Beca Ltd

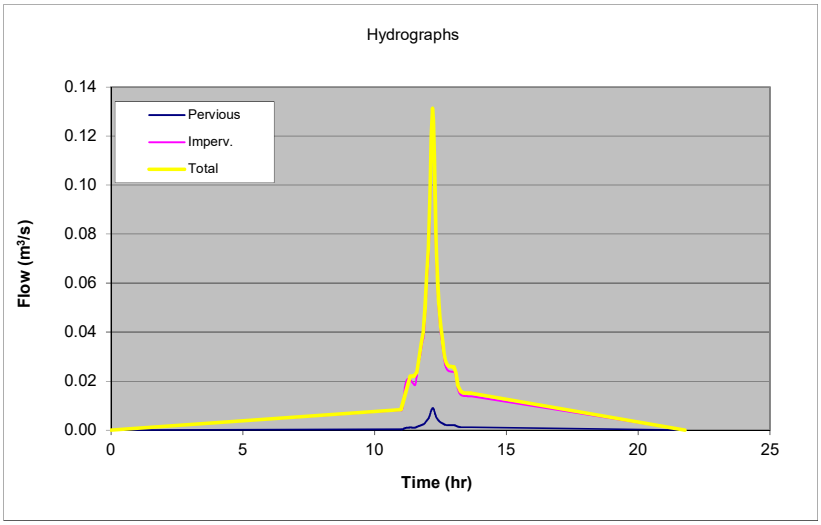
JOB NO: 3124460

Hydrographs- SCS Method:

Project Description Kohi - Attenuation Storage Catchment (A2Q10)

Total Hydrograph in tabular form: (based on simulation from above)

Volumetric error in scaling 0.01%



Time (hr)	Flow (m^3/s)
0.000	0.000
11.001	0.008
11.347	0.022
11.491	0.022
11.601	0.024
11.694	0.030
11.776	0.036
11.850	0.040
11.918	0.049
11.981	0.064
12.040	0.074
12.096	0.096
12.150	0.120
12.201	0.131
12.232	0.127
12.264	0.111
12.297	0.093
12.331	0.077
12.365	0.067
12.400	0.059
12.437	0.052
12.474	0.046
12.513	0.042
12.553	0.039
12.594	0.035
12.637	0.031
12.682	0.029
12.729	0.027
12.778	0.026
12.830	0.026
12.886	0.026
12.945	0.026
13.010	0.026
13.082	0.023
13.163	0.018
13.260	0.016
13.386	0.015
13.690	0.015
21.770	0.000
-1.000	0.000

$$Q = \frac{2}{3} C_d \sqrt{2g}\ bh^{\frac{3}{2}}$$

JOB NO: 3124460

Hydrograph Routing

Project Description Kohi - Attenuation Storage Catchment (P1-P19, P22, A1, A2 & A8)

Inflow Hydrograph

Time (hr)	Flow (m3/s)	H above IL
0.000	0.000	
11.001	0.123	
11.347	0.327	
11.491	0.327	
11.601	0.354	
11.694	0.456	
11.776	0.536	
11.850	0.601	
11.918	0.744	
11.981	0.965	
12.040	1.123	
12.096	1.456	
12.150	1.828	
12.201	1.999	
12.232	1.929	
12.264	1.699	
12.297	1.421	
12.331	1.182	
12.365	1.024	
12.400	0.906	
12.437	0.798	
12.474	0.710	
12.513	0.649	
12.553	0.602	
12.594	0.543	
12.637	0.481	
12.682	0.438	
12.729	0.417	
12.778	0.406	
12.830	0.400	
12.886	0.398	
12.945	0.397	
13.010	0.396	
13.082	0.360	
13.163	0.279	
13.260	0.243	
13.386	0.233	
13.690	0.232	
21.610	0.000	
-1.000	0.000	

Depth/ Volume Relationship

RL (m)	Volume (m^3)
26.050	0
26.550	1.3
27.050	2.5
27.550	3.8
28.050	5.1
28.550	6.4
29.050	7.6
29.150	7.9
29.200	8.0
29.350	8.4
29.450	8.7
29.550	8.9
29.650	9.2
29.750	9.4
29.850	9.7
29.950	9.9
30.050	10.2
30.150	10.4
30.250	10.7
30.350	10.9
-1.000	

Flow Rating Curve

RL (m)	Flow (m3/s) Pipe	Weir	Total
26.050	0.000	0.000	0.000
26.550	0.117	0.000	0.117
27.050	0.236	0.000	0.236
27.550	0.316	0.000	0.316
28.050	0.408	0.000	0.408
28.550	0.457	0.000	0.457
29.050	0.500	0.000	0.500
29.150	0.508	0.000	0.508
29.200	0.513	0.000	0.513
29.350	0.525	0.423	0.948
29.450	0.533	1.050	1.583
29.550	0.540	1.843	2.383
29.650	0.548	2.771	3.319
29.750	0.556	3.817	4.372
29.850	0.563	4.969	5.532
29.950	0.570	6.219	6.789
30.050	0.578	7.558	8.136
30.150	0.585	8.982	9.567
30.250	0.592	10.486	11.078
30.350	0.599	12.065	12.664
-1.000			

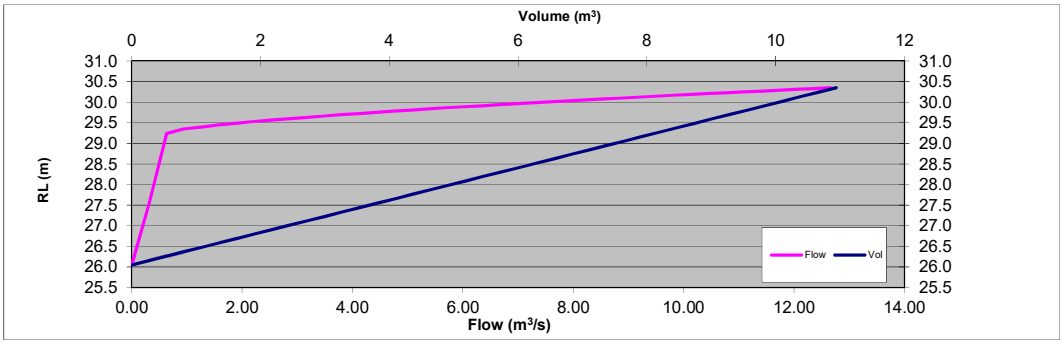
Weir RL (m)	**29.23**
Weir Length (m)	**5.65**
Outlet Pipe Dia (m)	**0.352**
Outlet Pipe Invert level (I	**26.50**
Orifice Cd	**0.670**
Weir CD	**0.6**

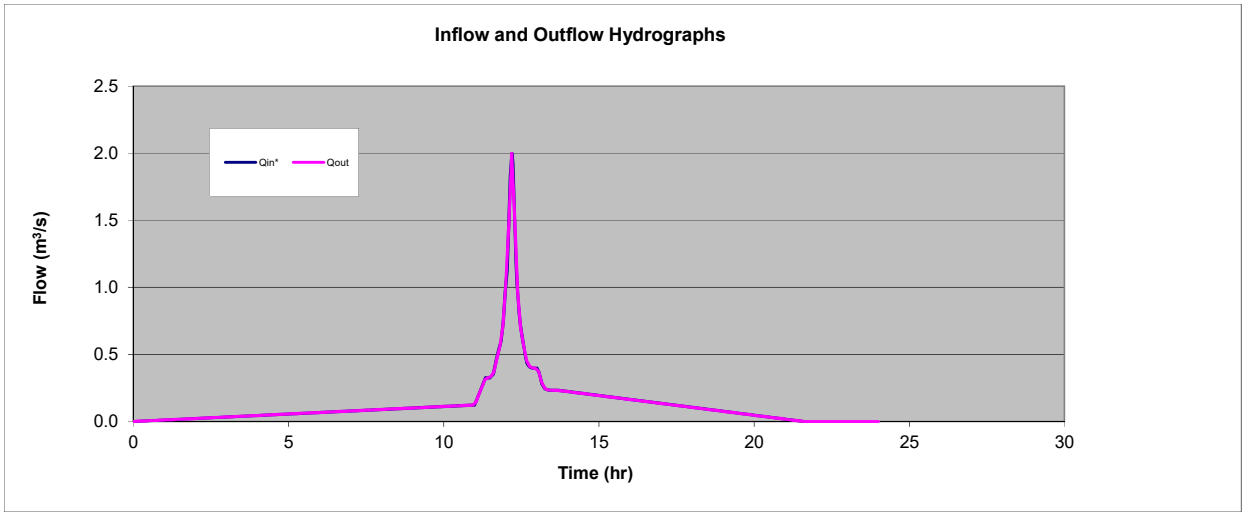
Stability Coefficient (0.5-1.0)	1.00
Start time (hr)	0
Finish time (hr)	24
Extraction rate (m^3/s)	0.00

1. Input data should be in ascending order in the boxes provided. The maximum no. of values is 40, 20 & 20. If a lesser no. of values is needed then terminate as a -1 for the x value.
2. If there is instability in the results then check that the depth/ vol. and/or the flow rating covers the flow range. Otherwise increase the stability coefff. towards 1.0. A value close to 0.5 has better accuracy.
3. Initial pond level will be taken as the RL corresponding to the initial flow on the inflow hydrograph.
4. Extraction rate applies to external pumping or infiltration.

Results:

Max.Inflow (m^3/s)	1.999
Time at Max. Inflow (hr)	12.19
Max. Outflow (m^3/s)	1.998
Time at Max. Outflow (hr)	12.19
Initial RL (m)	26.050
Max. RL (m)	29.502
Max. Volume (m^3)	**8.8**
Inflow Volume (m^3)	11062.7
Volumetric error	0.00%
Extraction Volume (m^3)	0.0





Beca Infrastructure Ltd

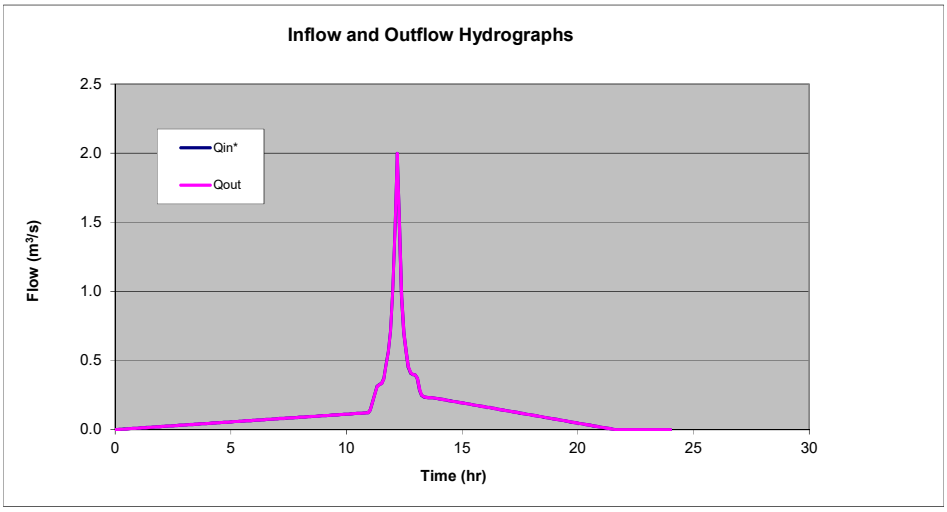
JOB NO:

Hydrograph Routing

Project Description

Total Hydrograph in tabular form: (based on simualtion from above)

Volumetric error in scaling 5.50%



Time (hr)	Flow (m^3/s)
0.000	0.000
3.520	0.039
4.977	0.056
6.096	0.068
7.039	0.079
7.870	0.088
8.621	0.097
9.312	0.104
9.955	0.111
10.559	0.118
11.130	0.197
11.673	0.428
12.192	1.998
12.421	0.861
12.655	0.473
12.894	0.399
13.138	0.305
13.388	0.235
13.644	0.232
13.906	0.226
14.175	0.218
14.452	0.210
14.737	0.201
15.031	0.193
15.335	0.184
15.650	0.174
15.978	0.165
16.320	0.155
16.677	0.144
17.053	0.133
17.450	0.122
17.873	0.109
18.328	0.096
18.822	0.082
19.369	0.066
19.989	0.048
20.725	0.026
21.684	0.000
24.000	0.000
-1.000	0.000

Calculation Sheet

Job Number 3124460 Date 14.02.2020
Job Name Kohimarama Retirement Village
Subject Proposed Stormwater Calc for a 1% AEP with Climate Change
By Conor O'Boyle Page No of

Beca Ltd

JOB NO: 0

Hydrograph Combination

Project Description Separation of Flows in Manhole to Determine Flows into the Attenaution Tank

