



**ASSESSMENT of the PROPOSED WATER
SERVICING PLAN
of the**

**FITZGIBBON URBAN DEVELOPMENT AREA
- AREAS B, C, E1, E2, F & G**

**PLANS AND DOCUMENTS
referred to in the ULDA
APPROVAL dated 15 / 12 / 11**

Revision History

Rev No	Author	Branch	Position	Name	Signature	Date
0	Arash Alizadeh	Asset Management	Manager - Infrastructure Planning	Andy Krumins		Feb 26, 2010
1	Arash Alizadeh	Asset Management	Manager - Infrastructure Planning	Andy Krumins		Mar 17, 2010

APPROVAL dated \ \
 referred to in the ULDA
 PLANS AND DOCUMENTS

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1 INTRODUCTION

Queensland Urban Utilities (QUU) was commissioned by the Urban Land Development Authority (ULDA) to assess the required water mains for development of areas B, C, E1, E2, F and G of the Fitzgibbon Urban Development Area (UDA).

The Fitzgibbon UDA covers 295 hectares of land in the northern suburbs of Fitzgibbon, Carseldine, Bald Hills, Talgum and Deagon. The area is located approximately 12 km from the Brisbane Central Business District. (see Figure 1-1)

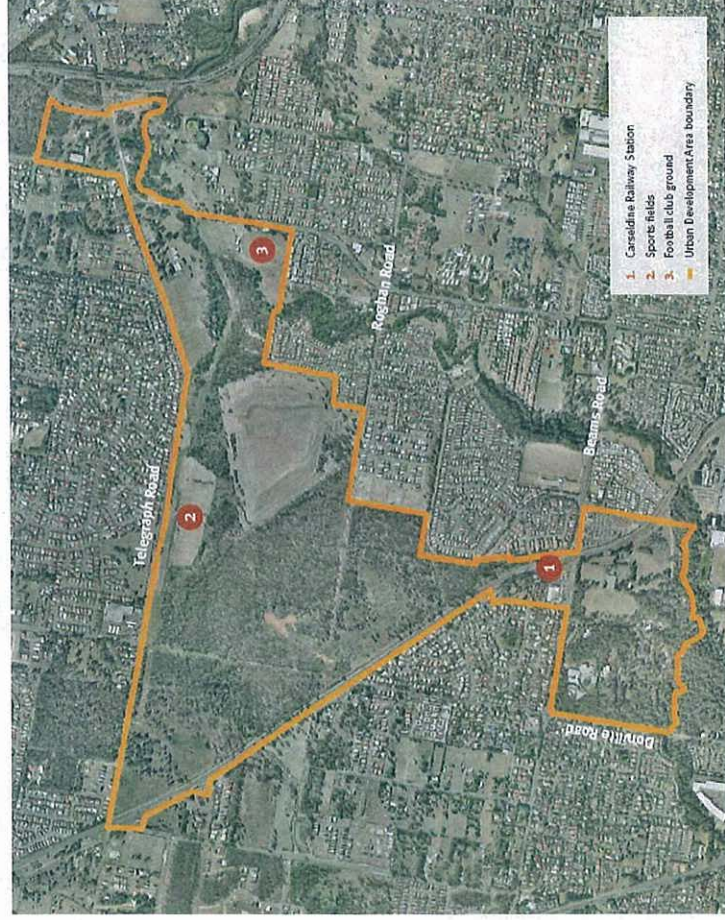
Areas B, C, E1, E2, F and G of the Fitzgibbon UDA are proposed to contain about 310 low, low-medium and medium residential allotments. The area is located south of Telegraph Rd, north of the railway and west of stages 1-4 which are currently being constructed (see figure 1-2).

