



U.S. CONSUMER PRODUCT SAFETY COMMISSION
Bethesda, Maryland

Public Hearing
Virginia Graeme Baker Pool and Spa Safety Act
Unblockable Drain Guidance

Wednesday, November 4, 2009
9:00 a.m.

Opening Remarks

CPSC Staff

Oral Presentations

Questions from the Commission and CPSC staff after each Panel

Panel I

Carvin DiGiovanni, Association of Pool & Spa Professionals (APSP)
Robert Rung, Hayward Pool Products
Myles McMorrow, Poolcenter.com Inc.

Panel II

David Stingl, Stingl Products
Paul Pennington, Pool Safety Council
Chip Whalen, Intex Recreation Corp.

Panel III

Ron Schroader, New Water Solutions
Leif Zars, ASME/ANSI
Bonnie Snow, BeeSafe Systems

Closing Remarks

Adjournment

Stevenson, Todd

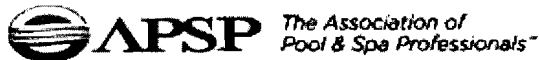
From: Carvin DiGiovanni [CDiGiovanni@APSP.org]
Sent: Wednesday, October 28, 2009 1:23 PM
To: CPSC-OS
Subject: APSP October 28, 2009 comments on "Unblockable Drains"
Attachments: 10-28-09 APSP Unblockable Comments to CPSC.pdf; 8-5-09 APSP Unblockable Comments to CPSC.pdf; CoverGrateFormulaExamples.pdf

The APSP respectfully requests the opportunity to testify at the November 4, 2009 public hearing on "Unblockable Drains".

Attached is the written presentation that the APSP would like to file and is the basis for our oral comments.

We thank you for the opportunity to present.

Carvin DiGiovanni



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The Global Source and Voice for the Recreational Water Industry

October 28, 2009

To: CPSC Office of the Secretary

Re: "Unblockable Drain Guidance"

The Association of Pool & Spa Professionals (APSP) appreciates the opportunity to review the amendments to the Commission's Draft Technical Guidance Document on Unblockable Drains posted in the Federal Register, October 21, 2009.

APSP continues however to respectfully disagree with the Commission's draft guidance and urges the Commission to use the definition submitted in our initial comment of August 5th 2009 that reads:

"Unblockable Drain: A suction outlet such that its perforated(open) area cannot be shadowed by the area of the 18x23 Body Blocking Element of ANSI/ASME A112.19.8-2008a and that the rated flow through the remaining open area cannot create a suction force in excess of the values in Table 1 of that Standard. For manufactured products, this is calculated or verified by laboratory testing in accordance with the Standard. For field- built outlets, this is calculated in accordance with Section 2.3.1.2 of the Standard."

We do agree with the Commission's emphasis on the fastening of the covers and therefore suggest the following language be added to our above August 5, 2009 definition to now read:

"Unblockable Drain: A suction outlet defined as all components, including the sump and/or body, cover/grate, and hardware such that its perforated (open) area cannot be shadowed by the area of the 18x23 Body Blocking Element of ANSI/ASME A112.19.8-2008a and that the rated flow through the remaining open area cannot create a suction force in excess of the values in Table 1 of that Standard. For manufactured products, this is calculated or verified by laboratory testing in accordance with the Standard. For field- built outlets, this is calculated in accordance with Section 2.3.1.2 of the Standard."

The reasons for our above comments are as follows:

- 1) The 29" diagonal dimension that appears in the CPSC Draft Technical Guidance document is an oversimplification of the problem, is not found in the ANSI/ASME A112.19.8-2008a standard and is not

validated. Therefore it needs to be removed and not referenced. Our concerns for why this is important to do are discussed in our previously submitted August 5, 2009 letter.

- 2) While we agree that the ANSI/ASME A112.19.8-2008a standard, and the Tables therein, are incorporated by reference into the VGBA, we feel it is critical that Table 1 in this standard be referenced by the Commission at every appropriate opportunity. It is our belief that compliance with VGBA and the ASME standard is not possible without evaluating the system to the standard. By referencing Table 1, the reader has no choice but to refer to the standard, or more appropriately, to use a qualified professional with experience complying with the standard. Our concern is that not to do so may lead some people reviewing the CPSC Technical Guidelines to mistakenly conclude that they do not need to also reference the ANSI/ASME A112.19.8-2008a standard.

Attached for the Commission's convenience are our prior comments and support data with examples that have been updated with additional new calculations that replaces the support data previously submitted on August 5, 2009.

We thank the CPSC for the opportunity to provide comments.

Carvin DiGiovanni,



Senior Director, Technical and Standards



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The Global Source and Voice for the Recreational Water Industry

August 5, 2009

To: CPSC Office of the Secretary

Re: "Unblockable Drain Guidance"

The following is submitted on behalf of the Association of Pool and Spa Professionals (APSP) in response to the Commission's request for public comment on July 2009 CPSC Staff Draft Technical Guidance on Unblockable Drains. These comments are also supported by the members of the Writing Committee for the ANSI/APSP -7 2006 American National Standard for Suction Entrapment Avoidance in Swimming Pools, Wading Pools, Spas, Hot Tubs, and Catch Basins.

The definition in the Draft Technical Guidance requires that a drain must measure in excess of 18" x 23 or must have a diagonal measurement in excess of 29". While we appreciate the desire of the Commission to provide simple and easily verified dimensional criteria to allow operators to determine whether a drain and cover are unblockable, we respectfully submit that the A112.19.8-2007 Standard for Suction Fittings in Use in Swimming Pools, Wading Pools, Spas, and Hot Tubs (as referenced in Section 1404 of the VGB Act) is based on performance criteria under specified conditions and does not lend itself to such simplification. Section 5 of this standard establishes a performance test using an 18" x 23" blocking element with specified corner radii, which must be removable with an applied force of 120 pounds or less. Manufactured unblockable covers are calculated or tested in this manner and certified by a nationally recognized testing laboratory (NRTL) to this criteria. Field fabricated covers must be certified as unblockable by a Registered Design Professional. This blocking element represents the 99 percentile male torso. Similar language is found in section 5.5.2 of the ANSI/APSP-7 standard.¹ Owners and operators of pools seeking to determine whether the cover(s) in their facilities are unblockable should be advised to check the certification for manufactured covers or the Design Professional, who must test and approve all field fabricated covers in any event.

Attached is a series of Cover Grate Formula Examples calculated in accordance with Section 2.3.1.2 of the ANSI/ASME A112.19.8-2008a standard. The calculations show that a cover or outlet with a diagonal of 29.2 inches can, under certain conditions, create a dangerously high entrapping force of up to 6366 pounds for the 99 percentile male torso. As also demonstrated, one might take an existing 18 x 18 outlet and add two "stubby" channels of 3" x 6", making a

¹ The ANSI/APSP-7 standard also recognizes as unblockable any outlet that is 3" or greater in width and 31" or greater in length.

length of 30 inches. The 99 percentile male torso would be able block the original square, and part of the channels, leading to a calculated force of 1413 pounds, well exceeding the 120 pound limit. Hence, the possibility exists that a cover would exceed or appear to exceed the 29" diagonal, and yet still not be unblockable. This further demonstrates why the attempt at simplification, while understandable, would run afoul of the 19.8 criteria, and, therefore, the VGB Act.

For these reasons, we suggest that the Commission reference the performance test found in 19.8. As an alternative, the Commission might wish to consider the following language which is consistent with the 19.8 and ANSI/APSP-7 Standards as well as the pending draft APSP/IAPMO -16 Standard.

“Unblockable Drain: A suction outlet such that its perforated(open) area cannot be shadowed by the area of the 18x23 Body Blocking Element of ANSI/ASME A112.19.8-2008a and that the rated flow through the remaining open area cannot create a suction force in excess of the values in Table 1 of that Standard. For manufactured products, this is calculated or verified by laboratory testing in accordance with the Standard. For field- built outlets, this is calculated in accordance with Section 2.3.1.2 of the Standard.”

We thank the Commission for its time and consideration.

Carvin DiGiovanni,

A handwritten signature in black ink, appearing to read 'Carvin DiGiovanni', written in a cursive style.

Senior Director, Technical and Standards

COVER/GRATE FORMULA EXAMPLES - See last page for Figures

For a suction outlet cover/grate that is partially blocked, Section 2.3.1.2 of ANSI/ASME A112.19.8 2007 gives the allowable flow in terms of geometric and hydraulic characteristics.

The entrapping force is the area of the blocked holes times the differential pressure
 The differential pressure is the loss coefficient C times the dynamic head of the water flowing in the opening
 The velocity is the flow divided by the remaining unblocked area

$$F = a_B \cdot \Delta p$$

$$\Delta p = C \cdot \frac{\rho}{2} \cdot v^2$$

$$v = \frac{Q}{a_R}$$

Eliminating velocity and differential pressure from these equations, we obtain the formula on page 4 in the standard shown below with example.

2.3.1.2 Entrapping Force Criterion for Q

$$Q = a_R \sqrt{\frac{F}{C \cdot \frac{\rho}{2} a_B}}$$

where
 a_B = largest area of the openings in ft², that can be blocked by the torso specimen in the most demanding position
 a_R = area of the openings in ft² that remains unblocked
 a_T = total area of the openings in ft² in the cover/grate
 C = flow coefficient based on the design of the openings in the cover/grate. It shall be taken at 2.1 unless otherwise demonstrated by calculation or test.
 F = allowable lifting load that can be exerted by a conscious entrapped person. It is taken at 120 lbf (534 N), about half the weight of the 99th percentile male whose weight is already entirely balanced by buoyancy.
 Q = limiting flow rate in ft³/sec based on the allowable entrapping force

ρ = mass density of water
 = $\frac{62.4 \text{ lb/ft}^3}{32.16 \text{ ft/sec}^2} = 1.940 \text{ slugs/ft}^3$

4

Example: Suppose we consider a channel cover partially blocked by a 99 percentile male whose strength allows a 120 pound removal effort.
 Without data on the flow resistance of the openings, use the conservative value of standard Use 45 % opening in uniformly perforated area $f := .45$

From the Figure for the 3 x 31 perforated area,

$$A_T := 3 \text{ in} \cdot 31 \text{ in} \quad A_T = 93 \text{ in}^2 \quad A_T = 0.646 \text{ ft}^2 \quad A_B := 76.969 \text{ in}^2 \quad A_R := (16.032) \text{ in}^2$$

For information, the diagonal is $\sqrt{3^2 + 31^2} = 31.145$

$$a_B := f \cdot A_B \quad a_B = 34.636 \text{ in}^2 \quad a_B = 0.241 \text{ ft}^2$$

$$a_R := f \cdot A_R \quad a_R = 7.214 \text{ in}^2 \quad a_R = 0.05 \text{ ft}^2$$

$$a_T := a_B + a_R \quad a_T = 41.85 \text{ in}^2 \quad a_T = 0.291 \text{ ft}^2 \quad (\text{ref only})$$

$C := 2.1$ dimensionless - from I.E. Idelchik, Handbook of Hydraulic Resistance, 3rdEd, 1994

$F := 120 \text{ lbf}$ $\rho := 1.94 \frac{\text{slug}}{\text{ft}^3}$ Flow Q is to be determined from the formula of Section 2.3.1.2

The result is

$$Q := a_R \cdot \sqrt{\frac{F}{C \cdot \frac{\rho}{2} a_B}} \quad Q = 0.784 \frac{\text{ft}^3}{\text{sec}} \quad \boxed{Q = 351.91 \text{ gpm}}$$

Perforated Channel 45%

The velocity through the openings in unblocked condition will be $V := \frac{Q}{a_T} \quad V = 2.698 \frac{\text{ft}}{\text{s}}$

This will be checked by actual hair testing

Now consider a cover with uniformly perforated area 18 x 23 inches with open area of 55%. $f := 0.55$
 (The actual size of a product would be larger due to support and fastening functions)

The areas "A" refer to gross area, and "a" refers to the corresponding open area. Outer frame is not considered at all.

For reference, the diagonal is $diag := \sqrt{(18in)^2 + (23in)^2}$ $diag = 29.206in$

The total area is $A_T := 18in \cdot 23in$ $A_T = 414in^2$

The area of the 99 percentile model, with 4 in radius corners, is $A_B := 18in \cdot 23in - 4 \cdot (4in)^2 + \pi \cdot (4in)^2$ $A_B = 400.265in^2$ $a_B := f \cdot A_B$ $a_B = 1.529ft^2$

The remaining area is $A_R := A_T - A_B$ $A_R = 13.735in^2$ $a_R := f \cdot A_R$ $a_R = 0.052ft^2$

As before, $Q := a_R \cdot \sqrt{\frac{F}{C \cdot \frac{\rho}{2} a_B}}$ $Q = 0.326 \frac{ft^3}{s}$ $Q = 146gpm$ **Unacceptably low flow rating for such a large (18 x 23) outlet with 55 % open area.**

Expectation would be on the order of 1.5 fps through the open area. $Q_{expected} := 1.5 \frac{ft}{s} \cdot A_T \cdot f$ $Q_{expected} = 2.372 \frac{ft^3}{s}$ $Q_{expected} = 1065gpm$

Suppose the outlet was mistakenly operated at this "expected" flow. The entrapping force can be obtained by rearranging the formula

$$F_{mistake} = \frac{Q_{expected}^2}{a_R} = 6366 lbf$$

This is dangerous, even for a strong man

Next let us consider the remaining area needed to achieve an expected flow. Rearranging, we have a formula useful for preliminary design

$$a_{Rneeded} := \frac{Q_{expected}}{\sqrt{\frac{F}{C \cdot \frac{\rho}{2} a_B}}} \quad a_{Rneeded} = 55.022in^2$$

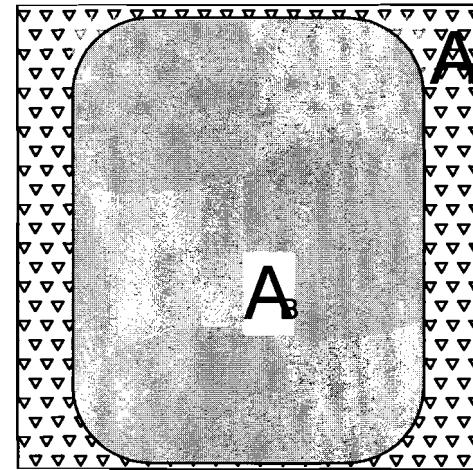
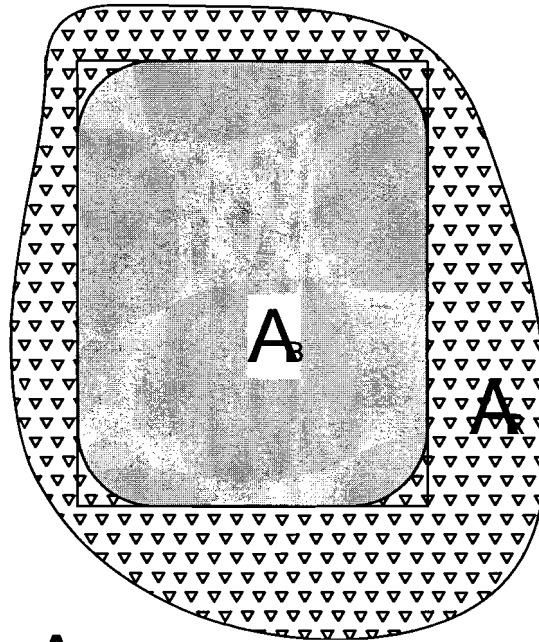
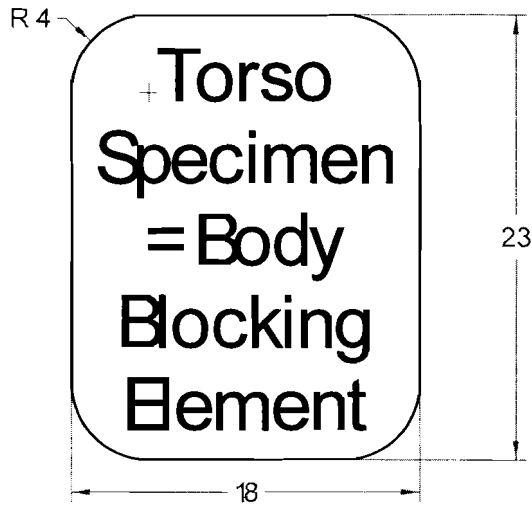
$$A_{Rneeded} := \frac{a_{Rneeded}}{f} \quad A_{Rneeded} = 100.039in^2$$

Then the needed total area of the perforated portion of the cover would be $A_{Tneeded} := A_B + A_{Rneeded}$ $A_{Tneeded} = 500.305in^2$

That would be, for example, a square of side $Side := \sqrt{A_{Tneeded}}$

This is very close to a traditional 24 x 24 inch grate, $Side = 22.37in$ with space for frame, providing a flow rating of $Q_{expected} = 1065gpm$ at $f = 0.55$

Discussion: A hypothetical 18 x 23 perforated area (29.2 inch diagonal) leaves a very small open area remaining when blocked by the 99 percentile man. The allowable flow is only 146 gpm, making such a product commercially impractical. It is less than half the rating of a much smaller Channel. If the more typical flow rating, corresponding to some local codes of 1.5 fps through the open area is used, the entrapping force exceeds three tons on the 99 percentile man, making it dangerous as well. A nominal 24 x 24 is better suited for this product category.



AB=400.265 AR=175.735

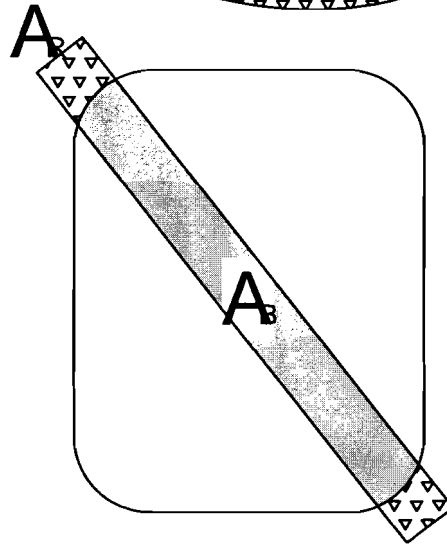
Torso Specimen/Body Blocking Element Above

Top Center is specimen on arbitrary large grate

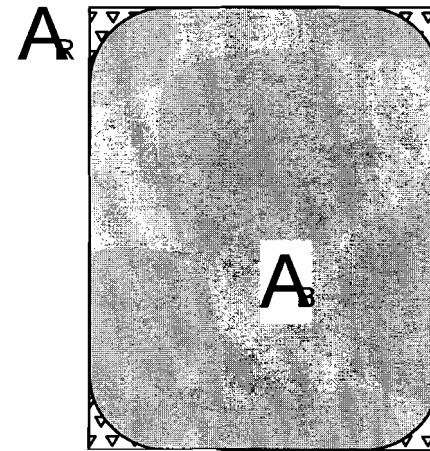
Right top is the specimen partially blocking a 24 x 24 cover/grate, showing the Area Blocked and the Area Remaining allowing flow

Near right shows a 3 x 31 channel diagonally. Note this position is chosen to be the most challenging, maximizing the Area Blocked and minimizing the Remaining Area.

At far right is the specimen blocking a rectangular grate with rectangular perforated area 18 x 23 allowing flow only through small area at corners producing a commercially useless flow rating



AB=76.969 AR=16.032



AB=400.265 AR=13.736

Channel conversion of 18 x 18

Now consider an existing cover with uniformly perforated area 18 x 18 inches with open area of 55%, with (2) 3 x 6 channels added to create diagonal greater than 30".

For reference, the diagonal is

$$\text{diag} := \sqrt{(30\text{in})^2 + (3\text{in})^2} \quad \text{diag} = 30.15 \text{ in}$$

The total area is

$$A_T := 18\text{in} \cdot 18\text{in} + 3\text{in} \cdot 12\text{in} \quad A_T = 360 \text{ in}^2$$

The area of the 99 percentile model, covers the original 18 x 18, plus part of the channels

$$A_B := 18\text{in} \cdot 18\text{in} + (23 - 18) \cdot 3\text{in}^2 \quad A_B = 339 \text{ in}^2 \quad a_B := f \cdot A_B$$

The remaining area is

$$A_R := 3 \cdot (30 - 23) \text{in}^2 \quad A_R = 21 \text{ in}^2 \quad a_R := f \cdot A_R \quad a_R = 0.08 \text{ ft}^2$$

$$Q := a_R \cdot \sqrt{\frac{F}{C \cdot \frac{\rho}{2} a_B}} \quad Q = 0.541 \cdot \frac{\text{ft}^3}{\text{s}} \quad \sqrt{Q = 243 \text{ gpm}}$$

Expectation would be on the order of 1.5 fps through the original open area.

$$Q_{\text{expected}} := 1.5 \frac{\text{ft}}{\text{s}} \cdot 18\text{in} \cdot 18\text{in} \cdot f \quad Q_{\text{expected}} = 1.856 \frac{\text{ft}^3}{\text{s}} \quad Q_{\text{expected}} = 833 \text{ gpm}$$

Suppose the outlet was mistakenly operated at this "expected" flow.

This likely the requirement for the original installation

The entrapping force can be obtained by rearranging the formula

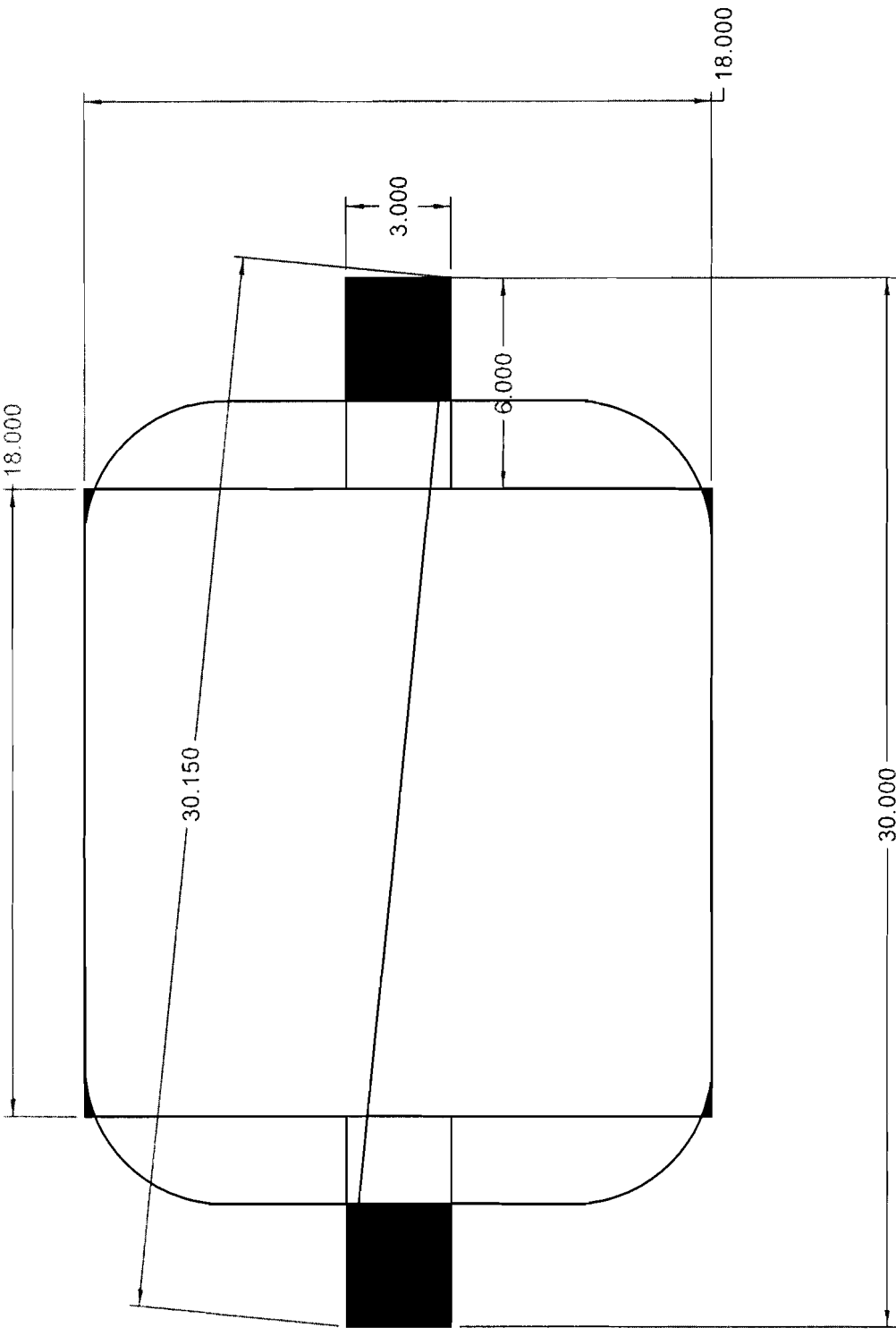


$$F_{\text{mistake}} = \frac{Q_{\text{expected}}^2}{C \cdot \frac{\rho}{2} a_B}$$



$$F_{\text{mistake}} = 1413 \text{ lbf}$$

This is dangerous, even for a strong man



Robert Rung
Hayward Pool Products

Stevenson, Todd

From: Robert Rung [RRung@haywardnet.com]
Sent: Wednesday, October 28, 2009 4:43 PM
To: CPSC-OS
Subject: Request to speak at CPSC Hearing on "Unblockable Drains", November 4, 2008
Attachments: UnblockableSuction Outlets.ppt

Dear Mr. Stevenson,

As a member of the ANSI/ASME A112.19.8 Project Team, I request the opportunity to speak at the November 4, 2008 Meeting on Unblockable Drains at CPSC offices.

