

TO: The Hearing Administrator, Lynley Scott, DP.Hearings@qldc.govt.nz

**BEFORE AN INDEPENDENT HEARING PANEL
APPOINTED BY QUEENSTOWN LAKES DISTRICT COUNCIL**

UNDER THE Resource Management Act 1991 (“**Act**”)

IN THE MATTER OF a Variation to the proposed Queenstown Lakes District Plan (Te Pūtahi Ladies Mile) in accordance with Part 5 of Schedule 1 to the Resource Management Act 1991 (“**Variation**”)

BETWEEN **GLENPANEL DEVELOPMENT LIMITED (“GDL”)**
Submitter

AND **QUEENSTOWN LAKES DISTRICT COUNCIL (“QLDC”)**
Proponent of the Variation

**STATEMENT OF EVIDENCE OF WARREN LADBROOK ON BEHALF OF THE
ANNA HUTCHINSON FAMILY TRUST**

DATED: 20 OCTOBER 2023

Before a Hearing Panel: David Allen (Chair), & Commissioners Gillian Crowcroft, Hoani Langsbury, Judith Makinson and Ian Munro

Introduction, qualifications and experience

1. My full name is Warren David Ladbrook. I am a self-employed, professional engineer.
2. I am presently engaged by GDL to provide expert evidence and advice on stormwater matters.
3. Prior to starting my self-employment, I was contracted to provide services to the Queenstown Lakes District Council (“**Council**”) on different projects that relate to the urban development of Ladies Mile. I was engaged from 2017-2019 as the Programme Manager for the development of the successful Housing Infrastructure Fund business case, and from 2019-2021 as the Government Liaison for the three Housing Infrastructure Fund projects, including Ladies Mile. In 2020 I was engaged as the Project

Manager for the procurement and initial development of the Ladies Mile Master Plan (now known as the Te Pūtahi Ladies Mile Masterplan), which was won by The Ladies Mile Consortium consisting of Candor3, Brown and Company Planning, and Studio Pacific Architecture.

Qualifications and experience

4. I have over 30 years working in the engineering profession, preceded by approximately 3 years in the construction industry, 2 years in the surveying industry, and over 4 years in unrelated work.
5. I have a Bachelor of Science in Engineering, Magna Cum Laude, from the University of Tennessee at Chattanooga. I am a Professional Engineer in Georgia, Texas, Colorado, Missouri, North Carolina, and South Carolina within the United States of America. I am a Chartered Professional Engineer, an International Professional Engineer, and a Fellow of Engineering New Zealand. I am certified as a Better Business Case Practitioner, and I am a LEED Accredited Professional with the United States Green Building Council, with a specialty in Neighbourhood Development. I also hold both Project and Programme Management credentials for the effective delivery of work products and broader programme outcomes.
6. I have extensive experience with many aspects of civil engineering, specifically including water, stormwater, and wastewater. I specifically note that I have previously led the stormwater design for the consenting of the Jacks Point development in Queenstown, in addition to numerous other projects and locations around New Zealand and abroad.

Code of Conduct

7. I confirm that I have read the Code of Conduct for Expert Witnesses contained in the Environment Court Practice Note 2023 and confirm that I have complied with it in preparing this evidence. I confirm that the issues addressed in this evidence are within my area of expertise, except where I have indicated that I am relying on others' opinions. I have not omitted material facts known to me that might alter or detract from my evidence.

Scope of evidence/matters to be addressed

8. I have prepared evidence in relation to stormwater in support of Flints Park application. My evidence includes:
- (a) involvement in Flint's Park processes;
 - (b) Stormwater management that allows for future climate change impacts (Minister's Statement of Expectations);
 - (c) Protect sensitive receiving environments including Lake Hayes and the Shotover River (Minister's Statement of Expectations)
 - (d) Acceptance of stormwater disposal to ground using underground chamber system;
 - (e) The composition and layout of the stormwater disposal system within the context of a push for a centralised system
 - (f) Council section 42A report and expert evidence
 - (g) Matters raised by other Submitters; and
 - (h) My conclusions and recommendations.
9. I consider the key matters in question or in dispute to be:
- (a) Stormwater management that allows for future climate change impacts (Minister's Statement of Expectations).
 - (b) Protection of sensitive receiving environments including Lake Hayes and the Shotover River (Minister's Statement of Expectations).
 - (c) Acceptance of stormwater disposal to ground using underground chamber system.
 - (d) The composition and layout of the stormwater disposal system within the context of a push for a centralised system.

