

**TREATMENT PLANT APPROVAL 06/2021**  
*Plumbing and Drainage Act 2018*

**Approval**

1. The **Aerobic Sand Filtration (HTSP)** (“the system”) described in the Specifications and Drawings in the attached Schedule and manufactured by **Sayer Civil Pty Ltd** (“the manufacturer”) (ABN 64 010 875 091) has been assessed in accordance with the Queensland Plumbing and Wastewater Code (QPW Code) dated 26 October 2017.
2. Approval is granted for the advanced secondary quality wastewater treatment system, subject to compliance by the manufacturer with the requirements of the *Plumbing and Drainage Regulation 2019* and the conditions of approval detailed below.
3. This approval, the conditions of approval and the Schedule comprise the entire Treatment Plant Approval document.
4. Any modification by the manufacturer to the design, drawings or specifications scheduled to this approval must be approved by the Chief Executive.

**Conditions of approval**

5. The manufacture, installation, operation, service and maintenance of the systems must be in conformity with the conditions of this Treatment Plant Approval.
6. The advanced secondary quality wastewater treatment system may only be used on premises that generate per day:
  - (a) a maximum hydraulic loading of 4000L; and
  - (b) a maximum organic loading of 1500 grams BOD<sub>5</sub>
7. For the system to meet the requirements of an advanced secondary quality wastewater treatment system, the system must produce the following effluent quality —
  - (a) 90% of the samples taken must have a BOD<sub>5</sub> less than or equal to 10g/m<sup>3</sup> with no sample greater than 20g/m<sup>3</sup>; and
  - (b) 90% of the samples taken must have total suspended solids less than or equal to 10g/m<sup>3</sup> with no sample greater than 20g/m<sup>3</sup>; and
  - (c) Where disinfection is provided 90% of the samples taken over the test period must have a thermotolerant coliform count not exceeding 10 organisms per 100ml with no sample exceeding 200 organisms per 100ml.
  - (d) Where chlorination is the disinfection process, the total chlorine concentration must be greater than or equal to 0.5g/m<sup>3</sup> and less than 2.0g/m<sup>3</sup> in four out of five samples taken.
8. Each system must be serviced in accordance with the manufacturers details supplied in the owner’s service and maintenance manuals.

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Delegated Authority  
Department of Housing & Public Works

9. Each system must be supplied with —
- (a) a copy of this Treatment Plant Approval document;
  - (b) details of the system and ancillary equipment;
  - (c) instructions for authorised persons for its installation;
  - (d) a copy of the owner's manual to be given to the owner at the time of installation;  
and
  - (e) detailed instructions for authorised service personal for its operation and maintenance.
10. This approval does not extend, apply to, or include the land application system used in conjunction with an approved system installed on premises.
11. At each anniversary of the Treatment Plant Approval date, the manufacturer must submit to the Chief Executive a list of all systems installed in Queensland that they have received an installation and commissioning certificate for during the previous 12 months.
12. Where the Chief Executive is notified of any system failures that they believe are a result of poor design or faulty manufacture, the Chief Executive may randomly select a number of installed systems for audit. The Chief Executive will notify the National Association of Testing Agencies (NATA) accredited laboratory nominated by the manufacturer, which systems are to be audited for Biochemical Oxygen Demand (BOD<sub>5</sub>) and Total Suspended Solids (TSS). The sampling and testing of the selected systems, if required, is to be done at the manufacturer's expense. The following results must be reported to the Chief Executive;
- (a) Address of premises.
  - (b) Date inspected and sampled.
  - (c) Sample identification number.
  - (d) Biochemical Oxygen Demand (BOD<sub>5</sub>).
  - (e) Total Suspended Solids (TSS).
13. The Chief Executive may, by written notice, cancel this approval if the manufacturer fails to comply with one or more of the conditions of approval; or within 30 days, to remedy a breach, for which a written notice been given by the Chief Executive.
14. This approval may only be assigned with the prior written consent of the Chief Executive.
15. This approval expires on 01 January 2024 unless cancelled earlier in accordance with paragraph 13 above.

