Grey Lynn Tunnel

Watercare Services Limited

Proposed Conditions

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February 2019

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Document history and status

Revision	Date	Description	By	Review	Approved
1	20/02/2019	Draft Issued to Watercare	A Tsang	T Hegarty	N Kay
2	26/02/2019	Final for Lodgement	A Tsang	T Hegarty	N Kay

Notice of Requirement Conditions

1. General conditions

1.1 Except as modified by the conditions below and subject to final design, the works shall be undertaken in general accordance with the information provided by the Requiring Authority in the Notice of Requirement dated February 2019, and supporting documents being:

a) Assessment of Effects on the Environment, titled "Grey Lynn Tunnel – Notice of Requirement, Resource Consent Application and Assessment of Environmental Effects" prepared by Jacobs, dated February 2019.

b) Drawings as detailed below:

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c) Technical Reports as detailed below:

- Ecological Assessment, prepared by Bioresearches Group Ltd, dated
- Archaeological and Historic Heritage Assessment, prepared by Clough & Associates Ltd, dated
- Traffic Impact Assessment, prepared by Commute, dated
- Noise Assessment, prepared by Marshall Day Acoustics, dated
- Vibration Assessment, prepared by McMillen Jacobs Associates, dated
- Groundwater Assessment, prepared by Williamson Water & Land Advisory, dated
- Settlement Assessment, prepared by McMillen Jacobs Associates, dated
- Air Quality Assessment, prepared by AECOM, dated
- Contamination Report, prepared by AECOM, dated
- Visual Impact and Landscape Assessment, prepared by Boffa Miskell Ltd, dated
- Arborist Report, prepared by Greenscene NZ, dated

1.2 As soon as practicable following completion of commissioning of the Project, the Requiring Authority shall, in consultation with the Council:

a) review the extent of the area designated for the Project;

b) identify any areas of designated land that are no longer necessary for the ongoing operation, maintenance, renewal and protection of the Project and associated structures and activities;

c) identify any areas of the designation within road reserve that are no longer necessary as the completed infrastructure is otherwise provided for and adequately protected by provisions of the Local Government (Auckland Council) Act 2009 and Utilities Access Act 2010;

d) give notice to the Council in accordance with Section 182 of the RMA for the removal of those parts of the designation identified in (b) and (c) above, which are not required for the long term operation and maintenance of the Project; and

e) provide as-built plans to the Council's Team Leader, Compliance and Monitoring, Resource Consents.

1.3 A liaison person shall be appointed by the Requiring Authority for the duration of the construction phase of the Project to be the main and readily accessible point of contact for persons affected by the designation and construction work. The liaison person's name and contact details shall be advised to affected parties by the Requiring Authority. This person must be reasonably available for on-going consultation on all matters of concern to affected persons arising from the Project. If a liaison person will not be available for any reason, an alternative contact person shall be nominated to ensure that a Project contact person is available by telephone 24 hours per day seven days per week during the construction phase.

1.4 The designation shall lapse on the expiry of a period of 10 years after the date on which the last of any appeals on all consents and notices of requirement associated with the Project is withdrawn or determined, or, if no appeals are lodged, the date on which the notices of requirement are included in the AUP in accordance with section 184(1)(c) of the RMA, unless:

a) it has been given effect before the end of that period; or

b) the Council determines, on an application made within 3 months before the expiry of that period, that substantial progress or effort has been made towards giving effect to the designation and is continuing to be made, and fixes a longer period for the purposes of this subsection.

1.5 Except as provided for in Condition 1.6 below, the Requiring Authority shall submit an Outline Plan of Works (OPW) for the Project for each of the relevant Project stages in accordance with section 176A of the RMA.

1.6 An OPW need not be submitted if the Council has waived the requirement for an OPW in accordance with section 176A(2)(c) of the RMA.

1.7 The OPW shall include the following Management Plans for the Project:

a) Construction Management Plan (CMP);

b) Traffic Management Plan;

c) Communications Plan;

d) Construction Noise and Vibration Management Plan (CNVMP); and

e) Site Reinstatement Plan.

1.8 The OPW shall include architectural plans for any proposed new permanent building at designated shaft site. The architectural designs for the building shall take into account the following matters:

a) The extent to which the buildings are appropriate to their context and minimise potential adverse effects on the amenity of the surroundings (including neighbouring properties);

b) The use of building materials which are sufficiently robust and minimise the potential for graffiti and vandalism;

c) The extent to which the buildings are visually recessive through use of appropriate colours, textures and modulation;

d) The extent to which buildings are designed to achieve appropriate visual amenity and scale with their surroundings through such aspects as modulation of building form, articulation of building components, and use of architectural detail; and

e) The extent to which any planting visually anchors the building and enhances amenity and/or natural values of the surroundings.

1.9 The OPW shall include design plans for any other permanent at grade and above ground structures. The design of any permanent at grade and above ground structures shall take into account the following matters:

a) the location, landscape setting and adjoining land uses;

b) the layout, architectural form and detail, and the use of a consistent and appropriate palette of materials, to ensure these elements are visually recessive;

c) the configuration of multiple surface elements to minimise their prominence and visual clutter;

d) the use of materials which are sufficiently robust and minimise the potential for graffiti and vandalism;

e) landscaping to integrate with the Site Reinstatement Plan required in Condition 12.1; and

f) site configuration that maximises the use of Crime Prevention Through Environmental Design (CPTED) principles.

