

**WHITEWATER.**

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**WhiteWater West  
Black Hole Water  
Slide**

**Non- Kiddie**

*Black Hole* \_\_\_\_\_  
" " " " " "

**OPERATIONS and MAINTENANCE  
GUIDELINES**

prepared for:

**WET' N WILD**

**Orlando, FL**

CARNY TOWN.COM

August 31, 1994



## OPERATIONS GUIDELINES

### Important Notice

The following operating procedures are presented to waterslide owners as guidelines only. They are not intended to be mandatory or exhaustive. These guidelines do not replace proper consultation with designers, manufacturers and legal counsel, and compliance to local, state (provincial) and federal laws and regulations involving, but not limited to, health, safety and building codes.

### General Operating Considerations

#### 1. Customers

While customers are the key ingredient to the success of any waterpark, certain rules and procedures must be made clear to them for the park to function efficiently.

##### 1.1 Warnings

A sign should be posted at the entrance to the waterpark that states the operator's liability and conveys the following rules and regulations:

1. Read and obey all posted signs.
2. Obey all instructions given by the attendants and operators.
3. No person should bring glass, cigarettes or food into the waterslide area.
4. Any person under the influence of alcohol or drugs will not be permitted in the park.
5. Pregnant women and persons with heart conditions or back trouble should not use the slides.
6. Ride at your own risk.

##### 1.2 Access

Provisions should be made to prevent customers entering the waterslide at any points other than at the designated entry access point.

### 1.3 Physical Condition

Waterslide customers should be checked for proper swimwear and physical condition. Attire should not have any metal parts that could damage the slides or cause injuries. Customers who show signs of drug or alcohol impairment should not be permitted on the site.

### 1.4 Visitors and Spectators

Visitors and spectators should be physically separated from the areas used by sliders. They should be maintained a safe distance away from any wet areas and not be permitted to interfere with the sliders.

### 1.5 Food and Drinks

No food or drinks should be allowed in the immediate area of the flumes and pools or on the decks, stairs and walkways surrounding the flumes and pools. Food and beverages should be confined to the visitor and spectator areas or similarly marked areas for sliders. Trash containers should be provided to keep litter off the decks and walkways and out of the flumes and pools.

## 2. Attendants

Waterpark attendants are responsible for the safe and orderly conduct of customers, safe entry and exit of riders from the slides, general crowd control and emergency procedures.

During operating hours, there should be at least one person on duty at all times who has completed a Red Cross or equivalent Standard First Aid and Safety course. This person should also be competent in carrying out any emergency procedures particular to the slide he or she is operating.

Every waterslide should be equipped with a battery or electronically operated system to provide voice communication between attendants at different locations on the slides and the park office or permanently manned control center.

### 2.1 Top of Slides

The area at the top of every waterslide should be supervised by at least one attendant who has continuous and direct supervision of that area and is responsible for:

- ensuring that customers conduct themselves in a safe and orderly manner.
- ensuring that customers enter the slides or rafts properly.

- ensuring that customers are dispatched at safe intervals.
- visually surveying all areas of the waterslide that are visible from the attendants position, with the exception of the splash pool, and communicating any problems to the other attendants.

## 2.2 **Splash Pool**

The recommended depth for splash pools is 3.0 - 3.5 feet except where noted in special conditions and therefore should be supervised by at least one certified lifeguard who has continuous and direct supervision of that area and is responsible for:

- ensuring that customers conduct themselves in a safe and orderly manner.
- ensuring that customers move into and out of the splash pool in a quick and orderly manner.
- controlling running, horseplay or other unsafe behaviour on the pool decks.

## 2.3 **Runout Lane**

The runout lanes of waterslides should be supervised by at least one attendant who has continuous and direct supervision of that area and is responsible for:

- ensuring that customers conduct themselves in a safe and orderly manner.
- ensuring that customers exit the runout lane in a quick and orderly manner.
- controlling running, horseplay or other unsafe behaviour on the slide apron.

## 2.4 **Water Treatment**

A specific person on each shift should be responsible for chlorination and water treatment procedures. They should be thoroughly trained in all aspects including, routine operations, handling, connection, disconnection, emergency procedures and leak control procedures. A safety chart should be posted in or near the chlorination room and a second safety chart should be placed in the pool office near the telephone. Emergency telephone numbers should also be shown on the safety charts.

### 3.3 Chemical Inspections

Proper water chemical balance should 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 authorities. Inspections should also be made during periods of heaviest usage to ensure that the circulation and filtration systems are handling peak loads. The operator should keep logs of all water testing performed. A typical form for water quality testing is shown on page 8.

The operator must be sure that customers can not come in contact with the water treatment, re-circulation and filtration equipment. Mechanical and chemical storage rooms should be locked at all times to prevent customer access.

