MODIFICATION OF CONSENT REPORT – DA142/18 (MOD005/19), MODIFICATION TO STAGING TO THE ORIGINAL APPROVAL-1 LOT INTO 134 RESIDENTIAL LOTS, OPEN SPACE, DRAINAGE RESERVES, DEVELOPMENT LOT & NEW ROADS, 994 GREAT WESTERN HIGHWAY BOWENFELS

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1. PROPOSAL

Council is in receipt of a modification of development consent application (MOD005/19) for DA142/18 to seek amendment to Condition 2 relating to staging of the application. Water and Sewer Conditions may also need to be modified if the modification is approved.

Condition 2 on the original DA142/18 Consent states:

*2. This development consent is for a **staged approval** being six stages in total being:*
Stage 1= 1 development lot.
Stage 2= 29 residential lots, one drainage reserve and link road reserve to Col Drewe Drive.
Stage 3= 21 lots (and construction of link road to Col Drewe Drive).
Stage 4= 34 residential lots and one open space lot.
Stage 5= 27 lots.
Stage 6= 23 lots.

The Subdivision Certificate for Stage 1 is not to be released until a sewer connection is made available on Lot 4 DP 1230208.

Construction of Stage 3 is not to commence until a road link between James O'Donnell Drive and Col Drewe Drive is constructed, dedicated as a public road and open to traffic.

The applicant seeks to amend the staging involving the future development lot. The intention of Stage 1 is to separate the future development lot from the residential allotments and for it to be sold as an unserviced lot. The condition as it stands prevents subdividing Lot 2 until Council constructs the new sewer pump station on Lot 4 DP 1230208 and a carrier main is constructed up to Lot 2.

It is requested that the Condition 2 is modified to state that a Subdivision Certificate for Stage 2 is not to be released until a sewer connection is made available to Lot 4 DP 1230208.

The original application was approved by Council, for a 134 lot residential subdivision, one development lot, drainage reserve, open space and new roads.

The application will be assessed under Section 4.55 1(A) of the *Environmental Planning and Assessment Act 1979.*

2. SUMMARY

To assess and recommend determination of Section 4.55 Modification of Consent MOD005/19 of DA142/18. Recommendation will be for approval subject to conditions.

3. LOCATION OF THE PROPOSAL

Legal Description:	Lot 2 DP 1049398, Lot 5 DP1230208 and Lot 1 DP 1082148 (Sweetbriar)
Property Address:	994, 998 and Sweetbriar, Great Western Highway, Bowenfels

4. DETAILS OF CURRENT APPROVAL

DA142/18 was originally approved by Council on 29 October 2018, and permitted 134 lot residential subdivision, one development lot, drainage reserve, open space and new roads.

5. PERMISSIBILITY: The development was originally permissible in the zone under Council's LEP 2014 which indicates that a subdivision is permissible in the zone. This permissibility is not proposed to change as part of this modification.

5.1 POLICY IMPLICATIONS (OTHER THAN DCP's)

Policy 1.2 Acquisition and Disposal of Assets
This Policy needs to be considered when Council is considering the acquisition and/or development of assets. This Development Application proposes to construct bio-retention basins, stormwater infrastructure and roads. Two drainage reserves and new road networks will be dedicated to Council as an asset as part of the Subdivision Certificate release process.

This was part of the original approval and is not proposed to be modified or impacted upon by the proposed modification.

Policy 7.2 Subdivision – Release of Subdivision Plans
The proposed development, being for a subdivision, will require compliance with this Policy as part of the Subdivision Certificate release.

Policy 7.5 Notification of Development Applications
Council's Policy states:

3.5 Notification of an application for Modification of Development Consent (Section 4.55 of the EP&A Act
Council will not notify S4.55(1) and S4.55(1A) applications where the Development Assessment Officer is of the opinion that the application involves minimal environmental impact and is unlikely to prejudice any person(s) who were originally notified, any person(s) who previously made a submission or having regard to any matter raised in those submissions.

The modification is considered to be minor and would have no impact to the surrounding properties. Therefore the modification was not re-notified as per the above Policy.

7.7 Calling in of Development Applications or Development Application/Construction Certificates by Councillors
This policy does not apply to applications to modify development consents unless the modification represents a significant departure from the original application; would involve issues the subject of an objection with the original application; or where the modification application itself has been called in under the processes outlined in this policy.

The original development application DA142/18 was not called-in by Councillors however was reported to Council for determination on 29 October 2018, and permitted 134 lot residential subdivision, one development lot, drainage reserve, open space and new roads.

As the modification relates to Council's services and future infrastructure, the modification is to be determined at a Council Meeting.

Policy 7.10 Voluntary Planning Agreements
A planning agreement was made as part of the original application. There ae no implications for this modification.

5.2 FINANCIAL IMPLICATIONS

Planning Agreements
A planning agreement was made as part of the original application. The proposed modification will not impact upon the recuperation of finances from this agreement.

Water Management Act 2000
Under the Water Management Act 2000, Section 305, an application for Certificate of Compliance must be submitted to Council. This Act states:

(1) A person may apply to a water supply authority for a certificate of compliance for development carried out, or proposed to be carried out, within the water supply authority's area.
(2) An application must be accompanied by such information as the regulations may prescribe.

Therefore Council's Section 64 Contributions under the Local Government Act 1993 for water and sewer connections will be required to be paid prior to the Subdivision Certificate release for each stage.

This was conditioned on the original consent and is proposed to remain as a condition.

5.3 LEGAL IMPLICATIONS

5.3.2 Environmental Planning and Assessment Act 1979- Section 4.55 (1A)

(1A) ***Modifications involving minimal environmental impact***
A consent authority may, on application being made by the applicant or any other person entitled to act on a consent granted by the consent authority and subject to and in accordance with the regulations, modify the consent if:
(a) it is satisfied that the proposed modification is of minimal environmental impact, and
(b) it is satisfied that the development to which the consent as modified relates is substantially the same development as the development for which the

consent was originally granted and before that consent as originally granted was modified (if at all), and

(c) it has notified the application in accordance with:

(i) the regulations, if the regulations so require, or

(ii) a development control plan, if the consent authority is a council that has made a development control plan that requires the notification or advertising of applications for modification of a development consent, and

(d) it has considered any submissions made concerning the proposed modification within any period prescribed by the regulations or provided by the development control plan, as the case may be.

Subsections (1), (2) and (5) do not apply to such a modification.

Comment: Council is satisfied that the modification is of a minimal environmental impact. The modification is similar to what was previously approved, as it only relates to the staging of the future development lot and the sewer connections for that lot.

The Regulations do not require the notification of the modification and Council does not have a DCP requiring the notification of the application. Further the modification is considered to be of a minor nature and will not impact on any nearby residents.

The development was referred to Council Water and Sewer Officer for comment. These comments are found later in this report.

Any Environmental Planning Instruments

Lithgow Local Environmental Plan 2014

The original application was assessed in accordance with the provisions of Lithgow's Local Environmental Plan 2014, and was found to be compliant. The modification does not require any further assessment under the LEP.

State Environmental Planning Policies

The original application was assessed in accordance with the provisions of the relevant SEPP's, and was found to be compliant. The modification does not require any further assessment under any SEPP.

Any draft environmental planning instrument that is or has been placed on public exhibition and details of which have been notified to the consent authority

Nil.

Any Development Control Plan

At the time of submission of the Development Application, no Development Controls Plans were in force. However, a previously repealed DCP, South Bowenfels DCP has been applied as a guideline for design purposes and consistency of assessments across the South Bowenfels development areas. An assessment of this proposal against those guidelines was assessed as part of the original assessment and was found to be compliant. The modification does not require any further assessment under the DCP.

Any planning agreement that has been entered into under Section 7.4, or any draft planning agreement that a developer has offered to enter into under Section 7.4?

A planning agreement was made as part of the original application. The proposed modification will not impact upon the recuperation of finances from this agreement.

Any matters prescribed by the regulations that apply to the land

The original application was assessed in accordance with the provisions of the Regulations, and was found to be compliant. The modification does not require any further assessment under the Regulations.

The likely impacts of that development, including environmental impacts on both the natural and built environments, and social and economic impacts in the locality

The original application assessed the likely impacts of the development and was found to be satisfactory. As the modification relates to staging and the timing of sewer connections service impacts were assessed as per the following:

Services: The Statement of Environmental Effects states that the purpose of the subdivision is not for residential development but for the sale of part of the land to facilitate further development in the area. As the servicing requirements for future developments and the design of future developments are unknown at this point, it is requested that conditions relating to service connections not be included in the conditions of consent.

The modification was referred to Council's Water and Sewer Officer for comment. It was recommended that condition 2 is amended to the following:

2. This development consent is for a **staged approval** being six stages in total being:
Stage 1= 2 Lots, to be unserviced.
Stage 2= 29 residential lots, one drainage reserve and link road reserve to Col Drewe Drive.
Stage 3= 21 lots (and construction of link road to Col Drewe Drive).
Stage 4= 34 residential lots and one open space lot.
Stage 5= 27 lots.
Stage 6= 23 lots.

A Subdivision Works Certificate for Stage 2 is not to be released until the matter/s referred to in Condition 61 of this consent are satisfied.

Construction of Stage 3 is not to commence until a road link between James O'Donnell Drive and Col Drewe Drive is constructed, dedicated as a public road and open to traffic.

It is proposed that a covenant be placed on the title of Lot 1 stating that any future development cannot commence until such time that the land is connected to Council's utilities.

Conditions will be placed on the consent that a Section 68 application is required for water and sewer services to be connected for future developments. The original water and sewer conditions will remai9n on the consent.

The Suitability of the site for the development

The original application was assessed in terms of site suitability and was found to be suitable. The modification does not require any further assessment of suitability.

Any submissions made in accordance with this Act or the Regulations

Given that the proposed amendment is for the staging and servicing of the future development lot the modification is considered to be minor and does not require re-notification or determination by the elected Council. The development was however re-referred to Council's Water and Sewer Officer for comment. These comments are found below:

COUNCIL'S WATER AND SEWER OFFICER

Council's Water and Sewer Officer has no objection to the modification subject to the following amended Condition 2

2. This development consent is for a **staged approval** being six stages in total being:
Stage 1= 2 Lots, to be unserviced.
Stage 2= 29 residential lots, one drainage reserve and link road reserve to Col Drewe Drive.
Stage 3= 21 lots (and construction of link road to Col Drewe Drive).
Stage 4= 34 residential lots and one open space lot.
Stage 5= 27 lots.
Stage 6= 23 lots.