Time Lag (min) 0 Time Lag (min) 0

Hydrograph A

Time (hr)	Flow (m^3/s)
0.000	0.000
11.001	0.123
11.347	0.327
11.491	0.327
11.601	0.354
11.694	0.456
11.776	0.536
11.850	0.601
11.918	0.744
11.981	0.965
12.040	1.123
12.096	1.456
12.150	1.828
12.201	1.999
12.232	1.929
12.264	1.699
12.297	1.421
12.331	1.182
12.365	1.024
12.400	0.906
12.437	0.798
12.474	0.710
12.513	0.649
12.553	0.602
12.594	0.543
12.637	0.481
12.682	0.438
12.729	0.417
12.778	0.406
12.830	0.400
12.886	0.398
12.945	0.397
13.010	0.396
13.082	0.360
13.163	0.279
13.260	0.243
13.386	0.233
13.690	0.232
21.610	0.000
-1.000	0.000

Hydrograph B

Time (hr)	Flow (m^3/s)
0.000	0.000
11.001	0.123
11.347	0.327
11.491	0.327
11.601	0.354
11.694	0.456
11.776	0.462
11.850	0.462
11.918	0.462
11.981	0.462
12.040	0.462
12.096	0.462
12.150	0.462
12.201	0.462
12.232	0.462
12.264	0.462
12.297	0.462
12.331	0.462
12.365	0.462
12.400	0.462
12.437	0.462
12.474	0.462
12.513	0.462
12.553	0.462
12.594	0.462
12.637	0.462
12.682	0.438
12.729	0.417
12.778	0.406
12.830	0.400
12.886	0.398
12.945	0.397
13.010	0.396
13.082	0.360
13.163	0.279
13.260	0.243
13.386	0.233
13.690	0.232
21.610	0.000
-1.000	0.000

Hydrograph A+B+C

Time (hr)	Flow (m^3/s)
0.000	0.000
11.001	0.000
11.347	0.000
11.491	0.000
11.601	0.000
11.694	0.000
11.776	-0.074
11.850	-0.140
11.918	-0.283
11.981	-0.503
12.040	-0.662
12.096	-0.995
12.150	-1.367
12.201	-1.537
12.232	-1.467
12.264	-1.238
12.297	-0.959
12.331	-0.720
12.365	-0.563
12.400	-0.445
12.437	-0.337
12.474	-0.249
12.513	-0.188
12.553	-0.141
12.594	-0.081
12.637	-0.020
12.682	0.000
12.729	0.000
12.778	0.000
12.830	0.000
12.886	0.000
12.945	0.000
13.010	0.000
13.082	0.000
13.163	0.000
13.260	0.000
13.386	0.000
13.690	0.000
21.610	0.000
-1.000	0.000

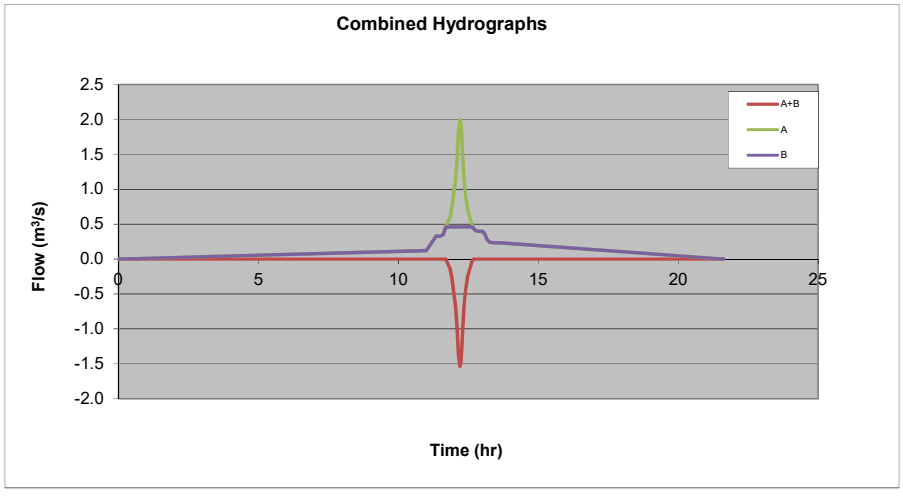
0.000

Notes:

1. *Input data should be in ascending order with time in the boxes provided. The maximum no. of values is 40. If a lesser no. of values is needed then terminate as a -1 for the x value.*
2. *The Time Lag is relative to the hydrograph times.*
3. *Volumetric error is generally due to the interpolation and reassignment of time values.*

Results:

Max. Flow (m^3/s) -A	1.999
Time (hr) at Max Flow	12.20
Max. Flow (m^3/s) -B	0.462
Time (hr) at Max Flow	11.78
Max. Flow (m^3/s)	2.460
Time (hr) at Max Flow	12.20
Volumetric Error	0.0%



JOB NO: 3124460

Hydrograph Routing

Project Description Kohi - Attenuation Storage Catchment (P1-P19, P22, A1, A2 & A8)

Inflow Hydrograph

Time (hr)	Flow (m3/s)
0.000	0.000
11.001	0.000
11.347	0.000
11.491	0.000
11.601	0.000
11.694	0.000
11.776	0.074
11.850	0.140
11.918	0.283
11.981	0.503
12.040	0.662
12.096	0.995
12.150	1.367
12.201	1.537
12.232	1.467
12.264	1.238
12.297	0.959
12.331	0.720
12.365	0.563
12.400	0.445
12.437	0.337
12.474	0.249
12.513	0.188
12.553	0.141
12.594	0.081
12.637	0.020
12.682	0.000
12.729	0.000
12.778	0.000
12.830	0.000
12.886	0.000
12.945	0.000
13.010	0.000
13.082	0.000
13.163	0.000
13.260	0.000
13.386	0.000
13.690	0.000
21.610	0.000
-1.000	0.000

Depth/ Volume Relationship

RL (m)	Volume (m^3)
27.200	0
27.400	117
27.600	235
27.800	352
28.000	470
28.050	499
28.150	558
28.400	704
28.600	822
28.800	939
29.000	1057
29.200	1174
29.400	1301
29.500	1373
29.600	1389
29.650	1399
29.700	1410
29.750	1416
29.800	1421
29.850	1428
-1.000	

Flow Rating Curve

	Flow (m3/s)		
RL (m)	Orifice	Overflow	Total
27.200	0.000	0.000	0.000
27.400	0.000	0.000	0.000
27.600	0.000	0.000	0.000
27.800	0.000	0.000	0.000
28.000	0.000	0.000	0.000
28.050	0.000	0.000	0.000
28.150	0.102	0.000	0.102
28.400	0.152	0.000	0.152
28.600	0.183	0.000	0.183
28.800	0.209	0.000	0.209
29.000	0.232	0.000	0.232
29.200	0.253	0.000	0.253
29.400	0.272	0.000	0.272
29.500	0.281	0.000	0.281
29.600	0.290	0.000	0.290
29.650	0.294	0.000	0.294
29.700	0.299	0.322	0.621
29.750	0.303	0.911	1.214
29.800	0.307	1.673	1.980
29.850	0.311	2.576	2.887
-1.000			

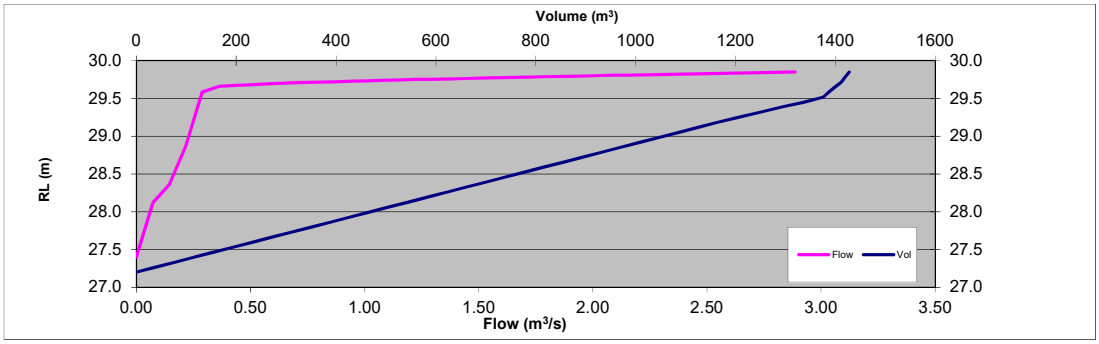
Tank Outflow Weir Level	28.10
tank Outflow Pipe RL	27.79
Orifice Cd	0.670
Tank Outflow Diameter	0.311
Wall Length	16
Weir RL	29.65
Weir CD	0.600

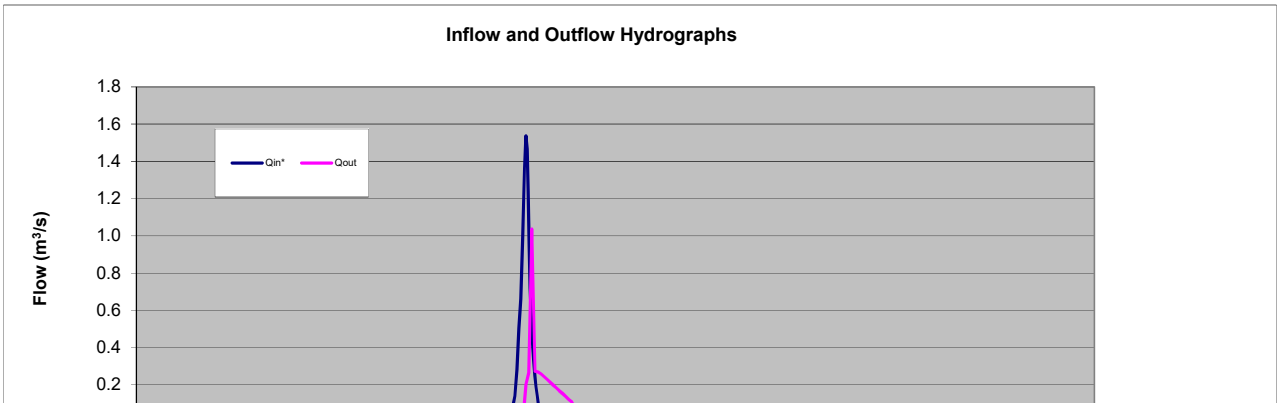
Stability Coefficient (0.5-1.0)	0.50
Start time (hr)	0
Finish time (hr)	24
Extraction rate (m^3/s)	0.00

1. *Input data should be in ascending order in the boxes provided. The maximum no. of values is 40, 20 & 20. If a lesser no. of values is needed then terminate as a -1 for the x value.*
2. *If there is instability in the results then check that the depth/ vol. and/or the flow rating covers the flow range. Otherwise increase the stability coefff. towards 1.0. A value close to 0.5 has better accuracy.*
3. *Initial pond level will be taken as the RL corresponding to the initial flow on the inflow hydrograph.*
4. *Extraction rate applies to external pumping or infiltration.*

Results:

Max.Inflow (m^3/s)	1.537
Time at Max. Inflow (hr)	12.19
Max. Outflow (m^3/s)	1.037
Time at Max. Outflow (hr)	12.38
Initial RL (m)	27.200
Max. RL (m)	29.735
Max. Volume (m^3)	**1413.9**
Inflow Volume (m^3)	1837.7
Volumetric error	-6.18%
Extraction Volume (m^3)	0.0





Calculation Sheet

Job Number 3124460 Date 14.02.20
Job Name Kohimarama Retirement Village
Subject Proposed Stormwater Calc for a 1% AEP with Climate Change
By Connor O'Boyle Page No ..... of .....

Beca Infrastructure Ltd

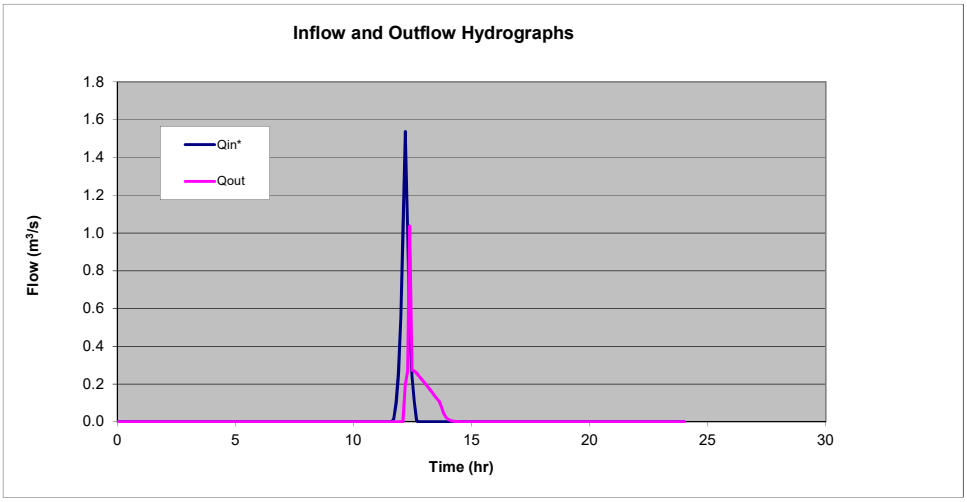
JOB NO: .....

