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SUNDALE GARDEN VILLAGE

McKinnon Drive, Tewantin

Water Supply Analysis

070407-001

December 2009

Infrastructure

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PROJECT 070407-001 – MCKINNON DRIVE – COVEY & ASSOSIATES

REV	DESCRIPTION	ORIG	REVIEW	WORLEY-PARSONS APPROVAL	DATE	CLIENT APPROVAL	DATE
0	Issued for internal review	P.Shah	K.Page	N/A	13-10-08	N/A	
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2	Revised Layout	K. Page	R. Savage		07-12-09		

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FIGURES

APPENDICES

1. INTRODUCTION

The proposed development is situated at McKinnon Drive, Noosa and includes the following development:

- Lot 2 on RP220516 and Lot 86 on MCH1415.
- The development will consist of Duplex Units and an Aged Care Centre

This report analyses the Noosa Shire water supply reticulation network in the Tewantin Water Supply Zone (WSZ) to ensure that the system provides Maximum Hour (MH) demand and fire-fighting flow within the development in compliance with the Sunshine Coast Regional Council (SCRC) desired Level of Service (LOS) and does not disadvantage existing customers within the zone.

To ensure Levels of Service (LOS) are maintained across all planning horizons, the proposed development has been analyzed for the Existing (2007) and Ultimate SCRC Water Supply Systems.

This report consists of:

- The Equivalent Tenant (ET) calculation for the proposed development;
- Design Criteria for the proposed development;
- Assesses Maximum Hour (MH) demand and desired fire-fighting flow within the development;
- Sizes the internal reticulation of the proposed development;
- Assesses the performance of the Existing (2007) and Headworks (Ultimate) Noosa Shire water supply systems in the Tewantin WSZ in relation to servicing the additional demand from the proposed development.
- Summarizes the analysis carried out.

2. PROPOSED DEVELOPMENT

2.1 Scope of Analysis

The following analysis has been performed utilising H2OMap models (Noosa Ultimate Planning Report, WorleyParsons, March 2008). It should be noted that this report concerns the water demand from the proposed development at McKinnon Drive, Tewantin in isolation.

The SCRC Existing and Ultimate models used in this assessment do not contain demands from recently proposed and approved developments outside of the proposed and approved developments for the proposed development. These models do however contain areas of future growth potential and augmentations to the water supply network as detailed in the SCRC Water Supply Master Planning.

This assessment has addressed technical matters only. The servicing of the land by the water supply systems will ultimately require Council Approval. Likewise any system augmentations suggested will again require the approval of Council and should not be regarded as being representative of Council's position.

3. WATER SUPPLY

3.1 Design Criteria

The reticulation network has been assessed based on the SCRC design criteria, which are in general consistent with the *Department of Natural Resources and Mines Planning Guidelines for Water Supply and Sewerage (March 2005)*. Analysis has been performed to assess the capacity of the Existing and Headworks water networks in delivering the desired SCRC LOS to the point of connection of the proposed development. The SCRC design criteria adopted for this investigation are:-

1. Existing and Headworks Average Day (AD) water demands of 850 L/ET/day;

2. Maximum Day (MD): AD peaking factor of 1.7

3.2 Development Loading

The subject land consists approximately of 8.6Ha and if the development is to occur, it will become part of the Tewantin Water Supply System.

SCRC adopts an ET as the basis for water supply infrastructure planning. Based on the information provided by the developer, the water demand for the proposed development is detailed in Table 3.1.

Table 3.1 Proposed Development Water Demand

Development Type	No. of Type	Unit Demand	Demand (EP)	Occupancy (EP/ET)	Demand (ET)
Duplex Units	180	2.3 EP/Unit	414	3.3	125
Aged Care Centre	60	1 EP/Bed	60.0	3.3	18.2
Kitchen	1	3.3 EP/500m2	1.43	3.3	0.44
Clubhouse	1	3.3 EP/500m2	4.65	3.3	1.4
Multipurpose Room	1	3.3 EP/500m2	3.49	3.3	1.1
Total			**483.57**		**146.14**

3.3 Existing Water Supply System

The proposed development is located within Tewantin reservoir complex (24.5 ML) located adjacent to Gumboil Road, Tewantin.

The proposed development would be supplied via the following connection point (Refer Figure W1):

- It is proposed to connect the development to the existing system via 1 point along an existing 375mm diameter main within McKinnon Drive.
- The proposed development would become part of the Tewantin District Meter Area (DMA). The Tewantin DMA PRV is located within McKinnon Drive and operates at a duty point of 60.0m pressure in Existing scenario and operates at a duty point 74.0m in Ultimate scenario.
- To supply the proposed development a network of 100mm diameter main would be required (Refer Figure W1).