Lindsay Walker  
**Director**  
**Plumbing, Drainage and Special Projects**  
**Building Legislation and Policy**  
Date approved: 05 February 2021

**Treatment Plant Approval**  
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Delegated Authority  
Department of Housing & Public Works

**TREATMENT PLANT APPROVAL No. 06/2021**  
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**SCHEDULE**

**Attachment 1**

Drawings and Specifications for the

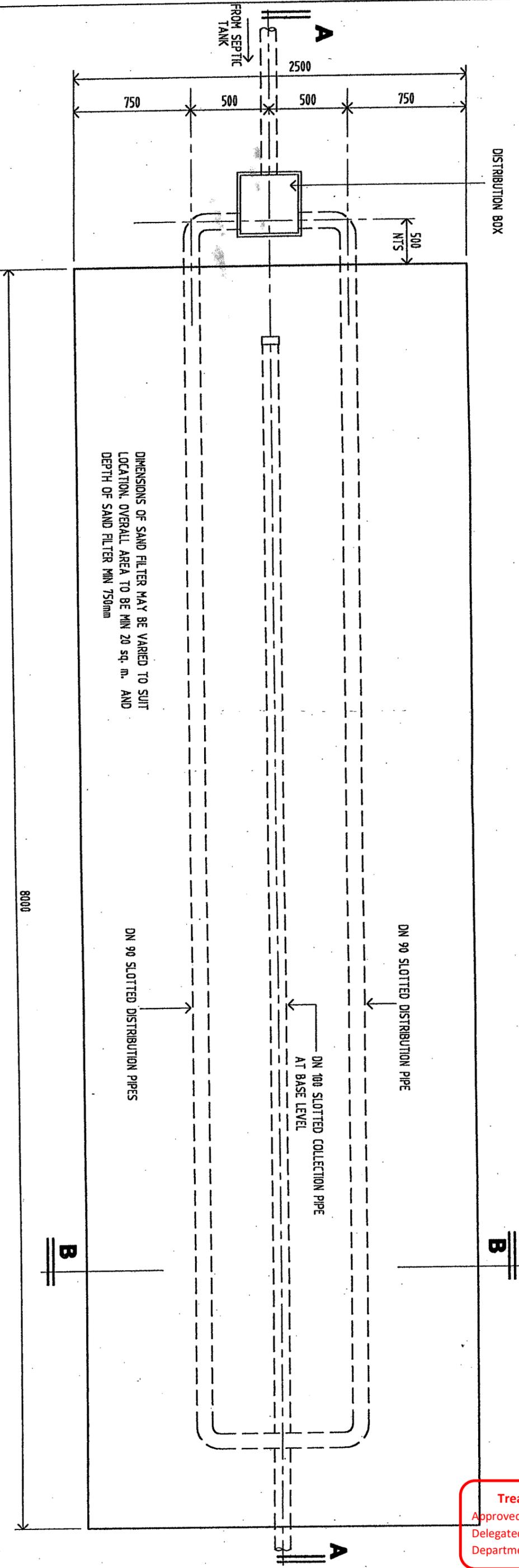
**Aerobic Sand Filtration (HTSP)**

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Department of Housing & Public Works

