Washington State Department of HEALTH

WATER RECREATION VARIANCE REQUEST
CHENEY AQUATIC CENTER

State Board of Health
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Introduction

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Background - Variances

WAC 246-262-160, Variance.

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 recreational water contact facility (attraction, device, equipment, procedure, etc.), **will adequately protect public health and safety**, as well as water quality.

The request is to vary from:

- WAC 246-262-060(5)(b)(vi) requirement for a diving envelope
- WAC 246-262-010(21) definition of a diving envelope

3 features proposed:

- Aqua climb climbing wall
- Aqua Zip'N rope swing
- Ninja cross obstacle course

Affected WAC

WAC 246-262-010(21) Definition of a Diving Envelope

"Diving envelope" means the minimum dimensions of an area within the pool necessary to provide entry from a diving board, platform, or attraction segment where users enter above pool water level.

WAC 246-262-060(5)(b)(vi) General Design, Construction, and Equipment requirements for Diving Envelopes

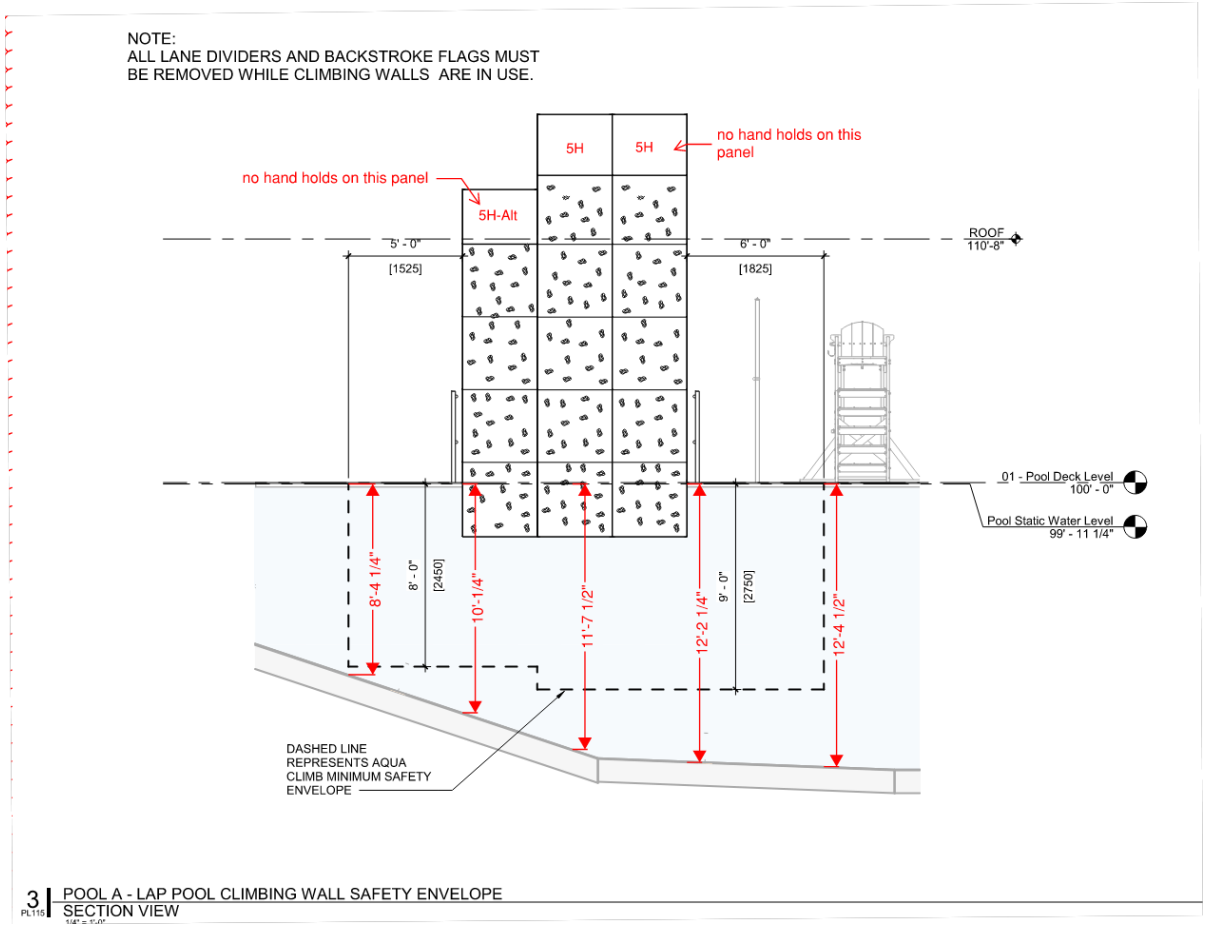
- Minimum Dimensions depending on diving deck level
- Handholds
- Ladders
- Nonslip tread
- Etc.

