

SH16 Safety Improvements - Contaminated Soils Management Plan

Prepared for Waka Kotahi NZ Transport Agency - Auckland
Prepared by Beca Limited

25 October 2022



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Appendix A – HAIL Properties

Revision History

Revision N°	Prepared By	Description	Date
1	Curtis Blyth	Draft for Resource Consent	18 December 2018
2	Curtis Blyth	Final	31 January 2019
3	Curtis Blyth	Final – Updated following Council information request	25 November 2019
4	Curtis Blyth	Final – Updated following Stage 2 design change for Stage 2 consent	23 November 2021
5	Curtis Blyth	Updated with minor edits	1 February 2022
6	Curtis Blyth	Updated with minor edits	13 September 2022
7	Curtis Blyth	Updated with minor edits	25 October 2022

This report was revised to a Beca report template from a Supporting Growth Alliance (SGA) template between Revision 3 and Revision 4. Note that this CSMP was updated to Revision 4 with the inclusion of the new Stage 2 design only. In general, these Stage 2 design changes include the widening of the road alignment to include a new shared pedestrian path alongside the existing road alignment. These Stage 2 design changes have been considered in the assessment of contaminated land (detailed in the Project Preliminary Site Investigation) and have not resulted in an increase in risk to human health or the environment. As such, the approach to managing contaminated soils remains consistent with the content provided in Revision 3 of this report (adopted for Stage 1 works). Revision 3 of this report was used for the consenting of Stage 1 and is still relevant for all Stage 1 works.

Document Acceptance

Action	Name	Signed	Date
Prepared by	Curtis Blyth		25 October 2022
Reviewed by	Phillip Ware (SQEP)		25 October 2022
Approved by	Peter Burgess		25 October 2022
on behalf of	Beca Limited		

This report has been reviewed by Phillip Ware, CEnvP Site Contamination Specialist. Phillip is a suitably qualified and experienced practitioner (SQEP) with over 20 years' experience as a contaminated land, hydrogeological and environmental consultant. He is a Technical Director and Technical Reviewer of contaminated soil, groundwater, and remediation projects across Australasia. Phillip is technically proficient in the science of contaminated land assessment and remediation, and has led projects across the UK, Europe, Australia, and New Zealand. Phil has been a Certified Environmental Practitioner Site Contamination Specialist since 2015.



1 Introduction

The State Highway (SH16) Stage 2 Project covers 4.3 km of the SH16 corridor between the existing Brigham Creek intersection and the Kumeū Town Centre (the Project). The majority of land where proposed works will be undertaken are within the designation of SH16.

The purpose of this Contaminated Soils Management Plan (CSMP) is to identify procedures that shall be undertaken during site redevelopment to control the disturbance and movement of soils, including any identified contaminated soils.

A Preliminary Site Investigation¹ (PSI) was undertaken for the Project which identified various horticultural land uses and one fuel refuelling land use (BP Service Station) neighbouring the length of the alignment where land disturbance activities will be occurring. No soil samples were conducted at the time of this investigation. The National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health (2011) (NESCS) permitted activity soil disturbance thresholds for each respective Hazardous Activities and Industries List (HAIL) property were not exceeded for each respective site. However, works are anticipated to exceed the two-month permitted activity soil disturbance timeframe.

It was considered that the exceedance of this two-month threshold would not present any additional risk to nearby receptors due to the localised works within these properties, with the only exposure pathway identified being to construction workers via dermal and inhalation risk.

A discretionary consent under the NESCS is being sought as no Detailed Site Investigation or soil sampling could be undertaken at the time of drafting the PSI. Sampling of HAIL sites within the extent of works is to be undertaken on a case-by-case basis to inform disposal. Onsite management of soil within these HAIL sites will be in accordance with this plan.

The planning controls of the NESCS and Auckland Unitary Plan (AUP) are applicable. Consent will be required to undertake earthworks as part of the site redevelopment. This CSMP will support the consent application for earthworks under the NESCS and AUP and is intended to be revised following any future soil sampling and assessment of contamination present where identified onsite.

1.1 Site Location and Description

The construction site of the Project involves 4.3 km of road widening and construction between Brigham Creek and Waimauku Roundabout. The majority of works are to be undertaken within the existing road's shoulder, within the designation of the current state highway. Only minor works are required within neighbouring properties along the boundary of the existing designation which are identified as contaminated (namely; orchards and vineyards).

The location of the Project is shown in **Figure 1** below. At the time of drafting this report, no land requirement boundaries had been confirmed. Neighbouring properties which require management of soils along their boundaries are identified in design plans provided in the Assessment of Environmental Effects and **Appendix A**. These properties will require sampling to assess disposal options and subsequently require the implementation of this plan.

¹ Preliminary Site Investigation (Contamination) – SH16 Improvements, Safe Roads Alliance, (Rev7, updated October 2022)



Figure 1: The SH16 Brigham Creek to Waimauku Project area.

1.2 Summary of Geology and Hydrogeology

Published information² for the underlying geology of the project area is recorded as being the Puketoka Formation and consists of pumiceous mud, sand and gravel with muddy peat and lignite: rhyolite pumice, including non-welded ignimbrite, tephra and alluvia. This is largely consistent across the project area. Works associated with this project are generally shallow regrading of soils adjacent the existing state highway.

1.3 Proposed Works

The proposed works involve shoulder widening, barrier improvements and the construction of a new pedestrian shared path within the proximity of the border of the existing state highway.

The following works are proposed for each section of the corridor, with the most up to date plans included in the Assessment of Environmental Effects. Please note that the proposed works as presented in this CSMP may be subject to minor changes through detailed design.

Stage 2:

- Section A (Brigham Creek roundabout through to Coatesville-Riverhead Highway intersection) – provide two lanes in each direction with median safety barrier and behind the road shoulders;
- Section B (Coatesville-Riverhead Highway intersection) – convert the existing priority-controlled intersection to a roundabout with consideration to safe accesses to adjoining residential and commercial properties;

² Heron D. W. (custodian) 2014. Geological Map of New Zealand 1:250 000. Institute of Geological and Nuclear Sciences.

- Section C (Coatesville-Riverhead Highway intersection through to Taupaki Road /Old North Rd intersection) – provide two lanes in each direction with median safety barriers and behind the road shoulders;
- Section D (Taupaki Road / Old North Road intersection through to the posted speed limit change (80km/h and 60km/h) east of Old Railway Road intersection, Kumeū) – provide flush median markings.

Stage 1 (already consented and not covered from Revision 4 of this CSMP):

- Section E (from Station Road intersection, Huapai to the posted limit change (100 km/h and 70km/h) east of Wintour Road, Waimauku) - provide median safety barrier and behind the road shoulders with safe turnaround facilities.

In addition to the above roading upgrades there will be stormwater infrastructure installations in certain areas of the alignment. These installations involve the construction of catch pits along the side of the road corridor and piping to various treatment swales and outfalls. All stormwater pipe installations are within the state highway designation.

The total volume of earthworks cut across the ~4.3 km Stage 2 Project site is ~14,348 m³, of which, where geotechnically suitable, will be reused onsite with an ~22,123 m³ of fill required for the design (i.e. Net fill of ~7,775 m³). Note these values are indicative only, pending completion of detailed design. All earthworks are within the immediate shoulder of the current alignment or adjacent to it, with works required to provide suitable batter slopes on both sides of the alignment. Work outside of the designation is predominantly limited to shallow topsoil stripping in areas to provide suitable batters with neighbouring properties, allowing the construction of the shared path or widening of the road. Several areas involve deeper earthworks outside the designation associated with the installation of stormwater pipelines or swales to accommodate outfalls from the new stormwater infrastructure running through the alignment.

1.4 Summary of Site History

The initial form of SH16 was constructed pre-1940, likely consisting of a gravel road prior to various upgrades overtime. This road has maintained its current alignment, with upgrades overtime resulting in the extent of highway we see today.

Various neighbouring land uses have occurred overtime on properties adjacent to the highway. These land uses are detailed in the PSI and mainly consist of agricultural, horticultural, residential lifestyle and several localised commercial uses.

1.5 Contamination Status of Site Soils and Identified Hazards

The PSI identified various activities neighbouring the works area that has the potential to contaminate site soils along the boundary of works. These activities are predominantly associated with horticulture and the potential use of pesticides.

Shallow excavation works are also required immediately adjacent the BP Service Station at 538 SH16. Works near the service station include shallow earthworks within the designation of the road corridor associated with the construction of the shared path along the front of this property and a stormwater swale ~10m from this property. This BP has recently been refurbished, including the construction of new entrances and the forecourt surface, as such, material to be worked is likely new basecourse and unlikely to be contaminated from potential hydrocarbon sources within the service station. This property/activity has been included on a conservative basis.

Contaminant concentrations of these areas are unknown as no sampling has been undertaken in locations of potential soil disturbance. Despite no sampling being undertaken in the PSI it is considered highly likely that

the site is either suitable for the proposed land use or can easily be made suitable with standard management and mitigation measures.

Sampling was unable to be undertaken during the contamination PSI stage due to the inability to sample soils (land access restrictions) and incomplete design. Soil sampling of the identified HAIL areas is to occur once land acquisition (if necessary) is finalised. Soil sampling will likely be undertaken during the construction phase, prior to earthworks commencing. Any contamination sampling will be undertaken in accordance with the MfE Contaminated Land Management Guidelines by a Suitably Qualified and Experienced Practitioner in contaminated land assessment.

Sample results from sampling at this time will assist the contractor with onsite management and disposal of these soils on a case-by-case basis. Sample results will be required to be collated and presented in an Earthworks Summary Report or Site Validation Report. This report will likely require disposal docket information.

Key contaminants of concern for land historically, or currently, in use as horticulture are:

- Organochlorine and Organophosphorus pesticides
- Heavy metals (arsenic, cadmium, copper, chromium, mercury, nickel, lead and zinc)

Key contaminants of concern for land currently in use as a service station are:

- Total petroleum hydrocarbons
- Heavy metals (arsenic, cadmium, copper, chromium, mercury, nickel, lead and zinc)

Potential contamination exposure routes have been identified for this site as follows:

- Soil ingestion, dermal contact, and inhalation of dust by personnel involved in the site development works.

Implementation of this CSMP aims to mitigate potential human health risks, reduce adverse contamination impacts upon the receiving environment (generation of dusts and off-site migration) and provide guidance for disposal options for the removal of surplus soil, groundwater or stormwater during the development works within the identified HAIL areas. This CSMP will be reviewed once sampling and results have been determined through the construction phase and updated if necessary.

