NAC
ARCHITECTURE

Patty Hayes, Board Chair
Washington State Board of Health
PO Box 47990
Olympia, WA 98504-7990

AQUATIC CENTER at MLK JR. PARK, Yakima

Variance Letter D ate: 2024.06.20

STATE IDENTIFICATION: State ID Facility #: F0476 Project #:2024003

Facility Information:
Aquatic Center at MLK Jr. Park (New outdoor pool facility with 5,300sf pool building and two leisure pools)
Plan Submittal: Drawing Plans have been submitted for review.

Aquatic Center at MLK Jr. Park, City of Yakima

Owner Contact:	Ken Wilkinson	Phone: 509-576-6416
Owner Address:	129 N 2nd street	Yakima, WA 98901
Facility Address:	610 S 9th Street	Yakima, WA 98901
Owner Representative:	Brooke Hanley (NAC Architecture) 509-838-8240	

Variance Request Contact:
NAC Architecture: Brooke Hanley Phone: 509-838-8240 Email: bhanley@nacarchitecture.com

Variance Request Citation:
WAC 246-262-160 states *the board may grant a variance from requirements of chapter **246-262** WAC if, in the sole discretion of the board, data and/or research provides sufficient evidence that the RWCF (attraction, device, equipment, procedure, etc.), will adequately protect public health and safety, as well as water quality.*

Variance Request: Code Related to Diving Envelope (WAC 246-262-010(21) & WAC 246-262-060(5)(vi)) for a **climbing wall** attraction.

Items noted in review letter include:

- **Climbing wall** attraction receiving pool shall meet the 2000-2001 FINA facility rules (depth application and setbacks)

In the Department of Health review response letter issued by Justin Law dated May 22, 2024, Justin requests NAC Architecture (NAC) and WaterTechnology, Inc. (WTI) to address important concerns regarding public safety related to the receiving pool for the proposed **climbing wall** attraction in Pool B. The concern is to address the minimum depth of the pool to be compliant with the WAC 246-262-010(21) & WAC 246-262-060(5)(c)(vi) regarding diving envelopes for features where users enter the water at 20” or higher above the water surface.

On behalf of the City of Yakima, WA; NAC & WTI respectfully requests your consideration of the current pool depth design at the climbing wall for the future Aquatic Center at MLK Jr. Park. To support this request we provide the attached information, engineering exhibits, and following commentary:

- The review letter states that the "diving envelope" from WAC 246-262-010(21) applies to **all attractions** where users enter above pool water level and therefore requires the CNCA (enter less than 20" above the water surface) or FINA (enter 20" or greater above the water surface) water depths. We submit that the attached engineering calculations for the **AquaClimb 3-Panel-High climbing wall** product will demonstrate that the manufacturer's required water depths and the designed water depths provided at the Yakima Aquatic Center are sufficient to protect the safety of the range of users allowed to participate in this attraction. Calculations were completed for a 48" tall, 50lbs person and a 78" tall, 250lbs person to show a range of sizes requested in the review letter. Please reference page 9 for the manufacturer's minimum depth requirements and pages 10-17 for the engineering calculations and associated notes. The Yakima design provides for 6" greater water depth than the minimum required by this engineering report. Please review the attached data in support of using the manufacturer's depth requirements in lieu of the CNCA or FINA diving envelope dimensions.

- WAC 246-262-060(5)(c)(vi) appears to apply specifically to "diving envelopes in pools or areas of pools designated for diving activities". The applicant submits that diving activities are generally defined as plunging into the water headfirst. Diving headfirst into water results in the need for deeper water to avoid a head & neck collision with the bottom of the pool which is different than a feet-first or tucked entry plunge where the body is significantly slowed in the first two feet of water. The **climbing wall** safety guidelines and standard operating procedures (provided in the exhibits) will note that users are required to re-enter the water in a feet-first manner. Diving from the unit is prohibited (and per the manufacturer data, bio-mechanically impossible). The engineering calculations completed also assumes a feet-first plummet into the water.

- The Model Aquatic Health Code also addresses the complexity of "other aquatic features" like **climbing walls** and would suggest that the manufacturer recommendations for design and operation would be adequate to install the feature.

  4.12.10[A] Other Aquatic Features Other AQUATIC FEATURES not otherwise addressed in the CODE, including but not limited to climbing walls, inflatables, and play structures, shall not be installed unless designed and operated in accordance with all manufacturer's installation and operations recommendations.

- 'A-frame' signs with all written safety guidelines will be publicly displayed near the **climbing wall** (see page 18 for example) to meet the criteria of WAC 246-262-070(10). The design team could also instruct AquaClimb to add a maximum height of 78" to the sign to correspond to the engineering calculations, if this would mitigate concerns over swimmers participating that do not fit within the engineering assumptions.

- See attached climbing wall diagram. The frame and panels of the wall tilt out over the water, ensuring the swimmer's descent is away from the wall and pool edge. The protective panels at the top do not have hand-holds and therefore prevents climbing over the top of the structure.

- This pool will be lifeguarded at all times while in operation and the lifeguard staff will be the first line of defense to screen bathers to make sure they are experienced swimmers, instruct swimmers on proper use of the attraction, and direct proper swimmer circulation to and from the activity within the pool to avoid congestion or collisions. The **climbing wall** will have a dedicated lifeguard to closely supervise the safety of swimmers when the attraction is open for use.

- Injury statistics requested by the review letter are not available from the manufacturer or another source, but the product literature, research paper, and testing tout the relative safety of the **climbing wall** compared to diving boards and slides. They also have over 1,000 installations across the world. See the provided letter from Aquatic Safety Research Group.

- The **AquaClimb** has also been designed and engineered to meet the following standards:
  - ASTM F24/F2291-21 Standard Practice for Design of Amusement Rides and Devices
  - ASTM F2461-20 Aquatic Play Equipment
  - European Standards EN17164 – Climbing walls for use in the water area
  - IBC 2018 & AISC Manual of Steel Construction
  - Other industry standards listed in the product data attached

- The City of Yakima specifically requested a pool design that would have a variety of intriguing activities for their patrons but would not need water deeper than 6-7ft. Pools deeper than 6-7ft come with their own safety risks and lifeguarding challenges. Shallow water is easier to supervise and guard. Rescues are much more likely to be needed in deep water where a bather in trouble cannot push off the bottom of the pool to bob back above the surface quickly until the lifeguard can assist them. Yakima is dedicated to making this facility fun while also as safe as possible for their community members and patrons.