Attached are the Power Point slides to accompany my oral presentation.

Thank you for this opportunity.

Respectfully,

Robert Rung, PE
Consultant
Hayward Pool Products

Office 973 398 4948
Cell 973 219 5244

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**Unblockable
Suction Outlet**

=

**Unblockable
Main Drain**

Who do we intend to protect?

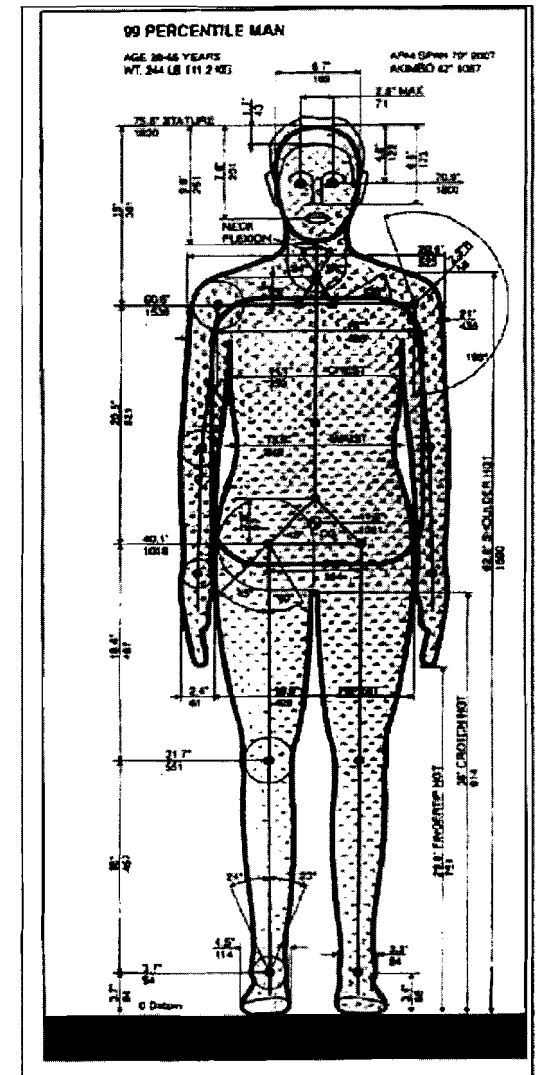
The 99 percentile man:

The composite figure is larger than 99% of all men.

Ref "The Measure of Man and Woman"

Based on known incidents, use rounded rectangle shown superimposed.

18"x23" & 4" radius corners

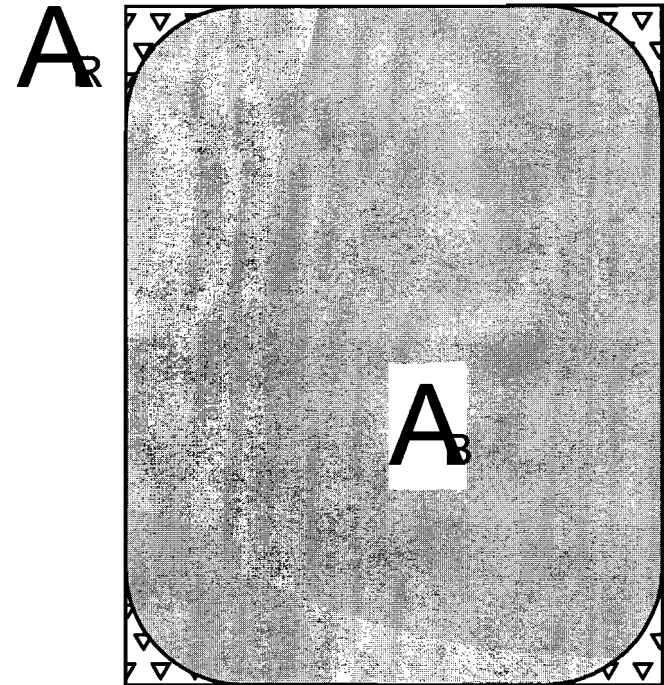


Suppose we make an outlet exactly that size and shape?

- The outlet is completely covered (400 sq in)
- No water can enter cover/grate
- The pump has no other source of water
- Pump reaches its greatest suction
 - Nearly full vacuum for pool pump 14.7 psi
- For grating with typical 50% opening
- Holding force: $400 \times .50 \times 14.7 = 2940$ pounds
- Too much

The 2006 ICC Code had an 18 x 23 RECTANGLE

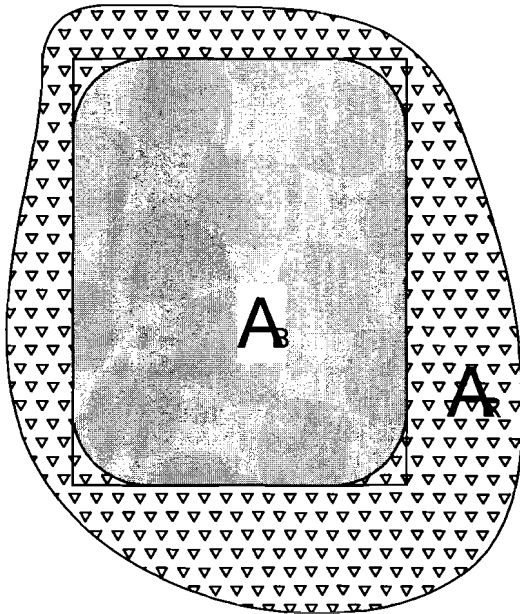
- Assumed Rounded corners for flow?
- Remaining grate area of 14 sq in
- Half is open area = 7 sq in
- Nominally, 1.5 fps thru open area of $18 \times 23 \times .50 = 207$ sq in
- Now forced through 7 sq in
- Velocity: $1.5 \times (207/7) = 44$. fps
- Velocity head
 $q = 44^2 / (2g) = 31$ ft wc = 13.25psi
- Loss coefficient from A112.19.8 = 2.1
- Drop thru grate = $2.1 \times 13.25 = 27.8$ psi
- Impossible - water would vaporize
 - (unless very deep)
- A very small flow rate would be OK
 - But why build such a big outlet?



$$AB = 400.265 \quad AR = 13.736$$

How to define allowable flow?

- ASME A112.19.8-2008a
- Formula or test
- Depends on perforated area
 - Area blocked by bather
 - Remaining area for flow
- Acceptable force
- Hydraulic loss coefficient



2.3.1.2 Entrapping Force Criterion for Q

$$Q = a_R \sqrt{\frac{F}{C \frac{\rho}{2} a_B}}$$

where

a_B = largest area of the openings in ft², that can be blocked by the torso specimen in the most demanding position

a_R = area of the openings in ft² that remains unblocked

a_T = total area of the openings in ft² in the cover/grate

C = flow coefficient based on the design of the openings in the cover/grate. It shall be taken at 2.1 unless otherwise demonstrated by calculation or test.

F = allowable lifting load that can be exerted by a conscious entrapped person. It is taken at 120 lbf (534 N), about half the weight of the 99th percentile male whose weight is already entirely balanced by buoyancy.

Q = limiting flow rate in ft³/sec based on the allowable entrapping force

ρ = mass density of water

$$= \frac{62.4 \text{ lb/ft}^3}{32.16 \text{ ft/sec}^2} = 1.940 \text{ slugs/ft}^3$$

The rating for the 2006 ICC
 18x23" rectangular grate
 with 55% opening
 is only 146 gpm

An impractical use of a large outlet

$$A_B := 18\text{in} \cdot 23\text{in} - 4 \cdot (4\text{in})^2 + \pi \cdot (4\text{in})^2$$

$$A_B = 400.265\text{in}^2$$

$$a_B := f \cdot A_B$$

$$a_B = 1.529\text{ft}^2$$

$$A_R := A_T - A_B$$

$$A_R = 13.735\text{in}^2$$

$$a_R := f \cdot A_R$$

$$a_R = 0.052\text{ft}^2$$

$$Q := a_R \cdot \sqrt{\frac{F}{C \cdot \frac{\rho}{2} a_B}}$$

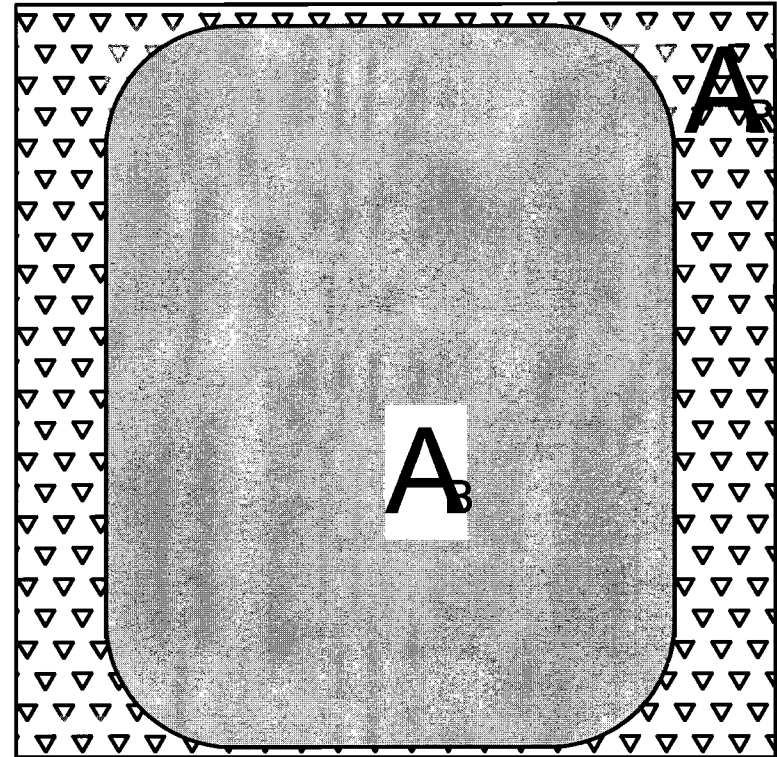
$$Q = 0.326 \frac{\text{ft}^3}{\text{s}}$$

$$Q = 146 \text{ gpm}$$

Unacceptably low flow rating
 for such a large (18 x 23) outlet
 with 55 % open area.

24x24 inch outlet

- 55% opening
22.37" square perforated zone
Flowing at 1.242 fps
Rating of 1065gpm
Using conservative $C=2.1$



3x31 Channel

45% open area

352 gpm

Flow velocity 2.7 fps (subject to hair test)

From the Figure for the 3 x 31 perforated area,

$$A_T := 3 \text{ in} \cdot 31 \text{ in} \quad A_T = 93 \text{ in}^2 \quad A_T = 0.646 \text{ ft}^2 \quad A_B := 76.969 \text{ in}^2 \quad A_R := (16.032) \text{ in}^2$$

For information, the diagonal is $\sqrt{3^2 + 31^2} = 31.145$

$$\begin{aligned} a_B &:= f \cdot A_B & a_B &= 34.636 \text{ in}^2 & a_B &= 0.241 \text{ ft}^2 \\ a_R &:= f \cdot A_R & a_R &= 7.214 \text{ in}^2 & a_R &= 0.05 \text{ ft}^2 \\ a_T &:= a_B + a_R & a_T &= 41.85 \text{ in}^2 & a_T &= 0.291 \text{ ft}^2 \quad (\text{ref only}) \end{aligned}$$

C := 2.1 dimensionless - from I.E. Idelchik, Handbook of Hydraulic Resistance, 3rdEd, 1994

F := 120bf $\rho := 1.94 \frac{\text{slug}}{\text{ft}^3}$ Flow Q is to be determined from the formula of Section 2.3.1.2

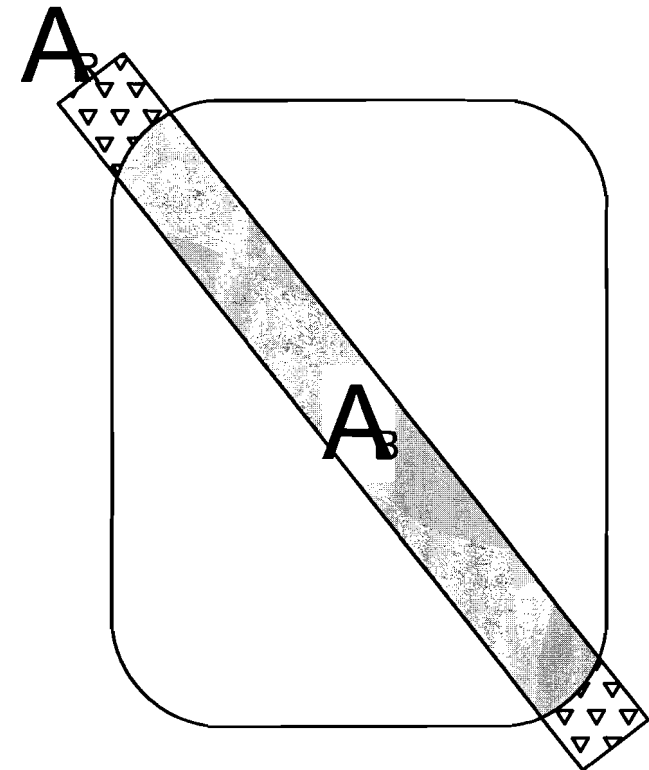
The result is

$$Q := a_R \cdot \sqrt{\frac{F}{C \cdot \frac{\rho}{2} a_B}} \quad Q = 0.784 \frac{\text{ft}^3}{\text{sec}} \quad \boxed{Q = 351.91 \text{ gpm}}$$

The velocity through the openings in unblocked condition will be

$$V := \frac{Q}{a_T} \quad V = 2.698 \frac{\text{ft}}{\text{s}}$$

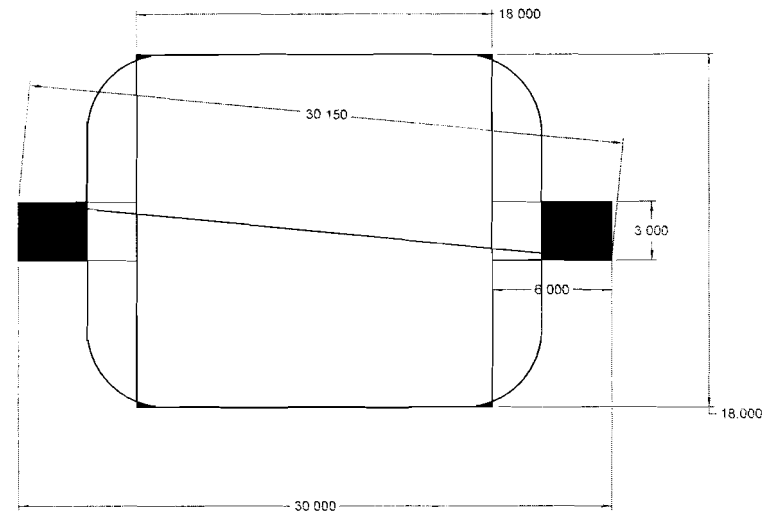
This will be checked by actual hair testing



$$AB = 76.969 \quad AR = 16.032$$

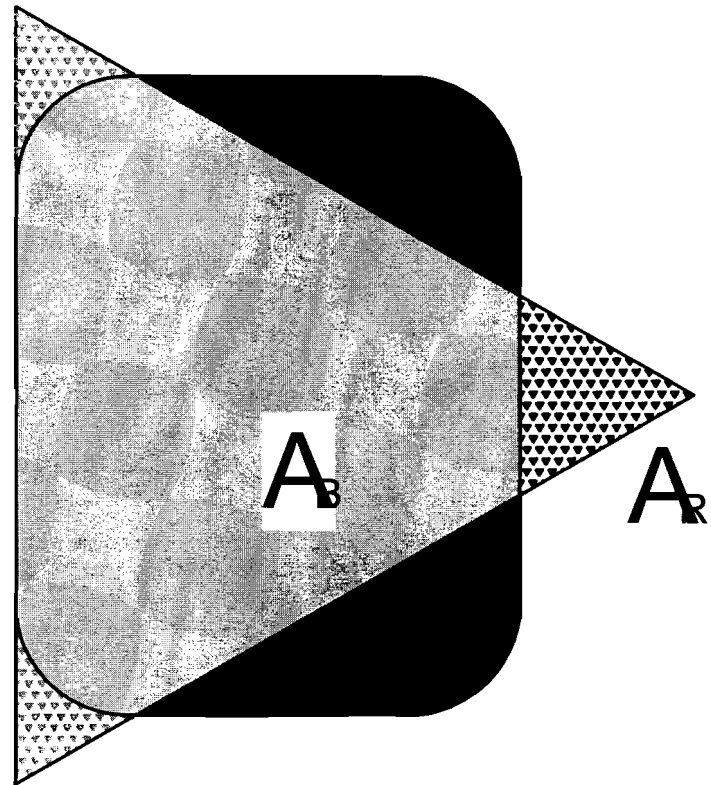
“Converting” 18x18” to 29” diagonal

- Add stub channels to existing 18 x 18 with 55% opening
- Was 833gpm @ 1.5 fps
 - Although this was unsafe
- Now only 243gpm
- Operator expects at least same rating
- Holding force at old “expected” flow is 1413 pounds



An interesting Configuration

- An equilateral triangle of side 28" would be incorrectly excluded by a 29" diagonal rule.
- It would have a flow rating of 495 gpm



AB=299246

AR=4023

Key Points

- “Unblockable “ implies a substantial open remaining area to prevent high pressure drop
- A simple diagonal measurement can lead to impractical or dangerous configurations
- A simple diagonal can inadvertently exclude viable designs
- The calculations are simple

**Unblockable
Suction Outlet**

=

**Unblockable
Main Drain**

Who do we intend to protect?

The 99 percentile man:

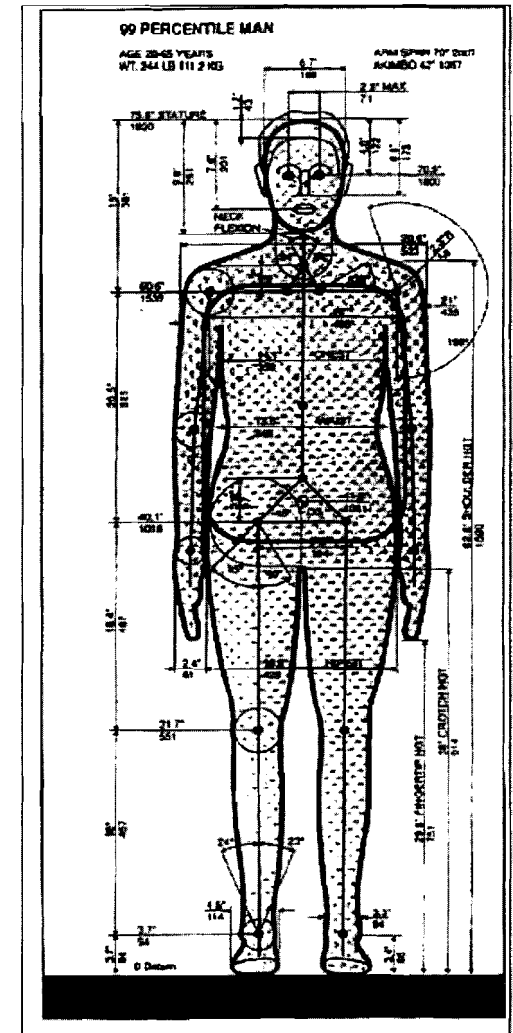
The composite figure is larger than 99% of all men.

Ref "The Measure of Man and Woman"

Based on known incidents, use rounded rectangle shown superimposed.

18"x 23" & 4" radius corners

Smaller persons LESS critical

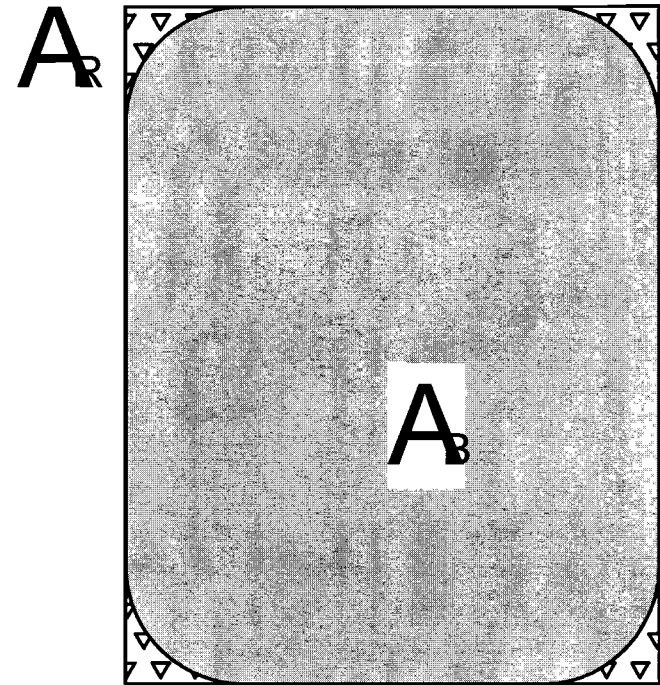


Suppose we make an outlet exactly that size and shape?

- The outlet is completely covered (400 sq in)
- No water can enter cover/grate
- The pump has no other source of water
- Pump reaches its greatest suction
 - Nearly full vacuum for pool pump 14.7 psi
- For grating with typical 50% opening
 - Holding force: $400 \times .50 \times 14.7 = 2940$ pounds
- Too much

The 2006 ICC Code had an 18 x 23 RECTANGLE

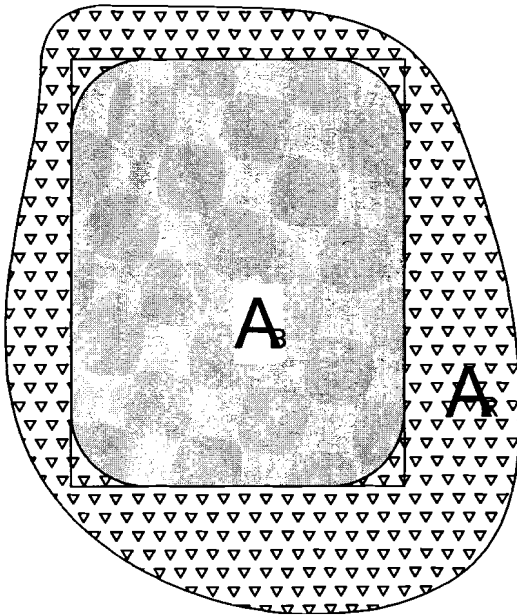
- Assumed Rounded corners for flow?
- Remaining grate area of 14 sq in
- Half is open area = 7 sq in
- Nominally, 1.5 fps thru open area of $18 \times 23 \times .50 = 207$ sq in
- Now forced through 7 sq in
- Velocity: $1.5 \times (207/7) = 44$. fps
- Velocity head
 $q = 44^2 / (2g) = 31$ ft wc = 13.25psi
- Loss coefficient from A112.19.8 = 2.1
- Drop thru grate = $2.1 \times 13.25 = 27.8$ psi
- Impossible - water would vaporize
 - (unless very deep)
- A very small flow rate would be OK
 - But why build such a big outlet?



$$AB = 400.265 \quad AR = 13.736$$

How to define allowable flow?

