

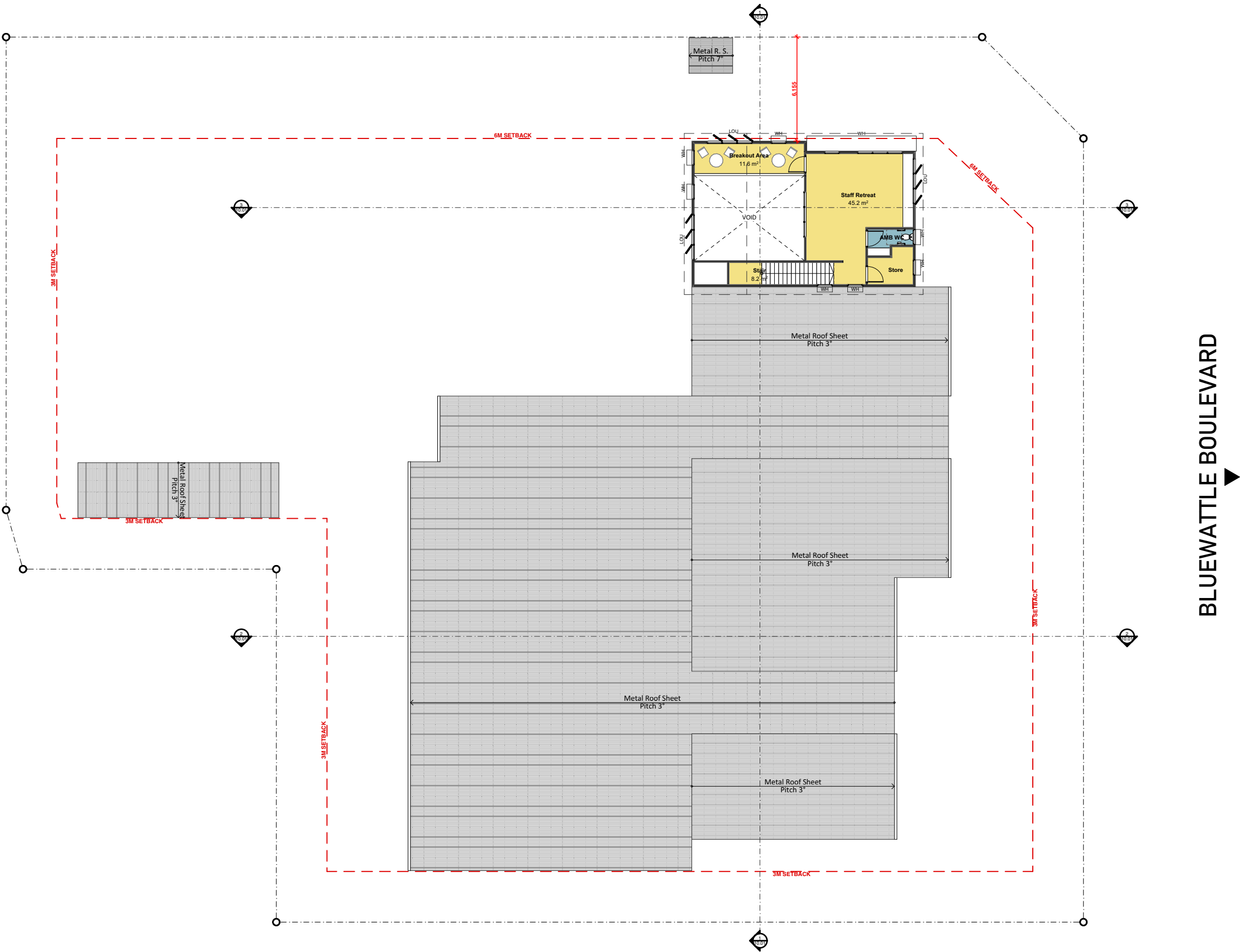
SALTBUSH BOULEVARD

LEGEND

B Bollard
LOU Fixed Louvre
WH Window Hood

Notes

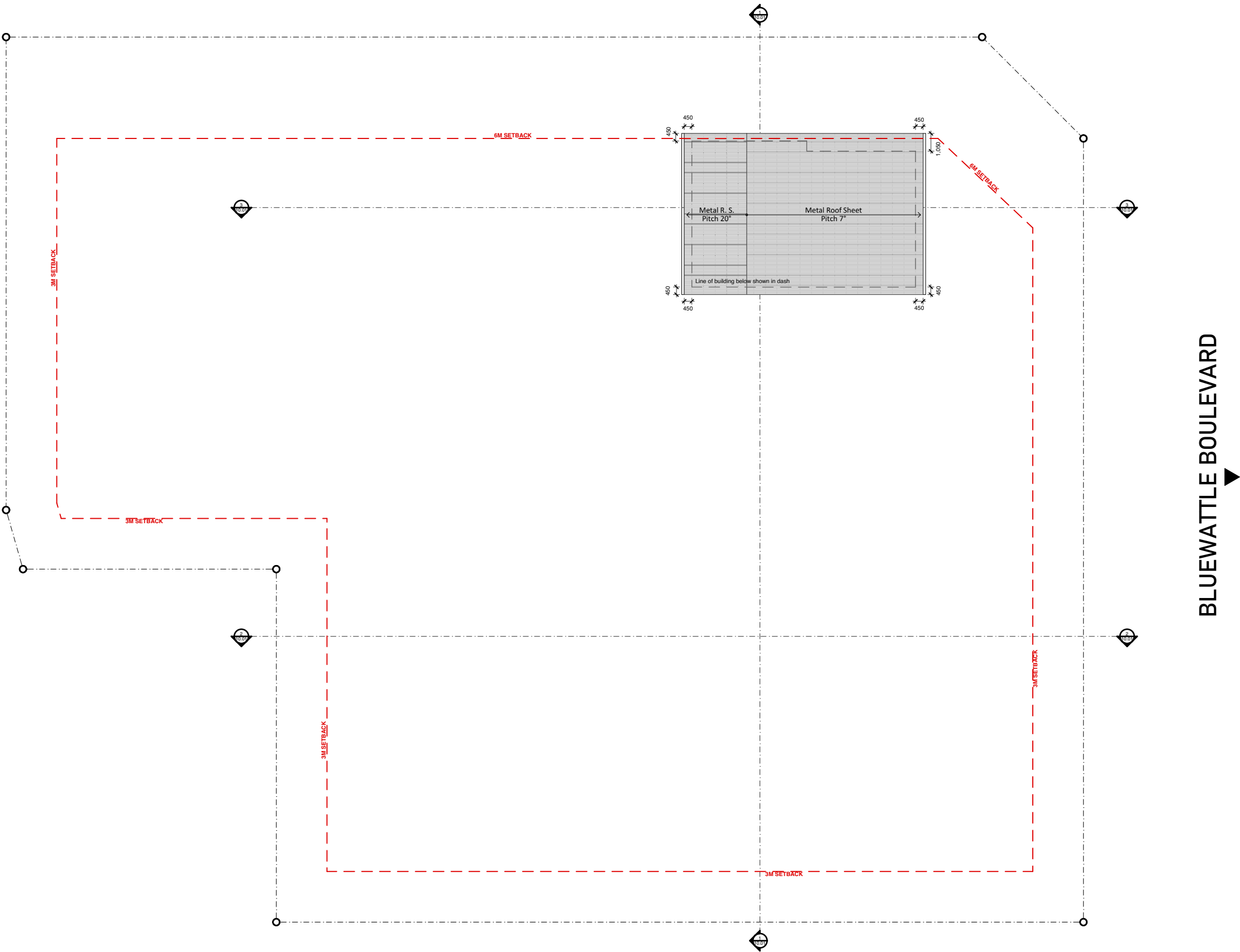
1. All ancillary equipments to be screened from both streetscapes.
2. Shade sail shown on plans are indicative only, location and extents are subjected to future playscape design and confirmation with childcare operator.
3. Refer to consultant's drawing for landscaping and streetscape detail.



DA
NOT FOR CONSTRUCTION



SALTBUSH BOULEVARD

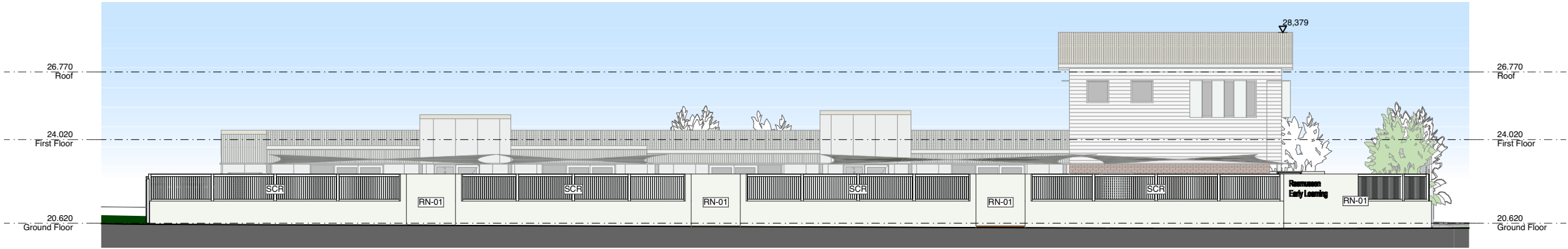


DA
NOT FOR CONSTRUCTION





1 North
- Scale 1:200



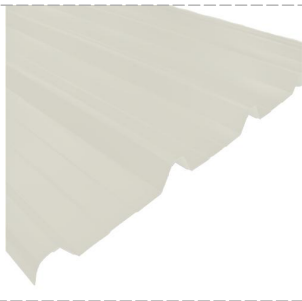
2 North - Fencing
- Scale 1:200

LEGEND

- B Bollard
LOU Fixed Louvre
WH Window Hood

Notes

1. All ancillary equipments to be screened from both streetscapes.
2. Shade sail shown on plans are indicative only, location and extents are subjected to future playscape design and confirmation with childcare operator.
3. Refer to consultant's drawing for landscaping and streetscape detail.



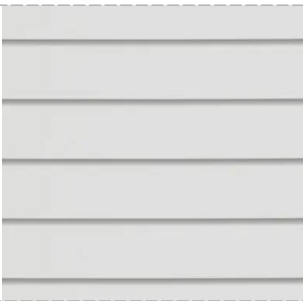
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METAL CLADDING
(LIGHT FINISH)



CLD-02
900MM FIBRE CEMENT PANELS
(WHITE FINISH)



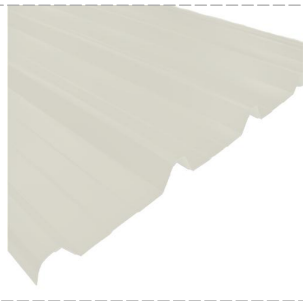
CLD-03
STANDARD BRICK
(NATURAL FINISH)



CLD-04
WEATHERBOARD
(WHITE FINISH)



CLD-05
FIBRE CEMENT PANELS
EXPRESSED JOINT
(WHITE FINISH)



RT-01
METAL ROOF SHEETTING
(LIGHT FINISH)



SCR
BATTENED SCREEN
(LIGHT FINISH)



RN-01
RENDERED BLOCK
(WHITE FINISH)



SHADE SAIL
INDICATIVE ONLY
SUBJECT TO FUTURE PLAYSCAPE DESIGN

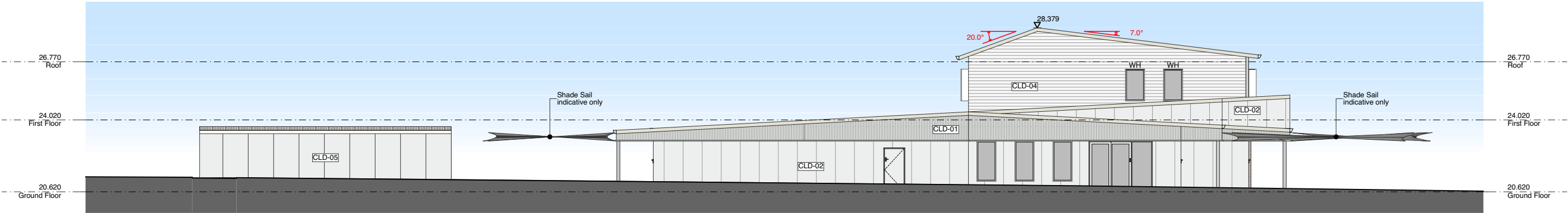
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LEGEND

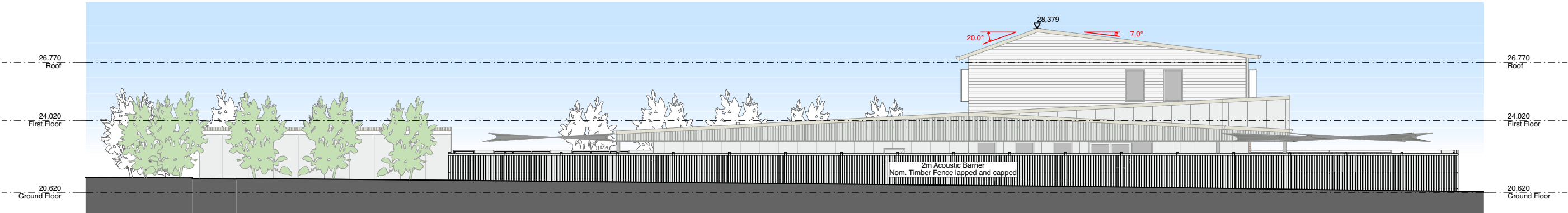
B Bollard
LOU Fixed Louvre
WH Window Hood

Notes

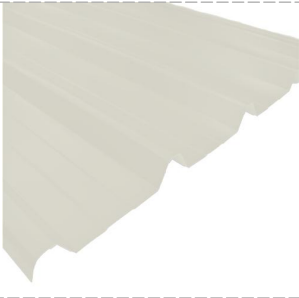
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- All ancillary equipments to be screened from both streetscapes.
2.
- Shade sail shown on plans are indicative only, location and extents are subjected to future playscape design and confirmation with childcare operator.
3.
- Refer to consultant's drawing for landscaping and streetscape detail.



1 East
Scale 1:200



2 East - Fencing
Scale 1:200



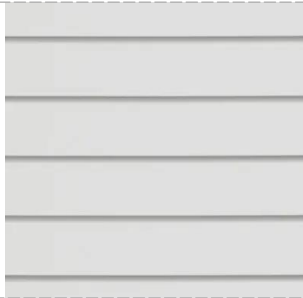
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(LIGHT FINISH)



CLD-02
900MM FIBRE CEMENT PANELS
(WHITE FINISH)



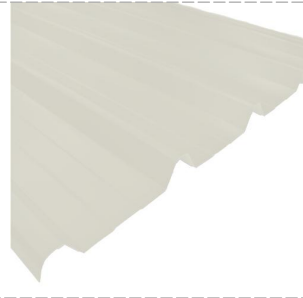
CLD-03
STANDARD BRICK
(NATURAL FINISH)



CLD-04
WEATHERBOARD
(WHITE FINISH)



CLD-05
FIBRE CEMENT PANELS
EXPRESSED JOINT
(WHITE FINISH)



RT-01
METAL ROOF SHEETING
(LIGHT FINISH)



SCR
BATTENED SCREEN
(LIGHT FINISH)



RN-01
RENDERED BLOCK
(WHITE FINISH)



SHADE SAIL
INDICATIVE ONLY
SUBJECT TO FUTURE PLAYScape DESIGN

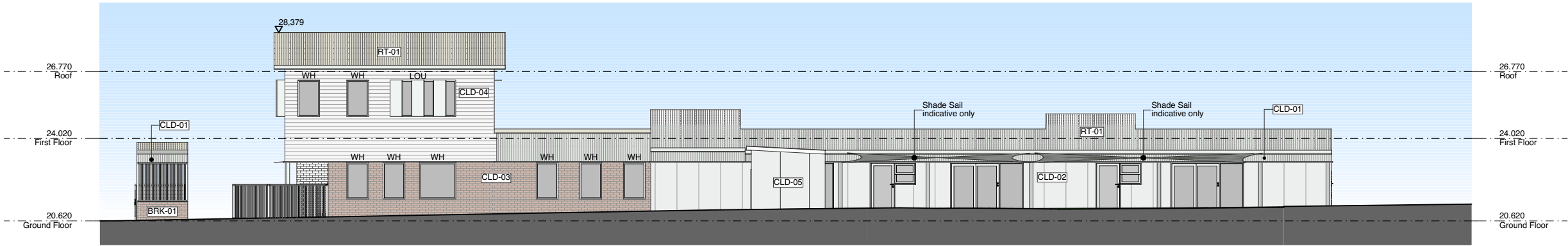
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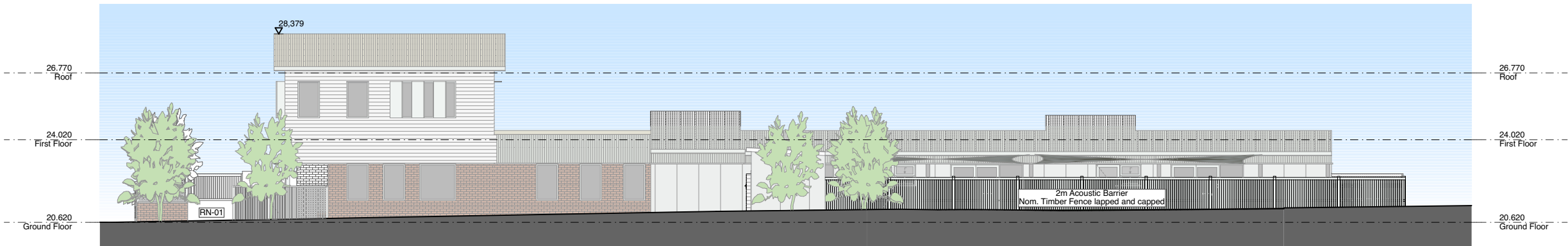
B Bollard
LOU Fixed Louvre
WH Window Hood

Notes

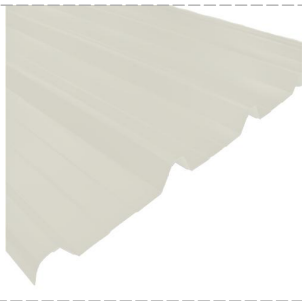
1. All ancillary equipments to be screened from both streetscapes.
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3. Refer to consultant's drawing for landscaping and streetscape detail.



