



## GOOGONG NEIGHBOURHOOD 3, 4 & 5 DEVELOPMENT APPLICATION

CIVIL INFRASTRUCTURE DESIGN REPORT  
SEPTEMBER 2021

PREPARED FOR GOOGONG TOWNSHIP PTY LTD

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## 1. INTRODUCTION

### 1.1 PROJECT OVERVIEW

Googong Township is a 25 year project being developed in partnership by Peet and Mirvac, operating as Googong Township Pty Ltd (GTPL). The emerging township is located in Southern NSW, 8km from Queanbeyan and 15km from Canberra. The Googong master plan is embedded in Queanbeyan-Palerang Regional Council's (QPRC) Googong Development Control Plan and provides the overarching structure for the township. It has been planned and is being developed as a freestanding township with five neighbourhoods, around 6,600 dwellings and a population of over 18,000 people over 25 years.

Neighbourhood's 1 and 2 (also known as Googong North and Googong Central) have completed Structure plans and DAs. Neighbourhood 2 is currently under staged construction.

The next 3 Neighbourhoods to be developed, under the next Development Application, are

- ▶ Neighbourhood 3 (including the Hamson land) – also known as Googong West
- ▶ Neighbourhood 4 – also known as Googong South
- ▶ Neighbourhood 5 – also known as Googong East

Neighbourhood's 3, 4 and 5 (NH345) is 235Ha in size and is bounded by Old Cooma Road to the west, Neighbourhood 2 and Neighbourhood 1B to the north, the Googong Dam foreshore and PinkTail Worm-Lizard Conservation Area to the east and rural land to the south.

The area around Googong is characterised by rural uses, while NH345 itself is characterised as former agricultural land.

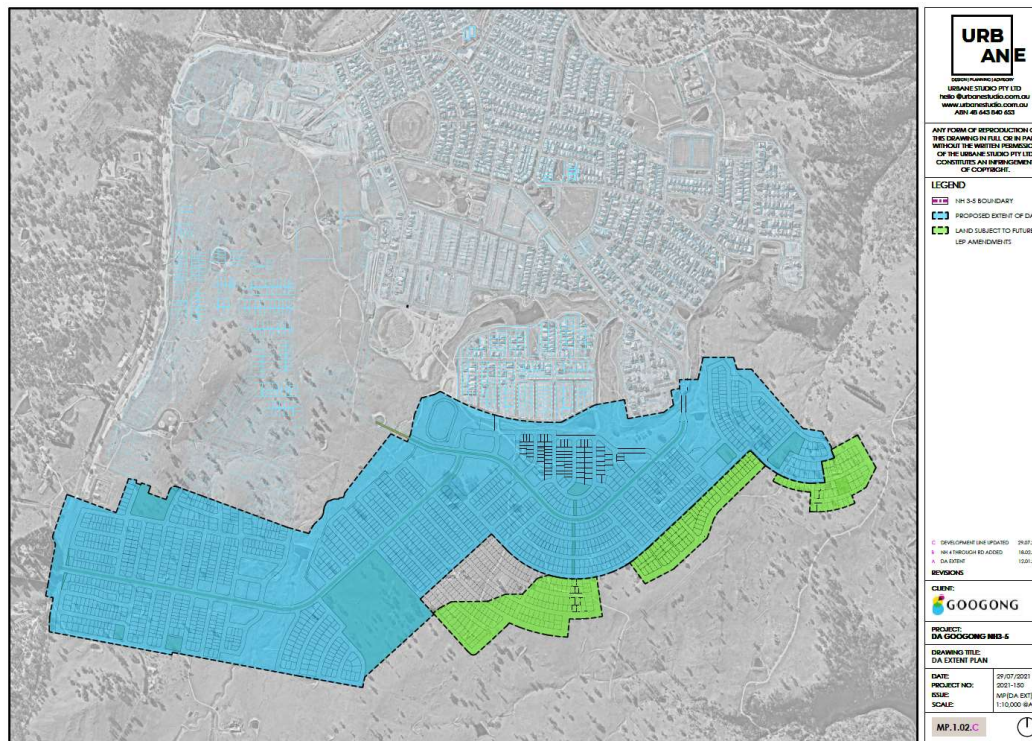
### 1.2 PROJECT OBJECTIVE

GTPL are seeking to submit a Development Application (DA) with QPRC for the subdivision of the land within Neighbourhoods 3, 4 & 5 (NH345).

The DA proposal seeks approval for:

- ▶ Torrens title subdivision of Neighbourhoods 3, 4 and 5 to create:
  - 1476 residential lots
  - 20 residual lots for future subdivision of higher density housing and other uses including the Neighbourhood Centre sites, to accommodate approximately 320 dwellings
  - public reserves including, local parks, a sports fields and Googong Common
  - public roads and drainage reserves.
- ▶ All subdivision works to prepare the land for the future development comprising site preparation and grading, stormwater and drainage works, road construction, tree removal, public domain landscaping and structures and utilities provision. The subdivision of the higher density super lots and the construction of all buildings (housing and schools) as well as the Neighbourhood Centre sites will be subject of future applications.

The DA proposal will apply to the area shown in blue on the following plan.



### 1.3 DEVELOPMENT APPLICATION

The DA Civil Infrastructure Drawing List is as follows:

| DRAWING | DESCRIPTION                                    |
|---------|--|
| CA000   | COVER SHEET - COVER SHEET                      |
| CA002   | DRAWING SCHEDULE - DRAWING SCHEDULE            |
| CA005   | GENERAL ARRANGEMENT PLAN - LAYOUT              |
| CA010   | EXISTING SERVICES PLAN - LAYOUT                |
| CA020   | CONSTRAINTS PLAN - LAYOUT                      |
| CA040   | STAGING PLAN - SHEET 1                         |
| CA041   | STAGING PLAN - SHEET 2                         |
| CA060   | CONSTRUCTION MANAGEMENT CONCEPT PLAN - SHEET 1 |
| CA061   | CONSTRUCTION MANAGEMENT CONCEPT PLAN - SHEET 2 |
| CA062   | CONSTRUCTION MANAGEMENT CONCEPT PLAN - SHEET 3 |
| CA100   | STREET HIERARCHY PLAN - LAYOUT                 |
| CA110   | PATH NETWORK PLAN - LAYOUT                     |
| CA120   | TYPICAL CROSS SECTIONS - SHEET 1               |
| CA121   | TYPICAL CROSS SECTIONS - SHEET 2               |
| CA122   | TYPICAL CROSS SECTIONS - SHEET 3               |
| CA123   | TYPICAL CROSS SECTIONS - SHEET 4               |

