



Development Contribution Policy - Stormwater

Drury Stormwater Methodology

August 2024, Version 1.0

aucklandcouncil.govt.nz



Contents

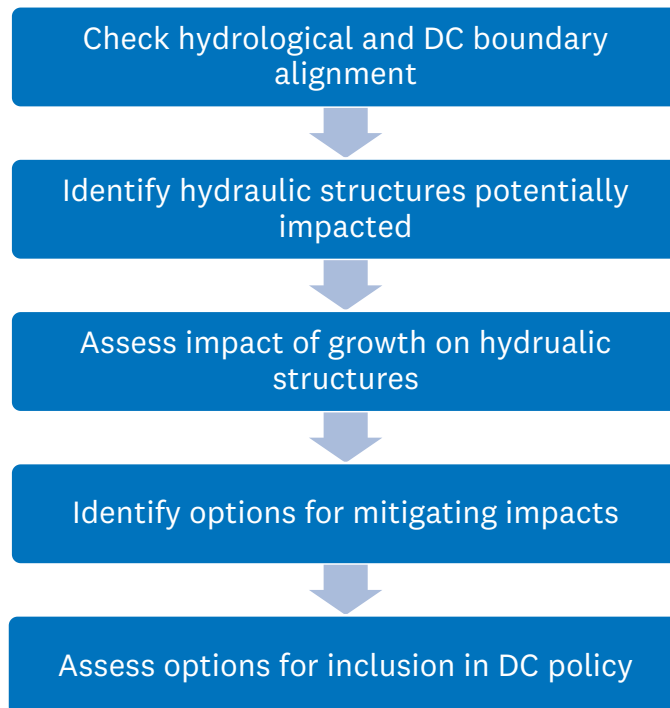
- Background..... 3
- Project identification methodology 4
 - Western Drury 5
 - Eastern Drury 6
- Funding Boundary..... 9
- Development Contribution Cost Modelling 10

Background

1. Governing Body adopted the Development Contributions Policy Variation A in April 2023 which took effect from 1 July 2023. Governing Body directed at the time of adoption that a 30-year Development Contributions policy be prepared for stormwater for Drury, for all council asset groups for Redhills, Westgate and Whenuapai and the Auckland Housing Programme Areas of Tamaki, Mangere and Mt Roskill.
2. Variation A was the first time that a longer term of 30 years was used in planning for the cost of infrastructure. Previously the term was 10 years.
3. The Drury Development Contribution area includes the precincts of Gatland Rd, 520 Great South Rd, Drury Centre, Drury East, Waihoehoe, Waipupuke, Drury 1 and Drury 2 precincts as well as the existing Drury township and Future Urban Zone land which is yet to be live-zoned.
4. The assumptions for growth are from the Auckland Growth Model and these are reflected in the Future Development Strategy. The Future Development Strategy 2023 indicated that the Slippery Creek floodplain will not be developed due to significant flood hazard.
5. Development Contributions are used to recover from those undertaking development the growth portion of the total cost of capital expenditure needed to service growth over time.
6. In a greenfield environment there is no existing comprehensive public stormwater network, so all the stormwater pipe network is constructed by the developer at the time of development. This means the vast bulk of infrastructure needed over 30 years is done as developer mitigation.
7. Current greenfield development is being zoned for high density development and subdivision consents are often lodged with levels of impervious surface that exceed zoning rules.
8. This planned for high density reduces the risk that infrastructure designed and installed for the developments will not be adequate for the future as the impervious surface area of the new developments will be closer to what could be expected to be the practicable maximum impervious surface area over time.
9. The most likely situation where stormwater infrastructure is best supplied by council is where there is a cumulative effect of land development on flood management and a catchment scale intervention is needed.

Project identification methodology

10. This diagram sets out the steps taken to identify projects in greenfield areas.



11. There are 4 hydrological catchments that cover the Drury Development Contribution area:

- Oira Creek
- Ngakaroroa Stream
- Slippery Creek (Otuwairoa)
- Hingaia Stream.

12. All the urban development anticipated in the Drury Development Contribution area is located near the bottom of the respective catchments.

13. Hydraulic structures within the Drury Development Contribution area that might be impacted by growth were identified and assessed. The assessment considered the pre and post-development flows, the impact this would have on the capacity of the structures to convey flow and if this would increase flooding of habitable floors or increase flood hazard.

