LOGAN WATER ALLIANCE

LOGAN NORTH WATER SUPPLY – DMA METERING FOR KIMBERLEY PARK AND UNDERWOOD

TASK NUMBER: 90-12-14

OCTOBER 2013
Approval Register

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# TABLE OF CONTENTS

**EXECUTIVE SUMMARY** ........................................................................................................................................... 6

1. **INTRODUCTION** .................................................................................................................................................. 9
   1.1 Objective ............................................................................................................................................................ 9
   1.2 Scope ............................................................................................................................................................... 9
   1.3 Business Drivers ................................................................................................................................................ 9

2. **METHODOLOGY** .................................................................................................................................................. 10
   2.1 Stakeholder engagement .................................................................................................................................. 11

3. **ASSUMPTIONS** .................................................................................................................................................. 12
   3.1 Population and Demand .................................................................................................................................. 12
   3.2 General Assumptions ....................................................................................................................................... 12
   3.3 Meter Sizing - Demand Factors ...................................................................................................................... 12
      3.3.1 Minimum Demand ................................................................................................................................... 12
      3.3.2 Maximum Demand .................................................................................................................................. 13

4. **OPTIONS ASSESSMENT** .................................................................................................................................. 15
   4.1 Kimberley Park HLZ ....................................................................................................................................... 15
      4.1.1 Flow Metering .......................................................................................................................................... 16
   4.2 Underwood LLZ & HLZ .................................................................................................................................. 17
      4.2.1 Flow Metering .......................................................................................................................................... 17

5. **DETAILED PLANNING** ...................................................................................................................................... 19
   5.1 Site 1 - 34A Telfer Street - Kimberley Park (Option 3) .................................................................................. 19
      5.1.1 Site Description .......................................................................................................................................... 19
      5.1.2 Flow Meter Requirements .......................................................................................................................... 20
      5.1.3 Approvals Assessment ............................................................................................................................... 20
      5.1.4 Telemetry .................................................................................................................................................. 20
      5.1.5 Power Supply ............................................................................................................................................ 20
      5.1.6 Cost estimate ............................................................................................................................................. 20
   5.2 Site 2 - 3025 Logan Road - Underwood ........................................................................................................... 21
      5.2.1 Site Description .......................................................................................................................................... 21
      5.2.2 Flow Meter Requirements .......................................................................................................................... 21
      5.2.3 Approvals Assessment ............................................................................................................................... 22
      5.2.4 Telemetry .................................................................................................................................................. 23
      5.2.5 Power Supply ............................................................................................................................................ 23
      5.2.6 Traffic Management .................................................................................................................................. 23
      5.2.7 Dial Before You Dig .................................................................................................................................. 23
      5.2.8 Cost estimate ............................................................................................................................................. 23
5.3 Capital Works Program Implications ................................................................. 24
6. CONCLUSION ........................................................................................................... 25
7. RECOMMENDATIONS ............................................................................................ 26
8. REFERENCES ............................................................................................................ 27

FIGURES
Figure 0-1: Kimberley Park Elevated Zone Meter Options ............................................. 6
Figure 0-2: Underwood Zone Meter Option ................................................................... 7
Figure 2-1: Task Methodology ..................................................................................... 10
Figure 3-1: Yearly Average Day Demand Profile ......................................................... 13
Figure 4-1: Kimberley Park HLZ .................................................................................. 15
Figure 4-2: Kimberley Park Elevated Zone Meter Options ........................................... 16
Figure 4-3: Underwood HLZ ....................................................................................... 17
Figure 4-4: Underwood Zone Meter Option ................................................................. 18
Figure 5-1: Proposed Kimberley Park Flow Meter Location .......................................... 19
Figure 5-2: Proposed Underwood Flow Meter Location ................................................. 21

TABLES
Table 2-1: Key stakeholders ....................................................................................... 11
Table 3-1: Population Projections ............................................................................... 12
Table 3-2: Minimum Demand Factors ......................................................................... 13
Table 3-3: Maximum Demand Factors ......................................................................... 13
Table 5-1: Kimberley Park HLZ Predicted Flow and Velocity ........................................ 20
Table 5-2: Underwood Flow Meter Cost Estimate ....................................................... 20
Table 5-3: Underwood HLZ Predicted Flow and Velocity ............................................ 22
Table 5-4: Underwood Flow Meter Cost Estimate ....................................................... 23
Table 5-5: Capital Works Program Items ...................................................................... 24
Table 5-6: Drivers for the Proposed Capital Works ...................................................... 24

APPENDICES
Appendix A  Desired Standards of Service
Appendix B  Approvals Information
Appendix C  Dial before You Dig Information
Appendix D  Site Plan
ABBREVIATIONS

AD    Average Day
DBYD  Dial Before You Dig
DMA   District Metered Area
DSS   Desired Standards of Service
DTMR  Department of Transport and Main Roads
EMP   Environmental Management Plan
EP    Equivalent Person
FF    Fire Flow
GIS   Geographic Information System
IDM   Infrastructure Demand Model
IFC   Issued for Construction
HGL   Hydraulic Grade Line
HLZ   High Level Zone
LCC   Logan City Council
LLZ   Low Level Zone
LWA   Logan Water Alliance
MD    Maximum Day
MDMM  Mean Day Maximum Month
MH    Maximum Hour
MOL   Minimum Operating Level
PIP   Priority Infrastructure Plan
PLMP  Pressure and Leakage Management Program
POAR  Planning Opportunity and Risk
PRV   Pressure Reducing Valve
QFRS  Queensland Fire and Rescue Service
SCADA Supervisory Control and Data Acquisition
SQE   Safety, Quality and Environment
WSZ   Water Supply Zone
EXECUTIVE SUMMARY

A pressure and leakage management program (PLMP) was initiated in Logan North in 2007 to segregate the water reticulation into discretely monitored areas in order to effectively assess leakage and manage pressures. As part of the PLMP pressure reducing valves (PRVs) and flow meters were installed at the supply points of each district metered area (DMA). The Logan Water Alliance (LWA) has recently completed *Water Balance Modelling and Detailed Leakage Assessment Report (LWA 2013)* which identified that there are two discrete areas in the Logan North water supply network that are currently unmetered:

- Kimberley Park high level zone (HLZ)
- Underwood high and low level zones (LLZ)

The objective of this task is to undertake detailed planning and preliminary design for the implementation of DMA metering and monitoring for two areas that are currently un-metered within the Logan North water supply network.

**Kimberley Park HLZ**

Three options were identified for the installation of a DMA meter for the Kimberley Park HLZ (DMA45). These are both upstream and downstream of the elevated reservoir and all of the proposed options take advantage of existing Logan telemetry equipment available at the reservoir site.

The options considered for metering which are presented in Figure 0-1 were:

- Option 1 – The existing chamber and tapping point (suitable for insertion meter) on the 375 mm outlet main within LCC property.
- Option 2 – A new meter pit in Telfer St.
- Option 3 – Clamp-on meter on the 100 mm discharge pipework within tower/pump station.

![Figure 0-1: Kimberley Park Elevated Zone Meter Options](image)
Underwood HLZ / LLZ

There are limited opportunities for flow monitoring for the Underwood zone (DMA46). The existing connection between the Springwood high level trunk main on Logan Road and the Underwood reticulation is approximately 1 m in length consisting of a valve and connections to the tees on both mains. There is therefore no opportunity to meter this existing connection. There are also limited opportunities for new connections to the trunk main as there is only 100 m of Springwood high level trunk main available on the west side of Logan Road with suitable proximity to the Underwood reticulation. With these constraints and the opportunity to use an existing Logan water site only a single option was considered for Underwood.

Figure 0-2: Underwood Zone Meter Option

The option for the Underwood DMA takes advantage of the wastewater pump site at SPS59, Logan Road (West) which has available capacity in the existing Logan telemetry equipment.

Based on the work undertaken for this study the following conclusions are drawn:

- Kimberley Park
  - Option 1 – The existing chamber and insertion point is not considered suitable for capturing night flow information due to the size of the main (375mm) and the anticipated minimum flow (<1 L/s).
  - Option 2 – A new meter pit in Telfer St would involve significant disruption to the adjacent properties and there are significant constraints from underground power and bulk water assets. Significant liaison with Seqwater would be required to use existing conduits.
  - Option 3 – A clamp-on meter on the 100 mm discharge pipework within the tower/pump station is preferred as there is no additional infrastructure, construction or interruption to customer supplies required. Telemetry and power are available within 3m of the proposed location.
• Underwood
  o Due to the limited availability of connection points between the Underwood reticulation and Springwood High Level Trunk network only one option has been considered
  o The proposed meter location is within the SPS59 Logan Road (West) wastewater pump station site.
  o The existing telemetry infrastructure at this site has spare channels and power is also available at the site
  o The site boundary also has sufficient footprint to accommodate a new meter arrangement
  o In-principle permission has been obtained from DTMR for this installation due to the likely future widening of Logan Road

Based on the outcomes of this study the Logan Water Alliance recommends that:

1. Option 3 be adopted as the preferred flow meter option for Kimberley Park HLZ and is connected to Council’s ClearSCADA network to implement DMA45, involving:
   • a clamp on meter on the 100 mm discharge main within the lower sections of the elevated tank structure, power and telemetry connections to the adjacent switchboard

2. The nominated Underwood flow monitoring option be adopted to implement DMA46, involving:
   • construction of a new meter chamber at the SPS59 site, with 150 mm connections to the existing 150 mm Underwood reticulation and 200 mm Springwood high level trunk main on Logan Road, power and telemetry connections to the adjacent switchboard within the pump station

3. Logan City Council amend the Capital Works Program to reflect the expected cost of $148,250 to implement the DMA metering at Underwood and Kimberley Park
1. INTRODUCTION

A pressure and leakage management program (PLMP) was initiated in Logan North in 2007 to segregate the water reticulation into discretely monitored areas in order to effectively assess leakage and manage pressures. As part of the PLMP pressure reducing valves (PRVs) and flow meters were installed at the supply points of each district metered area (DMA). The Logan Water Alliance (LWA) recently completed the *Water Balance Modelling and Detailed Leakage Assessment Report, (LWA 2013)* which identified that there were two discrete areas in the Logan North water supply network that are currently unmetered:

- Kimberley Park high level zone
- Underwood high and low level zones

1.1 Objective

The objective of this task is to undertake detailed planning and preliminary design for the implementation of DMA metering and monitoring for two areas that are currently un-metered within the Logan North water supply network.

1.2 Scope

The scope of this detailed planning report includes the following activities:

- Workshop with LCC Planning and LCC Operations representatives to discuss new DMA zones and locations of DMA flow meters
- Undertake site visit to confirm site constraints/opportunities
- Obtain Dial Before You Dig (DBYD) information
- Planning Opportunity and Risk (POAR) workshop
- Prepare drawings & first principles cost estimates

1.3 Business Drivers

The primary business driver for this task is system improvement. Installing additional flow meters will serve to provide the following business benefits:

- Facilitation of leakage assessments for these areas and to inform the overall leakage performance of the Logan North water supply network
- Improved understanding of the performance of these areas over a range of operating conditions
- Improved understanding of customer demands and demand use in these areas
2. METHODOLOGY

The methodology applied for this study is described in Figure 3-1

Stage 1
Background

- Review previous planning and recommendations
- Confirm project drivers
- Review the existing and proposed short-term water supply arrangements

Stage 2
Project Development

- Review network operational philosophy
- Outline specifications for proposed flow meter installations (objective, flow ranges)
- Identify possible locations for flow meters
- Identify opportunities to maximise existing infrastructure

Stage 3
Detailed Planning & Preliminary Design

- Determine site footprint
- Undertake Environmental, Town Planning, Cultural Heritage, Land Acquisition, Construction and Telemetry assessment for the proposed flow meter sites
- Prepare concept drawings for the proposed sites
- Prepare first principle cost estimates for the proposed sites
- Undertake POAR workshop with the relevant LCC representatives

Figure 2-1: Task Methodology
2.1 Stakeholder engagement

The key stakeholders for this project and their respective areas of interest are outlined in Table 2-1.

**Table 2-1: Key stakeholders**

<table>
<thead>
<tr>
<th>Section</th>
<th>Stakeholder</th>
<th>Areas of Interest</th>
</tr>
</thead>
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<td>Infrastructure Planning</td>
<td>Sandy Veeren</td>
<td>• Impacts on capital works program</td>
</tr>
<tr>
<td></td>
<td>Tracey Leslie</td>
<td>• Interaction with other planning tasks</td>
</tr>
<tr>
<td>Operations Branch</td>
<td>Darshan Udayaratna</td>
<td>• Impacts on the operation of network assets</td>
</tr>
<tr>
<td></td>
<td>Lester Bridgham</td>
<td>• Understanding potential water quality improvement activities</td>
</tr>
<tr>
<td>Telemetry</td>
<td>Peter Bell</td>
<td>• Connection of future flow meter/monitoring locations to the SCADA system</td>
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3. ASSUMPTIONS

3.1 Population and Demand

Water demands for Logan North were obtained from the 2010 IDM Version 5. The methodology used to convert forecasts of residential and non-residential growth into demand is outlined in the *Priority Infrastructure Plan Infrastructure Demand Model Report (LWA 2011)*.

No review of the population projections has been undertaken as part of this study. Table 3-1 outlines the population projections adopted from the IDM for each unmetered zone.

<table>
<thead>
<tr>
<th>Table 3-1: Population Projections</th>
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<tbody>
<tr>
<td>Zone</td>
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<tr>
<td>Kimberley Park HLZ</td>
</tr>
<tr>
<td>Underwood LLZ/HLZ</td>
</tr>
</tbody>
</table>

3.2 General Assumptions

The following general assumptions were made for this study:

- No geotechnical investigations have been undertaken for the proposed flow meter sites as part of this planning study; detailed site investigation and assessment of ground conditions shall be undertaken during detailed design.
- No assessment of preferred flow meter technology has been undertaken for this study. It was assumed that meters shall be bi-directional and capable of reading across all of the anticipated flow ranges.

3.3 Meter Sizing - Demand Factors

The sizing of flow meters was undertaken to span the range of anticipated flows for each proposed flow meter location. The method of calculation for both minimum and maximum flow as it relates to demand ratios is outlined below.

