



ANNEXURE 4. INFRASTRUCTURE ENGINEER'S REPORT

apcon**PATERSON**
LTD**ENGINEERS**CIVIL-STRUCTURAL
GEOTECHNICAL-FIRE10 KEYSTONE AVE MT ROSKILL AUCKLAND 4
PHONE/FAX: 09-620 9099 MOBILE: 025 585504
EMAIL: neville.apconpaterson@watchdog.net.nz

JOB

Soil Permeability

ADDRESS

509-511 Sandringham Rd
Sandringham

SUBJECT

Rock core Soakage

REF

SCALE

DATE

3/11/04 BY AAT

Limited Brief: Soakage Testing only for resource consent to support conversion to business zone. Building consent plans to follow after which stormwater layout may be designed.

Testing to AEC Manual 2003.

3 Holes Tested.

Ref attached Plan.

All had full hydrant capacity which varied due to hose length.

Bore A.	17.5 l/s	734 ⁺ m ² .
Bore 1.	16.3 l/s	683 ⁺ m ²
Bore 2.	17 ⁺ l/s	712 ⁺ m ² .
		<u>2129</u> m ² .
		Min area
		able to drain.

Site Area 2lots. - 938 m².

Any 2 Bores will be adequate to drain fully developed (impermeable)

Combined site

⇒ Soakage adequate for development.

1/4



SOAKHOLE INSPECTION SHEET

CLIENT: APCON PATTERSON DATE: 25.10.07

LOCATION: 509 SANDRINGHAM ROAD, SANDRINGHAM

SOAKHOLE DESCRIPTION FLOW TEST EXISTING BORE

(A)

TYPE OF LID:

SOAKHOLE DIAMETER:

DEPTH:

TYPE OF CONSTRUCTION:

CLEAN:

CONCRETE BASE:

BOREHOLES:

DIA:

SYPHONS:

SOAKHOLE TEST

LITRES TO FILL CHAMBER: PRE SOAK 10MINS

METER START: 13725.8

METER FINISH: 13736.3

TOTAL LITRES: 10,500L OVER 10 MINS 17.5L/S

DRILLING REQUIRED: ?

*Full Hydrant Flow
as advised by driller*

InterROCK DRILLING

ROCK DRILLING SPECIALISTS

8/11/02

Date 08.11.02

BORE LOG SHEET

Client	H. Watt		
Description of Work	Bore for soakage and test		
Location	509 Sandringham Road, Sandringham		
Method of Boring	Percussion		
Borehole No:	One	Borehole Dia:	100mm
Borehole I.D.	Marked (A)		

Depth	STRATA		FLOW TEST			
	Description		Meter Start	Meter Finish	Duration	Ltrs per sec
0.4m	Concrete/Base Course					
3m	Basalt Rock, (Dense)					
4.0m						
5.2m	Soft Fractured Rock					
7.0m	Broken Rock, Cavities					
		E.O.B.	12650.2	12655.7	10mins	
			=	5,500L	1600secs	9.1L/s
				Full	Hydrant	Flow
<p>Refer 2007 test with upgraded hydrant capacity.</p> <p>Now 17 ¹⁷ l/s.</p> <p>17.5⁺ l/s.</p>						



BORE LOG SHEET

DATE: 25.10.07

CLIENT: Apcon Patterson
 DESCRIPTION OF WORK: Drill bore for soakage and test
 LOCATION: 511 Sandringham Road, Sandringham
 METHOD OF BORING: Percussion
 BOREHOLE NO: One BOREHOLE DIA: 100mm
 BOREHOLE I.D: Marked
 BOREHOLE LOC: Rear of property

STRATA		FLOW TEST			
Depth	Description	Meter Start	Meter Finish	Duration	Lts / sec
0.1m	Concrete				
1.2m	Boulders, Ash				
3m	Basalt Rock				
5.5m	Broken Rock, Cavities				
6.2m	E.O.B.	Pre	Soak	10mins	
		13737.7	13747.5	10mins	
		=	9,800L	1/600secs	16.3L/S
			Full	Hydrant	Flow
1m					
2m					
3m					
4m					
5m					
6m					
7m					
8m					
9m					
10m					
11m					
12m					
13m					
14m					
15m					
16m					
17m					
18m					
19m					
20m					

INTOROCK DRILLING

ROCK DRILLING SOLUTIONS



BORE LOG SHEET

DATE: 25.10.07

CLIENT: Apcon Patterson
 DESCRIPTION OF WORK: Drill bore for soakage and test
 LOCATION: 511 Sandringham Road, Sandringham
 METHOD OF BORING: Percussion
 BOREHOLE NO: Two BOREHOLE DIA: 100mm
 BOREHOLE I.D.: Marked
 BOREHOLE LOC: Rear of property