Hydrograph Routing

Project Description

Total Hydrograph in tabular form: (based on simualtion from above)

Volumetric error in scaling 55.48%



Time (hr)	Flow (m^3/s)
0.000	0.000
3.575	0.000
5.056	0.000
6.192	0.000
7.150	0.000
7.994	0.000
8.757	0.000
9.458	0.000
10.111	0.000
10.725	0.000
11.305	0.000
11.857	0.000
12.384	1.037
12.610	0.265
12.840	0.233
13.075	0.196
13.315	0.158
13.561	0.119
13.812	0.047
14.070	0.009
14.335	0.002
14.607	0.000
14.888	0.000
15.177	0.000
15.476	0.000
15.786	0.000
16.108	0.000
16.444	0.000
16.796	0.000
17.166	0.000
17.557	0.000
17.973	0.000
18.420	0.000
18.906	0.000
19.444	0.000
20.054	0.000
20.778	0.000
21.722	0.000
24.000	0.000
-1.000	0.000

Beca

JOB NO: 3124460

Hydrograph Routing

Project Description Kohi - Attenuation Storage Catchment (P1-P19, P22, A1, A2 & A8)

Stability Coefficient (0.5-1.0)	0.70
Start time (hr)	0
Finish time (hr)	24
Extraction rate (m^3/s)	0.00

1. Input data should be in ascending order in the boxes provided. The maximum no. of values is 40, 20 & 20. If a lesser no. of values is needed then terminate as a -1 for the x value.
2. If there is instability in the results then check that the depth/ vol. and/or the flow rating covers the flow range. Otherwise increase the stability coefff. towards 1.0. A value close to 0.5 has better accuracy.
3. Initial pond level will be taken as the RL corresponding to the initial flow on the inflow hydrograph.
4. Extraction rate applies to external pumping or infiltration.

Inflow Hydrograph

Time (hr)	Flow (m3/s)
0.000	0.000
11.001	0.000
11.347	0.000
11.491	0.000
11.601	0.000
11.694	0.000
11.776	0.074
11.850	0.140
11.918	0.283
11.981	0.503
12.040	0.662
12.096	0.995
12.150	1.367
12.201	1.537
12.232	1.467
12.264	1.238
12.297	0.959
12.331	0.720
12.365	0.563
12.400	0.445
12.437	0.337
12.474	0.249
12.513	0.188
12.553	0.141
12.594	0.081
12.637	0.020
12.682	0.000
12.729	0.000
12.778	0.000
12.830	0.000
12.886	0.000
12.945	0.000
13.010	0.000
13.082	0.000
13.163	0.000
13.260	0.000
13.386	0.000
13.690	0.000
21.610	0.000
-1.000	0.000

Depth/ Volume Relationship

RL (m)	Volume (m^3)
27.200	0
27.400	117
27.600	235
27.800	352
28.000	470
28.050	499
28.150	558
28.400	704
28.600	822
28.800	939
29.000	1057
29.200	1174
29.400	1301
29.500	1373
29.600	1389
29.650	1399
29.700	1410
29.750	1416
29.800	1421
29.850	1428
-1.000	

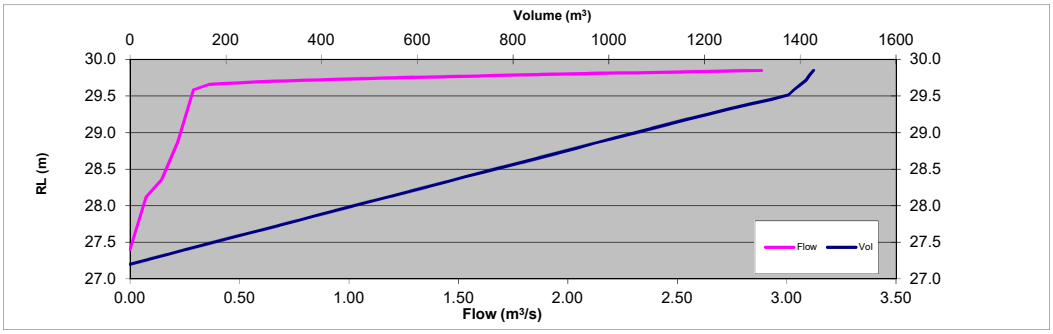
Flow Rating Curve

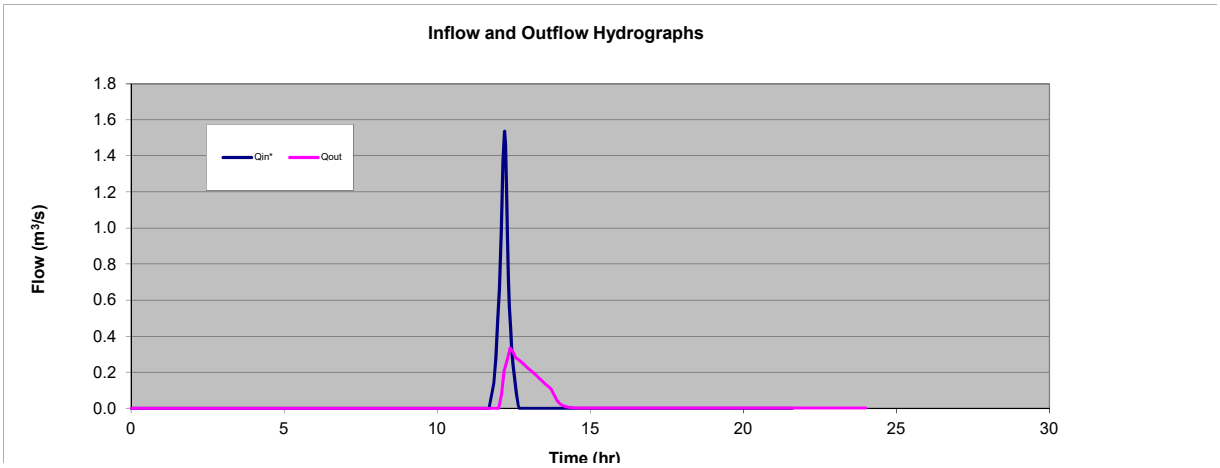
RL (m)	Flow (m3/s) Orifice	Overflow	Total
27.200	0.000	0.000	0.000
27.400	0.000	0.000	0.000
27.600	0.000	0.000	0.000
27.800	0.000	0.000	0.000
28.000	0.000	0.000	0.000
28.050	0.000	0.000	0.000
28.150	0.102	0.000	0.102
28.400	0.152	0.000	0.152
28.600	0.183	0.000	0.183
28.800	0.209	0.000	0.209
29.000	0.232	0.000	0.232
29.200	0.253	0.000	0.253
29.400	0.272	0.000	0.272
29.500	0.281	0.000	0.281
29.600	0.290	0.000	0.290
29.650	0.294	0.000	0.294
29.700	0.299	0.322	0.621
29.750	0.303	0.911	1.214
29.800	0.307	1.673	1.980
29.850	0.311	2.576	2.887
-1.000			

Tank Outflow Weir Level	28.10
tank Outflow Pipe RL	27.79
Orifice Cd	0.670
Tank Outflow Diameter	0.311
Wall Length	16
Weir RL	29.65
Weir CD	0.600

Results:

Max.Inflow (m^3/s)	1.537
Time at Max. Inflow (hr)	12.19
Max. Outflow (m^3/s)	0.335
Time at Max. Outflow (hr)	12.38
Initial RL (m)	27.200
Max. RL (m)	29.656
Max. Volume (m^3)	**1400.6**
Inflow Volume (m^3)	1837.7
Volumetric error	0.00%
Extraction Volume (m^3)	0.0





Beca Infrastructure Ltd

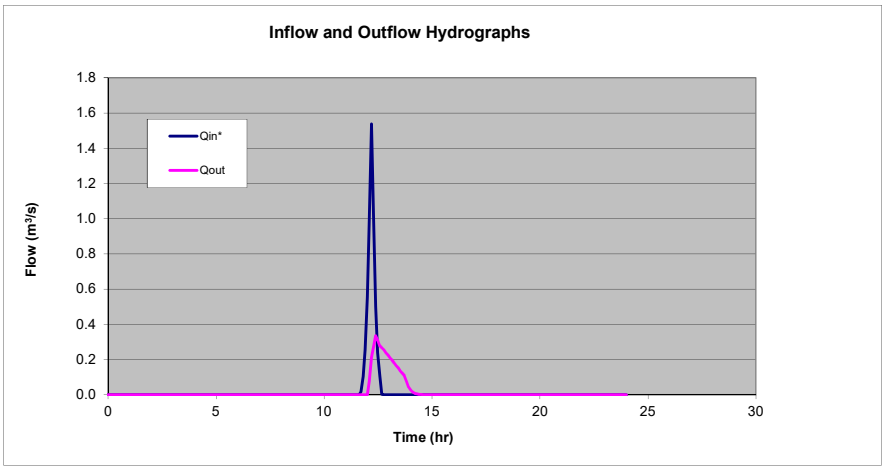
JOB NO: .....

Hydrograph Routing

Project Description

Total Hydrograph in tabular form: (based on simualtion from above)

Volumetric error in scaling 5.11%



Time (hr)	Flow (m^3/s)
0.000	0.000
3.575	0.000
5.056	0.000
6.192	0.000
7.150	0.000
7.994	0.000
8.757	0.000
9.458	0.000
10.111	0.000
10.725	0.000
11.305	0.000
11.857	0.000
12.384	0.335
12.610	0.274
12.840	0.243
13.075	0.207
13.315	0.169
13.561	0.130
13.812	0.078
14.070	0.019
14.335	0.004
14.607	0.001
14.888	0.000
15.177	0.000
15.476	0.000
15.786	0.000
16.108	0.000
16.444	0.000
16.796	0.000
17.166	0.000
17.557	0.000
17.973	0.000
18.420	0.000
18.906	0.000
19.444	0.000
20.054	0.000
20.778	0.000
21.722	0.000
24.000	0.000
-1.000	0.000

Beca Ltd

JOB NO: 3124460

Hydrographs- SCS Method:

Project Description Direct Overland Flow to No 17 - P21

Rainfall Depth (mm) 222

Notes:

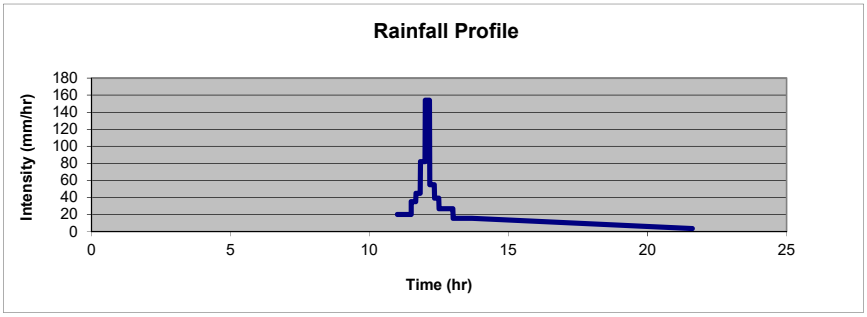
1. Inputs

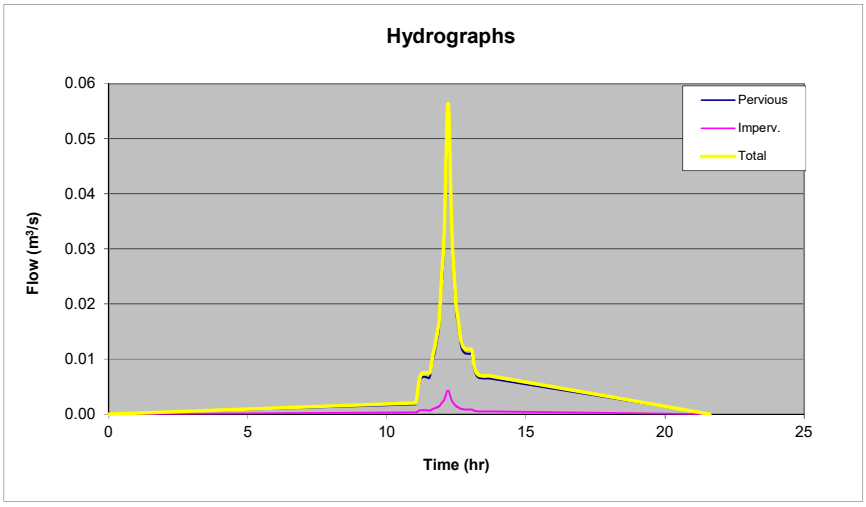
2. Typical inputs for CN are in 'Typical CN Values' Sheet

3. Method based on ARC TP108

Catchment Data	Pervious Area	Impervious Area
Area (ha)	0.1713	0.0111
Runoff No (CN)	74	98
Initial Loss (Ia-mm)	5	0
Time of Concentration (tc-min)	10.0	10.0
Soil storage (S-mm)	89.2	5.2

Outputs			Total
Area (ha)	0.1713	0.0111	0.1824
Runoff (mm)	153.8	216.9	157.6
Peak Flow (m^3/s)	0.052	0.004	0.056
Time (hr) at Peak Flow	12.20	12.20	12.20
Rainfall (mm/h) over tc	154.01	154.01	154.01
Runoff Coefficient - Peak	0.71	0.90	0.72
Runoff Coefficient - Volume	0.69	0.98	0.71





