

# THE COMPLETE GUIDE TO WATERPARK MAINTENANCE





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We love waterparks and have built our business to support them all around the world – we know when you buy one of our products it is to bring your park to life. Your waterpark equipment works hard for you to keep your guests happy and that means you need to maintain it to keep it working properly and we are here to help!

In this guide we've outlined many of the things you need to do to take care of your park so that your guests love it as much as you do.

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# THE IMPORTANCE OF WATERPARK MAINTENANCE

Proper maintenance of your waterpark and its equipment is essential to keeping park guests happy. A comprehensive maintenance plan ensures rider safety & comfort, extends the lifecycle of your equipment, and increases the curb appeal of the park.

Heading into the season with a comprehensive and organized strategy for the maintenance of your waterpark can eliminate significant attraction down time

and control costs. Properly maintained waterpark equipment is proven to be more profitable and will provide years of uninterrupted service and keep your guests playing the way they are meant to - SAFE and FUN. By keeping your equipment and all its components properly maintained, you will be ensuring high performance and high guest satisfaction.

# THE IMPORTANCE OF WATERPARK MAINTENANCE: RIDER SAFETY & COMFORT



A satisfied guest is a safe and comfortable waterpark guest. There are many interactive and fun elements that make up the experience of riding down a waterslide or playing on a play structure that need to be maintained in order to induce maximum smiles and laughter.



THE IMPORTANCE  
OF WATERPARK MAINTENANCE:  
RIDER SAFETY & COMFORT

## SLIDE JOINTS

# 01



*Properly  
maintained  
waterpark  
equipment will  
give you years  
of service and  
keep your guests  
playing the way  
they are meant to  
- SAFE and FUN!*

Scott Heke  
VP of WhiteWater's  
Maintenance Team

Keep your guests' backs and bums happy with a smooth sliding surface!

Slide joints play an important role in rider comfort, safety and pleasure. Proper maintenance will keep the joints smooth, safe and trouble free for years and a smile on your guests face!

The fiberglass waterslide sections expand and contract daily with temperature changes and can cause joints to deform

and crack or chip over time. Additionally, the caulking used to seal joints can deteriorate from pool chemical exposure and may require re-caulking to stop leaks and close gaps that can become uncomfortable to riders.



THE IMPORTANCE  
OF WATERPARK MAINTENANCE:  
RIDER SAFETY & COMFORT

## SLIDING SURFACE

# 02



*Waxing before  
and after  
the season is  
essential to lessen  
UV breakdown  
and to keep your  
waterslide's  
riding path  
smooth and slick.*

Roger Skaggs  
Maintenance Supervisor  
NRH2O Waterpark

The sliding surface of the flume is subject to wear and weathering.

It is important to clean and remove water deposit buildup to keep the riding surface smooth and comfortable for the riders.

This ensures the ride experience matches the rider's expectations and that customer satisfaction remains high.

The sliding surface is also exposed to UV fade from direct sunlight and

chemical oxidation from the pool water. The waterslide fiberglass can become discoloured and faded and unattractive to guests. The faded fiberglass can be brought back to life through a highly involved process of wet sanding, power buff polishing and gloss sealing.

## SLIDE EXTERIOR SURFACE

### 03



The exterior of the slide is also subject to weathering and deterioration.

UV fade from direct sunlight eventually causes a white fade to appear where your slides are exposed to direct sunlight. If left untreated for



many years, UV exposure can deteriorate the gel coat surface and expose the structural fiberglass layers potentially

reducing the structural strength of the fiberglass parts.

Where long term UV degradation has caused the structural fiberglass layer to be exposed re-gel coating is recommended to renew the integrity of the fiberglass parts.

Your fiberglass waterslide should be professionally inspected if the waterslide is five years old or older.

# TOWERS STAIRWELLS DECKS AND PATHWAYS

## 04

As a guest climbs the stairs to their destination to embark on the thrilling adventure of riding a waterslide, park operators need to ensure they get there safely and comfortably. The climb up the slide tower is the beginning of the experience for your waterpark



guest.

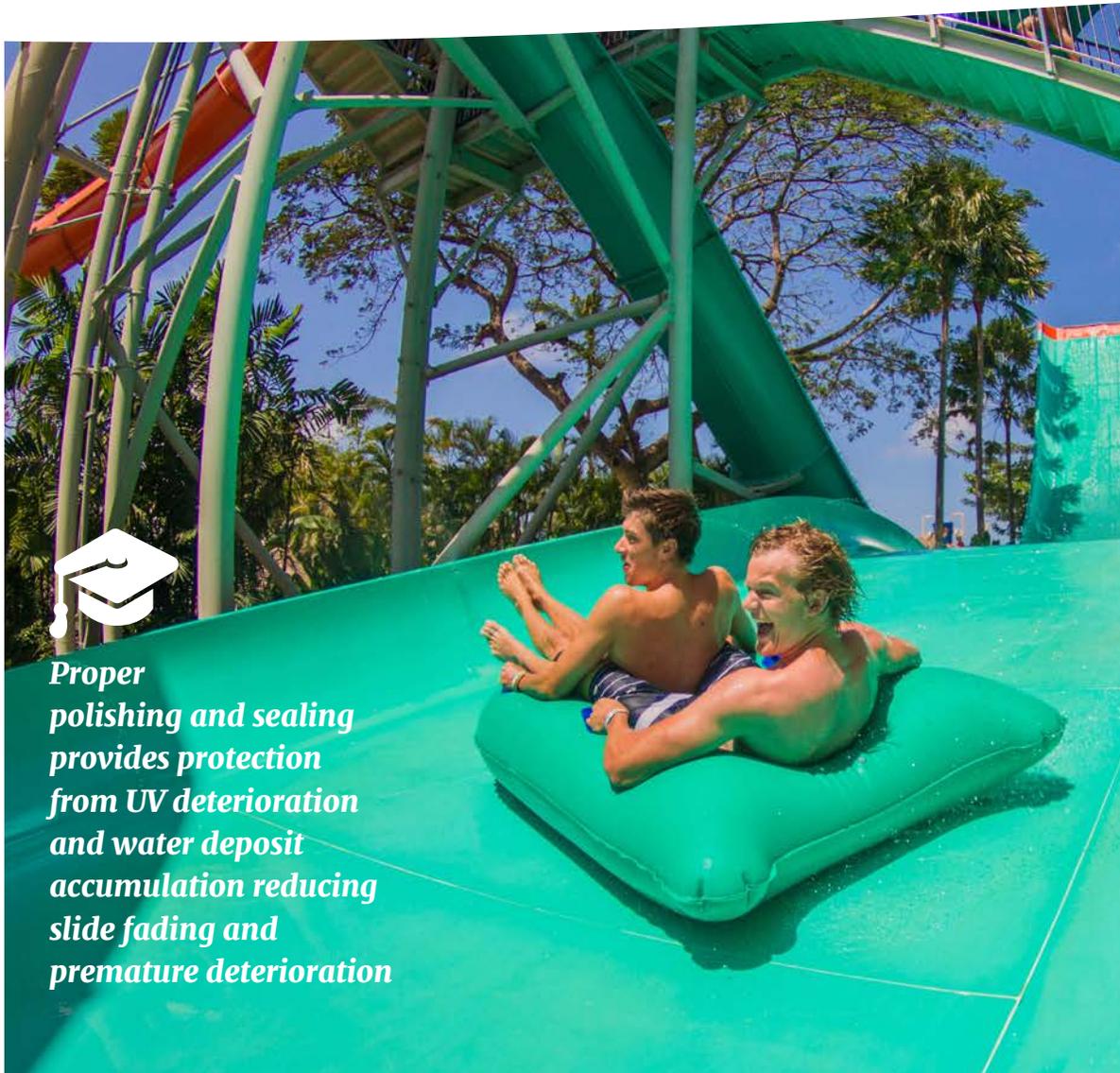
This remains true as they weave through the stairwells and decks of a play structure. As towers, stairs and platforms age, they are exposed to weather, pool chemical deterioration, rust and corrosion. Problem areas can be reconditioned or may need to be replaced.

