New Terminal Wastewater Pump Station – Springs Road, Prebbleton

Selwyn District Council

Notice of Requirement

June 2018

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Appendices

Form 20

NOTICE OF TERRITORIAL AUTHORITY'S REQUIREMENTS FOR DESIGNATION OR ALTERATION OF DESIGNATION

Section 168A and 181(4), Resource Management Act 1991

To: Selwyn District Council
PO Box 90
Rolleston 7614

Attention: The Chief Executive

Selwyn District Council (SDC) gives notice of its requirement for a designation for a public work.

The site to which the requirement applies is located at 606 Springs Road, Prebbleton, and legally described as Section 1 Survey Office Plan 515629.

A description of the site and surrounds is contained in Section 3.

The nature of the proposed work is:

The construction, operation and ongoing maintenance of a new terminal wastewater pump station.

The pump station is required to pump wastewater from Prebbleton to the existing Selwyn Road pump station, which then pumps wastewater onto the Pines Wastewater Treatment Plant. The proposed pump station will form a key part of the East Selwyn Sewerage Scheme (ESSS) which connects Prebbleton, Lincoln, Springston and Rolleston to transport wastewater for treatment and disposal at the Pines Wastewater Treatment Plant.

The effects that the public work will have on the environment, and the ways in which any adverse effects will be mitigated, are described in Section 6.

Alternative sites, routes, and methods have been considered to the extent described in Section 5.

The public work and designation are reasonably necessary for achieving the objectives of the territorial authority for the reasons as set out in Section 4.

The following resource consents are required for the proposed activity.

Canterbury Land and Water Regional Plan 2017

- Resource consent as a ***restricted discretionary activity*** under **Rule 5.120** for the take and use of groundwater for the purpose of dewatering during construction.
- Resource consent as a ***discretionary activity*** under **Rule 5.176** for the excavations required to construct the pump station.

Resource consent under the rules listed above will be submitted to Environment Canterbury before construction of the Pump Station commences. Resource consent for a range of activities at both the construction and operational stages are required.

SDC attaches all relevant information required to be included in this notice by the district plan, regional plan, or any regulations made under the Resource Management Act 1991 (RMA):

Consultation has been undertaken with parties that are likely to be affected, as described in Section 7.1.

J. J. Schrier

Signed on behalf of Selwyn District Council

JEFFREY J SCHRIER

Name

pp M. ENGLAND. WATER SERVICES: ASSETS MANAGER.

Dated: 8 June 2018.

ADDRESS FOR SERVICE of requiring authority during processing:

Selwyn District Council
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GHD Limited
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Christchurch 8141

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Selwyn District Council
2 Norman Kirk Drive
Rolleston 7643

Attention: Jeff Schrier

1. Introduction

SDC seeks to designate the land required for the new pump station.

Part 8 of the RMA relates to designations and heritage orders. Sections 166 to 172 under Part 8 set out the provisions for preparing, assessing and confirming designations.

Pursuant to Section 166 of the RMA, SDC is a Requiring Authority and has statutory and financial responsibility for the operation, maintenance and enhancement of wastewater assets within Selwyn.

Section 168

Section 168(2) states that a requiring authority for the purposes approved under Section 167 of the RMA, may at any time give notice of its requirement for a designation. This Notice of Requirement (NOR) is a new requirement by SDC under Section 168(2) of the RMA.

Section 171

Section 171(1) of the RMA prescribes what the territorial authority must have regard to, when considering a NOR.

In accordance with this section a territorial authority must, subject to Part 2 of the RMA, consider the effects on the environment of allowing the requirement. The effects on the environment of allowing this requirement are considered in Section 6 of this report; Part 2 matters are considered in Section 9.

Section 171(1) (a) – (d) sets out the particular matters that a territorial authority must have regard to when considering the effects on the environment of allowing the requirement:

(a) An assessment of the proposal against the relevant planning provisions is provided in Section 8 of this report;

(b) A consideration of alternatives is given in Section 5;

(c) The necessity of the proposed works is discussed in Section 4; and

(d) Other matters, including other planning and policy documents not listed in s171(1)(a), that are relevant for the territorial authority to consider in making a decision on the requirement are addressed in Section 8.5.

These matters provide a comprehensive assessment of the proposal in terms of its necessity and effects on the environment and in terms of statutory requirements and national, regional and district planning documents.

Having regard to these matters, the territorial authority may, under Section 171(2), recommend to the requiring authority that it:

(a) Confirm the requirement;

(b) Modify the requirement;

(c) Impose conditions; or

(d) Withdraw the requirement.

2. Nature of Proposed Work

The proposal is to construct, operate and maintain a new terminal wastewater pump station. The pump station is required to pump wastewater from Prebbleton to the existing Selwyn Road pump station, which then pumps wastewater on to the Pines Wastewater Treatment Plant near Rolleston. It will relieve pressure on the existing Prebbleton terminal pump station located on Springs Road, that is currently operating at its design capacity and on occasion during peak flows beyond that capacity. The new pump station will form a key part of the East Selwyn Sewerage Scheme that connects Prebbleton, Lincoln, Springston and Rolleston to transport wastewater for treatment and disposal at the Pines Wastewater Treatment Plant.

The new pump station is required to accommodate wastewater from the surrounding Prebbleton area that is subject to increased residential development. The NOR enables the construction of a new pump station, and its ongoing operation and maintenance. The works enabled by the NOR are an integral part of the East Selwyn Sewerage Scheme.

2.1 Height, Shape and Bulk of the Works

The Pump Station will consist of the following equipment:

- **Control room building:** A single building on the site will house the odour control system, a 300 kVA emergency generator, and the pump power and control equipment. The control room building is 5.6 m high at its maximum.
- **Odour treatment:** Odour treatment will consist of a micro-scrubber. The micro-scrubber is a two stage odour treatment system consisting of biological and activated carbon processing. The proposed micro-scrubber is footprint is around 2.3 m x 1.2 m. A fan and vent stack are required for the operation of the micro-scrubber. The vent stack will be integrated with the control building and will be approximately 8.5 m in height.
- **Pump station control:** The pump station will operate automatically based on wastewater levels in the wet well. The pump station will be equipped with a SCADA[1] and telemetry system to allow monitoring and remote control of the pumps. Fault and level alarms will also be provided to communicate directly with operations staff.
- **Exhaust stack:** The exhaust stack from the emergency generator will be approximately 8.5 m high.

The following equipment will be located on site in proximity to the building:

- **Wet well:** A 3 m x 3 m wet well is proposed. The wet well is constructed of concrete, and will be set down approximately 4.65 m below ground level. The purpose of the wet well is to house the submersible pumps and to provide a sufficient volume of wastewater per pumping cycle.
- **300 kVA transformer:** A 300 kVA transformer, approximately 1.5m^3 will be installed to power the pump station, this will be located adjacent to the proposed infrastructure onsite.

The pump station exterior design has been influenced by the local context in which the station is located, with reference made to historical pump stations located around the Christchurch and Selwyn districts.

The control room building has a gable roof which is similar to residential buildings close to the site. The proposed profiled metal roofing is also in keeping with the materiality of surrounding

[1] SCADA: Supervisory control and data acquisition

residential roofs, whilst the proposed odour and exhaust stacks are at a height relative to chimneys of nearby double-storey houses.

The pump station building will be clad in precast concrete panels, with detailing to create a more intimate scale, similar to the neighbouring residential houses.

The bulk of the control room building and various equipment on the site has been designed so that it is of a similar scale to the surrounding residential land uses. The control room building has been set back from Springs Road, and from the neighbouring residences to reduce the bulk of the pump station. A single building houses the majority of the pump station equipment so that the equipment is not able to be seen from the street and reflects the residential character of the area.

The attached plans in Appendix B show the height, shape, bulk and layout of the works.

2.2 Acoustic Design

An acoustic assessment has been carried out (see Appendix C). Noise generating equipment at the site includes pumps, the odour scrubber fan, emergency generator (when operating) and ventilation fans for the generator room and the switchboard room. To manage noise at the site, the pump station will be designed so that there are no gaps or openings into the wet well. The generator room will have an acoustically rated door, a continuous ceiling and an acoustic louvre to manage noise from the facility.

A 2 m high timber fence will be installed along the northeast boundary of the site. The outdoor unit for the switchroom will be located at least 5 m from the closest boundary.

To reduce noise from the odour control stack, the fan speed will be limited, and the fan will be encased in a steel enclosure of at least 0.5 mm thickness.

2.3 Site Layout, Access and Landscaping

A site plan showing the layout of the pump station is attached in Appendix B. The wet well and valve chamber have been located along the rear site boundary (north western boundary), away from the road and the existing residential houses located adjacent to the south western boundary.

A hardstand area separates the wet well and the control room. This area provides access to the odour control system, and provides on-site manoeuvring for maintenance and construction vehicles, so that vehicles can exit the site forward facing onto Springs Road. A lockable gate across the entrance to Springs Road will restrict entry to and from the site.

The control room will be located at the front of the site, nearest to Springs Road. The building is setback 4 m from Springs Road, and a minimum of 2 m from the side and rear boundaries. The control room will contain the pump controls, electrical equipment and switchgear. The emergency generator will be located at the rear of the control room.

All structures on the site are located away from any boundary, so that there is sufficient room to carry out landscaping along each boundary, to help soften views of the pump station from Springs Road and neighbouring properties. Mature trees surrounding the site will be retained. Timber paling fencing (1.8 m – 2 m high) will be constructed along all boundaries except the Springs Road boundary. The paling fence is in keeping with surrounding properties, as well as acting as an acoustic buffer to the pump station and associated equipment. A 1.2 m high timber and steel palisade fence along Springs Road will maintain views of the existing mature vegetation along the Springs Road boundary. A perspective of the proposed pump station is shown below in Figure 1.

Additional landscaping along the remaining boundaries will help screen the pump station from adjoining properties, including the two existing residential dwellings at 21 and 23 Edwin Trent Drive. The type of vegetation has not been confirmed, however, species will be chosen which

grow to a height sufficient to screen the Pump Station from the neighbouring sites. A full landscape plan will be provided with the Outline Plan.

Figure 1: Indicative view of the Pump Station from Springs Road

2.4 Finished Contour of the Site

The finished contour of the site will be no different to the existing site contours. Earthworks to prepare the ground for the control room building and the various pieces of equipment, including the underground wet well are minimal, and will not greatly alter the contour of the site. The site is relatively flat and will remain flat as a result of the works.

2.5 Vehicle Access, Circulation, and Parking

As stated in Section 2.3, a hardstand area separates the wet well and the control room. This area provides access to the odour control system, and provides on-site manoeuvring for maintenance and construction vehicles, so that vehicles can exit the site forward facing onto Springs Road. Access to and from the site will be via a single vehicle access onto Springs Road, which has been designed to meet the relevant vehicle crossing standard in the District Plan. There is also sufficient space for maintenance vehicles to park on site while carrying out any maintenance activities. A lockable gate also allows a maintenance truck to park in front of the gate without obstructing traffic on Springs Road or the footpath while the gate is unlocked.

2.6 Site Services

Stormwater from the site will be collected and discharged to the existing stormwater network on Springs Road or to ground as appropriate.

Water supply for the station will be from the Council's reticulated system.

The pump station will be connected to an existing 11 kV underground cable located on the western side of Springs Road. A 300 kVA transformer will be installed in the northeast corner of the site.

2.7 Physical Works

2.7.1 Earthworks

Earthworks to construct the pump station facility are proposed to be approximately 300 m^3 in volume comprising of foundations, pipe trenches, the wet well, a valve chamber and manholes. The depth of excavations vary across the site, with the deepest excavation being approximately 5.8 m for the installation of the wet well.

The site is located over an unconfined and semiconfined aquifer, and within the community drinking water protection zone (see Figure 2).

Figure 2: Aquifer and Community Drinking Water Protection Zone overlays (Source: Canterbury Maps).

The necessary resource consents will be obtained from Environment Canterbury for the earthworks required over an unconfined or semiconfined aquifer, and within a Community Drinking Water Protection Zone. Full details on the construction works will be provided in the resource consent application to Environment Canterbury.

2.8 Construction Programme

Construction is anticipated to take 24-30 weeks. Construction will likely be limited to 7 am to 6 pm, Monday to Saturday.

3. Site Description

The site (804.9 m^2) to be designated is located at 606 Springs Road, Prebbleton, and is legally described as Section 1 Survey Office Plan 515629. The site has recently been purchased from Meadow Mushrooms who own the surrounding land, and has been subdivided off the original site owned by Meadow Mushrooms (shown in red in Figure 1).

The site is located within the Selwyn District and is zoned Living X under the Operative Selwyn District Plan 2016 (the District Plan). The proposed location of the pump station in the context of the surrounding land is shown in Figure 3.

Figure 3: New Terminal Wastewater Pump Station location at 606 Springs Road, Prebbleton

The surrounding land (shown in red) is owned by the Meadow Mushrooms and is occupied by the Meadow Mushrooms processing facility. There are a number of buildings associated with the mushroom processing located in the northern and eastern corners of the surrounding land. The western corner is vacant, and the southern area where the pump station site is located (in yellow) is close to a shed and a dwelling which are currently occupied and owned by Meadow Mushrooms. There is a stand of existing vegetation located along the length of Springs Road (see Figure 4). An existing driveway is located further along Springs Road, north of where the pump station will be constructed.

Figure 4: Existing vegetation along Springs Road and in front of the Pump Station site

Adjacent properties to the south-west of the site are occupied by single residential dwellings, and are zoned Living 1A3 under the District Plan. These dwellings are located off Edwin Trent Drive and Kiln Lane. In particular, numbers 21 and 23 Edwin Trent Drive share a boundary with the site. Opposite the site (located off Springs Road) is further residential development. These sites are also located within the Living X zone. The extent of each zone within the immediate vicinity of the site is shown in Figure 5. The site and adjoining sites are not subject to any specific overlays or scheduled items. Springs Road at this location is classified as an arterial road, and the nearest intersection with Trents Road is located approximately 150m to the south of the site.

The land to be designated is owned by SDC and is vacant. As shown in Figure 4, there is a stand of existing vegetation along the road boundary. The Computer Freehold Register for the site is attached in Appendix A. It is acknowledged that the residual Meadow Mushrooms site is also zoned Living X and will be developed for residential purposes in the future. This has been taken into account in the external design of the pump station as the building has been designed to comply with the Living X bulk and location controls. Furthermore the main building has been designed in a style that aligns with residential dwellings.

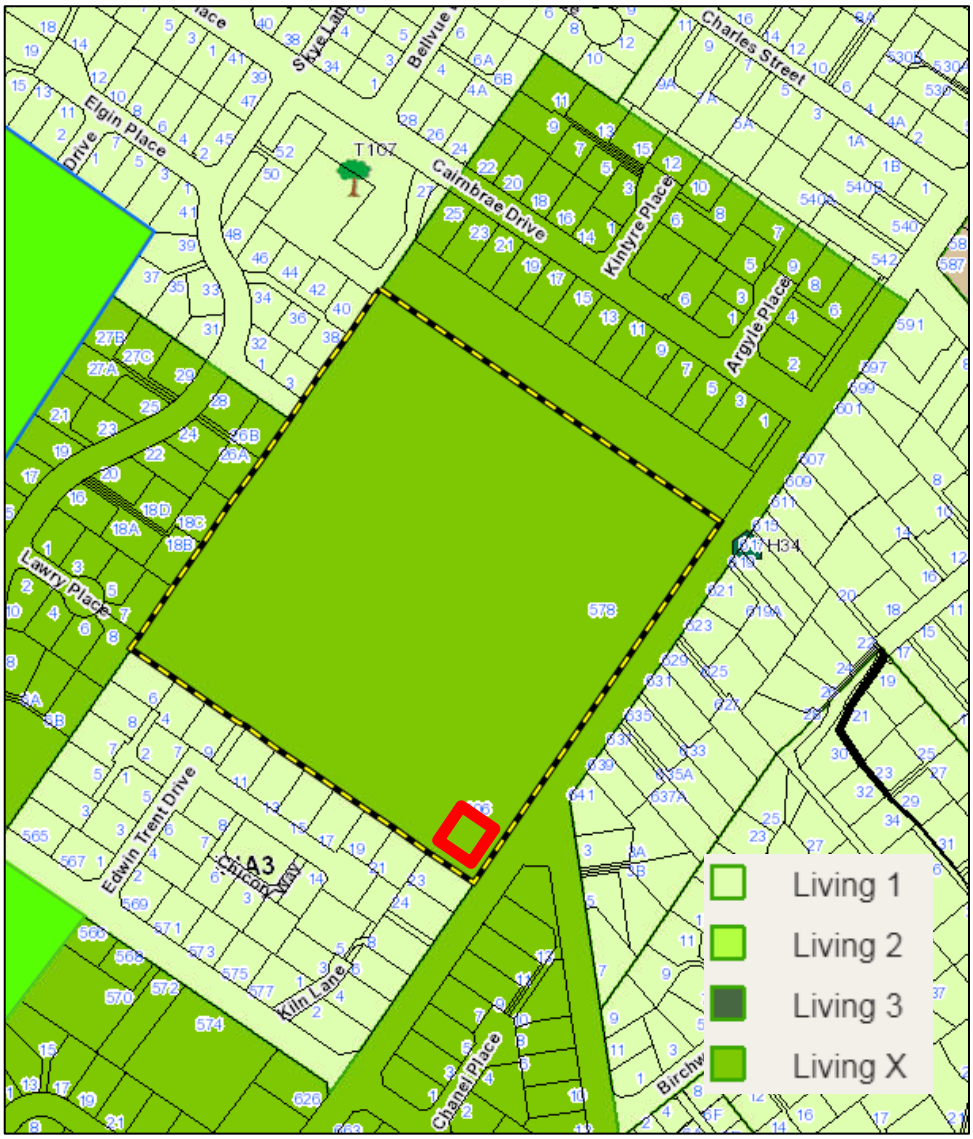


Figure 5: Location of the Pump Station (location indicated in red), and the surrounding zoning under the District Plan

4. Necessity of Works and Designation

Section 171(1)(c) states that the territorial authority must have regard to whether the work and designation are reasonably necessary for achieving the objectives of the requiring authority for which the designation is sought.