Aqua Climb – Installation Cheney

- This feature is a climbing wall using the 5-Alt and 5 high configurations.
- When used as expected, participants enter the water in a body orientation with the head up.
- It is designed with the expectation that participants may strike the pool bottom with their feet.
- Maximum participant velocity at recommended installation depth is 1.35 m/s.

Aqua Climb – Installation Cheney Continued

- 5-Alt climbing section
  - CG Fall height = 8.5 feet
  - depth = 10.02 feet
  - Safety envelope depth = 8 FT
  - Velocity at safety envelope = 1.35 m/s
- 5-high climbing sections
  - CG Fall Height = 9.33
  - minimum depth = 10.90 feet
  - Safety envelope depth = 9 FT
  - Velocity at safety envelope = 1.00 m/s
- Results are for the largest size participant.
- Participants are unlikely to contact the pool bottom at install depths.



Summary & Recommendations – Aqua Climb

We believe this installation meets the intent of providing a “diving envelope” because participants are unlikely to contact the pool bottom.

DOH and Spokane Regional Health District recommend that the Board approve this variance request with conditions:

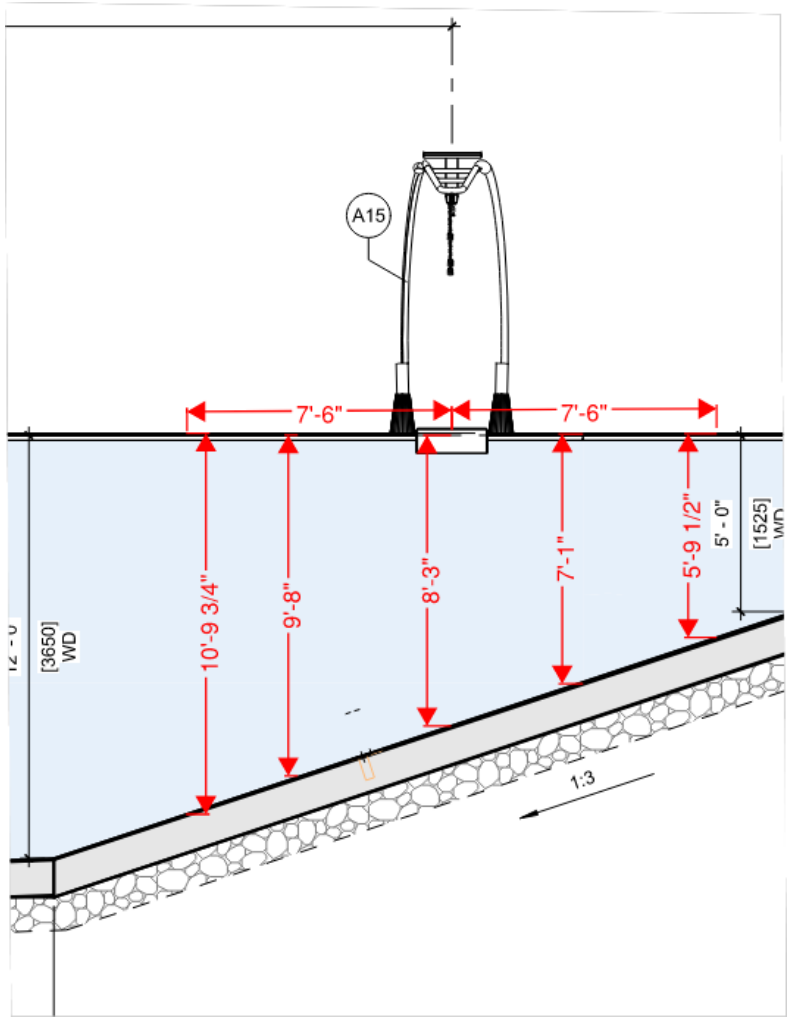
1. All manufacturer installation, maintenance, and use guidelines must be followed.
2. The Aqua Climb must be installed as shown on submitted plans with a minimum water depth of 10 ft. under the 5-alt climbing panels, and a minimum water depth of 11 feet under the 5-high climbing panels.
3. Detailed rules signs must be provided, including the minimum and maximum user height and weight.
4. Only one user may be permitted to occupy the Aqua Climb at one time.
5. A dedicated lifeguard must be provided for the Aqua Climb climbing wall. The lifeguard must control the entry and exit of users.
6. The Aqua Climb climbing wall must be inspected daily and any identified maintenance issues must be addressed prior to opening the wall to users.
7. Lifeguard and operations plans must be developed and submitted to the local health jurisdiction prior to the issuance of a pool operating permit.
8. SRHD also recommended that only the Krystal clear version be used to promote visibility through the climbing wall structure.