A Subdivision Certificate for Stage 2 is not to be released until the matter/s referred to in Condition 61 of this consent are satisfied.

Construction of Stage 3 is not to commence until a road link between James O'Donnell Drive and Col Drewe Drive is constructed, dedicated as a public road and open to traffic.

The public interest

The original application was assessed in terms of the public interest. The proposed modification does not change whether the development is within the public interest.

6. DISCUSSION AND CONCLUSIONS

The application has been thoroughly assessed under Section 4.55 1(A) of the *Environmental Planning and Assessment Act 1979* and is appropriate for recommendation of approval subject to conditions.

7. ATTACHMENTS

Schedule A- Conditions of consent.

8. RECOMMENDATION

THAT the Section 4.55 Modification of Consent application MOD005/19 associated with DA142/18 be approved subject to the following amended and additional conditions:

1. That the development be carried out in accordance with the application, **Modification of Development Consent (MOD 005/19)** Statement of Environmental Effects, accompanying information, plans listed in the approval and any further information provided during the process unless otherwise amended by the following conditions.

-Amended as per MOD005/19

2. This development consent is for a **staged approval** being six stages in total being:
Stage 1= 2 Lots, to be unserviced.
Stage 2= 29 residential lots, one drainage reserve and link road reserve to Col Drewe Drive.
Stage 3= 21 lots (and construction of link road to Col Drewe Drive).
Stage 4= 34 residential lots and one open space lot.
Stage 5= 27 lots.
Stage 6= 23 lots.

A Subdivision Certificate for Stage 2 is not to be released until the matter/s referred to in Condition 61 of this consent are satisfied.

Construction of Stage 3 is not to commence until a road link between James O'Donnell Drive and Col Drewe Drive is constructed, dedicated as a public road and open to traffic.

-Amended as per MOD005/19

11 An application shall be submitted to Council for the supply of a Certificate of Compliance under Section 305 of the Water Management Act for each Stage. A Subdivision Certificate shall not be issued until such time as the contributions applicable to release the Certificate of Compliance are paid in full to Council. Each Stage requires payment for the following allotments created being: Stage 1= 1 **2 lots**, Stage 2= 29 lots, Stage 3= 21 lots, Stage 4= 34 lots, Stage 5=27 lots and Stage 6= 23 lots. as The rate of contribution per lot/ET is $2,921 for water and $14,213 for sewer set by *Lithgow City Council Development Servicing Plan for water supply and sewerage, August 2018* or the rate adopted in any subsequent Development Servicing Plan, annually adjusted for CPI (Sydney) applicable at the time of payment.

-Amended as per MOD005/19

15a. A covenant is to be placed on the title of Lot 1 stating that any future development cannot commence until such time that the land is connected to Council's utilities.

-Additional as per MOD005/19

Report prepared by: Supervisor:……

Dated:…… …….Dated:……

Signed:……Signed:…….

REASONS FOR CONDITIONS
The conditions in Schedule A have been imposed for the following reasons:

- To ensure compliance with the terms of the relevant Planning Instruments
- To ensure no injury is caused to the existing and likely future amenity of the neighbourhood
- Due to the circumstances of the case and the public interest.
- To ensure that adequate road and drainage works are provided.
- To ensure that satisfactory arrangements are made to satisfy the increased demand for public recreation facilities.
- To ensure access, parking and loading arrangements will be made to satisfy the demands created by the development.
- To protect the environment.
- To prevent, minimise, and/or offset adverse environmental impacts.
- To ensure lots are adequately serviced.
- To ensure there is no unacceptable impact on the water quality.
- To ensure compliance with the requirements of the Rural Fire Services.
- To ensure adequate soil conservation and protect against movement of soil and sediments.

Schedule A

Conditions of Consent (Consent Authority) and General Terms of Approval (Integrated Approval Body) ***(delete highlighted if not integrated)***

Please Note: It should be understood that this consent in no way relieves the owner or applicant from any obligation under any covenant affecting the land.

ADMINISTRATIVE CONDITIONS

1. That the development be carried out in accordance with the application, **Modification of Development Consent (MOD 005/19)** Statement of Environmental Effects, accompanying information, plans listed in the approval and any further information provided during the process unless otherwise amended by the following conditions.

   -Amended as per MOD005/19

2. ~~This development consent is for a staged approval being six stages in total being:~~
   ~~Stage 1= 1 development lot.~~
   ~~Stage 2= 29 residential lots, one drainage reserve and link road reserve to Col Drewe Drive.~~
   ~~Stage 3= 21 lots (and construction of link road to Col Drewe Drive).~~
   ~~Stage 4= 34 residential lots and one open space lot.~~
   ~~Stage 5= 27 lots.~~
   ~~Stage 6= 23 lots.~~

   ~~The Subdivision Certificate for Stage 1 is not to be released until a sewer connection is made available on Lot 4 DP 1230208.~~

   ~~Construction of Stage 3 is not to commence until a road link between James O'Donnell Drive and Col Drewe Drive is constructed, dedicated as a public road and open to traffic.~~

   This development consent is for a **staged approval** being six stages in total being:
   Stage 1= 2 Lots, to be unserviced.
   Stage 2= 29 residential lots, one drainage reserve and link road reserve to Col Drewe Drive.
   Stage 3= 21 lots (and construction of link road to Col Drewe Drive).
   Stage 4= 34 residential lots and one open space lot.
   Stage 5= 27 lots.
   Stage 6= 23 lots.

   A Subdivision Certificate for Stage 2 is not to be released until the matter/s referred to in Condition 61 of this consent are satisfied.

   Construction of Stage 3 is not to commence until a road link between James O'Donnell Drive and Col Drewe Drive is constructed, dedicated as a public road and open to traffic.

   -Amended as per MOD005/19

3. That the a Subdivision Certificate Application, release fee, Registered Surveyors Plans (original & 11 copies) along with associated 88B instrument if applicable, be submitted to Council for finalisation following the compliance with all conditions of this consent.

4. No coal burning appliances are to be installed on the residential allotments. A restrictive covenant shall be placed on each lot created through an 88(b) Instrument of the *Conveyancing Act 1919* with Council having the right to vary, modify or release this restriction.

5. 2.08ha of land is to be dedicated to Council as open space/public reserve prior to the issue of the Subdivision Certificate for stage 4.

6. A street tree planting plan is to be submitted to Council and approved for the overall subdivision prior to Subdivision Certificate release of Stage 1. The street trees are to be implemented within each stage prior to Subdivision Certificate release of those stages respectively.

7. A street lighting plan is to be provided with adequate street lighting in accordance with AS/NZS and be to the satisfaction of the relevant electricity supplier prior to release of Stage 1. Such lighting shall have regard to its visual impact and be designed to complement the streetscape. Street lighting is to be implemented for each stage prior to the Subdivision Certificate Release of each stage respectively.

Utilities

8. The applicant shall consult with an Authorised telecommunications, Electricity and Gas Authorities for the provision of telephone, electricity and gas to each allotment. Confirmation of connection to each allotment or a 'Notification of Arrangement' shall be lodged from each authority, with Council prior to the issue of a Subdivision Certificate.

9. Prior to the issue of the Subdivision or Construction Certificate in connection with a development, the developer (whether or not a constitutional corporation) is to provide evidence satisfactory to the Certifying Authority that arrangements have been made for:
   (i) the installation of fibre-ready facilities to all individual lots and/or premises in a real estate development project so as to enable fibre to be readily connected to any premises that is being or may be constructed on those lots. Demonstrate that the carrier has confirmed in writing that they are satisfied that the fibre ready facilities are fit for purpose.

   and

   (ii) the provision of fixed-line telecommunications infrastructure in the fibre-ready facilities to all individual lots and/or premises in a real estate development project demonstrated through an agreement with a carrier.

   Note: real estate development project has the meanings given in section 372Q of the Telecommunications Act.

Voluntary Planning Agreement

10. That the Voluntary Planning Agreement (VPA) be endorsed by all parties as proposed by Voerman & Ratsep Land Surveyors on 04/06/2018 prior to the Subdivision Certificate release of Stage 1. Additionally, the contribution agreed to within the VPA is to be paid at a rate of $6200.00 per lot for community facilities ($6000) and public open space ($200) prior to the Subdivision Certificate release of each stage. The dedication of the open space is to be undertaken prior to the Subdivision Certificate release of stage 4.

Section 64 Contributions

11. An application shall be submitted to Council for the supply of a Certificate of Compliance under Section 305 of the Water Management Act for each Stage. A Subdivision Certificate shall not be issued until such time as the contributions applicable to release the Certificate of Compliance are paid in full to Council. Each Stage requires payment for the following allotments created being: Stage 1= ~~1~~ **2 lots**, Stage 2= 29 lots, Stage 3= 21 lots, Stage 4= 34 lots, Stage 5=27 lots and Stage 6= 23 lots. as The rate of contribution per lot/ET is $2,921 for water and $14,213 for sewer set by *Lithgow City Council Development Servicing Plan for water supply and sewerage, August 2018* or the rate adopted in any subsequent Development Servicing Plan, annually adjusted for CPI (Sydney) applicable at the time of payment.

-Amended as per MOD005/19

Environmental Protection

12. Prior to the issue of the Subdivision Certificate, Council is to be provided with a report from Upper Macquarie County Council indicating:
    - Noxious plants are under adequate management; or
    - Noxious plant management has been undertaken and adequate control measures are in place; or
    - Noxious plants are not a concern for the property

    A vegetation management plan (VMP) over proposed lot 236 shall be prepared by a suitably qualified person to accord with the *DPI –Office of Water – Guidelines for vegetation management plans on waterfront land* or other equivalent document is to be submitted to Council prior to the issue of the Subdivision Certificate for Stage 1.

    The applicant is to implement the recommendations of that plan during construction of the remaining stages of development prior to the final dedication of those lands to Council.

    The applicant is to pay a maintenance bond to ensure compliance of this condition. The bond amount is to be agreed to by Council and the proponent prior to the release of Stage 1 Subdivision Certificate based on a cost estimate to be provided by the applicant. Council will routinely inspect the site to monitor compliance and at the completion of the bond period. If work is deemed to be either outstanding or defective in any way Council reserves the right to expend the bond monies on rehabilitation work.

WATER AND WASTEWATER REQUIREMENTS

13. Section 68 Approval is required for all Water and Sewer works prior to release of the Construction Certificate. Each stage will require a separate Section 68 Approval for construction.

