CITY OF GOLDCOAST.

Local Government Infrastructure Plan

Extrinsic Material Report
Financial Methodologies

Date: July 2019

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1. Introduction

This extrinsic material report has been prepared to assist in the interpretation of Council's Local Government Infrastructure Plan (LGIP). The report summarises the assumptions and methodology used to determine establishment costs, cost apportionment and financial considerations within the LGIP Schedule of Works (SoW) model and financial sustainability assessment.

2. Schedule of Works costing methodology

Figure 1 below outlines the typical build-up of costs which is included within the LGIP SoW model. Further detail about the determination of each of the relevant inputs, in addition to apportionment and financial considerations have been provided in the following sections.

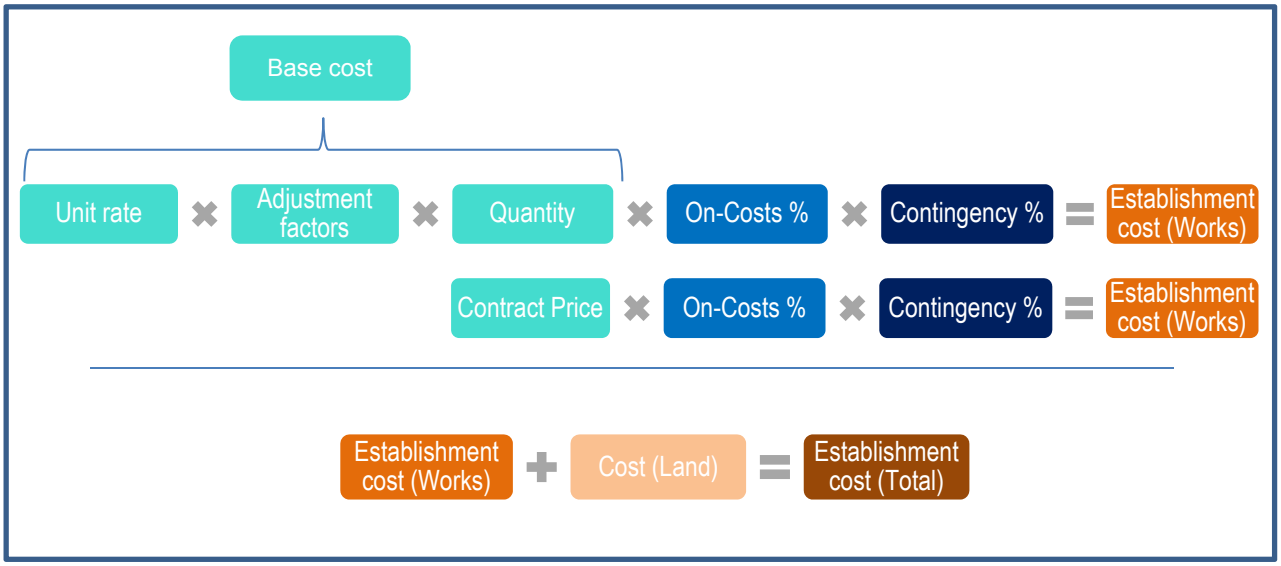

Figure 1. Establishment cost

3. Determination of establishment costs (Works)

Base costs

Base costs for the LGIP have been developed using two methodologies, where appropriate for the circumstances of each network. The first of these methodologies utilises a range of standardised unit rates, locational adjustment factors and an asset quantity (such as length or size) to determine base cost. Unit rates are an appropriate costing methodology where project planning is at an early stage and no contract price exists for a particular asset.

An alternative method of pricing assets is to use contract specific prices. Contract prices should reflect the actual costs of a particular asset, without utilising assumptions or averages across a network. These cost estimates are generated where more detailed planning is available, such as project planning reports, therefore allowing for more precise estimation of costs for construction of the project.

The approaches employed for each of the LGIP networks are identified below.

3.1 Water supply

Base costs for existing water supply trunk infrastructure have been determined using costs within Council's asset register.

Base costs for future water supply trunk infrastructure including mains, pump stations, valves and reservoirs have been calculated using the unit rate to construct approach. This aligns with the asset replacement cost as they are based on the same unit rates, detailed in the Unit Rates Report (Cardno, 2013). Unit rates have been provided for the following construction methods:

- trenching
- micro-tunnelling
- directional drilling

The construction type allocated to all assets is determined using spatial analysis against relevant barriers to constructions (e.g. existing roads/waterways). The unit rates stated in the report assume that construction occurs within an urban area in good soil conditions.

Unit rates are applied to water supply trunk infrastructure assets based on the following assets attributes in order to facilitate a suitable future infrastructure network, where relevant:

- length (m);
- pump size (kW);
- quantity (No); or
- volume (kL).

Other considerations in the determination of the Assets unit costs include depth and size. Further detail of the approach for determining the required Trunk Infrastructure is provided in the *LGIP Extrinsic Material Report – Water Supply Network.*

A range of adjustment factors are then applied to the unit rate to account for alternative site conditions. With the exception of the project scale factor, applied based on the asset's length, the factors are applied using spatial analysis. The relevant cost factors utilised in the valuation of the Water Supply network are identified in Table 3.1 below.

Table 3.1. Water supply network adjustment factors

Factor type	Description	Construction type	Application
Development	Rural, Urban, High Density Urban	Trenching	Existing and future assets
Soil	Ranging from sand to hard rock and acid sulphate soils	Trenching	Existing and future assets
Scale (Length)	Allowance for economies/ diseconomies of scale	Trenching Micro-tunnelling Directional drilling	Future assets only
Dewatering	Pipes constructed below the water table	Trenching	Existing and future assets

The base cost is derived from multiplying the unit rates and adjustment factors according to the quantity of an asset.

The base unit rates for all sizes and assumed materials used in the determination of the establishment cost of water supply trunk infrastructure are presented in Appendix A of this report.

3.2 Sewerage

Base costs for existing sewerage trunk infrastructure have been determined using costs within Council's asset register.

Base costs for future sewerage trunk infrastructure including mains, manholes and pump stations have been calculated using the unit rate to construct approach. This aligns with the asset replacement cost as they are based on the same unit rates, detailed in the Unit Rates Report (Cardno, 2013). Unit rates have been provided for the following construction methods:

- trenching
- micro-tunnelling
- directional drilling.

The construction type allocated to all assets is determined using spatial analysis against relevant barriers to constructions (e.g. existing roads/waterways). The unit rates stated in the report assume that construction occurs within an urban area in good soil conditions.

Unit rates are applied to sewerage trunk infrastructure assets based on the following assets attributes in order to facilitate a suitable future infrastructure network, where relevant:

- length (m)
- pump size (kW)
- quantity (No) or
- volume (kL)

Other considerations in the determination of the Assets unit costs include depth and size. Further detail of the approach for determining the required Trunk Infrastructure is provided in the *LGIP Extrinsic Material Report – Sewerage Network*.

A range of adjustment factors are then applied to the base rate to account for alternative site conditions. With the exception of the project scale factor, applied based on the asset's length, the factors are applied using spatial analysis. The relevant cost factors utilised in the valuation of the Sewerage network are identified in Table 3.2 below.

Table 3.2. Sewerage network adjustment factors:

Factor type	Description	Construction type	Application
Development	Rural, Urban, High Density Urban	Trenching	Existing and future assets
Soil	Ranging from sand to hard rock and acid sulphate soils	Trenching Micro-tunnelling Directional drilling	Existing and future assets
Scale (Length)	Allowance for economies/ diseconomies of scale	Trenching Micro-tunnelling Directional drilling	Future assets only
Dewatering	Pipes constructed below the water table	Trenching	Existing and future assets

The Base cost is derived from multiplying the unit rates and adjustment factors according to the quantity of an asset.

The base unit rates used for all sizes and assumed materials in the determination of the establishment cost of sewerage trunk infrastructure are presented in Appendix A of this report.

With respect to the larger and more complex infrastructure items such as sewerage treatment plant upgrades and long-term ocean release, these costs have been on individual project estimates derived from specific detailed planning reports.

3.3 Stormwater quality

Base costs for future stormwater quality trunk infrastructure including bio-retention basins, sediment ponds and wetlands have been calculated using the unit rate to construct approach based on unit rates detailed in the Stormwater Quality Infrastructure Planning Report (DesignFlow, 2017).

Unit rates are applied to future stormwater quality trunk infrastructure assets based on the infrastructures treatment area (m^2). The base cost is derived from multiplying the unit rates to the quantity of an assets treatment area.

The base unit rates used in the determination of the establishment cost of future stormwater quality trunk infrastructure are presented in Appendix A of this report.

Base costs for identified existing trunk infrastructure assets have been determined using corresponding replacement costs as recorded in Council's asset register. These values are included within the SOW though are not used in the cost apportionment calculations because an impact basis methodology has been adopted for the stormwater quality network as per Table 5.2 below. It should also be noted the existing items do not service a trunk demand and do not provide a 'trunk function'. For this reason the impact basis methodology is considered most appropriate.

3.4 Transport

Base costs for existing transport trunk infrastructure have been determined using costs within Council's asset register.

The establishment cost of future trunk transport infrastructure (roads and intersections) was calculated using a combination of unit rates and project planning report estimates (where available).

The unit rates used to calculate the establishment cost of road upgrade projects were formulated based on average contract rates. These rates have been adjusted to June 2016 by applying PPI (RBC) variation. The unit rates include the following standard street furniture:

- Street lighting;
- Indented bus stop set-down areas;
- Concrete footpaths;

Unit rates used to determine the base cost of intersection projects are based on comparable projects that have recently been delivered by the City.

The base unit rates used in the determination of the establishment cost of transport trunk infrastructure are presented in Appendix A of this report.

Detailed contract prices have been used to establish the cost of transport infrastructure where available. The values have been obtained from the City Road Infrastructure ten year works program and adjusted for inflation using the PPI (RBC) to be current at June 2016.

3.5 Parks and land for community facilities

Base costs for existing trunk infrastructure have been determined using costs within Council's asset register.

Future park embellishments have been based on unit rates derived using average construction rates for parks recently constructed or delivered. A standard unit rate has been prepared for each hierarchy type, to the desired standard of service (DSS). These unit rates have been applied to future parks, having consideration of the level of embellishment required to meet the DSS.

In the case of Land for Community Facilities, a standard unit value has been determined for site establishment costs associated with connection of necessary services and basic preparation of the land for its intended use.

The base unit rates used in the determination of the establishment cost of parks and community land trunk infrastructure are presented in Appendix A of this report.

On costs

On-costs are applied to the works Base Costs determined for each infrastructure asset, to account for other project owners' costs that are not typically captured within the civil construction costs. The on costs for each network have been applied as per Table 3.4 below as a percentage of the base cost.

Table 3.4 Application of on-costs – All LGIP networks

Expense	On-cost percentage used				
	Water	**Sewerage**	**Stormwater quality**	**Transport**	**Parks and land for community facilities**
Master planning	2%	2%	3%	3%	6.5%
Survey	2%	2%	3%	2%	
Geotechnical investigation	1%	1%	0%	3%	
Environmental	1%	1%	3%	1%	
Design	9%	9%	5%	8%	
Project management and contract administration	5%	5%	6%	6%	4%
TOTAL	**20%**	**20%**	**20%**	**23%**	**10.5%**

Contingencies

The application of contingencies to future works varies by network, and has been included to deal with project risks. Tables 3.5 - 3.8 identify the relevant networks and method of application.