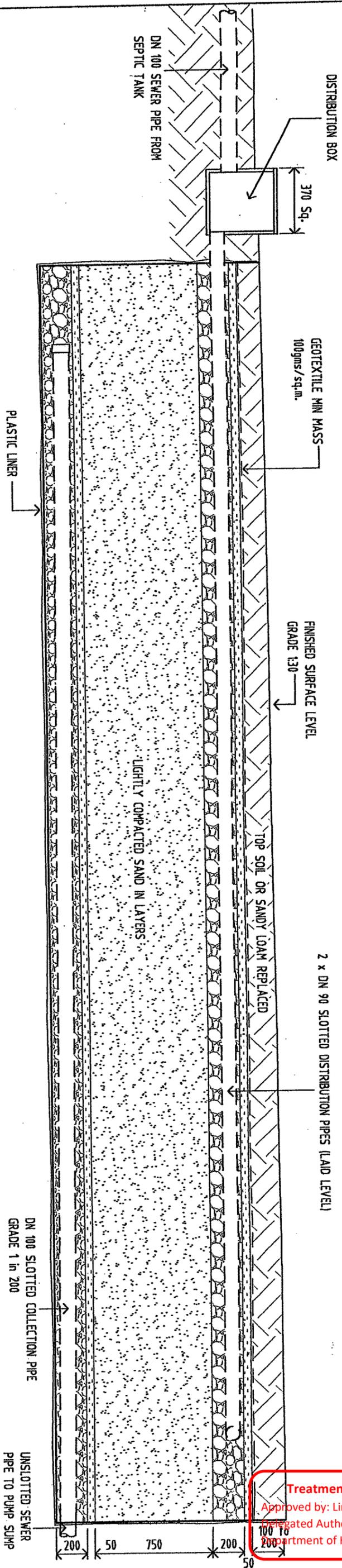


**SAND FILTER LAYOUT**

SCALE 1:25

D					
C					
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	DATE	AMENDMENT DESCRIPTION			
FOR APPROVAL		DRAWING STATUS			
DRAWING TITLE: <b>TREATMENT PLANT LAYOUT</b>		<p><b>SAYER CIVIL PTY LTD</b>  <b>CIVIL ENGINEERING CONTRACTORS - ABN 64 010 875 091</b>  <b>85 GARDNERS LANE, MALENY QLD 4552</b>          Phone 07 5494 2979 Fax 07 5494 2899 Mobile 0417 712 979          e-mail: <a href="mailto:graham@sayercivil.com.au">graham@sayercivil.com.au</a></p>			
PROJECT: <b>PROPOSED AEROBIC SAND FILTRATION</b>		CLIENT:			
TREATMENT OF DOMESTIC WASTE WATER		SITE ADDRESS:			
DRAWN: G. SAYER		DATE:			
DRAWING No: <b>GS/2002/S1</b>		DRAWING No:			

