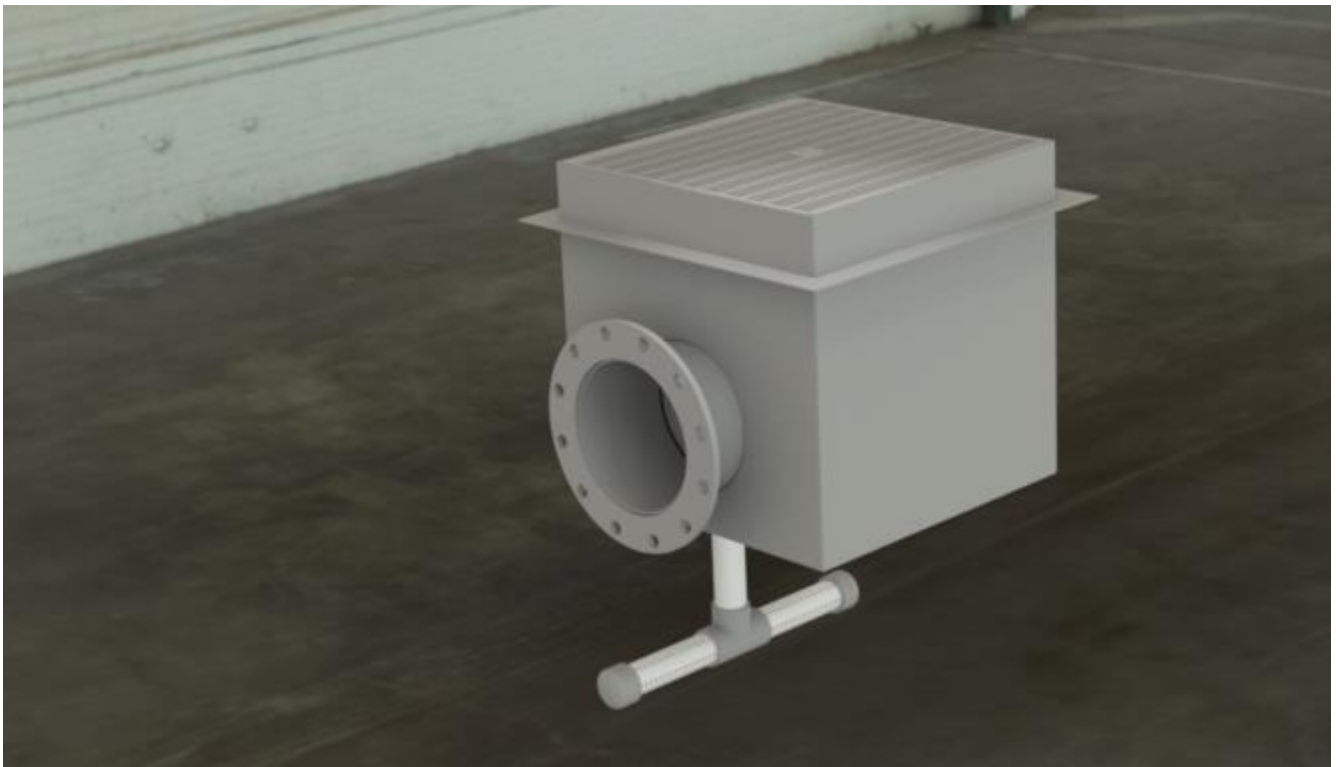


# Main Drain Installation & Operation Manual

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## Table of Contents

1.0 REVISIONS.....	3
2.0 GENERAL INFORMATION.....	4
3.0 SERVICE LIFE OF PRODUCTS & COMPONENTS .....	8
4.0 INSTALLATION INSTRUCTIONS.....	10
5.0 USER MAINTENANCE .....	13
6.0 DRAWINGS.....	14
7.0 APPENDIX.....	15

## 1.0 REVISIONS

REVISION	DATE	DESCRIPTION	BY	CHECK
0	04/23/2024	Submission	VCC	
1	5/01/2024	Revised IAPMO R&T filing & content	VCC	

## 2.0 GENERAL INFORMATION

### Introduction

For over fifty-five years, professionals of the most distinctive aquatic centers have come to rely on Paddock Pool Equipment Company to provide total project solutions. Far from just a pool equipment manufacturer, Paddock offers innovative high-performance products, and construction expertise to builders — all tailored to meet the unique demands of each individual project.