- ASME A112.19.8-2008a
- Formula or test
- Depends on perforated area
 - Area blocked by bather
 - Remaining area for flow
- Acceptable force
- Hydraulic loss coefficient



2.3.1.2 Entrapping Force Criterion for Q

$$Q = a_R \sqrt{\frac{F}{C \frac{\rho}{2} a_B}}$$

where

a_B = largest area of the openings in ft², that can be blocked by the torso specimen in the most demanding position

a_R = area of the openings in ft² that remains unblocked

a_T = total area of the openings in ft² in the cover/grate

C = flow coefficient based on the design of the openings in the cover/grate. It shall be taken at 2.1 unless otherwise demonstrated by calculation or test.

F = allowable lifting load that can be exerted by a conscious entrapped person. It is taken at 120 lbf (534 N), about half the weight of the 99th percentile male whose weight is already entirely balanced by buoyancy.

Q = limiting flow rate in ft³/sec based on the allowable entrapping force

ρ = mass density of water

$$= \frac{62.4 \text{ lb/ft}^3}{32.16 \text{ ft/sec}^2} = 1.940 \text{ slugs/ft}^3$$

The rating for the 2006 ICC
 18" x 23" rectangular grate
 with 55% opening
 is only 146 gpm

An impractical use of a large outlet

$$A_B := 18\text{in} \cdot 23\text{in} - 4 \cdot (4\text{in})^2 + \pi \cdot (4\text{in})^2$$

$$A_B = 400.265\text{in}^2$$

$$a_B := f \cdot A_B$$

$$a_B = 1.529\text{ft}^2$$

$$A_R := A_T - A_B$$

$$A_R = 13.735\text{in}^2$$

$$a_R := f \cdot A_R$$

$$a_R = 0.052\text{ft}^2$$

$$Q := a_R \cdot \sqrt{\frac{F}{C \cdot \frac{\rho}{2} a_B}}$$

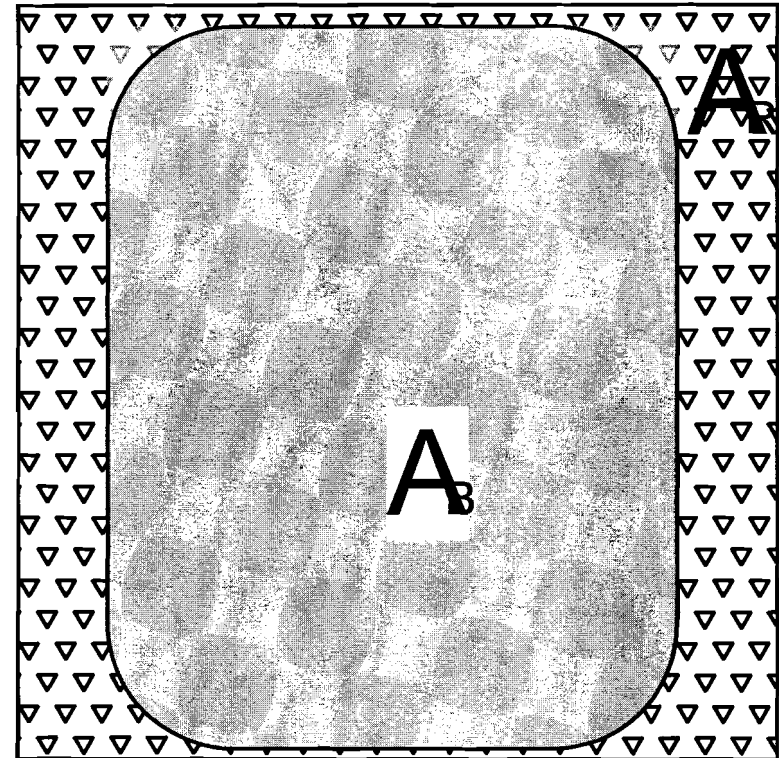
$$Q = 0.326 \frac{\text{ft}^3}{\text{s}}$$

$$Q = 146 \text{ gpm}$$

Unacceptably low flow rating
 for such a large (18 x 23) outlet
 with 55 % open area.

24" x 24" Inch Outlet

- 55% opening
- 22.37" square perforated zone
- Flowing at 1.242 fps
- Rating of 1065gpm
- Using conservative $C=2.1$



3" x 31" Channel with 45% open area

352 gpm

Flow velocity 2.7 fps (subject to hair test)

From the Figure for the 3 x 31 perforated area,

$$A_T := 3 \text{ in} \cdot 31 \text{ in} \quad A_T = 93 \text{ in}^2 \quad A_T = 0.646 \text{ ft}^2 \quad A_B := 76.969 \text{ in}^2 \quad A_R := (16.032) \text{ in}^2$$

For information, the diagonal is $\sqrt{3^2 + 31^2} = 31.145$

$$a_B := f \cdot A_B \quad a_B = 34.636 \text{ in}^2 \quad a_B = 0.241 \text{ ft}^2$$

$$a_R := f \cdot A_R \quad a_R = 7.214 \text{ in}^2 \quad a_R = 0.05 \text{ ft}^2$$

$$a_T := a_B + a_R \quad a_T = 41.85 \text{ in}^2 \quad a_T = 0.291 \text{ ft}^2 \quad (\text{ref only})$$

C := 2.1 dimensionless - from I.E. Idelchik, Handbook of Hydraulic Resistance, 3rdEd, 1994

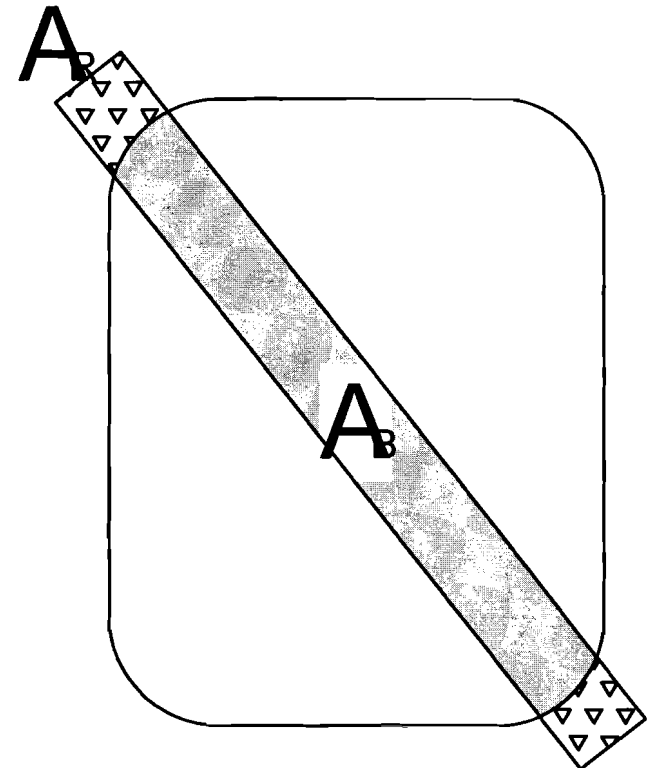
F := 120 lbf $\rho := 1.94 \frac{\text{slug}}{\text{ft}^3}$ Flow Q is to be determined from the formula of Section 2.3.1.2

The result is

$$Q := a_R \cdot \sqrt{\frac{F}{C \cdot \frac{\rho}{2} a_B}} \quad Q = 0.784 \frac{\text{ft}^3}{\text{sec}} \quad \boxed{Q = 351.911 \text{ gpm}}$$

The velocity through the openings in unblocked condition will be $V := \frac{Q}{a_T} \quad V = 2.698 \frac{\text{ft}}{\text{s}}$

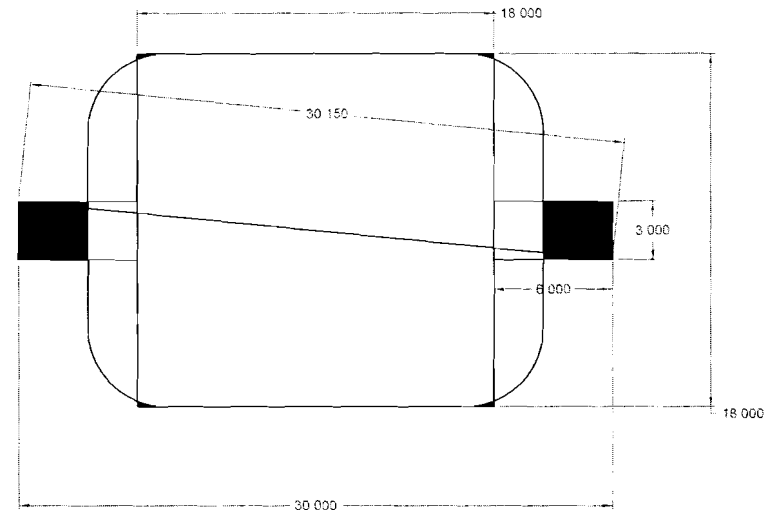
This will be checked by actual hair testing



$$AB = 76.969 \quad AR = 16.032$$

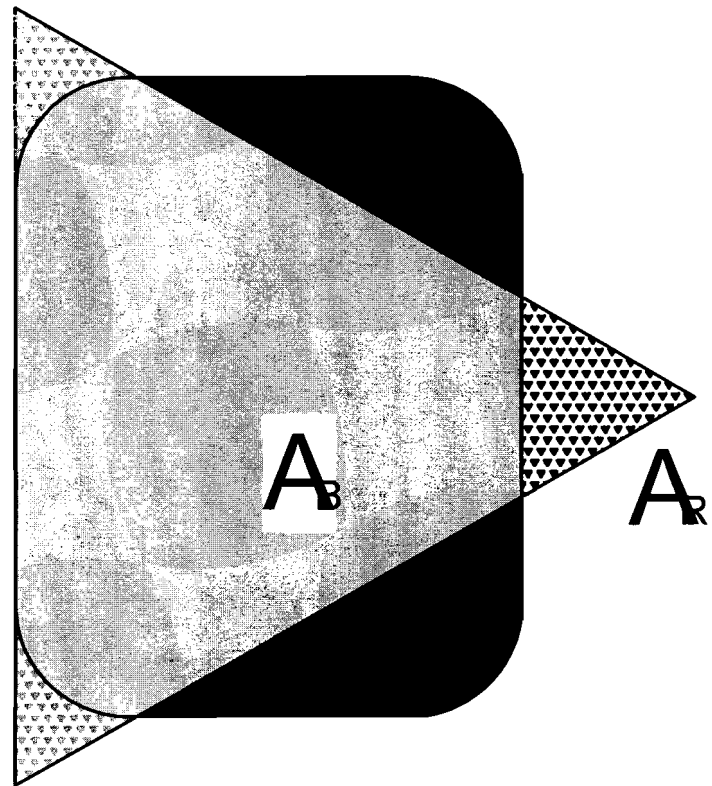
“Converting” 18x18” to 29” diagonal

- Add stub channels to existing 18 x 18 with 55% opening
- Was 833gpm @ 1.5 fps
 - Although this was blockable
- Now only 243gpm
- Operator expects at least same rating
- Holding force at old “expected” flow is 1413 pounds



An interesting Configuration

- An equilateral triangle of side 28"
- Would be incorrectly excluded by a 29" diagonal rule.
- It would have a high flow rating: 495 gpm

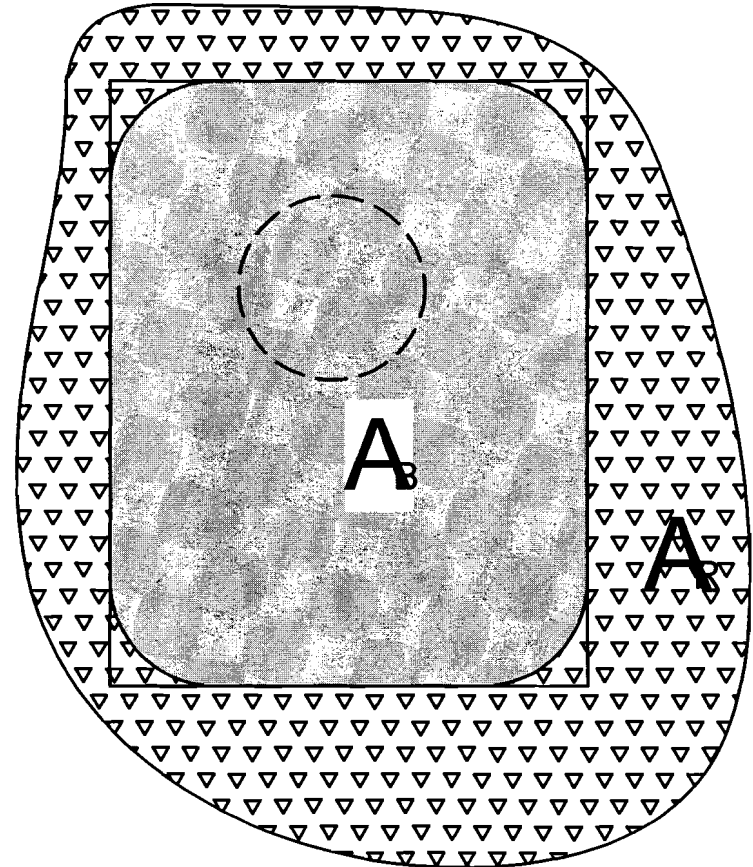


AB-299246

AR-4023

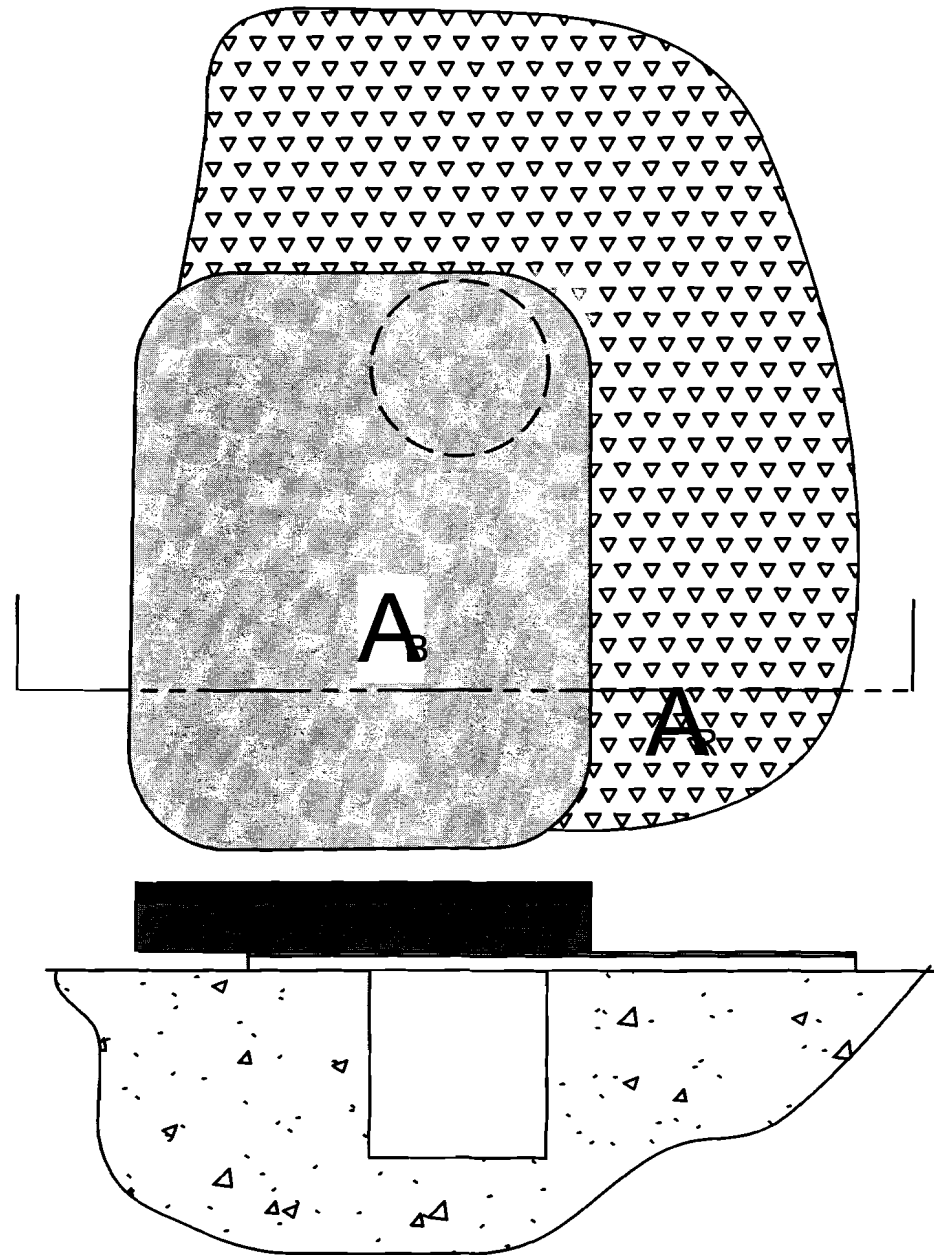
Top-Perforated Cover over smaller sump

- Cover perforated on Top Surface Only
- Test is valid
- Calculation per A112.19.8
 - Not applicable
 - Extra resistance
 - “Remaining” holes close to floor
 - contrary to basis, which assumes direct flow to sump



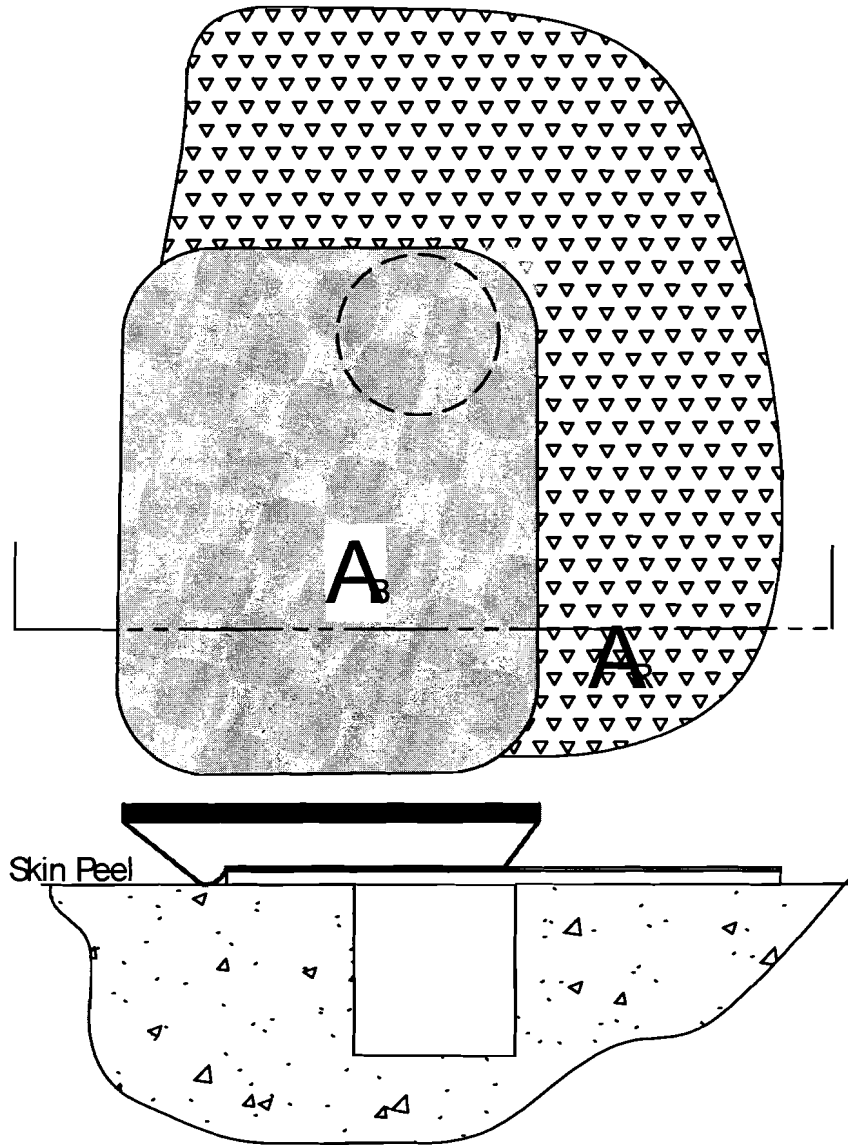
Edge-Only Perforated Cover

- Calculation not applicable
 - Plywood/Foam Element not in contact with holes
 - Different Effect:
Low pressure between element and floor due to
 - Fluid drag
 - Bernoulli's law
- Test not applicable
 - Element behavior



Edge-Only Perforated Cover

- Actual body/skin behaves differently
- Plywood = rib cage
- Skin separates from ribs
- Skin conforms to cover
- Skin peels away



Key Points

- “Unblockable” implies a substantial open “remaining area” to prevent high pressure drop
- A simple diagonal measurement can lead to impractical or dangerous configurations
- A simple diagonal can inadvertently exclude viable designs
- Calculations of ASME A112.19.8 are simple for cover on full size sump
- Calculations not applicable for some complex flow paths or body/cover interface

Myles McMorrow
Poolcenter.com

Stevenson, Todd

From: Google Documents [noreply@google.com] on behalf of myles.mcmorrow@gmail.com
Sent: Wednesday, October 28, 2009 3:47 PM
To: CPSC-OS; myles.mcmorrow@gmail.com
Subject: Virginia Graeme Baker Pool and Spa Safety Act; Draft Technical Guidance on Unblockable Drains
Attachments: To CPSC last draft.doc

Todd Steveson,

I would like to speak at the public hearing , Attached is a copy of my statement

--
Myles McMorrow
Poolcenter.com
Poolnewsfeed

Statement by Myles P. McMorrow

My name is Myles P. McMorrow and I work for Poolcenter.com Inc. We host many pool repair supply sites such as Poolcenter.com,

Poolalarms.com, and Swimmingpoolparts.net. I also do a pool industry Twitter called The Poolnewsfeed which follows swimming

pool news from around the world.

I have unique knowledge on the Virginia Graeme Baker Pool and Spa safety Act and how it affects pools and the people that use them

nationwide. The company I work for sells 90% of the VGB-compliant products on the market. It is my responsibility to help people find the

right product to comply with the VGB Act. I have collaborated with John Gable of Pool Safety Consultants of Michigan LLC, a firm that

manufactures and retrofits custom drain covers to meet ASME/ANSI A112.19.8

In reference to the wording of a document entitled “July 2009 CPSC Staff Draft Technical Guidance on Unblockable Drains”

The wording is too technical and vague for the average pool operator or someone

who has not worked around pools. . We propose that you draft a 3 point complying statement for “unblockable drains”

Such as :

To be compliant as an “unblockable drain”, the drain must meet the following criterias:

ASME/ANSI A112.19.8 states: “it requires drain covers to be tested and approved for body entrapment, limb entrapment, finger entrapment, hair entrapment (entanglement) and evisceration/disembowelment. Existing drain covers may meet all of these provisions but they were not tested thus the manufacturers of these covers will not retroactively certify them”

Many people think with the way that the July draft is worded now, it is one, or the other; but not all of it. From reading of the law all

covers must meet the ASME/ANSI testing standards to be compliant.