2. Construction Management

2.1 The Requiring Authority shall prepare Construction Management Plans (CMP) for each of the relevant Project stages. The purpose of the CMP(s) is to set out the detailed management procedures and construction methods to be undertaken in order to avoid, remedy or mitigate potential adverse effects arising from construction activities and to achieve compliance with the specific conditions of this designation that relate to the matters referred to items (c) to (p) of Condition 2.2 below. The CMP(s) shall be submitted to the Council with the relevant OPW for the stage to which they relate.

2.2 The CMP(s) required by Condition 2.1 above shall include specific details relating to the management of all construction activities associated with the relevant Project stage, including:

a) Details of the site or project manager and the construction liaison person identified in Condition 1.3, including their contact details (phone, postal address, email address);

b) An outline construction programme;

c) The proposed hours of work;

d) Measures to be adopted to maintain the land affected by the works in a tidy condition in terms of disposal / storage of rubbish, storage and unloading of construction materials and similar construction activities;

e) Location of site infrastructure including site offices, site amenities, contractors yards site access, equipment unloading and storage areas, contractor car parking, and security;

f) Procedures for controlling sediment run-off, dust and the removal of soil, debris, demolition and construction materials (if any) from public roads and / or other places adjacent to the work site;

g) Procedures for ensuring that residents, road users and businesses in the immediate vicinity of construction areas are given prior notice of the commencement of construction activities and are informed about the expected duration and effects of the works;

h) Means of providing for the health and safety of the general public and for pedestrian management as required by Conditions 6.1;

i) Procedures for the management of works which directly affect or are located in close proximity to existing network utility services;

j) Procedures for responding to complaints about construction activities;

k) Procedures for the refuelling of plant and equipment;

l) A Construction Noise and Vibration Management Plan (CNVMP) containing measures to address the management of noise and vibration as identified in Condition 3.1;

m) Measures for the protection and management of trees as identified in Condition 10.1; and

n) Measures to address CPTED issues within and around the site.

2.3 The CMP shall be implemented and maintained throughout the entire construction period for the Project or relevant Project stage to manage potential adverse effects arising from construction activities. The CMP or any specific component of the CMP shall be updated as necessary and provided to the Council in accordance with 2.1.

3. Construction Noise and Vibration

3.1 A Construction Noise and Vibration Management Plan (CNVMP) either as part of the CMP, or as a standalone plan, shall be prepared by a suitably qualified person, and shall be submitted to the Council with the OPW to which it relates. The purpose of the CNVMP is to provide a framework for the development and implementation of the Best Practicable Option ('BPO') for management of all construction noise and vibration effects and to define the procedures to be followed when full compliance with the construction noise and vibration standards of Conditions X to X are not met following adoption of the BPO.

3.2 Construction noise shall be measured and assessed in accordance with NZS6803:1999 Acoustics – Construction Noise, and shall comply with the following noise limits, unless varied in accordance with Condition 3.5:

Time and Day	Noise Limits	
	L_{Aeq} dB	L_{Amax} dB
Monday to Saturday 0730 – 1800	70	85
At All Other Times and Public Holidays	45	75

3.3 Construction works which exceed a level of LAeq 45dB at the most exposed receiver(s) are restricted to between 0730 to 1800 on weekdays and Saturdays, with no noisy works permitted on Sundays and Public Holidays. Each CNVMP shall define which activities will comply with a limit of LAeq 45dB and can therefore be undertaken outside of these hours in compliance with Condition 8.1.

3.4 Each CNVMP shall, in demonstrating compliance with Condition 3.2, as a minimum, address the following aspects with regard to construction noise:

a) a description of noise sources, including machinery, equipment and construction techniques to be used;

b) predicted construction noise levels;

c) hours of operation, including times and days when noisy construction work would occur;

d) physical noise mitigation measures, including prohibiting the use of tonal reverse alarms, maintenance of access roads (to ensure they are smooth), acoustic screening around the site, plant selection and maintenance procedures, and site layout;

e) construction noise criteria for any specific areas and sensitive receivers such as schools, child care centres, medical or aged care facilities;

f) the identification of activities and locations that will require the design of specific noise mitigation measures;

g) the consultation undertaken by the Requiring Authority with affected stakeholders to develop the proposed noise management measures and any feedback received from those stakeholders, along with the noise management measures that will be adopted based on this consultation;

h) methods for monitoring and reporting on construction noise;

i) methods for receiving and responding to complaints about construction noise; and

j) construction operator training procedures.

3.5 Where a CNVMP predicts that noise levels from a particular activity will or will likely exceed the noise limits set out in Condition 3.2, or where noise measurements show that compliance is not being achieved, the Requiring Authority shall prepare and submit for the approval of the Council an Activity Specific Construction Noise Management Plan (ASCNMP). The ASCNMP(s) shall be submitted to the Council for review and approval at least 7 working days prior to the proposed works commencing.

Works subject to the ASCNMP(s) shall not commence until approval is received from the Council. If monitoring shows that levels specified in an ASCNMP are being exceeded, work generating the exceedance shall stop and not recommence until further mitigation is implemented in accordance with an amended ASCNMP approved by the Council.

In addition to the requirements of 3.4, an ASCNMP must:

a) describe the activity (including duration), plant and machinery that is expected not to comply with the noise limits in Condition 3.2;

b) describe the mitigation measures proposed to reduce the noise levels as far as practicable, including any options that have been discounted due to cost or any other reason;

c) provide predicted noise levels for all receivers where the noise levels will not be compliant with the limits in Condition 3.2, including the effect of mitigation specified in 3.5(b);

d) provide a set of noise limits that are Activity – Specific;

e) describe the noise monitoring that will be undertaken to determine compliance with the Activity – Specific noise limits; and

f) describe any additional noise mitigation measures that may be implemented to maintain compliance with Activity Specific noise limits.