Table 3.5. Application of contingencies - Water and Sewer Networks:

All Assets	Contingency percentage*	
	Water	**Sewerage**
All future assets	30%	30%

** It is anticipated that, as all future projects are master planning stage only, the 30% contingency will apply to those projects. Refer to the LGIP Extrinsic Material Report Water and Sewerage Infrastructure Detailed Costing Analysis Methodology for clarification of the contingency rate applied.*

Table 3.6. Application of contingencies – Stormwater quality Network:

Delivery horizon	Contingency percentage
	Stormwater quality
All future assets	30%

Table 3.7. Application of contingencies - Transport network:

Design level	Contingency percentage*	
	Transport (Roads)	Transport (Intersections)
Detailed Design	10%	10%
Concept Design		20%
Master Planning		30%

** The recent review on City's intersection upgrade projects has indicated that the cost estimation for intersection projects can increase significantly from the planning stage to delivery. Therefore, higher contingency allowance has been adopted for intersection upgrade projects to cover the risks.*

Table 3.8. Application of contingencies - Parks and land for community facilities Network:

Delivery horizon	Contingency percentage
	Parks and land for community facilities
0 - 5 Years	10%
6 + Years	20%

Contingency rates are multiplied against the base estimate (i.e. base cost + on-cost) in order to determine the establishment cost (Works) for each asset.

4. Determination of costs (Land)

Across all LGIP infrastructure networks, the two (2) approaches outlined below have been used to determine the estimated cost of land being:

1. Site-specific valuation; and
2. Statistical areas (SA2) valuation.

Under the ***site-specific valuation*** approach, the establishment cost for land required for trunk infrastructure has been determined by a registered Valuer for each site using the direct comparison method of valuation. This method considers comparable sales of land having generally similar planning classification and characteristics and makes adjustments for the degree to which the sales evidence is superior, inferior or comparable to a relevant property. These characteristics include:

- location of the land
- physical constraints such as flood, slope or waterways
- improvements to the land.

This method can be utilised for large acquisition sites to determine a more accurate land valuation. The larger projects have a higher project cost and therefore a higher level of risk. The benefit of a detailed land valuation is that it provides greater certainty for the land cost component of the project.

For the ***statistical area (SA2) valuation*** approach, a simplified version of the direct comparison method (also known as the broad-brush method) has been used to estimate the cost of land. This method is similar to the site-specific method above but instead of assessing an individual value for each site it produces a median land value rate per square metre for each Statistical Area 2 (SA2) across the city. This rate is then applied to the relevant land required for trunk infrastructure to determine its estimated cost. In contrast to the direct comparison method, it considers comparable sales of land across wider geographic areas, has regard to the planning classification of the land, but considers fewer key land characteristics given the general nature of its application. The SA2 land value rates have been determined by a registered Valuer (CBRE Richard Ellis) and are presented in Appendix B of this report for application against both existing and future land requirements.

The key assumptions of this valuation method are as follows:

- Land value rates are based upon a notional area of 1 hectare.
- The land has a residential zoning similar to that of surrounding land.
- Where there are different residential zonings within one area, a median value is adopted based on a cross-section of the type of development and density within that area.
- In the case of existing land associated with the Parks and Community Facilities network, an “Open Space” planning classification has been applied (refer to Note 2 of Table 4.1 below for more details).

For land below the Q100 flood level, a fixed rate of $7.50/m² is applied irrespective of the location. This rate represents the average land value for “undevelopable land” within the city and has been assessed by a registered Valuer after consideration of sales evidence of properties in the region which are completely or predominantly undevelopable.

Application of Land Valuation Methods across All LGIP Networks

Valuation approaches for each network have been identified in Table 4.1.

Table 4.1. Land valuation approaches

LGIP Network	Existing	Future	Notes
Water supply	No land costs	No land costs	The majority of the future water supply and sewerage network is located on existing Council owned land, or within road reserves. In these cases, there are no future land requirements. Where minor land requirements are necessary for the siting of trunk infrastructure on private land, this is either acquired or secured though an easement as part of the development application process. Through this process, the land or easement is acquired at no cost to Council, and therefore is not included in the schedule of works.
Sewerage			
Stormwater quality	N/A	SA2 valuation	A detailed assessment of the land dedication and acquisition requirements for all future trunk infrastructure was performed. The majority of the future stormwater quality trunk network is located on existing Council owned land. In these cases, there are no future land requirements. . Private land to be acquired for sitting trunk stormwater quality infrastructure has been identified for each applicable project. In all cases this land is constrained by Q100 flooding. Establishment costs have been estimated applying the flat rate for undevelopable land within the City of $7.50 per square metre as described in section 4 above.
Transport	No land costs (Refer to **Note 1** below)	Site-specific	A detailed assessment of the land dedication and acquisition requirements for all future trunk infrastructure was performed. This has allowed for site-specific valuations to be determined for all future road projects. The cost of land is calculated based on the average land values from recent sales evidence in the vicinity of the listed trunk road projects.
Parks and land for community facilities	SA2 valuation (Refer to **Note 2** below)	SA2 valuation/ Site-specific (Refer to **Note 3** below)	The SA2 valuation method is predominantly used for development delivered park sites, whilst site-specific valuations can be prepared where Council is likely to acquire additional parkland in known locations.

Notes accompanying Table 4.1:

Note 1 - Existing land for the Transport network is not retained since it is transferred to the State as Road Reserve upon completion of the relevant infrastructure project. Therefore there is no value retained for existing land for trunk infrastructure for the Transport network.

Note 2 - For the valuation of existing land in the Parks and Community Facilities network, an "Open Space" planning classification has been applied, which has a lower development potential than the "Residential" planning classification upon which the simplified direct comparison (or broad-brush) method is determined. For existing land above the Q100 flood level, the SA2 land value rates are applied to the relevant land required for trunk infrastructure and discounted by a rate of 15-50%. The discount rate reflects the lower development potential and hence lesser value of Open Space land within the relevant SA2 location. It has been determined by a registered Valuer after consideration of the general cost and risk of achieving a higher Residential classification with acceptable conditions from an Open Space classification for land throughout the region.

Note 3 - For the valuation of future land in the Parks and Community Facilities network, in some cases the location of future land cannot be precisely identified in the LGIP. A broader location is identified which includes an estimated nominal site using GIS technology that considers the standard of the park or facility required and the characteristics of the land such as the Q100 flood level. The relevant SA2 land values and the fixed rate for undevelopable land are applied to the nominal site as necessary to provide an estimated land cost.

Allowances for land valuation costs

For all land required for trunk infrastructure, an additional allowance is added to account for additional land acquisition costs such as legal and professional fees, transfer duties and administration costs.

Table 4.2. Land valuation allowances

LGIP Network	Allowance
Water supply	N/A
Sewerage	
Stormwater quality	20%
Transport	20%
Parks and land for community facilities	10%

The allowances applied to acquisition costs for the transport and stormwater quality networks are higher than the other networks due to more complex acquisition processes and more highly fragmented land resumptions. Parks and community land acquisition processes are most commonly acquired through the development assessment process and of larger size, creating economies of scale.

5. Cost apportionment basis and charge method

There are two cost apportionment methodologies in use for City of Gold Coast LGIP. The first is 'catchment demand', which apportions the costs equally to the benefiting catchments based on their proportion of the total demand. The second methodology is 'percentage of use', which utilises external modelling outputs to determine the proportion of an asset which will be utilised by a particular catchment and apportions the cost accordingly. Both methodologies are permitted under the Minister's Guidelines and Rules. A summary of the chosen approach for the LGIP networks are presented in Table 5.1 below, with further network-specific details provided in the subsequent sections.

Table 5.1. Cost apportionment basis

LGIP Network	Cost apportionment basis
Water supply	Catchment demand
Sewerage	Catchment demand
Stormwater quality	Catchment demand
Transport	Percentage of use
Parks and land for community facilities	Catchment demand

With respect to the methods available for deriving the infrastructure costs per unit of development, the Minister's Guidelines and Rules allow Councils to utilise either a 'user pays' or 'impact basis' methodologies. The difference

between these two methodologies is whether existing infrastructure costs and existing demand are taken into account in establishing a cost per demand unit.

The **user pays** methodology divides the sum of existing and future infrastructure costs by the sum of existing and future infrastructure demand, as demonstrated below.

$$User\ Pays = \frac{Existing\ Infrastructure\ Cost + Future\ Infrastructure\ Cost}{Existing\ Infrastructure\ Demand + Future\ Infrastructure\ Demand}$$

Alternatively, the **impact-basis** methodology divides only the future infrastructure costs by future demand.

$$Impact\ basis = \frac{Future\ Infrastructure\ Cost}{Future\ Infrastructure\ Demand}$$

A summary of the chosen approach for the LGIP networks are presented in Table 5.2 below

Table 5.2. Charge Method

LGIP Network	Cost apportionment basis
Water supply	User pays
Sewerage	User pays
Stormwater quality	Impact-basis
Transport	User pays
Parks and land for community facilities	User pays

The Minister's Guidelines and Rules also allows councils to elect to utilise a Discounted Cash Flow (DCF) methodology when undertaking the required financial modelling of the schedule of works in the LGIP. This modelling approach recognises that the 'time value of money' is an important factor in the funding and delivery of infrastructure, particularly given that infrastructure provision typically leads development, that is costs are incurred before the revenues arrive to pay for them.

City of Gold Coast have elected to utilise a DCF financial modelling in the calculation of the costs per demand unit.

Water supply

The service catchments have been determined based on logical operational boundaries around the existing and future infrastructure network. Given the water supply trunk infrastructure owned and operated by the City of Gold Coast excludes the major bulk water distribution mains (SEQ water assets), there is no instances where infrastructure is required to be shared between service catchments.

The service catchments for the water supply network are identified in LGIP-PFTI-WAT-0 to LGIP-PFTI-WAT-53.

Sewerage

Service catchments have been determined based on the Development Areas served by each major wastewater treatment plant across the city. In most instances, assets have a single allocation to the catchment in which they fall, with the exception of the Long Term Release project.

The service catchments for the sewerage network are identified in LGIP-PFTI-SEW-0 to LGIP-PFTI-SEW-53 and LGIP-PFTI-RWR-0 to LGIP-PFTI-RWR-44.

Stormwater quality

The stormwater quality network DSS defines trunk demand as demand created by future development after the future development has complied with the Design Objectives[1]. Trunk demand is determined by modelling the pollutant load for future development and subtracting the pollutant load from existing development. Existing pollutant load is therefore the baseline from which trunk demand is determined. That necessarily means that existing demand is not trunk demand. It also necessarily means that existing infrastructure, which mitigates demand from existing development, is not performing a trunk function because it is servicing existing development, and therefore taken into account in determining the existing baseline.

Given existing stormwater quality demand within the City is not trunk demand, and existing water quality infrastructure within the City is not trunk infrastructure[2], it is noted that the resultant infrastructure costs per unit of development are the same when determined by either the allowed 'user pays' or 'impact basis' methodologies. This is because nil 'Existing Infrastructure Cost' and nil 'Existing Infrastructure Demand' inputs into the 'user pays' method equation result in an equation equal to the 'impact-basis' method equation of 'Future Infrastructure Cost' divided by 'Future Infrastructure Demand'. Hence, use of either the 'user pays' or 'impact-basis' method derive the same resultant infrastructure costs per unit of development.

Terrain data was used to identify watershed catchments which result from rainfall. Stormwater run-off within these watersheds captures and transports pollutants to receiving waters. Each watershed is isolated in the sense that there is no distribution of run-off to, or from, adjacent watersheds. Accordingly, these watersheds have each been adopted as service catchments for which network demand has been quantified and trunk infrastructure proposed to service these demands has been determined to meet the adopted DSS of no increase of existing pollutant loads within each service catchment from future development.