- NAC submits that the design as described above and substantiated in the attached documentation meets the intent of providing a safe receiving pool for the **climbing wall** feature. NAC, WTI, and the City of Yakima respectfully requests a variance accordingly. If the State Board of Health has any follow-up conditions or actions required of the owner/operator, we are committed to implementing them.

NAC Architecture (NAC) has teamed with Water Technology (WTI) on numerous aquatic projects and so we have a history of producing these projects successfully. WTI has been designing Aquatic venues for over 40 years. WTI is widely known in the industry as one of the leading aquatic design firms in North America. As one of the industry's leaders, WTI has represented the waterpark industry during CPSC meetings on review of VGB rules and has also been involved in reviewing/editing sections of the MAHC.

They are also represented in the Washington DOH committee to update the existing administrative code to adopt a more comprehensive aquatic code like the MAHC. The NAC and WTI commitment to safe aquatic facilities is proven. The design of the receiving pool at the **climbing wall** for the Yakima Aquatic Center will not put the health and safety of the public at risk. The City of Yakima, having operated a public pool for many years is experienced and committed to the safety and the welfare of their patrons.

On behalf of the City of Yakima, NAC Architecture would like to thank you for your consideration of this Variance Request. Please feel free to contact me with any questions you may have regarding this request.

Thank you,

Brooke Hanley

Brooke Hanley, AIA, Principal Architect, NAC Architecture

Attachments:

- AquaClimb Safety and Fall Zone Engineering, including a floor plan and section of the receiving pool as designed for the Yakima Aquatic Center.

POOL B-ACTIVITY DATA

DESCRIPTION	QTY	UNITS		
POOL PERIMETER	314'-0"	FEET		
WATER SURFACE AREA	3,832	SQUARE FEET		
POOL WATER TEMPERATURE	84	°F		
POOL VOLUME	136,514	GALLONS		
SURGE TANK OPERATING VOLUME	7,415	GALLONS		
TOTAL VOLUME OF WATER	147,268	GALLONS		
CIRCULATION RATE	1,033	GPM		
TURNOVER/VOLUME/FLOW	60 MIN.		19,330 GAL.	322 GPM
TURNOVER/VOLUME/FLOW	180 MIN.		127,938 GAL.	711 GPM
FILTRATION RATE	12.66	GPM/FT²		
BACKWASH FLOW	306	GPM		
SURGE FACTOR	1.06	GAL/SQFT		
AVAILABLE SURGE CAPACITY IN SURGE TANK	4075	GALLONS		

SCHEDULE - BASIS OF DESIGN - POOL B

POOL ID	EQUIPMENT ID	EQUIPMENT	QTY	MANUFACTURER	DESCRIPTION
B	01	POOL LIFT	1	SR SMITH, AQUA CREEK, OR EQUAL	STANDARD ANCHORED, ROTATIONAL POOL LIFT, WITH 400 LB MINIMUM LIFTING CAPACITY. MUST MEET ALL APPLICABLE ADA REQUIREMENTS, WHILE MAINTAINING REQUIRED DECK CLEARANCE. PACKAGE TO INCLUDE ARMRESTS, ANCHOR, LIFT COVER, BATTERY CHARGER, AND CADDY
B	02	GRAB RAILS (PAIRS)	6	PARAGON AQUATICS, SPECTRUM AQUATICS, SR SMITH OR EQUAL	PRETZEL BEND STYLE, 1.50" OD x .120 WALL THICKNESS, 500 GRIT FINISH MIN.
B	03	ESCUTCHEON PLATE	34	PARAGON AQUATICS, SPECTRUM AQUATICS, SR SMITH OR EQUAL	STAINLESS STEEL ROUND ESCUTCHEON FOR 1.50" O.D. RAILS
B	04	WEDGE ANCHOR	34	PARAGON AQUATICS, SPECTRUM AQUATICS, SR SMITH OR EQUAL	CAST BRONZE, 4-1/4" LONG, ACCEPTS 1.500" OD TUBING
B	05	IN-WALL STEPS	18	PARAGON AQUATICS, SPECTRUM AQUATICS, SR SMITH OR EQUAL	17-1/2" x 6", INJECTION MOLDED PLASTIC, PEBBLE TEXTURE, 1/4" WALL THICKNESS
B	09	LANE DIVIDERS	3	COMPETITOR SWIM PRODUCTS	4" WAVE QUELLING RACING LANE LINE, COLORS BY OWNER / ARCHITECT
B	10	DaiFLEX LANE LINE ANCHOR	6	DALDORADO	12" – NON-CORROSIVE PVC FLIP UP LANE LINE ANCHOR TO BE USED WITH DALDORADO PARALLEL GRATING. INCLUDES FLIP-UP HATCH, BASE UNIT, & SILICON COVERED SS BRAIDED STRAP EXTENSION WITH HOOK. CAN BE USED WITH THE DaiFLEX 8" OR 14" LANE LINE EXTENSION.
B	11	SAFETY ROPE	6	PARAGON AQUATICS	3/4" POLYETHYLENE ROPE WITH 5"x9" HANDI-LOCK FLOAT, VERIFY LENGTH WITH PLANS
B	12	CUP ANCHOR	10	PARAGON AQUATICS, SPECTRUM AQUATICS, SR SMITH OR EQUAL	4" SQUARE 304L SS ANCHOR AND 304L SS EYE BOLT
B	13	BASKETBALL HOOP	1	SR SMITH	STAINLESS STEEL BASKETBALL HOOP WITH ROCKSOLID ANCHOR
B	14	AQUA ZIPN	1	AQUACLIMB	DECK-MOUNTED OVERHEAD ROPE SWING, WITH SELF-RETRACTING TROLLEY, POWDER-COATED STAINLESS STEEL WITH HIGH TENACITY POLYESTER ROPE. INCLUDES SAFETY PAD-UNIVERSAL, WITH 316 SS HILTI FLUSH MOUNT CONCRETE ANCHORS.
B	15	AQUACLIMB	1	AQUACLIMB	2 WIDE X 3 HIGH AQUATIC CLIMBING WALL
B	16	LIFEGUARD CHAIR	2	TAILWIND, KEIFER, SPECTRUM AQUATICS, SR SMITH OR APPROVED EQUAL	RECYCLED PLASTIC WITH 304 SS HARDWARE, COLOR BY OWNER/ARCHITECT 40" SEAT HEIGHT (OWNER'S SAFETY CONSULTANT TO SPECIFY LOCATION.)
B	17	NINJACROSS	1	NINJACROSS	AQUATIC OBSTACLE COURSE
B	18	SAFETY PAD	3	PLAYTIME	WALL AND DECK SAFETY PAD AT NINJACROSS SYSTEM

SCHEDULE - CUSTOM RAILGOODS - POOL B

POOL ID	EQUIPMENT ID	EQUIPMENT	QTY	MANUFACTURER	DESCRIPTION
B	01	HAND RAIL	3	PARAGON AQUATICS, SPECTRUM AQUATICS, SR SMITH OR EQUAL	CUSTOM FABRICATED, 316L SS, 1.50" OD x .120 WALL THICKNESS, 500 GRIT FINISH MIN.
B	02	HAND RAIL	2	PARAGON AQUATICS, SPECTRUM AQUATICS, SR SMITH OR EQUAL	CUSTOM FABRICATED, 316L SS, 1.50" OD x .120 WALL THICKNESS, 500 GRIT FINISH MIN.