Keeping all of these areas clean and safe ensures a guest starts the experience off on a good foot, literally.





# THE IMPORTANCE OF WATERPARK MAINTENANCE: EXTEND THE LIFE OF YOUR ATTRACTIONS WITH REGULAR MAINTENANCE



*Proper  
polishing and sealing  
provides protection  
from UV deterioration  
and water deposit  
accumulation reducing  
slide fading and  
premature deterioration*

To extend the life of your waterslide, play structure or other waterpark equipment, it's important to conduct regular maintenance services.

- **Waterslides** require polishing and sealing of the riding surface to reduce the risk of cracks and chips
- **Play Structures** have small moving parts and valves that need to be checked regularly to keep water flowing steadily
- **Wave Generating Equipment** relies on its pumps so keeping them properly maintained is essential

Completing specific milestones will ensure your equipment is operating properly season after season this reducing the risk of major annual repairs and replacements.



THE IMPORTANCE  
OF WATERPARK MAINTENANCE:  
EXTEND THE LIFE OF YOUR  
ATTRACTION WITH REGULAR  
MAINTENANCE

## SEASON START-UP

# 01

After a piece of equipment sits dormant during the off-season, it needs some attention before it's ready to entertain eager waterpark guests. Off-season downtime is the perfect time to conduct a thorough inspection, cleaning, and testing of all waterpark equipment.

A proper season start-up regimen will safeguard your attractions to make sure they operate the way they are intended to do so.

Before the gates open, the park and its equipment may require repairs or upgrades and it's important to think of these requirements ahead of time to ensure there is enough time put aside to complete all necessary repairs before opening day.



*Flip to the end of this guide for your Printable Maintenance Tools, including a complete season start-up checklist!*



THE IMPORTANCE  
OF WATERPARK MAINTENANCE:  
EXTEND THE LIFE OF YOUR  
ATTRACTION WITH REGULAR  
MAINTENANCE

## DAILY INSPECTIONS

# 02



*Your daily inspections should cover everything from physically walking the waterslide flumes to inspect them and ensure they're clear to checking water flow and water chemistry.*

Daily inspections include quick checks and tests that ensure your waterpark guests have a safe and fun day at the waterpark. Inspecting all major rides and park equipment before the park opens each day to ensure they are operating properly reduces risk of accidents and potential liability. The daily inspections don't take a long time each day, but can save time and money in the long run and improve overall customer satisfaction.

Permanently bound log books should be kept to record all inspections, operational tests, water quality monitoring, accidents, complaints and unusual occurrences that may require more detailed inspection leading to repairs for risk mitigation. These can also be useful to demonstrate your duty of care was carried out should any legal evidence ever be required.

*See the "Conducting Regular Maintenance and Service" section for a more detailed overview of the daily inspection checklists.*



THE IMPORTANCE  
OF WATERPARK MAINTENANCE:  
EXTEND THE LIFE OF YOUR  
ATTRACTION WITH REGULAR  
MAINTENANCE

## WINTERIZING 03



*Poor seasonal shutdown can cost significant time and money in the spring when you realize you have to get things repaired, replaced and/or cleaned.*

Pat Finnegan  
Former Director of Operations  
Wet'n'Wild Orlando  
Former General Manager Chula  
Vista Resorts

Winterization is the process of preparing your equipment for the winter layover. It can involve draining, cleaning, disassembling and properly storing equipment during the off season to further extend the product's life.

Winterizing your equipment is very important to reduce the amount of degradation that occurs during winter when your waterslides, towers and play structures are exposed to the harsh elements.