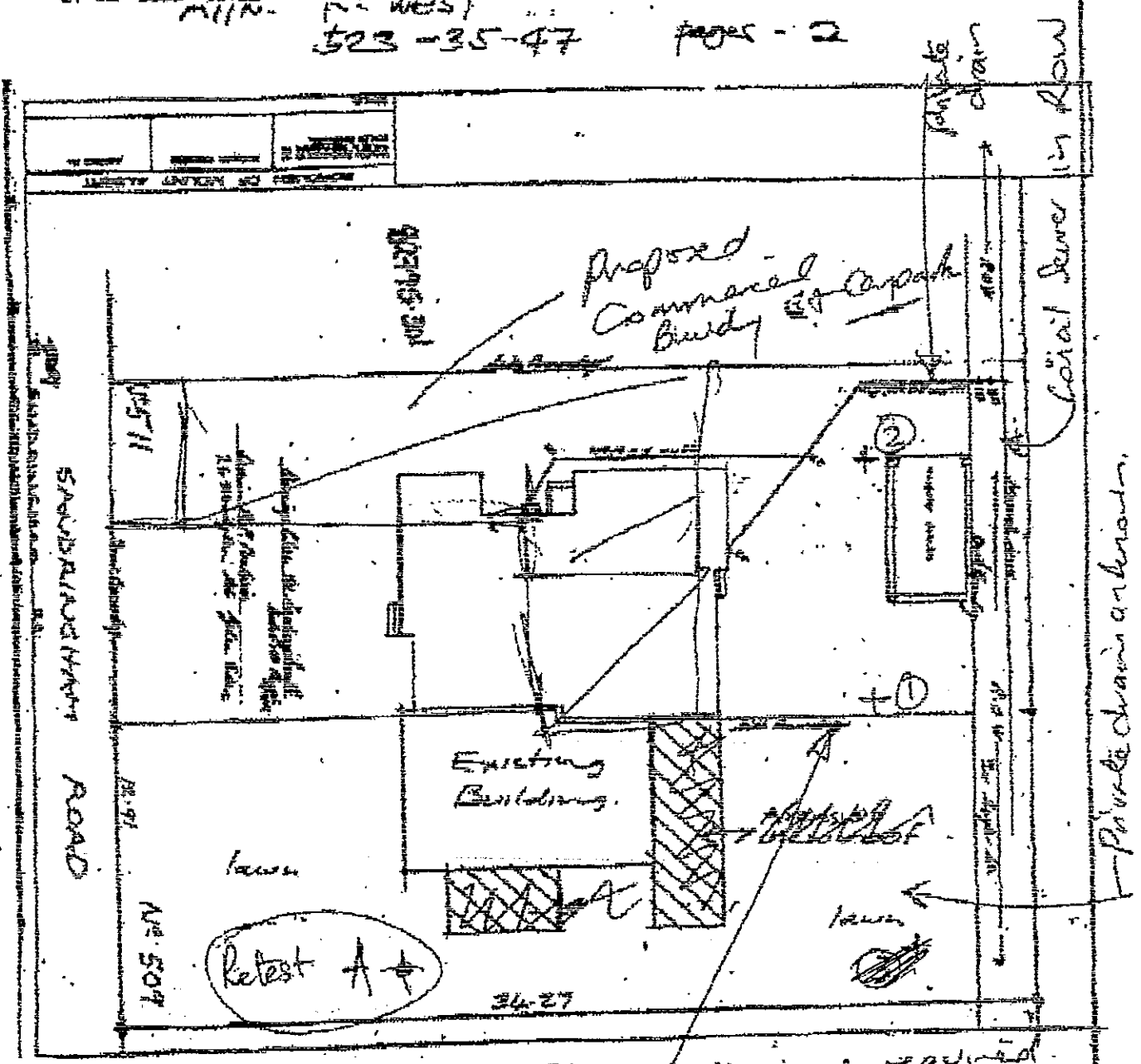
STRATA		FLOW TEST			
Depth	Description	Meter Start	Meter Finish	Duration	Lts / sec
1m	0.1m Concrete >> 0.5m Ash				
2m	Basalt Rock				
3m					
4m	Broken Rock, Cavities				
5m		4.5m			
6m		5.3m			
7m	E.O.B.	Pre	Soak	10mins	
8m		13749.0	13759.2	10mins	
9m		=	10,200L	/600secs	17.0L/S
10m			Full	Hydrant	Flow
11m					
12m					
13m					
14m					
15m					
16m					
17m					
18m					
19m					
20m					

27-SEP-2007 11:12
M/R

AK CITY ENVIRONMENTAL
WEST
523-35-47

pages - 2

21/11/2007 10:32



PRIVATE PLUMBING AND DRAINAGE PLAN

File Address: 305 Sandringham Road
 Date Printed: 27 September 2007 10:32 AM
 Page: 1 of 1
 Not to Scale



AUCKLAND CITY

Note: This plan may be subject to change or withdrawal without notice. It is the responsibility of the client to ensure that the plan is used for the purpose intended and that all necessary permissions and consents are obtained before any work is carried out. The client is responsible for ensuring that the plan is used in accordance with the relevant legislation and that any necessary consents are obtained before any work is carried out.

ep Miller

W2

WORKSHEET 2. CONSTANT-HEAD PERCOLATION TEST

Site Address: Soep-511 Sandringham Rd.

Completed by: Into Rockdrilling

Date of test: _____

Signature: See Drillers Log

Attach the following:

- Log of borehole showing depth, geological layers and water table
- Site-plan showing the location of the hole AT SOAKPIT LOCATION.
(tick when attached)

- Civil Engineer
- Engineering Technician
- Engineering Geologist
(tick one)

Ensure the following procedures are followed:

- A permit is obtained from Metrowater
- Hole is pre-soaked for 10 minutes prior to test
- Test is continued for 10 to 15 minutes
- Rockbores are maintained full
- Testpits are maintained 1/2 full
- Bores within 10m of each other are tested simultaneously
- Borehole drilling is attempted before constructing a testpit
(tick when complete)

Drilling Contractor

3. Test Details

Time	Flowrate (L/s)	Time	Flowrate (L/s)
<u>Refer Drillers Log.</u>			

4. Determine capacity of rockbore/testpit:

All. Full Hydrant Flow

(a) Capacity of bore = $P_2 = \frac{\text{Flowrate}^*}{1.3} =$

$\frac{17.5^+}{1.3} = 13.46^+ \text{ L/s Bore A}$

* Use the end-of-test flowrate.