2 Management Procedures

This section sets out general management procedures and requirements.

1. It is recommended that implementation of this CSMP is contractually enforced throughout the duration of the site construction works.
2. This CSMP applies to the site that is the subject of the resource consent application for the Project, which includes the area of land owned by Waka Kotahi and small boundary areas of neighbouring properties which are subject to shallow re-grading earthworks.
3. All personnel involved in the site construction works are to be familiar with this CSMP and ensure that the requirements of this CSMP have been followed.
4. A copy of this CSMP is to remain available onsite at all times so that reference can be made to it when undertaking any site works.
5. The CSMP is intended to assist the site Contractor in meeting their legal obligations related to potentially contaminated soils with respect to health, safety and the environment. It is not intended to cover the general site safety procedures required for typical excavation and construction activities at the site. The CSMP is not intended to relieve the Contractor of their legal responsibilities and does not intend to overrule any Contractor Health and Safety Plan prepared for the project.
6. Excavation, demolition and construction activities at the site may be subject to other controls/rules/policies under the relevant district and regional plans, including but not limited to, the Resource Management (National Environmental Standard for Assessing and Managing Contaminants in Soil to Protect Human Health) Regulations 2011. Any conditions imposed by the regulatory authorities must be adhered to. However, it is expected that this CSMP will be incorporated into any consent/permit involving excavation/disturbance work at the site to ensure the risks associated with contaminated soils are managed appropriately.
7. Overall responsibility for the implementation of this CSMP shall be held by Waka Kotahi. However, the specific requirements and provisions of the management plan will be under the control of the site Contractor.

3 Site Management

The procedures below apply to all properties identified in **Appendix A** where soil disturbance is occurring on land that has had, or currently has, a potentially contaminating activity operating on them (namely; horticulture or the BP service station).

3.1 Pre-development Site Set-up

A pre-construction site meeting shall be held and attended by the Waka Kotahi, the Contractor, the Engineer's Representative and personnel involved with the earthworks (e.g. sub-contractor, if any) to discuss the risks and site procedures for handling any identified contaminated soils at the site prior to earthworks commencing. The Contractor shall prepare a site-specific Contractor's Health & Safety Plan (CHSP) (or similar Project H&S plan) for the earthworks which shall cover potential exposure to contaminated soil.

Procedures for the whole project area, including relating to the management of noise, dust, stormwater, and stockpiling will be detailed in the Contractor's Construction Management Plan (CMP) and Erosion and Sediment Control Plan (ESCP) and shall be implemented by the Contractor. This CSMP contains management of dust, stormwater and stockpiling specific to contaminated areas only.

Prior to works commencing, the Contractor shall establish the following controls to aid in the management of aspects of site safety and environmental compliance:

- Restriction of access to the earthworks areas to authorised personnel (such as warning tape or barriers), following appropriate site induction procedures;
- Signage, including site works information, health and safety requirements, site reporting requirements;
- Health and safety facilities such as personal protection equipment;
- Stormwater (surface runoff) diversion and collection systems; and
- Dust control systems.

Procedures relating to the management of dust, sediment, stormwater and stockpiling are detailed below and shall be implemented by the Contractor. All procedures shall comply with the relevant Council bylaws and conditions of any applicable consents.

3.1.1 Site Contacts

The following contact details shall be included in this CSMP prior to works commencing:

Engineer to Contract for civil works:

Engineer's Representative:

Environmental Scientist/Engineer:

3.1.2 Dust Control Procedures

Standard good practice for dust controls shall be implemented by the Contractor including the following, as determined in conjunction with the Engineer:

- Timing of works including prevalent wind direction.
- Dampening any exposed soils during dry and windy conditions through use of a water truck or portable water sprays.
- Covering any stockpiles.
- Reduction of vehicle speeds on site.
- Minimising drop heights from loaders.

Identified contaminated sites will require attentive dust management in order to minimise inhalation risk and offsite migration of contaminants in air blown particulate.

3.1.3 Stormwater and Sediment Control Procedures

Erosion and sediment control procedures for confirmed contaminated areas will include similar methodology as that described in the Project ESCP. Stormwater runoff from contaminated areas should be preferentially maintained onsite and allowed to infiltrate soil wherever possible to reduce the volume of water and material discharged. Sediment captured from the excavation of potentially contaminated material shall be managed in the same manner as soils requiring off-site disposal, as described in Section 3.2.2.

Refer to Section 3.4 for groundwater control procedures.

3.1.4 Stockpile Procedure

Stockpiling shall be minimised. Where stockpiles are required they shall be maintained at a low level (no more than 3m in height). Stockpiles shall not be placed in an area where runoff cannot be controlled.

Stockpiling of potentially contaminated soil may be necessary for these works in isolated areas. The stockpiles shall be managed by the Contractor as follows:

- Stockpiles shall be sited within an area away from the main working area to minimise potential contact by site workers;
- Stockpiled materials shall be placed on suitable material (i.e. polythene sheet) to prevent contaminants leaching into clean soils; and
- Where adverse weather is forecast, the stockpiled material shall be covered by a suitable material (such as polythene) to prevent the ingress of rainwater into the material and therefore minimise the potential for generation of leachate or sediment in stormwater.

Stockpiles of potentially contaminated material are only likely required on a short-term basis (e.g. < a month). Regardless of duration, the above procedures will be implemented and continued monitoring of the stockpile will be required to ensure adequate protection.

3.2 Soil Excavation/Disturbance Procedures

3.2.1 Onsite Soil Management and Movement

All soils can be reused on the site in which they were disturbed. Soils from contaminated sites should not be spread elsewhere throughout the Project unless testing has identified the material to be clean fill. Excess cut from contaminated sites will need to be disposed of to a facility licenced to accept such waste unless the necessary regulatory consents are sought and procedures followed.

The Contractor shall ensure that records are kept of all excavations and soil movements from identified contaminated sites. These shall include the location and dimensions of the excavation, the ground conditions, the soil's movement on site and whether waste materials, unusual staining and/or odour were observed. Any identified contaminated soils will be documented by the Contractor for the provision to Council.

3.2.2 Off-Site Disposal

Landfill acceptance of excavated materials to be disposed offsite from potentially contaminated sites shall be obtained prior to works commencing within that specific site. Results from the sampling to be undertaken will be supplied to the contractor in order to address offsite disposal acceptance. Offsite disposal of contaminated soil must be to a facility licensed to accept such material. The Contractor must retain copies of all disposal receipts/documentation and provide these to Waka Kotahi within 5 days of receipt.

The excavation, handling and off-site removal of the material shall be managed by the Contractor as follows:

- Materials requiring excavation for disposal to a licensed landfill or reuse at another commercial location shall be excavated and loaded directly into trucks where possible (limiting stockpiling), subject to the necessary approvals being obtained as outlined above.
- All trucks shall be covered before leaving site and any soils brushed off wheels to avoid tracking onto public roads. Should the site become wet and material adheres to wheels a wheel wash facility shall be installed and truck wheels washed before exiting the site.
- The Contractor shall maintain a register of soil movements and records such as location of excavation, disposal location, quantity of material and off-site weighbridge documents.

Procedures outlined in Section 3.1.4 shall be followed if materials excavated from potentially contaminated sites are required to be temporarily stockpiled.

3.2.3 Unexpected Contamination Discovery

The procedures outlined below provide the Contractor with protocols to identify potential contamination if suspected contaminated soils or hazardous materials are discovered during the excavation works other than contaminated soils already identified in **Appendix A** of this CSMP. These protocols will enable the appropriate action to avoid exposure of contaminants to site workers or the dispersion of contaminants into the surrounding environment.

Contamination indicators or hazardous materials may include but are not limited to the following:

- Unusual odours
- Discoloured or stained water seeps and soils
- Petroleum hydrocarbon contaminated soil and/or free product
- Liquid waste, putrescible waste, household refuse and any material that normally would be sent to a licensed landfill
- Suspected Asbestos Containing Material (ACM)
- Intact or broken drums and containers.

During the earthworks on site, the Contractor shall actively monitor for the conditions/materials specified above. In the event that one of these is identified, the Contractor should take the following actions:

- Stop all earthworks within a 5 m radius of the area where the suspected material/emission/discharge has been recorded
- Immediately notify the site supervisor
- Cordon off the area as practicable with a suitable barrier.
- Work shall not resume or commence within a 5 m radius of the area unless authorised by the Engineer's Representative.

The site supervisor shall contact the Engineer's Representative who will consult with the suitably qualified and experienced practitioner and advise on the appropriate course of action. The suitably qualified and experienced practitioner shall:

- Notify the regulatory authorities (Auckland Council's Natural Resources and Specialist Input Team and Licencing and Compliance Team), if required, that contamination has been discovered and contingency action is being implemented.
- Characterise the contamination by collecting samples for chemical laboratory analysis.
- If appropriate, advise the Contractor to excavate the suspected contaminated material and stockpile (as detailed in Section 3.1.4) or place in a covered container to allow works to continue with minimum delay.
- If stockpiling/containerising is inappropriate, advise construction work to proceed to an area clear of contamination indicators until material testing, as necessary, defines the material characteristics.

- When the material characteristics have been established, advise the site supervisor as to whether the materials may remain on site or what remedial measures are required to manage this material on-site, or the options available to disposal of this material off-site (as per Section 3.2.2).
- Instruct relevant staff so that all appropriate information such as location and quantity of material and off-site weighbridge dockets are recorded.

Should asbestos be observed or suspected during the earthworks, the Health & Safety at Work (Asbestos) Regulations (2016) will be followed. Works can recommence once all asbestos has been removed safely. Any such asbestos works (assessment, delineation, removal and verification) shall be undertaken by a specialist asbestos contractor.

3.3 Imported Materials

Material imported to the site for the purposes of filling and landscaping shall be certified cleanfill. Records must be provided by the Contractor to demonstrate that any imported material is obtained from a quarry or other certified source. Material shall not be imported from any site that is, or would be considered, a HAIL site (MfE, 2011), unless sampled by a suitably qualified environmental scientist/engineer to show that it is suitable for the intended land use and is acceptable to the client.

3.4 Groundwater Procedures

Groundwater is not expected to be encountered during the shallow excavations of the potentially contaminated sites along the edge of the highway.

If groundwater is encountered during the excavation works, the Contractor shall:

- Contain groundwater within the excavation and not allow it to discharge across the site surface.
- If dewatering is required, the pumped groundwater discharge could be discharged to Auckland Council's reticulated wastewater system with prior approval.
- The groundwater may be disposed to stormwater only if laboratory testing of water indicates it is appropriate. Sampling must be undertaken by a suitably qualified environmental scientist/engineer.