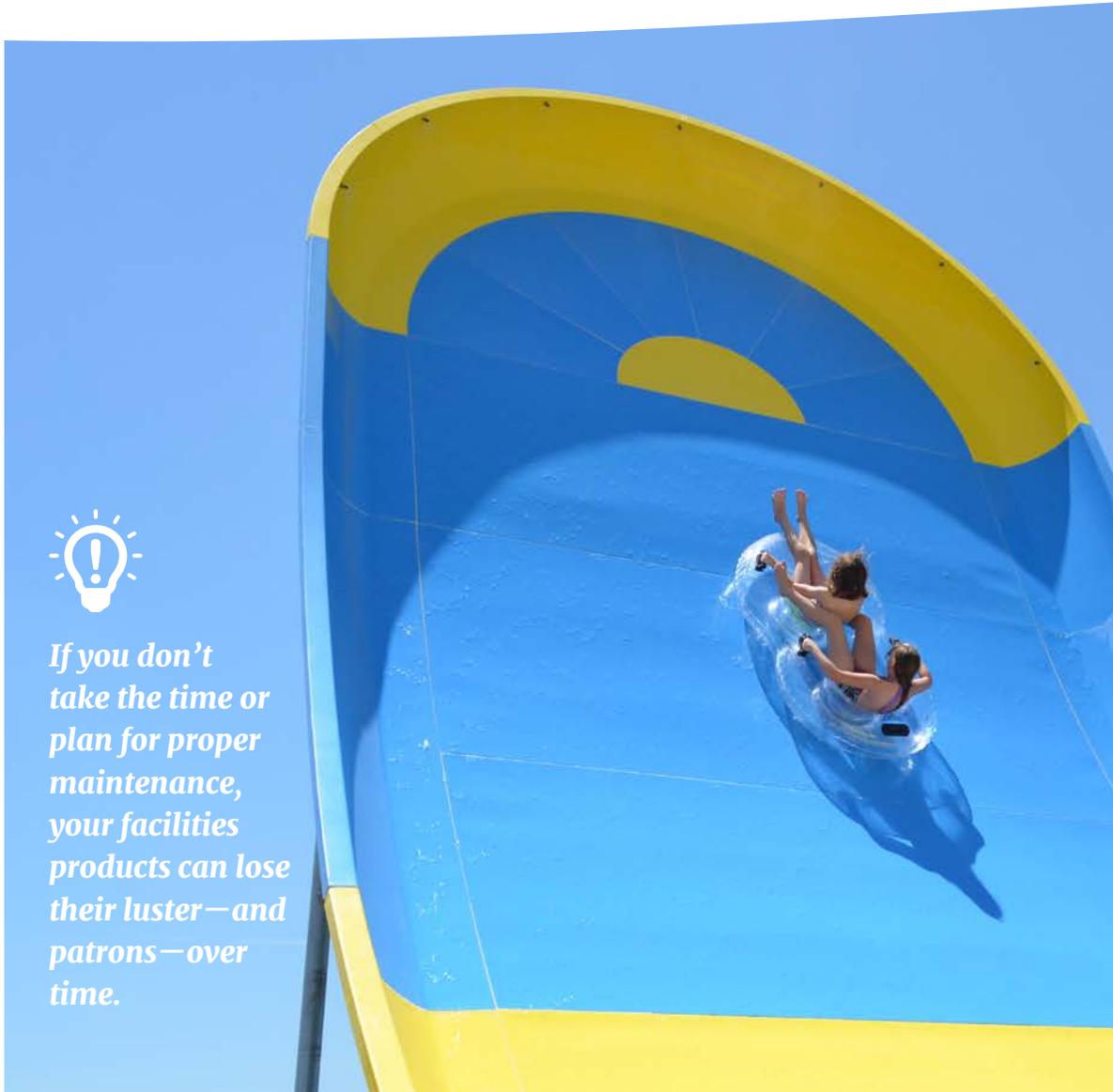
If a park and its equipment are inadequately winterized there are risks of incurring additional and unexpected costs. For example, if water supply and drain pipes of waterslides and play structure are not properly drained at the end of the season and exposed to freezing temperatures, the water can freeze over the winter causing the water volume to expand leading to blown gaskets and seals.



# THE IMPORTANCE OF WATERPARK MAINTENANCE: CURB APPEAL



*If you don't take the time or plan for proper maintenance, your facilities products can lose their luster—and patrons—over time.*



Customer perception is a factor in return business so careful maintenance helps keep your park looking at its best. Make sure the slides stay bright, the fiberglass shiny and the atmosphere positive and attractive by paying attention to maintenance details! Taking action to ensure operations staff eliminate rust, calcium build-up and any broken spray toys, for example, will increase guest satisfaction and your waterpark's curb appeal.

The option to change the colour of your waterslide or play structure also exists if you feel your waterpark needs a facelift and some refreshing. At WhiteWater we can also help add theming elements to give structures an updated new look.

# THE IMPORTANCE OF WATERPARK MAINTENANCE: BUDGETING ACCORDINGLY



Avoiding regular maintenance may seem like a way to save costs in the short-term, but will actually cost more in the long term. Regular maintenance can prevent major repairs and replacements ensuring you don't need to conduct emergency repairs during the operating season, which is very costly.

Breakdowns of major attractions can result in unhappy customers, loss of revenue and an increase in maintenance costs. By budgeting and conducting regularly scheduled maintenance your risk of downtime is significantly diminished.

# CREATING YOUR MAINTENANCE PLAN IN 6 STEPS



There are multiple milestones of a maintenance plan that you must consider. Planning the maintenance schedule you should be following during the off-season as well as allocating resourcing to your season start-up plan are essential for a successful operating season. There are daily, weekly and monthly maintenance measures to take that ensure each day is a great one for every guest.

The following 6 steps take you through the process of creating your maintenance plan, the ideal reference tool to guide you through your entire year of maintenance, services and repairs.

The manufacturers Operations and Maintenance (O&M) Manual is the best tool for specific maintenance requirements and instructions.



***Plan ahead! A preventative maintenance program is only effective when you have a schedule of tasks and plan on when to complete them.***

Jason Bays  
Director of Aquatics  
Camelback Lodge  
& Aquatopia Indoor Waterpark

# TAKE INVENTORY 01



Perform an inventory of all the equipment in your park and develop a list and schedule of required maintenance for each attraction.

Your inventory should list of all the major components of the attraction, as well as manufacturer and model information and specifications, local vendor or supplier and technical representative contact information, warranty information and estimated costs.



*Check out our 6-Step  
Maintenance Plan video!*

## SET YOUR SCHEDULE

# 02



The next step is to determine the frequency that each item should be checked. The day-to-day maintenance requirements, even if they seem obvious, need to be line items within your maintenance plan.

Additionally, have a replacement plan — yearly, or every three or five years — that replaces either equipment or parts, and

budget for it. The maintenance schedule for year-round and seasonal parks will differ as will indoor and outdoor parks.

# CRAFT YOUR GAME PLAN

## 03



*Don't be afraid of change and always challenge the status quo of your maintenance plan!*

Anthony Sabo  
Rides Maintenance Manager  
Columbus Zoo and Aquarium



Seasonal water parks have the advantage of being able to perform repairs without disrupting the operations. As part of your repair and replacement plan, at the end of the season you take note of the major repairs and replacements that will need to be completed prior to your upcoming opening.

While it's difficult to do the same type of major repairs to a year-round facility, proper planning allows operators to anticipate repairs and minimize disruption.