Note: It is accepted that the noise limits in Condition 3.2 may not be met at all times, but that the Requiring Authority will adopt the Best Practicable Option to achieve compliance and will obtain the written consent of affected persons to any exceedances.

3.6 Each CNVMP shall also describe measures adopted to meet the requirements of German Standard DIN4150-3:1999, and as a minimum shall address the following aspects with regard to construction vibration:

a) vibration sources, including machinery, equipment and construction techniques to be used;

b) preparation of building condition reports on 'at risk' buildings prior to, during and after completion of works, where for the purposes of this condition an 'at risk' building is one at which the levels in the German Standard DIN4150-3: 1999 are likely to be approached or exceeded;

c) use of building condition surveys to determine the sensitivity of the building(s) on the adjacent sites to ground movement in terms of the Line 1-3 criteria of the DIN standard;

d) identification of any particularly sensitive activities in the vicinity of the proposed works (e.g. commercial activity using sensitive equipment such as radiography or mass-spectrometry), along with the details of consultation with the land owners of the sites where the sensitive activities are located and any management measures that will be adopted based on this consultation;

e) the consultation undertaken by the Requiring Authority with affected stakeholders to develop the proposed vibration management measures and any feedback received from those stakeholders, along with the vibration management measures that will be adopted based on this consultation;

f) methods for monitoring and reporting on construction vibration; and

g) methods for receiving and responding to complaints about construction vibration.

3.7 Construction activities shall comply with the Guideline vibration limits set out in DIN 4150- 3:1999 unless varied in accordance with 3.8.

3.8 The Guideline vibration limits set out in DIN4150 must not be exceeded except where the Requiring Authority can demonstrate to the satisfaction of the Council:

a) that the receiving building(s) are capable of withstanding higher levels of vibration and what the new vibration limit is. The investigation required to demonstrate this must include an assessment of the building(s) by a suitably experienced and qualified structural engineer and a full pre-condition survey; and

b) that the Requiring Authority has obtained the written agreement of the building owner(s), that a higher limit may be applied.

3.9 Each CNVMP shall be implemented and maintained throughout the entire construction period. Each CNVMP shall be updated when necessary and any updated CNVMP shall be submitted to the Council in accordance with Condition 3.1.

4. Operational Noise

4.1 The noise arising from any operational activities undertaken on the designated land, shall not exceed the following noise limits when measured at or within the boundary of any site zoned as follows:

Residential	
Time	Noise Limit*
0700-2200 hours	50 dB L_{Aeq}
2200-0700 hours	40 dBL_{Aeq} 75 dB L_{Amax}
Business	
Time	Noise Limit
At all times	60 dB L_{Aeq}

***Notes:**

(1) These noise limits relate to noise generated by the normal operation of permanent works associated with the Project and do not apply to short term maintenance activities.

(2) Noise levels shall be measured and assessed in accordance with New Zealand Standards NZS6801:2008 Acoustics - Measurement of Environmental Sound and NZS6801:2008 Acoustics - Environmental Noise.

5. Traffic Management

5.1 A detailed Traffic Management Plan (TMP) or plans shall be prepared for the Project or relevant Project stage by a suitably qualified person and submitted as part of the CMP. The purpose of the CTMP is to:

a) Manage the road transport network for the duration of construction to manage congestion and minimise delays to road users;

b) Inform the public about traffic management on the road transport network for the duration of construction;

c) Protect public safety including the safe passage of pedestrians and cyclists;

d) Maintain pedestrian access to private property at all times;

e) Provide vehicle access to private property to the greatest extent possible; and

f) Manage traffic effects from construction yards on adjacent properties.

5.2 The TMP(s) shall describe the measures that will be taken to avoid, remedy or mitigate the traffic effects associated with construction of the Project or Project stage. In particular, the TMP(s) shall describe:

a) Traffic management measures to maintain traffic capacity or minimise the impact on traffic capacity during weekdays and weekends;

b) Any road closures that will be required and the nature and duration of any traffic management measures that will result, including any temporary restrictions, detours or diversions for general traffic and buses;

c) Methods to manage the effects of the delivery of construction material, plant and machinery;

d) Measures to maintain, existing vehicle access to property where practicable, or to provide alternative access arrangements;

e) Measures to maintain pedestrian and cyclist movements and reduce the impact on mobility impaired users on roads and footpaths adjacent to the construction works. Such access shall be safe, clearly identifiable and seek to minimise significant detours;

f) Any proposed monitoring to measure the impact of the works on traffic and the impact of the traffic management measures. If safety or operational issues are evident, measures to be implemented to address these issues;

g) Measures to manage the proposed access to the site should the access be unable to cater for two-way traffic passing at the same time, and in particular to minimise reverse movements and blocking of the road; and

h) The availability of on-street and off-street parking if the designated site is unable to accommodate all contractor parking. This shall include an assessment of available parking (if any) for contractors on street and identify measures to meet and/or reduce contractor parking demand should it be found that there is insufficient on-street parking to meet this demand.

5.3 The TMP(s) shall be consistent with the New Zealand Transport Agency Code of Practice for Temporary Traffic Management, which applies at the time of construction.

5.4 Any damage in the road corridor directly caused by heavy vehicles entering or exiting the site shall be repaired as within two weeks or within an alternative timeframe to be agreed with Auckland Transport.