## 4. Accidents

The most common accidents in water parks are: slips and falls, collisions between one riding customer and another customer, impact with the splashdown pool surface, and abrasion from sidewalls. Operators should keep detailed logs of all reported accidents at the site. A typical accident report form is included on page 9.

### 4.1 Flotation Devices

The operator should not infer that rafts, tubes or any other flotation device, with the exception of government approved life jackets, offers the user any safety benefits. Where unapproved flotation devices are provided, signs should be posted stating that they are for pleasure only and should not be used as a substitute for approved flotation devices.

### 4.2 Slips and Falls

Slips and falls are a constant concern in all areas of the waterpark. All surfaces intended for pedestrian traffic, whether in the water, on walkways, on loading platforms or on stairs should be made and maintained slip-resistant. Proper periodic maintenance of walking surfaces should be carried out to remove the growth of algae and fungi which could inhibit the surface's intended function. Adequate drainage should be maintained around all areas of the slide.

The entry section to flumes should be given particular attention with respect to slips and falls. The combination of the flowing water and the customer contacting water on a slippery surface for the first time can be confusing and disorienting. The exit area of the splashdown pool will always be wet and flowing with water which requires special attention with respect to slip-resistant surfaces, drainage and number and location of attendants.

To minimize slip and fall type accidents, attendants throughout the water park should control running and horseplay.

#### 4.3 **Bodily Collisions**

Bodily collisions occur in the flumes and the splash pools as a result of riders travelling at different speeds and riders slowing or stopping in the flume. Bodily collisions can be minimized by restricting traffic flow to one vehicle or passenger in the flume at a time. The top attendant and the lower attendant should have, collectively, a view of much of the slide and have a means of communication between them. The entry attendant must be alert and aware of the fact that people will travel at different rates due to variations in body weight, body friction, and rider position. Generally, the heavier the person, the faster the rider will travel. Slippery materials like nylon, slide much faster than cotton clothing. All other factors being equal, riders in a sitting position will travel slower than a person lying flat on their back. Under no circumstances should customers be permitted to ride flumes in a standing position. Similarly, running or leaping entry into the flumes must not be permitted.

In addition to slide entry attendants, the use of signal lights or electro-mechanical starting gates should be considered for rider entry control.

As bodily collisions in the splash pool area can not be fully controlled even with proper entry rates, the splash pool attendants should be well trained, attentive and aggressive, continuously urging and encouraging customers to leave the flume discharge and the splash pool area. They must be alert to the possibility of problems and be prepared to enter the water at any time to assist a customer. In the event of a delay at the discharge, following riders should be stopped at the entry. Riders tend to congregate in the pool, either because they are temporarily confused and disoriented upon impact with the water, or to wait for their friends who are coming behind, or to socialize with persons in the splash pool. Collisions also result from multiple rider entry (i.e., trains). This practice is absolutely prohibited even for small children being carried on their parent's legs.

If marker buoys or lane ropes are used in the splash pool, they must be arranged such that they do not become an obstacle for riders. Such devices, if used, should float and be simple in design to avoid the possibility of entangling riders.

#### 4.4 **Chemical Hazards**

Personnel must be fully trained in the use of waterpark chemicals. Potentially fatal accidents could result from the release of gaseous chlorine. Improper chemical control into the water could result in skin and eye irritation from excessive treatment of bacterial problems from inadequate treatment.

## 5. **Emergency Procedures**

Every park should have an emergency plan with specific procedures covering:

- crowd control
- park evacuation
- drowning heart attacks
- cuts and burns
- neck and spinal injuries
- power or other utility failures
- fires
- security (fights, robbery, vandalism)
- exposure to chlorine
- environmental conditions (e.g., lightning, windstorms, hail, earthquakes)

Any emergency plan should address those factors which affect, firstly, human safety, secondly, protection and correction of equipment, and thirdly, customer relations. All employees should be trained and drilled periodically in the execution of the emergency plan. The emergency plan should be easily accessible and be located with first aid equipment and emergency telephone numbers.

Each facility should have posted by the telephone a list of current emergency numbers, such as the nearest available doctor, ambulance service, hospital, rescue service, police department, fire department and poison control center. A typical emergency telephone list is shown on page 10.

Each facility should have available the following first aid supplies:

- a standard 24-unit first aid kit stocked and readily accessible for use.
- a stretcher and blankets.
- a standard plywood backboard or other acceptable splint for persons with back and neck injuries.
- an area or room set aside for the emergency care of injuries.