1 South
- Scale 1:200



2 South - Fencing
- Scale 1:200



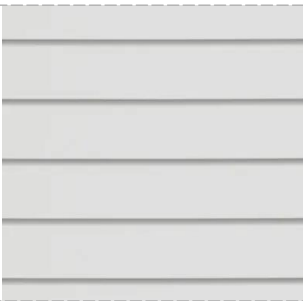
CLD-01
METAL CLADDING
(LIGHT FINISH)



CLD-02
900MM FIBRE CEMENT PANELS
(WHITE FINISH)



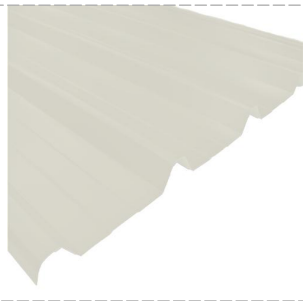
CLD-03
STANDARD BRICK
(NATURAL FINISH)



CLD-04
WEATHERBOARD
(WHITE FINISH)



CLD-05
FIBRE CEMENT PANELS
EXPRESSED JOINT
(WHITE FINISH)



RT-01
METAL ROOF SHEETING
(LIGHT FINISH)



SCR
BATTENED SCREEN
(LIGHT FINISH)



RN-01
RENDERED BLOCK
(WHITE FINISH)



SHADE SAIL
INDICATIVE ONLY
SUBJECT TO FUTURE PLAYScape DESIGN

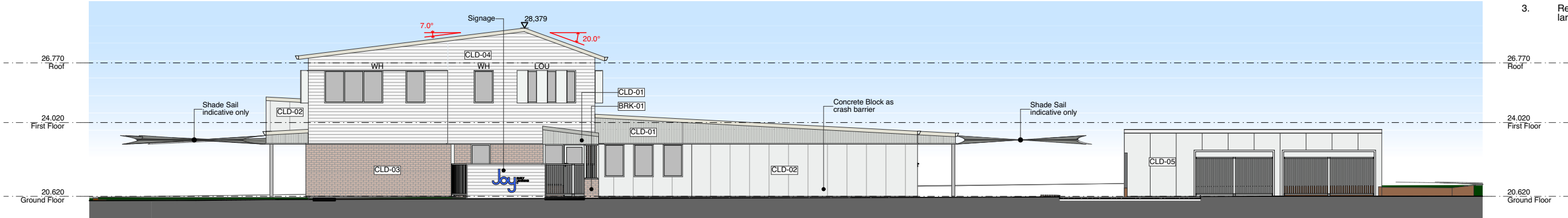
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NOT FOR CONSTRUCTION

LEGEND

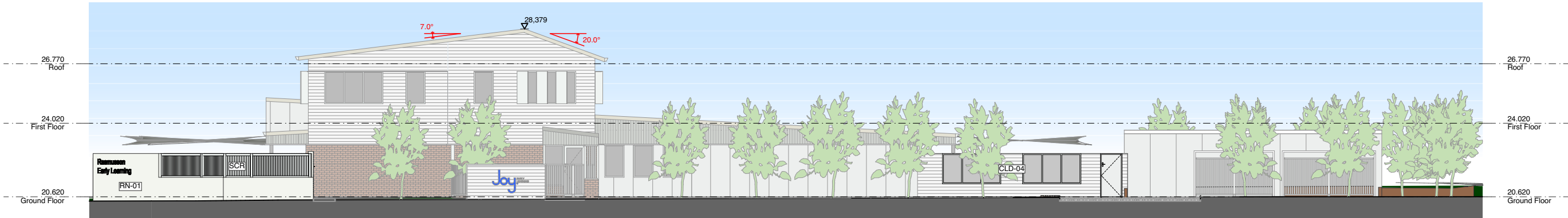
B Bollard
LOU Fixed Louvre
WH Window Hood

Notes

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3. Refer to consultant's drawing for landscaping and streetscape detail.



1 West
- Scale 1:200



2 West - Fencing
- Scale 1:200



CLD-01
METAL CLADDING
(LIGHT FINISH)



CLD-02
900MM FIBRE CEMENT PANELS
(WHITE FINISH)



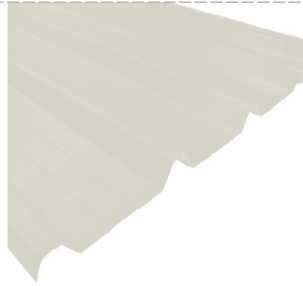
CLD-03
STANDARD BRICK
(NATURAL FINISH)



CLD-04
WEATHERBOARD
(WHITE FINISH)



CLD-05
FIBRE CEMENT PANELS
EXPRESSED JOINT
(WHITE FINISH)



RT-01
METAL ROOF SHEETTING
(LIGHT FINISH)



SCR
BATTENED SCREEN
(LIGHT FINISH)

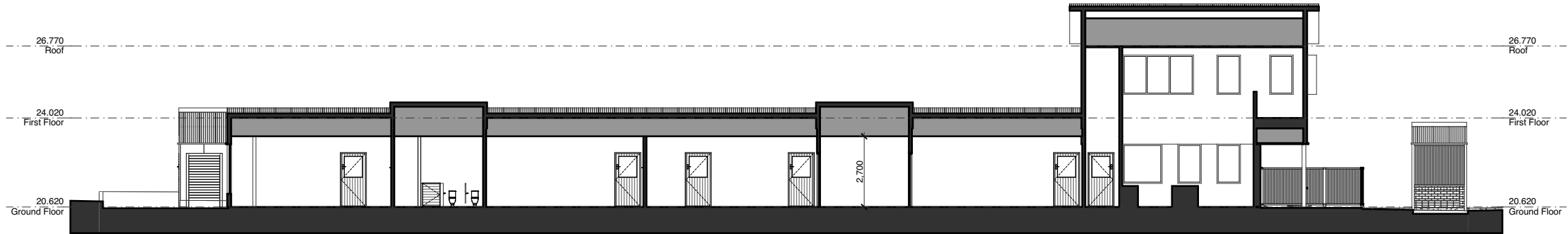


RN-01
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(WHITE FINISH)

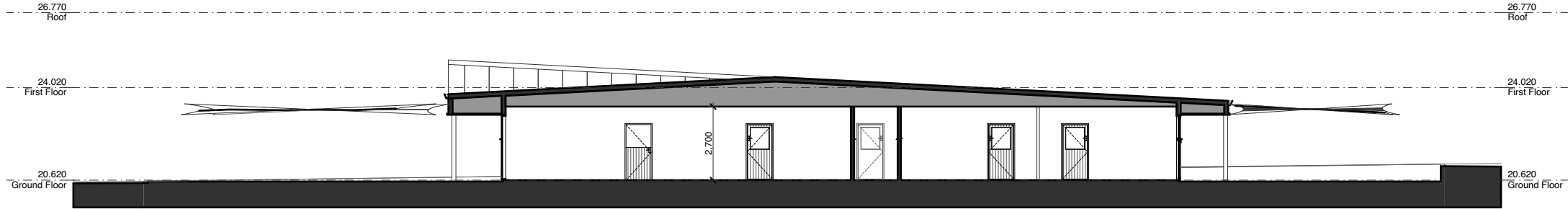


SHADE SAIL
INDICATIVE ONLY
SUBJECT TO FUTURE PLAYSCAPE DESIGN

DA
NOT FOR CONSTRUCTION



1 Section A
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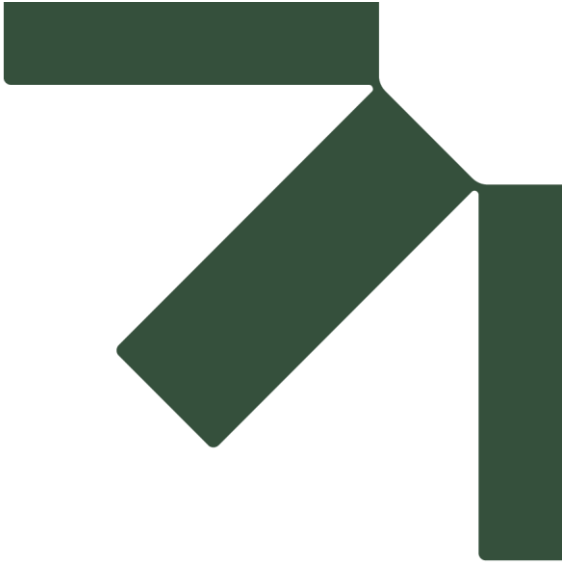


2 Section B
- Scale 1:200



3 Section C
- Scale 1:200

DA
NOT FOR CONSTRUCTION



Appendix C Ambient Noise Monitoring Graphs

**Rasmussen Early Learning Centre, Lot 194 Saltbush
Boulevard, Rasmussen**

Noise Impact Assessment

Belo Developments Pty Ltd

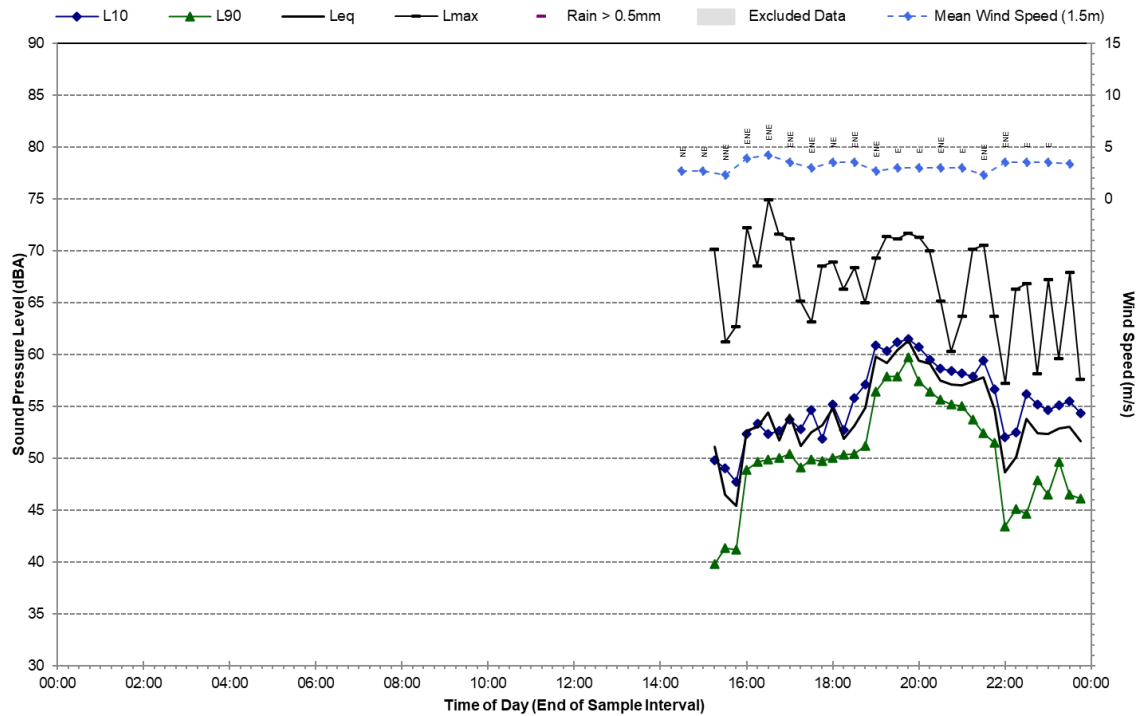
SLR Project No.: 620.043108.00001

18 February 2026



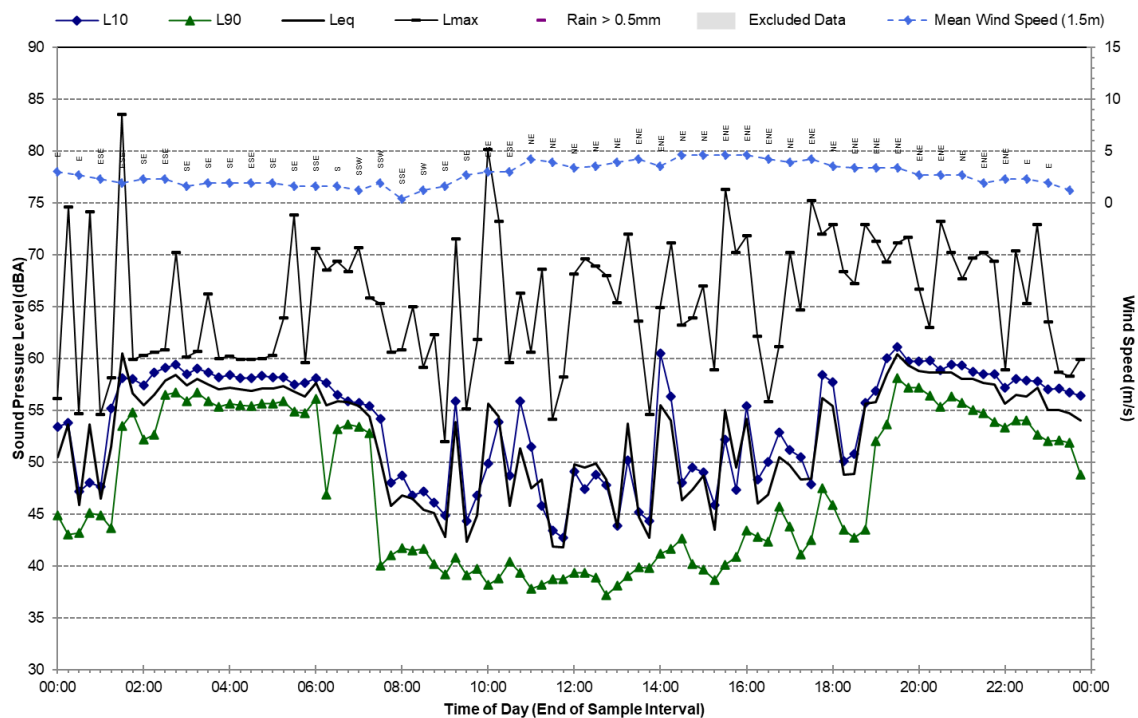
Statistical Ambient Noise Levels

Noise Monitoring Location - Thursday, 29 January 2026



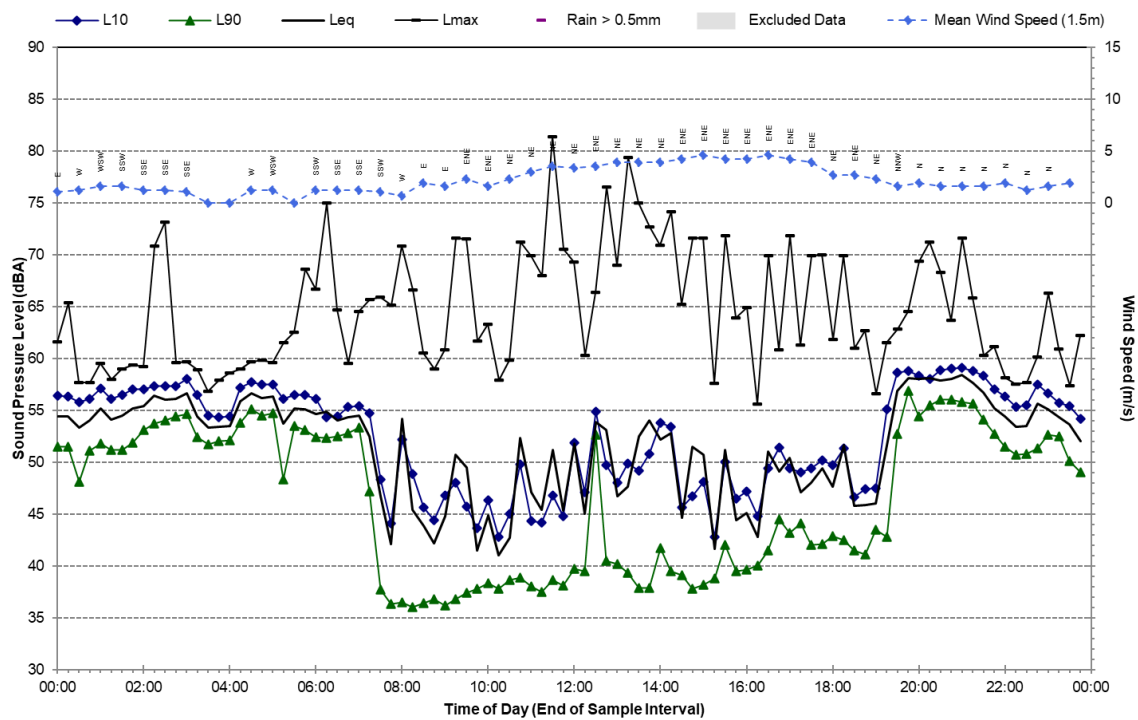
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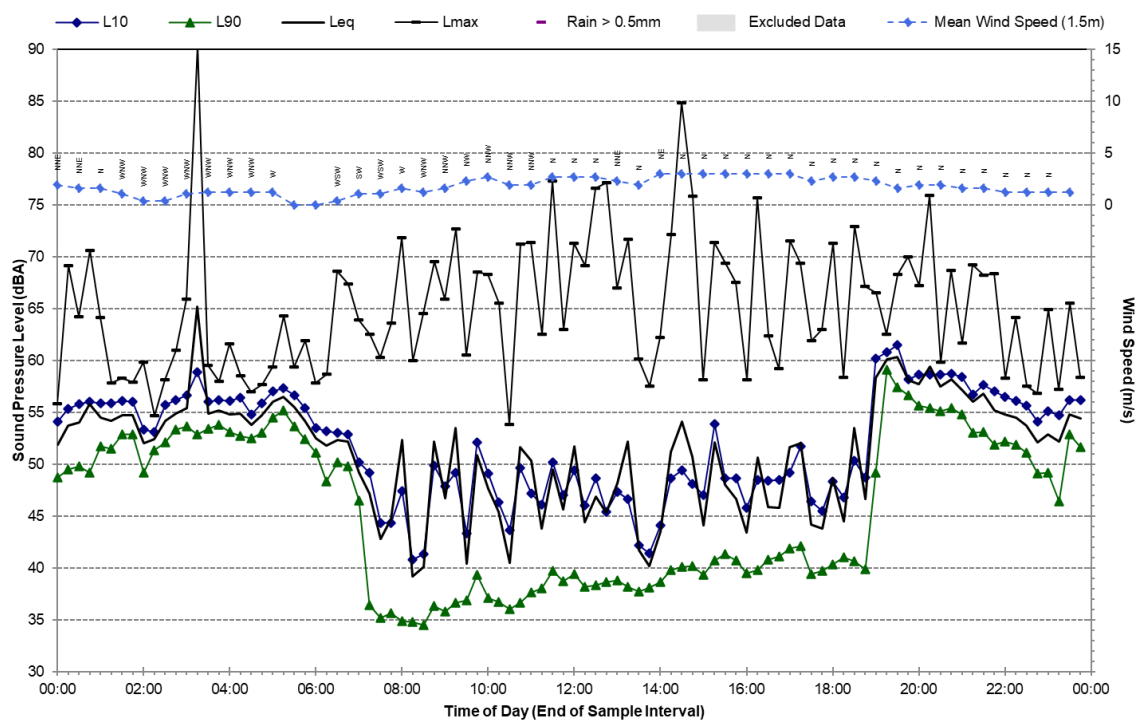
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Noise Monitoring Location - Saturday, 31 January 2026