Involvement in Flint's Park processes

10. I prepared the Flint's Park Stormwater Concept Design which was included in respect of the application for Fast Track Consent.
11. I have also been involved in preparing for the re-lodgement of a second application for Fast Track Consent.

Stormwater management that allows for future climate change impacts (Minister's Statement of Expectations)

12. To accommodate future climate change, the stormwater design is based on High Intensity Rainfall Design System (HIRDS) rainfall intensities associated with the highest Representative Concentration Pathways, RCP8.5, as determined by the United Nations Intergovernmental Panel on Climate Change (IPCC).
13. RCP8.5 projects future rainfall intensities for the years 2081-2100, a 25% average increase in rainfall over historical events for all return periods, and a maximum increase of 35% for short-duration, low-exceedance probability storm events. RCP8.5 is approximately 8% higher than RCP6.0 which is accepted by QLDC as meeting the 2.1 degC increase in climatic temperature – and provides an additional safety factor to all subsequent calculations.

Protect sensitive receiving environments including Lake Hayes and the Shotover River (Minister's Statement of Expectations)

14. The proposed stormwater system is designed to accommodate the 24-hour 1% AEP (100 year ARI Return Period rainfall event using the conservative RCP8.5 (2081-2100) projections, meaning that no stormwater will actually leave the site for any rainfall event less than the critical storm – in alignment with existing conditions.
15. In the unlikely event that secondary flow is required, the flowpath for any stormwater overflows is routed along the internal road corridors towards the State Highway swales.

Acceptance of stormwater disposal to ground using underground chamber system

16. I understand that there is consensus that stormwater should be discharged to land in accordance with existing conditions, rather than collected for discharge off-site.
17. Stormwater disposal to land is primarily achieved by either the use of ponds or underground disposal chambers. While both methods are viable, ponds can take a lot of land and reduce the number of houses that can be constructed. Further, measured infiltration rates are higher at deeper depths, and underground stormwater chambers will result in higher disposal rates.

The composition and layout of the stormwater disposal system within the context of a push for a centralised system

18. As noted in the evidence of Mr Gardiner, the TPLM Masterplan process proposed an integrated stormwater system with two primary stormwater devices. However, “this was removed from the notified TPLM Variation, with stormwater to be addressed by developers”.
19. I agree that the creation of a centralised system is problematic due to the large number of land-owners and the different time-scale associated with any development. Further, it is unlikely that the Council will have funding available to purchase land for a centralised stormwater system.
20. The initial plan for stormwater disposal at Flint’s Park was for a distributed approach, with multiple smaller devices. However, the Council has requested a smaller number of devices for operational and maintenance purposes.
21. I agree that a lower number of devices could be accommodated, and the current Flint’s Park Stormwater Concept Design shows that the devices can be consolidated into four corridors along roads with larger amounts of green space.
22. It would be possible to further consolidate the underground stormwater chambers into one main area running East to West, with a secondary

alignment in the same vicinity but running North-South along the entrance road, as shown in Appendix A.

23. It is noted that underground stormwater chambers should not be located below roadway kerbs, and preferably not below road pavements. However, it would be preferable for these to be located in generally grassed areas with/without footpaths or landscaping.
24. If the primary stormwater system is along a primary East-West corridor, this concept could be extended to neighbouring properties for the purpose of creating a quasi-integrated system of similar stormwater solutions in general alignment.
25. While the new concept is generally in alignment with preferences for more centralised stormwater system, the decisions about the exact size and location should be deferred to the Detailed Design.

Council section 42A report and expert evidence

26. As noted in the evidence by Ms Prestidge, “there are feasible options available to service this area”. I agree.
27. As noted in the evidence by Mr Gardiner, “there is no technical reason associated with either stormwater or earthworks than mean the TPLM Variation Area cannot be rezoned for urban purposes”. I also agree.

Matters raised by other Submitters

28. I understand that there has been concern expressed about the stormwater from this site draining into Lake Hayes. While there may be other concentrated flows from other sites that run into the Lake, the area covered by this development is nearly flat due to the close proximity to the catchment boundary between the Shotover River verses Lake Hayes where this area appears to have thicker layers of gravel and higher infiltration rates. Consequently, the stormwater on this site infiltrates into the ground from existing low points rather than running off-site into the Lake. As noted above, the proposed stormwater system will collect, attenuate, and dispose of stormwater to the land in alignment with existing conditions.