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**SECTION "A-A" TYPICAL SAND FILTER SECTION**  
SCALE 1:25

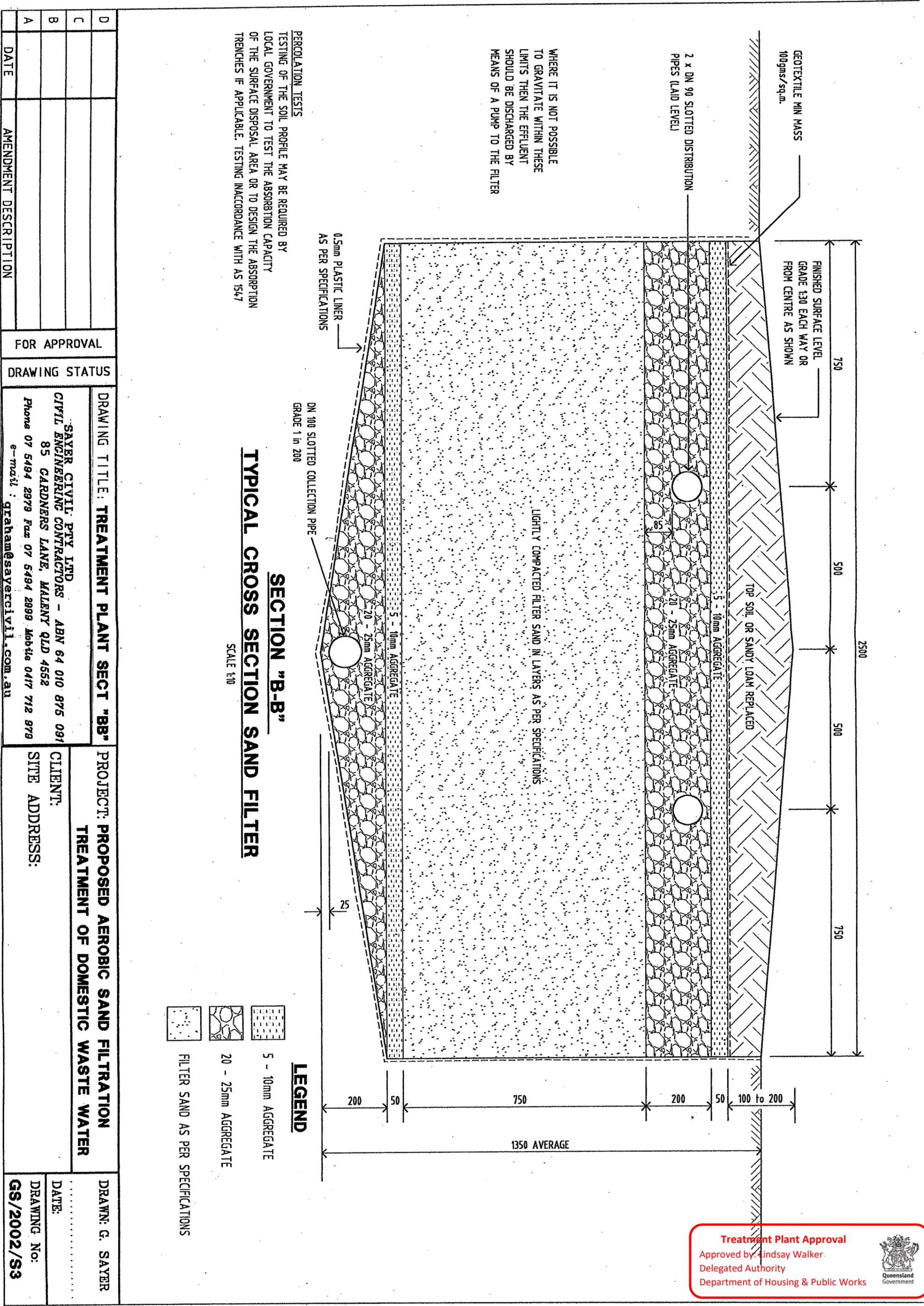
**LEGEND**

-  5 - 10mm AGGREGATE
-  20 - 25mm AGGREGATE
-  FILTER SAND AS PER SPECIFICATIONS

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DATE	AMENDMENT DESCRIPTION					
FOR APPROVAL						
DRAWING STATUS						
DRAWING TITLE: <b>TREATMENT PLANT SECT "AA"</b>						
PROJECT: <b>PROPOSED AEROBIC SAND FILTRATION</b> <b>TREATMENT OF DOMESTIC WASTE WATER</b>						
CLIENT: SAYER CIVIL PTY LTD CIVIL ENGINEERING CONTRACTORS - ABN 64 010 875 091 85 GARDNERS LANE, MALENTY QLD 4552 Phone 07 5494 2979 Fax 07 5494 2899 Mobile 0417 712 979 e-mail: graham@sayercivil.com.au						
DRAWN: G. SAYER DATE: ..... DRAWING No: <b>GS/2002/S2</b>						

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WHERE IT IS NOT POSSIBLE TO GRAVITATE WITHIN THESE LIMITS THEN THE EFFLUENT SHOULD BE DISCHARGED BY MEANS OF A PUMP TO THE FILTER

**PERCOLATION TESTS**  
 TESTING OF THE SOIL PROFILE MAY BE REQUIRED BY LOCAL GOVERNMENT TO TEST THE ABSORPTION CAPACITY OF THE SURFACE DISPOSAL AREA OR TO DESIGN THE ABSORPTION TRENCHES IF APPLICABLE. TESTING IN ACCORDANCE WITH AS 1547