Paddock Suction Outlet Fitting Assemblies (SOFA) are certified by IAPMO R&T to comply with ANSI/APSP/ICC-16 2017 (PA 2021). These SOFAs shall not be installed in seating or backrest areas. There shall be no less than a 3-foot separation between suction fittings installed on a common line. These fittings are designed for installation with concrete, vinyl or composite lined pools.

Paddock's SOFA's have passed all required tests for body entrapment and hair entanglement. They have been approved to the maximum flow indicated on the SOFA flow rate chart.

**THIS DOCUMENT CONTAINS IMPORTANT SAFETY INSTRUCTIONS. READ, UNDERSTAND, AND FOLLOW ALL WARNINGS AND INSTRUCTIONS.**

**SAVE THESE INSTRUCTIONS!**

**Disclaimer:** The information in this document is subject to change by Paddock Pool Equipment Company, Inc. ("Paddock") without notice. Paddock assumes no responsibility for inaccuracies or omissions and specifically disclaims any liabilities, losses or risks, personal, business or otherwise, incurred as a consequence, directly or indirectly, of the use or application of any or all of the contents of this document. For the latest or updated documentation, if available, contact Paddock at 555 Paddock Parkway, Rock Hill, SC 29730 T: (803) 324-1111 or visit us online at [www.paddockpoolequipment.com](http://www.paddockpoolequipment.com).

**Intended Use:** Use of this document or the Paddock product(s) depicted herein are only for the purpose it/they were designed for; refer to the appropriate specifications sheet. For the latest or updated documentation, if available, contact Paddock at 555 Paddock Parkway, Rock Hill, SC 29730 t: (803) 324-1111, email to [info@paddockindustries.com](mailto:info@paddockindustries.com) or visit us online at [www.paddockpoolequipment.com](http://www.paddockpoolequipment.com).

**EXCEPT AS EXPRESSLY STATED HEREIN, PADDOCK POOL EQUIPMENT COMPANY INC. MAKES NO WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS OF THE PRODUCT FOR ANY PARTICULAR PURPOSE, EVEN IF THAT PURPOSE IS KNOWN OR SHOULD HAVE BEEN KNOWN TO PADDOCK.**

**Patents:** Paddock has patents pending on the product(s) which it manufactures depicted in this document.

### VGBA Compliant Sump and Cover Key Terminology



**ESMD** - Entrapment Safe Main Drain (Sump Unit)  
**AVRD** - Anti-Vortex Reduction Device (Stainless Steel)  
**PCFC** - Paddock Certified Flat Cover (Flat Cover)  
**SOFA** – Suction Outlet Fitting Assembly

**ANSI/APSP/ICC-16 2007 (PA 2021)**

### Paddock VGBA Compliant SOFA models available

Model #	Description
<b>9300046</b>	18" X 18" ESMD W/6" Connection, 6" AVRD, Relief Valve and 24" X 24" PCFC, Floor and Wall Flow Rating at 915 GPM
<b>9300044</b>	18" X 18" ESMD W/8" Connection, 8" AVRD, Relief Valve and 24" X 24" PCFC, Floor and Wall Flow Rating at 920 GPM
<b>9300006</b>	24" X 24" ESMD W/8" Connection, 8" AVRD, Relief Valve and 24" X 24" PCFC, Floor and Wall Flow Rating at 920 GPM
<b>9300007</b>	24 X 24 ESMD W/10" Connection, 10" AVRD, Relief Valve and 24" X 24" PCFC, Floor and Wall Flow Rating at 920 GPM
<b>9300011</b>	24" X 48" ESMD W/12" Connection, 12" AVRD, Relief Valve And (2) 24" X 24" PCFC, Floor Flow Rating at 3500 GPM and Wall Flow Rating at 3000 GPM
<b>9300013</b>	24" X 48" ESMD W/ (2)-12" Connection, (2)-12" AVRD, Relief Valve And (2) 24" X 24" PCFC, Floor Flow Rating at 3500 GPM and Wall Flow Rating at 3000 GPM
<b>9300056</b>	24" X 48" ESMD W/14" Connection, 14" AVRD, Relief Valve And (2) 24" X 24" PCFC, Floor Flow Rating at 3500 GPM and Wall Flow Rating at 3000 GPM

