

Stephen Rod

From: Stephen Rod
Sent: Monday, 12 December 2005 10:22
To: Hans Ottow (E-mail)
Cc: Leon Burke (E-mail)
Subject: 81a Remuera Road

Hans/Leon

I have had a brief look at the documentation on the disk and advise as follows:

The original structure was designed in 1973 with the additions in 1991. The design and materials codes in use back in 1973 were substantially different from those in use now particularly with respect to seismic requirements. Should there be a change of use of the structure including the additions you propose I would expect Council to request a full seismic assessment of the existing structure with upgrading where required. I would not expect the requirements to be too onerous but I do not have the expertise to comment further from what I have seen. I recommend that we engage someone who is experienced in this particular area to comment should that be required now.

I have reviewed the gravity loads used in the design of the structure and made a brief assessment based on adding two further stories. My assessment assumes light weight construction for the floors, walls and roof. I have allowed 0.5 kPa dead load for the floors and another 0.5 kPa superimposed dead load for partitions/walls. I have assumed the new roof loads will be similar to the existing roof.

The existing floor was designed for 7.5 kPa LL. Assuming the average future LL on that floor will be 2.0 kPa leaves 5.5 kPa. Applying the current NZS 4203 live load factor of 1.6 to this residual gives 8.8 kPa to play with.

Taking the DL and SDL as above and again assuming a 2.0 kPa average LL for another two levels and applying load factors of 1.2 for DL and 1.6 for LL gives
 $2 \times (1.2 \times 1.0 + 1.6 \times 2.0) = 8.8$ kPa. What a coincidence.

Please note that the average 2.0 kPa LL does not allow for communal areas such as dining rooms, gymnasiums etc. The above assessment does not allow for live load reductions which may be able to be applied in assessing the existing structure due to contributory areas on the various structural elements. This would help in the final assessment and may compensate for areas of loading which exceed the 2.0 kPa.

I also believe fire issues will be need to be addressed at an early stage.

Please ring and discuss if you require further information.

Stephen Rod
B.E.(Hons)(Civil); MIPENZ(Civil,Structural)
CPEng; IntPE
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for Chris Howell and Associates

FACSIMILE COVER SHEET

Job No. **8190**



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To:	Hans Ottow
Company:	Ottow Burke and Associates
Fax:	
From:	Stephen Rod
Date:	31 January, 2006
Pages including this cover page:	10 pages

Re: 81-83 Remuera Road

Attached is Craig's report. It appears stormwater is ok apart from some upgrading of the existing line to bring it up to public standards. Sanitary sewer is inconclusive due to the lack of available information with respect to the existing reticulation. The existing reticulation would have to have a CCTV inspection together with a level survey to take the investigation further.

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25 January 2006

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Att'n Stephen Rod

**RE : PRELIMINARY INFRASTRUCTURE CAPACITY REPORT FOR
81A - 83 REMUERA ROAD, REMUERA**

1 Introduction

As requested we have undertaken a preliminary investigation and capacity assessment of the public stormwater and wastewater infrastructure for the above property and proposed development. We have also assessed private drainage capacity issues where these would have significant implications on any proposed development.

This involved a search and review of available Council private drainage plans, GIS public drainage maps, and discussions with Metrowater. A desktop study only was made of this information and preliminary calculations presented herein are based on information supplied by the client regarding the proposed development.

2 Catchment Characteristics

The catchment is separated with public stormwater and wastewater lines located within the properties of 5 - 9 St Marks Road. Public stormwater lines are also located on the northeastern side of the rail corridor at the rear of 83 Remuera Road.

A combined public sewer is also located in the road reserve of Remuera Road, however this is understood to serve only those properties on the northeastern side of Remuera Road.

3 Stormwater Drainage

Public Stormwater

Council GIS maps show a network of pipes varying in diameter with little information given on invert levels. However the catchment topography is such that the logical conclusion is that the pipes drain in a north westerly direction where they connect to a piped system increasing in diameter and draining in a northerly direction along the rail corridor boundary.