3.4 Bulk Water Supply Impacts

The proposed development site is to be supplied by the Tewantin Reservoirs. The parcel of land is located within the SCRC Headworks boundary and has an Ultimate demand allocation of 134.2ET.

The demand from the proposed development is within the Ultimate allocated demand for the subject site, thus no Bulk Water analysis is required.

4. NETWORK ANALYSIS AND RESULTS

4.1 Design Cases

The demand from the proposed development was added to the H2OMap network models of the Existing (2007) and Ultimate SCRC water supply systems.

The following analyses have been performed:

1. A dynamic analysis under MH conditions for the Existing system, with the demand from the proposed development.

2. A static analysis under Fire Flow conditions (15 L/s) for the Existing system, with the demand from the proposed development.

3. A dynamic analysis under MH for the Ultimate system, with the demand from the proposed development.

4. A static analysis under Fire Flow conditions (15 L/s) for the Ultimate system, with the demand from the proposed development.

4.2 2007 System Analysis

The results for the proposed development from the SCRC water supply network during MH demand and under fire fighting conditions for the Existing system are given in Table 4.1 and Table 4.2 respectively. The proposed internal reticulation and node identities are shown in Figure W1 and Appendix A provides the results of the development demand nodes under existing conditions.

Table 4.1 Results under Maximum Hour Conditions at the Critical Node within the Existing System

Node Identifier	HGL (m)	Pressure (m)	Acceptance Criteria	Result
MD24	59.73	55.73	>22m	Satisfactory

Table 4.2 Results under Fire Flow Conditions at the Critical Node within the Existing System

Node Identifier	Fire Flow (L/s)	Residual Pressure (m)	Acceptance Criteria	Result
MD24	15	25.27	>12m	Satisfactory

The above analysis demonstrates that the existing Tewantin water supply system is capable of supplying the development in accordance with the design criteria.

4.3 Ultimate System Analysis

The results for the proposed development from the SCRC water supply network during MH demand and under fire fighting conditions for the Ultimate system are given in Table 4.3 and Table 4.4 respectively. Appendix B provides the results of the development demand nodes under Ultimate conditions.

Table 4.3 Results under Maximum Hour Conditions at the Point of Connection with the Headworks System

Node Identifier	HGL (m)	Pressure (m)	Acceptance Criteria	Result
MD24	72.96	68.96	>22m	Satisfactory

Table 4.4 Results under Fire Flow Conditions at the Point of Connection with the Headworks System

Node Identifier	Fire Flow (L/s)	Residual Pressure (m)	Acceptance Criteria	Result
MD24	15	38.5	>12m	Satisfactory

The above analysis demonstrates that the Ultimate SCRC water supply system is capable of supplying the development in accordance with the design criteria.

4.4 Internal Water Reticulation Sizing

Connection to areas surrounding the proposed development have been considered in the design of the internal reticulation with the proposed 100mm diameter reticulation deemed adequate to service SCRC LOS for Maximum Hour & Fire Flow conditions (Refer Figure W1).

4.5 Effects on Existing Customers

The proposed development does not significantly impact on the capacity of other surrounding areas within the existing network and does not contravene the principle of “no disadvantage” to existing customers.

5. SUMMARY

5.1 Water Supply Analysis

The proposed development is situated at McKinnon Drive, Tewantin

The proposed development is located within the SCRC water supply Headworks boundary and would become part of the Tewantin WSZ.

The water supply analysis is summarized below:

1. The Tewantin Reservoirs and Tewantin Pumping Station have adequate capacity to service the proposed development within the Tewantin WSZ for Existing (2007) and Ultimate conditions.

2. Sufficient capacity exists within the Tewantin water supply system to provide Noosa Shire Levels of Service to the proposed development for Existing (2007) and Ultimate conditions.

3. The proposed development does not significantly impact on the capacity of Tewantin WSZ and does not contravene the principle of “no disadvantage” to existing customers.

6. QUALIFICATION

1. In preparing the report WorleyParsons has exercised the degree of skill and care and diligence normally exercised by members of the engineering profession and has acted in accordance with accepted practices of engineering design principles.

2. WorleyParsons has used all reasonable endeavours to inform itself of the parameters and requirements of the project and has taken all reasonable steps to ensure that the report is as accurate and comprehensive as possible given the information upon which it is based.

3. It is not intended that this report represent a final assessment of the feasibility of the project.

4. WorleyParsons reserves the right to review and amend all calculations and/or opinions included or referred to in the report if additional sources of information not presently available (for whatever reason) are provided or become known to WorleyParsons.