4 Health and Safety Procedures

Given the land use activities that have occurred on properties adjacent the site, there is the potential to encounter contaminated soils as part of the proposed site works. Prior to earthworks being undertaken, a Job Safety and Environment Analysis (JSEA) (or similar process) will be carried out by the Contractor that will identify the appropriate personal protective equipment (PPE) and behaviours to reduce the exposure risk from contaminated soils. Note the contaminants identified at this site potentially pose a low health risk to construction workers.

Workers may be exposed to contaminants via the accidental ingestion of, or skin contact with soil and/or groundwater and/or surface water. To prevent this exposure, procedures should be followed by workers who are likely to come in contact with contaminated soil and/or water, including the following:

- Wear cloth overalls.
- All staff physically involved in works likely to result in hand contact with contaminated materials should wear gloves.
- Wear a P2 dust mask if conditions generate dust.
- Minimise hand to mouth contact.
- Wash hands and face prior to eating, drinking or smoking.
- No eating or drinking within the excavation area.
- Wash any skin abrasions immediately and treat to prevent infections.
- Follow any additional requirements in the Contractor (Site Specific) Health and Safety Plan (CHSP).

Further hazards may be identified during the course of the works. The Contractor is responsible for reviewing any new work element and assessing whether there are any new associated hazards, and whether these can be eliminated, isolated or minimised. The Contractor shall then instruct all staff on the health and safety procedures associated with the new hazard and update the site CHSP. This CSMP is not intended to overrule any CHSP prepared for the project. Procedures relating to the minimization of risk from contamination exposure is core to the function of this CSMP as per MfE Contaminated Land Management Guidelines 1.

5 Limitations

This report has been prepared by Beca Ltd for Waka Kotahi (the Client). Beca was requested to produce a Contaminated Soils Management Plan (CSMP) in relation to the State Highway 16 Improvements project being undertaken by the Client. This report is prepared solely for the purpose of the management of contaminated soils encountered during Stage 2 of this project. The contents of this report may not be used by the Client for any purpose other than in accordance with the stated scope.

This report is prepared solely for the Client. Beca accepts no liability to any other person for their use of or reliance on this report, and any such use or reliance will be solely at their own risk.

Unless specifically stated otherwise in this report, Beca has relied on the accuracy, completeness, currency and sufficiency of all information provided to it by, or on behalf of, the Client or any third party, and has not independently verified the information provided. Beca accepts no responsibility for errors or omissions in, or the currency or sufficiency of, the information provided.



Appendix A – HAIL Properties

GENERAL NOTES:

- ALL NOTES HEREIN SHALL FORM PART OF THE CONTRACT.
- ALL NOTES SHALL BE READ IN CONJUNCTION WITH THE CONTRACT SPECIFICATIONS AND ALL DESIGN DRAWINGS APPLICABLE TO THE CONTRACT.
- ALL WORKS SHALL BE CONSTRUCTED AS DETAILED IN ALL DESIGN DRAWINGS AND IN ACCORDANCE WITH THE REQUIREMENTS OF THE CONTRACT SPECIFICATIONS.
- THE CONTRACTOR MUST CHECK ALL DESIGN DRAWINGS AND IDENTIFY ANY INCONSISTENCIES BETWEEN DESIGN DRAWINGS AND AGAINST THE CONTRACT SPECIFICATIONS, BASIS OF PAYMENT AND SCHEDULE OF PRICES IN ADVANCE AND PRIOR TO ANY CONSTRUCTION WORKS. THE CONTRACTOR MUST NOTIFY THE ENGINEER IF THERE ARE ANY INCONSISTENCIES.
- THE CONTRACTOR MUST INFORM AUCKLAND COUNCIL'S ARBORIST FOR ANY WORK UNDER THE DRIPLINE OF THE TREES. NOTIFICATION SHALL BE MADE WELL IN ADVANCE OF ANY CONSTRUCTION WORKS.
- SEE LANDSCAPE PLANS FOR ALL AREAS OF EXISTING GRASS AND/OR PLANTING AFFECTED DURING CONSTRUCTION.
- SITE CLEARANCE SHALL BE CONDUCTED PRIOR TO COMMENCEMENT OF ALL CONSTRUCTION WORKS. REFER TO SITE CLEARANCE PLANS.

SETTING OUT NOTES:

- SET-OUT INFORMATION FOR ROAD CENTRELINES, EDGE LINES AND KERB LINES WILL BE SUPPLIED TO THE CONTRACTOR IN 3D ELECTRONIC FORMAT. FOR KERB TYPES AND LOCATIONS, REFERENCE SHOULD BE MADE TO KERB AND BARRIER DRAWINGS.
- THE CONTRACTOR MUST CHECK AND VERIFY ALL COORDINATES / LEVELS / DIMENSIONS / SETTING-OUT INFORMATION PRIOR TO COMMENCEMENT OF WORK AND REPORT DISCREPANCIES, IF ANY, IMMEDIATELY TO THE ENGINEER.
- THE CONTRACTOR MUST TAKE ALL STEPS TO MAKE SURE THAT THE ENGINEER VERIFIES ALL LEVELS AND SETTING-OUT ON SITE PRIOR TO COMMENCEMENT OF CONSTRUCTION.
- THE CONTRACTOR MUST UNDERTAKE A SURVEY ON ALL CARRIAGEWAY, FOOTPATH, KERB AND CHANNEL TIE-INS TO PREVENT STORMWATER PONDING. EXTENTS OF WORK MAY EXTEND BEYOND THE LIMITS SHOWN IN THE DESIGN DRAWINGS WITH THE ENGINEER'S APPROVAL.

ROAD KERB AND CHANNEL, FOOTPATH, CENTRAL MEDIAN AND OTHER ROAD ELEMENTS

- NEW KERB, CHANNEL AND TRAFFIC ISLAND KERBLINES ALONG SH16 SHALL BE SEMI-MOUNTABLE, (SM1 AND SM2 KERB PROFILE). FOR DETAILS AND EXTENTS OF KERB AND CHANNEL REFER TO BARRIER AND KERBING PLANS AND CIVIL WORKS DETAILS DRAWINGS.
- NEW TRAFFIC ISLAND KERBING TO BE PAINTED REFLECTORISED WHITE IN ACCORDANCE WITH MOTSAM, PART 2 SECTION 2.08.03, RAISED ISLANDS.
- NEW TRAFFIC ISLANDS INFILL TO BE 20MPa EXPOSED AGGREGATE CONCRETE INFILL WITH 4% BLACK OXIDE. SEE DETAIL 18 ON DRAWING 3235084-CP-3205..
- NEW FOOTPATHS/SHARED PATHS AND PRAM CROSSINGS TO BE 20MPa CONCRETE 100mm DEEP OVER 100mm DEPTH OF COMPACTED BASECOURSE (AP40).
- ALL SAWN CONCRETE JOINTS MUST BE SAWCUT NEATLY. SAWCUTTING SHALL GENERALLY BE SQUARE TO THE KERB AND CARRIAGEWAY ALIGNMENT. DRY CUTTING IS NOT PERMITTED.
- BASECOURSE SHALL BE PLACED AND COMPACTED TO ACHIEVE A MINIMUM CLEGG IMPACT VALUE OF 12 FOR CONCRETE FOOTPATHS.
- ALL PATH EDGES SHALL BE CONSTRUCTED FLUSH WITH THE ADJACENT GROUND TO AVOID CREATING PEDESTRIAN TRIP HAZARDS.
- NEW PRECAST KERBS ADJACENT TO GRASS BERM OR PLANTING BEDS TO BE MORTAR POINTED BEFORE REINSTATEMENT WITH TOPSOIL, MULCH ETC.
- BATTER SLOPES ARE EITHER 4H:1V, 3H:1V OR SLIGHTLY STEEPER DEPENDING ON THE ROADSIDE CONDITION AT THE LOCATION. FOR STEEPENED SLOPES, CONTRACTOR TO UNDERTAKE GROUND TESTING, HAND AUGERS AND / OR SHEAR VANES AT THE DIRECTION OF THE ENGINEER. ENGINEER THEN SHALL ASSESS THE FINDINGS AND INSTRUCT IF FURTHER SLOPE STABILISATION WILL BE REQUIRED.
- FOR NEW WIRE ROPE MEDIAN BARRIER AND W-SECTION EDGE BARRIER LOCATIONS AND DETAILS, REFER TO BARRIER AND KERBING PLANS .

PROPERTY ACCESS:

- ALL PROPERTY ACCESS ALONG THE CORRIDOR SHALL BE MAINTAINED AS EXISTING UNLESS NOTED OTHERWISE ON THE GENERAL ARRANGEMENT PLANS. TYPICALLY, DETAILED LAYOUTS SHALL FOLLOW EITHER DIAGRAM D OR AUCKLAND TRANSPORT TDM VEHICLE CROSSING DETAIL VY0103B FOR ALL RESIDENTIAL AND LIGHT COMMERCIAL PROPERTIES OR DIAGRAM E FOR HEAVY COMMERCIAL PROPERTIES ACCORDING TO WAKA KOTAHĪ PLANNING POLICY MANUAL, APPENDIX 5B ACCESSWAY STANDARDS AND GUIDELINES.
- REFER TO PAVEMENT AND SURFACING DRAWINGS FOR PROPERTY ACCESS CONSTRUCTION MATERIALS AND DETAILS.

SURVEY:

- THE SURVEY AND DESIGN IS IN TERMS OF NZTM COORDINATES AND NZVD 2016 VERTICAL DATUM.

SERVICES:

- REFER TO UTILITY PLANS FOR LOCATION OF EXISTING AND NEW SERVICES .
- CONTRACTOR MUST LIAISE WITH ALL SERVICE AUTHORITIES FOR LOCATION OF SERVICES AND OBTAIN ANY NECESSARY CONSENTS IN ADVANCE AND PRIOR TO ANY CONSTRUCTION WORKS.
- CONTRACTOR TO CARRY OUT DETAILED DESIGN SERVICES LOCATION PRIOR TO ANY EXCAVATION WORKS.
- ANY SERVICES DAMAGED BY THE CONTRACTOR SHALL BE REPAIRED, TO THE SATISFACTION OF THE SERVICE PROVIDER, AT THE CONTRACTORS EXPENSE.