**SECTION "B-B"**  
**TYPICAL CROSS SECTION SAND FILTER**

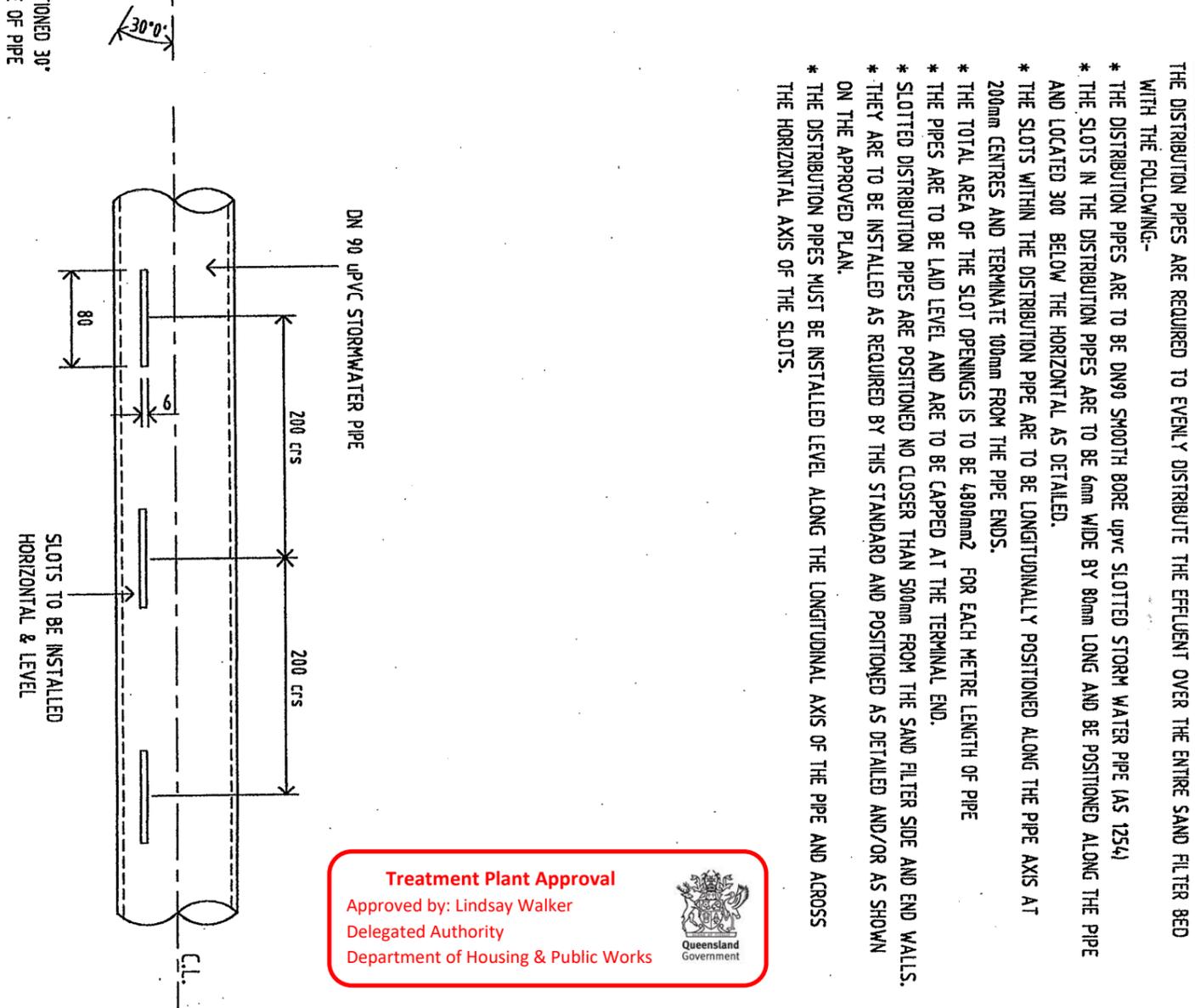
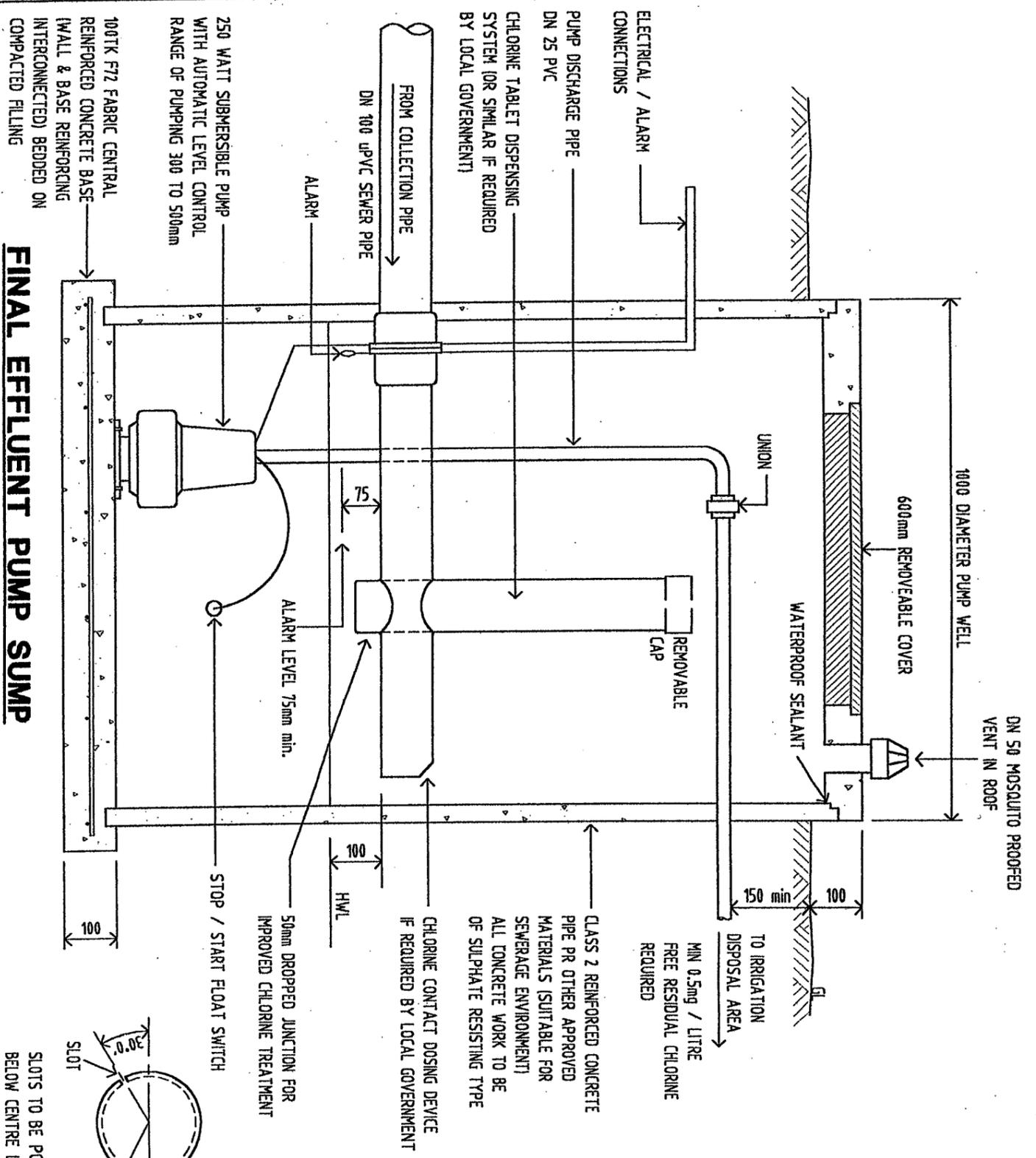
SCALE 1:10