|       |   |
|-------|---|
| CA124 | TYPICAL CROSS SECTIONS - SHEET 5                |
| CA150 | TYPICAL DETAILS - SHEET 1                       |
| CA151 | TYPICAL DETAILS - SHEET 2                       |
| CA152 | TYPICAL DETAILS - SHEET 3                       |
| CA153 | TYPICAL DETAILS - SHEET 4                       |
| CA170 | BUS ROUTE PLAN - LAYOUT                         |
| CA180 | DRIVEWAY PLAN - SHEET 1                         |
| CA181 | DRIVEWAY PLAN - SHEET 2                         |
| CA182 | DRIVEWAY PLAN - SHEET 3                         |
| CA200 | GRADING PLAN - LAYOUT                           |
| CA201 | GRADING PLAN - SHEET 1                          |
| CA202 | GRADING PLAN - SHEET 2                          |
| CA203 | GRADING PLAN - SHEET 3                          |
| CA280 | SLOPE ANALYSIS PLAN EXISTING - LAYOUT           |
| CA290 | SLOPE ANALYSIS PLAN PROPOSED - LAYOUT           |
| CA300 | INTERSECTION DETAILS - SHEET 1                  |
| CA301 | INTERSECTION DETAILS - SHEET 2                  |
| CA302 | INTERSECTION DETAILS - SHEET 3                  |
| CA303 | INTERSECTION DETAILS - SHEET 4                  |
| CA310 | INTERSECTION SIGHT DISTANCE - SHEET 1           |
| CA311 | INTERSECTION SIGHT DISTANCE - SHEET 2           |
| CA312 | INTERSECTION SIGHT DISTANCE - SHEET 3           |
| CA313 | INTERSECTION SIGHT DISTANCE - SHEET 4           |
| CA320 | INTERSECTION TURNING MOVEMENTS - SHEET 1        |
| CA321 | INTERSECTION TURNING MOVEMENTS - SHEET 2        |
| CA330 | LOCAL CENTRE PLAN - SHEET 1                     |
| CA331 | LOCAL CENTRE PLAN - SHEET 2                     |
| CA332 | LOCAL CENTRE PLAN - SHEET 3                     |
| CA340 | ROAD DETAILS - NH3 INTERSECTIONS                |
| CA341 | ROAD DETAILS - NH4 RESERVE                      |
| CA350 | SEWER CATCHMENT PLAN - LAYOUT                   |
| CA360 | SEWER CATCHMENT DETAILS - SHEET 1               |
| CA361 | SEWER CATHCMENT DETAILS – SHEET 2               |
| CA370 | SEWER CONCEPT MASTER PLAN - SHEET 1             |
| CA371 | SEWER CONCEPT MASTER PLAN - SHEET 2             |
| CA372 | SEWER CONCEPT MASTER PLAN - SHEET 3             |
| CA380 | SEWER PUMP STATION GENERAL ARRANGEMENT - SPS 04 |
| CA385 | SEWER RISING MAIN PLAN - LAYOUT                 |
| CA390 | SEWER MAIN LONG SECTIONS - SHEET 1              |
| CA391 | SEWER MAIN LONG SECTIONS - SHEET 2              |
| CA392 | SEWER MAIN LONG SECTIONS - SHEET 3              |
| CA400 | WATER CONCEPT MASTER PLAN - LAYOUT              |
| CA410 | WATER CONCEPT PLAN POTABLE - SHEET 1            |

|       |  |
|-------|--|
| CA411 | WATER CONCEPT PLAN POTABLE - SHEET 2                     |
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| CA602 | WATER SENSITIVE URBAN DESIGN PLAN - SHEET 2              |
| CA603 | WATER SENSITIVE URBAN DESIGN PLAN - SHEET 3              |
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| CA651 | BUNYIP DRIVE CULVERT CROSSING - SECTIONS                 |
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| CA656 | GORMAN DRIVE BRIDGE CROSSING - SECTIONS                  |
| CA670 | RIPARIAN CORRIDOR PLAN - LAYOUT                          |
| CA671 | RIPARIAN CORRIDOR PLAN - SHEET 1                         |
| CA672 | RIPARIAN CORRIDOR PLAN - SHEET 2                         |
| CA673 | RIPARIAN CORRIDOR PLAN - SHEET 3                         |
| CA700 | SOIL & WATER MANAGEMENT PLAN - GENERAL NOTES AND DETAILS |
| CA701 | SOIL & WATER MANAGEMENT PLAN - PHASE 1 - SHEET 1         |
| CA702 | SOIL & WATER MANAGEMENT PLAN - PHASE 1 - SHEET 2         |
| CA703 | SOIL & WATER MANAGEMENT PLAN - PHASE 1 - SHEET 3         |
| CA704 | SOIL & WATER MANAGEMENT PLAN - PHASE 2 - SHEET 1         |
| CA705 | SOIL & WATER MANAGEMENT PLAN - PHASE 2 - SHEET 2         |
| CA706 | SOIL & WATER MANAGEMENT PLAN - PHASE 2 - SHEET 3         |
| CA750 | UTILITY CONCEPT MASTER PLAN - LAYOUT                     |
| CA800 | TYPICAL SHARED TRENCH ARRANGEMENT - SHEET 1              |
| CA801 | TYPICAL SHARED TRENCH ARRANGEMENT - SHEET 2              |
| CA802 | TYPICAL SHARED TRENCH ARRANGEMENT - SHEET 3              |
| CA803 | TYPICAL SHARED TRENCH ARRANGEMENT - SHEET 4              |
| CA804 | TYPICAL SHARED TRENCH ARRANGEMENT - SHEET 5              |
| CA805 | TYPICAL SHARED TRENCH ARRANGEMENT - SHEET 6              |



## 2. THE SITE

### 2.1 EXISTING SERVICES

The site has the following existing services which have been depicted on Drawing CA010:

- ▶ Existing overhead 132kV and 11kV electrical to be relocated adjacent to Old Cooma Road by Essential Energy
- ▶ Existing electrical overhead connected to Neighbourhood 1 (NH1) Gorman Drive and transverses NH5.
- ▶ Telstra communications assets to be relocated to within the 11kV electrical trench
- ▶ Existing structures and associated contamination to be remediated prior to construction
- ▶ Farm Dams – to be removed progressively with staged construction
- ▶ Farm Tracks – to be removed progressively with staged construction
- ▶ Farm Fences – to be removed progressively with staged construction

### 2.2 CONSTRAINTS

The site has several constraints that have been considered in the preparation of this DA. These constraints include, but are not limited to the following:

- ▶ Montgomery Creek second order riparian corridor
- ▶ Existing NH1 and NH2 levels and services
- ▶ Close proximity to neighbouring lands
- ▶ Environmentally sensitive lands – Pink Tail Worm Lizard (PTWL) Conservation Zone and NH4 Reserve
- ▶ High Value trees to be retained
- ▶ Culturally significant assets including a scar tree located within NH3 and a scar tree within the PTWL Conservation Zone
- ▶ Biodiversity Certification Assessment Report (BCAR) requirements
- ▶ Googong Dam Catchment Boundary

### 3. DEPARTURES FROM DESIGN SPECIFICATIONS

The DA is generally in accordance with the QPRC Design Specifications, although the following table outlines proposed departures:

**Table 1: Departures from QPRC Design Specification**

| Design Specification | Rule/Criteria  | Departure   | Reason for Departure   |
|----------------------|--|---|--|
| D1.10 & D1.31.2      | <i>Laneway Cross Section</i>   | No 1.2m Footpath provided   | Standard residential lots will address Bunyip Drive and Road 361 where pedestrian paths are provided. These lanes also do not create quicker or more desirable pedestrian movements that would warrant installation of a footpath.   |
| D1.07.9              | <i>Maximum Length of a straight laneway</i>  | Straight length >65m  | The laneways include intermediate thresholds to differentiate the laneway to other streets and 90 degree change in directions to remove long straight lengths and opportunities for unacceptable acceleration.   |
| D1.08.7              | <i>Road links with another road is more than two levels higher or lower</i>                            | Access Street & Sub-Arterial Roads intersections                          | Traffic volumes do not warrant a higher order classification for a majority of roads intersecting with the with Sub-Arterial Roads.  |
| D1.08.8              | <i>Internal Road Connections shall be T-junctions or controlled by roundabouts or other treatments</i> | 4-way intersections located within NH3 and along Local Sub-Arterial Roads | Indentations introduced promote slow travel speeds. Linemarking adopted to clearly delineate priority. The intersections are located on lower order classified roads with acceptable sight distance for drivers approaching. The suggested locations experience volumes below 2000vpd. |
| D1.09.3              | <i>Collector Street Design Speed</i>   | Collector Street Deviation Design Speed is 60km/h                         | Collector Street Deviation adopts the typical cross section and design speed of a Local Sub-Arterial to remain consistent along Gorman Drive. The traffic volumes in these locations only warrant the classification of a Collector Street   |
| D1.17.5              | <i>Two minor streets intersecting a major street to have 50m centreline separation</i>                 | Minor street separation are less than 50m                                 | Separation of intersecting minor streets follows the same methodology adopted in NH1 & NH2. Reduced separation provides a traffic calming effect and promotes a low speed environment.   |
| D12.07.5             | <i>Curved Sewers not permitted</i>   | Curved sewers proposed  | The geometry of the estate, driven by the topography of the site, requires curved sewers using pipe deflection.  |

| Design Specification | Rule/Criteria  | Departure  | Reason for Departure   |
|----------------------|--|--|--|
| D12.15.1             | <i>Ductile Iron Pipes shall be used for Sewer Rising Mains</i>   | HDPE Proposed  | HDPE provides flexibility and eliminates the number of joints required and can be constructed more efficiently                     |
| D12-B                | <i>ADWF = 200L/EP/D</i><br><i>Portion<sub>wet</sub> = 10% ADWF</i><br><i>GWI = 10% ADWF</i><br><i>I = 31.81mm/hr</i> | ADWF = 180L/EP/D<br>Portion <sub>wet</sub> = 0<br>GWI = 0<br>I = 23mm/hr | Parameters adopted are consistent with the Township sewer masterplanning that has been adopted since the conception of the project |