14. Locations shown on Figure 1 below were assessed.

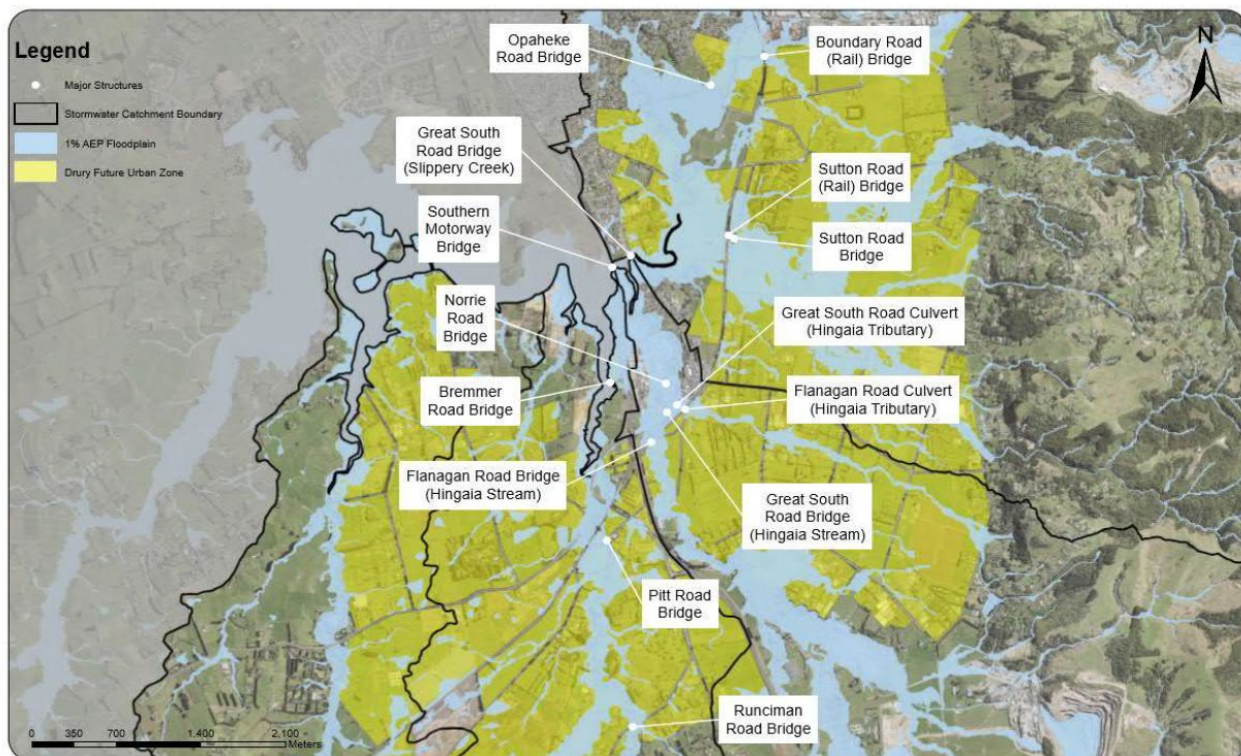


Figure 1. Hydraulic structures in Drury assessed for impacts

Western Drury

15. On the western side the floodplains are relatively contained to the existing stream extents of the Oiran and Ngakaroa. Most of the FUZ land on the west drains through the Ngakaroa catchment.
16. There is one location of interest in the Ngakaroa near Burberry Rd. This location includes a culvert under SH22 draining the Drury 2 precinct before a drainage channel diverts flows to the Ngakaroa Stream before going under the NIMT and then under SH22 which then drains out to the sea.
17. The detailed design for SH22 upgrade lodged with the Notice of Requirement documents shows an increase in the vertical alignment of SH22 leading up to and including the bridge over Ngakaroa. This will increase the conveyance potential and increase the freeboard when completed. It is assumed then that the SH22 upgrade will be undertaken with appropriate timing, so it is not considered that any other works are required at this location.
18. The Oira tributary is the western boundary of the FUZ land. Most of the upstream catchment is rural and isn't anticipated to change under current long term planning scenarios. There may be some alteration to flows due to forthcoming plan changes, but it is unclear if there would be any significant impact on infrastructure.