3.3.1 Minimum Demand

Historical flow data from Logan's ClearSCADA system was assessed in order to calculate the minimum flow each respective meter could expect. For each of the two relevant water supply zones, Kimberley Park and Springwood High Level, twelve months of DMA data was assessed in order to calculate the most accurate minimum demand factor. Flow data for all DMA's in each zone was utilised to determine a nominal diurnal pattern, these were then averaged to provide a pattern for each zone.

The average demand profiles derived for each water supply zone are presented in Figure 3-1.
The minimum hour demand factors for the Kimberley Park and Springwood High water supply zones (WSZs), used for the proposed Kimberley Park Elevated and Underwood DMAs was directly derived from the average day demand profiles (Figure 3-1) and are presented in Table 3-2.

### Table 3-2: Minimum Demand Factors

<table>
<thead>
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<th>WSZ</th>
<th>Minimum Hour Demand Factor (Average Day)</th>
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<tr>
<td>Kimberley Park</td>
<td>0.25</td>
</tr>
<tr>
<td>Springwood High</td>
<td>0.34</td>
</tr>
</tbody>
</table>

The minimum flow for each respective area was derived using the following formula:

- 2013 AD flow * corresponding WSZ minimum demand factor

#### 3.3.2 Maximum Demand

The maximum hour demand factor for the Kimberley Park and Springwood High water supply zones (WSZs), was derived from multiplying the average day demand profiles (Figure 3-1) by the most conservative average day/maximum day peaking factor of 1.7 prescribed in Logan's DSS. The maximum hour peaking factors derived for the proposed Kimberley Park Elevated and Underwood DMAs are presented in Table 3-3.

### Table 3-3: Maximum Demand Factors

<table>
<thead>
<tr>
<th>WSZ</th>
<th>Maximum Hour Demand Factor (Maximum Day)</th>
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</thead>
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<tr>
<td>Kimberley Park</td>
<td>2.8</td>
</tr>
<tr>
<td>Springwood High</td>
<td>2.55</td>
</tr>
</tbody>
</table>
Working on the assumption that the life span of a flow meter is approximately 10 years, the maximum flow for each flow meter was calculated using the following formula:

- 2026 AD* corresponding WSZ maximum demand factor
4. OPTIONS ASSESSMENT

4.1 Kimberley Park HLZ

The Kimberley Park HLZ is supplied by the Kimberley Park elevated reservoir which in turn is supplied by Kimberley Park ground level reservoir via a pump station sited in the ground floor of the elevated tank structure. There is no development forecast in the IDM between the 2013 and 2026 planning horizons. Current planning forecasts as presented in Table 3-1 indicate a decline in population, this is due to the forecast reduction in occupancy rates which has been applied in the IDM. There are small developments forecast for the ultimate planning horizon, which is outside the scope / life span of the flow meters.

Figure 4-1: Kimberley Park HLZ
4.1.1 Flow Metering

There are three opportunities for the installation of a flow meter for the Kimberley Park HLZ. These are both upstream and downstream of the elevated reservoir and all options can take advantage of capacity available in the existing Logan telemetry equipment available at the tower.

The options considered for metering were (refer to Figure 4-2):

- Option 1 – The existing chamber and tapping point (suitable for insertion meter) on the 375 mm outlet main within LCC property.
  - This option was not considered suitable for capturing night flow information due the size of the main (375mm) and the anticipated minimum flow (< 1L/s).

- Option 2 – A new meter pit in Telfer St.
  - This option would involve significant disruption to the adjacent properties and there are significant constraints from underground power and bulk water assets. Significant liaison with Seqwater would be required to use existing conduits to connect power and telemetry at the tank.

- Option 3 – Clamp-on meter on the 100mm discharge pipework within tower/pump station.
  - This is the preferred option as there is no additional infrastructure, construction or interruption to customer supplies required. Telemetry and power are available within 3m of the proposed metering location.
4.2 Underwood LLZ & HLZ

The Underwood zone is supplied directly by the Springwood high level reservoir. There is growth of approximately 500 EP forecast in the IDM between the 2013 and 2026 planning horizons, the approximate life span of the flow meter. According to the IDM the demand in the zone approximately doubles between the 2026 planning horizon and the ultimate planning horizon.

![Figure 4-3: Underwood HLZ](image)

4.2.1 Flow Metering

There are limited opportunities for flow monitoring for the Underwood zone. The existing connection between the Springwood high level trunk main on Logan Road and the Underwood reticulation is approximately 1 m in length consisting of a valve and connections to the tees on both mains. There is therefore no opportunity to meter the existing connection. There are also limited opportunities for new connections to the trunk main as there is only 100 m of Springwood high level trunk main available on the west side of Logan Road with suitable proximity to the Underwood reticulation. With these constraints and the opportunity to use an existing Logan water site, only a single option was considered for Underwood.
Figure 4-4: Underwood Zone Meter Option

The option for the Underwood DMA takes advantage of the wastewater pump station site at SPS59 Logan Road (West) which has available telemetry capacity.
5. DETAILED PLANNING

5.1 Site 1 - 34A Telfer Street - Kimberley Park (Option 3)

5.1.1 Site Description
A flow meter is proposed for the 100 mm discharge main which runs directly from the Kimberley Park elevated reservoir to the HLZ. The flow meter will be a clamp-on meter placed on the 100 mm main shown in Figure 5-1. No additional infrastructure or construction is required. This location is within the pump house directly below the Kimberley Park elevated tower and takes advantage of existing telemetry and power which is within 3 m of the pipework.

Figure 5-1: Proposed Kimberley Park Flow Meter Location
5.1.2 Flow Meter Requirements
The flow and velocity range calculated from the most recent infrastructure demand model (IDM), and based on 100 mm pipework is presented in Table 5-1. The maximum and minimum flows were calculated using the methodology set out in Section 3.3 of this report.

Table 5-1: Kimberley Park HLZ Predicted Flow and Velocity

<table>
<thead>
<tr>
<th>Zone</th>
<th>Flow (L/s)</th>
<th>Velocity (m/s)</th>
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<tr>
<td>Minimum Flow</td>
<td>0.9</td>
<td>0.11</td>
</tr>
<tr>
<td>Maximum Flow</td>
<td>12.5</td>
<td>1.59</td>
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5.1.3 Approvals Assessment
Due to the proposed location being within a LCC asset (Kimberly Park elevated reservoir / pump station) no approvals were sought for the proposed location of the flow meter. This option provides a solution with no interruption to customer supplies.

5.1.4 Telemetry
The booster pump station (WPS000022) that services the Kimberley Park elevated reservoir has existing telemetry. Following consultation with stakeholders, it was found that the telemetry at the booster pump station has sufficient capacity to relay the flow data to the ClearSCADA network.

5.1.5 Power Supply
Along with telemetry, power supply to site can be sourced from the booster pump station in the vicinity of the proposed flow meter.

5.1.6 Cost estimate
A cost estimate for this site is shown in Table 5-2.

Table 5-2: Underwood Flow Meter Cost Estimate

<table>
<thead>
<tr>
<th>Cost Item</th>
<th>Quantity</th>
<th>Cost ($)</th>
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<tr>
<td>Flow Meter</td>
<td>1</td>
<td>$8,000.00</td>
</tr>
<tr>
<td>Commissioning/ connection to existing telemetry</td>
<td>1</td>
<td>$2,000.00</td>
</tr>
<tr>
<td>Total</td>
<td>-</td>
<td>$10,000.00</td>
</tr>
</tbody>
</table>

The LCC Mechanical and Electrical Operations team have already procured this meter and installation is scheduled to be completed by 4 October 2013.
5.2 Site 2 - 3025 Logan Road - Underwood

5.2.1 Site Description

The proposed site for the flow meter is to be located at 3025 Logan Road, which was previously acquired by LCC in order to house wastewater pump station SPS59. This location takes advantage of existing infrastructure including telemetry and power.

The existing connection between the Springwood high level trunk main on Logan Road and the Underwood reticulation is approximately 1 m in length consisting of a valve and connections to the tees on both mains. There is therefore no opportunity to meter the existing connection. There are also limited opportunities for new connections to the trunk main as there is only 100 m of Springwood high level trunk main available on the west side of Logan Road with suitable proximity to the Underwood reticulation. With these constraints, and the opportunity to use an existing council site, only a single option was considered for Underwood. The proposed flow meter and general pipework arrangement is presented in Figure 5-2. A site plan is attached in Appendix D.

![Figure 5-2: Proposed Underwood Flow Meter Location](image)

5.2.2 Flow Meter Requirements

The flow and velocity range calculated from the most recent infrastructure demand model (IDM), and based on 150 mm pipework is presented in Table 5-3. The maximum and minimum flows were calculated using the methodology set out in Section 3.3 of this report.
Table 5-3: Underwood HLZ Predicted Flow and Velocity

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<thead>
<tr>
<th>Zone</th>
<th>Flow (L/s)</th>
<th>Velocity (m/s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum Flow</td>
<td>1.4</td>
<td>0.18</td>
</tr>
<tr>
<td>Maximum Flow</td>
<td>43.3</td>
<td>3.78</td>
</tr>
</tbody>
</table>

### 5.2.3 Approvals Assessment

The LWA Approvals team undertook an assessment of the proposed site. There were no major approvals issues; however some consideration and approvals will need to be sought due to the issues outlined below.

In principal approval from the Department of Transport and Main Roads (DTMR) is required as they are the registered owner of Logan Road, for the proposed connection of pipework within the state road reserve. This approval has been obtained as part of this exercise (DTMR Ref. CM5091).

Previous advice from DTMR in this area indicates a planned widening of Logan Road at some point in the future. Based on this advice the location of the meter pit has been extended beyond the anticipated future road alignment and into the pump station boundary.

Closer to construction commencing, a pre-start meeting will need to be held on site with DTMR where the Issued for Construction (IFC) drawings, Safety, Quality and Environment (SQE) report and Environmental Management Plan (EMP) for the project must be provided. Provided DTMR have no objection to these documents, a Works Permit will be issued, allowing construction to begin.

As the site in question is Council owned land, easements for Council infrastructure are not required over Council-owned land. However, the following actions are required:

- The LCC Property team requires notification for any proposed access for investigation works.
- Consent is required from Logan City Council Parks and Conservation for the new infrastructure.

Should construction access or a lay down area be required for the proposed works over this property, approval for temporary use of the site from LCC would be required. Where this is required, a simple application would be lodged with the LCC Property Team. Conditions of approval are likely to relate to safety, maintenance and revegetation requirements.

#### 5.2.3.1 Approvals Required

The following approvals and consent are required in order to carry out any works:

- Consent from LCC for lay down / construction areas.
- DTMR In principle application required
- DTMR Works permit required before construction.
- Notification and consent from LCC required for works.

All available information pertaining to approvals is attached in Appendix B.
5.2.4 Telemetry
The wastewater pump station site SPS59 Logan Road (West), has existing telemetry. Following consultation with stakeholders, it was found that the telemetry at the site has sufficient capacity to relay flow and pressure data to the ClearSCADA network.

5.2.5 Power Supply
Along with telemetry, power supply to site can be sourced from SPS59 in close proximity to the proposed flow meter.

5.2.6 Traffic Management
Traffic management will be required for the construction of the flow meter. The existing pipes supplying the area are located close (within 1 m) of the Logan Road under the foot path and under the road. An allowance has been made in the costs for traffic management.

5.2.7 Dial Before You Dig
Dial before you dig (DBYD) was consulted and no constraints were identified. Over head power lines are the only third party assets found that impact on the proposed site.

The DBYD information can be found in Appendix C.

5.2.8 Cost estimate
Table 5-4 outlines the direct cost estimate for this site.

Table 5-4: Underwood Flow Meter Cost Estimate

<table>
<thead>
<tr>
<th>Cost Item</th>
<th>Quantity</th>
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<tr>
<td>Site Supervision</td>
<td>1</td>
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<td>Site Establishment</td>
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<td>$2,140</td>
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<tr>
<td>DN 150 - Flow meter and pipework</td>
<td>1</td>
<td>$43,644</td>
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<tr>
<td>Power &amp; Telemetry Conduits - 2 x DN 100</td>
<td>25 m</td>
<td>$6,792</td>
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<tr>
<td>Rehabilitation of disturbed ground</td>
<td>1</td>
<td>$672</td>
</tr>
<tr>
<td>External DN 150</td>
<td>45 m</td>
<td>$22,500</td>
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<tr>
<td>Provisional Sum (Construction Fence &amp; Traffic Management)</td>
<td>1</td>
<td>$3,000</td>
</tr>
<tr>
<td>Provisional Sum (Connection to existing Power and Telemetry)</td>
<td>1</td>
<td>$2,000</td>
</tr>
<tr>
<td><strong>Total – Direct cost</strong></td>
<td>-</td>
<td><strong>$96,438</strong></td>
</tr>
<tr>
<td><strong>Delivery Costs</strong></td>
<td>-</td>
<td><strong>$41,810</strong></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>-</td>
<td><strong>$138,248</strong></td>
</tr>
</tbody>
</table>
5.3 Capital Works Program Implications

The Capital Work Program will need to be updated to include the proposed works reconfigurations outlined in this report. The capital works line items are included in Table 5-5.

Table 5-5: Capital Works Program Items

<table>
<thead>
<tr>
<th>Project Name</th>
<th>Project Description</th>
<th>Project Status</th>
<th>Total Project Cost</th>
<th>Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>Logan North Water Supply - Metering for Kimberley Park HLZ and Underwood LLZ/HLZ</td>
<td><strong>The objective of this task is to undertake detailed planning and preliminary design for the implementation of DMA metering and monitoring for two areas that are currently un-metered within the Logan North water supply network. The scope of work includes hydraulic model analysis with upgraded unified model to determine the required pipe sizes and meter specification.</strong> The augmentations identified are as below</td>
<td>Preliminary Design</td>
<td>$148,250</td>
<td>2013/2014</td>
</tr>
<tr>
<td></td>
<td><strong>Pipeline Augmentations</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Flow meter, chamber and associated pipework, conduits and connections for Underwood DMA45 meter at SPS59 site</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Clamp-on meter and associated installation at Kimberley Park HL DMA46 at elevated tower/PS site</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The breakdown of drivers for this project is presented in Table 5-6.