SCHEDULE - WATER FEATURE - POOL B

POOL ID	FEATURE ID	FEATURE	QTY	MANUFACTURER	DESCRIPTION	GPM (ea)	GPM (Total)
B	F01	DROP SLIDE	1	SPLASHTACULAR	FUTURE SLIDE PROVIDE PIPING CAPPED ONLY	500	500
B	F02	WATER SPRAY	2	WATERPLAY	PIPE DELUGE-FAN SPRAY FEATURE	60	120

INSTALL A 4" CONTRASTING VERTICAL PAINT STRIPE FROM 4" ABOVE FLOOR UP TO THE WATERLINE TILE. TYPICAL ALL INSIDE CORNERS. 3 / PL102

CLIMBING WALL IN ELEVATION VIEW, RECEIVING POOL IN SECTION VIEW

CLIMBING WALL IN PLAN, RECEIVING POOL IN PLAN VIEW

4" WIDE BAND @ 5'-0" WD CONTINUOUS ON POOL WALLS AND FLOOR. COLOR CONTRASTING TO POOL FINISH 2 / PL102

Pool Lower Deck Level 0"

Pool Static Water Level 0"

6' - 6" [1975] WD

FILL

5' - 0" [1525] | 8' - 6 3/4" [2600] | 5' - 0" [1525]

CLIMBING WALL DRAWINGS AT POOL B

PL120 POOL B - ACTIVITY PLAN
PLAN VIEW
1/4" = 1'-0"

N

REVISIONS

REV.NO.	DESCRIPTION	DATE
1	CHANGE PROPOSAL	04/16/2024

CONFORMED SET

CITY OF YAKIMA
YAKIMA POOL
YAKIMA WA

WTI WATER TECHNOLOGY, INC.
World Leaders in Aquatic Planning, Design and Engineering
100 Park Avenue | Beaver Dam, WI 53916
t 920.887.7375

NAC ARCHITECTURE
nacarchitecture.com
1203 WEST RIVERSIDE AVENUE
SPOKANE WA 99201
P:509.838.8240

NAC NO 111-22082
ISSUE DATE: 4/16/24
PROJECT NUMBER: 22314
DRAWN BY: T.ED
CHECKED BY: ACC

7893 REGISTERED ARCHITECT
MATTHEW W. FREEBY
STATE OF WASHINGTON
4/16/2024

POOL B - ACTIVITY POOL PLAN

PL120

Turn your pool into an ADVENTURE with AquaClimb®

For recreation centers, fitness facilities, camps, and private clubs, AquaClimb expands poolside programming with an easy addition that is safe, engaging, and fun. As the market leader, AquaClimb offers more benefits to its customers than any other climbing product:

Modular and Customizable

AquaClimb's height, width, and panel style can all be tailored to fit the size and design of your pool, with options for adding more panels at a later phase as your budget allows.

Challenging, Realistic Climbing

With 3D contoured panels, AquaClimb delivers a realistic rock-climbing experience that engages adolescents through adults to conquer the climb in different ways.

Top Safety Record

With best-in-class safety features to ensure climbers fall away from the wall, AquaClimb also has a proven performance history from 1,000 installations across the globe.

Activates the Deep End

As a safer alternative or enhancement to diving boards, AquaClimb attracts tweens and teens to those under-utilized, deep areas of a pool.

Easy to Install

Because AquaClimb is pre-assembled in the factory, no specialized skills or equipment are required for onsite installation at your facility on any pool gutter configuration.

Minimal Footprint

AquaClimb's small deck-mounted system saves clearance space and doesn't interfere with normal lap swimming. And with no water source required, it is an easy amenity to add.

AQUACLIMB® Four Unique Models

AquaClimb Krystal

- Budget-friendly and entry-level option
- Modular, flat panels in clear, blue, and green transparent tint
- Customizable up to four height options sized to pool's depth

AquaClimb 3D

- 3D contoured panels for realistic climbing available in translucent **Ice, Glacier,** or **Jade** colors, and solid painted color schemes
- Modular panels can be turned and flipped to change up the experience
- Translucent panels allow lifeguard visibility while giving privacy to the climber behind the wall

AquaClimb Kurve

- Sleek, curved frame that allows heights up to 20 feet
- 3D contoured panels available in color options of Ice or Glacier
- Translucent panels allow lifeguard visibility while giving privacy to the climber behind the wall

AquaClimb Luxe

- Completely customizable design to match your pool's aesthetics
- 3D contoured panels
- Deck mounted or Pool wall mounted

Take on the ADVENTURE with AquaClimb®

It's never been easier to add an exciting new amenity to your:

- Camp
- Country Club
- College/University
- Swim Club
- Recreation/Aquatic Facility
- Health/Fitness Center
- Military Wellness & Recreation
- Private Residence

Join thousands of other satisfied customers who love their AquaClimb:

"Our AquaClimb is spectacular. From the time we open the pool until the time we close, there is a line to make the climb. What an ingenious product and so much fun for the kids... and a few adults."

Mark Tiernan
General Manager at the Valley Country Club
Centennial, CO

"We had a great first year with the AquaClimb. Kids were constantly lined up for it, and everyone had a blast. AquaClimb was a big reason we saw a 40% increase in attendance over the last year."

