1 Triton Square

Building Services Test pack

Rainwater Harvesting

Prepared by:

TClarke

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246868-T_C-ZZ-ZZ-COM-XX-52097	REV C01	19/02/2021

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COMMISSIONING CERTIFICATE
Rainwater Harvesting System

Client: Lendlease **Date:** 09/12/2020

Project: One Triton Square

Project No: TC11387

Commissioning Details:

Combined attenuation and rainwater harvesting system commissioning

Location: PH Tank Room, Basement

Equipment being commissioned:

- **System Pipework**
- **Coarse Filter**
- **Grey Water Storage Tank**
- **Non-potable water Storage Tanks**
- **Membrane Tanks**
- **Aqua Control Unit (Booster Set)**
- **Aqua Recycling Control Unit**
- **Water Meters**

- **Equipment function clearly explained including operation and maintenance requirements.**
- **Equipment demonstrated operating as per system design.**

<u>Note</u>

Grey Water system only part complete. Grey Water membrane tanks left dry. 40% building occupancy required in order to complete commissioning of this equipment

Drawing No.: 246868-T_C-ZZ-ZZ-SCM-XX-52811

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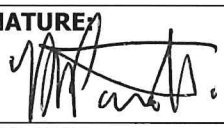
This is to certify that the above commissioning has been satisfactorily carried out.

NAME:	**SIGNATURE:**	**TCLARKE**	**DATE:**
NAME:	**SIGNATURE:**	**Core Group**	**DATE:**
NAME:	**SIGNATURE:**	**Lendlease**	**DATE:**
NAME:	**SIGNATURE:**	**Arup**	**DATE:**
NAME:	**SIGNATURE:**	**Aecom**	**DATE:**
NAME: D. PARROTT	**SIGNATURE:** 	**CML** SUSTAIN	**DATE:** 12/02/21
NAME:	**SIGNATURE:**	**Broadgate Estates**	**DATE:**
NAME:	**SIGNATURE:**	**Butler & Young**	**DATE:**

aquality
intelligent water management

Commissioning Check Sheet

Water reclamation system: rainwater harvesting / greywater recycling – AQUA-CONTROL/AQUA-RECYCLING CONTROL B+

Project name:	Triton Square
Project no:	
Site Address:	Triton Square
	London

Aquality Trading & Consulting Ltd
6 Wadsworth Road
London UB6 7JJ
Tel: 0845 270 71 71
www.aqua-lity.co.uk
service@aqua-lity.co.uk

Date of commissioning:	09/12/2020
Commissioning Engineer:	Simon Maynard

YES, NO AND N/A TICK BOXES TO BE COMPLETED WITH "X" OR "x"

1 PIPE WORK

		YES	NO	N/A
1.1	IS ALL PIPE WORK COMPLETE AND CORRECTLY INSTALLED WITH NO LEAKS	x		
1.2	HAS PIPE WORK BEEN PRESSURE TESTED TO BRITISH OR MANUFACTURER'S STANDARD	x		
1.3	ARE PIPE SUPPORTS SUFFICIENT TO PREVENT MOVEMENT DURING NORMAL OPERATION	x		
1.4	HAS PIPE WORK BEEN INSULATED	x		
1.5	HAS PIPE WORK BEEN LABELLED TO BRITISH STANDARD BS 8515 AND/OR BS 8525	x		
1.6	IS GREY WATER OVER FLOW TERMINATED IN A SEALED UPSTAND	x		
1.7	IS NON POTABLE WATER STORAGE TANK OVERFLOW SUFFICIENTLY SEPARATED FROM GREY WATER TO PREVENT BACKFLOW	x		
1.8	IS PIPE WORK SUFFICIENTLY COMPLETE TO ENABLE COMMISSIONING TO BE COMPLETED	x		

2 COARSE FILTER

		YES	NO	N/A
2.1	HAS(HAVE) COARSE FILTER(S) BEEN INSTALLED CORRECTLY AND SECURELY	x		
2.2	HAS AUTO WASH PIPEWORK BEEN CONNECTED CORRECTLY IF APPLICABLE	x		
2.3	HAS SOLENOID VALVE BEEN WIRED BACK TO CONTROL UNIT CORRECTLY	x		
2.4	HAS PRESSURE REDUCING VALVE BEEN INSTALLED IN THE LINE FEEDING THE AUTO WASH	x		
2.5	HAS ISOLATION VALVE BEEN INSTALLED UPSTREAM OF THE PRESSURE REDUCING VALVE	x		
2.6	HAS THE FILTER GRID BEEN WRAPPED TO PREVENT CONTAMINATION DURING BUILD/FIT OUT	x		
2.7	HAVE THE FILTER WASH JETS BEEN CHECKED FOR DIRECTION AND OPERATION	x		
2.8	IS(ARE) THE COARSE FILTERS SUFFICIENTLY COMPLETE TO ENABLE COMMISSIONING	x		
2.9	HAS(HAVE) THE COARSE FILTER(S) BEEN COMMISSIONED	x		

