

The Model Aquatic Health Code

The Code



Release for
Final Public Comment

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U.S. Department of Health and Human Services
Centers for Disease Control and Prevention

**Model Aquatic Health Code Complete DRAFT Version
for the Second 60-day Review**

**Posted for Public Comment on 03/28/2014
Currently Open for Public Comment that Closes on 05/27/2014**

The MAHC is posting the complete DRAFT version of the MAHC for a second 60-day public comment review period. Each MAHC module was revised and reposted after the first 60-day public comment period. These modules have been merged into a single document and we have attempted to correct inconsistencies and duplications that arose as part of the modular development process. This second review should allow reviewers to cross check between different sections of the MAHC to improve consistency and coherence. This draft will be revised again based on the public comments received and released as the MAHC 1st Edition. The MAHC organizers appreciate your patience with the review process and commitment to this endeavor as we all seek to produce the best aquatic health code possible.

This information is distributed solely for the purpose of pre-dissemination public comment under applicable information quality guidelines. It has not been formally disseminated by the Centers for Disease Control and Prevention. It does not represent and should not be construed to represent any agency determination or policy.

This document does not address all health and safety concerns, if any, associated with its use. It is the responsibility of the user of this document to establish appropriate health and safety practices and determine the applicability of regulatory limitations prior to each use.

MAHC Complete Draft Version Review Guidance

The **Model Aquatic Health Code (MAHC) Organizers** appreciate your willingness to review this MAHC Complete Draft Version. Your unique perspectives and science-based suggestions will help ensure that the best available standards and practices for protecting aquatic public health are available for adoption by state and local environmental health programs. Please consult the Public Comment Process webpage (www.cdc.gov/healthywater/swimming/pools/mahc/comments.html) for guidance on how to submit public comments on this version of the MAHC. Read the “Review Guidance” below for details about this draft and submitting comments.

Reminder: please be as specific, complete, and succinct as possible in suggestions for improving this draft

Review Guidance:

- Please download and use the [MAHC Comment Form](http://www.cdc.gov/healthywater/swimming/pools/mahc/structure-content/) (<http://www.cdc.gov/healthywater/swimming/pools/mahc/structure-content/>) to submit your detailed, succinct comments and suggested edits. Return your review form by 05/27/2014, as an email attachment to MAHC@cdc.gov.
 - **NOTE:** Only comments sent in this form will be accepted.
 - **Draft MAHC Section Number:** Provide specific citation of draft MAHC section where a change is needed.
 - **Recommended New Draft MAHC Section Language:** Provide specific amended language.
 - **Basis for Suggested Change:** Are these comments supported by published scientific studies, existing state or local codes, or other references or editorial in nature?
 - **Comment Previously Addressed:** Using the Public Comment Tracking List, determine if your proposed comment has been previously addressed by the first 60-day round of public comment. Unless there is new, peer-reviewed, scientific data to support the change request, the MAHC committees strongly encourage submission of new comments that were not addressed during the previous comment period.
 - **Suggested Change Reference Citation:** Please provide the full publication citation information for basis of suggested change including notation of specific page number or section number. Mark Editorial, if no reference information is provided
- If part of a larger group or organization, please consolidate comments to speed the MAHC response time to public comments.
- The complete MAHC 1st Edition, with all of the individual 2nd 60-day public comment responses addressed and the public comment responses will be posted when completed.
- The published MAHC will be regularly updated through a collaborative all-stakeholder process.

Please address any questions you may have about MAHC or the review process to MAHC@cdc.gov. You may also request to be on the direct email list for alerts (“Get Email Updates” is in a box on the right hand side of the MAHC website (www.cdc.gov/healthywater/swimming/pools/mahc/index.html) or the Healthy Swimming website (www.cdc.gov/healthyswimming)).

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Thank you again, and we look forward to your help in this endeavor.

Sincerely,

Douglas C. Sackett, Director

MAHC Steering Committee

***Reviewer Note on MAHC Complete Draft Version
Section Numbering:***

Please use the specific section numbers to make your comments on this Model Aquatic Health Code Complete Draft Version.

DRAFT

Foreword

Reserved for final publication

Acknowledgments

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Information to Assist the User with the MAHC Format

Organization

The *Model Aquatic Health Code* is divided into chapters and subsections that focus on each operational area (Design and Construction, Operation and Maintenance, Policies and Management) important to safeguarding public health at aquatic facilities.

Section Number

The international numbering system is used to organize the guidelines in this document.

Title, Keyword, Phrase

Each of the guidelines is formatted with a title, keyword, or phrase after the section number.

Description

The public health compliance wording guidance or explanation is provided in this statement.

Module Abbreviations

To assist the reviewers in following the progression from module to fully merged code, the MAHC committee decided to put abbreviations from the previous module format beside most sections. These abbreviations will not be in the final MAHC publication. The abbreviations are as follows:

- REG Regulatory
- D&C Design & Construction
- RM Risk Management
- VEN Ventilation
- LG Lifeguard & Bather Supervision
- R&F Recirculation & Filtration
- DWQ Disinfection & Water Quality
- M&T Monitoring & Testing
- HYG Hygiene
- FMO Facility Maintenance & Operation
- OT Operator Training
- FVB Fecal Vomit Blood Contamination

1.0 Preface

1.1 Introduction

1.1.1 Rationale

There has been a dramatic increase in waterborne disease outbreaks associated with public disinfected AQUATIC FACILITIES (e.g. swimming pools, water parks, etc.) in recent decades. As a result, public health investigations have revealed that many diseases can be prevented by proper maintenance and water treatment and by more modern disease prevention practices. Drowning and falling, diving, chemical use, and suction injuries continue to be major public health injuries associated with AQUATIC FACILITIES, particularly for young children. In this context, the health and safety at AQUATIC FACILITIES is regulated by state and local jurisdictions since, in the United States, there is no federal regulatory authority responsible for these AQUATIC FACILITIES. All public pool codes are developed, reviewed, and approved by state and/or local public health officials or legislatures. Consequently, there is no uniform national guidance informing the design, construction, operation, and maintenance of public swimming pools and other public disinfected AQUATIC FACILITIES. As a result, the code requirements for preventing and responding to recreational water illnesses (RWIs) and injuries can vary significantly among local and state agencies. State and local jurisdictions spend a great deal of time, personnel, and resources creating and updating their individual codes on a periodic basis.

1.1.2 Need for Further Guidance

Based on illness tracking data, outbreak reporting, and stakeholder feedback, CDC believed further prevention-oriented planning and action were needed. CDC worked with the Council of State and Territorial Epidemiologists to get agreement on the need for a national workshop to develop guidance for preventing future RWI outbreaks. This CSTE position statement was passed in 2005 and CDC was tasked with organizing the national workshop.

1.1.3 Responsibility of User

This document does not address all safety or public health concerns, if any, associated with its use. It is the responsibility of the user of this document to establish appropriate health and safety practices and determine the applicability of regulatory limitations prior to each use.

1.1.4 Original Manufacturer Intent

In the absence of exceptions or further guidance, all fixtures and equipment shall be installed according to original manufacturer intent.

1.1.5 Local Jurisdiction

The MAHC refers to existing local building codes in the jurisdiction for specific needs. In the absence of existing local codes, the authority having jurisdiction should specify an appropriate code reference.

1.2 Recreational Water-Associated Illness (RWI) Outbreaks and Injuries

1.2.1 RWI Outbreaks

Large numbers of recreational water-related outbreaks are documented annually, which is a significant increase over the past several decades

1.2.2 Significance of *Cryptosporidium*

Cryptosporidium, which causes a FECAL-ORALLY spread diarrheal disease, is tolerant of CHLORINE and other halogen disinfectants and has emerged as the leading cause of pool associated outbreaks in the United States.

1.2.3 Drowning and Injuries

Drowning and falling, diving, chemical use, and suction injuries continue to be major public health injuries associated with aquatic venues. Drowning is a leading cause of injury death for young children and a leading cause of unintentional injury death for people of all ages.

1.2.4 Pool Chemical-Related Injuries

Pool chemical-related injuries occur regularly and can be prevented if pool chemicals are stored and used as recommended.

1.3 Model Aquatic Health Code (MAHC)

1.3.1 Background

All AQUATIC FACILITY CODES in the United States are reviewed and approved by state and/or local public health officials with no uniform national public health STANDARDS governing design, construction, operation, maintenance, policies, or management of public swimming pools and other AQUATIC FACILITIES.

The effort to create the MAHC stems from a CDC-sponsored national workshop called "Recreational Water Illness Prevention at Disinfected Swimming Venues" that was convened on February 15-17, 2005, in Atlanta, Georgia. The workshop assembled persons from different disciplines working in state, local, and federal public health agencies, the aquatics industry, and academia to discuss ways to minimize the spread of recreational water illnesses at disinfected swimming venues. The major recommendation from this workshop was that CDC lead a national partnership to create a model guidance document that helps local and state agencies incorporate science-based practices into their swimming pool codes and programs without having to

"recreate the wheel" each time they create or revise their pool codes. The attendees also recommended that this effort be all-encompassing so that it covered the spread of illness but also included drowning and injury prevention. Such an effort should increase the evidence base for AQUATIC FACILITY design, construction, and operation while reducing the time, personnel, and resources needed to create or improve pool codes across the country. Since 2007, CDC has been working with public health, industry, and academic representatives from across the United States to create this guidance document. Although, the initial workshop was responding to the significant increases in disease outbreaks at swimming pools, the MAHC is a complete AQUATIC FACILITY guidance document with the goal of reducing the spread of disease and occurrence of drowning and injuries at public aquatic facilities. Based on stakeholder feedback and recommendations, CDC agreed that public health improvements would be aided by development of a comprehensive, science-based, systematic, collaboratively developed guidance on AQUATIC FACILITY design and construction, operation and maintenance, and policies and management to address existing and emerging public health threats.

1.3.2 MAHC Vision and Mission

The Model Aquatic Health Code's (MAHC) vision is "Healthy and Safe Aquatic Experiences for Everyone". The MAHC's mission is to provide guidance on how state and local officials can transform a typical health department pool program into a data-driven, knowledge-based, risk reduction effort to prevent disease and injuries and promote healthy recreational water experiences. The MAHC will provide local and state agencies with uniform guidelines and wording for in the areas of design and construction, operation and maintenance, and policies and management of swimming pools and other public disinfected AQUATIC FACILITIES.

1.3.3 Best Available Practice

The availability of the MAHC should provide state and local agencies the best available guidance for protecting public health so they can use it to create or update their swimming pool codes.

1.3.4 Process

The MAHC development process created comprehensive risk reduction guidance for AQUATIC FACILITIES based upon national interaction and discussion. The development plan encompassed design, construction, alteration, replacement, operation, and management of these facilities. The MAHC is data and best-practices based. It was developed by a process that included input from all sectors and levels of public health, the aquatic industry, academia, and the general public. It was open for two 60-day public comment periods during the process. It is national in scope and the guidance can be used to write or update pool codes across the U.S.

1.3.5 Updating the MAHC

The MAHC will be updated on a continuing basis through an inclusive, transparent, all-stakeholder process.

1.3.6 Authority

Regulatory agencies like state and local governments have the authority to regulate AQUATIC FACILITIES in their jurisdiction.

1.3.7 CDC Role

The MAHC is hosted by the Centers for Disease Control and Prevention (CDC), a Federal agency whose mission is “To promote health and quality of life by preventing and controlling disease, injury, and disability.” CDC has been involved in developing swimming pool-related guidance since the 1950’s.

1.3.7.1 Public Health Role

CDC is “the primary Federal agency for conducting and supporting public health activities in the United States”; however, they are not a regulatory agency.

1.3.7.2 Model Guidance

The MAHC is intended to be guidance that state and local public health agencies can use to write or update their pool codes in part or in full as fits their jurisdiction’s needs. The CDC adopted this project because no other U.S. federal agency had commission over public disinfected aquatic facilities. Considering the CDC’s mission and historical interest in aquatics, this organization was the best qualified to lead a national consortia to create such a document.

1.4 Public Health and Consumer Expectations

1.4.1 Industry & Government Responsibility

Both the aquatics industry and the government share the responsibility of offering AQUATIC FACILITIES that provide consumers with safe and healthy recreational water experiences and that do not become sources for the spread of COMMUNICABLE disease or outbreaks or the cause of injuries. This shared responsibility extends to working to meet consumer expectations that AQUATIC FACILITIES are properly designed, constructed, operated, and maintained.

1.4.2 Swimmer Responsibility

The consumer or BATHER shares a responsibility in maintaining a healthy swimming environment by practicing the CDC-recommended healthy swimming behaviors to improve hygiene and reduce disease transmission. Consumers and BATHERS also share responsibility for using AQUATIC FACILITIES in a healthy and safe manner to reduce the incidence of injuries.

1.5 Advantages of Uniform Guidance

1.5.1 Industry Agreement

The aquatics industry and public health officials recognize the value in uniform guidance created by multi-sectoral discussion and agreement – both for getting the best possible

information and gaining industry acceptance. Uniform guidance helps all public sectors, including businesses and consumers, resulting in the best product and experiences.

In addition, the MAHC's combination of performance-based and prescriptive recommendations gives AQUATIC FACILITIES freedom to use innovative approaches to achieve acceptable results. However, AQUATIC FACILITIES must ensure that these recommendations are still being met, whatever the approach may be.

1.5.2 MAHC Provisions

The MAHC provides guidance on AQUATIC FACILITY design standards & construction, operation & maintenance, and policies & management that can be uniformly adopted for the aquatics industry.

- Is the collective result of the efforts and recommendations of many individuals, agencies, and organizations, and
- Embraces the concept that safe and healthy recreational water experiences by the public are directly affected by how we collectively design, operate, and maintain our aquatic facilities.

1.5.3 Aquatic Facility Requirements

Model performance-based recommendations essentially define public aquatic safety expectations, usually in terms of how dangerous a pathogen or injury is to the public. By using a combination of performance-based recommendations and prescriptive measures, aquatic facilities are free to use innovative approaches to provide safe aquatic facilities whereas traditional evaluations mandate how aquatic facilities achieve acceptable results. However, to show compliance with the model performance-based recommendation, the aquatic facility must demonstrate that control measures are in place to ensure that the recommendations are being met. The underlying theme of the MAHC is that it should be science-based where possible and that change will be gradual so all parties can prepare for upcoming changes; "Evolution, not revolution".

1.6 Modifications and Improvements in this MAHC Version

1.6.1 Modifications and Improvements in this MAHC Version

This draft version of the MAHC was assembled from 14 modules that had been posted for the first 60-day public comment period, revised based on public comment, and reposted. This version of the MAHC was assembled and checked for discrepancies and duplications arising from the modular development approach and was then posted for an additional 60-day public comment period to allow reviewers to check model wording and cross check that throughout the document. After revising the document based on public comment, the document will be reposted as the MAHC 1st Edition.

1.7 MAHC Adoption at State or Local Level

1.7.1 MAHC Adoption at State or Local Level

The MAHC is provided for voluntary use by governing bodies at all levels to regulate AQUATIC FACILITY STANDARDS. At the state and local levels the MAHC may be used in part or in whole to:

- 1) Enact into statute as an act of the state legislative body; or
- 2) Promulgate as a regulation, rule or code; or
- 3) Adopt as an ordinance.

1.8 The MAHC Revision Process

1.8.1 MAHC Revisions

CDC will accept concerns and recommendations for modification of the MAHC from any individual or organization for this second 60-day public comment period via the email address MAHC@cdc.gov.

1.8.2 Future Revisions

The MAHC realizes that this it is an evolving document. As the MAHC is used and recommendations are put into practice, MAHC revisions will likely need to be made. As the future brings new technologies and new aquatic health issues, the MAHC governing body will institute a revision process that welcomes all stakeholders to participate in making this document as comprehensive, easy to understand, and technically sound as possible.

1.9 Acknowledgements

1.9.1 Acknowledgements

Many individuals devoted considerable time and effort in addressing concerns and developing recommendations that are now reflected in the MAHC.

1.9.1.1 Diversity

These individuals represent a diverse group of regulators, educators, industry leaders, and consumer representatives acting through their agencies, companies, professional groups, or trade organizations.

1.9.1.2 Dedication

It is only through the dedicated efforts and contributions of experienced professionals that a scientifically sound, well focused, and up- to-date model MAHC is possible.

1.9.1.3 Development

CDC acknowledges with gratitude the substantial assistance of those who contributed to public health and aquatic safety in the development of the MAHC.

