

'MFG' Series Media Filter Systems



Overview

The Marlo 'MFG' Series automatic backwashing media filter system is designed to provide the highest quality in water filtration equipment while covering a wide variety of commercial applications including turbidity reduction, iron removal, and chlorine removal. A broad range of filter media and component options are offered to fit your exact specifications.

'MID' Multi-Media Filters

High efficiency, in-depth filter system using a layered media bed of anthracite, silica sand, and two grades of garnet for excellent filtration down to the order of 5 - 10 micron.

'MZA' Natural Zeolite Filters

An alternative, single media approach to traditional multi-media filters that achieves a finer filtration to 3-5 micron with longer service run times.

'MGA' Iron Removal Filters

Filter system capable of reducing iron, manganese, and hydrogen sulfide using manganese greensand filter media.

'ACA' Carbon Filters

Granular Activated Carbon (GAC) is designed for the reduction of chlorine, taste, odor, and dissolved organic material from municipal and industrial water supplies.

Standard Equipment & Features

- Control Valve:
 - Top Mount, Multi-port Type, Low Lead Brass
 - Fleck 2750 - 1" Valve
 - Fleck 2850 - 1-1/2" Valve
 - Fleck 3150 - 2" Valve
 - Fleck 3900 - 3" Valve
- Resin Tanks: Fiberglass reinforced polyethylene - (FRP) NSF 44 certified
- Internal Distributors: Sch 80 PVC/ABS
- 12-Day Timeclock Initiated Backwash Cycle (Electro-mechanical)
- Automatic Backwash Flow Controller

Operating Parameters

- Inlet Pressure: 30-100 psig
- Electrical: 120VAC, 1-Phase, 60 Hz
- 120/24 VAC, 50/60 Hz wall mount transformer (Digital Control Valves Only)
- Temperature: 35-100 °F

Options Available

- Skid mounted, pre-piped, pre-wired systems
- Multi-tank system configurations (twin, triple, quad)
- Fleck XT/NXT Digital Control Timers
- ASME Stamped Pressure vessels (18" dia. & higher)
- Inlet/Outlet pressure gauges and sample valves
- Differential pressure switch backwash cycle
- Separate Source Backwash Cycle
- Recirculation Pumps (Cooling Towers)
- Backwash Water Supply Pumps
- Alternate filter media (Birm, Filter-AG, Calcite)
- RO Lockout Switch
- Greensand Intermittent Regenerant Tank Systems
- Greensand Continuous Regeneration Systems

Specifications

MZA - Natural Zeolite Filter Specifications (Turbidity Reduction)

CATALOG NUMBER	FLOW RATES			PIPE SIZE		MEDIA	TANK SIZE	OVERALL DIMENSIONS (INCHES) ②			SHIPPING WEIGHT (LBS) ③
	SERVICE		BACK WASH	SERVICE	DRAIN			SINGLE (L1xWxH)	TWIN (L2xWxH)		
	CONT. GPM ①	PEAK GPM								GPM	
MZA-10G-1	5	10	8	1	1	1	10x54	10x10x62	32x10x62	190	
MZA-12G-1	8	16	12	1	1	2	12x52	12x12x60	36x12x60	240	
MZA-14G-1	10	20	15	1	1	3	14x65	14x14x73	40x14x73	315	
MZA-16G-1	14	28	20	1	1	4	16x65	16x16x73	44x16x73	380	
MZA-16G-1-1/2	14	28	20	1-1/2	1	4	16x65	16x16x73	44x16x73	385	
MZA-18G-1	18	28	25	1	1-1/2	5	18x65	18x18x75	48x18x75	465	
MZA-18G-1-1/2	18	36	25	1-1/2	1-1/2	5	18x65	18x18x75	48x18x75	470	
MZA-21G-1-1/2	24	48	35	1-1/2	1-1/2	7	21x62	21x21x75	54x21x75	625	
MZA-24G-1-1/2	31	62	50	1-1/2	2	10	24x72	24x24x83	60x24x83	850	
MZA-24G-2	31	62	50	2	2	10	24x72	24x24x86	60x24x86	870	
MZA-30G-2	49	98	70	2	2	15	30x72	30x30x86	72x30x86	1,295	
MZA-36G-2	70	100	105	2	3	20	36x72	36x36x86	84x36x86	1,980	
MZA-36G-3	70	140	105	3	3	20	36x72	36x36x91	84x36x91	2,060	

MID - Multimedia Filter Specifications (Turbidity Reduction)

