

14 May 2026

Our ref: RL-01-2509-01

Sydney Central City Planning Panel
Department of Planning, Housing and Infrastructure
4PSQ, 12 Darcy Street,
Parramatta NSW 2150

Via email: Sharon.Edwards@planning.nsw.gov.au

Dear Sharon

RE: Development Application Independent Review – Stormwater Matters - 346-350 Old Northern Road, Castle Hill (PPSSCC- 592)

Rhelm Pty Ltd (**Rhelm**) has completed this review for the Sydney Central City Planning Panel (**SCCPP**) of the stormwater-related aspects of a development application for a seniors housing development 346-350 Old Northern Road, Castle Hill (the **Site**) within The Hills Shire Council (**Council**) local government area.

The application (DA 101/2025/JP) is for the proposed demolition of the existing retirement village and the construction of a seniors housing development including 229 independent living units, clubhouse and administration, parking and associated works.

This review has been informed by a review of the development application documentation available on the NSW Planning Portal and supplementary documentation prepared by the applicant and provided by the Department of Planning, Housing and Infrastructure.

In summary, there are a number of key issues that require resolution, particularly in the context of providing sufficient mitigation of the flood risk that affects portions of the site. It is recommended that these issues be dealt with prior to consent being issued. In summary, the issues and potential opportunities to provide further analysis or alteration to the proposal are as follows:

- Flood impact assessment not representative of the latest civil engineering drawings, not consistent with current guidance (being ARR2019 Version 4.2) and does not account for future climate change, making it challenging to properly evaluate the development against the provisions of Clause 5.21 of The Hills Local Environment Plan 2019 (**THLEP 2019**). An updated hydraulic assessment is required to address these inconsistencies such that the actual effects of the proposed development can be properly considered. The outcomes of such an assessment might result in an amendment to the proposed drainage arrangements, architectural plans and/or the internal road network.
- Proposed shelter in place arrangements require an update to be consistent with the Shelter in Place Guidelines (2025) and further details are required to provide more certainty around the means by

which risk to life to a vulnerable community might be managed. This might require amendment to the proposed drainage arrangements, architectural plans and/or the internal road network.

- Design issues and design-life issues with proposed channel modifications required to support the development (of relevance given the works are proposed on Council land and would be inherited by Council for long-term maintenance). A rock-lined channel solution would be a preferred outcome in this location.
- Indeterminate Impact of proposed channel modifications on biodiversity. Further information and coordination with an appropriately qualified arborist is required. Design amendments to the stormwater system to reduce impacts and/or updates to the Biodiversity Development Assessment Report to more reliably report impacts may be required.
- Concern for the analysis methods for complex OSD tank arrangements and potential maintenance access issues for proposed combined OSD/WSUD facilities. Further calculations as described in this letter and a plan showing how the OSD tanks will be accessed for maintenance is required. This might require amendment to the architectural plans and/or the internal road network.

Details of these issues that require resolution are described in the later portions of this review.

Site Context

The site is legally known as Lot 503 DP 1048808. It has an area of 3.699 ha.

A locality plan is provided as **Figure 1**.

The site is bordered by Palisander Place to the west and Old Northern Road to the east. Pioneer Place Reserve (also known as Pioneer Park) is located immediately to the south-west.

Zoning

The land is zoned C4 - Environmental Living under The Hills Local Environment Plan (THLEP) 2019. A seniors housing development is generally a prohibited use within the zone however the proposal is permitted as an Additional Permitted Use under (THLEP, 2019). Adjacent properties on Palisander Place and Old Northern Road are zoned Environmental Living (C4) whilst Pioneer Park are zoned Public Recreation (RE1). The site is currently used for seniors housing (being the Levande Castle Ridge Retirement Village).

Catchment Context

The site is located near the ridgeline of the Castle Hill Creek catchment. Castle Hill Creek is a tributary of Cattai Creek (joining Cattai Creek just downstream of Gilbert Road). Cattai Creek is a tributary of the Hawkesbury River.



Figure 1 Locality Plan and Mapped Easements (Site outlined) (Watercourses source: NSW Hydroline database)

The topography is steep and the ground levels at the site range approximately from 140 – 170 mAHD (**Figure 2**). The eastern portion of the site largely grades to the west. The northern portion of the site grades to the south-west whilst the southern portion grades to the north-west.