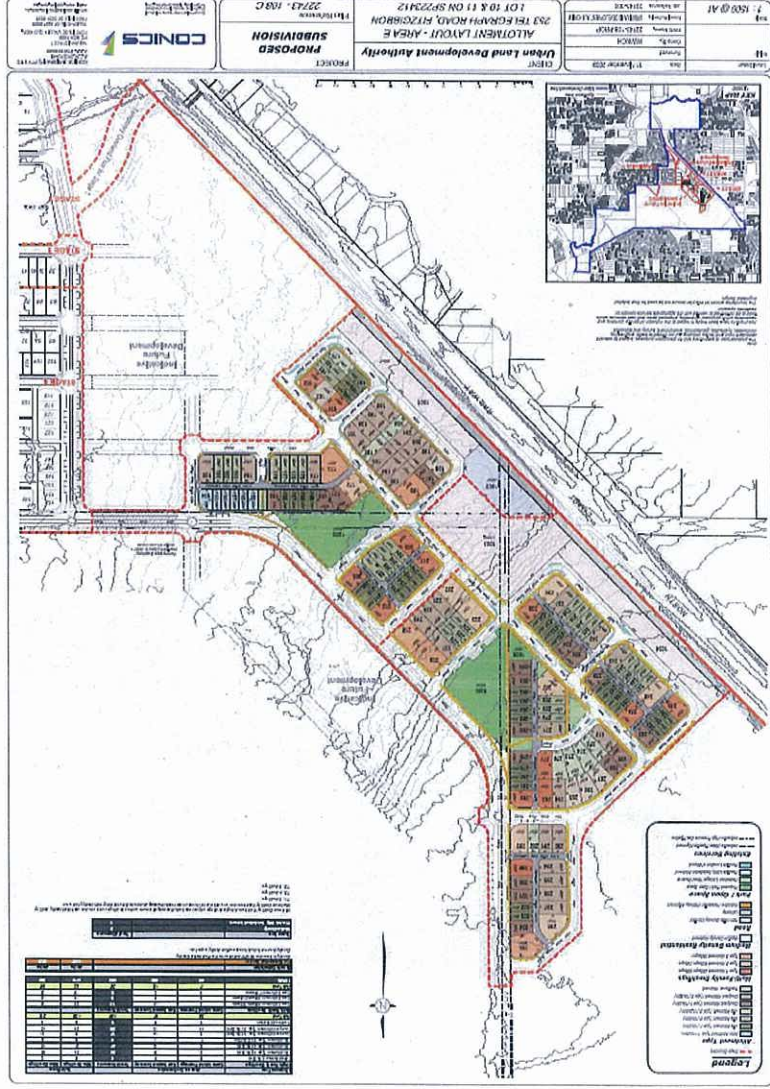
The study area is within the Bracken Ridge Water Supply Area (WSA) and is supplied by gravity from Bracken Ridge reservoir (50.4 mAHD Minimum Operating Level) (see Figure 1-3).

This document has been prepared to assess the required water mains to meet Brisbane City Council (BCC) design standards to:

- Achieve minimum pressures;
- Achieve required fire-flow capacities;
- Ensure reliability of supply to the proposed development.

Figure 1-1 Fitzgibbon UDA





2 POPULATION AND DEMAND

Number and types of allotments for the study area were provided by the ULDA and are shown in Figure 2-1.

The majority of allotments are of Low Density residential (LDR) and Low-Medium Density Residential (LMR) categories with three larger allotments (Super Lots) along the railway line categorised as Medium Density Residential (MR).

Equivalent Persons (EP) were calculated from the allotment data by equating one LDR and LMR dwelling to 2.5 EP, and one MR dwelling to 1.7 EP. (see Table 2-1)

Table 2-1 Study Area Equivalent Persons Calculation

Allotment Type	City Plan Category	No. of Allotments	Yield Range		EP per Dwelling	Total Max EP
			Min Dwellings	Max Dwellings		
Single Family Dwellings	LDR	126	126	213	2.5	533
Multi-Family Dwellings	LMR	26	178	309	2.5	773
Total EP						1,305
Super Lots	MR	3	21.76	66	1.7	111
Total EP						2,441

Per capita demands were calculated based on an Average Day Demand (AD) of 268L/person/d, a Peak Day (PD) to Average Day factor of 1.7 and a Peak Hour Demand (PH) factor of 1.89. Non Revenue Water of 46L/EP/day was also added to the calculated demand. This equated to a Peak Hour Demand of 0.0111L/s/EP. Table 2-2 shows the study area's demand calculation.