While trunk stormwater quality demand has been modelled at a catchment level, the approach taken by the City for infrastructure charging, as it relates to stormwater trunk infrastructure, is a City wide approach. An important aspect of trunk stormwater quality infrastructure is that residents throughout the City will benefit from the trunk stormwater quality infrastructure even where external to the catchment in which it is provided. For example, a resident external to the Logan catchment will still benefit from the water quality improvements and the consequential ecosystem protection functions that the trunk infrastructure will provide.

The service catchments for the stormwater quality network are identified in LGIP-PFTI-STW-QLY.

[1] The Design Objectives are identified in section 4.5.4.2 of City Plan Policy SC6.11 – Land Development Guidelines.

[2] A limited number of existing infrastructure items were identified as a result of a requirement arising during Stage 2 of the amendment process under Section 2.4B of *Statutory Guideline 01/16*. The criteria used to identify these items were that the infrastructure was funded by the City and services a wider catchment comprising multiple development sites. These items do not service a trunk infrastructure demand and do not meet the DSS for trunk infrastructure. For these reasons the items do not perform a 'trunk function' and existing trunk demand values are not provided in the SOW.

Transport

Service catchments have been determined using Council's Strategic Transport Model - Multi Modal Version 2, which includes 12 internal and 1 external catchment, separated by logical boundaries such as waterways, landscape features and major road links. Trunk roads have been separated into segments, and a proportion of their cost has been allocated to each catchment based on the origin/destination of traffic identified in the Transport Model. Where

external demand is present on a road segment, the infrastructure value attributable to this demand has been allocated to an external catchment, and has been excluded from the summary cost calculations.

The service catchments for the transport network are identified in LGIP-PFTI-TRN-0 to LGIP-PFTI-TRN-17.

Parks and land for community facilities

Service catchments have been determined based on an assessment of the accessibility standards for the different levels of Parks. This has resulted in a multi-tiered catchment approach that applies to the different Park Hierarchies. Infrastructure within the Parks and land for community facilities network has been apportioned according to the hierarchies identified in Table 5.3 below. The application of these allocation approaches for each service catchment has been outlined in Table 5.4.

Table 5.3. Park hierarchy allocations

Hierarchy	Catchment allocation	Comments
Local Parks	Local allocation	Catchments 1 - 10
District Recreation Parks	Regional allocation	Catchments A - C
District Sports Parks	Regional allocation	North/South Catchments
City Sports Parks	Citywide allocation	Entire LGA
City Recreation	Citywide allocation	Entire LGA
Land for Community Facilities	Citywide allocation	Entire LGA

Table 5.4. Parks and Land for Community Facilities – Allocation of SA2 Projection Areas to Service Catchments

SA2 Projection Area	Local Allocation	Regional Allocation	Citywide Allocation
Arundel	2	B	Northern Zone
Ashmore	6	B	Northern Zone
Benowa	3	B	Northern Zone
Biggera Waters	4	B	Northern Zone
Broadbeach Waters	8	B	Southern Zone
Bundall	3	B	Northern Zone
Burleigh Heads	9	B	Southern Zone
Burleigh Waters	9	B	Southern Zone
Carrara	3	A	Southern Zone
Clear Island Waters	8	B	Southern Zone
Coolangatta	10	B	Southern Zone
Coombabah	4	A	Northern Zone
Coomera	1	A	Northern Zone
Currumbin - Tugun	10	B	Southern Zone
Currumbin Valley - Tallebudgera	10	B	Southern Zone
Currumbin Waters	10	B	Southern Zone
Elanora	10	B	Southern Zone
Guanaba - Springbrook	11	B	Southern Zone
Helensvale	1	A	Northern Zone

SA2 Projection Area	Local Allocation	Regional Allocation	Citywide Allocation
Highland Park	3	A	Southern Zone
Hope Island	5	A	Northern Zone
Jacobs Well - Alberton	5	A	Northern Zone
Labrador	2	B	Northern Zone
Main Beach	3	B	Southern Zone
Mermaid Beach - Broadbeach	8	B	Southern Zone
Mermaid Waters	8	B	Southern Zone
Merrimac	8	A	Southern Zone
Miami	9	B	Southern Zone
Molendinar	6	B	Northern Zone
Mudgeeraba - Bonogin	9	B	Southern Zone
Nerang - Mount Nathan	6	A	Southern Zone
Ormeau - Yatala	5	A	Northern Zone
Oxenford - Maudsland	1	A	Northern Zone
Pacific Pines – Gaven	2	A	Northern Zone
Palm Beach	10	B	Southern Zone
Paradise Point - Hollywell	4	A	Northern Zone
Parkwood	2	B	Northern Zone
Pimpama	1	A	Northern Zone
Reedy Creek - Andrews	9	B	Southern Zone
Robina	8	B	Southern Zone
Runaway Bay	4	A	Northern Zone
Southport	6	B	Northern Zone
Surfers Paradise	3	B	Southern Zone
Upper Coomera - Willow Vale	11	A	Northern Zone
Varsity Lakes	9	B	Southern Zone
Worongary - Tallai	8	A	Southern Zone

The service catchments for the parks and land for community facilities network are identified in LGIP-PFTI-REC-1 to LGIP-PFTI-REC-17.

6. Financial modelling inputs and assumptions

A number of financial modelling assumptions and inputs are required to inform the SoW model for the LGIP. These inputs are detailed below and identified for each of the LGIP Networks.

Indexation of costs to the modelling base year

Table 6.1 identifies the relevant Australian Bureau of Statistics indexation tables which have been used to align all relevant network costs to the base year of the LGIP (2016). These indices have been applied to each asset value using the relevant quarterly index amount at the date of the valuation and adjusting these to the base year of the LGIP (i.e. June 2016 quarter) using the nominated indices below.

Table 6.1. Indexation Tables used for alignment of costs to the modelled base year:

LGIP Network	Works	Land
Water supply	PPI (NRBC)	N/a
Sewerage	PPI (NRBC)	N/a
Stormwater quality	PPI (RBC)	CPI
Transport	PPI (RBC)	CPI
Parks and land for community facilities	PPI (NRBC)	CPI

Notes accompanying Table 6.1:

PPI (RBC): Producer Price Index (Road and bridge construction Queensland) (Index ID A2333727L)
PPI (NRBC): Producer Price Index (Non-residential building construction Queensland) (Index ID A2333721X)
CPI: Consumer Price Index (Brisbane) (Index ID A2325816R)

Weighted Average Cost of Capital (WACC)

In determining a suitable WACC rate, the City of Gold Coast has consulted Queensland Treasury Corporation (QTC) and reviewed a number of recent documents[1] relating to the determination of WACC's for South East Queensland regulated entities. Generally, the market data used in the WACC calculation should be consistent across networks, varying only for the different level of risk associated with each network. Risk is priced into the WACC calculation through both the cost of debt and the cost of equity. This Post-tax Nominal WACC has been applied to the expenditures forecasted in the LGIP financial modelling.

For the purposes of determining the net present value of the forecasted demands (which is a proxy for revenues), a *Real* Post-tax Nominal WACC has been developed which has been adjusted for inflation (i.e. Charge Inflation) using the Fischer Equation. Table 6.2 identifies the applicable WACC rates for each network, which have been derived on a 60:40 debt to equity ratio.

With respect to determining the net present value for future infrastructure identified within the LGIP, an expected year for provision or construction has been nominated. In some circumstances, this has been presented as a time cohort (e.g. 2032 to 2036) in which the mid-point year has been used for the purpose of discounting the values (in this case the year 2034).

Escalation Rates

Table 6.2 identifies the applicable escalation rates for each network. Escalation rates for land and works have been calculated based on historical and forecast CPI and historical PPI movements experienced for each Infrastructure Network. Escalation rates for land have been determined through an assessment of the 10-year average escalation of UCV within the CoGC area. The rates are applied within the SoW model against the nominated expenditures for the purposes of determining the associated net present value.

Modelled and Levied Charge Inflation Rates

Table 6.2 identifies the applicable inflation rates applied for each network. There are two versions of the inflation rates used within the SoW modelling:

1. Modelled Inflation Rate – Applied to demands (through the formulation of a Real WACC) as an input into the discounted cash flow (DCF) modelling. This approach reflects the fact that charge rates (i.e. revenues) will

increase by a nominal rate over the life of the financial modelling. In this case, the 3-year average rolling PPI available at the time of preparation.

2. Levied Charge Inflation Rate – Used in calculation of the charge revenues used in the Financial Sustainability Assessment and cashflow predictions within the SoW model. This rate has also been based on the 3-year average rolling PPI available at the time of preparation.

Table 6.2. Financial inputs to schedule of works model:

Financial modelling assumptions		Model-wide	Water supply	Sewerage	Stormwater quality	Transport (Roads and Pathways)	Parks and land for community facilities
Model setup	Base year of model	2016					
	Infrastructure planning horizon		50	50	15	15	15
	Demand unit (Unit of Measure)*		EPs	EPs	TN kg/yr	Trips	EPs
Financial inputs	**Discount rates**						
	Post-tax Nominal WACC to be applied to Expenses (WACC)		8.15%	8.15%	5.26%	5.26%	5.46%
	Real Post-tax Nominal WACC to be applied to Revenues (RWACC)		5.51%	5.51%	2.69%	2.69%	2.89%
	Indexation						
	Works Escalation Rate		3.84%	3.84%	3.00%	3.00%	3.00%
	Land Escalation Rate (for discounting purposes)		3.58%	3.58%	3.58%	3.58%	3.58%
	Modelled Charge Inflation Rate		2.50%	2.50%	2.50%	2.50%	2.50%
	Levied Charge Inflation Rate (3-Year Average Rolling PPI)	2.50%					

*For explanations of the demand units used for each network type, refer to the relevant extrinsic reports.

7. Financial sustainability assessment and LTFF alignment

7.1 Charge Revenue Assumptions

The revenues expected to be received under the LGIP has been determined for both residential and non-residential development. Council has investigated a range of approaches in order to most accurately model the anticipated revenues. The chosen approach has reviewed Development Applications received between 2014 and 2016 in order to

understand the composition of the residential dwelling types and non-residential charge categories to gain a better understanding of the potential revenues forecasted for both development types.

7.1.1 Residential revenue

The residential revenue forecasts are directly linked to the projected growth in dwellings presented in the planning assumptions which underpin the LGIP, which are identified for both single and multiple dwelling types. The City's current Adopted Infrastructure Charges Resolution (AICR) has informed the relevant equivalent charge rates, which are applied to the LGIP development types in accordance with Table 7.1 below:

Table 7.1. Residential equivalent charge application

LGIP development types		Charge Resolution (CR) categories	Proportion of CR categories	Equivalent charge
Residential	Detached dwellings	(i) 1 or 2 bedrooms dwelling ($20,222.30) (ii) 3 or more bedroom dwellings ($28,311.20)	(i) 10% (ii) 90%	$28,311.20 / dwelling^
	Attached dwellings	(i) 1 or 2 bedrooms dwelling ($20,222.30) (ii) 3 or more bedroom dwellings ($28,311.20)	(i) 82% (ii) 18%	$21,655.91 / dwelling

Notes accompanying Table 7.1:

^ Although detached dwellings are found to have a minor proportion of 1-2 bedroom product, as the details of the final dwelling are not known at the time of the original reconfiguration of the land, the Charges Resolution applies the 3+ bedroom product charge rate. Therefore the charge rate is assumed at 100% of the 3+ bedroom product charge rate.

This has produced a total residential revenue forecast over a 15-year period of **$2,053,899,157** (in 2016 dollars) which equates to an average of **$136,926,610** per annum. Further details of these calculations are provided in the City's SoW model.