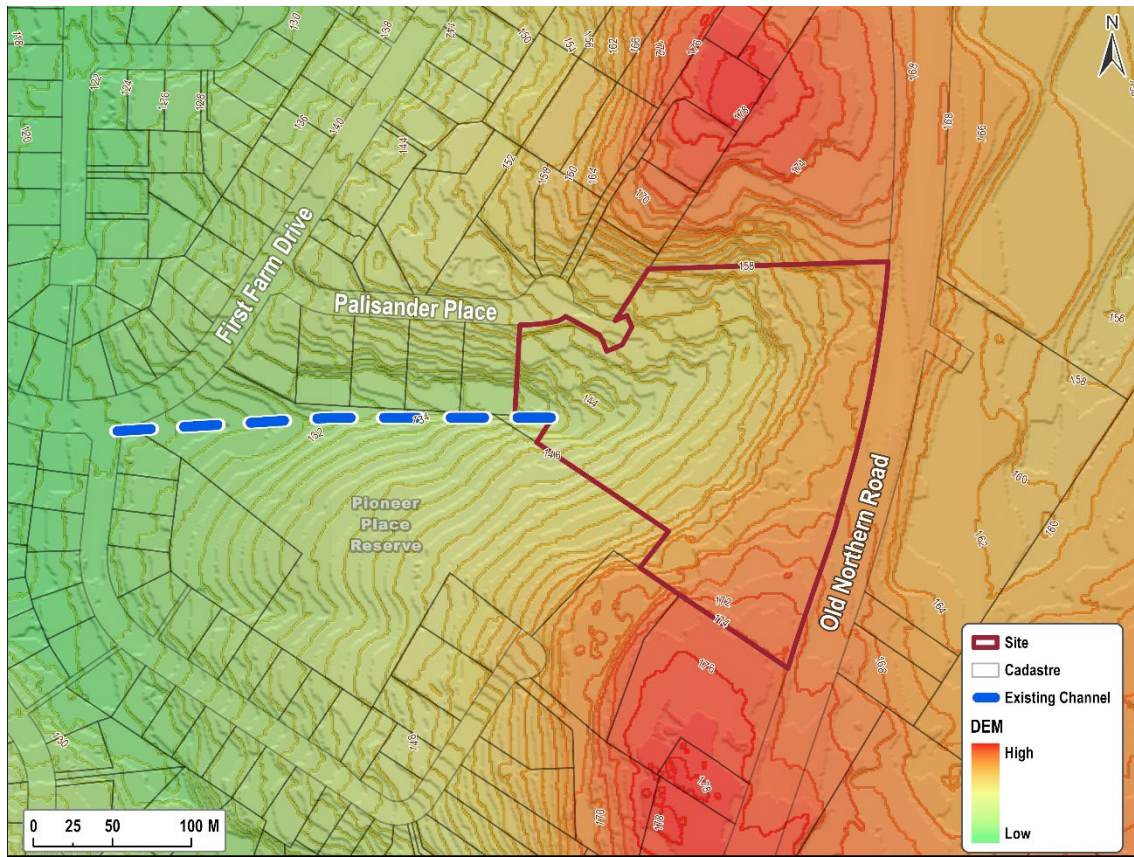


Figure 2 Topography (Site outlined) annotated with existing open stormwater channel location

Existing Stormwater Drainage Network

The site is serviced by an existing public stormwater drainage network operated by Council (downstream of the site). The site itself also has an existing internal stormwater drainage network.

Figure 3 shows all of the Council stormwater assets mapped in the vicinity of the site. The map shows a watercourse mapped as a 'Minor' watercourse within the site itself, which flows to the west through Pioneer Park to a stormwater pit and pipe network.

The minor watercourse (also referred to in this review as the 'channel') within Pioneer Place Reserve is not mapped as a watercourse under the NSW Water Management (General) Regulation 2025 and is located upstream of first order watercourses within the Hydroline database (see **Figure 1**). However, as outlined above, the channel is identified as a 'Minor Watercourse' by Council (see **Figure 3**).

The existing channel within Pioneer Place Reserve is bounded by retaining walls on the northern side and steep vegetated banks to the south. The channel widens as it approaches First Farm Drive with a public footpath bridge crossing over the channel providing access to a children's playground.

The channel discharges into a 675mm diameter pipe joining the local First Farm Drive stormwater drainage network, as captured in survey completed for the applicant by Australian Locating Services; Reference Number 210141, Revision C dated 11 November 2024.