Allotment Type	Access Configuration		Total Allotments	Yield Range	
	Conventional Frontage	Rear Loaded Laneway		Min. Dwellings	Max. Dwellings
Single Family Dwellings					
Soho Allotment (10x25m)	0	6	6	6	12
Villa Allotment Type 1 (10x25m)	3	31	34	34	65
Villa Allotment Type 2 (10x32m)	5	22	27	27	49
Villa Allotment Type 3 (12.5x32m)	7	1	8	8	9
Courtyard Allotment Type 1 (15x25m)	3	14	17	17	31
Courtyard Allotment Type 2 (15x32m)	16	13	29	29	42
Traditional Allotment	5	0	5	5	5
Sub Total	39	87	126	126	213
Multi-Family Dwellings					
Type 1 Allotment 450sqm-599sqm	2	11	13	26	39
Type 2 Allotment 600sqm-749sqm	2	6	8	16	32
Type 3 Allotment 750sqm+	3	2	5	10	25
Sub Total	7	19	26	52	96
TOTAL	46	106	152	178	309

Density Calculation		dw/ha	dw/ha
Net Residential Density			

Density is based on SEQRPP definition for Net Residential Density

Density does not include future medium density super lots

Super Lots	Total Allotments
Medium Density	3
Possible Utility Installation Allotment	1

Minimum Dwelling Yield based single dwellings only on rear loaded laneway allotments and two dwellings constructed on each Multi-family dwelling

Maximum Dwelling Yield based on an additional lot home on rear loaded laneway allotments & the following multi-family yield rates:

T1 - 3 dwellings

T2 - 4 dwellings

T3 - 5 dwellings

Figure 2-1 Number and Types of Allotments in Study Area

Table 2-2 Study Area Demand Calculation

City Plan Category	Total EP	AD (l/EP/d)	PD/AD (l/EP/d)	PD (l/EP/d)	MH/PD (l/EP/d)	MH (l/EP/d)	MH Inc. NRW (l/EP/s)	MH (l/EP/s)
LDR/LMR	1,305	268	1,70	456	1,89	861	0,010	0,011
MR	2,441	268	1,70	456	1,89	861	0,010	0,011
								25,75

In hydraulic modeling and for LDR and LMR allotments, EP loads were distributed uniformly across the existing parcels within the study area. For the Super Lots, the EP demand for each parcel was applied to the nearest junction in the model.

3 HYDRAULIC ANALYSIS

Hydraulic analysis of the proposed water reticulation mains was undertaken using hydraulic analysis software. The following scenario runs were undertaken:

1. Peak Hour pressures
2. Fire Flow

3.1 PEAK HOUR SCENARIO

System performance was assessed under PH demands with Bracken Ridge reservoir at Minimum Operating Level (MOL). The adequacy of proposed water service mains was checked to ensure a minimum service pressure of 210kPa (21m) is maintained at the water meters.

3.2 FIRE FLOW SCENARIO

System requirements were identified to supply fire fighting flows of 25 (from two hydrants) and 45 L/s (from up to three hydrants) for low and high risk areas respectively. Assessment of fire flow capacity was made with a concurrent background demand equivalent to 2/3 of PH demand with a minimum allowable residual pressure of 100kPa (10m) at the hydrants.

3.3 RELIABILITY OF SUPPLY

The network configuration was reviewed to ensure that a reliable supply to the development would be available into the future. Potential connection to the adjacent Aspley WSA and also the number of cross connections between the reticulation and trunk mains were considered to provide an adequate reliability of supply.

4 PROPOSED AND REVIEWED WATER RETICULATION MAINS

The augmentations proposed by ULDA are shown in SK06 - SK10. The plan comprises a DN225 backbone supply that runs parallel to the existing DN410 along the future extension of Roghan Rd and connects to the existing DN300 in Roghan Rd. The proposed water reticulation mains are mostly sized as DN150.

Supplementary information provided by ULDA in the course of reviewing the draft version of the study is also listed below:

- Major parts of the study area are subject to bulk fill. In worst case the fill depth in the vicinity of the existing DN410 trunk main can add as much as 1.7m extra soil depth.