While some maintenance tasks can be scheduled months or even years

in advance, others can pop up more suddenly, and operators need to be prepared. Sit down and think of the critical items that, if they fail, will shut down the attraction immediately, or if you do continue operating, could lead to injury. Identify high risk areas and have a game plan and perhaps a backup.

Include in your game plan to have spares or repair kits on hand for smaller items needing attention during the operating season.

## ESTABLISH YOUR BUDGET

# 04



Budgeting for major and minor repairs is integral to the success of a preventive-maintenance plan. Use your maintenance tasks checklist as a list of line items that require budget numbers, enter the estimated cost of each item and its date that the cost may occur.

Once complete, submit your summary budget to your approver for implementation and look forward to seeing your waterpark funded for improvement and maximum customer enjoyment.

*Contact the WhiteWater maintenance experts for full inspections and budgeting assistance:*  
+1.604.273.1068  
aftersales@whitewaterwest.com

## EDUCATE YOUR TEAM

# 05



Ensure staff who are required to deal with the waterpark equipment are familiar with it and receive the training they need to operate the equipment safely. This can be particularly challenging in a seasonal environment, but if those who are meant to carry out your maintenance plan aren't properly trained, your plan won't be very effective.

The employees in charge of maintenance inspections should be put through a basic training program to familiarize themselves with the components of the aquatic facility. The most effective way to safeguard

your maintenance plan is to have your maintenance team utilize a series of checklists created by the manufacturers for each piece of equipment.

## DOCUMENT AND REVIEW

# 06



*Label your  
waterslide  
joints!*

*By labeling the  
joints, it makes  
it extremely  
easy to identify,  
log and  
communicate  
the exact  
location of any  
issues.*

Chris Perry  
Former General Manager of  
Wild Wadi Waterpark, Dubai

Documenting routine inspections is necessary to maintain compliance with O&M Manual recommendations as well as Occupational Health and Safety and Insurance compliance. Accurately recorded and audited checklists help guide the process, ensure no items are left unmaintained or not inspected, while protecting the health and safety of maintenance staff, park patrons and facility operators from liability.

A preventive-maintenance plan is not fail-safe but, carefully structured and adhered to, it can reduce the likelihood of major incidents and keep attractions running at their best.



# CONDUCTING REGULAR MAINTENANCE AND SERVICE



Regular maintenance of the play unit is important not just for appearance or function, but in keeping the play unit safe. Although you will probably have a maintenance staff to perform repair work on the structure, attendants must also play a part through observing the play structure during morning start-up and daily operation. The attendants will be the first line of defense in spotting potential hazards that might develop.



***Checklists are your friend! The details are important and you can't possibly remember everything. Keep a log of your maintenance. You will be amazed how helpful that information will be when you go to perform the same task in the future.***

Jason Bays  
Director of Aquatics  
Camelback Lodge  
& Aquatopia Indoor Waterpark



# WATERSLIDES MAINTENANCE CHECKLIST

Daily inspections of the waterslide flume's riding surface must be completed to maintain a safe and fun environment in your waterpark.

## DAILY

- Obstructions in slide paths
- Cracks, chips or bubbles in sliding surfaces
- Rough patchwork at joints or cracks
- Caulking protruding from joined flanges
- Leaking seals at joints
- Loose risers on turns
- Excessive movement of flumes when walked on
- Joints opening up
- Proper inflation and condition of rafts, tubes and vehicles
- Landing or pool bottom padding, if used, is in good condition and properly secure
- Safety hazards (before turning on water)
- Sufficient water flow in the channel and correct water level in splash pool or runout lane
- Correctly operating pumping and filtration equipment
- Properly operating conveyor system to ensure it poses no hazard

### **Specialty Waterslide Inspections and Maintenance:**

*Specialty waterslide parts require additional inspection and maintenance components, such as the AquaLoop™ and Master Blaster®. For complete maintenance guidelines and how to care for the advanced equipment, please refer to the original manufacturers Operations and Maintenance Manuals.*



*Ensure water flow is maintained in accordance with manufacturers' guidelines at all times throughout operations. Serious hazards may develop when water flow fluctuates, is blocked or interrupted in a water slide flume. Riders should not be allowed to enter a water slide when water flow or water levels at any area of a water slide are observed to deviate from the recommended settings*



*A full printable checklist is available at the back of this book*



# PLAY STRUCTURE EQUIPMENT CHECKLIST

Daily, weekly, semi-annual and end of season inspections of the structure's play area and mechanical systems must be completed to ensure all components are operating safely and uninterrupted. Regular audits of the daily inspection and maintenance checklist will ensure all inspections and maintenance tasks are up to date.

## DAILY

- Obstructions in play area pathways
- Cracks or chips in deck surfaces
- Chipped or peeling paint
- Properly secured and tied net lashings
- Cuts, tears or damage to climbing nets, safety nets, and web crawl tunnels
- General wear of climbing nets, safety nets, and web crawl tunnels
- Excessively sagging climbing nets
- Proper operating pressure and flow to all effects
- GPM flow rates conform to design flow rates for each waterslide
- Empty filter baskets of lint and debris

## WEEKLY

- Aligned torque indicators on the tipping bucket's lock nuts
- Delamination or excessive wear and tear to tipping bucket façade
- Damaged safety net handrails, support bars or attachments
- Check valve operating assemblies
- Clogged jets and nozzles causing ineffective operation of interactive elements

## SEMI-ANNUALLY

- Loose connections between tipping bucket support frame and the structure's stand pipes
- Loose metal roof cladding
- Signs of fatigue in the tipping buckets pivot shaft (cracking of metal or welds)
- Free swinging tipping bucket with properly secured bearings



*All daily inspections to waterslides apply to the waterslides that are also part of your play structure.*



*A full printable checklist is available at the back of this book*



# WAVE GENERATING EQUIPMENT CHECKLIST

Daily, weekly, semi-annual and end of season inspections of the wave generating equipment mechanical systems must be completed to ensure all components are operating safely and uninterrupted.

## DAILY

- Tight nuts and bolts and tighten as required
- Air leaks from compressed air system
- Unusual noises from fans or compressors
- Excessive motion of fans and compressors
- Air filter bowl drainage

## WEEKLY

- Oil level of air compressor and top-up if necessary
- Compressor air receiver for full drainage
- Properly drained and cleaned air filter bowl
- Pressure of air supply valve set to O&M Manual levels
- Wave control valve cylinders are properly mobbing back and forth with the same speed as the other control valves
- Tightness of nuts on all bolted joints on swivel arms



*A full  
printable  
checklist is  
available  
at the back  
of this book*



# WAVE GENERATING EQUIPMENT CHECKLIST

Daily, weekly, semi-annual and end of season inspections of the wave generating equipment mechanical systems must be completed to ensure all components are operating safely and uninterrupted.

