
Received by Beca	-

NZ TRANSPORT AGENCY WAKA KOTAHI

Project: WATERVIEW CONNECTION PROJECT SH16 / SH20

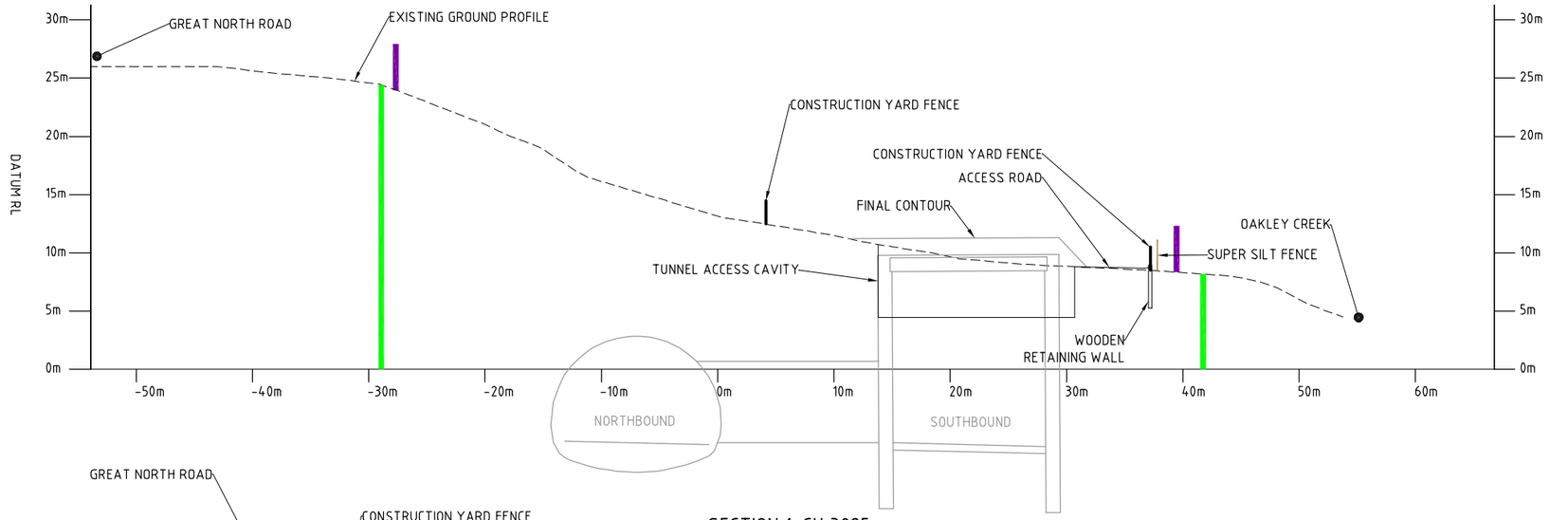
Title: CONSTRUCTION YARD 7 STAGE 3

Base level: MSL AUCK. VERT. DATUM 1946
Grid Reference: MT EDEN 2000
Originator No.
Project No. 20.1.11-3-D-N-912-305
Rev. B