6. Pedestrian Management

6.1 Any temporary accessways shall be designed as far as practicable in accordance with CPTED (Crime Prevention Through Environmental Design) principles and provide appropriate lighting and signage where necessary.

7. Work within Road Reserve

7.1 The Requiring Authority shall not require Auckland Transport or network utility operators with existing infrastructure within the road reserve to seek written consent under Section 176 of the RMA for on-going access, to enable works associated with the routine construction, operation and maintenance of existing assets.

7.2 Works within transport corridors shall be undertaken in accordance with the National Code of Practice for Utility Operators' Access to Transport Corridors (November 2011), or any approved update of that code, unless otherwise agreed between the Requiring Authority and the Corridor Manager.

8. Construction Hours

8.1 Construction hours shall be as follows, except where work is necessary outside the specified days or hours for the purposes specified in Condition 8.2 below.

a) Tunnelling activities – 24 hours a day, 7 days a week operations for all tunnelling activities, including the main tunnel works and the link tunnels.

b) General site activities – 7am to 6pm, Monday to Friday, 8am to 6pm Saturday.

c) Truck movements – 7am to 6pm, Monday to Friday, 8am to 6pm Saturday.

8.2 Purposes for which work may occur outside of the specified days or hours are:

a) where, due to unforeseen circumstances, it is necessary to complete an activity that has commenced;

b) where work is specifically required to be planned to be carried out at certain times;

c) for delivery of large equipment or special deliveries required outside of normal hours due to traffic management requirements;

d) in cases of emergency

e) for the securing of the site or the removal of a traffic hazard; and/or

f) for any other reason specified in the CMP or TMP.

Where any work is undertaken pursuant to paragraphs (a) – (f), the Consent Holder shall, within five working days of the commencement of such work, provide a report to Council detailing how the work was authorised under those paragraphs.

9. Community Information and Liaison

9.1 The Requiring Authority shall prepare a Communications Plan (CP) for the construction phase of the Project or for each Project stage, and submit the plan in accordance with Condition 1.8. The CP shall set out:

a) the method(s) of consultation and liaison with key stakeholders and the owners/occupiers of neighbouring properties regarding the likely timing, duration and effects of works;

b) details of prior consultation or community liaison undertaken with the parties referred to in (a) above, including outlining any measures developed with such persons or groups to manage or to mitigate any adverse effects or inconvenience that may arise;

c) full contact details for the person appointed in accordance with Condition 1.3 to manage the public information system and be the point of contact for related enquiries; and

d) the information required by Conditions 3.4(g) and (i) and 3.6(f) and (h).

10. Tree Management

10.1 The Requiring Authority shall provide details in the CMP as to how the potential impacts of construction on trees and vegetation will be managed. The details shall provide for the:

a) Identification of trees to be protected, pruned, removed, or transplanted and procedures for marking these out on site.

b) Procedures for identifying and protecting trees to be retained where works occur in the dripline of such trees as identified by a suitably qualified person.

11. Archaeology and Heritage

11.1 Detailed protocols for the management of archaeological and waahi tapu discoveries shall be developed by the Requiring Authority in consultation with tangata whenua and the Heritage New Zealand prior to construction. These detailed protocols shall confirm the names and contact details for tangata whenua, the Heritage New Zealand and Auckland Council to be contacted in accordance with Condition 11.2.

11.2 If any archaeological material, including human remains are exposed during site works then the following procedures shall apply:

a) Immediately after it becomes apparent that an archaeological or traditional site has been exposed, all site works in the immediate vicinity shall cease.

b) The Requiring Authority shall immediately secure the area so that any artefacts or remains are untouched.

c) The Requiring Authority shall notify tangata whenua, the Heritage New Zealand and the Council (and in the case of human remains, the New Zealand Police) as soon as practicable, and advise those parties that an archaeological site has been exposed so that appropriate action can be taken. Works shall not recommence in the immediate vicinity of the archaeological site until approval is obtained from the Heritage New Zealand.

12. Site Reinstatement

12.1 Prior to commencement of works at all surface construction sites, the Requiring Authority shall prepare a Reinstatement Plan for the site, in consultation with the landowner(s). The Reinstatement Plan shall be submitted to the Council in accordance with Condition 1.9. The Reinstatement Plan shall include:

a) Any existing structures or features on the site to be protected during works or reinstated on completion of works.

b) The location and design of permanent wastewater infrastructure to remain at the site including the design of lid structures and chamber covers including the associated contouring of ground.

c) The location and design of permanent access to the wastewater infrastructure. As far as practicable, permanent all-weather access for heavy vehicles shall minimise areas of new impermeable surfaces and, in open space areas, the use of grass cell, or similar, shall be preferred.

d) Details of proposed landscaping and planting, including implementation and maintenance programmes.

12.2 When contractors' yards or other temporary works areas are no longer required for any construction or operational purpose, site works, including site offices, storage and equipment sheds, fencing and hard stand areas shall be removed and the area reinstated in accordance with Conditions 12.1.