## CHECK AFTER 150 HOURS OF OPERATIONS FOR:

- Tighten all bolts as required
- Leaks in air connection, joints and unloading lines
- Air compressor filter and clean as required
- Air compressor belt tension and adjust if necessary
- Clogged or dirty filter elements and clean as necessary

## CHECK AFTER 800 HOURS OF OPERATIONS FOR:

- Change of air compressor oil
- Greased main fan bearings
- Greased wave control valve bearings



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# FLOWRIDER® EQUIPMENT CHECKLIST

If damage on any FlowRider attraction is left unnoticed and/or unattended, small problems (e.g. small holes, tears or bubbles in the ride surface) can result in massive issues and potential ride shutdown. Operators must ensure hazards are removed immediately and this is achieved through conducting inspections on a regular bases.

## DAILY

- Excessive dirt build-up
- Sharp or pointed foreign objects or debris that can easily damage the ride surface and/or system overall especially under nozzle flaps and side closures
- Sharp or pointed items on riders' clothing, shoes, back pockets, etc.
- Tears, cuts, cracks, delamination and/or bubbles
- Fraying seams across the entire ride surface
- Loose or broken bars specifically in the rear recovery/pillow padding area
- Sharp edges, burrs, splinters or damage on queue area handrails
- Security of all grates covering pump area
- Properly functioning buttons, switches and indicator lights on pump controls
- Sufficient water level in tank, so as to avoid flow decay (occurs when too low)

## WEEKLY

- Sufficient ride surface tension (flow decay occurs when too loose)
- Appropriate nozzle aperture – should be 1.5” to 2.5”
- Power usage reading – should be between 90 and 98 percent

## ANNUALLY

- Sufficient tightness of all bolts supporting steel structure supporting pillow padding
- Sufficient tightness of all bolts that connect pillow padding brackets to the walls
- Structural integrity of steel at rear
- Structural integrity of steel at front; pay special attention to the joints; check for cracked or broken welds
- Properly seated side closures; there should be no gapping
- Sufficient tension at each tension point at rear and on each side
- Tightness of each bolt holding tension members in place



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## CHEMICAL BALANCE INSPECTIONS

Proper water chemical balance recordings must be obtained each day before the facility is opened to the public. While the facility is operational, water quality testing should be performed at intervals in accordance with local health authority's guidelines.

Inspections should also be made during periods of heavy usage to ensure circulation and filtration systems are handling peak loads. The attendant should be keeping logs of all water tests performed to ensure consistency, accountability and proper testing methods.



# CONDUCTING REGULAR MAINTENANCE AND SERVICE PRE-SEASON STARTUP PLANNING



All park equipment needs to be thoroughly inspected and tested following an extended period where it is not operational before it is opened to the public.



## PLAY STRUCTURES PRE-SEASON CHECKLIST

- Filling pools
- Checking under platforms and behind skirted in areas for leaks
- Checking water supply to each interactive feature
- Cycling valves and replacing worn valves
- Inspecting restrictor plates, valves and restrictive areas of flow to remove debris blockages
- Checking and balancing water chemistry
- Checking water supply filters for blockages and build up
- Walking all waterslide flumes inspecting joints and ride surfaces, clearing out debris
- Inspecting slide tower stairs and all slide entry tubs
- Testing any electronic slide traffic systems
- Run water in all equipment prior to opening to ensure flow is consistent and ensure water flow is as required in O&M Manual and no leaks, pooling water, standing water
- Cleaning and waxing the waterslide flume

## WATERSLIDES PRE-SEASON CHECKLIST

- Filling pools
- Checking and balancing water chemistry
- Checking filters for blockages and build up
- Inspecting all valves and wear & tear items on play structures
- Walking all waterslide flumes inspecting joints and ride surfaces, clearing out debris
- Inspecting netting and stairs in play structures for holes, chips or cracks
- Inspecting slide tower stairs and all slide entry tubs
- Testing any electronic slide traffic systems
- Run water in all equipment prior to opening to ensure flow is consistent and ensure water flow is as required in O&M Manual and no leaks, pooling water, standing water
- Cleaning and waxing the waterslide flume



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# CONDUCTING REGULAR MAINTENANCE AND SERVICE END OF SEASON REQUIREMENTS



The end of the operating season is the time when a thorough inspection of all waterpark equipment should be performed. This ensures that if any repairs are needed, they can be performed before the next operating season.

***To avoid changing your gaskets yearly, it's important to winterize your play structure by draining all the pipes properly. Take the bleed cap off and let the water drain otherwise it will freeze and expand and look for some way out, which will probably be your gasket seal!***

Roger Skaggs  
Maintenance Supervisor  
NRH2O Waterpark



## PLAY STRUCTURES END OF SEASON CHECKLIST

- Drain the pool and play unit of all water
- Drain the large tipping bucket and leave the drain open for the winter season
- Open all handwheel and lever operated valves and leave them open for the winter season
- Make sure all pull rope valves are open during draining
- Make sure all basins, water curtains and small tipping buckets are empty
- Make sure all hose-bib basin feed valves are open
- After draining basins, operate one-man and two-man pumps to remove any remaining water
- Operate the bucket conveyor to insure all buckets are empty
- Operate waterguns to allow any water to drain out
- Make sure all waterwheels, runnels, etc. are emptied of standing water

## WATERSLIDES END OF SEASON CHECKLIST

- Turn off and drain all water supply pipes
- Inspect waterslide flume for required repairs
- Check slide joints for proper alignment
- Check caulking in slide joints
- Create a maintenance plan and budget for the following season

## FLOWRIDER® END OF SEASON CHECKLIST

- Drain the ride and filtration system completely and ensure that it remains free of water and liquid. Water that freezes in the ride has the potential to cause irreparable damage to the FlowRider
- Remove the ride surface, clean and dry before placing in storage
- As an option you can cover the attraction with a tent of some kind to ensure that the ride surface remains free of water and snow



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# CONDUCTING REGULAR MAINTENANCE AND SERVICE IN-HOUSE VS. OUTSOURCED SERVICES



You can spend the staff resources trying to bring things up to snuff yourself, or you can simplify the process by hiring an outside service provider to provide maintenance for your waterpark. The benefits of this approach are extensive. A professional team will be able to pinpoint the exact maintenance needs of your park, and because they are performing these tasks at parks across the country, they have more experience than your staff, who also have other duties outside of park maintenance.