**Specifications:****Paddock ANSI/APSP/ICC-16 2017 (PA 2021)****Compliant and IAPMO R&T Certified Swimming Pool Suction Outlet Fitting Assemblies**

- The Swimming Pool Suction Outlet Fitting Assemblies (SOFA) shall include a velocity, vacuum entrapment, hair entanglement **ANTI-VORTEX REDUCTION DEVICE (AVRD)** which has been submitted under ANSI/APSP/ICC-16 2017 (PA 2021) for testing by IAPMO R&T and found to be in compliance with this standard.
- The SOFA both cover/grate and sump, shall be fabricated from 304L stainless steel. The outlet and outlet piping assembly shall be fabricated with stainless steel piping and designed for compliance with the testing requirements ANSI/APSP/ICC-16 2017 (PA 2021).
- The open area of the SOFA shall be equal to or exceeds the open area of the outlet pipe of the SOFA.
- All grating fasteners in the assembly shall be 316L stainless steel Pan Head Phillips fasteners. All exposed security fasteners shall be inserted or removed with #2 Phillips Screwdriver with a maximum torque of 19.8-inch pounds. All fasteners shall be engaged by a minimum of three (3) threads.
- The velocity of water entering any orifice on the cover/grate of the SOFA during normal operation shall not exceed 1.5 feet per second.
- Blockable SOFAs in existing pools with single SOFA systems shall be installed with an additional anti-entrapment device or system (listed in section 9.4 of ANSI/APSP/ICC-16 2017).
- Paddock's SOFAs must be installed as a multiple SOFA system.
- SOFAs shall be chosen so that the individual flow rate is great than the pumping system's MAX system flow rate (not including secondary circulation systems - skimmer, gutters, etc.)
- Paddock SOFAs are not designed to use any pool surface as a portion of the flow path.

## Paddock Suction Outlet Fittings Flow Rates

Suction Outlet P/N & Model #	Mounting Position	Total Open Area	Recommended Flow	Maximum Flow per NSF	Blockable or Unblockable
P/N 9300046 Model # 2424PCFC 1818ESMD (sump), 6" Connection	Floor or Wall Use	219.6 sq. inches	915 GPM @ 1.38 fps	915 GPM	Unblockable
P/N 9300044 Model # 2424PCFC 1818ESMD (sump), 8" Connection	Floor or Wall Use	219.6 sq. inches	920 GPM @ 1.38 fps	920 GPM	Unblockable
P/N 9300006 Model # 2424PCFC 2424ESMD (sump), 8" Connection	Floor or Wall Use	219.6 sq. inches	920 GPM @ 1.38 fps	920 GPM	Unblockable
P/N 9300007 Model # 2424PCFC-AVRD 2424ESMD (sump), 10" Connection	Floor or Wall Use	219.6 sq. inches	920 GPM @ 1.38 fps	920 GPM	Unblockable
P/N 9300011 Model # 2448PCFC-AVRD 2448ESMD (sump), 12" Connection	Floor Use	439.2 sq. inches	1996 GPM @ 1.5 fps	3500 GPM	Unblockable
	Wall Use	439.2 sq. inches	1996 GPM @ 1.5 fps	3000 GPM	Unblockable
P/N 9300013 Model # 2448PCFC-AVRD 2448ESMD (sump), (2) 12" Connections	Floor Use	439.2 sq. inches	1996 GPM @ 1.5 fps	3500 GPM	Unblockable
	Wall Use	439.2 sq. inches	1996 GPM @ 1.5 fps	3000 GPM	Unblockable
P/N 9300056 Model # 2448PCFC-AVRD 2448ESMD (sump), 14" Connection	Floor Use	439.2 sq. inches	1996 GPM @ 1.5 fps	3500 GPM	Unblockable
	Wall Use	439.2 sq. inches	1996 GPM @ 1.5 fps	3000 GPM	Unblockable