2.0 User Guide

2.1 Overview

2.1.1 New Users

A new user will find it helpful to review the Table of Contents in order to quickly gain an understanding of the scope and sequence of subjects included in the CODE.

2.1.2 Topic Presentations

MAHC provisions address essentially three areas: Design & Construction (Chapter 4), Operation & Maintenance (Chapter 5), Policies & Management (Chapter 6). In addition, an overarching explanation of the MAHC as a risk reduction plan is provided in the Annex.

2.2 MAHC Structure and Format

2.2.1 Numbering System

The CODE follows a numeric outline format. The structural numbering system of the document is as follows:

- 1) Chapter 1.0
- 2) Part 1.1
- 3) Subpart 1.1.1
- 4) Section 1.1.1.1
- 5) Paragraph 1.1.1.1.1

2.2.2 Title, Keyword, Phrase Text.

On the same line and next to the number is a title, keyword or phrase summary showing the information contained in the corresponding MAHC wording below.

2.2.3 MAHC Requirement

Recommended MAHC requirement wording is shown below the number of title, keyword or phrase. These requirements usually appear in sentence or paragraph format.

2.2.4 Illustrations

Appropriate charts, diagrams, and other illustrative material found in the Chapters will also appear in the Annex.

2.2.5 Consistency Between Chapters 4.0 and 5.0

Each Part or Sub-part is repeated throughout CODE Chapters 4.0 (Design Standards & Construction) and 5.0 (Operation & Maintenance). For example, for DISINFECTION, the design recommendations and construction aspects are addressed in Subpart 4.7.3 and the operation and maintenance aspects are addressed in Subpart 5.7.3. If a topic is not

applicable then that section is marked with a N/A (e.g., the size or width of the DECKING is not really applicable for Operation & Maintenance versus Design Standards & Construction). This is designed to allow MAHC users to see how a topic of interest applies under both chapter headings.

2.2.6 Conventions

The following conventions are used in the Model Aquatic Health Code. “Shall” means the act is imperative, i.e., “shall” constitutes a command. “May not” means absolute prohibition. “May” is permissive and means the act is allowed. The term “Means” is followed by a declared fact.

2.2.7 Definitions

Defined words and terms are in “SMALL CAPS” in the text of the CODE chapters to alert the reader that there is a specific meaning assigned to those terms and that the meaning of a provision is to be interpreted in the defined context. A concerted effort was also made to place in “SMALL CAPS” all forms and combinations of those defined words and terms that were intended to carry the weight of the definition.

2.3 Annex

2.3.1 Rationale

The annex is provided to:

- 1) Give further explanations of why certain recommendations are made;
- 2) Discuss rationale for making the MAHC content decisions;
- 3) Provide a discussion of the scientific basis for selecting certain criteria, as well as discuss why other scientific data may not have been selected, e.g. due to data inconsistencies;
- 4) State areas where additional research may be needed;
- 5) Discuss and explain terminology used; and

Provide additional material that may not have been appropriately placed in the main body of suggested MAHC recommendations. This would include summaries of scientific studies, charts, graphs, or other illustrative materials.

2.3.2 Content

The annex developed to support the MAHC Code language document is meant to provide additional help to those responsible for using the MAHC. Statements in the annex are intended to be supplements and additional explanations. They are not meant to be interpreted as MAHC code wording or used to create enforceable code language.

2.3.3 Bibliography

The Annex includes a list of codes referenced, a bibliography of the reference materials, and scientific studies that form the basis for MAHC recommendations.

2.3.4 Appendices

The Appendices supply additional information or tools that may be useful to the reader of the MAHC Annex and Code

DRAFT

3.0 Glossary of Acronyms and Terms used in this Code

Acronyms Used in the MAHC

ACCA	Air Conditioning Contractors of America
ADA	Americans with Disabilities Act
AED	Automated external defibrillator
AHAC	Aquatic Health Advisory Committee
AHJ	Authority Having Jurisdiction
AMCA	Air Movement and Control Association
ANSI	American National Standards Institute
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
ATSDR	Agency for Toxic Substances and Disease Registry
BBP	blood borne pathogens
BCDMH	1-bromo-3-chloro-5, 5-dimethylhydantoin
CCPRF	Citizen CPR Foundation
CDC	Centers for Disease Control and Prevention
CEU	Continuing Education Units
CPR	Cardiopulmonary Resuscitation
CPSC	Consumer Product Safety Commission
CYA	Cyanuric Acid
DBDMH	dibromodimethylhydantoin
DBP	Disinfection by-product
DVGW	Deutscher Verein des Gas- und Wasserfaches e.V. – Technisch wissenschaftlicher Verein (German Technical and Scientific Association for Gas and Water)
EAP	Emergency Action Plan
ECCU	Emergency Cardiovascular Care Update
EPA	Environmental Protection Agency
FAC	Free available chlorine
FC	footcandles
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FINA	Federation Internationale de Natation Amateur
GFCI	ground-fault circuit interrupter
GPM	Gallons per minute
HMIS	Hazardous Material Identification System
HAEESS	Hazardous Substance Emergency Events Surveillance System
HOCl	Hypochlorous acid
IARC	International Agency for Research on Cancer
IBC	International Building Code
ICC	International Code Commission
ICBO	International Council of Building Officials

IESNA	Illuminating Engineering Society of North America
ILCOR	International Liaison Committee on Resuscitation
IPC	International Plumbing Code
MAHC	Model Aquatic Health Code
MERV	minimum efficiency reporting value
METS	Metabolic Equivalents
MSBL	maximum sustainable bather load
MSDS	Material Safety Data Sheets
NCAA	National Collegiate Athletic Association
NEC	National Electrical Code
NEHA	National Environmental Health Association
NEISS	National Electrical Injury Surveillance System
NFPA	National Fire Protection Association
NPDS	National Poison Data System
NPSH	Net Positive Suction Head
NRTL	Nationally Recognized Testing Laboratory
NSF	National Sanitation Foundation
OEM	Original Equipment Manufacturer
ÖNORM	Österreichisches Normungsinstitut (Austrian Standards Institute)
ORP	Oxidation reduction potential
OSHA	Occupational Safety and Health Administration
PEL	Permissible Exposure Limit
PHMB	Polyhexamethylene biguanide hydrochloride
POS	Perimeter overflow system
PPE	Personal Protective Equipment
PPM	Parts per million
PVC	Polyvinyl chloride
PVC-P	Plasticized polyvinyl chloride
RED	Reduction Equivalent Dose
RLV	Relative limit value
RPZ	Reduced Pressure Zone
RWI	Recreational Water Illness
SCBA	Self-contained breathing apparatus
SCI	Spinal Cord Injury
SDS	Secondary Disinfection System
SI	Saturation Index
SMACNA	Sheet Metal and Air Conditioning Contractors' National Association
STEL	short term exposure limit
SVRS	Safety Vacuum Release System
TDH	Total Dynamic Head
TDS	Total Dissolved Solids
THM	Trihalomethane
TLV	Threshold Limit Value
UPC	Universal Plumbing Code
USLSC	United States Lifeguarding Standards Coalition
UV	Ultraviolet

UVT	UV Transmissivity
VFD	Variable Frequency Drive
WC	water closet
WQTD	Water Quality Testing Device

Terms Used in the MAHC

“**Accessible Route**” means access/egress standards as defined by current Americans with Disabilities Accessibility Guidelines (ADAAG), published by the U.S. Access Board.

“**Activity pool**” means a water attraction designed primarily for play activity that uses constructed features and devices including pad walks, flotation devices and similar attractions.

“**Air Handling System**” means equipment that brings in outdoor air into a building and removes air from a building for the purpose of introducing air with fewer contaminants and removing air with contaminants created while bathers are using aquatic venues. The system includes components which move, transport, and condition the air for humidity and temperature control and stratification.

“**Agitated Water**” means an aquatic venue with mechanical means (aquatic features) to discharge, spray, or move the water's surface above and/or below the static water line of the aquatic venue. Where there is no static water line, movement shall be considered above the deck plane.

“**Aquatic Facility**” means a physical place that contains one or more aquatic venues and support infrastructure.

“**Aquatic Feature**” means an individual component within an aquatic venue. Examples include slides, structures designed to be climbed or walked across, and structures that create falling or shooting water.

“**Aquatic Health Advisory Committee**” means a committee created by the AHJ to serve as an “independent” review function in the overall appeals process in the AHJ. It serves the AHJ in an advisory capacity only.

“**Aquatic Facility or Venue Enclosure**” means an uninterrupted barrier surrounding and securing an aquatic facility.

“**Aquatic Venue**” means an artificially constructed or modified natural structure where the general public is exposed to water intended for recreational or therapeutic purpose. Such structures do not necessarily contain standing water, so water exposure may occur via contact, ingestion, or aerosolization. Examples include swimming pools, wave pool, lazy rivers, spas (including spa pools and hot tubs), therapy pools, spray pads and other interactive water venues.

“Authority Having Jurisdiction” (AHJ) means an agency, organization, office, or individual responsible for enforcing the requirements of a code or standard, or for approving equipment, materials, an installation, or a procedure.

“Automatic or Robotic Cleaner” means a modular vacuum system consisting of a motor-driven in-pool suction device, either self powered or powered through a low voltage cable which is connected to a deck side power supply.

“Automated controller” means a system of at least one chemical probe, a controller, and auxiliary or integrated component that senses the level of one or more water parameters and provides a signal to other equipment to maintain the parameters within a user-established range.

“Backflow” means a hydraulic condition caused by a difference in water pressure that causes non-potable water or other liquid to enter the potable water system by either backpressure or back-siphonage.

“Barrier” means an obstacle preventing direct access from one point to another.

- **“Enclosure barrier”** means a constructed feature or obstacle that is intended to deter or effectively prevent unpermitted, uncontrolled, and unfettered access (by children) to an aquatic facility or aquatic venue such as a swimming pool, wading pool, or spa. It is designed to resist climbing and to prevent passage through it and under it.
- **“Separation barrier”** means a constructed feature that is intended to control and limit but not prevent direct access from one area to another area within a pool enclosure. It may be permanently installed or moveable.

“Bather” means a person at an aquatic venue who has contact with water either through spray or partial or total immersion. The term bather as defined, also includes staff members, and refers to those users who can be exposed to contaminated water as well as potentially contaminate the water.

“Bather Load” means the maximum number of persons allowed in the water of an aquatic venue. Bather load is used to determine the number of RINSE and CLEANSING SHOWERS. Bather Load is not the same as occupant load which refers to maximum aquatic facility loads. The bather load is calculated by dividing the surface area in ft² (aquatic venue surface area) of the aquatic venue by the density factor (D) that fits the specific aquatic venue being considered ($BL = \text{aquatic venue surface area}/D$). The density factors are based on defining three types of aquatic venue water:

“Best Practice” means a technique or methodology that, through experience and research, has been proven to reliably lead to a desired result.

“Body of Water” (per NEC, q.v.) means any aquatic venue holding standing water, whether permanent or storable.

“Breakpoint Chlorination” means the conversion of inorganic chloramine compounds to nitrogen gas. When chlorine is added to water containing ammonia (from urine, sweat, or the environment, for example), it reacts with the ammonia to form chloramines. If more chlorine is added, the total residual chlorine continues to rise until the concentration reaches a point that forces the reaction with ammonia to go to rapid completion. In this reaction, the inorganic chloramines are converted to dichloramine, then to nitrogen trichloride, and then to nitrogen gas. Compounds of nitrogen and chlorine are released into the water, and the apparent residual chlorine decreases. The point at which the drop occurs is referred to as the “breakpoint”. The amount of free chlorine that must be added to the water to achieve breakpoint chlorination is approximately ten times the amount of combined chlorine in the water. As additional chlorine is added, all inorganic combined chlorine compounds disappear, resulting in a decrease in eye irritation potential and “chlorine odors.”

“Bulkheads” means a movable partition that physically separates a pool into multiple sections.

“Catch Pool” means a pool or designated section of a pool located at the exit of one or more waterslide flumes. The body of water is provided for the purpose of terminating the slide action and providing a means of exit to a deck or walkway area.

“Circulation Path” means an exterior or interior way of passage from one part of an aquatic facility to another for pedestrians, including, but not limited to walkways, pathways, decks, and stairways. This must be considered in relation to ADAAG Guidelines.

“Chemical Storage Space” means an interior space of a building used for the storage of pool chemicals including, at a minimum, acids, fertilizers, salt, oxidizing cleaning materials, other corrosive or oxidizing chemicals, or pesticides.

“Chlorine” means an element that at room temperature and pressure is a heavy green gas with characteristic odor and is extremely toxic. It can be compressed in liquid form and stored in heavy steel tanks. Chlorine and chlorine-based disinfectants release hypochlorous acid, the primary disinfecting agent, and hypochlorite ion when dissolved in water. Chlorine is a general term used in the MAHC which refers to hypochlorous acid in an aqueous solution.

“Cleansing Shower” means a shower located within a hygiene facility using warm water and soap. The purpose of these showers is to remove contaminants including perianal fecal material, sweat, skin cells, personal care products, and dirt before bathers enter the pool.

“Code” means a systematic statement of a body of law, especially one given statutory force.

“**Combustion Device**” means any appliance or equipment using fire. These include, but may not be limited to, gas or oil furnaces, boilers, pool heaters, domestic water heaters, etc.

“**Construction Joint**” means a watertight joint provided to facilitate stopping places in the construction process. Construction joints also serve as contraction joints which control cracking.

“**Contamination Response Plan**” means a plan for handling contamination from formed-stool, diarrheal-stool, vomit, and contamination involving blood.

“**Contaminant**” means a substance that soils, stains, corrupts, or infects another substance by contact or association.

“**Corrosive Materials**” means pool chemicals, fertilizers, cleaning chemicals, oxidizing cleaning materials, salt, de-icing chemicals, other corrosive or oxidizing materials, pesticides, and such other materials which may cause injury to people or damage to the building, air-handling equipment, electrical equipment, safety equipment, or fire-suppression equipment, whether by direct contact or by contact via fumes or vapors, whether in original form or in a foreseeably likely decomposition, pyrolysis, or polymerization form. Refer to labels and MSDS forms.

“**Crack**” means any and all breaks in the structural shell of a pool vessel. Such breaks shall be identified, evaluated, and repaired in a manner that will restore structural integrity and water tightness to the vessel.

“**CT Value**” means a representation of the concentration of the disinfectant (C) multiplied by time in minutes (T) needed for inactivation of a particular contaminant. The concentration and time are inversely proportional; therefore, the higher the concentration of the disinfectant, the shorter the contact time required for inactivation. The CT value can vary with pH or temperature change so these values must also be supplied to allow comparison between values.

“**Current pool**” means a pool that creates a current for the purpose of exercise.

“**Deck**” means surface areas serving the aquatic venue, including the perimeter/wet deck, pool deck, and dry deck.

- “**Dry Deck**” means all pedestrian surface areas within the pool enclosure not subject to frequent splashing or constant wet foot traffic. (Not perimeter deck or pool deck) which connect the pool to adjacent amenities, entrances, and exits. Landscape areas are not included in this definition.
- “**Perimeter Deck**” means the hardscape surface area immediately adjacent to and within 4 feet (1.22 m) of the edge of the swimming pool also known as the “wet deck” area.

- **“Pool Deck”** means surface areas serving the aquatic venue, beyond perimeter deck, which is expected to be regularly trafficked and made wet by bathers.

“Diaper-aged children” mean children less than 5 years of age.

“Diaper-changing station” means a hygiene station that includes a safe and approved diaper-changing unit, adjacent hand-washing sink, soap and dispenser, hand drying device or paper towels and dispenser, and trash receptacle, and disinfectant products to clean the changing surface after use.

“Diaper-changing unit” means a safe and approved diaper-changing surface that is part of a diaper-changing station.

“Dichloramine” means a disinfection by-product formed when chlorine binds to nitrogenous waste in pool water to form an amine- containing compound with two chlorine atoms (NHCl₂). It is a known acute respiratory and ocular irritant.

“Disinfection” means a treatment that kills microorganisms (e.g., bacteria, viruses, and parasites); in water treatment, a chemical (commonly chlorine, chloramine, or ozone) or physical process (e.g., ultraviolet radiation) can be used.

“Disinfection By-Product” means a chemical compound formed by the reaction of a disinfectant (e.g. chlorine) with a precursor (e.g. natural organic matter, nitrogenous waste from bathers) in a water system (pool, water supply).

“Diving pool” means a pool used exclusively for diving.

“Drop Slide” means a slide that drops bathers into the water from a height above the water versus delivering the bather to the water entry point.