Resource Consent Conditions

1. General conditions

Plans and Information

1.1 Except as modified by the conditions below and subject to final design, the works shall be undertaken in general accordance with the plans and information submitted with the application including:

a) Assessment of Effects on the Environment, titled "Grey Lynn Tunnel – Notice of Requirement, Resource Consent Application and Assessment of Environmental Effects" prepared by Jacobs, dated February 2019.

b) Drawings as detailed below:

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c) Technical Reports as detailed below:

- Ecological Assessment, prepared by Bioresearches Group Ltd, dated
- Archaeological and Historic Heritage Assessment, prepared by Clough & Associates Ltd, dated
- Traffic Impact Assessment, prepared by Commute, dated
- Noise Assessment, prepared by Marshall Day Acoustics, dated
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- Contamination Report, prepared by AECOM, dated
- Visual Impact and Landscape Assessment, prepared by Boffa Miskell Ltd, dated
- Arborist Report, prepared by Greenscene NZ, dated

Lapse

1.2 For construction related, or construction and operation related consents:

This consent shall lapse on the expiry of a period of 10 years after the date on which the last of any appeals on all consents and notices of requirement associated with the Project is withdrawn or determined, or, if no appeals are lodged, the date on which the notices of requirement are included in the AUP in accordance with section 184(1)(c) of the RMA, unless:

a) it has been given effect before the end of that period; or

b) the Council determines, on an application made within 3 months before the expiry of that period, that substantial progress or effort has been made towards giving effect to the consent and is continuing to be made, and fixes a longer period for the purposes of this subsection.

Construction Management

1.3 Prior to the commencement of works authorised by these consents, the Consent Holder shall prepare Construction Management Plans (CMP) for each of the relevant Project stages. The purpose of the CMP(s) is to set out the detailed management procedures and construction methods to be undertaken in order to avoid, remedy or mitigate potential adverse effects arising from construction activities and to achieve compliance with the specific conditions of this designation that relate to the matters referred to items (c) to (p) of Condition 1.4 below.

1.4 The CMP(s) required by Condition 1.3 above shall include specific details relating to the management of all construction activities associated with the relevant Project stage, including:

a) Details of the site or project manager and the construction liaison person, including their contact details (phone, postal address, email address);

b) An outline construction programme;

c) The proposed hours of work;

d) Measures to be adopted to maintain the land affected by the works in a tidy condition in terms of disposal / storage of rubbish, storage and unloading of construction materials and similar construction activities;

e) Location of site infrastructure including site offices, site amenities, contractors yards site access, equipment unloading and storage areas, contractor car parking, and security;

f) Procedures for controlling sediment run-off, dust and the removal of soil, debris, demolition and construction materials (if any) from public roads and / or other places adjacent to the work site;

g) Procedures for ensuring that residents, road users and businesses in the immediate vicinity of construction areas are given prior notice of the commencement of construction activities and are informed about the expected duration and effects of the works;

h) Means of providing for the health and safety of the general public;

i) Procedures for the management of works which directly affect or are located in close proximity to existing network utility services;

j) Procedures for responding to complaints about construction activities;

k) Procedures for the refuelling of plant and equipment;

l) A Construction Noise and Vibration Management Plan (CNVMP) containing measures to address the management of noise and vibration;

m) Measures for the protection and management of trees; and

n) Measures to address CPTED issues within and around the site.

1.5 The CMP shall be implemented and maintained throughout the entire construction period for the Project or relevant Project stage to manage potential adverse effects arising from construction activities. The CMP or any specific component of the CMP shall be updated as necessary and provided to the Council in accordance with Condition 1.3.

Dust Management

1.6 Beyond the boundary of the site, there shall be no dust caused by discharges from the site, which in the opinion of an enforcement officer, is noxious, offensive or objectionable.

1.7 All processes on site shall be operated in accordance with the CMP as required by Condition 1.3 of this consent.

1.8 The Consent Holder shall ensure that dust management during excavation works generally complies with the Good Practice Guide for Assessing and Managing the Environmental Effects of Dust Emissions, MfE (2001).

2. Earthworks

2.1 All earthworks shall be managed to minimise any discharge of debris, soil, silt, sediment or sediment-laden water beyond the site to either land, stormwater drainage systems, watercourses or receiving waters. In the event that a discharge occurs, the activity which resulted in the discharge shall cease immediately and the discharge shall be mitigated and/or rectified to the satisfaction of the Manager.

2.2 Prior to earthworks commencing at any site, a detailed Erosion and Sediment Control Plan ("ESCP") for that area which clearly identifies the type and location of the controls proposed, shall be submitted to the Council for certification. The ESCP(s) shall be in general accordance with GD05 and any amendments to that document.

2.3 Erosion and sediment control measures shall be carried out in accordance with the approved ESCP(s) required by this consent.

2.4 Any subsequent amendments to the approved ESCP(s) and / or methodology must be approved by the Manager in writing prior to any such amendment being implemented.

2.5 Prior to earthworks commencing at any site, a certificate signed by a suitably qualified person, confirming that the erosion and sediment controls have been constructed and completed in general accordance with the ESCP(s), shall be forwarded to the Manager.

2.6 The Consent Holder or their agent shall arrange and conduct a pre-construction site meeting between representatives of the Council, the Consent Holder and their contractor, prior to any works commencing on a site. The purpose of the pre-construction site meeting is to discuss the proposed site access arrangements, ESCP(s) and other measures to be taken to comply with conditions of this consent. If as a result of that meeting any amendments are required to the erosion and sediment control methodology, those amendments shall be submitted to the Manager for certification in accordance with Condition 2.2.

2.7 All perimeter controls shall be operational before earthworks begin.

2.8 All cleanwater runoff from stabilised surfaces including catchment areas above the site shall be diverted away from earthwork areas via a stabilised system, so as to prevent surface erosion.

2.9 All sediment laden runoff shall be treated on site by sediment control measures, as described in the consent application or modified under Condition 2.2. These measures are to be constructed or installed in accordance with best practice, be operational before commencement of works and be maintained to perform at full operational capacity until the site has been adequately secured against erosion.