Aqua Zip'N – Installation Cheney

- This feature is a rope swing/zipline.
- When used as expected, participants enter the water in a body orientation with the head up.
- It is anticipated that participants have the potential to strike the pool bottom with their feet when installed using the manufacture's recommended minimum water depth.

Aqua Zip'N – Installation Cheney Continued

- Maximum handhold height = 87”
- Expected maximum fall = 2.43 ft
- Maximum depth penetration = 5.76 ft
- Maximum participant = 6 ft / 250 lbs



Summary & Recommendations – Aqua Zip'N

We believe this installation meets the intent of providing a "diving envelope" because participants are unlikely to contact the pool bottom.

DOH and Spokane Regional Health District recommend that the Board approve this variance request with conditions:

1. All manufacturer installation, maintenance, and use guidelines must be followed.
2. The Aqua Zip'N must be installed as shown on submitted plans with a minimum water depth of 8ft. under the center of the Aqua Zip'N device.
3. Detailed rules signs must be provided, including the minimum and maximum user height and weight.
4. Only one user may be permitted at one time.
5. A dedicated lifeguard must be provided for the Aqua Zip'N. The lifeguard must control the entry and exit of users.
6. The Aqua Zip'N must be inspected daily and any identified maintenance issues must be addressed prior to opening the wall to users.
7. Lifeguard and operations plans must be developed and submitted to the local health jurisdiction prior to the issuance of a pool operating permit.