“Dry Deck” means all pedestrian surface areas within the pool enclosure not subject to frequent splashing or constant wet foot traffic (not perimeter deck or pool deck) which connect the pool to adjacent amenities, entrances, and exits. Landscape areas are not included in this definition.

“Emergency Action Plan” means a plan that identifies the objectives that need to be met for a specific type of emergency, who will respond, and what each person’s role will be during the response. and what equipment is required as part of the response.

“Enclosure” means an uninterrupted barrier surrounding and securing an aquatic facility.

“EPA Registered” means all pesticide products regulated and registered under the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) by the U.S. Environmental Protection Agency (EPA; <http://www.epa.gov/agriculture/lfra.html>). EPA registered products will have a registration number on the label (usually it will state “EPA Reg No.”

followed by a series of numbers). This registration number can be verified by using the EPA National Pesticide Information Retrieval System (<http://ppis.ceris.purdue.edu/#>)

“Equipment Room” means a space intended for the operation of pool pumps, filters, heaters, and controllers. This space is not intended for the storage of hazardous pool chemicals.

“Exit Gate or Door” means an emergency exit is a gate or door allowing free exit at all times. Such exits shall be conspicuously marked on the inside of the facility.

“Exercise pool” means a pool of shallow depth that operates with or without a current.

Note: Exercise pools are usually associated with health spas.

“Expansion Joint” means a watertight joint provided in a pool vessel used to relieve flexural stresses due to movement caused by thermal expansion/contraction.

“Flat Water” means an aquatic venue in which the water line is static except for movement made by users.

“Flume” means the deep riding channels and vertical / lateral curves of a waterslide with high water flows that accommodates riders using or not using mats, tubes, rafts, and other transport vehicles.

“Flume Valleys or Dips” means a specific part of a waterslide that are designed to create an external force to propel the rider to a higher elevation prior to continuing down the flume.

“Foot baths” means standing water in which patrons or aquatics staff rinse their feet.

“Free Chlorine Residual” OR “Free Available Chlorine” means the available disinfectant in the water. It is the portion of total chlorine that is not combined chlorine and is available as disinfectant. When chlorine is added to water, hypochlorous acid is produced in either the molecular state (HOCl) or the ionized state (hypochlorite ion (OCl⁻) plus hydrogen ion (H⁺)), and a by-product specific to the type of chlorine is produced. The pH of the water determines the amount of hypochlorous acid in each state. HOCl is a very effective bactericide and is the active available chlorine disinfectant in the water. OCl⁻ is also a bactericide, but acts more slowly than HOCl. Thus chlorine is a much less effective bactericide at high pH. The sum of HOCl and OCl⁻ is referred to as “free chlorine” in pool water. The hypochlorous acid that remains in pool water uncombined with ammonia is called “free chlorine residual.” Free chlorine residual must be maintained for adequate disinfection.

“Generally Accepted Practice” means a technique or methodology that is widely used but may or may not be the “best practice.”

“Ground-Fault Circuit Interrupter” means a device for protection of personnel that de-energizes an electrical circuit or portion thereof in the event of excessive ground current.

“Hand Wash Station” means a hand wash sink, adjacent soap with dispenser, hand drying device or paper towels and dispenser, and trash receptacle.

“High-risk Venue” means a venue which due to its intrinsic characteristics including intended users, has a greater likelihood of affecting the health and safety of the patrons of that venue. Examples of high-risk aquatic venues include wading pools, spas, and therapy pools.

“Horizontal Use Water” means an aquatic venue in which the water line is static except for movement made by users usually as a horizontal use as in swimming. Diving spargers do not void the flat water definition.

“Hot Water” means an aquatic venue with water temperature over 90 degrees Fahrenheit (30 degrees Celsius).

“Hydraulically apportioned” means both the relative difference between the water flow over the gutter or through the skimmers compared with the water flow through the main drain; and the even distribution of treated water returned to different areas of the pool through the inlets.

“Hygiene Facility” means a structure or part of a structure that contains toilet, shower, diaper-changing unit, hand wash station, and dressing capabilities serving bathers and patrons at an aquatic facility. **“Hygiene Fixtures”** means all components necessary for hygiene facilities including plumbing fixtures, diaper-changing stations, hand wash stations, trashcans, soap dispensers, paper towel dispensers or hand dryers, and toilet paper dispensers.

“Hyperchlorination” means the intentional and specific raising of chlorine levels for a prolonged period of time to inactivate pathogens following a fecal or vomit release in an aquatic venue as outlined in MAHC section 6.5.

“Imminent Health Hazard” means a significant threat or danger to health that is considered to exist when there is evidence sufficient to show that a product, practice, circumstance, or event creates a situation that requires immediate correction or cessation of operation to prevent injury based on the number of potential injuries and the nature, severity, and duration of the anticipated injury or illness.

“Increased Risk Aquatic Venue” means an aquatic venue which due to its intrinsic characteristics and intended users has a greater likelihood of affecting the health and safety of the patrons of that venue by being at increased risk for contamination (e.g., by diaper-aged children/children aged <5 years old) or being used by people that may be more susceptible to infection (e.g., therapy patients with open wounds). Examples of

increased-risk aquatic venues include spray pads, wading pools and other aquatic venues designed for diaper-aged children as well as therapy pools.

“Indoor Aquatic Facility” means a physical place that contains one or more aquatic venues and the surrounding bather and spectator/stadium seating areas within a structure that meets the definition of “Building” per the 2012 International Building Code. It does not include equipment, chemical storage, or bather hygiene rooms or any other rooms with a direct opening to the aquatic facility.

“Infinity Edge” means a pool wall structure and adjacent perimeter deck that is designed in such a way where the top of the pool wall and adjacent deck are not visible from certain vantage points in the pool or from the opposite side of the pool. Water from the pool flows over the edge and is captured and treated for reuse through the normal pool filtration system. They are often also referred to as “vanishing edges,” “negative edges,” or “zero edges.”

“Inlet” mean wall or floor fittings where treated water is returned to the pool.

“Integral Vacuum System” means a vacuum system that utilized the main circulating pump or a dedicated vacuum pump connect to the pool with PVC piping and terminating at the pool with a flush-mounted vacuum port fitting.

“Interactive Water Play Aquatic Venue” means any indoor or outdoor installation that includes sprayed, jetted or other water sources contacting patrons and not incorporating standing or captured water as part of the patron activity area. These aquatic venues are also known as splash pads, spray pads, wet decks. For the purposes of the MAHC, only those designed to recirculate water and intended for public use and recreation shall be regulated.

“Interactive Water Play Collection Tank” means the vessel used to collect the water that has been sprayed on the interactive water play area and returned through the interactive water play drains.

“Interactive Water Play Features” means the devices and plumbing used to convey the treated water to the play area to spray the patrons.

“Interior Space” means any substantially enclosed space having a roof and having a wall or walls which might reduce the free flow of outdoor air. Ventilation openings, fans, blowers, windows, doors, etc., shall not be construed as allowing free flow of outdoor air.

“International Mechanical Code” means the mechanical code standards produced by the International Code Council.

“Island” means a structure inside a pool where the perimeter is completely surrounded by the pool water and the top is above the surface of the pool.

“**Isolation**” (as applied to storage spaces) means the limitation of air movement from a storage space to other spaces of a building or structure.

“**Lazy River**” means a channeled flow of water of near-constant depth in which the water is moved by pumps or other means of propulsion to provide a river-like flow that transports patrons over a defined path. A lazy river may include play features and devices. A leisure river may also be referred to as a tubing pool, leisure pool or a current channel.

“**Leisure Rivers**” means manufactured streams in which the water is moved by pumps or other means of propulsion to provide a river-like flow that transports bathers over a defined path that may include water features and play devices.

“**Manual Disinfectant Feed System**” means a disinfectant delivered by a flow through erosion feeder or metering pump without an automated controller.

“**mg/L**” means the equivalent metric measure to parts per million (ppm).

“**Monitoring**” is the regular and purposeful observation and checking of systems or facilities and recording of data, including system alerts, excursions from acceptable ranges, and other facility issues. Monitoring includes human or electronic means.

“**Moveable Floors**” means a pool floor whose depth varies through the use of controls.

“**Natatorium**” means a building which contains one or more aquatic venues.

“**Nationally Recognized Testing Laboratory**” means a testing facility recognized by ANSI as an organization that provides third party product safety testing and certification services to manufacturers.

“**No Diving Marker**” means the universal international symbol for “No Diving” pictured as an image of a diver with a red circle with a slash through it.

“**Occupant Load**” means the combined total of the bather load and the dry deck, pool deck, and perimeter deck surrounding the aquatic venue. Occupant load is used to determine the number of toilets, sinks, and diaper changing stations.

“**Oocyst**” means the thick-walled, environmentally resistant structure released in the feces of infected animals that serves to transfer the infectious stages of sporozoan parasites (e.g., *Cryptosporidium*) to new hosts.

“**Oxidation**” means the process of changing the chemical structure of water contaminants by increasing the number of oxygen atoms or reducing the number of electrons of the contaminant, which allows the contaminant to be more readily removed from the water or made more soluble in the water. It is the “chemical cleaning” of pool water. Oxidation can be achieved by common disinfectants (e.g., chlorine, bromine),

secondary disinfection/sanitation systems (e.g. ozone) and oxidizers (e.g. potassium monopersulfate).

“Oxidation-reduction potential” means a measure of the tendency for a solution to either gain or lose electrons; higher (more positive) reduction potential indicates a more oxidative solution.

“Patron” means a bather or other person or occupant at an aquatic facility who may or may not have contact with aquatic venue water either through partial or total immersion. Patrons may not have contact with aquatic venue water, but could still be exposed to potential contamination from the aquatic facility air, surfaces, or aerosols.

“Peninsula / Wing Wall” means a structural projection into a pool intended to provide separation within the body of water. Wing walls or peninsulas are not considered deck unless they are at least four feet clear in width. Wing walls or peninsulas may be used for lifeguarding depending on size, location and configuration.

“Performance measures/Performance-based design” means an engineering approach to design elements of a facility based on agreed upon performance goals and objectives, engineering analysis and quantitative assessment of alternatives against the design goals and objectives using accepted engineering tools, methodologies, and performance criteria. It is different from the prescriptive approach, which identifies specific requirements for the design of a facility.

“Perimeter Deck” means the hardscape surface area immediately adjacent to and within 4 feet (1.22 m) of the edge of the swimming pool also known as the “wet deck” area.

“Perimeter Gutter System” means the alternative to skimmers as a method to remove water from the pool’s surface for treatment. The gutter provides a level structure along the pool perimeter versus the intermittent skimmers.

“Plumbing Fixture” means a receptacle, fixture, or device that is connected to a water supply system or discharges to a drainage system or both and may be used for the distribution and use of water; for example: toilets, urinals, showers, and hose bibs. Such receptacles, fixtures, or devices require a supply of water; or discharge liquid waste or liquid-borne solid waste; or require a supply of water and discharge waste to a drainage system.

“pH” means the negative log of the concentration of hydrogen ions. When water ionizes, it produces hydrogen ions (H+) and hydroxide ions (OH-). If there is an excess of hydrogen ions the water is acidic. If there is an excess of hydroxide ions the water is basic. pH ranges from 0 to 14. Pure water has a pH of 7.0. If pH is higher than 7.0, the water is said to be basic, or alkaline. If the water’s pH is lower than 7.0, the water is acidic. As pH is raised, more ionization occurs and chlorine disinfectants decrease in effectiveness.

“**Plunge pool**” means a pool with a depth of greater than 24 inches (61 centimeters), located at the exit end of a waterslide flume and intended and designed to receive a patron emerging from the flume.

“**Pool**” means a subset of aquatic venue designed to have impounded/standing water for total or partial bather immersion.

“**Pool Deck**” means the hardscape surface areas beyond the perimeter deck within the aquatic facility enclosure, which is regularly trafficked and made wet by bathers.

“**Pool Slide**” means an attraction having a configuration as defined in The Code of Federal Regulations (CFR) Ch. II, Title 16 Part 1207, or is similar in construction to a playground slide used to allow users to slide from an elevated height to a pool. They shall include children’s (tot) slides, pool slides, and all other non- flume slides that are mounted on the pool deck or within the basin of a public swimming pool. Pool slides have a flow rate of less than 100 GPM, and do not exceed 10 feet in height.

“**Portable Vacuum System**” means a modular vacuum system normally consisting of a dolly-mounted pump, filter, and power cord.

“**Public Water Supply or System**” means water systems including community water systems, non-transient/non-community water systems, or transient non-community water systems with exceptions as noted by AHJ.

“**Purge**” means to bring in outdoor air at the same rate required for maximum occupancy until the one complete air exchange of the indoor aquatic facility has been achieved.

“**Qualified Lifeguard**” means an individual who has successfully completed an AHJ-recognized lifeguard training course offered by an AHJ-recognized training agency, holds a current certificate for such training, has met the pre-service requirements, and is participating in continuing in-service training requirements of the aquatic facility.

“**Qualified Lifeguard Supervisor**” means an individual that is responsible for the oversight of lifeguard performance and emergency response at an aquatic facility. A qualified lifeguard supervisor is an individual who has successfully completed a lifeguard supervisor training course and holds an unexpired certificate for such training; and who has met the pre-service and continuing in-service requirements of the aquatic facility according to this code.

“**Qualified Operator**” means an individual who has successfully completed an AHJ-recognized operator training course offered by an AHJ-recognized training agency and holds a current certificate for such training.

“**Qualified Person**” means a person who has the proper and/or necessary skills, training, or credentials to carry out the tasks associated with a particular function.

“**Recessed Steps**” means a way of ingress/egress for a pool similar to a ladder but the individual treads are recessed into the pool wall.

“**Recirculation System**” means the combination of the main drain, gutter or skimmer, inlets, piping, pumps, controls, surge tank or balance tank to provide pool water recirculation to and from the pool and the treatment systems.

“**Reduction Equivalent Dose (RED) bias**” means a variable used in UV system validation to account for differences in UV sensitivity between the UV system challenge microbe (e.g., MS2 virus) and the actual microbe to be inactivated (e.g, *Cryptosporidium*).

“**Re-entrainment**” means a situation where the exhaust(s) from a ventilated source such as an indoor aquatic facility is located too close to the air handling system intake(s), which allows the exhausted air to be re-captured by the air handling system so it is transported directly back into the aquatic facility.

“**Responsible Supervisor**” means an individual responsible for water treatment operations when a “qualified operator” is not on-site at an aquatic facility.

“**Rinse Shower**” means a shower typically located in the pool deck area with ambient temperature water. The main purpose is to remove dirt, sand, or organic material prior to entering the aquatic venue to reduce the formation of disinfection by-products.

“**Run-out**” means that part of a waterslide where riders are intended to decelerate and/or come to a stop. The run-out is a continuation of the waterslide flume surface.

“**Run-out slide**” means a water slide where the rider does not exit into a plunge pool, but has a deceleration area that permits the patron to stop before exiting the slide flume.

“**Safety**” (as it relates to construction items) means a design standard intended to prevent inadvertent or hazardous operation or use (i.e., a passive engineering strategy).

“**Safety Plan**” means a written document that has procedures, requirements and/or standards for pre-service employees, communications, safety team members, in-service training, staffing, rescue skill competency, lifeguard rotation procedures, lifeguard management, emergency action plan, incident follow up, bloodborne pathogen exposure control, emergency closure, and single lifeguard situations(if applicable).

“**Safety Team**” means any employee of the aquatic facility that has job responsibilities related to the aquatic facility’s emergency action plan.

“**Sanitize**” means reducing the level of microbes to that considered safe by public health standards. This may be achieved through a variety of chemical or physical means including chemical treatment, cleaning or drying.

“**Saturation Index**” means a mathematical representation or scale representing the ability of water to deposit calcium carbonate, or dissolve metal, concrete or grout.

“**Secondary disinfection systems**” means those disinfection processes or systems which are required to be used for “increased risk aquatic venues” to meet the minimum standards of this code and are in addition to the requirements of Section 5.0 of this code.

“**Secure Perimeter**” means any combination of building envelopes, site walls, or fencing to prevent entry by unauthorized persons.

“**Skimmer**” means a device installed in the pool wall whose purpose is to remove floating debris and surface water to the filter. They shall include a weir to allow for the automatic adjustment to small changes in water level, maintaining skimming of the surface water.

“**Skimmer Pool**” means a pool using a skimmer system.

“**Skimmer System**” means periodic locations along the top of the pool wall for removal of water from the pool’s surface for treatment.