## 4. ROAD NETWORK

### 4.1 TRAFFIC ASSESSMENT

A traffic study was undertaken by SCT Consulting to analyse the traffic generated by the development. SCT Consulting reviewed and updated QPRC's strategic model TRACKS to reflect NH345 and the ultimate Township. The results of their intersection and strategic model analysis are provided in the Traffic Impact Assessment submitted with the NH345 DA.

### 4.2 ROAD HIERARCHY

#### 4.2.1 OLD COOMA ROAD

Old Cooma Road is classified by Transport for New South Wales(TfNSW) as a Regional Road. The proposed road cross section for Old Cooma Road will remain unchanged other than the introduction of a 3.5m auxiliary lane, 2.5m line marked median and 3.5m channelised right turn for the intersection of Bunyip Drive.

#### 4.2.2 LOCAL SUB-ARTERIAL

The proposed Local Sub-Arterial has been designed in accordance with QPRC's D1.07.07 and is consistent with the existing cross sections of Gorman Drive and Wellsdale Drive in NH1 and NH2 respectively.

#### 4.2.3 COLLECTOR STREET

The proposed Collector Street has been designed in accordance with QPRC's D1.07.06.

The proposed Collector Street Deviation adopts the typical cross section of a Local Sub-Arterial however only experiences the traffic volumes of a Collector Street.

#### 4.2.4 LOCAL STREET

Four Local Street cross sections have been proposed and meet QPRC's minimum design requirements outlined in QPRC's D1.07.5. A summary of the four different cross sections is in Table 2.

**Table 2: Local Street Cross Section Breakdown**

| Typical Cross Section                      | Road Reserve Width | Carriageway Width | Changes between Cross Section                                 |
|--|--------------------|-------------------|---|
| Local Street                               | 18.00m             | 8.00m             | -   |
| Local Street Deviation                     | 19.70m             | 9.70m             | Wider to permit cars passing with informal parking both sides |
| Local Street Deviation 2                   | 20.60m             | 10.60m            | Formal parking added both sides                               |
| Local Street Deviation – 90 Degree Parking | 23.00m             | 15.50m            | 90 degree parking added                                       |



#### 4.2.5 ACCESS STREET

The proposed Access Street cross section has been designed in accordance with QPRC's D1.07.05.

#### 4.2.6 LANEWAY(PUBLIC)

The proposed one-way public laneways are located adjacent to Bunyip Drive where traffic volumes prohibit driveway access. The laneways service standard residential lots with the proposed circulation:

- ▶ Road 370: Clockwise to remove the option of a right turn onto Edward Drive too close to Bunyip Drive intersection
- ▶ Road 371: Anti-clockwise to allow exiting laneway traffic to clearly see approaching vehicles from both directions on Road 361.

Both laneways are proposed to include a different pavement treatment intermittently through the laneway to indicate it is a slow speed environment.

The proposed laneways differs from QPRC's D1 specification with the following departures:

- ▶ Maximum length is greater than 65m – As standard residential lots are serviced by the laneway the average lot frontage is 16m, therefore requiring additional length to accommodate the standard lot frontage. The introduction of 90 degree bends have been included along with intermediate deviations in the laneway to discourage vehicles inappropriately accelerating through.
- ▶ 1.2m footpath – Standard residential lots will address Bunyip Drive, Road 561 and Road 361 where pedestrian paths are provided. Therefore a footpath within the laneway is not warranted.

#### 4.2.7 NEIGHBOURHOOD CENTRE 4 STREET

The proposed Neighbourhood Centre 4 Street incorporates the design elements of a Local Street however with the addition of indenting parallel parking and 90 degree parking between the two neighbourhood centre 4 blocks. This road also accommodates with the widening of kerbs the turning movements of a prime mover and semi-trailer to service the neighbourhood centre blocks.

### 4.3 ROAD GEOMETRY

#### 4.3.1 DESIGN SPEED

The adopted design speeds for NH345 are in accordance with D1.09.3 and summarised in Table 3.

**Table 3: Design and Posted Speed Summary**

| Road Hierarchy | Design Speed | Posted Speed | QPRC D1.09.3 Design Speed |
|----------------|--------------|--------------|---------------------------|
| Old Cooma Road | 90km/hr      | 80km/h       | -                         |

| Road Hierarchy               | Design Speed | Posted Speed | QPRC D1.09.3 Design Speed |
|------------------------------|--------------|--------------|---------------------------|
| Local Sub-Arterial           | 60km/h       | 50km/h       | 60/80km/h                 |
| Collector Street – Deviation | 60km/h       | 50km/h       | 50km/h                    |
| Collector Street             | 50km/h       | 40km/h       | 50km/h                    |
| Local Street                 | 40km/h       | 30km/h       | 40km/h                    |
| Access Street                | 25km/h       | 15km/h       | 25km/h                    |
| Laneway                      | 25km/h       | 15km/h       | 25km/h                    |

#### 4.3.2 VERTICAL GEOMETRY

The proposed longitudinal gradients of roads within NH345 are in accordance with QPRC's D1.10. We note there are instances where proposed road grades approach the minimum gradient of 0.5% however there are no instances where grades are proposed any flatter. Locations where flat road grades are adopted are to eliminate any trapped overland flow paths. All road grades proposed are less than the desirable maximum outlined in QPRC's D1.10 Specification.

#### 4.3.3 HORIZONTAL GEOMETRY

The proposed road geometry has been designed in accordance with QPRC's D1.11. A minimum kerb return radii of 8m is proposed for all roads within NH345. There are locations within NH345 where turning movements and sight distances dictated wider radii which have been accommodated.

##### 4.3.3.1 Sight Distances

Sight distance checks have been completed for intersections within the Site, generally in accordance with QPRC's D1.17.6. Additionally, approach sight distance were prepared for corners that are less than 90 degrees to confirm the chamfers on blocks were adequate.

Sight distance checks have been documented on drawings CA310 to CA313 for the intersection of Old Cooma Road/Bunyip Drive and Wellsvale/Gorman/Bunyip Drive. For the signalised intersection on Wellsvale/Gorman/Bunyip Drive is has been assumed that approach speeds in the event of the signals being out of order would be less than the design speed of the Sub-Arterials as cars will be approaching the intersection with caution.

##### 4.3.3.2 Turning Movements

Turning movements have been prepared throughout the site to confirm the road geometry is in accordance with QPRC Design Specification.