CATALOG NUMBER	FLOW RATES			PIPE SIZE		MEDIA	TANK SIZE	OVERALL DIMENSIONS (INCHES)		SHIPPING WEIGHT (LBS)
	SERVICE		BACK WASH	SERVICE	DRAIN			SINGLE (L1xWxH)	TWIN (L2xWxH)	
	CONT. GPM ❶	PEAK GPM								
MID-10G-1	5	10	8	1	1	1	10x54	10x10x62	32x10x62	225
MID-12G-1	8	16	12	1	1	2	12x52	12x12x60	36x12x60	310
MID-14G-1	10	20	15	1	1	3	14x65	14x14x73	40x14x73	420
MID-16G-1	14	28	20	1	1	4	16x65	16x16x73	44x16x73	520
MID-16G-1-1/2	14	28	20	1-1/2	1	4	16x65	16x16x73	44x16x73	525
MID-18G-1	18	28	25	1	1-1/2	5	18x65	18x18x75	48x18x75	640
MID-18G-1-1/2	18	36	25	1-1/2	1-1/2	5	18x65	18x18x75	48x18x75	645
MID-21G-1-1/2	24	48	35	1-1/2	1-1/2	7	21x62	21x21x75	54x21x75	870
MID-24G-1-1/2	31	62	50	1-1/2	2	10	24x72	24x24x83	60x24x83	1,200
MID-24G-2	31	62	50	2	2	10	24x72	24x24x86	60x24x86	1,220
MID-30G-2	49	98	70	2	2	15	30x72	30x30x86	72x30x86	1,820
MID-36G-2	70	100	105	2	3	20	36x72	36x36x86	84x36x86	2,680
MID-36G-3	70	140	105	3	3	20	36x72	36x36x91	84x36x91	2,760

ACA - Activated Carbon Filter Specifications (Dechlorination)

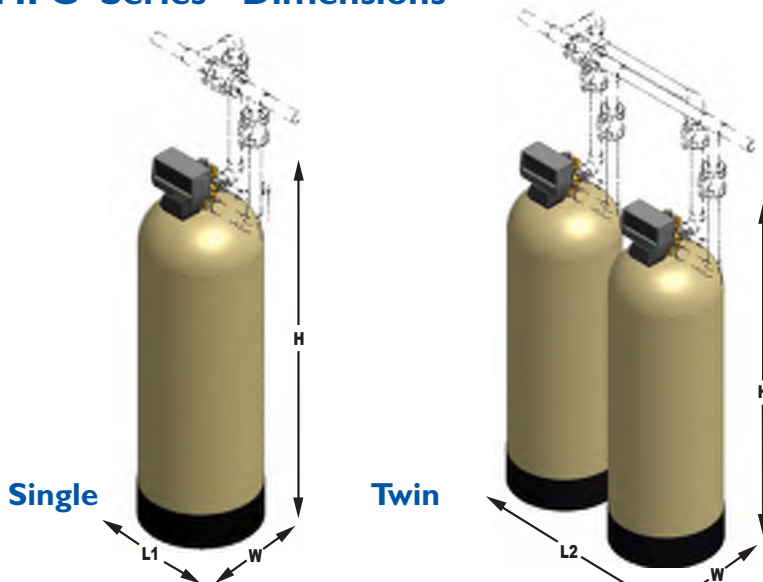
CATALOG NUMBER	FLOW RATES			PIPE SIZE		MEDIA	TANK SIZE	OVERALL DIMENSIONS (INCHES) ②		SHIPPING WEIGHT (LBS) ③
	SERVICE		BACK WASH GPM	SERVICE INCHES (NPT)	DRAIN INCHES (NPT)			SINGLE (L1xWxH)	TWIN (L2xWxH)	SINGLE
	CONT. GPM ①	PEAK GPM								
ACA-10G-1	2	4	5	1	3/4	1	10x54	10x10x62	32x10x62	165
ACA-12G-1	4	8	8	1	1	2	12x52	12x12x60	36x12x60	195
ACA-14G-1	6	12	10	1	1	3	14x65	14x14x73	40x14x73	250
ACA-16-1	8	16	15	1	1	4	16x65	16x16x73	44x16x73	305
ACA-16G-1-1/2	8	16	15	1-1/2	1	4	16x65	16x16x73	44x16x73	310
ACA-18G-1	10	20	20	1	1	5	18x65	18x18x75	48x18x75	360
ACA-18G-1-1/2	10	20	20	1-1/2	1	5	18x65	18x18x75	48x18x75	365
ACA-21G-1-1/2	14	28	25	1-1/2	1-1/2	7	21x62	21x21x75	54x21x75	520
ACA-24G-1-1/2	20	40	30	1-1/2	1-1/2	10	24x72	24x24x83	60x24x83	715
ACA-24G-2	20	40	30	2	1-1/2	10	24x72	24x24x86	60x24x86	735
ACA-30G-2	30	60	50	2	2	15	30x72	30x30x86	72x30x86	1,050
ACA-36G-2	40	80	70	2	2	20	36x72	36x36x86	84x36x86	1,390
ACA-36G-3	40	80	70	3	2	20	36x72	36x36x91	84x36x91	1,450
ACA-42G-2	60	100	100	2	3	30	42x72	42x42x105	96x42x105	1,720
ACA-42G-3	60	120	100	3	3	30	42x72	42x42x110	96x42x110	1,780

MGA - Manganese Greensand Filter Specifications (Iron Removal)