“**Spa**” means a permanent structure intended for either warm or cold water where prolonged exposure is not intended. Spa structures are intended to be used for bathing or other recreational uses and are not usually drained and refilled after each use. It may include, but is not limited to, hydrotherapy, air induction bubbles, and recirculation.

“**Standard**” means something established by authority, custom, or general consent as a model or example.

“**Storage**” means the condition of remaining in one space for one hour or more. Materials in a closed pipe or tube awaiting transfer to another location shall not be considered to be stored.

“**Structural Crack**” means a break or split in the pool surface that weakens the structural integrity of the vessel.

“**Substantial Alteration**” means the alteration, modification, or renovation of an aquatic venue (for outdoor aquatic facilities) or indoor aquatic facility (for indoor aquatic facilities) where the total cost of the work exceeds 50% of the replacement cost of the aquatic venue (for outdoor aquatic facilities) or indoor aquatic facility (for indoor aquatic facilities).

“**Superchlorination**” means the addition of large quantities of chlorine-based chemicals to kill algae, destroy odors, or improve the ability to maintain a disinfectant residual.

“Supplemental treatment systems” means those disinfection processes or systems which are optional and not required on an aquatic venue for health and safety reasons. They may be used to enhance overall system performance and improve water quality.

“Therapy Pool” means a pool used exclusively for aquatic therapy, physical therapy, and/or rehabilitation to treat a diagnosed injury, illness, or medical condition, wherein the therapy is provided under the direct supervision of a licensed physical therapist, occupational therapist, or athletic trainer. This could include wound patients or immunocompromised patients whose health could be impacted if there is not additional water quality protection.

“Trichloramine” means a disinfection by-product formed when chlorine binds to nitrogenous waste in pool water to form an amine-containing compound with three chlorine atoms (NCl_3). It is a known acute respiratory and ocular irritant. It has low solubility in water and is rapidly released into the air above pools where it can accumulate, particularly in indoor settings.

“Trihalomethanes or THM” means chemical compounds in which three of the four hydrogen atoms of methane (CH_4) are replaced by halogen atoms. THMs are also environmental pollutants, and many are considered carcinogenic.

“Turnover” or “Turnover Rate” means the period of time, usually expressed in hours, required to circulate a volume of water equal to the capacity of the pool, spa, or other water feature.

“Underwater Bench” means a submerged seat with or without hydrotherapy jets.

“Underwater Ledge” or “toe ledge” means a continuous step in the pool wall that allows swimmers to rest by standing without treading water.

“Underwater Shelf” means a shallow area less than two feet in water depth that is primarily intended for lounging and sunbathing.

“UV Transmissivity” means the percentage measurement of ultraviolet light able to pass through a solution.

“Vertical Use Water” means an aquatic venue with mechanical means (aquatic features) to discharge, spray, or move the water's surface above and/or below the static water line of the aquatic venue so people are standing or playing vertically. Where there is no static water line, movement shall be considered above the deck plane.

“Wading Pool” means any pool used exclusively for wading and intended for use by children where the depth does not exceed 2 feet (0.6 m).

“Water Slide” means an attraction having a configuration that enables users to slide from an elevated height to a pool. A water slide must consist of one or more flumes,

landing areas, catch pools or slide run-outs, and facilities for the disinfection and chemical treatment of the water.

“Water Replenishment System” means a way to remove water from the pool as needed and replace with make-up water shall be provided to maintain water quality.

“Water Quality Testing Device” means a product designed to measure the level of a parameter in water. A WQTD includes a device or method to provide a visual indication of a parameter level, and may include one or more reagents and accessory items.

“Wave Pools” means any pool designed to simulate breaking or cyclic waves for purposes of general play or surfing.

“Wing Wall / Peninsula” means a structural projection into a pool intended to provide separation within the body of water. Wing walls or peninsulas are not considered deck unless they are at least four feet clear in width. Wing walls or peninsulas may be used for lifeguarding depending on size, location and configuration.

“Zero Depth Entry” means a sloped entry into a pool that is 5'-0" in width or wider.

DRAFT

4.0 Design and Construction

4.1 Plan Submittal

4.1.1 Plan Submittal

REG

4.1.1.1 Purpose

REG

AQUATIC FACILITY construction plans shall be designed to provide sufficient clarity to indicate the location, nature, and extent of the work proposed

4.1.1.2 Conform

REG

AQUATIC FACILITY construction plans shall show in detail that it will conform to the provisions of this CODE and relevant laws, ordinances, rules and regulations, as determined by the AHJ and to protect the health and SAFETY of the facility's BATHERS and PATRONS.

4.1.1.3 Approved Plans

REG

No person shall begin to construct a new AQUATIC FACILITY or shall SUBSTANTIALLY ALTER an existing AQUATIC FACILITY without first having the construction plans detailing the construction or SUBSTANTIAL ALTERATION submitted to and approved by the AHJ.

4.1.1.4 Plan Preparation

REG

All plans shall be prepared by a design professional who is registered or licensed to practice their respective design profession as defined by the state or local laws governing professional practice within the jurisdiction in which the project is to be constructed.

4.1.1.5 Required Statements

REG

All construction plans shall include the following statements:

- 1) "The proposed AQUATIC FACILITY and all equipment shall be constructed and installed in conformity with the approved plans and specifications or approved amendments," and
- 2) "No SUBSTANTIAL ALTERATION, changes, additions, or equipment not specified in the approved plans or allowed in the CODE can be made or added until the plans for such SUBSTANTIAL ALTERATION, changes, additions, or equipment are submitted to and approved by the AHJ."

4.1.2 Content of Design Report

4.1.2.1 Basis of Design Report

REG

4.1.2.1.1 Names / Addresses

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AQUATIC FACILITY plans shall include the name, address, and contact information for the owner, designer, and builder if available at the time of submission.

"This information is distributed solely for the purpose of pre-dissemination public comment under applicable information quality guidelines. It has not been formally disseminated by the Centers for Disease Control and Prevention. It does not represent and should not be construed to represent any agency determination or policy."

4.1.2.1.2 Site Information**REG**

AQUATIC FACILITY plans shall include site information indicating at a minimum the location of all utilities, wells, topography, natural water features, and potential sources of surface drainage and pollution which may affect the proposed AQUATIC FACILITY.

4.1.2.1.3 Plot Plan**REG**

AQUATIC FACILITY plans shall include a site plot plan including:

- 1) A general map and detailed scaled drawings of the AQUATIC FACILITY site plan or floor plan with detailed locations of the AQUATIC VENUES and AQUATIC FEATURES; and
- 2) The locations of all water supply facilities, sources of drinking water, public or private sewers, and relative elevations of paved or other walkways and the EQUIPMENT ROOM floor shall be shown on the plans with the elevations of storm and sanitary sewer inverts and street grade.

4.1.2.2 Plans and Specifications**REG****4.1.2.2.1 Drawings****REG**

Detailed scaled and dimensional drawings for each individual AQUATIC VENUE shall include an AQUATIC VENUE area plan and layout plan along with dimensioned longitudinal and transverse cross sections of the AQUATIC VENUE.

4.1.2.2.2 Venue Attributes**REG**

Detailed scaled and dimensional drawings for each individual AQUATIC VENUE shall include location and type of:

- 1) INLETS,
- 2) Overflows,
- 3) Drains,
- 4) Suction outlets,
- 5) Overflow gutters or devices,
- 6) Piping,
- 7) Designed POOL water elevation,
- 8) AQUATIC FEATURES such as ladders, stairs, diving boards, slides, and play features, and
- 9) Lighting.

4.1.2.2.3 Area Design**REG**

Detailed scaled and dimensional drawings of the AQUATIC FACILITY and for each individual AQUATIC VENUE, as appropriate, shall include location and type of:

- 1) Design of DECK, curb, or walls enclosing the AQUATIC VENUE,
- 2) DECK drains,

- 3) Paved walkways and other hardscape features,
- 4) Non-slip flooring,
- 5) AQUATIC VENUE area finishes,
- 6) Drinking fountains or other sources of drinking water,
- 7) Entries and exits,
- 8) Hose bibs,
- 9) Fences,
- 10) Telephones, and
- 11) Area lighting.

4.1.2.2.4 Venue Recirculation and Treatment Design REG

Detailed scaled and dimensional drawings for each individual AQUATIC VENUE shall contain a flow diagram showing the location, plan, elevation, and isometrics of:

- 1) Filters,
- 2) Pumps,
- 3) Chemical feeders,
- 4) Ventilation devices or AIR HANDLING SYSTEMS,
- 5) Heaters,
- 6) Surge tanks, including operating levels,
- 7) BACKFLOW prevention assemblies and air gaps,
- 8) Valves,
- 9) Piping,
- 10) Flow meters,
- 11) Gauges,
- 12) Thermometers,
- 13) Test cocks,
- 14) Sight glasses, and
- 15) Drainage system for the disposal of AQUATIC VENUE water and filter wastewater.

4.1.2.2.5 Equipment Room Design REG

Detailed scaled and dimensional drawings for each individual AQUATIC VENUE shall contain a schematic layout of the AQUATIC VENUE EQUIPMENT ROOM (or equipment area if permitted by the local AHJ) showing accessibility for installation and maintenance.

4.1.2.2.6 Chemical Storage Area Design REG

Detailed scaled and dimensional drawings for each individual AQUATIC VENUE shall contain a schematic layout of the aquatic CHEMICAL STORAGE AREA(S).

4.1.2.2.7 Hygiene Facility Design REG

Detailed scaled and dimensional drawings for each AQUATIC FACILITY shall show the location and number of all available HYGIENE FACILITIES provided including dressing rooms, lockers and basket STORAGE, showers, lavatory, toilet fixtures, and DIAPER-CHANGING STATIONS.

4.1.2.3 Technical Specifications **REG****4.1.2.3.1 Accompany Drawings** **REG**

Technical specifications for the construction of each AQUATIC VENUE and all appurtenances shall accompany the drawings for the AQUATIC FACILITY plans.

4.1.2.3.2 Technical Details **REG**

The technical specifications for each AQUATIC FACILITY and each AQUATIC VENUE shall include all construction details not shown on the plans that relate to the AQUATIC FACILITY.

4.1.2.3.3 Water Sources **REG**

The technical specifications for each AQUATIC FACILITY shall include the sources of all water supplies.

4.1.2.3.4 Area and Volume **REG**

Technical specifications shall include the water surface area and volume of each AQUATIC VENUE and associated water features, if applicable.

4.1.2.3.5 Bather Load **REG**

The technical specifications for each AQUATIC FACILITY and each AQUATIC VENUE shall include anticipated maximum BATHER LOAD, respectively.

4.1.2.3.5.1 Bather Load Calculation

The BATHER LOAD shall be calculated by dividing the surface area in ft² of the AQUATIC VENUE by the density factor (D) that fits the specific AQUATIC VENUE being considered.

- $BATHER\ LOAD = AQUATIC\ VENUE\ surface\ area / D$

The density factors are:

- 1) HORIZONTAL USE WATER
 - a. Density factor = 20 ft² per person.
- 2) VERTICAL USE WATER
 - a. Density factor = 15 ft² per person.
- 3) HOT WATER
 - a. Density factor = 10 ft² per person.

4.1.2.3.6 Equipment Characteristics and Rating **REG**

The technical specifications and supplemental engineering data for each AQUATIC FACILITY and each AQUATIC VENUE shall include:

- 1) Detailed information on the type, size, operating characteristics, and rating of all mechanical and electrical equipment;

- 2) Hydraulic computations for head loss in all piping and recirculation equipment; and
- 3) Pump curves that demonstrate that the selected recirculation pump(s) are adequate for the calculated required flows.

4.1.2.3.7 Recirculation Rate and Turnover **REG**

The technical specifications for each AQUATIC VENUE shall include the recirculation rate and TURNOVER time.

4.1.2.3.8 Filter Media **REG**

The technical specifications for each AQUATIC VENUE shall include information on the filter media such as diatomaceous earth, sand, gravel or other approved material.

4.1.2.3.9 Equipment Specifications **REG**

The technical specifications for each AQUATIC VENUE shall include information on each piece of equipment associated with that venue.

4.1.2.3.10 Safety Equipment Specifications **REG**

The technical specifications for each AQUATIC FACILITY shall include information on all aquatic SAFETY equipment.

4.1.2.3.11 Other Specifications **REG**

The technical specifications for each AQUATIC FACILITY and each AQUATIC VENUE shall include additional information related to the project requested by the AHJ for the purposes of the construction of the AQUATIC FACILITY and each AQUATIC VENUE and all appurtenances.

4.1.3 Plan Approval **REG**

4.1.3.1 New Construction **REG**

4.1.3.1.1 Approval Limitations **REG**

The AHJ shall clearly state on the plans the limitations of their approval.

4.1.3.1.2 Plan Review Training **REG**

The AHJ staff shall be adequately trained to conduct plan reviews.

4.1.3.1.3 Owner Responsibility **REG**

The owner shall have final responsibility for the accuracy and completeness of the plans and specifications, as well as for subsequent construction and installation.

4.1.3.1.4 Other Approvals **REG**

The approval shall also state that it is independent of all other required approvals such as Building, Zoning, Fire, Electrical, Structural and any other approvals as required by

local or state law or CODE and the applicant must separately obtain all other required approvals and permits.

4.1.3.1.5 Plan Review Coordination REG

The AHJ shall coordinate their AQUATIC FACILITY plan review and communicate their approval with other agencies involved in the AQUATIC FACILITY construction.

4.1.3.1.6 Plan Review Report REG

The AHJ shall provide a plan submission compliance review list to the AQUATIC FACILITY owner with the following information:

- 1) Categorical items marked satisfactory, unsatisfactory, not applicable, or insufficient information;
- 2) A comment section keyed to the compliance review list shall detail unsatisfactory and insufficient;
- 3) Indication of the AHJ approval or disapproval of the AQUATIC FACILITY construction plans;
- 4) In the case of a disapproval, specific reasons for disapproval and procedure for resubmittal; and
- 5) Reviewer's name, signature and date of review.

4.1.3.1.7 Plans Maintained REG

The AQUATIC FACILITY owner shall maintain at least one set of their own approved plans made available to AHJ on-site for as long as the AQUATIC FACILITY is in operation.

4.1.3.2 Non-Substantial Alterations REG

4.1.3.2.1 Alteration Review REG

The AQUATIC FACILITY owner planning a non-SUBSTANTIAL ALTERATION shall contact the AHJ to review proposed changes prior to starting the non-SUBSTANTIAL ALTERATION.

4.1.3.2.2 Alteration Scope REG

The AQUATIC FACILITY operator shall consult with the AHJ to determine if new or modified plans must be submitted for plan review and approval for other non-SUBSTANTIAL ALTERATIONS proposed.

4.1.3.2.3 Plan Review Fee REG

A plan review fee shall be paid if new or modified plans are required.

4.1.3.2.3.1 Established REG

The fees for the review of plans and associated construction inspections shall be established by the AHJ.

4.1.3.3 Replacements REG

4.1.3.3.1 Replacement Equipment Equivalency REG

The replacement of pumps, filters, feeders, controllers, SKIMMERS, flow-meters, valves, or other similar equipment with identical or substantially similar equipment may be done without submission of new or altered AQUATIC FACILITY plans.

4.1.3.3.2 Replacement Approval **REG**

The AQUATIC FACILITY owner shall submit to the AHJ the replacement equipment technical specification that verifies the proposed replacement equipment's equivalency to the originally approved and installed equipment prior to equipment's replacement.

4.1.3.3.3 Emergency Replacement **REG**

In emergencies, the replacement may be made prior to receiving the AHJ's approval, with the owner accepting responsibility for proper immediate replacement, if the equipment is not deemed equivalent by the AHJ.

4.1.3.3.3.1 Documentation **REG**

The owner shall submit documentation of the replacement to the AHJ for formal approval within 45 days of installation for review and approval.

4.1.3.3.4 Replacement Record Maintenance **REG**

The AHJ shall provide the AQUATIC FACILITY owner written approval or disapproval of the proposed replacement equipment's equivalency.

4.1.3.3.5 Documentation **REG**

Documentation of proposed, approved, and disapproved replacements shall be maintained in the AHJ's AQUATIC FACILITY files.

4.1.4 Compliance Certificate **REG**

4.1.4.1 Construction Compliance Certificate **REG**

A certificate of construction compliance shall be submitted to the regulatory authority for all AQUATIC FACILITY plans for new construction and SUBSTANTIAL ALTERATIONS requiring AHJ approvals.