My final comment : There is no such thing as an “unblockable drain” as seen in the September 2009 entrapment of a man in a hot

tub with 3 compliant covers in Seal Beach CA. People always will come up with a way to get injured on any product. You might

consider changing that term “Unblockable drains” to “Entrapment resistant” so that you and manufactures of these products will not be

involved in any legal liability as to the standards you are enforcing.

On my behalf and the behalf of John Gable, Thank you for the opportunity to provide input on this important matter.

10/28/2009
McMorrow

Myles P.

Todd A. Stevenson
Office of the Secretary
U.S.C.P.S.P.

Unblockable Drain Guidance

I am pleased that the commission intends to add "fasteners and fastener integrity" to the guidelines. I believe that the commission should hold off on issuing final guidelines until the standards writing committee(s) can address the following hazards.

The size of the current referenced blocking element, 18"x23" or a diagonal measurement of greater than 29", is too small. We have seen that a channel drain that is consistent with these dimensions has proven hazardous. The addition of the language "the need for the remaining open flow area of the cover, once shadowed, to provide sufficient flow to prevent entrapment", actually creates an unintended problem. The registered testing laboratories are not set up to test at the flows available to VERY large suction outlets (6'x6').

I suggest that the standards writing committee define two categories of Unblockable Drains. The first category for covers with an open area and diagonal dimension greater than X. This would apply to the huge water park outlets that even when shadowed by the human body could cause no entrapping hazard. These should be certified by a PE, taking into account all five entrapment hazards, structural and fastening integrity, with X to be determined by the committee.

A second category for covers smaller than X that can be tested and certified by a recognized testing laboratory to the same criteria. This specific testing language needs to be added to the current standard(s) ASME/ANSI A112.19.8 or IAPMO/APSP 16. When the drain is being shadowed, it should be done with a rubber mat cut to the size of the human torso. The current foam blocking element does not replicate human skin. Attempts have been made to use simulated skin, but the simulated skin does not hold up to repeated testing. Until a suitable material can be found for the existing blocking element, the rubber mat test is much more realistic. The committee can draft the specifications for the blocking mat.

This two category approach would relieve the unintended burden currently on the large commercial facilities while ensuring that smaller covers are truly unblockable as defined by the Act.

Thank You

David Stingl
Stingl Products

Stevenson, Todd

From: Jager100@aol.com
Sent: Tuesday, October 27, 2009 2:43 PM
To: CPSC-OS
Cc: Jager100@aol.com
Subject: Unblockable Drain Guidance
Attachments: StinglCommentsREV.doc

Mr. Stevenson,

Please see my comments attached.

Thank You,

David Stingl
Stingl Products

Stevenson, Todd

From: jager100@aol.com
Sent: Wednesday, October 28, 2009 8:47 AM
To: CPSC-OS
Subject: Re: Unblockable Drain Guidance

Yes
Thanks
David

Sent via BlackBerry by AT&T

From: CPSC-OS <CPSC-OS@cpsc.gov>
Date: Wed, 28 Oct 2009 08:45:59 -0400
To: Jager100@aol.com<Jager100@aol.com>
Subject: RE: Unblockable Drain Guidance

Are you intending to make an oral presentation

Todd Stevenson
Director, Office of the Secretary
Division of Information Management
Office of Information Technology Services
US Consumer Product Safety Commission
(301) 504-6836, Fax (301) 504-0127

From: Jager100@aol.com [mailto:Jager100@aol.com]
Sent: Tuesday, October 27, 2009 2:43 PM
To: CPSC-OS
Cc: Jager100@aol.com
Subject: Unblockable Drain Guidance

Mr. Stevenson,

Please see my comments attached.

Thank You,

David Stingl
Stingl Products

*****!!! Unless otherwise stated, any views or opinions expressed in this e-mail (and any attachments) are solely those of the author and do not necessarily represent those of the U.S. Consumer Product Safety Commission. Copies of product recall and product safety information can be sent to you automatically via Internet e-mail, as they are released by CPSC. To subscribe or unsubscribe to this service go to the following web page: <https://www.cpsc.gov/cpsclist.aspx> *****!!!

Paul Pennington
Pool Safety Council

Pool Safety Council



Pool Safety Council
P.O. Box 34100
Washington, DC 20043

October 26, 2009

Todd Stevenson
Office of the Secretary
U.S. Consumer Product Safety Commission
4330 East West Highway
Suite 502
Bethesda, MD 20814

Email to cpsc-os@cpsc.gov

RE: CPSC Proposed Amendment to July 2009 Staff Guidance on Unblockable Drains

Dear Mr. Stevenson,

The Pool Safety Council is writing in support of the Consumer Product Safety Commission's (CPSC) proposed amendment to the July 2009 Staff Draft Guidance on Unblockable Drains as found in Federal Register (Vol. 74, No. 202).

In prior correspondence that we submitted as part of public comment on August 4, 2009, we raised the fact that the definition of an unblockable drain must be narrowly construed. As we said:

Current Staff Attempts to Provide a Precise Measurement for what Constitutes an "unblockable drain" are arbitrary and erroneous.

Beside the definition quoted above, VGB offers no further guidance as to exactly what constitutes an unblockable drain. Surely, however, Congress intended this to be a very narrow exception to the layers of protection requirements of the bill. One example most frequently discussed during PSC's meetings with staff and members during VGB's Congressional consideration were the extremely large drains covered by grates on very large public pools where the grate was substantially larger than one human body. The belief was that such large surfaces could not conceivably pose an entrapment problem. The staff's current effort to define "unblockable" by using a measurement of 18" by 23" is troubling as it does not take into account the back of an adult male's arms in addition to his back. Together that could certainly constitute a surface larger than 18" by 23" and thus would enhance the chances of entrapment.

PSC strongly disputes the Guidance that a surface of 18" by 23" renders a drain unblockable. A much stricter standard should be required to categorize any drain as "unblockable."

1.800.970.8420

P.O. Box 34100, Washington, D.C. 20043

www.PoolSafetyCouncil.org

We believe the CPSC has taken these comments seriously and we applaud the Commission's new rulemaking. This is evident in the language that was proposed and how it reflects the intent of the Virginia Graeme Baker Pool and Spa Safety Act (Pub. L 110-140, 121 Stat. 1794 ("VGB")). The language as proposed amends the guidance to include the following sentence: "In reaching this definition for an unblockable drain, the characterization of a suction fitting is taken from the standard to include the sump and cover as a unit, along with the following: (1) The blocking element dimensions and the diagonal measure to define a minimum size requirement (in excess of 18" x 23" or a diagonal measurement greater than 29"); (2) the need for the remaining open flow area of the cover, once shadowed, to provide sufficient flow to prevent entrapment; and (3) the general requirements of the standard for fasteners and fastening integrity (i.e., the cover must stay in place)."

It should be noted that we continue to oppose the use of a so called unblockable drain cover to make a drain unblockable. Our previous comments have addressed this issue (see attached).

Conclusion

It can not be repeated too often that the foundation policy of VGB is the layers of protection discussed repeatedly in the statute. A drain cover conforming to ASME/ANSI performance standard is required for every public pool. In addition, each public pool with a single main drain, other than an unblockable drain, is also required to have a suitable anti-entrapment device.

The policy must be to limit the definition of "unblockable drain" narrowly to avoid creating a loophole larger than the mandate of the statute. The proposed new language does this very well and preserves the congressional "layers of protection" mandate.

Additional costs to public pools to install anti-entrapment devices are small compared to the loss of a human life, which is incalculable.

We appreciate the CPSC's proposed amendment and look forward to discussing at the public hearing on November 4, 2009.

Sincerely,



Danielle Kazmier
Executive Director
Pool Safety Council

1.800.970.8420

P.O. Box 34100, Washington, D.C. 20043

www.PoolSafetyCouncil.org

Pool Safety Council



Pool Safety Council
P.O. Box 34100
Washington, DC 20043

August 4, 2009

Todd Stevenson
Office of the Secretary
U.S. Consumer Product Safety Commission
4330 East West Highway
Suite 502
Bethesda, MD 20814

Email to cpsc-os@cpsc.gov

RE: Unblockable Drains Guidance

Dear Mr. Stevenson,

The Pool Safety Council (PSC) is pleased to have the opportunity to offer comments on the July 2009 CPSC Staff Draft Technical Guidance on Unblockable Drains ("Guidance"). As one of the main forces behind enactment of the Virginia Graeme Baker Pool and Spa Safety Act ("VGB"), our members are anxious that VGB be used to the maximum extent possible to enhance pool safety and reduce the incidents of entrapment drownings across America.

The philosophy behind passage of VGB is simple. All pools will be far safer if equipped with just a few safety devices including a proper drain cover and an anti entrapment device that instantly interrupts pump suction during an entrapment emergency. In other words, all pools should have these "layers of protection" specifically enumerated in the bill.

VGB thus requires all PUBLIC pools with a single main drain to be equipped with a conforming drain cover and an approved anti entrapment device within one year of passage of VGB. That year has come and gone and while many public pools are in compliance with VGB, other public pools still do not contain the safety devices mandated by the bill. They still lack the layers of protection necessary to make those pools safe.

Among the single main drain public pools exempted from the layers of protection requirement were public pools with so called "unblockable drains." VGB defines an unblockable drain as "a drain of any size and shape that a human body cannot sufficiently block to create a suction entrapment hazard." Such a drain cannot by definition create a suction force sufficient to entrap a swimmer and hence poses no threat to public safety.

I. Current Staff Attempts to Provide a Precise Measurement for what Constitutes an “unblockable drain” are arbitrary and erroneous.

Beside the definition quoted above, VGB offers no further guidance as to exactly what constitutes an unblockable drain. Surely, however, Congress intended this to be a very narrow exception to the layers of protection requirements of the bill. One example most frequently discussed during PSC’s meetings with staff and members during VGB’s Congressional consideration were the extremely large drains covered by grates on very large public pools where the grate was substantially larger than one human body. The belief was that such large surfaces could not conceivably pose an entrapment problem. The staff’s current effort to define “unblockable” by using a measurement of 18” by 23” is troubling as it does not take into account the back of an adult male’s arms in addition to his back. Together that could certainly constitute a surface larger than 18” by 23” and thus would enhance the chances of entrapment.

PSC strongly disputes the Guidance that a surface of 18” by 23” renders a drain unblockable. A much stricter standard should be required to categorize any drain as “unblockable.”

II. Contrary to the Guidance, there is no such thing as an “unblockable drain cover.”

VGB offers a definition of “unblockable drain.” It also offers guidance for which drain covers conform to the requirements of VGB. There is no definition, however, of “unblockable drain cover,” nor is such a term discussed at all in the legislation. This is because the hazard is with the drain itself, not the cover. The cover is designed to mitigate the dangers of the drain, but it cannot change the nature of the drain itself.

CPSC’s investigation into the February 26, 2009 entrapment of Tim McIntyre confirms this point as the bather was entrapped in a spa fitted with an unblockable drain cover.

Hence, PSC strongly disagrees with anything in the Guidance that purports to define a term that does not appear anywhere in the VGB legislation.

III. No drain cover can change a single main drain into an “unblockable drain.”

PSC strongly disagrees with the Guidance that a drain smaller than 18” by 23” can be made “unblockable” and hence exempt from the layers of protection merely by attaching a larger drain cover measuring 18” by 23”. As discussed above, such a view confuses a “drain” with a “drain cover.”

Second, the Guidance cannot account for the fact that an “unblockable drain cover” almost certainly will become detached, a frequent problem with low maintenance public pools. The Guidance suggests that the pool would then be out of compliance with VGB but then there would be no anti entrapment device available to insure swimmer safety. Such a situation defies common sense and surely represents a tortured construction of the statute.

Finally, and most important, such an interpretation would create a loophole larger than the rule itself. If all single drain pools could be brought into conformity merely by attaching a larger drain cover, the whole "layers of protection" philosophy would be rendered null and void. Surely Congress did not intend a result that would allow public pools to avoid one of the layers of protection merely by installing a slightly larger drain cover.

IV. This question has been reviewed previously.

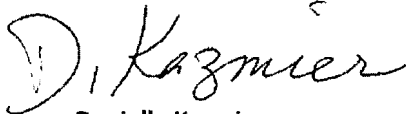
In September, 2008, we understand that the Commission staff looked at a drain cover that was being marketed as a device that could transform a drain into an unblockable drain and thus satisfy all requirements of VGB. After review, we were advised that staff concluded that the drain cover itself did not obviate the need for the other layers of protection.

It is critical that CPSC continue to form their own judgments on these key safety issues and not be unduly influenced by arbitrary standards (such as APSP-7) adopted by private trade groups that may not be sufficient to carry out the purposes of VGB.

Conclusion

The VGB policy of requiring virtually all public pools with a single main drain to have multiple layers of protection, including a conforming drain cover and an anti entrapment device, is good public policy. To dilute these protections in any way is to compromise public safety and exposes young swimmers to unnecessary risk.

Sincerely,

A handwritten signature in cursive script that reads "Danielle Kazmier". The signature is written in black ink and is positioned to the left of the typed name.

Danielle Kazmier
Executive Director
Pool Safety Council

CC: Alan Korn, Safe Kids

Stevenson, Todd

From: danielle@poolsafetycouncil.org
Sent: Monday, October 26, 2009 4:28 PM
To: CPSC-OS
Subject: CPSC - Unblockable Drain Guidance & Hearing
Attachments: PSC Letter on Unblockable Drains.pdf; 8.4.09 CPSC Draft Technical Guidance on Unblockable Drains.pdf

Importance: High

Dear Mr. Stevenson,

Attached please find the Pool Safety Council's letter regarding the proposed amendment to the July 2009 Staff Draft Guidance on Unblockable Drains as found in Federal Register (Vol. 74, No. 202). We've also attached the prior correspondence the we submitted as part or public comment on August 4, 2009.

We look forward to discussing this issue further at the public hearing on November 4, 2009. **Paul Pennington, founding member of the Pool Safety Council, will be attending the hearing in person to deliver comments on behalf of the Council.**

Sincerely,

Danielle Kazmier
Executive Director
Pool Safety Council

Matthew Whalen
Intex Recreation Corp.

Stevenson, Todd

From: Matthew Whalen [mwhalen@intexcorp.com]
Sent: Tuesday, October 27, 2009 5:46 PM
To: CPSC-OS
Cc: Zoran Madzar
Subject: Unblockable Drain Guidance
Attachments: Unblockable drain rule hearing presentation-Intex Recreation.doc

Todd A. Stevenson
Office of the Secretary
Consumer Product Safety Commission
4330 East-West Highway
Bethesda, Maryland 20814

Dear Mr. Stevenson,

I hereby request an opportunity to make an oral presentation at the public hearing regarding the draft guidance for industry entitled "July Staff Draft Technical Guidance on Unblockable Drains". Attached please find the text of my intended remarks.

I look forward to your reply as soon as possible so that I can arrange my travel.

Best regards,

Matthew (Chip) Whalen
Director of Risk Management
Intex Recreation Corp.
(310) 549-5400 ext 229

My name is Matthew Whalen and I represent Intex Recreation Corp of Long Beach California. Intex is the largest distributor of portable soft sided above ground swimming pools in the United States. We distribute primarily two constructions of soft sided pools: the self rising frameless pool and the metal frame pool. The self rising pool has no independent structure and maintains stability by virtue of its shape. The metal frame pool utilizes a steel tubing structure to maintain stability. I have brought a miniature sample of each style so that the members and audience can better understand the types of pools that I intend to discuss.

The ASME A112.19.8-2007 standard defines unblockable drain as a drain of any size and shape that the torso representation cannot sufficiently block to create a suction hazard. This is tested by labs by measuring the force needed to remove a torso representation from a drain shadowed by it. It seems clear that the standard allowed any size and shape simply because it is unreasonable to limit the design as there are numerous ways of achieving the desired results of "unblockability". Since the test criteria measures actual performance that is defined and verifiable, why attempt to prescribe dimensions or designs that limit the available approaches and designs that accomplish a satisfactory performance result, when those dimensions or designs may not be practical for certain pools such as above ground pools?

The suction fittings you see on my miniature samples are currently certified to the ASME standard as unblockable suction fittings. To use a suction fitting for this style of pool that measures in excess of 18" x 23" (or a diagonal measurement greater than 29") would be overly burdensome, expensive, and not accomplish anything more than the currently certified fitting that we use. Furthermore, a fitting of that size cannot be practically assembled onto a soft-sided AGP, as cutting a hole of that size into the side-wall would distort the shape and likely affect the pool's structural stability, making this approach entirely unfeasible for these kinds of pools.

The ASME A112.19.8-2007 standard includes specific performance tests for the suction fitting as well as fastener requirements that include minimum engagement, minimum grade of stainless material, cycle testing, etc. Accordingly, fasteners do not need to be redefined within the CPSC guidelines. The Act references all requirements of the standard therefore automatically covering the fastener requirements therein. If further fastener details are found to be appropriate, they should be incorporated within the standard itself. In addition, any fastener requirements must be flexible enough to encompass portable soft sided above ground pools without excluding these very popular types of pools.

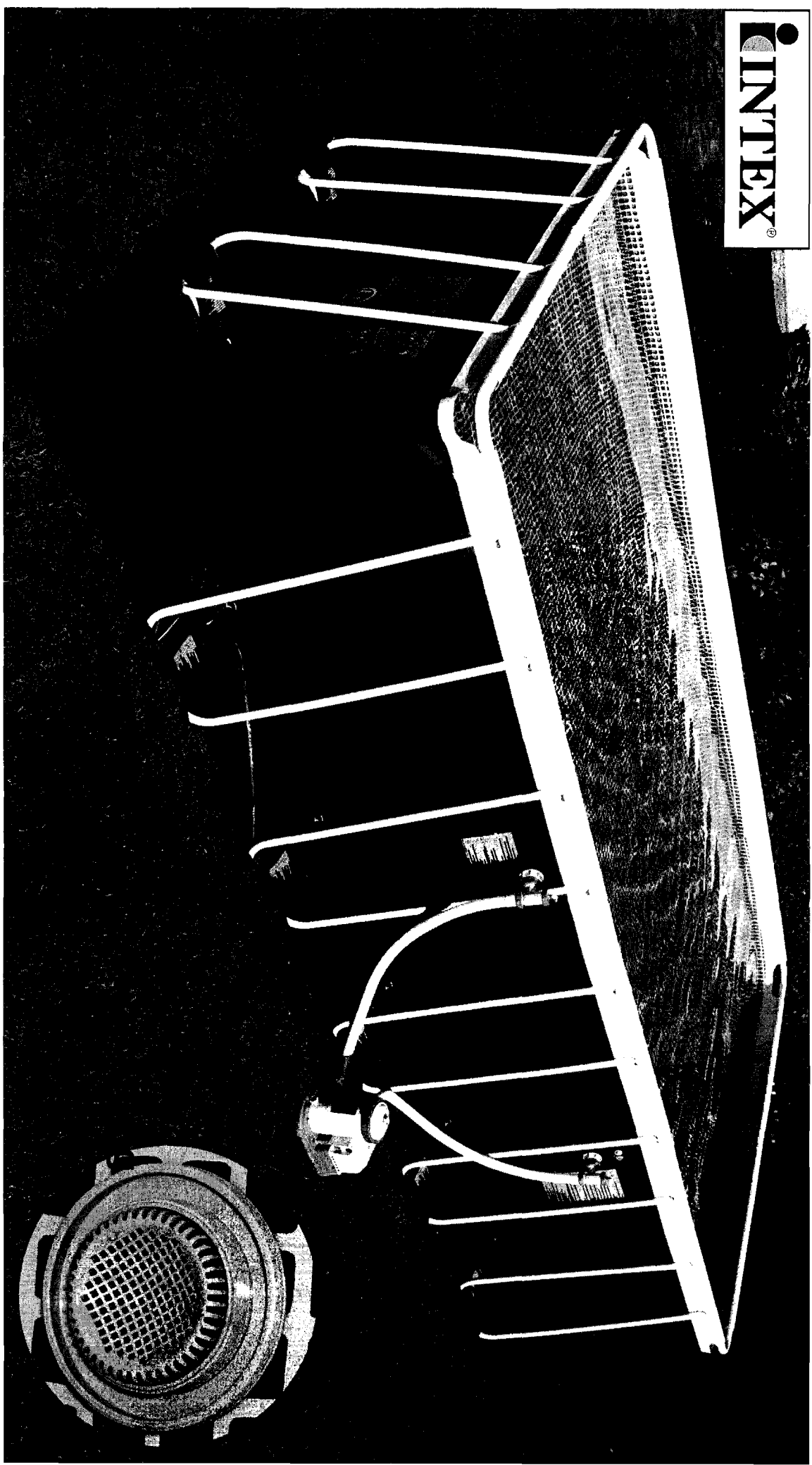
Sumps are often referenced as a part of the complete suction outlet; however sumps are not always present in all designs. Portable above ground pools by virtue of their design do not incorporate a sump.

The VGB Act is extremely broad and was created to address high volume/power suction hazards relating to permanent in-ground pools, public pools, and spas. Above ground pools, such as those manufactured by Intex, do not create such power suction hazards. Just to provide a visual: some tests have shown that torso representation pressed against the fitting on an Intex pool barely even sticks to the fitting and practically falls away by itself, without measurable force necessary to remove it. It would therefore seem reasonable to differentiate low power and low volume circulation systems from those powerful

enough to actually present any suction related hazard. For this reason, it is very important that the portable pool category be considered in clearly defining the scope of the rule. We would like to propose that a separate rule be adopted to address the unique needs and designs of portable soft sided pools.

Thank you.

PINTEX®



Stevenson, Todd

From: Reilly, Kathleen
Sent: Tuesday, October 27, 2009 10:44 AM
To: Stevenson, Todd; Whitfield, Troy
Subject: FW: VGB Pool and Spa Safety Act Inspection Update

Fyi, A comment on unblockable drains.

From: Ron Schroader [mailto:ron@drainsafe.com]
Sent: Monday, October 26, 2009 3:46 PM
To: News from CPSC
Cc: Wolfson, Scott
Subject: Re: VGB Pool and Spa Safety Act Inspection Update

October 26, 2009

Office of the Secretary
U.S. Consumer Product Safety Commission
Attn: Mr. Todd A. Stevenson
4330 East West Highway, Suite 502
Bethesda, MD 20814-4408

Re: Virginia Graeme Baker Pool and Spa Safety Act
Technical Guidance on Unblockable Drains

Dear Mr. Stevenson:

The Virginia Graeme Baker Pool and Spa Safety Act defines an "Unblockable Drain" as a drain of any size and shape that a human body cannot sufficiently block to create a suction entrapment hazard. The Act makes clear that the intent of the legislation is to provide layers of protection against suction outlet entrapment. The VGB Act was written to protect bathers, especially children who are most vulnerable, from the life threatening suction outlet cover velocities and suction forces created by a circulation pump. Hair entrapment occurs when water velocities in and through the suction outlet cover are excessive resulting in high turbulence. Body and limb entrapment are most problematic when a suction outlet or drain cover is missing or broken. The following is the text I wish to deliver, in person to the CPSC Committee on the 4th of November, with your permission.

The ASME/IAPMO/APSP definition of an Unblockable Drain is presently under review, but the latest description of an Unblockable Drain is "a suction outlet that cannot be shadowed by the area of an 18"x 23" Body Blocking element and that the rated flow through the remaining open area of the cover cannot create a hazardous suction force." CPSC's June 16, 2009 position memorandum on the subject of "Unblockable Drains" also references a similar definition of an unblockable drain as follows: "outlet cover measurements in excess of 18"x 23" (or a diagonal measurement greater than 29") would provide a means to render the outlet 'unblockable' and subsequently, the sumps below (drains) would be inaccessible and unblockable providing the outlet cover remains in place."

I agree with CPSC's recent statement, following public comment, that an unblockable drain includes the sump and cover as a unit. I do not agree with the 18" x 23" unblockable drain dimensions proposed by CPSC. Further, there must be a clear understanding of adequate sump design to mate with an unblockable drain cover.