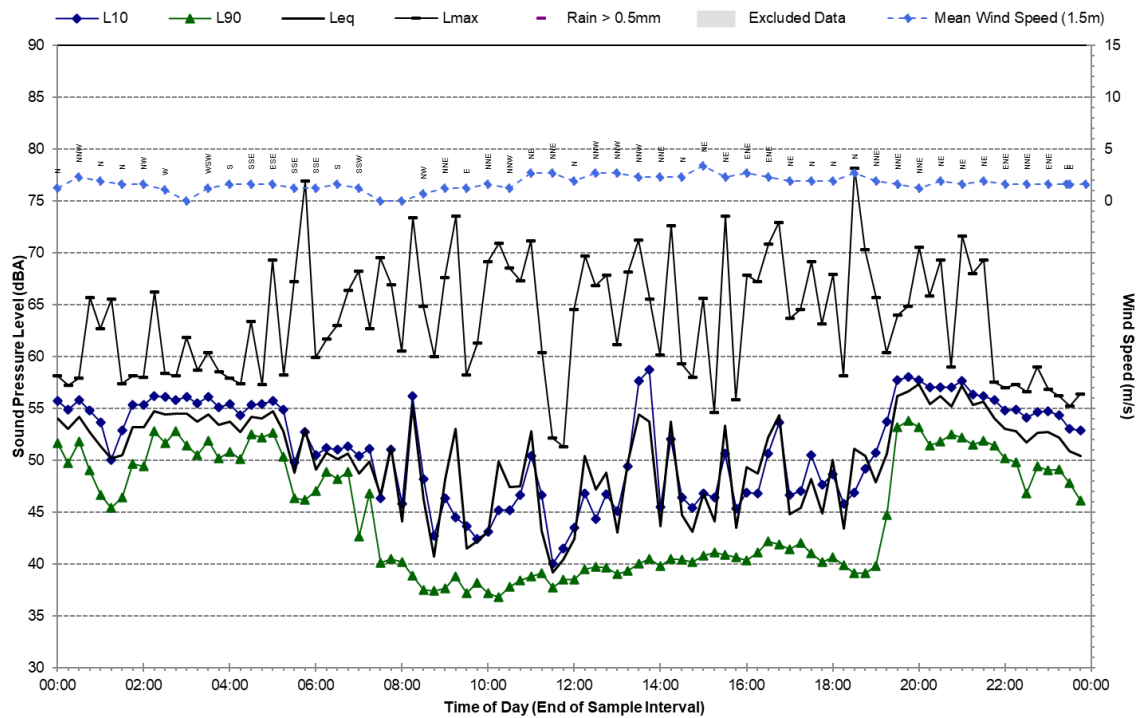
Statistical Ambient Noise Levels

Noise Monitoring Location - Sunday, 1 February 2026



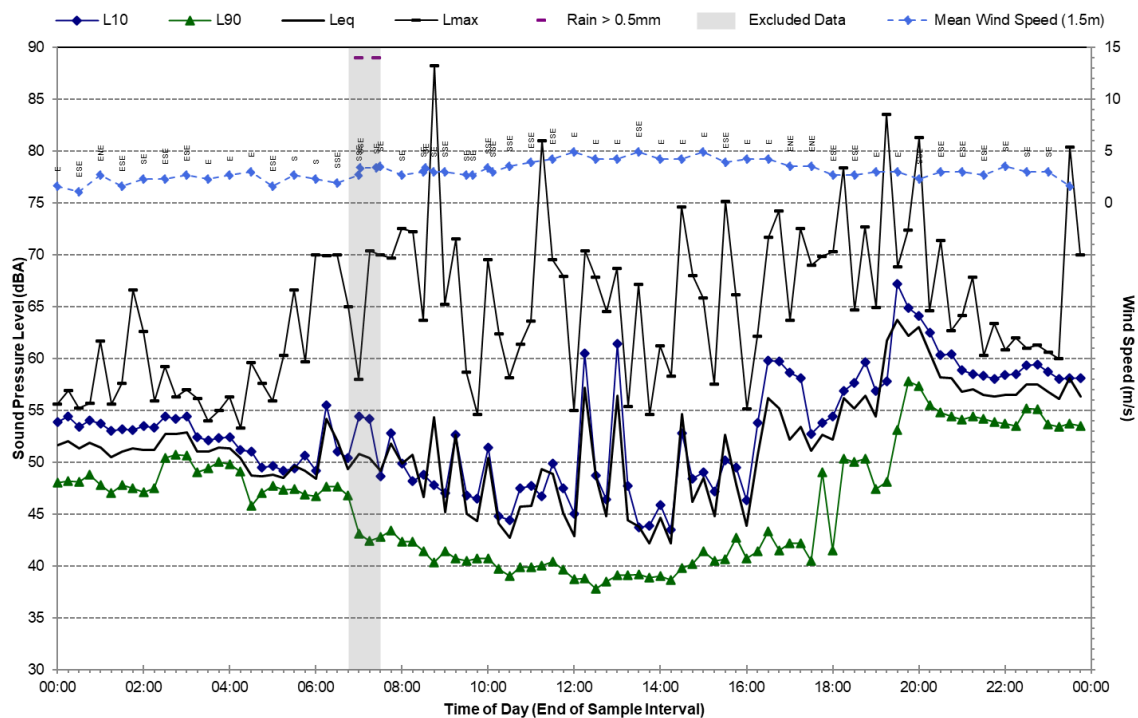
Statistical Ambient Noise Levels

Noise Monitoring Location - Monday, 2 February 2026



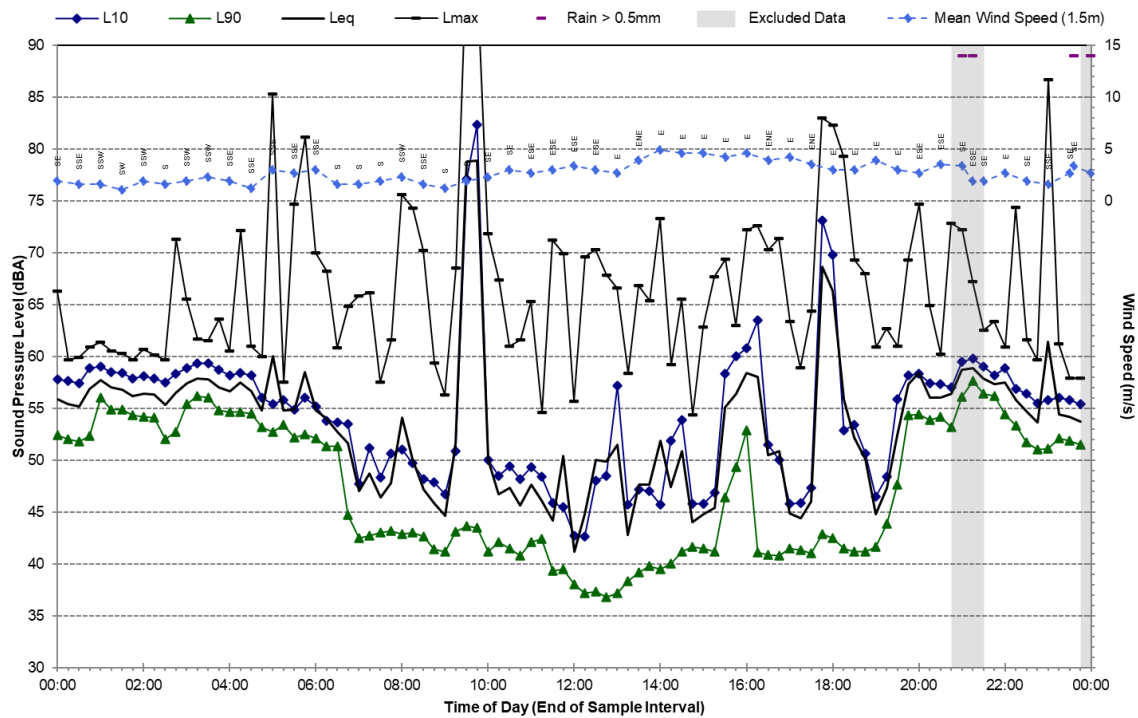
Statistical Ambient Noise Levels

Noise Monitoring Location - Tuesday, 3 February 2026



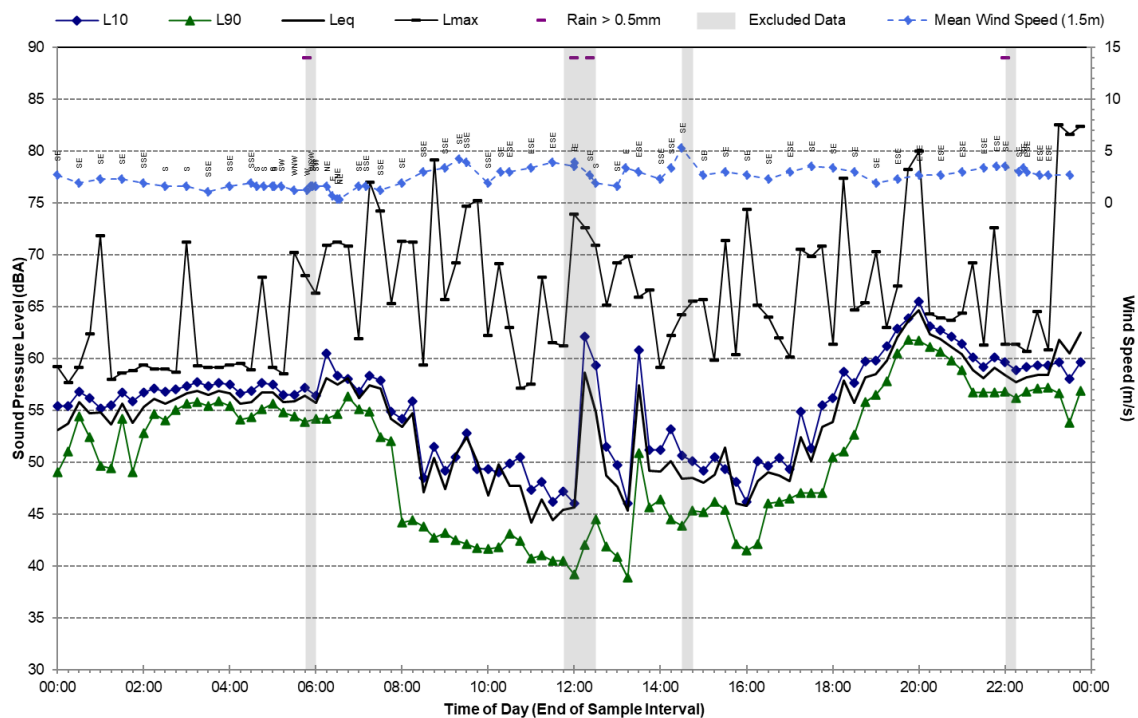
Statistical Ambient Noise Levels

Noise Monitoring Location - Wednesday, 4 February 2026



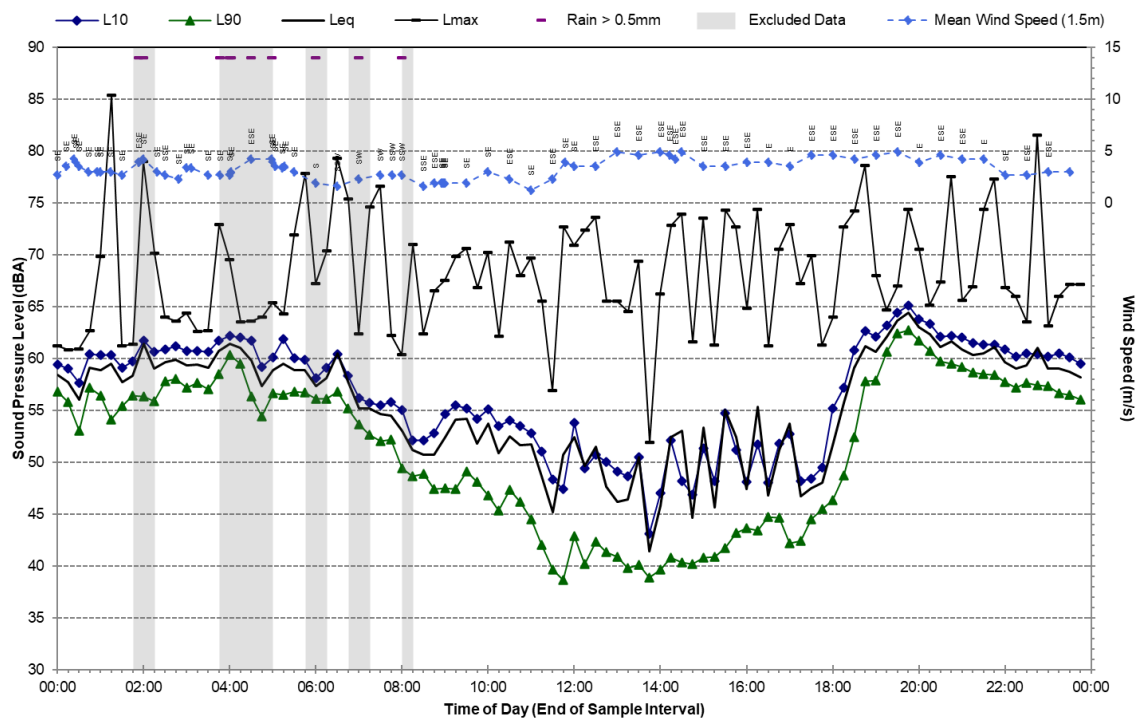
Statistical Ambient Noise Levels

Noise Monitoring Location - Thursday, 5 February 2026



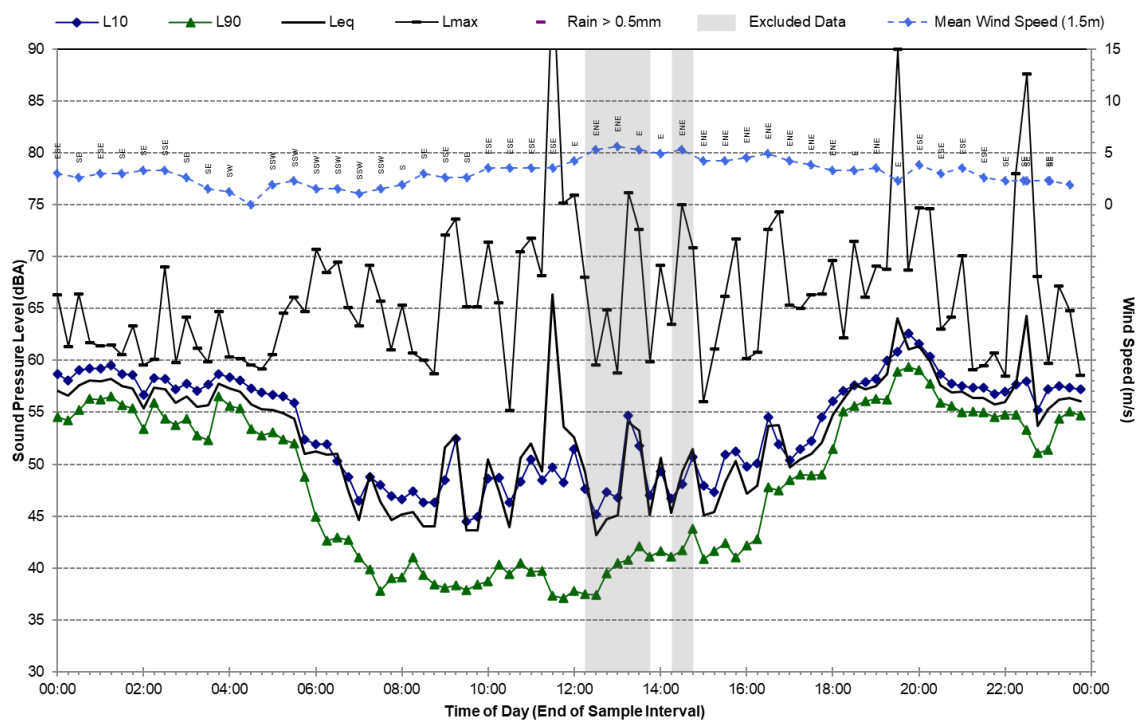
Statistical Ambient Noise Levels

Noise Monitoring Location - Friday, 6 February 2026



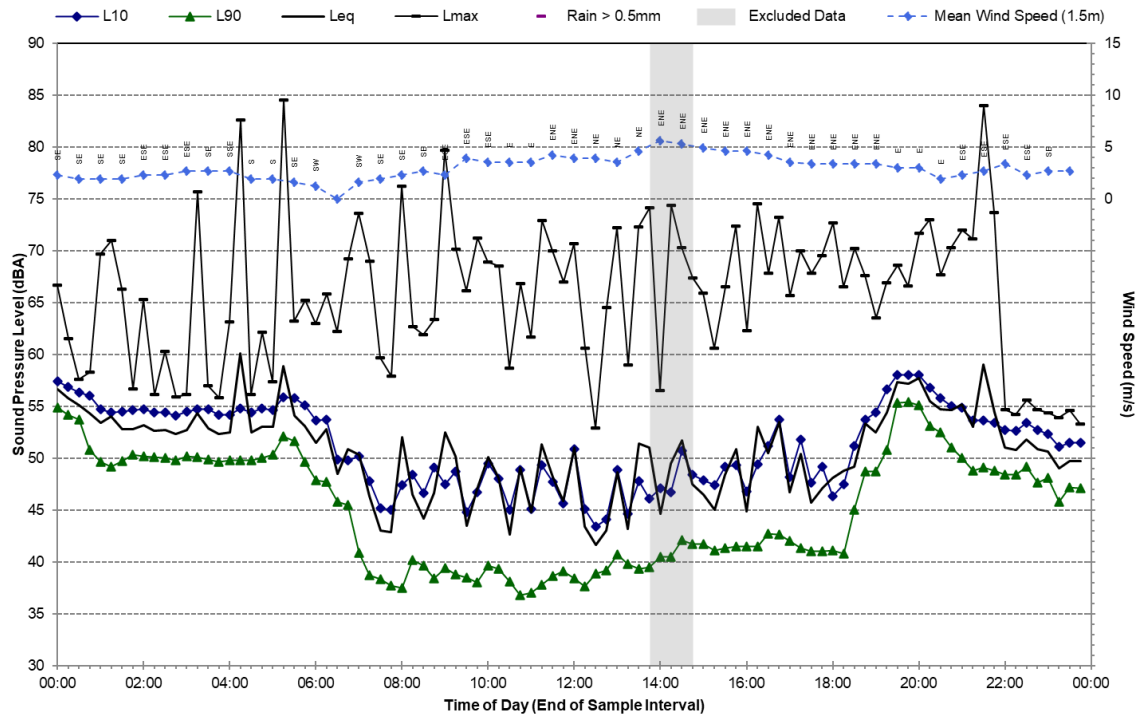
Statistical Ambient Noise Levels

Noise Monitoring Location - Saturday, 7 February 2026



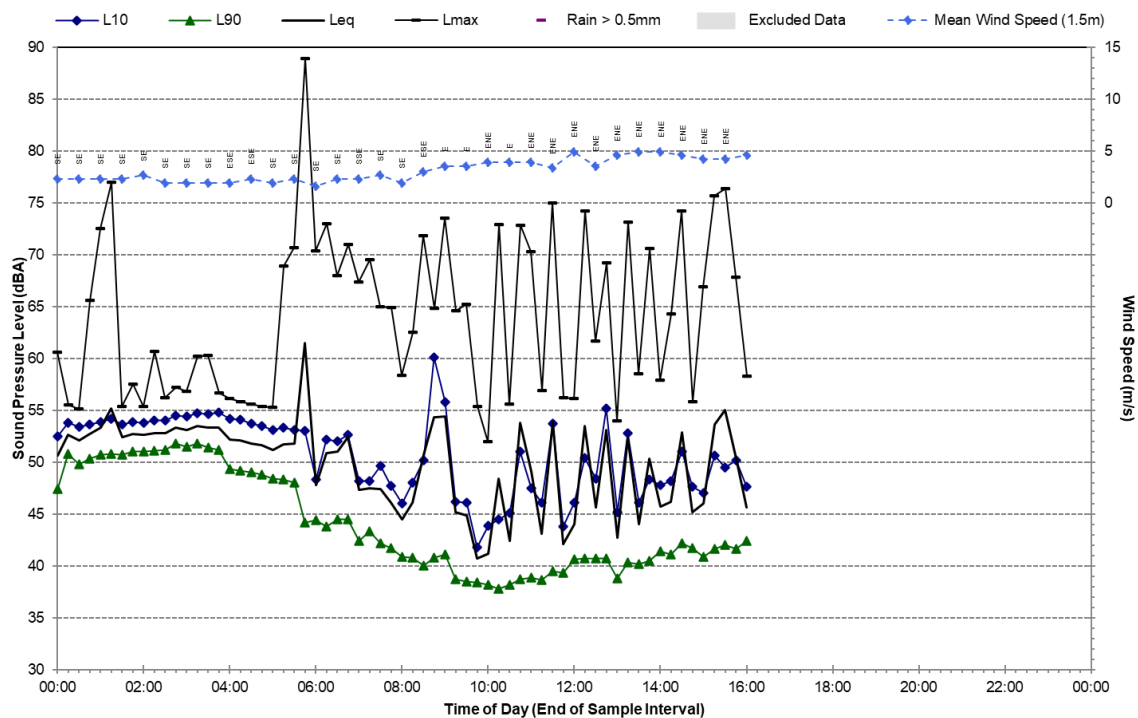
Statistical Ambient Noise Levels

Noise Monitoring Location - Sunday, 8 February 2026

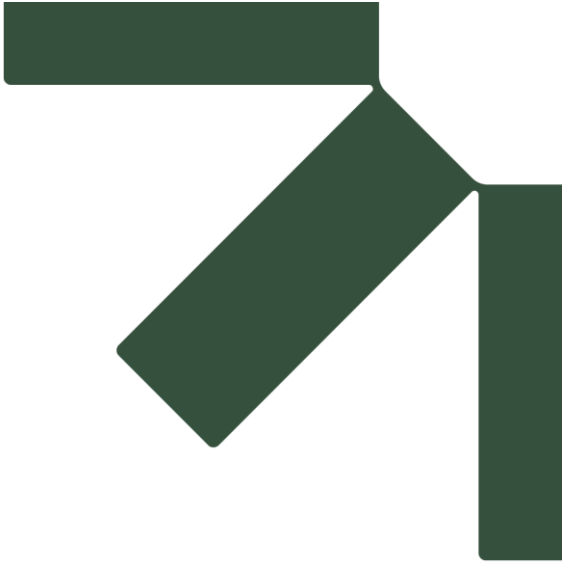


Statistical Ambient Noise Levels

Noise Monitoring Location - Monday, 9 February 2026







Appendix D SoundPLAN Noise Emissions Contour Maps

**Rasmussen Early Learning Centre, Lot 194 Saltbush
Boulevard, Rasmussen**

Noise Impact Assessment

Belo Developments Pty Ltd

SLR Project No.: 620.043108.00001

18 February 2026





Rassmussen Early Learning Centre

Prepared for Belo Developments
By SLR Consulting Australia Pty Ltd

Map
D-1

Ground Floor $L_{Aeq,15min/1hr}$ Free Field Outdoor Play Noise Levels at 1.5 m Above the Ground With Noise Barriers

Project engineer: Thomas Anderson
Created: 16/02/2026
Processed with SoundPLAN 8.2
Project No.: 620.043108.00001

Noise Levels

$L_{Aeq,15min/1hr}$
in dB(A)
Free Field

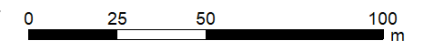
		≤ 35
35 <		≤ 40
40 <		≤ 45
45 <		≤ 50
50 <		

Signs and symbols

- Area Noise Source
- Building
- Noise Barrier
- NSR Cluster
- Assessed Receptor Location



Length scale 1:1500





Rassmussen Early Learning Centre

Prepared for Belo Developments
By SLR Consulting Australia Pty Ltd

Map
D-2

First Floor $L_{Aeq,15min/1hr}$ Free Field Outdoor Play Noise Levels at 4.5 m Above the Ground With Noise Barriers

Project engineer: Thomas Anderson
Created: 16/02/2026
Processed with SoundPLAN 8.2
Project No.: 620.043108.00001

Noise Levels

$L_{Aeq,15min/1hr}$
in dB(A)
Free Field

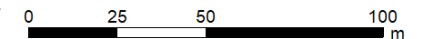
	$\leq$	35
35 <	$\leq$	40
40 <	$\leq$	45
45 <	$\leq$	50
50 <		

Signs and symbols

- Area Noise Source
- Building
- Noise Barrier
- NSR Cluster
- Assessed Receptor Location



Length scale 1:1500





Rassmussen Early Learning Centre

Prepared for Belo Developments
By SLR Consulting Australia Pty Ltd

Map
D-3

Ground Floor $L_{Aeq,15min/1hr}$ Free Field Carpark Activity Noise Levels at 1.5 m Above the Ground With Noise Barriers

Project engineer: Thomas Anderson
Created: 16/02/2026
Processed with SoundPLAN 8.2
Project No.: 620.043108.00001

Noise Levels

$L_{Aeq,15min/1hr}$
in dB(A)
Free Field

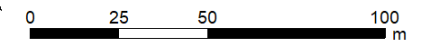
	$\leq$	35
35 <	$\leq$	40
40 <	$\leq$	45
45 <	$\leq$	50
50 <		

Signs and symbols

- Building
- Noise Barrier
- NSR Cluster
- Assessed Receptor Location
- Line Noise Source



Length scale 1:1500





Rassmussen Early Learning Centre

Prepared for Belo Developments
By SLR Consulting Australia Pty Ltd

Map
D-4

First Floor $L_{Aeq,15min/1hr}$ Free Field Carpark Activity Noise
Levels at 4.5 m Above the Ground With Noise Barriers

Project engineer: Thomas Anderson
Created: 16/02/2026
Processed with SoundPLAN 8.2
Project No.: 620.043108.00001

Noise Levels

$L_{eq,15min/1hr}$
in dB(A)
Free Field

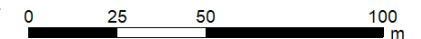
	$\leq$	35
35 <	$\leq$	40
40 <	$\leq$	45
45 <	$\leq$	50
50 <		

Signs and symbols

- Building
- Noise Barrier
- NSR Cluster
- Assessed Receptor Location
- Line Noise Source



Length scale 1:1500





Rassmussen Early Learning Centre

Prepared for Belo Developments
By SLR Consulting Australia Pty Ltd

Map
D-5

Ground Floor $L_{Aeq,15min/1hr}$ Free Field Condenser Noise Levels at 1.5 m Above the Ground With Noise Barriers

Project engineer: Thomas Anderson
Created: 16/02/2026
Processed with SoundPLAN 8.2
Project No.: 620.043108.00001

Noise Levels

$L_{Aeq,15min/1hr}$
in dB(A)
Free Field

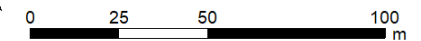


Signs and symbols

- Building
- Noise Barrier
- NSR Cluster
- Assessed Receptor Location
- Area Noise Source



Length scale 1:1500