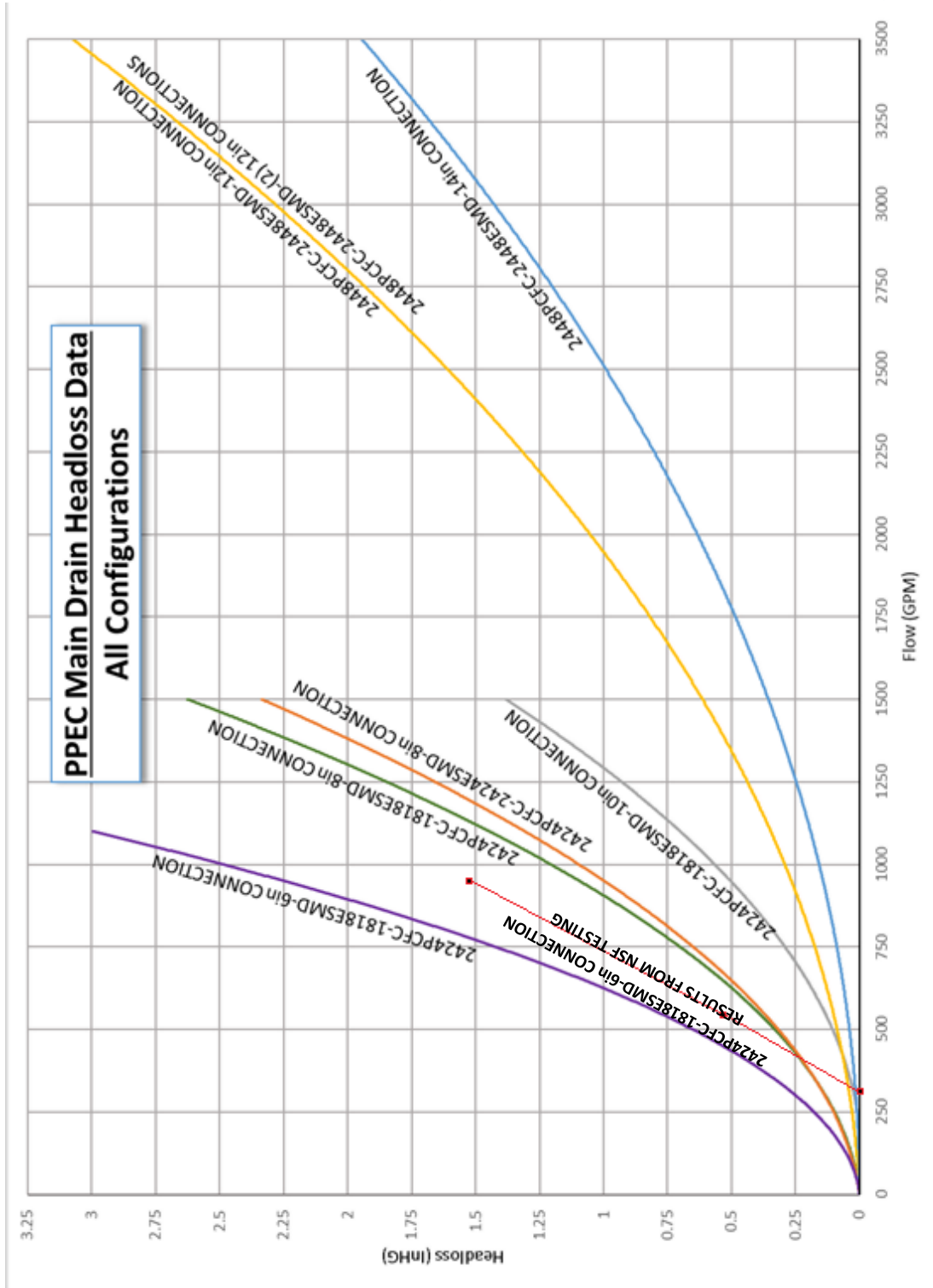
### **ONLY INSTALL ON SOFA CONFIGURATIONS LISTED.**

#### CAUTIONARY NOTES:

- Do not exceed maximum allowable flow rate as stated above.
- If pump needs to be changed, a replacement must be the same as the original pump. If a different pump is required, a Registered Design Professional must be contracted to assure original flow rate is not exceeded.