CATALOG NUMBER	FLOW RATES			PIPE SIZE		MEDIA	TANK SIZE	OVERALL DIMENSIONS (INCHES)		SHIPPING WEIGHT (LBS)
	SERVICE		BACK WASH	SERVICE	DRAIN			SINGLE (L1xWxH)	TWIN (L2xWxH)	
	CONT. GPM ①	PEAK GPM								
MGA-10G-1	2	4	5	1	3/4	1	10x54	10x10x62	32x10x62	225
MGA-12G-1	3	6	8	1	1	2	12x52	12x12x60	36x12x60	310
MGA-14G-1	4	8	10	1	1	3	14x65	14x14x73	40x14x73	420
MGA-16-1	6	12	15	1	1	4	16x65	16x16x73	44x16x73	520
MGA-16G-1-1/2	6	12	15	1-1/2	1	4	16x65	16x16x73	44x16x73	525
MGA-18G-1	7	14	20	1	1	5	18x65	18x18x75	48x18x75	640
MGA-18G-1-1/2	7	14	20	1-1/2	1	5	18x65	18x18x75	48x18x75	645
MGA-21G-1-1/2	10	20	25	1-1/2	1-1/2	7	21x62	21x21x75	54x21x75	870
MGA-24G-1-1/2	13	26	30	1-1/2	1-1/2	10	24x72	24x24x83	60x24x83	1,200
MGA-24G-2	13	26	30	2	1-1/2	10	24x72	24x24x86	60x24x86	1,220
MGA-30G-2	20	40	50	2	2	15	30x72	30x30x86	72x30x86	1,820
MGA-36G-2	30	60	70	2	2	20	36x72	36x36x86	84x36x86	2,680
MGA-36G-3	30	60	70	3	2	20	36x72	36x36x91	84x36x91	2,760
MGA-42G-2	40	80	100	2	3	30	42x72	42x42x105	96x42x105	3,520
MGA-42G-3	40	80	100	3	3	30	42x72	42x42x110	96x42x110	3,580

* Sizing assumes inlet water supply of less than 2 ppm iron with continuous or intermittent regeneration with potassium permanganate (KMnO₄).

'MFG' Series - Dimensions



NOTE:
Installation piping (shown in broken lines) are provided by others.

Notes

- ① At expected pressure loss not exceeding 5 psig, based on a clean filter bed
- ② Dimensions are estimate only. Actual dimensions may vary based on job-site space limits and piping layout. Allow a minimum of 24" above height dimension for media loading. Consult factory for dimensions on skid mounted systems.
- ③ Shipping weights are estimate only. Weights include media and support gravel, which are added to the tanks after installation. Double weight for twin tank systems.





Submittal

Prepared For:

Webster University, Webster Grove, MO
C/O CW Boiler Supply

October 28, 2016

Description:

High Purity RO/DI Water Skid

Job Number: S-100516001

Submittal pages have been numbered to aid in referencing

All equipment and components shall be sized to fit in the available allocated space with the required working clearances.

All equipment and components shall be sized to fit within the service elevator.

General Specifications

Job Name: Webster University, Webster Grove, MO

Job No.: S-100516001

Items: High Purity RO/DI Water Skid

RO/DI Skid Consisting of the Following:

- MAT-60-1" Twin Alt Softener with SXT Digital Timer
- ACA-10G-1" Single Activated Carbon Filter with SXT Digital Timer/ RO Lockout Switch
- MRO-3600-4V" Deluxe RO System with Digital Conductivity
- 460V/3-Phase/60 Hz , 120V /1phase/60 Hz
- (2) 14" x 47" DI Bottles with 3.6 ft3 Mixed Bed Resin and Reslite (Piped in Series)
- 300 Gallon Polyethylene Conical Bottom Storage Tank, PRV Valve, Float Switches
- 5 GPM Flow Control for Slip Stream Recirculation
- (2) Grundfos CM 316 SS Re-press Pumps with VFD Drives & Sensors
- 35gpm @ 76 psi
- Motor Starter Panel with Disconnect
- Aquafine CSL-4R UV System
- Shelco 5FOS3 316 SS Final Filter with (5) 30" .2 Micron Filter Cartidges
- Master AB 1400 PLC with PV 800 Series 7" HMI Interface
- Ethernet Ports for Modbus Communication to BMS
- PLC to Display the Following Points
- (2) Recirculation Loop Flow Sensors
- (2) Recirculation Loop Resistivity Sensors
- (1) RO Conductivity Sensor
- Complete system less Permeate Tank to be Skid-Mounted, Pre-piped and Wired
- Split Skid Design
- Sch 80 PVC Piping to RO System
- Fused Poly Pro Piping Post RO

All components to be made to fit on service elevator. - icon Mechanical

Reference Drawings:

High Purity Skid General Arrangement Drawing

S-100516001-03-01

High Purity Water Treatment System P&ID

S-100516001-07-01

Shop Drawing Submittal Review

Transmitted To: Cannon Design

Date: December 20, 2016

Attention: stl-cac@cannondesign.com

Contact Person / WTA Field Inspector:
Patrick Garner

Project Name: Webster University-**ISB**

Reviewed by: Mike Whitworth (WES)

Project No. WT 14127.01
WES 607

☐ UPS ☐ Courier ☒ **Email**

Copies	No.	Description
1 PDF	226700P01B	(Submittal No.'s:)
		(Cannon #22 6700-006) - (Paric #15051-0389) – (WES #607)
		➤ Processed Water System - Resubmittal

***Remarks: See Submittal Review from Webb Engineering.**

c: Kelvin Patel
Kpatel@cannondesign.com

☒ ***Reviewed**

☒ ***No Exceptions Taken**

☐

☐ *Make Corrections As Noted,
No Resubmittal Required

Corrections or comments made on shop drawings during this review do not relieve contractor from compliance with requirements of drawings and specifications. This check is only for review of general conformance with the design concept of project and general compliance with information given in contract documents. Contractor is responsible for: confirming and correlating all quantities and dimensions; selecting fabrication processes and techniques of construction; coordinating his work with that of all other trades; and performing his work in a safe and satisfactory manner.