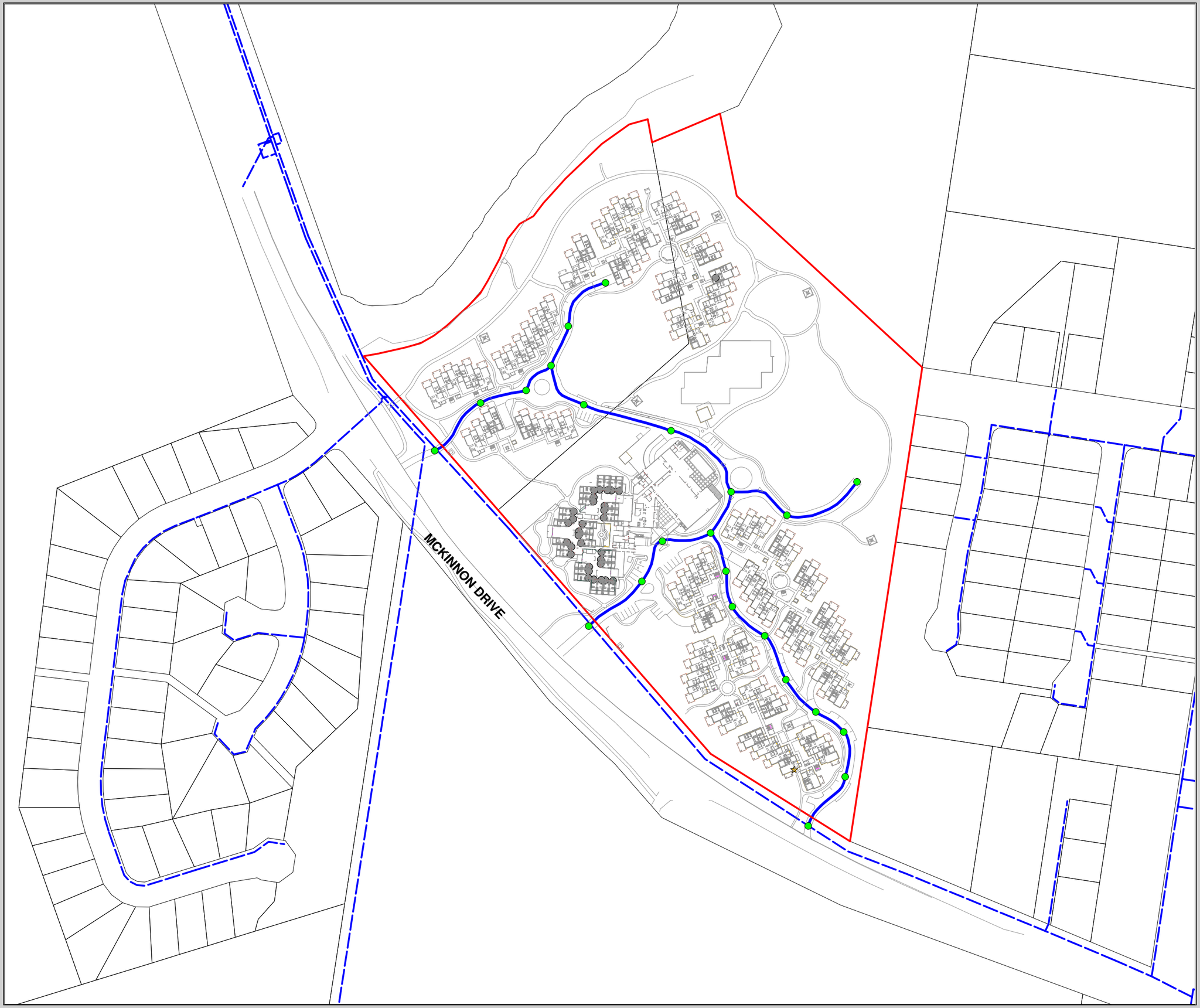
5. The report is preliminary only and restricted in that certain information is obtained from external sources and has not been independently verified.

9. This report is for the use of the party to whom it is addressed and for no other persons. No responsibility is accepted to any third party for the whole or part of the contents of this report.

10. If any claim or demand is made by any person against WorleyParsons on the basis of detriment sustained or alleged to have been sustained as a result of reliance upon the report or information therein, WorleyParsons will rely upon this provision as a defense to any such claim or demand.