## Paddock Suction Outlet Fittings Head Loss Data (from CFD Study)



HEADLOSS MEASUREMENT TAKEN AS CLOSE AS PRACTICAL TO THE SUMP CONNECTION.



### 3.0 SERVICE LIFE OF PRODUCTS & COMPONENTS

#### Paddock Main Drain Cover Lifespan

- **Component Lifespans** – The SOFA cover and sump have a lifespan greater than 20 years. The screws should be replaced every 7 years.
- **Requirement** – Inspect cover at 10 years minimum for any signs of damage and replace if needed. (Covers older than 10 years must be inspected yearly by facility operators and documented, then every year thereafter for any damage compromising unit which would necessitate replacement.)
- **Requirement** – Replace screws every 7 years at minimum and document information for records (use only the size and grade of stainless-steel screws 8/32 x 1/2" SS 316 recommended by Paddock).
- **Recommendation** – Establish a yearly checklist for facility operators to document inspection of covers and screws for damage – replace any covers or screws immediately that are compromised, damaged or broken in any way. If threaded holes become damaged contact PPEC immediately to determine the best means of repair (brittle/missing pieces, cracks, non-superficial changes to color).
- The 2424ESMD and 2448ESMD Stainless Steel Sump Box and their components are permanently mounted in the pool shell and will not require replacement. This includes all integral parts listed on ESMD Parts List Breakdown.
- Paddock Main Drain Covers do not need to be replaced unless they are compromised, damaged or broken and all above requirements are met. These are stainless steel covers and should last life of facility if properly maintained. Ultraviolet light test which establishes life expectancy is for degradation of resin products such as PVC or plastics.
- SOFA(s) should be chosen so that the individual suction system flow rate is greater than the pumping system's **MAXIMUM** system flow rate.
- The capacity of the secondary circulation systems should not be included when evaluating an individual suction system flow rating.
- To determine the flow rating for pools with multiple blockable SOFAs in one body of water without isolation valves combine all SOFAs minus the flow rate of one. If not, all SOFAs flow rates are equal subtract the largest flow rate. The flow rating for existing pools with a single blockable SOFA is the flow rating of the SOFA when also installed w/an additional device to prevent suction entrapment. The flow rating of a single blockable SOFA without an additional device is zero.
- The flow rating for pools with single or multiple unblockable SOFAs shall be the combined flow rate of all SOFAs pipe together on one body of water.
- SOFAs shall not be located on backrests or seats.
- When installing and using this equipment basic safety precautions shall always be followed including the **"Important Safety Instructions"** included in Section 4 Installation Instructions.
- Service life begins when the SOFA is installed (with or without water).

## 4.0 INSTALLATION INSTRUCTIONS

# SAVE THESE INSTRUCTIONS!

## **IMPORTANT SAFETY INSTRUCTIONS READ, UNDERSTAND, AND FOLLOW ALL WARNINGS AND INSTRUCTIONS**

**IMPORTANT:** READ AND STORE THESE INSTRUCTIONS FOR FUTURE REFERENCE.

**WARNING!** Install this equipment in accordance with the instructions provided. FAILURE TO FOLLOW INSTRUCTION AND/OR USE WITH COMPONENTS NOT PROVIDED BY PADDOCK AND INTENDED TO BE USED WITH THIS PRODUCT MAY RESULT IN IMPROPER POSITIONING OR FUNCTIONING OF SUCTION OUTLET AND MAY CAUSE SEVERE PERSONAL INJURY OR DEATH.

**CAUTION LABEL:** REMOVE AND INSTALL ALL EXPOSED SCREWS WITH A PHILLIP #2 SCREWDRIVER. APPLY A MAXIMUM TORQUE OF 19.8 INCH POUNDS. DO NOT USE POWER TOOLS TO INSTALL FASTENERS.