3 GREY WATER STORAGE TANKS

		YES	NO	N/A
3.1	ARE TANKS MOUNTED ON CORRECT HEIGHT PLINTH TO ENABLE BACKFLOW FROM BMT TANKS	x		
3.2	HAS INTER-CONNECTING PIPE WORK BEEN COMPLETED AND LEAK FREE	x		
3.3	IS THERE SUFFICIENT WATER CONTENT TO ENABLE COMMISSIONING (MIN 600MM)			x
3.4	HAS SUBMERSIBLE PUMP BEEN CHECKED FOR OPERATION AND CONNECTIONS	x		
3.5	HAS FLOAT SWITCH BEEN CHECKED FOR OPERATION AND CONNECTIONS	x		
3.6	HAS BREATHER PIPE WORK BEEN INSTALLED		x	
3.7	IS BREATHER PIPE WORK VENTED LOCALLY		x	
3.8	HAS CARBON FILTER TWO WAY BREATHER BEEN INSTALLED (IF VENTED LOCALLY)		x	
3.9	ARE TANKS CLEAN AND FREE FROM INSTALLATION DEBRIS	x		
3.10	HAVE INTERCONNECTING SPACERS BEEN INSTALLED			x
3.11	IS THE GAP BETWEEN THE TANKS SUFFICIENT FOR TANK SETTLEMNT	x		
3.12	ARE INTER-CONNECTING PIPES UN-SUPPORTED	x		
3.13	IS(ARE) THE GREY WATER STORAGE TANKS READY FOR COMMISSIONING	x		
3.14	HAS(HAVE) THE GREY WATER STORAGE TANK(S) BEEN COMMISSIONED	x		
3.15	HAS THE GREY WATER SYSTEM BEEN ACTIVATED		x	