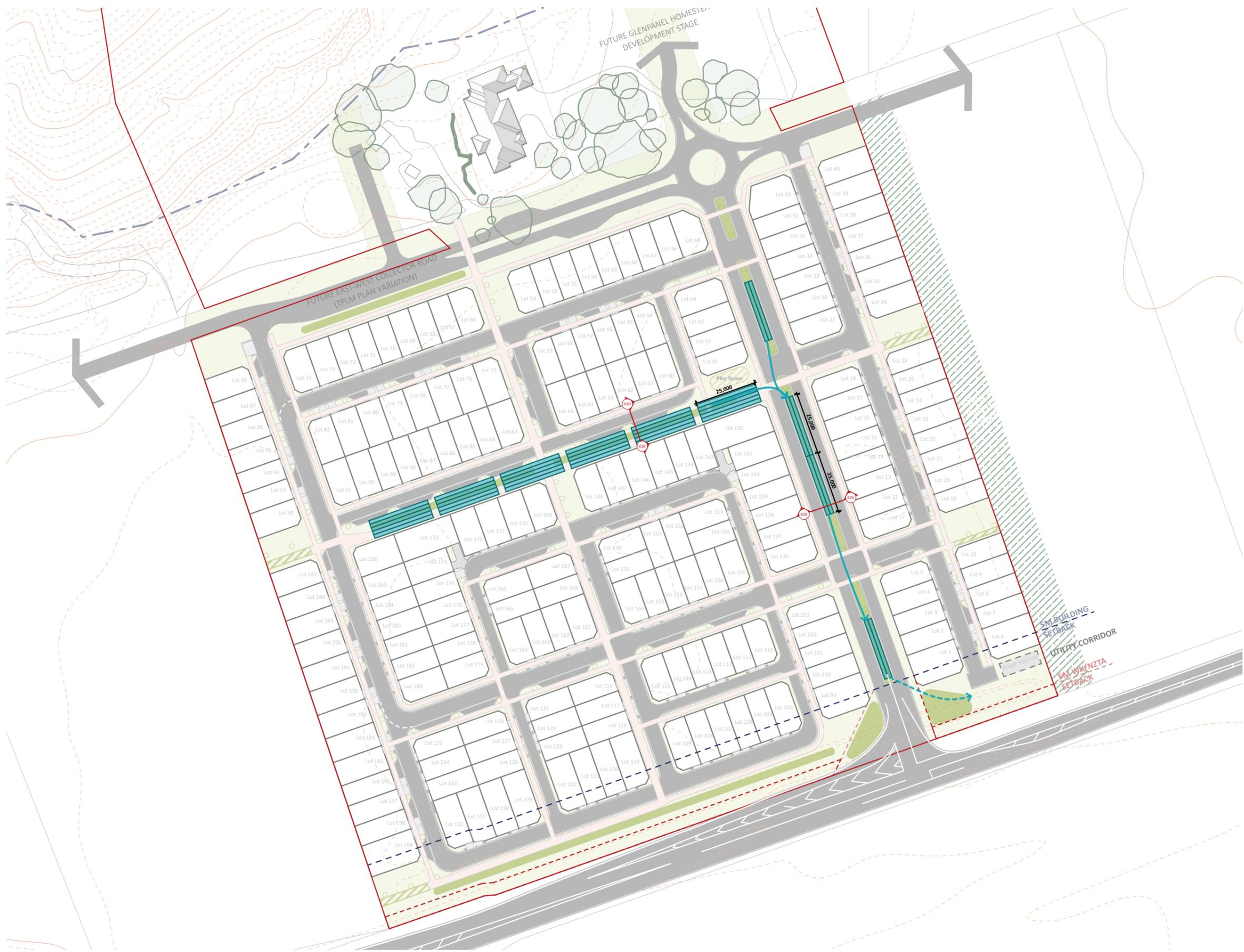
My conclusions and recommendations

29. The Flint's Park Stormwater Concept Design is technically sound.
30. The Minister's Statement of Expectations have been addressed.
31. The Council section 42A report confirms that stormwater must be addressed by developers, and that there is no technical reason why the proposed stormwater management system should prevent rezoning for urban purposes.
32. The proposed stormwater system will not impact Lake Hayes.
33. It is recommended that during Detailed Design, the Flints Park stormwater system maximizes the amount of stormwater that is disposed into the central East-West device, and the two devices on the South and North are minimised or eliminated, in close alignment with the layout in Appendix A.