1400 S. 3rd Street, Suite 201
St. Louis, Missouri 63104
Phone: (314) 588-0600
Fax: (314) 588-0604

Letter of Transmittal

To: **wtashop@wmtao.com**

From: **Mike Whitworth**

Date: **December 20, 2016**

Re: **Webster University ISB**

WES No: **607**

☐ For your Files

☐ For Review

☐ Please Comment

☐ Please Reply

Item No.	Description	No. of Copies	Date
1	Shop Drawing Review – (226700-006 REV002) 226700 Processed Water Systems for Laboratory Facilities	1	12-20-2016

•Signature: Mike Whitworth



**WEBB
ENGINEERING
SERVICES INC.**

www.webb-engineering.com

The review of this submittal is limited to the general conformance with the designated design concept and intent of this project and with the general compliance of the information provided in the contract documents. All comments, remarks and notations made on the submittal(s) as a result of this review do not relieve the contractor from full compliance with requirements of the contract documents. Approval for a specific item shall not include approval of an assembly of which the item is not a component. The contractor is solely responsible for rough-in and installation confirming and correlating all quantities and dimensions; selecting fabrication processes and techniques of construction; coordination of this work with that of other trades on this project; and in a safe and satisfactory manner. All work shall be installed in full compliance with the manufacturer's recommendation, Federal, State and Local rules and regulation and the Authority Having Jurisdiction (AHJ) and applicable adopted codes and standards.

PROJECT NAME: Webster University ISB

LOCATION: St. Louis Missouri

CLIENT PROJ. No.: N/A

WES PROJ. No.: 607

SPEC SECTION: 22 6700
Processed Water System
for Laboratory Facilities

SUBMITTAL ITEM:: See Below -

CONTRACTOR: ICON Mechanical.

CTR. SUBMITTAL # 22 6700-006 REV002

SUBMITTAL DATE: December 19, 2016

DATE RECEIVED: December 20, 2016

RECEIVED VIA: E-Mail

RECEIVED FROM: WTA

DATE RETURNED: DECEMBER 20, 2016

RETURNED VIA: E-MAIL

RETRURNED TO: WTASHOP@WMTAO.COM

STATUS KEY:

NEC	MCN	AAR	REJ	REV	NO EXCEPTION TAKEN	
					MAKE CORRECTIONS NOTED, NO RESUBMITTAL:	
					AMEND AND RESUBMIT	
					REJECTED, SEE REMARKS:	
					REVIEWED ONLY	
					ITEM	REMARKS
Submittal pages have been numbered to aid in referencing						
All equipment and components shall be sized to fit in the available allocated space with the required working clearances.						
All equipment and components shall be sized to fit within the service elevator.						
					Page 001 Cover Page	
X					Page 002 Marlo General Specifications	
X					Page 003 Marlo P&I Diagram	
X					Pages 004 - 005 Marlo Skid General Arrangement	
X					Pages 006 – 008 Marlo MAT Series Softener Systems Model – MAT 60M-1	
X					Pages 009 – 011 Marlo MFG Series Media Filter Systems Model – ACG-10G-1 Activated Carbon Filter	
X					Page 012 – 022 Marlo MRO-4V Reverse Osmosis Systems Model – MRO-3600-4V with pump	



X					Pages 023 – 025 Wave Cyber DI Tank Model 14"x47"	
X					Pages 026 – 028 Pentair Pentek Filter Housings Model – Not specified	
X					Page 029 – 031 Water Storage Tank Den Hartog Model – 36" x 325 Gal. Cone Bottom	1. Includes – stand and vent filter assembly
X					Pages 032 – 033 SPDT Pump Switch SJE Rhombus Model – Not Specified	
X					Page 034 - 035 Pressure Relief Valve Plast-O-Matic Model – Not Specified	
X					Pages 036 – 048 PP Piping Georg Fischer	1. Reviewed for uses as shown on submittal page 003
X					Page 049 – 059 Distribution Pumps Grundfos Model – CM 10-3	1. Motor starter control panel not included in submittal.
X					Pages 060 – 062 Pressure Gauges PIC Gauges Model – 301LFW	
X					Pages 063 – 066 UV System Aquafine Model – CSL-4R	
X					Pages 067 – 069 Final Filter Shelco Filters Model – 5FOS3	
X					Pages 070 – 074 Conductivity/Resistivity Sensor Georg Fischer Model Signet 2850	
X					Pages 075 – 079 Flow meter Georg Fischer Model – Signet 2537	
X					Pages 080 – 082 Pressure Sensor Ifm Electronic Model – PX3234	
X					Pages 083 – 085 Micro Drive Yaskawa Model – Not Specified.	
X					Pages 086 – 087 PLC Allen - Bradley	



1400 S. 3rd Street, Suite 201 • St. Louis, Missouri 63104 • 314.588.0600 • *fax* 314.588.0604

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ENGINEERING
SERVICES**_{INC.}

www.webb-engineering.com

X					Pages 088 – 089 HMI Interface Allen Bradley Model – Pane View 800 (7")	
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REVIEWED BY: Michael R. Whitworth DATE: December 20, 2016

THESE COMMENTS ARE TO BE ATTACHED TO ALL COPIES OF THE SHOP DRAWING REFERENCED ABOVE.