4	NON POTABLE WATER STORAGE TANKS			
		YES	NO	N/A
4.1	ARE TANKS MOUNTED ON PLINTH IN CORRECT POSITIONS AS PER SCHEMATICS	x		
4.2	HAS INTER-CONNECTING PIPE WORK BEEN COMPLETED AND LEAK FREE	x		
4.3	IS THERE SUFFICIENT WATER CONTENT TO ENABLE COMMISSIONING (MIN 600MM)	x		
4.4	HAS THE LEVEL SENSOR HOSE BEEN INSTALLED WITH WEIGHT AND HEIGHT SET TO 10CM FROM BASE	x		
4.5	HAS BREATHER PIPE WORK BEEN INSTALLED			x
4.6	IS BREATHER PIPE WORK VENTED LOCALLY			x
4.7	HAS CARBON FILTER TWO WAY BREATHER BEEN INSTALLED (IF VENTED LOCALLY)			x
4.8	ARE TANKS CLEAN AND FREE FROM INSTALLATION DEBRIS	x		
4.9	HAVE INTERCONNECTING SPACERS BEEN INSTALLED			x
4.10	IS THE GAP BETWEEN THE TANKS SUFFICIENT FOR TANK SETTLEMNT			x
4.11	ARE INTER-CONNECTING PIPES UN-SUPPORTED			x
4.12	HAS AUTOMATIC TANK DRAIN DOWN BEEN INSTALLED CORRECTLY (IF REQUIRED)	x		
4.13	IS(ARE) THE NON POTABLE WATER STORAGE TANKS READY FOR COMMISSIONING	x		
4.14	HAS(HAVE) THE NON POTABLE WATER STORAGE TANK(S) BEEN COMMISSIONED	x		
5	MEMBRANE TANKS (BMT TANKS)			
		YES	NO	N/A
5.1	ARE TANKS MOUNTED ON PLINTH IN CORRECT POSITIONS AS PER SCHEMATICS	x		
5.2	HAS INTER-CONNECTING PIPE WORK BEEN COMPLETED AND LEAK FREE	x		
5.3	ARE ALL HOSES CONNECTIONS COMPLETE AND LEAK FREE	x		
5.4	IS(ARE) THE LIFTING HANDLE(S) ON THE MEMBRANE(S) SECURE	x		
5.5	IS THERE ANY TRANSIT DAMAGE TO THE MEMBRANE(S) OR FLOAT SWITCH(ES)		x	
5.6	IS THE BACK FLOW PIPE WORK TO THE GREY WATER STORAGE TANK DRAINING IN THE RIGHT DIRECTION	x		
5.7	HAS THE WIRING BEEN COMPLETED CORRECTLY	x		
5.8	ARE THE FILTRATE PUMP(S) OPERATING CORRECTLY	x		
5.9	HAS THE OPERATION OF THE FLOAT SWITCHES BEEN TESTED	x		
5.10	IS THERE SUFFICIENT CONTAINMENT FOR THE HOSES AND CABLES	x		
5.11	ARE THE HOSES AND CABLES NEAT AND TIDY	x		
5.12	ARE THE MEMBRANES DRY AND FREE FROM CONTAMINATION	x		
5.13	IS(ARE) THE MEMBRANE TANK(S) READY FOR COMMISSIONING	x		
5.14	HAS(HAVE) THE MEMBRANE TANK(S) BEEN COMMISSIONED		x	
6	AQUA CONTROL UNIT (BOOSTER SET)			
		YES	NO	N/A
6.1	HAS THE AQUA CONTROL BEEN MOUNTED ON LEVEL GROUND AND IS THERE ADEQUATE SPACE SURROUNDING THE UNIT FOR SERVICING	x		
6.2	HAS THE ACCUMULATOR BEEN CONNECTED ON THE PRESSURE SIDE WITH AN ISOLATION VALVE AND DRAIN POINT	x		
6.3	IS POWER AVAILABLE TO THE UNIT	x		
6.4	IS WATER AVAILABLE TO THE UNIT	x		
6.5	HAVE BOOSTER PUMPS BEEN FILLED AND BLED PRIOR TO TESTING	x		
6.6	HAS THE ACCUMULATOR BEEN SECURED TO THE FLOOR	x		
6.7	HAS THE ACCUMULATOR BEEN PRESSURISED TO 0.2 BAR BELOW PUMP SWITCH ON PRESSURE	x		
6.8	IS COMPRESSOR FOR LEVEL SENSOR OPERATING CORRECTLY	x		
6.9	IS LEVEL SENSOR FOR NON POTABLE WATER TANK LEVEL OPERATING CORRECTLY	x		
6.10	IS BREAK TANK LEVEL SENSOR OPERATING CORRECTLY	x		
6.11	IS SYSTEM PRESSURE SENSOR OPERATING CORRECTLY	x		
6.12	HAS BREAK TANK RUN DRY OPERATION BEEN TESTED AND LEVEL CHECKED	x		
6.13	HAS BREAK TANK OVER FLOW ALARM BEEN TESTED AND LEVEL CHECKED (CLOSED VALVE TEST)	x		
6.14	IS PHASE ROTATION CORRECT (400 VOLT UNITS ONLY)	x		
6.15	DO BOOSTER PUMPS ACHIEVE PLATED MAX HEAD AGAINST CLOSED VALVE	x		
6.16	DO BOOSTER PUMPS ACHIEVE MAX PLATED FLOW RATE (ULTRASONIC FLOW TEST)			x
6.17	IS THE MAINS WATER TOP UP SOLENOID OPERATING CORRECTLY	x		
6.18	ARE THE MOTORISED DIVERTER VALVES OPERATING CORRECTLY	x		
6.19	HAS THE BMS SYSTEM BEEN TESTED AND COMMON FAULT CREATED	x		
6.20	IS THE AQUA CONTROL UNIT READY FOR COMMISSIONING	x		
6.21	HAS THE AQUA CONTROL UNIT BEEN COMMISSIONED	x		