Eastern Drury

19. Three locations potentially impacted by growth were identified in Drury East. They are Norrie Rd bridge, Flannagan Rd culvert under the North Island Main Trunk line and Flannagan Rd culvert under Great South Rd (see Figure 1 above).
20. These locations are in the Hingaia Stream catchment. Approximately 70% of the FUZ land in that catchment is live-zoned with approximately 25% of that land already with resource consent.
21. Norrie Rd bridge is currently a low-level bridge crossing the Hingaia Stream and acts as a constraint to conveyance in its current form. It was discounted from inclusion in the DC policy as the bridge will be removed and replaced with a high-level bridge when the road is realigned as part of the Project 35A of the Drury Development Contributions Policy Transport Projects.
22. The Flanagan Rd culverts are connected and convey the Fitzgerald Stream under the North Island Main Trunk Line and under Great South Road and existing businesses to discharge into the Hingaia Stream with the culverts being owned by Kiwirail and Auckland Transport respectively.
23. The risk at this location is that the additional flow from the newly developed land would coincide with the much larger rural peak flow from upstream. This would result in increased flooding both locally within the Drury East and Drury Centre precincts and in the existing Drury Town Centre. Conveyance improvements at this location are needed to mitigate this risk.
24. The condition of the existing NIMT culvert is poor and without any mitigation there will be flooding upstream of the existing culvert and existing flooding in the Drury township may become more hazardous due to prolonged discharge of the floodplain to the Hingaia Stream.
25. The options explored for mitigating effects at this location are:
 - 1) Install a second culvert under the NIMT and upsize the culvert under Great South Rd.
 - 2) Multiple flood attenuation basins or other flood mitigation measures on each developer's land.
 - 3) Construct a new high flow conveyance channel discharging into Hingaia Stream further upstream.

26. The benefits and disbenefits of each option are set out below.

Table 1. Options to improve conveyance at Flanagan Road.

	Option 1 - Replace and upsize culverts	Option 2 - Flood Attenuation basins	Option 3 - High flow conveyance channel
Description	<ul style="list-style-type: none"> • Add second culvert under NIMT to convey higher flows. • Upsize culverts under Great South Rd and business land. 	<ul style="list-style-type: none"> • Developers for all stages provide flood attenuation basins on site. • Attenuation will need to be for 48 hrs. 	<ul style="list-style-type: none"> • A high flow channel diverting high flows from the Fitzgerald Stream via a 2m culvert to further upstream of Hingaia Stream.
Benefits	<ul style="list-style-type: none"> • Will improve conveyance in larger storm events. • Replaces existing culverts at risk of failure which will still need to convey the Fitzgerald Stream. 	<ul style="list-style-type: none"> • Solution supplied by those creating effect and at a scale relative to their effect. • Could be disestablished if not required. • No CAPEX cost to council 	<ul style="list-style-type: none"> • Will improve conveyance in larger storm events. • Less complicated ownership as new culvert will be owned and maintained by Auckland Council. • Addresses cumulative risk of development.
Disbenefits	<ul style="list-style-type: none"> • Complicated contractual arrangements with Kiwirail, Auckland Transport and landowners will be required to implement. • Some land acquisition likely needed. • Significant portion of the FUZ land subdivided and paid under the current DC policy so will not contribute to the cost of this option. 	<ul style="list-style-type: none"> • High risk of future transfer to council of multiple basins with associated operational cost to council. • Uncertain if it would be sufficient to avoid flooding effects once all FUZ land in the sub-catchment developed. • Unlikely to prevent additional flood hazard in existing Drury township. • Doesn't remove risk of NIMT culvert collapse. Inefficient use of land if multiple basins. 	<ul style="list-style-type: none"> • Doesn't remove risk of NIMT culvert collapse. • Technically challenging. • Land acquisition will be needed for both construction and operation.

27. Option 1 would be relatively simple but is time constrained in that the optimal time to deliver it would be when Kiwirail do 4 tracking of the rail line at that location. Numerous conversations over the last four years have failed to reach agreement on the practical aspects of delivering this option. It would also be complicated from an accounting perspective as the option requires capital expenditure on a third-party asset as council do not own the culvert under the North Island Main Truck Line.

28. Option 3 is the preferred option put forward by Fulton Hogan and Kiwi Property. Delivering Option 3 would have a number of challenges:

- There will likely be the need to acquire land to enable to the inletting into the diversion channel to work and to cross land for a feasible alignment.
- Inletting design isn't known so indicative design for the inlet used for Option 1 was used for costing.

- The high-level concept design shows the diversion alignment running close to the Waikato Watermain One. Watercare may not issue work-over approval until the second Waikato Water Main is completed and secure which would be from 2033 at the earliest.
- Agreement with Kiwirail will be needed for a culvert under the North Island Main Trunk line. Council will own the culvert.

29. Option 3 will be included in the 30-year DC policy with the year of construction at 2040. The alignment circled in red is what has been costed and included.

30. Note that the design as costed is a concept design and has not been modelled to determine if the design is sufficient for the flows involved. Fulton Hogan note that their modelling has been for Precincts 48 and 49 and does not include the remaining FUZ land that would also drain into that sub-catchment.