SUBMITTAL IDENTIFICATION SHEET

To be completed by Contractor/CM

PROJECT NAME	
ADDRESS	
NUMBER	
OWNER	
ARCHITECT / ENGINEER	
SUBMITTED BY	
CONTRACTOR / CM SUBMITTAL NO.	CANNON DESIGN SUBMITTAL NO.
DRAWING / DETAIL REFERENCE	SPECIFICATION SECTION / PARAGRAPH
MANUFACTURER / SUPPLIER	ITEM / PRODUCT ID
REQUIRED DATE	PRIORITY
CRITICAL	☐

To be completed by Reviewer

CANNON DESIGN SUBMITTAL NUMBER
RECEIVED DATE

- ☐ **A. No Exceptions Taken**
No further review of submittal is required.
- ☐ **B. Make Corrections Noted**
Incorporate corrections in work;
resubmission is not required.
- ☐ **C. Revise and Resubmit**
Revise as noted, and resubmit for review.
- ☐ **D. Rejected**
Submittal is not in compliance with Contract Documents;
provide new submittal.
- ☐ **E. For Record / Information Only**
Submittal was reviewed for Record / Information
purposes only.
- ☐ **F. Not Required for Review**
Submittal is not required by Contract Documents
and has not been reviewed.

Review is for conformance with the design concept of this project and for general compliance with contract documents. Contractor is responsible for quantities, dimensions and compliance with contract documents and for information that pertains to fabrication processes, construction techniques and coordination of this work with all trades which will be affected thereby. This review is null and void if submittal deviates from contract documents and does not indicate or note deviations.

ITEM BEING SUBMITTED (check only one)

- ☐ Shop Drawings ☐ Certification / Qualifications ☐ Coordination Drawing
☐ Samples ☐ Record Documents ☐ Calculations
 (_____ copies) ☐ Product Data ☐ Schedules
☐ LEED Submittal ☐ O&M Manuals
☐ Other _____

ITEM BEING SUBMITTED FOR (check only one)

- ☐ Action ☐ Information Only ☐ Record

REMARKS OR DEVIATIONS

CONTRACTOR / CM CERTIFICATION
(SUBMITTALS NOT CERTIFIED WILL BE RETURNED WITHOUT REVIEW)



PARIC CORPORATION
SUBMITTAL STAMP

THIS SHOP DRAWING HAS BEEN REVIEWED BY PARIC CORPORATION

Subcontractor remains responsible for dimensions, quantities, coordination with other trades and compliance with contract documents.

Ry:

Devin D. Gates

REVIEWED BY	DATE

A/E COMMENTS

- ☐
- See attached sheet(s) for additional comments

REVIEWED BY	DATE



77 Westport Plaza
Suite 250
St. Louis, MO 63146

TRANSMITTAL

No. 15051-0389

Paric Corporation

PROJECT: 15051-Webster University Interdisciplinary Science Building

DATE: 12/19/2016

TO: Cannon Design
1100 Clark Ave
St Louis MO 63102

Fax;
314-241-2203

RE: Processed Water System Shop Drawing
and Product Data REV1

ATTN: Kelvin Patel

JOB: 15051

WE ARE SENDING:	SUBMITTED FOR:	ACTION TAKEN:
☐ Shop Drawings	☒ Approval	☐ Approved as Submitted
☐ Letter	☐ Your Use	☐ Approved as Noted
☐ Prints	☐ As Requested	☐ Returned After Loan
☐ Change Order	☐ Review and Comment	☐ Resubmit
☐ Plans		☐ Submit
☐ Samples	SENT VIA:	☐ Returned
☐ Specifications	☐ Attached	☐ Returned for Corrections
☒ Other: Product Data	☐ Separate Cover Via:	☐ Due Date:

Item	Package	Code	Rev.	Copies	Date	Description	Status
Submittal		226700-006	2		12/19/2016	Processed Water System Shop Drawing and Product Data REV1	Submitted

NOTES:

CC:

Signed: _____
Devin Gates



Mechanical

LETTER OF TRANSMITTAL

TO: Paric Corporation

77 West Port Plaza #250

St. Louis, MO 63146

ATTN: Jason Szachnieski, Devin Gates

DATE: 12/8/16

JOB #: 5768

RE: Webster ISB

We are sending you

☒

Shop drawings

☐ Attached

☐ Prints

☐ Change order

☐ Under separate cover

☐ Plans

☐ Other

☐ Samples

☐ Specifications

☐ Copy of letter

COPIES	DATE	NO.	DESCRIPTION
1	12/8/16	226700	Processed Water System - Resubmittal

These are transmitted as checked below:

☐ For signature

☐ For your use

☐ As requested

☐ For bids due

☒ For review and comment

☐ Approved as submitted

☐ Approved as noted

☐ Returned for corrections

☐ Prints returned after loan to us

☐ Other

☒ Resubmit

☐ Submit

☐ Return

☐ copies for approval

☐ copies for distribution

☐ corrected prints

Remarks: Please return by 12/15/16

RESUBMITTAL WITH HIGHLIGHTED COMMENTS FROM MARLO BELOW WITHIN SUBMITTAL.