14. All lots to connect to a gravity sewer reticulation system. This will coincide with the construction of new sewerage pump station to service this area in accordance with Councils Development Services Plan and the West Bowenfels Sewerage Strategy.

15. The applicant shall provide a full Water and Sewer Design Plan for approval prior to the release of the Construction Certificate/Subdivision Works Certificate. Design to include, longitudinal sections for each main, minimum depth and cover, maximum depth, grade, chainage, inverts, size, depths, manholes, manhole numbers, manhole depths, pipe velocity, proposed material and positions of junctions and dead ends for all Lots.

15a. **A covenant is to be placed on the title of Lot 1 stating that any future development cannot commence until such time that the land is connected to Council's utilities.**

-Additional as per MOD005/19

ENGINEERING REQUIREMENTS

16. A Construction Certificate must be obtained prior to the commencement of any Civil Works.

17. Plans are to be lodged to Council for the issue of a Construction Certificate prior to the commencement of any Civil Works.

18. All engineering works are to be to the standard specified in Council's "Guidelines for Civil Engineering Design and Construction for Development". This document is available on Council's website or upon request from Council's administration desk.

19. That a Geotechnical Report be provided for all proposed roads, including subgrade design prior to a Construction Certificate being issued. Geotechnical compaction tests and visual deflection tests are to be undertaken and to be approved by Council prior to the application of seal. Such tests are to be included with the Construction Certificate Engineering Drawings.

20. The road crossfall must not exceed a maximum of 3% at any point.

21. The footpath and shared path crossfall must not exceed a maximum of 4% at any point.

22. All batters must not exceed a maximum gradient of 1:5.

23. The road grade must not exceed a maximum of 12% at any point. All internal roads shall have a minimum of 150mm (subject to testing) of DGB-20 road base applied and compacted providing a smooth transitional surface. The road surface is to be constructed to an 8m wide carriageway formation within a 15m wide minimum road reserve, an 11m wide carriageway formation within an 18m wide minimum road reserve and a 13m wide carriageway formation within a 20m wide minimum road reserve.

24. All internal residential roads are to be surfaced with a minimum 40mm thickness of Asphaltic Concrete (AC) laid upon a sprayed bituminous prime coat, designed in accordance with the RTA publication “Sprayed Sealing Guide”. Layers of asphaltic concrete may be included in the total design pavement depth, but should not be assigned a layer equivalency of greater than unity. Where variation to this condition is required, approval may be granted subject to discussion with Council.

25. All cul-de-sacs/turning circles are to be surfaced with a minimum 40mm thickness of Asphaltic Concrete (AC) laid upon a sprayed bituminous prime coat, designed in accordance with the RTA publication “Sprayed Sealing Guide”. Cul-de-sacs/turning circles are to be constructed so that a minimum kerbline radius of 9.5 metres is achieved from the centre of the cul-de-sac/turning circle. The boundary of the road reserve should be curved with a minimum radius of 14 metres to provide for a 4.5 metre wide footpath. Where the head of the cul-de-sac is located on the low side of the road, special provision should be made to convey overland storm water flows through easements or drainage reserves.

26. Roll top kerb and guttering is to be provided on both sides of all internal roads. Where a road borders onto an open space area integral kerb and gutter is to be constructed. Gutter crossovers are to be constructed to provide access to the open space area with a removable bollard installed to prevent unauthorized access. The location of gutter crossovers is to be determined in consultation with Council’s Development Engineer.

27. 2 x 3.5m wide footways are to be provided adjacent to all internal roads. Footpaths must continue to all intersections.

28. Street signs are required at all road junctions. Signs shall be purchased from Council. The location of proposed street signs is to be shown on the Engineering Drawings submitted with the construction certificate.

29. Traffic signs, traffic signals, pavement markings, guide posts, delineators, safety barriers and the like, whether permanent or temporary, are to be designed and installed at all roads in accordance with guidelines contained within the Austroads publication, “Guide to Traffic Engineering Practice – Part 8: Traffic Control Devices”, Australian Standard 1742 – Manual of Uniform Traffic Control Devices and the Roads and Traffic Authority “Road Design Guide”. All traffic control devices and signage are to be detailed in the engineering drawings submitted with the construction certificate. The consent of Lithgow City Council’s Executive Manager of Operations or appointed officer will be required prior to the installation of any traffic control

devices on existing roads.

30. Two street trees per lot are to be planted within the road reserve. The developer shall consult with and seek approval from Council regarding the species to be used. Only non-frangible trees, having a mature diameter of less than 100mm, shall be planted near road verges and medians. A landscaping plan showing, but not limited to, plant species and estimated height and spread of mature trees is to be provided to Council with the construction certificate.

31. Street lighting shall be provided on all internal access roads in accordance with Australian Standard 1158 – Road Lighting. Energy absorbing columns may be required where fallen columns would be particularly hazardous. The use of energy-saving lighting fixtures is encourages, however no rebate will be issued to the developer if these types of lamps are approved.

32. A fully certified traffic control plan and road works signage will be required where machinery may obstruct traffic on any Public Road whilst construction work is being undertaken. A traffic control plan and certification of fully qualified contractors/persons will be required to be submitted to Council prior to any work commencing on the shoulder of any Public Road. Failure to comply may result in Work Cover Intervention and may also include Council stopping all work immediately until such time the developer complies with suitable traffic management procedures.

33. A maintenance bond of 5% of final construction costs shall be paid to Council upon final inspection and approval of all civil works. The value of the maintenance bond shall be approved by Council after witnessing a certified copy of the contract documentation showing all civil construction costs for the subdivision. The maintenance period will start from the date of final inspection for a period of 12 months. At the conclusion of the 12 month period a final inspection is to be undertaken by Council at the request of the developer to determine if any defects have arisen during this time. All deficiencies are to be rectified by the developer, should outstanding works remain Lithgow City Council reserves the right to expend bond monies on rectification works.

34. A site investigation is to be performed which is to include logging of test holes to a depth not less than one metre below design subgrade levels (unless rock is encountered). Soil tests shall be taken at the design depth and samples taken for CBR testing in accordance with Australian Standard 1289. The design California Bearing Ratio (CBR) shall be selected following a careful assessment of the materials encountered in the site investigation and the variability of subgrade moisture and density conditions likely in service. The design CBR value should assume poor drainage and shall be determined from soaked CBR. A copy of the site investigation, including test results, is to be included with the Engineering Drawings. Where the design subgrade CBR is below 3, the subgrade shall be chemically stabilised to a minimum depth of 150mm, and the pavement design based on a CBR of 3.

35. Each layer of pavement shall be tested for compaction and deflection as detailed below. The Executive Manager of Operations or his delegate must approve each layer prior to the placing and compaction of subsequent layers.

    (a)Compaction Testing:

    The subgrade, and all pavement layers, shall be density tested in-situ at the start and finish of the work (within the first/last five metres), and thereafter at intervals of no more than 50 metres, or as indicated by Council's Development Engineer. A minimum of two tests will be required for road pavements less than 50 metres in length. At cul-de-sacs, additional testing will be required at the turning head. The test sites selected should be representative of the likely minimum pavement compaction levels achieved. Density testing must be undertaken by an authorised representative

of a laboratory registered by the National Association of Testing Authorities (NATA). Density testing may be conducted using either the sand replacement test, nuclear gauge, or other NATA approved method.

Where a nuclear gauge in direct transmission mode is used to determine pavement density, the test method shall comply with RTA Test Method T173. Results of density testing shall be forwarded directly to Council for approval. No pavement layer shall be covered by a subsequent layer until the results of the density testing have been delivered to and approved by Council's Development Engineer. Table 1 below sets out the minimum compaction requirement for each pavement layer.

Layer	Compaction Requirement	Standard
Subgrade	98% standard maximum dry density California Bearing Ratio (CBR) test	AS 1289.E1.1 AS 1289.F1.1
Sub-Base	100% standard maximum dry density	AS 1289.E1.1
Base	100% standard maximum dry density • *Unbound Materials* • *Cemented Materials* Density in place test California Bearing Ratio (CBR) test	 AS 1289.E2.1 AS 1289.E3.1 AS 1289.E3.1 AS 1289.F1.1

Laboratory determination of maximum dry density for pavement materials which have been modified with cement must be undertaken within 4 hours of the cement being added to the material. Materials tested outside this time will be subject to an adjustment to correctly determine the maximum dry density of the sample. For either natural or modified material, the laboratory determination of maximum dry density shall be undertaken at a frequency of no less than one determination for each days production of material.

(b)Deflection Testing:

All pavement layers must be proof-rolled, and approved by Council's Development Engineer prior to the placement of subsequent pavement layers.

The proof-rolling will be conducted using either:

(i) a roller having a load intensity of seven (7) tonnes per metre width of roller.

(ii) a tandem axle rigid vehicle, having a maximum load of 15 tonnes per axle group (8 tyres), 12 tonnes per axle group (6 tyres), or 10 tonnes per axle group (4 tyres). Single axle vehicles should have maximum loads of 8.5 tonnes (dual tyres), or 5.4 tonnes (single tyres).

Any movement of the pavement layer under loading will be deemed a failure.

Although not a subdivision requirement at this stage, Council strongly encourages Developers to specify in their contracts the use of Benkelman Beam tests to test for any deflection in the pavement layers, and as a means of quality assurance.

(c) Final Road Profile:

(i) The mean construction tolerance on pavement surface crossfalls should be within ±5% of the design crossfall. The maximum allowable construction tolerance is ±5%, and the maximum standard deviation of crossfalls is 5%.The vertical alignment should not deviate by more than 25mm from the value shown on the drawings.

36. All road, drainage, kerb and gutter, water and sewerage reticulation works associated with a development shall be inspected by Council's Operations Department. The whole of the works are to be carried out to the satisfaction of the Executive Manager of Operations. Council shall inspect engineering works at the following stages as a minimum:

- Following site regrading and shaping, and prior to installation of footway services;
- Installation of erosion and sedimentation control measures;
- Storm water drainage lines prior to backfill;
- Water and sewer lines prior to backfill;
- Testing of water and sewer lines;
- Subgrade preparation, before placing pavement;
- Establishment of line and level for kerb and gutter placement;
- Completion of each pavement layer ready for testing;
- Road pavement surfacing;
- Completion of works

The developer or contractor shall give Council a minimum 24 hours' notice when requesting an inspection to ensure that development works are not delayed. The developer shall, if required by a Council Engineer, submit delivery dockets for all materials used, and all material and performance test results obtained in the development.