SDC is responsible for 14 reticulated wastewater systems that service 55% of properties within the Selwyn District. There are 39 pump stations located in the District, and seven wastewater treatment and disposal plants.

This NOR is required to connect communities at Prebbleton, Lincoln, Springston and Rolleston to the Pines Wastewater Treatment Plant, and is required as part of the East Selwyn Sewerage Scheme (ESSS). The purpose of the ESSS project is to provide adequate wastewater treatment and disposal services, necessary for the projected future growth in the surrounding townships.

The ESSS planning has been ongoing since 2007 and the new Prebbleton pump station forms a critical component of this scheme. Much of the surrounding infrastructure has already been put in place including new pipework in Springs Road. As previously noted, the existing pump station on Springs Road is currently operating at its optimal operating capacity. Recent overloading of this pump station has contributed to sewerage overflows into residential areas having occurred upstream of the pump station. The new pump station will relieve pressure on the existing infrastructure and prevent similar overflows from happening.

SDC's objectives for the New Terminal Wastewater Pump Station at Prebbleton project are:

- Deliver a terminal wastewater pump station that supports the long term population growth in Prebbleton.
- Provide for the secure operation and long-term management of wastewater infrastructure in the Selwyn District.
- Deliver critical infrastructure for the conveyance of wastewater
- Extend the operational life span of the existing infrastructure
- Keeping options available in the event of an emergency

The designation for the Terminal Wastewater Pump Station, Prebbleton is required to:

- Construct the new pump station at 606 Springs Road;
- Provide additional wastewater services for communities in the Selwyn District;
- Protect and allow for future maintenance and upgrades associated with the pump station;
- Provide for the integrated and long-term management of wastewater in the Selwyn District.

Designating the pump station site will provide certainty for the Council in establishing, maintaining and upgrading as required. It is SDC's responsibility to provide a wastewater network that provides for the necessary movement and treatment of wastewater across the Selwyn District. This NOR will allow for certainty in how wastewater is managed within the District.

5. Consideration of Alternatives

Section 171(1)(b) states that the territorial authority must have regard to whether adequate consideration has been given to alternative sites, routes, or methods of undertaking the work if; the requiring authority does not have an interest in the land sufficient for undertaking the work, or if it is likely that the work will have a significant adverse effect on the environment.

As provided by the assessment of effects (Section 6 of this report), and the supporting specialist reports (in Appendix C) the proposal will not have any significant adverse effects on the environment.

In addition, SDC, as requiring authority, has full interest in all of the land required for undertaking the work.

Nevertheless, consideration has been given to alternative sites or methods as set out below.

5.1 Alternative Sites

5.1.1 Status Quo

The existing Springs Road wastewater pump station is located on the west side of Springs Road, in the road reserve and just north of Cairnbrae Dr. The pump station was constructed in 1996. It also receives all flows from the entire Prebbleton area and then discharges to Lincoln. There are six smaller pump stations, located in different parts of Prebbleton that discharge to the existing Springs Road pump station.

Rapid development in Prebbleton and surrounds over the past 2 decades has led to this pump station now reaching its full design capacity (some years earlier than expected when it was designed) resulting in increased flows into the pump station. This is evidenced by the pump station being very close to overflowing during recent high rainfall events, and by two failures that have resulted in upstream overflows.

5.1.2 Upgrading the Existing Pump Station

Currently wastewater from the Prebbleton area is pumped to Lincoln. From Lincoln all the wastewater is pumped on to Selwyn Road pump station and then on to the Pines Wastewater Treatment Plant. All wastewater from the ESSS which includes Prebbleton, Lincoln, Springston, Rolleston and West Melton is treated at the Pines Wastewater Treatment Plant in Rolleston.

Upgrading the existing pump station so that it pumps to the Selwyn Road Pump Station has been considered, however, due to the physical constraints of the existing site, which is situated in the roadside berm of Springs Road, and the size required for a pump station to suit future Prebbleton growth, this is not a viable option. There are also significant construction constraints to overcome when upgrading an existing pump station while it continues to operate. As a result, the decision to construct a new pump station at a different location was made.

5.1.3 Alternative Sites

Several alternative sites were considered in an options assessment completed by MWH Consultants. The site assessment considered a number of factors including initial capital cost, operational costs, land ownership, public perception risk, resource consenting risk, the risk that existing structures nearby create, depth of excavations required, and the extent of new gravity pipelines that would be required to integrate the site with the existing network.

The conclusions reached by MWH in relation to the various sites are summarised below, and the site assessment completed for each of the sites is attached in Appendix E.

Site A: Meadow Mushrooms - Opposite 615 Springs Road

Meadow Mushrooms own a strip of undeveloped land located opposite 615 Springs Road. The land is adjacent to residential properties on the northern boundary, and the Meadow Mushrooms processing facility to the south. This site was preferred as part of the Prebbleton Master Plan. When approached to discuss the purchase , Meadow Mushrooms were reluctant to sell. The Alternative Sites Assessment then followed.

The length of gravity pipeline required was more than the chosen site (Site H), and the depth of excavation was high at 7.7 m deep. The public perception risk and the risk of undermining nearby structures was low, and the consenting risk was deemed to be of a medium level. The estimated capital cost of developing this site was $1.81 million.

Site B: Selwyn District Council Reserve – Corner of Cairnbrae Drive and Kintyre Place

This site is currently a community reserve and is located adjacent to a children's playground, and two residential properties. The Pump Station would result in a loss of a large portion of the existing playground, and the public perception risk was deemed to be high. The capital cost was also the second highest at $2.06 million, compared to the anticipated $990,000 for the chosen site. The length of gravity pipelines required was also high at 969 m. The public perception risk, consenting risk, and the risk from adjacent structures was considered to be medium. The depth of earthworks required was estimated to be 8.1 m, at the deepest end of the spectrum for the sites considered. The operational costs were deemed to be low.

Site C: Empty Lot – 8 Argyle Place

This site is an empty lot at 8 Argyle Place, and would require purchase of the land as it is privately owned. This potential site is surrounded by several residential dwellings, and the Prebbleton Childcare and Education Centre is located to the northeast. A right of way through the adjacent Childcare Centre would be required to access the site, and the depth of excavations required had the potential to undermine nearby structures. The capital cost was high at an estimated $1.95 million, and the length of gravity fed pipelines required was high at 892 m. The risk public perception and consenting risk were both considered to be high, and the risk of undermining nearby structures medium. The depth of earthworks required was the high at 7.5 m deep.

Site D: Car Park – 542 Springs Road

This site is an existing carpark located to the southeast of the Prebbleton Childcare and Education Centre. This option would require a land swap with the Childcare Centre to maintain access to the Centre. Existing trees would also need to be removed. As the site is adjacent to a Childcare Centre and a Fruit and Vegetable Shop, the risk of not obtaining consent and from a public perception perspective were both considered to be high. The depth of excavations (7.4 m) would result in a medium risk of undermining nearby structures, and the length of gravity fed pipes required was medium-high, with 845 m of pipes required. The capital cost was medium-high at $1.86 million, however, the operational costs were considered low.

Site E: Development Site – 9-17 Toswill Road

This site is a privately owned site located at 9-17 Toswill Road, and was considered as an alternative option as part of the Prebbleton Master Plan. This site also requires landowner consent or compulsory land purchase. The current landowner was not willing to sell. This site is located opposite residential dwellings, and adjacent to bare land currently being developed, and a business/hotel. This option would require an additional length of pressure main, resulting in a high capital cost ($2.39 million), 983 m of gravity fed pipeline, and 7.7 m deep excavations. The risk from a public perception perspective, and a consenting perspective were considered high. The risk to nearby structures was considered to be low.

Site F: Car Park South – 617 Springs Road

This site is a carpark located adjacent to the rear of the Prebbleton Hall, and is owned by the Council. The site is surrounded by residential dwellings. The public perception risk was deemed to be medium, and the consenting and undermining existing structures risks were both high. The depth of excavation (7.9 m) and the length of gravity pipeline required (885 m) were both relatively high. The capital cost was low-medium ($1.6 million), and the operational costs low.

Site G: Vehicle Yard – 621 Springs Road

This site is a vehicle yard at 621 Springs Road, which is privately owned, and is located adjacent to the Allied Fuel Station, Prebbleton Hall and one residential property. As the site is located adjacent to a Petrol Station there is potential for the ground to be contaminated, and excavations (7.9 m) could undermine the fuel tanks nearby (high risk). The capital cost was an estimated $1.89 million, and the length of gravity fed pipes anticipated to be 885 m. The public perception risk was deemed to be medium, and the consent risk high.

Site I: Selwyn District Council Reserve – Corner of Springs Rd and Birchs Rd

This site is a small reserve located opposite the chosen Meadow Mushrooms site. The site is adjacent to a residential property and a large portion of the reserve would be lost, were a pump station to be installed here. The site also houses a bore which is part of the SDC water supply network. The public perception risk was considered high as it would be located next to a children's playground, and the operational costs were also high. The initial capital costs were low at an estimated $990,000 (comparable to the chosen site). The distance of gravity pipelines required was minimal (515 m), and the excavation depth low (5.9 m). The consenting risk was considered to be low, and the risk of undermining adjacent structures was deemed to be medium.

Site H: Meadow Mushrooms (South) – 606 Springs Road: Preferred Option

The Alternative Sites Assessment Report identified this site as the preferred option.

The advantages of this site over the other sites include technical, financial and risk management:

- Shallower Pump Station: not constrained by the incoming pipeline depths from Springs Road.
- Remote: from the town centre for construction and maintenance access.
- Retains: the existing pump station as a lift station to the new pump station.
- Efficiencies: Will divert approx. 37% of flows directly into new pump station thereby extending the life span of the existing pump station. Also cost efficiencies (see below)
- Public Disruption: Gravity mains between Birches Road and Springs Road PS will not require upgrading meaning less construction activity in Springs Road.
- Cost: i) This option is shown as being capital cost effective & ii) will ultimately be more operationally cost effective due to pump choice efficiencies and avoiding double pumping to Lincoln.
- Resilience: Offers the options in an emergency event of diverting all or part of the flows to Christchurch and/or Lincoln. Retaining two operational pump stations gives flexibility in the event of failure of either.
- Social: Every site considered would have some social challenges, some more so than others. This site borders two properties and every consideration is and will be given to minimising the impact on the properties.

5.2 Alternative Methods

5.2.1 Resource Consents

Under the District Plan the establishment of the pump station would be a Discretionary Activity (Rule 1.1.2.2) as it involves the temporary storage of solid and/or liquid waste conveyed to the site. SDC Planners have confirmed that due to the sites residential zoning, this rule is triggered and resource consent would be required. In addition, in the future it is likely that ongoing maintenance or upgrade works could require additional resource consents. As a result, designating the site is the preferred option, as maintenance and minor upgrades can be carried out in accordance with the purpose of the designation, under an Outline Plan or Outline Plan waiver to be submitted to the Council – depending on the scale of works.

6. Assessment of Effects

This section provides an assessment of the actual or potential effects of the proposed works on the environment, and identifies the ways in which these effects can be avoided, remedied or mitigated.

As a starting point, to determine the nature and scale of effects that the public work will have on the environment, it is relevant to consider the existing environment and the activities that are currently being undertaken on the site.

6.1 Existing Environment

Currently, the site is vacant, and is surrounded by residential land uses, and is located adjacent to the Meadow Mushrooms processing facility. The Meadow Mushrooms processing facility is a medium-large scale industrial facility that holds air discharge consents associated with the discharge of odour. It is zoned Living X and anticipated to be developed for residential purposes in the future. The surrounding residential areas are low density, and are generally large single or two storey dwellings on large sites. Dwellings are generally setback from the road, and have attached garages, and a single vehicle crossing.

6.2 Permitted Baseline

The permitted baseline refers to the adverse effects of permitted activities on the subject site. The permitted baseline may be taken into account and the Council has the discretion to disregard those effects. Rules relating to Utilities are set out in Chapter 6 of the Township volume of the Selwyn District Plan. This Chapter notes that all of the rules in the plan are applicable to utilities except some specified rules relating to some of the bulk and location controls and setbacks from water bodies.

Rule 6.1.1.1 provides for the upgrade, maintenance and operation of existing utilities provided that the effects are the same or similar to what existed prior to the upgrade. Rule 6.1.1.2 requires any pipe to convey water, sewage or gas to be laid underground.

As noted above, within the Living (and Business) zones, the following activity is discretionary irrespective of whether it complies with the rules in the other chapters (including Chapter 6 – Utilities): *" Any facilities for the temporary storage of solid and/or liquid waste delivered or conveyed to the site*." By their nature pump stations involve the temporary storage of waste on site prior to it being pumped on to the final treatment plant, as such, while the pipework associated with the conveying the effluent to and from the site is permitted the wet well and other associated infrastructure is not.

With respect to the bulk and location controls, utilities are exempt from complying with the maximum height, landscaping, and site coverage controls.

Earthworks are a permitted activity within the Living X zone provided that they do not exceed 2000m^3, and no more than 5% of the total vertical cut is over 2 metres. Vehicle access to the site via a single vehicle crossing is permitted.

6.3 Assessment of Effects – Construction

6.3.1 Dust

The Contractor will be required to have in place suitable dust controls during construction, so that there is no discharge of dust beyond the site. Controls may include wetting down exposed soils, covering stockpiled soils, removing excavated soil from the site if it is not to be reused, and staging

earthworks so that the area of soil exposed is minimised. Using controls during excavation will manage dust from excavations, so that the effects from dust on the surrounding environment. Are less than minor.

6.3.2 Sedimentation

The Contractor will be required to have in place erosion and sediment controls throughout construction. Suitable controls are required so that sediment-laden water is not discharged beyond the site. As the site is flat, the site (or adjacent sites) will not be susceptible to erosion, however, runoff must be managed during soil disturbance. Control measures may include directing runoff from the site to a suitable location to be treated (or to settle) before it is discharged to the reticulated stormwater network. Sediment will not be discharged to the stormwater network. Control measures including silt and sediment control fences, geotextile cloth inserted into stormwater grates and only exposing small areas of soil which will be used as required, so that sediment laden water is not discharged to the surrounding environment.

6.3.3 Construction Traffic

Traffic associated with the construction of the pump station will be temporary in duration. Construction of the pump station is schedule to take approximately 24-30 weeks – and construction traffic will be limited to the hours of 7am and 6pm Monday-Saturday. As there will be sufficient space for vehicles to manoeuvre on the site before exiting onto Springs Road, the effects on safety for pedestrians and road users will be minimal.

6.4 Assessment of Effects – Operation

6.4.1 Visual Amenity

The pump station has been designed to be in keeping with the surrounding residential character of the area. The control room is setback 4 m from Springs Road and at least 2 m from the other boundaries- as is required by the permitted activity standards for the surrounding Living zones. The control room has also been designed so that it meets the recession plane requirements of the adjoining Living zone.

The pump station has been designed so that most equipment is located in a single building, as opposed to multiple buildings, or not located within a building at all. The single building on the site provides a more residential character to the site, so that it is not evidently a pump station. The wet well will be located to the rear of the proposed building and as such will not be visible from Springs Road. The exact location of the transformer is yet to be confirmed,

The pitch of the roof has been designed so that it is similar to surrounding residential dwellings, and the external cladding and materials have been chosen that are in keeping with the material used by dwellings in the immediate area. The cladding is proposed to be precast concrete with reveals cast into the concrete. The roof cladding will be profiled metal, and timber battens will act as a screen to the odour scrubber. In addition, the odour and exhaust stacks are no higher than the anticipated height of a chimney on a new residential dwelling, if a new two-storey dwelling were to be constructed on the site.

The existing vegetation along Springs Road will help to screen the pump station from the road, and new landscaping will improve the amenity along the other boundaries.

Additional landscaping along the remaining boundaries is proposed to obscure the pump station from adjoining properties, including the two existing residential dwellings at 21 and 23 Edwin Trent Drive.

The type of planting to be used has not been finalised, however, the species of plants will be large enough so that they help obscure the pump station from the adjoining sites and in particular from

21 and 23 Edwin Trent Drive. Species will not be chosen that when fully grown, would shade the adjoining properties. A detailed landscape plan will be provided with the Outline Plan.

6.4.2 Odour

The pump station has the potential to produce objectionable odour. Armatec Environmental Ltd, a company that specialises in emissions reduction and odour control solutions was consulted to obtain their expert advice about treatment measures that would be appropriate for this site given its location in a residential area. The solution they have advised is a two-stage treatment process of biological scrubbing followed by activated carbon as a polishing stage. The biological scrubbing typically reduces the Hydrogen Sulphide gas (H2S) by ±90 % and the activated carbon acts as a polishing stage to remove remaining gas. The unit Armatec has proposed, based on this principle is a Micro-scrubber – which can typically remove ≥ 99 % of gases when properly operated and maintained. The micro-scrubber treats odour to a higher standard than those systems normally installed at pump stations and has been identified as the most effective odour treatment option, due to the pump station being located in a largely residential environment. Once installed, ongoing monitoring of the odour pre and post treatment will take place. In the instance that adjustments to the treatment are necessary, Armatec a NZ company will be engaged to assist.

Overall, the micro-scrubber is expected to be able to adequately treat the odour discharged from the site, so that while it may be noticeable occasionally it is not objectionable or offensive beyond the site boundary. For these reasons, it is considered that any adverse effects associated with odour will be less than minor.