Beca Ltd

JOB NO: 0

Hydrograph Combination

Project Description Combined Total Overland Flow to No 17

Time Lag (min) 0 Time Lag (min) 0

Direct Overland Flow

Time (hr)	Flow (m^3/s)
0.000	0.000
11.001	0.002
11.347	0.008
11.491	0.008
11.601	0.009
11.694	0.012
11.776	0.014
11.850	0.016
11.918	0.020
11.981	0.026
12.040	0.030
12.096	0.040
12.150	0.051
12.201	0.056
12.232	0.055
12.264	0.048
12.297	0.041
12.331	0.034
12.365	0.030
12.400	0.026
12.437	0.023
12.474	0.021
12.513	0.019
12.553	0.018
12.594	0.016
12.637	0.014
12.682	0.013
12.729	0.012
12.778	0.012
12.830	0.012
12.886	0.012
12.945	0.012
13.010	0.012
13.082	0.011
13.163	0.008
13.260	0.007
13.386	0.007
13.690	0.007
21.610	0.000
-1.000	0.000

Tank Overflow

Time (hr)	Flow (m^3/s)
0.000	0.000
3.575	0.000
5.056	0.000
6.192	0.000
7.150	0.000
7.994	0.000
8.757	0.000
9.458	0.000
10.111	0.000
10.725	0.000
11.305	0.000
11.857	0.000
12.384	0.335
12.610	0.274
12.840	0.243
13.075	0.207
13.315	0.169
13.561	0.130
13.812	0.078
14.070	0.019
14.335	0.004
14.607	0.001
14.888	0.000
15.177	0.000
15.476	0.000
15.786	0.000
16.108	0.000
16.444	0.000
16.796	0.000
17.166	0.000
17.557	0.000
17.973	0.000
18.420	0.000
18.906	0.000
19.444	0.000
20.054	0.000
20.778	0.000
21.722	0.000
24.000	0.000
-1.000	0.000

Hydrograph A+B+C

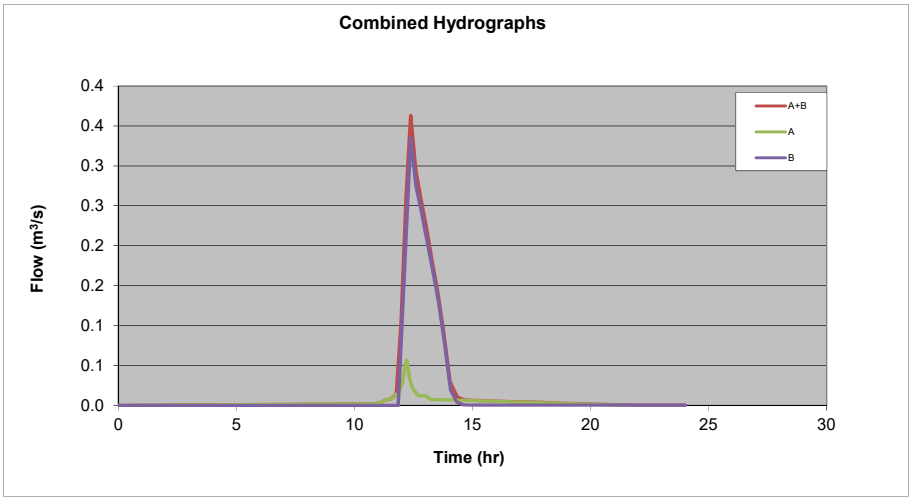
Time (hr)	Flow (m^3/s)
0.001	0.000
3.575	0.001
6.347	0.001
7.233	0.001
7.877	0.001
8.402	0.002
8.852	0.002
9.251	0.002
9.612	0.002
9.944	0.002
10.251	0.002
10.538	0.002
10.809	0.002
11.065	0.003
11.309	0.007
11.542	0.008
11.764	0.014
11.979	0.103
12.185	0.263
12.384	0.363
12.595	0.294
12.814	0.258
13.041	0.223
13.277	0.182
13.524	0.143
13.782	0.091
14.054	0.029
14.340	0.010
14.645	0.007
14.971	0.006
15.322	0.006
15.705	0.006
16.128	0.005
16.606	0.005
17.162	0.004
17.844	0.004
18.783	0.003
21.722	0.000
24.000	0.000
-1.000	0.000

Notes:

1. *Input data should be in ascending order with time in the boxes provided. The maximum no. of values is 40. If a lesser no. of values is needed then terminate as a -1 for the x value.*
2. *The Time Lag is relative to the hydrograph times.*
3. *Volumetric error is generally due to the interpolation and reassignment of time values.*

Results:

Max. Flow (m^3/s) -A	0.056
Time (hr) at Max Flow	12.20
Max. Flow (m^3/s) -B	0.335
Time (hr) at Max Flow	12.38
Max. Flow (m^3/s)	0.363
Time (hr) at Max Flow	12.38
Volumetric Error	0.0%



Beca Ltd

JOB NO: 3124460

Hydrographs- SCS Method:

Project Description Direct Overland Flow to No 27-45 - P20

Rainfall Depth (mm) 222

Notes:

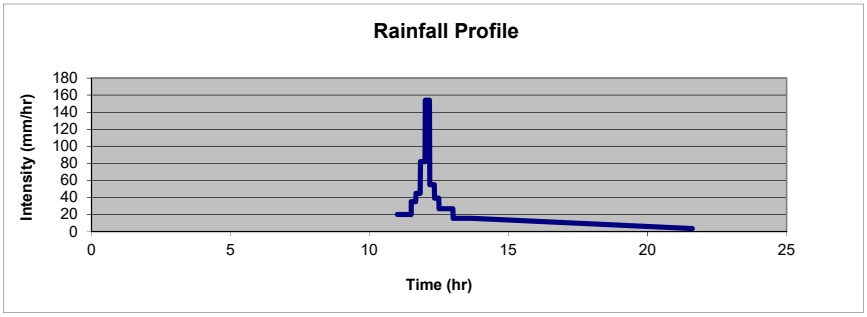
1. Inputs

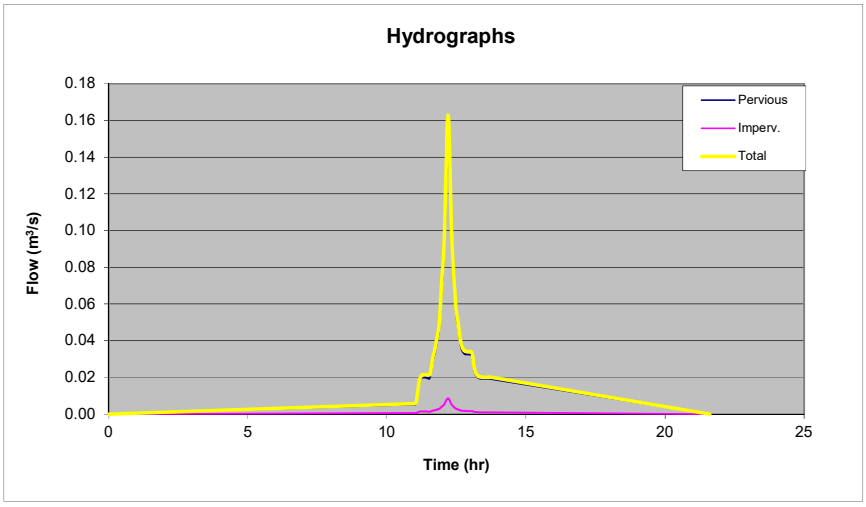
2. Typical inputs for CN are in 'Typical CN Values' Sheet

3. Method based on ARC TP108

Catchment Data	Pervious Area	Impervious Area
Area (ha)	0.5067	0.0224
Runoff No (CN)	74	98
Initial Loss (Ia-mm)	5	0
Time of Concentration (tc-min)	10.0	10.0
Soil storage (S-mm)	89.2	5.2

Outputs			Total
Area (ha)	0.5067	0.0224	0.5291
Runoff (mm)	153.8	216.9	156.4
Peak Flow (m^3/s)	0.154	0.009	0.163
Time (hr) at Peak Flow	12.20	12.20	12.20
Rainfall (mm/h) over tc	154.01	154.01	154.01
Runoff Coefficient - Peak	0.71	0.90	0.72
Runoff Coefficient - Volume	0.69	0.98	0.70





Beca Ltd

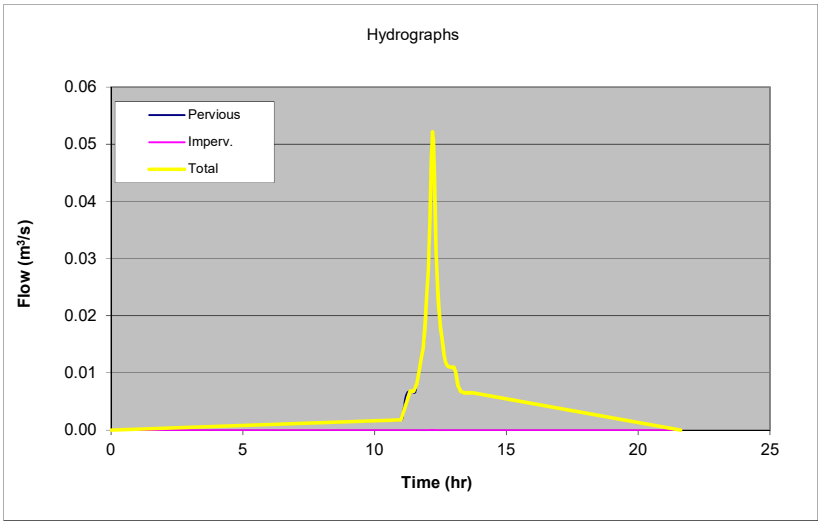
JOB NO: 3124460

Hydrographs- SCS Method:

Project Description Direct Overland Flow to No 17 - P21

Total Hydrograph in tabular form: (based on simulation from above)

Volumetric error in scaling 0.01%



Time (hr)	Flow (m^3/s)
0.000	0.000
11.001	0.002
11.347	0.007
11.491	0.007
11.601	0.008
11.694	0.011
11.776	0.013
11.850	0.014
11.918	0.018
11.981	0.024
12.040	0.028
12.096	0.037
12.150	0.047
12.201	0.052
12.232	0.051
12.264	0.045
12.297	0.038
12.331	0.032
12.365	0.027
12.400	0.024
12.437	0.022
12.474	0.019
12.513	0.018
12.553	0.016
12.594	0.015
12.637	0.013
12.682	0.012
12.729	0.011
12.778	0.011
12.830	0.011
12.886	0.011
12.945	0.011
13.010	0.011
13.082	0.010
13.163	0.008
13.260	0.007
13.386	0.007
13.690	0.007
21.610	0.000
-1.000	0.000

D

Appendix D – Pre-application memo

Pre-Application Consenting Memo

Pre-Application No. PRR00031670		
Date of request	10/06/2019	
Customer	Ryman Healthcare	
Contact details	**Phone**	Karen Joubert; 0211089447
	Email	karen.joubert@mitchelldaysh.co.nz
Site address	223 Kohimarama Road Kohimarama Auckland 1071 and 7 John Rymer Place	

Please note that there may be hyerlinks throughout the memo which are underlined. Please click on the highlighted text for further information.

Resource Management Documents		
Auckland Unitary Plan (Operative in part)	Zoning	Residential - Mixed Housing Urban Zone
	Precinct	NA
	Overlays	NA
	Controls	Controls: Macroinvertebrate Community Index - Urban
	Designations	NA
	Appeals	NA
	Plan Changes	NA
Other Relevant Acts	Hauraki Gulf Marine Park Act	

Property Information	
Legal Description	Lot 1 DP 332284: 223 Kohimarama Road Lot 51 DP 163242: 7 John Rymer Place
Certificate of Title	This has not been viewed, so there may be easements, building line restrictions and other restrictions that need to be taken into account in preparing any development proposal. If the title is 'limited as to parcels', you may need to get this surveyed, particularly where some of the controls, are reliant on accuracy being insured.

Site constraints Type	Y	N	Site constraints Type	Y	N
(Potential) Contaminated Land	☒	☐	Coastal Erosion	☐	☒
Land Instability	☐	☒	Coastal Storm Inundation	☐	☒
Floodplain	☒	☐	Coastal Storm Inundation (plus 1m sea level rise)	☐	☒
Overland flow paths (ephemeral/intermittent/permanent stream)	☒	☐	Cultural Heritage Inventory	☐	☒
Flood Sensitive	☒	☐	Combined Network	☐	☒
Arterial Roads	☒	☐	Building Frontage Control	☐	☒
Vehicle Access Restriction Control	☒	☐	Geology (rock breaking)	☐	☒

Meeting Record

Meeting Record	
Date	19/12/2019 (Stormwater discussions)
Council Officers	Maree Gleeson – Specialist, Healthy Waters Christina Bloom – Streamwaters Specialist, Auckland Council Arsini Hanna – Senior Stormwater Specialist, Auckland Council Masato Nakamura – Senior Planner, Resource Consents
Customer	**Meeting Attendees:** Karen Joubert – Associate Planning Consultant, Mitchel Daysh; Matthew Brown – Ryman Development Manager; Conor O'Boyle – Beca, Associate Civil Engineer; Ron Melton – Beca, Technical Director – Land Development; Blaise Cummins – Beca, Technical Director / Principal Engineer; Jack Turner – Tektus, Director, Engineer, Planner; and Richard Turner Mitchell Daysh, Director, Planner;

Relevant matters discussed at the meeting	
Background and Proposal	• A catchment wide analysis has been undertaken to determine the stormwater flows and discharge routes as it currently stands. The catchment has an area of 19ha, which is an excess of what the network in the local area is designed to take. The overland flow paths within the area also follows the general pattern of stormwater pipes.