Recent suction entrapment events have shown that a 3" x 31" size channel drain with a diagonal dimension of over 31" can be blocked by an individual of average stature. The Seal Beach, California incident clearly showed how Tim McIntyre, a man of average height and build, was able to entrap himself on a VGB approved channel drain. Other entrapment events have shown how individuals can be stuck to a suction outlet cover where the body torso and the arms were involved in making an entrapping seal on a suction outlet. Any unblockable drain definition based solely on body torso dimensions, with no arm dimensions included, is deficient in terms of protecting bather safety. The 18" x 23" body torso dimensions are inadequate in size. The greater than 29" diagonal measurement is an inadequate dimension.

The unblockable drain must be sized to insure that when it is overshadowed by a bather, the remaining open area of the cover must be large enough to prevent a hazardous entrapping condition. This includes the possibility of hair entrapment as well as body or limb entrapment. These requirements for bather safety would necessitate an unblockable drain cover with dimensions of 36" x 48", as opposed to the 18"x 23" size previously stated by CPSC. This larger cover size results in a diagonal dimension in excess of 60" as opposed to the 29" proposed by CPSC.

No fastening system is invulnerable to failure. An unblockable suction outlet cover can come loose, become broken or it can be ripped away by a bather. This reality demands that for single suction outlet applications, the underlying sump also must be designed to protect against entrapment. Given the intent to provide layers of protection against suction outlet entrapment, it is not plausible to conclude that the VGB Act intended to equate a single unblockable drain cover with a single unblockable drain. Should the unblockable drain cover become missing or broken, the sump underneath the cover must be designed to protect against suction entrapment. If not, and the sump underneath poses an entrapment threat, ***there must be an additional layer of bather protection.***

It is my conclusion that the VGB Act and its interpretation should err on the side of safety. A single unblockable drain cover should not be permitted to classify a blockable single drain sump as an unblockable drain. The term unblockable drain in the Act should be interpreted to mean the combination of the cover and the sump, and both must be designed to guard against suction entrapment.

Ron Schroader, Vice President
New Water Solutions, Inc.

----- Original Message -----

From: [News from CPSC](#)

To: [Ron](#)

Cc: [Margolies, Philip](#)

Sent: Thursday, October 22, 2009 10:15 AM

Subject: VGB Pool and Spa Safety Act Inspection Update

To the pool and spa safety community:

The following message was sent recently but an electronic glitch prevented it from being delivered to most listserv members. I am sorry if you are receiving this for the second time. Thank you for your patience.

CPSC will conduct a public hearing to receive views from interested parties on the Virginia Graeme Baker Pool & Spa Safety Act July 2009 Staff Technical Guidance on Unblockable Drains (see: <http://www.poolsafety.gov/unblockdrain.pdf>). The Commission invites public participation in the hearing. Oral presentations should be limited to ten minutes and will become part of the public record. See the following page for details: <http://www.cpsc.gov/about/cpsia/unblockable.pdf>.

Requests to make oral presentations and the written text of the oral presentations must be received by the Office of the Secretary no later than 5 p.m. ET on October 28, 2009. The hearing will begin at 9 a.m. on November 4, 2009.

**Sincerely,
Kathleen Reilly
Public Affairs Specialist
U.S. Consumer Product Safety Commission**

You are currently subscribed to the email list "poolsa" as: ron@drainsafe.com

To unsubscribe, send a blank email to leave-1120204-400075.bb56293d89153f4a6e24739e108f0186@list.cpsc.gov

You can find more information on the Virginia Graeme Baker Pool and Spa Safety Act on our Web site at <http://www.poolsafety.gov>

'CPSC 2.0' Launches Product Safety Agency into Social Media -- Learn more at <http://www.cpsc.gov/cpsc/pub/prere1/prhtml09/09346.html>

- * Visit our new blog, OnSafety at www.cpsc.gov/onsafety
- * See our videos on YouTube at <http://www.youtube.com/uscpsc>
- * Follow us on Twitter at <http://twitter.com/OnSafety>
- * See our photos on Flickr at <http://www.flickr.com/photos/uscpsc>

This message is from the U.S. Consumer Product Safety Commission, an independent federal regulatory agency, located at 4330 East West Highway, Bethesda, MD 20814 Toll-free hotline: (800) 638-2772.

Thank you.

Stevenson, Todd

From: Ron Schroader [ron@drainsafe.com]
Sent: Wednesday, October 28, 2009 12:03 PM
To: Stevenson, Todd
Subject: Re: VGB Pool and Spa Safety Act Inspection Update

Mr. Stevenson,

Yes sir, if at all possible. I represent a rather large group(s) of safety professionals who all agree with my presentation.

I would appreciate the opportunity to voice our opinion on this very important subject.

Thank you,

Thank you for promoting child (main drain/suction outlet) entrapment avoidance,

Ron Schroader

Aquatic Safety Consultant

New Water Solutions, Inc.

561-309-1333 cellular

----- Original Message -----

From: Stevenson, Todd
To: ron@drainsafe.com
Sent: Wednesday, October 28, 2009 9:17 AM
Subject: FW: VGB Pool and Spa Safety Act Inspection Update

Were you planning to make this an oral presentation?

Todd Stevenson
Director, Office of the Secretary
Division of Information Management
Office of Information Technology Services
US Consumer Product Safety Commission
(301) 504-6836, Fax (301) 504-0127

From: Reilly, Kathleen
Sent: Tuesday, October 27, 2009 10:44 AM
To: Stevenson, Todd; Whitfield, Troy
Subject: FW: VGB Pool and Spa Safety Act Inspection Update

Fyi, A comment on unblockable drains.

From: Ron Schroader [mailto:ron@drainsafe.com]
Sent: Monday, October 26, 2009 3:46 PM
To: News from CPSC
Cc: Wolfson, Scott
Subject: Re: VGB Pool and Spa Safety Act Inspection Update

October 26, 2009

Office of the Secretary
U.S. Consumer Product Safety Commission
Attn: Mr. Todd A. Stevenson
4330 East West Highway, Suite 502
Bethesda, MD 20814-4408

Stevenson, Todd

From: Leif Zars [leif@garypools.com]
Sent: Tuesday, October 27, 2009 4:18 PM
To: CPSC-OS
Subject: Unblockable Drain Guidance
Attachments: AR-M450_20091026_155530.pdf

Mr. Stevenson:

Please accept this email as my formal request to speak at the public hearing regarding Unblockable Drains. I have attached the written version of my presentation. One cannot condense years of experience and knowledge into ten minutes, therefore I will be distributing copies of the attached literature of which I plan to high-light during my oral presentation. If possible I would appreciate access to a computer and a screen to show several jpeg images (loaded onto a flash drive) to the attendees.

Most Sincerely,

Leif Zars
Project Team Leader _
ASME/ANSI A112.19.8-2007
Chairman _
APSP/IAPMO-16

INTERPRETATION VERBIAGE

The ASME A112.19.8 Project Team as well as the APSP/IAPMO-16 Committee would sincerely appreciate the opportunity to work with the CPSC in their much appreciated efforts to clarify the understanding of this most important Standard. For example we have the following:

July 2009 CPSC Staff Draft Technical Guidance on Unblockable Drains' (Examples of statements causing confusion)

"In addition, the drain cover must measure in excess of 18" x 23" or have a diagonal measurement greater than 29".

WRONG - NO DIAGONAL, AND DIMENSION NEEDS 4" RADUISED CORNERS

"Staff has determined that when a drain cover with these specifications is in place, a human body cannot sufficiently block it to create a suction entrapment hazard."

WRONG - REMAINING OPEN AREA MUST BE REQUIRED (even though you mention this later)

"If the drain cover is removed or broken, the drain is no longer an 'unblockable drain'"

HALF RIGHT - THE POOL MUST BE CLOSED

"the pool or spa would thus be out of compliance, both because it lacks an ASME/ANSI A112.19.8 compliant drain cover and because it lacks a second anti-entrapment system."

**NO - A SECOND ANTI-ENTRAPMENT SYSTEM IS NO GUARANTEE TO SAVE A BATHER
THE POOL MUST BE CLOSED**

AND THEN IN ANOTHER DOCUMENT

DRAIN IN SLIDE RUNOUT QUESTION
(Difficult to interpret.)

"If a waterslide ends in a pool that a user will need to wade through or swim in, it falls within the definition of pool in the Act. If the slide ends on a deck with minimal runoff water, it is not a pool, and the Act is not applicable."

A SIMPLER RESPONSE COULD BE

" If there is a suction outlet accessible to bathers it must meet ASME A112.19.8." This removes the question of what is "minimal runoff water".

Unfortunately, legal language sometimes comes in the way of a direct answer, that is why I feel we would always like to be involved in providing CPSC with recommended wording for clarifications, and then CPSC can add the necessary legal portions.

Respectfully,

Leif Zars
Project Team Leader
ASME A112.19.8

Chairman
APSP/IAPMO-16

October 25, 2009

IN THE CPSC SURVEY

IT WAS SAID

"This interpretation allows for large covers (greater than 29") to be installed onto small diameter sumps. There is no testing for this in the current ASME A112.19.8 standard."

NOT CORRECT

5.1.2.1 Body Entrapment Test shall apply to all fittings and suction outlets covered under this Standard. For manufactured fittings only one new fitting shall be required to be tested.

"Should the unblockable drain cover become missing or broken, the sump underneath the cover must also be an unblockable sump. - - there must be an additional layer of bather protection."

SEE UTSA DRAIN SUMMARY

(2nd layer of very limited value and the design of an unprotected commercial drain sump highly complex and cost prohibitive. The cover must stay in place. Also see energy in a 10" pipe - attached.)

"These covers are installed on uneven pool (plaster) surfaces and will be easily broken or removed by pre-teen and teenage bathers."

SEE ATTACHED PHOTOS OF TEXT RESULTS TO 1,500 POUND PULL
(Covers can and must be made to stay in place.)

"A dangerous drain outlet cannot be made fully safe by only using an antientrapment drain cover. The Act, in our view and by its plain language, does not allow for an exemption to the requirement for a second layer of protection simply by using an "unblockable drain cover" of certain larger dimensions over an otherwise hazardous single drain outlet."

ALL DRAIN SUMPS - LARGE AND SMALL - ARE DANGEROUS AND MUST BE PROTECTED
(Covers can and must be made to stay in place - I really can see no other practical solution. My Committee will be reviewing the fastener section in this regard.)

I agree with the proposed wording below:

"Unblockable Drain: A suction outlet such that its perforated(open) area cannot be shadowed by the area of the 18x23 Body Blocking Element of ANSI/ASME A112.19.8-2008a and that the rated flow through the remaining open area cannot create a suction force in excess of the values in Table 1 of that Standard. For manufactured products, this is calculated or verified by laboratory testing in accordance with the Standard. For field- built outlets, this is calculated in accordance with Section 2.3.1.2 of the Standard."

Leif Zars
Chairman
APSP/IAPMO-16
10-25-09

UTSA SUCTION DRAINS - CURRENT STATE OF THE ART

TYPICAL OF COMMERCIAL POOL SUCTION OUTLETS. LARGE SUMPS, NUMEROUS LARGE PIPE PENETRATIONS, HIGH GPM, SECURE APPROVED COVERS AN ABSOLUTE NECESSITY.

SVRS 2ND LAYER OF LIMITED VALUE:

EVISGERATION - NO VALUE

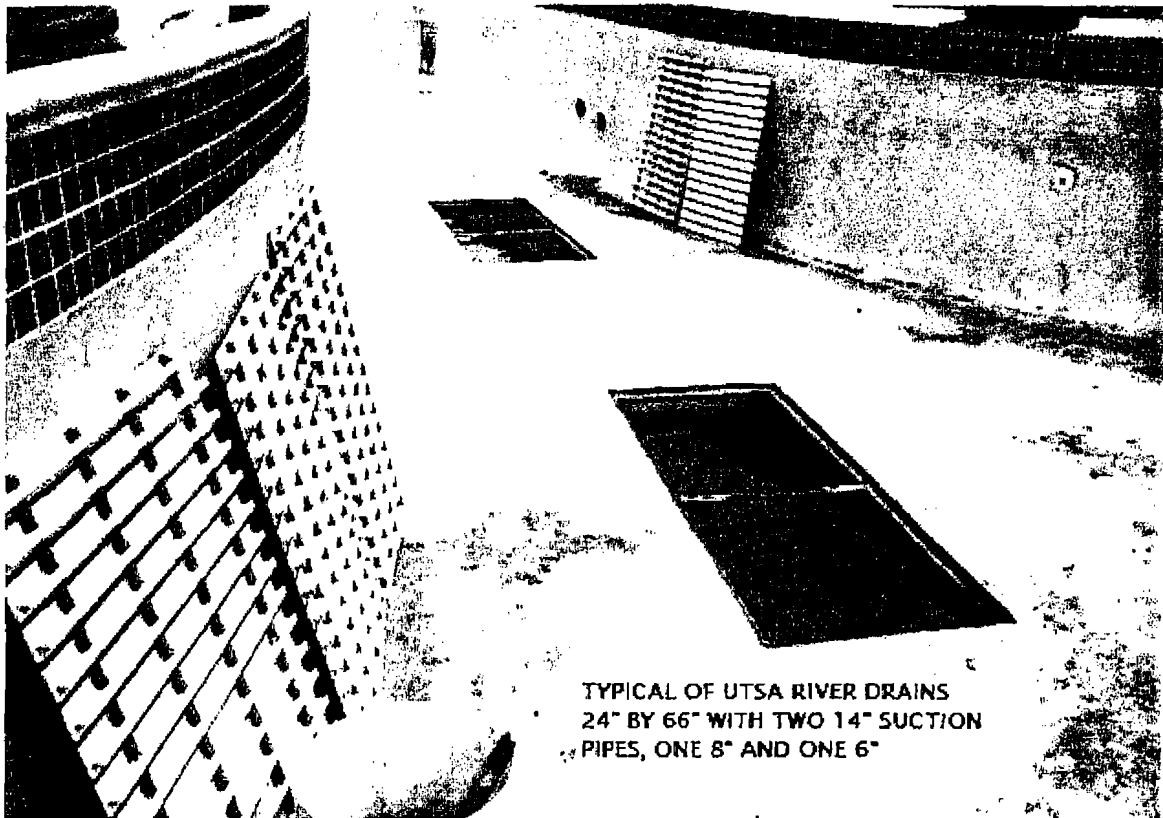
HAIR ENTANGLEMENT - ALREADY ENTANGLED

MECHANICAL ENTRAPMENT - UNRELATED

LIMB ENTRAPMENT - DOUBTFUL REMOVAL EFFORT

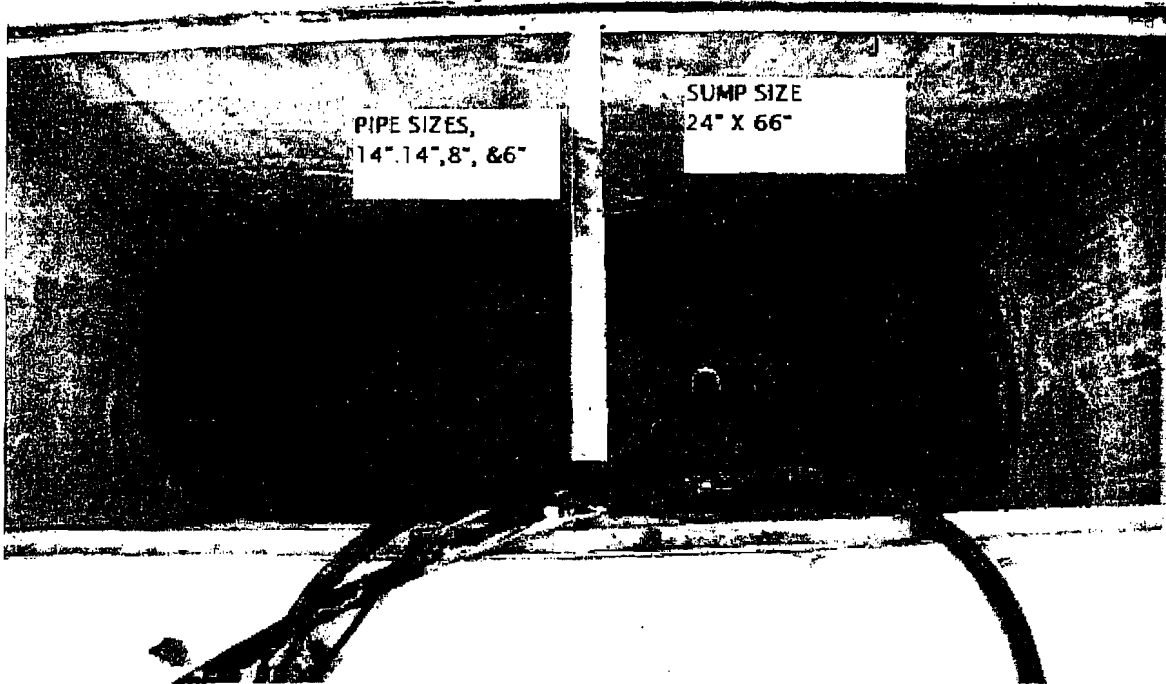
BODY ENTRAPMENT - VERY SMALL DRAINS ONLY

AGAIN SECURE APPROVED COVERS AN ABSOLUTE NECESSITY

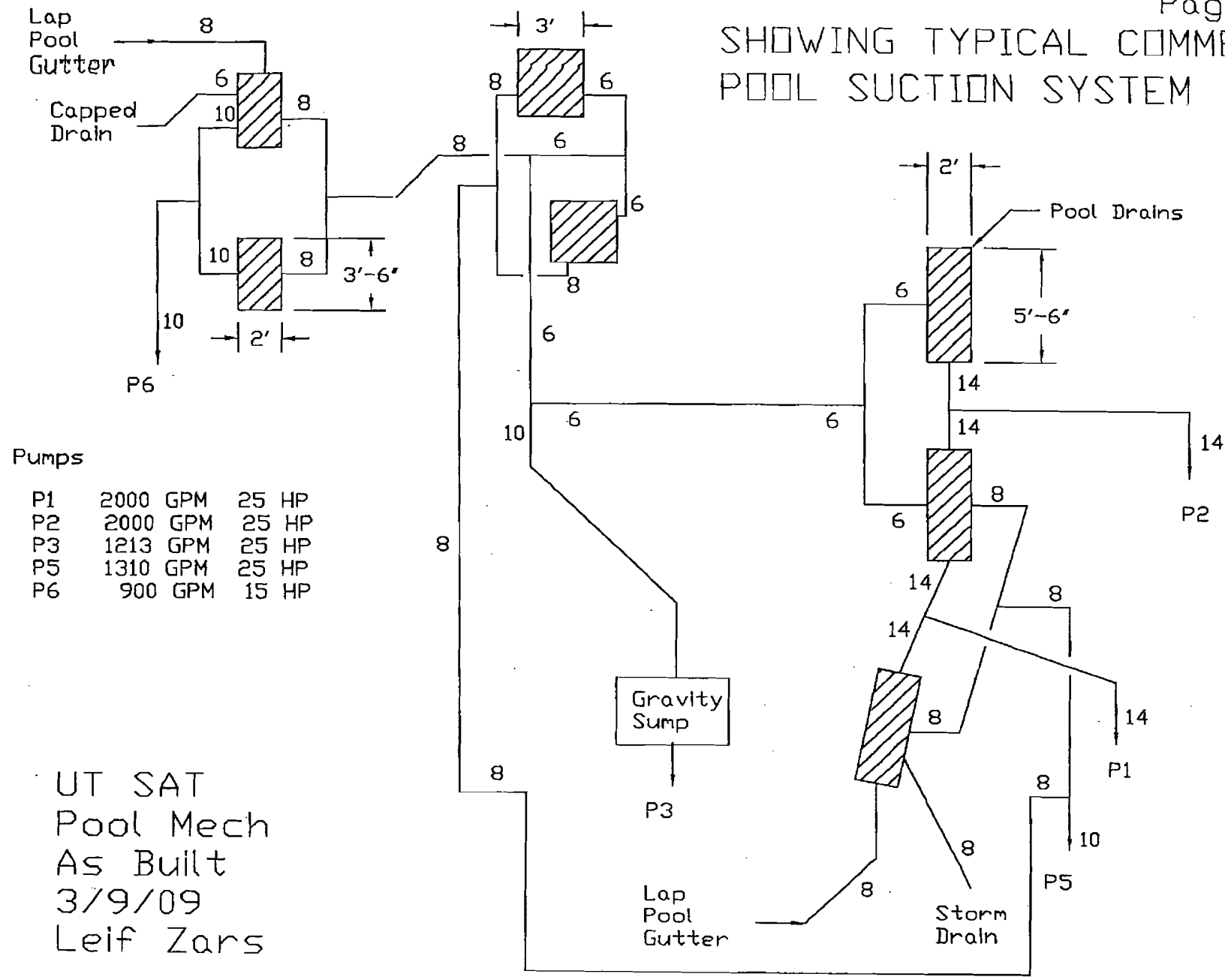


TYPICAL OF UTSA RIVER DRAINS
24" BY 66" WITH TWO 14" SUCTION
PIPES, ONE 8" AND ONE 6"