### TYPICAL DAILY WATER QUALITY LOG

Location: \_\_\_\_\_ Weather: \_\_\_\_\_

Date: \_\_\_\_\_

Day: \_\_\_\_\_

#### WATER TEST AND FILTER CHECK

Time	Chlorine Count	pH	Water Clarity	Backwash	Temperature	Initial
10:						
11:						
12:						
1:						
2:						
3:						
4:						
5:						
6:						
7:						
8:						
9:						
10:						
11:						
12:						

### TYPICAL FIRST-AID REPORT

Location \_\_\_\_\_ Date \_\_\_\_\_

Please check one ( ) Guest ( ) Employee \_\_\_\_\_ Time \_\_\_\_\_ a.m. \_\_\_\_\_ p.m.

Name of Victim: \_\_\_\_\_ Age \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Phone \_\_\_\_\_

What Happened - Victim Statement: \_\_\_\_\_

As the victim of this accident, I hereby certify that the above statement is true to the best of my knowledge.

Signature of Victim: \_\_\_\_\_

Location of Accident: \_\_\_\_\_

Name of Witness: \_\_\_\_\_

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_ Zip \_\_\_\_\_

Phone \_\_\_\_\_

Statement of Witness: \_\_\_\_\_

Describe Injury: \_\_\_\_\_

On-Site Treatment: \_\_\_\_\_

Was Ambulance Called? \_\_\_\_\_ Yes: \_\_\_\_\_ No

Attending Employee on Duty: \_\_\_\_\_

Statement: \_\_\_\_\_

Manager on Duty: \_\_\_\_\_

Statement: \_\_\_\_\_

Note: If you need more space for witnesses, write information on the back of this report.

DIRECTIONS: This report must be filled out completely and accurately, with the original report to be mailed each Monday to the health authority along with the Daily Reports.

EMERGENCY PHONE NUMBERS

Location \_\_\_\_\_

POLICE \_\_\_\_\_

SHERIFF \_\_\_\_\_

HWY PATROL \_\_\_\_\_

AMBULANCE \_\_\_\_\_

FIRE DEPT. \_\_\_\_\_

HOSPITAL \_\_\_\_\_

PLUMBER:

Company \_\_\_\_\_

Phone \_\_\_\_\_

Person \_\_\_\_\_

Home Phone \_\_\_\_\_

Other Emp. \_\_\_\_\_

Home Phone \_\_\_\_\_

GENERAL CONTRACTOR:

Company \_\_\_\_\_

Phone \_\_\_\_\_

Person \_\_\_\_\_

Home Phone \_\_\_\_\_

Other Emp. \_\_\_\_\_

Home Phone \_\_\_\_\_

ELECTRICIAN:

Company \_\_\_\_\_

Phone \_\_\_\_\_

Person \_\_\_\_\_

Home Phone \_\_\_\_\_

Other Emp. \_\_\_\_\_

Home Phone \_\_\_\_\_

SWIMMING POOL SUPPLY:

Company \_\_\_\_\_

Phone \_\_\_\_\_

Person \_\_\_\_\_

Home Phone \_\_\_\_\_

Other Emp. \_\_\_\_\_

Home Phone \_\_\_\_\_

VENDING MACHINE COMPANY:

Company \_\_\_\_\_

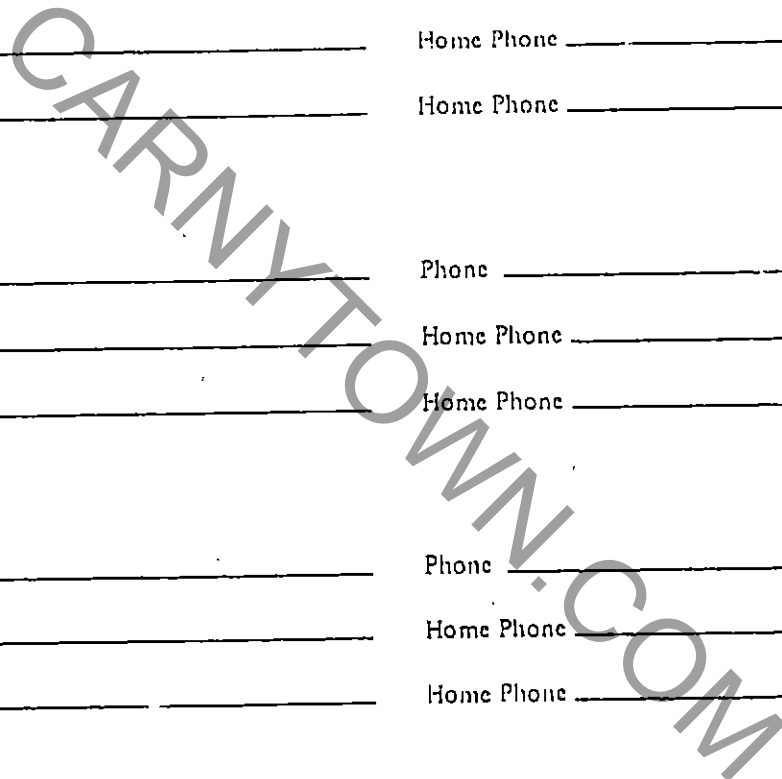
Phone \_\_\_\_\_

Person \_\_\_\_\_

Home Phone \_\_\_\_\_

Other Emp. \_\_\_\_\_

Home Phone \_\_\_\_\_



# **MAINTENANCE GUIDELINES**

[CITYRNYTOWN.COM](http://CITYRNYTOWN.COM)