GIS special features and hazards maps identify a flood prone area generally following the public stormwater line alignment across St Marks Road, into 5 - 9 St Marks Road and along the rail corridor.

Provided the proposed development does not increase impervious areas draining to the public stormwater system and does not introduce any existing areas not already draining

to same, it is unlikely that stormwater detention will be required. However should subdivision of either of the properties at 81a or 83 Remuera Road be proposed, it is most likely that upgrading of the existing public stormwater system and/or installation of stormwater detention tanks will be a condition of any subdivision consent granted by Council. This should be further assessed and confirmed prior to preparing budgets for any proposed subdivision of the subject sites.

Private Stormwater

Private stormwater drainage plans were available for 83 Remuera Road only. These detail a private 225mm (9") diameter line commencing at the southwest corner of 83 Remuera Road, crossing 85 Remuera Road and connecting to the public stormwater line located in 7 St Marks Road. Existing use rights would apply for this property.

As there were no private drainage plans for 81a Remuera Road it is assumed that this line serves only 83 Remuera Road.

This line has more than adequate capacity based on the existing impervious area of 83 Remuera Road and the probable grade of the existing 225mm diameter line. However the line would not be able to be used for drainage of 81a Remuera Road as common private lines are not permitted within Auckland City, unless it is made a public line.

If 81a Remuera Road was able to gravity feed to this line, Council would most likely request the line be brought up to public standards which would include, confirming the condition and material of the line and installing manholes at each change in direction and grade of the line. The line is acceptable in terms of the minimum diameter for public stormwater lines.

As this line traverses private property, affected property owners' consents would be required for this work. These are not guaranteed and obtaining property owner consents can be costly and time consuming.

It is therefore strongly recommended that stormwater disposal for 81a Remuera Road be confirmed on site prior to any purchase of this property.

4 Wastewater Drainage

Public Wastewater

Similar to the public stormwater system, Council GIS maps show a network of wastewater pipes varying in diameter with little information given on invert levels. However the catchment topography is such that once again the logical conclusion is that the pipes drain in a north westerly direction where they connect to a piped system increasing in diameter and draining in a easterly direction across the rail corridor boundaries.

Discussions were held with Metrowater staff who advised that they had no capacity information for the subject public wastewater system. They also advised that a change of use for either of the existing sites would trigger detailed investigation of the existing public infrastructure to confirm pipe sizes, grade, condition and layout including

catchment analysis and/or modelling. This would require significant field work including surveying and asbuilding the public system.

The scope of services requested in commissioning this brief report obviously does not allow for such detailed investigation. However preliminary calculations based on assumptions as to the grades of the public wastewater system indicate that the proposed development (35 dwelling units and 5 dental surgeries for the two sites) would comprise approximately 4% to 5% of the total assumed capacity of the public line.

It is the experience of the author that this figure would definitely trigger a more detailed investigation as described above should a change of use for the two sites be proceeded with as proposed.

Should subdivision of either of the properties at 81a or 83 Remuera Road be proposed, it is most likely that extension of the existing public wastewater system will be a condition of any subdivision consent granted by Council. This should be further assessed and confirmed prior to preparing budgets for any proposed subdivision of the subject sites.

Because there is so little information regarding the condition, diameters, grades and therefore capacities of the public wastewater lines it is not recommended that any purchase of the two sites is finalised until it has been confirmed that the receiving sewer has adequate capacity for the proposed development.

Private Wastewater

Private wastewater drainage plans were available for 83 Remuera Road only. These detail a private 100mm (4") diameter line commencing at the southwest corner of 83 Remuera Road, crossing 85 Remuera Road and connecting to the public wastewater line located in 7 St Marks Road. Existing use rights would apply for this property.

As there were no private drainage plans for 81a Remuera Road it is assumed that this line serves only 83 Remuera Road.