- Some sections of the proposed plan have already been constructed (see sketch SK06) in smaller size than proposed by QUV in previous advice¹.

- It was proposed to lay reticulation mains in the future busway to connect to as existing main in Lavender Pl.

The proposed plan and the background information were reviewed by QUV and recommendations were identified as follows:

- Contingency of Supply: Due to the development being situated on a trunk main branch from Bracken Ridge reservoir, and given the size of the development, it is necessary to ensure that a contingent supply from adjacent Aspley WSA can be delivered in case of failure/maintenance of the trunk mains. Two options were identified either can address the above issue:

- Option 1: To upsize the proposed DN150 water main supplying Area B to DN250 (line 4, see Figure 4-1) and to connect it to existing DN225 in Aspley WSA via Carselgrove

¹ "Assessment of the Proposed Water Servicing Plan of the Fitzgibbon Urban Development Area - Areas B, C, E1, E2, F & G - Draft" - Dated 26 February 2010

Ave. It is also proposed to upsize the section further north (line 3, see Figure 4-1) from DN150 to DN200.

- o Option 2: To install a standard 200mm BCC flow meter / PRV pit, with internal pipework as an offtake from the existing DN300 in Roghan Rd (see Figure 4-2). It is recommended to initially install pipe shorts instead of the PRV and flow meter. This will allow relatively easy installation of a PRV and flow meter, if required. It is also required to insert a new valve into the existing DN410 (see Figure 4-2) to isolate the trunk main from Bracken Ridge in case it has to be shutdown.
- Fire Flow Provision: The reticulation has been sized on the basis of providing minimum flows of 45 L/s. However it is suggested the ULDA engage with the fire authority to ascertain the overall level of fire protection required.
- Water main sizing: Opportunities were identified to downsize some of the proposed main sizes from DN150 to DN100 whilst meeting the Peak Hour and Fire Flow requirements. There may be opportunities to downsize the reticulation mains in area G; however it can not be determined until a detailed layout of the development of the surrounding area is known.
- Future busway: It is recommended not to lay any future reticulation mains in the busway as it is not in compliance with the BCC Standards which implies: "water mains shall be located to allow easy access for repairs and maintenance".
- Bulk Fill: It is recommended to lay the proposed water reticulation mains until after the bulk fill within the area is completed, if possible. This is to avoid issues of access the water mains in case of maintenance or repair. With regards to the existing water mains such as the DN410 trunk main between Norris Rd and Dorville Rd, the issue is currently being discussed between the BCC and the

ULDA representatives to ensure the necessary actions will be taken to protect the assets.

- The proposed DN225 (line 1) is upsized to DN250 as DN225 is not a standard size for BCC's new water mains.
- Two connection points between the proposed line 3 and the existing DN410 were identified to ensure robust supply to the proposed development.
- The proposed main sizes are expressed as Nominal Bore. The material and class of pipe will need to be selected during design to give hydraulic equivalence.

5 CONCLUSION

The proposed two options for water main network are shown in figures 4-1 and 4-2 for Areas B, C, E1, E2, F and G of the Fitzgibbon UDA.

References

Queensland Urban Utilities. Bracken Ridge WSA Master Planning Report, July 2009.

Urban Land Development Authority. Fitzgibbon Urban Development Area Development Scheme, July 2009.

Urban Utilities
ASSET MANAGEMENT BRANCH

FITZGIBBON UDA - AREAS B, C, E1, E2, F & G
QUU PROPOSED WATER RETICULATION
MAINS LAYOUT - OPTION 1

FIGURE 4-1

DATE : 12 MARCH 2010

NOTES :

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PHONE : 3403 0220

Scale 1:7,500
(at A3)

Meters

0 187.5 375

Based on data provided with the questionnaire of the Department of Water Resources and Urban Development, 2002.

As shown, the map is a plan view of the water mains network. It is not a cross-section and does not show the depth of the mains. The map is intended to show the layout of the mains and not the exact location of the mains. The map is intended to show the layout of the mains and not the exact location of the mains.