6.4.3 Noise

Acoustic Engineering Services was engaged to undertake an acoustic assessment for the site (Appendix C). The maximum permitted noise levels assessed at any point beyond the boundary of the site from which the source of any noise of interest is situated are:

- Daytime: 07:30 to 20:00 hours 50 dB LA10 85 dB LAFmax.
- Night-time: 20:00 to 07:30 hours 35 dB L A10 70 dB LAFmax.

To minimise the noise from the operation of the pump station, a range of design features have been included, as discussed in Section 2.2. The design measures included will control the operational noise to within the site boundaries.

Further acoustic assessment will be carried out when the pump station is in operation, to ensure that the relevant noise standards are adhered to.

Generator testing will be required on an ongoing basis. It is anticipated that testing will take place once a month. The testing will be done during daytime hours (refer above) and will adhere to the relevant daytime noise standards. In the case of an emergency (an extended power outage), the generator will be required during night-time and as such will exceed the night time noise thresholds. In this instance (an emergency situation), the effects from noise on the adjacent landowners while noticeable, will be temporary and infrequent.

In summary all noise emanating from the site will comply with the above limits with the exception of generator use during night-time, which will only be in the event of an emergency. As such, it is considered that any effects from this non-compliance will be less than minor.

6.4.4 Effects on the Surrounding Traffic Network

Access to the site is provided via a single vehicle entry/exit point from Springs Road. The hardstand area provided is sufficient for construction and maintenance vehicles to manoeuvre on site, and exit the site forward facing onto Springs Road. A lockable gate will be located to allow a

truck to park in front of the gate without obstructing the traffic lane or the footpath on Springs Road.

Traffic to and from the site on an ongoing basis will be minimal. It is anticipated that one vehicle movement will be required per week, for maintenance purposes. As a result, the effects on the existing transport network from the ongoing operation of the pump station will be negligible.

6.5 Summary of Effects

The proposed pump station is required to convey wastewater from the surrounding Prebbleton communities. Overall, the effects from the pump station will be less than minor. Noise effect will be limited to infrequent noise associated with the emergency generator. The odour from the pump station will be treated to the highest standard possible, and while utilising an odour stack design that is sympathetic to the nearby residential environment. The traffic to and from the site will mainly be temporary and limited to construction. The pump station has been designed to be in keeping with the character and scale of the surrounding residential land uses, and the majority of vegetation along the Springs Road boundary will be retained so that the amenity of the site is not dissimilar to that of the current site.

Suitable sediment and dust controls will be in place throughout construction, so that the effects from construction are limited to the site.

7. Consultation

7.1 Consultation

The applicant has carried out consultation with the Consents Team at SDC, Meadow Mushrooms, and adjacent landowners. A summary of the consultation, including any outcomes is provided in Table 2.

Table 2: Summary of Consultation Carried out for the Proposed Works

Group Consulted	Discussion Summary
Meadow Mushrooms	Initial engagement with Meadow Mushrooms in May 2015 – to pursue discussion to acquire land identified (Site A in section 5.1.3) in the Eastern Selwyn Sewerage Scheme: Master Plan 2014 for this Pump Station. Meadow Mushrooms not keen to pursue. SDC considered the Public Works Act – but to do so would have to show more alternative sites considered. SDC commissioned a study to assess and investigate alternative potential development sites for the pump station. Nine sites and ten options considered. Report submitted Oct 2015 – recommended the chosen site as the most suitable. Report made available to Meadow Mushrooms in Nov 15. Jan 16 Meadow Mushrooms approved negotiation on sale of land. Lengthy delay in agreeing value of land – thereafter was the legal formalities with the land eventually being transferred to SDC in December 2017. Sale Agreement included further terms that SDC would implement in development of the site as a safe-guard for Meadow Mushrooms for potential redevelopment of their land at some later time. They have been made aware of the conceptual design for the site and have not raised any concerns.
Adjacent landowners	Immediately surrounding landowners were notified of the proposed activity by letter. Two meetings were held, one with the landowners of 19, 21 and 23 Edwin Trent Drive and one with the landowners of 13 Chanel Place. At the first meeting with the residents of Edwin Trent Drive concerns were raised about the transparency of Council's process in selecting this site for the pump station as well as the effect of its establishment on their property values. The residents also discussed concerns about odour and noise effects and sought a guarantee from Council that there would be no odour at their properties. Council was keen to seek the residents input into preferred landscaping around the pump station, however no suggestions were made at this meeting. Some residents subsequently met with the Mayor and elected members to discuss their concerns and additional information was provided to them including details of the site selection process and noise assessment. The owners of 13 Chanel Place expressed their concern about the potential odour discharges from the site, especially in light of the challenges residents had already faced with odour from the

	mushroom factory and their experiences with odour from other pump stations. They also expressed concern about the location of the pump station in proximity to the community drinking water supply well. An offer was made for them to visit an existing pump station with similar odour mitigation, however to date this offer has not been taken up.

8. Relevant Plan Provisions

Section 171(1)(a) states that the territorial authority must have regard to any relevant provisions of any national or coastal policy statement, any regional policy statement or plan, and, any district plan.

Section 171(1)(d) states that the territorial authority must have regard to any other matters reasonably necessary in order to make a decision; this includes other planning documents not considered under subsection (a).

This section provides an assessment of the project against the relevant planning documents.

8.1 Canterbury Regional Policy Statement 2013

This NOR is consistent with the purpose of the Canterbury Regional Policy Statement (RPS). In particular, the NOR is consistent with the following objectives and policies:

- ***Objective 5.2.1:*** *Location, design and function of development (Entire Region);*
- ***Objective 5.2.2:*** *Integration of land-use and regionally significant infrastructure;*
- ***Policy 5.3.2:*** *Development conditions (Wider Region);*
- ***Policy 5.3.5:*** *Servicing development for potable water, and sewage and stormwater disposal (Wider Region);*
- ***Policy 5.3.6:*** *Sewerage, stormwater and potable water infrastructure (Wider Region); and*
- ***Policy 5.3.9:*** *Regionally significant infrastructure (Wider Region).*

The objectives and policies from the RPS are set out in full in Appendix D of this NOR. Of most relevance to this NOR for a new wastewater pump station is Objective 5.2.2 and Policies 5.3.2 and 5.3.6.

Objective 5.2.2 and Policy 5.3.2 recognise the importance of providing for infrastructure that is regionally significant, and the importance of avoiding, remedying or mitigating adverse effects from the development and operation of regionally significant infrastructure. As discussed in Section 5, the adverse effects from the pump station will be managed to provide for the social, economic and cultural well-being and health and safety of people and communities. Regionally significant infrastructure includes *"sewage collection, treatment and disposal networks"*.

Policy 5.3.6 seeks to enable the development of infrastructure required to manage sewerage, stormwater and potable water, provided that any adverse effects are avoided, mitigated or appropriately controlled. Section 5 has illustrated that the primary effects from the pump station are noise and odour. As discussed, a micro-scrubber will treat odour before discharging from the site, and a range of design features, including the location of noise generating equipment have been considered and been included, to control the noise effects from the pump station.

8.2 Selwyn District Plan

The NOR is consistent with the objectives and policies of the District Plan, in particular, those which are related to the provision of Utilities, including wastewater. The following table provides an assessment against the relevant objectives and policies of the District Plan.

Table 1: Assessment against the Relevant Objectives and Policies of the Selwyn District Plan 2016

Selwyn District Plan 2016 Objectives/Policies	Assessment against the Notice of Requirement
Objective B2.2.1: *Access to utilities to enable people and communities to carry out their activities.*	The provision of an additional pump station will ensure that the wastewater within Selwyn District can be suitably managed so that the neighbouring communities can continue to carry out their activities. The pump station facility is restricted to a single site which is currently vacant. The effects from the construction and operation of the facility will be controlled within the site and will not affect the ability of people and communities nearby to operate.
Objective B2.2.2: *Efficient use of utilities is promoted.*	The pump station is required to facilitate the ESSS upgrade project. The ESSS project has been designed to ensure that the efficient management of wastewater occurs.
Objective B2.2.3: *The provision of utilities where any adverse effects on the receiving environment and on people's health, safety and wellbeing is managed having regard to the scale, appearance, location and operational requirements of the facilities.*	The wastewater utility has been designed to be of a compatible scale to the existing residential land uses located to the southeast of the site. Due to the operational requirements, an odour stack and generator are required. The odour stack (location and height) has been designed to integrate with the existing environment, while allowing for technical requirements to discharge odour so that the effects from the odour are less than minor. The generator is located within the control room, and a range of measures have been included in the design so that the noise from the generator will only exceed the permitted noise thresholds if it is run overnight.
Policy B2.2.5: *Avoid potential 'reverse sensitivity' effects of activities on the efficient development, use and maintenance of utilities*.	The pump station will not adversely affect the ability for existing utilities to operate, including their routine maintenance.
Policy B2.2.6: *Ensure the effects of utilities are compatible with the amenity values and environmental characteristics of the zone in which they locate, also having regard to operational, functional and economic constraints.*	The potential adverse effects associated with the pump station are odour and noise. Pump Station facilities are located in a variety of areas (including adjacent to existing residential areas). The effects from the pump station (Section 5) have been mitigated as far as possible and are considered to be

	compatible with the surrounding residential area.
Policy B3.4.2: *To provide for any activity to locate in a zone provided it has effects which are compatible with the character, quality of the environment and amenity values of that zone.*	Section 5 of this notice has demonstrated that the effects associated with character and amenity will be less than minor, notwithstanding that there will be a minor adverse effect when the emergency generator is required to operate during night-time hours.
Noise	
Policy B3.4.10: *Ensure noise in all zones does not adversely affect the health or well-being of people.*	The ongoing noise will not exceed the permitted noise thresholds. However, in an emergency event the noise from the emergency generator will exceed the permitted noise thresholds overnight. In an emergency event, the generator will be used for a short duration to ensure that the wastewater can continue to be adequately conveyed to the treatment station and disposed of.
Policy B3.4.11: *Maintain background sound levels which are appropriate to the quality of the environment and amenity values of each zone.*	The ongoing noise from the pump station will meet the permitted noise thresholds. The day to day operational noise from the Pump Station will not adversely affect the amenity values of the area.
Dust	
Policy B3.4.1.4: *Avoid nuisance effects caused by dust from stockpiled material or construction work in Living or Business zones.*	Dust emissions will be controlled through measures which will be set out in a Construction Management Plan which will be prepared for the works. Disturbed soil will be stockpiled temporarily on the site and any excess soil will be removed following completion of the works.
Scale and Nature of Activities	
Policy B3.4.16: *Ensure the operating hours for non-residential activities in Living zones do not disturb surrounding residential activities, particularly at night.*	The pump station will operate 24 hours a day, seven days a week. However, as the pump station will adhere to the permitted noise thresholds it is not anticipated that the facility will disturb surrounding residential activities.
Building Design	
Policy B3.4.26: *Ensure buildings are setback an appropriate distance from road boundaries to maintain privacy and outlook for residents*	The buildings required for the pump station have been designed so that they are setback 4m from the boundary with Springs Road. The setback is similar to the surrounding

and to maintain the character of the area in which they are located.	residential areas in order to maintain the character of the surrounding environment.
Policy B3.4.27: *Ensure buildings and structures in Living zones which are used for non-residential activities, are of a size and bulk and in a setting compatible with the quality of the environment and amenity values of a residential area.*	The pump station building and structures are used for non-residential activities and have been designed so that their size and bulk is comparable with the residential environment.
Landscaping and Amenity Plantings	
Policy B3.4.31: *Encourage sites in Living and Business 1 Zones to maintain a landscaped area along the road frontage of the site.*	The existing vegetation along the Springs Road boundary will be retained. Several trees set further back will be removed.

8.3 Other Planning Documents

8.3.1 Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011 (NES Soils

The NES Soils applies to a piece of land where a Hazardous Activities and Industries List (HAIL) activity is more likely than not to have occurred. The site is not listed on Environment Canterbury's Listed Land Use Register (LLUR).

9. Part 2 RMA

Part 2 of the RMA sets out the purpose and principles of the Act. The purpose of the Act in accordance with Section 5, is to promote the sustainable management of natural and physical resources. The proposed pump station is required to adequately convey wastewater from the surrounding Prebbleton, Springston, Rolleston and Lincoln communities. Recent and anticipated residential development in these areas has resulted in the need for additional wastewater services, as the existing wastewater arrangement is not sufficient to convey the anticipated volumes of wastewater from new residential development in the surrounding areas.

Section 6 of the RMA sets out matters of national importance to be recognised and provided for. There are no matters of national importance relevant to this application.

Other matters to have particular regard to are set out in Section 7 of the Act. The efficient use and development of natural and physical resources are addressed in 7(b). The proposed pump station is a physical resource which is required to manage wastewater from residential development in Prebbleton and the surrounding area. Section 7(c) recognises the importance of maintaining and enhancing amenity values and Section 7(f) recognises the need to maintain and enhance the quality of the environment. The proposed pump station has been designed so that it is in keeping with the surrounding residential character and scale, and the vegetation along Springs Road will be retained. As a result, the amenity of the site will be maintained. An odour scrubber will treat the discharge from the pump station. It is not anticipated that the quality of the environment will be negatively affected from the pump station construction and operation.

Overall, the proposed pump station at Prebbleton is consistent with the purpose and principles of the RMA.

10. Conclusion

SDC is seeking to designate land for the new Terminal Wastewater Pump Station at Prebbleton through a NOR under section 168 of the RMA.

Section 171(1) of the RMA prescribes what a territorial authority must consider when looking at a NOR.

A territorial authority must consider the effects on the environment of allowing the requirement.

The Assessment of Effects in Section 6 above has considered the potential for adverse effects on the environment:

- Visual amenity effects;
- Noise;
- Construction effects – dust and sedimentation;
- Odour;
- Effects on the transport network.

It is considered that the proposal is consistent with Part 2 of the RMA.

There are four other particular matters that a territorial authority must have regard to when considering the effects on the environment of allowing the requirement.

SDC own the land for which the designation is sought and consideration has been given to alternative sites and options for the conveyance of wastewater.

Designation is the most appropriate planning method available to SDC because the designation becomes embodied in the District Plan, thereby providing long term certainty for SDC and the community.

It is considered that the works and designation are reasonably necessary for achieving the objectives of the Requiring Authority.

It is therefore appropriate that SDC (processing arm) recommend to SDC (the requiring authority) that the Requirement be confirmed.

This NOR meets the requirements of the Resource Management Act 1991 and all relevant planning documents. Any environmental effects arising from the public works undertaken in accordance with the NOR will be suitably managed.

Appendices

Appendix A – Computer Freehold Register

COMPUTER FREEHOLD REGISTER
UNDER LAND TRANSFER ACT 1952

Historical Search Copy

R.W. Muir
Registrar-General
of Land

Identifier	**821376**
Land Registration District	**Canterbury**
Date Issued	08 February 2018

Prior References
CB24F/931

Estate	Fee Simple
Area	807 square metres more or less
Legal Description	Section 1 Survey Office Plan 515629
Purpose	pump station

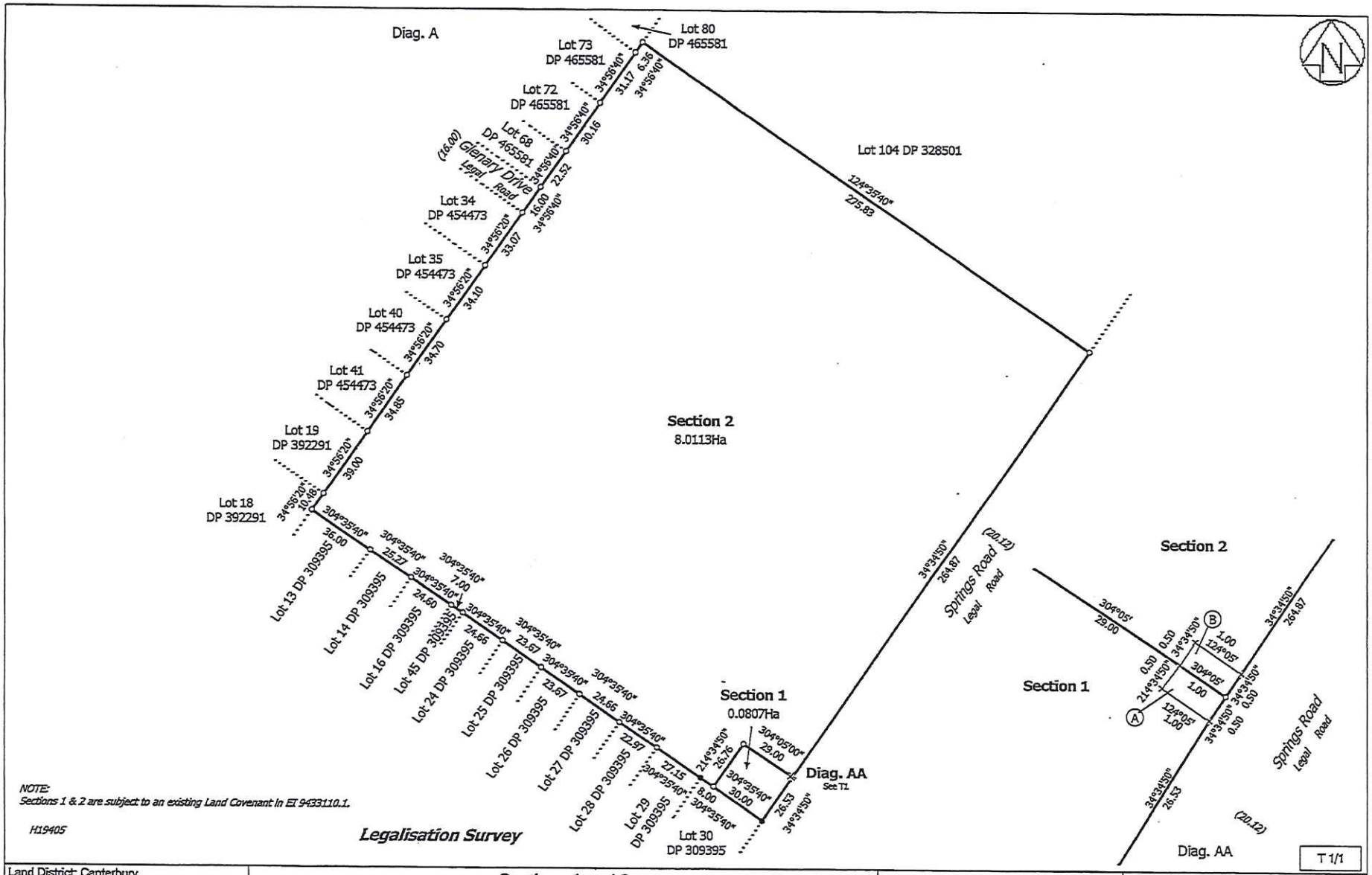
Original Proprietors
Selwyn District Council