Rassmussen Early Learning Centre

Prepared for Belo Developments
By SLR Consulting Australia Pty Ltd

Map
D-6

First Floor $L_{Aeq,15min/1hr}$ Free Field Condenser Noise
Levels at 4.5 m Above the Ground With Noise Barriers

Project engineer: Thomas Anderson
Created: 16/02/2026
Processed with SoundPLAN 8.2
Project No.: 620.043108.00001

Noise Levels

$L_{Aeq,15min/1hr}$
in dB(A)
Free Field

	$\leq$	35
35 <	$\leq$	40
40 <	$\leq$	45
45 <	$\leq$	50
50 <		

Signs and symbols

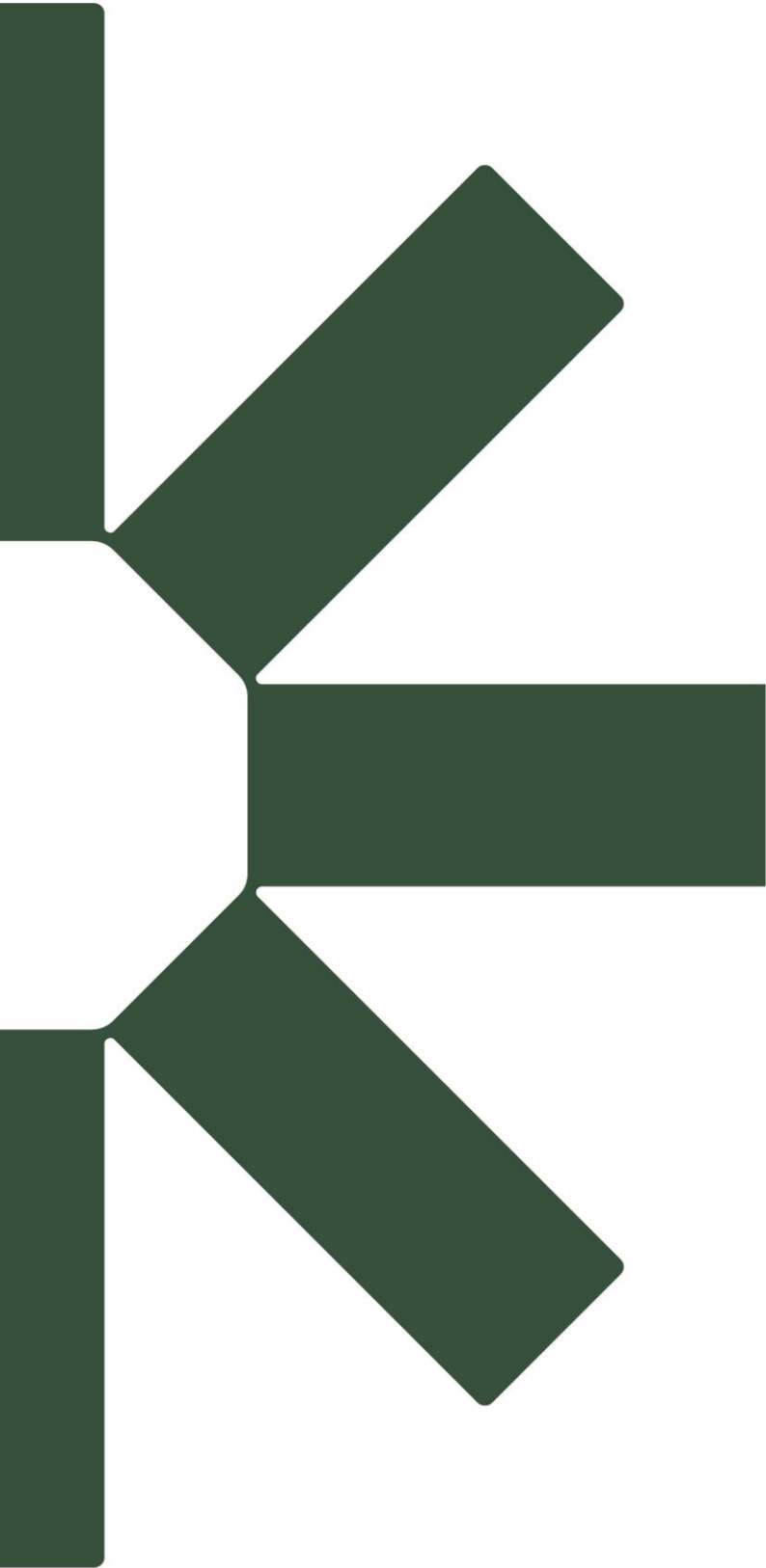
- Building
- Noise Barrier
- NSR Cluster
- Assessed Receptor Location
- Area Noise Source



Length scale 1:1500

0 25 50 100 m





Making Sustainability Happen

APPENDIX E

Sewer and Water Capacity Assessment prepared by DPM Water

brazier motti





GRIFFITH CAPITAL PTY LTD

**RASMUSSEN EARLY LEARNING
CENTRE**

**WATER & SEWER CAPACITY
ASSESSMENT**

16 January 2026 (Rev B)

TABLE OF CONTENTS

1	INTRODUCTION	2
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4	SEWER INFRASTRUCTURE PLANNING	8
4.1	Sewer Network Modelling	9

Appendix A – Rasmussen Early Learning Centre Development Plans

Appendix B – Rasmussen Early Learning Centre - WaterGEMS Modelling Figures & Results

Appendix C – Rasmussen Early Learning Centre - SewerGEMS Modelling Figures & Results

DOCUMENT STATUS

Revision	Purpose	Date
A	Initial Version	12/01/2026
B	Updated to include latest development plans	16/01/2/26

DOCUMENT AUTHORISATION

AUTHOR	DESMOND MOSELEY
Signature	

1 INTRODUCTION

An early learning centre is proposed at the intersection of Bluewattle Boulevard and Saltbush Drive in Rasmussen. The development will be accessed off Saltbush Drv with the extract from the development layout plan provided as Figure 1.1 below. Additional development plans are provided in Appendix A.

The proposed early learning centre will consist of the following:

- Located on a 2,988 m² land parcel.
- A Gross Floor Area (GFA) of 962.9m²
- A maximum capacity of 120 children
- A total of 21 staff.

To confirm the proposed development is able to be serviced with a potable water supply and sewage service, the capacity of the existing Council water & sewer networks are required.



Figure 1.1 – Rasmussen Early Learning Centre Development Plan

The following report sections detail the water & sewer system performance to service the proposed early learning centre. The assessment has shown:

- The existing DN150 PVC water main along the Saltbush Drv frontage of the proposed early learning centre has sufficient capacity to service the development with peak hour demands and 30 l/s fire flows. This existing DN150 PVC reticulation water main is connected to the DN300 trunk water main at the intersection of Saltbush Drv and Bluewattle Bvd.

- The existing DN150 gravity sewer that is located on the southern boundary of the development site has sufficient capacity to service the proposed early learning centre. The existing DN150 gravity sewer extends to the south and then east and onto the existing DN450 trunk gravity sewer in the catchment of PS C5C (St Lucia Drv).

No upgrades are required to the existing water and sewer infrastructure to service the proposed early learning centre development.

2 POPULATION ASSESSMENT

The following section provides the population assessment for the proposed Rasmussen Early Learning Centre that is to be located at the intersection of Saltbush Drv & Bluewattle Bvd in Rasmussen. The population assessment has been based on the number of staff and students that is to be accommodated in the facility at its full development.

As per the layout plan in Appendix A, the childcare centre development will have:

- Maximum of 120 students.
- Maximum of 21 staff.

Table 2.1 and 2.2 show the equivalent population for the proposed early learning centre development. The loading rates are based on the infrastructure demand unit rates that are detailed in the “Local Government Infrastructure Plan – DSS, Definitions & Demand (TCC April 2017)” with the student loading rate based on the primary student classification.

Table 2.1 – Water Equivalent Population Assessment

Loading Type	Number	Loading Rate	Equivalent Population
Students	120	0.14 EP/student	16.8 EP
Staff	21	0.28 EP/staff	5.9 EP
Total			22.7 EP

Table 2.2 – Sewer Equivalent Population Assessment

Loading Type	Number	Loading Rate	Equivalent Population
Students	120	0.22 EP/student	26.4 EP
Staff	21	0.43 EP/staff	9.0 EP
Total			35.4 EP

The equivalent population calculated in the above tables have been used for the water and sewer capacity assessment.