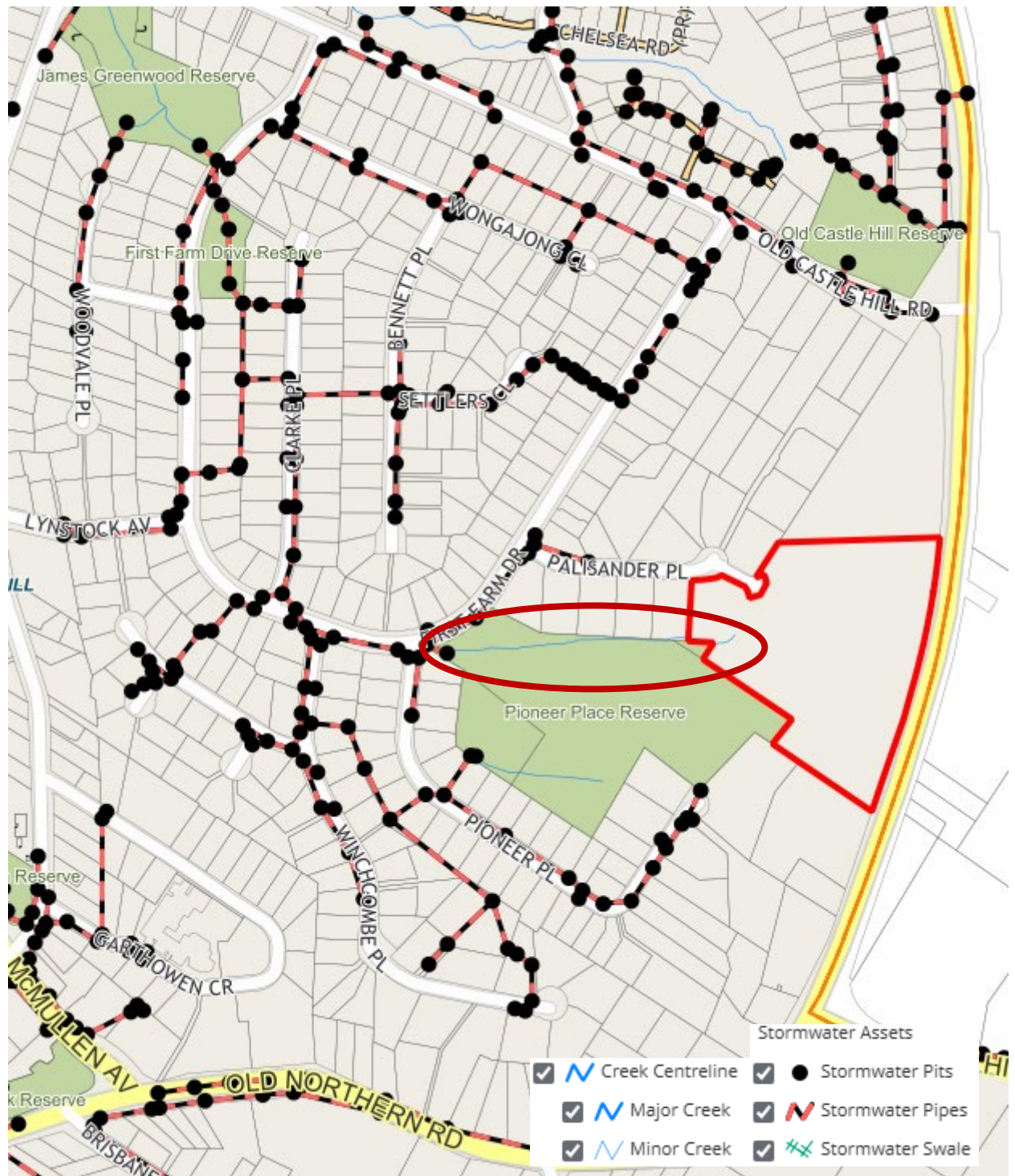


Figure 3 Extract from The Hills Shire Council Online Interactive Map – Stormwater Assets and Minor Creek centreline (circled)

The site itself is serviced by the following drainage assets:

- A 1.2 m diameter stormwater pipe that conveys flows through the site (the **North-south drainage line**). The pipe is contained with an existing drainage easement.
- An existing stormwater detention basin located in the western-most region of the site (that discharges to Pioneer Place Reserve)
- A twin headwall outlet (450mm and 400mm diameter pipes) into an existing open channel within Pioneer Place Reserve.

In correspondence available to Rhelm, it is noted that Council has also identified that there are three other detention basins within the site in its existing form. It is unclear as to the size and location of these basins.

Note also that there is longitudinal and transverse stormwater drainage in Old Northern Road that is relevant to the site insofar as it largely carries flow up to the design capacity of the pit and pipe network from Old Northern Road to the east, but not all overland flow (flows in excess of the drainage network capacity are conveyed through the site). Old Northern Road is a state road under the control of Transport for NSW. It is assumed that any replacement or repair of Transport assets would be conditioned in the consent.

Flood Context

The site is affected by overland flow flooding. It is above the extent of other types of flooding (such as flooding from Castle Hill Creek or flooding in the Hawkesbury Nepean River).

Council has completed a *Draft Urban Overland Flow Study* (THSC, 2024) (the **OLFS**) for the locality. An extract from the draft report provided by Council to Rhelm is shown in **Figure 4** shows the site as being affected by overland flow flooding in the 1%AEP design flood event and depicts overland flow commencing just upstream of the site in the adjacent property to the north (352 Old Northern Road) and then flowing south and south-west through the site to Pioneer Place Park. It is understood that the study was completed using Australian Rainfall and Runoff (2019) Version 4. (Ball et al, 2019).

Council provided a copy of the TUFLOW model files from the OLFS to the applicant for the purposes of the assessment.

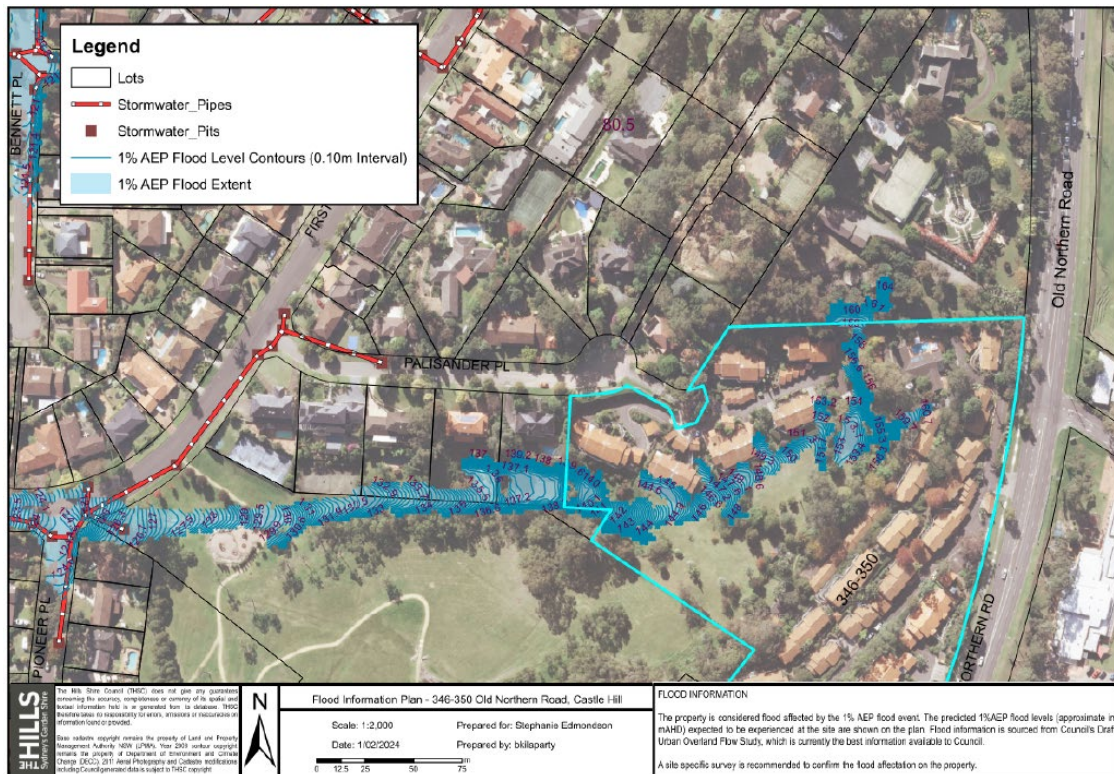


Figure 4 1% AEP flood extract - Draft Urban Overland Flow Study (THSC, 2024) (Site outlined)