31. The design below has been costed by Alta Consulting following the costing methodology for Strategic Assessment level projects agreed with Healthy Waters. The estimated P50 unescalated cost for the design is approximately \$20 million. Alta's concept design costing included a 320m culvert of 2m diameter. The final escalated cost, including an allowance for land costs is \$36.2 million.

32. We have assumed land acquisition of 3660 sqm from one property, with other land requirements being met through developer mitigation. Using Auckland Council greenfield land pricing model, land acquisition cost is estimated at \$3.39m, inclusive of contingency and escalation, assuming an acquisition date of 2038.



Funding Boundary

33. The cause and need for this project is limited to those draining through the Fitzgerald Stream to the Flannagan Rd culverts. A large part of this sub-catchment has been live zoned for residential development through Precincts 48 (Drury Centre) and Precinct 49 (Drury East). There is an additional portion of FUZ land that has not yet been live-zoned that is also part of this sub-catchment. A catchment planner familiar with the catchment hydrology of the area identified the properties that are hydraulically relevant and therefore will have an impact on this location.

Figure 2. Conveyance options with costed option circled.

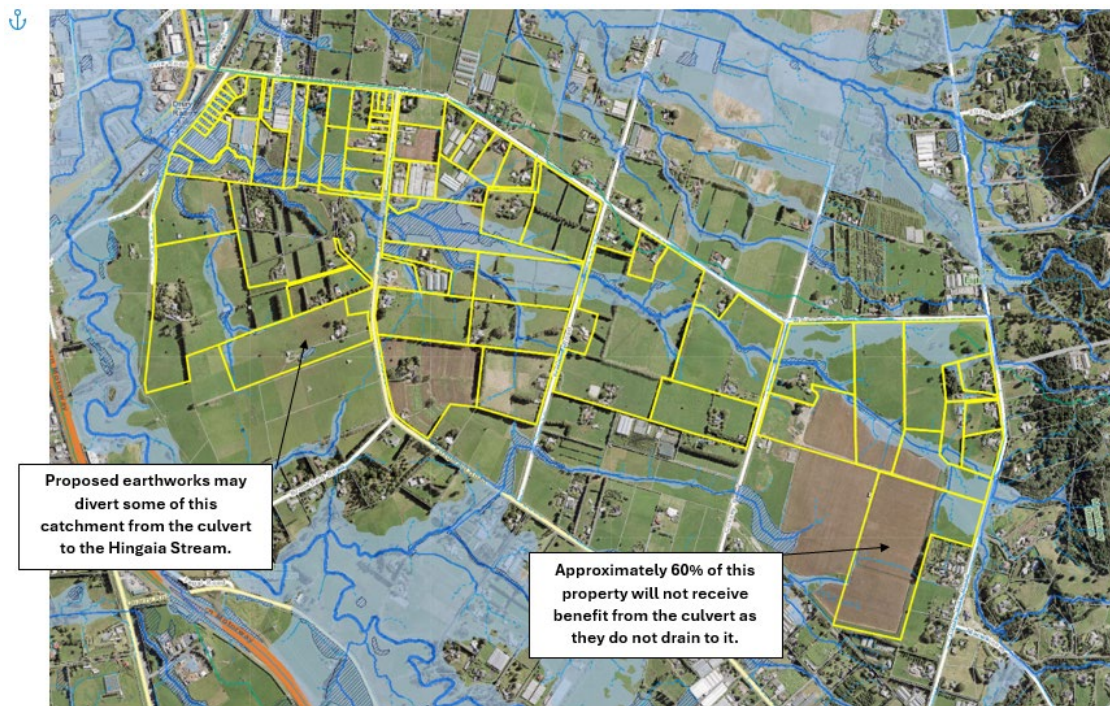


Figure 3. Map of properties within the funding boundary

Development Contribution Cost Modelling

34. Based on the designs above 100% would be to growth as there is no asset being renewed. Those who benefit also create the need for this project and as the area is greenfield land being developed there are only a few existing landowners who would benefit. Therefore, it is appropriate that 100% of the proposed project is growth and collected through Development Contributions.
35. A portion of the land has been live zoned and consented for Stage 1 development and consents for Stage 1 include attenuation basins to mitigate the effects of that development. It is anticipated that it will take some time to complete Stage 1 and so a construction has been modelled to begin in 2040 and spread over four years.
36. The beneficiaries of the project will be those in FUZ land in the Fitzgerald Stream sub-catchment of the Hingaia Stream catchment.