- LEGEND**
-  5 - 10mm AGGREGATE
  -  20 - 25mm AGGREGATE
  -  FILTER SAND AS PER SPECIFICATIONS

D		FOR APPROVAL	DRAWING STATUS	<b>DRAWING TITLE: TREATMENT PLANT SECT "BB"</b> <b>PROJECT: PROPOSED AEROBIC SAND FILTRATION TREATMENT OF DOMESTIC WASTE WATER</b> SAYER CIVIL PTY LTD CIVIL ENGINEERING CONTRACTORS - ABN 64 010 875 091 85 CARDNERS LANE, MALENTY QLD 4552 Phone 07 5494 2979 Fax 07 5494 2999 Mobile 0417 712 979 e-mail: graham@sayercivil.com.au	CLIENT: SITE ADDRESS:	DRAWN: G. SAYER DATE: DRAWING No: <b>GS/2002/S3</b>
C						
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		AMENDMENT DESCRIPTION				

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- THE DISTRIBUTION PIPES**
- THE DISTRIBUTION PIPES ARE REQUIRED TO EVENLY DISTRIBUTE THE EFFLUENT OVER THE ENTIRE SAND FILTER BED WITH THE FOLLOWING:-
- \* THE DISTRIBUTION PIPES ARE TO BE DN90 SMOOTH BORE uPVC SLOTTED STORM WATER PIPE (AS 1254)
  - \* THE SLOTS IN THE DISTRIBUTION PIPES ARE TO BE 6mm WIDE BY 80mm LONG AND BE POSITIONED ALONG THE PIPE AND LOCATED 300 BELOW THE HORIZONTAL AS DETAILED.
  - \* THE SLOTS WITHIN THE DISTRIBUTION PIPE ARE TO BE LONGITUDINALLY POSITIONED ALONG THE PIPE AXIS AT 200mm CENTRES AND TERMINATE 100mm FROM THE PIPE ENDS.
  - \* THE TOTAL AREA OF THE SLOT OPENINGS IS TO BE 4800mm<sup>2</sup> FOR EACH METRE LENGTH OF PIPE
  - \* THE PIPES ARE TO BE LAID LEVEL AND ARE TO BE CAPPED AT THE TERMINAL END.
  - \* SLOTTED DISTRIBUTION PIPES ARE POSITIONED NO CLOSER THAN 500mm FROM THE SAND FILTER SIDE AND END WALLS.
  - \* THEY ARE TO BE INSTALLED AS REQUIRED BY THIS STANDARD AND POSITIONED AS DETAILED AND/OR AS SHOWN ON THE APPROVED PLAN.
  - \* THE DISTRIBUTION PIPES MUST BE INSTALLED LEVEL ALONG THE LONGITUDINAL AXIS OF THE PIPE AND ACROSS THE HORIZONTAL AXIS OF THE SLOTS.

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**FINAL EFFLUENT PUMP SUMP**

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	DATE	AMENDMENT DESCRIPTION	

<b>DRAWING TITLE: TREATMENT PLANT DETAILS</b>		<b>FOR APPROVAL</b>	<b>DRAWING STATUS</b>
<b>PROJECT: PROPOSED AEROBIC SAND FILTRATION TREATMENT OF DOMESTIC WASTE WATER</b>		<b>DRAWING TITLE: TREATMENT PLANT DETAILS</b>	
<b>CLIENT:</b>	<b>SAYER CIVIL PTY LTD</b>	<b>CIVIL ENGINEERING CONTRACTORS - ABN 64 010 875 091</b>	
<b>SITE ADDRESS:</b>	85 GARDNERS LANE, MALENY QLD 4652	Phone 07 5494 2979 Fax 07 5494 2999 Mobile 0417 712 979	
		e-mail: graham@sayercivil.com.au	
<b>DRAWN: G. SAYER</b>	<b>DATE:</b>	<b>DRAWING No: GS/2002/S4</b>	