TYPICAL OF 7 DRAIN SUMPS @ UTSA SITE



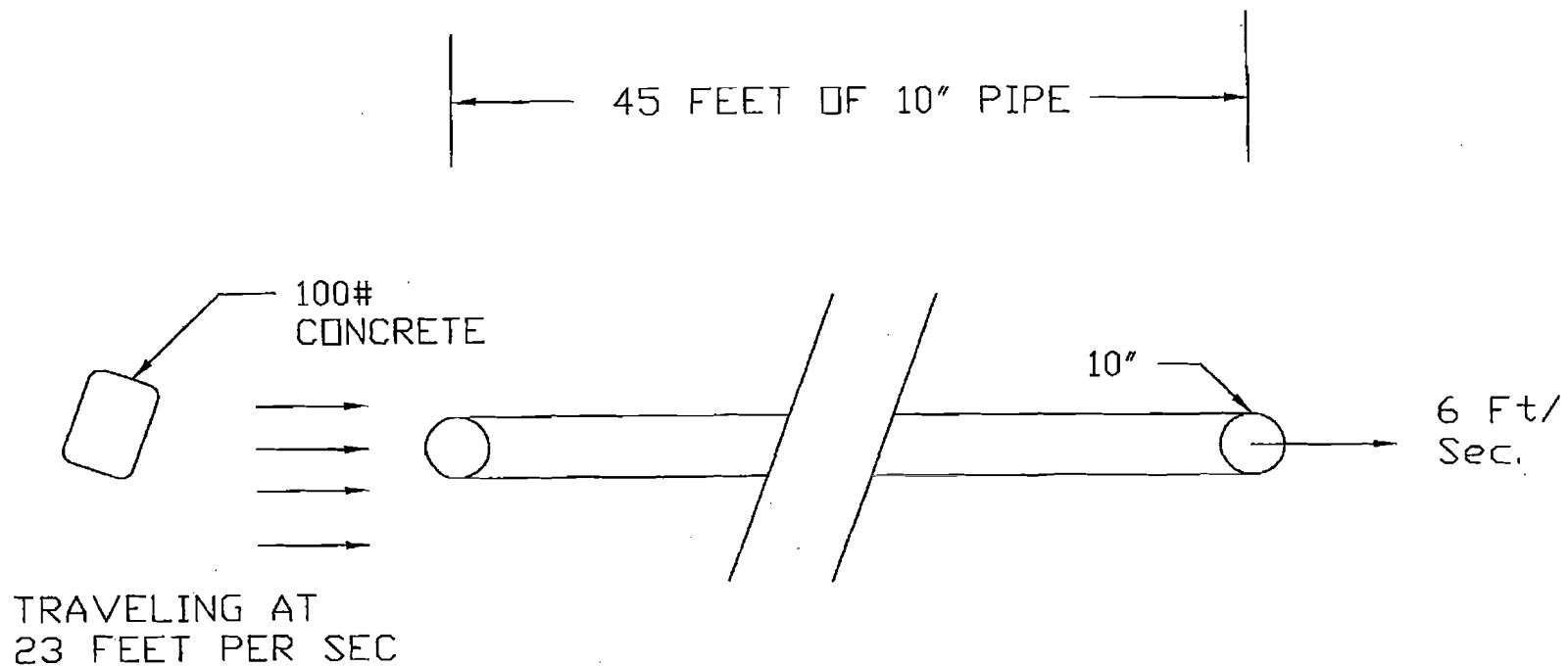
SHOWING TYPICAL COMMERCIAL POOL SUCTION SYSTEM



Pumps

P1	2000 GPM	25 HP
P2	2000 GPM	25 HP
P3	1213 GPM	25 HP
P5	1310 GPM	25 HP
P6	900 GPM	15 HP

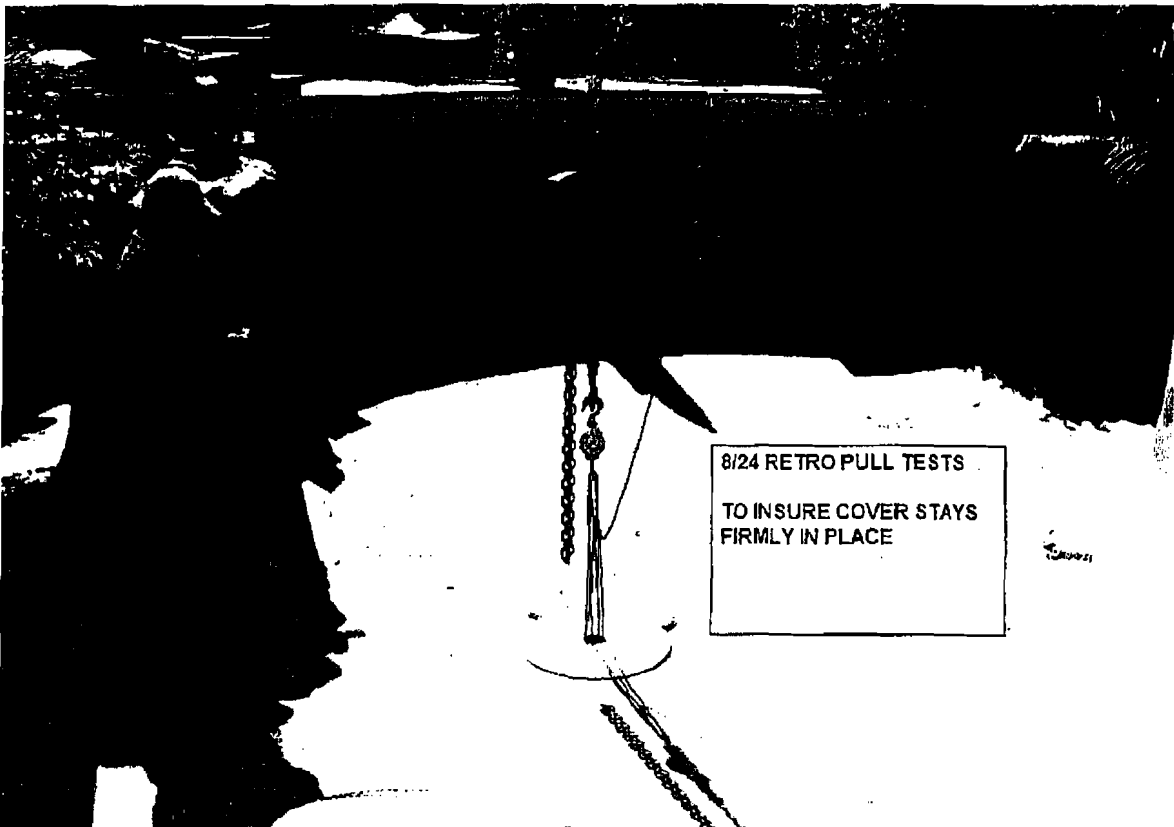
UT SAT
 Pool Mech
 As Built
 3/9/09
 Leif Zars



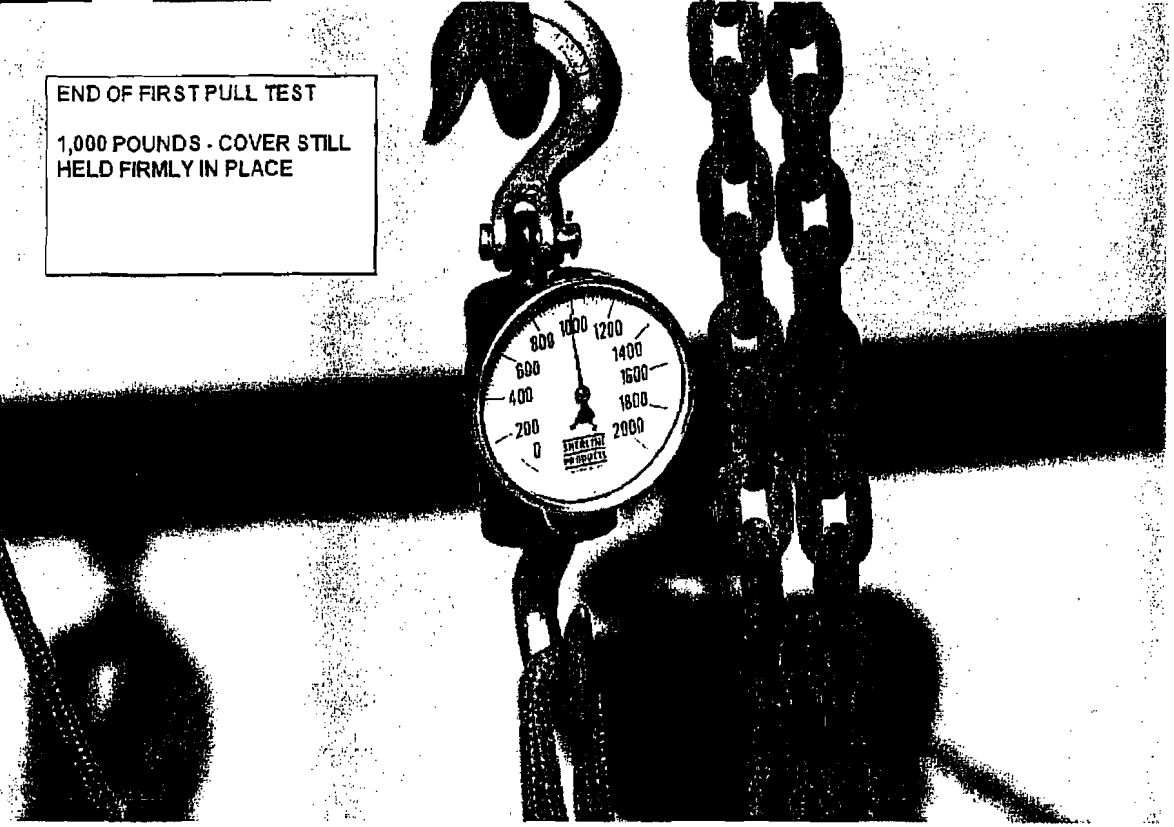
EQUIVALENT ENERGY OF WATER FLOW IN 10" PIPE

Evisceration takes place in less than 1/2 second.
 Inertia of water in large piping invalidates vent action
 Hair is not a factor in open piping
 Limbs are only a factor on piping under 4" diameter.
 Mechanical entrapment not a related factor.

COVERS MUST REMAIN IN PLACE

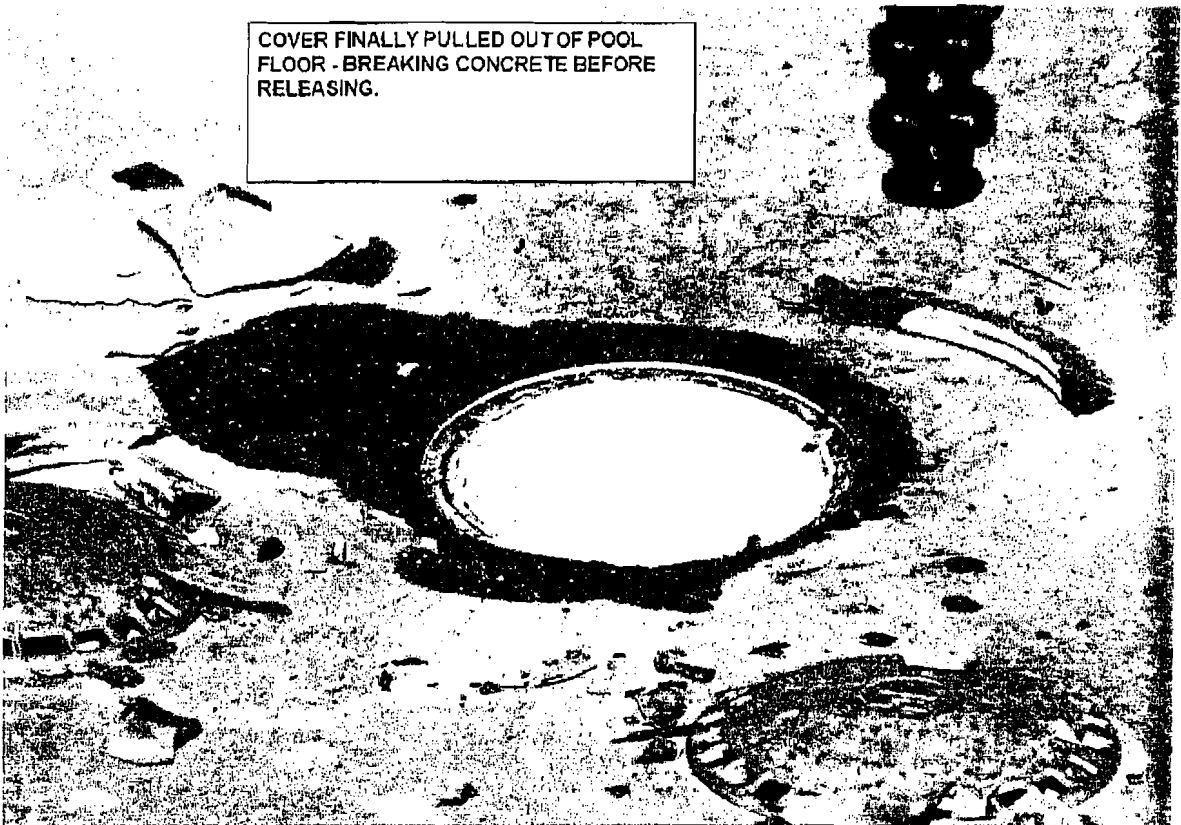


8/24 RETRO PULL TESTS
TO INSURE COVER STAYS
FIRMLY IN PLACE

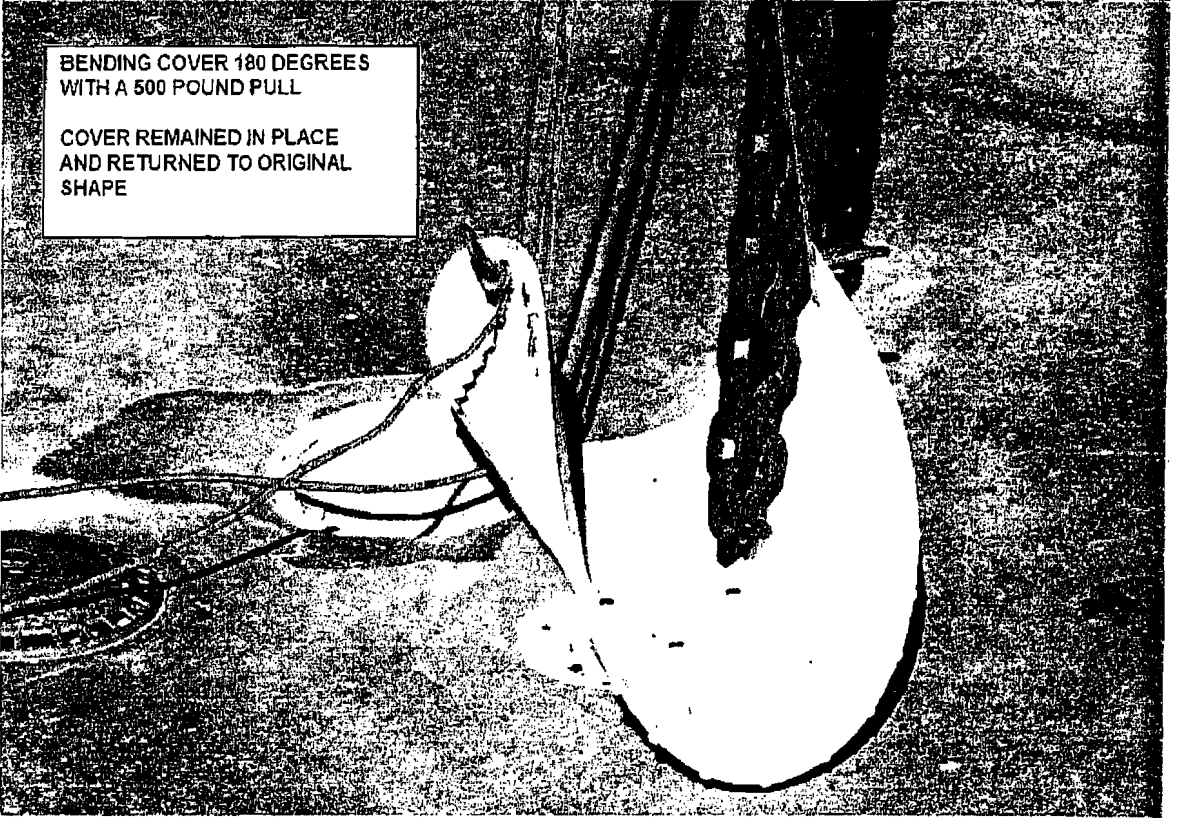


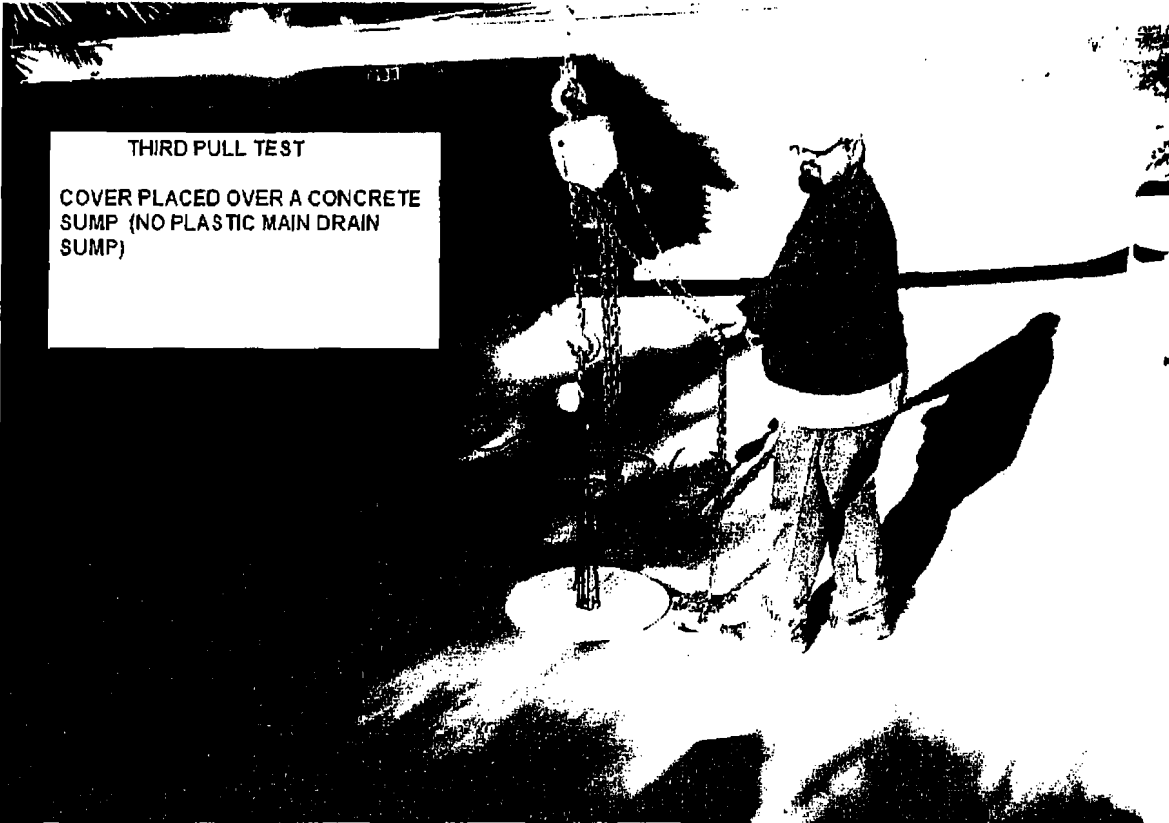
END OF FIRST PULL TEST
1,000 POUNDS - COVER STILL
HELD FIRMLY IN PLACE

COVER FINALLY PULLED OUT OF POOL FLOOR - BREAKING CONCRETE BEFORE RELEASING.

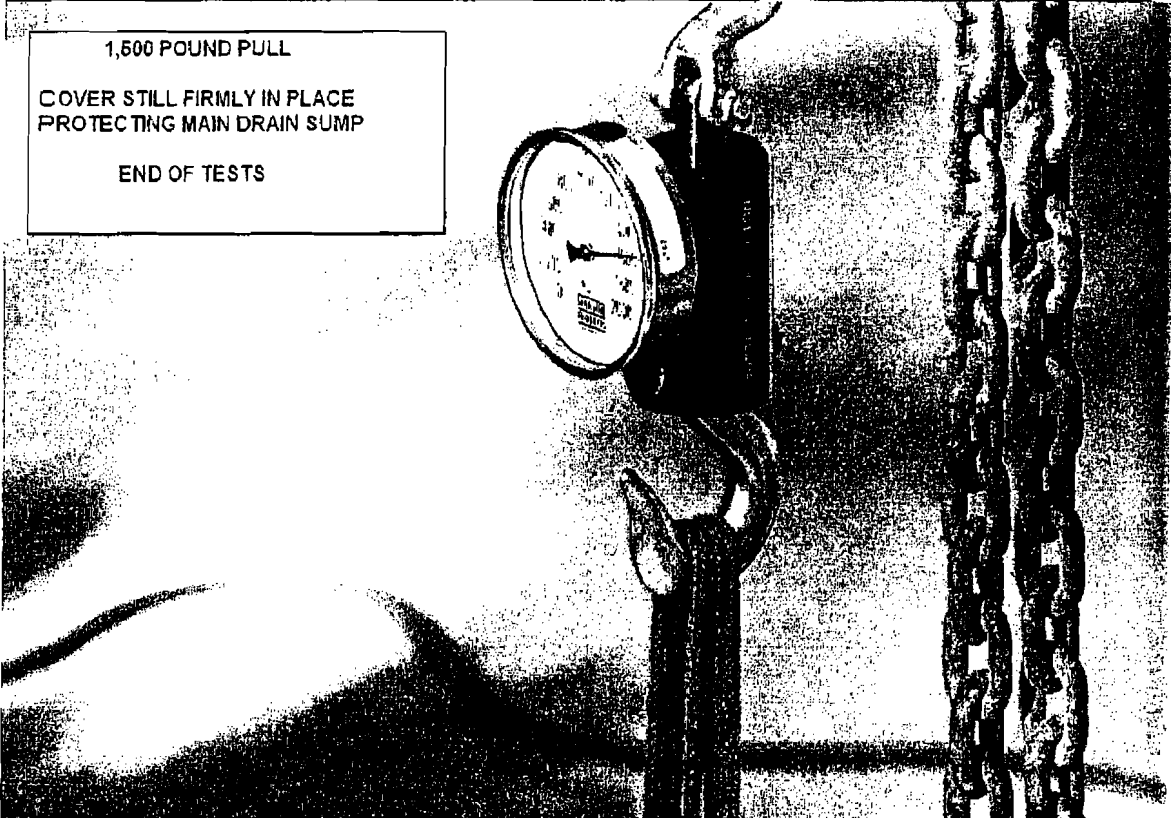


BENDING COVER 180 DEGREES WITH A 500 POUND PULL
COVER REMAINED IN PLACE AND RETURNED TO ORIGINAL SHAPE





THIRD PULL TEST
COVER PLACED OVER A CONCRETE
SUMP (NO PLASTIC MAIN DRAIN
SUMP)



1,500 POUND PULL
COVER STILL FIRMLY IN PLACE
PROTECTING MAIN DRAIN SUMP
END OF TESTS

Leif Zars

From: Leif Zars [leif@garypools.com]
Sent: Thursday, October 22, 2009 5:59 PM
To: Carvin DiGiovanni (CDiGiovanni@APSP.org)
Cc: Robert Rung (rrung@haywardnet.com); (cfalvey@cpsc.gov); Troy Whitfield (twhitfield@cpsc.gov)
Subject: CPSC SURVEY CONDENSED RESPONSES
Attachments: Document (15).pdf; Comments on CPSC Survey.xls; Document (15).pdf

Carvin, Bob,

My observation of the CPSC Unblockable Survey (Attached). The issues I see are: Should we require unblockable sump (4), 2nd layer not required (4), 2nd Layer required (3).

The basic response I see on the "unblockable sump" is that 95% of all large commercial pools have large concrete sumps into which 6" to 14" suction pipes enter - some sumps with 4 to 5 such pipe entrances. Making such 4 foot by 6 foot sumps "unblockable" nationwide is an overwhelming task and an unreasonable financial burden if somehow reconstruction were possible. To comply, everything will have to shut down for many, many months, if indeed they ever reopen. What we need to do is to insure SECURE COVERS - covers that remain in place. Tightening the wording in 19.8 - 16 should accomplish this.

The next point is if a 2nd layer is required or is not required: On these large commercial pools the so called "2nd layer" (SVRS) will do absolutely nothing and here is why:

Take 45 foot of 10" suction pipe flowing at 6 ft/sec, we have the kinetic energy of a 100 pound bag of cement traveling at you at 23 feet per second. The child is half way down the pipe before anything trips. No protection for: Hair Entanglement, Limb Entrapment, Suction Entrapment, Evisceration, or Mechanical Entrapment. Quoting from my paper on "Visual Study of Prolapse", "Full pump suction removed several inches of intestines in a little over 1/2 second." Clearly we would be misleading the consumer by supporting an SVRS in such situations.

We also need to be more specific in our writings, be open to questions, and provide CPSC with our suggested wording in answer to most questions regarding the intent of the Standard - not the other way around. Take for example my observation in the trade press of the following CPSC statement: "Around the same date, CPSC's Office of the General Counsel effectively declared that water slide run-outs do not fall under the scope of the VGB Act, but if catch pools in which patrons must exit via some depth of water do."

I in turn wrote Troy "Just so I understand, what if one of these has a suction outlet? I need to be on the same page."

I received a very nice reply from Cheryl Falvey (attached), (which I sincerely appreciated) that basically stated: "If a waterslide ends in a pool that a user will need to wade through or swim in, it falls within the definition of pool in the Act. If the slide ends on a deck with minimal runoff water, it is not a pool and the Act is not applicable."

This is good, but what is "minimal water", and what if there is still a suction outlet there? What could have been said is that "if there is a suction outlet accessible to bathers it must meet 19.8." Unfortunately, legal language sometimes comes in the way of a direct answer, that is why I feel we should provide CPSC with recommended wording for clarifications, and then they can add the necessary legal portions.

Regards,
Leif
Project Team Leader
ASME A112.19.8

Chairman
APSP/IAPMO-16

Written Text for Public Hearing on Unblockable Drains
By: Bonnie Snow, Owner/CEO BeeSafe Systems

Slide One: Introduction “BeeSafe Systems A Better Answer to Suction Entrapment”

My name is Bonnie Snow. Before becoming the owner of BeeSafe Systems, I worked as an Environmental Health Scientist as an inspector of swimming pools in Utah County. Thank-you for allowing me to discuss my guidance to you in regards to Unblockable Drains. I would like to start with a brief history of the term “Unblockable” over the past 3 to 4 years.

Slide two – APSP Guidelines

The guidelines published in 2006 were carefully studied and our determination was that a Large Unblockable Outlet would be the best option for solving entrapment. As I discussed the options with my co-workers we found many reasons to not like the dual-drain and mechanical turn off devices, and determined that an unblockable drain could have all of the benefits of both options without the undesirable qualities. We liked the statement that a Licensed Professional Engineer could validate the use of an Unblockable Drain.

