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Beca
by email

Attention: Helen Allison

THE STRAND STATE HIGHWAY DESIGNATION– NOISE AND VIBRATION ASSESSMENT

Dear Helen

In summary, there will be no appreciable change to traffic noise enabled by the designation

We understand that NZ Transport Agency Waka Kotahi (NZTA) wishes to designate The Strand corridor, between the motorway ramps at Tennis Lane and the Tāmaki Road / Quay Street intersection. The extension is essentially a designation 'tidy up' in the Auckland Unitary Plan (AUP) for a portion of the State highway network that has been omitted from the existing designation for SH16. There are currently no planned works for the portion of the state highway subject to the proposed designation. This letter assesses the construction and road traffic noise implications of the proposed designation.

In summary:

- There is no appreciable spatial change to road traffic noise enabled by the proposed designation, so an assessment in accordance with NZS 6806 would not be required.
- The AUP rules would be overridden and no longer apply to a designation. Instead, NZTA proposes the following Designation advice note: "*Work will be undertaken in accordance with the NZTA State Highway Construction and Maintenance Noise and Vibration Guide (August 2019, V1.1)".* The advice note will achieve similar outcomes to the AUP rules and result in no change in construction noise and vibration effects.

This letter is supported by the following appendices:

- Appendix A: Glossary of relevant technical terms
- Appendix B: Designation Plans
- Appendix C: AUP zoning map

The designation adopts the existing road extents plus two sites next to The Strand rail bridge

The proposed designation adopts the existing AUP 'Road Zone' extents, with the addition of two parcels beyond the road reserve (both in the Business - City Centre Zone). The two sites are owned by the Crown and administered by NZTA and are identified on the relevant designation plan using blue land parcel borders in Figure 1 overleaf. They are also identified on the AUP Zoning map in Figure 2 overleaf.

The two triangular sites are immediately east of the Parnell Rise/The Strand rail overbridge:

- Northern site: The proposed designation applies to a narrow section at the southern boundary. It is not proposed to extend the proposed designation over the whole site. We understand the proposed designation would essentially enable maintenance of the shared use path located within the road reserve immediately abutting the site boundary, and for the site boundary to be straightened in the future if needed.
- Southern site: The proposed designation applies to the whole site. The site is an awkward shape that cannot enable an expansion or major realignment of the motorway beyond the sliver at the northern road boundary due to the rail overbridge abutment. We understand the wider parcel is only included to support future construction if required (e.g. laydown area).

Figure 1: Designation Plan GIS-3814891-2 with two sites identified with blue borders