Interests

Land Covenant in Easement Instrument 9433110.1 - 26.8.2013 at 8:58 am

Subject to a right to convey electric power over part marked A on SO 515629 created by Easement Instrument 11025012.6 - 8.2.2018 at 12:49 pm

Appurtenant hereto is a right to convey electric power created by Easement Instrument 11025012.6 - 8.2.2018 at 12:49 pm



Land District: Canterbury Digitally Generated Plan Generated on: 09/01/2018 08:40am Page 3 of 3	Sections 1 and 2	Surveyor: Theresa Nell Cole-Swami Firm: Davie Lovell-Smith Ltd	Title Plan SO 515629 Approved on: 9/01/2018

Appendix B Site Plans and Design

SELWYN DISTRICT COUNCIL
51-37704
PREBBLETON PUMP STATION
5137704

PRELIMINARY

No	Revision	Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Job Manager	Project Director	Date
C	PRELIMINARY		JB		AB	19.03.18
B	PRELIMINARY		JB		AB	20.02.18
A	PRELIMINARY		JB		AB	24.01.18

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DO NOT SCALE

Drawn	JB	Designer	JB
Drafting Check		Design Check	
Approved (Project Director)			
Date	24.01.2018		
Scale	This Drawing must not be used for Construction unless signed as Approved		

Client **SELWYN DISTRICT COUNCIL**
Project **51-37704**
Title **PREBBLETON PUMP STATION COVER PAGE**

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Rev: **C**

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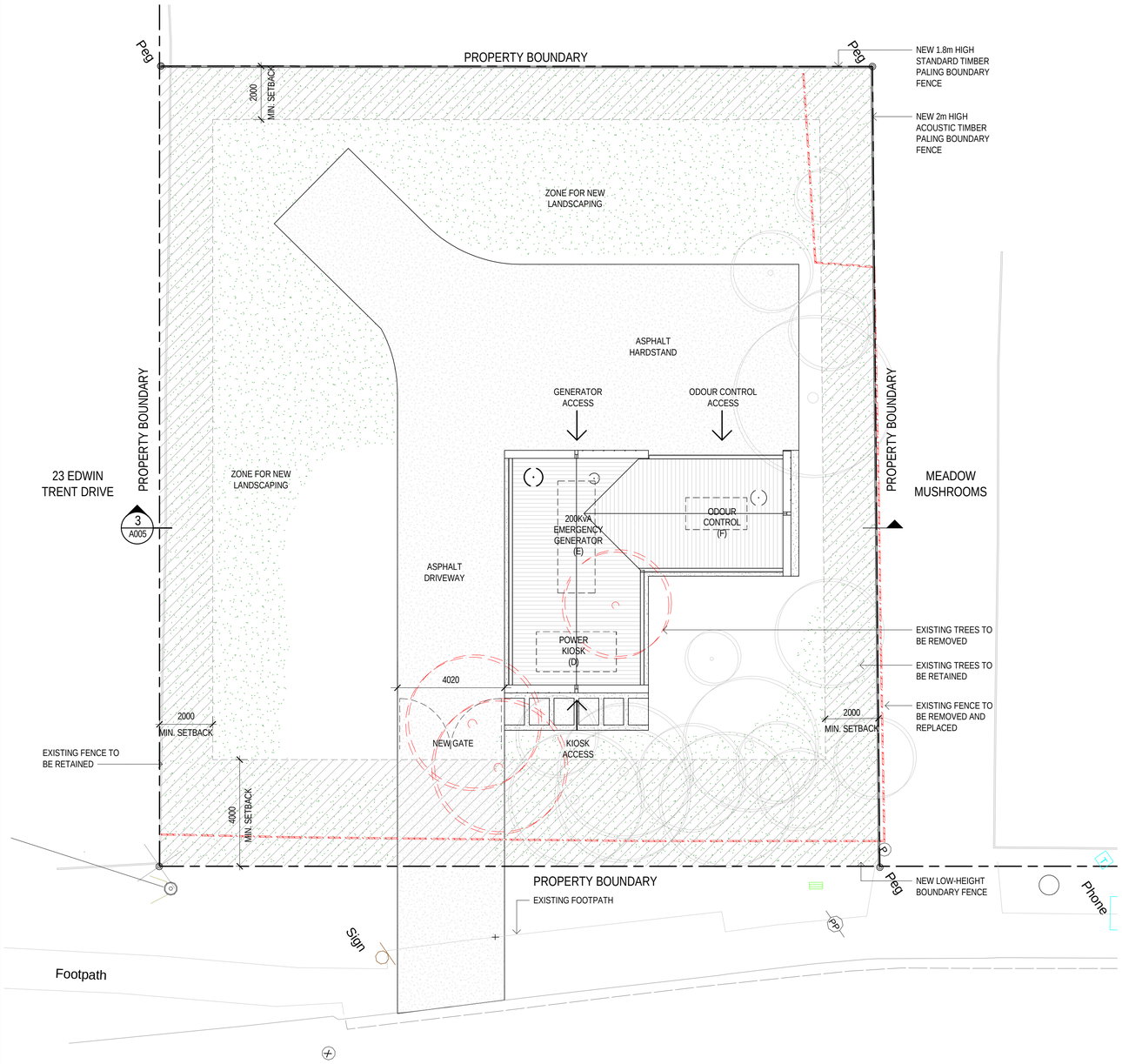

SITE PLAN

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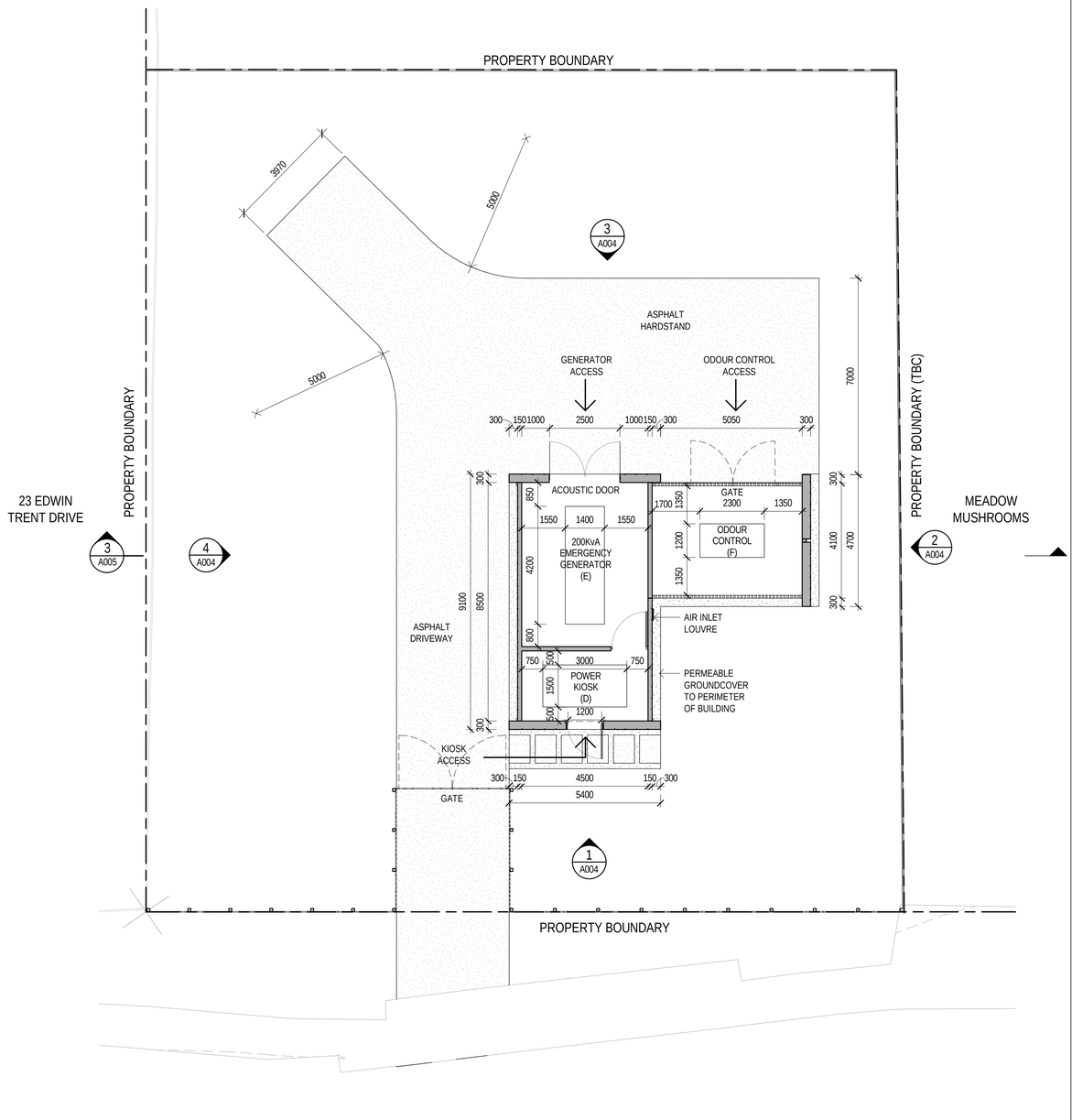

GROUND FLOOR PLAN

SCALE 1 : 100

PRELIMINARY

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A	PRELIMINARY		JB		AB	24.01.18

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Drafting Check		Design Check	
Approved (Project Director)			
Date	26.01.2018		
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Client **SELWYN DISTRICT COUNCIL**
Project **51-37704**
Title **PREBBLETON PUMP STATION SITE & GROUND FLOOR PLAN**

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Rev: C

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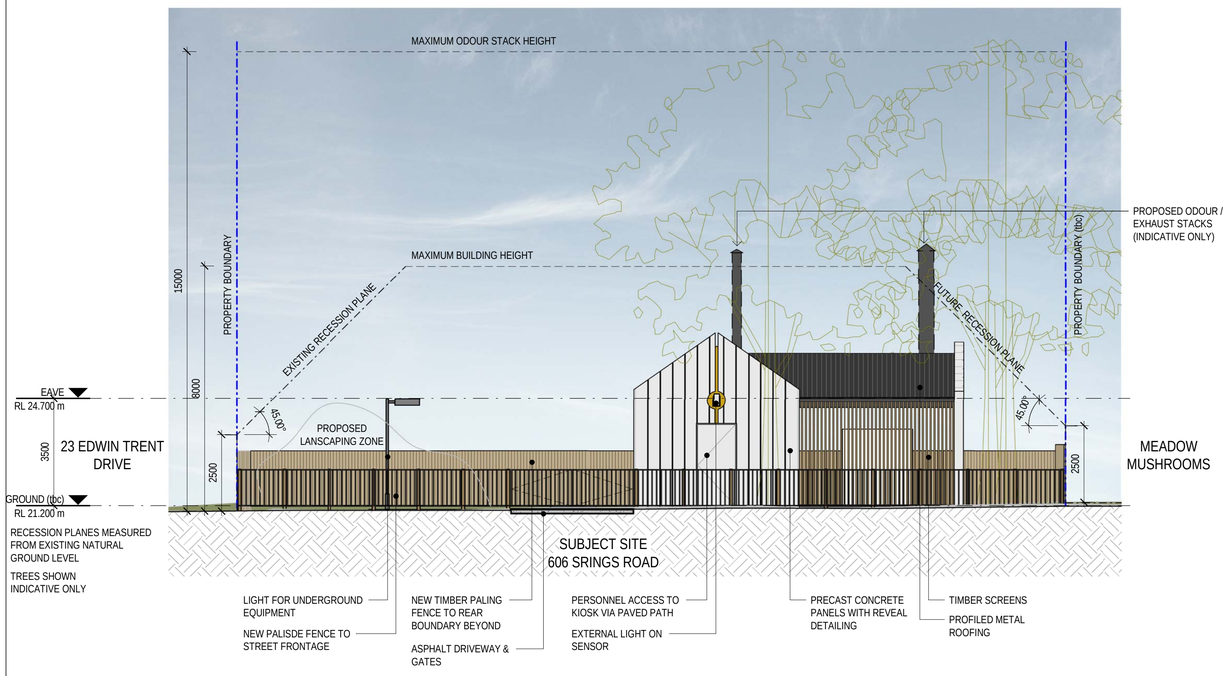

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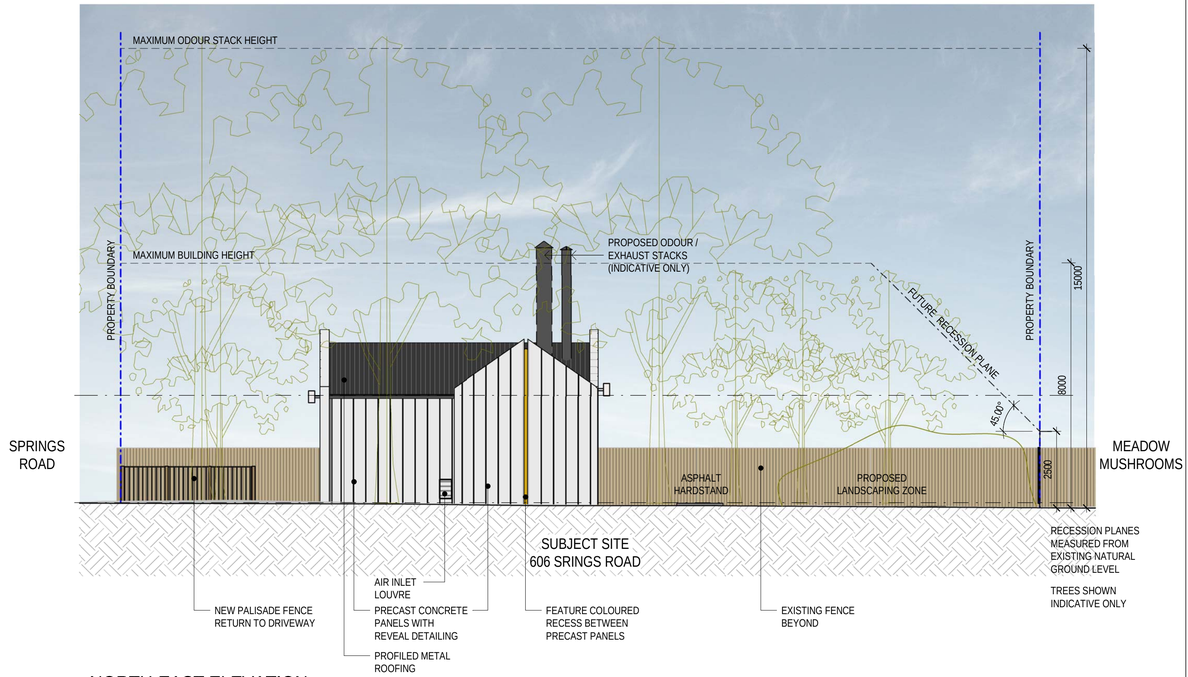

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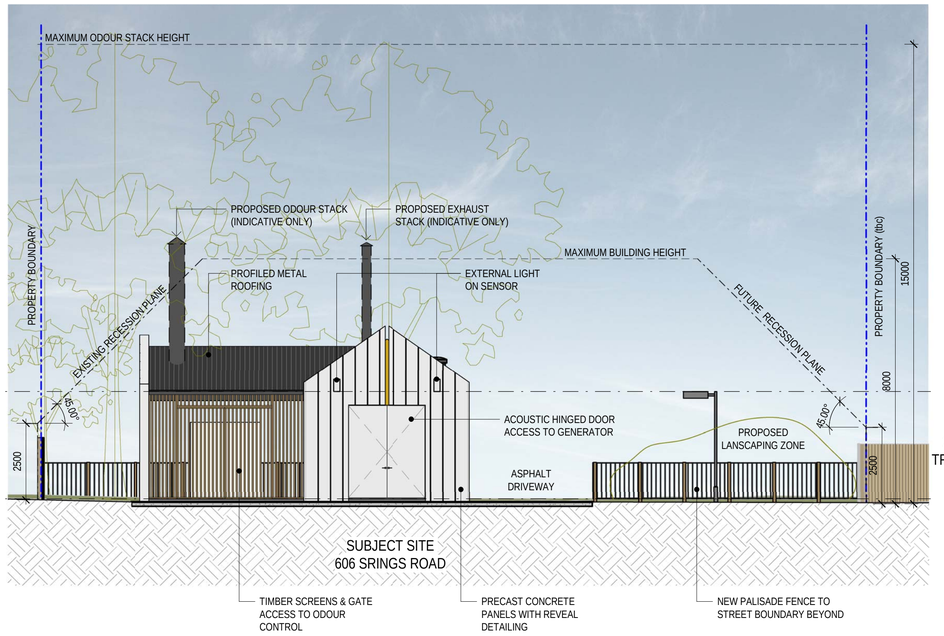