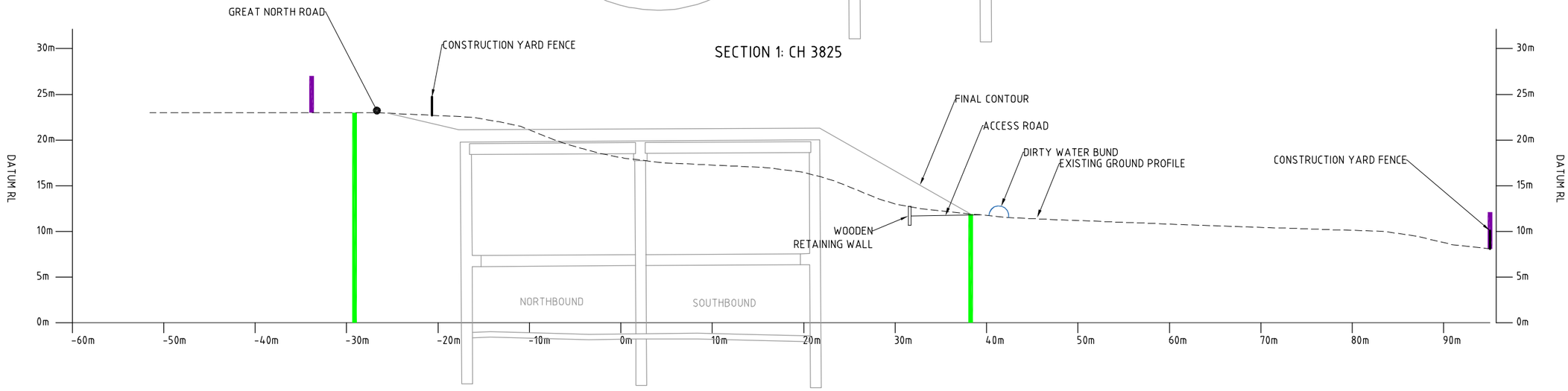
DO NOT SCALE

IF IN DOUBT ASK.

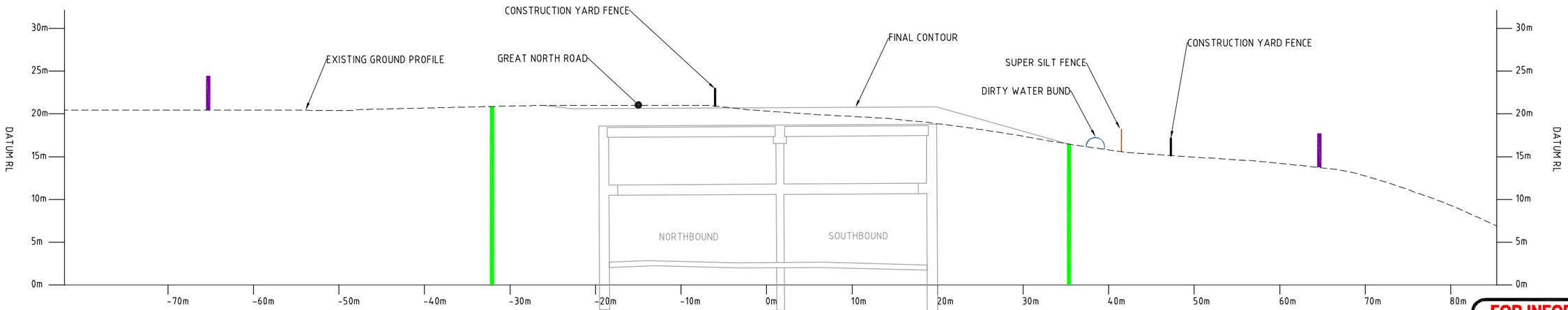
Drawing Plotted: 28 Apr 2011 11:32



SECTION 1: CH 3825



SECTION 2: CH 3925



SECTION 3: CH 4055

LEGEND

PROPOSED DESIGNATION

PROPOSED SUBSURFACE DESIGNATION

NOTE:

REFER TO DRAWINGS 20.1.11-3-D-N-912-301 TO 305.

A3 SCALE 1:500
A1 SCALE 1:250

0 10 20 30 (m)

FOR INFORMATION
NOT FOR CONSTRUCTION

No.	Revision	By	Chk	Appd	Date
A	FOR INFORMATION	JRH			-

Drawing Originator: Beca

Original Scale (A1) 1:250
Reduced Scale (A3) 1:500

Designer	BM
Reviewer	AL
Drafting Checked	JRH
Consultant Approval	AL
Received by Beca	-

NZ TRANSPORT AGENCY
WAKA KOTAHI

Project: WATERVIEW CONNECTION PROJECT SH16 / SH20

Title: CONSTRUCTION YARD 7 CROSS SECTIONS

Base level: MSL AUCK. VERT. DATUM 1946
Grid Reference: MT EDEN 2000
Originator No.
Project No. 20.1.11-3-D-N-912-306
Rev. A

DO NOT SCALE

IF IN DOUBT ASK.

Document No. 20.1.11-3-D-N-912-366.dwg