Biodiversity Context

Pioneer Park contains patches of a critically endangered ecological community listed under the *Biodiversity Conservation Act, 2016* (being Blue Gum High Forest). This is relevant to this review as the patches coincide with the location of the channel and there are works proposed in close proximity as described below.

Summary of Proposed Development

As outlined above, the proposed development is for the demolition of the existing retirement village and the construction of a seniors housing development. This includes:

- 229 independent living units within 13 buildings (Buildings A-M),
- 347 basement parking spaces,
- clubhouse / administration facilities; and
- internal roads with independent road access from either Palisander Place or Old Northern Road.

The proposed development is set out in plans prepared by Cox Architects. The version considered for this review is Revision 3 dated 4 June 2025 (Project Number 222114.00), see the site plan in **Figure 5**.

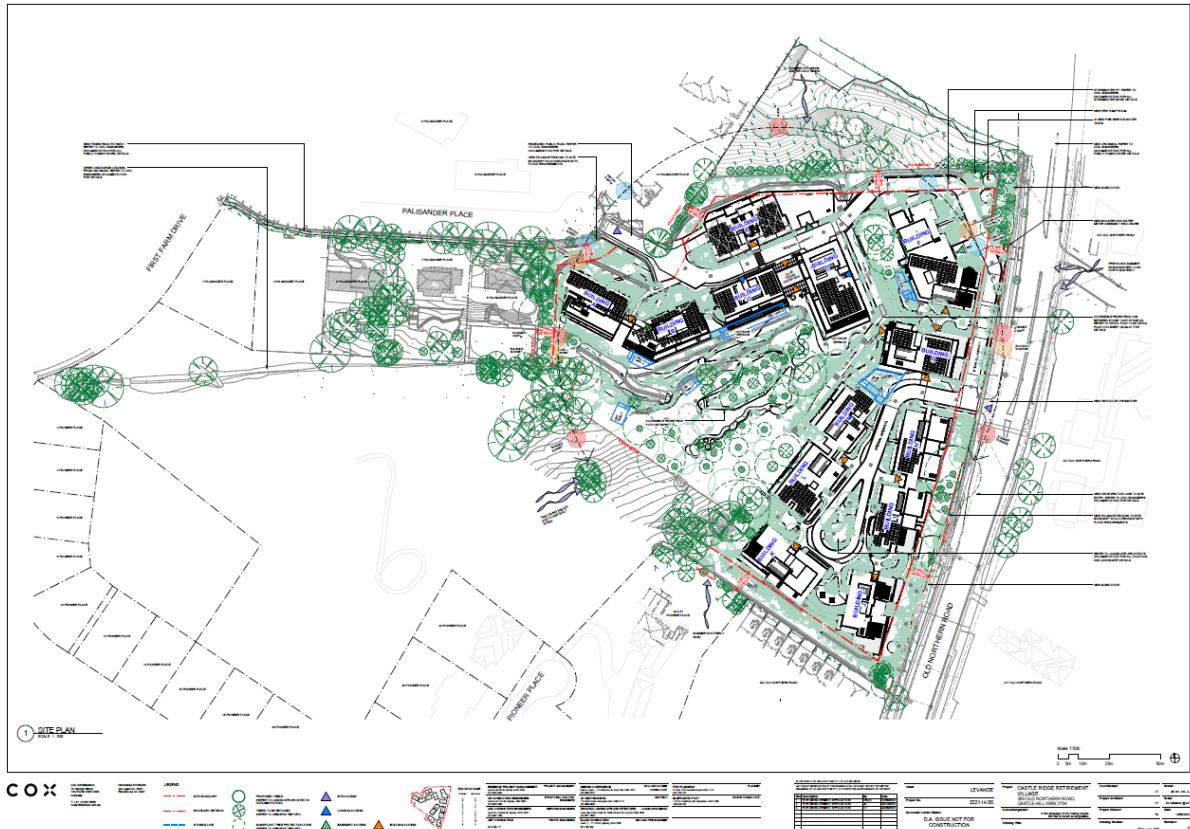


Figure 5 Site Plan (Source: Cox Architects Revision 3)

The development involves bulk earthworks (net excavation in support of the basement parking) and downstream drainage channel stabilisation works on three adjoining properties (Lot 26 DP 262133 / Lot 33 DP 262389 within Pioneer Park and Lot 28 DP 262389, No. 9 Palisander Place, Castle Hill). A letter of owner's consent from the property owner at 9 Palisander Place has been included as part of this submission whilst owner's consent has been provided by the General Manager, on behalf of Council-owned Pioneer Park.

Drawing No. C0200 of the civil design drawing set presents the bulk earthworks plan depicting a total cut/fill (net excavation) of 93,470m³.