37. Works as Executed (WAE) Plans detailing all services and infrastructure are to be prepared by a registered surveyor or professional engineer, and submitted to Council. The WAE plans shall be lodged prior to the release of the linen plan. The applicant is required to submit three complete sets of hard copy plans (one A1-sized, two A3-sized) and one set of electronic plans in AUTOCAD format.

38. A "Work-As-Executed" (WAE) plan is required to be prepared by a Registered Surveyor or professional engineer and forwarded to Council prior to the final inspection. The WAE is to include, as a minimum:
    - certification that all works have been completed generally in accordance with the approved plans and specification,
    - any departure from the approved plans,
    - any additional/deleted work,
    - the location of conduits, subsoil lines, stub mains and inter-allotment drainage lines,
    - pipeline long sections showing the constructed invert levels of each pipe at each pit and pipe dimensions,
    - details of overland flow provisions,
    - site regrading areas by new contours, and
    - all other details which have a bearing on the extent of works and their acceptance by Council.

39. All Engineering Drawings submitted to Council for approval are to have a title block showing the following:
    - Applicant's Name,
    - Consultant's Name, Address, Phone No. and Contact Name,
    - Drawing Number, Sheet Number and Amendment Number,
    - Schedule showing Date and Nature of Amendments,
    - Site Address, including Lot and Deposited Plan (DP) Number,
    - Council's File Reference,
    - Stage Number,
    - Drawing Title,
    - Scale with Scale Bar, and
    - Signature of Authorised Person

40. Construction noise shall be in accordance with the 'Noise Control Guidelines for Construction Noise Standards'. Hours of operation shall be permitted between 7am and 6pm Monday to Friday and 8am and 1pm Saturdays. No heavy machinery work or usage shall be permitted on Sundays or Public Holidays.

41. The applicant shall submit a soil erosion and sedimentation control plan with the engineering design for Council approval. Such shall address both short and long term management of all disturbed areas and specified methods and structures to be employed to minimise any impact.

42. Prior to and during the commencement of works the applicant shall erect soil erosion and sedimentation controls for the following purposes:
- control of soil erosion and sedimentation movement during the bulk earthworks stage,
- control of run off and diversion of the sedimentation trap prior to the development of land,
- method of stabilising the land from erosion and sediment movement after the completion of works and prior to the development of the land.

43. The applicant is to comply with all reasonable requests from Council with regard to any complaints received during construction works.

44. The following conditions apply to Stormwater Drainage design and construction:

a) Stormwater Drainage plans shall submitted to Council as part of the construction certificate, drawn at a scale sufficient to show all necessary details, nominally 1:200, 1:500, 1:1000 or 1:2000. The following data is to be included with a contoured catchment area plan:
   i. Catchment areas and sub-areas, watershed (catchment boundary), overland flow paths, existing and proposed pipe layout. For large catchments, the total catchment area should be shown at a large scale on a separate plan or inset.
   ii. All sub-areas, drainage lines and pits are to be logically numbered.
   iii. A schedule of pipe details, including pipe number, size, class, bedding type, joint type, invert levels at inlet and outlet, slope, and length.
   iv. A schedule of pit details, including pit number, type, road chainage, surface level to the Australian Height Datum (AHD), invert level to AHD, depth, and lintel length.
   v. North point and legend.
   vi. Setout information.
   vii. Accurate position and level of all services and utilities which cross underground drainage pipelines.
   viii. Identify those building allotments adjacent to channels and major storm flow paths which may be liable to flooding in major flood events, and the minimum design habitable floor level adjacent to prevent flooding in the design flood event.
   ix. Inlet and outlet treatments.
   x. Measures for the prevention of erosion and sedimentation.

b) Stormwater pit construction:
   i. Pits shall be provided in drainage lines at all changes in grade, level, and direction, and at all pipe junctions and shall be spaced at no more than 85m apart.
   ii. Drainage pits are to conform to Council's standard Drawings, or RTA standards for Classified Roads. Non-standard structures shall be constructed as detailed in the design drawings. Such designs shall comply with AS3600 –Concrete Code, AS4100 – Steel Structures, AS1657 – SAA code for fixed platforms, walkways, stairways and ladders; and any other relevant standard.
   iii. Pits used for storm water drainage shall be fitted with square lids to distinguish them from sewer manholes.
   iv. Junction pits shall be fitted with reinforced lids and approved lifting eyes.
   v. Grated inlet pits shall not be used for street or roadway drainage.

vi. Precast pits, incorporating insitu bases, may be used if the prior approval of the pit type and design are approved by the Group Manager of Operations.
vii. Every endeavour shall be made to maintain flow velocities through pits. Excessive drops will not be permitted.
viii. Pipe grading across pits should be designed on the following basis:
- No change in direction or diameter - minimum 50mm;
- Direction change but no change in diameter - minimum 70mm;
- Changes in pipe diameter should be graded from obvert to obvert;

ix. At pit connections, a 3 metre length of approved subsoil drainage pipe enclosed in a geofabric sock shall be placed alongside the main pipe so as to enter the pit at the same invert level and adequately drain the main trench, in accordance with Council's standard drawing EN 1016 (copy attached).

c) Location of pits in roadways, for the adopted minor drainage system annual exceedance probability:
i. Inlet pits shall be located so as to restrict the maximum gutter flow width to 2.5 metres.
ii. Maximum spacing between any two consecutive pits is 85 metres.
iii. Pit bypass flows should be limited to 15% of the gutter flow at that location.
iv. At intersections, kerb inlet pits shall be constructed adjacent to the upstream kerb return tangent point where flows exceed 20 litres per second or gutter flow width is more than 1 metre.
v. The minimum clearance from the top of the manhole to the design pit water level should be 150mm.
vi. The product of flow velocity and depth of flow in the kerb and gutter should not exceed 0.4 m2/s.
vii. Kerb inlet pits should be located clear of horizontal curves, pedestrian desire lines, and vehicle driveways.
viii. Inlet conditions shall be designed so that the potential for blockage by silt and debris is minimised. This may require special treatment of the inlet sump under some conditions.

d) Hydraulic Design
i. Pit inlet capacities shall be estimated from design charts and formulae, based on lintel size for on-grade pits and depth of ponding for sag pits. The calculated inlet capacity shall be reduced by a factor of 50% for sag pits, and 20% for on-grade pits, on the assumption that debris is preventing some inflow.
ii. Standard lintel sizes of 1.8, 2.4, 3.0, or 3.6 metres should be used when possible.
iii. The minimum internal lintel size on a sag should be 2.4 metres.
iv. The head loss through pits shall be determined from Missouri Charts or other recognised methods.

45. Prior to the release of the stage 3 sub-division certificate (prior to release of the 31st allotment) a linkage road is to be constructed linking Col Drewe Drive to James O'Donnell Drive. The road is to be constructed to collector road standard as defined in Council's 'Guidelines for Civil Engineering Design and Construction for Development'. Conditions 15 – 23, 25, 42 and 43 are to be met during the design and construction of the linkage road.

46. James O'Donnell Drive is to be upgraded to a Collector Road standard as defined in Council's 'Guidelines for Civil Engineering Design and Construction for Development' for the full length within the development (existing kerb and gutter to the Great Western Highway). This includes a carriageway width of 11m, roll top kerb and gutter and a properly designed stormwater drainage system.
a. Engineering Plans for the full upgrade are to be submitted prior to the release of the Stage 2 subdivision certificate

b. The section of James O'Donnell Drive fronting lots 115 to 120 is to be fully upgraded prior to the release of the Stage 2 subdivision certificate.
c. The remaining section of James O'Donnell Drive through the development is to be fully upgraded prior to the release of the Stage 4 subdivision certificate.

47. The engineering designs of Bio-Retention 1 & 2 must be consistent with Water by Design, 2014, "Bio-Retention Technical Design Guidelines", Healthy Waterways Ltd, Brisbane. The designs must incorporate an impermeable liner when located in close proximity to Sewer and/or Water infrastructure. In coordination with the engineering designs an Operational and Maintenance Plan for the assets is to be developed and submitted to Council for approval.

48. Bio-Retention Basin 1 is to be constructed to sedimentation basin stage prior to the release of the subdivision certificate for stage 2. The asset is to be handed over to Council at this stage. The following conditions must be met prior to asset handover:
a) Certification that the asset has been constructed in accordance with approved plans
b) Work as executed drawings and engineering certifications have been provided
c) All required sediment and water management controls as outlined in the soil and water management plan are in place and functioning as intended
d) Details of any incidents including Work Health and Safety incidents, public safety and complaints received are documented and provided to Council
e) Any required maintenance and security bonds have been received as detailed in condition 49.

49. Bio-Retention Basin 2 is to be constructed to sedimentation basin stage prior to the release of the subdivision certificate for Stage 4. The asset is to be handed over to Council at this stage. The following conditions must be met prior to asset handover:

a) Certification that the asset has been constructed in accordance with approved plans
b) Work as executed drawings and engineering certifications have been provided
c) All required sediment and water management controls as outlined in the soil and water management plan are in place and functioning as intended
d) Details of any incidents including Work Health and Safety incidents, public safety and complaints received are documented and provided to Council
e) Any required maintenance and security bonds have been received as detailed in condition 49.

50. The following stormwater asset maintenance and security bonds are required prior to asset handover:
a) Bio-Retention Basins –A bond totalling the cost to complete the Bio-Retention Basin construction and expected maintenance costs for a 2 year maintenance period are to be provided to Council prior to asset handover.

The Bio-Retention Basins are to be completed once the level of development in the catchment has reached 90%. The Bio-Retention Basin construction security bond will be returned to the developer after full construction of the asset.

51. Legal access is to be maintained to the Bio-Retention Basins through all stages of the development. Prior to the stage 1 subdivision certificate release details of proposed access to Bio-Retention Basin 2 is to be provided to Council for approval.

52. The upgrade of the existing footpath along James O'Donnell Drive to a shared path standard is to occur in conjunction with staged upgrade of James O'Donnell Drive to a Collector Road standard. The developer should also take into consideration the required staging for the upgrades to power and how this will relate to the shared path. The existing footpath is to be upgraded in accordance with Council's standard engineering drawing EN1009. Council's

standard drawings are available on Council's website. The shared path width is to be a minimum of 2.5m.

53. The construction of the new shared path is to be staged in accordance with the staging plan and is to be constructed in accordance with Council's standard engineering drawing EN1009.