$16.3^+ / 1.3 = 12.53^+ \text{ Bore 1}$

6. Percolation Rate (testpit only)

$17^+ / 1.3 = 13.07^+ \text{ Bore 2}$

(do not complete this step for rockbores)

(a) Soakage surface (1/2 total wall area + base area) = _____ m²

(b) Percolation rate = $P_1 = \frac{P_2 \times 60}{(\text{soakage_surface})} =$ _____ L/m²/min

WORKSHEET 4. ROCKBORE SOAKHOLE

W4/W6

Site Address: 509-511 SANDRINGHAM RD

Design by: NB/K

Date: 3/10/07

1. Equivalent Impervious Area

Cover Type	Area (m ²)	Ratio, R _E	Area x R _E (m ²)
Roof	A _R =	1	
Paved	A _C =	1	
Pervious (lawn etc)	A _P =	0.3	

(a) Equivalent impervious area (A_E):

Σ A_E = 938 m² *max allow for full site as Bore A Bore 1 Bore 2 Roof or Paved.*

2. Rockbore Capacity (if no storage provided)

(a) Constant-head flow (from WORKSHEET 2) = P₂ =

13.07 L/s *vs Bore 2*

(b) Maximum area that can be served by bore =

$$\frac{P_2 \times 60}{1.1} = \frac{734}{1.1} = 683 \text{ m}^2$$

*Bore A
Bore 1
Bore 2*

(c) If area from (b) > A_E, no storage is needed and step 3 does not need to be completed.

2119 >> 938

Combined Site Area

3. Storage Required

(a) Catchment soakage ratio = P₃ = $\frac{P_2 \times 60}{A_E}$ =

(b) Read off storage ratio (from CHART 2) = R₂ = _____ m³/m²

(c) Calculate storage required = R₂ x A_E = _____ m³

(d) Compare to available storage = _____ m³

** L/min/(m² equivalent impervious area)*

SCORIA TRENCH LENGTH REQUIRED

= A_c x 0.067

FORM "OSM-O&M-PLAN"

(A) SITE & OSM DEVICE DETAILS:

(1) Site Address: _____

(2) Owners Name: _____

(3) Details of OSM Device(s):

Ref. No	Type	Size (eg m ² or m ³)	Location	Runoff Source*
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____

* eg roof, paved area

(4) Name & Address of Parties Responsible for Inspecting and Maintaining the Devices:

(B) O&M PLAN PREPARED BY:

(1) Firm: APCON PATERSON LTD

(2) Responsible Individuals Name: N. PATERSON

(3) Firms Address: 10 KEYSTONE AVE MT ROSKILL

(C) ATTACHED FORMS:

(1) Form "OSM-O&M-Routine"

(2) Forms "DEVICE-SPECIFIC O&M DETAILS":

(one for each OSM device)

Ref. No	Type
_____	_____
_____	_____
_____	_____
_____	_____

N. B. Paterson
Signed _____ Date _____

ACE Office Use:

Reference No. _____

Checked by: _____ Date: _____
Entered by: _____ Date: _____

FORM "OSM-O&M-ROUTINE"
List of Routine Maintenance Requirements

(a) Monitoring & Inspection Programme:

Routine monitoring and inspections are required to:

- Develop a condition history
- Improve scheduling efficiency
- Apply preventative maintenance

Inspection records are to be used to:

- Determine where special maintenance conditions exist
- Determine optimal frequencies for future inspection and maintenance
- Establish scheduled and unscheduled maintenance provisions
- Assure OSM device operation and aesthetics

Specific requirements cover:

- The owner will be responsible for conducting inspections (or having them done on his/her behalf) with the OSM device "as-built" plans in hand, generally at the following intervals (noting that this may vary, depending on site-specific conditions):
 - quarterly basis for the first 2 years
 - minimum of semi-annually thereafter
- The owner will be responsible for keeping inspection records to track the progressive development of the OSM device(s) over time, covering (note that these are to be available to the maintenance contractor noted in Section 11.2 and/or the City/ACE as may be required):
 - general condition of vegetation area(s), predominant plant species, distribution, and success rate (where applicable)
 - sediment condition and depth in forebay (or other pre-treatment structure), treatment facility, bench planting zones, and other sediment removal components
 - water elevations/observations (sheen, smell, etc.)
 - condition of the inlet, outlet, and overflow structures/devices, etc
 - unscheduled maintenance needs
 - components that do not meet performance criteria and require immediate maintenance
 - common problem areas, solutions, and general observations
 - aesthetic conditions

(b) Soils in Stormwater Planters & Rain Gardens:

The following requirements apply:

- Test the pH of planting bed soils in areas where vegetation has died:
 - if the pH is below 5.2, apply limestone
 - if the pH is above 7.0, add iron sulfate plus sulfur to reduce the pH
- Use core aeration of unvegetated areas if the surface of the bed becomes clogged with fine sediments over time: redesign plantings to correct problems, and re-establish soil coverage

(c) Vegetation Management:

Vegetated stormwater facilities may require a number of control practices, especially during the 2-year establishment period. Corresponding required practices cover:

- Maintain plantings for a period of 2 years after date of the Building Consent final inspection
- During the establishment period, remove undesired vegetation with minimal (or preferably no) use of toxic herbicides and pesticides at least three times in year 1, and once or twice in the summer of year 2; replace plants that die during this period within 3 months
- At the end of the second year, healthy plant establishment shall be achieved for at least 90% of the vegetation
- Selectively irrigate if necessary during the establishment period, during times of drought, or until the vegetation becomes established: it is preferred that the facility be designed to sustain its function without a permanent irrigation system
- Replenish mulch at least annually, and specify the mulching schedule in the O&M Plan; noting also that mulching shall be done to retain topsoil, heat, and moisture, and to inhibit weed growth
- Schedule maintenance outside sensitive wildlife and vegetation seasons
- Minimise plant disturbance during maintenance activities
- Do not use fertilisers, herbicides, or pesticides for vegetation maintenance, unless it is specifically called for in the O&M Plan
- Use replacement plants that conform with the initial planting plan