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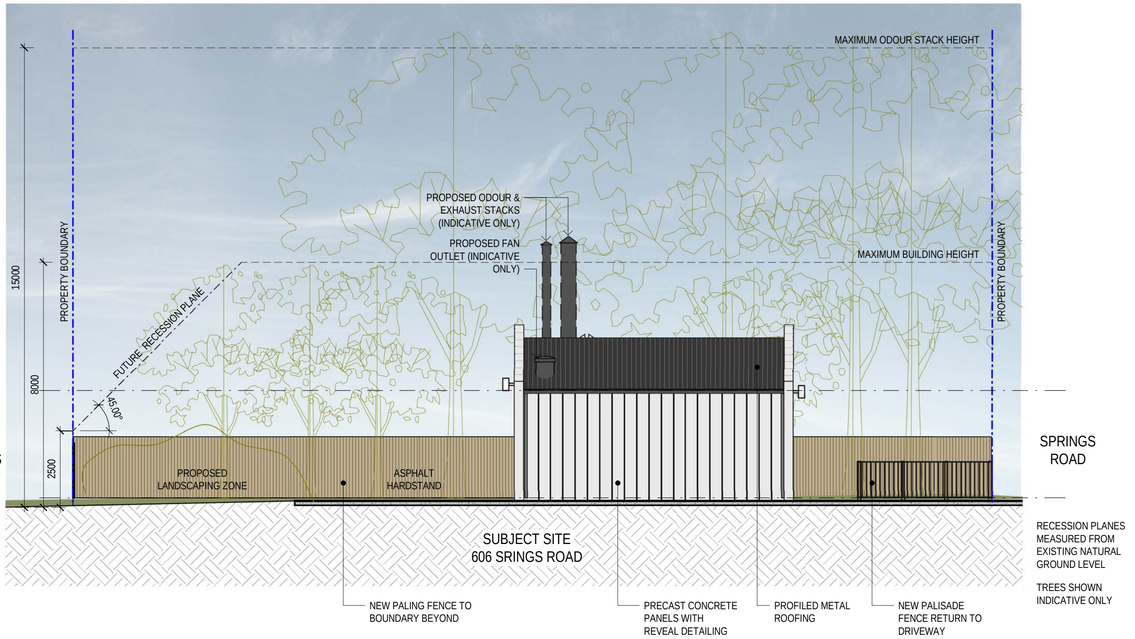

SOUTH-WEST ELEVATION

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PRELIMINARY

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Client **SELWYN DISTRICT COUNCIL**
Project **51-37704**
Title **PREBBLETON PUMP STATION ELEVATIONS**

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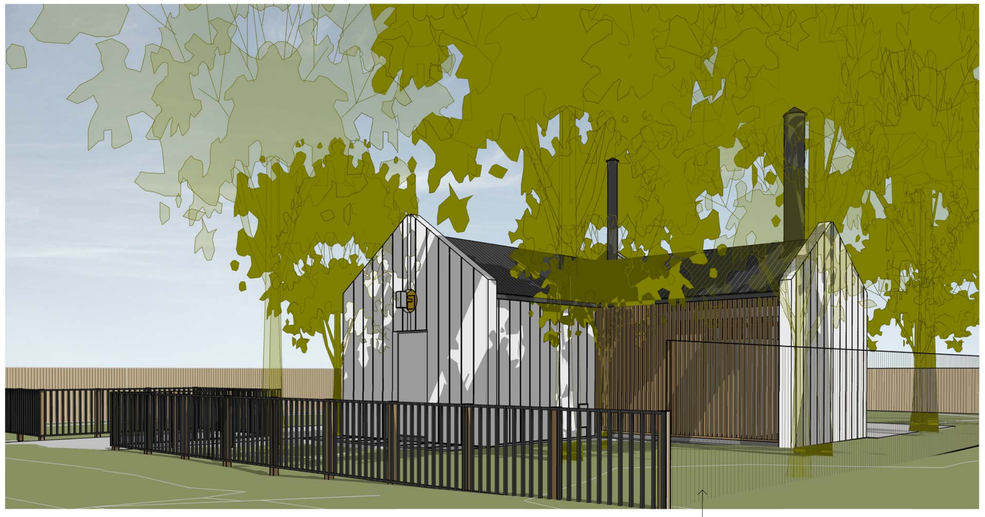
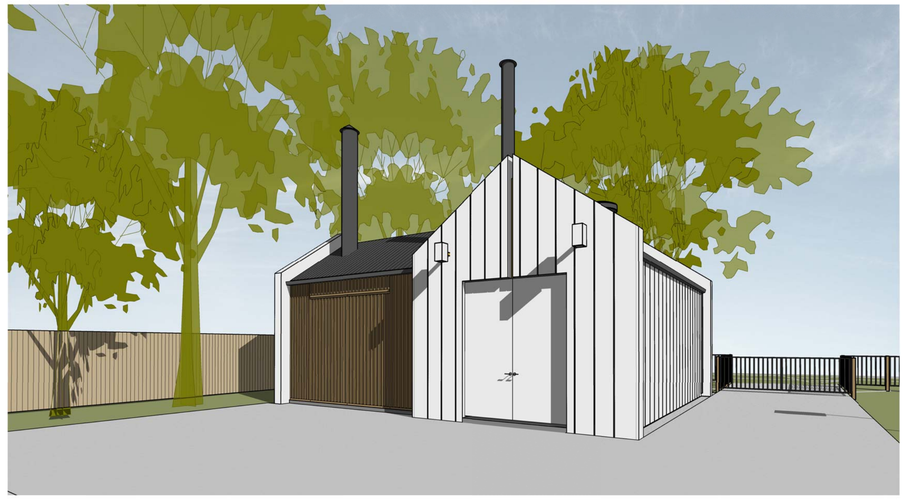
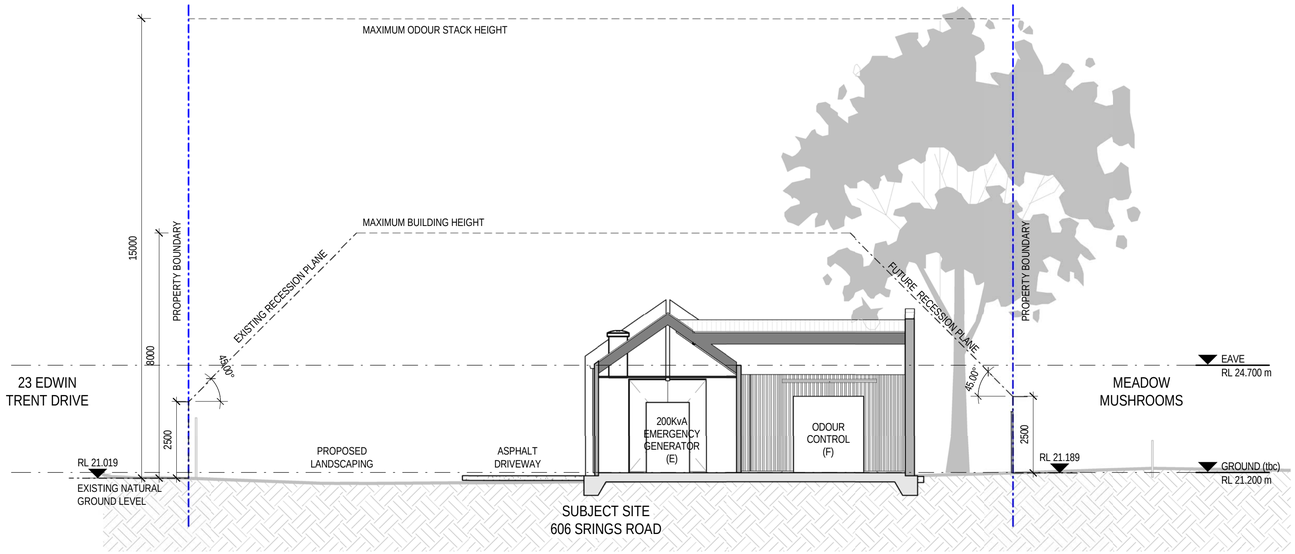


BOUNDARY PALING FENCE
SHOWN TRANSPARENT
FOR CLARITY

PERSPECTIVE VIEW FROM SPRINGS ROAD



PERSPECTIVE VIEW FROM HARSTAND



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A	PRELIMINARY		JB		AB	20.02.18

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Drafting Check		Design Check	
Approved (Project Director)			
Date			
Scale 1 : 100	This Drawing must not be used for Construction unless signed as Approved		

Client **SELWYN DISTRICT COUNCIL**
Project **51-37704**
Title **PREBBLETON PUMP STATION SECTION & 3DS**

Original Size **A1**
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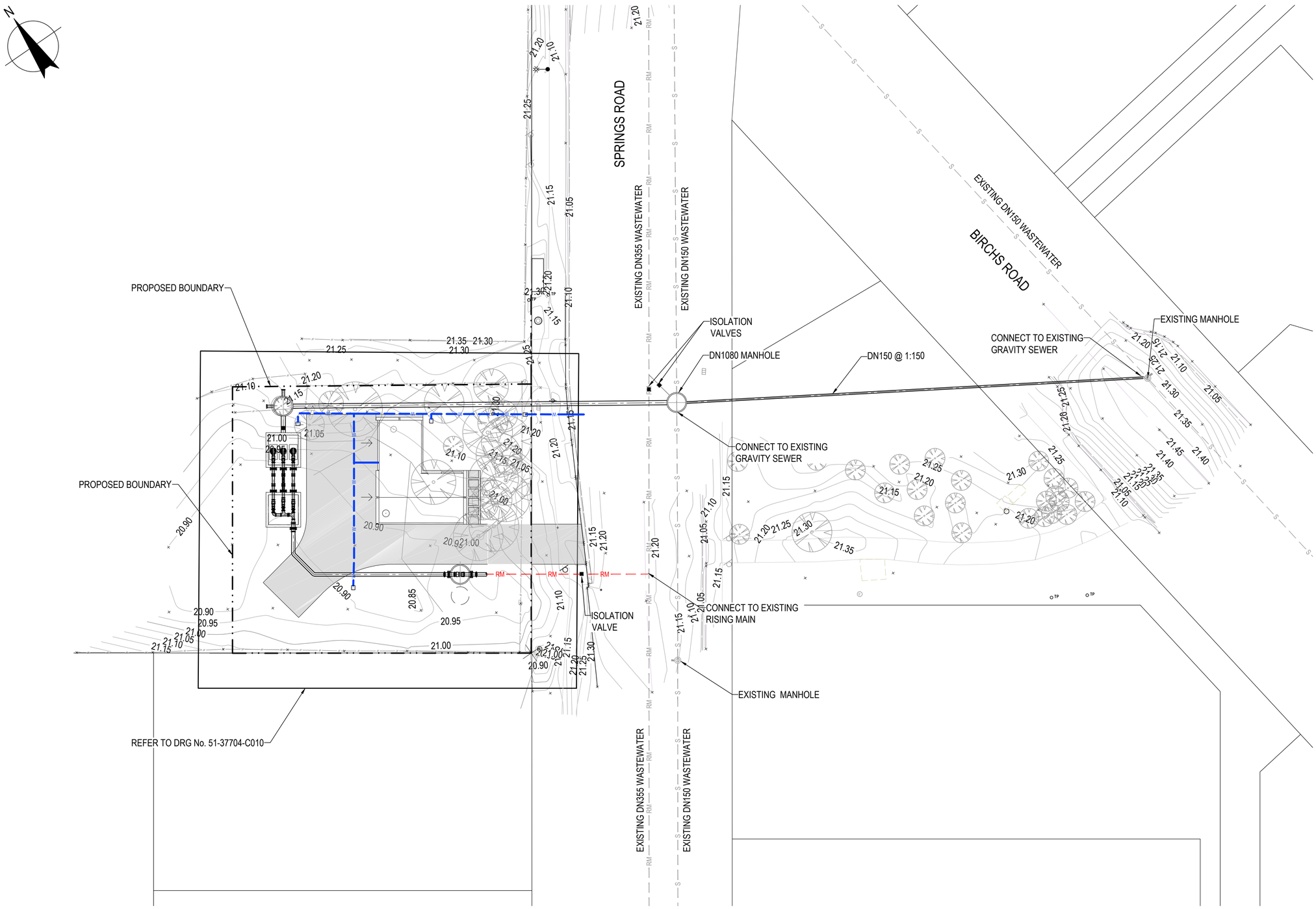

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SCALE 1:200

LEGEND - PROPOSED

- LEGAL BOUNDARY LINE
- RISING MAIN PIPE

LEGEND - EXISTING

- FENCES
- RISING MAIN PIPE
- WASTEWATER PIPE
- TREES
- STREET LIGHTS, POWER POLES, TELECOM POLE
- ROAD SIGNS
- SUMPS, MANHOLES
- HYDRANTS, WATER METER

PRELIMINARY

No	Revision	Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Job Manager	Project Director	Date
A	PRELIMINARY		IA			

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SCALE 1:200 AT ORIGINAL SIZE

Selwyn DISTRICT COUNCIL

GHD
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Christchurch 8013, New Zealand
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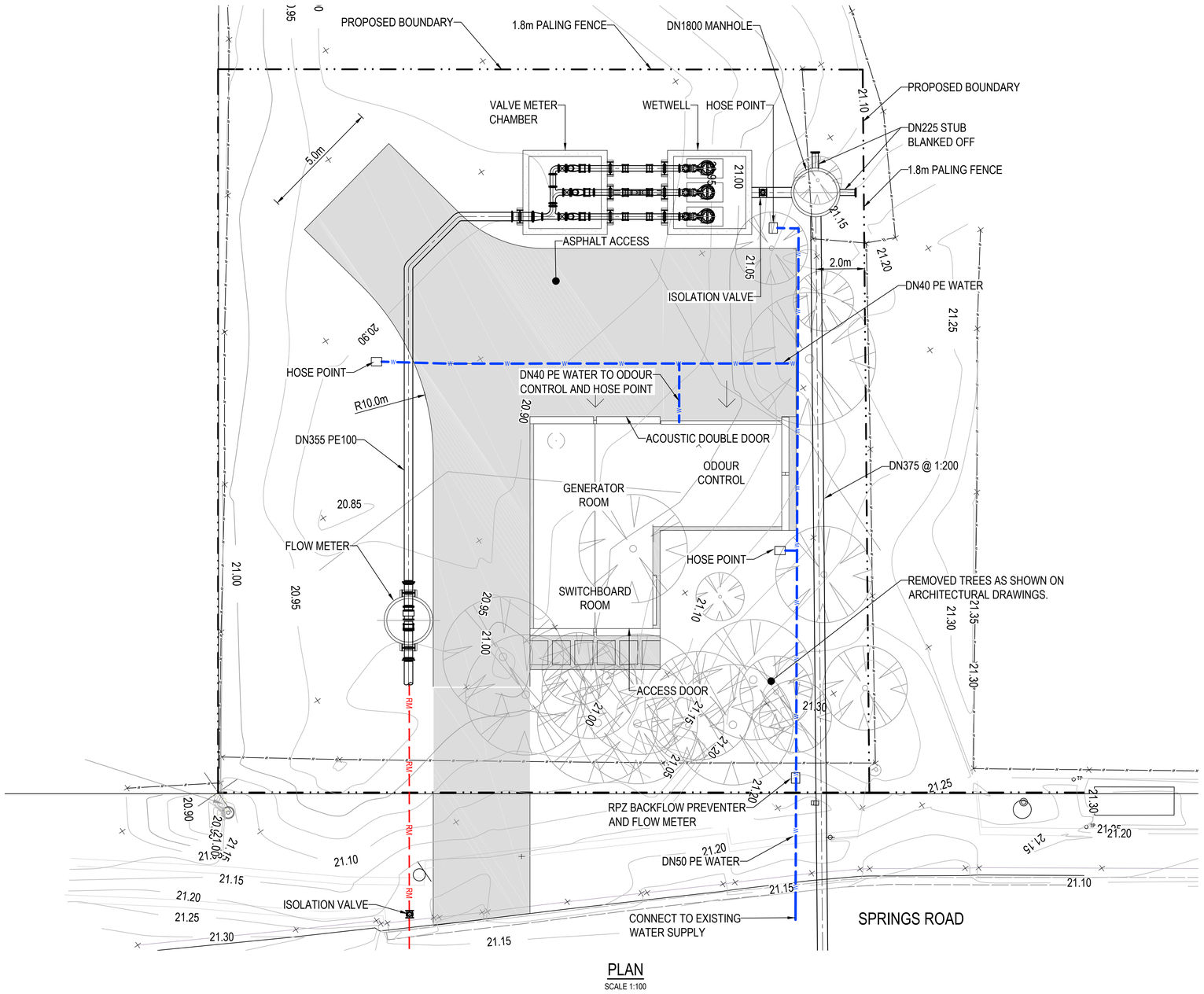
DO NOT SCALE

Drawn	I. ALFEREZ	Designer	P. CARTER
Drafting Check		Design Check	
Approved (Project Director)			
Date			
Scale	1:200	This Drawing must not be used for Construction unless signed as Approved	

Client SELWYN DISTRICT COUNCIL
Project PREBBLETON WW PUMP STATION
Title GENERAL SITE LAYOUT

Original Size A1
Drawing No: 51-37704-C005
Rev: A

Plot Date: 20 March 2018 - 2:38 p.m. Plotted by: Gina Aldersley
Cad File No: N:\NZ\Christchurch\Projects\51\37704\CADD\Drawings\51-37704-C005.dwg



PLAN

SCALE 1:100

LEGEND - PROPOSED

- LEGAL BOUNDARY LINE
- RISING MAIN PIPE
- WATER PIPE

LEGEND - EXISTING

- FENCES
- RISING MAIN PIPE
- WASTEWATER PIPE
- TREES
- STREET LIGHTS, POWER POLES, TELECOM POLE
- ROAD SIGNS
- SUMPS, MANHOLES
- HYDRANTS, WATER METER