**DETAIL OF SLOTS ON DISTRIBUTION PIPE**

SCALE 1:5  
 AREA OF SLOTS = 4800 sq.mm. PER METRE LENGTH OF PIPE

**FILTER SAND**

ONLY FILTER SAND CONFORMING WITH THE FOLLOWING CRITERIA MUST BE USED:

- \* THE EFFECTIVE SAND PARTICLE SIZE MUST NOT BE LESS THAN 0.25mm AND NOT GREATER THAN 0.6mm
- \* THE SAND MUST HAVE A UNIFORMITY CO-EFFICIENT OF LESS THAN 4
- \* THE SAND MUST CONTAIN LESS THAN 5% VOLUME OF CLAY AND FINE SILTS AS DETERMINED BY THE TEST METHOD IN AS 114.1, SECTION 33.

WHERE THE:

EFFECTIVE SIZE

= MAXIMUM PARTICLE SIZE OF THE SMALLEST 10% (D10) BY MASS OF THE SAMPLE

UNIFORMITY CO-EFFICIENT (UC)

= RATIO OF THE MAXIMUM PARTICLE SIZE OF THE SMALLEST 60% (D60) BY MASS

OF THE SAMPLE TO THE MAXIMUM PARTICLE SIZE OF SMALLEST 10% (D10) BY MASS OF THE SAMPLE.

$\frac{D60}{D10} = UC$

CERTIFICATION MUST BE PROVIDED BY THE SUPPLIER OF THE FILTER SAND AND STATING THAT THE SAND SUPPLIED COMPLIES WITH THE SPECIFICATION AS DETAILED ABOVE.

**AGGREGATES**

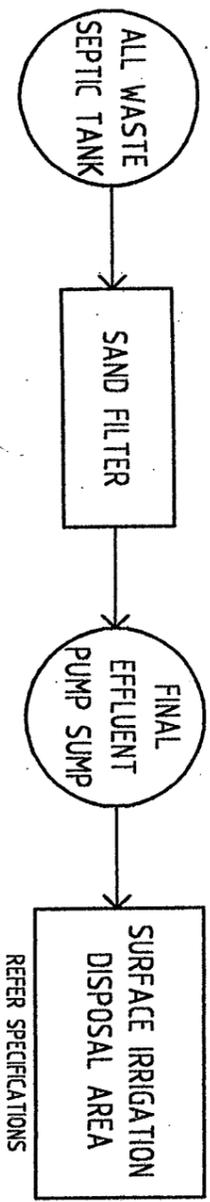
ALL AGGREGATES ARE TO BE CLEAN HARD QUARTZ STONE OR OTHER APPROVED STONE, BE OF SPECIFIED SIZE RANGE AND BE FREE OF DUST, DIRT, LOAM, SOFT PARTICLES, ORGANIC MATTER OR OTHER FOREIGN MATERIAL AND BE SUITABLE FOR USE WITH SEPTIC TANK EFFLUENT.

THE AGGREGATES AND SAND MUST BE PLACED WITHIN THE LINED SAND FILTER BED IN SUCH A MANNER AS NOT TO DAMAGE THE LINER, COLLECTION AND DISTRIBUTION PIPE INLET AND OUTLET STRUCTURES, DISTRIBUTION SUMP AND PUMP SUMP.