2.10 Sediment control measures shall be inspected on a weekly basis and after a significant storm event to ensure effective operation.

2.11 The site shall be stabilised in accordance with the ESCP in a progressive manner as earthworks are completed across various areas of the site.

2.12 To prevent discharge of sediment-laden water or other debris into any public stormwater drainage systems or watercourses and therefore into receiving waters, and to prevent nuisance and amenity impacts on users of the road reserve, there shall be no deposition of earth, mud, dirt or other debris on any public road or footpath resulting from earthworks activity on the site. In the event that such deposition does occur, it shall immediately be removed. In no instance shall roads or footpaths be washed down with water without appropriate erosion and sediment control measures in place to prevent contamination of the stormwater drainage system, watercourses or receiving waters.

2.13 If works on a site are abandoned or will be unused for any reason, adequate preventative and remedial measures shall be taken to control sediment discharge and shall thereafter be maintained for as long as necessary to prevent sediment discharges from the site. All such measures shall be of a type and to a standard which are to the prior satisfaction of the Manager.

3. Groundwater

General Conditions

3.1 This consent shall expire on in 35 years from the granting of the consent unless it has lapsed, been surrendered or been cancelled at an earlier date pursuant to the RMA.

3.2 The Consent Holder shall ensure that all excavation, dewatering systems, retaining structures and associated works for the construction of the shafts, tunnels, underground structures and associated works, including all temporary and permanent works, shall be designed, constructed and maintained so as to avoid, as far as practicable, any damage to buildings, structures and services (including road infrastructure assets such as footpaths, kerbs, catch-pits, pavements and street furniture).

3.3 The Consent Holder shall ensure that all backfilling of temporary shafts is designed and constructed to the required engineering standard, so as to avoid any damage to buildings, structures and services.

3.4 The Consent Holder shall, at least 10 working days prior to the commencement of shaft sinking or tunnelling, advise the Manager, in writing, of the date of the proposed commencement of this work.

3.5 The Consent Holder shall, at least 10 working days following completion of shaft sinking or tunnelling, advise the Manager, in writing, of the date of completion. Monitoring and Contingency Plan.

Monitoring and Contingency Plan

3.6 The Consent Holder shall, before commencement of shaft sinking or tunnelling, prepare a Monitoring and Contingency Plan or Plans ("M&CP") addressing groundwater and settlement monitoring for each of the relevant Project stages. The M&CP shall demonstrate how the conditions of this consent will be implemented and shall include the following:

a) details of the building risk assessment process and building condition surveys required by Conditions 3.10 to 3.16 of this consent;

b) details of the groundwater monitoring programme required by Conditions 3.17 – 3.19, 3.21 and 3.23 of this consent;

c) details of the ground surface settlement and building movement monitoring required by Conditions 3.24 – 3.27, 3.29 and 3.32 of this consent;

d) location Plan of settlement monitoring marks and the location of existing and proposed groundwater monitoring bores;

e) details of the shaft retaining wall monitoring programme required by Conditions 3.24 and 3.27 of this consent;

f) the groundwater, deformation and settlement Alert and Alarm Levels (Trigger Levels) to be utilised for early warning of settlement with the potential to cause damage to buildings and services and details of the processes used to establish, and if necessary, to review these triggers;

g) details on the procedures for notification of the Manager in the event that Trigger Levels are exceeded;

h) options for additional investigations and analyses to determine the potential for groundwater effects or settlement and for damage to structures, including additional groundwater or settlement monitoring and building condition surveys;

i) details of the contingency measures to be implemented in the event of trigger levels being exceeded, including details on the practicable methodologies to avoid, remedy, or mitigate surface settlements with the potential to cause damage to buildings; and

j) A methodology to identify trenched sections where there is potential for ground settlement to cause damage to houses or buildings and the measures that will be taken to ensure such damage does not occur.

3.7 The Consent Holder shall submit to the Council for written approval:

a) at least 14 months prior to the Commencement of Dewatering for shaft sinking or tunnelling of any Project stage, those aspects of the M&CP dealing with preconstruction monitoring, including the pre-construction monitoring required under Conditions 3.10, 3.11, 3.19 and 3.26; and

b) at least 20 working days prior to Commencement of Dewatering for shaft sinking or tunnelling of any Project stage, the M&CP.

3.8 The Consent Holder shall comply with the M&CP at all times.

3.9 The Consent Holder may amend the M&CP from time to time, as necessary for the Project or any Project stage. Any amendments to the M&CP must be approved by the Council in writing prior to any such amendment being implemented.

Pre-construction Condition Survey

3.10 The Consent Holder shall consult with owners of the LDS Church on Surrey Crescent Street, the government buildings near Richmond Road, 30,2/30, 32, 34, 38 Sackville Street and 35, 37, 39, 41 and 42 Tawariki Street, and subject to the owner's approval on terms acceptable to the Consent Holder, undertake a detailed pre-construction condition survey of these structures to confirm their existing condition and enable the sensitivity of the existing buildings and structures to any groundwater and ground settlement changes to be accurately determined. The survey shall be completed at least three months prior to the Commencement of Dewatering of any Project stage involving shaft sinking or tunnelling. The intent of the survey is to assist in enabling the magnitude of allowable effects from changes in groundwater pressure and ground settlement movements to be reasonably determined. The survey shall include but not necessarily be limited to the following:

a) major features of the buildings and site developments, including location, type, construction, age and existing condition;

b) type and capacity of foundations;

c) existing levels of aesthetic damage;

d) existing level of structural distress or damage;

e) assessment of structural ductility;

f) susceptibility of structure to movement of foundations, including consideration of the local geological conditions; and

g) susceptibility of scheduled heritage buildings to movement of foundations. A photographic record of the inspection shall be included.