CONDUCTING REGULAR  
MAINTENANCE AND SERVICE

## BENEFITS OF HIRING PROFESSIONAL TECHNICIANS



*Check with your manufacturer to find Certified Technicians and Contractors. Our Certified team members will work with your staff to train them in the proper repair and maintenance of your equipment or perform the maintenance work for you.*

A service provider will be able to perform standard maintenance and notify you if there are any concerns or potential problems.

A professional technician can evaluate your existing waterpark elements and perform a detailed cost analysis. If you want to be able to have your team perform minor maintenance themselves, most service providers will provide training. With vast experience in maintaining waterslides and water play equipment across the country, an experienced technician can show you what works, and what doesn't.

Waterpark equipment is expensive and technical, especially when it gets damaged by uncertified technicians conducting repairs or performing maintenance services. Uncertified technicians or contractors can actually cause more problems than good.

Using untested and unproven repair methods, materials or products can reduce the service life of your equipment by allowing UV deterioration, pool chemical fade and deterioration, and possibly result in having to prematurely remove material or equipment due to product failure.

# CREATING YOUR MAINTENANCE BUDGET



Parks can control their costs by engaging in proper capital planning which allows you to understand the expenditures for the year and budget accordingly. Emergency repairs caused by deprioritized issues and deferred maintenance will likely incur long-term higher costs than well-planned repairs and/or maintenance.

Well maintained equipment is less problematic and it frees up manpower and funds to do things that will really make your waterpark stand out, such as adding new equipment elsewhere, or investing in other improvements. Waterpark

owners that don't develop a dedicated maintenance plan eventually realize the cost of not prioritizing a budget to dedicate funding to waterpark equipment maintenance over the years.

Budgeting for annual waterpark maintenance has been proven to defer long term capital replacement costs, increase safety, and dramatically improve the aesthetic appearance and attraction to park patrons.



***Budgeting for annual waterpark maintenance has been proven to defer long term capital replacement costs, increase safety, and dramatically improve the aesthetic appearance and attraction to park patrons.***



## ESTIMATING YOUR MATINENANCE EXPENDITURES



*Did you know that indoor waterparks face higher maintenance requirements because of their enclosed moist environment? The moisture in the air facilitates the chemicals used throughout the park to penetrate the porous steel leading to more rust and degradation.*

There are many variables to take into consideration when estimating your maintenance expenditures in order to properly prepare your annual budget.

When determining the types of budgeting considerations your park faces when preparing your budget, ask yourself:

- Is my waterpark indoor or outdoor?
- What's my product mix?
- Does the location of my park present unique constraints barriers or challenges?
- How much training do my maintenance staff require?
- How many maintenance staff do I have on my roster?
- How many waterslides are in my waterpark?
- What's square footage and length of each waterslide flume that requires maintenance?
- Are there any environmental factors that will affect my maintenance plan (i.e. cold weather, extreme heat, storm season, water quality, salt water, UV exposure, etc.)?

In the first year, the maintenance budget will be an estimate based on best practices. Your second year will be refined based on the variances observed and experience gained from the first year. Year three will allow for further refinement and the clear definition of annual improvement opportunities based on the first two years. By following these steps you'll have a reliable and robust maintenance budget based on the variables unique to your park.



## COMPONENTS OF YOUR MAINTENANCE BUDGET



*Resurfacing costs of a waterslide flume range from \$17-25 per square foot and is highly dependent on environmental variables, working conditions, and service availability.*

Various products require different treatments and maintenance to keep guests smiling and all your equipment operating safely. Conducting steps 1, 2 and 3 in “Creating your Maintenance Plan” will help to prioritize budgeted items and clarify what is required.

### ANNUAL PLAY STRUCTURE MAINTENANCE BUDGET

Your play structure maintenance budget will be mainly allocated to general wear and tear items. These items include:

- Climbing and safety netting
- Web crawl tunnels
- Hose jets, pull ropes, valves
- Thematic elements
- Repair materials: paint kit
- Spare parts kit
- Cleaning the play structure

### ANNUAL WATERSLIDE MAINTENANCE BUDGET

Your annual waterslide maintenance budget will be mainly allocated to repairing the sliding surface. These items include:

- Gel coat chips, cracks and blemishes
- Slide joint sealant
- Repair materials: gelcoat repair kit
- Cleaning, buffing and waxing



## COMPONENTS OF YOUR MAINTENANCE BUDGET



*Did you know  
you can completely  
change the color  
of your waterslide  
or play structure?  
Updating the  
colour or theme  
of a play structure  
can refresh  
the waterpark  
environment and  
can drive your gate!*

### LONG-TERM PLAY STRUCTURE MAINTENANCE BUDGET

The following long-term maintenance services and structure component repairs should be considered as the play structure ages:

- Fiberglass stairs and decks
- Buckets and bearings
- Repainting the play structure
- Replacement of thematic elements

### LONG-TERM WATERSLIDE MAINTENANCE BUDGET

Consider following these long-term maintenance services and structure component repairs for all stand-alone waterslides and the waterslide features in your play structure ages:

- Resurfacing the waterslide – external flume surface and the sliding surface
- Recoloring the waterslide to refresh the park
- Replacement of corroded slide joint bolts
- Replacement of sections of the water slide or replacement of the entire slide path
- Replacement of corroded structural steel tower, stair, and support elements
- Replacement of corroded structural bolts at steel tower, stair, and support elements
- Replacement of decking on tower platforms and stairs

# UNDERSTANDING THE ROI OF MAINTENANCE



To understand ROI, it's essential to understand your costs versus your benefits achieved by the investment. The challenge is many benefits are qualitative and hard to quantify with hard numerical data. However showing the impact of maintenance can be an important part of winning approval for the budget.