COPY TO: file

SIGNED:

Alex Chambers



Mechanical

Webster University ISB Webster Groves, MO

Submittal #:

226700

Submittal Description:

Processed Water System-Resubmittal

Return By:

12/15/16

Please Note: To avoid scheduling delays and equipment release delays, please submit by the "Return By" date.

CHECKED BY:			
DESIGNER:		X	ENGINEER:
X	NO EXCEPTION TAKEN		MAKE CORRECTIONS NOTED
	SUBMIT SPECIFIED ITEM		REVISE AND RESUBMIT
	REJECTED		
Checking is only for general conformance with the design concept of the project and general compliance with the information given in the contract documents. Any action shown is subject to the requirements of the plans and specifications. Equipment supplier is responsible for: dimensions which shall be confirmed and correlated at the job site; fabrication processes and techniques of construction; coordination of his work with that of all other trades; and satisfactory performance of his work.			
		Job #:	5768
		Date:	12/8/16
		By:	ARC

• 2227 South Street • P.O. Box 044170
• Racine, Wisconsin 53404-7003
• Phone: 262-681-1300 • Fax: 262-681-1318
www.marlo-inc.com



Date: 12-06-16
RE: Webster University RO/DI Skid
TO: CW Boiler

Paul,

The following letter is to confirm that the RO/DI system is designed based on the P&ID supplied. The system proposed meets and exceeds the demands and performance required per the written specification section 226700. The Marlo system proposed is a custom skid mounted system with PLC controls which will deliver the required RO/DI quantity and quality required. Any questions feel free to give me a call.

Thanks,

Erik Stirle
Commercial & Industrial Division
Marlo Incorporated

Shop Drawing Submittal Review

Transmitted To: Cannon Design

Date: November 22, 2016

Attention: stl-cac@cannondesign.com

Contact Person / WTA Field Inspector:
Patrick Garner

Project Name: Webster University-**ISB**

Reviewed by: Mike Whitworth (WES)

Project No. WT 14127.01
WES 607

☐ UPS ☐ Courier ☒ **Email**

Copies	No.	Description
1 PDF	226700P01A	(Submittal No.'s:)
		(Cannon #22 6700-006) - (Paric #15051-0319) – (WES #607)
		➤ Processed Water System – (High Purity RO/DI Water Skid)
		(Resubmittal)

***Remarks: See Submittal Review from Webb Engineering.**

c: **Kelvin Patel**
Kpatel@cannondesign.com

☒ ***Reviewed**

☒ ***No Exceptions Taken**

☒ ***Make Corrections Noted,
No Resubmittal**

☒ ***Amend & Resubmit**

Corrections or comments made on shop drawings during this review do not relieve contractor from compliance with requirements of drawings and specifications. This check is only for review of general conformance with the design concept of project and general compliance with information given in contract documents. Contractor is responsible for: confirming and correlating all quantities and dimensions; selecting fabrication processes and techniques of construction; coordinating his work with that of all other trades; and performing his work in a safe and satisfactory manner.



1400 S. 3rd Street, Suite 201
St. Louis, Missouri 63104
Phone: (314) 588-0600
Fax: (314) 588-0604

Letter of Transmittal

To: **wtashop@wmtao.com**

From: **Mike Whitworth**

Date: **November 22, 2016**

Re: **Webster University ISB**

WES No: **607**

☐ For your Files

☐ For Review

☐ Please Comment

☐ Please Reply

Item No.	Description	No. of Copies	Date
1	Shop Drawing Review – Resubmittal 226700 Processed Water Systems for Laboratory Facilities	1	11-22-2016

•Signature: Mike Whitworth



**WEBB
ENGINEERING
SERVICES, INC.**

www.webb-engineering.com

The review of this submittal is limited to the general conformance with the designated design concept and intent of this project and with the general compliance of the information provided in the contract documents. All comments, remarks and notations made on the submittal(s) as a result of this review do not relieve the contractor from full compliance with requirements of the contract documents. Approval for a specific item shall not include approval of an assembly of which the item is not a component. The contractor is solely responsible for rough-in and installation confirming and correlating all quantities and dimensions; selecting fabrication processes and techniques of construction; coordination of this work with that of other trades on this project; and in a safe and satisfactory manner. All work shall be installed in full compliance with the manufacturer's recommendation, Federal, State and Local rules and regulation and the Authority Having Jurisdiction (AHJ) and applicable adopted codes and standards.