LEGEND

	EXISTING ROAD DESIGNATION BOUNDARY
	EXISTING PROPERTY BOUNDARY
	EXISTING POWER POLE (REFER TO UTILITY DRAWINGS FOR POLES TO BE REMOVED)
	EXISTING STREET LIGHTING COLUMN (REFER TO STREET LIGHTING DRAWINGS FOR COLUMNS TO BE REMOVED)
	EXISTING CELL PHONE TOWER ON BORIC LAND TO REMAIN
	EXISTING SPARK INTERNATIONAL CABLE
	NEW MASH TL-3 WIRE ROPE BARRIER
	NEW MASH TL-3 WIRE ROPE BARRIER END TERMINAL
	NEW MASH TL-3 W-BEAM BARRIER
	NEW MASH TL-3 W-BEAM BARRIER LEADING TERMINAL
	NEW MASH TL-3 W-BEAM BARRIER TRAILING TERMINAL
	NEW THRIE BEAM BARRIER
	NEW RETAINING WALL
	NEW 2.0m HIGH NOISE BARRIER (IN ACCORDANCE WITH WAKA KOTAHĪ STATE HIGHWAY NOISE BARRIER DESIGN GUIDE)
	NEW 2.5m HIGH NOISE BARRIER (IN ACCORDANCE WITH WAKA KOTAHĪ STATE HIGHWAY NOISE BARRIER DESIGN GUIDE)
	NEW TRAFFIC SIGN
	NEW EARTHWORKS IN CUT
	NEW EARTHWORKS IN FILL
	NEW CONCRETE FOOTPATH/SHARED PATH OR MEDIAN ISLAND (REFER TO DETAIL 18 ON PAVEMENT DRAWING 3235084-CP-3205 FOR ISLAND AND PAVEMENT TYPE H ON DRAWING 3235084-CP-3201 FOR FOOTPATH/SHARED PATH)
	NEW TACTILE GROUND SURFACE INDICATORS
	RECONSTRUCTED RESIDENTIAL VEHICLE CROSSING (REFER TO PAVEMENT TYPE F ON DRAWING 3235084-CP-3201)
	NEW RAISED TABLE (REFER TO PAVEMENT DRAWING 3235084-CP-3207)

D	FOR CONSENTING	AH	SP	GC	01.08.22
C	DRAFT DETAILED DESIGN	AH	SP	GC	18.03.22
B	DRAFT DETAILED DESIGN	AH	SP	GC	19.01.22
A	PRELIMINARY DESIGN	AH	SP	NL	26.03.21
No.	Revision	By	Chk	Appd	Date

Drawing Originator:



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NTS	Drawn	A. HOLT	26.03.21	
Reduced Scale (A3)	Dwg Verifier			Date
NTS	Dwg Check			
	* Refer to Revision 1 for Original Signature			

Client:



Project:

SH16 - SAFETY IMPROVEMENTS
STAGE 2
BRIGHAM CREEK TO KUMEU

Title:

CIVIL WORKS
GENERAL NOTES
AND LEGEND

Discipline

CIVIL ENGINEERING

Drawing No.

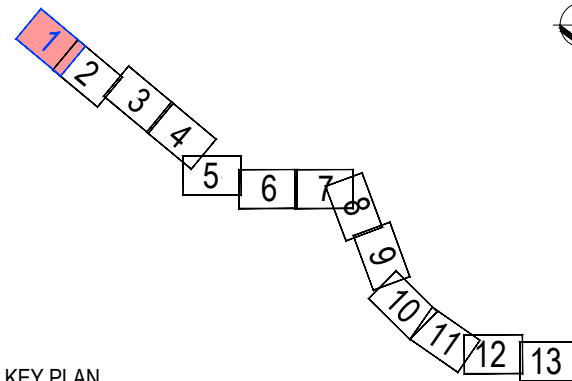
3235084-CA-1200

Rev.

D

ORIGINAL DRAWING
IN COLOUR

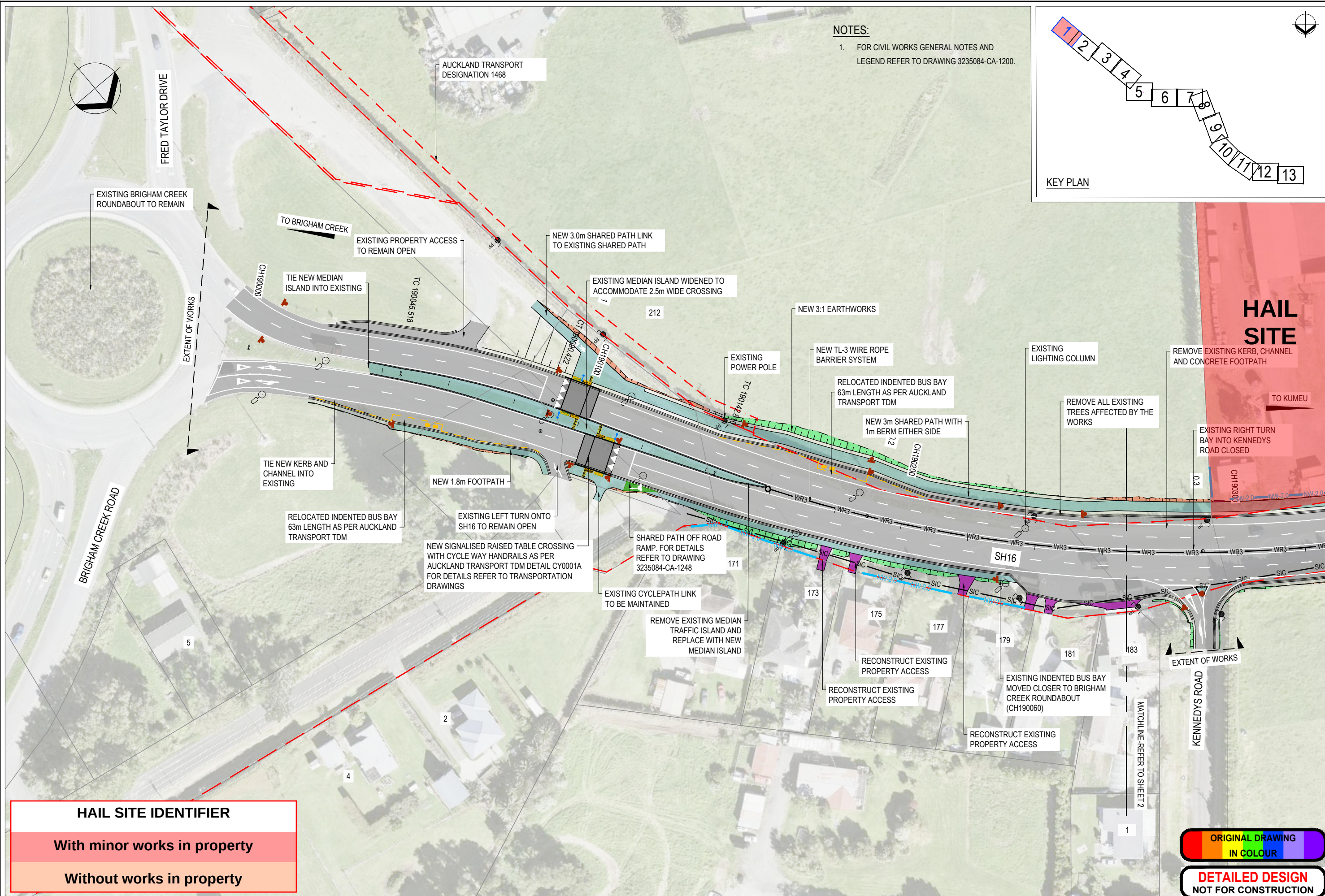
DETAILED DESIGN
NOT FOR CONSTRUCTION



KEY PLAN

NOTES:

1. FOR CIVIL WORKS GENERAL NOTES AND
LEGEND REFER TO DRAWING 3235084-CA-1200.



HAIL SITE IDENTIFIER

With minor works in property

Without works in property

ORIGINAL DRAWING
IN COLOUR

DETAILED DESIGN
NOT FOR CONSTRUCTION

E	DETAILED DESIGN	AH	SP	GC	25.08.22
D	FOR CONSENTING	AH	SP	GC	01.08.22
C	DRAFT DETAILED DESIGN	AH	SP	GC	18.03.22
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No.	Revision	By	Chk.	Appd.	Date

Drawing Originator:
Beca

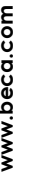
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Reduced Scale (A3)	Drawn	A. HOLT	26.03.21	Date
1:1000	Design Check			
	* Refer to Revision 1 for Original Signature			

Client:
WAKA KOTAHU
NZ TRANSPORT AGENCY

Project: SH16 - SAFETY IMPROVEMENTS
STAGE 2
BRIGHAM CREEK TO KUMEU

Title: GENERAL ARRANGEMENT
PLAN
SHEET 1

Discipline: CIVIL ENGINEERING
Drawing No: 3235084-CA-1201
Rev: E



1. FOR CIVIL WORKS GENERAL NOTES AND
LEGEND REFER TO DRAWING 3235084-CA-1200.

HAIL SITE

TREES WITHIN
CY 191 TO BE UNAFFECTED

NEW PEDESTRIAN FOOTBRIDGE ADJACENT TO CARRIAGEWAY OVER BRIGHAM CREEK CULVERT. FOR DETAILS REFER TO STRUCTURAL DRAWINGS

TO KUMEU

MATCHLINE-REFER TO SHEET 3

EXISTING BRIGHAM CREEK CULVERT WITH NEW MEDIAN WIRE ROPE BARRIER AND THREE-BEAM EDGE BARRIERS

NEW RETAINING WALLS BOTH SIDES OF CARRIAGEWAY. FOR DETAILS REFER TO GEOTECHNICAL DRAWINGS.