This line has more than adequate capacity to serve the proposed development (35 dwelling units and 5 dental surgeries) based on two scenarios for assumed grades (1% and 10%) of the existing 100mm diameter line. However the line would not be able to be used for drainage of 81a Remuera Road as common private lines are not permitted within Auckland City.

If 81a Remuera Road was able to gravity feed to the vicinity of the southwest corner of 83 Remuera Road, Council would most likely request extension of the public wastewater line to serve 81a. As any proposed public wastewater line extension would require crossing private property, affected property owners' consents would be required for this work. These are not guaranteed and obtaining property owner consents can be costly and time consuming.

It is therefore strongly recommended that wastewater disposal for 81a Remuera Road be confirmed on site prior to any purchase of this property.

5 Summary and Recommendations

The above information is based solely on a desktop study of available Council public drainage and private drainage plans and maps. The available asbuilt information is incomplete and very vague in most instances and for this reason any recommendations presented herein are subject to further detailed investigation of both the public and private drainage systems serving 81a and 83 Remuera Road. The information should not be relied upon solely to determine if any proposed development is feasible although it does highlight potential problems with regard to the servicing these sites.

Provided the proposed development does not increase impervious areas it is unlikely that stormwater detention will be required. Subdivision (unit title or otherwise) of either of the properties at 81a or 83 Remuera Road will require upgrading of the existing public stormwater system and/or installation of stormwater detention tanks.

Upgrading of the existing private 225mm diameter line to a public line will be required to serve 81a Remuera Road or extension of the public line.

- It is strongly recommended that stormwater disposal for 81a Remuera Road be confirmed on site prior to any purchase of this property.

Preliminary calculations based on assumptions as to the grades of the public wastewater system indicate that the proposed development would comprise approximately 4% to 5% of the total assumed capacity of the public wastewater line.

However there is little accurate information regarding the condition, diameters, grades and therefore actual capacities of the public wastewater lines.

- It is not recommended that any purchase of the two sites is finalised until it has been confirmed by further detailed investigation that the receiving sewer has adequate capacity for the proposed development.

The private wastewater line serving 83 Remuera Road has more than adequate capacity to serve the proposed development (35 dwelling units and 5 dental surgeries) based on two scenarios for assumed grades (1% and 10%) of the existing 100mm diameter line. However the line would not be able to be used for drainage of 81a Remuera Road as common private lines are not permitted within Auckland City.

The minimum acceptable diameter for a public wastewater line is 150mm and therefore extension of the public line to serve any proposed subdivision development will be required.

- It is therefore strongly recommended that wastewater disposal for 81a Remuera Road be confirmed on site prior to any purchase of this property.

Subdivision (unit title or otherwise) of either of the properties at 81a or 83 Remuera Road will require extension of the existing public wastewater system.

Significant on site investigation will need to be undertaken to be able to confirm capacities of both public and private stormwater and wastewater systems.

Any change of use and/or subdivision of the properties may result in significant infrastructure upgrade construction costs to serve both sites.

- Due to the many unknowns with regard to existing public and private infrastructure it is not recommended that any firm commitment with regard to purchasing the subject properties be given at this stage.

Report Prepared by :



Craig Anderson

Report Reviewed by :

Stephen Rod

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Page: 1.

Date: 25/01/06

Engr: CDA

Project: 81a - 83 REMUERA ROAD,

METRO WATER WASTEWATER DESIGN MANUAL =

HIGH RISE RESIDENTIAL = ADWF PER PERSON \Rightarrow 180 l/p/d.

RECOMMENDED: 2.4 PERSONS PER HIGH RISE DWELLING UNIT, (IRRESPECTIVE OF NUMBER OF BEDROOMS).