4.1.4.2 Certificate Preparation **REG**

This certificate shall be prepared by a licensed professional and be within the scope of their practice as defined by the state or local laws governing professional practice within the jurisdiction of the permit issuing official.

4.1.4.3 Certificate Statement **REG**

The certificate shall also include a statement that the AQUATIC FACILITY, all equipment, and appurtenances have been constructed in accordance with approved plans and specifications.

4.1.4.4	Systems Commissioning	REG
<p>Commissioning or testing reports for systems such as AQUATIC FACILITY lighting, air handling, recirculation, filtration, DISINFECTION, and BATHER SAFETY shall be included in furnished documentation.</p>		
4.1.4.5	Maintenance	REG
<p>Documentation of AQUATIC FACILITY new construction or SUBSTANTIAL ALTERATION plan compliance shall be maintained in the AHJ's AQUATIC FACILITY files.</p>		
4.1.5	Construction Permits	REG
4.1.5.1	Building Permit for Construction	REG
<p>Construction permits required in this CODE and all other applicable permits shall be obtained before any AQUATIC FACILITY may be constructed.</p>		
4.1.5.2	Remodeling Building Permit	REG
<p>A construction permit or other applicable permits may be required from the appropriate regulatory authority before remodeling of an AQUATIC FACILITY.</p>		
4.1.5.3	Permit Issuance	REG
<p>After receiving a certificate of completion from the design professional verifying information submitted and when new construction, SUBSTANTIAL ALTERATIONS, or annual renewal requirements of this CODE have been met, the AHJ shall issue a permit to the owner to operate the AQUATIC FACILITY.</p>		
4.1.5.4	Permit Denial	REG
<p>The permit (license) to operate may be withheld, revoked or denied by the AHJ for noncompliance of the AQUATIC FACILITY with the requirements of this CODE, and the owner will be provided:</p> <ol style="list-style-type: none">1) Specific reasons for disapproval and procedure for resubmittal;2) Notice of the rights to appeal this denial and procedures for requesting an appeal; and3) Reviewer's name, signature and date of review and denial.		
4.1.5.5	Documentation	REG
<p>Documentation of AQUATIC FACILITY permit renewal or denial shall be maintained in the AHJ's AQUATIC FACILITY files.</p>		

4.2 Materials

4.2.1 Pools

D&C

4.2.1.1 Construction Material

D&C

AQUATIC VENUES shall be constructed of reinforced concrete or impervious and structurally sound material(s), which provide a smooth, easily cleaned, watertight structure capable of withstanding the anticipated stresses/loads for full and empty conditions as required by applicable CODES.

4.2.1.2 Durability

D&C

All materials shall be inert, non-toxic, and resistant to corrosion, impervious, enduring, and resistant to damages related to environmental conditions of the installation region (such as freezing).

4.2.1.2.1 Darker Colors

D&C

The AHJ may grant a variance to the requirements of this CODE.

4.2.1.2.2 Competitive pools

D&C

Competitive or lap POOLS may have lane markings and end wall targets installed in accordance with FINA, NCAA, USA Swimming, NFSHSA, or other recognized STANDARD.

4.2.1.2.3 Design Parameters

D&C

Any graphics, color, or finish incorporated into the construction of a POOL or painted on the floor or walls must not prevent the detection of a BATHER in distress, algae, sediment, or other objects in the AQUATIC VENUE.

4.2.1.2.3.1 Permission in Writing

D&C

Permission in writing from the AHJ for the use of graphics shall be obtained before the graphics are used.

4.2.1.3 Watertight

D&C

POOLS shall be designed in such a way to maintain their ability to retain the designed amount of water.

4.2.1.4 Smooth Finish

D&C

All vertical walls shall have a durable finish suitable for regular scrubbing and cleaning at the waterline.

4.2.1.4.1 Daily Cleaning

D&C

The finish shall be able to withstand daily brushing, scrubbing, and cleaning of the surface in accordance with the professional society or manufacturer's recommendations.

4.2.1.4.2 Skimmer Pools D&C

SKIMMER POOLS shall have a 6 inch (150 mm) to 12 inch (300 mm) high waterline finish that meets the requirements of MAHC Section 4.2.1.4 and 4.2.1.4.1.

4.2.1.4.3 Gutter / Perimeter Overflow Systems D&C

Gutter or perimeter overflow systems shall have a minimum finish height of 2 inches (50 mm) that meets the requirements of MAHC Section 4.2.1.4 and 4.2.1.4.1.

4.2.1.4.4 Dark Colors D&C

If dark colors are utilized for the POOL finish, these colors shall not exceed a maximum height of 12 inches (300 mm) below the waterline.

4.2.1.5 Slip Resistant D&C

POOL floors in areas less than 3 feet (0.9 m) deep shall have a slip resistant finish with an acceptable coefficient of friction.

4.2.1.6 Vinyl or PVC pools D&C

Vinyl, PVC-P, or PVC panel and liner POOL finish systems shall be acceptable provided that the system is installed on top of approved materials and design requirements as listed within this section or approved by the AHJ.

4.2.1.6.1 Damaged D&C

If at any time the liner system is damaged or cut in such a way that its integrity is compromised, the POOL shall be shut down until the system is fully repaired.

4.2.1.7 Not Permitted D&C

Wood, sand, or earth shall not be permitted as an interior finish.

4.2.2 Natatorium D&C

4.2.2.1 Interior Finish D&C

4.2.2.1.1 Relative Humidity D&C

The interior finish of a NATATORIUM shall be suitable for indoor relative humidity as high as 80%.

4.2.2.2 Condensation Prevention D&C

4.2.2.2.1 Cold Weather D&C

NATATORIUM building envelope construction shall include a vapor-retarder/insulation arrangement to assist in preventing the condensation of water on inside building surfaces under the coldest outdoor conditions based on the ASHRAE climate data for the project locale or nearest reporting city and the highest design indoor relative humidity.

4.2.2.2.2 **Paint or Coating** **D&C**

Where a paint or coating serves as the vapor retarder of a NATATORIUM, the paint or coating shall be applied so as to produce a permeability rating of 0.2 U.S. perm (11.4 ng·s⁻¹·m⁻²·Pa⁻¹) or less.

4.2.2.2.2.1 **Application** **D&C**

The paint or coating shall be applied according to the manufacturer's recommendations for use as a vapor retarder.

4.2.2.2.3 **Perforated interior-finish material** **D&C**

Where a perforated interior-finish material is used in a NATATORIUM, as for acoustic effects, the perforated material shall not be considered to be a vapor retarder unless it has a listed permeability rating less than 0.2 U.S. perm (11.4 ng·s⁻¹·m⁻²·Pa⁻¹).

4.2.2.3 **Mechanical Systems** **D&C**

4.2.2.3.1 **Equipment Rooms** **D&C**

For EQUIPMENT ROOMS, see MAHC section 4.9.1.

4.2.2.3.2 **Chemical Storage** **D&C**

For CHEMICAL STORAGE SPACES, see MAHC section 4.9.2.

4.2.2.3.3 **Natorium Air Pressure** **D&C**

AQUATIC FACILITY AIR HANDLING SYSTEM design, construction, and installation shall comply with the ASHRAE STANDARD 62.1, Ventilation for Acceptable Indoor Air Quality, and/or applicable local CODES with additional requirements as stated in section MAHC 4.6.2.

4.2.2.3.3.1 **Chemical Storage Air Pressure** **D&C**

VENTILATION SYSTEM design for chemical STORAGE rooms shall conform to the International Mechanical CODE or Uniform Mechanical CODE, and either the International Fire CODE or the Uniform Fire CODE, and any applicable local CODES.

4.2.2.3.4 **Air Ducts** **D&C**

Where air ducts are required to be insulated on the inside, the insulation shall be rated moisture and mold resistant.

4.2.2.3.5 **Filters** **D&C**

Filters for outdoor-air intake shall be rated moisture-resistant.

4.2.2.4 **Natorium Doors** **D&C**

4.2.2.4.1 **Corrosion-Resistant** **D&C**

NATATORIUM doors shall either be constructed of corrosion-resistant materials or have a covering or coating to withstand humid and CORROSIVE environments which is acceptable to the AHJ.

4.2.2.4.2 Uncontrolled Condensation D&C

NATATORIUM doors which may be exposed to temperatures below NATATORIUM-air dew point shall have thermal breaks, insulation, and/or glazing as necessary to minimize the risk of uncontrolled condensation.

4.2.2.4.2.1 Heating Systems D&C

Exception 1: Other doors shall be acceptable, subject to approval by the AHJ, where heating systems are so arranged as to maintain such doors above the maximum design dew point of the NATATORIUM air.

4.2.2.4.3 Biological Contaminants D&C

NATATORIUM doors and door-frame construction shall not contribute to the growth of biological CONTAMINANTS.

4.2.2.4.4 Air Leakage D&C

NATATORIUM doors and/or door frames shall be equipped with seals and/or gaskets to minimize air leakage when the door is closed.

4.2.2.4.5 Automatic Door Closer D&C

All pedestrian doors around the NATATORIUM perimeter shall be equipped with an automatic door closer capable of closing the door completely without human assistance.

4.2.2.4.5.1 Difference in Air Pressure D&C

Door closers must be able to close the door against the specified difference in air pressure between NATATORIUMS and other INTERIOR SPACES.

4.2.2.5 Natatorium Windows D&C

4.2.2.5.1 Frames D&C

NATATORIUM window frames shall be constructed of suitable materials or shall have a suitable covering or coating to withstand the expected atmosphere.

4.2.2.5.2 Biological Contaminants D&C

NATATORIUM window frames shall be constructed of materials that do not contribute to the growth of biological CONTAMINANTS.

4.2.2.5.3 Thermal Breaks D&C

NATATORIUM window frames shall have thermal breaks or be otherwise constructed to minimize the risk of uncontrolled condensation.

4.2.2.6 Natatorium Electrical Systems D&C

Refer to MAHC Section 4.6.2

4.3 Equipment Standards

4.3.1 General

D&C

4.3.1.1 Accredited Standards Facility

D&C

Where applicable, all equipment used or proposed for use in AQUATIC FACILITIES governed under this CODE shall be of a proven design and construction and shall be listed by NSF International, Underwriters Laboratories or another ANSI-accredited certification organization.

4.3.1.2 No Standards

D&C

Where STANDARDS do not exist, the design professional shall establish that adequate testing has been performed to establish suitability for use in AQUATIC FACILITIES.

4.3.2 Recirculation Systems and Equipment

D&C

4.3.2.1 ANSI-Accredited Testing

D&C

Where applicable, all equipment used or proposed to use in AQUATIC FACILITIES shall be of proven design and construction and shall be listed by NSF International, Underwriters Laboratories, or another ANSI accredited certification organization, or EPA registration where applicable.

4.3.2.2 Suitable for intent

D&C

RECIRCULATION SYSTEMS and all materials used therein shall be suitable for their intended use and be installed in accordance with this CODE, as certified by an ANSI-Accredited third-party testing and certification organization, and as specified by the manufacturer.

4.4 Aquatic Venue Operation and Facility Maintenance

4.5 Aquatic Venue Structure

4.5.1 Design for Risk Management

LG

Design of AQUATIC FACILITIES and/or AQUATIC VENUE(s) shall include the owner and/or an aquatic risk management consultant to incorporate operational considerations such as the layout of zones of PATRON surveillance.

4.5.1.1 Basic Requirements

D&C

The AQUATIC VENUE shape shall provide for the SAFETY of swimmers, thorough and complete circulation of the water, the ability to clean and maintain the AQUATIC VENUE, and the supervision of PATRONS using the AQUATIC VENUE.

4.5.2 Bottom Slope D&C

4.5.2.1 Parameters and Variance D&C

The bottom slope of a POOL shall be governed by the following parameters, but variances may be granted for special uses and situations so long as public SAFETY and health are not compromised.

4.5.2.2 Under 5 Feet D&C

In water depths under 5 feet (1.52 m), the slope of the floor of all POOLS shall not exceed 1 foot (0.3 m) vertical drop for every 12 feet (3.66 m) horizontal.

4.5.2.3 Over 5 Feet D&C

In water depths 5 foot and greater, the slope of the floors of all POOLS shall not exceed 1 foot (0.3 m) vertical to 3 feet (0.9 m) horizontal, except that POOLS designed and used for competitive diving shall be designed to meet the STANDARDS of the sanctioning organization (such as NFSHSA, NCAA, USA Diving or FINA).

4.5.2.4 Drain D&C

POOLS shall be designed so that they drain without leaving puddles or trapped standing water.

4.5.3 Access Ladders/Recessed Steps/Stairs

4.5.4 Pool Access / Egress D&C

4.5.4.1 Accessibility D&C

Each POOL shall have a minimum of two means of access and egress.

4.5.4.2 Acceptable Means D&C

Acceptable means of access / egress shall include stairs / hand rails, grab rails / RECESSED STEPS, ladders, ramps, swimouts, and zero-depth entries.

4.5.4.3 Large Venues D&C

For POOLS wider than 30' (9.14 m), such means of access / egress shall be provided on each side of the POOL, not more than 75' (22.9 m) apart.

4.5.5 Stairs D&C

4.5.5.1 Slip Resistant D&C

Where stairs are provided, they shall be constructed with slip-resistant materials.

4.5.5.2 Outlined Edges D&C

The leading horizontal and vertical edges of stair treads shall be outlined with slip-resistant contrasting tile or other permanent marking of not less than 1 inch (25 mm) and not greater than 2 inches (50 mm).

4.5.5.3 Deep Water

D&C

Where stairs are provided in POOL water depths greater than 4.0 feet (1.2 m), the lowest tread shall be not less than 4.0 feet (1.2 m) below the DECK elevation.

4.5.5.4 Rectangular Stairs

D&C

Traditional rectangular stairs shall have a minimum uniform horizontal tread depth of 12 inches (0.3 m), and a minimum unobstructed tread width of 24 (0.6 m) inches.

4.5.5.5 Dimensions

D&C

Dimensions of stair treads for other types of stairs shall conform to requirements of Table 4.5.5.6, Figure 4.5.5.6.1, Figure 4.5.5.6.2, and Figure 4.5.5.6.3.

Table 4.5.5.6: Required Dimensions for Stair Treads and Risers **D&C**

Dimensions	T-1 Standard	T-1 Convex, Concave, Triangular	T-2	W-1	H-1
Minimum	14"	21"	12"	24"	6"
Maximum	18"	24"	16"	N/A	12"

Figure 4.5.5.6.1: Stair Treads and Risers **D&C**

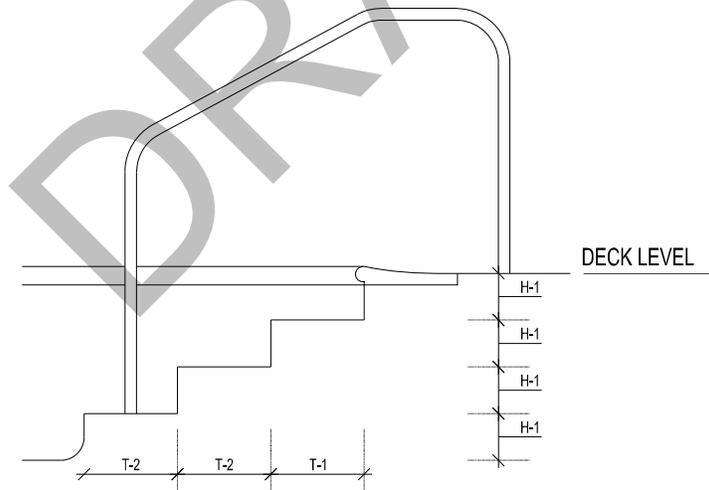


Figure 4.5.5.6.2: Stair Treads **D&C**

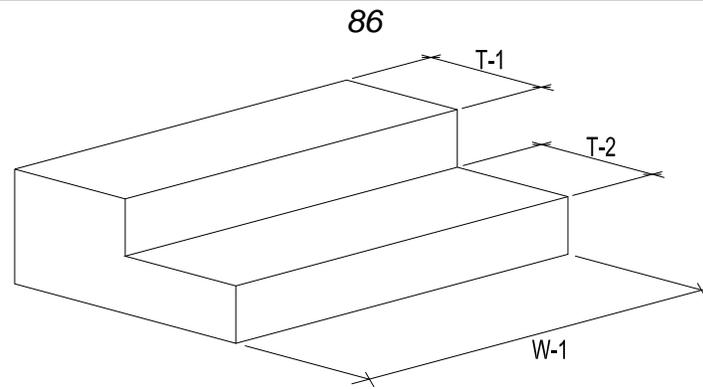
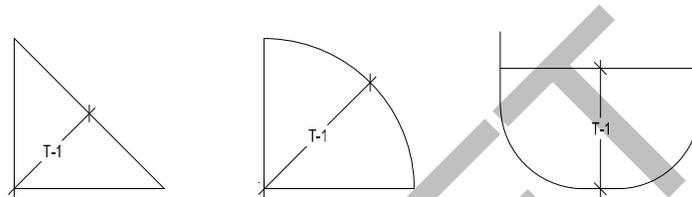


Figure 4.5.5.6.3: Unique Stair Treads

D&C



4.5.5.7 Stair Risers

D&C

Stair risers shall have a minimum uniform height of 6 inches (0.15 m) and a maximum height of 12 inches (0.3 m), with a tolerance of 1/2 inches (13 mm) between adjacent risers.