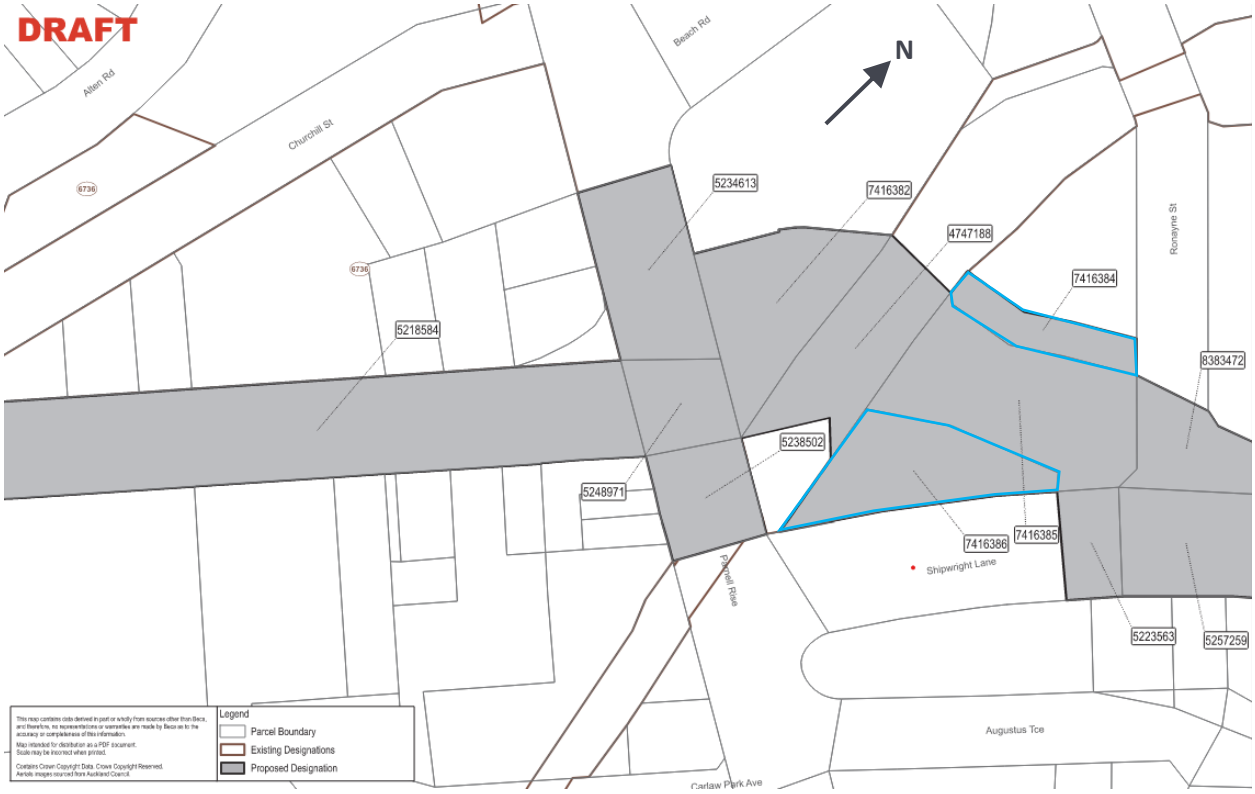


Figure 2: AUP Zoning – Proposed SH16 designation aligns with Road Zone plus land within two sites identified with blue borders

The proposed designation does not enable any appreciable change in road traffic noise

AUP rule E25.6.33 requires road traffic noise from new and altered roads must comply with New Zealand Standard NZS 6806:2010 *Acoustics – Road traffic noise – New and altered roads* (NZS 6806). Likewise, NZTA also use NZS 6806 for the assessment of road traffic noise of new and altered roads within its designations. The proposed designation would not change the approach to the assessment of road traffic noise.

NZS 6806:2010 describes assessment positions as "Protected Premises and Facilities" (PPF). PPFs include: "*dwellings (including those that have building consent but are not built yet), educational facilities and their playgrounds within 20m of any school building, boarding houses, retirement villages, Marae, hospitals with in-patient facilities and motels/hotels in residential zones."* The closest existing PPFs are the townhouses on the east side of Ronayne St. Any potential future dwellings that are not yet consented are not PPFs. Also, businesses and industrial operations are not PPFs because they are not considered noise sensitive and are often noise generators (e.g. buildings on the south side of Shipwright Ln).

NZS 6806 provides a pragmatic approach to road traffic noise mitigation for PPFs. It sets criteria for triggering a road traffic noise assessment. Mitigation is considered if a roading project is predicted to result in a noticeable increase in noise level and mitigation would achieve a noticeable reduction in noise level at PPFs.

NZS 6806 only applies to roading projects that are within its scope:

- The Strand is an existing road (i.e. it is not 'new')
- Clause 1.5.2 defines the application of NZS 6806 to altered roads. The standard applies only when the Do-minimum noise environment is compared to the Do–nothing noise environment, and either of the following occurs:
    - The Do-minimum noise environment is greater than or equal to 64 dB $L_{Aeq(24h)}$ and noise levels are predicted to increase by 3 dB or more, or;
    - The Do-minimum noise environment is greater than or equal to 68 dB $L_{Aeq(24h)}$ and noise levels are predicted to increase by 1 dB or more.

    However, there is no appreciable realignment enabled by the proposed designation. The setback to PPFs would remain similar, if not identical. We predict that any increase in road traffic noise enabled by the designation would be less than 1 dB for PPFs with noise levels of 68 dB $L_{Aeq(24h)}$ or higher, and less than 3 dB at all other PPFs. Therefore, any future works would not be within the scope of NZS 6806.
- Clause 1.5.4 excludes road maintenance (e.g. resurfacing, surface treatment and rehabilitation)

Therefore, any future project works enabled by the designation would have no appreciable effect on the overall noise environment and would be outside the scope of NZS 6806.