The below assumptions have been accommodated throughout the development:

- ▶ A service vehicle (8.8m) and passenger vehicle can turn simultaneously at all 90degree or greater bends
- ▶ A service vehicle (8.8m) can traverse the proposed one-way laneways in NH3

- ▶ A single unit truck (12.5m) and passenger vehicle can turn simultaneously at the intersection of Collector Streets with Local Street Deviations and Sub-Arterial Roads.
- ▶ A prime mover and semi trailer (19m) can perform all movements at the intersection of Old Cooma Road/Bunyip Drive except the left turn from Bunyip onto Old Cooma Road which has been designed for a single unit truck (12.5m)
- ▶ A prime mover and semi trailer (19.0m) can navigate around all streets fronting the three local centres
- ▶ A single unit truck (12.5m) can perform all movements at the intersection of Wellsvale/Bunyip/Gorman Drive and the prime mover and semi trailer (19.0m) can enter and exit the proposed Local Centre Road 435

Turning movements have been demonstrated within the prepared civil design drawing set for the intersection of Wellsvale/Bunyip/Gorman Drive, Old Cooma Road/Bunyip Drive and streets fronting the future neighbourhood centres.

#### 4.3.3.3 Kerb Indentation

As adopted throughout NH1 and NH2, kerb indents at intersections through NH345 have been proposed. The methodology on the locations of indentation for NH345 is outlined below:

- ▶ Adopted for left kerb return entry onto local and access streets
- ▶ Carriageway width reduced to 6m at indent locations local and access streets
- ▶ Indentation provided on both sides of the road to a carriageway width of 6.5m when formal parking proposed
- ▶ Only adopted when required turning movements can be accommodated
- ▶ Kerbs indented for parking along Bunyip, Gorman and Wellsvale Drive

#### 4.3.3.4 Four Way Intersections

From the initial stages of structure plan development, legibility and wayfinding have been the most important principals that guided the design for NH345.

Combining the above with the aim to maximize permeability to encourage walkability has resulted in a grid configuration with clear sightlines towards Googong Common as the main pedestrian destination.

In NH3 there has been number of constraints and design considerations that resulted in formation of 2 four-way intersections. The following explains the rationale behind the design and why alternative arrangements are less optimal from the urban design perspective.

- ▶ Edward Dr and Reginal Road: Both are major roads travelling north south on either side of Nangi Pimble, connecting the Googong Town Centre to NH3. The alignment of these 2 roads are fixed in NH2 so there was a degree of limitation to change the alignment over a short distance.
- ▶ Road 354 has been located to provide a main pedestrian access connecting Nangi Pimble to Googong Common while maintaining visual accessibility. The alignment of this

road is defined by topography. This road is located at the end of the Nangi Pimble park and on a saddle to reduce the amount of earthwork.

- ▶ Sections between Edward Dr and Road 304 in NH3 could have been turned into east-west section to avoid the two intersections. This would have resulted in creation of blocks with excessive (2-3m) cross fall which would have created a poor public realm outcome.

The proposed line marking along Road 354 has been depicted on Drawing CA340 to demonstrate the proposed priorities.

#### 4.3.3.5 Traffic Calming

Traffic calming has been proposed in select locations to reduce the possibility of cars accelerating unnecessarily. The proposed locations and treatments are:

- ▶ Road 003: Raised pedestrian crossing to link the open space corridor to the proposed 2.5m shared path
- ▶ Glenrock Drive: Raised pedestrian crossing treatment is to be located adjacent Neighbourhood Centre 3 to draw drivers attention to the change in character of the precinct; promoting pedestrian connectivity to the open space from the Neighbourhood Centre. The proportion of Glenrock Drive adjacent Neighbourhood Centre 3 will be also be finished with a tactile treatment to distinguish the precinct area.

### 4.4 CREEK CROSSINGS

Two creek crossings are proposed connecting the neighbourhoods across Montgomery Creek.

#### 4.4.1 BUNYIP DRIVE

The proposed Montgomery Creek crossing along Bunyip Drive will maintain the typical Sub-Arterial cross section. A reinforced concrete box culvert and headwalls will be provided in this location to connect NH3 to NH4.

#### 4.4.2 GORMAN DRIVE

The creek located beneath Gorman Drive connecting NH1 and NH5 is incised and warrants the construction of a bridge crossing. The proposed bridge will span 28m and be constructed utilising Super T units with a cast in-situ deck slab. The cross section at the bridge will consist of:

- ▶ 3.5m travel lanes
- ▶ 1.5m cycle lanes
- ▶ 2.5m paths/verge

The posted speed along Gorman Drive is 50km/h, therefore permitting a 300mm high non-mountable kerb between the travel lane and the pedestrian path. The inclusion of the non-mountable kerb negates the requirement for traffic barriers. An integrated pedestrian handrail and bridge barrier is proposed along the crossing as depicted in CA656.



## 4.5 PARKING

The NH345 development includes a combination of on-street and off-street parking arrangements.

### 4.5.1 ON STREET PARKING

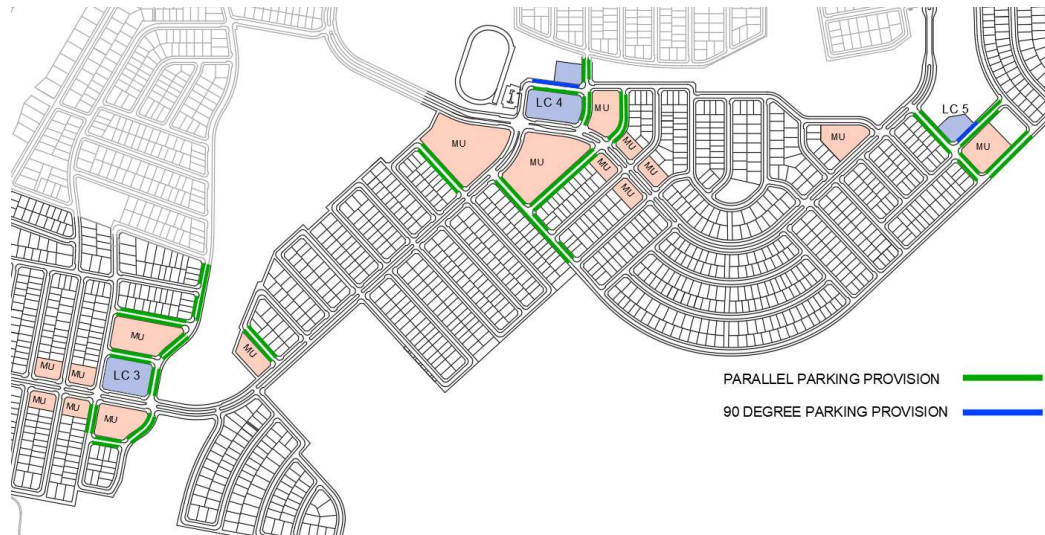
A summary of where provision for on street parking has been provided based on the proposed road hierarchy is below in Table 4.

**Table 4: On-Street Parking Summary**

|  | Parking Provided           | Parking Width                              | Linemarked                       |
|--|----------------------------|--|----------------------------------|
| Local Sub Arterial                             | Yes – Parallel             | 2.1m                                       | Yes                              |
| Collector                                      | Yes - Parallel             | 2.1m                                       | Yes                              |
| Local Street – Deviation 2                     | Yes - Parallel             | 2.3m                                       | Yes                              |
| Local Street – Deviation with 90Degree Parking | Yes – Parallel & 90 Degree | Parallel – 2.1m<br>90 Degree – 2.5m x 5.4m | Parallel – No<br>90 Degree - Yes |
| Local Street Deviation                         | Yes - Parallel             | 2.1m                                       | No                               |
| Local Street                                   | Informal on-street parking |  | No                               |
| Access Street                                  | Informal on-street parking |  | No                               |
| Laneway  | No                         | -  | -                                |

On-street parking has been carefully considered with specific road cross sections adopted around proposed local centres and multi-unit lots to cater for expected increased on-street parking demands. Figure 1 below depicts the locations within NH345 that account for on-street parking in addition to the indented parking located along Wellsvale Drive, Gorman Drive and Bunyip Drive.

