APPLICATION FOR HCAI SPECIAL SEISMIC CERTIFICATION PREAPPROVAL (OSP)

OFFICE USE ONLY

APPLICATION #: OSP-0677

HCAI Special Seismic Certification Preapproval (OSP)

Type: ☐ New ☒ Renewal

Manufacturer Information

Manufacturer: Water Control Corporation

Manufacturer's Technical Representative: Josh Petersen

Mailing Address: 7150 143rd Avenue NW, Ramsey, MN 55303

Telephone: (763) 427-9638 Email: josh.petersen@watercontrolinc.com

Product Information

Product Name: Phoenix GT High-Capacity Ultrafiltration

Product Model Number(s): See Attachment

Product Category: Other

Product Sub-Category: High-Capacity Ultrafiltration (HUF) Systems

General Description: Floor mounted High-Capacity Ultrafiltration (HUF) systems for legionella and pathogen control in building water systems.

Mounting Description: Base Mounted Rigid

Tested Seismic Enhancements: Seismic enhancements made to the test units and/or modifications required to address anomalies during the tests shall be incorporated into the production units.

Applicant Information

Applicant Company Name: Manwill Engineering LLC

Contact Person: Derek Manwill

Mailing Address: PO Box 1194, Bend, OR 97709

Telephone: (541) 241-2102 Email: derek@manwillse.com

Title: President

California Licensed Structural Engineer Responsible for the Engineering and Test Report(s)

Company Name: MANWILL ENGINEERING LLC

Name: Derek Manwill California License Number: S6266

Mailing Address: PO Box 1194, Bend, OR 97709

Telephone: (541) 241-2102 Email: derek@manwillse.com

Certification Method

☐ GR-63-Core ☒ ICC-ES AC156 ☐ IEEE 344 ☐ IEEE 693 ☐ NEBS 3

☐ Other (Please Specify):

Testing Laboratory

Company Name: ENVIRONMENTAL TESTING LABORATORIES, INC. (ETL)

Contact Person: Jeremy Lange

Mailing Address: 11034 Indian Trail, Dallas TX 75229-3513

Telephone: (972) 247-9657 Email: jeremy@etldallas.com

Seismic Parameters

Certified Response Spectral Acceleration Factors:(F_p/W_p)

Horizontal	(A Flx-H), g=	3.20	(A Rig-H), g=	2.40
Vertical	(A Flx-V), g=	1.68	(A Rig-V), g=	0.68

S_{DS} (Design spectral response acceleration at short period, g) = 2.00 (z/h=1), 2.50 (z/h=0)

Hf (Force amplification height factor) = 1 @ z/h=0; 3.5 @ z/h=1

Ru (Structure ductility redution factor) = 1 @ z/h=0; 1.3 @ z/h=1

I_p (Importance factor) = 1.5

z/h (Height ratio factor) = 0 and 1

HCAI Approval (For Office Use Only) - Approval Expires on 08/27/2031

Date: 8/27/2025

Name: Timothy Piland Title: Senior Structural Engineer

Condition of Approval (if applicable):

WATER CONTROL CORPORATION
Phoenix GT High-Capacity Ultrafiltration

TABLE 1

	S_{DS} (g)	H_f / R_μ	$A_{flx\text{-}h}$	$A_{rig\text{-}h}$	$A_{flx\text{-}v}$	$A_{rig\text{-}v}$	I_P
Mounting: Base mounted rigid.	2.00	3.5 / 1.3	3.20	2.40	1.68	0.68	1.5
	2.50	1.0 / 1.0					

Product Construction: Stainless steel framing; modified polyethersulfone (PES) membrane; UPVC membrane housing.
Options/Subcomponents: Subcomponents are uniquely identified by the model number of the module.
Module vs. System: A complete system (GT-1 through GT-4) consists of one Control Module and one to four Filter Modules. Connections between the Control Module and a Filter Module as well as a Filter Module to another Filter Module shall be flexible connections similar to the test assembly.

Model Number	Dimensions (in)			Max. Wt. (lb)	Description / Notes	Basis
	Depth	Width	Height			
Phoenix GT High-Capacity Ultrafiltration						
Phoenix GT Control Module	23.1	24.6	73.4	225		**UUT 1**
Phoenix GT Filter Module	23.1	15.9	73.4	315		**UUT 2**
GT-1	23.1	56.3	73.4	540	Control (UUT 1) + 1 Filter (UUT 2)	**UUT 1+2**
GT-2	23.1	87.9	73.4	855	Control (UUT 1) + 2 Filters (UUT 2)	EXTRAP
GT-3	23.1	119.6	73.4	1,170	Control (UUT 1) + 3 Filters (UUT 2)	EXTRAP
GT-4	23.1	151.2	73.4	1,485	Control (UUT 1) + 4 Filters (UUT 2)	EXTRAP

End of TABLE 1. Notes, information, and seismic parameters are shown at the beginning of the table.

UUT 1

Manufacturer: Water Control Corporation
Model number: Phoenix GT Control Module
Unit function: High-Capacity Ultrafiltration
Serial number: N/A

Dimensions (in)			Weight	Res. Freq. (Hz)		
Depth	Width	Height	(lb)	F-B	S-S	V
23.1	24.6	73.4	225	15.5	9.6	14.4

Code & criteria: 2025 CBC, ICC-ES AC156
Test laboratory: Environmental Testing Laboratory
Report: 20095TR1.0 (dated 12-17-20), tested on 11-23-20

S_{DS} (g)	H_f / R_μ	A_{FLX-H} (g)	A_{RIG-H} (g)	A_{FLX-V} (g)	A_{RIG-V} (g)
2.00	3.5 / 1.3	3.20	2.40	1.68	0.68
2.50	1.0 / 1.0				

Importance Factor, I_P = 1.5: Unit was full of operating content during the shake table test. Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test.