(d) Sediment Management/Pollutant Control:

Sediment and other pollutants that degrade water quality will accumulate in OSM devices and require removal to ensure proper operational performance. Corresponding requirements cover:

- Remove sediment when accumulations reach 100 mm in depth, or 50% of the designed sediment storage depth; or if sediment accumulation inhibits facility operation
- Dispose of the sediment in a safe manner
- If sediment and/or other pollutants are accumulating more rapidly than assumed when the O&M Plan was formulated, investigate and rectify the cause

(e) Access and Safety:

O&M programmes must provide for safe and efficient access to a facility. The following are general requirements; specific conditions may require site-specific modifications:

- Secure easements necessary to provide facility and maintenance access (if applicable)
- Use only suitably trained personnel to access confined spaces
- Maintain ingress/egress routes to design standards, in a manner that allows efficient maintenance of the facility
- Ensure that fencing is in good repair

FORM "OSM-O&M-CERT"

(A) SITE & OSM DEVICE DETAILS:

Site Address: _____
 Owners Name: _____
 Device(s):

Ref. No	Type	Size	Date Installed
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

(B) MAINTENANCE CONTRACTOR'S DETAILS:

Firms Name: _____
 Firms Address: _____
 Name of Serviceperson: _____
 Date(s) of Service: _____

(C) SERVICE DETAILS:

Device Checklist	MAINTENANCE ACTION	
Ref No	Completed*	Action (describe, eg "pipe replaced")
1		(a) _____
		(b) _____
		(c) _____
		(d) _____
2		(a) _____
		(b) _____
		(c) _____
		(d) _____
3		etc....(continue on a separate sheet)

* on attached form "Device-Specific O&M Details"

(D) CERTIFICATION:

I/we hereby certify that:

- The OSM device inspection and maintenance programme has been undertaken in accordance with the provision of Section 11 of the City's "OSM Manual" dated 2002
- The details above and on the attached form(s) are a full and correct record of the work performed
- The OSM device(s) are in sound working order
- The owner has been advised of the problems found (if any) and alerted as to the need to inspect for any recurrences and rectify such promptly

Signed _____ Date _____

ACE Office Use:

Reference No. _____
 Checked by: _____ Date: _____
 Entered by: _____ Date: _____

**FORM "DEVICE SPECIFIC O&M DETAIL SM005"- PAGE 1 OF 2
OPERATION AND MAINTENANCE OF ROCKBORE SOAKHOLE**

Note: One form required for each OSM device on a site

(A) DESCRIPTION OF ROCKBORE SOAKHOLE

The rockbore soakhole is a concrete chamber with a borehole extending down into fractured rock beneath the chamber. The chamber normally extends to the surface with a steel lid to allow access. The top of the borehole is lined with a PVC liner that ends in syphon or a coil of perforated pipe. Rainwater is piped into the concrete chamber, and flows into the borehole through the syphon or perforated pipe.

(B) OPERATIONAL POINTS

- Any site runoff (from paved areas) feeding to the soakhole will first pass through a pre-treatment device, such as a raingarden or a sandfilter. Maintenance of the pre-treatment device will be covered under a separate O&M form, and this will also cover maintenance of any catchpits or stormwater pipes feeding to the pre-treatment device.
- Roof runoff flows through a small chamber before entering the soakhole (does not apply to soakholes installed prior to 2003). The small chamber will be connected to the pipework between the spouting and the soakhole.

(C) GENERAL O&M NEEDS

- Maintenance of flow through the spouting and downpipe system.
- Removal of leaves and sediment from the small chamber.
- Removal of accumulated sediment from the soakage chamber.
- Cleaning of the rockbore soakage surface.
- Checking the soakage capacity of the soakhole.

(D) RECORD KEEPING

- Completed form must be submitted to ACE. For 2 yearly inspections, the form must be submitted with an "OSM-O&M Cert" form.
- A copy of the completed form (and any additional inspection records) is to be kept on-site and made available to the plumber/drainlayer.

Site Address: _____

Building Consent Number: _____

Reference Number (from Form "OSM-O&M-Plan"): _____

Date Installed: _____

FORM "DEVICE SPECIFIC O&M DETAIL SM005"- PAGE 2 OF 2
 CHECKLIST - ROCKBORE SOAKHOLE

Frequency		Action			Notes
After storm	✓	Every 3 months	✓	Every 2 years*	✓
			✓		

Spouting, downpipes and small chamber:

- Check for debris accumulation, blockages and leaks.
- Remove waste material and maintain as necessary.

Rockbore and soakage chamber:

- If chamber is dry, remove sediment manually (eg using a shovel and bucket).
- If chamber is wet, remove sediment using an air-vacuum system.
- Check syphon or perforated pipe for clogging and correct operation. Clean and repair as necessary.
- Remove borehole cap (if present) and check borehole is dry.
- Carry out rockbore cleaning as required and at least every 4 years on commercial sites and 6 years on residential sites (process detailed below).

Rockbore cleaning:

- Remove accumulated sediment from borehole using an air-vacuum system.
- Hydro-blast borehole.
- Use the air vacuum system to remove sediment loosened by hydroblasting.
- Check that rockbore is draining correctly (if not, it may require replacement).