PRELIMINARY

No	Revision	Drawn	Job Manager	Project Director	Date
A	PRELIMINARY	IA			

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SCALE 1:100 AT ORIGINAL SIZE

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Approved (Project Director)			
Date			
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Client SELWYN DISTRICT COUNCIL

Project PREBBLETON WW PUMP STATION

Title PUMP STATION SITE LAYOUT

Original Size A1

Drawing No: 51-37704-C010

Rev: A

Plot Date: 20 March 2018 - 2:38 p.m. Plotted by: Gina Aldersley

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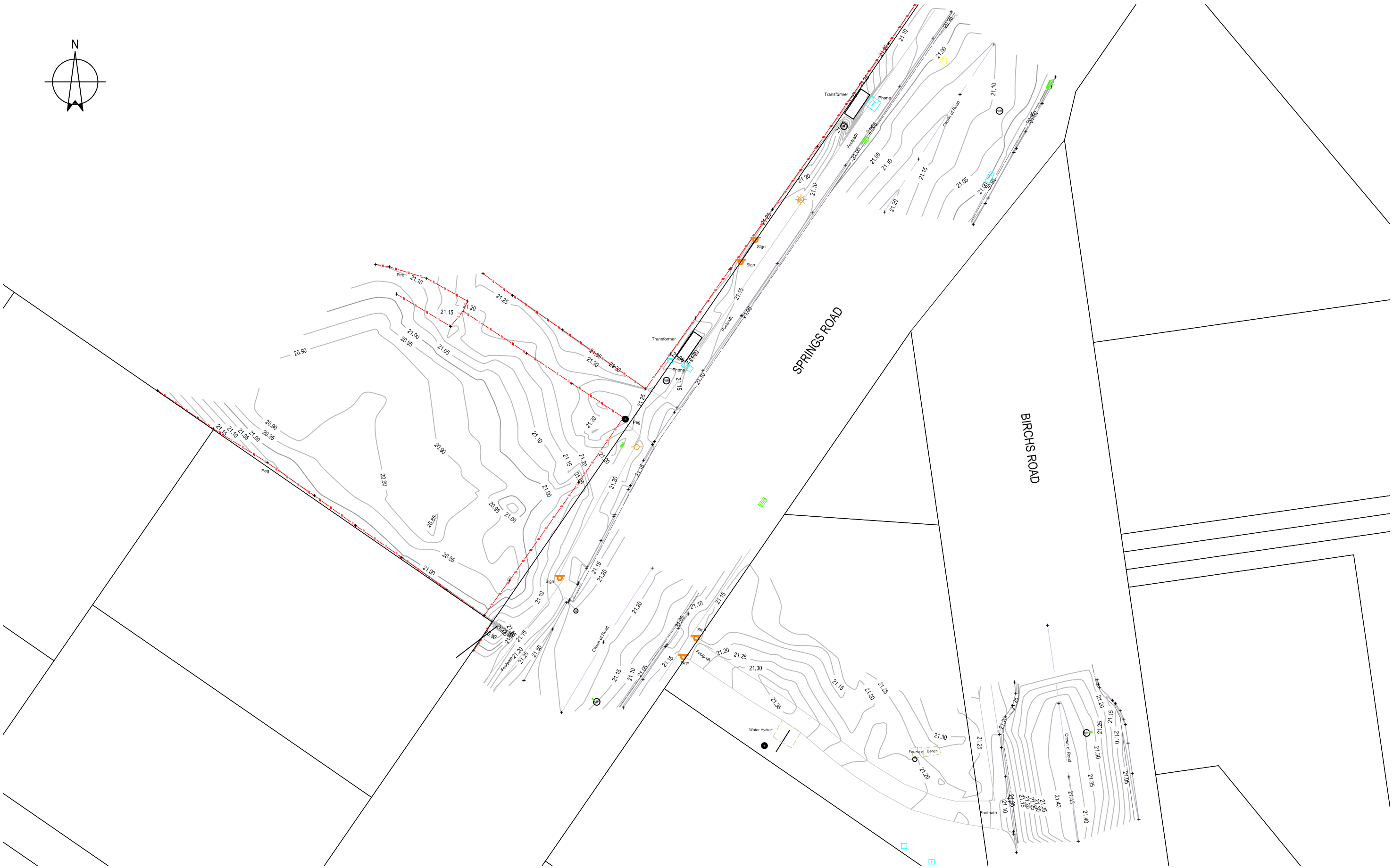

PRELIMINARY

No	Revision	Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Job Manager	Project Director	Date

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Date		
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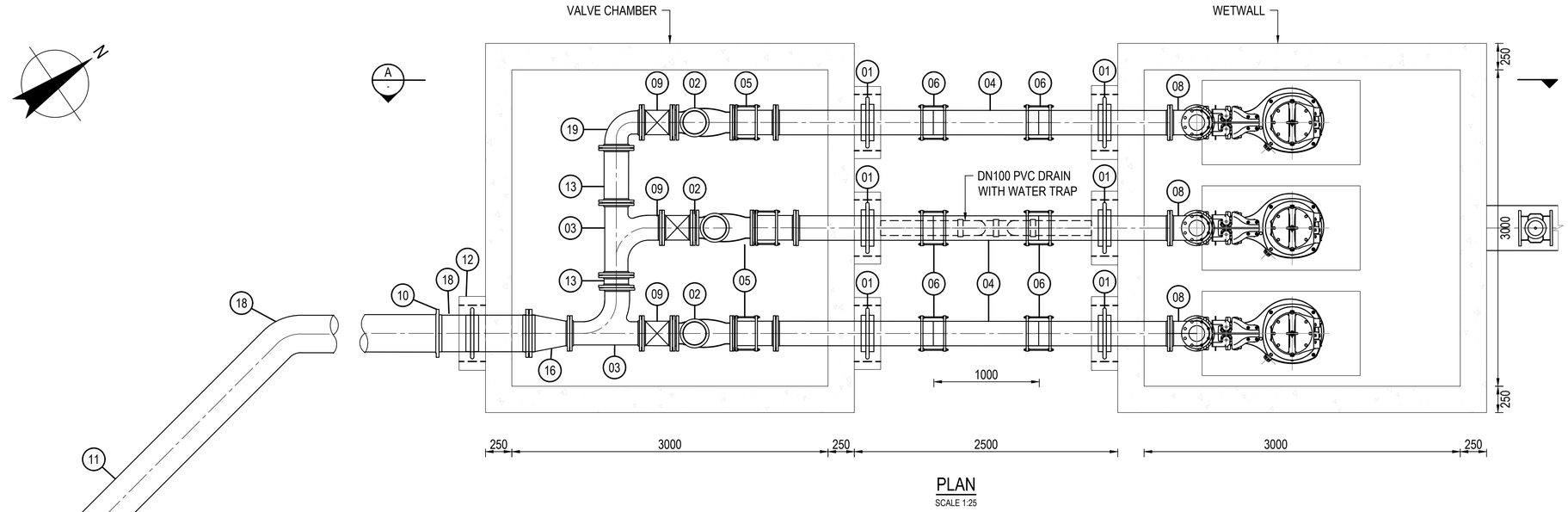
Client SELWYN DISTRICT COUNCIL
Project PREBBLETON WW PUMP STATION
Title SITE SURVEY PLAN

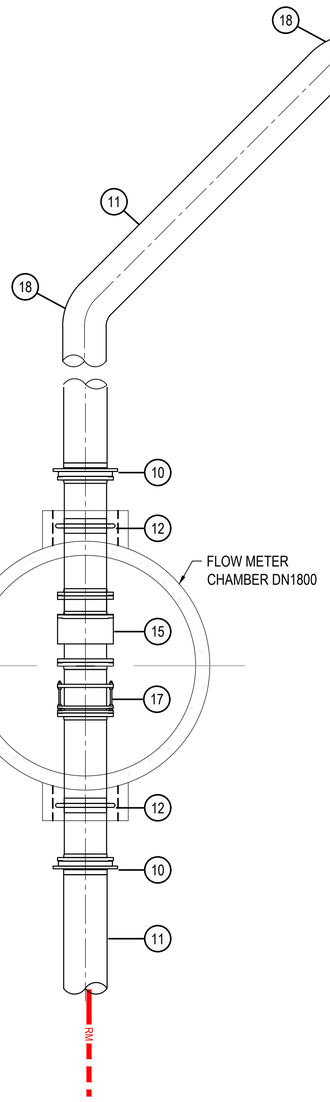
Original Size A1
Drawing No: 51-37704-G001
Rev: A

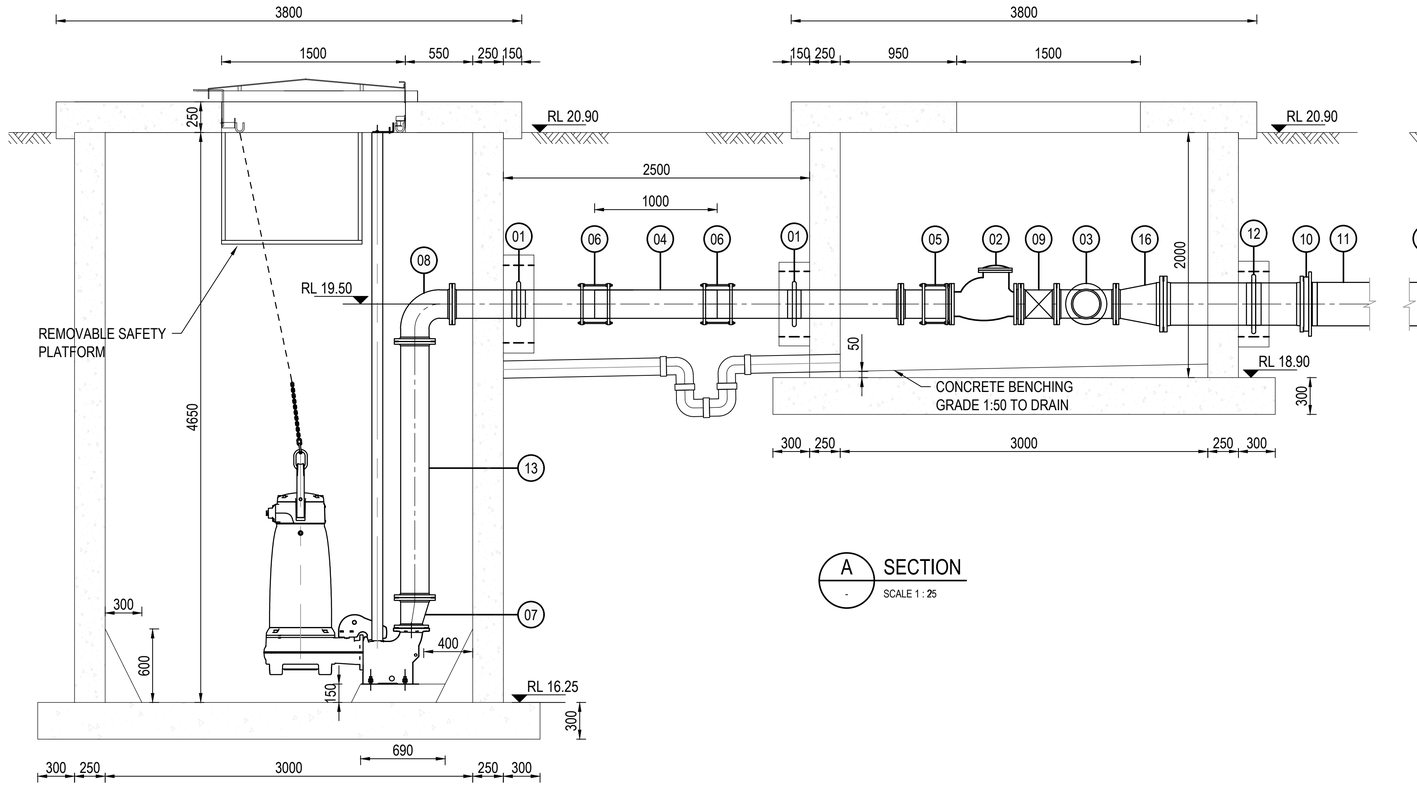
Plot Date: 9 January 2018 - 11:06 a.m. Plotted by: George Lidgett Cad File No: G:\51\37704\CADD\Drawings\51-37704-G001.dwg



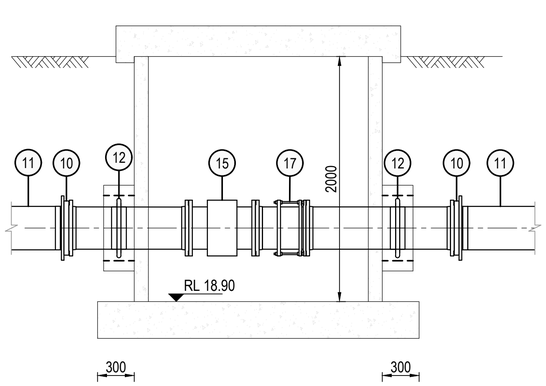
PLAN
SCALE 1:25

MATERIAL LIST		
ITEM	SIZE	DESCRIPTION
01	DN200	DI WITH PUDDLE FLANGE
02	DN200	NON RETURN VALVE
03	DN200	DI SWEEP TEE
04	DN200	DI
05	DN200	DISMANTLING JOINT
06	DN200	GIBAULT
07	DN200x150	ECCENTRIC REDUCER
08	DN200	DI 90° BEND
09	DN200	GATE VALVE
10	DN355	PE100 STUB FLANGE AND STEEL BACKING PLATE
11	DN355	PE100 PN16
12	DN300	DI WITH PUDDLE FLANGE
13	DN200	STEEL
14	DN300	DI
15	DN300	FLOWMETER
16	DN300x200	DI REDUCER
17	DN300	DISMANTLING JOINT
18	DN300	45° BEND
19	DN200	DI 90° BEND





A SECTION
SCALE 1 : 25



B SECTION
SCALE 1 : 25

PRELIMINARY

No	Revision	Note: * indicates signatures on original issue of drawing or last revision of drawing	Drawn	Job Manager	Project Director	Date
A	PRELIMINARY		IA			

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SCALE 1:25 AT ORIGINAL SIZE

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Drafting Check	Design Check	
Approved (Project Director)		
Date		
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Client SELWYN DISTRICT COUNCIL
Project PREBBLETON WW PUMP STATION
Title PUMP STATION DETAIL

Original Size A1
Drawing No: 51-37704-W001
Rev: A

Plot Date: 20 March 2018 - 2:38 p.m. Plotted by: Gina Aldersley Cad File No: N:\NZ\Christchurch\Projects\51\37704\CADD\Drawings\51-37704-W001.dwg

Appendix C Acoustic Assessment

acoustic
engineering services

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PO Box 549
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Ph 03 377 8952
www.aeservices.co.nz
office@aeservices.co.nz

File Ref: AC17268 – 02 – R1

15 February 2018

Mr A. Bresler
GHD
PO Box 12 468
CHRISTCHURCH 8141

Email: Andre.Bresler@ghd.com

Dear Andre,

Re: New Terminal Pump Station, Prebbleton
Noise Compliance Review

Acoustic Engineering Services (AES) have been engaged to provide acoustic advice relating to noise emissions from mechanical plant to be installed in a new pumping station located on Springs Road in Prebbleton by the Selwyn District Council.

Our review is based primarily on preliminary architectural drawings prepared by GHD Woodhead and dated the 24th of January 2018 along with preliminary plant selections provided via email on the 29th of January 2018. Further detail regarding the odour control room and generator room extract was also provided via email on the 12th of February 2018.

1.0 Site location and proposal

The proposed site will occupy the south east corner of Lot 1 DP 46168 which is located in a Living X zone under the Selwyn District Plan. The remainder of this site is currently occupied by the Meadow Mushrooms Prebbleton plant (to the northeast), with pastoral land on the northwest portion. There are residential dwellings along the southwestern boundary which are located in a Living 1A3 zone and across Springs Road to the southeast in a Living X zone. The site location is shown in figure 1.1 below.

The proposal consists of a precast concrete building which will contain an emergency generator, power kiosk and odour scrubber plant. Driveway and hardstand areas will be constructed to allow access to the building. Three submersible pumps will be installed 4.5 metres deep in a concrete wet well.

Existing fencing will be retained at the boundary with existing dwellings and new 1.8 metre high timber fencing installed to the remaining boundaries of the site.

The generator will only operate during the night-time period during an emergency. There will also be periodic testing during the daytime period. Other plant may operate at any time of the day or night.

We understand that while there are three pumps in the well, only up to two pumps may operate at the same time. Typically only one pump will operate.

Figure 1.1 – Site and surrounding area (Source: Canterbury Maps 9/02/18)

2.0 District Plan noise limits

The noise standards which apply to non-residential activities within the Living Zones are those described in the *Selwyn District Plan, Part C, Section 10: Living Zone Rules - Activities: 10.6 Activities and Noise as follows;*

> Noise assessed at any point beyond the boundary of the site from which the source of any noise of interest is situated:
>
> Daytime: 0730 to 2000 hours
> 50 dB L_{A10} 85 dB L_{AFmax}
>
> Night-time: 2000 to 0730 hours
> 35 dB L_{A10} 70 dB L_{AFmax}

Where L_{10} means the L_{10} exceedance level, in A-frequency-weighted decibels, which is equalled or exceeded ten percent of the total measured time; and L_{max} means the maximum A-frequency-weighted sound level during a stated time period.

Sound levels are to be assessed at any point beyond the boundary of the site from which the source of any noise of interest is situated.

The various sound measurement and assessment terms and parameters used in the Selwyn District Plan are described fully in NZS 6801:1999 *Acoustics – Measurement of Environmental Sound* and NZS 6802:1991 *Assessment of Environmental Sound*. We note that these standards referenced in the District Plan have been superseded with updated versions, most recently 2008.