Table 5-6: Drivers for the Proposed Capital Works

<table>
<thead>
<tr>
<th>Capital Works Drivers</th>
<th>Business Drivers</th>
<th>Weighting</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Improvement</strong></td>
<td>Maintaining levels of service</td>
<td>50 %</td>
</tr>
<tr>
<td>Capital expenditure associated with improving service levels and reliability to meet customer preferences</td>
<td>Optimised infrastructure investment</td>
<td>50 %</td>
</tr>
</tbody>
</table>

Capital costs have been based on first principles costing and recent operational works. These costs should be confirmed in the next stage of design.
6. CONCLUSION

Based on the work undertaken for this study the following conclusions are drawn:

- Kimberley Park
  - Option 1 – The existing chamber and insertion point is not considered suitable for capturing night flow information due the size of the main (375mm) and the anticipated minimum flow (<1 L/s).
  - Option 2 – A new meter pit in Telfer St would involve significant disruption to the adjacent properties and there are significant constraints from underground power and bulk water assets. Significant liaison with Seqwater would be required to use existing conduits.
  - Option 3 – A clamp-on meter on the discharge pipework within the tower/pump station is preferred as there is no additional infrastructure, construction or interruption to customer supplies required. Telemetry and power are available within 3m of the proposed location.

- Underwood
  - Due to the limited availability of connection points between the Underwood reticulation and Springwood High Level Trunk network only one option has been considered
  - The proposed meter location is within the SPS59 Logan Road (West) wastewater pump station site
  - The existing telemetry infrastructure at this site has spare channels and power is also available at the site
  - The site boundary also has sufficient footprint to accommodate a new meter arrangement
  - In-principle permission has been obtained from DTMR for this installation due to the likely future widening of Logan Road.
7. RECOMMENDATIONS

Based on the outcomes of this study the Logan Water Alliance recommends that:

1. Option 3 be adopted as the preferred flow meter option for Kimberley Park HLZ and is connected to Council’s ClearSCADA network to implement DMA45, involving:
   - a clamp on meter on the 100 mm discharge main within the lower sections of the elevated tank structure, power and telemetry connections to the adjacent switchboard

2. The nominated Underwood flow monitoring option be adopted to implement DMA46, involving:
   - construction of a new meter chamber at the SPS59 site, with 150 mm connections to the existing 150 mm Underwood reticulation and 200 mm Springwood high level trunk main on Logan Road, power and telemetry connections to the adjacent switchboard within the pump station

3. Logan City Council amend the Capital Works Program to reflect the expected cost of $148,250 to implement the DMA metering at Underwood and Kimberley Park
8. REFERENCES

Logan Water Alliance 2011, *Priority Infrastructure Plan Infrastructure Demand Model Report (Task 90-10-57-005)*

Appendix A  Desired Standards of Service
# WATER NETWORK DSS

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Water Demand</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Peaking factors</strong></td>
<td>MDMM/AD</td>
</tr>
<tr>
<td>Residential detached</td>
<td>1.4</td>
</tr>
<tr>
<td>Residential attached</td>
<td>1.3</td>
</tr>
<tr>
<td>Rural residential</td>
<td>1.4</td>
</tr>
<tr>
<td>Commercial</td>
<td>1.2</td>
</tr>
<tr>
<td>Industry</td>
<td>1.2</td>
</tr>
<tr>
<td>Parks / Open Space</td>
<td>1.2</td>
</tr>
<tr>
<td><strong>System planning</strong></td>
<td></td>
</tr>
</tbody>
</table>
| Bulk supply and reticulation | 3 days of MDMM. Reservoirs to have a net positive inflow and capable of continuous operation and not fall below the emergency level.  
3 days of MD. Reservoirs should not fall below the emergency level.  
5 days of AD. Reservoirs should fill from empty to full |
| **Minimum service pressure** | |
| Minimum operating pressure at MH | On demand areas – 22m at the property boundary based on reservoir at minimum operating level (MOL). MOL defined as 15% of storage height or top of emergency storage  
Constant flow areas – 10m at the property boundary based on reservoir at minimum operating level (MOL). MOL defined as 15% of storage height or top of emergency storage. |
| Maximum operating pressure | 80 m at the boundary based on the reservoir at TWL |
| Target pressure | 55 m at the property boundary based on the reservoir level at TWL |
| **Fire fighting** | |
| System pressure | On demand areas – 12 m minimum at property boundary  
Constant flow areas – no fire service provided |
| Fire flow | Residential – 15L/s for 2 hrs  
Commercial & Industrial – 30 L/s for 4 hrs  
Special risk / hazard to be advised by Allconnex Water |
| Background demand | 2/3 MH (as per DERM requirements) |
| Reservoir level | MOL |
| Number of fires | <5000 EP – single fire for residential or industrial / commercial  
>5000 EP – simultaneous single residential fire plus single commercial / industrial fire for sizing trunk mains |
**WATER NETWORK DSS**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Reservoir storage</strong></td>
<td></td>
</tr>
</tbody>
</table>
| Ground level storage capacity    | 3 (MD - MDMM) + (Greater of emergency storage/fire fighting storage)  
   Emergency Storage = the greater of 4 hr MDMM demand in zone or 0.5 ML whichever is greater.  
   Where Fire Fighting Reserve is:  
   > 4800EP:  
     - CF services for rural residential 72 kL (2 x 5 L/s x 2hrs);  
     - for industry, business 540 kL (i.e. 30 L/s x 4hrs + 15 L/s x 2hrs) otherwise 210 kL (2 x 15L/s x 2hrs).  
   < 4800 EP:  
     - CF services 36 kL (15L/s x 2 hrs); for business & industry 432 kL (30L/s for 4 hrs); otherwise 150kL (= 15 L/s for > 2hrs). |
| Elevated storage capacity        | 6/(MH - 1/12 MDMM) + minimum fire fighting reserve.  
   Where fire fighting reserve is:  
   > 4800EP:  
     - CF services for rural residential 72 kL (2 x 5 L/s x 2hrs);  
     - for industry, business 540 kL (i.e. 30 L/s x 4hrs + 15 L/s x 2hrs)  
     - otherwise 210 kL (2 x 15L/s x 2hrs).  
   < 4800 EP:  
     - CF services 36 kL (15L/s x 2 hrs);  
     - for business & industry 432 kL (30L/s for 4 hrs);  
     - otherwise 150kL (= 15 L/s for > 2hrs). |
| **Pumping capacity**             |          |
| Pump supplying a ground level reservoir | MDMM over 20 hr |
| Pump supplying an elevated reservoir | (6MH – operating volume) / (6 x 3600) |
| Standby pump capacity             | To match duty, except where more than one duty pump or as determined by risk assessment |
| Reticulation booster pumps/pumped system | MH + fire flow |
| **Pipeline design**              |          |
| Main capacity                     | Raw water mains & trunk feeding ground level reservoir : MDMM for a gravity supply and MDMM over 20hrs for a pumped supply  
   Trunk Mains feeding elevated reservoir: capacity of pumps |
| Mains size                        | Constant flow areas - where mains terminate in short runs such as cul de sacs minimum sizes that may be acceptable are:  
   DN 63 up to 150 m from main  
   DN 80 up to 350 m from main |
| On demand areas - minimum reticulation main 100 mm in residential areas and 150 mm in commercial and industrial areas |
| Friction default values           | Hazen Williams  
   Existing assets will use the below table to determine the C value. |
| Pipeline Type | Pipeline Age  
  (All diameters) | < 10 Years | 10 to 25 Years | > 25 Years |
| MSCL           | 150        | 140        | 130        |
| DICL           | 140        | 130        | 120        |
| DI             | 140        | 125        | 110        |
| CICL           | 140        | 130        | 120        |
| CI             | 140        | 125        | 110        |
| UPVC           | 150        | 145        | 140        |
| Asbestos Cement| 140        | 130        | 120        |
| Concrete       | 140        | 130        | 120        |
New infrastructure will use the following more conservative C values due to uncertainty in material type at the master planning stages.

**Distribution:**
- <300mm, C=110
- 300mm – 600mm, C=120
- >600mm, C=125

**Reticulation:**
- <= 150mm, C=100
- 200mm - 300mm, C=110
- >300mm, C=120

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum velocity</td>
<td>2.5 m/s</td>
</tr>
</tbody>
</table>

**Water quality**

Appendix B  Approvals Information
21 August 2012

Logan City Council
PO Box 1183
Beenleigh Qld 4207

Attention: Simon Hawkes

Dear Sir

Logan Rd West Pump Upgrade
Brisbane Beenleigh Rd (204)
Underwood

I refer to your proposal, dated 17 August 2012 (received 20 August 2012) and subsequent discussions dated [insert date] between [insert name of Applicant] and [insert name of PUP Officer] notifying The Department of Transport and Main Road’s South Coast Region (SCR) of your proposed works along Brisbane Beenleigh Rd (204) Underwood.

After reviewing your proposal and checking with the department SCR future planning of this area, the department have identified future roadwork upgrades in this area. The following issues will need to be considered in your detail design:

1. Future widening is proposed on the western side of Brisbane-Beenleigh Road (204). To avoid any future conflicts in this area, the Department preference is for Logan Water Alliance to replace/upgrade the network on the eastern side of Brisbane-Beenleigh Road.

2. It should be noted, this Department will not bear any future relocation costs for unapproved installations should they require relocation in the future at time of road works.
To assist with the final assessment and approval of your final submission you are required to provide details which address all, but not necessarily limited to Environmental, Habitat, Cultural Heritage Native Title issues, Red Fire Ants, Work Place health and Safety and comply with Department of Transport and Main Roads Doc’s PUP00W01 “Road Corridor Permit conditions” and PUP00W02 “Installation of Utility Services within the Boundaries of state-controlled roads”, Appendix B - Details of typical trench under Existing Roads.

Note:
This notice has been assessed on 21 August 2012 against our current concept plans, but is not to be considered as an approval in principle, as these plans may change pending the date of your final submission to the department’s for approval. For all further communication with the department you must provide the DTMR ref # 500/0024-60675 (2012.03460) to assist with your inquiry.

As of 01 February 2011, when traffic control is required on State-controlled roads, ‘only traffic management companies registered with DTMR will be permitted to work on State-controlled roads’. From this date, registration will be mandatory for all traffic companies working on state controlled roads.


If you wish to discuss this matter further or obtain a copy of Department of Transport and Main Roads Doc’s PUP00W01 "Road Corridor Permit conditions“ and PUP00W02 “Installation of Utility Services within the Boundaries of state-controlled roads“, Appendix B - Details of typical trench under Existing Roads, please contact Senior Public Utilities Coordinator on (07) 5596 9500.

Yours sincerely

[Signature]

for Paul Noonan

Regional Director (South Coast)
Jeremy Thomas

Hi Alex,

The Department has no objection to your updated proposal. When your detailed design is finalised could you please send to pdo.regions.goldcoast@tmr.qld.gov.au for final approval, referencing CM5091

Kind regards,

Corridor Management Team | South Coast Region / Gold Coast Office
Program Delivery & Operations | Department of Transport and Main Roads

Hi Angela,

RE: DTMR ref # CM5091(500/00224)

In response to your ‘no objection’ notice email below, the Logan Water Alliance has amended our design to ensure our proposed flow meter chamber is contained within the existing pump station compound on Lot 2 RP910633, and outside the TMR preferred exclusion zone. However, we will still need to construct a 150mm connection pipe to the existing mains on the edge of Logan Road to ensure the operability of the new flow meter. When the proposed road widening works in the area are undertaken, it is assumed that these mains in the exclusion zone would eventually be decommissioned and new mains would be installed closer to the PS site. Please refer to the attached Drawing 90-12-14-S-DWG-Cl-2000.

Based on this information and the attached drawing, the Logan Water Alliance hereby requests ‘Approval in Principle’ from TMR for these works. If a meeting is required, we would be more than happy to arrange.

Please let me know if additional information is required.

Kind Regards
Sent: Thursday, 26 September 2013 2:26 PM
To: Alex Moro
Subject: Department of Transport and Main Roads approval for Logan Water alliance Project #150mm water connection- DTMR Ref CM5091 - (500/00224)

Attached is the letter of no objection and associated documents and forms.

You can obtain access to South Coast Regions Traffic Permit application and indemnity forms and "Guide to managing traffic disruption in the South Coast Region" by clicking the following link.


WARNING: This email (including any attachments) may contain legally privileged, confidential or private information and may be protected by copyright. You may only use it if you are the person(s) it was intended to be sent to and if you use it in an authorised way. No one is allowed to use, review, alter, transmit, disclose, distribute, print or copy this email without appropriate authority.

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It is your responsibility to ensure that this email does not contain and is not affected by computer viruses, defects or interference by third parties or replication problems (including incompatibility with your computer system).

Opinions contained in this email do not necessarily reflect the opinions of the Department of Transport and Main Roads, or endorsed organisations utilising the same infrastructure.

*******************************************************************************
DISCLAIMER:-

While all reasonable care has been taken in producing this information, Council does not warrant the accuracy, completeness or currency of this information and accepts no responsibility for, or in connection with, any loss or damage suffered as a result of any inaccuracies, errors or omissions or your reliance on this information.

Planning and Development information can be confirmed by obtaining a Flood Search from Council.

The flooding and inundation area maps provided were determined using the information available to Council at the date of issue. The flooding and inundation area maps have been developed to provide the public with information on flooding in Logan and show areas where flooding may occur. The flooding and inundation area maps are a reference guide only and do not indicate whether a property has or has not been affected by floods. Council may have since revised flood data in areas where more detailed information has become available.

Produced by Logan City Council.

Base material reproduced with the permission of Director-General, Department of Natural Resources and Mines, 2013. GPO Box 2454, Brisbane, Queensland 4001, Australia. © The State Of Queensland (Department of Natural Resources and Mines) 2013.