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Legend

Study Area

BRACKEN RIDGE Reservoir Zone

Proposed Reticulation Mains Nominal Dia.

DN250

DN200

DN150

DN100

Existing Reticulation Mains Diameter (mm)

250 to 300

200 to 250

150 to 200

100 to 150

80 to 100

Existing Trunk Mains Diameter (mm)

1,000 to 3,000

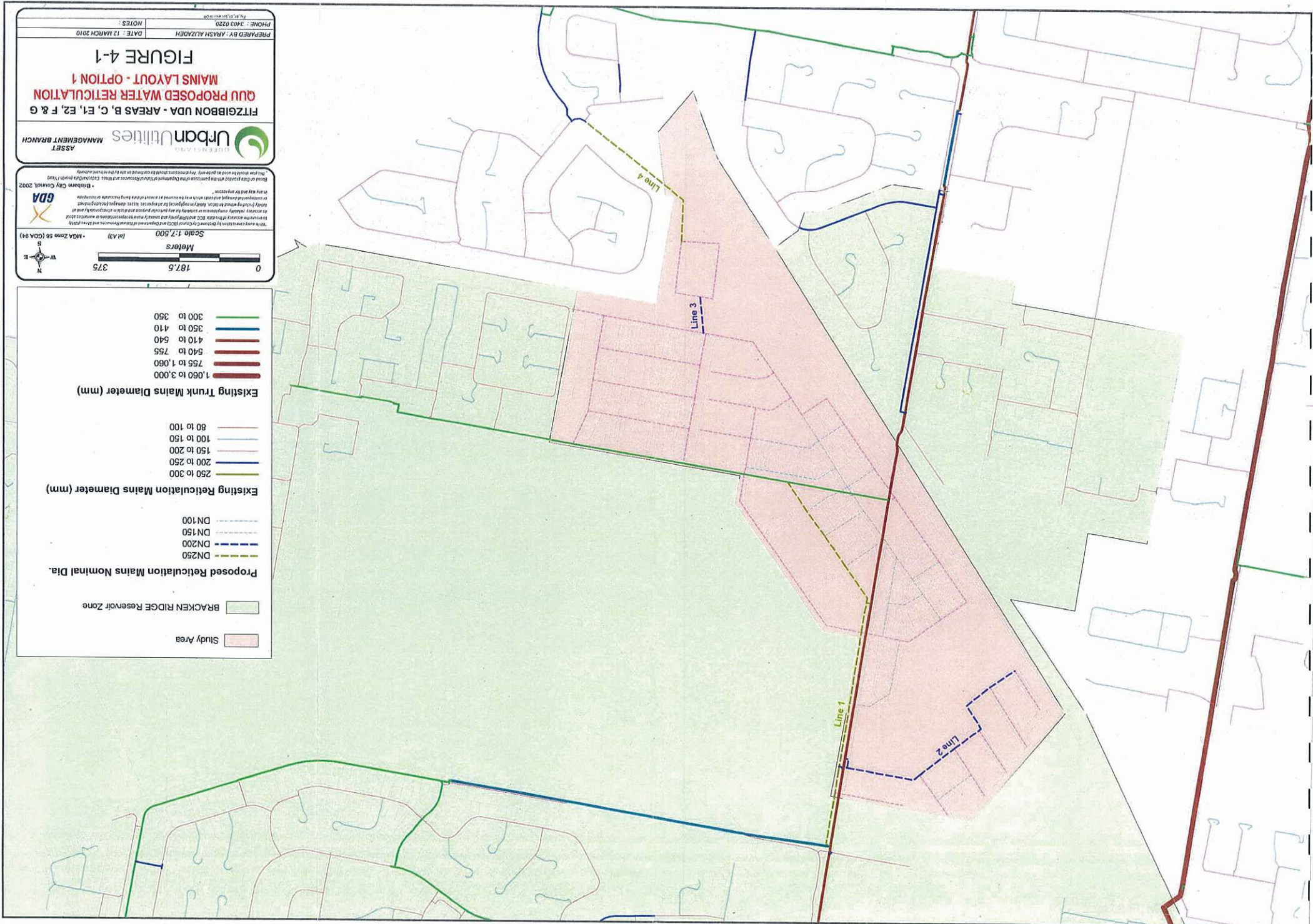
755 to 1,000

540 to 755

410 to 540

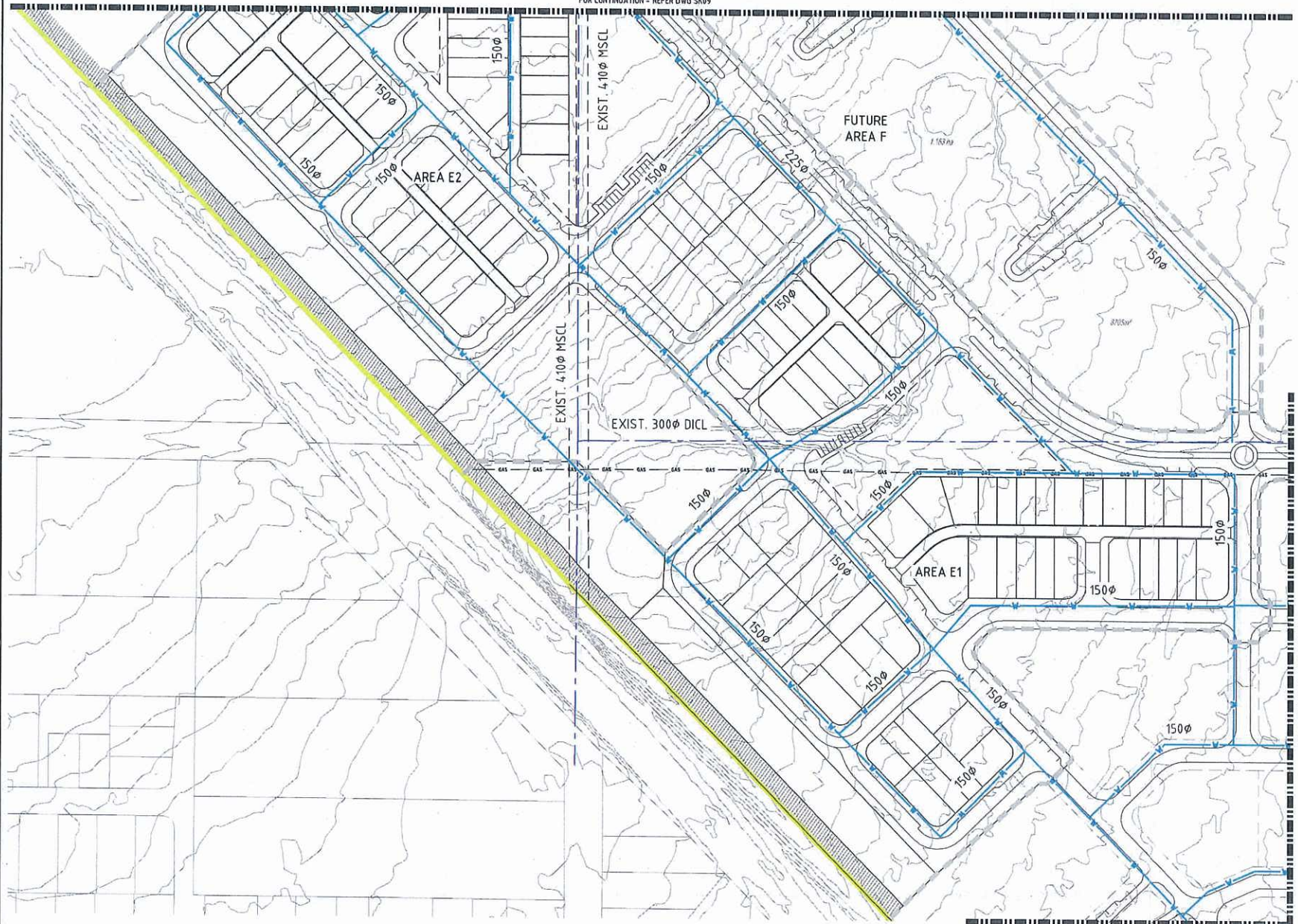
350 to 410

300 to 350





FOR CONTINUATION - REFER DWG SK09



- LEGEND**
- PROPOSED WATER
 - EXISTING WATER MAIN
 - STAGE BOUNDARY
 - TOTAL SITE BOUNDARY