**NOTE:** GRATE ALIGNMENT & ELEVATION IS CRUCIAL. IF NOT PROPERLY ALIGNED, HOLES WILL NOT MATCH. MARK GRATE LOCATION ON FRAME TO MATCH FOR REINSTALLATION LATER. THE GRATE MUST BE SET FLUSH WITH POOL FLOOR, IF NOT THE EDGES POSE A HAZARD FOR POOL OCCUPANTS. FIELD MODIFICATIONS NOT AUTHORIZED BY PADDOCK POOL EQUIPMENT COMPANY OR THESE INSTALLATION INSTRUCTIONS SHALL VOID THE SOFA CERTIFICATION. ANY MODIFICATION THAT INCREASES THE FLOW RATE OF THE CIRCULATION SYSTEM SHALL REQUIRE RE-EVALUATION OF THE COVER/GRATE AND SUMP TO ENSURE THAT THE FLOW RATING OF THE SUCTION OUTLET FITTING ASSEMBLY (SOFA) IS NOT EXCEEDED.

NO CONFIGURATION CHANGES TO THE STRUCTURE OR FLOW PATH OF THIS DRAIN ASSEMBLY ARE ALLOWED UNLESS THE NEW CONFIGURATION HAS BEEN CERTIFIED.

ADHESIVES AND PERMANENT ATTACHMENT METHODS ARE PROHIBITED. THE COVER IS TO REMAIN REMOVABLE.

INSPECT FOR MISSING, BROKEN OR CRACKED SUCTION FITTINGS, THESE SHALL BE REPLACED BEFORE BATHERS ARE ALLOWED TO USE THE POOL.

ANY LOOSE COVER/GRATES AND ASSOCIATED COMPONENTS SHALL BE REATTACHED BEFORE BATHERS ARE ALLOWED TO USE THE POOL.

**\*\*\* Make** sure product is properly cleaned with Sheila Shine or similar after installation. Carbon contamination could show up as surface rust in a couple of months from dissimilar materials coming in contact with stainless steel. Example: carbon drill bits or saw blades.

## **Installation: RENOVATION**

1. Bonding SOFAs (Electrical Inspection may be required).
  - a. Chip to find rebar in structural frame of pool, which is grounded.
  - b. Attach grounding lug to existing structural rebar. (reference National Electric Code Article 680)
  - c. Attach grounding lug and 8-gauge grounding wire to structural frame of pool.



- d. Use hydraulic cement to backfill chipped area around rebar. Backfill to area just below finish because you may have to patch area outside of cover with Marcite. (or similar product)
  - e. Attach 8-gauge grounding wire from structural frame of pool to cover.
  - f. Encapsulate grounding wire and lugs with an epoxy to prevent leaching from grounding wire.
2. Drain Assembly for Testing
  - a. The Paddock SOFA includes a blanking plate to allow for plumbing pressure testing.
  - b. The supplied hardware will allow for installation of the blanking plate and the AVR. Ensure the blank plate is removed prior to putting the pool in operation.

### 3. Completing installation

- a. Confirm all suction outlet fitting components and fastener receptacles are clean and free of debris or obstructions during installation of cover/grate and fasteners.
- b. Start all fasteners by hand to ensure proper thread engagement and prevent cross threading then tighten to a maximum torque of 19.8-inch pounds. **Do not use power tools to install fasteners.**
- c. Make sure that cover is flush to the existing pool finish and confirm snugness of the cover/grate to the sump/frame by a hand check after installation.
- d. Marcite voids around frame if needed.
- e. Give owner certificate of compliance and extra screw pack for cover.
- f. **Log date of installation once work is completed.**

[Contact Paddock Pool Equipment Company, Customer Service for assistance.](#)

## 5.0 USER MAINTENANCE

### Inspection Schedule

#### Daily (or before each use of the facility):

- a. Inspect the cover/grate, including fasteners, for damage or tampering each operation day.
- b. Missing, broken or cracked covers/grates, including fasteners, shall be replaced before bathers are allowed to use the pool.

#### Important Notes

- Before removing the cover/grate(s), mark the cover/grate that matches the screw hole(s) and make sure the smooth side is facing up. This will insure placement of cover/grate(s) will line-up correctly. Improper install of the cover/grate(s) will cause the screws to not fit the sump and a hazard to the bathers.
- Any loose cover/grates and associated components shall be reattached before bathers are allowed to use the pool.
- All exposed fasteners on Paddock Main Drain Cover/Grate require a Phillip #2 Screwdriver for insertion and removal. Start all fasteners by hand to ensure proper thread engagement and prevent cross threading then tighten to a maximum torque of 19.8-inch pounds. DO NOT USE POWER TOOLS TO INSTALL FASTENERS.
  - a. Confirm all SOFA components and fastener receptacles are clean and free of debris or obstructions during installation of cover/grate and fasteners.
  - b. Make sure that cover is flush to the existing pool finish and confirm snugness of the cover/grate to the sump/frame by a hand check after installation.
- Paddock Pool Equipment Company must be contacted in the event a fastener fails to engage (stripped or cross threaded hold) the stainless sump/frame prior to allowing bathers to return to the pool.