3 WATER SUPPLY PLANNING

Water network modelling has been undertaken for the Kirwan and Upper Ross areas of Townsville. The proposed Rasmussen Early Learning Centre development is to be located at the intersection of Bluewattle Bvd and Saltbush Drv in Rasmussen, which is within Precinct 2 of the Somers & Hervey Estate.

The existing water supply system that services the proposed Rasmussen Early Learning Centre is summarised below:

- The existing 2 x 16.5 ML Douglas No 2 & 3 reservoirs that are located on the foothills of Mt Stuart. These two reservoirs are supplied from the Douglas WTP and have a base level of 54mAHD and a top water level of 64mAHD.
- DN600 MSCL trunk water main outlet from the reservoir that extends along Angus Smith Drv and then along the northern boundary of the Douglas WTP to Ross River. The DN600 main crosses under Ross River from Douglas to Condon. A parallel DN375 main was taken out of service (damaged) in 2019 following the Townsville floods.
- A replacement DN750 PE water main was constructed under Ross River in 2022 and interconnected to the existing DN600 and DN300 water mains on the western side of Riverway Drv and to the existing DN900 MSCL water main on the eastern (Douglas WTP) side of the river.
- The existing DN300 AC water main on the western side of Riverway Drv extends to the south through to Allambie Lane and have a number of offtakes from it to service the existing residential areas.
- The existing DN600 DICL/AC water main on the western side of Riverway Drv extends to the intersection with Gouldian Ave and then extends to the west along Gouldian Ave to Pinnacle Drv (as a DN500 DI main). The DN600 AC main continues to the south along Riverway Drv but is the pumped main that supplies the Ponti Rd reservoir and the Kelso water supply area.
- A DN500/450/375 water main connects to the above DN500 DI main on Gouldian Ave and continues to the south along Pinnacle Drive to Bluewattle Boulevard.
- A DN300 water main extends to the west along Bluewattle Boulevard and Treeline Drv from Riverway Drive through to South Beck Drv. A DN375 main then extends to the north along South Beck Drv to the entrance of the Riverstone residential development area.
- A DN150 water main extends to the south along Saltbush Drv from the above DN300 trunk water main on Bluewattle Bvd. The proposed Rasmussen Early Learning Centre will be serviced off the DN150 PVC water main on Saltbush Drv.

The above illustrates the Upper Ross area and the proposed Rasmussen Early Learning Centre is well serviced with a trunk and reticulation water network. The performance of the existing water network to service the proposed early learning centre at the intersection of Bluewattle Bvd and Saltbush Drv is provided in the following report sections.

3.1 Water Demands

Water demands have been calculated in accordance with Townsville City Council planning scheme and CTM Code. The following table provides the water demand parameters for the CTM Code which

have been used in the water infrastructure assessment for proposed early learning centre development.

Table 3.1 - Water Demand Parameters

Parameter	Unit Demand	Peaking Factor
Average Day (AD)	600 L/day/EP	
Mean Day Max Month (MDMM)	900 L/day/EP	1.5 AD
Peak Day (PD)	1125 L/day/EP	1.25 MDMM
Peak Hour (PH) (Residential Demands)	0.033 L/s/EP	2.56 PD

The CTM Code also have diurnal water demand patterns that are applied to the various water uses. As the early learning centre development is commercial, the commercial demand diurnal pattern will be applied. The commercial demand diurnal pattern (refer to Figure 3.1 below) has a peaking factor of 1.5, instead of the 2.56 peaking factor provided in the above table for residential water demands.

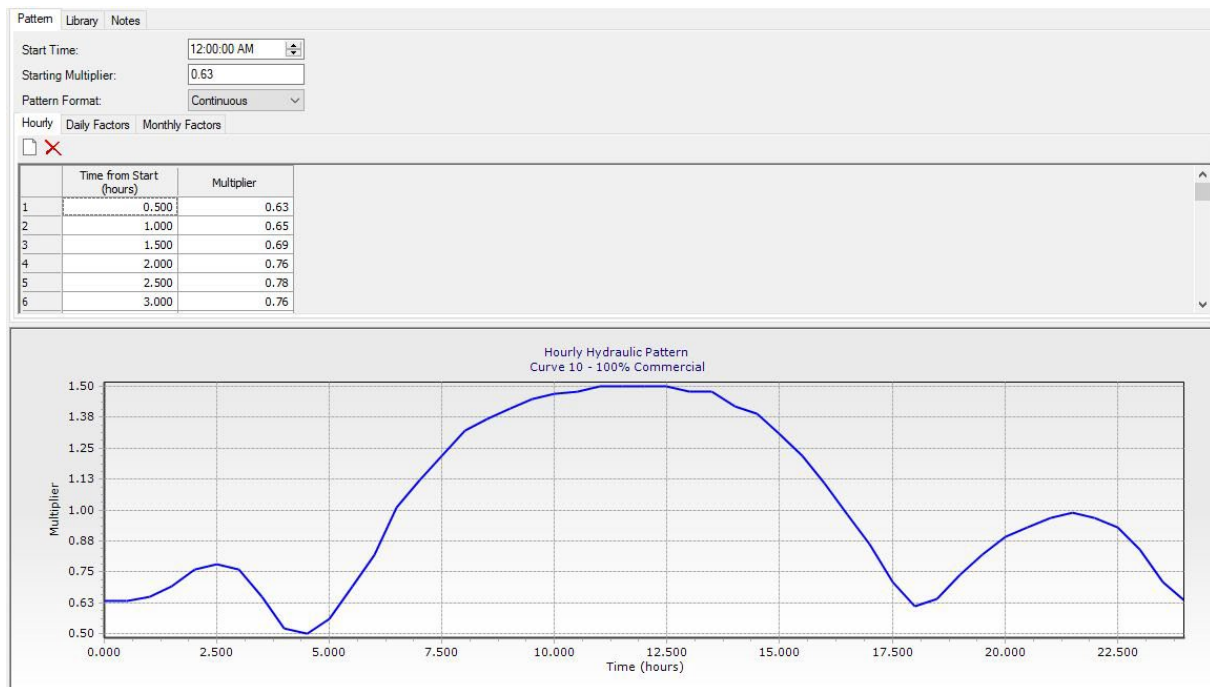


Figure 3.1 – Commercial Diurnal Demand Pattern

Based on a full development equivalent population of 22.7 EP, the peak water demand for the development is:

$$\begin{aligned}
 &= 22.7 \text{ EP} \times 1125 \text{ L/day/EP} \times 1.5 \text{ (commercial peaking factor)} \\
 &= 22.7 \times (1125 / (24 \times 3600)) \times 1.5 \\
 &= 0.44 \text{ l/s}
 \end{aligned}$$

In addition to the above, as the development is commercial a 30 l/s fire flow is required in accordance with Council's design standards. The water network modelling results for the proposed Rasmussen Early Learning Centre development is detailed in the following report sections.

The following figures illustrates the equivalent population loading and fire flow applied in the WaterGEMS model.

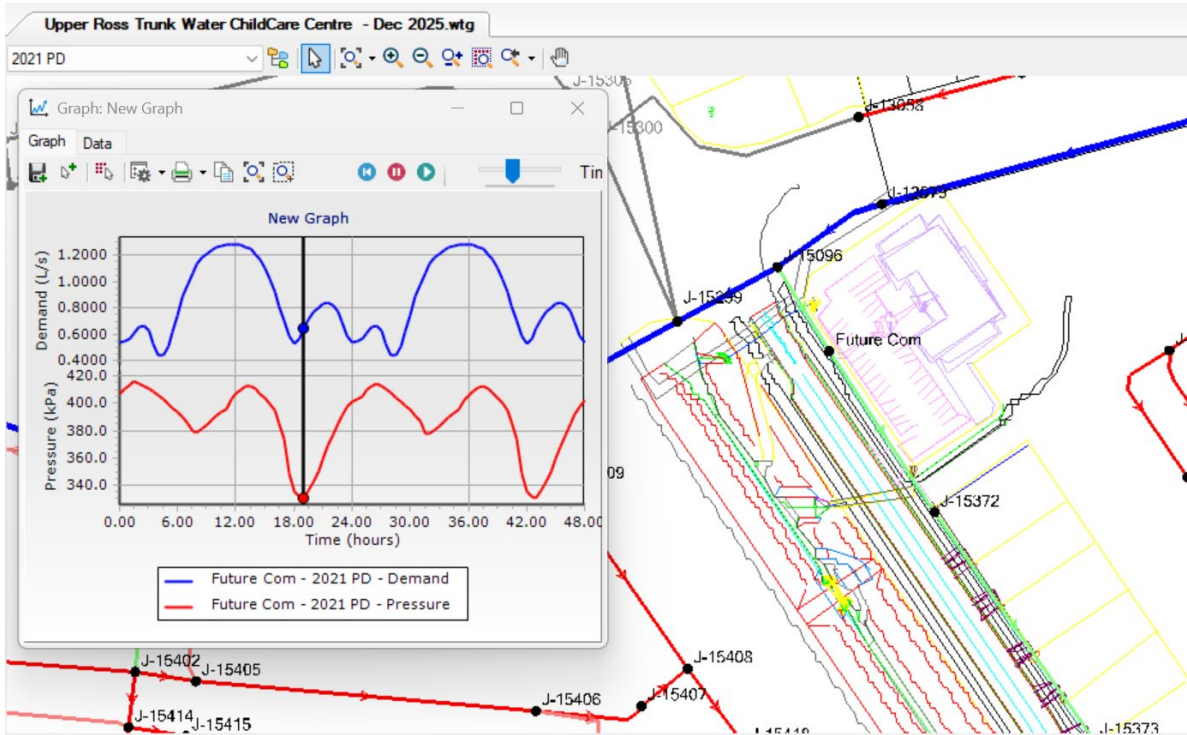


Figure 3.2 – Early Learning Centre Water Demands

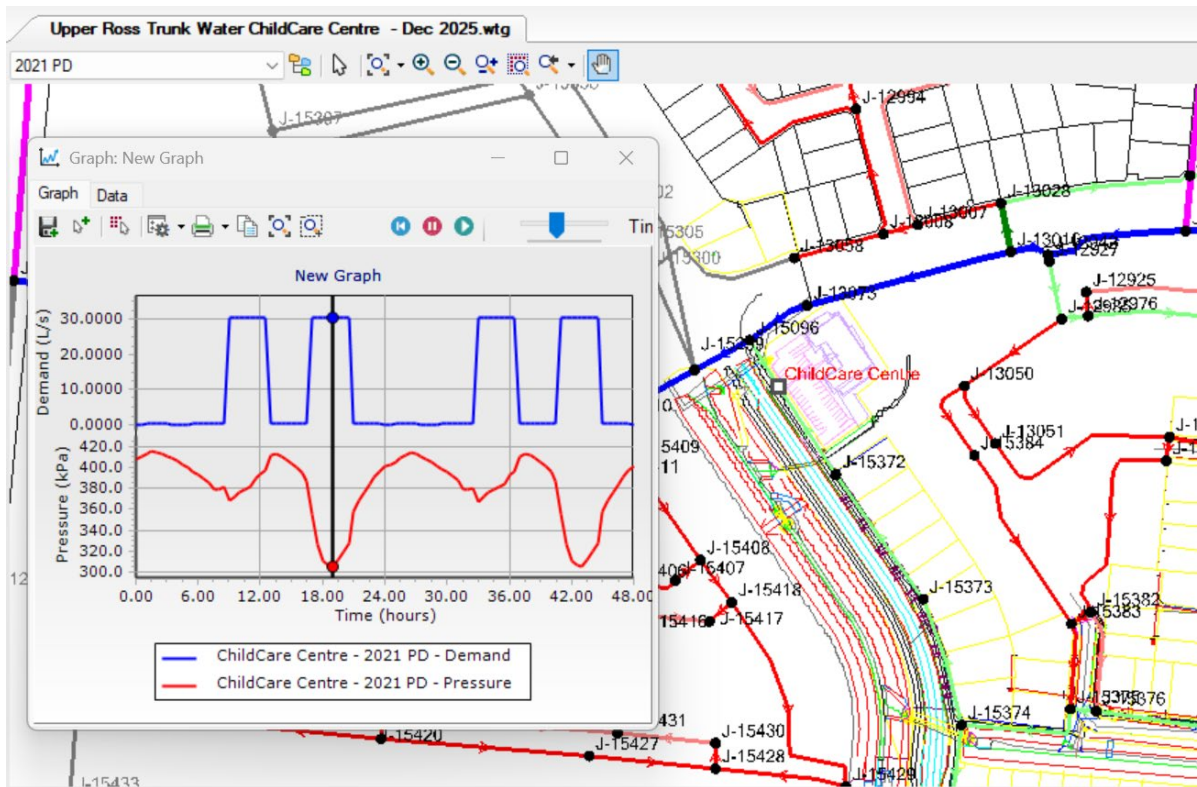


Figure 3.3 – Early Learning Centre Fire Flow Water Demands

3.2 Water Network Modelling

The proposed Rasmussen Early Learning Centre will be located at the intersection of Bluewattle Bvd and Saltbush Drv. Stage 4C/D of the Somers & Hervey Estate includes the construction of Saltbush Drv including a DN150 PVC water main along the frontage of the development site. This DN150 PVC water main connects to the existing DN300 trunk water main on Bluewattle Bvd.

The performance of the existing water network along with the new water mains that service Precinct 2 of Somers & Hervey Estate and the proposed early learning centre is summarised below:

- The water demands for the proposed early learning centre were added to the DN150 PVC water main along the Saltbush Drv frontage of the development site.
- The water pressure at the offtake to the proposed early learning centre is reduced to 407 kPa for peak hour demands at 12noon, being the peak commercial demand period. The water pressure at 7pm (being the peak residential demand period) is reduced to 331 kPa. The water pressure at 7pm is lower due to the large amount of residential development in the Rasmussen area. Both these modelled water pressures meet the minimum pressure requirement in the CTM Code of 220 kPa. Figure 3.2 below illustrates the water demand and pressure in the DN150 water main on Saltbush Drv that will service the early learning centre.
- The water pressures within the remainder of surrounding development area are generally around 331 kPa. The lowest pressure of 330 kPa is at the southern end of Saltbush Drv. These are all above the minimum 220 kPa standard.
- With the inclusion of the 30 l/s commercial fire flow on the DN150 water main on Saltbush Drv, the water pressures are reduced to 394 kPa at 12 noon. The water pressure at 7pm is reduced to 306 kPa. Both these modelled fire flow pressures meet the CTM code requirement of 120 kPa.
- The velocity and headloss gradient along the existing and proposed water mains in this area of the Somers & Hervey Estate are up to 0.44 m/s and 0.002 m/m respectively. These both meet Council standards. The velocity along the water mains is up to 1.60 m/s with the 30 l/s fire flow assessment. This is within the maximum fire flow velocity requirement of 4.0 m/s.

The water modelling therefore shows that the existing water network that services the Upper Ross water supply area and the Somers & Hervey Estate are adequately sized to provide the peak hour and fire flows to the proposed Rasmussen Early Learning Centre at the intersection of Bluewattle Bvd and Saltbush Drv. The WaterGEMS network modelling results are provided in Appendix B.

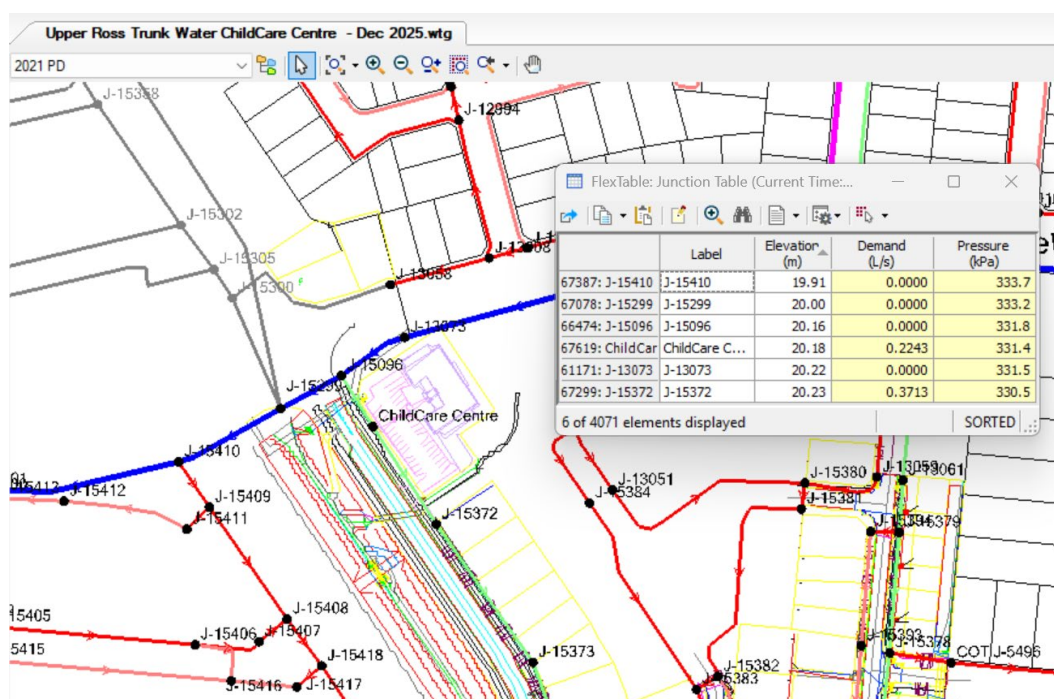


Figure 3.4 – Early Learning Centre Water Modelling & Pressures

4 SEWER INFRASTRUCTURE PLANNING

The Upper Ross area is currently serviced with a reticulated sewer system that is directed to the Condon STP, which is located on the western side of the Bohle River. The Upper Ross sewer area generally consists of the suburbs of Condon, Rasmussen and Kelso with the sewer area illustrated on Figure 4.1 below.