	• There is a 450mm (although inconsequential in terms of the minutes), pipe currently existing in the site. It is likely that this is an asset that was never vested to Healthy Waters from the past, when John Rymer Place was developed. From the site boundary to John Rymer, this is a 600mm line. A CCTV survey has been conducted for these lines. It is noted that these networks were not designed for climate change. • The existing lines on the site has a capacity of 700-750L/s (this has yet to be confirmed). Any volume and velocity beyond this will cause flooding. • The overland flow path on Kohimarama Road does not enter the subject site. The proposal will be designed to ensure that this arrangement continues. • With regards to down stream properties, there are buildings which do not provide freeboard, with fences which obstruct the flow path. In terms of flooding effects within the environment. • The subject site naturally provides attenuation and floodwater storage and attenuation. The applicant team views this as the baseline to how the stormwater effects should be assessed for the proposal. • Hydrology mitigation under E8 or the NDC will not be proposed. Further discussion and details are to be provided pending availability.
Questions to the Council Team	• With regards to the region wide NDC, whether the proposal should be assessed using the greenfield or brown field development criteria. The preferred position of the applicant team is that the brownfield development criteria is adopted, noting that the requirements of greenfield development would not be able to be complied with. • As the existing network was not designed for climate change, whether the proposal should also take into account the climate change is queried. • Whether the existing level of surcharge can be proposed onto the network as a result of the proposal. In other words, can the full capacity of the line be used as part of the discharge of stormwater from this proposal. • Whether the existing attenuation (occurring naturally) on the subject site can be factored into the assessment for the proposal. • The response to these questions will provide the parameters for further refinement and detailed design.

The Options	• Three options were outlined by the applicant team. The option selected are dependent on the response from Council regarding the matters raised above, as this will set parameters moving forward for the applicant team. • Option 1: Onsite attenuation only. No new outlet; relying solely on the existing network. • Option 2: Capture stormwater at the top of the site, and discharge to outlet in the creek to the west of the site. This option is likely to be made public. Would rely on a new outlet. • Option 3: Capture stormwater within the site, and discharge to the outlet as per above (would rely on a new outlet). This option is likely to be private. • Regardless of the options, the intention is to direct as much stormwater as possible to the public line.
Outlet Locations	• Depending on the discharge option adopted, a new outlet structure will be proposed to the stream to the west of the subject site. Regardless of the options adopted, the proposed location of the outlet is likely to be the same. The location of the outlet will be further down the contours, further than originally designed during past discussions. • The applicant team should be mindful of the walking track proposal within the creek, and whether the proposed outlet and associated works will have an impact.
Other	• The applicant team also suggested whether surcharge impacts onto properties connecting to the network can be assessed post consent. This is not supported by the officers, noting that this is likely a matter which will also be discussed at the hearing down the track. The Council will also want to be clear on the extent of the adverse effects associated with the proposal.

Following the meeting, a table outlining the design criteria and values Ryman is proposing was provided by Ms Joubert. Maree Gleeson from Healthy Waters provided comments following review of the table, and Paula Vincent provided input on the NDC questions. The table is intended to be used as guidance for the decision to be made on the preferred stormwater options for the development.

<table>
<tr><th></th><th>Design Criteria Options</th><th>Proposed Criteria</th><th>HWD response 16-1-20</th></tr>
<tr><td colspan="3">Existing Situation</td><td></td></tr>
<tr><td>Design Rainfall</td><td>TP108 data without climate change allowance

Or

TP108 data with climate change allowance.</td><td><u>TP108 data without climate change allowance.</u>

The existing downstream network would not have been designed with climate change allowance. In addition to this, it does not have sufficient capacity to accommodate the existing 1 in 10 year flows from the catchment when climate change is considered, even when the attenuation effects of the hollows on-site is considered. Existing networks are not upgraded to accommodate climate change, instead climate change results in reducing level of service.</td><td>See below the design rainfall and design flow assessment for 10yr and 100yr ARI :

<table><tr><th>Rainfall (10yr and 100yr)</th><th>Existing Development Scenario design flows

(existing network with existing on-site attenuation)</th><th>Post Development Scenario design Flows

(existing network with proposed on-site attenuation)</th></tr><tr><td>TP108 without CC</td><td>X l/s</td><td>X l/s</td></tr><tr><td>TP108 with CC</td><td>X l/s</td><td>X l/s</td></tr></table></td></tr>
<tr><td>Capacity Assessment of the Downstream Network</td><td>Existing downstream network allowed to be surcharged when estimating the existing capacity of the network.

Or

Existing capacity of the network estimated based on unsurcharged conditions.</td><td><u>Existing downstream network allowed to be surcharged when estimating the existing capacity of the network.</u>

This reflects what the pipe capacity actually is, as the network will surcharge prior to causing surface ponding or overland flow downstream.</td><td>The capacity of the existing stormwater network should be based on un-surcharged conditions. The reason for this approach is concern about surcharging of the private drainage connected to the existing public stormwater network and the risk of exfiltration from the network if the network is functioning under pressure. The dwelling at 17 John Rymer place is located directly over the existing 600 mm dia SW network.</td></tr>
</table>

Degree of pipe blockage when estimating secondary overland flows	Values between 0% and 100%	80% An open channel is located upstream of both of the pipes on-site which appears not to be regularly maintained.	The SW COP indicates for pipes less than or equal to 600 mm dia, 100% blockage should be assumed when determining the 100yr ARI flows (overland flows via the secondary flow path)
Existing Peak Flow Estimates	Accounting for the reduction in existing peak flows from the 'accidental' hollows on-site providing attenuation. Or Not accounting for the reduction in existing peak flows from the 'accidental' hollows on-site providing attenuation.	Accounting for the reduction in existing peak flows from the 'accidental' hollows on-site providing attenuation. Although the hollows were created not by design, they are attenuating the peak flows from the site and reducing the flood risk to downstream properties.	As advised above the existing peak flow estimate can consider the existing on site attenuation mentioned at the meeting 19-12-19.
Roughness value of downstream pipework when estimating capacity	0.6 or 1.5	0.6 The existing network would likely have been designed based on a pipe roughness value of 0.6. Although a value of 1.5 is quoted in the stormwater code of practice, there is a lot of literature recommending a value of 0.6.	1.5 to comply with SW COP
Existing catchment upstream of John	The actual existing stormwater catchment of	For both the existing and proposed network calculations we are using what	Agree with this approach.

Rymer Place (including Selwyn College & Kohimarama Road)	John Rymer Place has been found, through on-site investigations to be larger to the catchment used in the Water Right and in the John Rymer Place network design. This further exacerbates the existing network capacity issues.	we believe to be the actual catchment boundaries that we have estimated, based on our investigation on-site.	
Proposed Situation			
Design Rainfall	TP108 data without climate change allowance Or TP108 data with climate change allowance.	TP108 data without climate change allowance. Should be the same as the existing situation.	As above rainfall with and without climate change is usually the assessment HWD would ask for.
Capacity Assessment of the Downstream Network	Same as the existing situation Or Maximum surcharge of the pipe that doesn't	Maximum surcharge of the pipe that doesn't result in surface ponding or overland flow in the 1 in 10 year event. Conveying a greater peak flow in the downstream pipe network will reduce the overland flow from the site. Proposed attenuation volumes are very sensitive to the proposed peak outflows from the site.	As above the capacity of the existing SW network should be estimated based on un-surcharged conditions.

	result in surface ponding or overland flow in the 1 in 10 year event.		
Degree of pipe blockage when estimating secondary overland flows	Values between 0% and 100%	50% The likelihood of blockages in the proposed network should be much less than the existing as it will be regularly maintained and the pipe inlets from the proposed stream will be designed to mitigate the risk of blockages.	The SW COP indicates for pipes less than or equal to 600 mm dia, 100% blockage should be assumed when determining the 100yr ARI flows -overland flows via the secondary flow path.
Site considered to be Brownfields or Greenfields in accordance with the Network Discharge Consent	Brownfields Or Greenfields	Brownfields Our site is an undeveloped site in the middle of a brownfield catchment, receiving flows from the upstream college and Kohimarama Road and discharging into a piped network downstream which is located under many residential properties.	Agree Brownfields large is appropriate for assessment under HWD SW regional NDC - schedule 4 • the site is an island of undeveloped land in a catchment that is already urbanized and has been for a long time. This places some constraints on the applicant with regards to pipe capacity which seemed to be their biggest issue with the possibility of the SMP being considered under greenfield requirements. • subsequent to the SMP meeting Schedule 4, the SMP would be able to be adopted into the NDC through the Schedule 8 process • The applicant may seek to create a new discharge point into the stream. We note that if the site was a pure greenfield site this would trigger a different process for adopting an SMP under condition 13c of the NDC. However in this instance the site already has an urban zoning which means the site is exempt from condition 13c. The SMP can therefore be adopted via the Schedule 8 process. For clarity, the applicant may progress the adoption of the SMP via Schedule 8 and meet Brownfields large in Schedule 4.

Hydrological Mitigation	Is retention / detention required for hydrological mitigation?	No The point of discharge is to a relatively low velocity stream which is approximately 250m from the tidal estuary. Therefore it is considered there may be limited hydrological benefit of providing retention / detention volumes at the site. We suggest a site visit with Healthy Waters along with the design team would be useful to help confirming this.	Yes - refer schedule 4 Brownfields large . • The requirements for water quality and stream hydrology management are the same for both greenfield and large scale brownfield. • The site is upstream of an SEA-Terrestrial (Purewa Stream). Consideration of how any adverse effects of stormwater on the SEA are managed are required by the general matters that an SMP must address and these apply to both greenfield and large scale brownfield.
Roughness value of downstream pipework when estimating capacity	0.6 or 1.5	0.6 Should the same as the existing situation.	1.5 as per SW COP.

Preliminary view on outcome and process
In terms of the notification process, the Council officers recommend that the application is lodged on a publicly notified basis. Further details are required to be provided for the Council form a conclusion on the overall outcome of the proposal. This is a preliminary view only. A final determination on whether Council can support the consent or not can only be made upon receipt of a formal application, site visit and review.

Resource Consent Strategy	
Specialist Assessments	You may need to provide written specialist report(s) to support your application, depending on the scale and significance of your proposal. As described above, in this case at a minimum the following is considered necessary: • Draft Construction Management Plan • Draft Construction Traffic Management Plan • Construction Noise and Vibration Assessment • Traffic Report • Geotechnical and Groundwater Report • Flood report (including hazard risk assessment) • Infrastructure Assessment • Landscaping Strategy, Landscape Plan and Maintenance Program • Stormwater Management Plan • Draft Erosion Sediment Control Plan ***Important Note:*** *The specialist assessments required above are advised based on the proposal provided for the pre-application meeting, should the nature and extent of proposal change, further specialist assessments may be required.*

General Information	
Development Contributions	Development contributions are the fees charged by the council for extra community and network infrastructure needed as a result of development projects. You will pay development contributions for residential and commercial development such as new houses, and subdivisions. The money collected from development contributions pays for the cost of public infrastructure that is needed to meet the additional demand from growth. This includes network infrastructure such as stormwater and transport, open space reserves and community facilities. To get an

	indication of the contribution please use the Development Contributions Estimator. Water supply and wastewater services are not included in the Development Contribution. This is covered in the infrastructure growth charge. This charge is administered by Watercare.

Important Information

The purpose of a pre-application is to facilitate communication between applicants and the council so that the applicant can make informed decisions about applying for consents, permits or licences.

The views expressed by council staff in or following a pre-application are those officers' preliminary views, made in good faith, on the applicant's proposal. The council makes no warranty, express or implied, nor assumes any legal liability or responsibility for the accuracy, correctness, completeness or use of any information or views communicated as part of the pre-application process.

The applicant is not required to amend their proposal to accommodate the views expressed by council staff. Further, it remains the applicant's responsibility to get their own professional advice when making an application for consents, permits or licences, and to rely solely on that advice, in making any application for consents, permits or licences.

The council acknowledges that the confidential nature of pre-application meetings is important to encourage future applicants to engage with the council and attend pre-application meetings. By attending a pre-application meeting, both parties expect that the meetings are held in confidence and the intention is that the associated information that is provided to the council at these meetings, and the meeting minutes, will remain confidential. However, under the Local Government Official Information and Meetings Act 1987 any person may request any information that is provided to, and held by, the council. The council can only withhold requested information where there is a good reason and it is in the public interest. This is assessed on a case by case basis."

