



Water Park and Water Features Plan Detail

Unique Process Requirements for Water Parks and Features

Preliminary Design Meeting

Before initiating detailed plans and specifications, a pre-design meeting should be scheduled with the designer, owner, and Washington State Department of Health (Gary Fraser, 360-236-3073 or gary.fraser@doh.wa.gov) to review the conceptual proposal for the proposed improvement.

Safety Review Report

Water parks with water slides, speed slides, inner tube rides, specialty design features, and play toy structures of certain designs require a report by an engineer certifying the design of the water feature is consistent with safety engineering practices and industrial standards. The certifying engineer shall have experience in safety design, including ergonomic aspects of biomechanics of Recreation Water Contact Facilities (RWCFs), amusement rides, or equal.

Water parks with features such as water slides, require assurance from the State Department of Health that the slide design will provide a safe ride for the intended users, including the public restrictions on size, weight, or other factors. The report needs to evaluate whether the ride will prevent the slider from falling out of slide flume, protect against impact to the sides of the flume or tube, provide safe entry into the landing pool or run-out, and provide sufficient force to prevent the slider from stopping in the ride.

Operational Components

Because there are so many aspects in the design of RWCF's that are integrated with the proper operation of facilities, the State Department of Health often asks for preliminary details of operation for particular aspects of features. This typically requests details from the owner on staffing, signage, communication systems, and line of sight issues which may involve additional staff.

General Water Features that are included as RWCF's

This table lists some types of Water Features under WAC 246-262 requirements:

| Water Slides and Tubes | Specialty Type Pools | Other Types of Features |
|--------------------------|--|--|
| Conventional water slide | Wave Pool | Play structure with standing features less than 4 feet above pool bottom |
| Inner tube | Zero depth entry pool, not a wave pool with built in activities for play | Play structure with standing features 4 feet or higher above pool bottom |
| Speed slide | Lazy River | Climbing wall |
| Drop Slide | Adult activity pool | Inflatable toy feature |
| Child flume | Child play feature pool | Intermediate speed river |
| Other (specify) | Toddler play feature pool | Wave Rider or similar |

Conventional Water Slides or Tubes

Conventional flumes or tubes with slopes averaging less than 12 percent. The last 10 feet of the flume or tube perpendicular to the pool designed to create a reduced exit speed. Speed sufficient to keep a timid slider from stopping in the ride. Conventional slides can be installed to enter into a landing pool or a run-out. They are designed to be used one person at a time with proper spacing to prevent collisions between sliders. Head first sliding is not allowed on these rides.

Inner Tube Rides

May be continuous or with intermediate pools. Riders properly spaced to prevent collisions. Intermediate pools require life guards to oversee users and provide assistance to prevent buildup of persons in a single intermediate pool. When sufficiently sized, multiple riders may ride on a single tube or raft. Lifeguards have access to and are able to see all intermediate pools.

Speed Slides

Speed slides are generally steep straight slides. Speed slides are generally designed with a run-out to provide protection for bathers on entry to water. Instructions to bathers are required to ensure proper entry to the slide and placement of feet and legs to prevent injury. Head first sliding is not allowed.

Drop Slides

Slides that do not enter below pool water level. Generally short straight slides that may be from 6 to 15 feet in height that drop at a predetermined height above pool water level. Some types of slides that provide a continuous steep run that could enter into the water at a steep angle may be considered a drop slide because of the potential depth penetration into the water. Drop slides require a minimum water depth of 9 feet, but depth requirements vary in accordance with the particular design.

Wave Pools

Pools contain artificially generated waves. Entry limited to the shallow area of the pool. Public prevented from entry at sides of pool. Provide details of inset steps and rails to allow swimmers to exit the pool on the side walls. Show location of lifeguard stations and emergency shut-off switches for turning off the wave feature by the guards. Provide details about the wave features, noting the type or types of waves that will be generated, the method by which they will be generated, the overall range of the height, frequency, and types of waves which the pool can generate. Provide information on the protections to prevent the public from accessing the area where waves are generated. Prevent access to areas not readily visible to lifeguards. A “warning” area is required to keep persons a certain distance from the wave generating area. If flotation devices are included, include information about their type and function. Some restrictions may apply for floatation devices with hard surfaces.

Activity Pools

May be a variety of different types and may be age specific, such as only for young children or only for older children through adults depending on the activities provided. In some instances where fall hazards are a potential problem, details on fall protection is needed.

Inflatable Toys

Soft inflatable toys designed for use in a pool. Provide details on the height of the toy feature, depth of water below the inflatable feature, distance from walls, and how the toy feature will be maintained in position to prevent it from coming too close to a wall or other activity. Design toy with protections to prevent impact injuries from one bather to another (e.g. procedures to prevent falling injuries). Demonstrate that lifeguards have a clear line of sight to all portions of the pool, including underneath the inflatable structure.