Slide three – ASME A112.19.8-2007 Standard

In March of 2007 the ASME A112.19.8-2007 Standard was published and the tests for determining if a product would solve the entrapment hazards were introduced. Definitive requirements for fasteners were written. Great! We wanted to have our product (that now had a patent application filed and was in the process of having injection molds made) to be tested. We had developed a product that we were sure would surpass all requirements. But this standard did not provide a way to test a Large Unblockable Drain.

Slide four – VGB and Addendum

As we all know, The Virginia Graeme Baker Pool and Spa Safety Act was signed into law on December 19, 2007 and it called for all public pools to be compliant by December 19, 2008. I am sure that we were not the only would be manufacturers that became frustrated over the long 9 months that it took for the ASME Committee to amend the standard to provide a way to test Large Unblockable Drain Systems. The addendum specified that the Izod Impact Test be used and in my estimation this was unrealistic and unequal to the testing of small drain covers, but the BeeSafe System after 2 disastrous rounds of testing did finally pass all requirements of the ASME A112.19.8a-2008 on March 4, 2009. Our company experienced better than we had hoped for success during April and May as pools prepared to open for the 2009 season.

Slide 5 - CPSC Comments and Hearing on Unblockable Drains.

You at CPSC called for comments on Unblockable Drains in July and scheduled these hearings in November. Customers keyed into this more than you may realize. We have many customers who are delaying their orders pending your decision. The CPSC has submitted proposed verbiage and APSP has

produced pictures of several possible unblockable drain options. APSP also supplied pages of complicated calculations to determine if the drains are in fact unblockable. A simplified calculation of the percent of open area that remains is also possible. By using either the complicated formula or the percent of open area divided by the total area of the cover, it is possible to determine if a cover will or will not provide sufficient flow to prevent entrapment. If APSP had included the BeeSafe System in their possibilities it would be obvious that there are Unblockable Drains that are equal to or better than dual drain systems and that they should not require any additional level of protection.

Slide 6 – BeeSafe is Unique

The BeeSafe System is unique in that it provides 156 tubes or channels each of which is 12 inches long. Water flows through the entire length of the tubes and continues into the sump. The dimensions of the tubes create laminar flow throughout the channel. This laminar flow through the tubes practically eliminates hair entanglement. In addition each tube functions like a self regulating switch. When blocked, a tube will quickly lose suction and all the other tubes that are not blocked will increase in suction to the total gallons per minute of the pool's pump. As quickly as an SVRS device can turn off a pump, the tubes of the BeeSafe System will release an entrapment without shutting off the pump and without causing any chemical imbalance. The blocked tubes will quickly empty and as this happens the suction on the blockage will be broken. This mechanism is equal to or better than the protection offered by an SVRS device without adding a mechanical device to the drain system.

Slide 7 – Conclusion

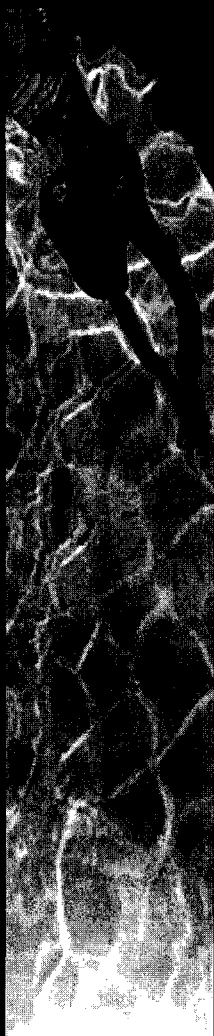
So we are here today to discuss Unblockable Drains. Every time I type it my computer alerts me that Unblockable is not a word or it is misspelled. What we are trying to say is a drain that cannot be blocked. This is what the VGB Act should be about. The BeeSafe System and some of the other Unblockable Options definitely are stand alone answers to entrapment.

But there is also the option of CPSC identifying "Other Systems" that are equal to or better than dual drains and mechanical shut off systems.

I urge CPSC to accept the recommended verbiage and to in a timely manner publish the results of the hearing. Every day of delay is causing us loss of customers as they are resorting to less desirable options in order to keep their pools open.

We have struggled with delays for almost 4 years and now ask that CPSC recognize the BeeSafe System either as a stand-alone Unblockable Drain or as an "Other System" that is equal to or better than the listed compliant options. Through our diligent study of the first guidelines in 2006 and the determination to get this product tested and approved, we now can state that the BeeSafe System is "A Better Answer to Suction Entrapment."

This concludes my presentation. Are there any questions that you would care to ask?



BeeSafe Systems A Better Answer To Suction Entrapment!

Bonnie Snow – Owner/CEO

Teri Snow – Owner/President

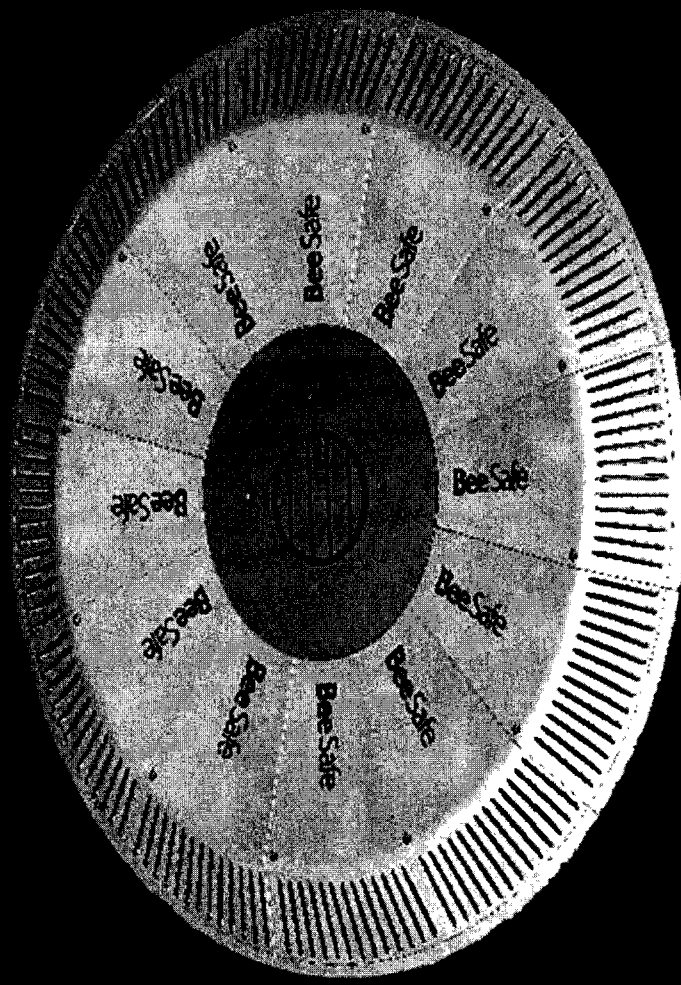
795 W Center Street

Provo Utah 84601

801-375-6881

beesafesystems@gmail.com

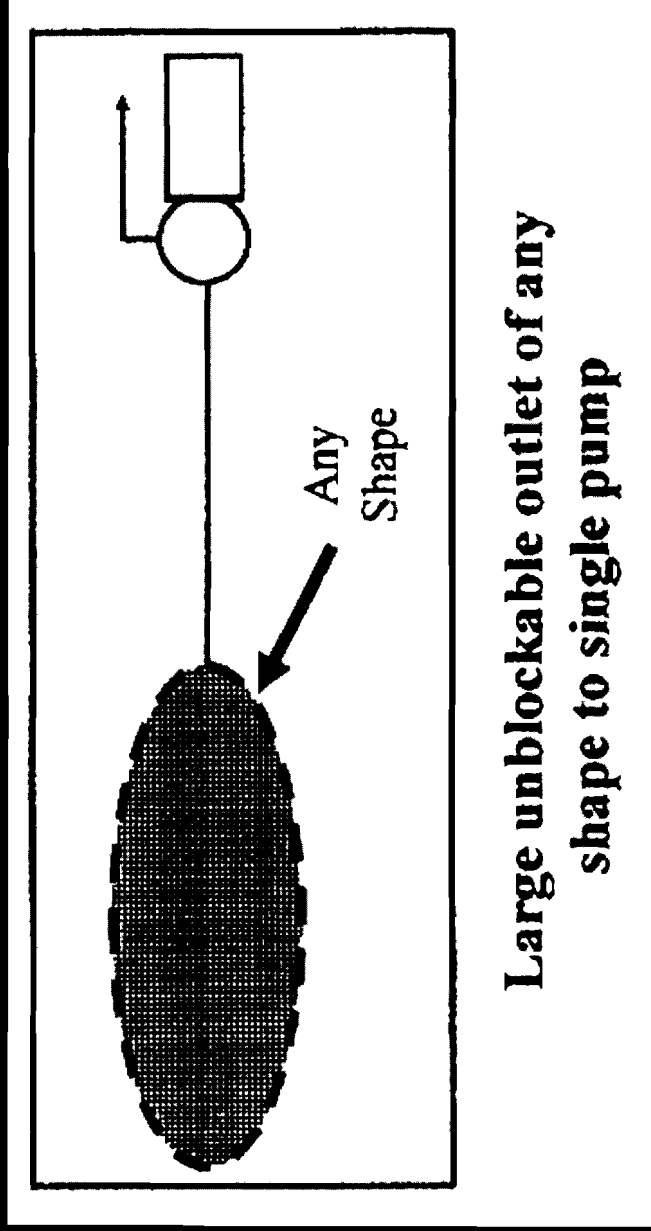
www.beesafesystems.com





A Better Answer To Suction Entrapment!

APSP – American National Standard for Suction Entrapment Avoidance....
September 11 2006



**Large unblockable outlet of any
shape to single pump**

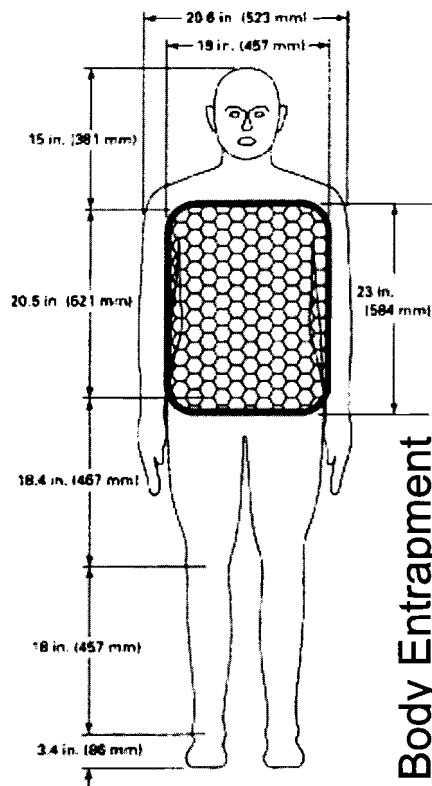
Outlets 24" x 24" or Larger – Outside the scope of this Standard.
Consult a Licensed Professional Engineer



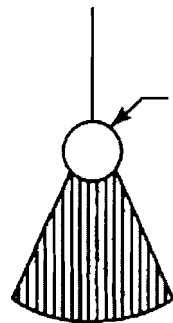
A Better Answer To Suction Entrapment!

ASME A112.19.8-2007 March 30th 2007

TORSO SPECIMEN WITH RECTANGLE SUPERPOSED



Body Entrapment



Full head of human hair

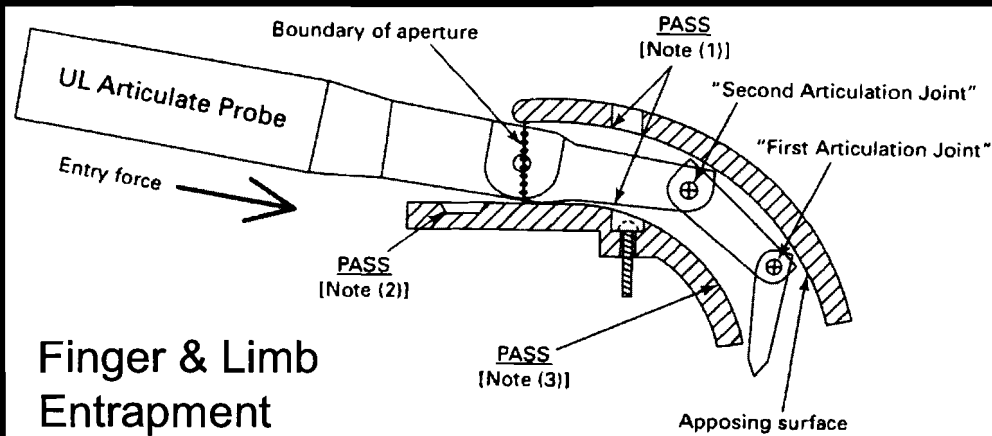
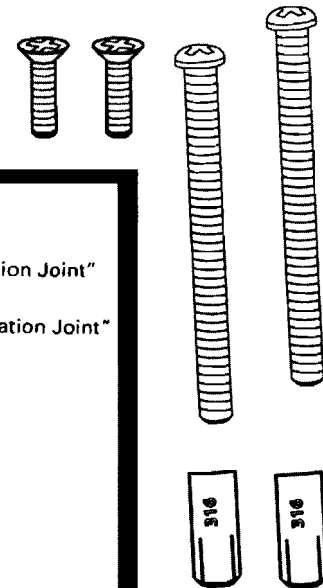


2 oz of human hair

Hair Entrapment

Fasteners

316 Stainless steel with three threads of engagement



Finger & Limb Entrapment



A Better Answer To Suction Entrapment:

Virginia Greame Baker Pool & Spa Safety Act December 19, 2007
A112.19.8 a-2008 August 30th 2008

Material Testing Physical & Flow Testing

Izod impact

Unrealistic & unequal to small product UV testing.

Specifies materials for fasteners.

Hair Entrapment

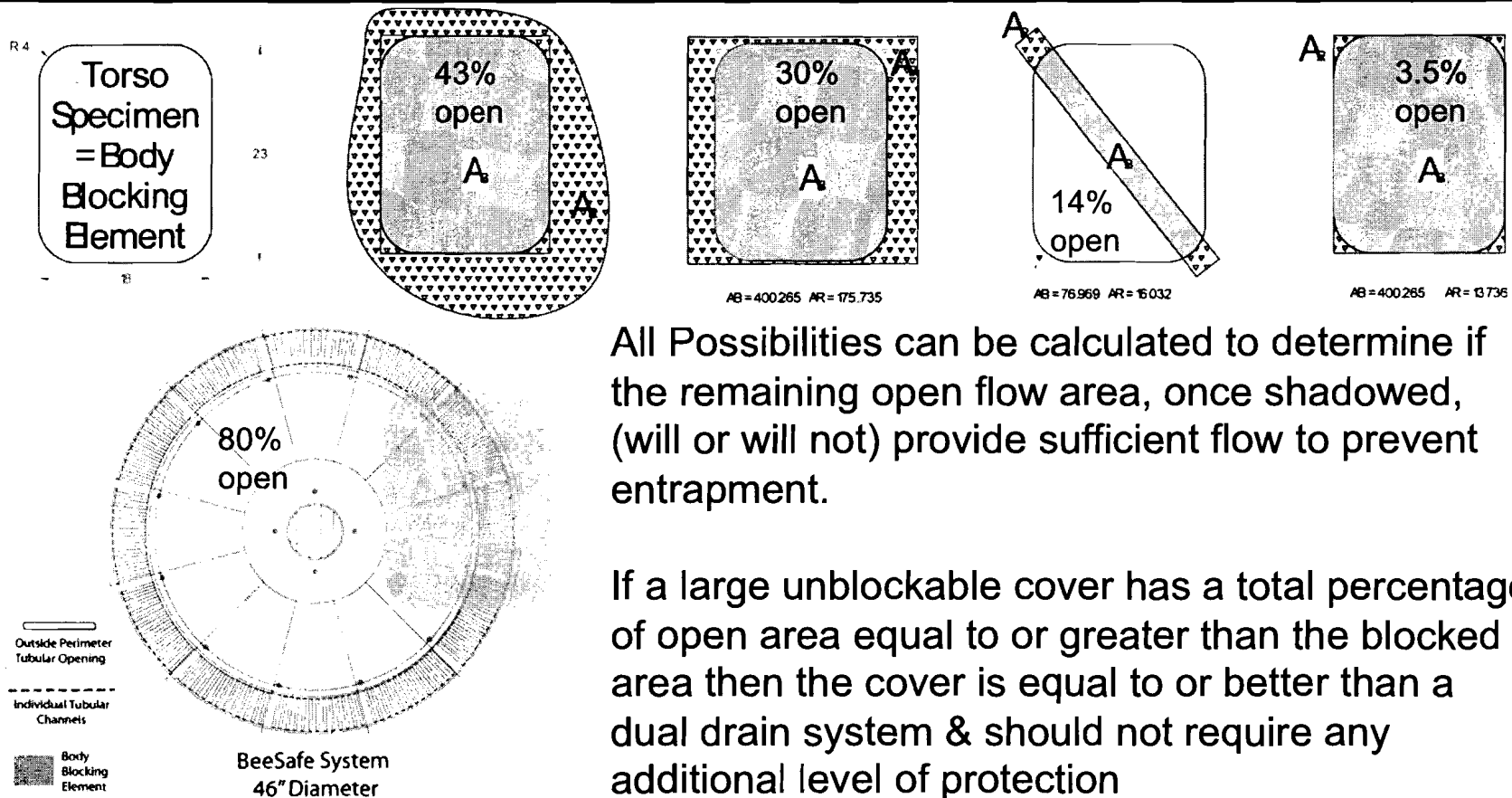
- Body Entrapment
- Finger & Limb Entrapment
- Mechanical Entrapment
- Evisceration

BeeSafe System passed all Material, Physical & Flow Testing



A Better Answer To Suction Entrapment!

Comments and hearing on Unblockable Drains



All Possibilities can be calculated to determine if the remaining open flow area, once shadowed, (will or will not) provide sufficient flow to prevent entrapment.

If a large unblockable cover has a total percentage of open area equal to or greater than the blocked area then the cover is equal to or better than a dual drain system & should not require any additional level of protection



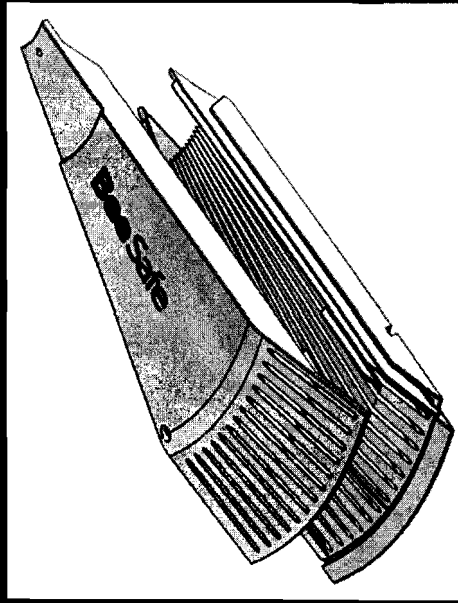
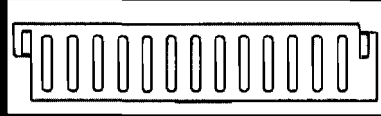
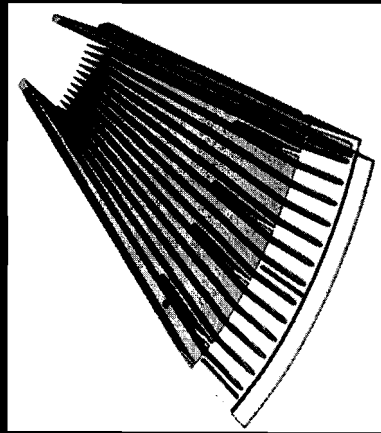
A Better Answer To Suction Entrapment!

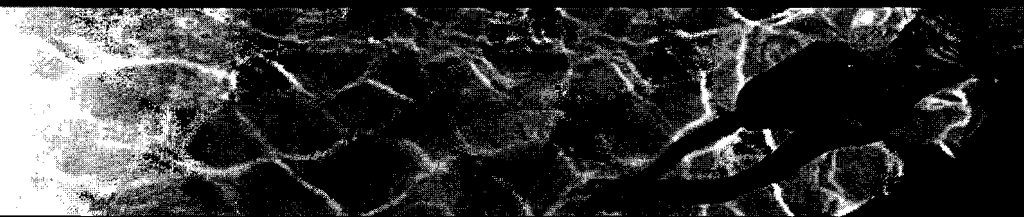
The Tubes Make BeeSafe System Unique!

The BeeSafe System is made with 156 tubes. Each tube is 12 inches long. As water enters the system from the outside edge, it flows into the tubes and results in laminar flow throughout the system.

The tubes make this system the best answer to hair entrapment. In addition each tube functions like a self-regulating hydraulic switch. The tubes offer a level of protection that is equal to or better than an SVRS device

These Switches are equal to or better than the level of protection offered by SVRS devices.





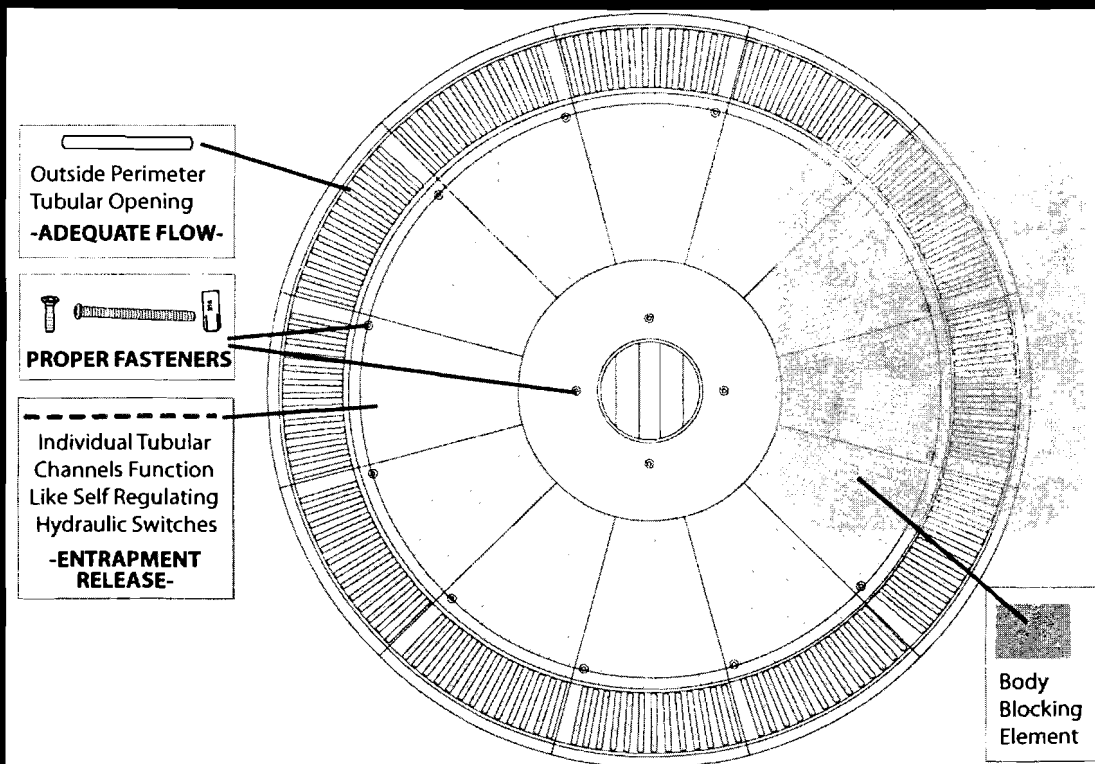
BeeSafe Systems

A Better Answer To Suction Entrapment!

Unblockable? Can Not Be Blocked...

What the VGB Act
should be about!!

OTHER SYSTEMS.—Any other system determined by the Commission to be equally effective as, or better than, the systems described in subparagraphs (A) through (E) of this paragraph at preventing or eliminating the risk of injury or death associated with pool drainage systems.