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Prepared by:
Name: Sandy Hsiao

Title:	Senior Planner, Resource Consents
Signed:	
Date:	10/02/2020

Pre-Application Consenting Memo

Pre-Application No. PRR00031670		
Date of request	10/06/2019	
Customer	Ryman Healthcare	
Contact details	**Phone**	Karen Joubert; 0211089447
	Email	karen.joubert@mitchelldaysh.co.nz
Site address	223 Kohimarama Road Kohimarama Auckland 1071 and 7 John Rymer Place	

Please note that there may be hyerlinks throughout the memo which are underlined. Please click on the highlighted text for further information.

Resource Management Documents		
Auckland Unitary Plan (Operative in part)	Zoning	Residential - Mixed Housing Urban Zone
	Precinct	NA
	Overlays	NA
	Controls	Controls: Macroinvertebrate Community Index - Urban
	Designations	NA
	Appeals	NA
	Plan Changes	NA
Other Relevant Acts	Hauraki Gulf Marine Park Act	

Property Information	
Legal Description	**Lot 1 DP 332284: 223 Kohimarama Road** **Lot 51 DP 163242: 7 John Rymer Place**
Certificate of Title	This has not been viewed, so there may be easements, building line restrictions and other restrictions that need to be taken into account in preparing any development proposal. If the title is 'limited as to parcels', you may need to get this surveyed, particularly where some of the controls, are reliant on accuracy being insured.

Site constraints Type	Y	N	Site constraints Type	Y	N
(Potential) Contaminated Land	☒	☐	Coastal Erosion	☐	☒
Land Instability	☐	☒	Coastal Storm Inundation	☐	☒
Floodplain	☒	☐	Coastal Storm Inundation (plus 1m sea level rise)	☐	☒
Overland flow paths (ephemeral/intermittent/permanent stream)	☒	☐	Cultural Heritage Inventory	☐	☒
Flood Sensitive	☒	☐	Combined Network	☐	☒
Arterial Roads	☒	☐	Building Frontage Control	☐	☒
Vehicle Access Restriction Control	☒	☐	Geology (rock breaking)	☐	☒

Meeting Record

Meeting Record	
Date	Streamworks and Planning (Onsite) – 19/06/2019 Urban Design and Landscape (Onsite) - 25/06/2019 All (Graham Street) – 27/06/2019
Council Officers	**Meeting Attendees:** Sheerin Samsudeen – Principal Urban Design, Design Review Ainsley Verstraeten - Principal Landscape Architect, Design Review Maree Gleeson – Specialist, Healthy Waters Matthew Revill – Project Manager, Regulatory Engineering Vinh Bui – Principal Traffic Engineer, Regulatory Engineering Masato Nakamura – Senior Planner, Resource Consents Jennifer Chivers – Team Leader, Resource Consents **Pre-Meeting Comments:** Matt Byrne - Streamworks Specialist, Specialist Unit Jin Lee – Development Engineer, Regulatory Engineering
Customer	**Meeting Attendees:** Ann O'Meagher – Architect, Beca Richard Jenkins - Civil Engineer, Beca Clinton Bird - Urban Designer

	Rebecca Skidmore - Landscape architect Leo Hills - Traffic Engineer, Commute Phil Mitchell – Planning Consultant, Mitchell Daysh Karen Joubert – Planning Consultant, Mitchell Daysh Richard Montgomerie - Streamworks Specialist, Freshwater Solutions

Relevant matters	
Proposal	The proposal is for the establishment of a new retirement village, considered as an Integrated Residential Development. The proposal in terms of built form is made up of seven new buildings labelled as B01 – B07. B01 is a larger building complex located to the northern side of the site, with buildings B02 – B07 being apartment buildings located across the rest of the site. The buildings range from three to five storeys in height, arranged in a stepped manner responding somewhat to the contours of the subject site. In terms of access and parking, the proposal creates a private accessway which links from Kohimarama Road down to John Rymer Place in a two-way direction. Parking is proposed to be provided at basement level under the buildings on the northern side of the site. A loading space will also be provided on site to service the retirement village. There is an identified stream on the subject site. This stream is proposed to be diverted closer to the eastern boundary of the subject site, to accommodate for the proposed building platform for B01.
Streamworks	The Council officers confirm that the activity to be applied to the diversion of the watercourse will be considered as E3.4.1 (A19). This will be a discretionary activity. The reclamation provisions should not be applied in this instance. The officers also agree that the identified stream to be diverted is classified as an intermittent stream, with further assessment being required to determine its nature after 01/07/2019. In the event this stream is to be used for stormwater management purposes, this will also need to be considered in terms of the stream ecology. There is no stream identified on the western part of the subject site. We see this as an error on the GIS mapping.
Construction & Earthworks	*Construction* Noting the scale of the proposal as well as the sensitivities of the residential activities nearby, a series of information in relation to the construction activity will need to be provided up front. This would include: • Draft Construction Management Plan

	• Draft Construction Traffic Management Plan (to be reviewed in conjunction with Auckland Transport) • An assessment of residential amenity impacts from the traffic movement • Confirmation on whether rock breaking, or impact piling would occur during the works • Noise and vibration assessment Even without rock breaking or impact piling, construction of this scale can easily infringe the noise and vibration standards of the zone. In addition, if construction is proposed for greater than 24 months (above ground), this triggers an additional reason for consent under E40.4.1 (A20) Earthworks Please provide a clear earthworks plan showing the area, volumes and locations of cut and fill, the maximum depths of cut and fill and the height of any retaining structures. (note: earthworks imbalances greater than 1000 m^3 need Auckland Transport involvement) Please note that the plans indicate excavations greater than 2.0 m which may have dewatering effects which should be assessed. The application would need to be supported by an assessment of the proposed activity against AUP Standards E7.6.1.6 & E7.6.1.10 to determine if the proposal is a Permitted Activity. Please provide a clear erosion and sediment control plan including monitoring of erosion and sediment control procedures.it is expected that the proposal will trigger regional consent for earthworks under chapter E11, and this document will be reviewed by the regional earthworks team. The proposed development is significant in terms of scale and anticipated excavations. It also appears to be over existing geomorphic gullies and areas which have been identified as being susceptible to land instability under the definition within the AUP. Please provide a geotechnical report supporting the proposed development including site specific assessments, intrusive testing, assessment of geotechnical risks including slope stability analyses and settlement and clear recommendations for anticipated earthworks. The geotechnical assessment must also include reference to the chapter E36, which includes geotechnical hazards. This should be applied where instability is identified on the subject site, as part of further investigations by the applicant team.
Servicing	*Infrastructure:* The application would need to be supported by an infrastructure report for stormwater, wastewater and water supply matters.

	Wastewater and Water Supply (Watercare): Due to the proposed height of the development, please provide a recent (within 12 months) fire hydrant test to confirm adequate water supply pressures to service the development. Please provide a clear plan showing the proposed connections for wastewater and water supply Please provide the peak wet weather flows calculations for the existing and proposed development as well as the upstream and downstream networks and confirm the capacity of the wastewater network is sufficient for the proposed development. Please note that due to the scale of development, we would require Watercare to provide input to the assessment. When the above information is provided, we would require the applicant to fill the attached form for us to send through to Watercare for assessment. Careful consideration should be given to where the private network meets the public network. *Stormwater:* The report will also need to provide assessment of downstream Network Capacity (10yr ARI). Any extension of public stormwater network infrastructure would require Engineering Plan Approval.
Flooding and Stormwater	*Stormwater:* The total impervious area for the development will need to be calculated and confirmed whether any regional consents are triggered in this regard. In the event a regional consent is triggered, a stormwater management plan will need to be prepared in support of the application. A plan would need to be provided which shows the proposed stormwater connections and any management devices. If stormwater mitigation is proposed, please provide a plan showing the locations of the stormwater mitigation devices so that we can confirm installation feasibility. Increased runoff from the development and assessment on existing downstream 100yr +CC OLFP in 17-19 John Rymer Place and 35a John Rymer Place. The proposal will require the consideration of the objectives and policies under chapter E1 for additional mitigation. Whilst the site is not identified as a SMAF area, water sensitive design approach required. The officers (Maree Gleeson) will confirm whether a network discharge consent will be required for this proposal.

	Noting the scale of development, storage and attenuation of the stormwater will be required on site. Maintaining pre-development flow should be given priority. How the run-off and flows from the podium structure should also be confirmed and included into the documentation to be provided. *Flooding:* There are identified flooding hazards on the subject site. The application will need to be supported by an overland flow path report addressing the overland flow paths onsite. This should include but is not limited to: • An assessment of the existing and proposed overland flow path characteristics (velocity, depth, level in m RL, flow, extent) • A plan showing the location and extent of overland flows through the existing and proposed site • Relevant cross sections demonstrating overland flow behavior • Confirmation of the entry and exit points of the overland flow path has not been altered, and if so, the effects of this • Confirmation that the capacity of flows has not been reduced as a result of works • Comment on the boundary fencing aligning with the requirements of AUP Standards E36 for the conveyance of overland flows • A risk assessment as per AUP Standards E36.9 in relation to the development, activity and safety of persons and vehicles. In addition, attention should be paid to any change to the flooding levels as a result of the diversion of the stream.
Traffic:	The application would need to be supported by a detailed traffic assessment. This should include: • SIDRA analysis at the northern vehicle access/ Kohimarama Rd, southern vehicle access/John Rymer Place and John Rymer Place/Kohimarama Rd. • Traffic generation from the activity as it relates to the nearby schools and other activities. • Address loading requirement, rubbish truck, servicing vehicles, truck tracking curves. • Address parking requirement, parking dimensions, manoeuvring dimensions, car tracking curves and show location of structural columns within the basement parking area.

	• A long section should be prepared for the two access points to the public road. • The circulation and movement of pedestrians should also be addressed. • Address bicycle parking, disabled parking and draft construction traffic management plan including an estimation of number of heavy vehicle movements per peak hour and per day. It is accepted that the traffic generation levels and peak times for the retirement village will be different than what is usually expected. This is noting the demographic expected within the development. The proposal has been reviewed by Auckland Transport for their preliminary comments. This is attached into this memo as attachment 1.
Urban Design and Landscape	The following is noted from an urban design and landscape perspective: • As the proposal currently stands, building B01 appears to be of a significant bulk and length. It is recommended that the building is broken up visually to reduce the dominance and building length. • The proposal to break up the built form into different apartment blocks (B02 – B07) is supported. However, further detail is required to understand how the podium works with the existing ground level. Consideration should also be given to integrated landscaping works as to how these group of buildings not read as one big mass. • Further cross sections showing the full width of the site and including the adjacent sites should be provided, not just segments for each building. This is required to understand to have a holistic view of the proposal as it relates to the adjacent sites. (refer mark-up on Attachment 2) • Sections to show the relationship between the north-eastern residential sites along Kohimarama Road should also be provided. • Visual Simulations: As mentioned at our site visit we previously raised questions around the visual simulations provided. While it is helpful to provide the panoramic 'visual simulations' for context it is common practice to also include a single frame image provided separately on an A3-size page with a reading distance to page of between 400mm – 500mm. The NZILA best practice guide for the preparation of visual simulations outlines how panorama images should be prepared and presented. In addition to this please ensure that vegetation included in the simulations is shown at 5-years growth, rather than at 10-years as illustrated on previous applications.

	• Viewpoint locations: The officers generally support the viewpoints suggested for analysis by the applicant team. Since the pre-app meeting Ms Verstraeten reviewed the viewpoint locations provided and understands that it is not proposed to provide all of these however the following are the preferred locations from a landscape and visual effects perspective as well as a number of additional ones that should be considered. Please note I have not had a chance to confirm these onsite – however I plan to do so next week. VP101 VP104 VP106 VP108 VP109 VP115 VP117 **Additional:** - From near the traffic island in John Rymer Place - Looking between 25 & 31 John Rymer Plc - Outside 279 Kohimarama Road - Outside of 20 Ashwell St • Ms Samsudeen requested an additional view point further west at the end of John Rymer Road is required to understand the full extent of the dominance effects presented by this proposal, onto the residential sites to the south of the subject site. This is included in this list above. • Landscape strategy / framework plan or document. On previous applications we commented that the landscape plan (or Tree master plan) went into the detail of individual tree species before providing an overall landscape masterplan that explains things like the landscape design principles, inspiration, or framework plan to better understand the design rationale. I have included below the commentary from the Scott Road Landscape S92 request as I consider it to be relevant for this new application. It would be useful if this type of framework plan were provided for this application. This information is commonly provided for other applications of a similar scale to this one. • please provide a landscape framework plan which indicates the 'arrangement' of landscape and open space and the function, purpose and character of

these spaces, include details of vegetation proposed to be retained;

- a set of landscape drawings at a more legible scale at A3 (may require detail drawings or multiple drawing pages) to better illustrate the proposed landscape design for each of the open spaces and boundary interfaces;
- the design and specifications of other landscape treatments, including hedges/shrubs, amenity planting, retaining walls, furniture, signs, hard landscape, fence and light treatments. Where relevant the design, type, location, height, materiality and colour, surface finish and size should be provided;
- plant schedule for all planting (trees, shrubs, hedge, climbers, groundcovers).
- please provide precedent images of the proposed fence treatments, and the front gate system with relevant annotations and key dimensions.