Items to Include in the Plans

Water Slides or Tubes

- Actual slide component or tube overall dimensions
- Total height
- Total feet of run
- Average slope
- Dimensions including diameter or width

Note: This plan detail doesn't yet include additional requirements needed to comply with the new federal law, the *Virginia Graeme Baker Pool and Spa Safety Act*. For guidance, see www.doh.wa.gov/ehp/wr/rules.htm.

Water Park and Features Plan Detail

- Accurate and detailed drawings showing the three dimensional configuration of each section including:
 - Elevation drops
 - Degrees of turns
 - Materials for surfacing
 - Finishes
- Method for joining sections and maintaining smooth surfaces
- Water flow for the water slide
- Manufacturer's acceptable range of flow
- A flow meter may be required for operator to monitor flow conditions in the flume

Slide attraction entrance and exit

- Show the location of walkways, stairs, and landings, leading to and from the feature
- Slope of the walking surfaces
- Amount and direction of slope
- Non-slip surface
- Slide flume entries on well drained non slip walking surfaces with sufficient area for attendant to control spacing of riders
- If slide entrances on elevated platforms, the platform provides protective barriers that prevent climbing or falling through
- Area where the slide meets with the platform cannot have gaps which could allow a person to fall through between the slide and the guardrails

The entry pool or run-out

- Location of landing pool or run-out
- Size of landing pool or run-out
- Conventional slides, inner tube slides and child slides enter **below** water level to entry pools when provided
- Spacing between slides in conformance with requirements
- Dimensions of the landing pool at entry
- Slope leading from the landing pool to stairs
- Communication system used between the attendant to the top and the pool entry guard at the bottom

Pool Dimensions and Surfacing Material

Describe the pool dimensions and area:

- Length
- Width
- Shallow water depth
- Deep water depths
- Square feet of surface area of pool that is more than 5 feet deep
- Square feet of surface area of pool that is less than 5 feet deep
- Total pool volume
- Type of pool surfacing material
- Pool color

Walking Surfaces and Dimensions

- Width
- Total square feet of walking surfaces
- All decks, locker rooms, and walkways to and from the pool sloped to drains
- Surface is non-slip
- Detail on type of surfacing material used
- Do not use materials such as carpeting that are not water proof, are difficult to clean and dry slowly

Pool Floor and Wall Dimensions

- Describe and detail the floor slopes
- Describe and detail wall dimensions including radius of slopes between floor and wall
- Pool surfaces free from protrusions
- Ledges generally not allowed in pools (exception found in 246-260-091[3])

Pool Setbacks

- Pool is at least 15 feet from accessible roof, balconies, trees, or any object that could allow a person to jump or dive into the pool

Barrier Protection

- Type of barrier provided
- Horizontal and vertical member construction of the barrier
- Maximum openings at the base of the barrier
- Assurance that the barrier isn't compromised to reduce the minimum barrier height measured from the outside of the barrier (sloping hill, bench, etc.)
- At pools without lifeguards:
 - All gates or doors leading into the pool self-closing and self-latching
 - Windows accessible to the public and opening to the pool, may not open more than 4 inches (bedroom windows that open need more barrier protection)
 - Separate locking method used to lock gates and doors when the pool is closed
 - Latches may be one of the following:
 - Continuously locked
 - Coded
 - Have an 18 inch radius of protection to prevent a person from reaching through the outside of the gate to unlatch the door or gate
 - Raised 60 inches or more in height
 - Check with the Disabilities Act for latch requirements; applying to at least one entrance is recommended
 - Check Fire Code for additional guidance for emergency exits

Inlets and Outlets and Make-up Water

- Number of inlets
- Location of inlets –when pool is greater than 2500 square feet bottom inlets required
- Designed flow per inlet
- If outlet is an overflow channel:
 - Details on the overflow channel design
 - General requirements of a minimum slope of 0.1 ft/ft of run, if slope is less than this; use a hydraulic engineering justification
 - Details of the accompanying balancing tank noting dimensions, valves, pipes, and freshwater makeup method with cross connection protection provided
 - Assurance that the design will be sufficient to handle peak design surges and turnover
 - Assurance that the design prevents flooding of the overflow system
 - Assurance that the design provides an equalizer line or similar protection
 - Controls provided to ensure against flooding and preventing air lock on the pump
- If outlet is a skimmer (pool less than 2500 square feet of surface area)
 - Total length of each weir
 - Total height of each weir
 - Assurance that the design can handle a range of 3 to 5 feet per second across the weirs at normal operating flow
 - Design normal operating flow going across the weir (minimum of 60 percent)
 - Equalizer line users have opening to the pool protected with a grate rated through IAPMO or UL to protect against hair entrapment