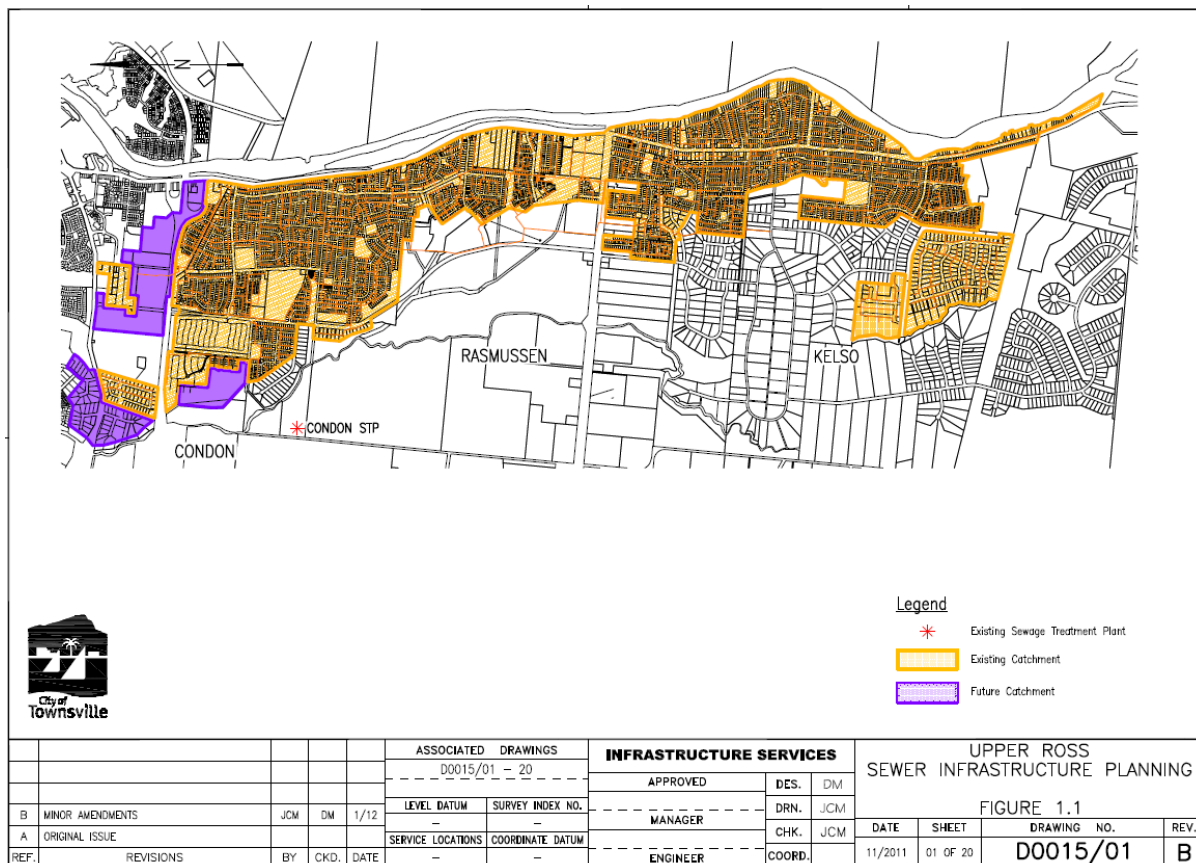


Figure 4.1 – Upper Ross Sewer Infrastructure Plan

The Upper Ross sewer system generally consists of the following trunk sewer infrastructure that services the proposed Rasmussen Early Learning Centre in the Somers & Hervey Estate:

- PS C6B (Vickers Rd).
 - This existing sewage pump station discharges sewage to the Condon STP via a DN450 pressure main and then a DN600 common pressure main with PS C36A (Bowhunters Rd).
 - It services the eastern area of Condon & Rasmussen. PS C6B has a large local gravity catchment but also receives pumped flows from PS C5C which discharges into the southern end of its DN525 gravity sewer.
- PS C5C (St Lucia Drv).
 - The pump station is located on the northern end of St Lucia Drv which is towards the north eastern end of the Somers & Hervey Estate. PS C5C pumps sewage to the north and into a DN525 gravity sewer in the PS C6B catchment.

- A DN450 gravity sewer extends to the south from PS C5C through to Allambie Lane (ie from MH 0/C5C to MH 16/C5C).
- Sewage from the eastern half of Kelso used to be directed along the DN450 sewer into PS C5C but in 2007 a DN450 diversion sewer was constructed along Allambie Lane from MH 16A/C5C to MH 38A/WT. This diversion sewer directed flows into the Upper Ross DN600 western trunk sewer and onto PS C36A (Bowhunters Rd).
- The eastern portion of the Somers & Hervey Estate is (and will be) connected to this existing DN450 trunk sewer in the catchment of PS C5C.

The proposed Rasmussen Early Learning Centre development will be serviced from an existing DN150 gravity sewer that is in the sewer catchment of existing PS C5C (St Lucia Drv).

4.1 **Sewer Network Modelling**

The existing gravity sewer system that will service the proposed Rasmussen Early Learning Centre is illustrated on the following extract from Council's GIS. The sewage from the development site will be serviced as follows:

- Existing sewer MH 1/C5C38D is located on the southern boundary of the development site. This maintenance hole is on a DN150 gravity sewer.
- The DN150 sewer extends to the south to MH 8/C5C38 before extending to the east and onto existing MH 12/C5C which is located on the frontage of No 19 Parsonia Drv.
- Existing MH 12/C5C is located on the existing DN450 trunk sewer that runs to the north and into PS C5C (St Lucia Drv).



Figure 4.2 – Council GIS Extract of Existing Sewer System

The SewerGEMS model for the Upper Ross sewer system was updated to include the additional sewage flows from the proposed Rasmussen Early Learning Centre. With the inclusion of additional sewage flows on existing MH 1/C5C38D, the sewer system performance is as follows:

- The existing DN150 gravity sewer from MH 1/C5C38D to MH 8/C5C38 that services the development site flows up to 22.6% full.
- The remainder of the existing DN150 sewer from MH 8/C5C38 to existing MH 12/C5C (that is on the DN450 trunk sewer) flows up to 41.8% full.
- With the sewage flows from the early learning centre along with the full development of Precinct 2 of the Somers & Hervey Estate, the existing DN450 trunk sewer in the catchment of PS C5C flows up to 41.2% full.
- The existing reticulation and trunk gravity sewer system that will service the proposed early learning centre and Precinct 2 of the Somers & Hervey Estate flows less than the CTM code requirement of a maximum of 75% full and therefore has sufficient capacity.

The figure below from the SewerGEMS network model illustrates the performance of the existing gravity sewer system that will service the proposed Rasmussen Early Learning Centre at the intersection of Bluewattle Bvd and Saltbush Drv. A larger version of this figure is provided in Appendix C.

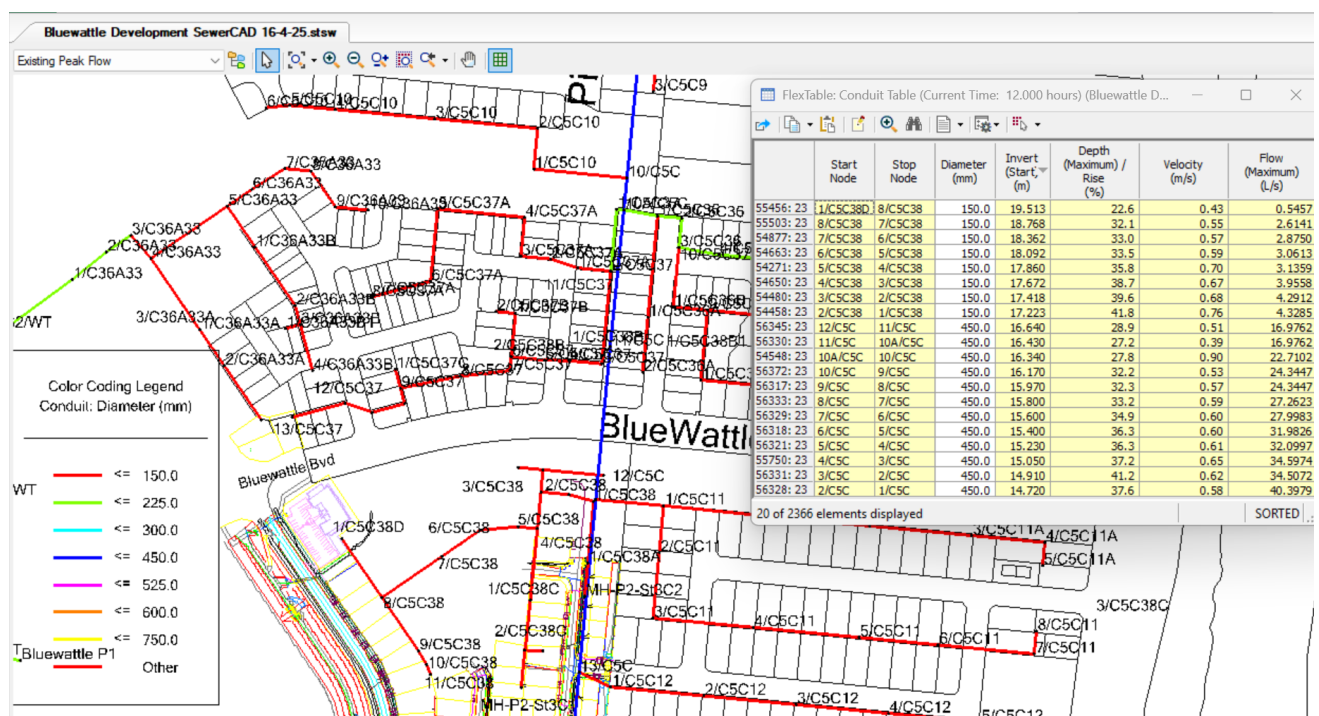


Figure 4.3 – SewerGEMS Modelling Results

APPENDIX A

RASMUSSEN EARLY LEARNING CENTRE

DEVELOPMENT PLANS

Rasmussen Early Learning Centre

New Lot on Saltbush Boulevard, Rasmussen, QLD 4815



SITE INFORMATION

Real Property Description: Lot 194 of Lot 904 SP344615

Local Authority: Townsville City Council
Site Area: 2,988m²
Site Cover: 1,081.1m²
Carparking Provided: 32 (Ratio of 1:3.75)

GFA: Ground 897.4m²
First 64.2m²
Total 961.6m²

Landscape (Incl. outdoor play): 1,067m² (35.7%)

Outdoor Play Calculations				
Zone	Age Group	Area Required	Area Provided	Occupancy
Outdoor Play 1	0-2 yrs	252.00	255.03	36
Outdoor Play 2	2-3 yrs	280.00	286.11	40
Outdoor Play 3	3-5 yrs	308.00	313.68	44
		840.00 m ²	854.82 m ²	120

Activity Room Calculations							
Level	Room	Age Group	Area Required	Area Provided	Staff Ratio	No. of Staff	Occupancy
Ground Floor	Activity Room 1	0-24 mnths	39.00	44.42	1:4	3	12
	Activity Room 2	0-24 mnths	39.00	40.39	1:4	3	12
	Activity Room 3	0-24 mnths	39.00	39.58	1:4	3	12
	Activity Room 4	2-3 yrs	65.00	66.44	1:5	4	20
	Activity Room 5	2-3 yrs	65.00	66.91	1:5	4	20
	Activity Room 6	3-5 yrs	71.50	71.68	1:11	2	22
	Activity Room 7	3-5 yrs	71.50	73.05	1:11	2	22
			390.00 m ²	402.47 m ²		21	120

DA
NOT FOR CONSTRUCTION

Saltbush Boulevard



DA
NOT FOR CONSTRUCTION





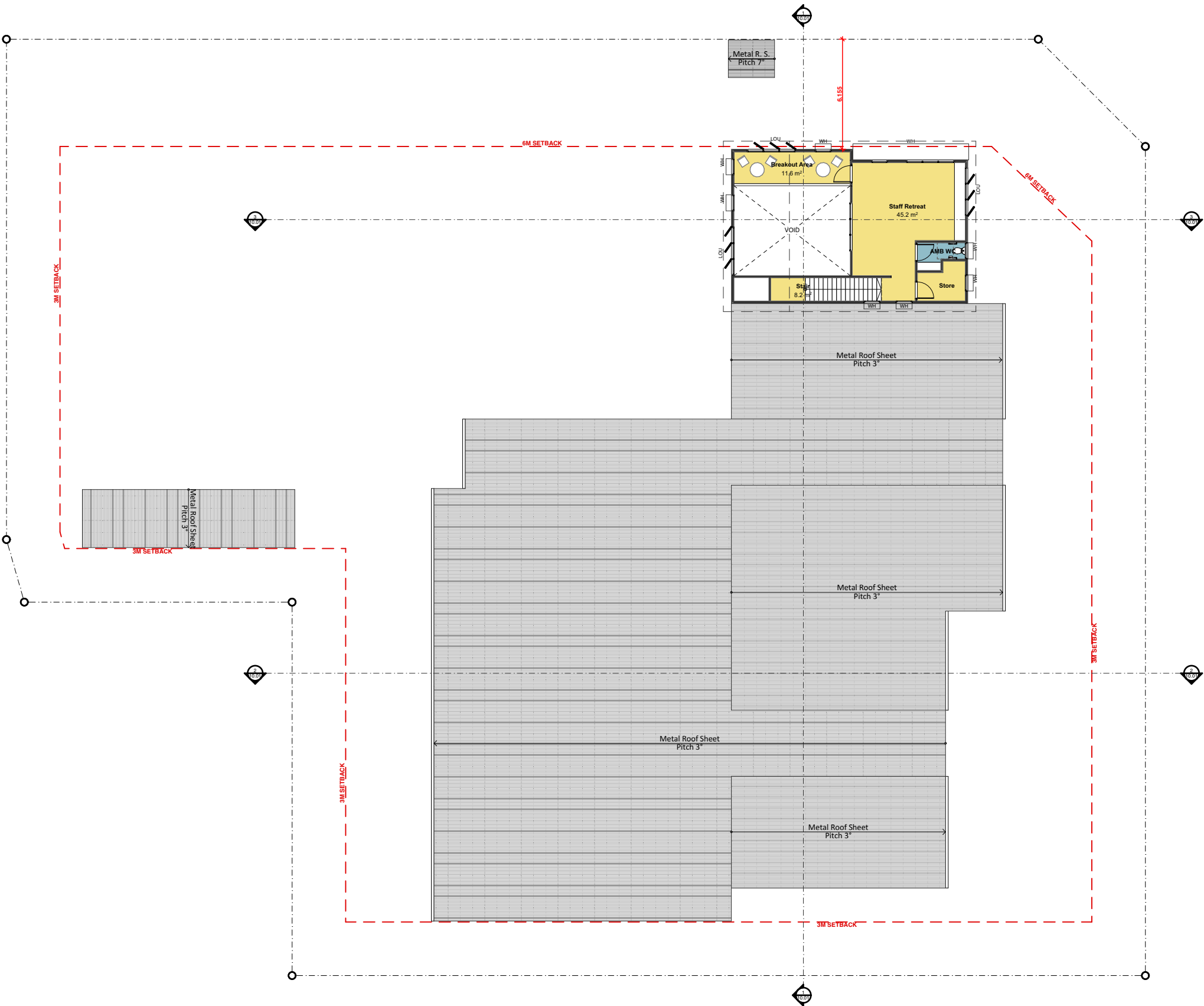
SALTBUSH BOULEVARD

LEGEND

B Bollard
LOU Fixed Louvre
WH Window Hood

Notes

1. All ancillary equipments to be screened from both streetscapes.
2. Shade sail shown on plans are indicative only, location and extents are subjected to future playscape design and confirmation with childcare operator.
3. Refer to consultant's drawing for landscaping and streetscape detail.