7.1.2 Non-residential revenue

The non-residential revenue forecasts are directly linked to the projected growth in non-residential floor space presented in the planning assumptions which underpin the LGIP, which are identified for each standard LGIP employment category. Council's current Adopted Infrastructure Charges Resolution (AICR) has informed the relevant equivalent charge rates, which are applied to the LGIP development types in accordance with Table 7.2 below.

In order to appropriately model the Stormwater quality component of the Levied Charge, an analysis of the Infrastructure Charges levied for all Development Approvals since 2014 years was performed, assessing the impervious area to GFA ratio associated with the different development types. This assessment is required as the State Government SoW uses Non-residential Floor Space (GFA) as a surrogate to project the future revenues to be received from Infrastructure Charges. As such, the costs per square metre of GFA are higher than the maximum adopted charge permitted under the State Planning Regulatory Provision (Adopted Charges) as in most cases, the ratio of impervious area to GFA on non-residential development exceeds 1:1. This is particularly evident for Commercial (Retail) and community Purposes development, whereby the requirement for car parking areas (which are imperious area) far exceeds the GFA typically provided for these developments.

This approach is considered to more accurately reflect the expected revenues for the stormwater quality component of infrastructure charges. Column 5 of Table 7.2 presents the equivalent stormwater quality infrastructure charges used for each LGIP Development Type for the revenue projections that support the Financial Sustainability Assessment.

Table 7.2. Non-residential equivalent charge application

LGIP development types		Charge Resolution (CR) categories	Proportion of CR categories	Equivalent charge (Excl Stormwater quality)	Equivalent charge (Stormwater quality only)
Non-residential GFA	Commercial	(i) Commercial (bulk goods) ($141.55 / m² GFA) (ii) Commercial (office) ($141.55 / m² GFA)	(i) 31.5% (ii) 68.5%	$141.55 / m² GFA	$18.11 / m² GFA
	Community purpose	(i) Places of assembly ($70.80 / m² GFA) (ii) ISRF* ($202.20 / m² GFA) (iii) ISRF* (Court Areas) ($20.20 / m² GFA) (iv) Essential services ($141.55 / m² GFA)	(i) 23.0% (ii) 20.6% (iii) 12.0% (iv) 44.4%	$123.30 / m² GFA	$70.46 / m² GFA
	Industry	(i) Industry ($50.55 / m² GFA) (ii) High impact industry ($70.80 / m² GFA)	(i) 90.6% (ii) 9.4%	$52.45 / m² GFA	$17.11 / m² GFA
	Retail	(i) Commercial (retail) ($182.00 / m² GFA)	(i) 100%	$182.00 / m² GFA	$35.35 / m² GFA
	Other†	(i) Education facility ($141.55 / m² GFA) (ii) Entertainment ($202.20 / m² GFA) (iii) Specialised uses ($158.00 / m² GFA)	(i) 64.0% (ii) 12.1% (iii) 23.9%	$152.50 / m² GFA	$21.75 / m² GFA

Notes accompanying Table 7.2:

^ Although detached dwellings are found to have a minor proportion of 1-2 bedroom product, as the details of the final dwelling are not known at the time of the original reconfiguration of the land, the Charges Resolution applies the 3+ bedroom product charge rate. Therefore the charge rate is assumed at 100% of the 3+ bedroom product charge rate.

* Indoor sport and recreational facility (ISRF);

† 'Other' development LGIP categories did not include 'Low impact rural', 'High impact rural', 'Minor uses' and 'Other uses' from the Charge Resolution as these categories had zero or near zero DAs between 2014 and 2016.

This has produced in a total non-residential revenue forecast over a 15-year period of **$706,304,103** (in 2016 dollars) which equates to an average of **$47,086,940** per annum. Further details of these calculations are provided in the City's SoW model.

7.1.3 Other revenue considerations

Council has identified a number of considerations that must be considered when understanding the forecasted revenues to be received under the current Adopted Infrastructure Charges Resolution. There are circumstances where the full charge on future development may not be levied, which have not otherwise been accounted for within the revenue modelling identified above. These include:

- where charges have been pre-paid and are currently being held as credits by Council
- where credits remain from previous development

- where Council provides exemptions to infrastructure charges based on the proposed use (such as kick-start programs)
- where commercial agreements and other subsidies are applicable.

The extent to which these factors have affected historical revenue receipts has been assessed by Council, which has informed the assumptions applied to the future cash flow calculations of the SoW model.

In addition to the above factors, it is important to understand the current 'starting position' in relation to trunk infrastructure for the purposes of producing a cash flow projection. Such factors that have been considered include:

- current cash reserves;
- existing debts / loans from general revenue and other cost centres within Council; and
- latent / spare capacity available within certain infrastructure networks that has been pre-funded.

7.2 Alignment of Long-term Financial Forecast (LTFF) with LGIP

Council maintains a long-term financial forecast over a 10 year horizon using a version of the Queensland Treasury Corporation (QTC) financial modelling tool. The LTFF guides the affordability of financial decision making in the organisation. Growth assumptions in the forecast vary by service. The inflation assumption is generally consistent across service areas.

The outputs of the model are used to guide the development of the annual budget in the corporate budget system.

The main annual update of the 10 year forecast follows the update of the 10 year capital program developed through the annual Asset Management Plan (AMP) process (prepared in the same corporate budget system), thus ensuring alignment between the financial forecast and AMP's.

The process for developing the LGIP has been run as a separate project with a specific model (CORR) procured for the recording of assumptions and infrastructure requirements. The final output of the project is the Schedule of Works (SOW) model for the submission to the State Government.

There is no interface between the CORR model and Budget system or the LTFF, leading to the risk that the two forecasts will not align. An iterative process has been implemented to ensure that the LGIP and the LTFF align. The development of the LGIP trunk infrastructure program was informed by Council's LTFF to manage broad affordability parameters. As the LGIP planning has progressed, the resulting trunk infrastructure program has informed the preparation of the LTFF.

The growth assumptions used across the board in the LTFF do not necessarily align with the assumptions used in the LGIP. However, the infrastructure projects identified in the LGIP are all included in the LTFF. Therefore, in regards to trunk infrastructure requirements, the LTFF assumes that growth will occur in line with the LGIP assumptions.

As discussed in more detail in Section 7.1 above, various scenarios for revenue have been developed and assessed in the review of the LGIP affordability.

7.3 Financial sustainability assessment

Council assesses financial sustainability based on four key pillars:

- Scope and Standard of Services
- Comparable Rates and Charges
- Debt Management
- Scope and Condition of Infrastructure Assets.

The LGIP impacts each of these pillars, but is just one component of the overall financial sustainability assessment. The assessment has been undertaken in two parts.

1. A standalone review of the SOW model
2. A review of the LGIP in the context of Council's consolidated financial model.

The 15 year SOW model considers the sustainability of the LGIP expenditure solely against infrastructure charges revenue. Based on the infrastructure charges revenue assumptions discussed in Section 7.1, there is a gap in funding over 15 years, resulting in a Financial Sustainability Ratio of 1.0 (NPV of revenue divided by NPV of expenses). This result is under the acceptable range specified in Australian Infrastructure Financial Management Guidelines – V1.3. These figures do not include the cost of infrastructure for the stormwater quantity network.

A comprehensive review of financial sustainability has been undertaken as part of Council's annual financial planning cycle, which has included the consolidation of the proposed LGIP infrastructure into the consolidated financial model.

The growth assumptions underlying LGIP projections are considered high compared to what is actually expected to be achieved, with revenue projections carrying the highest amount of risk. Therefore, various revenue scenarios have been used in assessing financial sustainability to provide a more rigorous review of affordability. In each scenario, the cost and timing of trunk infrastructure has remained unchanged.

The key findings of the review are as follows:

1. For all revenue scenarios, Council remains within State benchmarks for the key financial sustainability ratios identified in the Australian Infrastructure Financial Management Guidelines – V1.3.
2. Council has a reasonable level of flexibility in funding trunk infrastructure from alternate revenue sources where infrastructure charges revenue falls short of expectations.
3. Council has considerable flexibility in the management of debt to deal with differences that occur in the timing of delivery of trunk infrastructure and the receipt of infrastructure charges revenue.
4. Despite having flexibility in alternate revenue sources and debt, it is critical that Council carefully monitors actual growth and revenue receipts and prudently manages the timing of the delivery of trunk infrastructure in accordance with those observations to deliver trunk infrastructure in accordance with the DSS and not in excess of it.
5. Trunk infrastructure needs to be included in the overall prioritisation of the entire capital program.

Noting that the financial assessment excludes trunk infrastructure for stormwater quantity and despite a projected gap in infrastructure charges revenue, Council deems that the LGIP is affordable.

Appendix A – Works and land units rates used in the LGIP

Water Supply Network Unit Rates

Water Mains Unit Rates (Including Fittings)		
Diameter (mm)	Material	Unit Rate ($/lm)
63	uPVC	$156
65	uPVC	$161
75	uPVC	$185
80	uPVC	$197
83	uPVC	$202
90	uPVC	$212
100	uPVC	$226
110	uPVC	$238
125	uPVC	$258
140	uPVC	$277
150	uPVC	$289
160	uPVC	$300
200	uPVC	$341
225	uPVC	$383
250	uPVC	$423
300	uPVC	$506
375	DICL	$967
411	DICL	$1,039
450	DICL	$1,116
500	DICL	$1,355
510	DICL	$1,376
525	DICL	$1,408
565	DICL	$1,494
590	DICL	$1,548
600	DICL	$1,569

Water Mains Unit Rates (Including Fittings)		
Diameter (mm)	Material	Unit Rate ($/lm)
660	MSCL	$2,426
675	MSCL	$2,449
700	MSCL	$2,489
750	MSCL	$2,672
800	MSCL	$3,011
825	MSCL	$3,056
850	MSCL	$3,102
900	MSCL	$3,194
915	MSCL	$3,349
960	MSCL	$3,814
965	MSCL	$3,824
1000	MSCL	$3,894
1050	MSCL	$4,043
1085	MSCL	$4,201
1125	MSCL	$4,412
1200	MSCL	$4,805
1290	MSCL	$5,019
1350	MSCL	$5,166
1440	MSCL	$5,399
1500	MSCL	$5,553
1650	MSCL	$6,029
1800	MSCL	$7,009
1950	MSCL	$7,470
2100	MSCL	$7,992

Water Mains Microtunnelling Unit Rates			
Diameter (mm)	Depth (m)	Material	Unit Rate ($/lm)
150	<1.5	PE	$2,374
200	<1.5	PE	$2,401
250	<1.5	PE	$2,435
300	<1.5	PE	$2,474
400	<1.5	PE	$2,567
450	<1.5	PE	$2,624
500	<1.5	PE	$3,144
600	<1.5	PE	$3,270
700	<3	MSCL	$4,306

Water Mains Microtunnelling Unit Rates			
Diameter (mm)	Depth (m)	Material	Unit Rate ($/lm)
800	<3	MSCL	$4,400
900	<3	MSCL	$4,692
1000	<3	MSCL	$5,430
1200	<3	MSCL	$6,437
1400	<3	MSCL	$6,856
1500	<3	MSCL	$7,774
1600	<3	MSCL	$8,483
1700	<3	MSCL	$10,045
1800	<3	MSCL	$12,298

Water Mains Microtunnelling Unit Rates			
Diameter (mm)	Depth (m)	Material	Unit Rate ($/lm)
750	<3	MSCL	$4,336

Water Mains Microtunnelling Unit Rates			
Diameter (mm)	Depth (m)	Material	Unit Rate ($/lm)