* Plumber/Drainlayer Checklist

Plumber/Drainlayer's Signature: _____ Date: _____

Name: _____ Reg Number: _____

Company Name: _____

Company Address: _____

Site Address: _____

Building Consent Number: _____

Reference Number (from Form "OSM-O&M-Plan"): _____

Date Installed: _____

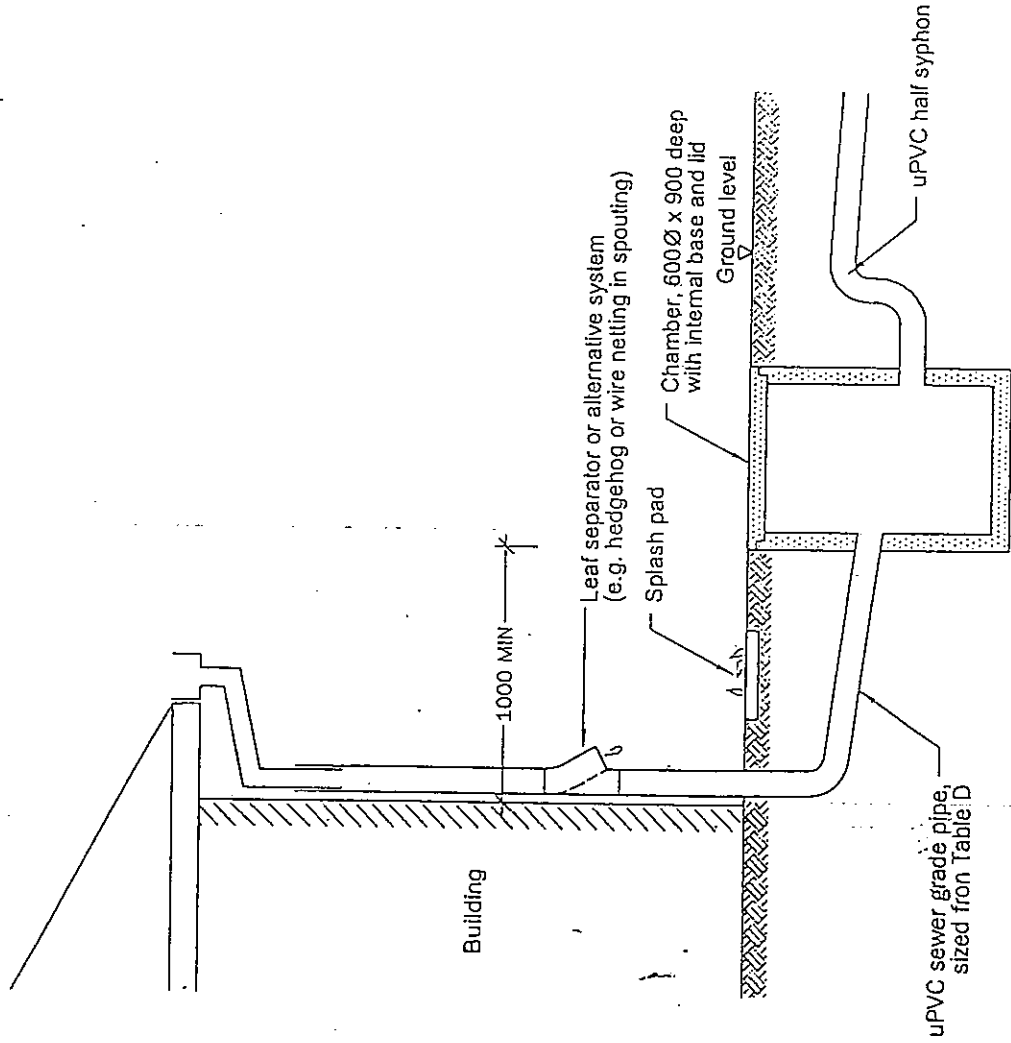
Notes:

- All dimensions are in mm (unless otherwise specified).

Table D

MAX Roof Area	MIN Pipe Size (mm)
210 m ²	100
350 m ²	125
550 m ²	150
1000 m ²	200

(tick)



Client:

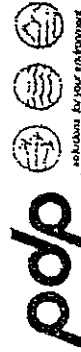


Project:

Stormwater Soakage
Design Manual

Title:

Settling Chamber
(for roof runoff)



PATTLE DELAMORE PARTNERS LTD
ANALYST ENGINEERS ARCHITECTS INTERIORS

Scale: NTS
Project No.: AJ88301
Drawing No.: 09
Revision: A

Table A

MAX Catchment Area*	MIN Overflow Pipe Size (mm)	
210 m ²	100	
350 m ²	125	
550 m ²	150	
1000 m ²	200	

* Measured as equivalent impervious area (tick)