Stevenson, Todd

From: Bonnie & Teri Snow [beesafesystems@gmail.com]
Sent: Wednesday, October 28, 2009 4:14 PM
To: CPSC-OS
Subject: "Unblockable Drain Guidance"
Attachments: Written Text - for CPSC Hearing on Unblockable Drains..docx; Unblockable Drain Guidance - Presentation by Bonnie Snow.pdf

Todd,

This is a duplicate of the presentation that I sent earlier today, but I have also include the picture pages that I will bring printed for the Commission Members and also on a disc in case there is equipment to do a PowerPoint Presentation. Please let me know when I will need to be there to give my presentation.

Thanks, Bonnie

--

Bonnie Snow, Owner/CEO
BeeSafe Systems

795 W. Center St. #2
Provo, UT 84601

801-375-6881 Phone
801-691-5761 Fax
888-306-0121 Toll Free

beesafesystems@gmail.com
www.beesafesystems.com

Stevenson, Todd

From: Bonnie & Teri Snow [beesafesystems@gmail.com]
Sent: Wednesday, October 28, 2009 8:46 AM
To: CPSC-OS
Subject: "Unblockable Drain Guidance"
Attachments: Written Text - for CPSC Hearing on Unblockable Drains..docx

Todd A Stevenson, Office of the Secretary, Consumer Product Safety Commission:

As the owner of BeeSafe Systems, I ask to be included to make an oral presentation at the Public hearing on "Unblockable Drains" on November 4, 2009. I have attached the text that I will present. I will also use pictures in the form of a hand out that will be given to the Commission Members or as a Power-Point presentation if computer equipment is available. I will send the pictures later today. Please notify me as to the time slot I will occupy or let me know if all presenters need to be in attendance throughout the hearing.

Thanks,
Bonnie Snow

--

Bonnie Snow, Owner/CEO
BeeSafe Systems

795 W. Center St. #2
Provo, UT 84601

801-375-6881 Phone
801-691-5761 Fax
888-306-0121 Toll Free

beesafesystems@gmail.com
www.beesafesystems.com

Comments
Unblockable Drain Guidance

The following submitted written comments but will not attend or give presentation at hearing:

Travis Bozick
The C.T. Brannon Corporation

Charles Balling
Glenview Park District

Mike Adams
Woodridge Park District

Steve Mihelich
Williams Architects

The Brannon Corporation

FAX 903/597-3346

1321 SOUTH BROADWAY PO BOX 7487
TYLER, TEXAS 75711

903/597-2122

We as everyday practitioners in the field of aquatic engineering would like to offer comment to the CPSC concerning interpretation of "unblockable drains".

We, following CPSC correspondence and reading the ANSI/ASME A112.19.8, have been reviewing and designing "unblockable" main drains on the following basis:

- 1) We feel a drain is "unblockable" if the 23" x 18" blocking element in any orientation does not fully obstruct the opening regardless of the shape of the opening
AND
- 2) In the case of a single drain, the unblocked free area remainder of the drain must be capable of carrying the actual pump flow at less than 1.5 feet per second across the grate
OR
- 3) In the case of multiple drains, the assumption is made that only one of the multiple drains is blocked by the element and the allowable flow capacity therefore is the sum of all the remaining drain capacities PLUS the unblocked free area remainder of the drain with the blocking element applied.

To further amplify, we feel it unreasonable to assume that EACH of the drains in a multiple drain serving one pump or pit is blocked at the same time.

Further, we feel that we should be able to use the unblocked remainder, i.e., that area of a drain not blocked by the blocking element in the orientation blocking the most grate surface area.

Along a different line, but still dealing with "unblockable" drains, we find the language concerning the depth from the bottom of the grate to the inside top of drain pipe to be confusing. While we recognize that 1.5 times the diameter of the pipe is safe and conservative, the language of the ASME A112 standard states that it is to be 1.5 times the diameter UNLESS otherwise prescribed by the manufacturer. Of course in a field fabricated situation there is often no manufacturer for the sump.

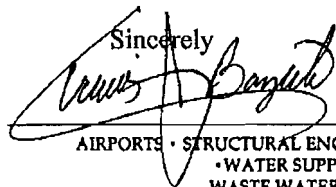
We suggest that if the design professional is allowed to design the grate, he or she should be able to design the sump and drain outfall pipe as well including the depth below the grate to the drain. Recognizing the rule is designed to reduce or prevent hair entrapment caused by localized velocities and vortices, there are alternatives available. Certainly the 1.5 factor should not always apply. For example:

- 1) If the grate cover is oversized significantly to where across-the-grate velocities are well below 1.5 feet per second, then velocity localization at the top of the pipe is mitigated.
- 2) Likewise, there are methods of extending the drain pipe into the sump and cutting the pipe end along a skew that greatly increases the orifice perimeter and thereby reduces velocity localization anywhere along the pipe. The same could be accomplished with a plate over the pipe but below the grate while not obstructing the grate.
- 3) And finally, an oversized drain pipe (when compared to the minimum pipe diameter allowable due to pipe velocities) creates a larger arc and therefore more perimeter, again mitigating the pipe entrance velocities. For example selecting an 8" pipe in lieu of a 6" pipe increases the perimeter of the orifice 44% and drastically changes the flow net.

Our point is simply that engineers should be allowed to do their jobs without being bound by constraints which consider only one scenario within the sump.

Thank you for your consideration of this issue and your concern for public safety.

Sincerely



Stevenson, Todd

From: Travis Bozick [bozick@brannoncorp.com]
Sent: Monday, October 26, 2009 12:32 PM
To: Stevenson, Todd
Subject: Unblockable hearing
Attachments: 20091026110147552.pdf

Todd,

Thank you for the opportunity to submit the enclosed letter for consideration during the "unblockable drain" definition hearing.

Travis Bozick, E.I.T.
The C.T. Brannon Corporation
P: 903/597-2122 F: 903/597-3346
TX firm Registration #F-242

Stevenson, Todd

From: Travis Bozick [bozick@brannoncorp.com]
Sent: Wednesday, October 28, 2009 10:05 AM
To: CPSC-OS
Subject: RE: VGB Unblockable Drain Hearing

Todd,

I am, regretfully, unable to attend.

Sincerely,
Travis Bozick

From: CPSC-OS [mailto:CPSC-OS@cpsc.gov]
Sent: Wednesday, October 28, 2009 8:17 AM
To: Travis Bozick
Subject: RE: VGB Unblockable Drain Hearing

Were you planning to make an oral presentation?

Todd Stevenson
Director, Office of the Secretary
Division of Information Management
Office of Information Technology Services
US Consumer Product Safety Commission
(301) 504-6836, Fax (301) 504-0127

From: Travis Bozick [mailto:bozick@brannoncorp.com]
Sent: Monday, October 26, 2009 10:53 AM
To: CPSC-OS
Subject: VGB Unblockable Drain Hearing

Mr. Stevenson,

I was pleased to receive the CPSC's Notice of Hearing through the e-mail service you provide.

I would like to submit our comments for the public record via a written text, nothing that would last longer than the ten minute oral presentation. However, it is not be possible for us to attend the public meeting in Maryland from Texas. I would like permission to submit a written text for the public record on the Unblockable drain definition without attending the public hearing if this is permitted.

We have been working within ASME A112.19.8-2007 defined drains in the field and have made several additional observations that may prove helpful to the CPSC.

Please let me know as soon as possible.

Sincerely,
Travis Bozick, E.I.T.
The C.T. Brannon Corporation
P: 903/597-2122 F: 903/597-3346
TX firm Registration #F-242

Stevenson, Todd

From: Travis Bozick [bozick@brannoncorp.com]
Sent: Monday, October 26, 2009 10:53 AM
To: CPSC-OS
Subject: VGB Unblockable Drain Hearing

Mr. Stevenson,

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I would like to submit our comments for the public record via a written text, nothing that would last longer than the ten minute oral presentation. However, it is not possible for us to attend the public meeting in Maryland from Texas. I would like permission to submit a written text for the public record on the Unblockable drain definition without attending the public hearing if this is permitted.

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Please let me know as soon as possible.

Sincerely,

Travis Bozick, E.I.T.

The C.T. Brannon Corporation
P: 903/597-2122 F: 903/597-3346
TX firm Registration #F-242

*****!!! Unless otherwise stated, any views or opinions expressed in this e-mail (and any attachments) are solely those of the author and do not necessarily represent those of the U.S. Consumer Product Safety Commission. Copies of product recall and product safety information can be sent to you automatically via Internet e-mail, as they are released by CPSC. To subscribe or unsubscribe to this service go to the following web page: <https://www.cpsc.gov/cpsclist.aspx> *****!!!



GLENVIEW PARK DISTRICT

1930 PRAIRIE STREET, GLENVIEW, ILLINOIS 60025-2823, (847) 657-3215, FAX: (847) 724-8601

October 28, 2009

COMMISSIONERS:

Judy Beck
William M. Casey
Mary Jean Coulson
Angie G. Katsamakos
Robert J. Patton
Ted M. Przybylo
Michael P. Scholl

Attorney:
Samuel W. Witwer, Jr.

Treasurer:
William D. Moore

ADMINISTRATION:

Charles T. Balling,
Executive Director/
Secretary

Barbara Cremin,
Superintendent of
Administrative Operations

Cheryl L. Deom,
Superintendent of
Special Facilities

Frederick W. Gullen,
Superintendent of
Park Services

Robert D. Quill,
Superintendent of
Leisure Services

Mr. Todd A. Stevenson
Office of the Secretary
Consumer Product Safety Commission
4330 East West Highway
Bethesda, Maryland 20814

Subject: Unblockable Drain Guidance

Dear Mr. Stevenson:

I am writing in regard to your request for public comment on the Virginia Graeme Baker (VGB) Pool and Spa Safety Act concerning the potential risk of entrapment in swimming pools. I currently serve as the Chairman of the Park District Risk Management Agency in Illinois and am also the Executive Director of the Glenview Park District. I have been engaged in ongoing discussions regarding the VGB Act with public pools owners throughout Illinois and neighboring states.

There is a great deal of uncertainty over what physical changes to existing pools may be necessary to ensure compliance with the VGB Act, as well as the costs related to that compliance. By way of example, in an effort to ensure compliance with the Act, at my Park District we have equipped our pools with certified drain grates that meet the required ASME/ANSI A112.19.8 standards. However, well qualified pool engineers are still uncertain if those new grates make our pools compliant with this law.

I understand the VGB Act was enacted to ensure public safety in pools and spas through federal regulations that require use of equipment that protects against potential risks associated with body entrapment, hair entanglement and evisceration. I believe in and fully support regulations which are intended to enhance public safety. Based upon the information provided by the pool engineers our agency has consulted with, I believe installing unblockable drain covers is a cost-effective method which fully protects against the risk of entrapment and thus fulfills the intent of the Act.

There is growing concern among many pool owners and operators that the VGB law may conflict with some state pool codes, and/or may be subject to varying interpretations by pool inspectors, who themselves appear confused over the exact requirements of the Act. This puts many local park and recreation agencies and their engineers in a precarious situation of not

CHARACTER COUNTS!
IN GLENVIEW



Trustworthiness • Respect
Responsibility • Fairness
Caring • Citizenship



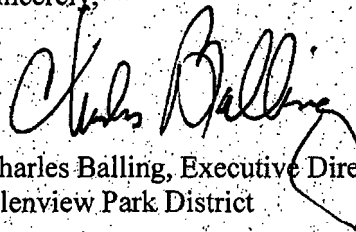
knowing if the physical changes they have made in order to comply with the Act will be viewed by the enforcement agencies as fully compliant with the Act. For example, the Act has sometimes been interpreted to include more extensive modifications such as cutting into the drains and piping in the basin of a pool. These potential modifications are not only costly to complete but can create ongoing leakage and maintenance issues.

Public pools are used by all age groups and income levels. The budgets of many park and recreation agencies are not able to meet unexpected demands for capital maintenance costs, especially where those costs may not be necessary to enhance public safety. According to a recent survey by the Illinois Association of Park Districts, many agencies are having difficulty understanding exactly what physical changes may be necessary to ensure that their pools are fully compliant with the VGB Act. Estimates at some locations are that it could cost more than \$150,000 *per pool* if the law is interpreted to require something more than the installation of unblockable drain covers to be compliant.

Please consider making the installation of ASME/ANSI certified covers as the only requirement for full compliance to the VGB Act.

Thank you for your time and consideration.

Sincerely,

A handwritten signature in black ink, appearing to read "Charles Balling". The signature is written in a cursive style with a large, looped initial "C".

Charles Balling, Executive Director
Glenview Park District

cc: Board of Park Commissioners

Stevenson, Todd

From: Chuck Balling [Chuck.Balling@glenviewparks.org]
Sent: Wednesday, October 28, 2009 4:19 PM
To: CPSC-OS
Cc: 'Peter Murphy'; Brett Davis (bdavis@pdrma.org); 'madams@woodridgeparks.org'
Subject: Public Hearing on Draft Guidelines on what constitutes an "unblockable drain"
Attachments: Unblockable Drain Guidance.pdf

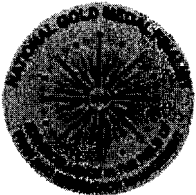
Dear Mr. Stevenson,

Please find attached my comments on this matter. I will not be able to make an oral presentation at the hearing on November 4, 2009.

Thank you for giving me the opportunity to express my concerns. Please call me if you have any questions.

Chuck Balling

Executive Director
Glenview Park District
1930 Prairie Street
Glenview, IL 60025
224-521-2250 direct
847-542-2512 cell
847-724-8601 fax
Chuck.Balling@GlenviewParks.org
www.GlenviewParkDist.org



2009 National Gold Medal Finalist

Glenview Park District Privacy Disclaimer

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Stevenson, Todd

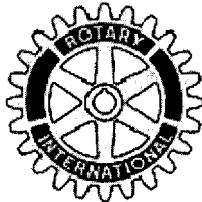
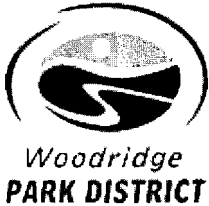
From: Mike Adams [madams@woodridgeparks.org]
Sent: Wednesday, October 28, 2009 5:03 PM
To: CPSC-OS
Subject: Unblockable Drain Guidance
Attachments: CPSC Unblockable Drain Guidance Reply.pdf

Dear Mr. Stevenson,

Unfortunately, due to the limited time of the public hearing notice we are unable to appear at the hearing scheduled for November 4, 2009. However, we ask that the following letter be entered in to the record for the hearing. We appreciate the opportunity to comment.

Sincerely,

Mike Adams, Executive Director
Woodridge Park District
2600 Center Drive
Woodridge, IL 60517
630/353.3300 Fax: 630/353.3310
madams@woodridgeparks.org





Woodridge
PARK DISTRICT

Community Center & Administrative Offices

2600 Center Drive • Woodridge • IL • 60517

Phone (630) 353 • 3300

Fax (630) 353 • 3310

www.woodridgeparks.org

info@woodridgeparks.org

October 28, 2009

Mr. Todd Stevenson

Office of the Secretary

U.S. Consumer Product Safety Commission

4330 East West Highway

Suite 502

Bethesda, MD 20814-4408

Re: "Unblockable Drain Guidance"

Dear Mr. Stevenson,

I am writing in regard to your request for public comment on the Virginia Graeme Baker (VGB) Pool and Spa Safety Act concerning the potential risk of entrapment in swimming pools. I currently serve as the Executive Director of the Woodridge Park District (WPD) in Woodridge, Illinois. The WPD owns and operate the award winning outdoor Cypress Cove Family Aquatic Park. We have been engaged in ongoing discussions regarding the VGB Act with our engineering consultants and architects.

There still seems to be a great deal of uncertainty over what physical changes to existing pools may be necessary to ensure compliance with the VGB Act, as well as the costs related to that compliance. By way of example, in an effort to ensure compliance with the Act, we have equipped our outdoor aquatic facility with certified drain grates on that meet the required ASME/ANSI A112.19.8 standards. However, our well qualified pool engineers are still uncertain if those new grates make our pools compliant with this law due to the differences in the required flow rate between ASME A112.19.9 and ANSI/APSP-7.

We understand the VGB Act was enacted to ensure public safety in pools and spas through federal regulations that require use of equipment that protects against potential risks associated with body entrapment, hair entanglement and evisceration. We believe in and fully support regulations which are intended to enhance public safety. Based upon the information provided by the pool engineers we have consulted with, it is essential the CPSC clarify the enforcement standard required, which in our opinion should be the ASME/ANSI A112.19.8, which is a cost-effective method which fully protects against the risk of entrapment and thus fulfills the intent of the Act.

We are concerned as many other pool owners and operators that the VGB law may conflict with some state pool codes and building codes, and/or may be subject to varying interpretations by pool inspectors, who themselves appear confused over the exact requirements of the Act. This puts many local park and recreation agencies and

their engineers in a precarious situation of not knowing if implementing various changes will be viewed by the enforcement agencies as fully compliant with the Act.

Public pools are used by all age groups and income levels. The budgets of many park and recreation agencies are not able to meet unexpected demands for capital maintenance costs, especially where those costs may not be necessary to enhance public safety. According to a recent survey by the Illinois Association of Park Districts, many agencies are having difficulty understanding exactly what physical changes may be necessary to ensure that their pools are fully compliant with the VGB Act. Estimates at some locations are that it could cost more than \$150,000 *per pool* if the law is interpreted to require something more than the installation of unblockable drain covers to be compliant.

Please consider making the installation of ASME/ANSI certified covers as the only requirement for full compliance to the VGB Act.

Sincerely,

A handwritten signature in black ink that reads "M. Adams". The signature is stylized and appears to be written in a cursive or semi-cursive style.

Mike Adams
Executive Director

Stevenson, Todd

From: Steve Mihelich [SWMihelich@williams-architects.com]
Sent: Wednesday, October 28, 2009 4:48 PM
To: CPSC-OS
Cc: Terry LeBeau
Subject: Unblockable Drain Guidance
Attachments: Project Memorandum VGB Public Hearing on 11_04_09.pdf

Dear Sir or Madam:

The attached memo is in reference to the Notice of Hearing on 04 November 2009 with regards to the Virginia Graeme Baker Pool and Spa Act. It is our intent to submit this memo for consideration for record as consideration for public record for this hearing.

Respectfully submitted,



Steve W. Mihelich

Principal

450 E. Gundersen Drive

Carol Stream, IL 60188

630.221.1212 T

630.221.1220 F

630.344.1045 D

www.williams-architects.com

swmihelich@williams-architects.com



PROJECT MEMORANDUM

PROJECT: Virginia Graeme Baker Act

PROJECT NO.: 2008-594

TO: Consumer Products Safety Commission

REGARDING: Unblockable Drain Guidance
Virginia Graeme Baker Pool and Spa Safety Act
Notice of Public Hearing, dated 04 November 2009

COPIES TO: Terry LeBeau / Halogen Supply Company

PREPARED BY: Steve Mihelich / Williams Architects in collaboration with
Terry LeBeau / Haolgen Supply Company

DATE PREPARED: 28 October 2009

NOTE: The following items shall be recorded as a part of the above project record and acted upon as noted unless Williams Architects, Ltd. is promptly directed to proceed otherwise.

ITEMS:

Williams Architects is a recognized leader in aquatic architecture. We have planned and designed more than 150 aquatic projects including water parks and indoor pool facilities for public sector clients in the Midwest.

The following are potential areas of conflicting information as per our experience in assisting a number of Illinois Park Districts in the suburban Chicagoland area. In preparation of this memo, we have collaborated with:

- Terry LeBeau, General Manager Commercial Systems
Division of Halogen Supply Company
- Member of the Society of Plumbing Engineers
- Accredited National Swimming Pool Foundation as a Certified
Pool Operator Instructor

MAIN AREAS OF CONFLICTING INFORMATION WITHIN THE ACT:

Sump Dimensions:

- ASME A112.19.8 diagrams standardize suction fittings design, assembly, and material requirements for existing main drains that a minimum require replacement with new covers/grates and at a worst case scenario require compliance with prefabricated and field fabricated outlets that have been tested to A112.198a – 2008 standards
- A concern is that jury-rigged piping attached to main drain piping, inside the main drain sump, and cut-off at a point at or below 1-1/2 times the pipe diameters does not seem to be a basis for a system approval, taking velocity / suction into account. Claims are made of having VGB approval, yet this seems too arbitrary for ASME A112.19.8 criteria.
- Oversized cover/grates placed above an existing main drain grate, so as to cover the smaller main drain cover/grate and sump: This oversized cover/grate would have a greater VGB approved flow rating. Does this eliminate the need to even have a sump? Could a raw pipe come through the floor of the pool and still allow the use of this oversized cover/grate?

Multiple Drains – Flow Rating Requirements for cover/grates:

Conflicts between ASME A112.19.8 and ANSI / APSP-7: Which Standard is being enforced?

The two standards are quite different with regards to required cover/grate sizing. ANSI/APSP-7 even delves into main drain pipe sizing. Adhering to this standard could force an owner to incur huge costs for upsizing main drain pipe sizes beyond ASME A112.19.8 requirements. The VGB Act does not direct pool owners to follow ANSI/APSP-7; it only says that the APSP standard was used as a reference.

APSP being adopted by a local Authority Having Jurisdiction or State Health Department requirement will conflict with VGB; that is, it goes above and beyond. For example, state health departments that have adopted ANSI/APSP-7, and in turn municipalities that have indirectly adopted it by adopting the 2009 edition of the IBC (International Building Code) as their model code are potentially requiring more of than the intent of the VGB act.

The intent of this federal act was never to have owners dig up the bottoms of their existing pools. There is no reason, and certainly no improved safety aspects, for requiring main drain cover/grates that are sized for a flow of 134% (in the case of three main drains) of maximum possible flow. If you have four main drains, the three remaining open if one is covered would be sized for 150% of maximum flow that the pump(s) could possibly produce. All of the associated piping for each sump would then have to be sized for this increased flow assumption so as not to exceed 6 fps velocity which in many opinions is above and beyond the intent of the Act.

That is again one of the primary areas of contention. It needs to be reexamined. If the pipe sizing is not able to accommodate APSP assumed flow at less than 6 fps, then those systems need to be grandfathered. Pipe velocities have no impact on suction entrapment or hair entanglement.

Here are the differences:

ASME A112.19.8 – “Suction Fittings for Use in Swimming Pools, Wading Pools, Spas, and Hot Tubs” by the American Society of Mechanical Engineers

ASME says that if one drain in a multiple drain system is blocked (or partially blocked ?) the remaining cover/grate(s) on the system must be rated to handle 100% of total system flow. ASME A112.19.8 describes “total” flow as the maximum possible flow that the pump(s) can produce. This will always be higher than “design” flow.

That means that if we have two drains, each must be rated at 100% of “total” system flow . . . three drains, each must be sized to handle 50% of “Total” system flow . . . four drains, each must be sized to handle 33.3% of “total” system flow, etc.

ANSI / APSP-7: “American National Standard for Suction Entrapment Avoidance in Swimming Pools...” by the Association of Pool & Spa Professionals

APSP requirements say that, for multiple main drain systems, the main drain cover/grates must provide a combined 200% of “total” system flow. In other words, two drain systems, each cover/grate must be VGB rated for 100% of “total” system flow . . . three cover/grates, each must be sized to handle 66.7% of “total” system flow . . . four cover/grates, each must be sized to handle 50% of “total” system flow etc.

APSP goes further and deals with main drain pipe velocities at these new higher “total” system flow characteristics for each main drain. These same drains were most likely sized for a maximum of 5 fps in the original design, but at these new predicted 200% flow requirements, the APSP 6 fps maximum could be exceeded and require digging up and replacing all of the main drain piping.

Conclusion

Adhering to the APSP standard would potentially cost owners tens of thousands of dollars. This must be clarified so that we adhere only to the ASME A112.19.8 standard. State health departments that have taken the VGB act and incorporated the extra burden of the APSP-7 requirements into their own criteria need to understand they have gone beyond the intent of the Act.

End of Project Memorandum

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