Note: The bottom riser may vary due to potential cross slopes with the POOL floor; however, the bottom step riser may not exceed the maximum allowable height required by this section.

4.5.5.8 Top Surface

D&C

The top surface of the uppermost stair tread shall be located not more than 12 inches (0.3 m) below the POOL coping or DECK.

4.5.5.9 Perimeter Gutter Systems

D&C

For POOLS with PERIMETER GUTTER SYSTEMS, the gutter may serve as a step, provided that the gutter conforms to all construction and dimensional requirements herein specified.

4.5.6 Handrails

D&C

4.5.6.1 Provided

D&C

Hand rail(s) shall be provided for each set of stairs.

4.5.6.2 Corrosion-resistant D&C

Hand rails shall be constructed of corrosion-resistant materials, and anchored securely.

4.5.6.3 Upper Railing D&C

The upper railing surface of hand rails shall extend above the POOL coping or DECK a minimum of 28 inches (0.7 m).

4.5.6.4 Wider than 5 feet D&C

Stairs wider than 5 feet (1.52 m) shall have at least one additional hand rail for every 12 feet (3.65 m) of stair width.

4.5.6.5 ADA Accessibility D&C

Hand rail outside dimensions intended to serve as a means of ADA accessibility shall conform to requirements of MAHC Section 4.5.6.5.1 and 4.5.6.5.2 (below).

4.5.6.5.1 Support D&C

Hand rails shall be designed to resist a load of 50 pounds (22.7 kg) per linear foot applied in any direction at the top and to transfer this load through the supports to the POOL or DECK structure.

4.5.6.5.2 200 Pound Load D&C

Hand rails shall also be designed to resist a single concentrated load of 200 pounds (90.7 kg) applied in any direction along the top.

4.5.6.5.3 Attachment Devices D&C

Hand rails shall have attachment devices and supporting structure to transfer loads to the POOL or DECK structure.

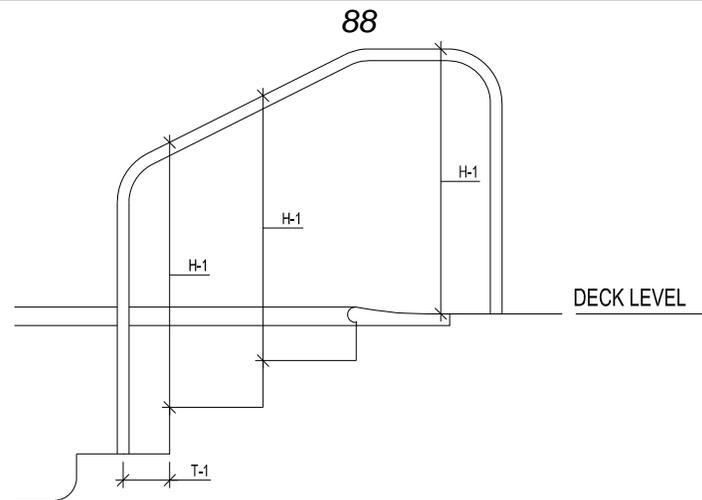
4.5.6.6 Dimensions D&C

Dimensions of hand rails shall conform to requirements of MAHC Table 4.5.6.7 and MAHC Figure 4.5.6.7.1.

Table 4.5.6.7: Stair Hand Rail Dimensions D&C

<i>Dimensions</i>	<i>T-1</i>	<i>H-1</i>
Minimum	3"	27"
Maximum	N/A	36"

Figure 4.5.6.7.1: Stair Hand Rails D&C



4.5.7 Grab Rails

D&C

4.5.7.1 Corrosion- Resistant

D&C

Where grab rails are provided, they shall be constructed of corrosion-resistant materials.

4.5.7.2 Anchored

D&C

Grab rails shall be anchored securely.

4.5.7.3 Provided

D&C

Grab rails shall be provided at both sides of RECESSED STEPS.

4.5.7.4 Clear Space

D&C

The horizontal clear space between grab rails shall be not less than 18 inches (0.46 m) and not more than 24 inches (0.6 m).

4.5.7.5 Upper Railing

D&C

The upper railing surface of grab rails shall extend above the POOL coping or DECK a minimum of 28 inches (0.7 m).

4.5.7.6 50 pounds

D&C

Grab rails shall be designed to resist a load of 50 pounds (22.7 kg) per linear foot applied in any direction at the top.

4.5.7.7 Transfer load

D&C

Grab rails shall be designed to transfer this load through the supports to the POOL or DECK structure.

4.5.7.8 200 Pounds

D&C

Grab rails shall also be designed to resist a single concentrated load of 200 pounds (90.7 kg) applied in any direction along the top.

4.5.7.9 Attachment Devices**D&C**

Grab rails shall have attachment devices and supporting structure to transfer this load to the POOL or DECK structure.

4.5.8 Recessed Steps**D&C****4.5.8.1 Slip-Resistant****D&C**

RECESSED STEPS shall be slip-resistant.

4.5.8.2 Easily Cleaned**D&C**

RECESSED STEPS shall be designed to be easily cleaned.

4.5.8.3 Drain**D&C**

RECESSED STEPS shall drain into the POOL.

4.5.8.4 Dimensions**D&C**

Dimensions of RECESSED STEPS shall conform to requirements of Table 4.5.8.5, Figure 4.5.8.5.1, and Figure 4.5.8.5.2.

Table 4.5.8.5: Recessed Step Dimensions**D&C**

<i>Dimensions</i>	<i>H-1</i>	<i>H-2</i>	<i>W-1</i>	<i>D-1</i>
Minimum	6"	5"	12"	5"
Maximum	12"	N/A	N/A	N/A

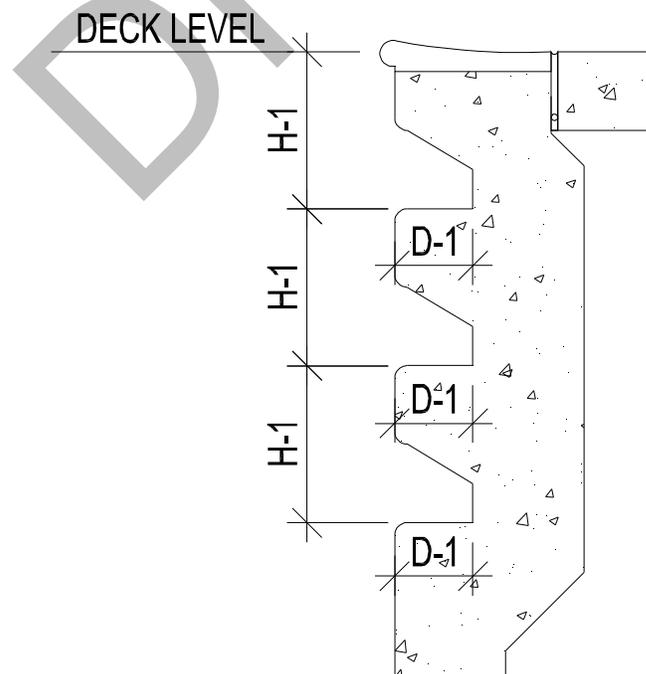
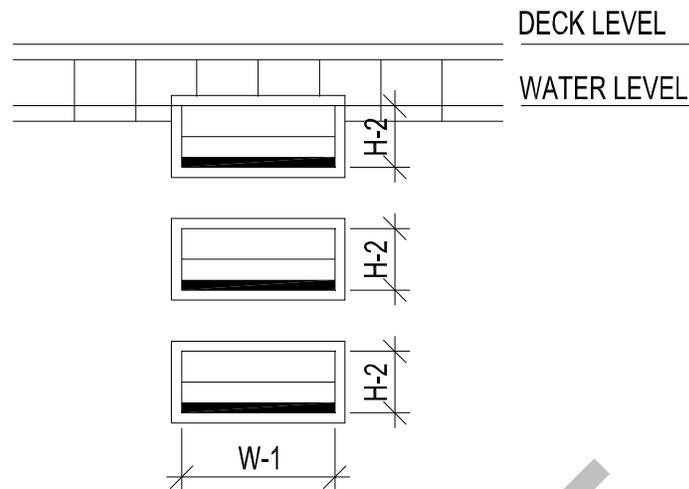
Figure 4.5.8.5.1: Recessed Step Dimensions**D&C**

Figure 4.5.8.5.2: Recessed Step Dimensions

D&C

**4.5.8.6 Uniformly Spaced**

D&C

RECESSED STEPS shall be uniformly spaced not less than 6 inches (0.15 m) and not more than 12 inches (0.3 m) vertically along the POOL wall.

4.5.8.7 Uppermost Step

D&C

The top surface of the uppermost RECESSED STEP shall be located not more than 12 inches (0.3 m) below the POOL coping or DECK.

4.5.8.8 Perimeter Gutter Systems

D&C

For POOLS with PERIMETER GUTTER SYSTEMS, the gutter may serve as a step, provided that the gutter is provided with a grating or cover and conforms to all construction and dimensional requirements herein specified.

4.5.9 Ladders

D&C

4.5.9.1 General Guidelines for Ladders

D&C

4.5.9.1.1 Corrosion-Resistant

D&C

Where ladders are provided, they shall be constructed of corrosion-resistant materials.

4.5.9.1.2 Anchored

D&C

Ladders shall be anchored securely to the DECK.

4.5.9.2 Ladder Hand Rails

D&C

4.5.9.2.1 Two

D&C

Ladders shall have two hand rails.

4.5.9.2.2 Clear Space

D&C

The horizontal clear space between hand rails shall be not less than 17 inches (0.43 m) and not more than 24 inches (0.6 m).

4.5.9.2.3 Upper Railing D&C

The upper railing surface of hand rails shall extend above the POOL coping or DECK a minimum of 28 inches (0.7 m).

4.5.9.2.4 Pool Wall D&C

The clear space between hand rails and the POOL wall shall be not less than 3 inches (76 mm) and not more than 6 inches (152 mm).

4.5.9.2.5 Resist Load D&C

Ladders shall be designed to resist a load of 50 pounds (22.7 kg) per linear foot applied in any direction at the top.

4.5.9.2.6 Transfer D&C

Ladders shall be designed to transfer this load through the supports to the POOL or DECK structure.

4.5.9.2.7 Concentrated Load D&C

Ladders shall also be designed to resist a single concentrated load of 200 pounds (90.7 kg) applied in any direction along the top.

4.5.9.2.8 Support D&C

Ladders shall have attachment devices and supporting structure to transfer this load to the POOL or DECK structure.

4.5.9.3 Ladder Treads D&C

4.5.9.3.1 Slip Resistant D&C

Ladder treads shall be slip-resistant.

4.5.9.3.2 Tread Depth D&C

Ladder treads shall have a minimum horizontal tread depth of 1.5 inches (38 mm) and the distance between the horizontal tread and the POOL wall shall not be greater than 4 inches (100 mm).

4.5.9.3.3 Uniformly Spaced D&C

Ladder treads shall be uniformly spaced not less than 7 inches (0.18 m) and not more than 12 inches (0.3 m) vertically at the hand rails.

4.5.9.3.4 Upmost Ladder Tread D&C

The top surface of the upmost ladder tread shall be located not more than 12 inches (0.3 m) below the POOL coping, gutter, or DECK.

4.5.10 Zero Depth (Sloped) Entries **D&C****4.5.10.1 Slip Resistant** **D&C**

Where ZERO DEPTH ENTRIES are provided, they shall be constructed with slip-resistant materials.

4.5.10.2 Maximum Floor Slope **D&C**

ZERO DEPTH ENTRIES shall have a maximum floor slope of 1:12, consistent with the requirements of MAHC Section 4.5.2.2.

4.5.10.2.1 Slope Changes **D&C**

Changes in floor slope shall be permitted.

4.5.10.3**Trench Drains** **D&C**

Trench drains shall be used along ZERO DEPTH ENTRIES at the waterline to facilitate surface skimming. The trenches may be flat or follow the slope of the ZERO DEPTH ENTRY. Any handholds that present a trip hazard shall not be continuous along the ZERO DEPTH ENTRY.

4.5.11 Disabled Access **D&C****4.5.11.1 Conform to ADA Standards** **D&C**

Access for disabled persons shall conform to ADA STANDARDS as approved by the Department of Justice.

4.5.12 Color and Finish **D&C****4.5.12.1 White or Light Pastel** **D&C**

Floors and walls below the water line shall be white or light pastel in color such that a BATHER is visible on the POOL floor.

4.5.12.1.1 Munsell Color Value **D&C**

The finish shall be at least 6.5 on the Munsell color value scale.

4.5.12.1.2 Exception **D&C**

An exception shall be made for the following AQUATIC VENUE components:

- 1) Competitive lane markings,
- 2) Dedicated competitive diving well floors,
- 3) Step or bench edge markings,
- 4) POOLS shallower than 24 inches (0.6 m), or
- 5) Other approved designs.

4.5.12.1.3 Darker colors **D&C**

Darker colors or designs such as rock formations may be permitted by the AHJ as long as the above criteria are met.

4.5.13 Walls

D&C

4.5.13.1 Plumb

D&C

POOL walls shall be plumb within a +/- 3 degree tolerance to a water depth of at least 5 feet (1.5 m), unless the wall design requires structural support ledges and slopes below to support the upper wall. Refer to Figure 4.5.13.4 below.

4.5.13.2 Support Ledges and Slopes

D&C

All structural support ledges and slopes of the wall shall fall entirely within a plane slope from the water line at not greater than a +/- 3 degree tolerance. A contrasting color shall be provided on the edges of any support ledge to draw attention to the ledge for BATHER SAFETY.

4.5.13.3 Rounded Corners

D&C

All corners created by adjoining walls shall be rounded or have a radius in both the vertical and horizontal dimensions to eliminate sharp corners.

4.5.13.4 No Projections

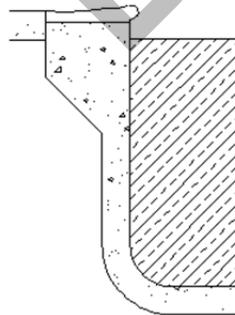
D&C

There shall be no projections from a POOL wall with the exception of structures or elements such as stairs, grab rails, ladders, hand holds, PENINSULAS, WING WALLS, underwater lights, SAFETY ropes, waterslides, play features, other approved POOL amenities, UNDERWATER BENCHES, and UNDERWATER LEDGES as described in this section. Refer to Figure 4.5.13.4 below.

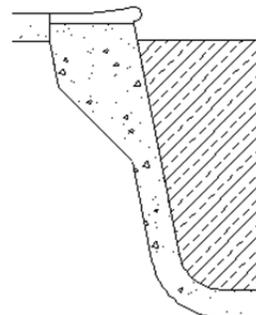
Figure 4.5.13.4: Pool Walls

D&C

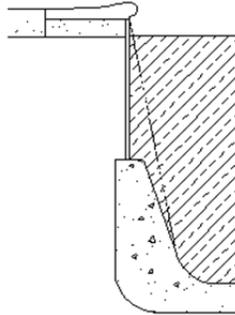
(A) Plumb within a +/- 3 degree tolerance.



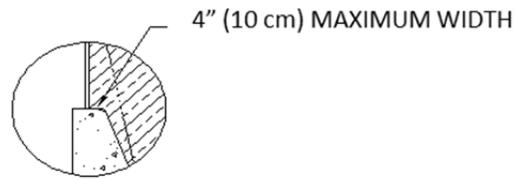
(B) Uniform slope not greater than 11 degrees or 1 in 5 from plumb.



(C) Structural support ledge all within 1 in 5 slope.



(D) Underwater Ledge for support of upper wall.



4.5.14 Structural Stability

D&C

4.5.14.1 Withstand Loads

D&C

POOLS shall be designed to withstand the reasonably anticipated loads imposed by POOL water, POOL PATRONS, and adjacent soils or structures.