Client: **AUCKLAND CITY**

Project: **Stormwater Soakage Design Manual**

Title: **Rockbore Soakhole**

pop submit for your environment

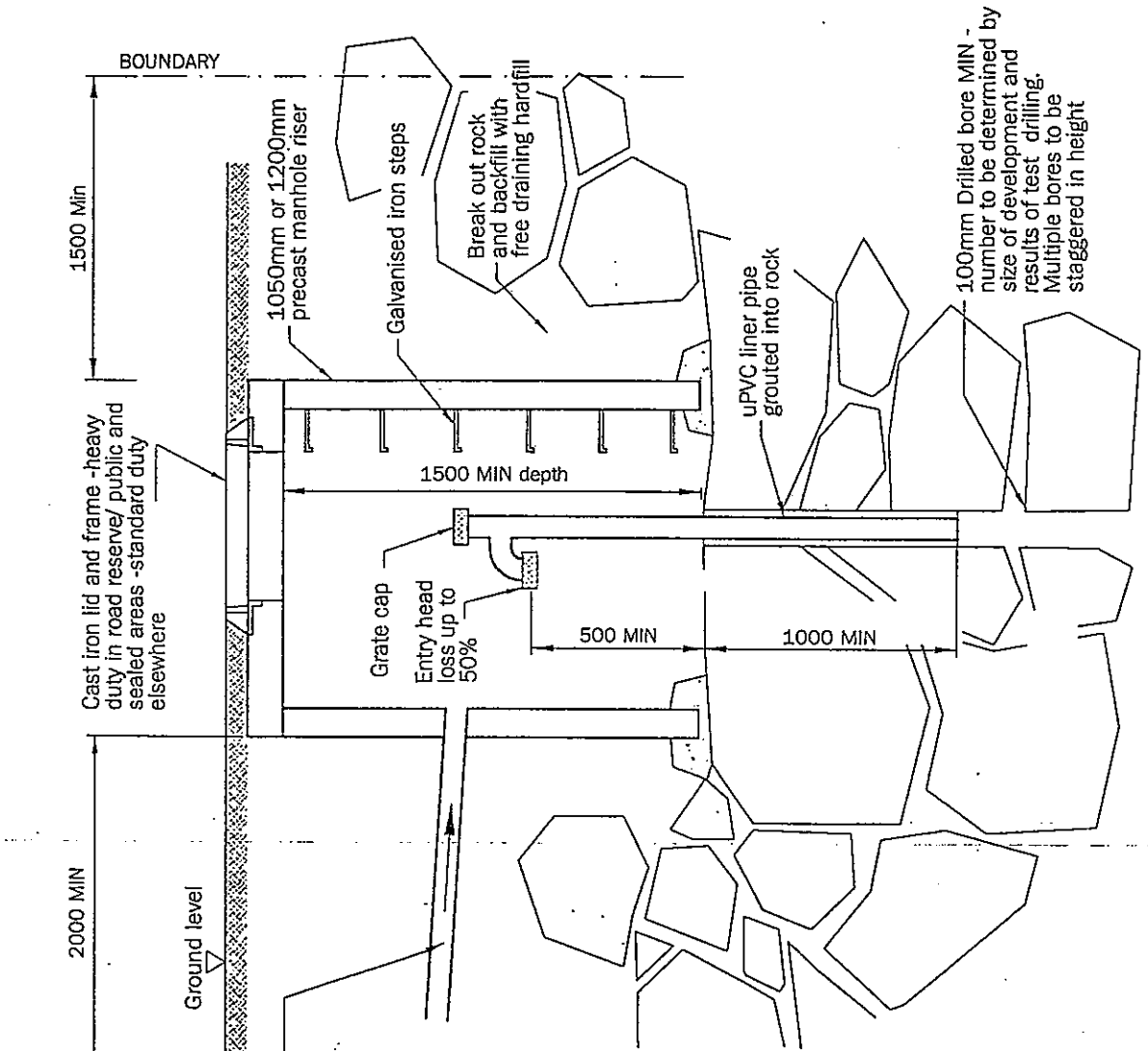
PATLE DELAMORE PARTNERS LTD

Scale: **NTS**

Project No.: **AJ88301**

Drawing No.: **05**

Revision: **A**



uPVC sewer grade pipe, sized from Table A.

-Runoff from roof areas must pass through a settling device. Refer to Drawing 09.

-If the total paved area exceeds 20m², site runoff must be pre-treated. Refer to Drawings 07, 08, 10.

Notes:

1. All dimensions are in mm (unless otherwise specified).
2. Depth will vary depending on type of ground encountered.
3. If rock is deeper than shown, then construct manhole on standard precast base.
4. The drilled bore is to be positioned under the MH access for ease of cleaning.
5. ARC requirements:-
Where 1000m² or more of impermeable area is to be drained to ground soakage, a Resource Consent will be required.
6. Soakholes may not be located within any building or in a subfloor/basement carpark.
7. Refer plan No. 12908/201 for precast manhole construction details.
8. An operation and maintenance plan is required. Refer to Form SM005.



WASTEWATER FILTRATION SYSTEMS

Nick Watson

Business Development Manager - NZ

Mobile: 021 401 474

16/14 Basalt Place East Tamaki Auckland

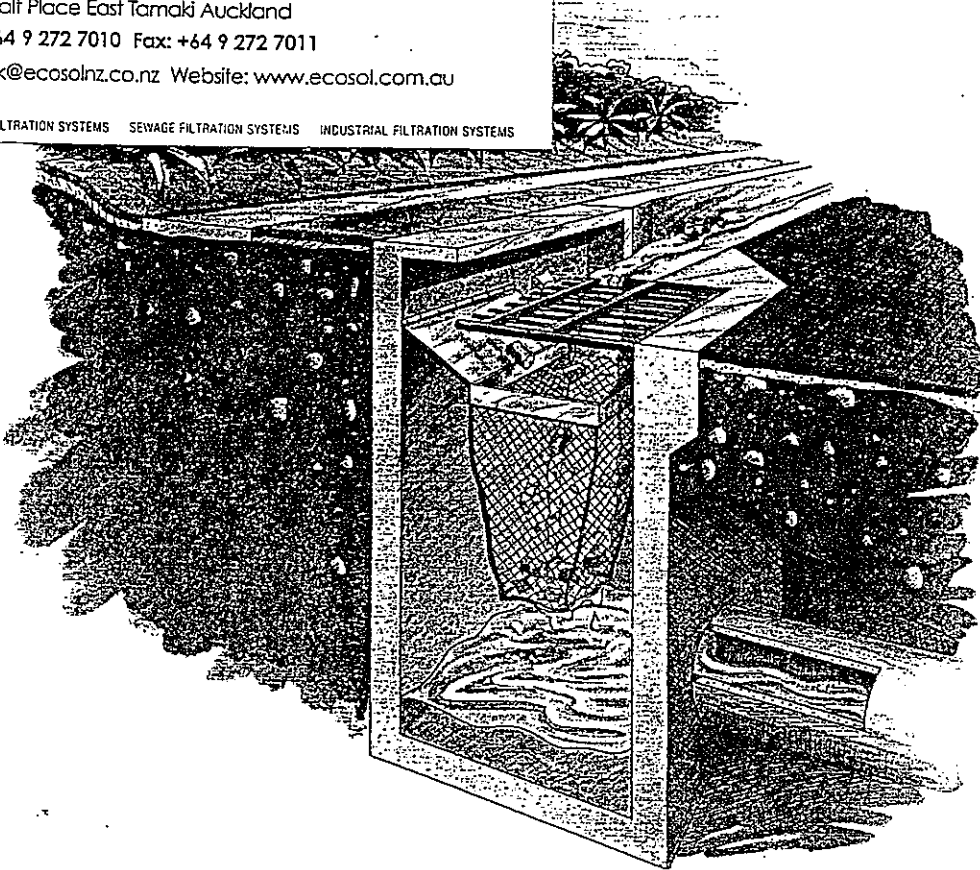
Phone: +64 9 272 7010 Fax: +64 9 272 7011