Map Projection: Universal Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia 1994
Grid: Map Grid of Australia, Zone 56

Date of issue: 30 March 2013

1:20,000 at A3
CURRENT TITLE SEARCH
DEPT OF NATURAL RESOURCES AND MINES, QUEENSLAND

Request No: 16639653
Search Date: 26/07/2013 11:33

Previous Title: 15069168

REGISTERED OWNER

Dealing No: 714871475  07/01/2013

LOGAN CITY COUNCIL

ESTATE AND LAND

Estate in Fee Simple

LOT 2           REGISTERED PLAN 910633
County of STANLEY            Parish of YEERONGPILLY
Local Government: LOGAN

EASEMENTS, ENCUMBRANCES AND INTERESTS

1. Rights and interests reserved to the Crown by
   Deed of Grant No. 10124128 (POR 157)

ADMINISTRATIVE ADVICES - NIL
UNREGISTERED DEALINGS - NIL

CERTIFICATE OF TITLE ISSUED - No

** End of Current Title Search **

COPYRIGHT THE STATE OF QUEENSLAND (DEPT OF NATURAL RESOURCES AND MINES) [2013]
Requested By: D APPLICATIONS CITEC CONFIRM
Search Receipt

Date/Time (AEST) 26−Jul−2013 11:33:20 AM
Account 2007−0558
User Name
Your Reference 2114461A 90−12−14
CONFIRM Reference 67314741
Transaction QLD Land Title Search
Value $19.14
GST $1.91
Price $21.05
Appendix C  Dial before You Dig Information
The following is a response to your Dial Before You Dig enquiry

Assets Affected: Nextgen Assets

Sequence No: 30767980
Location: 3025 Logan Rd Underwood, QLD 4119
Commencement Date: 26/09/2013 12:00:00 AM

IMPORTANT:

- Please read and understand all the information and disclaimers provided below
- Sketches and Plans provided by Nextgen Networks are circuit diagrams only and indicate the presence of telecommunications plant in the general vicinity of the geographical area shown; exact ground cover and alignments cannot be given with any certainty and cover may alter over time. Telecommunications plant seldom follow straight lines and careful on site investigation is essential to uncover and reveal its exact position
- The accuracy and/or completeness of the information in the plans can not be guaranteed often due to changes in the surrounding land subsequent to Nextgen's deployment and, accordingly the plans are intended to be indicative only

"DUTY OF CARE"
When working in the vicinity of telecommunications plant you have a legal "Duty of Care" that must be observed. The following points must be considered:

1. It is the responsibility of the owner and any consultant engaged by the owner, including an architect, consulting engineer, developer, and head contractor to design for minimal impact and protection of Nextgen Networks plant. Nextgen Networks will provide free plans and sketches showing the presence of its network to assist at this design stage.
2. It is the owner's (or constructor's) responsibility to:
   a) Request plans of Nextgen Networks plant for a particular location at a reasonable time before construction begins
   b) Visually locate Nextgen Networks plant by vacuum excavation (pot-holing) where construction activities may damage or interfere with Nextgen Networks plant (see "Essential Precautions and Approach Distances" section for more information)
   c) Contact Nextgen Networks Network (see below for details) if Nextgen Networks plant is wholly or partly located near planned construction activities

DAMAGE
ANY DAMAGE TO Nextgen Networks NETWORK MUST BE REPORTED TO 1800 032 532 IMMEDIATELY

- The owner is responsible for all plant damage when works commence prior to obtaining Nextgen Networks plans, or failure to follow agreed instructions
- Nextgen Networks reserves all rights to recover compensation for lose or damage to its cable network or other property including consequential losses
CONCERNING NEXTGEN NETWORK PLANS

• Phone 1100. Dial Before You Dig for free plans of Nextgen Networks plant locations. Please give at least 2 business days notice
• Nextgen Networks plans and information provided are valid for 50 days from the date of issue
• Nextgen Networks retains copyright in all plans and details provided in conjunction with your request. These plans and or details should be disposed of by shredding or any other secure disposal method after use
• Nextgen Networks plans or other details are provided for the use of the applicant, its servants, or agents, and shall not be used for any unauthorised purpose
• Please contact the Network Help Desk (see below for details) immediately should you locate Nextgen Networks assets not indicated on these plans
• Nextgen Networks, its servants or agents shall not be liable for any loss or damage caused or occasioned by the use of plans and or details so supplied to the applicant, its servants and agents, and the applicant agrees to indemnify Nextgen Networks against any claim or demand for any such loss or damage
• Please ensure Nextgen Networks plans and information provided remains on-site at all times throughout your construction phase

ESSENTIAL PRECAUTION AND APPROACH DISTANCE
NOTE: If the following clearances cannot be maintained, please contact the Nextgen Network Help Desk (see below for details) for advice on how best to resolve this situation

1. On receipt of plans and sketches and before commencing excavation work or similar activities near Nextgen Networks plant, carefully locate this plant first to avoid damage. Undertake prior exposure (vacuum excavation) such as potholing when intending to excavate or work closer to Nextgen Networks plant than the following approach distances:

   • Where Nextgen Networks plant is in an area where load and footpaths are well defined by kerbs or other features a minimum clear distance of 600mm must be maintained from where it could be reasonably presumed that plant would reside
   • In non established or unformed reserves and terrain, this approach distance must be at least 1.5 metres
   • In country/rural areas which may have wider variations in reasonably presumed plant presence, the following minimum approach distances apply:
     a) Parallel to major plant: 10 metres (for optic fibre cable)
     b) Parallel to other plant: 5 metres

   Note: Even pot-holing needs to be undertaken with extreme care, common sense and employing techniques least likely to damage cables. For example - vacuum excavation.

   • If construction work is parallel to Nextgen Networks plant, then careful pot-holing at least ever 5m is required to establish the location of all plant, hence continuing nominal locations before work can commence

2. Maintain the following minimum clearance between construction activity and actual location of Nextgen Networks Plant.
Jackhammers/Pneumatic Breakers | Not within 1.0m of actual locations
--- | ---
Vibrating Plate or Wackers Packer Compactors | Not within 0.5m of Nextgen Networks ducts
300mm compact clearance cover before compactor can be used across Nextgen Networks ducts, and
600mm clearance across Nextgen Networks cables in the solid
--- | ---
Boring Equipment (in-line, horizontal and vertical) | Not within 2.0m of actual location
Constructor to check depth via vacuum excavation (pot-hole)
--- | ---
Heavy Vehicle Traffic (over 3 tonnes) | Not to be driven across Nextgen Networks ducts with less than 600mm cover. Not to be driven across Nextgen Networks fibre with less than 1.2m cover
Constructor to vacuum excavate (pot-hole) and expose plant
--- | ---
Mechanical Excavators, Boring and Tree Removal | Not within 1.0m of actual location
Constructor to vacuum excavate (pot-hole) and expose plant

- All Nextgen Networks pits and manholes should be a minimum of 1.2m in from the back of kerb after the completion of your work
- All Nextgen Networks conduit should have the following minimum depth of cover after the completion of your work:

  Footway 450mm
  Roadway 450mm at drain invert and 600mm below the pavement subgrade level invert

- All Nextgen Networks fibre in the solid should have the following minimum depth of cover after the completion of your work:

  Footway 600mm
  Roadway 1200mm at drain invert and 1200mm below the pavement subgrade level invert

- For clearance distances relating to Nextgen Networks above ground infrastructure please contact the Network Help Desk (see below for details)

**FURTHER ASSISTANCE**

Over-the-phone assistance can be obtained by calling the Network Help Desk below.

**Nextgen require 5 clear business days notice to conduct an on-site location.** The initial on site location visit will not normally incur a charge, but at the discretion of Nextgen subsequent site visits may incur a charge to be applied at an hourly rate. Where an on-site location is provided, the owner is responsible for all vacuum excavation work (pot-holing) to visually locate and expose Nextgen Networks plant. If plant location plans or visual location of Nextgen Networks plant by vacuum excavation reveals that the location of Nextgen Networks plan is situated wholly or partly where the owner plans to work, then Nextgen Networks must be contacted through the Network Help Desk to discuss possible engineering solutions. The contact number for the Network Help Desk is 1800 032 532.

**NOTE:**

If Nextgen Networks relocation or protection works are part of the agreed solution, then payment to Nextgen Networks for the cost of this work shall be the responsibility of the principal developer. The principal developer will be required to provide Nextgen Networks with the details of their proposed work showing how Nextgen Networks plant is to be accommodated and these details must be approved by the Nextgen National Operations Manager prior to the commencement of site works.

**RURAL LANDOWNER - IMPORTANT INFORMATION**
Where Nextgen Networks owned cable crosses agricultural land Nextgen Networks will provide a one off free-on-site electronic cable location. Please note that the exact location of cables can only be verified by visual proving by pot holing, which is not covered by this service. The Network Integrity HelpDesk Officer will provide assistance in determining whether a free-on-site location is required. Please ring the Nextgen Network Help Desk as listed above.

**PRIVACY NOTE**

Your information has been provided to Nextgen Networks by DBYD to enable Nextgen Networks to respond to your DBYD request. Nextgen Networks keeps your information in accordance with its privacy statement entitled ‘Protecting Your Privacy’ which can be obtained from Nextgen Networks either by calling 1800 032 532 or visiting our website [www.nextgennetworks.com.au](http://www.nextgennetworks.com.au).

**Warning:** Nextgen Networks plans show only the presence of cables and plant. They only show their position relative to road boundaries, property fences etc, at the time of installation and Nextgen Networks does not warrant or hold out that such plans are accurate thereafter due to changes that may occur over time. DO NOT ASSUME DEPTH OR ALIGNMENT of cables or plant as these vary significantly. The customer has A DUTY OF CARE when excavating near Nextgen Networks cables and plant. Before using machine excavators NEXTGEN PLANT MUST FIRST BE PHYSICALLY EXPOSED BY VACUUM EXCAVATION (potholing) to identify its location. Nextgen Networks will seek compensation for damages caused to its property and losses caused to Nextgen Networks and its customers.

**EXPERIENCED PLANT LOCATORS (for your area)**

On-site assistance should be sought from an Experienced Plant Locater if the telecommunications plant cannot be located within 2.5 metres of the locations indicated on the drawings provided. On-site advice should be obtained from a suitably qualified contractor highly skilled in locating Nextgen Networks plant. If there is any doubt whatsoever about the actual location of the telecommunications plant, the best method for locating the telecommunications plant or the correct interpretation of the drawings provided. In the case where Nextgen Networks plant is outside a recognised road reserve Nextgen Networks recommends that the [Network Help Desk](http://www.nextgennetworks.com.au) is contacted for assistance prior to engaging an Experienced Plant Locater.

For the assistance of customers Nextgen Networks has established strict criteria to assess the skill of contractors that may be engaged by owners requiring Nextgen Networks plant locating services to perform any of the following activities if requested to do so by the owner:

- Review Nextgen Networks plans to assess the approximate location of Nextgen Networks plant
- Advise owners of the approximate location of Nextgen Networks plant according to the plans
- Advise the owners of the best method for locating Nextgen Networks plant
- Advise owners of the hazard of unqualified persons attempting to find the exact location of Nextgen Networks plant and working in the vicinity of Nextgen Networks plant without first locating its exact position
- Perform trial hole explorations by vacuum excavation (potholing) to expose Nextgen Networks plant with a high degree of skill, competence and efficiency and utilising all necessary safety equipment

Nextgen Networks does not accept any liability or responsibility for the performance of or advice given by any Plant Locater engaged by you but we will, if requested, recommend suitably qualified plant locators that Telstra has accredited.
Sequence Number: 30767980
Date: 24/09/2013

DISCLAIMER: THIS DRAWING SHOULD NOT BE SCALED TO LOCATE CABLES. NO WARRANTY IS GIVEN THAT THE INFORMATION IS ACCURATE OR COMPLETE. IF YOU REQUIRE INFORMATION REGARDING LOCATING THE CABLE PLEASE CALL VISIONSTREAM. THIS DOCUMENT HAS BEEN PREPARED SOLELY FOR DIAL BEFORE YOU DIG USE. THIS PLAN CONTAINS COMMERCIALLY SENSITIVE INFORMATION AND IS TO BE TREATED ACCORDINGLY. NO SUCH INFORMATION IS TO BE PASSED ONTO OTHER PARTIES WITHOUT WRITTEN CONSENT FROM VISIONSTREAM PTY LTD.

nextgen group
While all reasonable care has been taken in producing this information, the Council does not warrant the accuracy, completeness or currency of this information and accepts no responsibility for, or in connection with, any loss or damage suffered as a result of any inaccuracies, errors or omissions or your reliance on this information. Planning and development information can be confirmed by obtaining a Planning and Development Certificate from the Council.
Logan City Council Water OVERVIEW MAP

Sequence No: 30767981
Dig Location: 3025 Logan Rd Underwood, QLD 4119
Date: 24/09/2013

Legend:
- Hydrant
- Valve
- Water Supply Line

Scale: 1 : 2490

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Base material reproduced with permission of the Director-General, Department of Natural Resources and Mines.
The State of Queensland (Department of Natural Resources and Mines) [2006].

Produced by Logan City Council.
In relation to your enquiry of the above address, Optus advises as follows:

The records of Optus disclose that there ARE NO underground Optus FIBRE OPTIC TELECOMMUNICATIONS cables in the vicinity of the above enquiry as per the attached plan(s). This reply is valid for a period of 30 days from the date above.

IMPORTANT INFORMATION

Drawings and Plans provided by Optus are reference diagrams which were correct at the time the asset was built. Exact ground cover and alignments cannot be provided with any certainty as these may alter over time. Depths of Telecommunications plant vary considerably as do alignments. It is essential to uncover the asset and positively identify the assets exact location.

Optus plans are provided as a guide only and the completeness of the information cannot be guaranteed.

“DUTY OF CARE”

When working in the vicinity of Telecommunications plant you have a legal “Duty of Care” that must be observed.

It is the responsibility of the owner and any consultant engaged by the owner, including an architect, consulting engineer, developer and head contractor to design for minimal impact to Optus plant. Optus will provide assistance at this design stage through the provision of plans and sketches or consultation.

It is the owner's (or constructor's) responsibility to:-

a) Request plans of Optus plant for a particular location at a reasonable time before construction begins. If you have doubts about the presence of Optus assets we strongly recommend that you engage an Optus Accredited plant locator.

b) Visually locate Optus plant by hand digging or using non-destructive water jet method where construction activities may damage or interfere with Optus plant.

c) Contact Optus Network Operations – Asset Analyst (details below) if Optus plant is wholly or partly located near construction activities.
CRIMINAL CODE ACT 1995

The following is an extract from the Criminal Code Act 1995 and is applicable to Optus plant

Chapter 10 National infrastructure
Part 10.6 Telecommunications Services
Division 474 Telecommunications offences
Sect 474.6 Interference with facilities

1) A person is guilty of an offence if the person tampers with, or interferes with, a facility owned or operated by:
   (a) a carrier; or
   (b) a carriage service provider; or
   (c) a nominated carrier.
Penalty: Imprisonment for 1 year.