Horizontal Directional Drilling Unit Rates		
Diameter (mm)	Enveloper Pipe	Unit Rate ($/lm)
150	Y	$2,778
200	Y	$2,912
250	Y	$3,049
300	Y	$3,187
400	Y	$3,387
450	Y	$3,592
500	Y	$3,823
600	Y	$4,199
700	Y	$4,653
800	Y	$5,161
900	Y	$5,722
1000	Y	$6,335
1200	Y	$7,721
1400	Y	$9,318
1500	Y	$10,196
1600	Y	$11,127
1700	Y	$12,112
1800	Y	$13,149

Horizontal Directional Drilling Unit Rates		
Diameter (mm)	Enveloper Pipe	Unit Rate ($/lm)
150	N	$3,987
200	N	$4,120
250	N	$4,258
300	N	$4,395
400	N	$5,223
450	N	$5,426
500	N	$5,658
600	N	$6,035
700	N	$7,235
800	N	$7,743
900	N	$8,304
1000	N	$9,768
1200	N	$11,154
1400	N	$13,730
1500	N	$14,608
1600	N	$16,638
1700	N	$17,622
1800	N	$18,659

Water Pump Station Motor Unit Rates	
Total Installed Motor (kW)	Civil ($/kW)
5	$19,205
10	$12,504
20	$8,668
30	$7,195
40	$6,379
50	$5,849
75	$4,807
100	$4,255
150	$3,625
200	$3,259
250	$3,010
300	$2,824
350	$2,681
400	$2,563

Reservoir (Ground) Unit Rates	
Reservoir Capacity (ML)	Civil ($/ML)
0.01	$4,438,211
0.1	$1,751,886
1	$691,523
5	$361,104
10	$272,965
15	$219,557
20	$188,280
25	$172,222
30	$164,098
35	$160,824
40	$160,900
50	$170,578

Reservoir (Elevated) Unit Rates	
Reservoir Capacity (ML)	Civil ($/ML)
0.01	$3,084,462
0.1	$3,084,462
1	$3,084,462
5	$3,084,462
10	$3,084,462
15	$3,084,462
20	$3,084,462
25	$3,084,462
30	$3,084,462
35	$3,084,462
40	$3,084,462
50	$3,084,462

Water Pump Station Motor Unit Rates	
Total Installed Motor (kW)	Civil ($/kW)
450	$2,465
500	$2,382
600	$2,243
700	$2,132
750	$2,083
900	$1,960
1000	$1,891
1050	$1,859
1100	$1,830
1150	$1,801
1200	$1,774
1250	$1,748
1300	$1,723
1360	$1,694
1400	$1,677
1450	$1,655
1500	$1,633
2000	$1,451
2500	$1,305

Reservoir (Ground) Unit Rates	
Reservoir Capacity (ML)	Civil ($/ML)

Reservoir (Elevated) Unit Rates	
Reservoir Capacity (ML)	Civil ($/ML)

Miscellaneous Items		
Asset Type	Application to Assets	$ / Item
Pump Telemetry	Existing, Augmentations and New	$23,552.07
Control Valve	Existing	$58,562.92
	Augmentations	$11,904.92
	New	$58,562.92
Control Valve Telemetry	Existing, Augmentations and New	$38,290.29

Sewerage Network Unit Rates

Sewer Gravity Mains Unit Rates			
Diameter (mm)	Depth (m)	Material	Unit Rate ($/lm)
50	<1.5	UPVC	$123
90	<1.5	UPVC	$127
100	<1.5	UPVC	$138
110	<1.5	UPVC	$142
150	<1.5	UPVC	$163
200	<1.5	UPVC	$220
225	<1.5	UPVC	$237
250	<1.5	UPVC	$235
300	<1.5	UPVC	$293
325	<1.5	UPVC	$339
350	<1.5	UPVC	$387
375	<1.5	UPVC	$433
400	<1.5	VC	$479
435	<1.5	VC	$498
450	<1.5	VC	$517
500	<1.5	VC	$646
525	<1.5	VC	$674
600	<1.5	VC	$758
660	<1.5	VC	$1,084
675	<1.5	VC	$1,100

Sewer Gravity Mains Unit Rates			
Diameter (mm)	Depth (m)	Material	Unit Rate ($/lm)
700	<1.5	VC	$1,129
710	>1.5-3.0	VC	$1,558
750	>1.5-3.0	HDPE/Conc	$1,588
800	>1.5-3.0	HDPE/Conc	$1,865
825	>1.5-3.0	HDPE/Conc	$1,996
900	>1.5-3.0	HDPE/Conc	$2,090
960	>1.5-3.0	HDPE/Conc	$2,448
1050	>1.5-3.0	HDPE/Conc	$2,560
1085	>1.5-3.0	HDPE/Conc	$2,604
1200	>1.5-3.0	HDPE/Conc	$3,046
1250	>1.5-3.0	HDPE/Conc	$3,287
1290	>1.5-3.0	HDPE/Conc	$3,481
1350	>1.5-3.0	HDPE/Conc	$3,560
1400	>1.5-3.0	HDPE/Conc	$3,676
1500	>1.5-3.0	HDPE/Conc	$3,792
1650	>1.5-3.0	HDPE/Conc	$4,069
1800	>1.5-3.0	HDPE/Conc	$4,844
1950	>1.5-3.0	HDPE/Conc	$5,214
2100	>1.5-3.0	HDPE/Conc	$5,629

Sewer Rising Mains Unit Rates		
Diameter (mm)	Material	Unit Rate ($/lm)
63	PVC	$129
80	PVC	$148
90	PVC	$160
100	PVC	$172
100	DICL	$198
110	PVC	$183
125	PVC	$198
150	PVC	$226
150	DICL	$261
160	PVC	$234
200	PVC	$264
200	DICL	$296
225	PVC	$299
225	DICL	$338
250	PVC	$329

Sewer Rising Mains Unit Rates		
Diameter (mm)	Material	Unit Rate ($/lm)
525	DICL	$1,316
600	DICL	$1,467
660	MSCL	$2,271
675	MSCL	$2,294
700	MSCL	$2,330
750	MSCL	$2,468
750	DICL	$2,653
800	MSCL	$2,780
825	MSCL	$2,821
900	MSCL	$2,949
960	MSCL	$3,522
1000	MSCL	$3,596
1050	MSCL	$3,737
1085	MSCL	$3,884
1125	MSCL	$4,078

Sewer Rising Mains Unit Rates		
Diameter (mm)	Material	Unit Rate ($/lm)
250	DICL	$360
280	PVC	$371
300	PVC	$399
300	DICL	$433
355	DICL	$770
375	DICL	$904
400	DICL	$951
450	DICL	$1,043
500	DICL	$1,267

Sewer Rising Mains Unit Rates		
Diameter (mm)	Material	Unit Rate ($/lm)
1200	MSCL	$4,442
1290	MSCL	$4,639
1350	MSCL	$4,775
1500	MSCL	$5,132
1650	MSCL	$5,572
1800	MSCL	$6,478
1950	MSCL	$6,905
2100	MSCL	$7,386

Gravity Mains Microtunnelling Unit Rates			
Diameter (mm)	Depth (m)	Material	Unit Rate ($/lm)
150	<1.5	VC	$2,615
200	<1.5	VC	$2,737
250	<1.5	VC	$2,802
300	<1.5	VC	$2,802
400	<1.5	VC	$2,596
450	<1.5	VC	$2,596
500	<1.5	VC	$2,954
600	<1.5	VC	$3,016
700	<3	VC	$4,074
750	<3	VC	$4,239
800	<3	VC	$4,244
900	<3	VC	$4,654
1000	<3	Concrete	$4,747
1200	<3	Concrete	$5,083
1400	<3	Concrete	$5,110
1500	<3	Concrete	$6,123
1600	<3	Concrete	$6,853
1700	<3	Concrete	$7,319
1800	<3	Concrete	$7,806
2000	<3	Concrete	$8,215

Rising Mains Microtunnelling Unit Rates			
Diameter (mm)	Depth (m)	Material	Unit Rate ($/lm)
150	<1.5	PE	$2,374
200	<1.5	PE	$2,401
250	<1.5	PE	$2,435
300	<1.5	PE	$2,474
400	<1.5	PE	$2,567
450	<1.5	PE	$2,624
500	<1.5	PE	$3,144
600	<1.5	PE	$3,270
700	<3	MSCL	$4,306
750	<3	MSCL	$4,336
800	<3	MSCL	$4,400
900	<3	MSCL	$4,692
1000	<3	MSCL	$5,430
1200	<3	MSCL	$6,437
1400	<3	MSCL	$6,856
1500	<3	MSCL	$7,774
1600	<3	MSCL	$8,483
1700	<3	MSCL	$10,045
1800	<3	MSCL	$12,298

Horizontal Directional Drilling Unit Rates		
Diameter (mm)	Enveloper Pipe	Unit Rate ($/lm)
150	Y	$2,778
200	Y	$2,912
250	Y	$3,049
300	Y	$3,187
400	Y	$3,387
450	Y	$3,592
500	Y	$3,823
600	Y	$4,199
700	Y	$4,653
800	Y	$5,161
900	Y	$5,722
1000	Y	$6,335
1200	Y	$7,721
1400	Y	$9,318
1500	Y	$10,196
1600	Y	$11,127
1700	Y	$12,112
1800	Y	$13,149

Horizontal Directional Drilling Unit Rates		
Diameter (mm)	Enveloper Pipe	Unit Rate ($/lm)
150	N	$3,987
200	N	$4,120
250	N	$4,258
300	N	$4,395
400	N	$5,223
450	N	$5,426
500	N	$5,658
600	N	$6,035
700	N	$7,235
800	N	$7,743
900	N	$8,304
1000	N	$9,768
1200	N	$11,154
1400	N	$13,730
1500	N	$14,608
1600	N	$16,638
1700	N	$17,622
1800	N	$18,659

Sewer Manholes Unit Rates			
Diameter (mm)	Depth (m)	Material	Unit Rate ($/ea)
1050	<1.5	Precast Manhole	$2,724
1200	<1.5	Precast Manhole	$3,643
1500	<1.5	Precast Manhole	$5,575
1800	<1.5	Insitu Manhole	$8,797
2000	<1.5	Insitu Manhole	$9,837
2250	<1.5	Insitu Manhole	$11,513
2400	<1.5	Insitu Manhole	$12,572
3000	<1.5	Insitu Manhole	$17,222
3200	>6	Insitu Manhole	$54,605
3500	>6	Insitu Manhole	$58,980
4900	>6	Insitu Manhole	$79,400
5000	>6	Insitu Manhole	$80,858
5400	>6	Insitu Manhole	$86,692
6000	>6	Insitu Manhole	$95,443

Sewerage Pump Station Well Unit Rates	
Well Capacity (kL)	Civil ($/kL)
5	$5,842
10	$5,056
15	$4,600
20	$4,393
26	$4,212
30	$4,118
35	$4,018
40	$3,932
45	$3,859
50	$3,794
55	$3,737
60	$3,685
65	$3,639
70	$3,596
75	$3,556
80	$3,520
85	$3,485
90	$3,453
95	$3,424
100	$3,395
105	$3,369
110	$3,344
115	$3,320
120	$3,298
125	$3,276
130	$3,256
135	$3,236
140	$3,218
145	$3,199
150	$3,183
155	$3,166
160	$3,149
165	$3,134

