CHIEF EXECUTIVE APPROVAL 21/2015
Plumbing and Drainage Act 2002, part 5.

Approval

1. The Klaro EPro15 ("the system") described in the Specifications and Drawings in the attached Schedule and manufactured by Graf Australia Pty Ltd (ABN 16 159 402 178) ("the manufacturer") has been assessed in accordance with the Queensland Plumbing and Wastewater Code (QPW Code) dated 15 January 2013.

2. Approval is granted for the secondary quality wastewater treatment system, subject to compliance by the manufacturer with the requirements of the Plumbing and Drainage Act 2002, part 5 and the conditions of approval detailed below.

3. This approval, the conditions of approval and the Schedule comprise the entire Chief Executive 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 Chief Executive Approval.

6. The secondary quality wastewater treatment system, may only be used on premises that generate per day:

   (a) a maximum hydraulic loading of 1,500 litres; and

   (b) a maximum organic loading of 70 grams/per person BODs.

7. The system must continue to meet the requirements of secondary quality wastewater treatment system, producing the following effluent quality:

   (a) 90% of the samples taken must have a BODs less than or equal to 20 g/m³ with no sample greater than 30 g/m³.

   (b) 90% of the samples taken must have total suspended solids less than or equal to 30 g/m³ with no sample greater than 45 g/m³.

   (c) 90% of the samples taken must have a thermotolerant coliform count not exceeding 200 organisms per 100 mL with no sample exceeding 1000 organisms per 100 mL.

   (d) The total chlorine concentration must be greater than or equal to 0.5 g/m³ and less than 2.0 g/m³ in four out of five samples taken.
8. Each system must be serviced in accordance with the details supplied in the owner’s service and maintenance manuals.

9. Each system must be supplied with —
   (a) a copy of this Chief Executive Approval document;
   (b) details of the system;
   (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. 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.

12. At each anniversary of the Chief Executive Approval date, the supplier must submit to the Chief Executive a list of all systems installed in Queensland during the previous 12 months. Where the Chief Executive is notified of any system failures the Chief Executive may randomly select a number of installed systems for audit. The Chief Executive will notify the supplier’s nominated NATA accredited laboratory which systems are to be audited for BODs and TSS. The sampling and testing of the selected systems, if required, is to be done at the supplier’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) BODs for influent and effluent; and
   (e) TSS for influent and effluent.

13. This approval may only be assigned with the prior written consent of the Chief Executive.

14. This approval expires on 12 August 2020 unless cancelled earlier in accordance with paragraph 11 above.

Lindsay Walker

Director
Plumbing, Drainage and Special Projects

Date approved: 3 August 2015
CHIEF EXECUTIVE APPROVAL No. 21/2015

*Plumbing and Drainage Act 2002, part 5, division 1, section 93*

**SCHEDULE**

Attachment 1

Specifications for the

*Klaro EPro15*
Technical data sheet for GRAF Professional wastewater treatment plant

Graf Australia Pty Ltd
Unit 2, 8 Piper Street
Cooee Courtyard QLD 4510
Tel. (+61) 1300 466 469
Email: info@grafaustralia.com.au

Design according to EN 12566-3

Plant size

- Maximum hydraulic load: Qd = 1.50 m³/d
- Maximum organic load: Bd = 0.56 kg/d

Effluent values:

<table>
<thead>
<tr>
<th>BOD5</th>
<th>COD</th>
<th>SS</th>
<th>NH4N</th>
<th>Ntot</th>
<th>P</th>
<th>colif. germs</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 20 mg/l</td>
<td>&lt; 30 mg/l</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Total tank capacity: 5.1 m³

Air compressor:
- Type: piston
- Installed motor power: 0.08 kW
- Power consumption at 0 bar: 0.09 kW
- Motor design: 50 Hz 1~ 230 V

Calculated maximum daily operating time: 9.7 h/d

Stage details:

<table>
<thead>
<tr>
<th>Stage</th>
<th>Number</th>
<th>Container, Material</th>
<th>Diameter Width [m]</th>
<th>Length [m]</th>
<th>Water Depth Maximum [m]</th>
<th>Volume Maximum [m³]</th>
</tr>
</thead>
<tbody>
<tr>
<td>SS + B</td>
<td>1/2</td>
<td>Carat 4.800L, PP</td>
<td>1.99</td>
<td>2.28</td>
<td>1.45</td>
<td>2.15</td>
</tr>
<tr>
<td>SBR</td>
<td>1/2</td>
<td>Carat 4.800L, PP</td>
<td>1.99</td>
<td>2.28</td>
<td>1.45</td>
<td>2.15</td>
</tr>
<tr>
<td>Pump-out</td>
<td>1</td>
<td>Saphir 900, PE</td>
<td>1.06</td>
<td>1.06</td>
<td>1.05</td>
<td>0.80</td>
</tr>
</tbody>
</table>
### Calculation for GRAF Professional wastewater treatment plant according to EN 12566-3

**Basic Data / Project Data**
- **Customer:** Graf Australia Pty Ltd
- **Type of Waste Water:** Domestic
- **Date:** 19.05.2015
- **Editor:** alk

**Base of Calculation**

<table>
<thead>
<tr>
<th>Outlet</th>
<th>BOD5</th>
<th>COD</th>
<th>SS</th>
</tr>
</thead>
<tbody>
<tr>
<td>pop. equiv. wastewater</td>
<td>$Q_d$</td>
<td>at $Q_{pe}$</td>
<td>$188 \text{l/(PE}^d\text{)}$</td>
</tr>
<tr>
<td>pop. equiv. waste load</td>
<td>BOD5</td>
<td>$B_d$</td>
<td>$70 \text{g/(PE}^d\text{)}$</td>
</tr>
<tr>
<td>pop. equiv. waste load</td>
<td>COD</td>
<td></td>
<td>$120 \text{g/(PE}^d\text{)}$</td>
</tr>
<tr>
<td>cleaning cycles per day</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**1. Stage: Sludge Storage and Buffer**
- **Type of Container:** Carat 4.800L
- **Number of Containers / Proportion of Chambers:** 50%
- **Width:** 1,99 m
- **Water Depth:** 1,45 m
- **Partition Height:** 1,61 m

<table>
<thead>
<tr>
<th>Sludge Storage (SS)</th>
<th>specific sludge storage volume</th>
<th>250 l/(PE)*a</th>
</tr>
</thead>
<tbody>
<tr>
<td>removal interval</td>
<td>8 months</td>
<td></td>
</tr>
<tr>
<td>required volume</td>
<td>1,33 m³</td>
<td></td>
</tr>
<tr>
<td>required water depth</td>
<td>0,94 m</td>
<td></td>
</tr>
<tr>
<td>selected water depth</td>
<td>0,95 m</td>
<td></td>
</tr>
</tbody>
</table>

**Buffer (b)**
- **Percentage of Daily Load:** 50%
- **Required Volume:** 0,75 m³
- **Required Water Depth:** 0,48 m
- **Selected Water Depth:** 0,50 m
- **Selected Volume:** 0,79 m³

**Overall (SS + PT + B)**
- **Required Water Depth:** 1,40 m
- **Required Volume:** 2,09 m³
- **Existing Total Volume:** 2,15 m³

### 2. Stage: Biological Treatment (SBR)
- **Type of Container:** Carat 4.800L
- **Number of Containers / Proportion of Chambers:** 50%
- **Width:** 1,99 m
- **Water Depth:** 1,45 m
- **Total Area:** 2,27 m²

**Reactor Before Loading Phase**
- **Required Average Volume:** 1,70 m³
- **Required Minimum Volume:** 1,51 m³
- **Required Minimum Water Depth:** 1,04 m
- **Selected Minimum Water Depth:** 1,05 m
- **Selected Average Volume:** 1,72 m³

**Reactor After Loading Phase**
- **Existing Volume:** 1,91 m³
- **Existing Water Depth:** 1,28 m
- **Total Water Depth:** 1,45 m

**Existing Total Volume**
- **$V_{BB}$:** 2,15 m³

**BOD5 Volume Load**
- **$B_{R}$:** 0,34 Kg/(m³*d)

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Department of Housing and Public Works
Chief Executive Approval

Approval No.: 21/2015
Date of Issue: 13/08/15
Delegate Signature: [Signature]
Building Codes Queensland
CHIEF EXECUTIVE APPROVAL No. 21/2015

Plumbing and Drainage Act 2002, part 5, division 1, section 93

SCHEDULE

Attachment 2

Drawings for the

Klaro EPro15