#### Winterization

The **winterization procedure** is to inspect drain(s) for cracks and damages.

- Replace grate if damaged. Also, inspect screws and make sure grate(s) is secure. Replace any missing screws. If required, remove grate(s) and associated hardware to allow for a sump pump to be utilized to prevent water from freezing in the sump.
- Store removed components in a well-marked box and store in a location that allows for easy retrieval for installation prior to putting the pool back into service. **See above Important Notes.**

## **6.0 DRAWINGS**

# **Main Drain Assembly Drawing(s) (In Drawing Folder)**

**7.0 APPENDIX**

# Appendix

# MAIN DRAIN INSTALLATION - SIGNOFF FORM

Job Name, City, State: \_\_\_\_\_ Job No.: \_\_\_\_\_

The following information is required to validate the expressed warranty. Complete this form upon start-up of pool and return via email (subject: Main Drain Installation) or mail to the address below.

[info@paddockindustries.com](mailto:info@paddockindustries.com)

**PLEASE NOTE:** Warranty **DOES NOT** go into effect until completed installation form has been received by Paddock Pool Equipment Company.

**Date of Main Drain Installation:** \_\_\_\_\_

**Service Life of Cover/Grate: > 20 years -- This SOFA is UNBLOCKABLE**

Select Installed P/N & Model	Qty	Location (comp., therapy, warm-up, lifestyle)	Mounting Position	Suction Outlet P/N & Model #	Maximum Flow per IAPMO R&T
<input type="checkbox"/>			Floor Use	P/N 9300046 Model # 2424PCFC - 1818ESMD (sump), 6" Connection	915 GPM
<input type="checkbox"/>			Wall Use		
<input type="checkbox"/>			Floor Use	P/N 9300044 Model # 2424PCFC - 1818ESMD (sump), 8" Connection	920 GPM
<input type="checkbox"/>			Wall Use		
<input type="checkbox"/>			Floor Use	P/N 9300006 Model # 2424PCFC - 2424ESMD (sump), 8" Connection	920 GPM
<input type="checkbox"/>			Wall Use		
<input type="checkbox"/>			Floor Use	P/N 9300007 Model # 2424PCFC-AVRD - 2424ESMD (sump), 10" Connection	920 GPM
<input type="checkbox"/>			Wall Use		
<input type="checkbox"/>			Floor Use	P/N 9300011 Model # 2448PCFC-AVRD - 2448ESMD (sump), 12" Connection	3500 GPM
<input type="checkbox"/>			Wall Use		3000 GPM
<input type="checkbox"/>			Floor Use	P/N 9300013 Model # 2448PCFC-AVRD - 2448ESMD (sump), (2) 12" Conn's	3500 GPM
<input type="checkbox"/>			Wall Use		3000 GPM
<input type="checkbox"/>			Floor Use	P/N 9300056 Model # 2448PCFC-AVRD - 2448ESMD (sump), 14" Connection	3500 GPM
<input type="checkbox"/>			Wall Use		3000 GPM

**Contractor/ Installer:**

Signature: \_\_\_\_\_

**Owner/Owner Representative:**

Signature: \_\_\_\_\_

Contractor/Installer: \_\_\_\_\_

(Print name)

Owner: \_\_\_\_\_

(Print name)

Date: \_\_\_\_\_

Date: \_\_\_\_\_

I have instructed customer on proper maintenance of drains.

I have read and understand instructions as instructed by contractor/installer as to proper operations.

THE INSTALLATION SIGNOFF FORM TO BE PERMANENTLY POSTED NEAR THE PUMP CONTROLS, A COPY GIVEN TO THE POOL OWNER & A COPY KEPT WITH OTHER POOL RELATED DOCUMENTS