PROJECT NAME: Webster University ISB
 LOCATION: St. Louis Missouri
 CLIENT PROJ. No.: N/A
 WES PROJ. No.: 607
 SPEC SECTION: 22 6700
Processed Water System
for Laboratory Facilities
 SUBMITTAL ITEM:: See Below -

CONTRACTOR: ICON Mechanical.
 CTR. SUBMITTAL # 22 6700-006
 SUBMITTAL DATE: October 28, 2016
 DATE RECEIVED: November 16, 2016
 RECEIVED VIA: E-Mail
 RECEIVED FROM: WTA
 DATE RETURNED: NOVEMBER 22, 2016
 RETURNED VIA: E-MAIL
 RETURNED TO: WTASHOP@WMTAO.COM

STATUS KEY:

NEC	MCN	AAR	REJ	REV	NO EXCEPTION TAKEN	
					MAKE CORRECTIONS NOTED, NO RESUBMITTAL:	
					AMEND AND RESUBMIT	
					REJECTED, SEE REMARKS:	
					REVIEWED ONLY	
					ITEM	REMARKS
Submittal pages have been numbered to aid in referencing						
All equipment and components shall be sized to fit in the available allocated space with the required working clearances.						
All equipment and components shall be sized to fit within the service elevator.						
					Page 001 Cover Page	
X					Page 002 Marlo General Specifications	
X					Page 003 Marlo P&I Diagram	
X					Pages 004 - 005 Marlo Skid General Arrangement	
X					Pages 006 – 008 Marlo MAT Series Softener Systems Model – MAT 60M-1	
X					Pages 009 – 011 Marlo MFG Series Media Filter Systems Model – ACG-10G-1 Activated Carbon Filter	
		X			Page 012 – 022 Marlo MRO-4V Reverse Osmosis Systems Model – MRO-3600-4V with pump	1. Verify assembly includes items and components as specified. Refer to specification section 226700, Part 2.2 – paragraph 7 in its entirety.



X				Pages 023 – 025 Wave Cyber DI Tank Model 14"x47"	
		X		Pages 026 – 028 Pentair Pentek Filter Housings Model – Not specified	1. Provide manufacturers model/part number and list all accessories as applicable.
X				Page 029 – 031 Water Storage Tank Den Hartog Model – 36" x 325 Gal. Cone Bottom	1. Includes – stand and vent filter assembly
		X		Pages 032 – 033 SPDT Pump Switch SJE Rhombus Model – Not Specified	1. Verify electrical rating of SPDT switch is compatible with electrical characteristics of pump.
		X		Page 034 - 035 Pressure Relief Valve Plast-O-Matic Model – Not Specified	1. Provide manufacturers model/part number.
X				Pages 036 – 048 PP Piping Georg Fischer	1. Reviewed for uses as shown on submittal page 003
		X		Page 049 – 059 Distribution Pumps Grundfos Model – CM 10-3	1. Verify correct size and capacities of pumps and motors. 2. Motor starter control panel not included in submittal. 3. Refer to specification section 226700, Pat 2.2, paragraph 7a.
X				Pages 060 – 062 Pressure Gauges PIC Gauges Model – 301LFW	
X				Pages 063 – 066 UV System Aquafine Model – CSL-4R	
X				Pages 067 – 069 Final Filter Shelco Filters Model – 5FOS3	
	X			Pages 070 – 074 Conductivity/Resistivity Sensor Georg Fischer Model Signet 2850	1. All required patch cords and cables are to be included with sensor. Refer to specification section 226700, Part 2.2, paragraph 7d.
	X			Pages 075 – 079 Flow meter Georg Fischer Model – Signet 2537	1. Include all required patch cords and cables.
X				Pages 080 – 082 Pressure Sensor Ifm Electronic Model – PX3234	
		X		Pages 083 – 085 Micro Drive Yaskawa Model – Not Specified.	1. Provide manufacturers model/part number
		X		Pages 086 – 087 PLC Allen - Bradley	1. Provide manufacturers model/part number



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X					Pages 088 – 089 HMI Interface Allen Bradley Model – Pane View 800 (7")	
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REVIEWED BY: Michael R. Whitworth DATE: November 22, 2016

THESE COMMENTS ARE TO BE ATTACHED TO ALL COPIES OF THE SHOP DRAWING REFERENCED ABOVE.

SUBMITTAL IDENTIFICATION SHEET

To be completed by Contractor/CM

PROJECT NAME	
ADDRESS	
NUMBER	
OWNER	
ARCHITECT / ENGINEER	
SUBMITTED BY	
CONTRACTOR / CM SUBMITTAL NO.	CANNON DESIGN SUBMITTAL NO.
DRAWING / DETAIL REFERENCE	SPECIFICATION SECTION / PARAGRAPH
MANUFACTURER / SUPPLIER	ITEM / PRODUCT ID
REQUIRED DATE	PRIORITY
CRITICALITY	

To be completed by Reviewer

CANNON DESIGN SUBMITTAL NUMBER
RECEIVED DATE

- ☐ **A. No Exceptions Taken**
No further review of submittal is required.
- ☐ **B. Make Corrections Noted**
Incorporate corrections in work;
resubmission is not required.
- ☐ **C. Revise and Resubmit**
Revise as noted, and resubmit for review.
- ☐ **D. Rejected**
Submittal is not in compliance with Contract Documents;
provide new submittal.
- ☐ **E. For Record / Information Only**
Submittal was reviewed for Record / Information
purposes only.
- ☐ **F. Not Required for Review**
Submittal is not required by Contract Documents
and has not been reviewed.