2.1 New Zealand Standard 6802

NZS 6802:2008 *Acoustics – Environmental noise* offers a guideline daytime limit of 55 dB $L_{Aeq\ (15\ min)}$ (approximately 57 dB L_{A10}) and a night-time noise limit of 45 dB $L_{Aeq\ (15\ min)}$

(approximately 47 dB L_{A10}) and 75 dB L_{AFmax} for "the reasonable protection of health and amenity associated with the use of land for residential purposes".

The standard recommends the boundary or notional boundary of noise sensitive sites as the appropriate assessment location.

In the 1999 revision of NZS 6802, L_{10} was replaced by L_{eq} as the descriptor for intrusive noise in order to align with both Australian and international practice.

We note that the Standard also provides guidance in section 8.3 regarding 'daytime' and 'night-time' for use in situations where these are not specified. The time frame recommended is 0700 to 2200 hours daytime, and 2200 hours to 0700 hours the following day for night-time.

2.2 World Health Organisation

Guidelines for Community Noise, a document produced by the World Health Organisation based on extensive international research recommends a guideline limit of 55 dB $L_{Aeq\ (16\ hours)}$ (approximately 57 dB L_{A10}) to ensure few people are seriously annoyed in residential situations. A guideline limit of 50 dB $L_{Aeq\ (16\ hours)}$ (approximately 52 dB L_{A10}) is recommended to prevent moderate annoyance. A guideline night-time limit of 45 dB L_{Aeq} (approximately 47 dB L_{A10}) and 60 dB L_{Amax} is recommended to allow occupants to sleep with windows open. This document recommends the assessment of noise at the façade of dwellings and other noise sensitive locations.

2.3 Conclusions regarding appropriate noise levels

Based on the above, the District Plan noise limits of 50 dB L_{A10} and 35 dB L_{A10} are more conservative than national and international guidance. If typical noise from the pump station complies with these District Plan noise limits, then we expect noise effects will be minimal.

However, for noise from the generator which will only operate during the night time period in an emergency, we consider that a less stringent noise limit of 45 dB L_{Aeq} at the boundary of the site would be sufficient to protect sleep disturbance. This is the level recommended by the WHO to prevent sleep disturbance with windows open.

As requested by GHD we have assessed noise levels to the internal boundaries of the site (with Meadow Mushrooms), although the District Plan limits do not currently apply here.

3.0 Noise sources

Based on the data and information supplied by GHD, the equipment sound power data has been deduced as follows in table 3.1.

Table 3.1 – Key noise generating plant associated with the pump station

Plant type	Model reference	Sound Power
Generator	Powerlink EC Series GMS312C	103 dBA[1]
Generator extract fan	Fantech AP0504AP10/31	81 dBA[2]
Submersible pumps	Xylem NP 3315	95 dBA[3]
Odour Scrubber Fan	Colasit CM Veco 160	58-76 dBA[4]
Air conditioning plant	Mitsubishi Electric PKA-RP-KAL 7.1 kW (indoor) Mitsubishi Electric PUHZ-RP-VHA 7.1 kW (outdoor)	56 dBA[5] 59 dBA[5]

[1] Based on manufacturer radiated sound power data at 7 metres provided by GHD. Spectrum assumed by AES.
[2] Based on manufacturer outlet sound power and spectrum data provided by GHD.
[3] No manufacturer data available. AES assumption based on pump size (85kW) and rated speed (1475 rpm).
[4] Based on manufacturer sound power and spectrum data from GHD. Sound power is dependent on the fan speed.
[5] Based on manufacturer data sourced by AES.

We understand that the building housing the above ground equipment will be constructed from minimum 100 mm precast concrete, with a profiled metal roof. There are three separate spaces within the building; the first is the space housing the generator, which has a roller door for access, along with an inlet air louvre and exhaust fan outlet for the generator. The second is the space containing the power kiosk, which has an external door. The third space contains the odour control equipment. This space has timber screen walls which allow airflow through into the space, although the scrubber itself is contained within an enclosed housing.

4.0 Mitigation

We have assessed a worst case typical scenario with all equipment except the generator operating (to meet 35 dB L_{A10} at the boundary), and again with all equipment including the generator operating (to meet 45 dB L_{Aeq} at the boundary).

To meet these proposed limits of acceptability we recommend that the following mitigation is installed:

Pumps:

- Install a concrete or steel (minimum 5 mm thick) lid to the wet well which is sealed with no gaps, cracks or openings. Any required vent piping must not compromise the acoustic seal.

- Install pumps on anti-vibration mountings to ensure that ground borne vibration is not problematic.

Generator:

- Replace the roller door access into the generator space with an acoustic rated system which achieves STC 30+. A suitable product would be a Nap Silentflo 100 mm Dyna Door (STC 40).

- Install a continuous ceiling to the generator space. This ceiling must consist of 9 mm fibre cement, or an equivalent mass lining installed on Rondo battens beneath the ceiling joists with fibrous insulation (batts) to the cavity.

- The intake louvre should be an acoustic louvre which achieves an insertion loss of at least 10 dB at 125 Hz (such as Fantech SBL2). Our calculation assumes that the louvre is not directly connected to the generator intake and is at low level. Further mitigation may be required if this is not the case.

- Install a ‘2D’ attenuator to the exhaust fan ductwork which achieves an insertion loss of at least 7 dB at 125 Hz (such as Fantech C2-056). Our calculation allows for one circular radius elbow and assumes that the exhaust fan ductwork is ducted into the room but not directly to the generator flue. Further mitigation may be required if this is the case.

- A two metre high acoustic fence should be installed along the northeast boundary with Meadow Mushrooms. This fence should be constructed from a material with a minimum surface mass of 8kg/m^2. The fence must be continuous, and maintained with no gaps or cracks. This will require timber palings to be well overlapped (25 mm minimum), or a “board and batten” system, with palings secured on top of each other to ensure no gaps in between, and a sleeper rail connecting the base of the palings to the ground.

Odour Scrubber:

We note that the mitigation indicated for this unit is indicative, as only data for the fan alone has been provided.

- The odour scrubber is contained within a manufacturer provided housing. Based on the noise levels provided for the fan operating at full speed (3600) and the distance to the boundary, the enclosure must reduce noise levels by in the order of 15 dB at 1000 Hz. Assuming that the enclosure is well sealed, with minimal openings a housing constructed of 0.5 mm steel or an equivalent mass product would be sufficient.

- To reduce noise levels from the stack to the boundary, the fan speed should be limited to 2200 rpm, or an attenuator selected for the stack which achieves an insertion loss of 11 dB at 1000 Hz.

Air-conditioning outdoor unit:

- Ensure that the outdoor unit is located at least 5 metres from the closest boundary.

5.0 Expected noise levels and District Plan compliance

With the mitigation described in section 4, we expect the cumulative noise levels received beyond the boundaries of the site would be below 35 dB L_{A10} during typical operation, or 45 dB L_{Aeq} when the generator is operating. As the generator will only operate during the night time in emergency situations, and 45 dB L_{Aeq} is sufficient to prevent sleep disturbance with windows open, we expect that noise levels of this order will be acceptable.

The District Plan night time limit of 35 dB L_{A10} would be exceeded at 21 and 23 Edwin Trent Drive while the generator is running. There would also be an exceedance of the District Plan limit at the boundary of the site with Springs Road.

While the internal boundaries to the northeast and north west are shown as the same site on the District Plan (and therefore the District Plan night time limits don't currently apply). However, if at any point in the future this site is subdivided, night time limit of 35 dB L_{A10} would be exceeded at these boundaries when the generator operates.

The daytime District Plan noise limit would be met at all times.

Please do not hesitate to contact me to discuss further as required.

Kind Regards,

William Reeve
B.E., MASNZ

Acoustic Engineering Services

Appendix D Regional Policy Statement Objectives and Policies

Regional Policy Statement Objectives and Policies

Objective 5.2.1 Location, design and function of development (Entire Region)

Development is located and designed so that it functions in a way that:

1. achieves consolidated, well designed and sustainable growth in and around existing urban areas as the primary focus for accommodating the region's growth; and
2. enables people and communities, including future generations, to provide for their social, economic and cultural well-being and health and safety; and which:
   (a) maintains, and where appropriate, enhances the overall quality of the natural environment of the Canterbury region, including its coastal environment, outstanding natural features and landscapes, and natural values;
   (b) provides sufficient housing choice to meet the region's housing needs;
   (c) encourages sustainable economic development by enabling business activities in appropriate locations;
   (d) minimises energy use and/or improves energy efficiency;
   (e) enables rural activities that support the rural environment including primary production;
   (f) is compatible with, and will result in the continued safe, efficient and effective use of regionally significant infrastructure;
   (g) avoids adverse effects on significant natural and physical resources including regionally significant infrastructure, and where avoidance is impracticable, remedies or mitigates those effects on those resources and infrastructure;
   (h) facilitates the establishment of papakāinga and marae; and
   (i) avoids conflicts between incompatible activities.

5.2.2 Integration of land-use and regionally significant infrastructure (Wider Region)

In relation to the integration of land use and regionally significant infrastructure:

1. To recognise the benefits of enabling people and communities to provide for their social, economic and cultural well-being and health and safety and to provide for infrastructure that is regionally significant to the extent that it promotes sustainable management in accordance with the RMA.
2. To achieve patterns and sequencing of land-use with regionally significant infrastructure in the wider region so that:
   (a) development does not result in adverse effects on the operation, use and development of regionally significant infrastructure.
   (b) adverse effects resulting from the development or operation of regionally significant infrastructure are avoided, remedied or mitigated as fully as practicable.
   (c) there is increased sustainability, efficiency and liveability.

5.3.2 Development conditions (Wider Region)

To enable development including regionally significant infrastructure which:

1. ensure that adverse effects are avoided, remedied or mitigated, including where these would compromise or foreclose :
   (a) existing or consented regionally significant infrastructure;
   (b) options for accommodating the consolidated growth and development of existing urban areas;
   (c) the productivity of the region's soil resources, without regard to the need to make appropriate use of soil which is valued for existing or foreseeable future primary production, or through further fragmentation of rural land;
   (d) the protection of sources of water for community supplies;
   (e) significant natural and physical resources;

2. avoid or mitigate:

(a) natural and other hazards, or land uses that would likely result in increases in the frequency and/or severity of hazards;
(b) reverse sensitivity effects and conflicts between incompatible activities, including identified mineral extraction areas; and

3. integrate with:
(a) the efficient and effective provision, maintenance or upgrade of infrastructure; and
(b) transport networks, connections and modes so as to provide for the sustainable and efficient movement of people, goods and services, and a logical, permeable and safe transport system.

5.3.5 Servicing development for potable water, and sewage and stormwater disposal (Wider Region)

Within the wider region, ensure development is appropriately and efficiently served for the collection, treatment, disposal or re-use of sewage and stormwater, and the provision of potable water, by:

1. avoiding development which will not be served in a timely manner to avoid or mitigate adverse effects on the environment and human health; and
2. requiring these services to be designed, built, managed or upgraded to maximise their on-going effectiveness.

5.3.6 Sewerage, stormwater and potable water infrastructure (Wider Region)

Within the wider region:

1. Avoid development which constrains the on-going ability of the existing sewerage, stormwater and potable water supply infrastructure to be developed and used.
2. Enable sewerage, stormwater and potable water infrastructure to be developed and used, provided that, as a result of its location and design:
(a) the adverse effects on significant natural and physical resources are avoided, or where this is not practicable, mitigated; and
(b) other adverse effects on the environment are appropriately controlled.
3. Discourage sewerage, stormwater and potable water supply infrastructure which will promote development in locations which do not meet Policy 5.3.1.

5.3.9 Regionally significant infrastructure (Wider Region)

In relation to regionally significant infrastructure (including transport hubs):

1. avoid development which constrains the ability of this infrastructure to be developed and used without time or other operational constraints that may arise from adverse effects relating to reverse sensitivity or safety;
2. provide for the continuation of existing infrastructure, including its maintenance and operation, without prejudice to any future decision that may be required for the ongoing operation or expansion of that infrastructure; and
3. provide for the expansion of existing infrastructure and development of new infrastructure, while:
(a) recognising the logistical, technical or operational constraints of this infrastructure and any need to locate activities where a natural or physical resource base exists;
(b) avoiding any adverse effects on significant natural and physical resources and cultural values and where this is not practicable, remedying or mitigating them, and appropriately controlling other adverse effects on the environment; and
(c) when determining any proposal within a sensitive environment (including any environment the subject of section 6 of the RMA), requiring that alternative sites, routes, methods and design of all components and associated structures are considered so that the proposal satisfies sections 5(2)(a) – (c) as fully as is practicable.

Appendix E Alternative Site Assessment

Eastern Selwyn Sewerage Scheme

Prebbleton Pump Station Site Investigations

Rev.	Date	Description	Prepared By	Reviewed By	Approved By
1	31/8/2015	Draft for comment	S Bishop	C Maguire	S Bishop
2	19/10/2015	Addn of MM Sth Gravity option	S Bishop	C Maguire	S Bishop
3	28/10/2015	Addn of Reserve	S Bishop	M Ridge	S Bishop

Summary

Further investigations have been requested by SDC to assess viable development sites for the terminal Pump Station (PS) for Prebbleton. This is from discussions held with Meadows Mushrooms for the purchase of land for the preferred location and their reluctance to enter into negotiations. The preferred location of Meadow Mushrooms would be at the southern end of their block facing Springs Road, across from Birches Road. Alternatives have been considered in response, as attached, with locations defined, issues reviewed and viability assessed (including cost estimates). This evaluation is summarised in the table below.

Ref	Site Description	Ownership	Cost Estimate (Capital)	Cost (Ops)	Gravity Pipelines (m)	Risk - Public Perception	Risk - Not Obtaining Consent	Risk - Nearby Structures	Risk - Construction Depth (m)
A	Meadow Mushrooms	Private	$ 1,810,000		851	Low	Medium	Low	7.7
B	SDC Reserve	SDC - Parks and Recreation	$ 2,060,000		969	Medium	Medium	Medium	8.1
C	Empty Lot	Private	$ 1,950,000		892	High	High	Medium	7.5
D	Car Park - Central	Private - Kindergarten	$ 1,860,000		845	High	High	Medium	7.4
E	Development Site	Private - Business	$ 2,390,000		985	High	High	Low	7.7
F	Car Park - South	SDC – Community Hall	$ 1,600,000		890	High	Medium	High	7.9
G	Vehicle Yard	Private - Business	$ 1,890,000		885	Medium	High	High	7.9
H	Meadow Mushrooms (South)	Private	$ 990,000		515	Low	Medium / Low	Low	5.9
H*	Meadow Mushrooms (South)	Private (Gravity Option)	$ 1,730,000		845	Low	Medium / Low	Low	7.1
I	SDC Reserve	SDC - Parks and Recreation	$ 990,000		515	High	Medium / Low	Medium	5.9

Each of these options requires a new PS installed as the terminal site, however the final option (for Meadow Mushrooms (South)) does require the Springs Road PS to remain as a lift station. Therefore, long term operational costs will be higher than for the other options. Advantages with this option over other sites include:

- Shallower PS: is not constrained by the incoming pipeline depths of the Springs Road PS;
- Remote: away from the town center for construction and maintenance access;
- Efficiencies: can divert approximately 20-25% of the town catchment away by gravity at Birches Rd;
- Consenting: the land owner has already suggested this as a preferred location compared the northern site;
- Public Disruption: gravity mains between Birches Road and the Springs Rd PS do not need to be upgraded with the diversion of flows meaning less construction on Springs Rd;
- Cost: although there will be some increased operational costs, there will be significant savings in capital investment. Long term operational costs would be in maintaining two sites, energy consumption (minimal given the high flow, low head that would be required from Springs Rd), and mechanical/electrical replacement.
- Resilience: A revised option exists that allows for gravity diversion of flows from Springs Road back to this location (refer final item within the table). This would allow for a contingency whereby flows may be able to head up within the network in the event of power outage at Springs Rd and be diverted to the southern site.

On balance, we believe there are benefits to both SDC and the private land owner to consider the Meadow Mushroom (South) site as the proposed location of the new Prebbleton PS.

Prebbleton Pump Station – Site Assessment Version 3

Assessment Criteria:

- It must be viable to connect by gravity from the existing collection system (to allow the mothballing of the existing Springs Road PS). To take full gravity flows from Prebbleton Catchment of 86 l/s.
- Ownership and consenting risks to be minimised to allow rapid development
- Site must be able to house the footprint required for the proposed pump station (storage/chambers/site building/odour control measures/valves/management)

The discussion of Consenting for each option below reflects Agreements that may be needed specific to the item listed. In each instance the options is within a Living zone with neighbouring properties. Therefore consents would be required for Discharge to Air (odour mitigation), noise mitigation, Excavation (Construction), Discharge of Groundwater (dewatering during construction). In each instance, traffic management planning would be required although to greater or lesser extents.