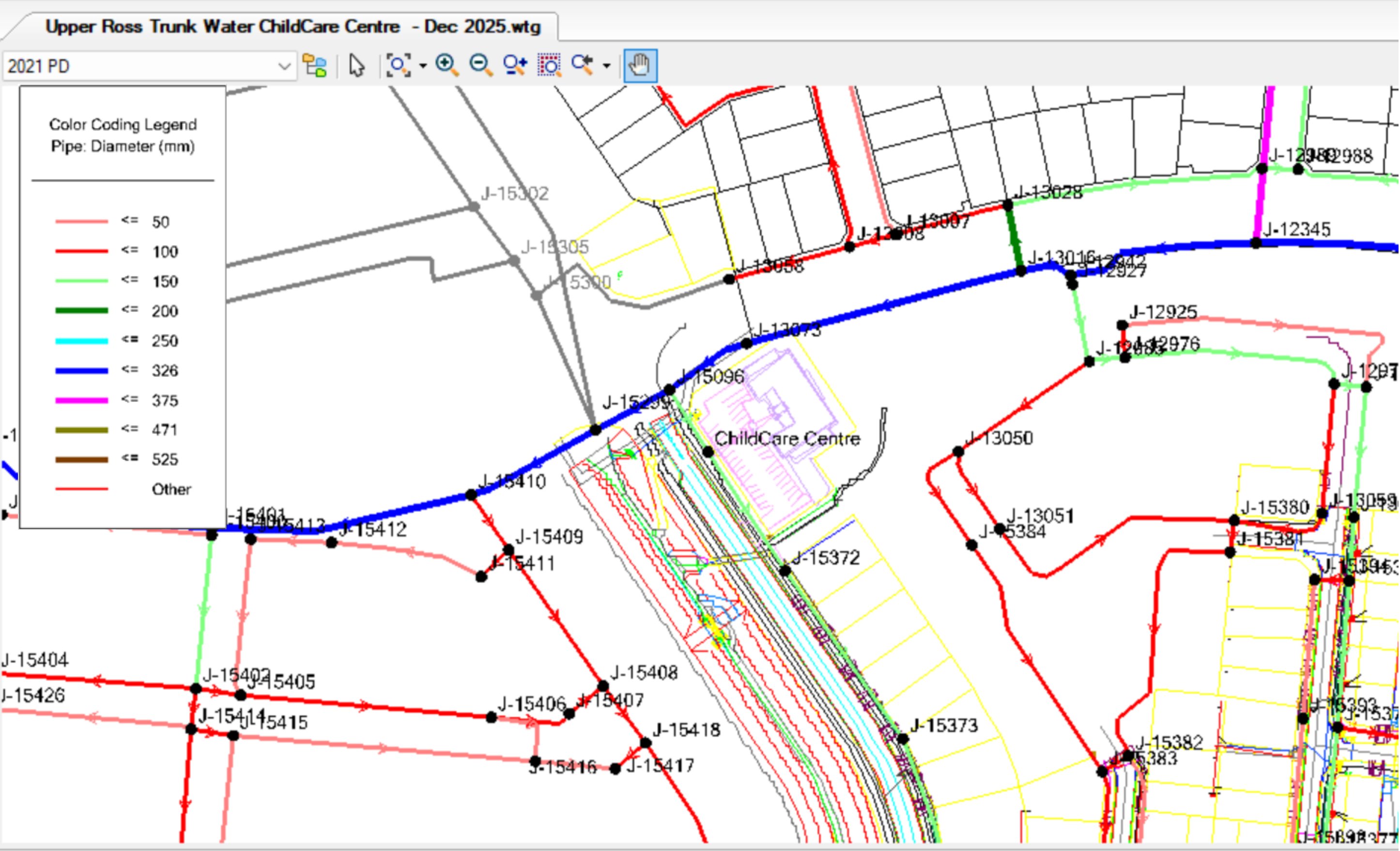


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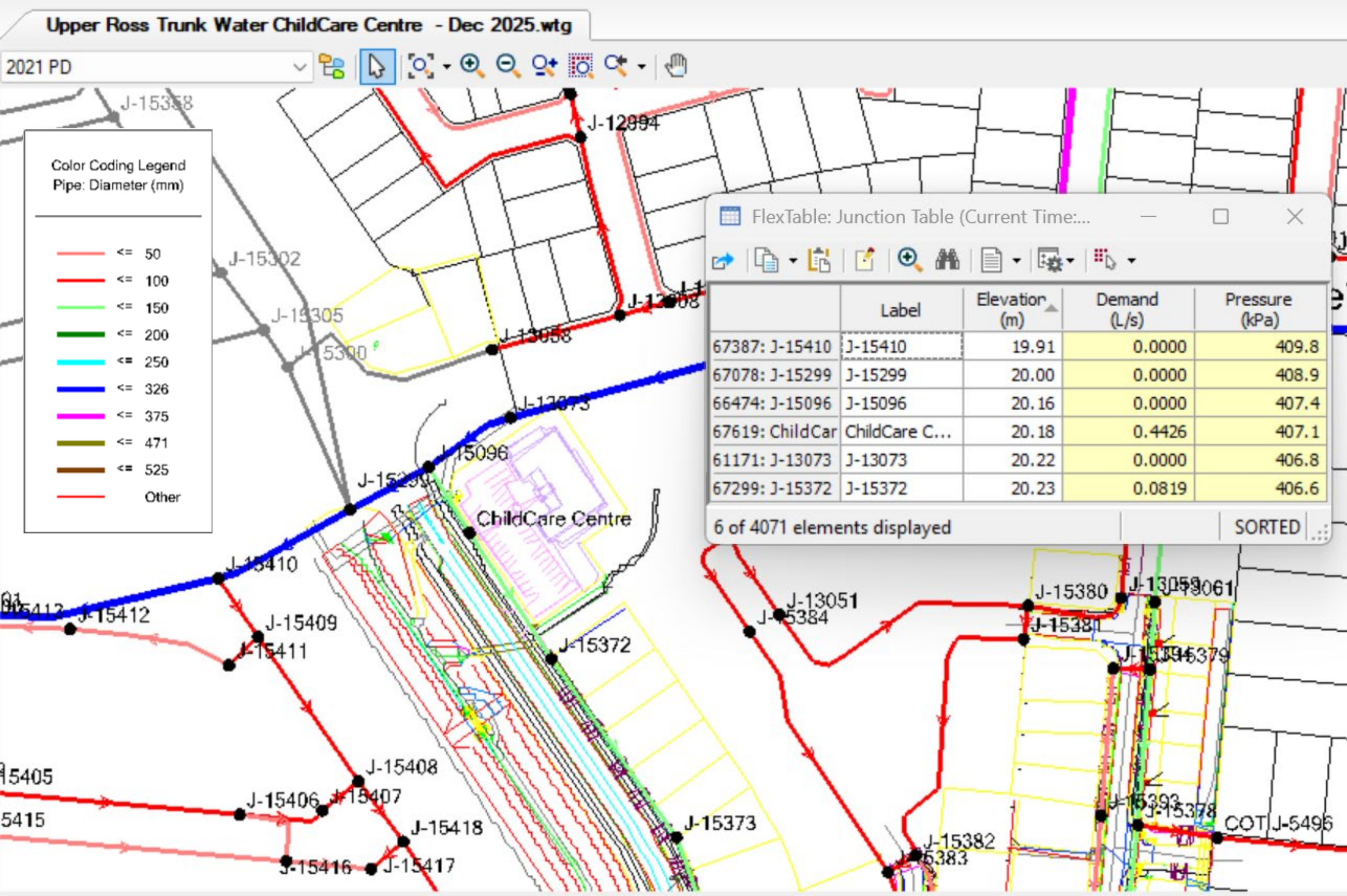


APPENDIX B

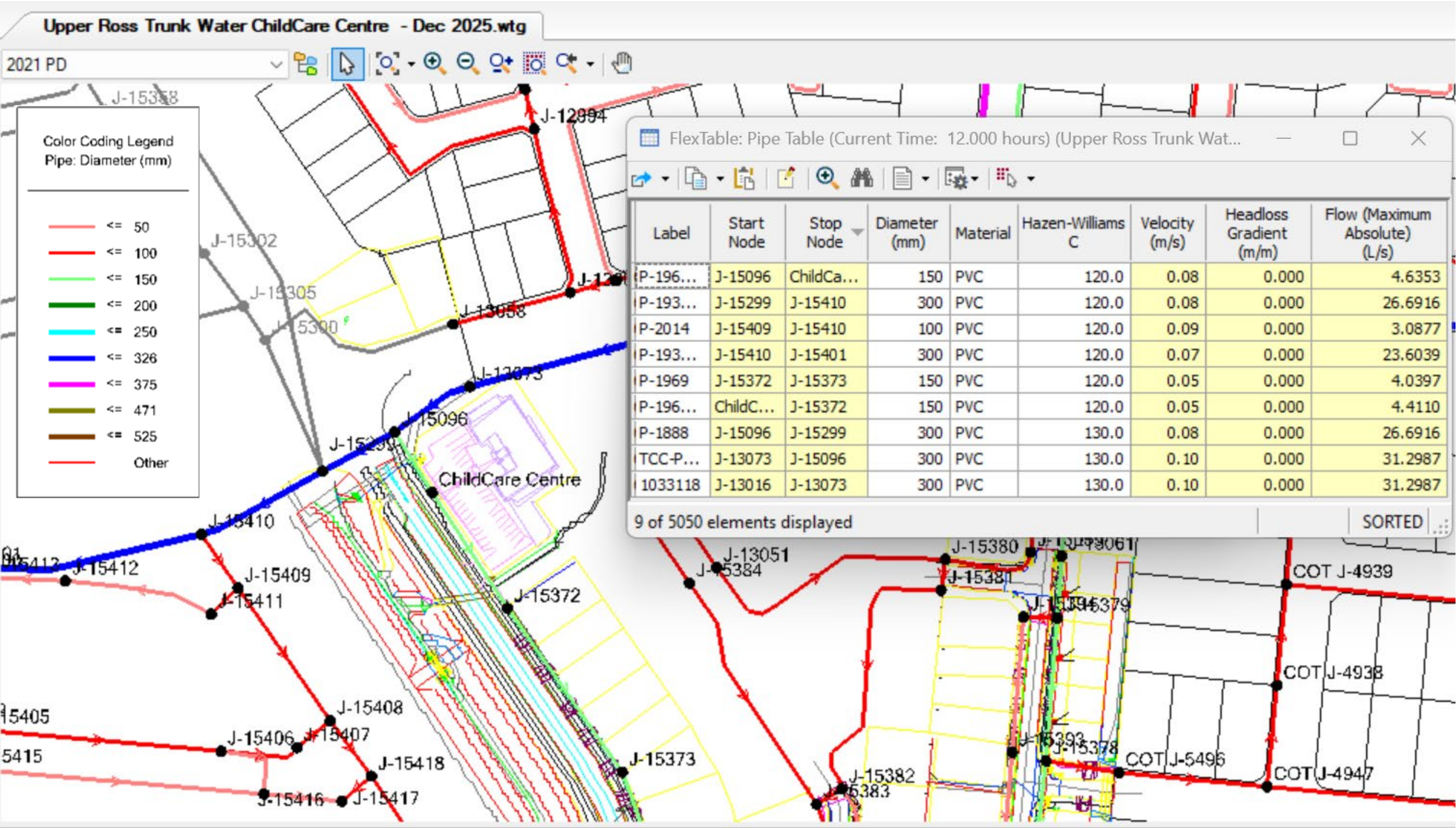
WATERGEMS MODELLING FIGURES & RESULTS



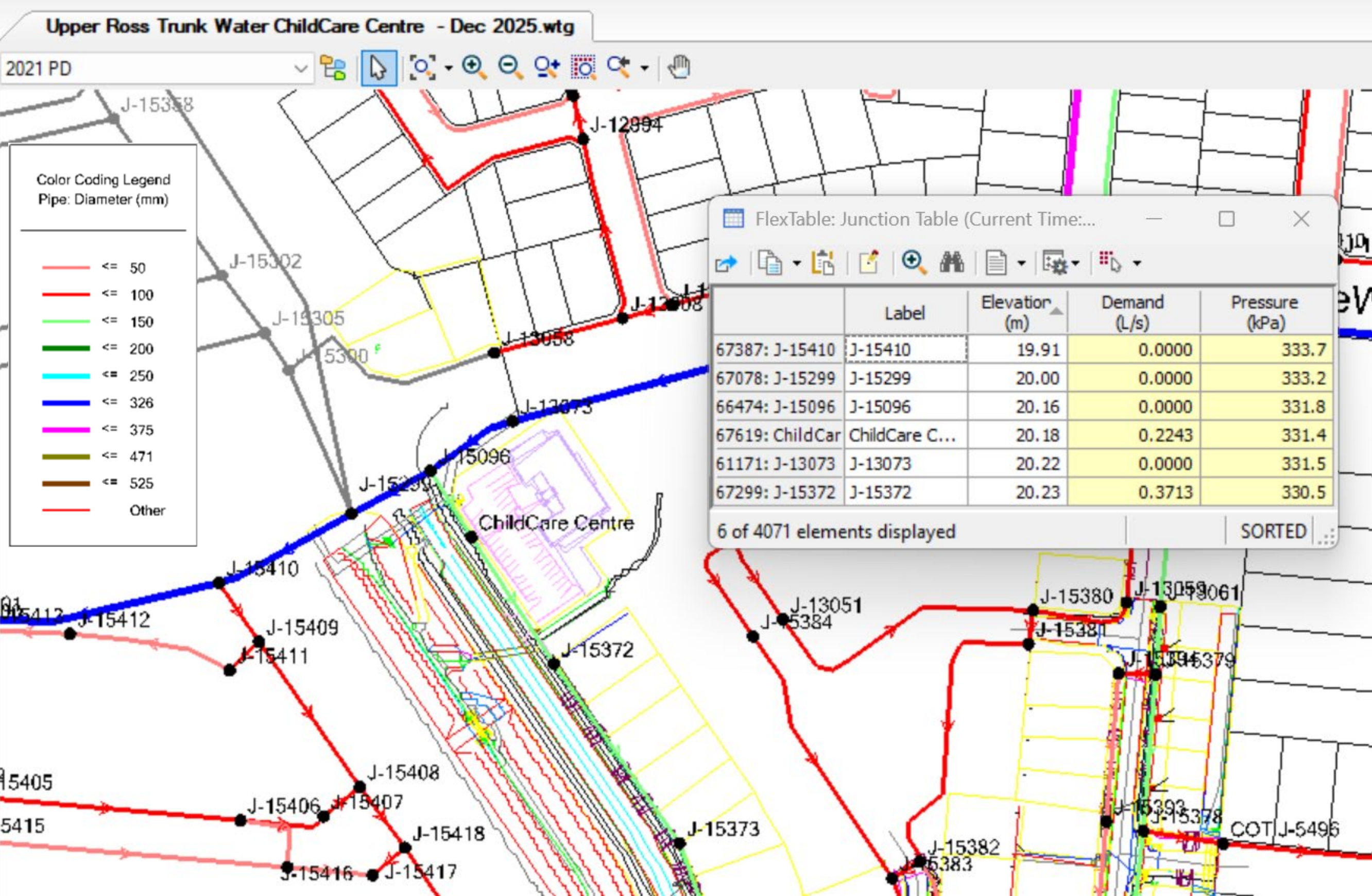
Rasmussen Early Learning Centre - WaterGEMS Model Figure



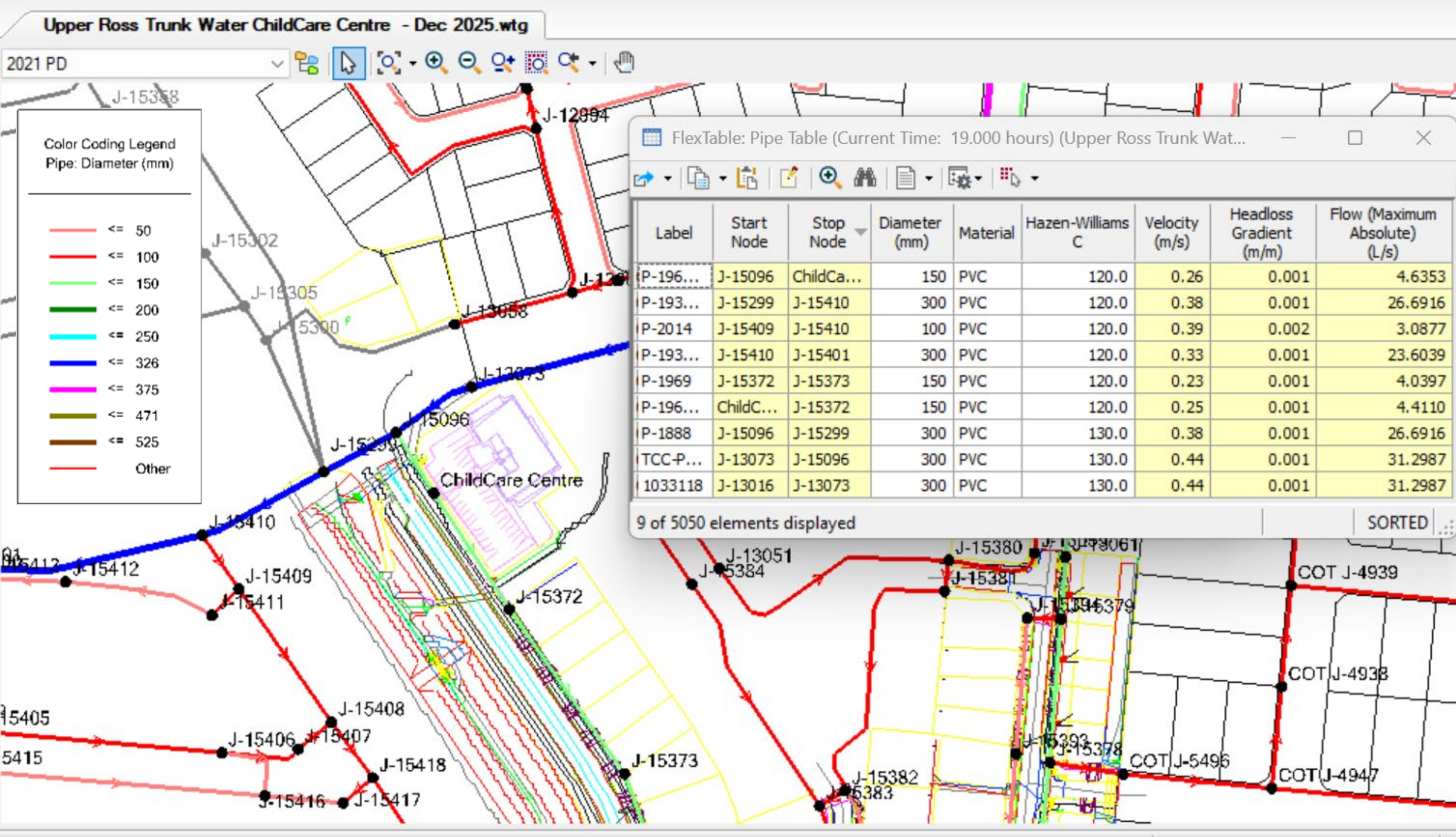
Rasmussen Early Learning Centre – Peak Hour Pressures (12 noon)