**Figure 1: Parking Locations within NH345 in addition to along Wellsvale/Gorman/Bunyip Drive**



#### 4.5.2 OFF STREET PARKING

Provision for parking has been included in NH345 for the NH4 Reserve and Sportsfield 7. The total number of spaces provided off-street are:

- ▶ NH4 Reserve: 26 standard 90 degree parks and 2 disabled parks
- ▶ Sportsfield 7: 60 standard 90 degree parks and 2 disabled parks

#### 4.6 PUBLIC TRANSPORT

Consultation with QCity was conducted to confirm that the ultimate bus route for the Township aligns with their servicing strategy. The proposed route and stops were endorsed by QCity on 9<sup>th</sup> September with the correspondence included in Appendix A. The proposed bus stop dimensions aligns with Austroads Guide to Road Design Part 3: Geometric Design with an approach length of 26m and exit length of 10m for the kerbside stops. Bus Shelters are proposed for the three (arriving and departing) bus stop locations adjacent the Neighbourhood Centres.

## 5. SITE RE-GRADING

### 5.1 EXISTING SLOPE

The existing slope of the proposed developable area ranges from <5% to 25%+ as depicted on Drawing CA280. Areas that are particularly steep are located south of the Nangi Pimble Reserve in NH3 and within the PTWL Conservation Zone. Montgomery Creek between NH3 and NH4 is a broad upland floodplain with gradual changes in grade. The creek adjacent NH1 becomes more incised with grades in excess of 25%. The site on average has slopes of 5% to 15%.

### 5.2 PROPOSED SLOPE

As shown on Drawing CA290 the proposed slope of the development ranges between <5% and 25%. There are no locations within the developable area that is disturbed and greater than 25%.

The proposed grading of the site has adopted the below slope criteria:

- ▶ Road Grades <16% in accordance with QPRC's Design Specification D1
- ▶ Interface Batters <25% in accordance with QPRC's Design Specification D6
- ▶ Residential lots <20% in accordance with QPRC's Design Specification D6

### 5.3 SITE GRADING

As shown on Drawing CA200 to CA203 re-grading is proposed across the majority of the Site. The proposed Site grading considers the following design principles:

- ▶ Creating roads that comply with QPRC's D1 Specification
- ▶ Connecting to existing roads and design levels in NH1 and NH2
- ▶ Creating lots with building envelopes less than 20%
- ▶ Avoiding earthworks outside of the Estate boundary
- ▶ Avoiding earthworks within the Riparian Corridor, PTWL Conservation Zone and NH4 Reserve
- ▶ Allowing stormwater assets along Montgomery Creek to service the site and still outlet to the creek.
- ▶ Connecting to existing infrastructure provided in NH1 and NH2
- ▶ Preserving high value trees and archaeological assets
- ▶ Maintaining overland flow paths and management of upstream catchments
- ▶ Providing necessary 1% AEP freeboard from Montgomery Creek to the proposed roads and blocks

The proposed grading across the three neighbourhoods involves the filling of minor gullies and farm dams to avoid localised trapped low points in the road grading. The proposed

grading has been largely dictated by the three sub-arterial roads connecting to NH1 & NH2 across Montgomery Creek.

The proposed earthworks results in a net import of material however is subject to final design of the which will be further developed for the Construction Certificate approval.

#### **5.4 BLOCK GRADING**

GTPL intends to, as adopted in NH2, provide lot benching across the development to provide greater regularity for the built form and to reduce potential issues between neighbouring lots post subdivision. Lot benching opportunities can be accommodated with the current road grades and earthworks shown on the DA. Although the site has been graded for the DA such that on-block retaining walls are not needed, at detailed design it is GTPL's intention to introduce, lot benching as previously documented and constructed in NH2 to achieve flatter blocks for builders. Specific locations of the lot benching will be further developed for the Construction Certificate approval.

#### **5.5 RETAINING WALLS**

Retaining walls have been located within NH5 to manage the interface with the PTWL Conservation Zone and manage required detention volumes at Water Sensitive Urban Design Asset 09.

The retaining walls located along Road 534 are proposed to be of a similar nature to those already constructed along Montgomery Rise in NH1B. Rock walls with soft landscaping integrated are proposed to soften interaction from the estate to the PTWL Conservation Zone.

Two stepped 900mm retaining walls are proposed along Road 531 to provide the adequate storage provision and embankment stability for the WSUD 09 detention basin.



## 6. CYCLING AND PEDESTRIAN ACCESS

### 6.1 ON ROAD CYCLING

On road cycling has been provided along Bunyip Drive, Wellsvale Drive and Gorman Drive. On-road cycling has not been provisioned for along Old Cooma Road due to the rural character of the existing road and the proposed shared use path adjacent the road. The shared use path parallel to Old Cooma Road is a continuation from NH2 and is located along the electrical easement. This path will continue along Old Cooma Road and along the Township's southern boundary.

### 6.2 FOOTPATHS

It is proposed footpaths within NH345 are to be provided on one side of the road (ranging in size from 1.5m to 2.5m). The extents of the proposed path network and crossing locations is shown on Drawing CA110.

An accessibility compliant footpath network has been considered in the road grading to maintain at a minimum, one accessible path of travel to key open space and local centre locations.

## 7. SEWER MASTERPLAN

### 7.1 PROPOSED SEWER INFRASTRUCTURE

The sewer catchments used to design the proposed sewer network in NH345 are shown on drawing CA350 with the details of these catchments summarised on drawing CA360 and CA361. The proposed sewer network for NH345 is shown on drawings CA370 to 372.

#### 7.1.1 CONNECTION LOCATIONS

The NH345 sewer network is proposed to connect into the existing Googong sewer system at 4 locations:

- ▶ NH3 catchment is proposed to connect into the existing network through the 300mm diameter carrier main running along the west side of Montgomery creek.
- ▶ Catchments NH4-A, B & C are proposed to connect into the existing network through the 300mm diameter carrier main on the Eastern side of Montgomery creek which continues through NH1B.
- ▶ NH4-D catchment is proposed to connect into the existing network through the 225mm diameter carrier main which extends south of NH1B.
- ▶ NH5 catchment is proposed to connect to the existing at the 225mm diameter carrier main within NH1B. In order to connect into the existing network the proposed carrier main will cross the Gorman Drive bridge. The main will be located in the services void with a tie-rod and cradle pipe support under the bridge deck.

All flows from the catchments in NH345 ultimately flow to SPS2 within NH1.

#### 7.1.2 DESIGN FLOWS

A series of nodes through NH345 have been used to calculate and confirm the size and grade of the proposed sewers. The results for each node are shown on drawing CA360 and CA361. The total flow to SPS2 has been calculated and are also shown on drawing CA360. These calculations have been compared to previous calculations completed during the NH2 DA submission and the most recent NH1B Stage 4D DA Submission. It was found that the total peak wet weather flow at SPS2 in the NH345 DA calculations was 124 L/s which is less than the predicted flow calculated during the NH1B Stage 4D DA submission of 172.73 L/s.

#### 7.1.3 SEWER PIPE DESIGN

The proposed sewer network of NH345 will be comprised of PVC pipe with 150mm diameter pipes servicing majority of the area with 225 diameter carrier mains within NH3, NH4-B & C and NH5 catchments. It is proposed that the sewer is designed to minimum allowable grade of achieving self-cleansing. This will reduce the depth of sewer also aiding in the accessibility for any future maintenance needed.

### 7.2 SEWER DESIGN CRITERIA

The proposed sewer network has been designed in accordance with WSA02 2002-2.3 and QPRC-D12.