ROADS AND MARITIME (RMS) REQUIREMENTS

54. Prior to the issuance of a subdivision certificate for/or including, the thirtieth (30th) allotment, the following road works are to be completed:

    - A road link between the proposed subdivision and Col Drewe Drive is to be constructed, dedicated as a public road and open to traffic.

    - Right turn and cross flow vehicular movements from Rabual Street and James O'Donnell Drive into and/or across the Great Western Highway are to be prevented by way of signage and concrete islands.

55. A formal agreement in the form of a Works Authorisation Deed (WAD) is required between the developer and Roads and Maritime for the developer to undertake "private financing and construction" of any works on the Great Western Highway. This agreement is necessary for works in which Roads and Maritime has a statutory interest.

56. Prior to the commencement of road construction works, the proponent is to contact Roads and Maritime's Field Traffic Manager to determine if a Road Occupancy Licence (ROL) is required. In the event that an ROL is required, the proponent is to obtain the ROL prior to works commencing within three (3) metres of the travel lanes on the Great Western Highway.

WATERNSW REQUIREMENTS

General

57. The lot layout, staging and subdivision works shall be as per the Statement of Environmental Effects (dated 30 May 2018); a letter to Council (dated 17 September 2018) and shown on the Proposed Lot Layout Plan and the Staging Plan (both Job Ref: 16084; both Rev 1; both dated 17.09.2018) and Soil and Water Plan (Job Ref: 16084; Rev 1; dated 14.08.2018), all prepared by Voerman & Ratsep Land Surveyors. No revisions to lot layout or staging of the subdivision that will impact on water quality, shall be permitted without the agreement of Water NSW.

Reason for the above Condition - Water NSW has based its assessment under State Environmental Planning Policy (Sydney Drinking Water Catchment) 2011 on this version of the subdivision.

Subdivision Roads

58. The subdivision roads shall be located and constructed as shown on the Proposed Lot Layout Plan prepared by Voerman & Ratsep Land Surveyors (Job Ref: 16084; Rev 1; dated 17.09.2018), but with the following specifications and requirements:
    - be sealed and otherwise constructed in accordance with Council's engineering standards, and
    - incorporate a suitable crossfall with runoff to be collected via a series of pits and pipes and directed to various water quality treatment measures detailed in the following conditions.

59. All stormwater structures and drainage works associated with the proposed subdivision roads shall be wholly included in the road or drainage reserve or within suitably defined easements.

60. An assessment of the proposed road upgrades to James O'Donnell Drive shall be undertaken **prior to issuance of a Construction Certificate for Stage 2 of the subdivision** to assess whether the existing pipe culverts are adequately sized or need upgrade to transfer

stormwater runoff from the proposed Stages 4, 5 and 6.

Reason for the above Conditions – To ensure that the proposed subdivision roads and associated infrastructure will have a sustainable neutral or beneficial impact on water quality during the operational phase of the development.

Sewage Pumping Station

61. **No Construction Certificate** for the subdivision shall be issued until appropriate design and specifications for the sewage pumping station and associated infrastructure have been prepared and finalised.

Reason for the above Condition – To ensure that the wastewater from the proposed subdivision will be managed in a manner to have a sustainable neutral or beneficial impact on water quality during the operational phase of the development.

Stormwater Management

62. All stormwater management measures as specified in the Conceptual Stormwater Management Plan (dated 14 May 2018) and shown on the Catchment Plans (Job No 2016.617B; Dwg Nos. P01 and P02; Iss P1; dated 10/05/18), all prepared by Calare Civil Pty Ltd, shall be incorporated in the Final Stormwater Drainage Plans to be prepared **prior to issuance of Construction Certificate for the relevant Stage of the subdivision** and to the satisfaction of Water NSW and approved by Council, and implemented in particular as elaborated or varied in the following conditions.

63. The proposed Lot PT236 and Lot 5 DP 1230208 drainage reserves, shall each have a combined sediment/bioretention basin to be designed and located as per the Conceptual Stormwater Management Plan (dated 14 May 2018), the Catchment Plans (Job No 2016.617B; Dwg Nos. P01 & P02; Iss P1; dated 14/05/18), Basin 01 and Basin 02 Details Plans (Job No. 2016.617B; Dwg Nos. P03 & P04; Iss P1; dated 14/05/18), and Bio-Retention Basin Details Plan (Job No. 2016.617B; Dwg Nos. P05; Iss P1; dated 14/05/18), all prepared by Calare Civil Pty. The basins shall initially be constructed as sediment basins, and converted to combined OSD/bioretention basins when all hardstand areas have been completed and all ground surfaces stabilised. Each bioretention basin, as appropriate, shall capture and treat all runoff from the road and the future dwelling envelopes and shall incorporate the following specifications and requirements:

- **For Stage 2**: a bioretention basin shall be designed, located and constructed as per the Basin 01 Details Plan (Job No. 2016.617AB; Dwg No. P03; Iss P1; dated 14/05/18) prepared by Calare Civil Pty Ltd, with a Surface Area of 80 square metres and Filter Area of 36 square metres
- **For Stage 4**: a bioretention basin shall be designed, located and constructed as per the Basin 02 Details Plans (Job No. 2016.617B; Dwg No. P04; Iss P1; dated 14/05/18) prepared by Calare Civil Pty Ltd, with a Surface Area of 154 square metres and Filter Area of 108 square metres
- The bioretention basins shall be constructed after all hardstand areas i.e. road construction, have been completed and all ground surfaces have been stabilised
- The bioretention basins shall be designed consistent with the Adoption Guidelines for Stormwater Biofiltration Systems Version 2 (Payne *et al*, 2015, Melbourne, CRC for Water Sensitive Cities) and shall also incorporate the following specifications:
  - a filter media consisting of a clean sandy loam with a certified median particle diameter of 0.5 mm, a maximum orthophosphate concentration of 40 mg/kg and a maximum total nitrogen concentration of 400 mg/kg
  - be planted with appropriate deep-rooted, moisture-tolerant vegetation protected by rock mulch (grass and turf is not appropriate vegetation and organic mulch is not

suitable)

- direct all discharge and overflow to the stabilised surfaces via armoured discharge points such that discharge does not cause erosion, as per the Outfall Details Plan (Job No. 2016.617B; Dwg No. P06; Iss P1; dated 14/05/18) prepared by Calare Civil Pty Ltd
- be accessible from the subdivision roads by machinery to facilitate cleaning, monitoring and maintenance of the structures
- ensure the discharge outlets are consistent with the requirements of any Controlled Activity Approval under the *Water Management Act* (*2000*) from the Department of Industry-Water
- be permanently protected from vehicular damage by bollards, fences, castellated kerbs or similar structures, with a sign to be erected to advise of its nature and purpose in water quality management, and
- be protected by sediment and erosion control measures during any construction and post-construction phase until the ground surface is revegetated or stabilised.

64. All run-on and stormwater from the existing developments upslope of the proposed subdivision shall be diverted around the proposed subdivision e.g. by means of a stabilised bund or drain with provision for energy dissipation at the outlet to prevent scouring or erosion.

65. No changes to stormwater treatment and management that will impact on water quality, shall be permitted without the agreement of Water NSW.

66. A suitably qualified stormwater consultant or engineer shall certify in writing to Water NSW and Council **prior to the issuance of a Subdivision Certificate for each stage of the subdivision** that all stormwater management structures have been installed as per these conditions of consent and are in a functional state.

67. An Operational Environmental Management Plan (OEMP) for each stage of the subdivision shall be prepared in consultation with Water NSW and Council by a person with knowledge and experience in the preparation of such plans. Each OEMP shall be prepared **prior to the issuance of a Subdivision Certificate for that stage of the subdivision**, and may be updated from the OEMP for the previous stage. The OEMP shall be provided to Council when the management and maintenance of the bioretention basins is handed over to Council. The OEMP as a minimum shall include but not be limited to:

- details on the location, description and function of stormwater management structures such as pits, pipes, bioretention basins and any other stormwater structures and drainage works
- an identification of the responsibilities and detailed requirements for the inspection, monitoring and maintenance of all stormwater management structures, before and after handing over to Council, including the frequency of such activities
- the identification of the individuals or positions responsible for inspection and maintenance activities, before and after handing over to Council, including a reporting protocol and hierarchy
- the identification of detailed requirements and measures for the protection of bioretention basins from future upstream construction works i.e. construction of dwellings on future lots, and
- checklists for recording inspections and maintenance activities.

68. All stormwater treatment devices, particularly bioretention basins, shall be monitored, maintained and managed as per the Operational Environmental Management Plan referred in the Condition above.

Reason for the above Conditions – To ensure that the stormwater quality management measures and structures for the proposed subdivision have a sustainable neutral or beneficial impact on water quality over the longer term.

Construction Activities

69. A Soil and Water Management Plan shall be prepared for all works proposed or required as part of each stage of the subdivision, including the subdivision road, by a person with knowledge and experience in the preparation of such plans. The Plan shall meet the requirements outlined in Chapter 2 of NSW Landcom's Soils and Construction: Managing Urban Stormwater (2004) manual - the "Blue Book". The Plan shall be developed in consultation with Water NSW and be prepared **prior to Council issuance of a Construction Certificate for that stage of the subdivision** and shall be to the satisfaction of Council.

70. A suitably qualified, certified professional shall oversee the implementation of the Soil and Water Management Plan for each stage of the subdivision and effective erosion and sediment controls at the site prior to and during any construction activity including site access and works within or near waterways and shall certify in writing to Water NSW and Council that erosion and sediment controls have been installed and maintained at the site in accordance with Condition 13 above. The controls shall prevent sediment or polluted water leaving the site or entering any stormwater drain or natural drainage system. The controls shall be regularly maintained and retained until works have been completed and ground surface stabilised or groundcover re-established.

Reason for the above Conditions – To manage adverse environmental and water quality impacts during the construction phase of the development so as to minimise the risk of erosion, sedimentation and pollution within or from the site during this phase.

Subsequent Development Applications

71. Any subsequent applications for dwellings and/or other developments on the proposed lots will be subject to the provisions of State Environmental Planning Policy (Sydney Drinking Water Catchment) 2011 (the SEPP) and will need to be assessed according to the Neutral or Beneficial Effect (NorBE) test in relation to the potential effect of the development on water quality.