## MAINTENANCE GUIDELINES FOR FRP FLUME

Properly maintained, your waterslide will give you years of service and keep sliding the way it was meant to be - SAFE and FUN. By keeping the slide and its components properly maintained you will be ensuring high performance and long life.

### 1. Inspections of Flume

**Note:** Before performing any inspection or maintenance work on the waterslide and related equipment, ensure that all equipment is electrically isolated using recognized equipment procedures. Equipment should not be turned on until all personnel are clear from the ride and accounted for.

Each slide should be walked through daily before start up to check for:

- obstructions in the slide path.
- cracks or chips in the sliding surface.
- rough patchwork.
- leaking seals at the joints.
- loose risers on the turns.
- bubble in slide path.
- structural flaws in the pump intake grating (see above note).

### 2. Cleaning

Maintenance requires removal of surface dirt by brushing the flumes with a soft bristled brush and clear water. Remove grease, suntan oil or stubborn dirt by scrubbing with a soft bristled brush and a mild detergent. Use only harsh abrasives or strong chemical cleaners, such as Comet, on tough to remove stains. Extensive use of such cleaners will remove the protective surface. Difficult stains may also be removed using steel wool pads or 600 grit wet & dry sandpaper.

**Note:** After using abrasive cleaners, steel wool, or wet & dry sandpaper, apply a good quality paste wax to restore the surface finish.

### 3. Waxing

At least twice each year the fiberglass finish should be waxed and buffed with high quality paste wax or polish. On scratched, dull or faded areas use a fine buffing compound to restore the original gloss before waxing. Prolonged exposure to the ultra-violet rays of the sun can, in time, cause discolouring and fading. We recommend using paste waxes or polishes containing ultra-violet screens.

**Caution:** If you use power tools for buffing or polishing, use extreme care to prevent overheating the surface. Overheating a rubbing compound burns small gritty particles into the slide surface causing blistering and streaking. This may require the area to be sanded and repainted.

## 4. Joints

Slide joints play an important role in rider comfort and pleasure. Proper maintenance will keep the joints smooth and trouble free for years.

### 4.1 Joint Caulking

All fiberglass sections will expand and contract with temperature changes. Therefore, the joints between sections are filled with a flexible, elastic caulking. Should the joints need re-caulking, all the old filler should be removed, the fiberglass cleaned and the joint re-filled using a flexible polyurethane sealant. Do not use a plastic filler that will harden. Under no circumstances should the joints be fiberglassed over. Excess joint caulking should be removed from the slide surface by scraping it off with a putty knife. Any remaining traces should be wiped off with lacquer thinner applied to a rag. Do not pour lacquer thinner directly onto a flume joint as it can dissolve the sealant.

### 4.2 Joint Roughness

Joints may become rough with use, especially if metal articles are allowed down the slide. For minor chips and cracks, the joints may be fixed using the procedures outlined in section 5.

More serious cases may require power sanding that will cut through the gelcoat. This will require a spray application of new gelcoat by a trained person, finished by sanding and polishing and waxing as outlined in section 5.

## 5. Patching

Chips and cracks may appear in the fiberglass flumes from normal usage. The following sections outline procedures to repair minor damage to the slides. However, due to the hazardous nature of the materials used and the variability of applications methods, we recommend that a qualified fiberglass laminator perform the repairs.

### 5.1 Minor Chips and Cracks

In areas that have chips or cracks in the gelcoat only, or have a scratch that is deep enough to penetrate through the gelcoat to the fiberglass but not deep enough to go completely through the laminate, follow the procedures given in section 5.4.

**Note:** For damage that penetrates completely through or deep into the laminate, we recommend that a qualified fiberglass laminator perform the repairs.

## 5.2 Surface Cracks

Hairline cracks, sometimes called spider webbing or star cracks, may develop in the gelcoat or surface coating of the fiberglass product. This is caused by a combination of weathering, vibrations, and/or impacts. Although unsightly, they do not affect structural strength. The hairline cracks can be fixed by sanding out the affected area with 100 grit sandpaper and re-coating the surface with gelcoat. Follow the patching instructions in section 5.4 omitting steps 4 through 6.