Supporting civil design drawings have been prepared by JN Consulting. The version considered for this review is Revision 9 dated 29 August 2025 (Job Number N0220991), see the stormwater site plan provided in **Figure 6**.

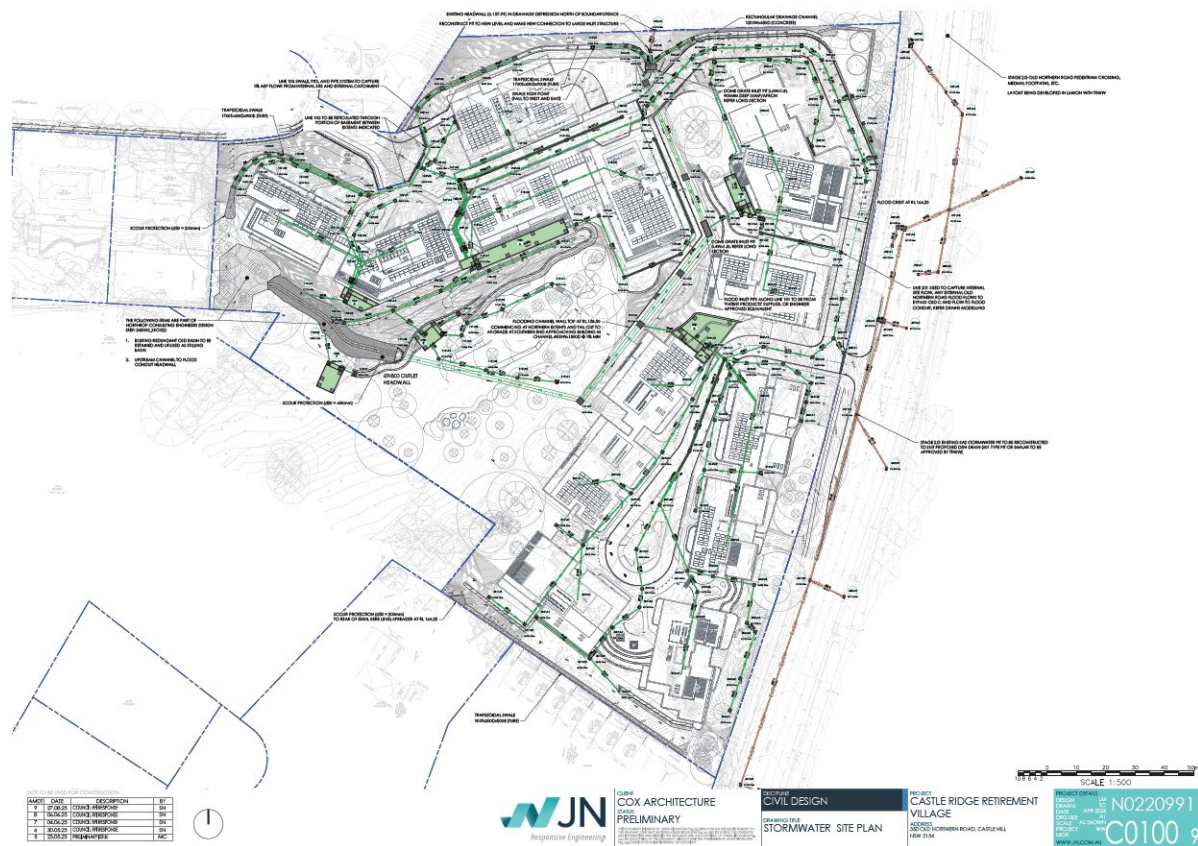


Figure 6 Stormwater Site Plan (Source: JN Consulting – Revision 9)

The development involves alterations to the existing stormwater arrangements. The proposed stormwater works include:

- North-south stormwater drainage line upgrade (Line 01) and re-alignment (a portion of the line will be retained as a 1.2 m diameter pipe and a portion upgraded to a 1.8 m diameter pipe, referred to as a 'flood conduit' and 'flood channel' on the Cox Architectural Plans). The line is steep (at nearly 7% grade) and includes large dome grated inlet pits (up to 5.4 m x 1.8 m in dimensions). The flood channel includes a 1.5 m high 'wall' along the length of the western side, presumably to prevent ingress of floodwaters to buildings.
- New east-west drainage line (Line 02) (450 mm diameter pipe with grade up to nearly 13%)
- Six large basement tanks (total volume of approximately 1515 m³), with the tanks being up to 6.5 m in depth. Each tank includes five separate chambers, one chamber for rainwater capture (from roofwater only), one for water quality treatment (the use of filter cartridges) and three of which are intended to provide detention (i.e. OSD Chamber, High Early Discharge (HED) Chamber and the Outlet Chamber).
- Provision of diversion swales to divert flow from some external catchments (and some internal catchments not directed to the proposed OSD tanks)
- Conversion of the existing detention basin to a stilling basin (to reduce flow velocity prior to discharge)
- Channel upgrade works for a 50 m length of the channel in Pioneer Park (where bedrock is not present this consists of a mix of types of scour protection, ranging from shotcrete, reno mattress bed protection, rock rip-rap bed and bank protection and sandstone blocks for bank protection). The design also includes a series of low-level rock cascades for energy dissipation.

- Vegetation management and rock edging for a length of approximately 100 m downstream of the channel upgrade works (in Pioneer Park).

These works are described further below.