Review is for conformance with the design concept of this project and for general compliance with contract documents. Contractor is responsible for quantities, dimensions and compliance with contract documents and for information that pertains to fabrication processes, construction techniques and coordination of this work with all trades which will be affected thereby. This review is null and void if submittal deviates from contract documents and does not indicate or note deviations.

ITEM BEING SUBMITTED (check only one)

- ☐ Shop Drawings ☐ Certification / Qualifications ☐ Coordination Drawing
☐ Samples ☐ Record Documents ☐ Calculations
 (_____ copies) ☐ Product Data ☐ Schedules
☐ LEED Submittal ☐ O&M Manuals
☐ Other

ITEM BEING SUBMITTED FOR (check only one)

- ☐ Action ☐ Information Only ☐ Record

REMARKS OR DEVIATIONS

CONTRACTOR / CM CERTIFICATION
(SUBMITTALS NOT CERTIFIED WILL BE RETURNED WITHOUT REVIEW)



PARIC CORPORATION
SUBMITTAL STAMP

THIS SHOP DRAWING HAS BEEN REVIEWED BY PARIC CORPORATION

Subcontractor remains responsible for dimensions, quantities, coordination with other trades and compliance with contract documents.

Ry:

By:
Devin D. Gates

REVIEWED BY	DATE

A/E COMMENTS

- ☐
- See attached sheet(s) for additional comments

REVIEWED BY	DATE



77 Westport Plaza
Suite 250
St. Louis, MO 63146

TRANSMITTAL

No. 15051-0319

Paric Corporation

PROJECT: 15051-Webster University Interdisciplinary Science Building

DATE: 11/11/2016

TO: Cannon Design
1100 Clark Ave
St Louis MO 63102

RE: Processed Water System Shop Drawing
and Product Data

ATTN: Kelvin Patel

JOB: 15051

WE ARE SENDING:		SUBMITTED FOR:	ACTION TAKEN:
☒ Shop Drawings		☒ Approval	☐ Approved as Submitted
☐ Letter		☐ Your Use	☐ Approved as Noted
☐ Prints		☐ As Requested	☐ Returned After Loan
☐ Change Order		☐ Review and Comment	☐ Resubmit
☐ Plans			☐ Submit
☐ Samples		SENT VIA:	☐ Returned
☐ Specifications			☐ Returned for Corrections
☒ Other: Product Data			☐ Due Date:
		☐ Separate Cover Via:	

<i>Item</i>	<i>Package</i>	<i>Code</i>	<i>Rev.</i>	<i>Copies</i>	<i>Date</i>	<i>Description</i>	<i>Status</i>
Submittal		226700-006	1		11/11/2016	Processed Water System Shop Drawing and Product Data	Submitted

NOTES:

CC:

Signed: _____
Devin Gates



Mechanical

LETTER OF TRANSMITTAL

TO: Paric Corporation

77 West Port Plaza #250

St. Louis, MO 63146

ATTN: Jason Szachnieski, Devin Gates

DATE: 11/11/16

JOB #: 5768

RE: Webster ISB

We are sending you

☒

Shop drawings

☐ Attached

☐ Prints

☐ Under separate cover

☐ Plans

☐ Samples

☐ Specifications

☐ Copy of letter

☐ Change order

☐ Other

COPIES	DATE	NO.	DESCRIPTION
1	11/11/16	226700	Processed Water System

These are transmitted as checked below:

☐ For signature

☐ For your use

☐ As requested

☐ For bids due

☒

For review and comment

☐ Approved as submitted

☐ Approved as noted

☐ Returned for corrections

☐ Prints returned after loan to us

☐ Other

☐ Resubmit

☒

Submit

☐ Return

☐ copies for approval

☐ copies for distribution

☐ corrected prints

Remarks: Please return by 11/25/16

COPY TO: file

SIGNED:

Alex Chambers



Mechanical

Webster University ISB Webster Groves, MO

Submittal #:

226700

Submittal Description:

Processed Water System

Return By:

11/25/16

Please Note: To avoid scheduling delays and equipment release delays, please submit by the "Return By" date.

CHECKED BY:			
DESIGNER:		X	ENGINEER:
X	NO EXCEPTION TAKEN		MAKE CORRECTIONS NOTED
	SUBMIT SPECIFIED ITEM		REVISE AND RESUBMIT
	REJECTED		
Checking is only for general conformance with the design concept of the project and general compliance with the information given in the contract documents. Any action shown is subject to the requirements of the plans and specifications. Equipment supplier is responsible for: dimensions which shall be confirmed and correlated at the job site; fabrication processes and techniques of construction; coordination of his work with that of all other trades; and satisfactory performance of his work.			
		Job #:	5768
		Date:	11/11/16
		By:	ARC