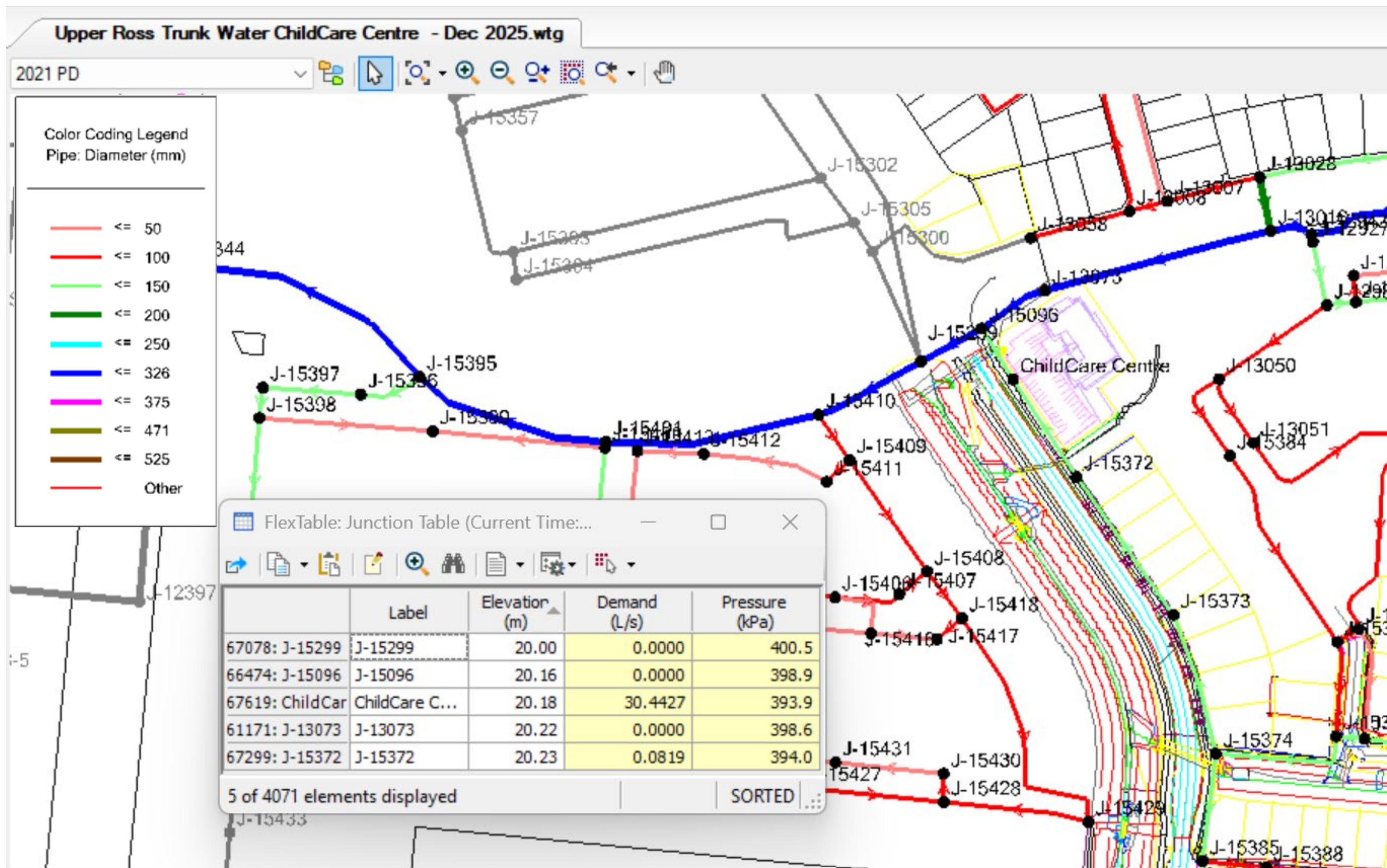
Rasmussen Early Learning Centre - Pipes Peak Hour Flows (12 noon)



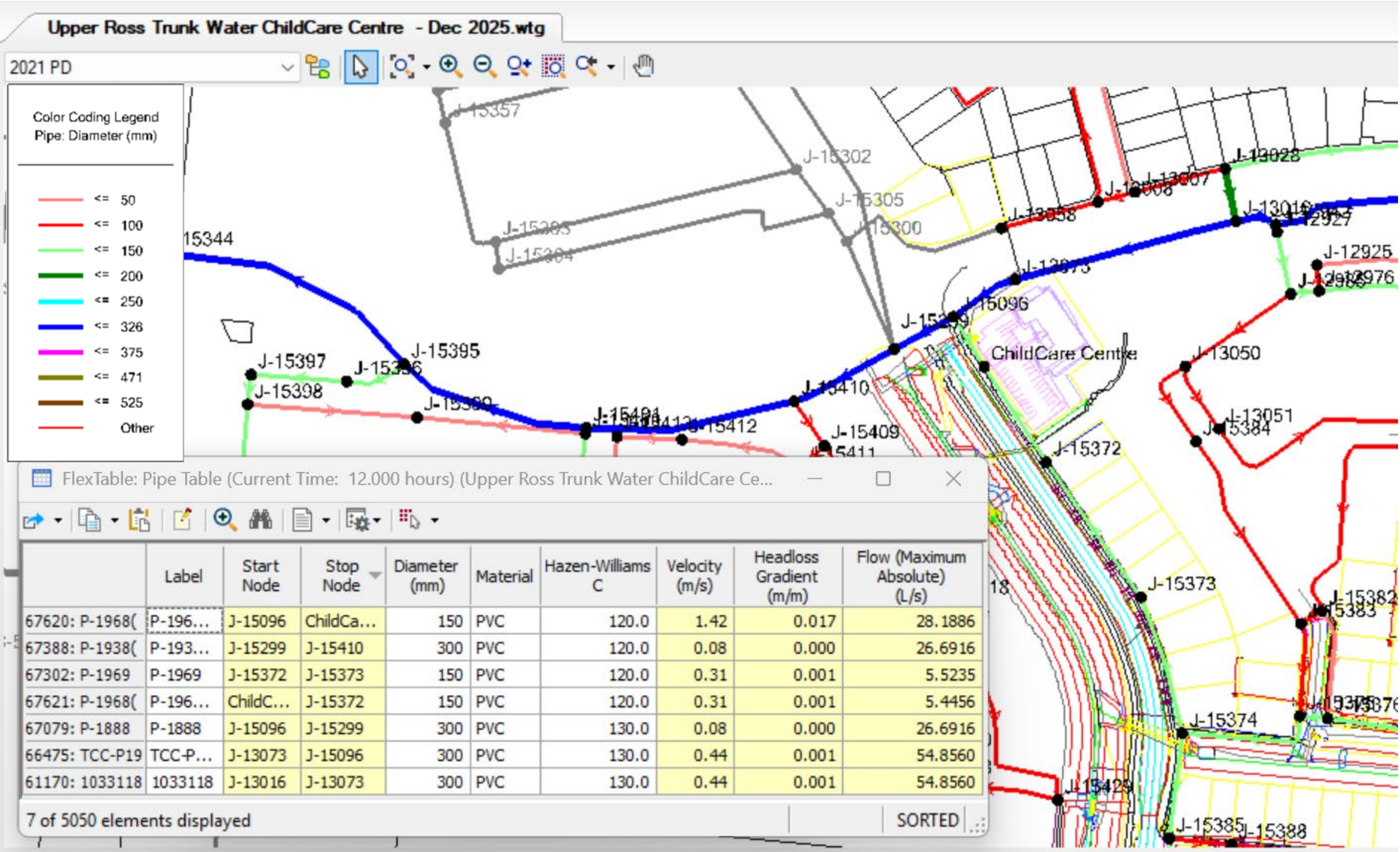
Rasmussen Early Learning Centre – Peak Hour Pressures (7pm)



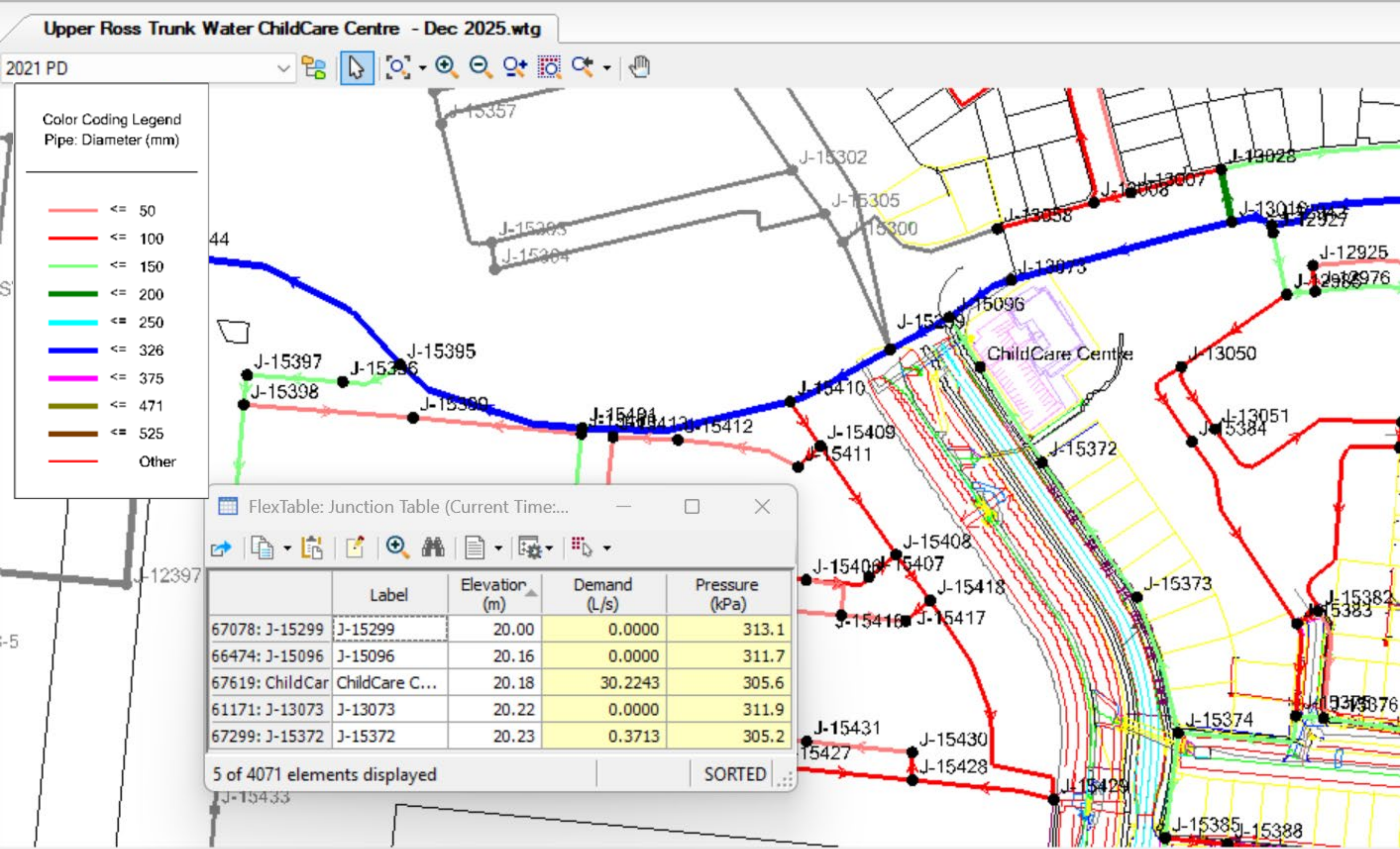
Rasmussen Early Learning Centre - Pipes Peak Hour Flows (7pm)



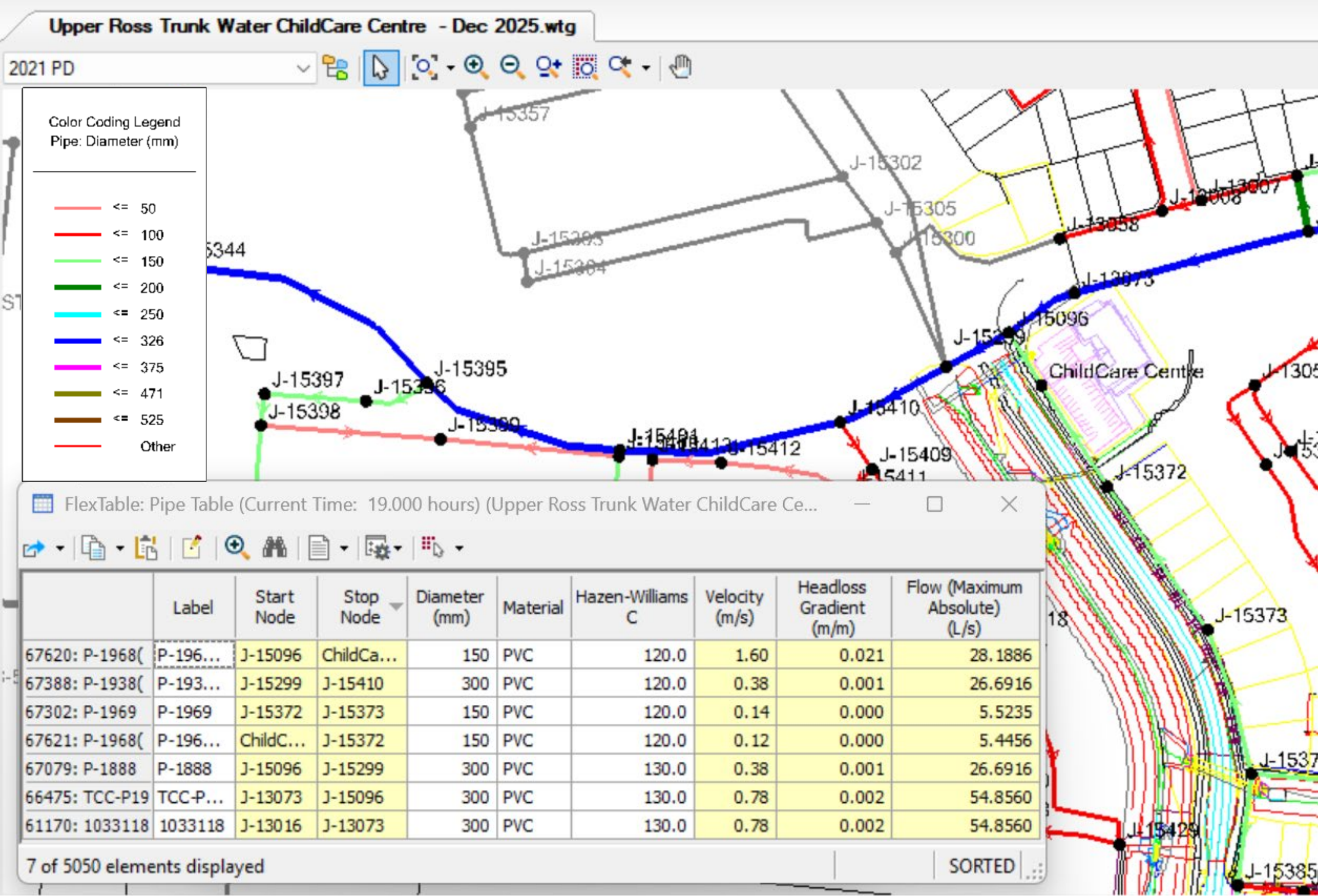
Rasmussen Early Learning Centre - Peak Hour Pressures & 30 l/s Fire Flow (12 noon)



Rasmussen Early Learning Centre - Pipes Peak Hour & 30 l/s Fire Flow (12 noon)



Rasmussen Early Learning Centre - Peak Hour Pressures & 30 l/s Fire Flow (7pm)

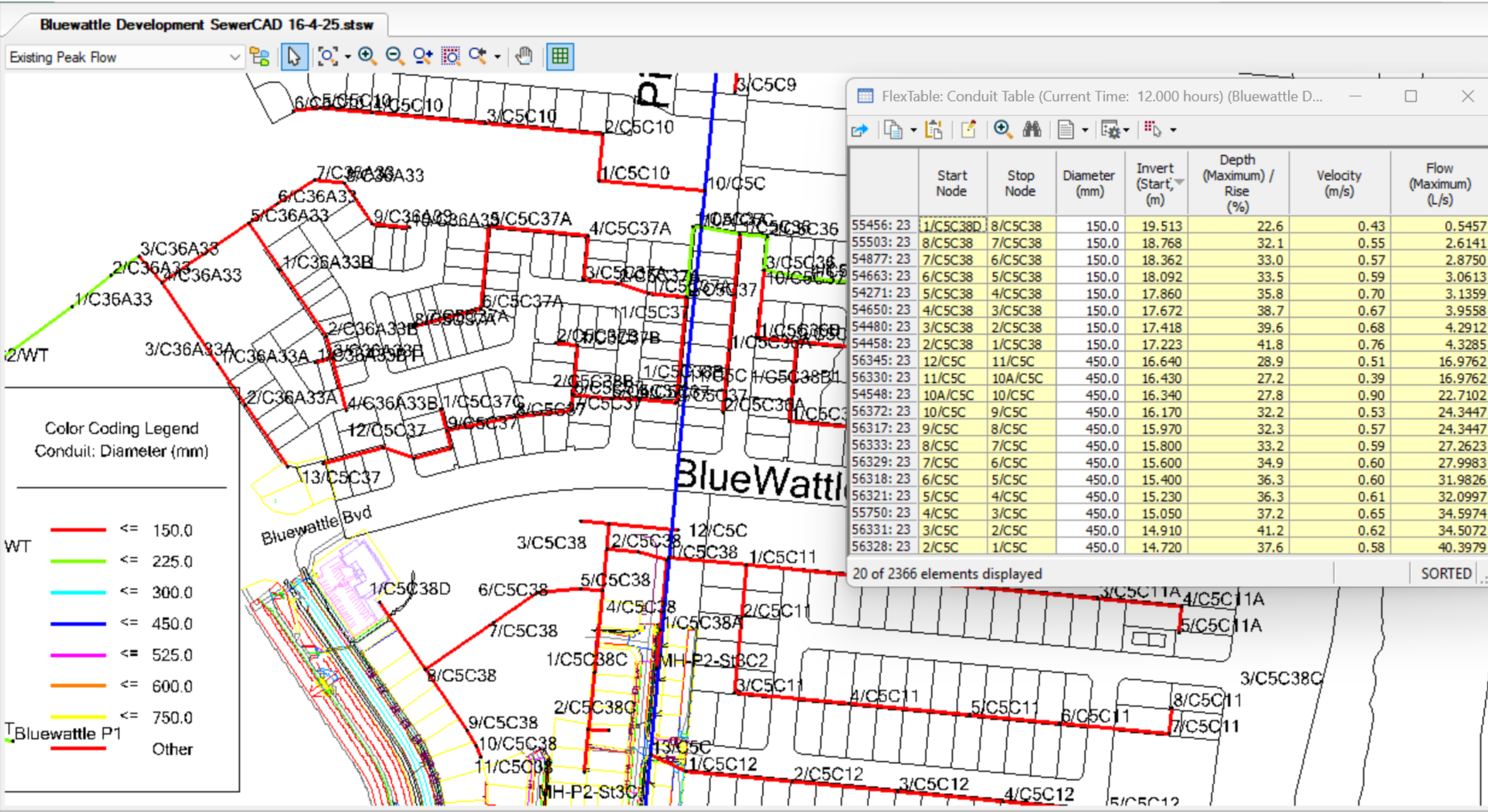


Rasmussen Early Learning Centre - Pipes Peak Hour & 30 l/s Fire Flow (7pm)

APPENDIX C

SEWERGEMS MODELLING FIGURES & RESULTS





RASMUSSEN EARLY LEARNING CENTRE – SEWERGEMS MODELLING RESULTS