ENDEAVOUR ENERGY REQUIREMENTS

72. The applicant will need to submit an application for connection of load via Endeavour Energy's Network Connections Branch to carry out the final load assessment and the method of supply will be determined. Depending on the outcome of the assessment, any required padmount substation will need to be located within the property (in a suitable and accessible location) and be protected (including any associated cabling) by an easement and associated restrictions benefiting and gifted to Endeavour Energy. As part of the application, the proposed undergrounding of the existing overhead power lines and the release of easement should also be addressed. Please see Endeavour Energy's Mains Design Instruction MDI 0044 'Easements and Property Tenure Rights'. Further details are available by contacting Endeavour Energy's Network Connections Branch via Head Office enquiries on telephone: 133 718 or (02) 9853 6666 from 8am - 5:30pm or on Endeavour Energy's website under 'Home > Residential and business > Connecting to our network' via the following link: http://www.endeavourenergy.com.au/

73. The planting of large trees in the vicinity of electricity infrastructure is not supported by Endeavour Energy. Suitable planting needs to be undertaken in proximity of electricity infrastructure. Only low growing shrubs not exceeding 3.0 metres in height, ground covers and smaller shrubs, with non-invasive root systems are the best plants to use. Larger trees should be planted well away from electricity infrastructure and even with underground cables,

be installed with a root barrier around the root ball of the plant. Landscaping that interferes with electricity infrastructure may become subject to Endeavour Energy's Vegetation Management program and/or the provisions of the *Electricity Supply Act 1995* (NSW) Section 48 'Interference with electricity works by trees' by which under certain circumstances the cost of carrying out such work may be recovered.

Schedule B

Natural Resources Access Regulator

General Terms of Approval

for proposed development requiring approval under s89, 90 or 91 of the Water Management Act 2000

Reference Number:	IDAS1108003
Issue date of GTA:	21 August 2018
Type of Approval:	Controlled Activity
Description:	Subdivision - 1 lot into 134 residential lots including open space, drainage reserves, split Zone lots, residue lot & new roads
Location of work/activity:	994 & 998 Great Western Highway BOWENFELS
DA Number:	DA142/18
LGA:	Lithgow City Council
Water Sharing Plan Area:	Greater Metropolitan Region Unregulated River Water Sources

The GTA issued by DPI Water do not constitute an approval under the *Water Management Act 2000*. The development consent holder must apply to DPI Water for the relevant approval **after development consent** has been issued by Council **and before** the commencement of any work or activity.

Condition Number	Details
	Design of works and structures
GT0009-00010	Before commencing any proposed controlled activity on waterfront land, an application must be submitted to Natural Resources Access Regulator, and obtained, for a controlled activity approval under the Water Management Act 2000.
GT0019-00003	Any proposed excavation on waterfront land must be undertaken in accordance with a plan submitted as part of a controlled activity approval, to be approved by Natural Resources Access Regulator
	Erosion and sediment controls
GT0014-00007	A. The consent holder must ensure that any proposed materials or cleared vegetation, which may: i. obstruct water flow, or ii. wash into the water body, or iii. cause damage to river banks, are not stored on waterfront land, unless in accordance with a plan held by Natural Resources Access Regulator as part of a controlled activity approval. B. When the carrying out of the controlled activity has been completed, surplus materials must be removed from waterfront land.
GT0021-00004	The proposed erosion and sediment control works must be inspected and maintained throughout the construction or operation period of the controlled activity and must not be removed until the site is fully stabilised.
	Plans, standards and guidelines
GT0002-00480	A. This General Terms of Approval (GTA) only applies to the proposed controlled activity described in the plans and associated documents found in Schedule 1, relating to Development Application 142/18 provided by Council to Natural Resources Access Regulator. B. Any amendments or modifications to the proposed controlled activity may render the GTA invalid. If the proposed controlled activity is amended or modified, Natural Resources Access Regulator, Parramatta Office, must be notified in writing to determine if any variations to the GTA will be required.
GT0004-00003	A. A security deposit must be provided, if required by Natural Resources Access Regulator. B. The deposit must be: i. a bank guarantee, cash deposit or equivalent, and ii. equal to the amount required by Crown Lands and Water Division for that controlled activity approval.

Natural Resources
Access Regulator

General Terms of Approval

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DA Number:	DA142/18
LGA:	Lithgow City Council
Water Sharing Plan Area:	Greater Metropolitan Region Unregulated River Water Sources

Condition Number	Details
GT00005-00217	A. The application for a controlled activity approval must include the following plan(s): - Sediment and Erosion Control Plan, Stormwater Management, Stormwater Outlet Structure Plan, Vegetation Management Plan. B. The plan(s) must be prepared in accordance with Crown Lands and Water Division's guidelines located on the website http://www.water.nsw.gov.au/water-Licensing/approvals/controlled-activity.
GT0010-00006	All documents submitted to Natural Resources Access Regulator as part of an application for a controlled activity approval must be prepared by a suitable qualified person.
GT0012-00004	Any proposed controlled activity must be carried out in accordance with plans submitted as part of a controlled activity approval application, and approved by Natural Resources Access Regulator.
GT0030-00006	The application for a controlled activity approval must include plans prepared in accordance with Natural Resources Access Regulator's guidelines located on the website https://www.industry.nsw.gov.au/water/licensing-trade/approvals/controlled-activities.
	Rehabilitation and maintenance
GT0023-00001	Vegetation clearance associated with the proposed controlled activity must be limited to where the controlled activity is to be carried out, as shown on the approved plan(s).
	Reporting requirements
GT0016-00003	The consent holder must inform Natural Resources Access Regulator in writing when any proposed activity carried out under a controlled activity approval has been completed.

SCHEDULE 1

The plans and associated documentation listed in this schedule are referred to in general terms of approval (GTA) issued by NRAR for integrated development associated with DA142/18 as provided by Council:

1. Statement of Environmental Effects#16084, Voerman & Ratsep, Dated 14.8.2018.

2. Soil & Water Plan, Ref#16084, Voerman & Ratsep, Dated 07.03.2018

Schedule C

Please find attached general design requirements in relation to the servicing requirements for water and sewerage as part of the abovementioned Development Application based on Preliminary Design drawing received by Council.

The attached conditions do not constitute approval under *section 68, Local Government Act 1993*. Prior to the commencement of any works as described below;

- Undertaking of water supply works
- Undertaking of sewerage works
- Installation, alteration, disconnection or removal of a meter connected to a service pipe
- Connect a private drain or sewer with a public drain or sewer under the control of a council or with a drain or sewer which connects with such a public drain or sewer
- The developer must obtain written Section 68 approval from Council; this will be required prior to the issue of the Construction Certificate. The Section 68 application requires the submission of all detailed engineering drawings/design, specifications and any applicable supporting information for the proposed works.

If your Section 68 application is approved, Council will issue you with a Section 68 approval containing conditions that must be complied with during construction.

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1. The gravity sewer design for all lots shall include the connection of the proposed reticulation system to a manhole located on Councils trunk main located downstream of the development.
2. Stage 1 sewer design shall provide points of connection for the existing properties located on Lot 4 DP221151 and Lot 2 DP706242.
3. The existing On-site sewerage management systems located on Lot 4 DP 221151 and Lot 2 DP 706242 shall be decommissioned and removed at owner's costs. The sanitary drainage from each dwelling shall be reconnected to the sewer reticulation systems point of connection at owner's costs and prior to the completion of Stage 6.
4. Maximum Grade of 20% is permitted for gravity sewer design purposes. Applicant is to provide details of addressing hydraulic jump, odour suppression and the use of energy dissipaters and sewer vents.
5. The maximum allowable sewer flow velocity shall be 3.0 m/s.

6. Applicant to gain full approval for any easements required for water and sewer works prior to release of construction certificate.
7. Privately owned Low Pressurised Sewer Systems and Package Pump Stations shall not be accepted.
8. Sewer mains located within lots adjacent to stormwater drainage lines shall be a minimum of 750 mm clear of the stormwater pipe.
9. Plans showing all proposed easements to be created over water and sewer infrastructure shall be submitted to Council prior to the release of the Construction Certificate.
10. All Water and Sewer works, including minimum and maximum flows and velocities, shall be designed in accordance WSAA code.
11. Manholes that have been elevated for flood zone requirements shall require work platforms for WHS purposes.
12. Full vehicular access shall be provided to all sewer man holes to allow for servicing and maintenance.
13. Rain gardens, Bio Retention Basins and Swales are not to be constructed over sewer mains. A sewer design plan with stormwater overlay shall be required for assessment prior to the issue of S68 approval.
14. The applicant shall provide detailed water design to include a ring main. The new water supply network shall connect into the Council reticulation network via two points of connection. Live connections by Council at owner's costs.
15. The design of water reticulation shall generally be in accordance with the latest version of the Water Services Association of Australia (WSAA) "Water Supply Code of Australia" (WSA 03).
16. The applicant shall provide fire flow analysis for all water supply networks prior to the release of the Construction Certificate, to ensure that the network is capable of providing the performance for the design of pressure for spring hydrants. Maximum spacing of hydrants shall be 60 metres. (Residential)
17. Construction Certificate design drawings and specifications shall clearly address the following:
    a. Location of pipelines, valves, hydrants, pipe materials, size, pressure class, jointing methods and corrosion protection measures.
    b. Specifications for products, materials, site investigation, excavation / trench details and other technical matters.
    c. Documentation of design assumptions, constraints and issues relevant to the design and not otherwise noted in the Concept Plan.
18. Water supply design to provide Desirable Minimum Static Pressure of 350kpa. Static Pressure shall not to exceed 500kpa at each house hold boundary.

19. Stop (dividing and isolating) and control valves shall be positioned to give required control of the system and to provide an alternative means of supply when a distribution main is taken out of service.
20. Minimum and maximum allowable service pressures will not be exceeded in each zone.
21. Minimum and maximum flows and velocities shall be in accordance with the WSAA Code.
22. A geotechnical report shall be submitted to Council prior to the release of the Construction Certificate. All Pipe and fitting materials must be suitable for application and environment.
23. The spacing and positioning of valves shall allow for isolation of individual zones.
24. Water mains shall only be installed in undisturbed ground.
25. All stop valves shall be anticlockwise closing and be positioned at a minimum of every 300 metres. Valves shall be positioned adjacent to branch take offs.
26. Each lot shall have an individual water meter, which shall be purchased from Council at the applicants full cost and held at Council store.
27. Right angled 90 degree brass lockable meter ball valves to be used as meter control valves and a type approved by the Water and Wastewater Manager. Council will secure the water meter valve with a stainless steel locking device prior to the subdivision certificate being released.
28. Water meters to be purchased by the owner after submitting to Council an Application for Work at Owners Cost Payment Authority Application and the completion of a Water Service Connection Application. Council will installed the meter when a Development Application has been approved for the new allotment and a S68 Approval granted for connection to draw water.