Note: ‘Commencement of Dewatering' means excavation below the groundwater table and/or commencing taking any groundwater from a shaft excavation (after construction of the pile walls (if required) and/or dewatering prior to excavation).

3.11 Where neighbouring building/property owners indicate, to the satisfaction of the Manager by way of a recommendation from a qualified and experienced vibration consultant, the presence of particularly sensitive structures (examples include old or brittle structures, vibration sensitive equipment, unusually heavy loads or settlement sensitive machinery) the Consent Holder shall undertake a full engineering assessment to determine what, if any, additional avoidance, design, remedial or monitoring works are required in this vicinity. The Manager may require an independent review of that assessment by a Chartered Professional Engineer.

3.12 The building condition surveys required by this consent shall be undertaken by an independent and suitably qualified person.

Post-construction Condition Surveys

3.13 Unless otherwise agreed in writing with the building owner that such survey is not required, the Consent Holder shall (subject to the owner(s) approval on terms acceptable to the Consent Holder), within six months of the Completion of Dewatering of any Project stage involving shaft sinking or tunnelling, undertake a postconstruction survey covering the matters identified in Condition 3.10 for any building located in an area where differential settlement of greater (steeper) than 1:1,000 occurs between two adjacent settlement monitoring points measured in accordance with the M&CP and a pre-construction condition survey was undertaken in accordance with Condition 3.10 or Condition 3.11. The Consent Holder may, if they are able to provide evidence to show the deformation was not caused by activities related to this consent, seek written approval from the Manager to waive this condition. If, since the pre-construction survey, any building damage is identified, the survey shall determine the likely cause of damage.

Note: 'Completion of Dewatering' means when all the permanent shaft lining, base slab and walls are complete and the tunnel lining is complete, and effectively no further groundwater is being taken for the construction of the shaft/tunnel.

3.14 The Consent Holder shall, at the direction of the Manager, and subject to the owner's approval on terms acceptable to the Consent Holder, undertake an additional survey on any existing building or structure surveyed in accordance with Condition 3.11, for the purpose of checking for damage and for following up on a report of damage to that building. The requirement for any such survey will cease six months after the Completion of Dewatering of any Project stage involving shaft sinking or tunnelling.

3.15 The Consent Holder shall ensure that a copy of the pre, post-construction and any additional building survey reports are forwarded to the respective property owner(s) and the Manager (unless the property owner(s) has instructed the Consent Holder not to do so) within 15 working days of completing the reports.

Repair of Damage

3.16 If the exercise of this consent causes any unforeseen damage to buildings, structures or services not assessed under Conditions 3.13 and 3.14, the Consent Holder shall notify the Manager as soon as practicable, and provide in writing to the Manager a methodology for repair of the damage caused that has been approved by a Chartered Professional Engineer and shall urgently undertake such repairs in accordance with the approved methodology, at its cost, unless written approval for this damage is provided from the owners.

Groundwater Monitoring

3.17 The Consent Holder shall install and maintain groundwater monitoring boreholes at the locations described in the M&CP for the period required by the conditions of this consent. Should any of the monitoring bores be damaged and become in-operable or unsuitable for monitoring, then the Manager is to be informed and a new monitoring bore shall be installed at a nearby location in consultation with the Manager.

3.18 The Consent Holder shall monitor groundwater levels in the groundwater monitoring boreholes and keep records of the water level measurement and corresponding date. All water level data shall be recorded to an accuracy of at least ± 5mm. These records shall be compiled and submitted to the Manager at six monthly intervals.

3.19 The Consent Holder shall monitor groundwater levels monthly in boreholes identified in the M&CP and keep records for a period of at least 12 months before the Commencement of Dewatering of any Project stage involving shaft sinking or tunnelling. The variability in groundwater levels over this period will be utilised to establish the seasonal groundwater level variability. The Consent Holder shall monitor groundwater levels monthly in any proposed boreholes for a period of at least two months (three readings indicating steady state) before the Commencement of Dewatering of any Project stage involving shaft sinking or dewatering.

3.20 Prior to the Commencement of Dewatering of any Project stage involving shaft sinking or tunnelling, the Consent Holder shall assess the potential groundwater effects resulting from the exercise of this consent. The output of this assessment shall be used to define the expected groundwater level at each borehole and to establish groundwater Trigger Levels for each borehole that minimise the potential for damage to existing buildings or structures. The process for establishing groundwater Trigger Levels shall be set out in the M&CP and shall be based upon the final tunnel alignment and construction methodology, and any groundwater monitoring required under this consent, and shall be based upon groundwater modelling completed using this data. A factor of natural seasonal variability shall be allowed for in this review based on the survey completed under Condition 3.19.

3.21 From Commencement of Dewatering of any Project stage involving shaft sinking or tunnelling, the Consent Holder shall monitor groundwater levels in each borehole at a minimum of monthly intervals and records shall be kept of each monitoring date and the corresponding water level in each borehole. In addition to the above, all boreholes located within 100 metres of the shaft construction site or within 100 metres of the tunnel excavation face shall be monitored for groundwater level at least once every week. These records shall be compiled and submitted to the Manager at six monthly intervals.