2) For the purposes of an offence against subsection (1), absolute liability applies to the physical element of circumstance of the offence, that the facility is owned or operated by a carrier, a carriage service provider or a nominated carrier.

3) A person is guilty of an offence if:
   (a) the person tampers with, or interferes with, a facility owned or operated by:
      i. a carrier; or
      ii. a carriage service provider; or
      iii. a nominated carrier; and
   (b) this conduct results in hindering the normal operation of a carriage service supplied by a carriage service provider.
Penalty: Imprisonment for 2 years.

4) For the purposes of an offence against subsection (3), absolute liability applies to the following physical elements of circumstance of the offence:
   (a) that the facility is owned or operated by a carrier, a carriage service provider or a nominated carrier;
   (b) that the carriage service is supplied by a carriage service provider.

5) A person is guilty of an offence if:
   (a) the person uses or operates any apparatus or device (whether or not it is comprised in, connected to or used in connection with a telecommunications network); and
   (b) this conduct results in hindering the normal operation of a carriage service supplied by a carriage service provider.
Penalty: Imprisonment for 2 years.

DAMAGE
ANY DAMAGE TO OPTUS NETWORK MUST BE REPORTED TO 1800 500 253 IMMEDIATELY
The owner is responsible for all plant damage when works commence prior to obtaining Optus Drawings, or failure to follow instructions.

Optus reserves the right to recover compensation for loss or damage to its cable network and other property including consequential loss

ASSET RELOCATIONS

You are not permitted to relocate or alter any Optus assets or network under any circumstance.

For all enquiries relating to the relocation of Optus assets please email Fibre.Locations@optus.net.au
ESSENTIAL PRECAUTIONS AND APPROACH DISTANCES

Note: If the following clearances cannot be maintained, please contact Optus Network Operations Asset Analysis Team for advice on how to resolve the situation.

1. On receipt of plans and before commencing excavation work or similar activities near Optus plant, carefully locate the plant first to avoid damage. Engage an Optus accredited locator to undertake exposure of the Optus plant when working within the following approach distances.

Where Optus plant is in an area where road and footpaths are well defined by kerbs or other features a minimum clear distance of 1.0m must be maintained from where it could be reasonably presumed that plant would reside.

In non established or unformed reserves this distance must be at least 3 metres.

In country or rural areas which may have wider variations in reasonably presumed plant presence, the following minimum approach distance applies:

a) Parallel to plant: 5 metres

Note: Indicated depths may vary significantly and pot-holing needs to be undertaken within extreme care, commonsense and using techniques least likely to damage cables. Potholing is only to be undertaken by an Optus accredited plant location contractor.

If construction work is parallel to Optus plant, then careful hand digging or using non destructive water jet method (pot holing) at least every 5m is required to establish the location of the plant, confirming the location of the plant prior to work commencing.

Under no circumstances is crossing of Optus plant to be performed without first exposing the Optus plant and having an Optus representative present onsite.

2. Maintain the following minimum clearance between construction activity and the actual location of Optus plant.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Clearance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jackhammers / Pneumatic Breakers</td>
<td>Not within 1.0m of actual location</td>
</tr>
<tr>
<td>Vibrating Plate or Wacker Packer Compactor</td>
<td>Not within 0.5m of actual location</td>
</tr>
<tr>
<td></td>
<td>300mm compact clearance before compactor can be used across Optus ducts</td>
</tr>
<tr>
<td></td>
<td>750mm compact clearance cover before compactor can be used across Optus Direct Buried cable</td>
</tr>
<tr>
<td>Boring Equipment</td>
<td>Not within 5.0m of actual location without Optus representative onsite</td>
</tr>
<tr>
<td>(in-line, horizontal and vertical)</td>
<td>Constructor to hand dig or non-destructive water jet method (pot holing) and expose the Optus plant</td>
</tr>
<tr>
<td></td>
<td>Not to cross the Optus plant without first exposing the plant at the crossing point and without Optus representative onsite</td>
</tr>
<tr>
<td>Heavy vehicle Traffic (over 3 tonnes)</td>
<td>Not to be driven across Optus ducts or plant with less than 600mm of cover</td>
</tr>
<tr>
<td></td>
<td>Depth to be verified via hand digging</td>
</tr>
<tr>
<td>Mechanical Excavators, Farm ploughing, Boring, Tree removal, fencing</td>
<td>Not within 1.0m of actual location</td>
</tr>
<tr>
<td></td>
<td>Constructor to hand dig or use non-destructive water jet method (pot holing) and expose plant</td>
</tr>
</tbody>
</table>
All Optus pits and manholes should be a minimum of 1.0m in from the back of kerb or within 15m of street intersection after the completion of your work.

All Optus conduit should have the following minimum depth of cover **after the completion of your work**:

- **Footway** 600mm
- **Roadway** 1000mm at drain invert and at road centre crown

In cases where it is considered that these clearances cannot be maintained at the completion of works advice is to be sought from the Optus Damages and Relocations Team

**FURTHER ASSISTANCE**

Assistance can be obtained by contacting Optus Network Operations Asset Analysis on **1800 505 777**

Where an on-site location is provided, the owner is responsible for all costs associated with hand digging or use of non-destructive water jet method (pot holing) to visually locate and expose Optus plant.

If plant location drawings or visual location of Optus plant by digging reveals that the location of Optus plant is situated wholly or partly where the owner plans to work, then Optus Damages and Relocates Team must be contacted through Optus Network Operations Asset Locations to discuss possible engineering solutions.

**PRIVATE RESIDENTIAL LANDOWNERS and RURAL LANDOWNERS**

Where Optus owned cable crosses private residential property or agricultural land, Optus may provide a once off free onsite electronic cable location. Optus Network Operations Asset Analyst will provide assistance in determining whether a free on-site location is required.

Please note:

- The exact location, including depth of cables can only be verified by pot holing which is not covered under this service
- This service is only available to assist private residential land owners and rural land owners
- The service covers one hour onsite only. Additional time will be charged at the current nominal rate.

**OPTUS ENGINEERING DRAWING SYMBOLS**
**ENERGEX DBYD RESPONSE**

**“ASSETS FOUND - EXISTING”**

Our search has revealed there are existing ENERGEX Underground Assets within the nominated search area. They are shown on the attached plan(s).

<table>
<thead>
<tr>
<th><strong>To:</strong></th>
<th>Mr Denver Pollock</th>
<th><strong>DBYD Sequence No:</strong></th>
<th>30767982</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Company:</strong></td>
<td>Logan Water</td>
<td><strong>Date of Response:</strong></td>
<td>24-Sep-2013</td>
</tr>
<tr>
<td><strong>Address:</strong></td>
<td>58-60 Manila St Beenleigh Qld 4207</td>
<td><strong>Period of Plan Validity:</strong></td>
<td>28 Days</td>
</tr>
<tr>
<td><strong>Email Address:</strong></td>
<td><a href="mailto:denver.pollock@lwalliance.com.au">denver.pollock@lwalliance.com.au</a></td>
<td><strong>Phone:</strong></td>
<td>0734124875</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Mobile:</strong></td>
<td>Not Supplied</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Fax:</strong></td>
<td>Not Supplied</td>
</tr>
<tr>
<td><strong>Location of Search:</strong></td>
<td>3025 Logan Rd Underwood QLD 4119</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>UBD Map Ref:</strong></td>
<td>221P6, 221Q6</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**External Comments (if any):**

**It is Important that you note:**

1. Please read and understand all the information and disclaimers provided – including the Terms and Conditions on the following pages.
2. We have only searched that area which has been nominated. If this nominated area is not what you require, please resubmit another enquiry with DBYD.
3. Plans provided by ENERGEX are only an indication of the presence of Underground assets within the nominated locations provided are approximate and the plans are not suitable for scaling purposes as exact ground cover and alignments cannot be provided.
4. Plans provided by ENERGEX do not show the presence of any Overhead Network.
5. That in addition to underground cables marked on attached plan there maybe underground Earth Conductors or Consumers Mains in the vicinity of the nominated work area(s) that are not marked on the plans.
6. This advice does not identify the presence of private underground cables (inc. consumers’ mains) that may run from ENERGEX mains onto private property. Assets located on private property are the responsibility of the owner for identification and location.
7. Underground Cable Locators can be found in the Yellow Pages under Electronic Detectors, or Underground Service Locators on an Internet search.
8. The ENERGEX Dial Before You Dig information provides the vicinity of underground cable and will not be adequate for conveyancing purposes. A Solicitor’s Search can be arranged through ENERGEX.
9. In the event that excavation does not commence within 28 days of receipt of a plan, a new plan should be obtained.
10. For Cable Support advice around the 33Kv and 110Kv Underground Networks please note that you should allow for a minimum of twenty (20) working days advance notice in your construction program to permit ENERGEX time to allocate the necessary resources to carry out the investigations. Please contact the ENERGEX DBYD team on the details listed below.
Dial Before You Dig Terms and Conditions

“Duty of Care” for Everyone

Responsibilities When Working in the Vicinity of ENERGEX Plant

Everyone has a legal “Duty of Care” that must be observed, particularly when working in the vicinity of electrical plant. Electrical plant includes underground cables, conduits and other associated underground equipment. When discharging this “Duty of Care” in relation to ENERGEX plant, the following points must be considered:

1. It is the responsibility of the architect, consulting engineer, developer, and head contractor in the project planning stages to design for minimal impact and protection of ENERGEX plant. ENERGEX will provide free plans showing the presence of its underground plant to assist at this design stage.

2. It is the constructor’s responsibility to:
   a) Anticipate and request plans of ENERGEX plant for a particular location at a reasonable time before construction begins.
   b) Visually locate ENERGEX plant by hand digging where construction activities may damage or interfere with ENERGEX plant.
   c) Contact ENERGEX’s Network Customer Services (see above for details) if ENERGEX plant is wholly or partly affected by planned construction activities.

3. As the alignment and boundaries of road ways with other properties (and roads within road ways) frequently change, the alignments and boundaries contained within ENERGEX plans and maps will frequently differ from present alignments and boundaries “on the ground”. Accordingly, in every case where it appears that alignments and boundaries have shifted, or new road ways have been added, the constructor should obtain confirmation of the actual position of ENERGEX cables and pipelines under the road ways. In no case should the constructor rely on statements of third parties in relation to the position of ENERGEX cables and pipelines.

Important Points To Note – Please Read

• Plans and or details provided by ENERGEX are current for one month from the date of dispatch and should be disposed of by shredding or any other secure disposal method after use.

• ENERGEX will provide free plans if an ENERGEX plant location request is made to Freecall “1100” (Dial Before You Dig – DBYD) and at least 2 business days notice is given. ENERGEX does not provide information on private underground installations.

• ENERGEX retains copyright in all plans and details provided in connection with your request.

• ENERGEX plans or other details are provided for the use of the applicant, its servants, or agents, and shall not be used for any unauthorised purpose.

• ENERGEX plans are circuit diagrams or pipe indication diagrams only and indicate the presence of plant in the general vicinity of the geographical area shown. Exact ground cover and alignments cannot be given with any certainty, as such levels can change over time.

• On receipt of plans and before commencing excavation work or similar activities near ENERGEX’s plant, carefully locate this plant first to avoid damage.

• ENERGEX, its servants or agents shall not be liable for any loss or damage caused or occasioned by the use of plans and or details so supplied to the applicant, its servants and agents, and the applicant agrees to indemnify ENERGEX against any claim or demand for any such loss or damage.

• The constructor is responsible for all plant damages when works commence prior to obtaining ENERGEX plans, or failure to follow agreed instructions.

• ENERGEX reserves all rights to recover compensation for loss or damage caused by interference or damage, including consequential loss and damages to its cable network, or other property.

• All underground conduits are presumed to contain asbestos. Refer to “Code of Practice for the Management and Control of Asbestos in Workplaces [NOHSC: 2018 (2005)]”
Remote Or On-Site Location Advice
This service shall be provided at ENERGEX’s discretion:

• In response to your request, ENERGEX provides this site visit when 33kV or above cables are present only, however any markings or pegs placed on the site will be indications of approximate equipment locations only. All markings must be confirmed by careful hand excavation.

• ENERGEX may provide either remote over the phone or on-site location advice to assist in the location of ENERGEX plant, including how to visually locate and protect the plant when excavating.

• If the constructor is unable to locate ENERGEX plant within 2.5 m of nominal plan locations, they should contact Network Customer Services for further advice.

• Where on-site location advice is provided, the constructor is responsible for all hand digging (potholing) to visually locate and expose ENERGEX plant.

When Working in the Vicinity of ENERGEX Plant, Please Observe the Following Conditions - Records
The first step before any excavation commences is to obtain records of ENERGEX plant in the vicinity of the work. For new work, records should be obtained during the planning and design stage. The records provided by ENERGEX must be made available to all construction groups on site. Where plant information is transferred to plans for the proposed work, care must be exercised to ensure that important detail is not lost in the process.

Location of Cables
Examining the records is not sufficient, as reference points may change from the time of installation. Records must also be physically proven when working in close proximity to them. The exact location of plant likely to be affected shall be confirmed by use of an electronic cable and pipe locator followed by careful hand excavation to the level of cover slabs or conduits. Hand excavation must be used in advance of excavators. In any case, where any doubt exists with respect to interpretation of cable records, ENERGEX Network Customer Services shall be contacted. For after hour’s enquiries, ENERGEX should be contacted on Ph 13 62 62.

Electrical Cable Covers
ENERGEX cables have warning covers of either:

1. Clay paving bricks or tiles marked “Electricity” or similar (also unmarked)
2. Concrete or PVC cover slabs
3. PVC, A/C or fibro conduit, fibre reinforced concrete, iron or steel pipe
4. Concrete encased PVC or steel pipe
5. Thin plastic marker tape
6. Large pipes housing multiple ducts
7. Multiple duct systems, including earthenware or concrete 2-, 4-, and 6-way ducts and shamrocks

Note: Some cables are known to be buried without covers.

Excavating Near Cables
For all work within 2.5 m of nominal location, the constructor is required to hand dig (pothole) and expose the plant, hence proving its exact location before work can commence.