4.5.14.2 Hydrostatic Relief Valve

D&C

A hydrostatic relief valve and/or suitable under drain system shall be provided when site conditions warrant.

4.5.14.3 Freezing

D&C

POOLS and related circulation piping shall be designed with a winterizing strategy when in an area subject to freeze/thaw cycles.

4.5.15 Hand Holds

D&C

4.5.15.1 Hand Holds Provided

D&C

Where not otherwise exempted, every POOL shall be provided with hand holds (PERIMETER GUTTER SYSTEM, coping, horizontal bars, recessed handholds, cantilevered DECKING) around the perimeter of the POOL where the water depth at the wall exceeds 24 inches (0.6 m). These handholds shall be installed not greater than 12 inches (305 mm) above, or 3 inches (75 mm) below static water level.

4.5.15.2 Horizontal Recesses

D&C

Horizontal recesses may be used for hand holds provided they are a minimum of 24 inches (0.6 m) long, a minimum of 4 inches (100 mm) high and between 2 inches (50 mm) and 3 inches (75 mm) deep.

4.5.15.2.1 Drain

D&C

Horizontal recesses shall drain into the POOL.

4.5.15.2.2 Consecutive Recesses

D&C

Horizontal recesses need not be continuous but consecutive recesses shall be separated by no more than 12 inches (0.3 m) of wall.

4.5.15.3 Decking **D&C**

Where PERIMETER GUTTER SYSTEMS are not provided, a coping or cantilevered DECKING of reinforced concrete or material equivalent in strength and durability, with rounded, slip-resistant edges shall be provided.

4.5.15.4 Coping Dimensions **D&C**

The overhang for coping or cantilevered DECKING shall not be greater than 2 inches (50 mm) from the vertical plane of the POOL wall, nor less than 1 inch (25 mm).

4.5.15.5 Coping Thickness **D&C**

The overhang for coping or cantilevered DECKING shall not exceed 2.5 inches (64 mm) in thickness for the last 2 inches (50 mm) of the overhang.

4.5.16 Infinity Edges **D&C**

4.5.16.1 Perimeter Restrictions **D&C**

Not more than fifty percent (50%) of the POOL perimeter shall incorporate an INFINITY EDGE detail, unless an adjacent and PATRON accessible DECK space conforming to MAHC Section 4.8.1 is provided.

4.5.16.2 Length **D&C**

The length of an INFINITY EDGE shall be no more than 30 feet (9 m) long when in water depths greater than 5 feet (1.5 m).

4.5.16.2.1 Shallow Water **D&C**

No maximum distance is enforced for the length of INFINITY EDGES in shallow water 5 feet (1.5 m) and less.

4.5.16.3 Handholds **D&C**

Handholds conforming to the requirements of MAHC Section 4.5.15 shall be provided for INFINITY EDGES, which may be separate from, or incorporated as part of the INFINITY EDGE detail.

4.5.16.4 Construction Guidelines **D&C**

Where INFINITY EDGES are provided, they shall be constructed of reinforced concrete or other impervious and structurally rigid material(s), and designed to withstand the loads imposed by POOL water, POOL PATRONS, and adjacent soils or structures.

4.5.16.5 Overflow Basins **D&C**

Troughs, basins, or capture drains designed to receive the overflow from INFINITY EDGES shall be watertight, free from STRUCTURAL CRACKS.

4.5.16.5.1 Finish**D&C**

Troughs, basins, or capture drains designed to receive the overflow from INFINITY EDGES shall have a non-toxic smooth and slip resistant finish.

4.5.16.6 Maximum Height**D&C**

The maximum height of the wall outside of the INFINITY EDGE shall not exceed 30 inches (0.76 m) to the adjacent grade and capture drain.

4.5.17 Underwater Benches**D&C****4.5.17.1 Slip Resistant****D&C**

Where UNDERWATER BENCHES are provided, they shall be constructed with slip-resistant materials.

4.5.17.2 Outlined Edges**D&C**

The leading horizontal and vertical edges of UNDERWATER BENCHES shall be outlined with slip-resistant color contrasting tile or other permanent marking of not less than 3/4 inch (19.05 mm) and not greater than 2 inches (50 mm).

4.5.17.3 Maximum Water Depth**D&C**

UNDERWATER BENCHES may be installed in areas of varying depths, but the maximum POOL water depth in that area shall not exceed 5 feet (1.5 m).

4.5.17.4 Maximum Seat Depth**D&C**

The maximum submerged depth of any seat or sitting bench shall be 20 inches (0.5 m) measured from the water line.

4.5.18 Underwater Ledges**D&C****4.5.18.1 Slip Resistant****D&C**

Where UNDERWATER TOE LEDGES are provided to enable swimmers in deep water to rest, or to provide structural support for an upper wall, they shall be constructed with slip-resistant materials.

4.5.18.2 Protrude**D&C**

UNDERWATER TOE LEDGES for resting may be recessed, or protrude beyond the vertical plane of the POOL wall, provided they meet the criteria for slip resistance and tread depth outlined in this section.

4.5.18.3 5 Feet or Greater**D&C**

UNDERWATER TOE LEDGES for resting shall only be provided within areas of a POOL with water depths of 5 feet (1.5 m) or greater.

4.5.18.3.1 Toe Ledge**D&C**

TOE LEDGES must start no earlier than 4 lineal feet (1.2 m) to the deep side of the 5 foot (1.5 m) slope break.

4.5.18.3.2 Below Water Level

D&C

UNDERWATER TOE LEDGES must be at least 4 feet (1.2 m) below static water level.

4.5.18.4 Structural Support

D&C

UNDERWATER LEDGES for structural support of upper walls are allowed.

4.5.18.5 Outlined

D&C

The edges of UNDERWATER TOE LEDGES shall be outlined with slip-resistant color contrasting tile or other permanent marking of not less than 1 inch (25 mm) and not greater than 2 inches (50 mm).

4.5.18.5.1 Visible

D&C

If they project past the plane of the POOL wall, the edges of UNDERWATER TOE LEDGES shall be clearly visible from the DECK.

4.5.18.6 Tread Depths

D&C

UNDERWATER TOE LEDGES shall have a maximum uniform horizontal tread depth of 4 inches (100 mm). Figure 4.5.13.4.

4.5.19 Underwater Shelves

D&C

4.5.19.1 Immediately Adjacent

D&C

UNDERWATER SHELVES may be constructed immediately adjacent to water shallower than 5 feet (1.5 m).

4.5.19.2 Nosing

D&C

UNDERWATER SHELVES shall have a slip-resistant, color contrasting nosing at the leading horizontal and vertical edges on both the top of horizontal edges and leading vertical edges and should be viewable from the DECK or from underwater.

4.5.19.3 Maximum Depth

D&C

UNDERWATER SHELVES shall have a maximum depth of 24 inches (0.6 m).

4.5.20 Depth Markers and Markings

D&C

4.5.20.1 Location

D&C

4.5.20.1.1 Markings

D&C

POOL water depths shall be clearly and permanently marked at the following locations:

- 1) Minimum depth,
- 2) Maximum depth,

- 3) On both sides and at each end of the POOL and,
- 4) At the break in the floor slope between the shallow and deep portions of the POOL.

4.5.20.1.2 Depth Measurements

D&C

Depth markers shall be located on the vertical POOL wall and positioned to be read from within the POOL.

4.5.20.1.3 Below Handhold

D&C

Where depth markings cannot be placed on the vertical wall above the water level, other means shall be used so that the markings will be plainly visible to persons in the POOL.

4.5.20.1.4 Coping or Deck

D&C

Depth markers shall also be located on the POOL coping or DECK within 18 inches (0.45 m) of the POOL structural wall or perimeter gutter.

4.5.20.1.5 Read on Deck

D&C

Depth markers shall be positioned to be read while standing on the DECK facing the POOL.

4.5.20.1.6 25' Intervals

D&C

Depth markers shall be installed at not more than 25 foot (7.6 m) intervals around the POOL perimeter edge and according to the requirements of this section.

4.5.20.2 Construction / Size

D&C

4.5.20.2.1 Durable

D&C

Depth markers shall be constructed of a durable material resistant to local weather conditions. Any depth markings that are illegible are required to be replaced.

4.5.20.2.2 Slip-Resistant

D&C

Depth markers shall be slip-resistant when they are located on horizontal surfaces.

4.5.20.2.3 Color and Height

D&C

Depth markers shall have letters and numbers with a minimum height of 4 inches (100 mm) of a color contrasting with background.

4.5.20.2.4 Feet and Inches

D&C

Depth markers shall be marked in units of feet and inches.

4.5.20.2.4.1 Abbreviations

D&C

Abbreviations of "FT" and "IN" may be used in lieu of "FEET" and "INCHES."

4.5.20.2.4.1.1

Abbreviations

RM

Symbols for feet (') and inches (") shall not be permitted on water depth signs.

4.5.20.2.4.2 Metric

D&C

Metric units may be provided in addition to—but not in lieu of—units of feet and inches.

4.5.20.3 Tolerance

D&C

4.5.20.3.1 Nearest 3 Inches

D&C

Depth markers shall be located to indicate water depth to the nearest 3 inches (75 mm), as measured from the POOL floor 3 feet (0.9 m) out from the POOL wall to the gutter lip, mid-point of surface SKIMMER(s), or surge weir(s).

4.5.20.4 No Diving Markers

D&C

4.5.20.4.1 Depths

D&C

For POOL water depths 5.0 feet or shallower, all depth markers required by MAHC section 4.5.20 above shall be provided with “NO DIVING” warning signs along with the universal international symbol for “NO DIVING” spaced at not more than 25 foot (7.6 m) intervals around the POOL perimeter edge. Reference: *NEMA Z535*

4.5.20.4.2 Durable

D&C

“NO DIVING” MARKERS shall be constructed of a durable material resistant to local weather conditions.

4.5.20.4.3 Slip Resistant

D&C

“NO DIVING” MARKERS shall be slip-resistant when they are located on horizontal surfaces.

4.5.20.4.4 At Least 4 Inches

D&C

All lettering and symbols shall be at least 4 inches (100 mm) in height.

4.5.20.5 Depth Marking At Break in Floor Slope

D&C

4.5.20.5.1 Over 5 Feet

D&C

For POOLS deeper than 5 feet (1.5 m), a line of contrasting color, not less than 2 inches (50 mm) and not more than 6 inches (150 mm) in width, shall be clearly and permanently installed on the POOL floor at the shallow side of the break in the floor slope, and extend up the POOL walls to the waterline.

4.5.20.5.2 Durable

D&C

Depth marking at break in floor slope shall be constructed of a durable material resistant to local weather conditions and be slip-resistant.

4.5.20.5.3 Safety Rope

D&C

One foot (0.3 m) to the shallow water side of the break in floor slope and contrasting band, a SAFETY float rope shall extend across the POOL surface.

4.5.20.6 Dual Marking System RM

Symmetrical AQUATIC VENUE designs with the deep point at the center may be allowed by providing a dual depth marking system which indicates the depth at the wall as measured in MAHC section 4.5.20.3.1 and at the deep point.

4.5.20.7 Non-traditional Aquatic Venues RM

Controlled-access AQUATIC VENUES such as an ACTIVITY POOL, LAZY RIVERS, etc. do not require depth markers but the depth shall be indicated on a sign at the entry to such an AQUATIC VENUE.

4.5.20.8 Spa Depth Markers RM

Depth markers for a SPA shall meet the above requirements. Small SPAS less than 200 square feet (18.6 square m) do not require depth markers or “No Diving” signs.

4.5.20.9 Wading Pool Depth Markers RM

AQUATIC VENUES such as wading POOLS and water activity areas or other AQUATIC VENUES are not required to have depth markings or no diving signage if water depth is 6 inches (15 cm) of water or less.

4.5.20.10 Movable Floor Depth Markers RM

For AQUATIC VENUES with movable floors, a sign indicating movable floor and/or varied water depth shall be provided and clearly visible from the DECK.

4.5.20.10.1 Movable Floors RM

The posted water depth shall be water level to the floor of the AQUATIC VENUE according to a vertical measurement taken 3 feet (0.9m) from the AQUATIC VENUE wall.

4.5.20.10.2 Signage RM

A sign shall be posted to inform the public that the AQUATIC VENUE has a varied depth and refer to the sign showing the current depth.

4.5.21 Aquatic Venue Shell Maintenance [N/A]

4.6 Indoor/Outdoor Environment

4.6.1 Lighting

4.6.1.1 General Requirements D&C

4.6.1.1.1 Outdoor Pools D&C

Lighting as described in this subsection shall be provided for all outdoor POOLS open for use from thirty (30) minutes before sunset to thirty (30) minutes after sunrise, or during periods of natural illumination below the levels required in MAHC Section 4.6.1.3.1.

4.6.1.1.2 Accessible

D&C

No lighting controls shall be accessible to the PATRONS or BATHERS.

4.6.1.2 Windows/Natural Light

D&C

4.6.1.2.1 Natural Lighting Methods

D&C

Where natural lighting methods are used to meet the light level requirements of MAHC Section 4.6.1.3.1 during portions of the day when adequate natural lighting is available, one of the following methods shall be used to ensure that lights are turned on when natural lighting no longer meets these requirements:

- 1) Automatic lighting controls based on light levels or time of day, or
- 2) Written operations procedures where manual controls are used.

4.6.1.3 Light Levels

D&C

4.6.1.3.1 Minimum Levels

D&C

POOL water surface and DECK light levels shall meet the following minimum maintained light levels*:

- 1) Indoor Water Surface - 30 horizontal footcandles (320 lux)
- 2) Outdoor Water Surface - 10 horizontal footcandles (100 lux)
- 3) DECK - 10 horizontal footcandles (100 lux)

Note: Higher levels may be advisable for acceptable spectator viewing for competitive swimming and diving events.

4.6.1.4 Overhead Lighting

RM

4.6.1.4.1 Artificial Lighting

RM

Artificial lighting shall be provided at all AQUATIC VENUES which are to be used at night or which do not have adequate natural lighting.

4.6.1.4.2 Aquatic Venue Floor

RM

Lighting shall illuminate all parts of the floor of the AQUATIC VENUE to enable a QUALIFIED LIFEGUARD or other person to determine whether a BATHER is on the floor of the AQUATIC VENUE.

4.6.1.4.3 Aquatic Venue Illumination

RM

Lighting shall illuminate all parts of the AQUATIC VENUE including the water, the depth markers, signs, entrances, restrooms, SAFETY equipment, and the required DECK area and walkways.

4.6.1.5	Underwater Lighting	D&C
4.6.1.5.1	Minimum Requirements	D&C
Underwater lighting of not less than 6 initial rated lumens per square foot of POOL water surface area shall be provided.		
4.6.1.5.1.1	Location	D&C
Such underwater lights, in conjunction with overhead or equivalent DECK lighting, shall be located to provide illumination so that all portions of the AQUATIC VENUE, including the AQUATIC VENUE bottom and drain(s), may be readily seen. Higher underwater light levels shall be considered for deeper water to achieve this outcome.		
4.6.1.5.2	Dimmable Lighting	D&C
Dimmable lighting shall not be used for underwater lighting.		
4.6.1.6	Night Swimming with No Underwater Lighting	D&C
4.6.1.6.1	Minimum Requirements	D&C
Where outdoor POOLS are open for use from thirty (30) minutes before sunset to thirty (30) minutes after sunrise, or during periods of low illumination underwater lighting may be excluded where maintained POOL surface lighting levels are a minimum of 15 horizontal footcandles (160 lux) and all portions of the POOL, including the bottom and drain(s), may be readily seen.		
4.6.1.7	Emergency Lighting	D&C
4.6.1.7.1	Emergency Egress Lighting	D&C
POOL areas requiring lighting shall be provided with emergency egress lighting in compliance with the applicable Building Code.		
4.6.1.7.2	Footcandles	D&C
In no case shall the path of egress be illuminated to less than a maintained value of 0.6 footcandles (6 lux).		
4.6.1.8	Glare	D&C
4.6.1.8.1	Windows	D&C
Windows and any other features providing natural light into the POOL space and overhead or equivalent DECK lighting shall be designed or arranged to inhibit or reduce glare on the POOL water surface that would prevent seeing objects on the POOL bottom.		
4.6.2	Indoor Aquatic Facility Ventilation	
4.6.2.1	Purpose	VEN
INDOOR AQUATIC FACILITY AIR HANDLING SYSTEMS shall be designed, constructed, and installed to support the health and SAFETY of the building's PATRONS.		