North-South Drainage Line Upgrade

In the civil design drawing set, Drawing No. C0100 (reproduced as **Figure 6**) depicts the stormwater site plan. There is an existing headwall capturing runoff from 352 Old Northern Road, north of the site, which is to be connected to a 'flood conduit' (see Drawing C0300) traversing the site (a stormwater drainage line, referred to as Line 01 on Drawing C605). The flood conduit is effectively an upgrade of the existing 1.2m diameter pipe culvert to a 1.8m diameter pipe culvert with the flow from this discharging flow into a rock riprap/reno mattress-lined open channel (described further below) and then into a stilling basin. Flow will then be discharged into an open channel located along the boundary with 9 Palisander Place and Pioneer Park. Note that the drawings show a section of the flood conduit being a 1.2 m diameter pipe, but the report says the pipe will be upgraded to a 1.8 m diameter pipe. Clarification of the proposed upgrade is required (and may necessitate a drawing update).

OSD

Prior to flowing into the stormwater lines (01 and 02), stormwater within the site itself will be directed to six separate On-Site Detention (OSD) tanks (**OSD A-F**). These tanks are located under 6 of the 13 proposed buildings and will be created by excavation. Rhelm notes that the proposed flow detention strategy has been deemed generally suitable by The Hills Shire Council (see the document entitled Appendix B email correspondence accompanying the application) when considered at a site-wide level where all detention tanks are operational.

Flow Diversions

The proposal also involves construction of surface runoff diversion swales to serve external and internal local site catchments.

Channel Works

A *Downstream Drainage Assessment* presentation was prepared by Levande and Northrop Consulting Engineers. The version considered for this review is Version 1, dated 14 January 2025 and provides a contextual overview of the Pioneer Park existing channel conditions and preferred solution. For context, the existing channel images have been included in **Figure 7**.



Steep banks on LHS, Property retaining walls on RHS



Erosion of creek channel caused by undercutting of bank



Confined, stable watercourse channel + steep vegetated bank



Downstream watercourse with rock stabilised banks

Figure 7 Pioneer Park channel - Existing condition (Source: Levande and Northrop Consulting Engineers, 2025)

The proposed 'Channel Stabilisation' (Revision 6, dated 10 November 2025) and 'Creek Works' (Revision 3, dated 9 October 2025) drawn by Northrop Consulting Engineers, both form part of the set of plans supporting the application (Reference SY243000) but it is noted that the two plan sets contain conflicting information.

- The 'Channel Stabilisation' Drawing (C04.01) presents the siteworks and stormwater management in plan view. This drawing depicts the proposed development plans to stabilise the Pioneer Park and No.9 Palisander Place channel with shotcrete immediately downstream of the point of discharge for approximately 50m, to stabilise the more confined narrow section of the existing channel adjacent to No.9 Palisander Place. The channel stabilisation will be followed by stabilisation works for approximately a further 45m, once the existing channel base width widens.
- The same drawing for the 'Creek Works' plans depicts the channel downstream of the stilling basin being entirely lined with shotcrete.

For the purposes of this review, the 'Creek Works' drawing has been assumed to be superseded by the 'Channel Stabilisation' drawing and therefore was excluded from this review.

An inter-allotment Drainage Easement will need to be sought from No. 9 Palisander Place to formalise the proposed arrangements. Evidence of in-principal agreement to this arrangement should be provided by the applicant prior to consent being issued (if not already provided).

It is noted that the proposed channel works have been reviewed by two organisations separate to the applicant's consultant (a design review and an existing morphology assessment with recommendations for stabilisation works):

- *Sustainability Workshop review* - The proposed 'Channel Stabilisation' works were reviewed for the applicant by Sustainability Workshop (letter dated 11 November 2025). The letter was prepared to

evaluate the proposed channel improvement works and concluded, following additional HEC-RAS hydraulic modelling undertaken by Northrop Consulting, that the proposed works *“strikes the right balance between managing the hydraulic risk (which in this case is a slope stability risk and not a flood risk), construction feasibility and safety, and ecological protection of the Blue Gum High Forest.”* (Sustainability Workshop, 2025).

- *DH Water Engineering review* - A review of the existing condition of the channel at Pioneer Park was prepared by DH Water Engineering for the applicant dated 10 November 2025 and was considered for this review. The review was prepared *“...to inform considerations regarding the interface between the proposed development and the existing modified channel within Pioneer Park...”* (DH Water Engineering, 2025). The review involved a visual inspection of the channel (broken into five ‘reaches’ for the purposes of the assessment) and provided recommendations for the proposed stabilisation works to address existing erosion issues and improve long-term channel stability, some of which have been implemented into the latest design. The specific design recommendations to control erosion risk within the narrow confined channel of reach R1 and the impact caused by erosion and accumulation of debris of the channel in reach R2 have not been appropriately incorporated into the design.

Flood Impact and Risk Assessment

A Flood Impact Assessment (**FIA**) prepared by JCO Consultants was prepared to support the application. The version considered for this review is Revision D, dated 19 February 2025. The FIA considered the existing and proposed development conditions, using rainfall data for 10%, 5%, 1% AEP and PMF storm events provided by The Hills Shire Council and assessed within a site specific TUFLOW hydraulic direct rainfall model. The TUFLOW hydraulic model was developed using a Survey Plan DEM prepared by ‘Norton Survey Partners’ dated 24th November 2022 and a 1x1m DEM sourced from Council. The existing Council drainage network for adjacent roadways was also included whilst site buildings were modelled as obstructions.

The post development site grading topography and proposed drainage network for the senior’s housing development was based on JN Engineering Consultants site grading. Levels and details of the modelled pit and pipe network were obtained from the Concept Civil Grading (reference drawings revision and date not provided).