The criteria used for design is as below:

#### Sewerage Flow Estimation

| Design Criteria       | Value  | Source   |
|-----------------------|--|--|
| EP/ha                 | 75/ha (Commercial)   | WSA02-2002-2.3 Table A.1   |
| ADWF                  | 180 L/EP/d = 0.0021 L/EP/S   | WSA02-2014-3.1-Appendix C  |
| GWI                   | 0  | Based on Googong Geotechnical / Groundwater level information obtained on site and adopted for all Googoon Sewer Masterplanning. |
| A                     | Gross Plan area of developments catchment in hectares (Leak tight sewerage system assumed, therefore no road catchment included. | WSA02-2014-3.1-Appendix C  |
| RDI                   | $0.03 * A_{eff} * C * I$   | WSA02-2014-3.1-Appendix C & QPRC D12-Appendix B  |
| $A_{eff}$             | $A_{eff} = A * (1 - 0.75 \text{ Portion Impervious})$  | WSA02-2014-3.1-Appendix C  |
| Portion Impervious    | 70% (Commercial)   | WSA02-2014-3.1-Appendix C  |
| Portion wet           | 0%   | Based on Googong Geotechnical / Groundwater level information obtained on site and adopted for all Googoon Sewer Masterplanning. |
| C                     | 0.6  | WSA02-2014-3.1 -Table C1   |
| I                     | $I_{1,2} * F_{size} * F_{containment}$   | WSA02-2014-3.1-Appendix C  |
| $I_{2,10}$            | 20.1mm/hr  | Bureau of Meteorology  |
| $F_{size}$            | $(40/A_{eff})^{0.12}$  | WSA02-2014-3.1-Appendix C  |
| Containment Frequency | 10 years   | WSA02-2014-3.1-Appendix C  |
| $F_{containment}$     | 1.5  | WSA02-2014-3.1-Appendix C  |
| PWWF                  | PDWF + GWI + RDI   | WSA02-2014-3.1-Appendix C  |
| Material              | PVC-U  | QPRC D12-Appendix B  |

#### Sewerage Pipe Hydraulics

| Design Criteria               | Value    | Source                 |
|-------------------------------|----------|------------------------|
| Minimum Velocity (PDWF)       | 0.70 m/s | WSA02-2002-2.3-4.5.7.1 |
| Maximum Velocity (PWWF)       | 2.0m/s   | QPRC D12-Appendix B    |
| Maximum Depth ratio at (PDWF) | 50%      | QPRC D12-Appendix B    |
| Maximum Depth ratio at (PWWF) | 95%      | QPRC D12-Appendix B    |

#### Sewerage Flow Estimation

|  |       |                          |
|--|-------|--------------------------|
| Minimum Self-Cleansing Shear Stress (PDWF) | 1.6Pa | WSA02-2014-3.1-5.5.7     |
| Design Minimum Grades (DN150)              | 0.55% | WSA02-2002-2.3-Table 4.6 |
| Design Minimum Grades (DN225)              | 0.33% | WSA02-2002-2.3-Table 4.6 |

### 7.3 SEWER PUMP STATION

A sewer pump station is proposed to service the eastern most catchment of NH5. The sewer pump station (SPS4) will connect into the 225mm diameter carrier main along Road 003 in NH5 via a rising main. A conceptual arrangement plan of SPS4 is shown on drawing CA380 and the preliminary rising main plan and long section are shown on drawings CA385 and CA390 respectively. SPS4 design parameters are subject to detailed design at Construction Certificate phase.

SPS4 is proposed to be maintained by a 12.5m service vehicle with a dedicated layby bay. The required overflow relief headwall is located to the north east of the SPS. It is proposed that the SPS4 system will store and control the rate at which flows are discharged into the gravity system connecting to Gorman Drive at Montgomery Creek.



## 8. WATER SUPPLY

### 8.1 WATER SUPPLY MASTERPLAN

The ultimate water masterplan for the Googong Township can be seen on CA400.

#### 8.1.1 RESERVOIRS

Googong Water Reservoirs supplying the Township are located atop the Nangi Pimble Reserve. Googong's Potable water tanks is supplied by Iconwater's trunk water supply main t via the Googong Bulk Water Pump Station. The recycled water tanks are supplied by the Googong Water Recycled Plant (WRP) located along Googong Road; North of NH1B. The design parameters of the final upgrade of the Nangi Pimble water reservoirs to accommodate the total Equivalent Population (EP) of 18,850 has been outlined in Table 5.

**Table 5: Nangi Pimble Water Reservoir Details**

|                         | Potable Reservoir 1 | Potable Reservoir 2 | Recycled Reservoir |
|-------------------------|---------------------|---------------------|--------------------|
| Full Operating Volume   | 1.9ML               | 4.0ML               | 8.5ML              |
| Minimum Operating Level | 798.86 RL           | 798.87 RL           | 799.10 RL          |
| Top Water Level         | 804.59 RL           | 804.61 RL           | 805 RL             |

Googong's Water Recycling Plant will undergo its final stage of upgrades to accommodate the ultimate EP of 18,850 during the progression of NH345.

#### 8.1.2 PRESSURE ZONES

Googong's water reticulation network consists of three separate pressure zones; reduced pressure zone, intermediate pressure zone and boosted pressure zone. The three pressure zones are detailed in Table 6.

**Table 6: Pressure Zone Parameters**

|                            | Elevation Range  | Location       | Zone Serviced By                    |
|----------------------------|------------------|----------------|-------------------------------------|
| Reduced Pressure Zone      | RL 790 to RL 760 | NH1 & NH5      | Pressure Reducing Valves            |
| Intermediate Pressure Zone | RL 760 to RL 725 | NH1, NH2 & NH4 | Direct Connection to Reservoirs     |
| Boosted Pressure Zone      | RL 725 to RL 710 | NH2, NH3 & NH4 | Booster Pumps Located At Reservoirs |

The three pressure zones have been designed to align with the standards adopted in Section 8.2.1.

The booster pumps required to supply the boosted zone located within NH2, NH3 and NH4 have been designed with the following parameters:

- ▶ Potable Water Pump – 30L/s @ 25m Head
- ▶ Recycled Water Pump – 60L/s @ 25m Head

A total of three pressure reducing valves (PRV) are required to supply the reduced pressure zone located within NH1 and NH5. Two existing below ground chamber PRV's have been constructed and are currently operational with the third and final below ground chamber PRV proposed in NH5.

### 8.1.3 DEMAND MODELLING

Montgomery Watson Harza (MWH) now Stantec were engaged by GTPL to determine the demand assumptions for the dual reticulation supply for the Googong Township at the commencement of the project. The demand assumptions adopted for NH345 are consistent with those utilised during the NH2 Development Application and masterplan work. The proposed peak day demand, peak hour factor and peak hour demand rates have been provided on drawing CA413 for potable supply and CA423 for recycled supply.

Diurnal curves supplied by Stantec have been adopted in the modelling of NH345 for each land use type. A 30 minute time step over a 7 day period was chosen to predict the water pressures and demonstrate compliance with design criteria outlined in 8.2.1. InfoWorks WS Pro water model was prepared to simulate the potable and recycled reticulation network.

## 8.2 PROPOSED WATER SUPPLY NETWORK

The proposed pipe network, demands, pressures and fire flow residual pressures can be seen on drawing CA410 to CA423.