- Details of movement and wayfinding within the site for the residents should also be provided. Associated with this, details of retaining walls proposed to be provided.
- The officers recommend that the proposal is reviewed by the Urban Design Panel, once further plans have been prepared which provide a clearer indication of the proposal. The officers (Masato Nakamura and Sheerin Samsudeen) will communicate the likely availability for the Panel.
- The panel lead has confirmed that this proposal would have to go through a panel review process, given the location, size and prominence.
    - The earliest available date is 22 August 2019. If the applicant's team is happy to commit - I will book it in. Noting that we would still have to confirm the panels availability for that date.
    - Emphasis will be placed on having the appropriate Urban Design and Landscape information presented to them, so that draft panel package is important and there is a need to be realistic about getting that to us on time.

Draft Panel Package	Final Panel Package	**AUDP Design Review**

		8 August	**15 August**	**22 August**
Logistics	The Council can keep this pre-application open. This will allow for continued meetings to be undertaken, with communications being open until the full application is lodged with Council. Input from Healthy Waters and Water Services Limited (WSL) will be managed by Matt Revill, as the project manager for engineering matters. Input from Auckland Transport is currently sought. This will be managed by Masato Nakamura (Planning) and Vinh Bui (Traffic). Once the draft version of documents is prepared, he reports can be forwarded to the officers (Masato Nakamura) to distribute to the Council team. This will allow for a soft launch of the application, and to front load any issues.			
Planning	*Interest:* The officers expect that the proposal would generate interest within the community. It is expected that the Orakei Local Board will provide feedback towards the application. It is advised that the applicant engages with the Board prior to the lodgement of the application. Noting past comments from the board around the issue of height, it is more than likely that there would be opposition expressed from the Local Board. *Use of Commissioners:* Noting the expected interest as well as the scale of the proposal. It is likely that any recommendations prepared by the officers will be determined by the Independent commissioners. The applicant is advised to include this into their consideration of risk (for notification), cost and timeframes. *Plan and Policy Context:* The zone expects a built form that is predominantly three storeys in height. The proposal is largely of a bulk that is in excess of this expectation. In this regard the officers seek further comments and assessment, and how the applicant team views this proposal as being within the planned built character of the zone. *Amenity Impacts:* Noting the scale of the proposal as it relates to the maximum height standard, it is not considered that the dominance or shadowing effects will be of a level that non-notification could be supported. Detailed shadowing diagrams should be prepared to demonstrate these effects. The visual simulations should also provide clarity around the dominance effects generated by the built form proposed. *Notification:* Noting the scale of the proposal, the interest likely to be generated, and the extent the proposal deviates from the planned outcomes of the Residential – Mixed Housing Urban Zone, the officers (Planning) advises that the application should be lodged on a publicly notified basis. This will			

	reduce the time required to liaise between the different party's overs the notification assessment and consider the merits of the outcome. In the event the application is not lodged on a publicly notified basis, the Council cannot guarantee any notification positions at this moment.

Preliminary view on outcome and process
In terms of the notification process, the Council officers recommend that the application is lodged on a publicly notified basis. Further details are required to be provided for the Council form a conclusion on the overall outcome of the proposal. This is a preliminary view only. A final determination on whether Council can support the consent or not can only be made upon receipt of a formal application, site visit and review.

Resource Consent Strategy	
Specialist Assessments	You may need to provide written specialist report(s) to support your application, depending on the scale and significance of your proposal. As described above, in this case at a minimum the following is considered necessary: • Draft Construction Management Plan • Draft Construction Traffic Management Plan • Construction Noise and Vibration Assessment • Traffic Report • Geotechnical and Groundwater Report • Flood report (including hazard risk assessment) • Infrastructure Assessment • Landscaping Strategy, Landscape Plan and Maintenance Program • Stormwater Management Plan • Draft Erosion Sediment Control Plan ***Important Note:*** *The specialist assessments required above are advised based on the proposal provided for the pre-application meeting, should the nature and extent of proposal change, further specialist assessments may be required.*

General Information	
Development Contributions	Development contributions are the fees charged by the council for extra community and network infrastructure needed as a result of development projects. You will pay development contributions for residential and commercial development such as new houses, and subdivisions. The

	money collected from development contributions pays for the cost of public infrastructure that is needed to meet the additional demand from growth. This includes network infrastructure such as stormwater and transport, open space reserves and community facilities. To get an indication of the contribution please use the Development Contributions Estimator. Water supply and wastewater services are not included in the Development Contribution. This is covered in the infrastructure growth charge. This charge is administered by Watercare.

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Prepared by:

Name: Masato Nakamura

Title: Senior Planner, Resource Consents

Signed:

Date: 05/07/2019

Reviewed by:

Name: Jennifer Chivers

Title: Team Leader, Resource Consents

Signed:

Date: 05/07/2019

ATTACHMENT 1: AT COMMENTS

From: Sarah Jaff (AT)
To: Masato Nakamura; Vinh Bui
Cc: Development Planning Central (AT)
Subject: RE: Request for AT Input - 223 Kohimarama Road PRR00031670 - Rymans Healthcare
Date: Wednesday, 3 July 2019 10:02:05 AM

Hi Masato,

Thank you for giving us the opportunity to provide high level feedback for the proposal. Please find our general comments below;

- General: Applicant to provide an ITA covering predicted traffic, and transport, trip generation for the development, road safety and assessment of effects
- Applicant to assess how the above would affect the immediate and overall transport network; including the available and proposed pedestrian, cycling and public transport amenities/ improvements. This development would generate vulnerable and mobility users which needs to be considered.
- Traffic and transport analysis to determine the effect of the trips generated on the network (not just Kohimarama Rd). This would include an operational assessment and SIDRA modelling for the signalised intersections, including the mid-block crossing adjacent to Selwyn College
- Applicant also to address/include the following;
    - Zoning, permitted activities and reference to E27 of the AUP
    - Vehicular tracking for all proposed accesses (with the appropriate design vehicle). Loading recommended to be contained on-site
    - Parking demand assessment – recommend all to be contained on site
    - Visibility assessment for all proposed accesses – the access on Kohimarama is just north of a blind bend/corner
    - Proposed pedestrian/cycling amenities/crossing facilities at the proposed accesses
    - Safety assessment – CAS analysis for minimum of previous 5 years
    - Safety assessment – how the proposal would also affect the safety and operations of the non-signal controlled intersections taking into account Selwyn College and St Thomas' School
    - Assessment into how this development would affect, in particular, the efficiency of the intersection of Kohimarama Rd/ Allum St/ John Rymer Place and the intersection of Kohimarama Rd/Kepa Rd (SIDRA and overall operation including weekend)
    - Assessment into feasibility of a right turn bay into the development from Kohimarama Rd. Whether the available road width/flush median would provide refuge for vehicles waiting to turn

Let me know if you have any questions. Many thanks

Kind regards,
Sarah Jaff | Senior Development Planner

From: Development Planning Central (AT)
Sent: Tuesday, 2 July 2019 11:34 a.m.

To: Sarah Jaff (AT) <Sarah.Jaff@at.govt.nz>
Subject: FW: Request for AT Input - 223 Kohimarama Road PRR00031670 - Rymans Healthcare

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From: Masato Nakamura <Masato.Nakamura@aucklandcouncil.govt.nz>
Sent: Friday, 28 June 2019 2:50 p.m.
To: Development Planning Central (AT) <DevelopmentPlanningCentral@at.govt.nz>
Cc: Vinh Bui <Vinh.Bui@aucklandcouncil.govt.nz>
Subject: Request for AT Input - 223 Kohimarama Road PRR00031670 - Rymans Healthcare

Good Afternoon,

Auckland Council is currently in pre-application discussions with Ryman Healthcare (Applicant) for a proposed retirement village at the above mentioned address.

Attached is the preliminary plans for the proposal, as well as some comments from Vinh who was present at the meeting.
No traffic reporting or assessment has been undertaken yet. So it is appreciated that any feedback will be limited and high level.

Please ensure any billing occurs to the pre-application number PRR00031670.

If you have any queries, please feel free to contact me on the details below.

Kind Regards,

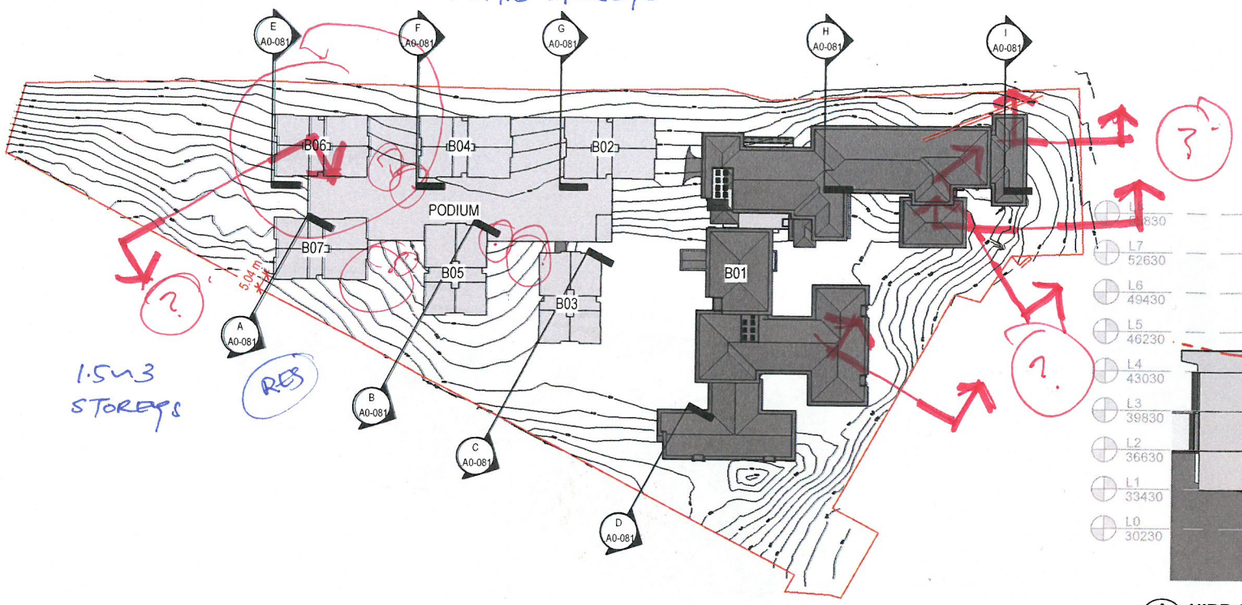
Masato Nakamura | Senior Planner

Central Resource Consenting – Auckland Council
35 Graham St, Auckland Central, Auckland 1010
Phone: (09) 301 0101 | EXT (46) 9352 | DDI (09) 353 9352 | MOB 021 530 356
Email: masato.nakamura@aucklandcouncil.govt.nz
Visit our website: www.aucklandcouncil.govt.nz

ATTACHMENT 2: MARK UPS

SCHOOL

1 to 1.5 STOREYS



1.5 to 3 STOREYS

RES

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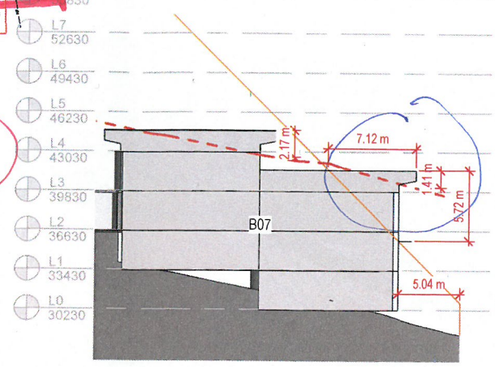
* INCLUDE ADJOINING SITES' LEVELS & BLDG HEIGHTS



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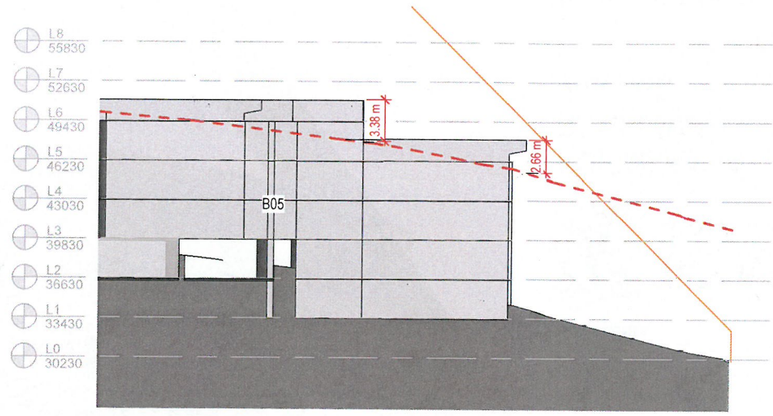