***When you have something new to offer before the season opens, it encourages group sales and increases the number of seasons pass holders.***

***We experienced the majority of this revenue boost by promoting the brand new Baboon Lagoon, pre-season.***

John Gannon  
General Manager  
Columbus Zoo and Zoombey Bay



# UNDERSTANDING THE ROI OF MAINTENANCE

## COST-BENEFIT ANALYSIS

### COSTS



Capital



Time



Labour  
(Staff Requirements)

### BENEFITS

- Increase season's pass sales by providing new opportunities for creative marketing campaigns
- Boosted guest perception and visual impact (guests prefer clean, new-looking products)
- Extends the service life of waterpark equipment, lowers long term capital costs
- Increased safety and lower litigation costs
- Avoids costly down time and refunding of gate fees.
- Reduces last minute unplanned spending for emergency repairs and maintenance
- Improved image of your waterpark's brand.



We hope that this guide has helped you with some practical steps to plan and budget for regular maintenance. The experience of our customers around the world is that regular preventative maintenance helps keep their parks SAFE and FUN. Planned maintenance schedules minimize the risk of unforeseen stoppages which can be very costly to repair and negatively impact customer satisfaction.

We make it our mission to help make our customers' parks successful in every way we can, which is why WhiteWater has a dedicated service department here to help you with some of the bigger maintenance jobs which you may choose to outsource.

If you need extra help or maintenance expertise please contact us at:

+1.604.273.1068  
aftersales@whitewaterwest.com

We love your waterslides and rides, and want to see them sparkle almost as much as you do!

# PRINTABLE MAINTENANCE TOOLS





# WATERSLIDES

## DAILY

Daily inspections of the waterslide flume's riding surface must be completed to maintain a safe and fun environment in your waterpark.

M T W Th F Sa Su

Obstructions in slide paths

Cracks, chips or bubbles in sliding surfaces

Rough patchwork at joints or cracks

Caulking protruding from joined flanges

Leaking seals at joints

Loose risers on turns

Excessive movement of flumes when walked on

Joints opening up

Proper inflation and condition of rafts, tubes and vehicles

Landing or pool bottom padding, if used, is in good condition and properly secure

Safety hazards (before turning on water)

Sufficient water flow in the channel and correct water level in splash pool or runout lane

Correctly operating pumping and filtration equipment

Properly operating conveyor system to ensure it poses no hazard

*NOTE: Ensure water flow is maintained in accordance with manufacturers' guidelines at all times throughout operations. Serious hazards may develop when water flow fluctuates, is blocked or interrupted in a water slide flume. Riders should not be allowed to enter a water slide when water flow or water levels at any area of a water slide are observed to deviate from the recommended settings.*



# WATERSLIDES

## PRE-SEASON STARTUP

All park equipment needs to be thoroughly inspected and tested following an extended period where it is not operational before it is opened to the public.

- Filling pools
- Checking and balancing water chemistry
- Checking filters for blockages and build up
- Walking all waterslide flumes inspecting joints and ride surfaces, clearing out debris
- Inspecting slide tower stairs and all slide entry tubs
- Testing any electronic slide traffic systems
- Cleaning and waxing the waterslide flume
- Run water in all equipment prior to opening to ensure flow is consistent and ensure water flow is as required in O&M Manual and no leaks, pooling water, standing water



# WATERSLIDES

## END OF SEASON REQUIREMENTS

The end of the operating season is the time when a thorough inspection of all waterpark equipment should be performed. This ensures that if any repairs are needed, they can be performed before the next operating season.

- Turn off and drain all water supply pipes
- Inspect waterslide flume for required repairs
- Check slide joints for proper alignment
- Check caulking in slide joints
- Create a maintenance plan and budget for the following season



# PLAY STRUCTURE EQUIPMENT

## DAILY

Daily, weekly, semi-annual and end of season inspections of the structure's play area and mechanical systems must be completed to ensure all components are operating safely and uninterrupted. Regular audits of the daily inspection and maintenance checklist will ensure all inspections and maintenance tasks are up to date.

M T W Th F Sa Su

Obstructions in play area pathways

Cracks or chips in deck surfaces

Chipped or peeling paint

Properly secured and tied net lashings

Cuts, tears or damage to climbing nets, safety nets, and web crawl tunnels

General wear of climbing nets, safety nets, and web crawl tunnels

Excessively sagging climbing nets

Proper operating pressure and flow to all effects

GPM flow rates conform to design flow rates for each waterslide

Empty filter baskets of lint and debris

*Note: all daily inspections to waterslides apply to the waterslides that are also part of your play structure.*



# PLAY STRUCTURE EQUIPMENT

## WEEKLY

Daily, weekly, semi-annual and end of season inspections of the structure's play area and mechanical systems must be completed to ensure all components are operating safely and uninterrupted. Regular audits of the daily inspection and maintenance checklist will ensure all inspections and maintenance tasks are up to date.

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Aligned torque indicators on the tipping bucket's lock nuts
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Delamination or excessive wear and tear to tipping bucket façade
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Damaged safety net handrails, support bars or attachments
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Check valve operating assemblies
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Clogged jets and nozzles causing ineffective operation of interactive elements



# PLAY STRUCTURE EQUIPMENT

## SEMI-ANNUALLY

Daily, weekly, semi-annual and end of season inspections of the structure's play area and mechanical systems must be completed to ensure all components are operating safely and uninterrupted. Regular audits of the daily inspection and maintenance checklist will ensure all inspections and maintenance tasks are up to date.

- |                          |                          |  |
|--------------------------|--------------------------|--|
| <input type="checkbox"/> | <input type="checkbox"/> | Loose connections between tipping bucket support frame and the structure's stand pipes |
| <input type="checkbox"/> | <input type="checkbox"/> | Loose metal roof cladding  |
| <input type="checkbox"/> | <input type="checkbox"/> | Signs of fatigue in the tipping buckets pivot shaft (cracking of metal or welds)       |
| <input type="checkbox"/> | <input type="checkbox"/> | Free swinging tipping bucket with properly secured bearings                            |



# PLAY STRUCTURE EQUIPMENT

## PRE-SEASON STARTUP

All park equipment needs to be thoroughly inspected and tested following an extended period where it is not operational before it is opened to the public.