## 5.3 Cracks around Flanges

The area around the flanges of the flumes contains a thick layer of gelcoat which is very stiff. Stresses from normal use may cause cracks in the gelcoat around the flanges. These are not structural cracks. Flange cracks may be remedied by sanding the affected area with 100 grit sandpaper and re-coating with gelcoat. Follow the patching instructions in section 5.4 omitting steps 4 through 6.

## 5.4 Repair Procedures

\*\*\*\*\* WARNING \*\*\*\*\*

Patching kits contain toxic, combustible and corrosive elements. Use only under well ventilated conditions. Do not inhale fumes. Harmful if swallowed. If contents are swallowed or inhaled, seek medical attention regarding polyester resins. If contacted to eyes, flush with water for 15 minutes and seek medical attention. If contents come in contact with skin or clothing, clean the area immediately with acetone.

\*\*\*\*\*

Before you start you will need:

1. Sandpaper - 36 to 100 grit, 220 to 320 grit - wet & dry, 600 grit - wet & dry
2. Sanding block
3. Acetone
4. 2" masking tape
5. Utility knife
6. Putty knife
7. Mixing board
8. Mixing cup
9. Fiberglass resin hardener (catalyst) - use a peroxide based catalyst, e.g., MEKP
10. Patching compound
11. Gelcoat paint
12. 2" fine paint brush
13. Automotive cut polish
14. High quality paste wax such as "Turtle" wax

#### 5.4.1 Storage Instructions

Store uncatalyzed patching compound and gelcoat in closed metal containers in a cool area below 73 degrees F (23 degrees C) out of direct sunlight. Do not allow to freeze.

Store liquid catalysts in their original containers according to manufacturer's instructions.

#### 5.4.2 Mixing Instructions

Mix only small amounts at one time. The mixtures will harden in 20 minutes to 1 hour, depending on the temperature and the amount of catalyst added. The mixture will harden faster at higher temperatures and with increasing amounts of catalyst added. Use caution when adding catalyst over catalyzing will result in the mixture cracking. Do not pour catalyzed mixtures back into the can. Do not reduce materials with a "conventional" paint or lacquer thinner.

Patching Compound: Add 1 part catalyst to 100 parts patching compound on the mixing board. Mix well.

Gelcoat: Add 1 part catalyst to 100 parts gelcoat in the mixing cup. Mix well.

#### 5.4.3 Patching Instructions

1. Sand area to be patched with 36 to 100 grit sandpaper. Feather sand to moulded surface and remove all rough edges.
2. Wash area clean with acetone and allow to dry.
3. Mask off area to be patched with 2" masking tape.
4. Using a putty knife, spread the patching compound smoothly over the prepared area to the top of the tape.

**Note:** Area must be dry and clear of contaminants, such as dirt and sanded particles, etc.

5. Keep the patched area dry and allow 20 minutes to 1 hour to harden.
6. After the patch has hardened, sand the patched area flush to the surrounding surface with 100 grit sandpaper.

**Note:** Sanding will remove the masking tape. Re-tape the area before painting.

7. Using a 2" fine paint brush, paint the area with gelcoat. Allow 20 minutes to 1 hour to dry.

**Note:** The paintbrush and tools can be cleaned with acetone.

8. After the gelcoat has dried, remove the masking tape. Using a sanding block, wet sand with 220 - 320 grit sandpaper. Repeat with 600 grit sandpaper.
9. Buff painted surface with auto cut polish and wash clean with water.
10. Wax and buff painted surface with a high quality paste wax.

Revised May 17, 1994  
Steve Hodge

CARNYTOWN.COM

**SLIDE OPERATIONS  
SPECIAL CONDITIONS**

CITYTOWN.COM

## SUPPLEMENT TO MANUAL FOR ASTM STANDARDS

**The ASTM standard F 770 - 88 Standard Practice for Operation Procedures for Amusement Rides and Devices.**

The ASTM standard F 770 - 88 for Amusement Rides and Devices is a broad based standard covering all the various rides and attractions encountered in the amusement industry. Most of the requirements are directed at complex mechanical rides that subject the rider to complex motions intended to entertain. Waterslides in general are extremely simple and have no moving parts. The path of motion is fixed, and vehicles if used consist of self contained boats and rafts. The following is to be used in conjunction with Whitewater's MANUAL OF OPERATION AND MAINTENANCE for waterslides to conform to ASTM.