Ninja Cross – Installation Cheney

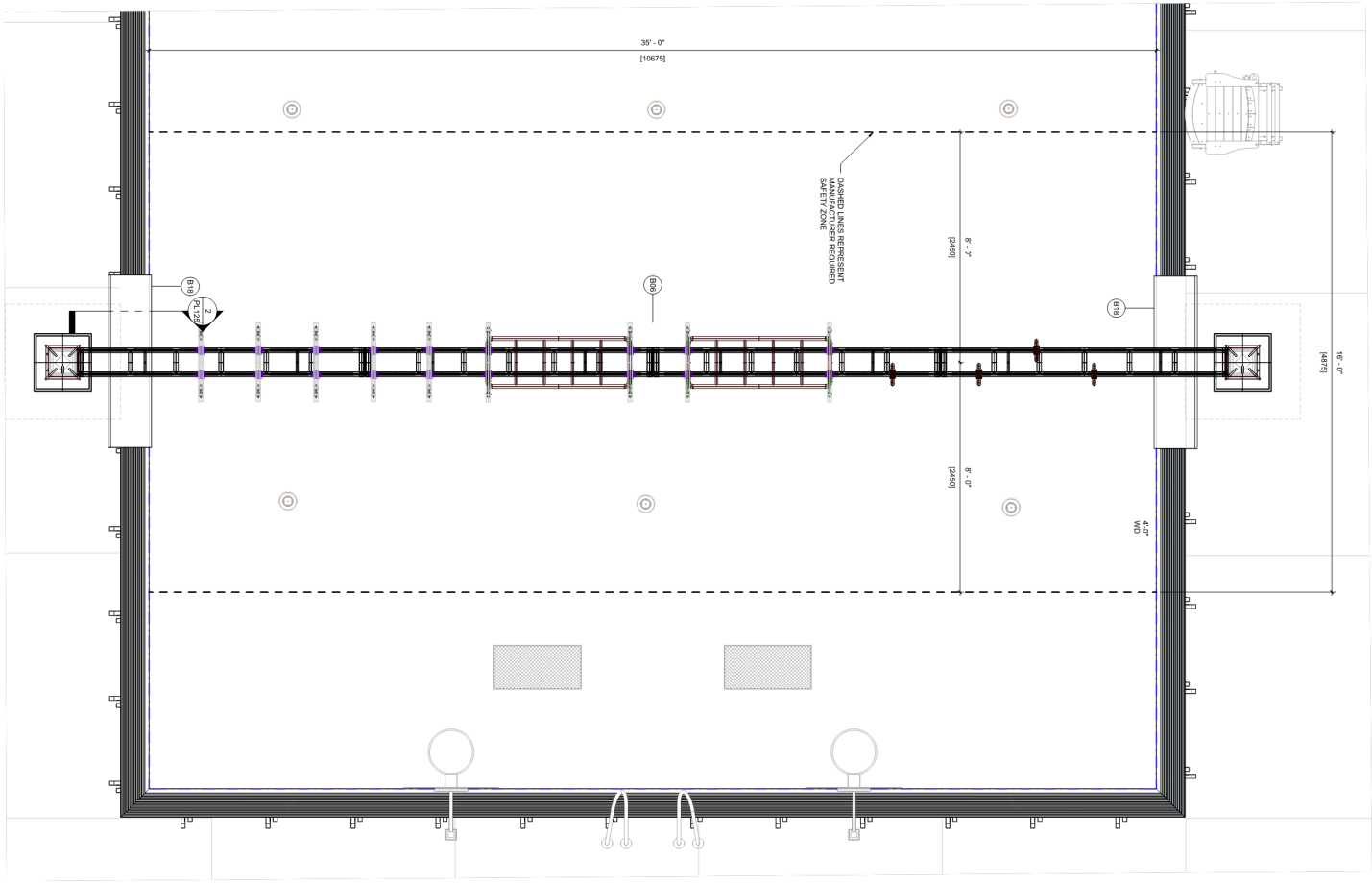
- This feature is an obstacle course with challenge elements suspended above the water.

- When used as expected, participants have part of their body in or touching the water.

- To ensure a “worst case scenario”, the engineering study assumed that participants begin their drop 20 inches above the water surface.

Ninja Cross – Installation Cheney Continued

- Pool water depth = 3.58 ft to 4.0 ft
- Manufacture specified safe water depth = 3.5 ft
- Calculated impact velocity for maximum participant = 1.41 m/s



Ninja Cross - Evaluation

- Part of body in the water.
- Participants are expected to hit bottom.
- Maximum velocity on contact is 1.4 m/s.
- A variance may not be required because this feature is designed to have the user enter at or below water level.

Summary & Recommendations - Ninja Cross

WAC 246-262-010(21) - "Diving envelope" means the minimum dimensions of an area within the pool necessary to provide entry from a diving board, platform, or attraction segment where users enter above pool water level.

DOH determined after review of the Ninja Cross specifications that, since the starting position of the user is partially in the water, and not above pool water level, diving requirements do not apply, and this item may not need a variance. In addition, the velocity of participants when they contact the pool bottom is similar to the velocity of a “step-in” pool entry from the deck.

DOH recommends that the Board determine that installation of a Ninja Cross as specified complies with the rules and does not require a variance.

Safety Calculations

NinjaCross System Design Participant Results				
	Vertical Drop	Diagonal Drop	Tucked Knee Drop	Horizontal Drop
Velocity at Pool Bottom	2.9 mph	2.9 mph	1.8 mph	0.0 mph
Effective Height of Drop	3.4 in	3.4 in	1.3 in	0.0 in