Excavating Parallel to Cables
If construction work is parallel to ENERGEX cables, then hand digging (potholing) at least every 4 m is required to establish the location of all cables, hence confirming nominal locations before work can commence. Generally, there is no restriction to excavations parallel to ENERGEX cables to a depth not exceeding that of the cable. If an excavation exceeds the depth of the cables it is likely that the covers or bedding material around the cables/pipes will move, ENERGEX shall be contacted.

Note: Cable depths may change suddenly.

Excavating Across Cables
A minimum clearance of 150 mm above and below cables shall be maintained. A standard clearance between services shall be maintained as set down by the individual authorities. If the width or depth of the excavation is such that the cables will be exposed or unsupported, then ENERGEX shall be contacted to determine whether the cables should be taken out of service, or whether they need to be protected or supported. In no case shall a cable cover be removed without approval. A cable cover may only be replaced under the supervision of an ENERGEX officer. Protective cover strips when removed must be replaced under ENERGEX supervision. Under no circumstances shall they be omitted to allow separation between ENERGEX cables and other services.

Heavy Machinery Operation Over Cables
Where heavy “Crawler” or “Vibration” type machinery is operated over the top of cables, a minimum cover of 450 mm to the cable protective cover mains must be maintained using load bearing protection whilst the machinery is in operation.

Directional Boring Near Cables
When boring or cutting parallel to cables, it is essential that trial holes are carefully hand dug at regular intervals to prove the actual location of the conduits/cables before using boring machinery. Where it is required to bore across the line of cables, the actual location of the cables shall first be proven by hand digging. A trench shall be excavated one metre from the side of the cables where the auger will approach to ensure a minimum clearance of 150 mm for cables can be maintained.

Explosives
Explosives must not be used within 5 metres of cables, unless an engineering report is provided indicating that no damage will be sustained. Clearances should be obtained from ENERGEX’s Planning Engineer for use of explosives in the vicinity of ENERGEX cables.

Damage Reporting
ENERGEX Limited - ABN 40 078 849 055
26 Reddacliff Street Newstead QLD 4006
GPO Box 1461 Brisbane Queensland 4001
24 Hour Loss of Supply 13 62 62
24 Hour Emergencies 13 19 62
General Enquiries 13 12 53
www.energex.com.au

Contact ENERGEX DBYD Monday to Friday from 7 am to 4 pm on (07) 3664 5400 or dbyd@energex.com.au
www.1100.com.au

To resubmit or change the nominated search area contact DBYD via Phone 1100 or www.1100.com.au
All damage to cables, conduits and pipes must be reported no matter how insignificant the damage appears to be. Even very minor damage to cable protective coverings can lead to eventual failure of cables through corrosion of metal sheaths and moisture ingress. All work in the vicinity of damaged plant should cease and the area should be vacated until a clearance to continue work has been obtained from an ENERGEX officer.
Working near power cables

Working in close proximity to overhead powerlines or underground power cables has its hazards. Every year workers die or suffer serious injuries as a result of unsafe work practices. Contact with underground power cables can not only result in injury or death, but costs to repair the damage can be expensive.

This brochure is designed to inform you about safe work practices for working around underground power cables. All machinery operators and other workers conducting work near underground power cables should also be aware of their safety obligations under the Electrical Safety Act 2002 and adopt safe work practices in accordance with the Code of Practice “Working Near Exposed Live Parts”. Copies of these publications can be obtained from the Queensland Government’s Electrical Safety Office at www.deir.qld.gov.au/electrical-safety.

Practice safe work habits

- Identify all electrical hazards, assess the risks, establish control measures and review these periodically. Control measures may include, but may not be restricted to:
  - applying appropriate signage at least 8 to 10 metres either side of powerlines and using visual indicators such as tiger tails fitted to the powerlines
  - using ground barriers, where appropriate
  - informing workers of required work practices.
- Ensure operators are aware of the height of their machinery in both stowed and working positions.
- Lower all machinery to the transport position when relocating.
- Work away from powerlines, not towards them.
- Contact us about placing identifiers on powerlines and power poles at your worksite and any further control measures.

Disclaimer

This brochure is not an exhaustive list of all safety matters that need to be considered. Whilst care is taken in the preparation of this material, ENERGEX does not guarantee the accuracy and completeness of the information.

ENERGEX will not be responsible for any loss, damage or costs incurred as a result of any errors or omissions in relation to the material in this document or for any possible actions ensuing from information contained in the document.

ENERGEX Limited
GPO Box 1461, Brisbane QLD 4001
Telephone 13 12 53
Facsimile (07) 3407 4609
energex.com.au
ABN 40 078 849 055
Electricity cables can be located underground as well as overhead. In the planning stages prior to performing any earthmoving or excavation, confirm if the work you are conducting may present a risk by coming into contact with underground power cables.

When using excavators and other machinery, also ensure you are aware of the location of overhead powerlines. Workers and equipment must maintain safety exclusion zones around overhead powerlines.

For safety advice and more information contact ENERGEX on 13 12 53 or visit energex.com.au.

### Dial Before You Dig

Contact the Dial Before You Dig service on 1100 for free and easy access to the records of a large number of organisations including telecommunications, water, electricity and gas underground services.

Plans and maps may help identify underground power cables, however, the depth of underground cables can vary from site to site, even on the same property.

Dial Before You Dig is an Australia-wide telephone service advising the location of numerous underground services of all types in many locations.

The Dial Before You Dig service is also designed to protect Australia’s excavators. Whether you are a back yard renovator, an individual tradesman or a professional excavator, the potential for injury, personal liability and even death exists every day. Obtaining accurate information about your work site significantly minimises these risks.

If you’re unsure, always seek safety advice from ENERGEX.

### Underground Services

<table>
<thead>
<tr>
<th>Colour</th>
<th>Underground Services</th>
</tr>
</thead>
<tbody>
<tr>
<td>Orange</td>
<td>Electricity</td>
</tr>
<tr>
<td>Yellow</td>
<td>Gas</td>
</tr>
<tr>
<td>Green</td>
<td>Water</td>
</tr>
<tr>
<td>White</td>
<td>Communications</td>
</tr>
<tr>
<td>Red</td>
<td>Fire Services</td>
</tr>
<tr>
<td>Cream</td>
<td>Sewerage</td>
</tr>
<tr>
<td>Purple</td>
<td>Reclaimed Water</td>
</tr>
<tr>
<td>Silver/Grey</td>
<td>Steam</td>
</tr>
<tr>
<td>Brown</td>
<td>Oils, Flammable Liquids</td>
</tr>
<tr>
<td>Light Blue</td>
<td>Air</td>
</tr>
<tr>
<td>Black</td>
<td>Other Liquids</td>
</tr>
</tbody>
</table>
Dear Mr Denver Pollock,

Council has been advised that you have placed an enquiry through the Dial Before You Dig service, with the following details of your proposed dig site:

Sequence No: 30767981  
Location: 3025 Logan Rd Underwood, QLD 4119  
Map Ref: UbdBris; 221P6, 221Q6

Our records indicate the enquiry with the above details are affecting Logan City Council asset(s).

NOTE: THE ATTACHED PLANS ARE INDICATIVE ONLY and while all reasonable care has been taken in producing this information, the Council does not warrant the accuracy, completeness or currency of this information and accepts no responsibility for, or in connection with, any loss or damage suffered as a result of any inaccuracies, errors or omissions or your reliance on this information.

PLEASE NOTE: COUNCIL CANNOT PROVIDE STORMWATER INFORMATION IN THE OLD BEAUDESERT SHIRE. TO OBTAIN DETAILS YOU WILL NEED TO COMPLETE A PS3 FORM.

For AS CONSTRUCTED Private SEWER/ROOFWATER (inside properties), please call DEVELOPMENT ASSESSMENT (07) 3412 5269  
http://www.logan.qld.gov.au/LCC/council/publicationsforms/Forms/PropertyInformation.htm

For AS CONSTRUCTED SEWER/WATER/STORMWATER (outside properties), please call CITY SERVICES (07)3412 5654  

If you have any enquiries, or if any of the above details are incorrect, please contact Deb Mulhearn on (07) 3412 5654.
Working near powerlines

Working in close proximity to overhead powerlines or underground power cables has its hazards. Every year workers die or suffer serious injuries as a result of unsafe work practices. Contact with overhead powerlines can not only result in injury or death, but costs to repair the damage can be expensive.

This brochure is designed to inform you about safe work practices for working around overhead powerlines.

All machinery operators and other workers conducting work near overhead powerlines should also be aware of their safety obligations under the Electrical Safety Act 2002 and adopt safe work practices in accordance with the Code of Practice "Working Near Exposed Live Parts". Copies of these publications can be obtained from the Queensland Government's Electrical Safety Office at www.deir.qld.gov.au/electricalsafety.

Practice safe work habits

- Identify all electrical hazards, assess the risks, establish control measures and review these periodically. Control measures may include, but may not be restricted to
  - applying appropriate signage at least 8 to 10 metres either side of powerlines and using visual indicators such as tiger tails fitted to the powerlines
  - using ground barriers, where appropriate
  - informing workers of required work practices.

- Ensure operators are aware of the height of their machinery in both stowed and working positions.

- Lower all machinery to the transport position when relocating.

- Work away from powerlines, not towards them.

- Contact us about placing identifiers on powerlines and power poles at your worksite and any further control measures.

Disclaimer

This brochure is not an exhaustive list of all safety matters that need to be considered. Whilst care is taken in the preparation of this material, ENERGEX does not guarantee the accuracy and completeness of the information.

ENERGEX will not be responsible for any loss, damage or costs incurred as a result of any errors or omissions or in relation to the material in this document or for any possible actions ensuing from information contained in the document.
Will your equipment be working near ENERGEX powerlines?

If the answer is “yes”, you need to follow the three step process

1. **Planning**
   
   **Exclusion zones**
   
   If the work you and your staff are planning has the potential to encroach into powerline exclusion zones, you should contact ENERGEX for advice on doing the job safely.

   Exclusion zone measurements depend on the voltage of the powerline, type of work being performed and qualifications of people involved. If unsure, always seek safety advice from ENERGEX.

   Generally, workers and their equipment must maintain exclusion zones around overhead powerlines as follows:

   - **three metres** for voltages up to 132kV (132,000 volt)
   - **six metres** for voltages up to 330kV (330,000 volt)
   - **eight metres** for voltages over 330kV (330,000 volt)

2. **Contact ENERGEX**

   The Electrical Safety Act 2002 requires you to contact ENERGEX if you are intending to undertake an activity where there is reasonable likelihood an object being handled by persons, operating plant, machinery or vehicles can come into direct contact with or enter an exclusion zone for an overhead powerline.

   It is mandatory that you consult ENERGEX to ensure you will not encroach these exclusion zones.

   You can obtain a copy of the Code of Practice for “Working Near Exposed Live Parts” from the Queensland Government's Electrical Safety Office by calling 1300 650 662.

   For a comprehensive guide to working near overhead powerlines, visit the ENERGEX website energex.com.au.

   To arrange a meeting with an ENERGEX representative contact 13 12 53 prior to commencement of your work.

3. **Safety Advice**

   **Application for Safety Advice**

   Once you have contacted ENERGEX, a suitable date and time will be arranged to meet and discuss working near overhead exposed live parts.

   **Safety Advice consultation**

   Upon consultation with ENERGEX and the person responsible for the work site, ENERGEX may determine the safety control measures to be implemented before any work is to commence.

   **Issue of Safety Advice**

   When control measures have been implemented, work may commence as indicated on the Safety Advice on working near ENERGEX exposed live parts.

   **Safety Advice relinquishment**

   Once the work has been completed, you must notify ENERGEX immediately and return the signed Safety Advice document to ENERGEX.
All underground cables shall be treated as being energized. Where a cable is located that is not represented on the EnerGisE EnerGisE DBYD map, then EnerGex shall be contacted immediately.
All underground cables shall be treated as being energized. Where a cable is located that is not represented on the ENERGEX EnerGIse DBYD map, then ENERGEX shall be contacted immediately.

For Emergency Situations
Please call 13 19 62

ENERGEX
Date: 24 Sep 13 Time: 10:17:54
Requested By: DBYD
Scale: 1:1000
Enquiry No: 30767982
Strip No 1

INDEX TO SHEETS

LOCALITY DIAGRAM

EIGHT MILE PLAINS

KURABA
UNDERWOOD

This output provides details of the ENERGEX electrical network. As no warranty or representation is implied by ENERGEX for the accuracy or completeness of the information provided. Exact positions of cables and electrical connectivity should be confirmed on site.
Telstra Accredited Plant Locators - Queensland (South-East)

Areas covered: Brisbane, Gold Coast, Nambour, Sunshine Coast (covers more than one page)

If a physical location is required please contact a Telstra accredited locator from the list below (fees apply).

*Optic fibre cable locations must be performed by a locator with Telstra optic fibre location accreditation. Locators with Telstra optic fibre cable location accreditation are indicated by a 'yes' in the 'Fibre' column.