Sewerage Pump Station Well Unit Rates	
Well Capacity (kL)	Civil ($/kL)
170	$3,119
175	$3,104
180	$3,091
185	$3,077
190	$3,064
195	$3,051
200	$3,039
205	$3,027
210	$3,015
215	$3,004
220	$2,993
225	$2,982
230	$2,972
235	$2,961
240	$2,951
245	$2,941
250	$2,932
255	$2,923
260	$2,914
265	$2,905
270	$2,896
275	$2,888
280	$2,880
285	$2,872
290	$2,863
295	$2,855
300	$2,848
305	$2,840
310	$2,833
315	$2,826
320	$2,819
450	$2,669

Sewerage Pump Station Motor Unit Rates	
Total Installed Motor (kW)	Mech/ Elev/ Pipework ($/kW)
0.5	$122,035
0.75	$86,020
1	$67,399
2.5	$31,786
5	$18,521
10	$11,092
15	$8,332
20	$6,849
25	$5,906
30	$5,246
35	$4,757
40	$4,517
45	$4,248
50	$4,025
55	$3,838
60	$3,677
65	$3,538
70	$3,417
75	$3,308
80	$3,212
85	$3,125
90	$3,047
95	$2,975
100	$2,909
105	$2,849
110	$2,794
115	$2,742
120	$2,693
125	$2,649
130	$2,607
135	$2,568
140	$2,531
145	$2,496

Sewerage Pump Station Motor Unit Rates	
Total Installed Motor (kW)	Mech/ Elev/ Pipework ($/kW)
150	$2,463
155	$2,432
160	$2,403
165	$2,375
170	$2,349
175	$2,323
180	$2,299
185	$2,276
190	$2,254
195	$2,233
200	$2,213
205	$2,193
210	$2,176
215	$2,157
220	$2,140
225	$2,124
230	$2,107
235	$2,093
240	$2,078
245	$2,063
250	$2,050
255	$2,037
260	$2,024
265	$2,010
270	$1,998
275	$1,987
280	$1,975
285	$1,964
290	$1,954
295	$1,943
500	$1,680
1000	$1,481

Stormwater Quality Network Unit Rates

Stormwater Quality Infrastructure	Cost ($/m^2)
Bio-retention basin	$420
Sediment pond	$164
Wetlands	$130

Transport Network Unit Rates

Intersection unit rates at base date (June 2016)		
Upgrade Type	**Upgrade Details**	**June 2016 $ / Item**
R1	Minor roundabout upgrade – linemarking and minor pavement works	$560,000
R2	Major roundabout upgrade – additional circulating lanes	$1,800,000
S1_1	Signalisation, minor intersections with minimum land resumption	$1,250,000
S1_2 / S2	Signalisation, minor intersections with minimum land resumption	$2,400,000
S4	Signalisation, major 4-way intersections with land resumption	$4,850,000
MS1	Minor upgrade to existing signalised intersections – turn pocket extension only	$290,000
MS2	Major upgrade to existing signalised intersections – additional lanes	$1,000,000

Rural Sub-Arterial (two lanes) - Thin Asphalt wearing course

General information for two lane road - rural		
Section description	**Distance/ Number**	**Units**
Traffic Volume	1000-14000	VPD
Design Speed	60	km/hr
Design Length	1,000	m
Design Width	23	m
Road Width	11	m
Weight of Asphalt	1,094	t
Road Area	11,000	m^2
Footpath Width	6	m
Based on dwg STANDARD DRAWING 02-004 (2015 edition)		

Rates current at 1/07/2016

ABS index No. 3101 Road and bridge construction Queensland
Base rate = 104.7 Jun-16

General Costs							
Section description	**Distance/ Number**	**Units**	**Cost per unit**	**Unit**	**Total**		
Table Drains	2,000	m	$232.3	m	$ 464,580		
Restoration of footpath after table drains	2,000	m	$25.8	m	$ 51,620		
375mm dia RRJ pipework, including supply, 10% on-site handling cost, excavation and disposal, bed, lay, joint, backfill, compaction and restoration (up to 1.5m deep)	0	m		m	$ -		
Underground stormwater drainage - 600mm	60	m	$283.9	m	$ 17,035		
Side inlet gully on grade, cast in-situ (medium level)	0	No.	$0.0	each	$ -		
Manholes - 1200mm circular	0	No.		each	$ -		
Reinforced Concrete Box culverts (RCBC's) 600x600	69	m	$620.4	m	$ 42,808		
Street Number reinstatement on new K&C	20	No.	$25.8	each	$ 516		
Lines	3,000	m	$0.5	m	$ 1,549		
Giveway, Holding and Stop Bar lines	50	m	$6.2	m	$ 310		
Precast headwall outlet for 600mm dia Pipe, including supply, installation and apron construction	8	No.	$1,032.4	each	$ 8,259	$ 586,676	General cost per 1000m
Minimum Pavement Thickness (mm)							
Description	**Depth**	**Unit**	**Cost**	**Unit**	**Total**		
40mm Asphalt thickness	1,094	t	$169.3	t	$ 185,229		
130mm thick Base course Class 1A - CBR 80	1,462	m^3	$134.2	m^3	$ 196,218		
150mm Sub-base Class 2 - CBR 45	2,129	m^3	$118.7	m^3	$ 252,768		
150mm Below Sub-base Class 3 - CBR 15	2,129	m^3	$113.6	m^3	$ 241,778		
Prime spray newly constructed roadworks prior to AC	14,250	m^2	$6.2	m^2	$ 88,270	$ 964,263	Pavement Cost per 1000m
Footpath Details							
Description	**Distance**	**Units**	**Cost**	**Units**	**Total**		
Length without footpath		m		m	$ -		
Footpaths - 100mm thick, including excavation by machine and disposal of soil - 1.2m wide		m	$92.9	m	$ -		
Footpaths - 100mm thick, including excavation by machine and disposal of soil - 2m wide - one side	1,000	m	$154.9	m	$ 154,860		
Streetscape Details	500	m^2	$31.0	m^2	$ 15,486		
Turf - supply	8,260	m^2	$12.4	m^2	$ 102,331		
Top soil	588	m^3	$46.5	m^3	$ 27,317		
Street lighting	8	No.	$4,645.8	each	$ 37,166	$ 337,161	Footpath cost per 1000m
Earthworks							
Description	**Qty.**	**Units**	**Cost**	**Units**	**Total**		
Preparation of Subgrade	14,250	m^2	$5.2	m^2	$ 73,559		
Earthworks in soil/clay over 100m^3	6,698	m^3	$41.3	m^3	$ 276,601		
Bulk cut and fill, average 400mm over site	9,200	m3	$20.6	m3	$ 189,962		
Box and trim road pavements (over 2.5m wide)	11,227	m^2	$2.1	m^2	$ 23,182	$ 563,302	Earthworks cost per 1000m

Average Cost per metre	Cost
General	587
Pavement	964
Footpath	337
Earthworks	563

Total cost per 1000m	**$**	**2,451,402**
Cost per m	**$**	**2,451**

$2,451,402

Common Costs							
Description	**Number**	**Unit**	**Cost**	**Unit**	**Total**		
Master Planning	3	percent	$ 2,451,402		$ 73,542	contingency	10%
Survey	2	percent	$ 2,451,402		$ 49,028	on-cost	23%
Geotechnical Investigation	3	percent	$ 2,451,402		$ 73,542		
Design	8	percent	$ 2,451,402		$ 196,112		
Provisional Amount	10	percent	$ 2,451,402		$ 245,140		
Project Management and Contract Admin	6	percent	$ 2,451,402		$ 147,084		
Environmental	1	percent	$ 2,451,402		$ 24,514	$ 808,963	

Total Cost ***$3,260,000 per km***

Note:
#1 CBR value has been assumed to be 8
#2 Asphalt surfacing (based on 2.486t/m3)> 300t
VPD Vehicles per day

References
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Excluded from Estimate:
Watermain
Water meters at takeoffs
Electrical conduit and power cable
Communications (Telstra) duct / cable
Fibreoptic cable
Sewer pipe run
Pumping stations

Urban Sub-Arterial (Two Lane) - Thin Asphalt wearing course

General information for Urban Sub-Arterial (Two Lane)		
Section description	**Distance/ Number**	**Units**
Traffic Volume	7000-14000	VPD
Design Speed	60	km/hr
Design Length	1,000	m
Design Width	20	m
Road Width	11	m
Weight of Asphalt	1,028	t
Road Area	11,000	m^2
Footpath Width	9	m
Based on dwg STANDARD DRAWING 02-004 (2015 edition)		

Rates current at 1/07/2016

ABS index No. 3101 Road and bridge construction Queensland
Base rate = 104.7 Jun-16

General Costs							
Section description	**Distance/ Number**	**Units**	**Cost per unit**	**Unit**	**Total**		
Roll Top Kerb & Channel by machine. (Note straights <5.00m & radii <3.00m to be done manually	2,000	m	$38.3	m	$ 76,516		
Restoration of footpath after K&C construction	2,000	m	$25.9	m	$ 51,700		
375mm dia RRJ pipework, including supply, 10% on-site handling cost, excavation and disposal, bed, lay, joint, backfill, compaction and restoration (up to 1.5m deep)	420	m	$181.0	m	$ 75,999		
450mm dia RRJ pipework, including supply, 10% on-site handling cost, excavation and disposal, bed, lay, joint, backfill, compaction and restoration (up to 1.5m deep)	300	m	$222.3	m	$ 66,693		
600mm dia RRJ pipework, including supply, 10% on-site handling cost, excavation and disposal, bed, lay, joint, backfill, compaction and restoration (up to 1.5m deep)	300	m	$294.7	m	$ 88,407		
Sub-surface drains, 100mm dia slotted PVC pipe including flushing points and connection to gullies complete	2,000	m	$62.0	m	$ 124,080		
Side inlet gully on grade, cast in-situ (medium level)	18	No.	$3,619.0	each	$ 65,142		
Manholes - 1050mm circular	9	No.	$2,585.0	each	$ 23,265		
Reinforced Concrete Box culverts (RCBC's) 600x600	13	m	$620.4	m	$ 7,755		
Street Number reinstatement on new K&C	20	No.	$25.9	each	$ 517		
Lines (Continuity, Edge, Broken Centre, Unbroken, Barrier, Lane, Turn, Holding), Bus and Taxi Zone marking	3,000	m	$0.8	m	$ 2,482		
Giveway, Holding and Stop Bar lines	50	m	$6.2	m	$ 310	$ 582,866	**General cost per 1000m**
Minimum Pavement Thickness (mm)							
Description	**Quantity**	**Rate**	**Cost**	**Unit**	**Total**		
40mm Asphalt thickness	1,028	t	$169.6	t	$ 174,324		
130mm thick Base course Class 1B - CBR 80	1,345	m^3	$134.4	m^3	$ 180,795		
150mm thick Sub-base Class 2 - CBR 45	1,778	m^3	$118.9	m^3	$ 211,422		
150mm Below Sub-base Class 3 - CBR 15	1,778	m^3	$113.7	m^3	$ 202,230		
Prime spray newly constructed roadworks prior to AC	10,348	m^2	$6.2	m^2	$ 64,199	$ 832,970	**Pavement Cost per 1000m**
Footpath Details							
Description	**Item**	**Units**	**Cost**	**Unit**	**Total**		
Length without footpath	0	m		m^2	$ -		
Footpaths - 100mm thick, including excavation by machine and disposal of soil - 1.2m wide	0	m		m	$ -		
Footpaths - 100mm thick, including excavation by machine and disposal of soil - 2.5m wide	2,000	m	$196.5	m	$ 392,920		
Streetscape Details	1,000	m^2	$31.0	m	$ 31,020		
Turf - supply and lay by contractor	5,700	m^2	$12.4	m^2	$ 70,726		
Road signs - Supply and installation of signs (including the sign, posts, holding pipe and fixing components) complete in place	8	No.	$258.5	each	$ 2,068		
Topsoil (delivered to site for medians and garden beds)	350	m^3	$46.5	m^3	$ 16,286		
Street Lighting	16	No.	$4,645.8	each	$ 74,333	$ 587,352	**Footpath cost per 1000m**
Earthworks							
Description	**Qty.**	**Units**	**Cost per m^2**	**Units**	**Total**		
Preparation of Subgrade	11,850	m^2	$5.2	m^2	$ 61,170		
Earthworks in soil/clay over 100m^3	5,570	m^3	$41.3	m3	$ 230,019		
Bulk cut and fill, ave 400mm over site	8,000	m3	$20.6	m3	$ 165,184		
Box and trim road pavements (over 2.5m wide)	10,327	m^2	$2.1	m^2	$ 21,323	$ 477,696	**Earthworks cost per 1000m**