7 AQUA RECYCLING CONTROL UNIT

		YES	NO	N/A
7.1	HAS AQUA RECYCLING CONTROL BEEN MOUNTED CORRECTLY	x		
7.2	HAVE ALL ELECTRICAL CONNECTIONS BEEN COMPLETED	x		
7.3	IS POWER AVAILABLE TO THE UNIT	x		
7.4	ARE ALL TANKS REGISTERING ON DISPLAY	x		
7.5	HAVE ALL COMPONENTS BEEN CHECKED FOR OPERATION IN MANUAL MODE	x		
7.6	HAS CORRECT LEVEL SENSOR BEEN INPUT IN PARAMETERS	x		
7.7	HAS CORRECT TANK OVERFLOW HEIGHT BEEN SET IN PARAMETERS	x		
7.8	HAVE BMT TANKS BEEN LEFT DRY	x		
7.9	HAVE BMT TANKS BEEN LEFT WET			x
7.10	IS AERATION WORKING CORRECTLY	x		
7.11	HAS AERATION COMPRESSOR FLOW RATE AND PRESSURE BEEN TESTED			x
7.12	HAS AQUA RECYCLING CONTROL BEEN LEFT IN CIRCULATION MODE			x
7.13	HAS AQUA RECYCLING CONTROL BEEN LEFT IN RECYCLING MODE			x
7.14	IS AQUA RECYCLING CONTROL READY FOR COMMISSIONING	x		
7.15	HAS AQUA RECYCLING CONTROL BEEN COMMISSIONED			x

8 ADDITIONAL ITEMS

		YES	NO	N/A
8.1	HAVE ADDITIONAL ITEMS BEEN INSTALLED AS PER AQUALITY SCHEMATIC DIAGRAMS	x		
8.2	IS POWER AVAILABLE TO ADDITIONAL ITEMS	x		
8.3	HAVE CONTROLS FOR ADDITIONAL ITEMS BEEN TESTED	x		
8.4	ARE ADDITIONAL ITEMS OPERATING CORRECTLY	x		
8.5	ARE LEVEL SENSORS FOR ADDITIONAL ITEMS SET CORRECTLY	x		
8.6	ARE MOTORISED VALVES FOR ADDITIONAL ITEMS OPERATING CORRECTLY			x
8.7	ARE ADDITIONAL ITEMS READY FOR COMMISSIONING	x		
8.8	HAVE ADDITIONAL ITEMS BEEN COMMISSIONED	x		

9 PARAMETER SETTINGS AND TESTS AQUA CONTROL

		BAR	LITRES/MIN	METERS
9.1	BOOSTER PUMP 1 SWITCH ON PRESSURE	5		
9.2	BOOSTER PUMP 2 SWITCH ON PRESSURE	5		
9.3	BOOSTER PUMP 3 SWITCH ON PRESSURE	5		
9.4	BOOSTER PUMP 1 SWITCH OFF PRESSURE	8		
9.5	BOOSTER PUMP 2 SWITCH OFF PRESSURE	8		
9.6	BOOSTER PUMP 3 SWITCH OFF PRESSURE	8		
9.7	MAX HEAD BOOSTER PUMP 1 (FROM PUMP DATA PLATE)			109
9.8	MAX HEAD BOOSTER PUMP 2 (FROM PUMP DATA PLATE)			109
9.9	MAX HEAD BOOSTER PUMP 3 (FROM PUMP DATA PLATE)			109
9.10	MAX FLOW BOOSTER PUMP 1 (FROM PUMP DATA PLATE)		250	
9.11	MAX FLOW BOOSTER PUMP 2 (FROM PUMP DATA PLATE)		250	
9.12	MAX FLOW BOOSTER PUMP 3 (FROM PUMP DATA PLATE)		250	
9.13	BOOSTER PUMP 1 MAX PRESSURE (CLOSED VALVE) TEST	11		
9.14	BOOSTER PUMP 2 MAX PRESSURE (CLOSED VALVE) TEST	11		
9.15	BOOSTER PUMP 3 MAX PRESSURE (CLOSED VALVE) TEST	11		
9.16	BOOSTER PUMP 1 MAX FLOW RATE (ULTRASONIC) TEST		n/a	
9.17	BOOSTER PUMP 2 MAX FLOW RATE (ULTRASONIC) TEST		n/a	
9.18	BOOSTER PUMP 3 MAX FLOW RATE (ULTRASONIC) TEST		n/a	

10 TESTS AQUA RECYCLING CONTROL

		mBAR	lITRES/MIN	N/A
10.1	MEMBRANE AERATION COMPRESSOR FLOW RATE			x
10.2	MEMBRANE AERATION COMPRESSOR PRESSURE			x
10.3	MEMBRANE MAX FILTRATION FLOW RATE			x
10.4	MEMBRANE SET FILTRATION RATE			x

