

Maintenance Agreement

The key points within the maintenance agreement are as follows:

Summary:

Maintenance, monitoring and upkeep of the green wall elements and ancillary plant

1. Statement of Intent

To signify the commitment of all parties, both to this agreement and to the provision of sufficient resources, to maintain the living green wall to a good standard at all times.

2. Inspection & Reporting

- Biotecture Ltd will undertake general on site building maintenance duties to include the inspection of the green wall elements and reporting of any perceived defects to all parties.
- Biotecture Ltd will make regular visual and photographic inspections of the green wall areas (all from ground level). These will be carried out at suitable prescribed intervals throughout the year.
- Biotecture Ltd will carry out an annual, close-up, detailed inspection of all the areas of the green wall using access equipment.

3a. Maintenance & Upkeep

- Biotecture Ltd will carry out annual maintenance of the green wall elements. This includes:
 - ◇ Replacing (up to) 100% of the plants as necessary
 - ◇ Topping up the nutrients tank
 - ◇ Tending of plants as necessary
 - ◇ Maintaining the irrigation system
 - ◇ Wherever possible, natural biological controls are to be used
- The 12 months maintenance package includes for a number visits to site as necessary. Further maintenance / upkeep works deemed necessary will be itemised and undertaken by Biotecture Ltd on the instructions of the Postal Heritage Trust .

3b. Exclusions

- Replacement or maintenance required as a result of:
 - ◇ Vandalism
 - ◇ Theft
 - ◇ Negligence
 - ◇ Late notice by the Postal Heritage Trust of any issues that may affect the living wall including, but not limited to, the reporting of any leaks and /or areas of the wall not receiving irrigation water
 - ◇ Insufficient or intermittent water or power supplied to the irrigation set up
 - ◇ Third Party Damage
 - ◇ Sustained Frost or Extreme (Sub-Zero) Temperatures
 - ◇ Force Majeure

4. Pump(s) & Irrigation / Dosing System:

- It will be the responsibility of Biotecture Ltd to ensure that the pump(s) and irrigation system are inspected and (where required) serviced at regular, prescribed intervals as necessary.
- It will be the responsibility of Biotecture Ltd to ensure that dosing of the required nutrients is carried out at suitable intervals.
- It will be the responsibility of the Postal Heritage Trust to ensure that an uninterrupted and suitable water and power supply is maintained at all times.
- Necessary replacement works will be itemised and undertaken by Biotecture Ltd on the instructions of the Postal Heritage Trust . For walls in excess of 12 months old any necessary parts and labour will be charged at cost + 15% in addition to the maintenance agreement.

5. Remote Monitoring of the Irrigation System:

- Biotecture Ltd will remotely monitor the irrigation controller on a regular basis during working hours with regard to expected values.
- Biotecture Ltd shall not be responsible for any Network, Connection or other issues that may hamper or impede any monitoring or reporting and for any consequential issues that may arise.
- Biotecture Ltd may remotely amend irrigation run times and irrigation program start times to suit the requirements of the plants.

- Any exceptions to programmed or expected flows or any other observed anomalies will be investigated and, if found to be the responsibility of Biotecture Ltd, will be resolved in accordance with the requirements of this agreement.
- In the event that the exception is considered to be a responsibility of the Postal Heritage Trust (i.e. observed power or water failure) Biotecture Ltd will seek to report any such event to the Postal Heritage Trust within 2 business days of that event occurring and will always do so within 5 days notwithstanding the provision of section 5.2.
- The Postal Heritage Trust will be wholly responsible for any resultant actions and all consequential issues that may arise from any event as per section above. This may include, for example, additional visits, horticultural work, plant replacement, irrigation maintenance and will be itemised and undertaken by Biotecture Ltd on the instructions of the Postal Heritage Trust .

6. Quality Control

- Sufficient resources are to be allocated to allow the Living Wall to be maintained to an acceptable standard.
- The criteria that determine the acceptable standard that must be maintained will be agreed between the parties.
- A review procedure is to be established to monitor quality control issues.

7. Access

- The Postal Heritage Trust will provide unobstructed access to the location of the living wall to allow all scheduled and instructed maintenance and servicing works to be undertaken.
- The expected means of access to reach the plants themselves is via a scaffold tower, and as part of this Agreement this will be provided in a safe and certified manner at all times necessary by Biotecture Ltd.
- A procedure for ensuring that access to enable any emergency maintenance and servicing work is always available will be established between both parties.