Proposed designation advice note manages potential construction noise and vibration effects

AUP E25.6.28 – 30 set construction noise and vibration rules for works in a road and on sites within the Business – City Centre Zone. They detail noise and vibration standards, limits and requirements for construction noise management plans (CNVMPs) as standard practice.

The AUP rules would be overridden and no longer apply to a designation. Instead, NZTA proposes the following Designation advice note: "*Work will be undertaken in accordance with the NZTA State Highway Construction and Maintenance Noise and Vibration Guide (August 2019, V1.1)".* The advice note will achieve similar outcomes to the AUP rules and result in no change in construction noise and vibration effects.

Yours faithfully

MARSHALL DAY ACOUSTICS LIMITED

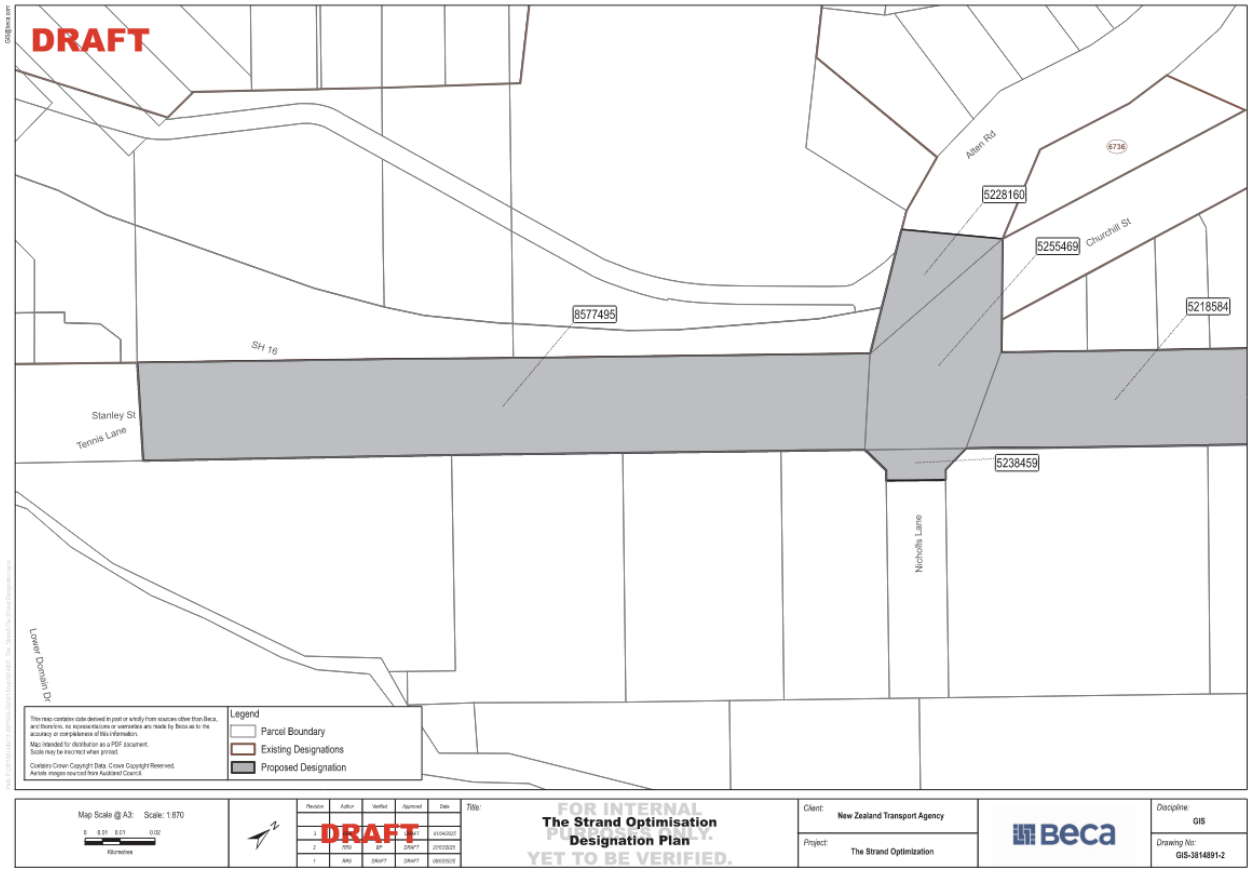
Craig Fitzgerald

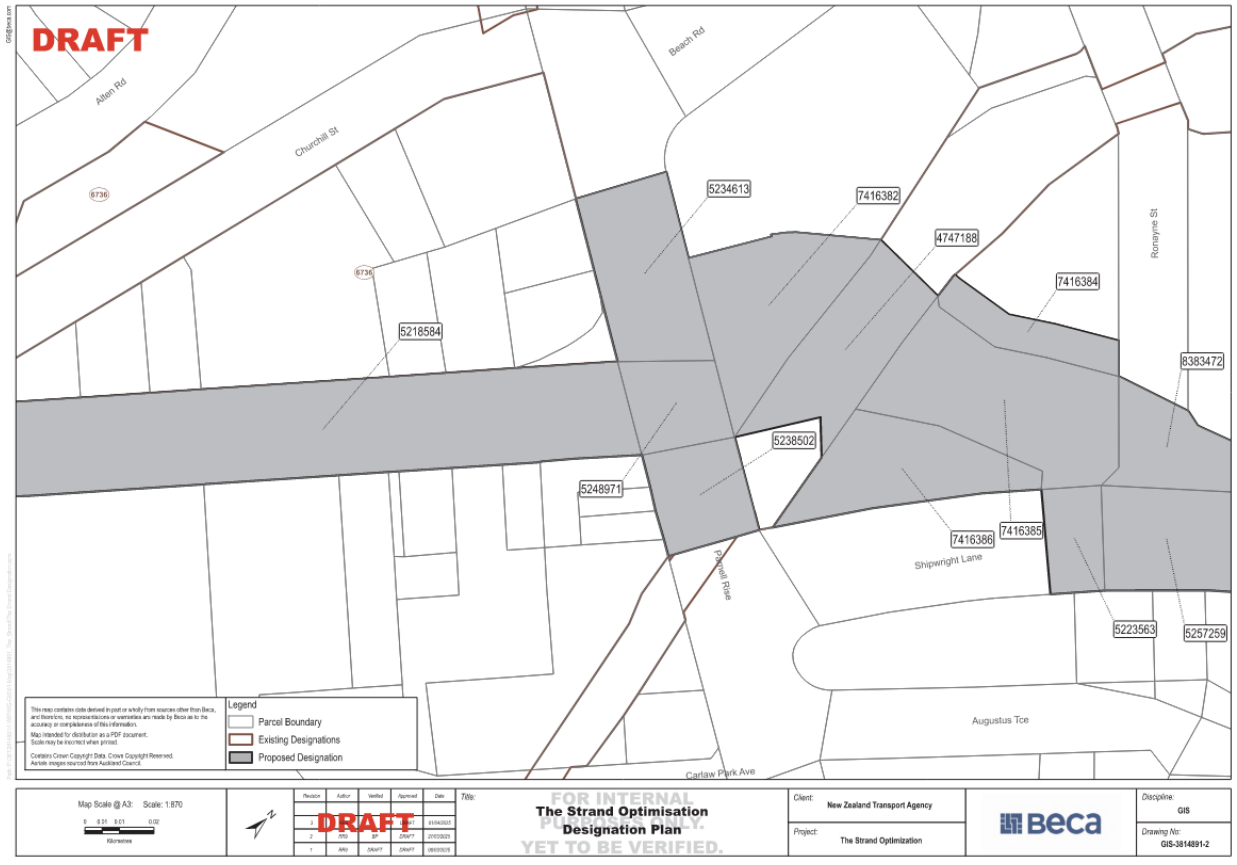
Acoustician

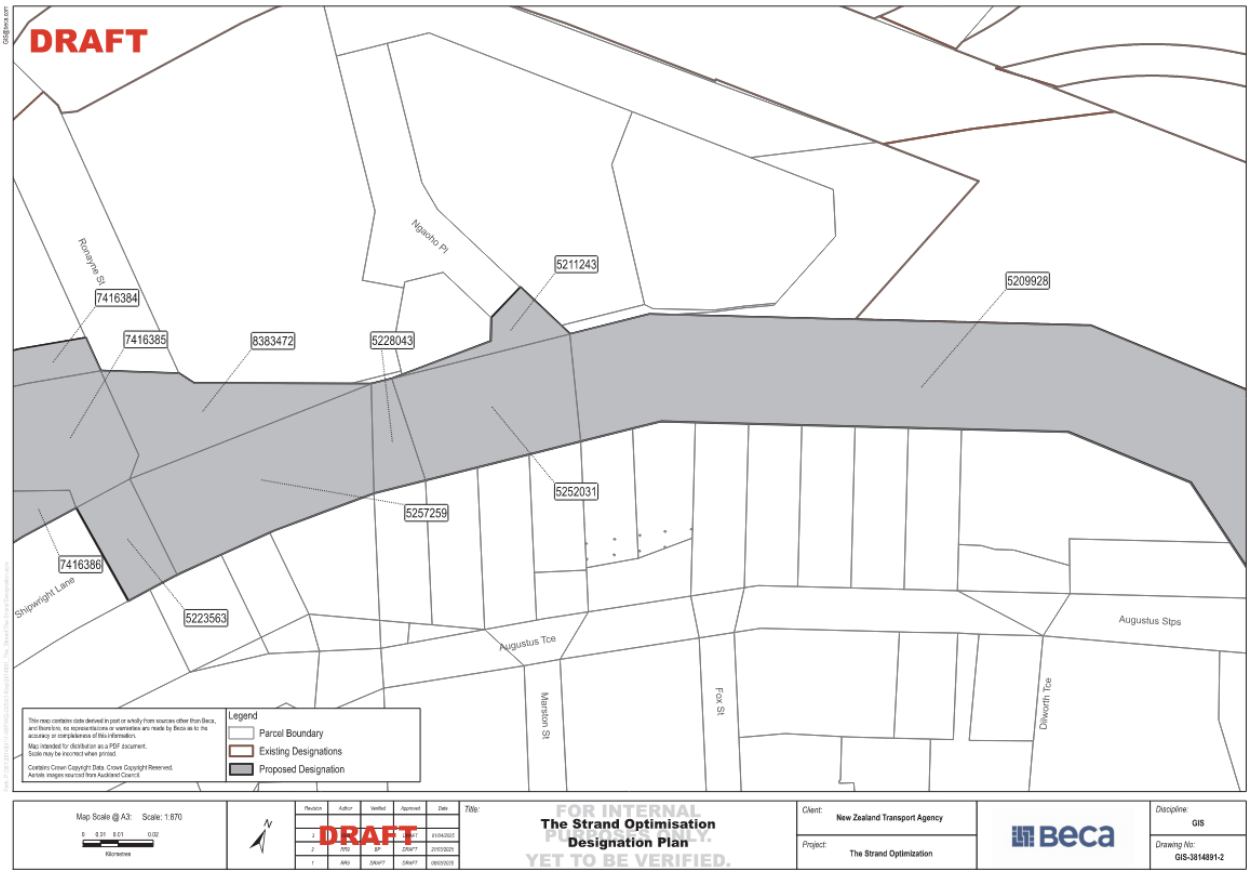
APPENDIX A GLOSSARY OF TERMINOLOGY