<table>
<thead>
<tr>
<th>Name &amp; areas covered</th>
<th>*Fibre</th>
<th>Contact details</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Find Cables - Monterey Keys</td>
<td>Yes</td>
<td>1300 734 772 or 0410 473 772</td>
</tr>
<tr>
<td>Brisbane, Gold Coast, Ipswich, Beaudesert and Caboolture</td>
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<tr>
<td>1300 Locate Pty Ltd</td>
<td></td>
<td>07 5499 3350 or 0407 570 441</td>
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<tr>
<td></td>
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<td>Fax (07) 5499 3353</td>
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<tr>
<td>AAA Locating - Toowoomba</td>
<td>Yes</td>
<td>0418 718 449</td>
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<tr>
<td>Darling Downs, Western Downs, Burnett, Lockyer Valley,</td>
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<td>Fax (07) 4630 1748</td>
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<tr>
<td>Brisbane Valley, Maryborough, Gladstone</td>
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<tr>
<td>ABC Locators Pty Ltd - Toowoomba</td>
<td>Yes</td>
<td>(07) 4632 3499 or 0407 423 499</td>
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<td>Darling Downs, Southern Downs, Burnett, Lockyer Valley,</td>
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<td>NSW</td>
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<tr>
<td>Abletech Underground - Doonan</td>
<td></td>
<td>(07) 5449 1382 or 0418 511 767</td>
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<tr>
<td>South East Qld, Northern NSW, Rockhampton, Gladstone,</td>
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<td>Fax (07) 5471 0872</td>
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<tr>
<td>Roma, Goondiwindi, Toowoomba, Charleville, Cunnamulla</td>
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<tr>
<td>Accurate Service Locators - Morayfield</td>
<td></td>
<td>(07) 5498 5020 or 0413 742 911</td>
</tr>
<tr>
<td>Brisbane North, Brisbane Valley, Sunshine Coast &amp; Hinterland,</td>
<td></td>
<td>Fax (07) 5498 5402</td>
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<td>Mary Valley, Gympie South</td>
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<td>All Underground Pipe &amp; Cable Location - Beerwah</td>
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<td>All Cable Locations - Maroochydore</td>
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<td>Yes</td>
<td>0429 968 812</td>
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<tr>
<td>South East Qld, South Qld</td>
<td></td>
<td>Fax: (07) 3818 6595</td>
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<tr>
<td>Anton Seng Plumbing - Toowoomba</td>
<td></td>
<td>(07) 4634 2427</td>
</tr>
<tr>
<td>Toowoomba, the Downs region</td>
<td></td>
<td>0408 716 821</td>
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<tr>
<td>Aussie Hydrovac Services - Underwood</td>
<td></td>
<td>(07) 3287 7818 or 0408 989 770</td>
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<td></td>
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<td>Fax (07) 3287 7819</td>
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<tr>
<td>A.U.S. Locators Pty Ltd - Forest Lake</td>
<td></td>
<td>(07) 3271 6494 or 0408 857 024</td>
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<tr>
<td></td>
<td></td>
<td><a href="mailto:ausneil@msn.com">ausneil@msn.com</a></td>
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<tr>
<td>Cardno Australian Underground Services - Loganholme</td>
<td></td>
<td>(07) 3806 8877 or 1300 224 664 or</td>
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<td></td>
<td></td>
<td>0408 705 341</td>
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<td></td>
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<td>Fax: (07) 3806 5711</td>
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<tr>
<td></td>
<td></td>
<td>email: <a href="mailto:cardnoaus@cardno.com.au">cardnoaus@cardno.com.au</a></td>
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<tr>
<td>Collingwood Services Pty Ltd - Palmwoods</td>
<td>Yes</td>
<td>(07) 5445 9291 or 0401 033 136</td>
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<tr>
<td>Brisbane, Gold Coast, Sunshine Coast to Kilcoy, Yarraman,</td>
<td></td>
<td>Fax (07) 5457 3800</td>
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<tr>
<td>Esk, Gympie, Rainbow Beach, Fraser Island</td>
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<tr>
<td>Name &amp; areas covered</td>
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<tr>
<td><strong>Dingo Home &amp; Rural Services</strong>  - Moogerah</td>
<td>Yes</td>
<td>(07) 5463 5504 or 0418 769 149</td>
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<td>South East Queensland, Boonah, Beaudesert, Warwick, Ipswich, Ambley</td>
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<td><strong>Downunder Locations</strong>  - Banora Point</td>
<td>Yes</td>
<td>0438 243 856</td>
</tr>
<tr>
<td>South East Qld and Northern NSW - Brisbane to Ballina/Tweed Heads</td>
<td></td>
<td>Fax: (02) 6623 0702</td>
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<tr>
<td><strong>Eye Spy Cable &amp; Pipe Locations Pty Ltd</strong>  - Goodna</td>
<td></td>
<td>0419 652 604</td>
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<td><strong>Find and Seek Locating</strong>  - Coomera</td>
<td>Yes</td>
<td>0407 510 289</td>
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<td>All Areas, Remote Destinations</td>
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<td><strong>How Deep Water Leaks</strong>  - Arundel</td>
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<td>0412 214 810</td>
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<tr>
<td>Runaway Bay, Gold Coast, Brisbane, The Tweed, Northern Rivers, Murwillumbah, Far North NSW</td>
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<td>Fax: (07) 5571 6287</td>
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<tr>
<td><strong>Hydro Digga</strong>  - Korora</td>
<td>Yes</td>
<td>Mob: 0447 774 000</td>
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<tr>
<td>All of NSW, ACT &amp; South East QLD</td>
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<td>Fax: (02) 6653 7255</td>
</tr>
<tr>
<td>Email: <a href="mailto:locator@hydrodigga.com">locator@hydrodigga.com</a></td>
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<td><strong>Hydrovac Excavations (Aust) Pty Ltd</strong>  - Morayfield</td>
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<td>(07) 5433 1811</td>
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<tr>
<td><strong>Integra Contracting Pty Ltd</strong>  - Nerang</td>
<td></td>
<td>Fax: (07) 5433 1911</td>
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<tr>
<td><strong>IRT Plumbing Services Pty Ltd</strong>  - Bribie Island</td>
<td></td>
<td>(07) 5497 6345 or 0417 668 069</td>
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<tr>
<td><strong>Katacole</strong>  - Greenbank</td>
<td></td>
<td>(07) 3297 6090 or 0438 873 683</td>
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<td><strong>Lambert Locations</strong>  - Gold Coast</td>
<td></td>
<td>Fax: (07) 3297 7068</td>
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<td>South East Queensland, Northern NSW</td>
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<td>1300 150 035 or 0418 150 035</td>
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<td><strong>Leaktech Australia</strong>  - Caloundra</td>
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<td>(07) 5438 2111 or 0421 624 794</td>
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<td><strong>Locom Locations</strong>  - Loganholme</td>
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<td>Fax: (07) 5437 2146</td>
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<td><strong>Lost Pipe &amp; Cable</strong>  - Everton Park</td>
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<td>0437 776 000 or 0418 983 520</td>
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<td><strong>Network Locations</strong>  - Gympie</td>
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<td>Fax: (07) 5540 3507</td>
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<td>Cooroy, Eumundi, Gympie, Maryborough, Pomona, South Burnett</td>
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<td>0407 758 165</td>
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<td><strong>Network Protection Specialists</strong>  - Tweed Heads</td>
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<td>Brisbane, Gold Coast, Northern Rivers</td>
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<td><strong>Orbital Underground Service Location</strong>  - Morayfield</td>
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<td>1300 672 482 or 0423 006 286</td>
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<td><strong>Patriot Tankers</strong>  - Ormeau</td>
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<td>Fax: (07) 5497 8384</td>
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<tr>
<td>Gold Coast, Brisbane, Ipswich, Sunshine Coast</td>
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<td>1800 Patriot or 0414 493 904</td>
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<td><strong>Pipeline Locators Australia Pty Ltd</strong>  - Greenbank</td>
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<td>Fax: (07) 3287 5987</td>
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<td>(07) 3200 0340 or 0418 183 858</td>
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<td><strong>Rock Boring Solutions Pty Ltd</strong> - West Burleigh</td>
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<td>South East Qld and Northern NSW</td>
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<td>(07) 3807 9890 or 0414 775 500</td>
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<td><strong>Safe Dig Vacuum Excavation</strong> - Greenbank</td>
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<td>0439 220 076 or 0408 880 262</td>
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<td><strong>Scan Man Pty Ltd</strong> - Town Mountain</td>
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<tr>
<td>All of Qld</td>
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<td>1800 SCANMAN (1800 722 6626)</td>
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<td>or 0420 307 226</td>
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<td>Emails: <a href="mailto:info@scanman.com.au">info@scanman.com.au</a></td>
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<td><a href="http://www.scanman.com.au">www.scanman.com.au</a></td>
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<td><strong>Shamrock Civil</strong> - Birkdale</td>
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<td><strong>TDC Water/Vacuum Truck Hire</strong> - Elimbah</td>
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<td>(07) 5496 7194 or 0428 648 149</td>
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<td><a href="mailto:charden@westnet.com.au">charden@westnet.com.au</a></td>
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<td><strong>Techdrill Civil Services Pty Ltd</strong> - Upper Coomera</td>
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<td>(07) 5573 1578 or 0407 319 997</td>
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<td>Fax: (07) 5665 7233</td>
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<td><strong>The Johnson Family Trust</strong> - Mudgeeraba</td>
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<tr>
<td>Brisbane, Gold Coast, Northern NSW to Murwillumbah</td>
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<td>(07) 5530 5773 or 0427 305 773</td>
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<td>Fax: (07) 5522 9769</td>
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<td><strong>Tipper Vacuum Excavations</strong> – Park Ridge South</td>
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<td>Brisbane, Gold Coast, Sunshine Coast</td>
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<td>0408 855 617</td>
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<td>Fax: (07) 3297 0009</td>
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<td>Email: <a href="mailto:tve@live.com.au">tve@live.com.au</a></td>
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<td><strong>Trakida Pty Ltd</strong> - Mt Nathan</td>
<td>Yes</td>
<td>(07) 5514 6373 or 0411 580 377</td>
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<td><strong>Utility Location Services Pty Ltd</strong> - Stapylton</td>
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<tr>
<td></td>
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<td>Fax: 07 3807 5599</td>
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</tbody>
</table>
DUTY OF CARE
TELSTRA CORPORATION ACN 051 775 556

IMPORTANT:
Please read and understand all the information and disclaimers provided below. Sketches and Plans provided by Telstra are circuit diagrams only and indicate the presence of telecommunications plant in the general vicinity of the geographical area shown; exact ground cover and alignments cannot be given with any certainty and cover may alter over time. Telecommunications plant seldom follow straight lines and careful on site investigation is essential to uncover and reveal its exact position.
Due to the nature of Telstra plant and the age of some cables and records, it is impossible to ascertain the location of all Telstra plant. The accuracy and/or completeness of the information cannot be guaranteed and, accordingly Telstra plans are intended to be indicative only.

"DUTY OF CARE"
When working in the vicinity of telecommunications plant you have a legal "Duty of Care" that must be observed.
It is the responsibility of the owner and any consultant engaged by the owner, including an architect, consulting engineer, developer, and head contractor to design for minimal impact and protection of Telstra plant. Telstra will provide plans and sketches showing the presence of its network to assist at this design stage.
It is the owner's (or constructor's) responsibility to:-

a) request plans of Telstra plant for a particular location at a reasonable time before construction begins. If you have any doubts as to the exact location of Telstra Plant, we strongly recommend that you engage an Accredited Plant Locator in your area;
b) visually locate Telstra plant by hand digging or using non destructive water jet method (pot holing) where construction activities may damage or interfere with Telstra plant (see "Essential Precautions and Approach Distances" section for more information); and
c) contact Telstra's Plan Services (see below for details) if Telstra plant is wholly or partly located near planned construction activities.

DAMAGE TO TELSTRA'S NETWORK MUST BE REPORTED TO 132203 IMMEDIATELY.
The owner is responsible for all plant damage when works commence prior to obtaining Telstra plans, or failure to follow agreed instructions.
Telstra reserves all rights to recover compensation for loss or damage to its cable network or other property including consequential losses.

Important note: The construction of Telstra’s network dates back over many years. Some of Telstra’s pits and ducts were manufactured from asbestos-containing cement. You must take care in conducting any works in the vicinity of Telstra’s pits and ducts. You must refrain from in any way disturbing or damaging Telstra’s network infrastructure when conducting your works. We recommend that before you conduct any works in the vicinity of Telstra infrastructure that you ensure your processes and procedures eliminate any possibility of disturbing, damaging or interfering in any way with Telstra’s infrastructure. Your processes and procedures should incorporate appropriate measures having regard to the nature of this risk.
EMERGENCY SITUATIONS - RECEIVING TELSTRA PLANS

Telstra's automated mapping system will provide a fast response for emergency situations. (faster than an operator can provide manually). Automated responses are normally available 24/7.

To receive a fast automated response from Telstra your request must -

- be a web request lodged at DBYD (www.1100.com.au) The request will be then forwarded directly to Telstra.
- contain your email address so you can receive the automated email response.
- be for the purposes of 'mechanical excavation' or other ground breaking DBYD activity. (requests with activity types conveyancing, planning & design or other non digging activities may not be responded to until the next business day).
- be for an area less than 350 metres in size to obtain a PDF map. (over 350 metres will default to DWF due to size )
- be for an area less than 2500 metres in size to obtain a DWF map

NATURAL DISASTERS

Natural Disasters include (amongst other things) earthquakes, cyclones, floods and tsunamis.

In the case of such events, urgent requests for plans or information relating to the location of Telstra network can be made directly to Telstra Network Integrity Team Managers as follows:

NSW - Joe Palucci 0419 496 015
QLD - Shaun Walliss 0419 638 150
VIC/TAS - David Povazan 0417 300 947
SA/NT/WA - Dave Ballard 0419 807 901

TELSTRA PLAN SERVICES

For all Telstra DBYD (Dial Before You Dig) map enquiries please contact Telstra Plan Services

email - Telstra.Plans@team.telstra.com
fax - (02) 4961 3714
phone - 1800 653 935 (for urgent, onsite or optic fibre enquiries)

Please note - to make an enquiry the plans must be current (within 60 days of issue). If your plans have expired you will need to submit a new request via DBYD.

ASSET RELOCATIONS

You are not permitted to relocate or alter any Telstra assets or network under any circumstance.
For all enquiries relating to the relocation of Telstra assets please phone 1800 810 443 or email F1102490@team.telstra.com

DATA EXTRACTION FEES

In some instances a data extraction fee may be applicable for the supply of Telstra information. Typically a data extraction fee may apply to large projects, requests to be supplied in non standard formats, excessive hardcopy printing or requests for non digging purposes. Further details can be obtained by contacting Telstra Plan Services.

PRIVACY NOTE

Your information has been provided to Telstra by DBYD to enable Telstra to respond to your DBYD request. Telstra keeps your information in accordance with its privacy statement entitled "Protecting Your Privacy" which can be obtained from Telstra either by calling 1800 039 059 or visiting our website at www.telstra.com.au/privacy
Concerning Telstra Plans:

Please note the following:

- For plans of Telstra locations contact Dial Before You Dig at least 2 business days prior to digging. ([www.1100.com.au](http://www.1100.com.au))
- Fast response can be provided by Telstra if an email address is supplied. (if posted, this may take up to one week or longer to receive plans)
- Telstra plans and information provided are valid for 60 days from the date of issue.
- Telstra owns and retains the copyright in all plans and details provided in conjunction with the applicant's request. The applicant is authorised to use the plans and details only for the purpose indicated in the applicant's request. The applicant must not use the plans or details for any other purpose. The plans and details should be disposed of by shredding or any other secure disposal method after use.
- Telstra plans or other details are provided only for the use of the applicant, its servants, or agents. The applicant may not give the plans or details to other parties, and may not generate profit from commercialising the plans or details.
- Please contact Telstra Plan Services (see above for details) immediately should you locate Telstra assets not indicated on these plans.
- Telstra, its servants or agents shall not be liable for any loss or damage caused or occasioned by the use of plans and or details so supplied to the applicant, its servants and agents, and the applicant agrees to indemnify Telstra against any claim or demand for any such loss or damage. Please ensure Telstra plans and information provided remains on-site at all times throughout your construction phase.