### 8.2.1 DESIGN CRITERIA

The design criteria used for the assessment of NH345 Potable and Recycled reticulation network is as follows:

**Table 7: Water Supply Network Criteria**

| Parameter                | Value  | Source   |
|--------------------------|--|--|
| Maximum Service Pressure | 800kPa   | Queanbeyan Design Spec D11.05.4                |
| Minimum Service Pressure | 200kPa   | WSA 03-2011 Water Supply Code Section 2.5 T2.3 |
| Minimum Pipe Size        | 100mm  | Queanbeyan Design Spec D11.09.9                |
| Maximum Headloss         | 5m/km $\leq$ $\varnothing$ 150<br>3m/km $\geq$ $\varnothing$ 200 | WSA 03-2011 Water Supply Code Section 3.1.6.2  |
| Maximum Velocity         | 2m/s   | WSA 03-2011 Water Supply Section 3.1.6.4       |
| Pipe Material            | Potable PVC-M PN16<br>Recycled PVC-O PN16                        | Queanbeyan Design Spec D11.10.01               |

| Parameter                                   | Value                                     | Source  |
|---|---|---|
| Hydrant Spacing                             | Potable – 90m<br>Recycled – 60m           | Queanbeyan Design Spec D11.07.1               |
| Minimum Radii                               | 300 x pipe diameter                       | iPlex Pipelines                               |
| Fire Flow Provision – Recycled Network Only |   |   |
| Minimum Fire Flow Required                  | 10L/s – Residential<br>30L/s - Commercial | AS2419.1:2017 Table 2.2.3.1 (A)               |
| Minimum Residual Pressure                   | 15m                                       | AS2419.1:2017 Table 2.2.3.1 (A)               |
| Maximum Velocity                            | 4m/s                                      | WSA 03-2011 Water Supply Code Section 3.1.6.4 |

## 8.2.2 WATER SUPPLY SYSTEM

Neighbourhood 3's reticulation system is located wholly within the boosted zone and is serviced via connections to the existing NH2 infrastructure. A distribution main along Lambrigg Road has been designed to supply the proportion of boosted zone located within NH4. No zone valves are required within NH3.

Neighbourhood 4's reticulation system consists of both the boosted and intermediate pressure zones. The boosted zone is supplied by the distribution main along Bunyip Drive from NH3 with the pressure boundary being configured to eliminate the need for zone valves and dead end mains. The intermediate zone is supplied by a distribution main that is connected to the Nangi Pimble Reservoirs and is located along Hungerford Street and Glenrock Drive in NH2. This distribution main will cross Montgomery Creek and run along Road 401, supplying NH4. The second connection proposed for the intermediate zone is at Wellsvale Drive with main feeder pipes running along Bunyip Drive and Gorman Drive to service the zone. A non-return valve is required along McTernan Street to promote water flows servicing the existing NH1B Stage 4, 6 & 8 (Montgomery Rise) from the currently constructed NH1B Gorman Drive mains and not via the Wellsvale Drive connection.

Neighbourhood 5's reticulation system consists of both the intermediate and reduced pressure zone boundary. Neighbourhood 5 will connect to the reticulation main connected to an existing PRV along Gorman Drive in NH1B. A second connection to the proposed reduced pressure zone within NH5 is located along Road 003 via the third and final PRV underground chamber. The location of the pressure reduced zone boundary requires one zone valve located on Road 501. The intermediate zone will be connected to existing infrastructure supplied from distribution mains located along Bunyip Drive and Gorman Drive.

For lots located within the vicinity of the proposed zone boundaries there is the possibility of achieving pressures greater than permitted at the meter. It is at the lot purchases discretion on whether a PRV at the meter is preferred to reduce the pressure.

## 9. STORMWATER MASTERPLAN

A separate detailed stormwater report submitted with this DA has been prepared by Spiire and outlines the following:

- ▶ Hydrological analysis of flows entering Montgomery Creek,
- ▶ Flood modelling along Montgomery Creek,
- ▶ Stormwater quality treatment asset selection and sizing,
- ▶ Stormwater pipe network design,
- ▶ Riparian Corridor extents; and,
- ▶ Proposed Soil and Water management.

## 10. UTILITIES

NH345 will be serviced by a reticulation network via a shared trench with gas, electricity and telecommunications in the road verges in accordance with typical configurations found in NH2.

### 10.1 GAS

Googong is currently supplied via the Queanbeyan maximum pressure main which connects to the District Regulator for medium pressure reticulation at the Googong Road/Beltana Intersection. An additional District Regulator to reduce the pressure from a proposed High Voltage gas steel main along Old Cooma Road (1050kPa) to acceptable reticulation pressures (210kPa) is required at the intersection of Old Cooma Road and Bunyip Drive. The District Regulator is typically a 1.5m x 1m x 1m underground chamber.

Consultation with Zinfra has highlighted that the trunk gas network (110PE) will be extended from the mains constructed in Gorman Drive NH1B and Wellsvale Drive NH2. The trunk gas will be located along Bunyip, Gorman and Wellsvale Drive in NH345.

### 10.2 TELECOMMUNICATIONS

NBN has confirmed that they can service the development as well as the proposed signalised intersection. GTPL propose to continue the existing roll out of NBN Fibre to the Home (FTTH) in NH345 with a new Developer Agreement. NBN highlighted that 2 P100 express conduits is required along Bunyip, Wellsvale and Gorman Drive.

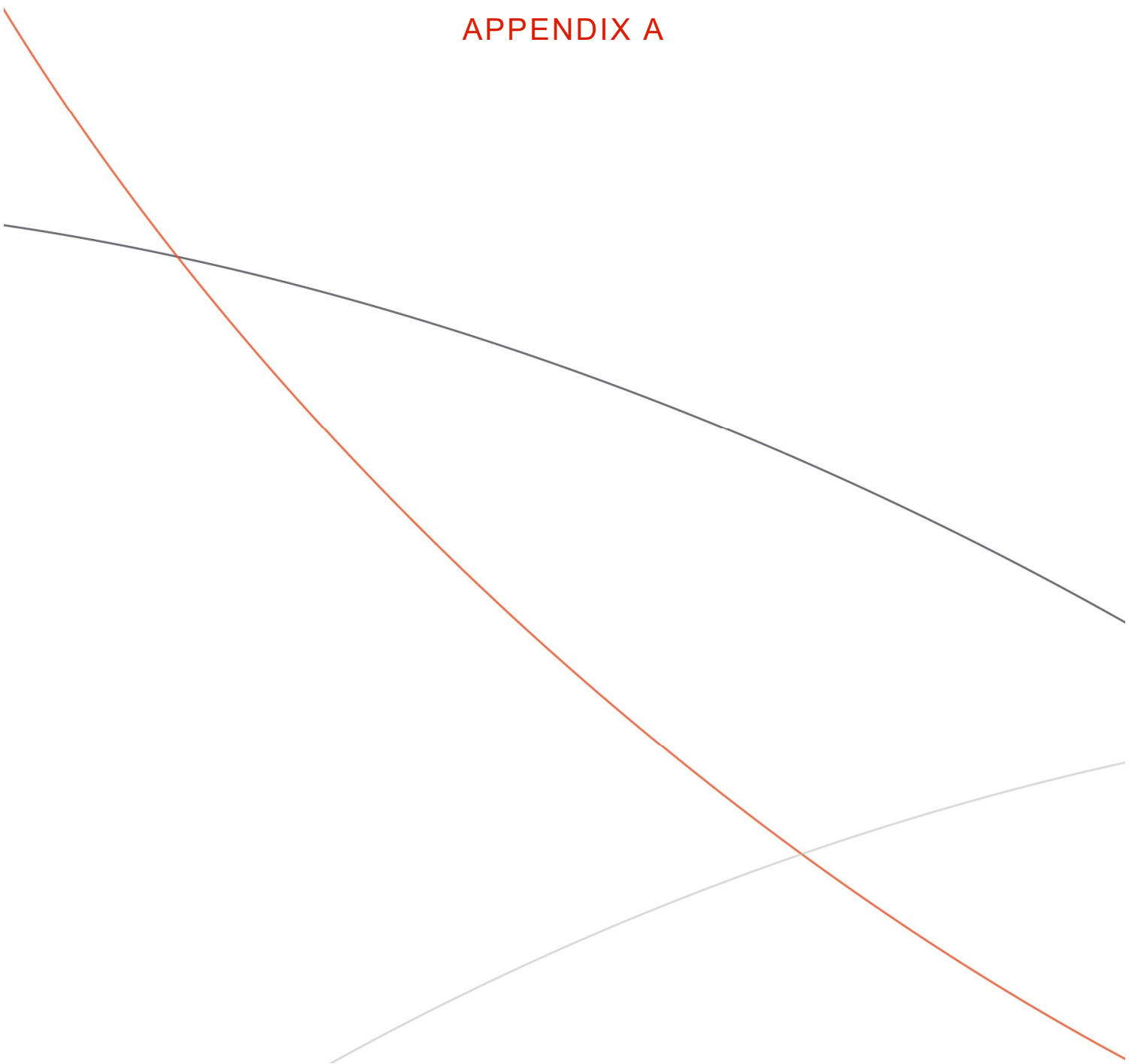
Telstra has confirmed that no provision is required within NH345 for a P100 Telstra conduit. An existing Telstra service adjacent the Old Cooma Road road reserve will need to be relocated clear of the residential areas. It is proposed that this relocation will be similar to the relocation arrangement adopted for NH2 where the Telstra assets were located within the 11kV overhead to underground relocation trench. The proposed relocation of the Telstra assets will be designed and constructed with the electrical relocations. The arrangement adopted previously and proposed for NH345, will see the alignment being prepared by GTPL's consultancy team, trenching and backfilling completed by GTPL's preferred contractor and Telstra designing and constructing the pit and pipe only