General Design Plans

Sewerage

1. General Design Considerations

A sewerage service is to be provided for each property; joint sewerage services are prohibited under the *Local Government (General) Regulation 2005, Part 6, Division 3, section 162*

1.1 Objectives

The sewerage objectives are seen as being achieved when:

i. The planning, design and construction of new facilities are adequate in servicing new and future developments.
ii. there is compatibility with the existing facilities, methods of operation, and maintenance techniques; and

iii. The facilities provide public health, environmental, and asset protection consistent with the accepted design and construction requirements set out in this document and with developments in technology as approved from time to time.

The pipe system may, on occasions, be subject to "surcharge" (where the hydraulic grade line is higher than the pipe obvert) or "overflows" (where sewage overflows out of maintenance holes). These situations may be the result of blockages and/or flows in excess of the design flows. In establishing the layout of the pipe network, designers should take care to ensure that any overflows are likely to cause only minimal nuisance or damage.

1.2 Maintenance Aspects

1.2.1 General
The sewerage system is to be designed with due regard to the continuing maintenance requirements after the works have been constructed. A system that can be easily and economically maintained is essential.
Maintenance holes located in readily identifiable locations (e.g. opposite a building line), and not within leased properties, are an aid to rapid clearance of sewer blockages.

1.2.2 Special equipment
The purchase of special maintenance equipment and plant requires considerable lead times, special approvals and funding. As a consequence, no design incorporating the need for special or unusual equipment should be prepared without the prior written approval of Lithgow City Council.

1.3 Discharges from stormwater systems to sewers

Unless approved otherwise, under the specific *Trade Waste Agreement*, no stormwater discharge will be accepted into sewers.

2. Location of Sewers

2.1 Sewer Locations

2.1.1 Sewers located outside privately owned lands

The design of a sewer system should take into account the fact that there is a significant increase in the risk of tree root blockages after a period of about 20 years. Further, the access to sewers for maintenance is a major problem in the Lithgow despite the use of sewerage reserves for this purpose. Therefore minimising the use of sewer alignments and reserves in leased land is an important feature of good sewer design. Where there is public land at the rear or the side of privately owned block the sewer should be located within the public land rather than within the leased/privately owned block.

i. Diversion of principal carrier sewers around leased lands

Blockages in the sewer system have the potential to result in sewage overflows into leased properties. To minimise problems caused by blockages, wherever practicable, sewers, particularly main carriers, shall be located in public areas rather than within leases.

ii. Other situations

Where a sewer is to be constructed across open areas it is to be sited to;
(1) Maximise its use for future development, and
(2) Minimise its impact on possible future use of the site.

Wherever possible sewers under playing fields are to be sited so that maintenance holes are not located within the playing area.

2.1.2 Sewers located within leased lands

Where a sewer is to be constructed within privately owned properties a 3m wide easement is to be created in favour of Council, with the pipe(s) centrally located within the easement and in a location that minimises the impact on the future development potential of the leased/ privately owned land(s).

2. Hydraulic Design

2.1 General Hydraulic Aspects

All sewer works in connection with the application are to be of a size no less then 150mm to the service tie or buried vertical riser.

i. Minimum grades for DN150 pipes

Minimum permissible grades of the uppermost reaches of sewers are to be no less than 1.00%

This is the absolute minimum grades that shall be used. In general, it is not considered good practice to use a minimum grade on a short intermediate section of sewer when the upstream and downstream sections are laid at steeper grades.

ii. Maximum grades for sewers

Restrictions are placed on the maximum grades of sewers to limit internal erosion of pipe material, and/or pipe movement (due to trench flows causing loss of bedding).

The maximum pipe grade for sewers larger than DN150 is 15%. Where grades steeper than 15% are planned the circumstances are to be referred to Lithgow City Council for assessment.

To limit the scouring effect arising from water flow within the pipe bedding material, and also to anchor the pipe, special bedding, scour stops or trench stops may be required. To enable easy location, scour and trench stops shall be placed at intervals of equal length with spacing not exceeding that which

is specified. The actual spacing and number of stops shall be nominated on layout drawings.

iii. Grade changes between pipe reaches

It is essential in the lower reaches of the sewerage system, where sewage may have low dissolved oxygen levels, that turbulence leading to the release of hydrogen sulphide from solution be avoided. In these areas, conditions such as a rapid change from steep to flat pipe slope, which favors the formation of a hydraulic jump at dry weather flows, must be avoided.

3. Structural Design

3.1 Sewer pipe materials and construction methods

3.1.1 Types of pipe

Sewers shall be constructed from materials proven to be structurally sound and durable, and shall have satisfactory jointing systems. The use of two or more types of pipe material on a single run of pipe between adjacent maintenance holes is not acceptable.

Materials approved for use in sewers are:

- Vitrified Clay - VC
- Reinforced Concrete - RC, see notes 1, 2 and 3
- Ductile Iron - DICL, see notes 1, 2
- Unplasticised Poly Vinyl Chloride – uPVC (Equivalent to class SEH, solid wall or approved structured wall), **150mm x 3m RRJ SN8 pipes and junctions are Councils preferred material**
- Glass Reinforced Plastics - GRP, see note 4 (Polyester Based)
- Polyethylene – HD-PE, see note 4

Notes

1. Not to be used within, nor up to 1 km downstream of industrial areas or hospitals.
2. Concrete shall be made with Type "SR" sulphate resisting cement with a tri-calcium aluminate content not greater than 5%, or Type "LH" low heat cement. Concrete pipes intended for other than trunk sewers shall be manufactured with a minimum 10mm sacrificial layer on the inside of the pipe.
3. Concrete pipes are not acceptable for DN150 and DN225 sewers.
4. Subject to special conditions and only with written approval of Lithgow City Council.

Proposals for the use of other materials will be considered if supported by adequate technical and performance data.

Where the pipe material is known it shall be shown on the drawings. Where the pipe material is not known prior to submission for detailed design acceptance, the drawings are to contain notes ensuring that the above requirements are satisfied.

4.1.2 Class of pipes

- Sewerage pipes must be of adequate strength to meet overburden and traffic loads. Loads are to include loads created from likely construction and maintenance activities;
- VC pipes shall be Class 4 or stronger;
- Class 2 (X), 3 (Y) and 4 (Z) reinforced concrete pipes manufactured in accordance with the latest version of AS 4058 are acceptable if used in accordance with the requirements of AS 3725;
- uPVC pipes shall be of grade Sewer Extra Heavy (SEH) or of equivalent SN grade in accordance with AS/NZS 1260;
- Classes for Ductile Iron, Glass Reinforced Plastics, Polyethylene, or ABS pipes shall be approved by Lithgow City Council prior to use.

Notes

1. Where load limits apply the locations shall be clearly designated on drawings.
2. During the construction phase specific load provision shall be made for heavy construction equipment where required.
3. No more than one type of pipe material will be used between successive maintenance holes or sewer maintenance shafts.

4.1.3 Pipe jointing

The sewer pipes are to be capable of excluding groundwater, resisting root intrusion, and withstanding pressure loading, both internal and external. Sewer systems must also have some flexibility, either through controlled deflection at joints (rigid materials) or pipe bending (flexible materials).

Acceptable pipe jointing systems are:

i. VC pipes with rubber ring jointing comprising:
    - Spigot - Socket system;
    - Spigot - Spigot system utilising approved Socket-Socket coupler.

ii. Reinforced Concrete Pipes, Spigot-Socket, with rubber ring jointing.

iii. PVC pipes:
    - DN100: solvent welded;
    - DN150: rubber ring jointed or solvent welded;
    - Larger than DN150: rubber ring jointed.

Note: For proclaimed mine subsidence areas, the Mine Subsidence Board should be referred to for advice of subsidence design parameters for proposed drainage systems.

4.2 Depth of sewer and cover

i. Depth of Cover

Sewers shall be laid with a depth of cover, measured from the top of the pipe socket or inspection opening to the ground surface as per section 3.7 of AS/NZS

3500.2, unless the product specific Standard specifies, or the manufacturer recommends, a greater depth.

ii. Maximum Depth

Sewer mains are to be designed for a maximum depth to invert of 5.0 metres. In special cases (e.g. to avoid a pump station or for a short length of line through a ridge) specific approval may be sought from Council to exceed this limit.

4.3 Sewer main junctions

Within a sewerage system it is mandatory that all sewer main junctions occur within maintenance holes. However, DN150 sewer tie connections can be connected by means of maintenance holes or sloped junctions. For connection of service ties see section 4.4.

4.4 Sewer Service Connections

Service ties (house junctions)

A sewerage service is to be provided for each property; joint sewerage services are prohibited under the *Local Government (General) Regulation 2005, Part 6, Division 3, section 162.*

4.4.1 Location

A service tie connecting to a sewer outside a residential block should generally be at right angles to the sewer. Where a service is a maintenance hole (manhole) or "dead-end", the service shall be at an angle between 90° and 180° from the downstream sewer to ensure a smooth flow of entry into the main line.

Service ties shall be located clear of all authorities easements, driveways and retaining walls.

Where the sewer main is located outside of the residential block, the service tie shall extend inside the property boundary and an inspection shaft extended vertically upward to the surface ground level to form a shaft. The tie should generally be located on the sewer main line at 1.0 metre from the lowest corner of the property and extend 1 metre into the boundary.

The upstream end of any "dead-end" sewer shall extend to at least 1 metre past the boundary to accommodate a service tie within a maintenance hole.

4.4.2 Size of Tie

Sewer service ties are normally 150mm solvent welded pipes or rubber ring. For multiple dwellings a single tie is to be provided per property.

4.4.3 Depth of Tie

A service tie is required to serve the entire leased block. However where building restrictions do not permit part of the block to be developed (e.g. set back distances from the front building line), then depths need to make allowance for this limitation.

In calculating the depth the designer should be familiar with the requirements for grade and depth provided in *AS/NZS 3500.2 sections 3.4 and 3.7.*

An acceptable design will have the following minimum depths of tie:

- For residential blocks: calculated on the basis of minimum cover with a property of 300mm and a maximum possible length of house drain at a grade of 1 in 60

- For residential blocks: calculated on the basis of minimum cover with in the property, if subject to vehicular traffic, of 500mm and a maximum possible length of house drain at a grade of 1 in 60.