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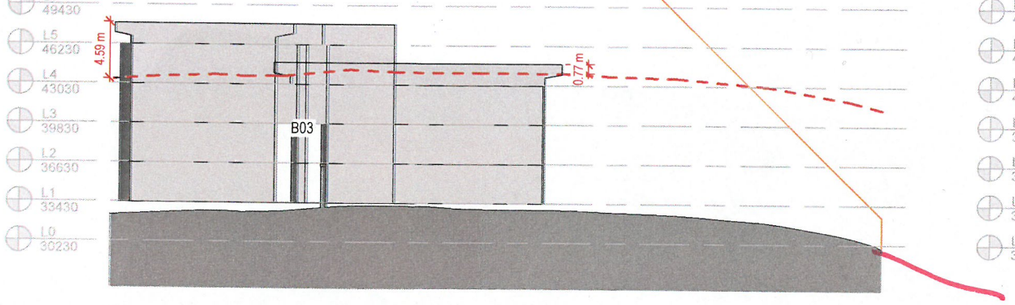

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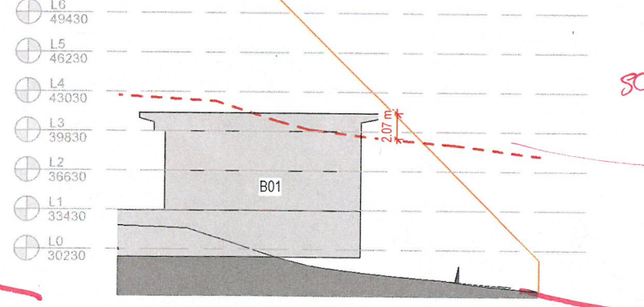

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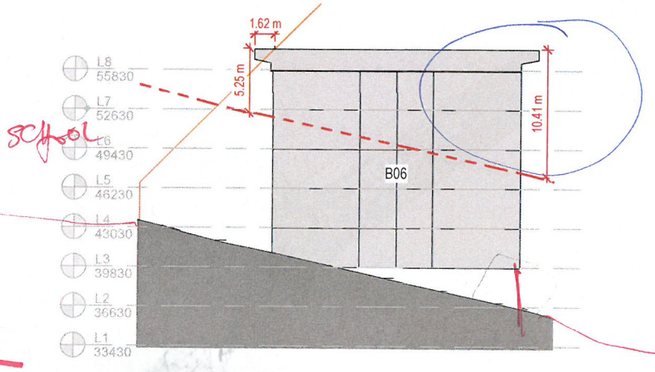

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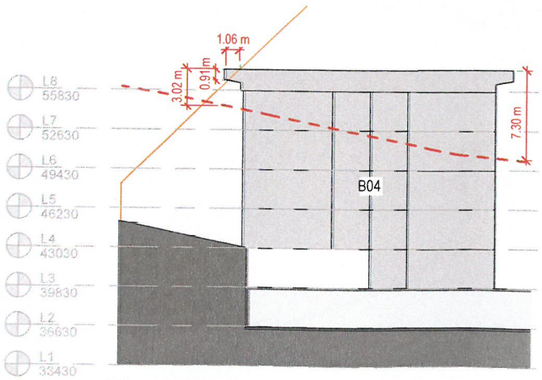

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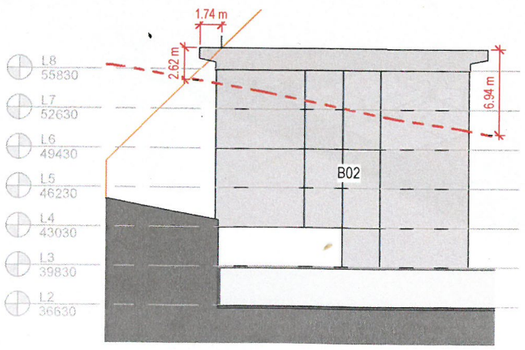

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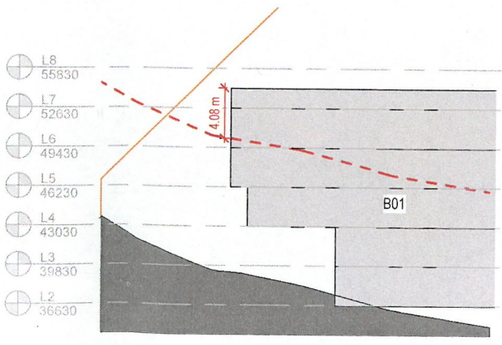

H HIRB Section H
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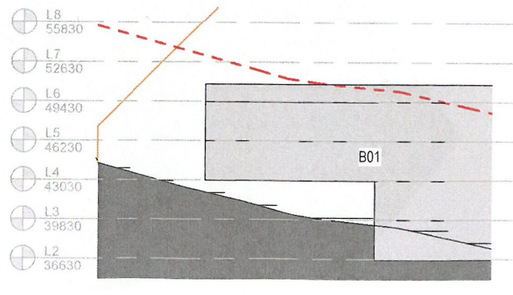


I HIRB Section I
A0-040 — A1 sheet scale = 1 : 250

AMENDMENTS

RYMAN HEALTHCARE LTD

KOHIMARAMA RETIREMENT VILLAGE

Height in Relation to Boundary - Sections

.A0-081

As indicated — Author KOH-

KOH- — A0-081

92 Russley Road CHRISTCHURCH NEW ZEALAND

200mm
100mm
0mm
ORIGINAL SCALE

15/05/2019 4:13:18 PM
BIM 360://044 - Kohimarama/044-RGT_S01_Arch.rvt

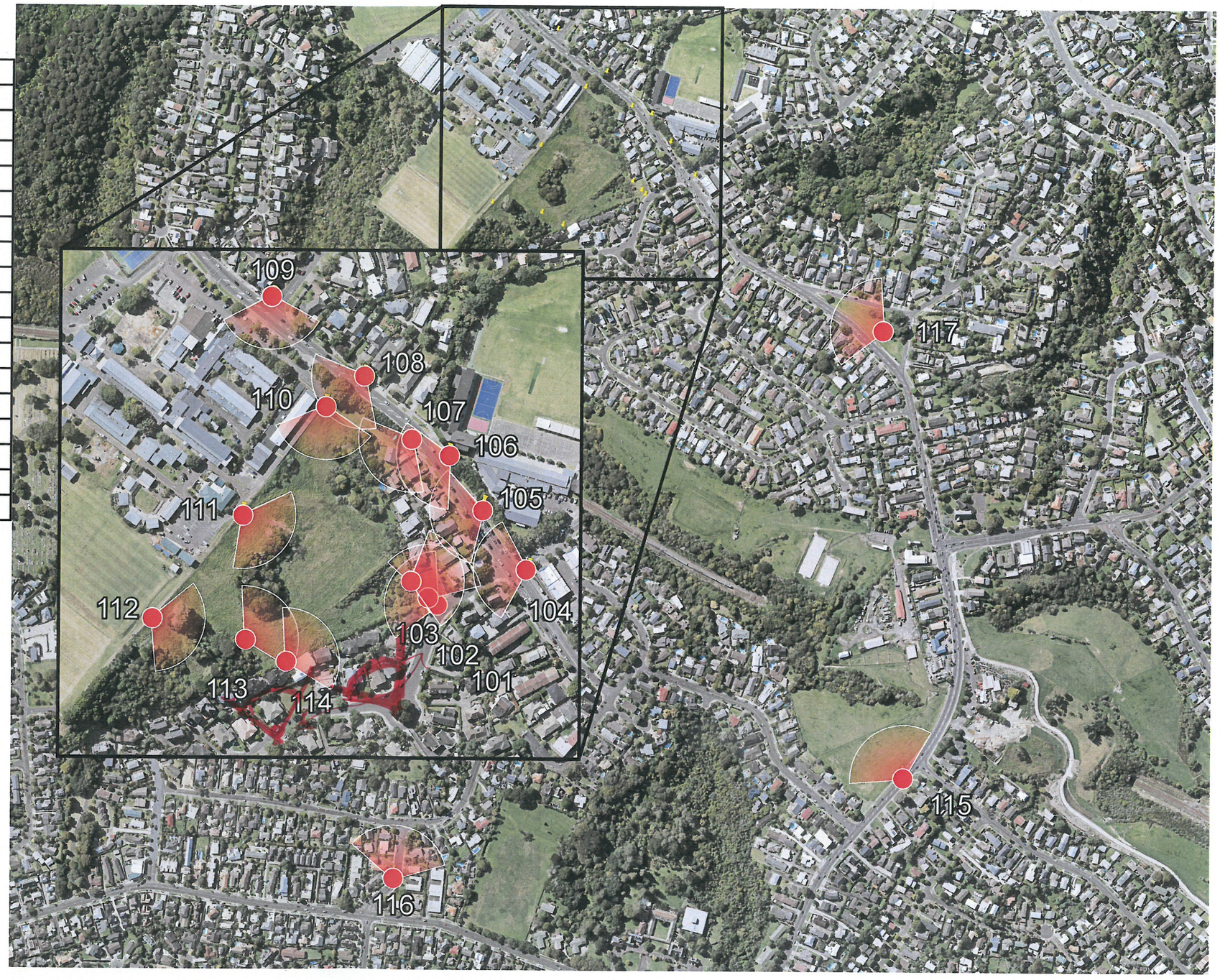
044 - Kohimarama - Location Map

VP#	Location
VP101	New Entry - John Ryder Place
VP102	On Site - near entry
VP103	On Site - near entry
VP104	Allum St & Kohimarama Road
VP105	Kohimarama Road
VP106	Kohimarama Road
VP107	245 Kohimarama Road
VP108	226 Kohimarama Road
VP109	Kohimarama Road & Southern Cross
VP110	On Site - School Boundary
VP111	On Site - School Boundary
VP112	On Site - School Boundary Soccer Grounds
VP113	Centre of Site
VP114	On Site - (shouth Boundary)
VP115	267 St Johns Road
VP116	6A Ipswitch Place
VP117	Kohimarama Road

?

DISTANT VIEWS

- From along John Rymer Place



From: Masato Nakamura
To: Karen Joubert; Weng Lye
Cc: hillary.johnston@tektus.nz; Maree Gleeson
Subject: Ryman"s Kohimarama - Memo 26.08.19
Date: Tuesday, 27 August 2019 3:05:56 PM

Hi All,

Please see the memo below for the meeting held yesterday for stormwater matters.

Hilary, FYI for the discussions from yesterday. Any question, please let me know.

Cheers,

Meeting Date: 26/08/2019
Meeting Time: 2:00PM – 3:00PM
Location: 35 Graham Street, Auckland
Attendees:
Maree Gleeson – Specialist, Healthy Waters
Masato Nakamura – Senior Planner, Resource Consents
Karen Joubert – Planning Consultant, Mitchel Daysh
Weng Lye – Associate Civil Engineering, Beca

Modelling and downstream flooding mitigation proposed

- The Council supports the use of TP108 for the run-off modelling. However, specific elements and restrictions which apply to the site must be factored into the assessment.
- The pre and post-development flows must be assessed for the 10 and 100 year ARI + Climate change.
- This run-off assessment must be included into the Stormwater Management Plan.
- How 10 year and 100 year pre development flows will be maintained by detention storage should be covered.
- There will be a significant volumes of detention proposed for the development to maintain flows to pre-development levels for the 10 year and 100yr ARI + Climate change. Considering the extent of the flows generated from the site, it is anticipated that inlets from the paved areas would need to be of appropriate size to accommodate these flows, particularly for 100 year ARI +Climate change. The detail and the capacity of these inlets should be provided to the Council as part of the SWMP.

Watercourse

- With regards to the proposed stream re-alignment, cross sections and water levels should be shown for 10 year and 100 year ARI +Climate change.

Flood Risk and OLFP's within the site and exiting the site

- 500mm FFL clearance from the flood waters should be achieved with the proposal.
- The entry and exit points of the overland flow path must be maintained. How the diversion of the flow paths occur must also be detailed in the application.
- The proposal must not exacerbate any flooding hazards onto adjacent properties, particularly 17 John Rymer Place.
- A hazard risk assessment would need to be undertaken for the overland flow paths.

Water Quality & Hydrology Mitigation for the impervious areas from the development

- Water quality (for gross pollutants) should be addressed and hydrology mitigation also must be provided in the Stormwater Management Plan.
- The proposal also includes stormwater retention. We have been advised that rain gardens and re-use within the apartments is proposed to provide hydrological mitigation. The details should be included in the Stormwater Management Plan.

Outfall

- The proposed outfall location is required to be provided, as well as its design. If located on School land, prior landowner approval will be required to implement this. Furthermore, written approval will also be required from the School.
- It is understood that the stormwater run-off will be discharged to land by sheet flow. This must not generate any erosion, particularly noting the slopes that are likely very steep around the outfall location.
- It is the responsibility of the applicant and any party engaged by the applicant to ensure that the full scope of the proposal and the effects are clearly understood.
- How this discharge will impact onto the existing overland flow paths to the south-west of the site must be assessed. The existing flow paths already impact some residential sites (51C John Rymer Place). The proposed outfall and the discharge from the site must not exacerbate the flooding hazards for these properties.

Technical Review

- The Council recommends a soft lodgement approach. Prior to the lodgement of the application, the draft version of the SWMP should be provided to Council for review, to identify whether there are any issues, to avoid delays during the processing of the application.

Masato Nakamura | Senior Planner

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