SH16

WR3

CT 1910600-0800

CG-1301

CH190600

0.6

SIC

HAIL SITE

HAIL SITE

HAIL SITE

Without works in property

E	DETAILED DESIGN	AH	SP	GC	25.08.22
D	FOR CONSENTING	AH	SP	GC	01.08.22
C	DRAFT DETAILED DESIGN	AH	SP	GC	18.03.22
B	DRAFT DETAILED DESIGN	AH	SP	GC	19.01.22
No.	Revision	By	Chk	Appd	Date



Beca

Original Scale (A1)	1:500
Reduced Scale (A3)	1:1000

Design	A. HOLT
Drawn	A. HOLT
Dsg Verifier	
Dwg Check	

* Refer to Revision 1 for Original Signature

06.03.21	Approved For Construction
06.03.21	
	Date



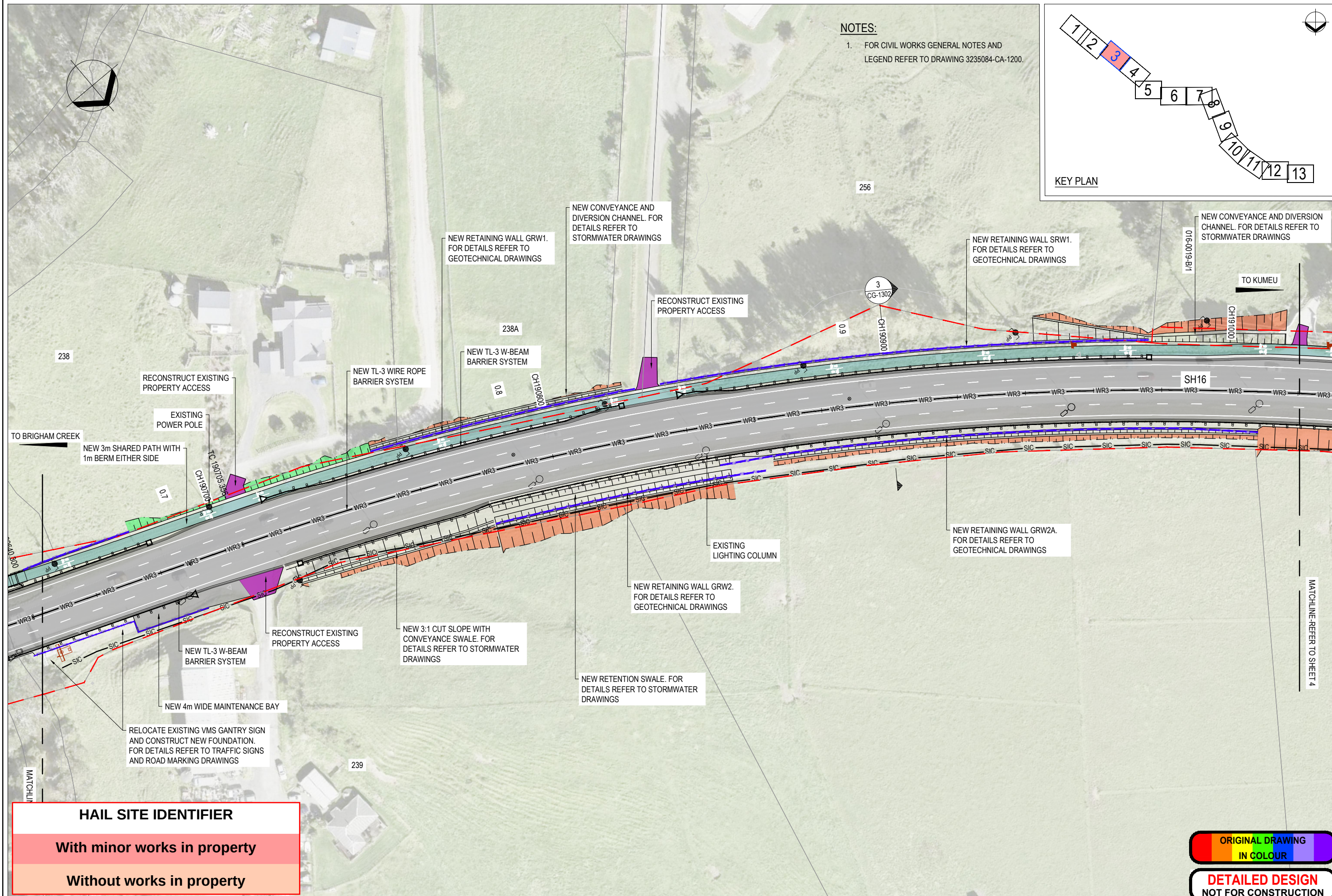
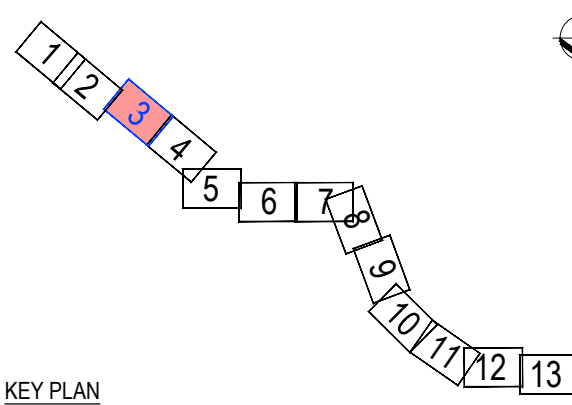
Project:	SH16 - SAFETY IMPROVEMENTS STAGE 2 BRIGHAM CREEK TO KUMEU
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Title: GENERAL ARRANGEMENT
PLAN
SHEET 2

Discipline		CIVIL ENGINEERING
Drawing No.		Rev.
3235084-CA-1202		E



- NOTES:
- 1. FOR CIVIL WORKS GENERAL NOTES AND LEGEND REFER TO DRAWING 3235084-CA-1200.



HAIL SITE IDENTIFIER

With minor works in property

Without works in property

ORIGINAL DRAWING
IN COLOUR

DETAILED DESIGN
NOT FOR CONSTRUCTION

E	DETAILED DESIGN	AH	SP	GC	25.08.22
D	FOR CONSENTING	AH	SP	GC	01.08.22
C	DRAFT DETAILED DESIGN	AH	SP	GC	18.03.22
B	DRAFT DETAILED DESIGN	AH	SP	GC	19.01.22
No.	Revision	By	Chk	Appd	Date

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				Design Check			
* Refer to Revision 1 for Original Signature							

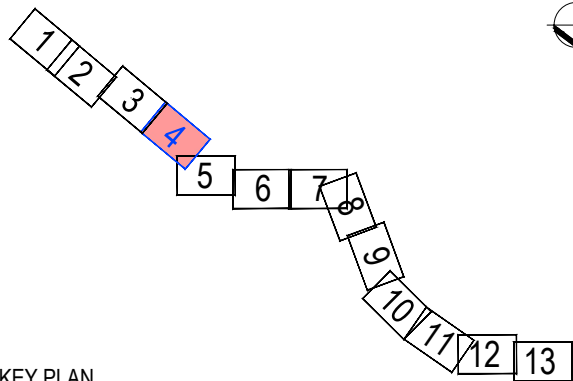
Client:	
Project:	SH16 - SAFETY IMPROVEMENTS STAGE 2 BRIGHAM CREEK TO KUMEU

Title:	GENERAL ARRANGEMENT PLAN SHEET 3		
Discipline	CIVIL ENGINEERING		
Drawing No.	3235084-CA-1203	Rev.	E

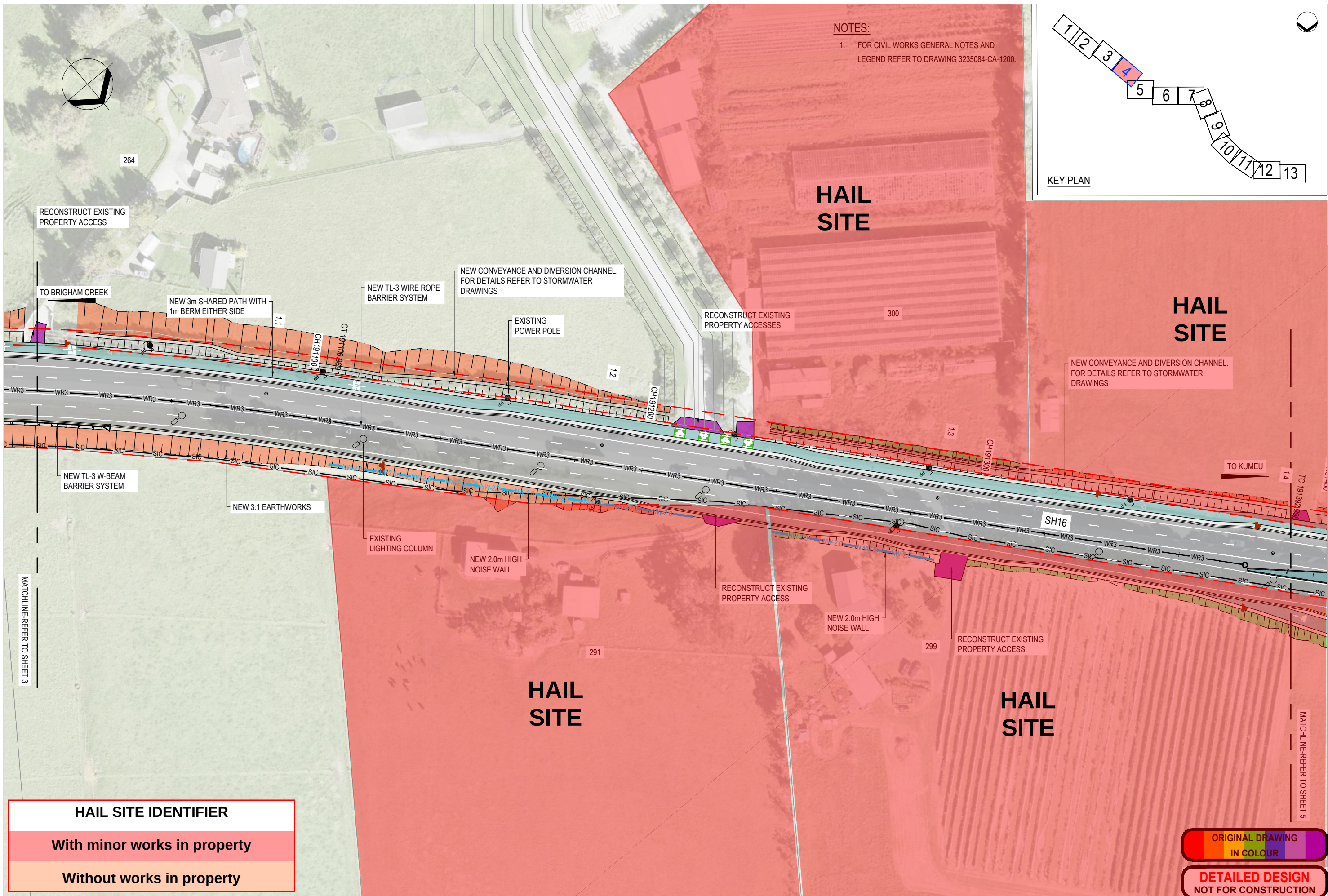


NOTES:

1. FOR CIVIL WORKS GENERAL NOTES AND
LEGEND REFER TO DRAWING 3235084-CA-1200.



KEY PLAN



HAIL SITE IDENTIFIER

With minor works in property

Without works in property

E	DETAILED DESIGN	AH	SP	GC	25.08.22
D	FOR CONSENTING	AH	SP	GC	01.08.22
C	DRAFT DETAILED DESIGN	AH	SP	GC	18.03.22
B	DRAFT DETAILED DESIGN	AH	SP	GC	19.01.22
No.	Revision	By	CHK	Appd	Date