8. Sub-Contractors and Assignment Rights

- The Postal Heritage Trust agrees that Biotecture Ltd may at any time employ Sub-Contractors to fulfil its obligations under this agreement.
- Biotecture Ltd may not assign their rights and responsibilities under these terms of agreement without the express written approval of the Postal Heritage Trust . Approval is not to be unreasonably withheld.

9. Liaison

- Regular meetings (minimum once a year) between the parties to take place to discuss maintenance and upkeep issues including programming and condition.

10. Financial Principles

- The Postal Heritage Trust will pay Biotecture Ltd an agreed annual fee of £4,750.00 (excl. VAT) to carry out the works as confirmed in sections 3 & 5 above, to be paid quarterly in advance.
- For items not included within the annual fee a schedule of rates will be agreed between the parties. These will allow for all foreseeable additional items of maintenance / upkeep / replacement / amendments that may be deemed necessary at any time during the term of the agreement.
- Any unforeseen maintenance / upkeep / replacement / amendment requirements are to be evaluated and agreed prior to being carried out. The basis for this evaluation, if possible, is to be the schedule of rates.
- The annual fee and the schedule of rates are to be index linked to the Retail Price Index.

11. Term of Agreement

- 1 year, with option to extend if both parties are in agreement.
- Review and if necessary amendment of terms of this agreement after every one year.
- Notwithstanding the above should the Postal Heritage Trust fail to fulfil their obligations in accordance with this Agreement such that the living wall is clearly not being allowed to perform well then Biotecture Ltd will have the option of terminating this Agreement.

Standard Maintenance Regime

The annual maintenance of a living wall across the year involves the following as standard:

Maintenance Operation	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Bi-monthly visual and photographic inspection of the wall	•		•		•		•		•		•	
Addition of Bio-controls to the irrigation system				•					•			
Full access visit to prune / tidy / replace background planting as necessary				•		•			•			
Daily check of the remote sensing irrigation log and moisture meters	•	•	•	•	•	•	•	•	•	•	•	•
Bi-monthly visual inspection of the irrigation plant room	•		•		•		•		•		•	
Topping up nutrient tank as necessary			•			•			•			
Pressure test irrigation system plant room components			•									
Strip, service and re-install dosing unit including by-pass until March											•	
Take dosing unit off by-pass system and re-engage			•									
Flush out all irrigation lines and check											•	

Note: Dates shown above are indicative only. Actual visit dates may change depending on seasonal variations, plant requirements etc.

Remote Monitoring and Control

Remote sensing gives secure knowledge of what is happening to the living walls. The living wall systems are monitored remotely, meaning timings can be altered and in the event of a failure (too much or too little water being delivered), we are alerted by email and text message. The living walls will be monitored in this way.

Flow-rate is the best measure of performance for managing and reporting the irrigation system per irrigation zone. This is measured in litres per minute (lpm). When the pressure in the pipelines is maintained between 0.8 bar and 4.3 bar the drippers will each emit water at 1.6 litres per hour. The drippers cannot operate at any other flow rate than this. Each irrigation zone is clearly defined and the number of drippers in that zone can also be clearly defined. The expected flow-rate if all is operating correctly is therefore simply number of drippers x Drip Rate (1.6 litres per hour) and this can be closely monitored. The screenshot shows an example of the remote monitoring system in operation.

Water Meter	Flow (LFM)	Volume (Daily L)	Volume (Total L)
Water Meter1	27	508	172573

Pos	Name and Number	On/Off	Card	Group	Flow (LFM)	Meter
1	Valve 001	000001	M+Wfire 1	Group 1	0025	1
2	Valve 002	000002	M+Wfire 1	Group 1	0025	1
3	Valve 003	000003	M+Wfire 1	Group 1	0018	1
4		000000	No Card	Group 0	0000	0

Pos	Zone1	MicroSec
1	Valve 001	03:00
2	Valve 002	03:00
3	Valve 003	04:00

Pos	Program	On/Off	Start Time	End Time
2	Program 1	OFF	12:45	
5	Program 1	OFF	17:00	
6	Program 1	OFF	00:00	
1	Program 1	ON	08:00	08:10
3	Program 1	ON	15:00	15:10
4	Program 2	ON	12:00	12:10

Every living wall is unique and reacts to its specific environment. A proper understanding of the living walls and their individual zones will be built by regular horticultural monitoring through the seasonal changes in the first year. The data obtained for the living walls on the changes made to the irrigation system through this period will be used to inform the anticipated parameters of a moisture sensing system for use in subsequent years.