3.22 All monitoring data obtained pursuant to Condition 3.21 shall be compared to the predicted groundwater levels for each borehole. Where Trigger Levels are exceeded the actions as set out in the M&CP shall be undertaken and the Manager shall be notified within three working days, advising of the trigger exceedance, the risk of settlement causing damage to buildings, and details of the actions taken.

3.23 The Consent Holder shall continue to monitor groundwater levels in each borehole at monthly intervals for a period of 12 months following Completion of Dewatering of any Project stage involving shaft sinking or tunnelling, or for a lesser period if groundwater levels in any particular borehole show either:

a) recovery of the groundwater level to within 2 metres of the pre-construction groundwater level and is above trigger levels; or

b) a trend of increasing groundwater level in at least three consecutive monthly measurements and is above trigger levels, in which case monitoring at that borehole may cease.

After 12 months following the Completion of Dewatering of any Project stage involving shaft sinking or tunnelling, monitoring of groundwater levels shall continue at the direction of the Manager if groundwater levels are not recovering from construction effects and there is a risk of adverse effects.

Settlement Monitoring

3.24 The Consent Holder shall establish and maintain a settlement monitoring network of Ground Settlement Monitoring Marks to detect any deformation (vertical and/or horizontal movements) at the locations described in the M&CP and for the period required by the conditions of this consent. The Ground Settlement Monitoring Marks shall be located at least one mark within 5 metres of each of the groundwater monitoring boreholes described in Condition 3.17;

3.25 In the event of any of the monitoring marks required under Condition 3.24 being destroyed or becoming inoperable, the Consent Holder shall, unless otherwise agreed in writing by the Manager, replace the monitoring marks with new monitoring marks.

3.26 The Consent Holder shall survey and record the elevation of each Ground Settlement Monitoring Mark and record the corresponding date. Ground Settlement Monitoring Marks shall be surveyed at least three times over a 12 month period prior to commencement of any Project stage involving shaft sinking or tunnelling to establish seasonal variability, and the minimum level of these baseline surveys shall be used to establish the pre-construction reference ground level. All surveys are to be completed to an accuracy of at least ± 2mm for level and ± 5mm for plan position, or as otherwise achieved by best practice precise levelling.

3.27 The Consent Holder shall survey and record the readings of each inclinometer as required in condition 3.24 at an average of each 2 metres depth of shaft excavation, and at a minimum frequency of fortnightly intervals from the Commencement of Dewatering of any Project stage involving shaft sinking for a period of one month after the Completion of shaft Excavation, thence monthly until the Completion of Dewatering for any Project stage involving shaft sinking. At least two baseline surveys shall be completed before Commencement of Dewatering.

3.28 Prior to the Commencement of Dewatering of any Project stage involving shaft sinking or tunnelling, the Consent Holder shall assess the potential settlement effects resulting from the exercise of this consent. The output of this assessment shall be used to define the expected settlement levels and to establish settlement Trigger Levels (Alert Levels and Alarm Levels) that minimise the potential for damage to existing buildings or structures. The process for establishing settlement Trigger Levels shall be set out in the M&CP and shall be based upon the final tunnel alignment and construction methodology, any groundwater, deformation or settlement monitoring required under this consent, and groundwater and settlement modelling completed using this data. A factor of natural seasonal variability shall be allowed for in this review based on the survey completed under Condition 3.26.

Note: 'Alert Level' is the Differential and Total Settlement Limit set at a threshold less than the Alarm Level, at which the Consent Holder shall implement further investigations and analyses as described in the M&CP to determine the cause of settlement and the likelihood of further settlement.

'Alarm Level' is the Differential and Total Settlement Limit set in Condition 3.31, or which has the potential to cause damage to buildings, structures and services, at which the Consent Holder shall immediately stop dewatering the site and cease any activity which has the potential to cause deformation to any building or structure or adopt the alternative contingency measures approved by the Manager.

3.29 During construction in any Project stage involving shaft sinking or tunnelling, the Consent Holder shall survey the complete settlement network described in Condition 3.24 at six monthly intervals and keep records of each date and the corresponding ground surface and building level. In addition to the above, all Ground Surface Monitoring Marks located within 50 metres of the excavated tunnel and within 100 metres of an excavated shaft or the tunnel excavation face shall be monitored at least once every month. These records shall be compiled and submitted to the Manager at six monthly intervals.

3.30 The Consent Holder shall compare all settlement monitoring data obtained during shaft sinking and tunnelling construction work to the pre-construction minimum levels in accordance with the M&CP. Where Trigger Levels are exceeded the appropriate actions as set out in the M&CP shall be undertaken and the Manager shall be notified within three working days, advising of the trigger exceedance, the risk of settlement causing damage to buildings, and details of the actions taken.

3.31 The Consent Holder shall use all reasonable endeavours to ensure that the exercise of this consent does not cause:

a) greater (i.e. steeper) than 1:1,000 differential settlement (the Differential Settlement Limit) between any two adjacent settlement monitoring points required under this consent; or

b) greater than 50mm total settlement (the Total Settlement Limit) at any settlement monitoring point required under this consent.

3.32 The Consent Holder shall continue to monitor the Ground Settlement Monitoring Marks at six monthly intervals for 12 months after Completion of Dewatering of any Project stage involving shaft sinking or tunnelling, or for a shorter period if approved by the Manager. At 12 months following the Completion of Dewatering of any Project stage involving shaft sinking or tunnelling, monitoring of ground and settlement marks shall continue at the direction of the Manager if settlement marks have breached trigger levels and there is risk of adverse effects.