Ted Davis
Southfield Parks and Recreation
Southfield, MI

To learn how you can bring the adventure of AquaClimb to your facility, contact us today:

POOLSIDE ADVENTURES™

PoolsideAdventures.com | 800.956.6692 | info@PoolsideAdventures.com

Building Courageous Kids for Life's Great Adventure

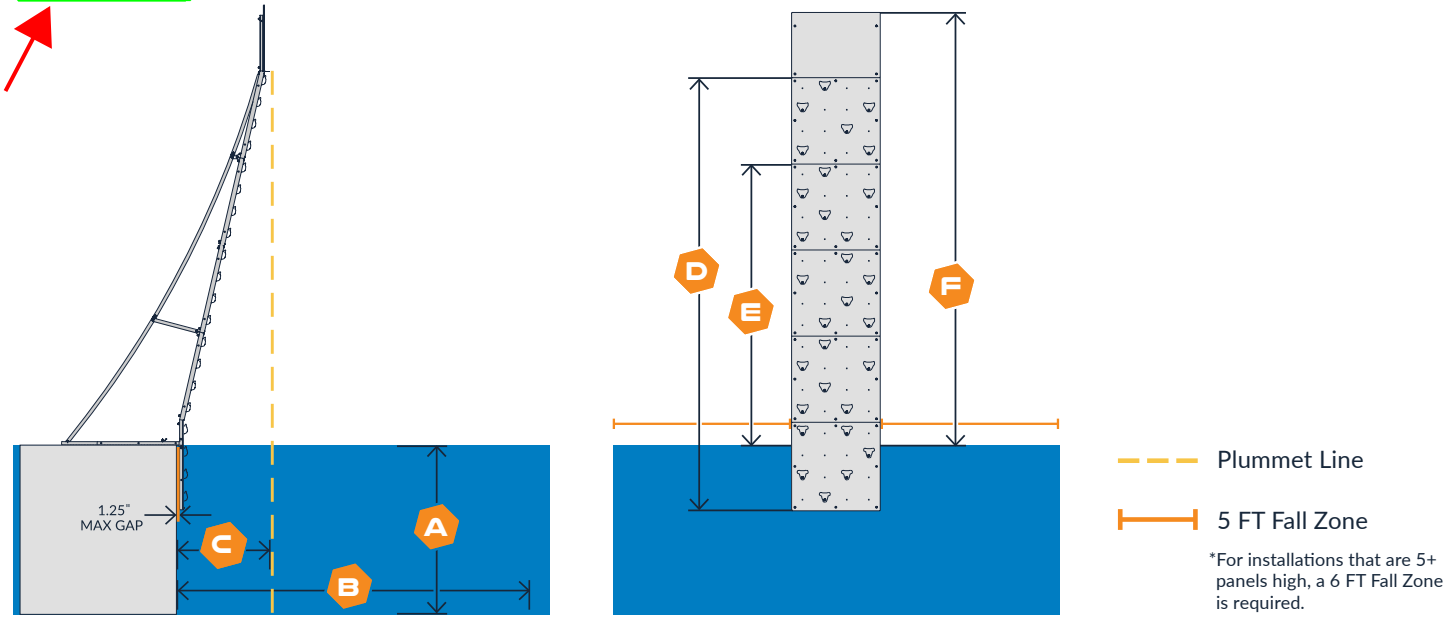
AQUACLIMB® Depth Requirements

Panel Options	A Minimum Pool Depth	B Drop Zone	C Plummet line from wall	D Available climbing height	E Height of top foothold*	F Above deck wall height
3 High Alt	5'	9'	1'9"	8'10"	4'5"	9'7"
3 High Yakima Product	6'	9'	1'9"	9'10"	5'5"	9'7"
4 High Alt	6'	10'	2'6"	12'1"	7'8"	12'10"
4 High	7'	10'	2'6"	13'1"	8'8"	12'10"
5 High Alt	8'	12'	3'3"	15'5"	11'	16'1"
5 High	9'	12'	3'3"	16'5"	12'	16'1"
6 High (Kurve Only)	10'	12'	3'3"	17'	12'5"	19'8"

*Based on climber's feet positioned at least 2' below highest hand grip

Alt - Alternate configurations will have the top row of handholds plugged for non-climbing terrain to meet pool depth requirements.

Important Safety Note: AquaClimb safety distances and pool depths are based upon a climber entering the water **feet first**. The AquaClimb was designed for a feet first entry at all times and supervision must be present when the AquaClimb is in use. To ensure the maximum level of safety, **there must be no diving at any time**.



To learn how you can bring the adventure of AquaClimb® to your facility, contact us today:

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Building Courageous Kids for Life's Great Adventure

FEAmax Report

AquaClimb Hand Calculation

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FEAmax LLC.

PROJECT INFO.

Change History:

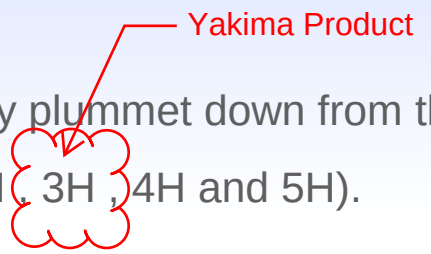
Version Number	Date	Summary	Author
V 1.0	2/2/2016	Initial release	Frank Wang

Client Information:

Contact name:	Laura Grandner
Email:	Laura@aquaclimb.com
Company name:	Pyramide USA
Address:	P.O. Box 530 Frederick, MD. 21705

PROJECT DESCRIPTION

- **Project Description**



1. Calculate the minimum depth required to safely plummet down from the highest foot hold point on the (4) levels of AquaClimb Walls (2H , 3H , 4H and 5H).
2. With the top climbing hold measurement provided – deduct 36” (3ft) down which would be the highest foot hold placement. Then with the following parameters calculate the minimum depth needed to safety let go and plummet straight down into the water without reaching the bottom floor of the pool.
3. Height: 48” minimum; 78” Maximum
4. Weight: 50 lbs minimum; 250 lbs maximum