Essential Precautions and Approach Distances:

Note: If the following clearances cannot be maintained, please contact Telstra Plan Services (see above for details) for advice on how best to resolve this situation.

1. On receipt of plans and sketches and before commencing excavation work or similar activities near Telstra's plant, carefully locate this plant first to avoid damage. Undertake prior manual exposure such as potholing when intending to excavate or work closer to Telstra plant than the following approach distances.

   Where Telstra's plant is in an area where road and footpaths are well defined by kerbs or other features a minimum clear distance of 600mm must be maintained from where it could be reasonably presumed that plant would reside.

   In non established or unformed reserves and terrain, this approach distance must be at least 1.5 metres.

   In country/rural areas which may have wider variations in reasonably presumed plant presence, the following minimum approach distances apply:

   a) Parallel to major plant: 10 metres (for IEN, optic fibre and copper cable over 300 pairs)
   b) Parallel to other plant: 5 metres

   Note: Even manual pot-holing needs to be undertaken with extreme care, commonsense and employing techniques least likely to damage cables. For example, orientate shovel blades and trowels parallel to the cable rather than digging across the cable.

   If construction work is parallel to Telstra plant, then careful hand digging or using non destructive water jet method (pot-holing) at least every 5m is required to establish the location of all plant, hence confirming nominal locations before work can commence.

2. Maintain the following minimum clearance between construction activity and actual location of Telstra Plant.
<table>
<thead>
<tr>
<th>Equipment Type</th>
<th>Distance from Plant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jackhammers/Pneumatic Breakers</td>
<td>Not within 1.0m of actual location.</td>
</tr>
<tr>
<td>Vibrating Plate or Wacker Packer Compactor</td>
<td>Not within 0.5m of Telstra ducts. 300mm compact clearance cover before compactor can be used across Telstra ducts.</td>
</tr>
<tr>
<td>Boring Equipment (in-line, horizontal and vertical)</td>
<td>Not within 2.0m of actual location. Constructor to hand dig or use non-destructive water jet method (pot-hole) and expose plant.</td>
</tr>
<tr>
<td>Heavy Vehicle Traffic (over 3 tonnes)</td>
<td>Not to be driven across Telstra ducts (or plant) with less than 600mm cover. Constructor to check depth via hand digging.</td>
</tr>
<tr>
<td>Mechanical Excavators, Farm ploughing and Tree Removal</td>
<td>Not within 1.0m of actual location. Constructor to hand dig or use non-destructive water jet method (pot-hole) and expose plant.</td>
</tr>
</tbody>
</table>

All Telstra pits and manholes should be a minimum of 1.2m in from the back of kerb after the completion of your work.

All Telstra conduit should have the following minimum depth of cover after the completion of your work:

- **Footway 450mm**
- **Roadway 450mm at drain invert and 600mm at road centre crown**

For clearance distances relating to Telstra pillars, cabinets and RIMs/RCMs please contact Telstra Plan Services (see above for details).

**FURTHER ASSISTANCE:**

Assistance can be obtained by contacting Telstra Plan Services

Where on-site location is provided, the owner is responsible for all hand digging or use non-destructive water jet method (pot-holing) to visually locate and expose Telstra plant.

If plant location plans or visual location of Telstra plant by digging reveals that the location of Telstra plant is situated wholly or partly where the owner plans to work, then Telstra's Network Integrity Group must be contacted through Telstra Plan Services to discuss possible engineering solutions.

**NOTE:**

If Telstra relocation or protection works are part of the agreed solution, then payment to Telstra for the cost of this work shall be the responsibility of the principal developer or constructor. The principal developer or constructor will be required to provide Telstra with the details of their proposed work showing how Telstra's plant is to be accommodated and these details must be approved by the Regional Network Integrity Manager prior to the commencement of site works.

**RURAL LANDOWNERS - IMPORTANT INFORMATION**

Where Telstra owned cable crosses agricultural land, Telstra may provide a once-off free on-site electronic cable location. The Telstra Plan Services operator will provide assistance in determining whether a free on-site location is required.

Please note:

- The exact location, including depth of cables can only be verified by pot holing, which is not covered by this service.
- This service is only available to assist private rural land owners.
- This service covers one hour on-site only. Additional time can be purchased directly from the Accredited Plant Locator.

For further information including terms and conditions, please contact Plan Services on **1800 653 935**.
Some examples of how to read Telstra plans:

- **One 50mm PVC conduit (P50)** containing a 50-pair and a 10-pair cable between two 6-pits, 20.0 m apart, with a direct buried 30-pair cable along the same route.

- **Two separate conduit runs** between two footway access chambers (manholes) 245m apart. A nest of **four 100mm PVC conduits (P100)** containing assorted cables in three ducts (one being empty) and one empty 100mm concrete duct (C100) along the same route.

**WARNING:** Telstra’s plans show only the presence of cables and plant. They only show their position relative to road boundaries, property fences etc. at the time of installation and Telstra does not warrant or hold out that such plans are accurate thereafter due to changes that may occur over time.

**DO NOT ASSUME DEPTH OR ALIGNMENT** of cables or plant as these vary significantly.

The customer has a **DUTY OF CARE** when excavating near Telstra cables and plant. Before using machine excavators, **TELSTRA PLANT MUST FIRST BE PHYSICALLY EXPOSED BY SOFT DIG (potholing)** to identify its location. Telstra will seek compensation for damages caused to its property and losses caused to Telstra and its customers.
ELECTRONIC PLANS - PDF AND DWF MAPS

If you have received Telstra maps via email you will have received the maps as either a PDF file (for smaller areas) or DWF file (for larger area requests). If you are unable to launch any one of the softcopy files for viewing and printing, you may need to download and install one or more of the free viewing and printing products such as Adobe Acrobat Reader (for PDF files) or Autodesk Design Review (for DWF files) available from the internet.

PDF files
PDF is the default softcopy format for all requests for areas up to approx *350m in length. (*depends on geographic location of request). The PDF file is formatted to A3 portrait sheet however it can be printed on any size sheet including from A4 to AO, either as the full sheet or selected areas to suit needs and legibility. (to print a selected area zoom up and print "current view"). If there are multiple layers of Telstra network you may receive up to 2 sheets in the single PDF file attachment supplied. There are three types or layers of network normally recorded - local network, mains cables or a combined layer of local and mains (usually displayed in rural or semi rural areas). If mains cable network is present in addition to local cables (i.e. as separate layer in a particular area), the mains will be shown on a separate sheet. The mains cable information should be read in conjunction with the local cable information.

DWF files
This is the default softcopy format for all requests for areas that are over 350m in length. Maximum length for a DWF automated response is approx 2500m - depending on geographic location of request (manually-processed plans may provide larger coverage). The DWF files differ from PDF in that DWF are vector files made up of layers that can be turned on or off and are not formatted to a specific sheet size. This makes them ideal for larger areas and for transmitting over email etc.

How to view Telstra DWF files -
Telstra DWF files come with all layers turned on. You may need to turn individual layers on or off for viewing and printing clarity. Individual layer names are CC (main cable/conduit), DA (distribution or local area network) and sometimes a combined layer - CAC. Layer details can be viewed by either picking off the side menu or by selecting ‘window’ then 'layers' off the top menu bar. Use ‘layers’ to turn individual layers off or on. (double click or right click on layer icon.)

How to print Telstra DWF files -
DWF files can be printed on any size sheet. They can be printed in their entirety or by selected areas of interest. Some DWF coverage areas are large and are not suited to printing legibly on a single A4 sheet - you may need several prints if you only have an A4 printer. Alternatively, an A3, A1 or larger printer could be used. To print, zoom in or out and then, by changing the ‘print range’ settings, you can print what is displayed on your screen to suit your paper size. If you only have a small printer, e.g. A4, you may need to zoom until the text is legible on your screen for it to be legible on the print. (which is why you may need several prints). To print what is displayed on your screen the ‘view’ setting should be changed from ‘full page’ to ‘current view’. The ‘current sheet’ setting should also be selected. You may need to print layers separately for clarity and legibility. (details above on how to turn layers on or off)

How to change the background colour from white to black (when viewing) Telstra DWF files -
If using Autodesk Design Review the background colour can be changed by selecting "Tools" then "options" then "sheet". Tick the box "override published paper colors" and select the colour required using the tab provided.

Telstra Automated Mapping System
Telstra provides an automated plan response for the majority of DBYD requests received. Requestors must supply a current email address on their request to DBYD and must also be able to accept a standard format of PDF or DWF. An automated response can be provided much faster than the alternative of a mailed hardcopy, and can avoid unnecessary delays in waiting for plans to arrive. Being softcopy, it can easily be sent directly to a worksite and can be available 7 days a week. The automated system can be configured for individual requestors to receive either PDF/DWF (where small requests are PDF and larger requests are DWF) or, alternatively, all in DWF (both small and large requests). Please contact Plan Services for further details or to have your preferences updated. Please note that all requests over *350m (approx.) in size can only be supplied in DWF format and there are size limits on what can be provided. (* actual size depends on geographic location of requested area)
ACCREDITED PLANT LOCATORS (For your area)

On-site assistance should be sought from an Accredited Plant Locator (Telstra accredited), if the telecommunications plant cannot be located within 2.5 metres of the locations indicated on the drawings provided.

On-site advice should be obtained from the Telstra Accredited Plant Locator who is highly skilled in locating Telstra plant. In the case where Telstra plant is outside a recognised road reserve Telstra recommends that Telstra Plan Services are contacted for assistance prior to engaging an Accredited Plant Locator.

Telstra does not permit external parties (non-Telstra) to conduct work on our network. Only Telstra staff or Telstra contractors are allowed to enter our manholes, open our pits, ducts, etc.

Please note it is a criminal offence under the Criminal Code Act 1995 (Cth) to tamper or interfere with communication facilities owned by a carrier. Heavy penalties may apply for breach of this prohibition, and any damages suffered, or costs incurred by Telstra as a result of any such unauthorised works may be claimed against you.

Should your projects require Telstra network location, any asset Plant Locator used MUST be Telstra accredited to be able to access and locate Telstra network. (a list of which is provided with the Dial Before You Dig plans). Alternatively you may seek your own Telstra accreditation through our registered training partner Coates Hire Training which is the only approved training provider for Plant Location accreditation for Telstra's network. You may contact Coates Hire Training on 1300 657 867 or visit www.coateshire.com.au

For the assistance of customers an accredited Asset Plant Locator can perform any of the following activities if requested to do so by the owner:

- review Telstra's plans to assess the approximate location of Telstra plant;
- advise owners of the approximate location of Telstra plant according to the plans;
- advise owners of the best method for locating Telstra plant;
- advise owners of the hazards of unqualified persons attempting to find the exact location of Telstra plant and working in the vicinity of Telstra plant without first locating its exact position; and
- perform trial hole explorations by hand digging (pot-holing) to expose Telstra plant with a high degree of skill, competence and efficiency and utilising all necessary safety equipment.

A list of Accredited Plant Locators operating in your area is attached. Accredited Plant Locators are certified by Telstra to perform the tasks listed above. Owners may engage Accredited Plant Locators to perform these services, however Telstra does not give any warranty in relation to these services that Accredited Plant Locators are competent or experienced to perform any other services.

The attached list provides the names and contact details for Accredited Plant Locators who service your area and can provide you with assistance in locating Telstra plant on site. These organisations have been able to satisfy Telstra that they have a sound knowledge of telecommunications plant and its sensitivity to disturbance; appropriate equipment for locating telecommunications plant and competent personnel who are able to interpret telecommunications plans and sketches and understand safety issues relevant to working around telecommunications plant. They are also able to advise you on the actions which should be taken if the work you propose will/could result in a relocation of the telecommunications plant and/or its means of support.

We recommend that you engage the assistance of one of these Accredited Plant Locators as a step towards discharging your Duty of Care obligations when seeking the location of Telstra's telecommunications plant.

Please Note:

- Optic fibre cable locations must be performed by a locator with Telstra optic fibre cable location accreditation. (not all copper accredited locators have optic fibre accreditation). The locators with additional optic fibre cable location accreditation are indicated by a 'yes' in the column headed 'Fibre'.
Each Accredited Plant Locator is NOT permitted to provide depth of communications plant unless physically exposed by hand digging.

The details of any contract, agreement or retainer for site assistance to locate telecommunications plant shall be for you to decide and agree with the organisation engaged. Telstra is not a party to any contract entered into between an owner and an Accredited Plant Locator. The Accredited Plant Locators are able to provide guidance concerning the extent of site investigations required.

Payment for the site assistance will be your responsibility and payment details should be agreed before the engagement is confirmed.

Telstra does not accept any liability or responsibility for the performance of or advice given by an Accredited Plant Locator. Accreditation is an initiative taken by Telstra towards the establishment and maintenance of competency standards. However, performance and the advice given will always depend on the nature of the individual engagement.

Each Accredited Plant Locator has been issued with a certificate which confirms the Accreditation. Every 2 years Telstra will reassess the accreditation and where appropriate will issue a letter confirming the accreditation for the next 2 years. You have the right to request the organisation you engage to show evidence of their ID card.

Neither the Accredited Plant Locator nor any of its employees are an employee or agent for Telstra and Telstra is not liable for any damage or loss caused by the Accredited Plant Locator or its employees.

The attached list contains the current names and contact details of Accredited Plant Locators who service your area, however, these details are subject to change.

IDEA FOR CONSIDERATION:
Telstra offer free Cable Awareness Presentations & Advanced Cable Reading Presentations, if you believe you or your company would benefit from this offer please contact Network Integrity on 1800 810 443 or F1102490@team.telstra.com
Appendix D  Site Plan