Drawing Originator:



Original Scale (A1)	Design	A. HOLT	26.03.21	Approved For Construction*
1:500	Drawn	A. HOLT	26.03.21	Date
Reduced Scale (A3)	Design Verifier			
1:1000	Design Check			
	* Refer to Revision 1 for Original Signature			

Client:



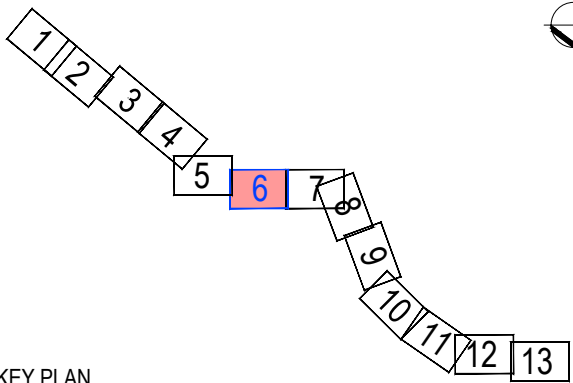
Project: SH16 - SAFETY IMPROVEMENTS
STAGE 2
BRIGHAM CREEK TO KUMEU

Title: GENERAL ARRANGEMENT
PLAN
SHEET 4

Discipline: CIVIL ENGINEERING
Drawing No: 3235084-CA-1204
Rev: E



Discipline		CIVIL ENGINEERING
Drawing No.	3235084-CA-1205	Rev. E



KEY PLAN

NOTES:

1. FOR CIVIL WORKS GENERAL NOTES AND LEGEND REFER TO DRAWING 3235084-CA-1200.

HAIL SITE

SOLJANS ESTATE WINERY

SH16

HAIL SITE

HAIL SITE

HAIL SITE IDENTIFIER

With minor works in property

Without works in property

E	DETAILED DESIGN	AH	SP	GC	25.08.22
D	FOR CONSENTING	AH	SP	GC	01.08.22
C	DRAFT DETAILED DESIGN	AH	SP	GC	18.03.22
B	DRAFT DETAILED DESIGN	AH	SP	GC	19.01.22
No.	Revision	By	Chk.	Appd.	Date

Drawing Originator:



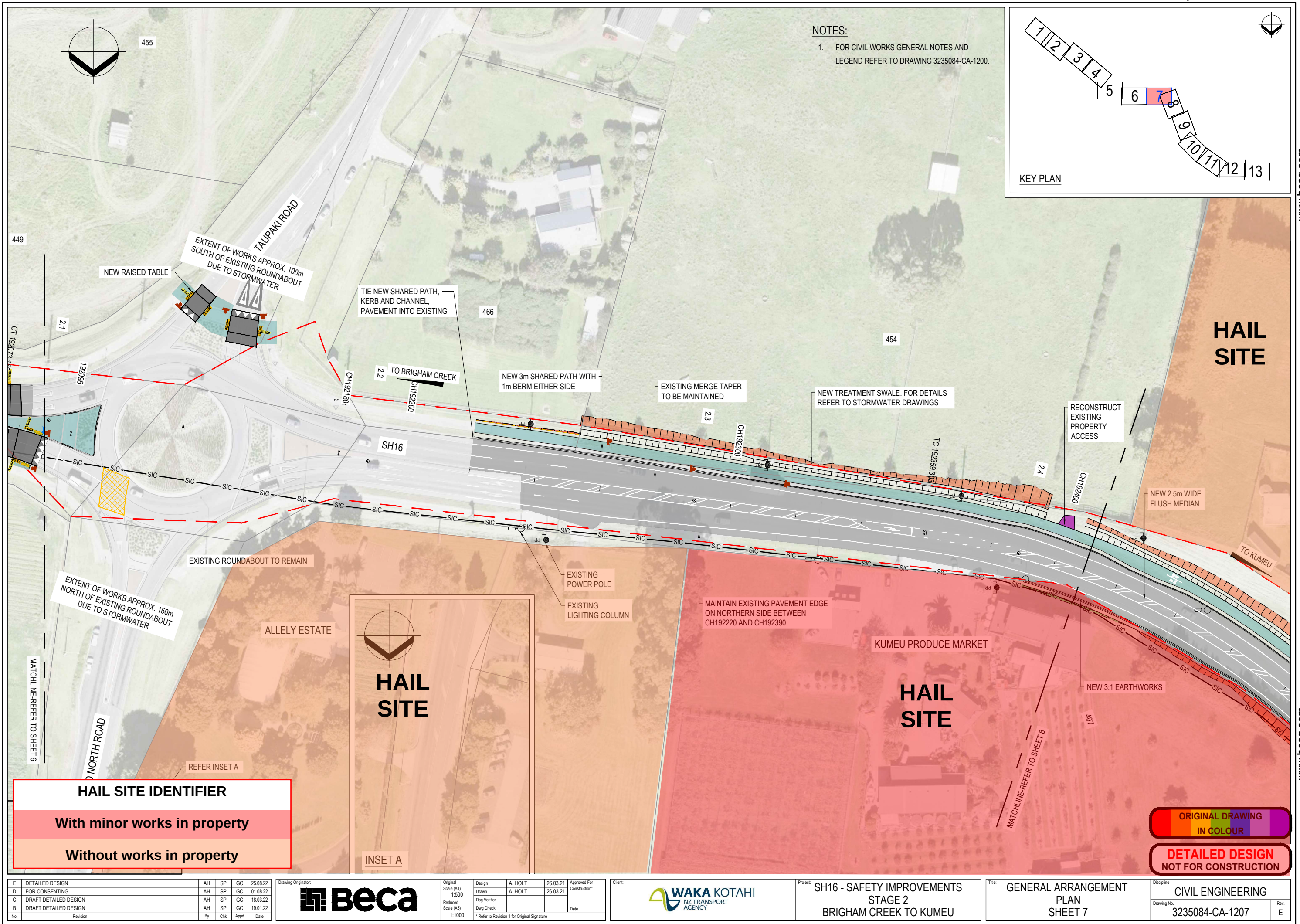
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Reduced Scale (A3) 1:1000	Design Checked A. HOLT 26.03.21	Date
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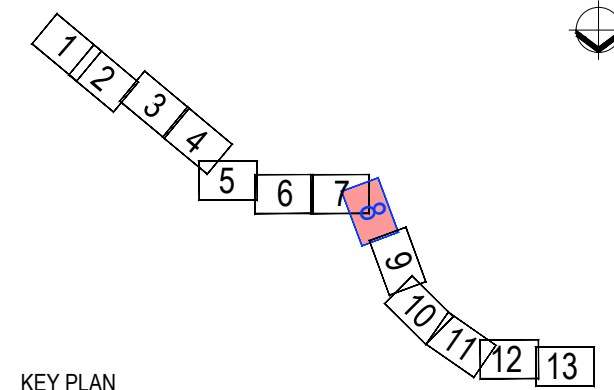


Project: SH16 - SAFETY IMPROVEMENTS
STAGE 2
BRIGHAM CREEK TO KUMEU

Title: GENERAL ARRANGEMENT
PLAN
SHEET 6

Discipline: CIVIL ENGINEERING
Drawing No: 3235084-CA-1206
Rev: E





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Document No. 3235084-CA-1208.DWG

1. FOR CIVIL WORKS GENERAL NOTES AND
LEGEND REFER TO DRAWING 3235084-CA-1200.

HAIL SITE

HAIL SITE

HAIL SITE

HAIL SITE IDENTIFIER

With minor works in property

Without works in property

E	DETAILED DESIGN	AH	SP	GC	25.08.22
D	FOR CONSENTING	AH	SP	GC	01.08.22
C	DRAFT DETAILED DESIGN	AH	SP	GC	18.03.22
B	DRAFT DETAILED DESIGN	AH	SP	GC	19.01.22
No.	Revision	By	Chk	Appd	Date