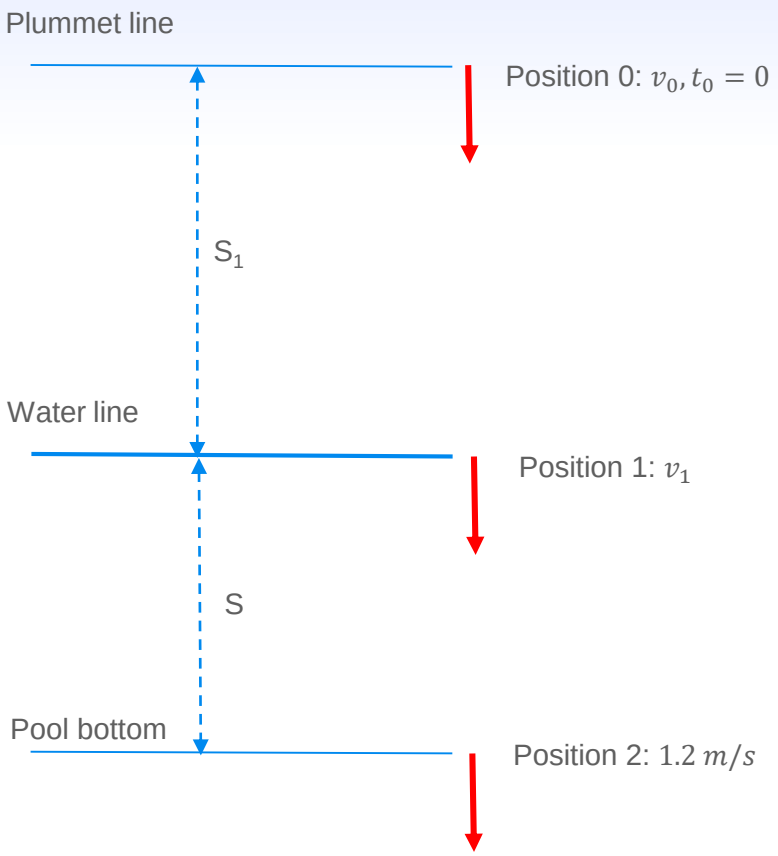
CALCULATION

Assumptions:

1. Minimum height of human body H_{human}= 48” = 1.2 meter
2. Water density ρ_{water}= 1.0 g/cm^3
3. Human body density ρ_{human}= 0.9 g/cm^3
4. The velocity enter the water = V_1
5. Water Resistance coefficient C_D = 1.0
6. Human body volume = V
7. Area of human body enter the water = A
8. Velocity of human body inside the water = V_x
9. The allowable decent velocity to the pool bottom = 1.2 m/s

Force applied to human body inside water:

1. Gravity $G = \rho_{human} g V$
2. Buoyancy (floating force) $\mathrm{F} = \rho_{water} g V$
3. Water resistance force $F_{resistance} = \frac{1}{2}\rho_{water} V_x^2 A C_D$



CALCULATION

According to Newton's second law, we have:

1. The acceleration in the water: $a = \frac{dV_x}{dt} = \frac{F}{m}$

2. $a = \frac{\rho_{human} gV - \rho_{water} gV - \frac{1}{2}\rho_{water} V_x^2 A C_D}{\rho_{human} V} = \frac{0.9\times9.8\times V - 1.0\times9.8\times V - 0.5\times1.0\times V_x^2 \times \frac{V}{1.2}\times1.0}{0.9\times V} = -(1.09 + 0.46V_x^2)$

3. $\frac{dV_x}{dt} = -(1.09 + 0.46V_x^2)$

4. $\mathrm{dt} = -\frac{dV_x}{(1.09+0.46V_x^2)}$

5. The max displacement of body moving in the water would be:

$$S = \int_0^t V_x \cdot dt = -\int_{1.2}^{V_1} V_x \cdot \frac{dV_x}{1.09 + 0.46V_x^2} = \cdots = -\int_{1.2}^{V_1} 0.46 \times \frac{1}{0.42} \times \frac{d(1 + 0.42 \times V_x^2)}{(1 + 0.42 \times V_x^2)}$$

$$= 1.09 \times [\ln(1 + 0.42 \times V_1^2) - \ln(1 + 0.42 \times 1.2^2)] = 1.09 \times [\ln(1 + 0.42 \times 2 \times 9.8 \times S_1) - 0.473]$$

6. The minimum depth of pool would be:

$$S = 1.09 \times \ln(1 + 8.23 \times S_1) - 0.52$$

CONCLUSION

If the body height is 48” (1.2 meter), we have:

$$S = 1.09 \times \ln(1 + 8.23 \times S_1) - 0.52$$

1. For 2H: S_1 = 1’ = 0.30 meter, we have the min pool depth:

   S = 0.84 meter = 2.8 feet

2. For 3H: S_1 = 1’9” = 0.53 meter, we have the min pool depth:

   S = 1.31 meter = 4.3 feet

3. For 4H: S_1 = 2’6” = 0.76 meter, we have the min pool depth:

   S = 1.64 meter = 5.4 feet

4. For 5H: S_1 = 3’3” = 1 meter, we have the min pool depth:

   S = 1.89 meter = 6.2 feet

Yakima Pool depth at climbing wall exceeds this recommendation and is 6'-6" deep

Yakima Product

Standard Height Options	Distance of plummet line from pool wall (A)	Minimum pool depth required (B)
2H	1'	4'
3H-5'	1' 9"	5'
3H	1' 9"	6'
4H-8'	2' 6"	8'
4H	2' 6"	9'
5H-11'	3' 3"	11'
5H	3' 3"	12'

CONCLUSION

If the body height is 78” (1.98 meter), the equation would be:

$$S = 1.78 \times \ln(1 + 5.49 \times S_1) - 0.60$$

1. For 2H: S_1 = 1’ = 0.30 meter, we have the min pool depth:

   S = 1.13 meter = 3.7 feet

2. For 3H: S_1 = 1’9” = 0.53 meter, we have the min pool depth:

   S = 1.83 meter = 6.0 feet

3. For 4H: S_1 = 2’6” = 0.76 meter, we have the min pool depth:

   S = 2.32 meter = 7.6 feet

4. For 5H: S_1 = 3’3” = 1 meter, we have the min pool depth:

   S = 2.73 meter = 8.9 feet

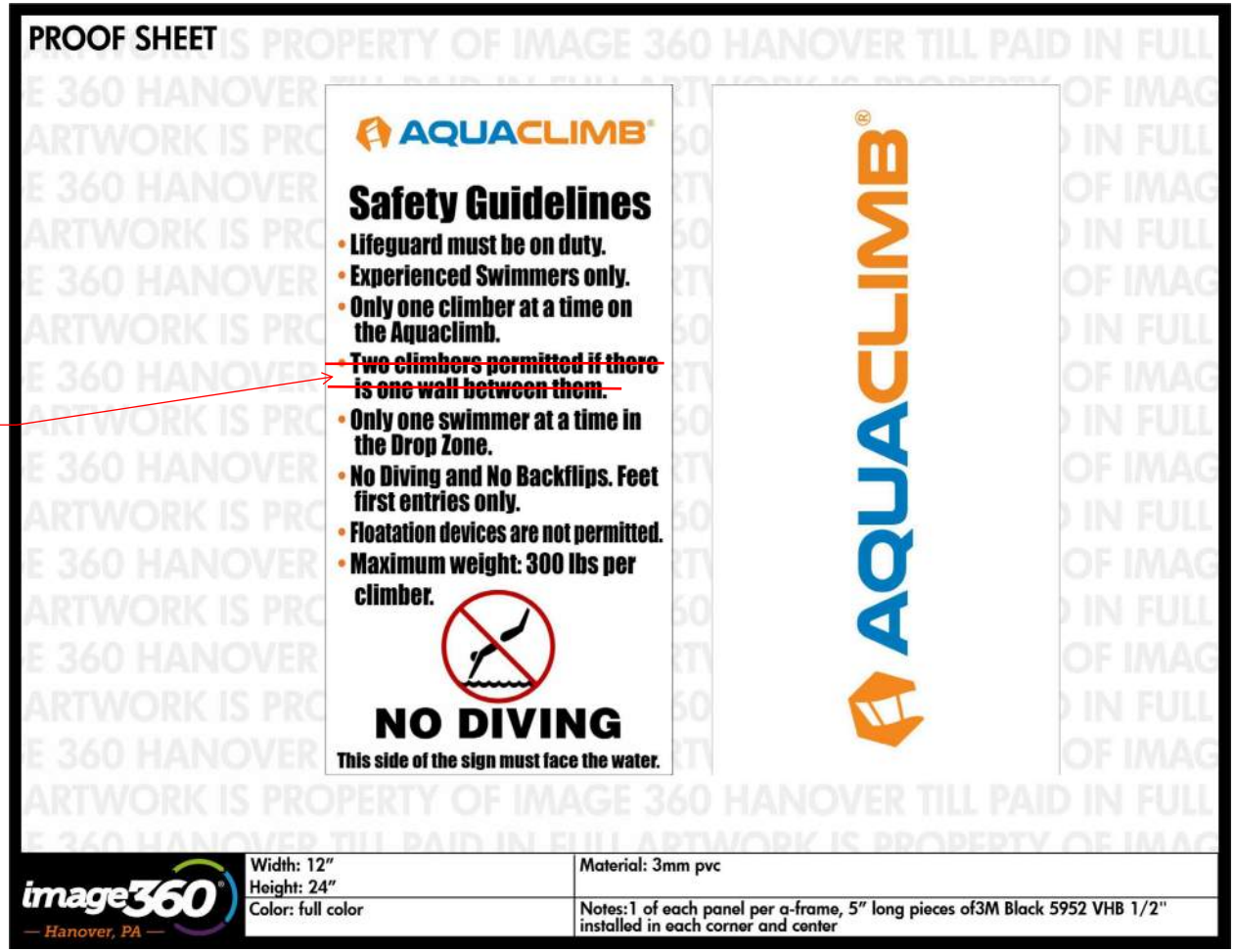
Yakima Pool depth at climbing wall exceeds this recommendation and is 6'-6" deep

Yakima Product

Standard Height Options	Distance of plummet line from pool wall (A)	Minimum pool depth required (B)
2H	1'	4'
3H-5'	1' 9"	5'
3H	1' 9"	6'
4H-8'	2' 6"	8'
4H	2' 6"	9'
5H-11'	3' 3"	11'
5H	3' 3"	12'

View proof for Printed PVC Panels for A-Frame

This rule does not apply to Yakima project since it is only 2 panels wide

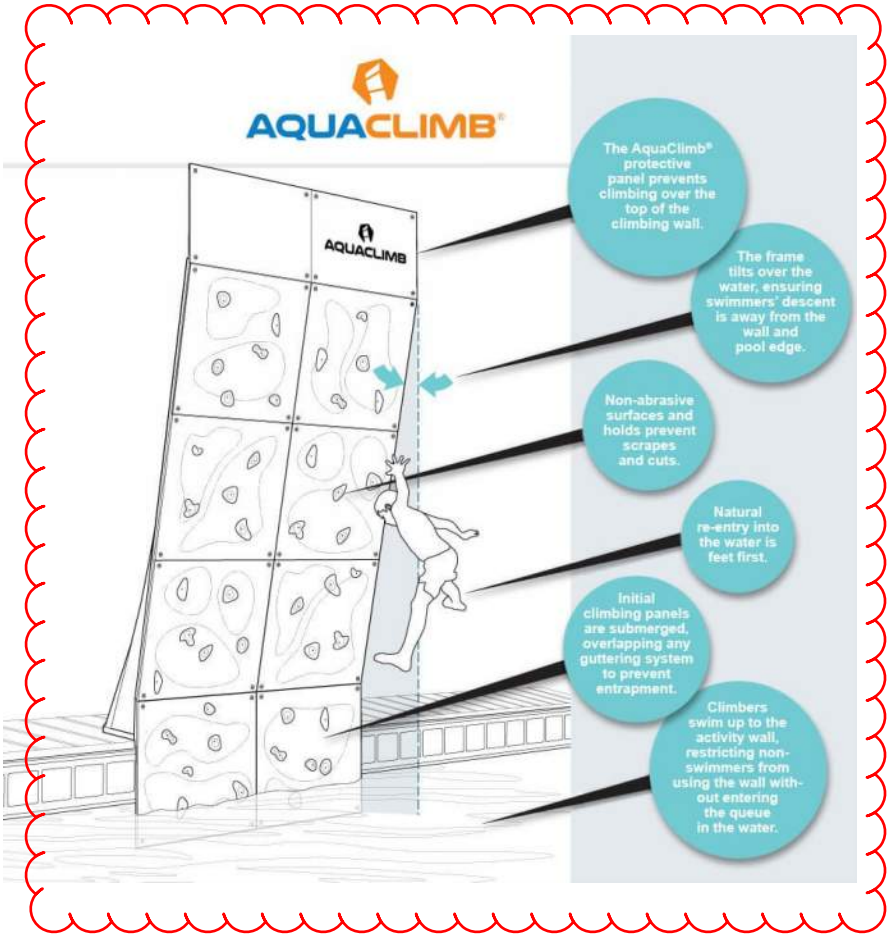


POOLSIDE ADVENTURES™

SAFETY

PROVIDE A SAFE WAY FOR POOL PLAY

AquaClimb® walls aren't just a fantastic poolside attraction. They're a safe way to play. They are specifically designed to eliminate the dangerous situations that can cause injury when sliding and diving. AquaClimb® is a safer alternative to diving boards and slides for both children and adults. Trust the brand that prioritizes you well being!