Average Cost per metre	Cost
General	583
Pavement	833
Footpath	587
Earthworks	478

Total cost per 1000m	**$**	**2,480,883**
Cost per m	**$**	**2,481**

$2,480,883

Common Costs								
Description	**Number**	**Unit**	**Cost**	**Unit**	**Total**			
Master Planning	3	percent	$ 2,480,883		$ 74,426	contingency	10%	
Survey	2	percent	$ 2,480,883		$ 49,618	on-cost	23%	
Geotechnical Investigation	3	percent	$ 2,480,883		$ 74,426			
Design	8	percent	$ 2,480,883		$ 198,471			
Provisional Amount	10	percent	$ 2,480,883		$ 248,088			
Project Management and Contract Admin	6	percent	$ 2,480,883		$ 148,853			
Environmental	1	percent	$ 2,480,883		$ 24,809	$ 818,691		

Total Cost ***$3,299,574 per km***

Note:
[#1] CBR value has been assumed to be 8
[#2] Asphalt surfacing (based on 2.486t/m3)> 300t
VPD Vehicles per day

References
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Excluded from Estimate:
Watermain
Water meters at takeoffs
Electrical conduit and power cable
Communications (Telstra) duct / cable
Fibreoptic cable
Sewer pipe run
Pumping stations

Rural Arterial (four Lane) - thin Asphalt wearing course

General information for Four Lane Road - Rural		
Section description	**Distance/ Number**	**Units**
Traffic Volume	14000-27000	VPD
Design Speed	80	km/hr
Design Length	1,000	m
Design Width	37	m
Road Width	20	m
Weight of Asphalt	1,922	t
Road Area	19,600	m^2
Footpath Width	6	m
Based on dwg STANDARD DRAWING 02-004 (2015 edition)		

Rates current at 1/07/2016

ABS index No. 3101 Road and bridge construction Queensland

Base rate = 104.7 Jun-16

General Costs							
Section description	**Distance/ Number**	**Units**	**Cost per unit**	**Unit**	**Total**		
Table Drains	2,000	m	$232.3	m	$ 464,580		
Restoration of footpath after table drains	2,000	m	$25.8	m	$ 51,620		
375mm dia RRJ pipework, including supply, 10% on-site handling cost, excavation and disposal, bed, lay, joint, backfill, compaction and restoration (up to 1.5m deep)	0	m		m	$ -		
600mm dia RRJ pipework, including supply, 10% on-site handling cost, excavation and disposal, bed, lay, joint, backfill, compaction and restoration (up to 1.5m deep)	120	m	$283.9	m	$ 34,069		
Side inlet gully on grade, cast in-situ (medium level)	0	No.		each	$ -		
Manholes - 1200mm circular	0	No.		each	$ -		
Reinforced Concrete Box culverts (RCBC's) 600x600	140	m	$619.4	m	$ 86,722		
Street Number reinstatement on new K&C	20	No.	$25.8	each	$ 516		
Lines	8,000	m	$0.5	m	$ 4,130		
Giveway, Holding and Stop Bar lines	100	m	$6.2	m	$ 619		
Precast headwall outlet for 600mm dia Pipe, including supply, installation and apron construction	8	No.	$1,032.4	each	$ 8,259		
Supply and installation of signs (including the sign, posts, holding pipe and fixing components) complete in place	12	No.	$258.1	each	$ 3,097	$ 653,612	General cost per 1000m
Minimum Pavement Thickness (mm)							
Description	**Depth**	**Unit**	**Cost**	**Unit**	**Total**		
40mm Asphalt thickness	1,922	tn	$169.3	t	$ 325,421		
130mm thick Base course Class 1A - CBR 80	2,548	m^3	$134.2	m^3	$ 341,972		
150mm thick Sub-base Class 2 - CBR 45	3,247	m^3	$118.7	m^3	$ 385,503		
150mm thick Below Sub-base Class 3 - CBR 15	3,247	m^3	$113.6	m^3	$ 368,742		
Prime spray newly constructed roadworks prior to AC	19,848	m^2	$6.2	m^2	$ 122,946	$ 1,544,585	Pavement Cost per 1000m
Footpath Details							
Description	**Distance**	**Units**	**Cost per m^2**	**Unit**	**Total**		
Length without footpath	0	m		m	$ -		
Footpaths - 100mm thick, including excavation by machine and disposal of soil - 1.2m wide		m		m	$ -		
Footpaths - 100mm thick, including excavation by machine and disposal of soil - 2.5m wide one side	1,000	m	$196.2	m	$ 196,156		
Streetscape Details	1,000	m^2	$31.0	m^2	$ 30,972		
Turfing (supply and lay by contractor)	11,000	m^2	$12.4	m^2	$ 136,277		
Top soil	840	m^3	$46.5	m^3	$ 39,025	$ 402,430	Footpath cost per 1000m
Earthworks							
Description	**Qty.**	**Units**	**Cost per m^2**		**Total**		
Preparation of Subgrade	23,350	m^2	$5.2	m2	$ 120,533		
Earthworks in soil/clay over 100m^3	10,975	m^3	$41.3	m3	$ 453,224		
Bulk cut and fill, average 400mm over site	14,400	m3	$20.6	m3	$ 297,331		
Box and trim road pavements (over 2.5m wide)	18,827	m^2	$2.1	m2	$ 38,874	$ 909,961	Earthworks cost per 1000m

Average Cost per metre	Cost
General	654
Pavement	1,545
Footpath	402
Earthworks	910

Total cost per 1000m	**$**	**3,510,588**
Cost per m	**$**	**3,511**

$3,510,588

Common Costs							
Description	**Number**	**Unit**	**Cost**	**Unit**	**Total**		
Master Planning	3	percent	$ 3,510,588		$ 105,318	contingency	10%
Survey	2	percent	$ 3,510,588		$ 70,212	on-cost	23%
Geotechnical Investigation	3	percent	$ 3,510,588		$ 105,318		
Design	8	percent	$ 3,510,588		$ 280,847		
Provisional Amount	10	percent	$ 3,510,588		$ 351,059		
Project Management and Contract Admin	6	percent	$ 3,510,588		$ 210,635		
Environmental	1	percent	$ 3,510,588		$ 35,106	$ 1,158,494	

Total Cost ***$4,669,000 per km***

Note:

#1 CBR value has been assumed to be 8

#2 Asphalt surfacing (based on 2.486t/m3)> 300t

VPD Vehicles per day

References

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Excluded from Estimate:

Watermain
Water meters at takeoffs
Electrical conduit and power cable
Communications (Telstra) duct / cable
Fibreoptic cable
Sewer pipe run
Pumping stations

Urban Arterial 4L - Thin Asphalt wearing surface

General information for Four Lane Road - Urban		
Section description	**Distance/ Number**	**Units**
Traffic Volume	14000-27000	VPD
Design Speed	80	km/hr
Design Length	1,000	m
Design Width	36	m
Road Width	19	m
Weight of Asphalt	1,760	t
Road Area	17,948	m^2
Based on standard dwg 02-004 (2015 edition)		

Rates current at 1/07/2016

ABS index No. 3101 Road and bridge construction Queensland
Base rate = 10· Jun-16

General Costs							
Section description	**Distance/ Number**	**Units**	**Cost per unit**	**Unit**	**Total**		
Barrier Kerb & Channel by machine. (Note straights <5.00m & radii <3.00m to be done manually	2,000	m	$38.2	m	$ 76,398		
Restoration of footpath after K&C construction	2,000	m	$25.8	m	$ 51,620		
375mm dia RRJ pipework, including supply, 10% on-site handling cost, excavation and disposal, bed, lay, joint, backfill, compaction and restoration (up to 1.5m deep)	495	m	$180.7	m	$ 89,432		
450mm dia RRJ pipework, including supply, 10% on-site handling cost, excavation and disposal, bed, lay, joint, backfill, compaction and restoration (up to 1.5m deep)	200	m	$222.0	m	$ 44,393		
600mm dia RRJ pipework, including supply, 10% on-site handling cost, excavation and disposal, bed, lay, joint, backfill, compaction and restoration (up to 1.5m deep)	400	m	$294.2	m	$ 117,694		
Side inlet gully on grade, cast in-situ (medium level)	18	No.	$3,613.4	each	$ 65,041		
Manholes - 1200mm circular	9	No.	$3,097.2	each	$ 27,875		
Sub-surface drains, 100mm dia slotted PVC pipe including flushing points & connection to gullies complete	4,000	m	$61.9	m	$ 247,776		
Reinforced Concrete Box culverts (RCBC's) 600x600	36	m	$619.4	m	$ 22,300		
Street Number reinstatement on new K&C	20	No.	$25.8	each	$ 516		
Lines	6,000	m	$0.5	m	$ 3,097		
Giveway, Holding and Stop Bar lines	100	m	$6.2	m	$ 619		
Supply and installation of signs (including the sign, posts, holding pipe and fixing components) complete in place	12	No.	$258.1	each	$ 3,097	$ 749,858	General cost per 1000m
Minimum Pavement Thickness (mm)							
Description	**Depth**	**Unit**	**Cost**	**Unit**	**Total**		
40mm Asphalt thickness	1,760	t	$169.3	t	$ 297,992		
130mm thick Base course Class 1A - CBR 80	2,333	m^3	$134.2	m^3	$ 313,117		
150mm thick Sub-base Class 2 - CBR 45	3,150	m^3	$118.7	m^3	$ 373,987		
150mm Below Sub-base Class 3 - CBR 15	3,150	m^3	$113.6	m^3	$ 357,727		
Prime spray newly constructed roadworks prior to AC	17,948	m^2	$6.2	m^2	$ 111,177	$ 1,453,999	Pavement Cost per 1000m
Footpath Details							
Description	**Distance**	**Units**	**Cost**	**Unit**	**Total**		
Length without footpath	0	m		m	$ -		
Footpaths - 100mm thick, including excavation by machine and disposal of soil - 1.2m wide	0	m		m	$ -		
Footpaths - 100mm thick, including excavation by machine and disposal of soil - 2.5m wide	2,000	m	$196.2	m	$ 392,312		
Streetscape Details	4,200	m^2	$31.0	m^2	$ 130,082		
Turf (supply and lay by Contractor)	8,300	m^2	$12.4	m^2	$ 102,827		
Top soil (delivered to site for medians & garden beds)	840	m^3	$46.5	m^3	$ 39,025		
Street Lighting	10	No.	$4,645.8	each	$ 46,458	$ 710,704	Footpath cost per 1000m
Earthworks							
Description	**Qty.**	**Units**	**Cost**	**Units**	**Total**		
Preparation of Subgrade	21,250	m^2	$5.2	m^2	$ 109,693		
Earthworks in soil/clay over 100m^3	9,988	m^3	$41.3	m^3	$ 412,464		
Bulk cut and fill - ave 400mm over area	14,400	m3	$20.6	m3	$ 297,331		
Box and trim road pavements (over 2.5m wide)	17,927	m^2	$2.1	m^2	$ 37,016	$ 856,504	Earthworks cost per 1000m