### 10.3 SMART CITIES

Googong's NH2 Wellsvale Drive includes smart cities infrastructure to provide wifi connectivity and smart streetlight systems to the residents of Googong and QPRC. Provision has been made in the typical cross sections and shared trench details for similar smart cities infrastructure. It has been assumed two trench types are required along Bunyip Drive, Gorman Drive and Wellsvale Drive:

- 1- One communications P100 conduit located on one side of the verge
- 2- Four (two communications and two electrical) P100 conduits located on the other side of the verge

APPENDIX A





## Chelsea Corcoran

---

**From:** Stewart Radcliffe <stewart.radcliffe@cdcbus.com.au>  
**Sent:** Thursday, 9 September 2021 10:20 AM  
**To:** Benjamin Cargill  
**Cc:** Stacey Carpenter; Chelsea Corcoran  
**Subject:** Re: Googong NH345 - Meeting Minutes

Good morning, Benjamin,

In principle I have no issues with the proposed bus route through Googong, have Transport for new South Wales been included in the consultation as our services are contracted to them and they will also have input into the route through Googong.

If you require any further information, please don't hesitate to contact me.

Regards.

Stewart Radcliffe.

Service Delivery Manager Queanbeyan, Yass & Fyshwick | Qcity Transit & Transborder Express

P 02 6299 3722 | M 0403 307 297

11 Bass Street | PO Box 6066 | Queanbeyan NSW 2620

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---

**From:** Benjamin Cargill <Benjamin.Cargill@spiire.com.au>  
**Sent:** Thursday, 9 September 2021 10:01 AM  
**To:** Stewart Radcliffe <stewart.radcliffe@cdcbus.com.au>  
**Cc:** Stacey Carpenter <stacey.carpenter@cdcbus.com.au>; Chelsea Corcoran <Chelsea.Corcoran@spiire.com.au>  
**Subject:** RE: Googong NH345 - Meeting Minutes

Stewart/Stacey,

Have you had a chance to look at the below as of yet?

Give us a call if you have any queries.

Regards,

**Benjamin Cargill**

Associate  
Civil Engineering



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**From:** Benjamin Cargill

**Sent:** Monday, 16 August 2021 12:50 PM

**To:** Stewart Radcliffe <[stewart.radcliffe@cdcbus.com.au](mailto:stewart.radcliffe@cdcbus.com.au)>

**Cc:** Stacey Carpenter <[stacey.carpenter@cdcbus.com.au](mailto:stacey.carpenter@cdcbus.com.au)>; Chelsea Corcoran <[Chelsea.Corcoran@spiire.com.au](mailto:Chelsea.Corcoran@spiire.com.au)>

**Subject:** RE: Googong NH345 - Meeting Minutes

Hey Stewart,

I hope all is well!

Further to the below correspondence we are pleased to provide you with the final plans we are proposing to include in our upcoming DA submission. The plans will not look very different to the last time you saw them it is just the information within the plan has gone through more rigorous development as part of the DA development process.

We would like to include correspondence with Q-City within the DA submission showing consultation and support for the proposed bus network so you could you please let us know via return email if you have an issues with the attached? If you require any further information to assist in reviewing these drawings please do not hesitate to ask.

Regards,

**Benjamin Cargill**

Associate  
Civil Engineering



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**From:** Stewart Radcliffe <[stewart.radcliffe@cdcbus.com.au](mailto:stewart.radcliffe@cdcbus.com.au)>

**Sent:** Thursday, 29 April 2021 3:24 PM

**To:** Benjamin Cargill <[Benjamin.Cargill@spiire.com.au](mailto:Benjamin.Cargill@spiire.com.au)>; Stacey Carpenter <[stacey.carpenter@cdcbus.com.au](mailto:stacey.carpenter@cdcbus.com.au)>; Tim Corby <[Tim.Corby@peet.com.au](mailto:Tim.Corby@peet.com.au)>; Katherine Hurley <[Katherine.Hurley@peet.com.au](mailto:Katherine.Hurley@peet.com.au)>; Nicholas Evans <[Nicholas.Evans@spiire.com.au](mailto:Nicholas.Evans@spiire.com.au)>; Chelsea Corcoran <[Chelsea.Corcoran@spiire.com.au](mailto:Chelsea.Corcoran@spiire.com.au)>

**Subject:** Re: Googong NH345 - Meeting Minutes

Benjamin.

All looks good as discussed, no issues from my end.

Regards.

Stewart Radcliffe.

**Depot Manager Queanbeyan, Yass & Fyshwick | Qcity Transit & Transborder Express**

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**From:** Benjamin Cargill <[Benjamin.Cargill@spiire.com.au](mailto:Benjamin.Cargill@spiire.com.au)>

**Sent:** Thursday, 29 April 2021 2:58 PM

**To:** Stacey Carpenter <[stacey.carpenter@cdcbus.com.au](mailto:stacey.carpenter@cdcbus.com.au)>; Stewart Radcliffe <[stewart.radcliffe@cdcbus.com.au](mailto:stewart.radcliffe@cdcbus.com.au)>; Tim Corby <[Tim.Corby@peet.com.au](mailto:Tim.Corby@peet.com.au)>; Katherine Hurley <[Katherine.Hurley@peet.com.au](mailto:Katherine.Hurley@peet.com.au)>; Nicholas Evans <[Nicholas.Evans@spiire.com.au](mailto:Nicholas.Evans@spiire.com.au)>; Chelsea Corcoran <[Chelsea.Corcoran@spiire.com.au](mailto:Chelsea.Corcoran@spiire.com.au)>

**Subject:** RE: Googong NH345 - Meeting Minutes

Hey Stacey/Stewart,

Just touching base on the below, can you confirm if you are happy with the proposed minutes/route?

Regards,

**Benjamin Cargill**

Associate

Civil Engineering



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**From:** Benjamin Cargill

**Sent:** Tuesday, 6 April 2021 8:20 AM

**To:** Stacey Carpenter <[stacey.carpenter@cdcbus.com.au](mailto:stacey.carpenter@cdcbus.com.au)>; Stewart Radcliffe <[stewart.radcliffe@cdcbus.com.au](mailto:stewart.radcliffe@cdcbus.com.au)>; Tim Corby <[Tim.Corby@peet.com.au](mailto:Tim.Corby@peet.com.au)>; Katherine Hurley <[Katherine.Hurley@peet.com.au](mailto:Katherine.Hurley@peet.com.au)>; Nicholas Evans <[Nicholas.Evans@spiire.com.au](mailto:Nicholas.Evans@spiire.com.au)>; Chelsea Corcoran <[Chelsea.Corcoran@spiire.com.au](mailto:Chelsea.Corcoran@spiire.com.au)>

**Subject:** Googong NH345 - Meeting Minutes

Morning All,

Please find attached the minutes from our meeting last week.

Any errors/omissions let me know.

Regards,

**Benjamin Cargill**

Associate  
Civil Engineering



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