A SAFE WAY TO PLAY

- Each AquaClimb® comes complete with guidelines for safe use.
- AquaClimb® has clear protective panels to prevent climbers from climbing over the top of the wall.
- The AquaClimb® frame curves and hangs over the pool so that the natural re-entry into the water is feet first and the descent is away from the pool wall and edge.
- Non-abrasive surfaces and holds prevent scrapes and cuts.
- Natural re-entry into the water is feet first.
- Initial AquaClimb® climbing panels are submerged, overlapping any guttering system to prevent entrapment.
- Climbers swim up to the AquaClimb® activity wall, restricting non-swimmers from using the wall without entering the queue in the water.

Poolside Adventures products are recommended by the Aquatic Safety Research Group (ASRG) and are approved by state and

MEET OUR SAFETY TEAM

DR. TOM GRIFFITHS

Dr. Tom Griffiths is the President and Founder of Aquatic Safety Research Group, LLC. Recognized as an international leader in water safety, he has spent 38 years teaching, coaching and managing aquatics at three major universities. Griffiths has produced videos, textbooks, articles, and presentations in

local health departments throughout the USA, in addition to major health and safety organizations like PlaySafe LLC, a member of the International Play Equipment Manufacturers Association.

AquaClimbs are designed and engineered to the following standards:

- AISC Manual of Steel Construction, 15 th Edition, ASD
- IBC 2018
- ASCE/SEI 7-16
- ASTM F24/F2291- 21- Standard Practice for Design of Amusement Rides and Devices
- ASTM F2461-20 Aquatic Play Equipment
- European Standards EN17164 – Climbing Walls for Use in the Water Area

AquaZip'Ns are designed and engineered to the following standards:

- ASTM F2291-18 Amusement Rides and Devices
- ASTM F2461-18 Aquatic Play Equipment

CHECK OUT THESE ARTICLES ON THE BENEFITS OF ROCK CLIMBING FOR KIDS!

various areas of aquatics focusing his efforts on safety. He has also conducted hundreds of aquatic facility and beach inspections across the nation and abroad and teaches full day Aquatic Risk Management seminars. Perhaps his most significant contributions are the Five Minute Scanning Strategy©, Griff's Guard Stations©, Disappearing Dummies, his research on Shallow Water Blackout, and the National Note & Float program. He has been an aquatic safety expert for more than 40 years and shares his knowledge, expertise, and experience worldwide. Griffiths just released the 3rd

Why Rock Climbing is Such an Awesome Activity For Kids

5 Mental Health Benefits of Rock Climbing

Poolside Adventures stands on a history of providing a safe climbing experience. The recommended rules provided on our signage and advised during the sales and acquisition process are extremely important to operating a safe and fun activity for all.

We have recently viewed four YouTube videos which show our walls not being properly supervised, having the safe operation signage being displayed at the wall and the wall itself being used in a potentially unsafe manner. Though no accidents have been reported we strongly ask that all facilities please review the safe operation signage with staff and follow our guidelines.

Thank you!

edition of the popular The Complete Swimming Pool Reference.

Read Dr. Tom Griffiths 10-Year Review of the AquaClimb (PDF)

RACHEL GRIFFITHS

Rachel Griffiths, M.A. is the Communication Director for Aquatic Safety Research Group. Rachel conducts water safety research to help prevent drowning and provides water safety education to the public. She is also the President of Note and Float Life Jacket Fund,

AQUATIC SAFETY
Research Group

We Take Water Safety Seriously

DATE: April 9, 2015
TO: Laura Grandner
FROM: Dr. Tom Griffiths
RE: AquaClimb

Ten Year Review

As you know, nearly ten years ago, we placed an AquaClimb climbing wall in the diving well on the Penn State University Campus to test and analyze your product. I was pleased to learn how attractive it was to our students, and how it promoted fun and fitness in the pool with a new and exciting activity that was safe.

Since that time, Rachel and I have inspected hundreds of aquatic facilities and discovered that AquaClimb Walls are a safer alternative to many other poolside recreational products, primarily because swimmers do not have to climb a ladder in a wet environment over a concrete swimming pool deck. Because AquaClimb is accessed from the water inside the swimming pool, rather the swimming pool deck, there is very little chance of a child falling and hitting the deck. Further, the AquaClimb is angled out over the water, and as a result it is very improbable, if not impossible, that a child can fall to the deck.

As an expert witness in courts of law, I see many horrific accidents involving diving boards and slides, but I have never heard of an accident of any kind, minor or major, involving an AquaClimb. As we travel around this country and abroad teaching our full day Aquatic Risk Management Seminars, promoting AquaClimb as a safe, fun, and fitness alternative to other pool products is an essential part of our program. As you recall, AquaClimb is particularly valuable as a replacement for diving boards which no longer meet the depth and distance requirement or because of inadequate protective railings. I might also add that I have never seen a pool product installed as quickly in a swimming pool as an AquaClimb. I truly believe in your product and remain available to answer any questions you and others may have concerning AquaClimb Climbing Walls.

1632 Glenwood Circle, State College, PA 16803 **T** 814.883.0058 **F** 814.234.0313 TomGriffiths@AquaticSafetyGroup.com
AquaticSafetyGroup.com

Regards,

Tom Griffiths
President and Founder
Aquatic Safety Research Group, LLC

Rachel Griffiths
Communication Director
Aquatic Safety Research Group, LLC

[redacted]

I. INTRODUCTION

The AquaClimb is an exciting new recreational and fitness component that offers new programming opportunities to aquatic facilities. Because the AquaClimb extends below the surface of the water, participants can easily swim up to the climbing wall and begin to traverse it without leaving the pool itself. Even those individuals without use of their legs can utilize the AquaClimb to exercise the upper body in a fun, challenging, and non-threatening way. Perhaps the most meritorious application of the AquaClimb is an alternative to a diving board in a swimming pool which no longer meets safe diving depth and distance requirements.

Climbers who fall from the AquaClimb will enter the water feet-first. To enter the water head-first from the climbing wall structure is almost a biomechanical impossibility. Prior to purchasing and installing an AquaClimb, aquatic facilities should contact their local regulatory agency (e.g. Health Department) to determine whether regulations, recommendations or suggestions regarding the safe installation and use of the AquaClimb exist. **AQUATIC SAFETY RESEARCH GROUP, LLC**, an independent and objective water safety consultant firm, remains available to assist facilities in answering questions concerning the safe use of the AquaClimb.