Email: nick@ecosolnz.co.nz Website: www.ecosol.com.au

STORMWATER FILTRATION SYSTEMS SEWAGE FILTRATION SYSTEMS INDUSTRIAL FILTRATION SYSTEMS

RSF 100™

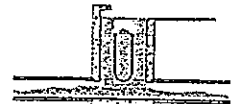
At-Source Solid Pollutant Filter



RSF 100 before the rain event



Pollutants are filtered from the flow



Overflow mechanism is activated



Flow ceases and flaps return to closed position

KEY FEATURES

Effective Pollutant and Litter Retention

- Captures more than 95% of gross pollutants > 1.5mm
- Collects significant quantities of sediment
- Filter media available to suit a range of sediment sizes
- No remobilisation of captured pollutants
- No toxic fermentation

Tested and Proven Fail-Safe Overflow System

- Patented by-pass overflow eliminates the risk of flooding
- Minimal head/hydraulic loss
- Does not affect the stormwater inlet capacity
- Independently tested at a NATA-approved facility
- Meets EPA and ANZECC guidelines

Cost-Effective Maintenance

- Easily cleaned by most street-sweeping vehicles
- Filter liner can be removed easily for manual cleaning
- Pollutants are not handled during cleaning
- Enables easy access to pit for drain maintenance
- Reduces sedimentation build-up & pipeline maintenance
- Maintenance procedures within OHS&W guidelines

Cost-Effective Design and Installation

- Simple design with corrosive-resistant materials
- Can be retro-fitted into existing pits or supplied in its own pit
- Safe installation procedures minimise public risk
- Cost-effective alternative to a GPT
- Visually unobtrusive
- Excellent aid for community awareness & public education

USE ECOSOL OR OTHER ACE APPROVED CP. FILTER.



Ecosol™ RSF 100™

At-Source Solid Pollutant Filter

The RSF 100 Solid Pollutant Filter is designed for use in stormwater flows, capturing pollutants at drainage entry points. It consists of a filtration/retention basket and an overflow by-pass flap(s). The basket is fitted below the invert of the gutter but inside the drainage pit and, importantly, does not obstruct flow in the outlet pipe.

Solid pollutants enter the RSF 100 with the stormwater from the roadside or other run-off areas, such as car parks. The incoming flow, and the pollutants, aquaplane across the flap(s) into the capture basket. The filtered stormwater then passes through to the drainage network with minimal head/hydraulic loss through the unit.

As the basket approaches 90% full, the by-pass flap(s) begins to open in response to the incoming flow. Once the basket is 100% full, the pressure of the

incoming flow forces open the by-pass flap(s), allowing the excess flow to enter the drainage system through the by-pass openings. This effectively eliminates the likelihood of flooding, a common fault with other at-source systems. Even when in by-pass, the captured pollutants are not remobilised and are retained in the basket, as confirmed by independent tests. When the flow ceases, the flap(s) returns to its normal position.

The RSF 100 is designed to treat 100% of the incoming flow and independent university tests have confirmed that it separates, collects, and retains more than 95% of solid pollutants down to at least 1.5mm in size. In practice, Ecosol has found that approximately 75% of the pollutants captured are less than 1.5mm size. The unique by-pass overflow system eliminates the risk of flooding without adversely affecting the inlet pit hydraulic performance.

RETRO FITTED RSF 100 AT-SOURCE UNIT

PIT TYPE	TYPICAL PIT INTERNAL DIMENSIONS (L x W) mm	POLLUTANT HOLDING CAPACITY AT BASKET DEPTH		TREATABLE FLOW RATE	BY-PASS CAPACITY m³/s	STATIC HEAD FOR BY-PASS mm
		450mm mm³	600mm mm³			
Single Grated With Kerb Lintel	900 x 750	0.16	0.23	100%	0.215	150
Double Grated With Kerb Lintel	1800 x 750	0.32	0.46	100%	0.430	150
Single Without Grate or Lintel ¹	900 x 600	0.11	0.16	100%	0.110	150
Double Without Grate or Lintel ¹	1800 x 600	0.22	0.32	100%	0.220	150

LIGHTWEIGHT PRE-CAST PIT INCLUDING RSF 100 AT-SOURCE UNIT

PIT CODE	TYPICAL PIT INTERNAL DIMENSIONS (L x W) mm	POLLUTANT HOLDING CAPACITY AT BASKET DEPTH		TREATABLE FLOW RATE	BY-PASS CAPACITY m³/s	STATIC HEAD FOR BY-PASS mm
		450mm mm³	600mm mm³			
FRC 66 or RC 66	600 x 600	0.08	0.11	100%	0.070	150
FRC 96 or RC 96	900 x 600	0.11	0.16	100%	0.110	150
FRC 99 or RC 99	900 x 900	0.21	0.30	100%	0.220	150