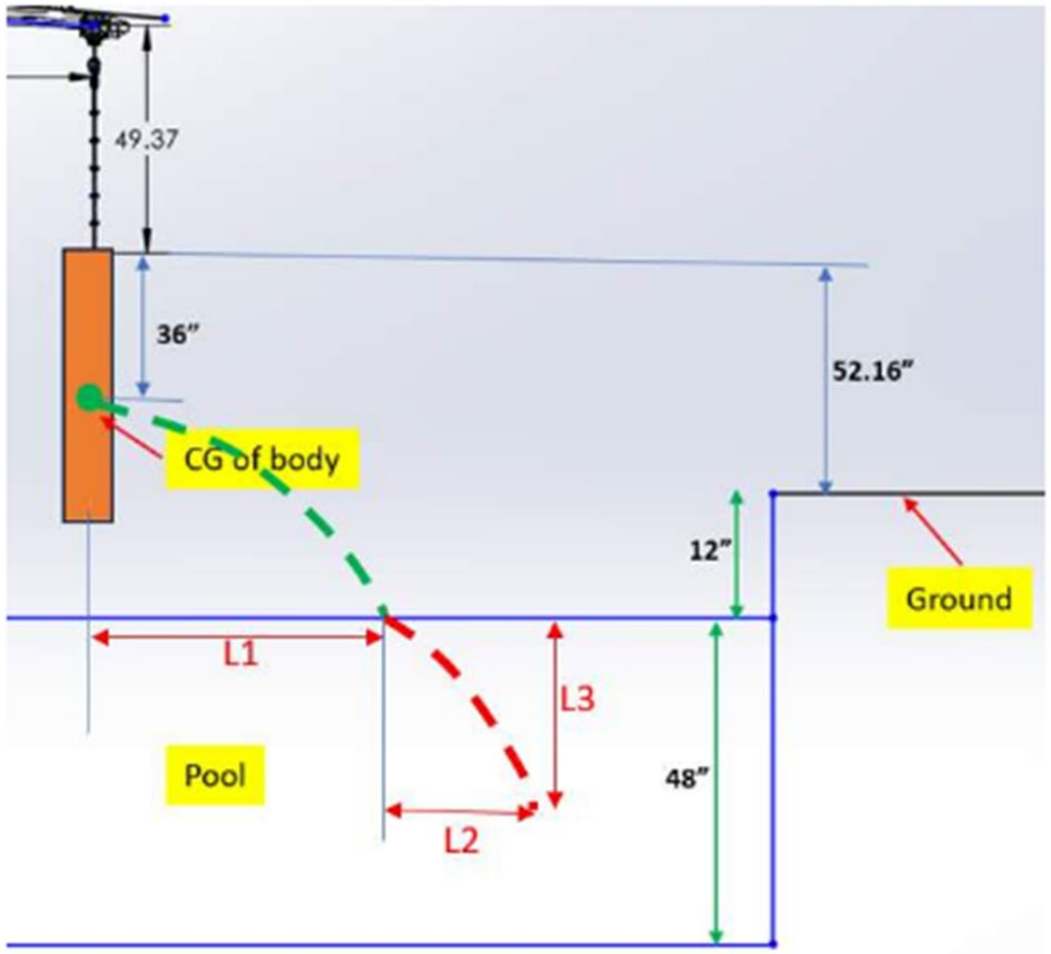
Aqua Climb Results for the largest participant

Model	Plummet Height (S_1)	Water Depth (S)	Calculated velocity at pool floor (V_2)	Benchmark velocity
3H	S_1 = 35" = 0.89m	S = 6' = 1.829m	0.84 m/s	2.99 m/s
3H Alt	S_1 = 25" = 0.64m	S = 5' = 1.524m	0.90 m/s	2.99 m/s
4H	S_1 = 73" = 1.85m	S = 7' = 2.134m	1.35 m/s	2.99 m/s
4H Alt	S_1 = 63" = 1.60m	S = 6' = 1.829m	1.63 m/s	2.99 m/s
5H	S_1 = 112" = 2.84m	S = 9' = 2.743m	1.00 m/s	2.99 m/s
5H Alt	S_1 = 102" = 2.59m	S = 8' = 2.438m	1.35 m/s	2.99 m/s

Safety Calculations Continued

Calculation Results:

- Before touching the water, the body can move in horizontal direction L1 = 4.75 ft
- The max moving distance in horizontal direction in the water is about L2 = 2.76 ft
- The max depth in the water is about L3 = 2.76 ft.
- Note: If counting the body height 6ft, the max depth in the water would be 5.76 ft



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THANK YOU!