Ref	Site Description	Ownership	Viability (Engineering)	Consenting / Approvals	Considerations	Cost Estimates (refer Table)
A	Meadow Mushrooms	Private	Depth of incoming sewer (Sewer IL) : ~5.4m Depth of PS (PS IL): ~7.7m	Requires owner consent or compulsory land purchase	Available within undeveloped land but contrary to land owners requests (June/July 2015)	Total Est: $1,810,000
B	SDC Reserve	SDC - Parks and Recreation	Sewer IL : ~5.9m PS IL : ~8.1m	Agreement required within SDC **Perception:** Adjacent to children's playground	Large portion of existing play area would be lost. Potential public backlash as high profile residential site.	Total Est: $2,060,000
C	Empty Lot	Private	Sewer IL : ~5.2m PS IL : ~7.5m	Requires owner consent or compulsory land purchase **Perception:** Adjacent to preschool / Kindergarten	Would require right of way to access site through pre-school. May be offset by partial return of property to neighbouring early childhood businesses. **Risk:** depth of excavation could undermine structures	Total Est: $1,950,000
D	Car Park - Central	Private - Kindergarten	Sewer IL : ~5.1m PS IL : ~7.4m	Requires owner consent or compulsory land purchase **Perception:** Adjacent to preschool / Kindergarten / Fruit and Vegetable store	Access from Springs Road. Require land swap with access for Kindergarten off Argyle Place. Would remove existing trees from site. **Risk:** depth of excavation could undermine structures	Total Est: $1,860,000
E	Development Site	Private - Business	Sewer IL : ~5.5m PS IL : ~7.7m	Requires owner consent or compulsory land purchase **Perception:** Business centre / hotel	Additional length of pressure main required to connect to installed 355mm dia. Not desired by current owner (June/July 2015)	Total Est: $2,390,000
F	Car Park - South	SDC – Community Hall	Sewer IL : ~5.6m PS IL : ~7.9m	Agreement required within SDC	Land not available at front of site, gravity pipeline would need to pass alongside the Hall. **Risk:** depth of excavation would likely undermine structures	Total Est: $1,600,000
G	Vehicle Yard	Private - Business	Sewer IL : ~5.6m PS IL : ~7.9m	Requires owner consent or compulsory land purchase	Existing petrol station and maintenance business. Unknown ground conditions (potential contaminants) **Risk:** depth of excavation could undermine structures/ fuel tanks	Total Est: $1,890,000

One of other alternative sites that exist if maintaining the Springs Road PS is being considered is a location at or about Birches Road. This was presented as an alternative by Meadow Mushrooms management and is summarised below.

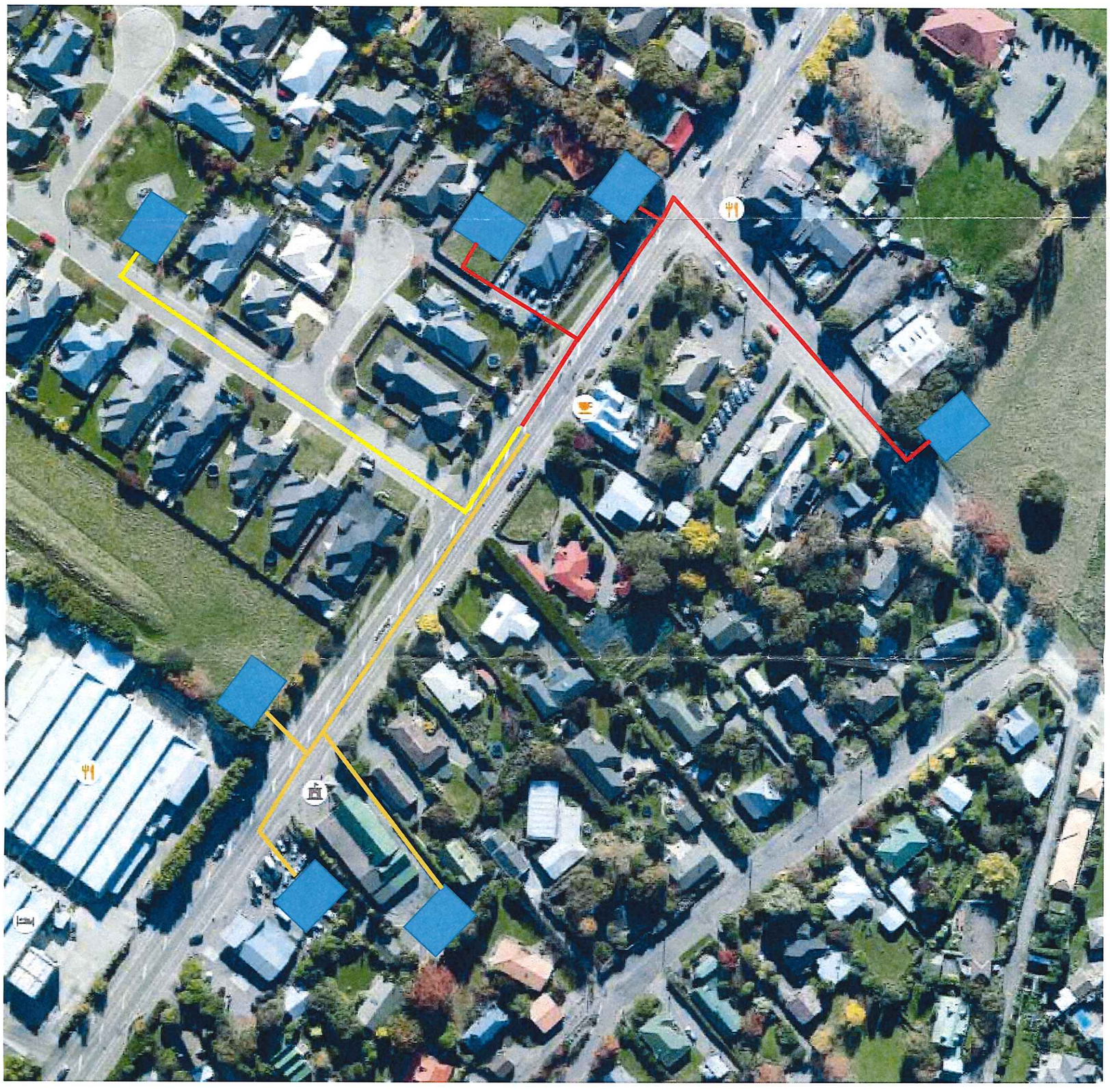
Ref	Site Description	Ownership	Viability (Engineering)	Consenting / Approvals	Considerations	Cost Estimates
H	Meadow Mushrooms (South)	Private	Sewer IL : ~3.6m PS IL : ~5.9m	Requires owner consent or compulsory land purchase (initial discussions owner defined as preferred of two sites). Adjacent to residential but away from town centre.	Shallower than other options but would require Springs Road PS as a lift station of approximately 60.3l/s. Diverts gravity flows at Birches/Springs Road intersection (25.7l/s of 86l/s design flows). Less excavation in Springs Road than other options as South to North gravity upgrades not required.	Total Est: $1,150,000 Credit (reduced depth of PS): -$160,000 (~10% of Capital cost) Revised Total Estimate: $990,000
H*	Meadow Mushrooms (South)	Private	Sewer IL : ~3.6m PS IL : ~7.0m	As above	As above, but with an option to install a gravity line from Cairnbrae Drive to the Meadow Mushroom (South) site	Total Est: $1,730,000
I	SDC Reserve	SDC - Parks and Recreation	Sewer IL : ~3.6m PS IL : ~5.9m	Agreement required within SDC **Perception:** Adjacent to children's playground	Large portion of established reserve would be lost. Location of potable water well head. Potential public backlash as high profile site.	As with Site H Revised Total Estimate: $990,000

Assumes: Property purchase includes $30,000 for legal delineation (if required), land purchase ($260,000 section 600-700m2 Hillview, The Woods, Woodlands August 2015), $10,000 contingency
The cost of the PS is very similar for the depths defined above except for the Meadow Mushrooms (South) site which is ~2m shallower and reflected as a credit.
Baseline is set as $0 pipeline costs for existing pipelines having been installed (i.e. imbedded costs for the pressure main in Springs Road) or are consistent with all options (gravity capacity upgrade from N-S on Springs Rd to Tosswill Rd)
Costs in the above table are baseline costs only. They do not take into account costing in of risk elements such as shoring up of structures and as such should be reviewed for the final selection.

Item	Prebbleton Pump Station Assessment Cost Estimate	Date Unit	31-Aug-15 Rate	Meadow Mushrooms Quantity	 Amount	SDC Reserve Quantity	 Amount	Empty Lot Quantity	 Amount	Car Park - Central Quantity	 Amount	Development Site Quantity	 Amount	Car Park - South Quantity	 Amount	Vehicle Yard Quantity	 Amount	Meadow Mushrooms (South) Quantity	 Amount	Meadow Mushrooms (South) with Gravity Quantity	 Amount
A	**Preliminary & General**																				
	Provides for all plant, labour, materials, temporary works, attendance and other equipment necessary to carryout the works accordance with the specification and drawings. Site establishment, Health and Safety Plan, Quality Plan, traffic management, coordination and liaison with all necessary authorities. Identification of existing services required for installation of the works, verification of invert levels and notification to the Engineer of potential clashes. Dewatering. Erosion and Sediment Control. As Built Drawings. Operation and Maintenance Manuals.																				
B	**Contingency / Engineering Costs / Financial and Scope Risk**																				
	Provides for Engineering costs for design, tendering and construction monitoring (10%), Contingency for unforeseen works activities on site (15%), Financial and Scope Risk (15%) to allow for market variances from the estimates provided.																				
	Subtotal 1				$ -		$ -		$ -		$ -		$ -		$ -		$ -		$ -		$ -
2	**New gravity sewers**																				
	Construction of new gravity pipework & manholes, inclusive of connections, stub and rocker pipes, excavation, bedding and pipe surround, benching, backfill and reinstatement, temporary support, dewatering, connections, removal & disposal of existing pipes as required, plus all associated items not covered elsewhere.																				
	Ø225 PVC gravity main, depth to invert between 3 and 4m (Kingscraft)	m	$ 900.00	435	$ 391,500.00	435	$ 391,500.00	435	$ 391,500.00	435	$ 391,500.00	435	$ 391,500.00	435	$ 391,500.00	435	$ 391,500.00	435	$ 391,500.00	435	$ 391,500.00
	Ø225 PVC gravity main, depth to invert between 3 and 4m (to Meadows PS)	m	$ 900.00	220	$ 198,000.00	220	$ 198,000.00	220	$ 198,000.00	220	$ 198,000.00	220	$ 198,000.00	220	$ 198,000.00	220	$ 198,000.00	0	$ -	0	$ -
	Ø225 PVC gravity main, depth to invert between 4 and 5m (to Springs Rd PS)	m	$ 1,100.00		$ -	50	$ 55,000.00	110	$ 121,000.00	110	$ 121,000.00	110	$ 121,000.00	0	$ -	0	$ -	0	$ -	0	$ -
	Ø300 PVC gravity main, depth to invert between 3 and 4m	m	$ 950.00		$ -		$ -		$ -		$ -		$ -		$ -		$ -		$ -		$ -
	Ø300 PVC gravity main, depth to invert between 4 and 5m	m	$ 1,200.00		$ -		$ -		$ -		$ -		$ -		$ -		$ -		$ -		$ -
	Ø300 PVC gravity main, depth to invert between 5 and 6m	m	$ 1,500.00	196	$ 294,000.00	264	$ 396,000.00	127	$ 190,500.00	80	$ 120,000.00	220	$ 330,000.00	235	$ 352,500.00	230	$ 345,000.00	80	$ 120,000.00	80	$ 120,000.00
	Connections & alterations to existing manholes	no.	$ 3,000.00	11	$ 33,000.00	13	$ 39,000.00	13	$ 39,000.00	13	$ 39,000.00	13	$ 39,000.00	11	$ 33,000.00	11	$ 33,000.00	2	$ 6,000.00	2	$ 6,000.00
	Ø1500 mm internal diameter pre cast concrete standard manhole of depth to invert between 5.0 and 6.0m with 100mm concrete surround to full depth	no.	$ 15,000.00	2	$ 30,000.00	3	$ 45,000.00	2	$ 30,000.00	2	$ 30,000.00	2	$ 30,000.00	2	$ 30,000.00	2	$ 30,000.00	0	$ -	4	$ 60,000.00
	P&G (@10% plus $10,000)				$ 104,650.00		$ 122,450.00		$ 107,000.00		$ 99,950.00		$ 120,950.00		$ 110,500.00		$ 109,750.00		$ 61,750.00		$ 99,100.00
	Contingency, Engineering and Financial & Scope Risk (40%)				$ 420,460.00		$ 498,780.00		$ 430,800.00		$ 399,780.00		$ 492,180.00		$ 446,200.00		$ 442,900.00		$ 231,700.00		$ 396,040.00
	Subtotal 3				*$ 1,471,610.00*		*$ 1,745,730.00*		*$ 1,507,800.00*		*$ 1,399,230.00*		*$ 1,722,630.00*		*$ 1,561,700.00*		*$ 1,550,150.00*		*$ 810,950.00*		*$ 1,386,140.00*
3	**New Pressure Sewers**																				
	Construction of new pressure sewer to connect to existing 355mm PE installed in Springs Road, inclusive of connections, excavation, bedding and pipe surround, benching, backfill and reinstatement, temporary support, dewatering, plus all associated items not covered elsewhere.																				
	Ø355 PE PN16 pressure main, depth to invert between 1 and 2m	m	$ 950.00	0	$ -	184	$ 174,800.00	67	$ 63,650.00	80	$ 76,000.00	220	$ 209,000.00	0	$ -	0	$ -	0	$ -	0	$ -
	Connection to existing Pressure Main	LS	$ 20,000.00	1	$ 20,000.00	1	$ 20,000.00	1	$ 20,000.00	1	$ 20,000.00	1	$ 20,000.00	1	$ 20,000.00	1	$ 20,000.00	1	$ 20,000.00	1	$ 20,000.00
	P&G (@10% plus $10,000)				$ 12,000.00		$ 29,480.00		$ 18,365.00		$ 19,600.00		$ 32,900.00		$ 12,000.00		$ 12,000.00		$ 12,000.00		$ 12,000.00
	Contingency, Engineering and Financial & Scope Risk (40%)				$ 12,800.00		$ 89,712.00		$ 40,806.00		$ 46,240.00		$ 104,760.00		$ 12,800.00		$ 12,800.00		$ 12,800.00		$ 12,800.00
	Subtotal 4				*$ 44,800.00*		*$ 313,992.00*		*$ 142,821.00*		*$ 161,840.00*		*$ 366,660.00*		*$ 44,800.00*		*$ 44,800.00*		*$ 44,800.00*		*$ 44,800.00*
	Land Purchase				$ 300,000.00				$ 300,000.00		$ 300,000.00		$ 300,000.00				$ 300,000.00		$ 300,000.00		$ 300,000.00
	New Gravity Sewers (rounded)				$ 1,470,000.00		$ 1,750,000.00		$ 1,510,000.00		$ 1,400,000.00		$ 1,720,000.00		$ 1,560,000.00		$ 1,550,000.00		$ 810,000.00		$ 1,390,000.00
	New Pressure Main (rounded)				$ 40,000.00		$ 310,000.00		$ 140,000.00		$ 160,000.00		$ 370,000.00		$ 40,000.00		$ 40,000.00		$ 40,000.00		$ 40,000.00
	Grand total (rounded)				**$ 1,810,000.00**		**$ 2,060,000.00**		**$ 1,950,000.00**		**$ 1,860,000.00**		**$ 2,390,000.00**		**$ 1,600,000.00**		**$ 1,890,000.00**		**$ 1,150,000.00**		**$ 1,730,000.00**

Prebbleton Pump Station – Approximate footprint on site

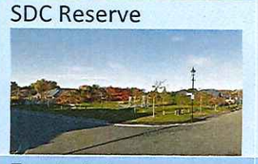
This plan assumes a developed footprint of 12m x 16m for each of the sites to give an impression of the extent that may be required, and are therefore indicative only. Further design work would be required for a site specific example to build up sufficient information for consenting and stakeholder discussions. This footprint is based on the 2014 Concept plan for the preferred site, but decreased by 20% assuming a more compact site development may be required at other locations.



Location	Distance from Springs Rd PS (m)	US IL (mRL)	DS IL (mRL) (grade 1:300)	Est GL	Depth (m)	PS Excavation Depth (m)
Meadow Mushrooms	116	16.18	15.79	21.20	5.41	7.66
SDC Reserve	184	16.18	15.57	21.43	5.86	8.11
Empty Lot	67	16.27	16.05	21.26	5.21	7.46
Car Park - Central	80	16.27	16.00	21.13	5.13	7.38
Development Site	220	16.27	15.54	21.00	5.46	7.71
Car Park - South	155	16.18	15.66	21.30	5.64	7.89
Vehicle Yard	150	16.18	15.68	21.30	5.62	7.87
Where the existing Springs Rd PS is used as a Lift Station to the south Meadows Site						
At southern site	15	18.16	18.11	21.71	3.60	5.85
At southern site (grav)	330	18.00	16.90	21.71	4.81	7.06

Prebbleton Pump Station – Assessment Site Plan

Properties have been labelled clockwise from the preferred Prebbleton Pump Station site on Meadow Mushrooms land as described in the Prebbleton Master Plan (2013) document.

Ref.	Site Description	Comments
A	Meadow Mushrooms 	Undeveloped land owned by Meadow Mushrooms adjacent to existing residential properties on Springs Road. Preferred location as part of Prebbleton Master Plan
B	SDC Reserve 	Community Reserve located at the corner of Kintyre Place and Cairnbrae Drive
C	Empty Lot 	Undeveloped lot at 8 Argyle Place
D	Car Park – Central 	Parking Area of existing Kindergarten at 542 Springs Road
E	Development Site 	Alternative Option considered as part of Prebbleton Master Plan

Ref.	Site Description	Comments
F	Car Park – South 	Parking area at the rear of Prebbleton Hall
G	Vehicle Yard 	Vehicle storage yard adjacent to Prebbleton Motors at 621 Springs Road
H	Meadow Mushrooms (South) 	Undeveloped land owned by Meadow Mushrooms on Springs Road. Preferred location as indicated by land owner.
I	SDC Reserve 	Community Reserve located at the corner of Springs Road and Birches Road

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Document Status

Revision	Author	Reviewer		Approved for Issue		
		Name	Signature	Name	Signature	Date
A	Amy Callaghan	Mary O'Callahan		Mary O'Callahan		30/05/18