All habitable floor levels are above the PMF and the driveway entry impacted by 1% AEP and PMF has provided sufficient freeboard. The FIA reports pit inlet blockage (50% sag and 20% on-grade) and 50% culvert inlet blockage factors were applied. Additional sensitivity testing for 100% culvert blockage was conducted to confirm the proposed internal road and overland flow channels will allow the water to safely overtop into the central lawn area and flow towards the Pioneer Park channel. The FIA concluded the proposed development inclusive of the drainage network measures will not return any adverse impacts on the existing flood behaviour and considered compliant with DCP 2012 and LEP 2019 requirements.

With respect to habitable floor levels, all habitable floor levels are to be set above the PMF level. However, basement entry points are set at the 1%AEP + 0.5. Having basement entry points set below the PMF is not consistent with the flood risk given the vulnerable nature of residents and visitors. In this regard, all building entry points should be set above the PMF. Specifically, the Building K basement entry should be checked for the threshold level to be above the PMF given the nature of the

development and the inability of residents to be able to evacuate the carpark in a timely manner in a flash flood event.

Flood Emergency Response Plan

A Flood Emergency Response Plan (**FERP**) was prepared (2024) prior to the issue of the Shelter in Place Guidelines (2025). It is recommended that this plan be updated to be relevant to the current requirements for Shelter in Place in NSW.

Additionally, the FERP identifies the installation of a 'flood detection system' but provides very limited details as to the purpose of this and how this system is to operate. This should be addressed in the update of the FERP.

A site flood coordinator is nominated in the FERP. It is unclear as to the management arrangements proposed for the site and any such coordinator role should not fall to a resident of the facility but to a full time role. Details of how that person might be trained and the how they would supervise the periodic testing of the flood evacuation system would also be appropriate.

The FERP and the proposed design would benefit from additional signage located in the vicinity of the proposed flood channel and along sections of roadway identified to flood.

Water Sensitive Urban Design

A Water Surface Urban Design (WSUD) treatment details were also prepared in support of the application within drawings C0710 and C0711 presenting the outcome of the reduction of pollutants using an eWater MUSIC model against Council's targets. No assessment of the requirements of Chapter 6 of the State Environmental Planning Policy (Biodiversity and Conservation) 2021 are made.

As outlined above, water quality is to be managed by capture and re-use of rainwater (for irrigation) and the use of filter media cartridges located in a chamber within the underground tank systems.

With respect to the rainwater tanks, a BASIX certificate for the various buildings was not sighted as part of this review and should be cross checked against the proposed plans.

Relevant Planning and Development Controls and Standards

A range of planning and development controls, legislation and guidelines apply to development on the site. These include:

- The Hills Local Environmental Plan 2019 (in particular Clause 5.21)
- The Hills Shire Council DCP 2012 – Part C, Section 6 Flood Controlled Land
- Subdivision/Developments Design Guidelines (December 2023)
- State Environmental Planning Policy (Biodiversity and Conservation) 2021
- Australian Rainfall and Runoff, 2019 (Version 4.2)
- Water Management Act, 2000.

The key issues identified below are in the context of these controls.

Key Issues with the Proposed Development and Potential Opportunities to Resolve

The following key issues and potential opportunities to provide further analysis or alteration to the proposal have been identified as part of this review:

- **Unrepresentative flood impact assessment** – The proposed scenario incorporated in the TUFLOW modelling does not align with the latest JN Consulting civil engineering drawings Revision 9 dated 29 August 2025 (Job Number N0220991) (noting that these drawings were completed four months after the FIA report). Therefore, the application is not sufficient to adequately assess in accordance with DCP 2012 – Part C, Section 6 Flood Controlled Land (specifically General Development Controls (a)). And (THLEP, 2019) Clause 5.21. An updated hydraulic assessment (including consideration of contemporary methods as outlined at the next point) is required to address these inconsistencies such that the actual effects of the proposed development can be properly considered. The outcomes of such an assessment might result in an amendment to the proposed drainage arrangements, architectural plans and/or the internal road network.
- **Stormwater design and analysis to ARR2019 Version 4.2** - The Development Application lodgement was dated 23 July 2024 with the applicant requested to provided additional information on: 26 July 2024, 14 August 2024, 23 October 2024, 11 November 2024, 1 April 2025, 5 August 2025 and 12 September 2025. During the numerous additional information exchanges, the Australian Rainfall and Runoff guidance was updated. As a result of the update of ARR2019 Version 4.2 in August 2024, primarily with respect to the projected effect of climate change on rainfall intensity-frequency-duration (IFD) relationships (in particular Book1, Chapter 6), it has been identified that there are material implications of changes that affect the proposed development. The application in its current form has not taken into account the updated guidance in ARR2019 Version 4.2 (within the flood impact assessment or stormwater management plan) for design calculations nor for the setting of habitable finished floor levels, likely underestimating discharge into the Pioneer Park channel, OSD tank sizing and flood levels for Current to Near-Term as well as future conditions. Furthermore, an objective of Clause 5.21 of the (THLEP, 2019) stipulates the development consider projected changes as a result of climate change. The Flood Impact Assessment and Stormwater Management Plan require updating to align with the latest guidance of ARR2019 version 4.2. This may necessitate resizing many of the stormwater design features and may require the alteration of some of the proposed building arrangements. Further comment on the development with respect to the flood risk would be expected to be necessary once the update is complete, particularly given the vulnerable nature of future residents and the nature of flood flow conveyance through the site.
- **Shelter in place suitability** - Proposed shelter in place arrangements require an update to be consistent with the Shelter in Place Guidelines (2025) and further details are required. This is required to provide more certainty around the means by which risk to life to a vulnerable community might be managed. This might require amendment to the proposed drainage arrangements (being an increase to the proposed 1.2 m diameter pipeline to reduce the flood hazard over the internal road network in rare and extreme events, which is material). Amendments to the architectural plans to avoid ingress of floodwater to any buildings or basements up to and including the PMF event and/or may require adjustments to the internal road network.
- **Issues with proposed drainage and channel modifications required to support the development** –
 - The proposed flood conduit illustrated in JN Consulting drawing C0300 with corresponding cross-sections in drawings C0556 / C0557 depicts Line 101 adopting a 1.2m diameter through to 1.8m diameter pipe conveying surface runoff from 352 Old Northern Road, north of the site before discharging flow into a rock riprap mattress-lined open channel. Above the flood conduit, is a proposed surface overflow flood channel with a flood wall, indicated as 4m minimum width, with the height of the flood wall not clearly defined (but appears to be up to 1.5 m). The