### **Description of Rides**

Waterslides use the flow of water to propel or lubricate the movement of riders down a fixed fiberglass flume section. The riders may ride alone with no vehicle, individually or in pairs in small boats or special inner tubes, or in groups in large rafts. This riding configuration depends on the specific product and the method of riding and number of riders and is fixed by Whitewater for each product as follows:

- All rides except as noted below allow only one rider or vehicle in the flume at one time. All rides are supervised as specified in the Whitewater Manual to assure that this is adhered to.
- The Speed Slide, PoolSider, Giant Slide, 32 inch Aqua-Tube are all ridden by individuals with one rider in the flume at a time. No vehicle is used.
- The 54 inch Giant Aqua-Tube may be ridden either with or without a vehicle. Vehicles may contain one or two people.
- The 54 inch Aqua-Luge uses a special raft vehicle exclusively and may not be used by riders without this vehicle. Vehicles may contain one or two people.
- The CTR flume is ridden using a raft or inner tube and may not be used by riders without this vehicle. Vehicles may contain one or two people.
- The Screamer flume is ridden with a special raft exclusively and may not be used by riders without this vehicle. Vehicles may contain one or two people.
- The Big One / Cyclone River is ridden with purpose built multi-person rafts with capacities from four to eight people depending on raft and ride configuration.

## Description of Motion

Waterslide flumes are fixed in position and do not move. Propulsion is from gravity aided by water flow in the flume. Riders with or without vehicles will experience motion and accelerations consistent with the flume path. Movements include right and left turns, vertical curves and deceleration at the finish. Riders or vehicles shall maintain constant contact with the flume ride surface.

## Maximum Total Passenger Weight

Whitewater flumes are designed to carry the following loads as worst cases. These loads do not supersede the limitations resulting from operational guidelines or vehicle maximum capacity.

CTR	950 lbs maximum
54 inch Giant Aqua-Tube	600 lbs maximum
32 inch Aqua-Tube	250 lbs maximum
Giant Slide	600 lbs maximum
PoolSider	250 lbs maximum
Speed Slide	250 lbs maximum
Big One	1000 lbs Maximum

## Operational Restrictions Due to Weather

The waterslide structure is designed to withstand wind loads specified in the building code in force for the ride location. Wind restrictions should be based only on the park operators perception of comfort of the patrons. Whitewater recommends suspending operation during winds in excess of 40 mph.

Virtually all waterslides use elevated towers as starting platforms. Therefore, operation of rides should be suspended during any storm or weather condition with lightening.

Rain will have no effect on the operation of a ride, with one exception. Open flumes such as CTR, Speed Slide, Giant Slide can be extremely hazardous if the water supply is shut off during rain. The rain water alone in an open flume can create a very slippery surface, with no braking effect from the volume of water. Under no circumstances should anyone enter an open slide during or soon after rain without the main water supply running at specified capacity.

## Safe Water Flow

The water flow rate is critical to the safe operation of the ride. Operators shall make sure that the water supply is adequate. Insufficient water volume can result in excessive speed and injury. The water tends to restrain and cushion violent motions and impacts as well as reduce maximum speed.

## Evacuation Procedures

In an emergency all riders still on the start tower should exit using the stairs as from any building. The riders in the flume can leave the ride as they arrive at the bottom.

## **The ASTM standard F 853 - 86 Standard Practice for Maintenance Procedures for Amusement Rides and Devices.**

The ASTM Standard F 853 - 86 for Amusement Rides and Devices is a broad based standard covering all the various rides and attractions encountered in the amusement industry. Most of the requirements are directed at complex mechanical devices that are subject to wear. These devices may have critical connectors and linkages that must be inspected regularly to avoid catastrophic failure. Waterslides in general do not have critical components which require extremely detailed inspection. The following is Whitewater's requirement for inspection of waterslides to conform to ASTM. This is to be used in conjunction with Whitewater's MANUAL OF OPERATION AND MAINTENANCE of waterslides.

### **Operational Tests of Critical Operating Items**

Waterslides use water pumped into the starting area of the ride to operate. The water volume is critical to the safe operation of the ride. In general the less water volume pumped through a flume with a wet surface the faster the rider will travel. Therefore, there is a danger if during operation the water supply is restricted or fails when riders enter the flume. Operators shall suspend operation when water volume is below specified operating requirements. A basic operational test should be performed daily in accordance with the MANUAL OF OPERATION AND MAINTENANCE.

Inspection of the fiberglass and sliding surface should be made daily in accordance with the MANUAL OF OPERATION AND MAINTENANCE. Small chips or surface imperfections may cause injury to riders.

### **Recommended Maintenance/Inspection**

The daily inspection of the slide as detailed in the MANUAL OF OPERATION AND MAINTENANCE covers virtually all the operational components of the ride. The only other items that should be inspected are the supporting structures for the slides.

Inspection of supporting structures:

- Structures that are hot dipped galvanized will require visual inspection on an biannual basis. Areas around field welds should be carefully checked and touched up with zinc rich paint as necessary. If rust streaking occurs the source should be identified and attended to. If ten years old or greater a comprehensive professional inspection should be performed.
- Structures that are painted with zinc rich primer and top coat enamel or epoxy systems should be visually inspected on an annual basis with particular attention paid to areas where the paint has chipped and at hidden surfaces in joints. Closed members and seal welded areas should be checked for bleeding and water accumulation. If over five years old a comprehensive professional inspection should be performed.