11 BRITISH STANDARD DYE TESTING (BS 8515+A1 & BS 8525)

		YES	NO	N/A
10.1	HAS A DYE TEST BEEN CARRIED OUT ON DRAINAGE PIPE WORK FEEDING THE GREY WATER/RAIN WATER HARVESTING SYSTEM			x
10.2	HAS ANY CROSS CONNECTION BEEN INVESTIGATED			x
10.3	IS THE DRAINAGE CORRECT TO ALLOW NORMAL OPERATION OF THE SYSTEM WITHOUT CONTAMINATION			x
10.4	CAN THE UNIT BE COMMISSIONED IN AUTOMATIC MODE			x

12 WATER METERS

		YES	NO	N/A
12.1	HAVE AQUALITY STANDARD WATER METERS BEEN INSTALLED	x		
12.2	ARE WATER METERS INSTALLED IN THE CORRECT PIPE WORK POSITION	x		
12.3	ARE WATER METER INSTALLED AS PER MANUFACTURERS RECOMMENDATION	x		
12.4	IF BLANKING PIPEWORK INSTALLED, HAS THE PIPEWORK BEEN FLUSHED TO ENABLE WATER METERS TO BE INSTALLED			x
12.5	HAS PULSE SENDER BEEN ATTACHED AND CONNECTED ELECTRICALLY	x		
12.6	ARE METERS SPINNING CORRECTLY	x		

MAINS WATER TOP UP WATER METER SERIAL NUMBER:	METER READING:

NON POTABLE WATER METER SERIAL NUMBER:	METER READING:
NON POTABLE WATER METER SERIAL NUMBER:	METER READING:

12	NOTES
12.1	Local carbon venting needs to be installed on the grey water storage tanks when the grey water system is activated
12.2	Storm control system tested and portal demonstrated.
12.3	IOT monitoring system tested and portal demonstrated.
12.4	Membrane tanks left dry pending 40% occupancy of the building.
12.5	Level sensor in transfer tank needs setting once the grey water system has been activated.
12.6	
12.7	
12.8	
12.9	
12.10	
12.11	
12.12	
12.13	

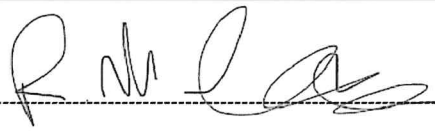
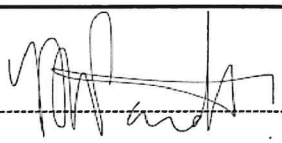
13 DECLARATIONS

If installations are incorrect or incomplete or the required preparations on site to enable commissioning or access to all components of the system are not provided on arrival our commissioning engineers will await completion/provision of such for maximum 30 minutes. After this they will abort the commissioning and we will need to invoice you for the travel costs, waiting time or other costs that occurred to us. We will then need to schedule an additional site visit at the full rate quoted on our service request forms. We reserve the right to recover all costs incurred for abortive visits - please cancel within 48hrs. If in doubt please contact our technical department or our office to avoid additional costs or delays.

Please give us sufficient notice that commissioning is required (at least six weeks before scheduled commissioning date and at least eight weeks before hand over or completion date). We cannot accept any responsibility for the delay of project deadlines if insufficient notice is given.

N.B

Please note that unless the building is immediately occupied to above 40% on completion, the grey water system will be commissioned in MAINS WATER MODE ONLY. The reason for this is that there will not be enough grey water flowing into the storage tanks to ensure adequate bacterial activity in the initial stages of the process. Once the building has reached 40% occupancy, the system can be activated by adding the activated charcoal and bacteria to the storage tanks. Once this has been done the control unit will be put into recycle mode and the flow rates of the filtrate pumps set.

Installer(s) resposible for installation:			
Contact Details:	Name:		
	Company:		
	Address:		
	Tel:		
Signature(s):			
Date:			
Commissioning Engineer(s):			
Contact Details:	Name:	Simon Maynard	
	Company:	Aquality Trading and Consulting Ltd	
	Address:	6 Wadsworth Road	
		Perivale	
		UB67JJ	
	Tel:		
Signature(s):			
Date:	08/12/2020		
Witnessing Engineer(s):			
Contact Details:	Name:	Rob Wendleken	Dean Parrott
	Company:	Core Group	CML
	Address:	Triton Square	Triton Square
	Tel:		
Signature(s):			
Date:	08/12/2020		