¹ These pits are fitted with only one by-pass flap - other pit combinations are fitted with two flaps

² The minimum required pit depth is 350mm

³ This is the TFR until the collection basket is full

⁴ FRC denotes Fibre Reinforced Concrete pit while RC denotes steel Reinforced Concrete pit. Pits can be supplied complete including galvanised grate and concrete surrounds to suit Class B or D loading

Ecosol also offers a comprehensive cleaning and maintenance service

 **Ecosol™**
WASTEWATER FILTRATION SYSTEMS

PIT

Brisbane
+61 7 3368 3966

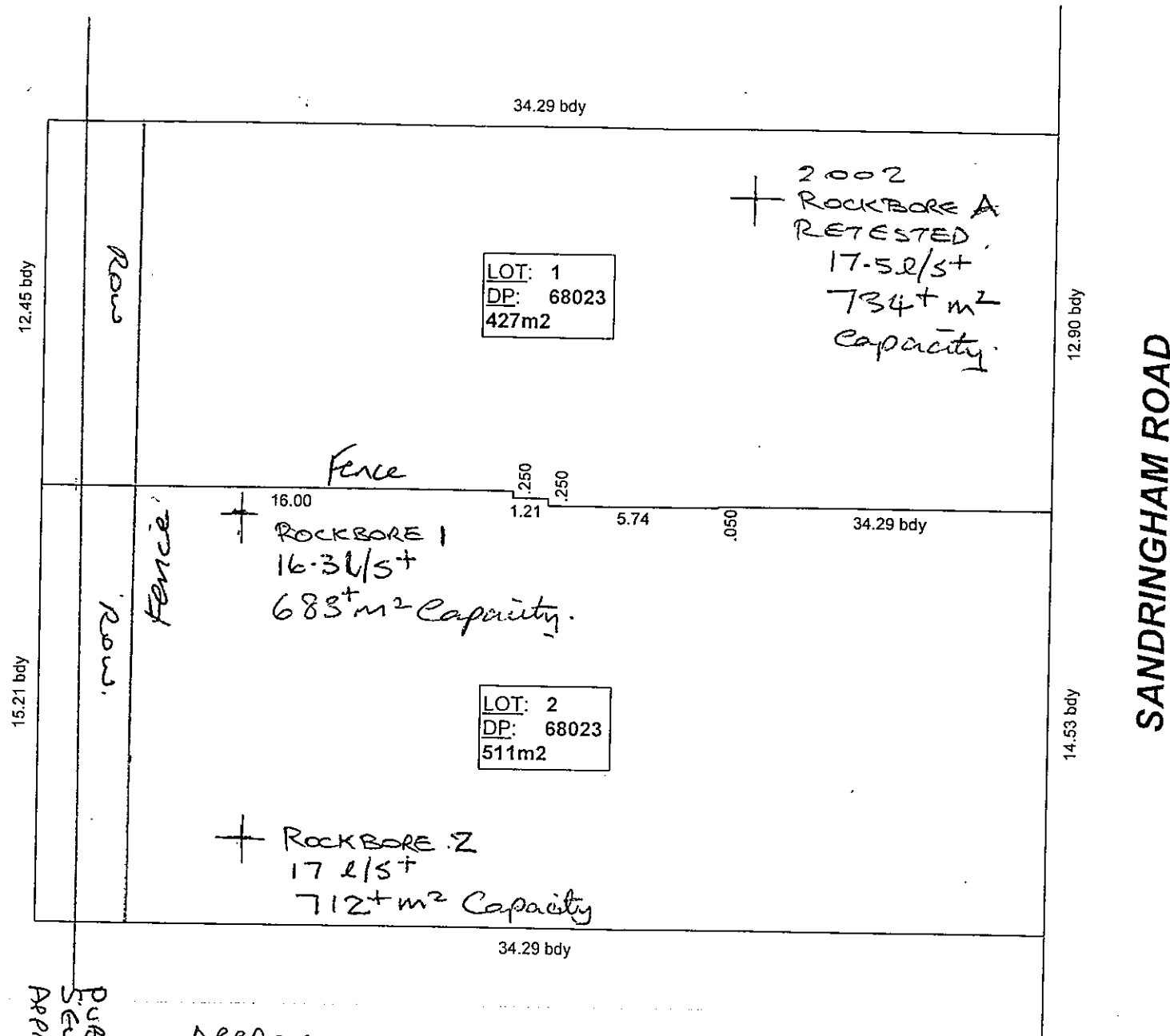
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SANDRINGHAM ROAD

SOAKAGE BORES LOCAL
31-10-07.

PUBLIC
SEWER
APPROX LOCATION

APPROX
ROCKBORE LOCATIONS PLOTTED OFF
FENCES. (COS.)
PIPING LAYOUT & PRETREAT LOCATIONS
TO BE DETERMINED AT BUILDING
CONSENT STAGE.
EACH BORE CAN CATER FOR NOTED
AREA. minimum OF SURFACE.
(Limit of hydrant for testing). (Any 2 Bores will have capacity for full site.)

1 Existing Site Layout
Scale: 1:200

Job CONCEPT for PRANEEL SINGH at SANDRINGHAM ROAD	
Date 09/07	
Page Scale 1:200	
Drawn By BENNETT DRAUGHTING 116 RED HILL ROAD PAPAKURA ph: (09) 296 6369	
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