- Structures that are painted with conventional primers and top coats or non-zinc "rust paints" should be visually inspected at the beginning and end of each operating season. Attention should be paid to hidden surfaces and joints. Regular maintenance checks should be made every two months. If over five years old a comprehensive professional inspection should be performed.
- Steel hardware used in wood structures should be inspected annually. Wood should be visually inspected annually for integrity, tightness of fasteners and condition of pressure treatment. If over five years old a comprehensive professional inspection should be performed.

Very dry climates with seasonal operation can extend the above intervals moderately. Very wet climates, indoor installation or year round operation may reduce the above intervals.

Other routine checks on an annual basis:

- All concrete filled stairs and decks should be visually inspected for worn finishes on the nosing and cracked concrete. The underside of metal decking should be checked for delamination and deterioration.
- All welds should be checked for condition, all bolts should be snug.
- Column anchor bolts should be checked for tightness and corrosion. Grout around base plates should be in good condition.
- Inspection and maintenance of fiberglass should be performed as per the Whitewater Operations and Maintenance Manual.

Comprehensive professional inspection would be performed by a qualified engineering or inspection firm. They would perform inspections with whatever methods they deemed appropriate to assure accurate review of the structure. These methods may include non-destructive testing using ultrasound or other techniques. Inspection would include condition of metal components, welds, bolts and any other critical item. The inspecting agency should produce a certificate of inspection and or a report on condition for review by a qualified engineer.

### **Fiberglass Wear Limits**

The only component of the slides subject to wear is the riding surface. Regular inspection should be made in accordance with the MANUAL OF OPERATION AND MAINTENANCE.

### **Other Wear Limits**

Those rides using boats will experience wear on the bottom and sides of the boats. If the wear is excessive it may impair the function of the boat and operation of the ride. This is especially true if the ride uses "shutdown lanes." The wear should be checked in accordance with the boat manufacturers recommendations.

## **Replacement Fasteners**

All replacement fasteners shall conform to the standards specified in the engineering drawings.

## **Electrical / Mechanical Systems Operation and Maintenance.**

All electrical motors, pumps, controls etc. shall be inspected and maintained in accordance with their manufacturer's recommendations.

All pump intake grating or screens must be inspected to ensure that no structural flaw is evident.

**Note:** Whenever inspection or maintenance work is being done on electrical/mechanical systems, including pump intake grating, all related equipment must be electrically isolated using recognized equipment lock out procedures.

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Revised May 17/94

Steve Hodge

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## 54" AQUA-TUBE INNER TUBE RIDE

Inner-tube rides eliminate many of the variables that affect rider speed in body slides and provide a nearly uniform rate of travel for all different types of customers. Therefore, the possibility of collisions in the flume can be greatly decreased by properly controlling entry rates.

An important safety factor is to ensure tubes are removed from the pool and not left lying on the pool decks or walkways. The responsibility for tube removal should not be assigned to the splash pool attendant while on duty at the pool. Other safety considerations include: slips and falls in the entry and exit areas, abrasions from the sidewalls and impact with the splashdown pool surface.

**Note: Water flow should be maintained between 1600 - 1800 US gallons per minute.**

### Posted Signs

Signs should be posted at the entry station of the ride to convey the following rules and regulations:

1. Children under 48 inches tall are not permitted on this ride.
2. Eyeglasses must be securely affixed to riders with head straps.
3. Swim wear with exposed zippers, buckles, rivets or metal ornamentation are not permitted.
4. Only one rider to enter the flume at a time.
5. Tubes should be ridden in a seated position, facing forward.
6. Riders must stay on the tubes during ride.
7. Riders must wait for the attendant's start signal before starting the ride.
8. Do not run, dive, stand, kneel, rotate or stop in the slide.
9. At the end of the slide, obey all instructions by attendant and exit quickly.
10. **CAUTION: At the end of the slide, obey all instructions by splash pool attendant and exit quickly, taking your tube with you.**

## **54" AQUA-TUBE INNER TUBE RIDE**

For slides terminating in splash pools, signs should be posted to convey the following rules and regulations:

1. Do not block the end of the slide.
2. Leave the splash pool quickly and orderly.
3. No swimming allowed in the splash pool.

### **Attendants**

All attendants should be alert to controlling crowd behavior, ensuring safe and orderly entry and exit and controlling the proper entry rate into the slide.

Attendant/top - 1 attendant per slide.