ASSOCIATED CONSULTANTS		CLIENT URBAN LAND DEVELOPMENT AUTHORITY		DESIGNED AL		APPROVED DATE	
PROJECT FITZGIBBON CHASE		LOCATION 153 TELEGRAPH ROAD, FITZGIBBON		DRAWN AL		DATE JANUARY 2010	
SHEET TITLE WATER RETICULATION LAYOUT PLAN - SHEET 3 OF 5		SHEET TITLE		CHECKED DATE		SCALE 0 20 40 60m SCALE 1:1000 (A1)	
B/D/P1 REV P1 PRELIMINARY REVISED		REVISED		BRIANNE AUSTRALIA 555 CORRIANTON DRIVE, 1000VAC QLD 4013 PH (07) 3371 7000 FAX (07) 3371 5870 EMAIL - mail@etsgroup.net.au		SUNSHINE COAST 20 BUNDABERG PARKWAY, BUNDABERG QLD 4670 PH (07) 5438 8100 FAX (07) 5438 8200 EMAIL - mail@etsgroup.net.au	
PAPUA NEW GUINEA PORT MORESBY 5TH FLOOR, 1111 HIGHWAY HOUSE, PO BOX 906 TEL (675) 321 1233 FAX (675) 321 7853 EMAIL - 400mg@etsgroup.net.au		ARCHITECTS CIVIL & STRUCTURAL ENGINEERS		ETS GROUP www.etsgroup.net.au		JOB CODE: ULDSFC SHEET NUMBER: SK08 REV: P1	

URBAN LAND DEVELOPMENT AUTHORITY
FITZGIBBON CHASE
153 TELEGRAPH ROAD, FITZGIBBON
WATER RETICULATION LAYOUT PLAN - SHEET 1

153 TELEGRAPH ROAD, FITZGIBBON

FITZGIBBON CHASE

URBAN LAND DEVELOPMENT AUTHORITY

SCALE 1:1000 (A1)



SCALE

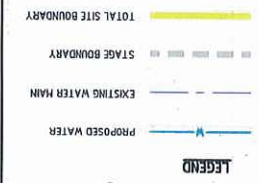
KERN HANWELL'S
SITING PLAN REF: 2005
M/BO 2205