4.4.4 Grades

The service tie shall have a minimum grade of 1.0 % and a maximum of 20 %. For ties to deep sewers, a buried vertical riser is to be used (refer section 4.4.5)

4.4.5 Buried Vertical Risers (BVR)

On deep sewers that are near boundaries it may be necessary to use a BVR. These are to be noted on work-as-executed drawings

It is absolutely critical that BVR's are installed on a compacted trench base with suitable concrete support

4.4.6 Manholes

Manholes shall be located along a sewer main at all changes in grade, level and direction and at the intersections with other mains or dead-ends. Manholes will not be accepted within the carriageway of public roads.

The maximum permissible spacing between adjoining manholes is 80 metres.

Manholes are to be designed so that sewage is not forced to deflect by an angle of more than 90 degrees.

Manholes shall be constructed using 20 MPa concrete cast in-situ base. Either Type C or Type D cement shall be used in the concrete mix.

Chamber and covers shall be constructed from either precast concrete or ductile iron covers in concrete surround, Class B or D load applications in accordance with AS3996 will apply or components of a type authorised by Council.

Drop manholes or Jump-ups may only be used to avoid underground services, or at the intersection of shallow and deep mains where the difference in the invert level exceeds 450mm. The maximum difference in invert levels is 2.0 metres. Drop manholes or Jump-ups are to be constructed as per the requirements of *section 4.10* of *AS/NZS 3500.2*

5. Testing

All drainage work is subject to testing and shall comply with the with the requirements of *section 12 of AS/NZS 3500.2*

Water

1.1.1 General

Lithgow's Water Supply System is to be designed with due regard to the continuing maintenance requirements after the works have been constructed. A system that can be easily and economically maintained is essential.

1.1.2 Special Equipment

The purchase of special maintenance equipment and plant requires considerable lead times, special approvals and funding. As a consequence, no design incorporating the need for special or unusual equipment should be prepared without the prior written approval of Lithgow City Council.

This requirement also extends to the need to use special techniques or hired equipment. To ensure that maintenance personnel can respond and overcome operational problems consistent with service objectives, it is essential that maintenance of the system is not dependent on non-standard techniques or equipment

2 Location of Water Mains

Water mains shall be constructed within road or public reserves or require the creation of a 3 metre wide easement for water supply, in favour of Council and subject to approval by Council. The pipe is to be centrally located within that easement should approval be given.

Easements across privately owned lands should be avoided.

Marking tape to *AS 2648* shall be laid in a continuous length on top of the pipe embedment material, 150mm above all water mains.

2.1 Provision of branches for future connection

Many branches provided for future development turn out to be either the wrong size, in the wrong place, or not eventually required. Temporary end caps on such branches are often not satisfactorily anchored, and become a liability if the branch is not subsequently used. To avoid this, the following is required:

- branches for future development shall not be provided unless the alignment and diameter of the future connecting mains are confidently known, and the extension is to occur within a short time span (less than 12 months);
- To avoid anchorage problems and future shut downs of the main, a flanged branch with a stop valve is preferred to a branch with an end cap. Valves shall be blank flanged. Where an end cap is necessary a full and adequate thrust block shall be provided;
- Where a branch is proposed to be laid across a road, the section across the road should be end capped at both ends rather than connected at one end initially (to avoid future road openings). If the pipes are not to be connected within 24 months, consideration should be given to charging it via a DN20 service connection and then flushing periodically.

3 Material, Size and Cover Requirements

Unless specifically approved otherwise by Lithgow City Council, pipes for water supply shall be selected from the following approved materials:

- Ductile iron, cement lined and rubber ring jointed, produced in standard lengths of 5.5 metres to AS 2280, having sizes of DN100, 150, 225, 300, 375, 450, 500, 600 and 750. For pipes up to DN300 an approved seal coating on the internal cement mortar lining is applied to reduce leaching. Class K9 shall be used for general application and class K12 where additional structural capability is required;
- PVC Class 16 to AS/NZS 1477 Series 2, having sizes of DN100, 150, 225, 300 and 375.
- **Modified PVC (PVC-M) Class 16 to AS/NZS 4765 (Int) Series 2**, having sizes **DN100,** 150, 225, 300, 375 and 450.
- Molecular Oriented PVC (PVC-O) Class 16 to AS/NZS 4441 (Int) Series 2, having sizes DN100, 150, 225, 300 and 375.
- for sizes above DN750, steel pipe to AS 1579, cement mortar lined to AS 1281, and externally coated with fusion bonded polyethylene;
- PE, pressure class PN16, to AS/NZS 4130 having size DN63. Direct tapping not permitted.

The minimum **cover to water mains** shall normally be **750mm** in roadways or traffic areas and 600mm elsewhere. The minimum **cover to water services** shall be 450mm in roadways or traffic areas and 375mm elsewhere. Provision shall be made for transient loads such as construction equipment where cover is reduced during the construction phase.

A pipeline shall be lowered when cover is removed from existing pipelines for new works (such as roads). If this is physically impossible then consideration shall be given to protection by a suitably designed reinforced concrete relieving slab; extending at least 500mm into natural ground beyond existing pipe trench lines. This slab shall be segmented by construction joints into maximum l.0 metre long easily removed segments, and separated from the pipe obvert by no less than 25mm of granular or compressible material.

Thrust or anchor blocks of plain or reinforced concrete, which have been designed to resist unbalanced hydraulic forces, shall be provided at all bends, tees, tapers, in-line stop valves and dead ends.
To limit the scouring effect arising from water flow within the pipe bedding material, and also to anchor the pipe, special bedding, trench stops and scour stops may be required. Scour stops shall be provided along inclined mains where the slope is 5 to 30%. Trench stops can be regarded as an alternative to scour stops and may be provided along inclined mains where the slope is 5 to 15%. To enable easy location, trench and scour stops shall be placed at intervals of equal length with spacing not exceeding that which is specified

4. Service Connections

Water service connections works are to be undertaken under the provisions of *section 152 of the Local Government (General) Regulations 2005*

Water services should be of single service drawn **copper pipe, Type A,** manufactured in accordance with *AS 1432*. Services are to be a minimum of 20mm diameter, with 1.4mm wall thickness.

Right angled 90 degree brass lockable meter ball valves to be used as meter control valves and a type approved by the Water and Wastewater Manager. Council will secure the water meter valve with a stainless steel locking device prior to the subdivision certificate being released.

Water meters to be purchased by the owner after submitting to Council an Application for Work at Owners Cost Payment Authority Application and the completion of a Water Service Connection Application. Council will installed the meter when a Development Application has been approved for the new allotment and a S68 Approval granted for connection to draw water.

Brass or copper capillary fittings are to be installed at all joints, branches, and bends. Meter boxes, meters, maincocks and elbows are to be of a type approved by the Water and Wastewater Manager or alternatively these fitting can be provided by Council at full cost recovery.

Separate metered water services are to be provided to every allotment, as well as parks, reserves and landscaped roundabouts.

The meter box for each lot should be located approximately **500mm outside the front and side property boundaries**. Services should be located in pairs at side property boundaries. Note that the stop valve should be located no more than 450mm from the water meter, measured from the road alignment.

All service connections should cross the road perpendicular to the road centreline. Non-detectable marking tape to *AS 2648* shall be laid 150mm above all water services. Such connections should be marked on each kerb with a "W"

A Work as Executed plan (WAE) **MUST** be submitted to council prior to the release of the linen plan, outlining the following:

- Service meter location
- All main isolation valves hydrants and scours
- Water mains lay out and property services

5. Pipe Fittings

Fire hydrants of an approved type are to be installed along the water main at such convenient distances, and at such places, as may be necessary for the ready supply of water to extinguish fires accordance with AS/NZS 2419.

On water mains without hydrants (e.g. generally bulk supply mains), scour (or drain) outlets, with isolating valve control, shall be provided at all low points. Wherever possible, on water mains with hydrants (e.g. reticulation), a hydrant should be located at or near all low points, and are to be discharged via a pipe to a storm water drainage pit.

Stop valves are generally located adjacent to tees, and so that no more than 25 properties are isolated at any one time, by closing no more than four valves. To close a valve, the spindle will turn anticlockwise, as viewed, when facing the spindle cap

Provision shall be made concerning air release from all high points on water mains. This should normally be achieved in reticulation mains by means of a fire hydrant, a branch, or a service pipe located at the high point. Where this cannot be achieved a DN25 single orifice air valve should be provided

All maincocks, tees, hydrants, stop valves, scour valves, and air valves should be located within the public footway and shall be of type approved by Council.

All gibaults are to be long sleeved.

At road intersections, two forty-five degree (45o) bends should be used to negotiate the corner.

Thrust blocks shall be provided at all bends, tees, and dead-ends.

All valves and hydrants shall be enclosed within valve chambers.

Markings and indicator posts shall be provided at all hydrants and valves.

6. Testing

Prior to acceptance of the water reticulation network, all pipelines shall be inspected and pressure testing will be carried out.

7. Mains in Cul-de-Sacs

Where the cul-de-sac incorporates an adjacent street connected by a pathway, or ends in a public reserve, the water main shall extend through the pathway or reserve so that a dead-end is not created in the main.

In all other cases, the main is to be looped around the cul-de-sac.

Work as Executed Plans

Following the satisfactory completion of works, 'Works-As-Executed' (W.A.E.) plans prepared by a registered surveyor or professional engineer shall be submitted to Council's Group Manager of Operations. Such plan must be lodged prior to the release of the subdivision linen plan, or prior to occupation or use of the development.

The W.A.E. plans shall be Engineering Drawings as modified, and shall include the following items:

- invert levels of all drainage and sewerage lines at entrance and exit of MH;
- location, class, size, and material of all pipes and subsoil lines;
- location and diameter of service conduits;
- location of stop valves, hydrants, water services,
- longitudinal sections for each sewer main,
- depth of sewer manholes,
- sewer man hole schedule numbered
- location of sewer junctions measured from downstream of MH
- minimum depth and cover, maximum depth, grade, chainage, inverts,
- storm water and interallotment drainage pits;

- location of water meters and serial number of meter installed in relation to the lot it is installed on
- site regarding details – finished surface levels at centre of front and rear boundaries;
- the location and level of any permanent survey marks;

Each Works-As-Executed plan must include certification by the Registered Surveyor responsible for the preparation of the plan.