20 October 2023

Warren Ladbrook

Appendix A:



NOTE - The areas and dimensions shown are indicative only. All consultants and contractors must verify all angles, dimensions, layouts, site measurements, and conditions before Council lodgement, marketing, fabrication, or construction.
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REV	ISSUE	DATE
A	Developed Design	06/09/2023
B	Developed Design	18/10/2023

- LEGEND
- Site Boundary
 - Site Contours (1m minor intervals)
 - Proposed Street Planting Locations
 - Stormwater Chambers (2 wide shown only)
 - Stormwater Chamber Connections
 - Stormwater Swales

TITLE
Stormwater Network

SCALE (A3)
 1: 1,500

NORTH

PROJECT
 Flints Park Stage 1 Addendum

CLIENT
 Glenpanel LP

JOB NO
 2308-002

STATUS
 Developed Design

DRAWING NO
 800

REVISION
 B

DATE
 18/10/23

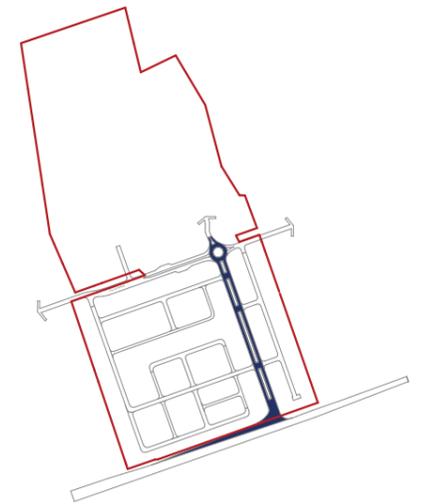
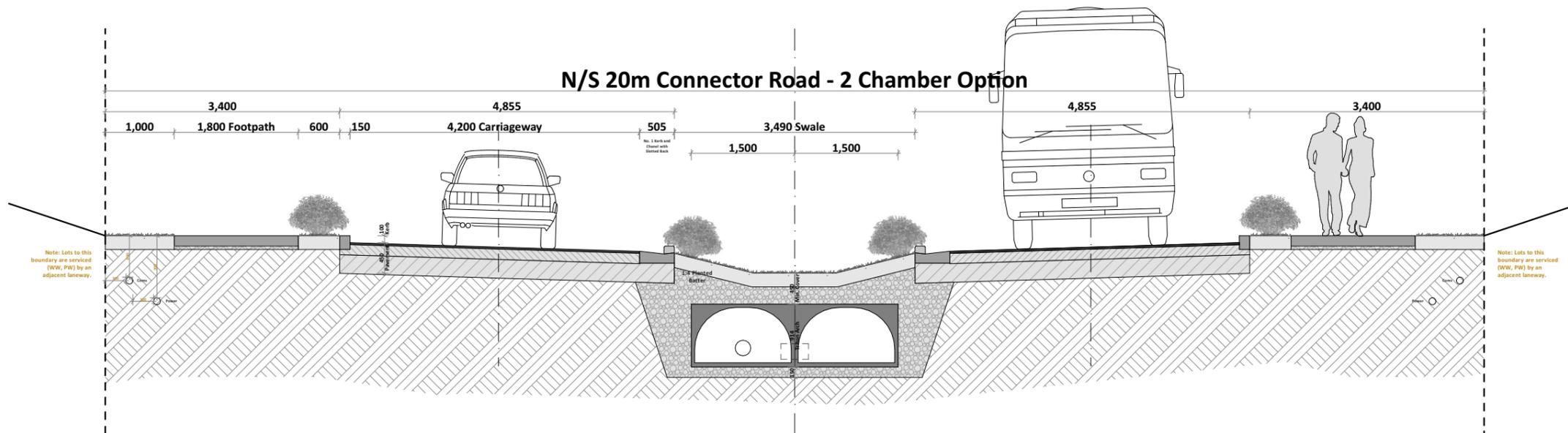
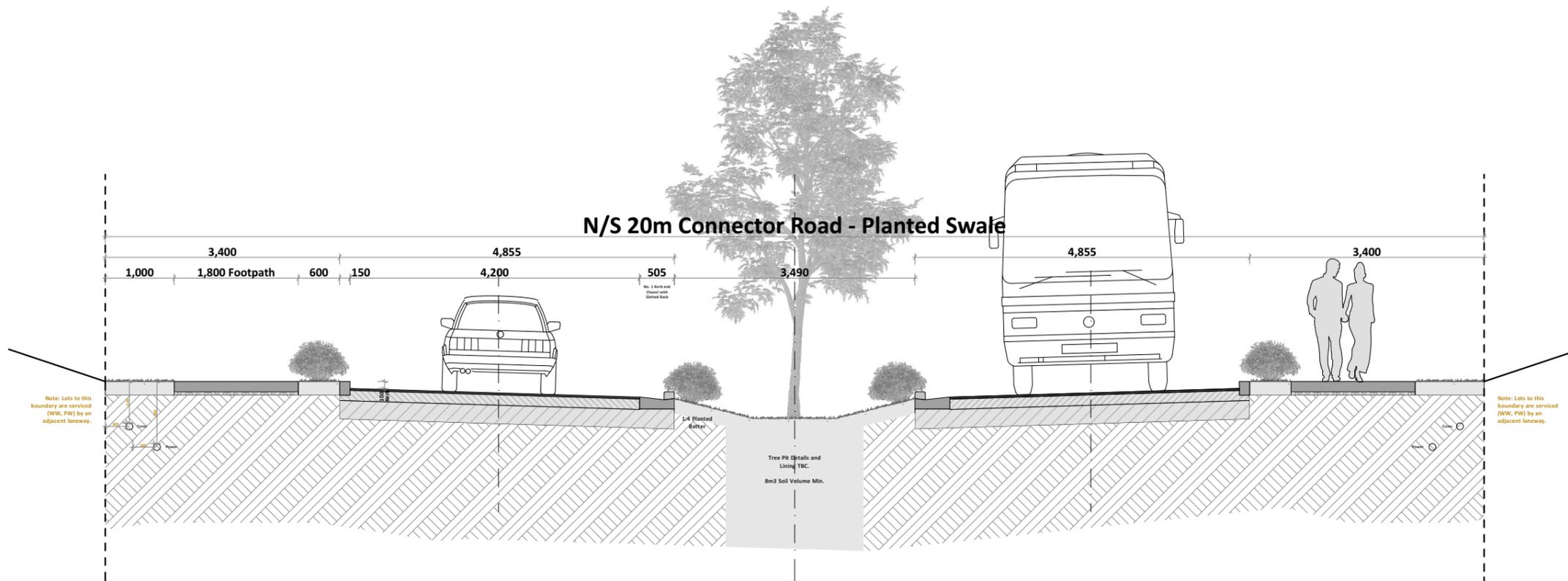
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REV	ISSUE	DATE
A	Developed Design	12/09/2023
B	Developed Design	18/10/2023