Figures

Figure W 1 Proposed Reticulation



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W E
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LEGEND:

- PROPOSED 100mm WATER PIPE
- EXISTING WATER PIPE
- PROPOSED NODES
- PROPOSED DEVELOPMENT BOUNDARY

MCKINNON DRIVE TIWANTING

FIGURE W1

PROPOSED WATER RETICULATION

NOT TO SCALE

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Appendix A
Existing System – Network Results

Table A1 – Proposed Subdivision Existing Max Hour Network Results

ID	Demand (L/s)	Elevation (m)	Head (m)	Pressure (m)
NBC026	0	4	60.7	56.7
MD8	0.24	4	60.04	56.04
MD7	0.17	4	60.03	56.03
MD6	0.15	4	60.02	56.02
MD5	0.15	4	60.02	56.02
MD4	0.18	4	60.01	56.01
MD3	0.12	4	60.01	56.01
MD26	1.13	2	59.71	57.71
MD24	0.13	4	59.73	55.73
MD23	0.08	2	59.73	57.73
MD21	0.31	2	59.73	57.73
MD20	0.22	2	59.73	57.73
MD2	0.17	4	60.01	56.01
MD19	0.31	2	59.79	57.79
MD18	0.01	2	59.88	57.88
MD16	0.12	2	59.98	57.98
MD15	0.12	4	59.98	55.98
MD14	0.19	2	59.98	57.98
MD13	0.08	4	60.06	56.06
MD12	0.3	4	60.22	56.22
MD11	0.3	4	60.39	56.39

Table A2 – Proposed Subdivision Existing Fire Flow Network Results

ID	Static Demand (L/s)	Static Pressure (m)	Static Head (m)	Fire-Flow Demand (L/s)	Residual Pressure (m)
NBC026	0	56.7	60.7	15	56.51
MD8	0.24	56.04	60.04	15	43.39
MD7	0.17	56.03	60.03	15	41.68
MD6	0.15	56.02	60.02	15	38.61
MD5	0.15	56.02	60.02	15	37.46
MD4	0.18	56.01	60.01	15	35.86
MD3	0.12	56.01	60.01	15	33.6
MD26	1.13	57.71	59.71	15	29.98
MD24	0.13	55.73	59.73	15	25.27
MD23	0.08	57.73	59.73	15	29.5
MD21	0.31	57.73	59.73	15	31.8
MD20	0.22	57.73	59.73	15	32.77
MD2	0.17	56.01	60.01	15	31.98
MD19	0.31	57.79	59.79	15	36.03
MD18	0.01	57.88	59.88	15	40.37
MD16	0.12	57.98	59.98	15	38.33
MD15	0.12	55.98	59.98	15	40.17
MD14	0.19	57.98	59.98	15	44.99
MD13	0.08	56.06	60.06	15	45.53
MD12	0.3	56.22	60.22	15	48.56
MD11	0.3	56.39	60.39	15	51.44

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Appendix B

Ultimate System – Network Results

Table B1 – Proposed Subdivision Ultimate Max Hour Network Results

ID	Demand (L/s)	Elevation (m)	Head (m)	Pressure (m)
NBC026	0	4	73.94	69.94
MD8	0.24	4	73.27	69.27
MD7	0.17	4	73.27	69.27
MD6	0.15	4	73.25	69.25
MD5	0.15	4	73.25	69.25
MD4	0.18	4	73.25	69.25
MD3	0.12	4	73.25	69.25
MD26	1.13	2	72.94	70.94
MD24	0.13	4	72.96	68.96
MD23	0.08	2	72.96	70.96
MD21	0.31	2	72.96	70.96
MD20	0.22	2	72.97	70.97
MD2	0.17	4	73.25	69.25
MD19	0.31	2	73.02	71.02
MD18	0.01	2	73.12	71.12
MD16	0.12	2	73.22	71.22
MD15	0.12	4	73.22	69.22
MD14	0.19	2	73.22	71.22
MD13	0.08	4	73.29	69.29
MD12	0.3	4	73.45	69.45
MD11	0.3	4	73.63	69.63

Table B2 – Proposed Subdivision Existing Fire Flow Network Results

ID	Static Demand (L/s)	Static Pressure (m)	Static Head (m)	Fire-Flow Demand (L/s)	Residual Pressure (m)
NBC026	0	69.94	73.94	15	69.45
MD8	0.24	69.27	73.27	15	56.62
MD7	0.17	69.27	73.27	15	54.92
MD6	0.15	69.25	73.25	15	51.84
MD5	0.15	69.25	73.25	15	50.69
MD4	0.18	69.25	73.25	15	49.1
MD3	0.12	69.25	73.25	15	46.84
MD26	1.13	70.94	72.94	15	43.21
MD24	0.13	68.96	72.96	15	38.5
MD23	0.08	70.96	72.96	15	42.73
MD21	0.31	70.96	72.96	15	45.03
MD20	0.22	70.97	72.97	15	46.01
MD2	0.17	69.25	73.25	15	45.22
MD19	0.31	71.02	73.02	15	49.26
MD18	0.01	71.12	73.12	15	53.61
MD16	0.12	71.22	73.22	15	51.57
MD15	0.12	69.22	73.22	15	53.41
MD14	0.19	71.22	73.22	15	58.23
MD13	0.08	69.29	73.29	15	58.76
MD12	0.3	69.45	73.45	15	61.79
MD11	0.3	69.63	73.63	15	64.68