Duties:

1. Ensure the crowd behaves in a safe and orderly manner.
2. Ensure all riders meet minimum height requirements.
3. Ensure eyeglasses are securely affixed to the riders.
4. Observe bathing suits for zippers, buckles, rivets, etc. and do not allow them on the slide.
5. Observe riders for any physical impairments and do not allow them on the slide.
6. Ensure all riders are in proper riding position before dispatching.
7. Ensure all riders are properly spaced. (We suggest a spacing of eight seconds). However, spacing should be based on conditions in the flume and type of rider.

## **54" AQUA-TUBE INNER TUBE RIDE**

**For slides using runout lanes - One (1) attendant per runout lane.**

**Duties:**

1. Ensure that all guests stay clear of runout area.
2. Ensure that water level in runout area is between minimum and maximum marks and stop dispatching (with appropriate signal to top attendant) if it is not.
3. Assist verbally or physically if necessary, each rider to exit the runout area quickly and on the correct side.

**For slides using a splash pool - 1 lifeguard per 4 slides.**

**Duties:**

1. Ensure customers conduct themselves in a safe and orderly fashion.
2. Do not allow riders to block the end of a slide. Delay entry of next rider if the slide discharge is blocked.
3. Ensure that all riders exit the pool immediately upon splashdown. Do not permit guests to sit on pool steps.
4. Be prepared to enter splash pool to assist customers out of pool.
5. Do not allow any swimming in splash pool.
6. Ensure tubes are removed from the splash pool.

**NOTE: Special attention is required at the splash pool due to reduced visibility from flowing water and the splash caused by riders entering the pool. The clarity of quiescent splash pool water is normally acceptable if no turbidity is noted and the bottom detail is clearly visible.**

## 32" AQUA-TUBE

The primary operating concern in the Aqua-Tube is the possibility of one riding customer colliding with another customer. This type of occurrence can be minimized by the use of well-trained attendants controlling entry and exit conditions. Other safety considerations include: correct riding position, slips and falls in the entry and exit areas; impact with the flume sidewalls and abrasion from the sidewalls.

**NOTE:** Water flow should be maintained at 300 US gallons per minute.

### Posted Signs

Signs should be posted at the entry station of the ride to convey the following rules and regulations:

1. Children under 48 inches tall are not permitted on this ride.
2. Eyeglasses must be securely affixed to riders with head straps.
3. Swimwear with exposed zippers, buckles, rivets or metal ornamentation are not permitted.
4. Only one rider to enter the flume at a time.
5. Slide must be ridden feet first, lying on your back with legs firmly crossed at the ankles and arms folded across the chest (to prevent elbows contacting the flume).
6. Riders must wait for the attendant's start signal before starting the ride.
7. Do not uncross your legs or attempt to sit up until you come to a stop in the shutdown lane.
8. At the end of the slide, obey all instructions by attendant and exit quickly.
9. **CAUTION:** For safety reasons, pregnant women and persons with heart conditions or back trouble should not ride this slide.

## **32" AQUA-TUBE**

### **Attendants**

Attendants should be alert to controlling crowd behaviour, ensuring safe and orderly entry and exit and controlling the proper entry rate into the slide.

**Attendant/top - One (1) attendant per slide.**

#### **Duties:**

1. Ensure the crowd behaves in a safe and orderly manner.
2. Ensure all riders meet minimum height requirements.
3. Ensure eyeglasses are securely affixed to the riders.
4. Observe bathing suits for zippers, buckles, rivets etcetera and do not allow them on the slide.
5. Observe riders for any physical impairments and do not allow them on the slide.
6. Ensure that landing area is clear before dispatching next rider.
7. Ensure all riders are in proper riding position before dispatching.
8. Observe runout area attendant at all times.
9. Stop dispatching riders when appropriate signal is given (arms crossed overhead) from runout attendant or when unsafe conditions are observed.

**For slides using runout lanes - One (1) attendant per runout lane.**

#### **Duties:**

1. Ensure that all guests stay clear of runout area.
2. Ensure that water level in runout area is between minimum and maximum marks and stop dispatching (with appropriate signal to top attendant) if it is not.
3. Assist verbally or physically if necessary, each rider to exit the runout area quickly and on the correct side.

## **32" AQUA-TUBE**

**For slides using a splash pool - One (1) lifeguard per four (4) slides.**

### **Duties**

1. Ensure customers conduct themselves in a safe and orderly fashion.
2. Do not allow riders to block the end of a slide. Delay entry of next rider if the slide discharge is blocked.
3. Ensure that all riders exit the pool immediately upon splashdown. Do not permit guests to sit on pool steps.
4. Be prepared to enter splash pool to assist customers out of pool.
5. Do not allow any swimming or flotation devices in splash pool.

**NOTE: Special attention is required at the splash pool due to reduced visibility from flowing water and the splash caused by riders entering the pool. The clarity of quiescent splash pool water is normally acceptable if no turbidity is noted and the bottom detail is clearly visible.**