structural integrity of the ‘flood wall’ and overland flow channel’s capacity to convey the Probable Maximum Flood has not been clearly defined and should be clarified given the reliance of the development on these features to manage risk to property and risk to life. As outlined above, the drainage network sizing is likely needed to be increased to reduce flood hazard on the internal road network.

- Downstream of the flood conduit is an open stormwater channel located within 9 Palisander Place and Pioneer Park. The flow of this channel has been analysed in a HEC-RAS hydraulic model, to evaluate the proposed ‘Channel Stabilisation’ (Revision 6, dated 10 November 2025) drawn by Northrop Consulting Engineers as an outcome of the Sustainability Workshop review. It is unclear as to why the Council TUFLOW model was not used for this purpose. A variety of channel treatments have been proposed including shotcrete, riprap, sandstone logs and a rock mattress. The ‘Channel Stabilisation’ proposes channel treatments that are likely to pose maintenance issues within the Council-owned Pioneer Park. A rock-lined channel solution would be a preferred outcome in this location.
- The channel stabilisation drawings show existing tree locations and identify areas where works will need to be modified to adapt to tree root locations but given the size of the affected trees detailed root mapping by an arborist would be beneficial to determine if the works are actually feasible. This is described further below.
- ***Indeterminate Impact of proposed channel modifications on biodiversity*** - The final development footprint of the ‘Channel Stabilisation’ has not been adequately represented and appears likely to impact the critically endangered ecological community (CEEC) Blue Gum High Forest (BGHF) identified to be located within the extent of the proposed development works. There is no consideration of Clause 5.21 of (THLEP, 2019) with respect to adversely affect the environment, the destruction of riparian vegetation or a reduction in the stability of watercourses. The velocity of flow discharged into the channel indicated within the HEC-RAS modelling in combination with the shotcrete and rock riprap mattress ‘Channel Stabilisation’ are insufficient to determine the impacts on the BGHF community. Note that Rhelm is only able to comment on the channel design and behaviour and any impacts on BGHF should be evaluated by a suitably qualified arborist and/or ecologist. Design amendments to the stormwater system to reduce impacts and/or updates to the Biodiversity Development Assessment Report to more reliably report impacts may be required.
- ***Maintenance access issues for proposed OSD facilities*** - The JN Consulting drawings Revision 9 dated 29 August 2025 drawings indicate six OSD tanks (these are also shown in the Cox Architecture drawing set). However, there is insufficient information to evaluate how each tank will be accessed and maintained. JN Consulting Drawing C0100 depicts the stormwater site plan whilst Drawing C0400 presents the grading site plan. With the majority of the OSD tanks located on the far side of the proposed buildings from the internal road network (or within the open channel itself), vehicular access for maintenance trucks to allow safe inspection required and to periodically clean each tank has not been adequately accounted for in the design. Additional plans are required or existing plans should be updated to show how access will occur (ideally showing a hardstand area that will not block traffic). An OSD maintenance schedule is also required to identify frequency of maintenance, noting that the maintenance will need to be relatively frequent given the inclusion of water quality treatment cartridges within the OSD tanks to meet water sensitive urban design requirements (noting that it has not been demonstrated that the provisions of Chapter 6 of the *State Environmental Planning Policy (Biodiversity and Conservation) 2021* have been met).
- ***Hydrological assessment OSD representation*** – The OSD stage-storage arrangements adopted within the post-development DRAINS hydrological modelling appears to have oversimplified the multi-chamber approach. The JN Consulting OSD designs include five separate chambers, three of which are intended to provide detention (i.e. OSD Chamber, High Early Discharge (HED) Chamber

and the Outlet Chamber). The DRAINS modelling of the multi-chamber system has excluded the low-level outlet between the OSD Chamber into the HED Chamber. Furthermore, the separation between the HED Chamber and the Outlet Chamber has not been considered. The three chambers appear to have been inaccurately modelled as one combined chamber, rather than separate features with individual outlet controls. This may potentially underestimate the system discharge and therefore inaccurately represent the surface runoff into the proposed 'Channel Stabilisation' within Pioneer Park. This is not consistent with Clause 5.21 of the (THLEP, 2019) and it is recommended that additional modelling be completed to account for the individual chamber outlet controls.

I trust this review is of assistance. Should you have any queries or would like to discuss anything further, please do not hesitate to contact either myself or Lee Williams on 02 9098 6998.

Sincerely,

A handwritten signature in black ink, appearing to read "Louise Collier".

Louise Collier

B.E (Hons) M.Eng.Sc FIEAust CPEng NER

Director/Principal