Main Drains

- Spacing between main drains and a minimum of two separate drains
- Assurance that drains manifolded so no single drain becomes the sole source of suction
- Maximum velocity through any one drain pipe shall not exceed 6 feet per second assuming 100 percent of the total recirculation flow at peak flow conditions

- Main drain gratings:
 - Total open area of the grates
 - Maximum flow potential across the drains does not exceed 1.5 feet per second
 - Dimensions of the drain grates
 - Means to secure and fasten the drain grates to the main drain sump

Fresh Water

- Note method for addition of fresh water
- Describe protections to prevent back pressure or back siphonage
- Size of the fresh water makeup in relation to anticipated daily needs

Valves, Strainer Basket, and Pump

- Identify valve placement in the design
- Flow control from the overflow and the main drain system assures at least 60 percent of the flow comes from the overflow system
- Note design flow of the pump in relation to the overall range of flows with the filter clean and with the filter dirty
- Provide estimated range of flows determined by the design (hydraulic calculations welcome)

Turnover Rate, Filter, Disinfection Equipment, and other Chemical Feeding Equipment

- Provide turnover rate
- Turnover rate meets the minimum turnover requirement when filter is dirty
- GPM/SF rate of flow with filter clean and dirty
- Filter and disinfection equipment listed to National Sanitation Foundation (NSF) standard 50 or equal
- Equipment sized to ensure it meets anticipated peak flows and demands, and average demands
- If using cartridge filters, specify an extra set of cartridges
- When recirculation pump is turned off, controls for feeding disinfectant and other chemical feeding equipment for controlling pH also turns off (describe how this is accomplished)
- If using supplemental disinfectants e.g. ozone, copper/silver, or uV, please contact the office to ensure that they are correctly used

Mechanical Equipment and Chemical Storage

- Adequate space provided for access to equipment for routine maintenance and use
- All gauges and flow meters placed where they can be easily read and provide accurate readings
- All chemicals stored in a separate room or according to the manufacturer's requirements
- Mechanical room:
 - Enclosed
 - Locked
 - Well ventilated
 - Sloped to drain
 - Lighting sufficient for equipment maintenance and reading of meters and gauges

Locker Rooms and Plumbing Fixtures

- Plumbing fixtures, toilets, urinals, showers, sinks, hose bibs, diaper changing stations, drinking fountains and janitor sinks, conform with applicable requirements
- Locker rooms designed to minimize cross traffic between persons in street shoes and those in bare-feet

- See requirements for fixtures for General use pools, Table 031.3, Limited use pools Table 031.4

Ladders, Steps, and Handrails

- Location and placement of ladders
- Location, placement, and dimensions of steps
- Location and placement of handrails

Mechanical Ventilation

- Conform with ASHRAE standards for indoor pools
- Demonstrate good air patterns provided in the indoor pool facility to eliminate short circuiting of fresh air to exhaust air
- Demonstrate protection against moisture buildup
- Air in indoor pool facility has slightly lower air pressure than surrounding rooms or areas
- Total air flow and the minimum fresh air component is detailed in specifications

Lighting – Outdoor Pools

- Pools used after dusk meet minimum lighting conditions of 10 foot candles on the decks and pool surface
- Pool closed before dusk
 - Letter from the owner provided

Lighting - Indoor Pools

- Meets minimum standards for indoor pools of 30 foot candles on pool surfaces, 10 foot candles on pool decks
- Lights have protective covers
- The direction of natural light from windows and potential for glare problems from sunlight considered

Bather Load

- Bather load projections calculated in accordance with size of the pool, walking surfaces, plumbing fixtures, surge volume in overflow channel, and balancing tank

Diving Boards, Platforms, and Starting Blocks

- Areas designed for diving, including deck level diving, meets specific pool dimension requirements
- Diving areas plans show sufficient cross sectional and plan view details, including:
 - Dimensions of the diving boards, platforms, and starting blocks
 - Construction plans for the diving boards, platforms, and starting blocks

Pool Depth Markings

- Placement of pool depth markings on pool decking and sidewall

First Aid Facilities

- Telephone
- First aid kit
- Blanket
- An area for treating injured persons
- Pools **without lifeguards**:
 - Reaching pole
 - Life hook
 - Throwing buoy
- Pools **with lifeguards**:
 - Rescue tube or buoy
 - Backboard with supporting materials

For more information contact the Washington State Department of Health Water Recreation Program at www.doh.wa.gov/ehp/wr/contact.htm