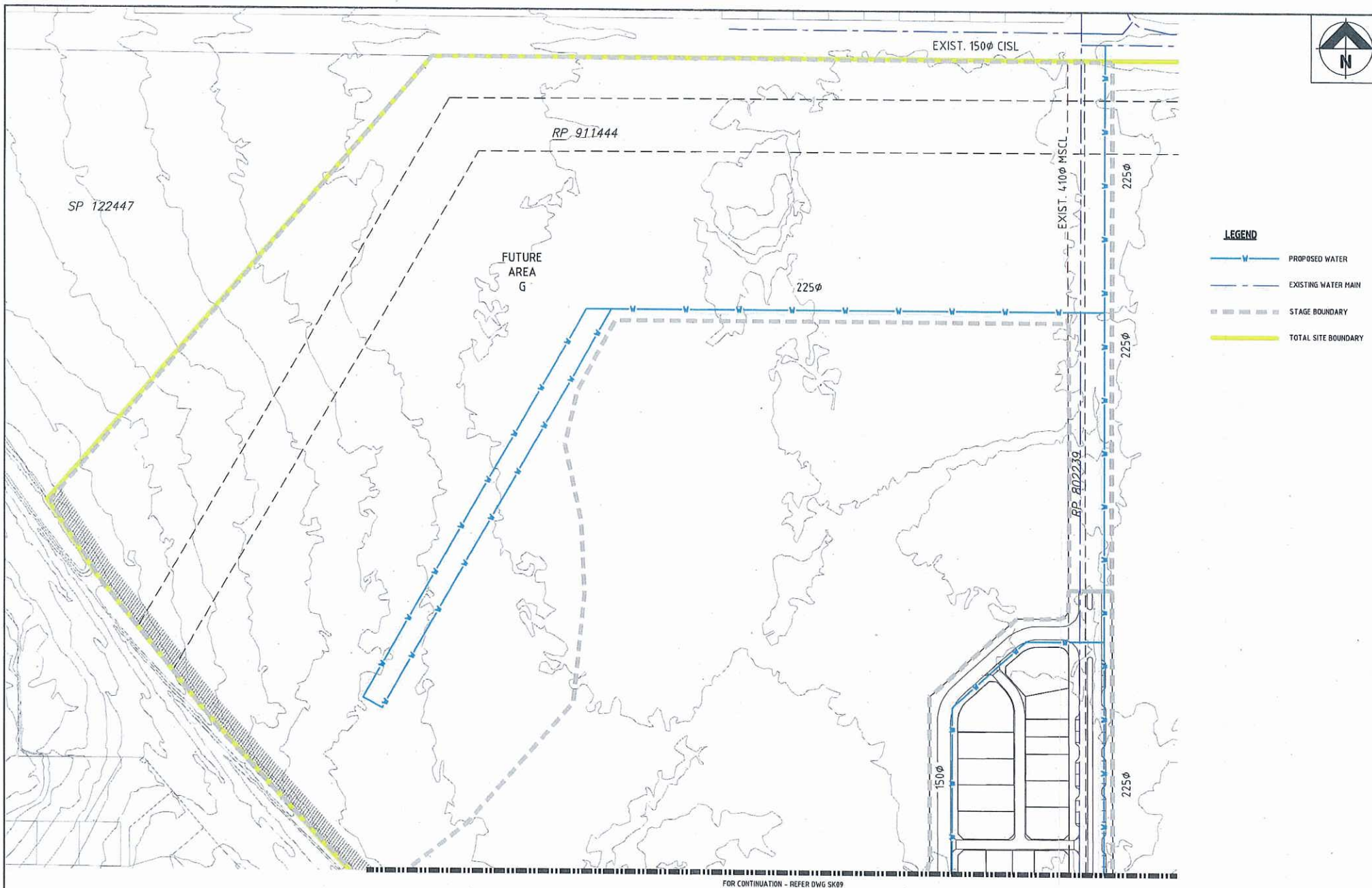
APPROVED

DATE



	
SK09 SHORT TAPPING P1	ULDSC JOB CODE





FOR CONTINUATION - REFER DWG SK09

ASSOCIATED CONSULTANTS				CLIENT				URBAN LAND DEVELOPMENT AUTHORITY				DR-SKETCHED		DATE		APPROVED				DATE		BRISBANE				AUSTRALIA				SUNSHINE COAST				JOB CODE:			
				PROJECT				FITZGIBBON CHASE				DRAWN		AL		KATH HANWELL REGISTERED PLANNER				RINO TIO REGISTERED PLANNER				555 CORONATION DRIVE, TODDINGTON QLD 4263 PH (07) 3371 7000 FAX: (07) 3371 5873 EMAIL: - info@uldsfc.com.au				20 BRINDAVANT PARWAY, BIRBITTA QLD 4575 PH (07) 5438 8100 FAX: (07) 5438 8200 EMAIL: - info@uldsfc.com.au				ULDSFC					
				LOCATION				153 TELEGRAPH ROAD, FITZGIBBON				CHECKED		DATE		SCALE				0 20 40 60m				PAPUA NEW GUINEA				POST MORREBY				SHEET NUMBER: REV:					
				SHEET				WATER RETICULATION LAYOUT PLAN - SHEET 5 OF 5				DATE		JANUARY 2010		SCALE 1:1000 (A1)				5TH FLOOR, CONNOR STREET HOUSE, PO BOX 908 TELEPHONE: (075) 231 1335 FACSIMILE: (075) 231 7853 EMAIL: - info@uldsfc.com.au				ARCHITECTS				CIVIL & STRUCTURAL ENGINEERS				SK10 P					
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