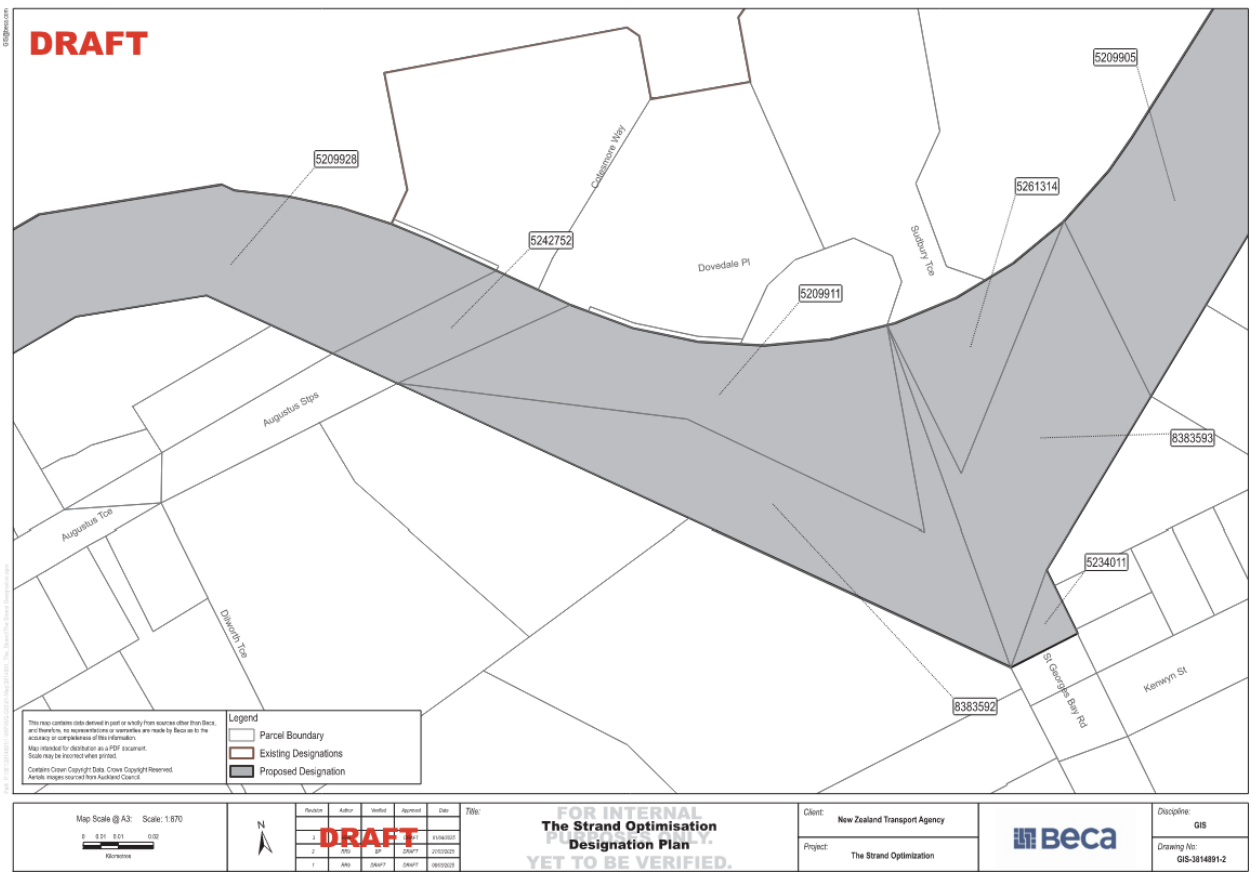
BS 5228:2009	British Standard BS 5228:2009 "Code of practice for noise and vibration control on construction and open sites, Part 1: Noise, Part 2: Vibration"
dB	Decibel (dB) is the unit of sound level. Expressed as a logarithmic ratio of sound pressure (P) relative to a reference pressure (Pr), where dB = 20 x log(P/Pr).
dBA	The unit of sound level which has its frequency characteristics modified by a filter (A-weighted) to more closely approximate the frequency bias of the human ear. A-weighting is used in airborne acoustics.
DIN 4150-3:2016	German Standard DIN 4150-3:2016 "Vibrations in buildings – Part 3: Effects of vibration on structures"
$L_{Aeq\,(t)}$	The equivalent continuous (time-averaged) A-weighted sound level commonly referred to as the average level. The suffix (t) represents the period, e.g. (8 h) would represent a period of 8 hours, (15 min) would represent a period of 15 minutes and (2200-0700) would represent a measurement time between 10 pm and 7 am.