Mounting: Base mounted rigid using (4) 3/8in Grade 8 bolts through 2in long 1-3/4x3x1/4in formed carbon steel angle brackets. Each angle bracket is connected to the unit base with (1) 1/2in Grade 2 bolt (4 bolts total).

Construction: Stainless steel framing.

Subcomponents: Subcomponents are uniquely identified by the model number.

Testing notes: UUT 1 and UUT 2 were connected using flexible pipe connections during the test to check functionality. The test units were spaced 15.75in apart to accommodate the flexible connectors.

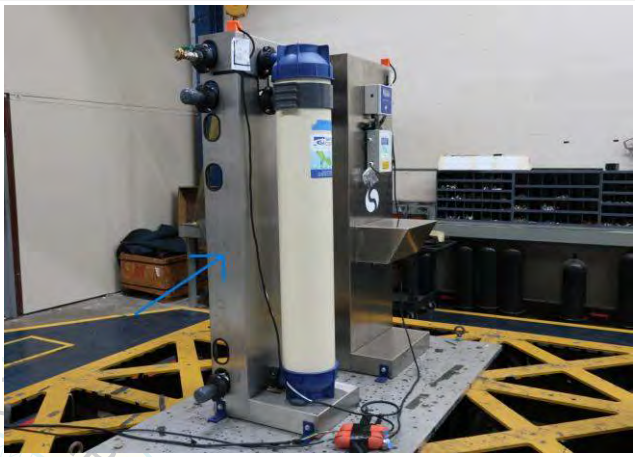
UUT 2

Manufacturer: Water Control Corporation
Model number: Phoenix GT Filter Module
Unit function: High-Capacity Ultrafiltration
Serial number: N/A

Dimensions (in)			Weight (lb)	Res. Freq. (Hz)		
Depth	Width	Height		F-B	S-S	V
23.1	15.9	73.4	315	11.5	9.4	>33

Code & criteria: 2025 CBC, ICC-ES AC156
Test laboratory: Environmental Testing Laboratory
Report: 20095TR1.0 (dated 12-17-20), tested on 11-23-20

S_{DS} (g)	H_f / R_μ	A_{FLX-H} (g)	A_{RIG-H} (g)	A_{FLX-V} (g)	A_{RIG-V} (g)
2.00	3.5 / 1.3	3.20	2.40	1.68	0.68
2.50	1.0 / 1.0				



Importance Factor, I_P = 1.5: Unit was full of operating content during the shake table test. Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test.

Mounting: Base mounted rigid using (4) 3/8in Grade 8 bolts through 2in long 1-3/4x3x1/4in formed carbon steel angle brackets. Each angle bracket is connected to the unit base with (1) 1/2in Grade 2 bolt (4 bolts total).

Construction: Stainless steel framing; modified polyethersulfone (PES) membrane; UPVC membrane housing.

Subcomponents: Subcomponents are uniquely identified by the model number.

Testing notes: UUT 1 and UUT 2 were connected using flexible pipe connections during the test to check functionality. The test units were spaced 15.75in apart to accommodate the flexible connectors.

UUT 1+2

Manufacturer: Water Control Corporation
Model number: GT-1
Unit function: High-Capacity Ultrafiltration
Serial number: N/A

Dimensions (in)			Weight	Res. Freq. (Hz)		
Depth	Width	Height	(lb)	F-B	S-S	V
23.1	56.3	73.4	540	11.5	9.4	14.4

Code & criteria: 2025 CBC, ICC-ES AC156
Test laboratory: Environmental Testing Laboratory
Report: 20095TR1.0 (dated 12-17-20), tested on 11-23-20

S_{DS} (g)	H_f / R_μ	A_{FLX-H} (g)	A_{RIG-H} (g)	A_{FLX-V} (g)	A_{RIG-V} (g)
2.00	3.5 / 1.3	3.20	2.40	1.68	0.68
2.50	1.0 / 1.0				

Importance Factor, I_P = 1.5: Unit was full of operating content during the shake table test. Unit maintained structural integrity and remained functional per manufacturer requirement after shake table test.

Mounting: Base mounted rigid using (8) 3/8in Grade 8 bolts through 2in long 1-3/4x3x1/4in formed carbon steel angle brackets. Each angle bracket is connected to the unit base with (1) 1/2in Grade 2 bolt (8 bolts total).

Construction: Stainless steel framing; modified polyethersulfone (PES) membrane; UPVC membrane housing.

Subcomponents: Subcomponents are uniquely identified by the model number.

Testing notes: UUT 1 and UUT 2 were connected using flexible pipe connections during the test to check functionality. The test units were spaced 15.75in apart to accommodate the flexible connectors.

WATER CONTROL CORPORATION
Phoenix GT High-Capacity Ultrafiltration

Phoenix GT High-Capacity Ultrafiltration																												
Digit:	1	2	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Sample:	G	T	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Digit	Digit Description	Codes	Definitions
1-2	Model Line	GT	Phoenix GT High-Capacity Ultrafiltration
4	Filter Module Designation	1	System with 1 Filter Module
		2	System with 2 Filter Modules
		3	System with 3 Filter Modules
		4	System with 4 Filter Modules