- Filling pools
- Checking under platforms and behind skirted in areas for leaks
- Checking water supply to each interactive feature
- Cycling valves and replacing worn valves
- Inspecting restrictor plates, valves and restrictive areas of flow to remove debris blockages
- Checking and balancing water chemistry
- Checking water supply filters for blockages and build up
- Inspecting all valves and wear & tear items on play structures
- Walking all waterslide flumes inspecting joints and ride surfaces, clearing out debris
- Inspecting netting and stairs in play structures for holes, chips or cracks
- Inspecting slide tower stairs and all slide entry tubs
- Testing any electronic slide traffic systems
- Cleaning and waxing the waterslide flume
- Run water in all equipment prior to opening to ensure flow is consistent and ensure water flow is as required in O&M Manual and no leaks, pooling water, standing water



# PLAY STRUCTURE EQUIPMENT

## END OF SEASON REQUIREMENTS

The end of the operating season is the time when a thorough inspection of all waterpark equipment should be performed. This ensures that if any repairs are needed, they can be performed before the next operating season.

- Drain the pool and play unit of all water
- Drain the large tipping bucket and leave the drain open for the winter season
- Open all handwheel and lever operated valves and leave them open for the winter season
- Make sure all pull rope valves are open during draining
- Make sure all basins, water curtains and small tipping buckets are empty
- Make sure all hose-bib basin feed valves are open
- After draining basins, operate one-man and two-man pumps to remove any remaining water
- Operate the bucket conveyor to insure all buckets are empty
- Operate waterguns to allow any water to drain out
- Make sure all waterwheels, runnels, etc. are emptied of standing water



# WAVE GENERATING EQUIPMENT

## DAILY

Daily, weekly, semi-annual and end of season inspections of the wave generating equipment mechanical systems must be completed to ensure all components are operating safely and uninterrupted.

M	T	W	Th	F	Sa	Su	
<input type="checkbox"/>	Tight nuts and bolts and tighten as required						
<input type="checkbox"/>	Air leaks from compressed air system						
<input type="checkbox"/>	Unusual noises from fans or compressors						
<input type="checkbox"/>	Excessive motion of fans and compressors						
<input type="checkbox"/>	Air filter bowl drainage						



# WAVE GENERATING EQUIPMENT

## WEEKLY

Daily, weekly, semi-annual and end of season inspections of the wave generating equipment mechanical systems must be completed to ensure all components are operating safely and uninterrupted.

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Oil level of air compressor and top-up if necessary
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Compressor air receiver for full drainage
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Properly drained and cleaned air filter bowl
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Pressure of air supply valve set to O&M Manual levels
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Tightness of nuts on all bolted joints on swivel arms
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Wave control valve cylinders are properly mobbing back and forth with the same speed as the other control valves



# WAVE GENERATING EQUIPMENT

## AFTER 150 HOURS OF OPERATION

Daily, weekly, semi-annual and end of season inspections of the wave generating equipment mechanical systems must be completed to ensure all components are operating safely and uninterrupted.

- Tighten all bolts as required
- Leaks in air connection, joints and unloading lines
- Air compressor filter and clean as required
- Air compressor belt tension and adjust if necessary
- Clogged or dirty filter elements and clean as necessary



# WAVE GENERATING EQUIPMENT

## AFTER 800 HOURS OF OPERATION

Daily, weekly, semi-annual and end of season inspections of the wave generating equipment mechanical systems must be completed to ensure all components are operating safely and uninterrupted.

- Change of air compressor oil
- Greased main fan bearings
- Greased wave control valve bearings



# FLOWRIDER® EQUIPMENT

## DAILY

If damage on any FlowRider attraction is left unnoticed and/or unattended, small problems (e.g. small holes, tears or bubbles in the ride surface) can result in massive issues and potential ride shutdown. Operators must ensure hazards are removed immediately and this is achieved through conducting inspections on a regular bases.

M T W Th F Sa Su

Excessive dirt build-up

Sharp or pointed items on riders' clothing, shoes, back pockets, etc.

Tears, cuts, cracks, delamination and/or bubbles

Fraying seams across the entire ride surface

Loose or broken bars specifically in the rear recovery/pillow padding area

Sharp edges, burrs, splinters or damage on queue area handrails

Security of all grates covering pump area

Properly functioning buttons, switches and indicator lights on pump controls

Sufficient water level in tank, so as to avoid flow decay (occurs when too low)

Sharp or pointed foreign objects or debris that can easily damage the ride surface and/or system overall especially under nozzle flaps and side closures



# FLOWRIDER® EQUIPMENT

## WEEKLY

If damage on any FlowRider attraction is left unnoticed and/or unattended, small problems (e.g. small holes, tears or bubbles in the ride surface) can result in massive issues and potential ride shutdown. Operators must ensure hazards are removed immediately and this is achieved through conducting inspections on a regular bases.

- |                          |                          |                          |                          |   |
|--------------------------|--------------------------|--------------------------|--------------------------|---|
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Sufficient ride surface tension<br>(flow decay occurs when too loose) |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Appropriate nozzle aperture<br>– should be 1.5” to 2.5”               |
| <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | Power usage reading<br>– should be between 90 and 98 percent          |



# FLOWRIDER® EQUIPMENT

## ANNUALLY

If damage on any FlowRider attraction is left unnoticed and/or unattended, small problems (e.g. small holes, tears or bubbles in the ride surface) can result in massive issues and potential ride shutdown. Operators must ensure hazards are removed immediately and this is achieved through conducting inspections on a regular bases.

- Sufficient tightness of all bolts supporting steel structure supporting pillow padding
- Sufficient tightness of all bolts that connect pillow padding brackets to the walls
- Structural integrity of steel at rear
- Structural integrity of steel at front; pay special attention to the joints; check for cracked or broken welds
- Properly seated side closures; there should be no gapping
- Sufficient tension at each tension point at rear and on each side
- Tightness of each bolt holding tension members in place



# FLOWRIDER® EQUIPMENT

## END OF SEASON REQUIREMENT

The end of the operating season is the time when a thorough inspection of all waterpark equipment should be performed. This ensures that if any repairs are needed, they can be performed before the next operating season.

- Drain the ride and filtration system completely and ensure that it remains free of water and liquid. Water that freezes in the ride has the potential to cause irreparable damage to the FlowRider
- Remove the ride surface, clean and dry before placing in storage
- As an option you can cover the attraction with a tent of some kind to ensure that the ride surface remains free of water and snow



This guide is NOT an operations and maintenance manual.

If you need more support, the WhiteWater's After Sales and Service department is here to help you. For full maintenance guidelines for your waterpark equipment please contact us:

+1.604.273.1068

[whitewaterwest.com](http://whitewaterwest.com)

[whitewaterwest.com/after\\_sales.html](http://whitewaterwest.com/after_sales.html)