L_{AFmax}	The A-weighted maximum noise level. The highest noise level which occurs during the measurement period.
Noise	A sound that is unwanted by, or distracting to, the receiver.
NZS 6803:1999	New Zealand Standard NZS 6803: 1999 *Acoustics - Construction Noise*
NZS 6806:2010	New Zealand Standard NZS 6806:2010 *Acoustics - Road-traffic noise - New and altered roads*
PPF	Protected premises and facilities (PPFs) are the locations where road-traffic noise is assessed and for which noise mitigation measures may be required. PPF's are spaces in buildings used for residential activities, marae, overnight medical care, teaching (and sleeping) in educational facilities and playgrounds that are part of educational facilities and are within 20m of buildings used for teaching purposes. NZS 6806 applies to PPFs within 100m of the edge of the closest traffic lane for a new or altered road in urban areas.
Do-nothing scenario	The scenario where the existing road layouts are retained, but traffic for a future design year (10-20 years after completion of a project) are used as basis of calculation.
Do-minimum scenario	A circumstance where a road project is implemented (e.g. where an existing road is altered) but no specific noise mitigation is implemented. This scenario also applies traffic volumes from the design year (see above).
PPV	Peak Particle Velocity (PPV) is the measure of the vibration amplitude, zero to maximum, measured in mm/s.
Vibration	When an object vibrates, it moves rapidly up and down or from side to side. The magnitude of the sensation when feeling a vibrating object is related to the vibration velocity. Vibration can occur in any direction. When vibration velocities are described, it can be either the total vibration velocity, which includes all directions, or it can be separated into vertical (up and down vibration), horizontal transverse (side to side) and horizontal longitudinal direction (front to back) components.