Note:
Swale longitudinal grade minimum 1%.

Standard kerb & channel longitudinal grade minimum 1 in 500 where back of kerb removed at 1m intervals to fall to swale. Elsewhere 1 in 250 minimum.



TITLE
N/S 20m Connector Street
Cross Section (A & B)

SCALE (A3)
1: 75

PROJECT
Flints Park Stage 1 Addendum

CLIENT
Glenpanel LP

JOB NO
2308-002

STATUS
Developed Design

DRAWING NO
620

REVISION
B

DATE
18/10/23

Saddleback
Strategy | Planning | Design

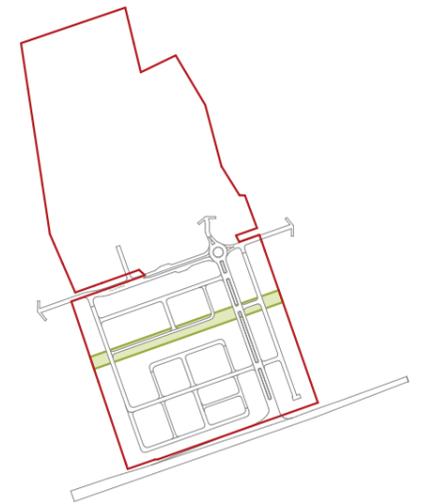
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Note:
Swale longitudinal grade minimum 1%.

Standard kerb & channel longitudinal grade minimum 1 in 500 where back of kerb removed at 1m intervals to fall to swale. Elsewhere 1 in 250 minimum.



TITLE
W/E 18m Green-Link
Cross Section (A & B)

SCALE (A3)
1: 75

PROJECT
Flints Park Stage 1 Addendum

CLIENT
Glenpanel LP

JOB NO
2308-002

STATUS
Developed Design

DRAWING NO
630

REVISION
B

DATE
18/10/23

Saddleback
Strategy | Planning | Design