Beca

Original Scale (A1)	1:500
Reduced Scale (A3)	1:1000

Design	A. HOLT
Drawn	A. HOLT
Dsg Verifier	
Dwg Check	

* Refer to Revision 1 for Original Signature

06.03.21	Approved For Construction
06.03.21	
	Date



Project: SH16 - SAFETY IMPROVEMENTS
STAGE 2
BRIGHAM CREEK TO KUMEU

Title: GENERAL ARRANGEMENT
PLAN
SHEET 8

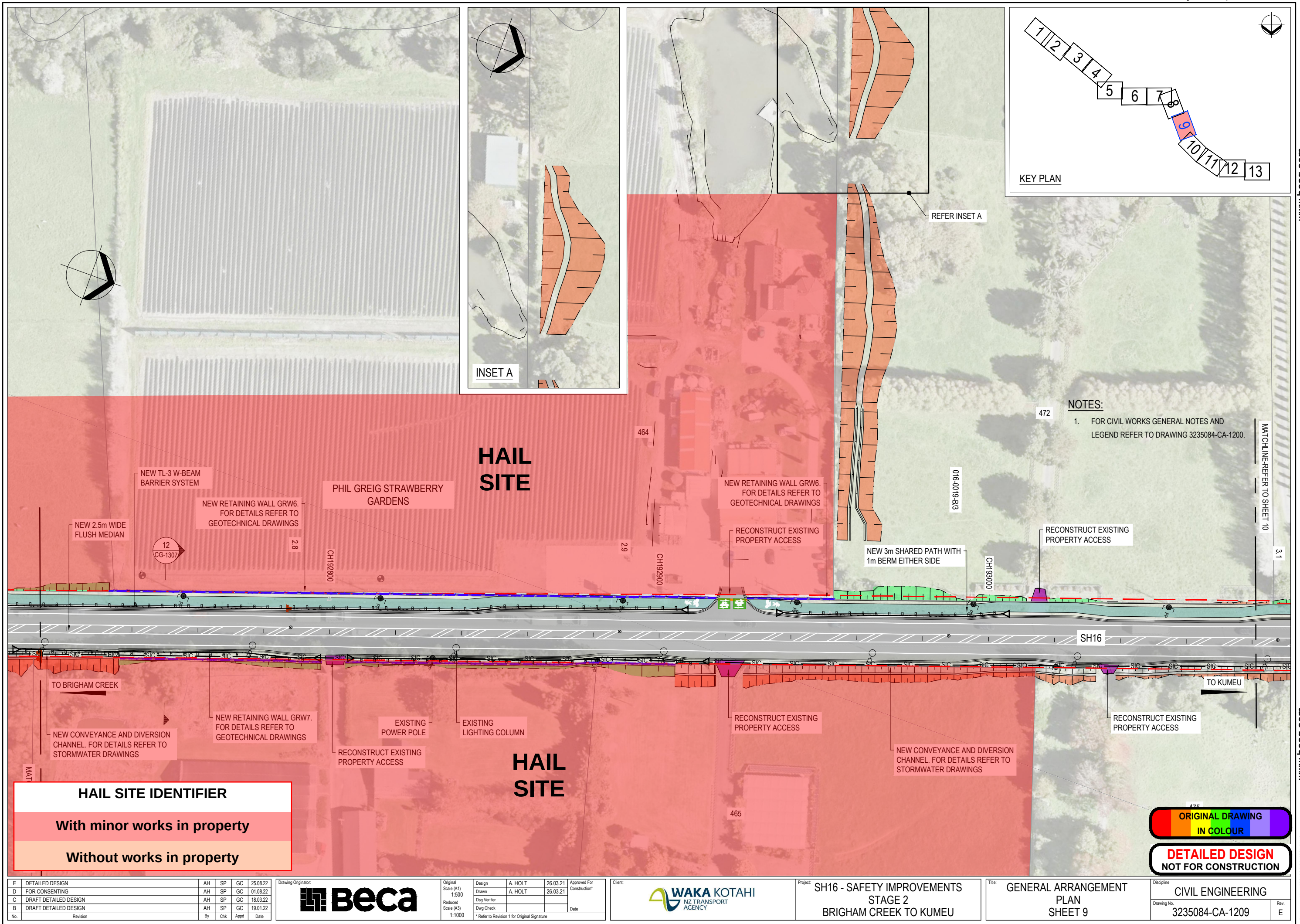
ORIGINAL DRAWING
IN COLOUR

DETAILED DESIGN
NOT FOR CONSTRUCTION

Discipline		CIVIL ENGINEERING
Drawing No.	3235084-CA-1208	Rev. E

DO NOT SCALE

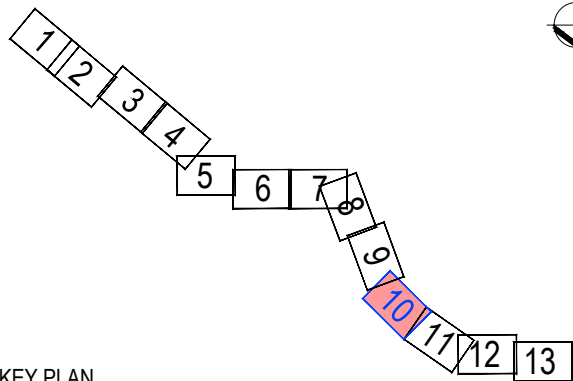
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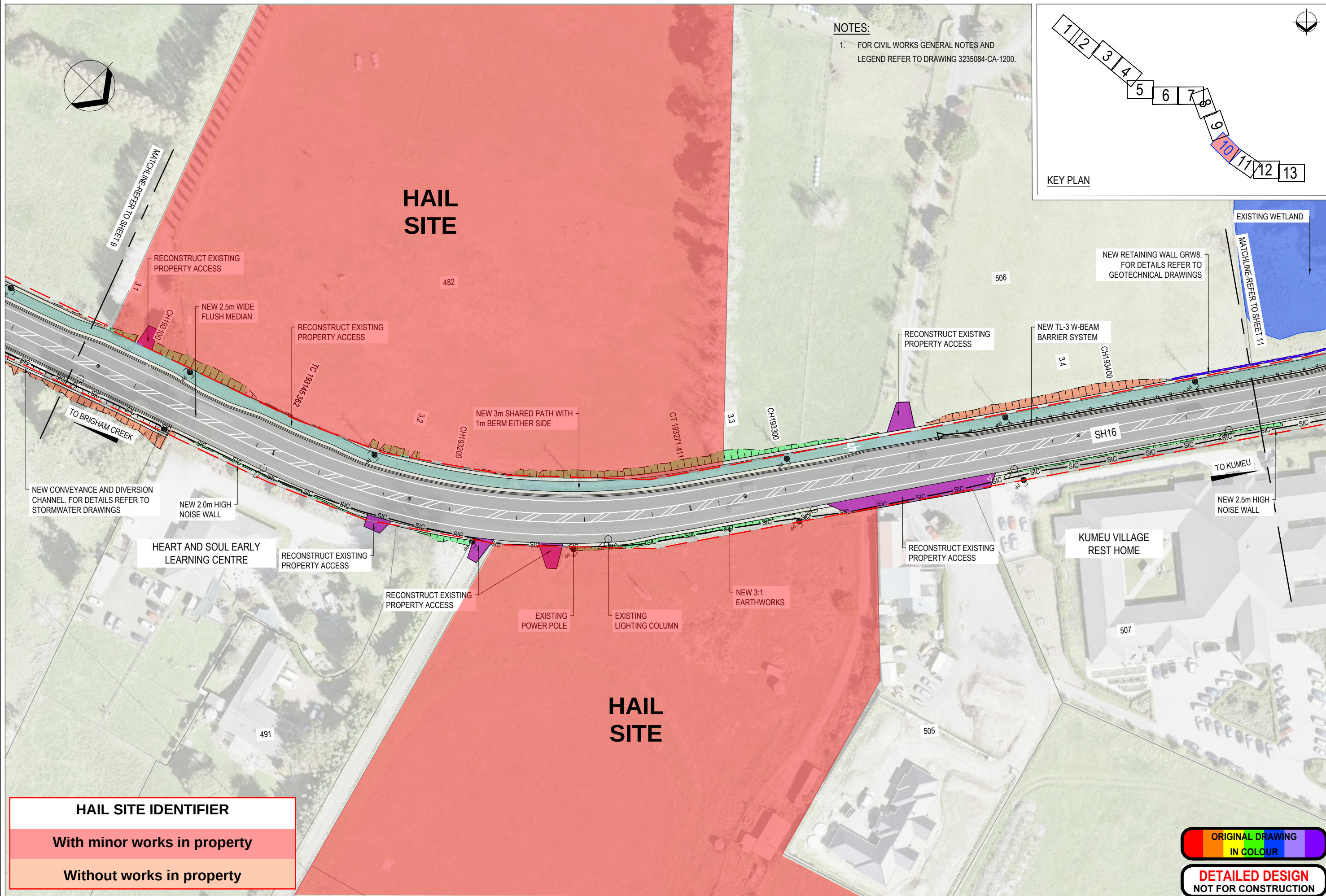


NOTES:

1. FOR CIVIL WORKS GENERAL NOTES AND
LEGEND REFER TO DRAWING 3235084-CA-1200.



KEY PLAN



HAIL SITE IDENTIFIER

With minor works in property

Without works in property

E	DETAILED DESIGN	AH	SP	GC	25.08.22
D	FOR CONSENTING	AH	SP	GC	01.08.22
C	DRAFT DETAILED DESIGN	AH	SP	GC	18.03.22
B	DRAFT DETAILED DESIGN	AH	SP	GC	19.01.22
No.	Revision	By	CHK	Appd	Date

Drawing Originator:



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Reduced Scale (A3)	Design Check			
1:1000	* Refer to Revision 1 for Original Signature			

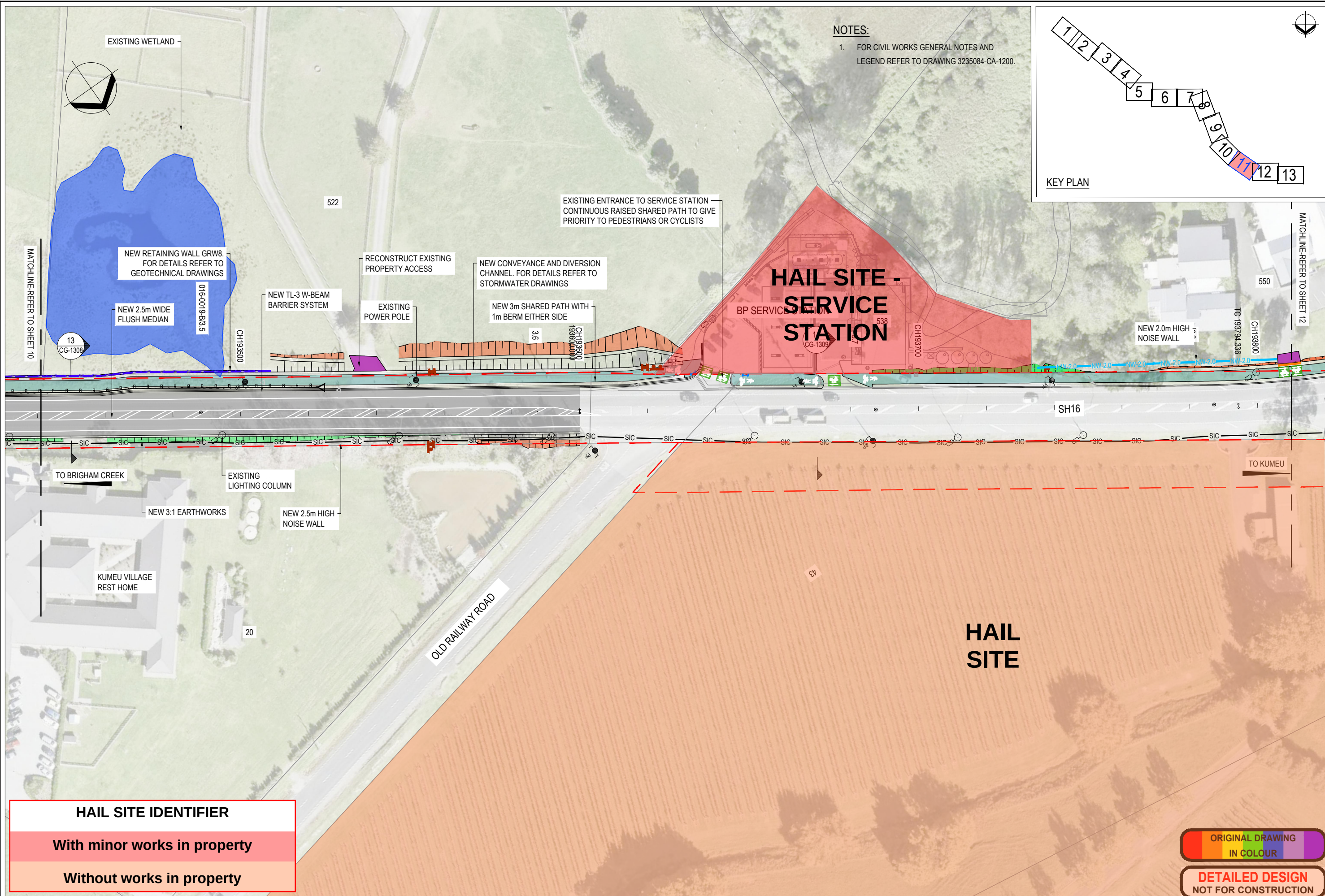
Client:



Project: SH16 - SAFETY IMPROVEMENTS
STAGE 2
BRIGHAM CREEK TO KUMEU

Title: GENERAL ARRANGEMENT
PLAN
SHEET 10

Discipline	CIVIL ENGINEERING
Drawing No.	3235084-CA-1210
Rev.	E



NOTES:
1. FOR CIVIL WORKS GENERAL NOTES AND
LEGEND REFER TO DRAWING 3235084-CA-1200.