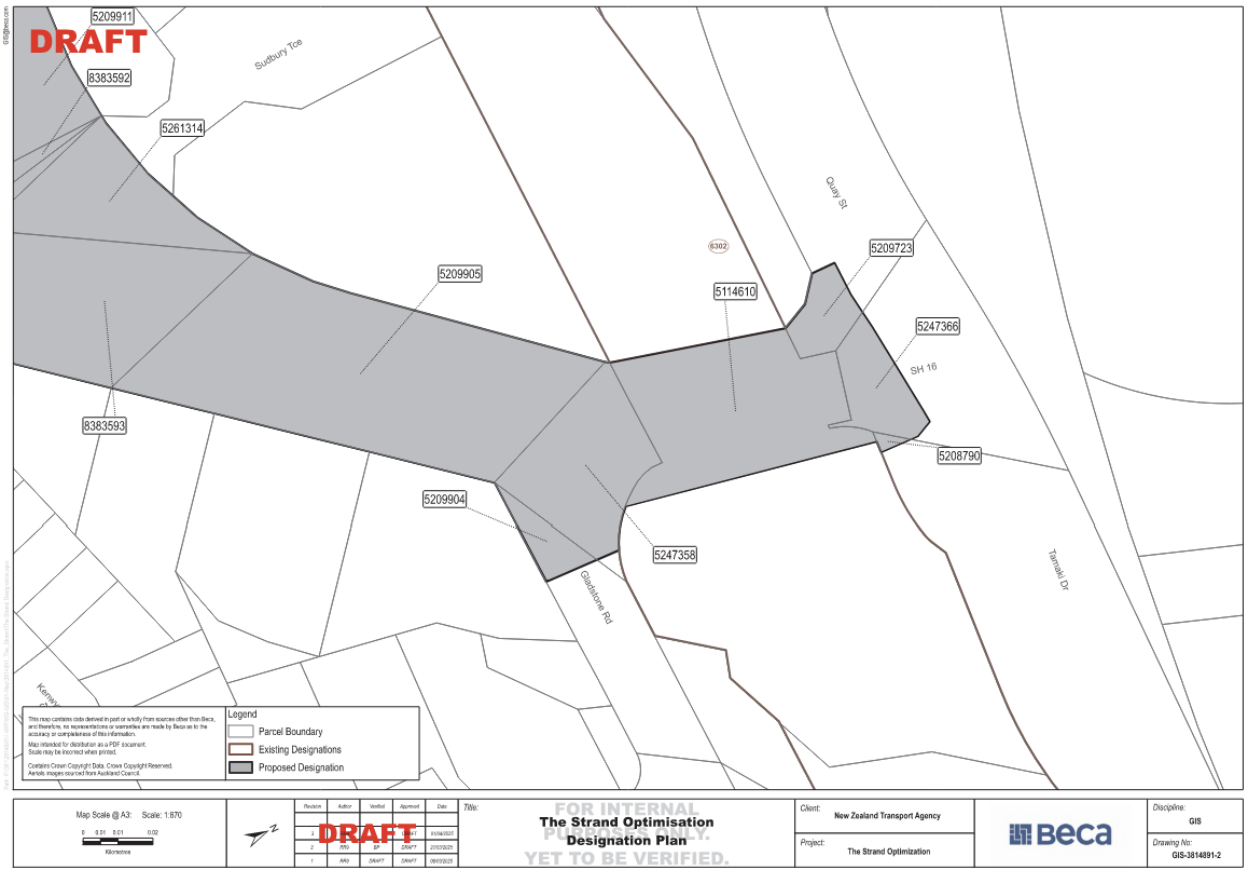
APPENDIX B DESIGNATION PLANS











APPENDIX C AUP ZONING