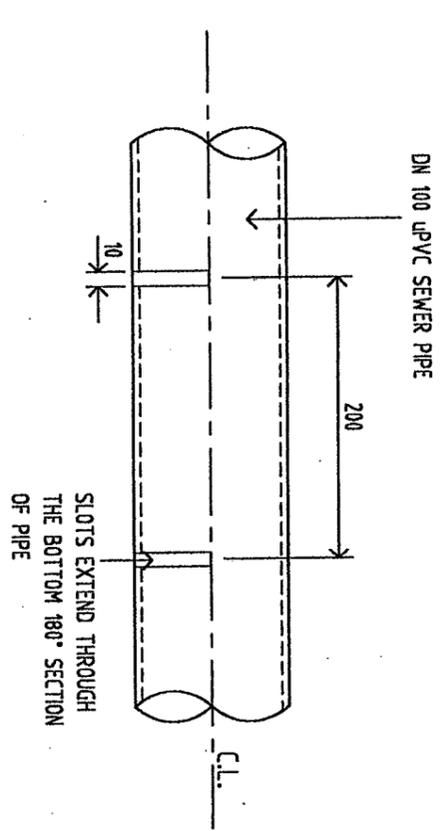
**PLASTIC LINER**

THE PLASTIC LINER USED IN CONSTRUCTION OF THE SAND FILTER MUST COMPLY WITH THE FOLLOWING:-

- \* THE PLASTIC LINER FOR THE FILTER BED MUST BE 0.5mm PVC SHEETING MANUFACTURED FROM VIGOROUS MATERIALS AND BE SUITABLE FOR USE WITH EFFLUENT FROM THE PRIMARY TREATED SEWAGE.
- \* ALL PVC SHEETING MUST HAVE THE BRAND NAME AND SHEET THICKNESS MARKED THEREON AND BE INSTALLED WITH THE NAME AND THICKNESS FACING UPWARDS
- \* ALL JOINTS SHALL BE LAPPED AND BE JOINED BY HIGH FREQUENCY WELDING IN ACCORDANCE WITH THE MANUFACTURER'S REQUIREMENTS.
- \* THE LINER MUST BE ASSEMBLED PRIOR TO THE PLACEMENT IN EXCAVATION AND ALL CORNERS MUST, WHERE PRACTICABLE, BE FORMED BY FOLDING THE SHEET RATHER THAN CUTTING AND HIGH FREQUENCY WELDED.
- \* ALL PIPE/FITTING PENETRATIONS THROUGH THE LINER MUST BE SEALED BY TAPING ON BOTH SIDES IN A MANNER RECOMMENDED BY THE MANUFACTURER OF THE LINER MATERIAL AND BE WATERTIGHT.
- \* THE LINER MUST EXTEND UP TO THE FINISHED GROUND LEVEL.
- \* WHERE THE SAND FILTER IS TO BE INSTALLED SUCH AS ROCK OR SHALE TYPE SOILS, THE LINER MUST BE PLACED OVER A 75mm LAYER OF CLEAN SAND SUITABLE FOR CONCRETE OR BRICKLAYING WORK.
- \* WHERE THE LINER IS DAMAGED DURING INSTALLATION IT MUST BE PATCHED WITH A LAYER OF PARENT MATERIAL AT LEAST 150mm BEYOND THE DAMAGED AREA. THE REPAIR IS TO BE SEALED JOINTING AND BE WATERTIGHT.



**TYPICAL ARRANGEMENT  
AEROBIC SAND FILTRATION  
DOMESTIC SYSTEM - Max 10 PEOPLE**



**DETAIL OF SLOTS ON COLLECTION PIPE**

SCALE 1:5  
AREA OF SLOTS = 9000 sq.mm. PER METRE LENGTH OF PIPE

**THE COLLECTION PIPES**

THE COLLECTION PIPES ARE TO BE DESIGNED AND INSTALLED TO COLLECT AND TRANSPORT THE TREATED EFFLUENT FROM THE SAND FILTER BED TO THE COLLECTION /SUMP PUMP. THE DESIGN AND INSTALLATION OF THE COLLECTION PIPES MUST COMPLY WITH THE FOLLOWING:-

- \* SLOTS IN THE COLLECTION PIPE ARE TO BE 10mm WIDE THROUGH 180° ACROSS THE PIPE AND SPACED AT 200mm CENTRES ALONG THE PIPE AND TERMINATE 100mm FROM THE PIPE ENDS AS DETAILED.
- \* THE TOTAL AREA OF THE SLOT OPENINGS IS 9000 sq. mm FOR EACH METRE LENGTH OF PIPE AND BE FACED DOWNWARDS.
- \* THE CAPPED ENDS OF THE COLLECTION PIPES MUST TERMINATE 500mm FROM THE INLET AND END TRENCH WALL.
- \* PIPES MUST BE LAID ON A GRADE OF 1 in 200 (0.5%), EXCEPT IN THE CASE OF THE INTERCONNECTING PIPES
- \* THE BASE OF THE SAND FILTER MUST BE GRADED TO DISCHARGE TO THE COLLECTION PIPE, WHERE MULTIPLE PIPES ARE UTILISED, THEY ARE TO BE CONNECTED TO A COMMON OUTLET.
- \* THE COLLECTION PIPES ARE TO BE INSTALLED AS REQUIRED BY THIS STANDARD AND POSITIONED AS DETAILED AND/OR AS SHOWN ON THE APPROVED PLAN.

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PROJECT: <b>PROPOSED AEROBIC SAND FILTRATION TREATMENT OF DOMESTIC WASTE WATER</b>		CLIENT:	DRAWN: G. SAYER	
SITE ADDRESS:			DATE:	
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