II. STANDARD OPERATING PROCEDURES

A. LIFEGUARDS

Whenever the AquaClimb is in use, it is recommended that a properly trained and certified lifeguard be assigned exclusively to the AquaClimb. The lifeguard should be strategically placed to supervise and control use of the structure and to minimize climber

misbehavior. Because the apparatus will be positioned in deep water, a lifeguard with deep water skills and qualifications is needed. This lifeguard must also be trained for the proper use and monitoring of the in-water climbing structure. The lifeguard should be positioned close to the wall with a full and unobstructed view of the climbing wall and drop zone, with the ability to see underwater in the drop zone. The lifeguard must stay focused on the climbing wall whenever in use and attention should not be diverted to other areas of the pool. Lifeguard orientations, in-service trainings and emergency action plans should include the AquaClimb and should be reviewed and practiced regularly but at least monthly. In many pools, the best vantage point for proper surveillance may be directly across the pool facing the wall. However, each facility should determine where to best position supervisory staff to ensure a full and unobstructed view of the climbing wall and the drop zone.

The aquatic facility should also establish an entrance and exit pattern (left to right and right to left) to avoid congestion of swimmers waiting to swim into the drop zone to begin their ascent on the wall. This pattern can be changed daily or hourly. For larger installations allowing two or more climbers, additional safety precautions must be implemented to minimize the risk of a climber falling onto someone swimming into or out of the drop zone. One such approach is to direct climbers, once they have fallen from the wall, to swim to the closest edge of the drop zone so as to avoid swimming underneath a second climber.

B. DEPTH REQUIREMENTS

While most competitive swim agencies, including the National Collegiate Athletic Association (NCAA), require a minimum water depth of five (5) feet to dive headfirst from starting platforms, the AquaClimb, which promotes only feet-first entries, takes a more conservative approach, requiring a minimum water depth of five (5) feet for installation of its shortest three-panel wall. As panels are added vertically to the structure, minimum water depth requirements increase. To ensure safety of climbers, AquaClimb has applied commonly accepted safe head-first diving depths to feet-first entries from the structure.

We recognize that these depths are very conservative given that they are intended to minimize the risk of injury from head-first entries rather than from feet-first entries, but

[redacted] absent additional research we cannot safely recommend alternative water depths which deviate from these nationally-accepted standards.

MINIMUM DEPTH REQUIREMENTS FOR AQUACLIMB INSTALLATION			
Panel Height* - standard	3 panels (lowered)	4 panels (lowered)	5 panels (lowered)
Minimum Water Depth	5 feet	7 feet	8 feet

* Each panel measures approximately $3ft^2$ or $1m^2$

MINIMUM DEPTH REQUIREMENTS FOR AQUACLIMB INSTALLATION			
Panel Height* - standard	3 panels	4 panels	5 panels
Minimum Water Depth	6 feet	8 feet	9 feet

C. DECK CLEARANCES

Whenever possible, four feet of deck space should be maintained between the end of the support structure and the perimeter pool wall or fence. If less than four feet is available, a combination of pedestrian control stanchions and traffic cones should be used to direct patrons around the support system. To best accommodate persons with disabilities, a minimum of three feet (36”) clearance around the support structures should be maintained. Even with spacious decks, stanchions and cones always come highly recommended, as they minimize the risk of someone coming into contact with the structure. Customers are advised to check building and fire codes to determine whether support structures can permissibly block access to the pool deck, particularly in cases where the support structure would come within three feet of a wall.

[redacted]

D. NUMBER OF CLIMBERS

With a one panel or two panel wide AquaClimb, it is ***highly recommended*** that only one climber use the AquaClimb at a time. With a three panel or wider AquaClimb, however, there is an opportunity to allow more than one climber on the wall at the same time. Multiple climbers should only be allowed when there is no possibility of one climber either interfering with or falling on top of another climber. Multiple climbers should be instructed to climb the wall vertically rather than to traverse the wall horizontally. Climbers should also maintain a distance of at least one panel from other climbers to minimize the risk of climber interference, horseplay and accidental concurrent falls.

E. VERIFIED SWIMMERS ONLY

Because the AquaClimb is installed in deep water (see minimum depth requirements above), this climbing attraction is to be used only by "swimmers" – persons with verified swimming ability. The attractive colors and the fun activity that the structure provides, are likely to draw younger, weaker swimmers to the climbing wall. These persons should be properly screened to ensure they possess the requisite deep-water skills necessary for using the structure. Following standard aquatic safety practices, anyone wishing to enter deep water to use the AquaClimb should be given a swim test. A recommended swim test would be to have the swimmer/climber jump into ***chest-deep*** water, surface, swim the equivalent length of the buffer zone and return to the starting point. Requiring climbers to tread water for 30 – 60 seconds comes highly recommended. Swim tests should be conducted in chest-deep water to maximize swimmer safety.

[redacted]

F. DROP ZONE

Climbers will fall from the wall into the water. It is therefore imperative to keep people from entering the "drop zone" where they would risk being struck by a falling climber. No other swimmers should be allowed into the drop zone when a climber is on the wall.

3 panel high:

4 panel high:

5 panel high:

G. FEET-FIRST ENTRIES ONLY

While head-first entries, including dives, are improbable to perform from the face of the climbing wall, and although the depth requirements for the various climbing wall configurations are extremely safe and tend to be conservative, climbers must be warned that all entries into the water from the AquaClimb should be feet-first. Climbers who intentionally violate this safety rule should be prohibited from using the AquaClimb.

[redacted]

H. UNDERWATER ACTIVITIES

Participants should not be allowed to play with the structure itself, particularly while submerged. While there are no hidden hazards or entrapment potentials inherent in the AquaClimb, it is intended for above-water use. It is not intended or designed for underwater use by climbers. Playing underwater around the structure makes it more difficult for the lifeguard to properly supervise the activity. This could lead to injury should a climber fall onto someone who was playing underwater in the drop zone.

[redacted]

III. SUGGESTIONS FOR SAFETY SIGNAGE

Perhaps the most appropriate place to place caution/warning signs would be on the side. The three most important warnings should include:

- "Swimmers Only"
- "No Head First Entries"
- "Only One Climber at a Time unless there are 1-2 clear panel between climbers"

These three warnings can be placed together on the same sign in the appropriate colors (red/white, black/yellow, orange/black). Additional signs/warnings may be mounted on the rear of the support structure.