Average Cost per metre	Cost
General	750
Pavement	1,454
Footpath	711
Earthworks	857

Total cost per 1000m	**$**	**3,771,065**
Cost per m	**$**	**3,771**

$3,771,065

Common Costs							
Description	**Number**	**Unit**	**Cost**	**Unit**	**Total**		
Master Planning	3	percent	$ 3,771,065		$ 113,132	contingency	10%
Survey	2	percent	$ 3,771,065		$ 75,421	on-cost	23%
Geotechnical Investigation	3	percent	$ 3,771,065		$ 113,132		
Design	8	percent	$ 3,771,065		$ 301,685		
Provisional Amount	10	percent	$ 3,771,065		$ 377,107		
Project Management and Contract Admin	6	percent	$ 3,771,065		$ 226,264		
Environmental	1	percent	$ 3,771,065		$ 37,711	$ 1,244,451	

Total Cost ***$5,016,000 per km***

Note:
#1 CBR value has been assumed to be 8
#2 Asphalt surfacing (based on 2.486t/m3)> 300t
VPD Vehicles per day

References
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Excluded from Estimate:
Watermain
Water meters at takeoffs
Electrical conduit and power cable
Communications (Telstra) duct / cable
Fibreoptic cable
Sewer pipe run
Pumping stations

Major Commercial Collector Street - Thin Asphalt wearing course

General information for Industrial Collector Street		
Section description	**Distance/ Number**	**Units**
Traffic Catchment	30	Ha
Design Speed	60	km/hr
Design Length	1,000	m
Design Width	25	m
Road Width	16	m
Weight of Asphalt	1,480	t
Road Area	16,000	m^2
Footpath Width	9	m
Based on dwg STANDARD DRAWING 02-002 (2015 edition)		

Rates current at 1/07/2016

ABS index No. 3101 Road and bridge construction Queensland

Base rate = 104.7 Jun-16

General Costs							
Section description	**Distance/ Number**	**Units**	**Cost per unit**	**Unit**	**Total**		
Barrier Kerb & Channel by machine. (Note straights <5.00m & radii <3.00m to be done manually	2,000	m	$37.7	m	$ 75,365		
Restoration of footpath after K&C construction	2,000	m	$25.8	m	$ 51,620		
375mm dia RRJ pipework, including supply, 10% on-site handling cost, excavation and disposal, bed, lay, joint, backfill, compaction and restoration (up to 1.5m deep)	450	m	$180.7	m	$ 81,302		
450mm dia RRJ pipework, including supply, 10% on-site handling cost, excavation and disposal, bed, lay, joint, backfill, compaction and restoration (up to 1.5m deep)	300	m	$222.0	m	$ 66,590		
600mm dia RRJ pipework, including supply, 10% on-site handling cost, excavation and disposal, bed, lay, joint, backfill, compaction and restoration (up to 1.5m deep)	300	m	$294.2	m	$ 88,270		
Side inlet gully on grade, cast in-situ (medium level)	18	No.	$3,613.4	each	$ 65,041		
Manholes - 1200mm circular	9	No.	$3,097.2	each	$ 27,875		
Sub-surface drains, 100mm dia slotted PVC pipe including flushing points & connection to gullies complete	2,000	m	$61.9	m	$123,888		
Reinforced Concrete Box culverts (RCBC's) 600x600	23	m	$619.4	m	$ 14,247		
Street Number reinstatement on new K&C	20	No.	$25.8	each	$ 516		
Lines	3,000	m	$5.2	m	$ 15,486		
Giveway, Holding and Stop Bar lines	100	m	$6.2	m	$ 619		
Supply and installation of signs (including the sign, posts, holding pipe and fixing components) complete in place	8	No.	$258.1	each	$ 2,065		
Street Lighting	16	No.	$4,645.8	each	$ 74,333	$ 687,217	General cost per 1000m
Minimum Pavement Thickness (mm)							
Description	**Depth**	**Unit**	**Cost**	**Unit**	**Total**		
40mm Asphalt thickness	1,480	t	$169.3	t	$250,584		
130mm thick Base course Class 1A - CBR 80	1,963	m^3	$134.2	m^3	$263,458		
150mm thick Sub-base Class 2 - CBR 45	2,490	m^3	$118.7	m^3	$295,628		
150mm thickBelow Sub-base Class 3 - CBR 15	2,490	m^3	$113.6	m^3	$282,774		
Prime spray newly constructed roadworks prior to AC	15,100	m^2	$6.2	m^2	$ 93,535	$ 1,185,980	Pavement Cost per 1000m
Footpath Details							
Description	**Distance**	**Units**	**Cost**	**Unit**	**Total**		
Length without footpath		m		m^2	$ -		
Footpaths - 100mm thick, including excavation by machine and disposal of soil - 1.2m wide		m	$92.9	m	$ -		
Footpaths - 100mm thick, including excavation by machine and disposal of soil - 2m wide	2,000	m	$154.9	m	$309,720		
Streetscape Details	1,500	m^2	$31.0	m^2	$ 46,458		
Turf (supply and lay by Contractor)	5,800	m^2	$12.4	m^2	$ 71,855		
Top soil (delivered to site for medians & garden beds)	450	m^3	$46.5	m^3	$ 20,906	$ 448,939	Footpath cost per 1000m
Earthworks							
Description	**Qty.**	**Units**	**Cost**	**Unit**	**Total**		
Preparation of Subgrade	15,600	m^2	$5.2	m^2	$ 80,527		
Earthworks in soil/clay over 100m^3	11,092	m^3	$41.3	m^3	$458,055		
Bulk cut and fill, ave 400mm	9,200	m3	$20.6	m3	$189,962		
Box and trim road pavements (over 2.5m wide)	15,100	m^2	$2.1	m^2	$ 31,178	$ 759,723	Earthworks cost per 1000m

Average Cost per metre	Cost
General	687
Pavement	1,186
Footpath	449
Earthworks	760

Total cost per 1000m	**$**	**3,081,859**
Cost per m	**$**	**3,082**

$3,081,859

Common Costs							
Description	**Number**	**Unit**	**Cost**	**Unit**	**Total**		
Master Planning	3	percent	$ 3,081,859		$ 92,456	contingency	10%
Survey	2	percent	$ 3,081,859		$ 61,637	on-cost	23%
Geotechnical Investigation	3	percent	$ 3,081,859		$ 92,456		
Design	8	percent	$ 3,081,859		$246,549		
Provisional Amount	10	percent	$ 3,081,859		$308,186		
Project Management and Contract Admin	6	percent	$ 3,081,859		$184,912		
Environmental	1	percent	$ 3,081,859		$ 30,819	$ 1,017,013	

Total Cost ***$4,099,000*** ***per km***

Note:

[#1] CBR value has been assumed to be 8

[#2] Asphalt surfacing (based on 2.486t/m3)> 300t

VPD Vehicles per day

References

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Excluded from Estimate:

Watermain
Water meters at takeoffs
Electrical conduit and power cable
Communications (Telstra) duct / cable
Fibreoptic cable
Sewer pipe run
Pumping stations

Parks and Land for Community Facilities Network Unit Rates

Park type	Unit Rate for Embellishments (June 2016 $/standard park unit)
Local Recreation Park	$493,817
District Recreation Park	$1,718,004
City Recreation Park	$4,382,006
District Sport Park	$3,429,056
City Sport Park	$5,373,350
Land for Community Facilities	$358,839

Appendix B – Statistical Area (SA2) land value rates

SA2 NAME	Existing Land Value		Future Land Value	
	Above Q100 Base Date (Jun 2016)	Below Q100 Base Date (Jun 2016)	Above Q100 Base Date (Jun 2016)	Below Q100 Base Date (Jun 2016)
Arundel	$71.21	$7.50	$94.94	$7.50
Ashmore	$63.05	$7.50	$84.07	$7.50
Benowa	$99.39	$7.50	$148.35	$7.50
Biggera Waters	$110.66	$7.50	$165.16	$7.50
Broadbeach Waters	$172.28	$7.50	$257.14	$7.50
Bundall	$132.53	$7.50	$197.80	$7.50
Burleigh Heads	$169.63	$7.50	$253.18	$7.50
Burleigh Waters	$125.90	$7.50	$187.91	$7.50
Carrara	$57.86	$7.50	$77.14	$7.50
Clear Island Waters	$86.14	$7.50	$128.57	$7.50
Coolangatta	$482.14	$7.50	$964.28	$7.50
Coombabah	$69.58	$7.50	$103.85	$7.50
Coomera	$59.34	$7.50	$79.12	$7.50
Currumbin - Tugun	$221.98	$7.50	$331.32	$7.50
Currumbin Valley - Tallebudgera	$33.63	$7.50	$39.56	$7.50
Currumbin Waters	$92.77	$7.50	$138.46	$7.50
Elanora	$53.41	$7.50	$71.21	$7.50
Guanaba - Springbrook	$22.70	$7.50	$26.70	$7.50
Helensvale	$48.21	$7.50	$64.29	$7.50
Highland Park	$41.54	$7.50	$55.38	$7.50
Hope Island	$119.94	$7.50	$179.01	$7.50
Jacobs Well - Alberton	$21.02	$7.50	$24.73	$7.50
Labrador	$106.02	$7.50	$158.24	$7.50
Main Beach	$1,038.45	$7.50	$2,076.90	$7.50
Mermaid Beach - Broadbeach	$630.49	$7.50	$1,260.98	$7.50
Mermaid Waters	$132.53	$7.50	$197.80	$7.50
Merrimac	$44.51	$7.50	$59.34	$7.50
Miami	$205.42	$7.50	$306.59	$7.50
Molendinar	$48.21	$7.50	$64.29	$7.50
Mudgeeraba - Bonogin	$41.54	$7.50	$55.38	$7.50
Nerang - Mount Nathan	$32.64	$7.50	$43.52	$7.50
Ormeau - Yatala	$35.60	$7.50	$47.47	$7.50
Oxenford - Maudsland	$45.99	$7.50	$61.32	$7.50
Pacific Pines - Gaven	$45.99	$7.50	$61.32	$7.50

SA2 NAME	Existing Land Value		Future Land Value	
	Above Q100 Base Date (Jun 2016)	Below Q100 Base Date (Jun 2016)	Above Q100 Base Date (Jun 2016)	Below Q100 Base Date (Jun 2016)
Palm Beach	$145.78	$7.50	$217.58	$7.50
Paradise Point - Hollywell	$139.15	$7.50	$207.69	$7.50
Parkwood	$66.76	$7.50	$89.01	$7.50
Pimpama	$40.80	$7.50	$54.40	$7.50
Reedy Creek - Andrews	$55.63	$7.50	$74.18	$7.50
Robina	$76.20	$7.50	$113.74	$7.50
Runaway Bay	$115.96	$7.50	$173.08	$7.50
Southport	$109.33	$7.50	$163.19	$7.50
Surfers Paradise	$989.00	$7.50	$1,978.00	$7.50
Tamborine - Canungra	$38.57	$7.50	$51.43	$7.50
Upper Coomera - Willow Vale	$76.20	$7.50	$113.74	$7.50
Varsity Lakes	$38.57	$7.50	$51.43	$7.50
Worongary - Tallai	$71.21	$7.50	$94.94	$7.50

CITY OF GOLDCOAST.

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