 \therefore 35 DWELLING UNITS \times 2.4 = 84 PERSONS.

$$\begin{aligned} \text{ADWF} &= 84 * 180 \text{ l/d.} \\ &= 15120 \text{ l/d.} \end{aligned}$$

$$\text{ADWF} \Rightarrow 0.175 \text{ l/sec.}$$

MAXIMUM DESIGN FLOW $Q = \text{ADWF} \times \text{PEAKING FACTOR}$
 (2.5)
 \times INFILTRATION
 FACTOR
 (2.0)

$$\begin{aligned} \therefore Q_{\text{MAX}} &= 0.175 * 2.5 * 2.0 \\ &= 0.875 \text{ l/sec.} \end{aligned}$$

PUBLIC W/W PIPE =

PIPE FULL CAPACITY FROM ATTACHED FLOWMASTER PRINTOUT = 20 l/sec (150 ϕ @ 1.94%).

$$\therefore \frac{0.875}{20} = 0.044 = 4.4\%$$

PRIVATE W/W PIPE =

PIPE FULL CAPACITY FROM ATTACHED FLOWMASTER PRINTOUT = 10 l/sec (100 ϕ @ 1%).

$$10 > 0.875 \text{ l/sec} \therefore \text{ok.}$$

PIPE FULL CAPACITY FROM ATTACHED FLOWMASTER PRINTOUT = 20 l/sec (100 ϕ @ 10%).

$$20 > 0.875 \text{ l/sec} \therefore \text{ok.}$$

**81a - 83 Remuera Road Public Wastewater
Worksheet for Circular Channel**

Project Description	
Project File	untitled
Worksheet	public wastewater
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Full Flow Capacity

Input Data	
Mannings Coefficient	0.013
Channel Slope	0.019400 m/m
Diameter	0.15 m

Results		
Depth	0.15	m
Discharge	0.02	m ³ /s
Flow Area	0.02	m ²
Wetted Perimeter	0.47	m
Top Width	0.00	m
Critical Depth	0.13	m
Percent Full	100.00	%
Critical Slope	0.017453	m/m
Velocity	1.20	m/s
Velocity Head	0.07	m
Specific Energy	FULL	m
Froude Number	FULL	
Maximum Discharge	0.02	m ³ /s
Full Flow Capacity	0.02	m ³ /s
Full Flow Slope	0.019400	m/m

**private wastewater
Worksheet for Circular Channel**

Project Description	
Project File	c:\fmw\mrpbww.fm2
Worksheet	81a - 83 Remuera Road Private Wastewater
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Full Flow Capacity

Input Data	
Mannings Coefficient	0.013
Channel Slope	0.010000 m/m
Diameter	0.10 m

Results		
Depth	0.10	m
Discharge	0.01	m ³ /s
Flow Area	0.01	m ²
Wetted Perimeter	0.31	m
Top Width	0.00	m
Critical Depth	0.07	m
Percent Full	100.00	%
Critical Slope	0.012513	m/m
Velocity	0.66	m/s
Velocity Head	0.02	m
Specific Energy	FULL	m
Froude Number	FULL	
Maximum Discharge	0.01	m ³ /s
Full Flow Capacity	0.01	m ³ /s
Full Flow Slope	0.010000	m/m

**private wastewater
Worksheet for Circular Channel**

Project Description	
Project File	c:\fmw\rmrapbww.fm2
Worksheet	81a - 83 Remuera Road Private Wastewater
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Full Flow Capacity

Input Data	
Mannings Coefficient	0.013
Channel Slope	0.100000 m/m
Diameter	0.10 m

Results		
Depth	0.10	m
Discharge	0.02	m ³ /s
Flow Area	0.01	m ²
Wetted Perimeter	0.31	m
Top Width	0.00	m
Critical Depth	0.10	m
Percent Full	100.00	%
Critical Slope	0.092878	m/m
Velocity	2.08	m/s
Velocity Head	0.22	m
Specific Energy	FULL	m
Froude Number	FULL	
Maximum Discharge	0.02	m ³ /s
Full Flow Capacity	0.02	m ³ /s
Full Flow Slope	0.100000	m/m