KEY PLAN

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HAIL SITE IDENTIFIER

With minor works in property

Without works in property

ORIGINAL DRAWING
IN COLOUR

DETAILED DESIGN
NOT FOR CONSTRUCTION

E	DETAILED DESIGN	AH	SP	GC	25.08.22
D	FOR CONSENTING	AH	SP	GC	01.08.22
C	DRAFT DETAILED DESIGN	AH	SP	GC	18.03.22
B	DRAFT DETAILED DESIGN	AH	SP	GC	19.01.22
No.	Revision	By	Chk.	Appd.	Date

Drawing Originator:

Original Scale (A1)	Design	A. HOLT	26.03.21	Approved For Construction*
1:500	Drawn	A. HOLT	26.03.21	Date
Reduced Scale (A3)	Design Verifier			
1:1000	Design Check			
	* Refer to Revision 1 for Original Signature			

Client:

Project: SH16 - SAFETY IMPROVEMENTS
STAGE 2
BRIGHAM CREEK TO KUMEU

Title: GENERAL ARRANGEMENT
PLAN
SHEET 11

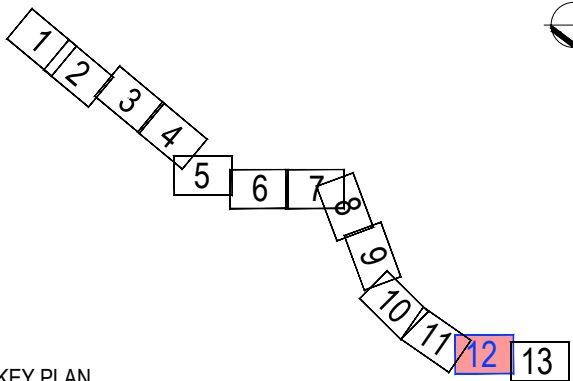
Discipline	CIVIL ENGINEERING
Drawing No.	3235084-CA-1211
Rev.	E

Document No. 3235084-CA-1211.DWG



NOTES:

1. FOR CIVIL WORKS GENERAL NOTES AND
LEGEND REFER TO DRAWING 3235084-CA-1200.



KEY PLAN

HAIL SITE

NEW PEDESTRIAN FOOTBRIDGE
ADJACENT TO KUMEU BRIDGE No.1
FOR DETAILS REFER TO
STRUCTURAL DRAWINGS

NEW RETAINING WALL GRW9.
FOR DETAILS REFER TO
GEOTECHNICAL DRAWINGS

NEW TL-3 W-BEAM
BARRIER SYSTEM

NEW RETENTION SWALE. FOR DETAILS
REFER TO STORMWATER DRAWINGS

NEW 3m SHARED PATH WITH
1m BERM EITHER SIDE

NEW 3:1
EARTHWORKS

EXISTING KUMEU
BRIDGE No.1 TO
REMAIN

KUMEU RIVER WINERY

RECONSTRUCT
EXISTING PROPERTY
ACCESS

NEW 2.0m HIGH
NOISE WALL

TO BRIGHAM CREEK

MATCHLINE-REFER TO SHEET 11

RIVERHEAD
ROAD

HAIL SITE IDENTIFIER

With minor works in property

Without works in property

E	DETAILED DESIGN	AH	SP	GC	25.08.22
D	FOR CONSENTING	AH	SP	GC	01.08.22
C	DRAFT DETAILED DESIGN	AH	SP	GC	18.03.22
B	DRAFT DETAILED DESIGN	AH	SP	GC	19.01.22
No.	Revision	By	CHK	Appd	Date

Drawing Originator:



Original
Scale (A1)
1:500
Reduced
Scale (A3)
1:1000

Design Drawn	A. HOLT	26.03.21	Approved For Construction*
Design Check	A. HOLT	26.03.21	Date
* Refer to Revision 1 for Original Signature			

Client:



Project: SH16 - SAFETY IMPROVEMENTS
STAGE 2
BRIGHAM CREEK TO KUMEU

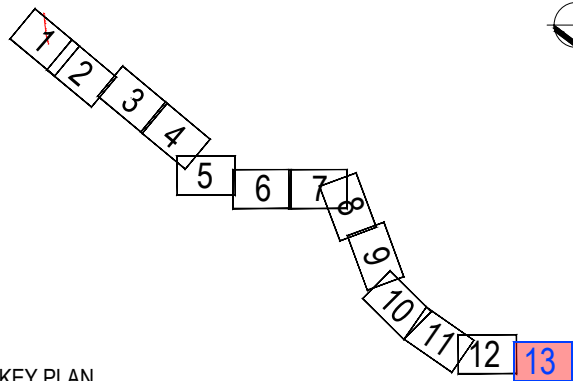
Title: GENERAL ARRANGEMENT
PLAN
SHEET 12

Discipline: CIVIL ENGINEERING
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Rev: E

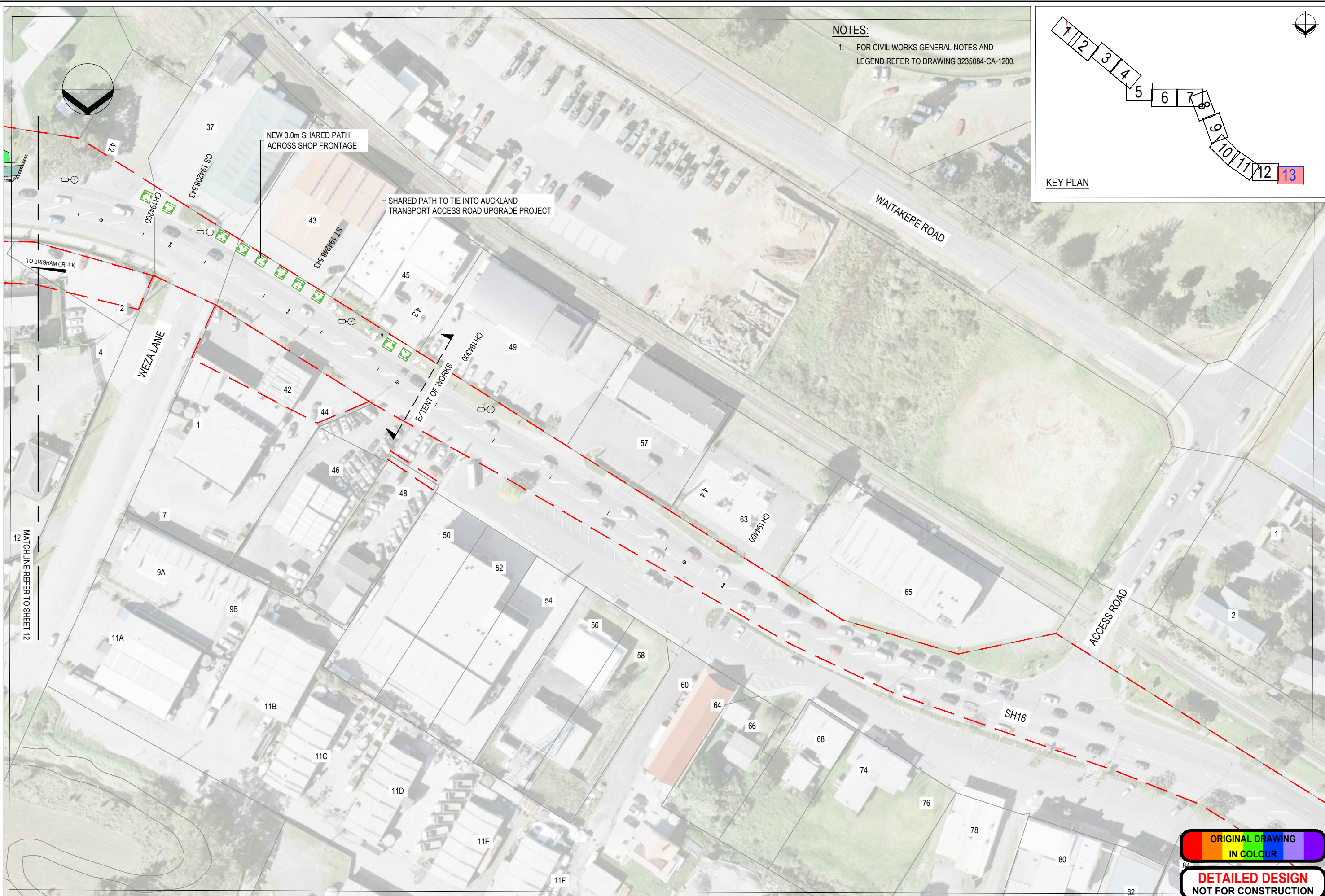


NOTES:

1. FOR CIVIL WORKS GENERAL NOTES AND
LEGEND REFER TO DRAWING 3235084-CA-1200.



KEY PLAN



E	DETAILED DESIGN	AH	SP	GC	25.08.22
D	FOR CONSENTING	AH	SP	GC	01.08.22
C	DRAFT DETAILED DESIGN	AH	SP	GC	18.03.22
B	DRAFT DETAILED DESIGN	AH	SP	GC	19.01.22
No.	Revision	By	CHK	Appd	Date

Drawing Originator:



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Reduced Scale (A3)	Design Verifier			
1:1000	Design Check			
	* Refer to Revision 1 for Original Signature			

Client:



Project: SH16 - SAFETY IMPROVEMENTS
STAGE 2
BRIGHAM CREEK TO KUMEU

Title: GENERAL ARRANGEMENT
PLAN
SHEET 13

Discipline	CIVIL ENGINEERING
Drawing No.	3235084-CA-1213
Rev.	E