4.6.2.2 Exemptions **VEN**

INDOOR AQUATIC FACILITY AIR HANDLING SYSTEM design requirements do not apply to AQUATIC FACILITIES that do not meet the definition of a “Building” in the International Building Code 2012.

4.6.2.3 Indoor Aquatic Facility **VEN**

AIR HANDLING SYSTEM design requirements shall apply to new or SUBSTANTIALLY ALTERED INDOOR AQUATIC FACILITIES including the area of the building’s AQUATIC VENUES and the surrounding BATHER and spectator/stadium seating areas.

4.6.2.4 Mechanical Code **VEN**

INDOOR AQUATIC FACILITY AIR HANDLING SYSTEM design, construction, and installation shall comply with applicable local CODES.

4.6.2.5 ASHRAE 62.1 **VEN**

INDOOR AQUATIC FACILITY AIR HANDLING SYSTEM design, construction, and installation shall comply with ASHRAE standard 62.1 2013, Ventilation for Acceptable Indoor Air Quality, and/or applicable local CODES with additional requirements as stated in section MAHC Section 4.6.2.6.

4.6.2.6 Air Handling System Design **VEN****4.6.2.6.1 Mechanical Systems** **VEN**

Ventilation shall be provided through mechanical systems and/or engineered openings for natural ventilation.

4.6.2.6.2 Design Factors and Performance Requirements **VEN**

The AIR HANDLING SYSTEM design engineer shall provide plan drawings and documentation showing the design meets the performance requirements per MAHC Section 4.6.2.7:

- 1) Building layout identifying the location of the INDOOR AQUATIC FACILITY,
- 2) INDOOR AQUATIC FACILITY size including area in square feet and volume in cubic feet,
- 3) The area in square feet for DECK and for stadium seating sections,
- 4) Maximum BATHER LOAD per AQUATIC VENUE and maximum number of building occupants,
- 5) Individual AQUATIC VENUE water quality systems, including water recirculation, filtration, DISINFECTION, and secondary treatment systems,
- 6) Placement of AIR HANDLING SYSTEM and other building outdoor air intakes exterior to the building,
- 7) Placement of AIR HANDLING SYSTEM and other building exhaust vents exterior to the building,
- 8) Placement of return air intakes within the INDOOR AQUATIC FACILITY,
- 9) Placement of supply air locations within the INDOOR AQUATIC FACILITY,

- 10) Identify system capabilities, if utilized, to automatically or manually modulate the amount of outdoor air for the purposes of reducing the number of cfm of outdoor air when occupancy is lower than peak BATHER/OCCUPANT LOAD, and
- 11) Identify system design to maintain negative air pressure in the INDOOR AQUATIC FACILITY relative to the indoor areas external to it.

4.6.2.6.3 Other Air Handling Systems **VEN**

AIR HANDLING SYSTEM design for chemical STORAGE, mechanical, toilet, shower, and dressing rooms are not included in the scope of this section of the CODE, but shall be considered for their effects on the performance requirements of MAHC Section 4.6.2.7 such as maintaining negative pressure, temperature differences, and contribution to the air volume of the INDOOR AQUATIC FACILITY.

4.6.2.6.4 Paddle Fans **VEN**

AIR HANDLING SYSTEM design may not consider mechanical fans used to push air within the space as part of the outdoor air calculations for the INDOOR AQUATIC FACILITY as defined in MAHC Section 4.6.2.7.

4.6.2.6.4.1 Air Turnover **VEN**

Mechanical fans used to push air within the space may be used in the calculation for air delivery rate.

4.6.2.6.5 Occupied and Open All Seasons **VEN**

AIR HANDLING SYSTEM design may include natural ventilation calculated in accordance with the ASHRAE Handbooks to substitute the corresponding portion of mechanical ventilation only if all the calculated exterior openings will be continuously controlled open during all times the INDOOR AQUATIC FACILITY is occupied, regardless of season.

4.6.2.6.6 Air Distribution Design **VEN**

The design of the distribution of supply air and distribution of exhaust or return air shall consider obstacles such as support columns, architectural structures, and AQUATIC FEATURES.

4.6.2.7 Performance Requirements for Air Handling System **VEN**

4.6.2.7.1 Minimum Outdoor Air Requirements **VEN**

The AIR HANDLING SYSTEM shall have a design capability to supply the minimum outdoor air requirements using ASHRAE standard 62.1 2013, Ventilation for Acceptable Indoor Air Quality.

4.6.2.7.2 System Alarm **VEN**

The AIR HANDLING SYSTEM design shall provide system features to notify the operator if the outdoor air entering the indoor AQUATIC FACILITY is below 0.48 cfm/ft².

4.6.2.7.3 Real-Time Occupancy **VEN**

Design of the AIR HANDLING SYSTEM shall meet the maximum BATHER/PATRON requirements, however, if a method to determine real-time actual occupancy is available then the system may modulate to reduce outdoor air cfm to meet the requirement for the actual occupancy for the associated time frame.

4.6.2.7.4 Air Deliver Rate **VEN**

The AIR HANDLING SYSTEM shall supply an air delivery rate as defined in ASHRAE Handbook – HVAC Applications 2011, Places of Assembly, Natatoriums.

4.6.2.7.5 Consistent Air Flow **VEN**

INDOOR AQUATIC FACILITY AIR HANDLING SYSTEM shall be designed to provide consistent air flow through all parts of the INDOOR AQUATIC FACILITY to preclude any stagnant areas.

4.6.2.7.6 Relative Humidity **VEN**

The AIR HANDLING SYSTEM shall maintain the relative humidity in the space as defined in ASHRAE Handbook – HVAC Applications 2011, Places of Assembly, Natatoriums.

4.6.2.7.6.1 Dew Point **VEN**

The AIR HANDLING SYSTEM shall be designed to maintain the dew point of the INTERIOR space less than the dew point of the interior walls at all times so as to prevent damage to structural members and to prevent biological growth on walls.

4.6.2.7.6.2 Condensation & Mold Control **VEN**

The AIR HANDLING SYSTEM shall be designed to distribute air toward walls and windows to reduce condensation and mold growth.

4.6.2.7.7 Negative Air Pressure **VEN**

System air flow shall be designed to maintain negative air pressure in the INDOOR AQUATIC FACILITY relative to the areas external to it.

4.6.2.7.8 Disinfection Byproduct Removal **VEN**

Sufficient return air intakes shall be placed near AQUATIC VENUE surfaces such that they remove the highest concentration of airborne DISINFECTION BY-PRODUCT contaminated air.

4.6.2.7.8.1 Airflow Across Water Surface **VEN**

The AIR HANDLING SYSTEM shall be designed considering airflow across the water surface to promote removal of DISINFECTION BY-PRODUCTS.

4.6.2.7.9 Re-entrainment of Exhaust **VEN**

AIR HANDLING SYSTEM outdoor air intakes shall be placed to minimize RE-ENTRAINMENT of exhaust air from building systems back into the facility.

4.6.2.7.9.1 System Exhaust **VEN**

AIR HANDLING SYSTEM exhaust from chemical STORAGE, mechanical, toilet, shower, and dressing rooms shall not be directed into the AQUATIC FACILITY.

4.6.2.7.10 Access Control **VEN**

The AIR HANDLING SYSTEM shall be designed to provide a means to limit physical or electronic access to system control to the operator and anyone the operator deems to have access.

4.6.2.7.11 Purge **VEN**

The AIR HANDLING SYSTEM shall have the capability to periodically PURGE air for air quality maintenance or for emergency situations.

4.6.2.7.11.1 Purge Capacity **VEN**

The AIR HANDLING SYSTEM shall have a PURGE capacity equal or greater than 2 times the ASHRAE CODE level. This PURGE would be activated manually and run for a time that achieved one complete air turn of the space.

4.6.2.7.11.2 Outdoor Air **VEN**

Outdoor air required for PURGE would not be required to be heated or otherwise treated.

4.6.2.7.12 Air Handling System Filters **VEN**

The AIR HANDLING SYSTEM design shall include filters for outdoor air and recirculated air with a Minimum Efficiency Reporting Value (MERV) rating of 8.

4.6.2.8 Air Handling System Installation **VEN**

4.6.2.8.1 Air Handling System Procedures **VEN**

The contractor installing the INDOOR AQUATIC FACILITY AIR HANDLING SYSTEM shall provide the AQUATIC FACILITY owner with an operating manual from the manufacturer which includes:

- 1) Startup and shutdown procedures,
- 2) PURGING and other SAFETY procedures,
- 3) Cleaning procedures,
- 4) General maintenance requirements with parts listings and frequency of maintenance (i.e., filter cleaning frequencies, motor bearing maintenance),
- 5) Pressure differential specifications for filter replacement, filter replacement type, and frequency of cleaning or replacement,
- 6) Troubleshooting processes,
- 7) Frequency of required calibration of equipment,
- 8) Descriptions of general operating schemes, and
- 9) Contact information for the manufacturer.

4.6.2.9 Air Handling System Commissioning **VEN**

4.6.2.9.1 System Commissioning **VEN**

A qualified, licensed professional shall commission the AIR HANDLING SYSTEM to verify that the installed system is operating properly in accordance with the system design.

4.6.2.9.2 Written Statement

VEN

A written statement of commissioning shall be provided to the AQUATIC FACILITY owner to include but is not limited to:

- 1) The number of cubic feet per minute of outdoor air flowing into the INDOOR AQUATIC FACILITY at the time of commissioning;
- 2) The number of cubic feet per minute of exhaust air flowing through the system at the time of commissioning; and,
- 3) A statement that the amount of outdoor air meets the performance requirements of MAHC Section 4.6.2.7.

4.6.3 Electrical Systems and Components

D&C

4.6.3.1 General Guidelines

D&C

4.6.3.1.1 Providing Relief

D&C

Nothing in this CODE shall be construed as providing relief from any applicable requirements of the National Electric CODE (NEC) or other applicable CODE, except where modified by this MAHC.

4.6.3.1.2 Natatoriums

D&C

NATATORIUMS shall be considered wet and CORROSIVE environments.

4.6.3.2 Electrical Equipment in Interior Chemical-Storage Space

D&C

4.6.3.2.1 Wet and Corrosive

D&C

CHEMICAL STORAGE SPACES shall be considered wet and CORROSIVE environments.

4.6.3.2.2 Electrical Conduit

D&C

Electrical conduit shall not enter or pass through an interior CHEMICAL STORAGE SPACE, except as required to service devices integral to the function of the room, such as pumps, vessels, controls, lighting and SAFETY devices.

4.6.3.2.3 Electrical Devices

D&C

Electrical devices or equipment shall not occupy an interior CHEMICAL STORAGE SPACE, except as required to service devices integral to the function of the room, such as pumps, vessels, controls, lighting and SAFETY devices.

4.6.3.2.4 Protected Against Breakage

D&C

Lamps, including fluorescent tubes, installed in interior CHEMICAL STORAGE SPACES shall be protected against breakage with a lens or other cover, or be otherwise protected against the accidental release of hot materials.

4.6.4 Pool Water Heating

4.6.4.1 High Temperature D&C

When designing POOL heating equipment, measures shall be taken to prevent PATRON exposure to water temperatures in excess of 104°F (40°C).

4.6.4.1.1 Low Temperature D&C

When designing POOL heating equipment, measures shall be taken to prevent PATRON exposure to water temperatures in excess of such lower maximum temperature as shall be recommended by the manufacturer for their equipment.

4.6.4.2 Pressure Relieve Device D&C

Where POOL water heating equipment is installed with valves capable of isolating the heating equipment from the POOL, a listed pressure-relief device shall be installed to limit the pressure on the heating equipment to no more than the maximum value specified by the heating-equipment manufacturer and applicable CODES.

4.6.4.3 Code Compliance D&C

POOL-water heating equipment shall be selected and installed to preserve compliance with the applicable CODES, the terms of listing, and labeling of equipment, and with the equipment manufacturer's installation instructions and applicable CODES.

4.6.4.4 Equipment Room Requirements D&C

Where POOL-water heaters use COMBUSTION and are located inside a building, the space in which the heater is located shall be considered to be an EQUIPMENT ROOM. The requirements of MAHC Section 4.9.1 shall apply.

4.6.4.5 Exception D&C

Heaters listed and labeled for the atmosphere shall be acceptable without ISOLATION from chemical fumes and vapors.

4.6.5 First Aid Room

4.6.5.1 Station Design LG

Design and construction of new AQUATIC FACILITIES shall include an area designated for first aid equipment and/or treatment.

4.6.6 Emergency Exit

4.6.6.1 Emergency Exit RM

The AQUATIC VENUE emergency exit(s) shall not be blocked by objects or secured in a manner that prevents PATRONS from exiting in the event of an emergency.

4.6.6.2 Labeling **RM**

Unless all gates or doors are so equipped, those gates and/or doors which will allow egress without a key shall be clearly and conspicuously labeled in letters at least 4 inches (10cm) high "EMERGENCY EXIT."

4.6.7 Drinking Fountains **D&C**

4.6.7.1 Provided **D&C**

A drinking fountain shall be provided inside an AQUATIC FACILITY.

4.6.7.1.1 Alternative **D&C**

Alternate locations or the use of bottled water shall be evaluated by the AHJ.

4.6.7.1.2 Common Use Area **D&C**

If the drinking fountain cannot be provided inside the AQUATIC FACILITY, it shall be provided in a common use building or area adjacent to the AQUATIC FACILITY entrance and on the normal path of BATHERS going to the AQUATIC FACILITY entrance.

4.6.7.2 Readily Accessible **D&C**

The drinking fountain shall be located where it is readily accessible and not a hazard to BATHERS.

4.6.7.2.1 Not Located **D&C**

The drinking fountain shall not be located in a shower area or toilet area.

4.6.7.3 Single Fountain **D&C**

A single drinking fountain shall be allowed for one or more AQUATIC VENUES within an AQUATIC FACILITY.

4.6.7.4 Angle Jet Type **D&C**

The drinking fountain shall be an angle jet type installed according to applicable plumbing CODES.

4.6.7.5 Potable Water Supply **D&C**

The drinking fountain shall be supplied with water from an approved potable water supply.

4.6.7.6 Wastewater **D&C**

The wastewater discharged from a drinking fountain shall be routed to an approved sanitary sewer system or other approved disposal area according to applicable plumbing CODES.

4.6.8 Garbage Receptacles D&C

4.6.8.1 Sufficient Number D&C

A sufficient number of receptacles shall be provided within an AQUATIC FACILITY to ensure that garbage and refuse can be disposed of properly to maintain safe and sanitary conditions.

4.6.8.2 Number and Location D&C

The number and location of receptacles shall be at the discretion of the AQUATIC FACILITY manager.

4.6.8.3 Tightly Closable D&C

Receptacles shall be designed to be tightly closed with a lid or other cover.

4.6.9 Food and Drink Concessions D&C

4.6.9.1 Meet AHJ Requirements D&C

Concessions for food and drink in an AQUATIC FACILITY shall meet all AHJ requirements.

4.6.10 Spectator Areas D&C

4.6.10.1 Within Aquatic Facility Enclosure D&C

An area designed for use by spectators may be located within an AQUATIC FACILITY ENCLOSURE.

4.6.10.2 Deck D&C

When a spectator area or an access to a spectator area is located within the AQUATIC FACILITY ENCLOSURE, the DECK adjacent to the area or access shall provide egress width for the spectators in addition to the width required by MAHC Section 4.8.1.5.

4.6.10.2.1 Additional Width D&C

The additional width shall be based on the egress requirements in the applicable building CODE based on the maximum OCCUPANT LOAD served with a minimum width of 4 feet (1.2 m) and have either of the following:

4.6.10.2.1.1 Barrier D&C

A BARRIER as defined in MAHC Section 4.8.6.1 located on the DECK to separate the DECK used by spectators from the PERIMETER DECK used by BATHERS.

4.6.10.2.1.1.1 Openings D&C

The BARRIER may have one or more openings directly into the BATHER areas.

4.6.10.2.1.2 Demarcation Line D&C

A demarcation line on the DECK that shows the separation between the DECK used by spectators and the PERIMETER DECK used by BATHERS.

4.6.10.3 Balcony D&C

A spectator or other area located in a balcony within 10 feet (3. m) of or overhanging any portion of an AQUATIC VENUE shall be designed to deter jumping or diving into the AQUATIC VENUE.

4.6.10.4 Bleachers D&C

Bleachers in a spectator area shall be designed according to the International Code Council's most recent version of the 300 Standard which has been approved for reference or another applicable CODE.

4.7 Recirculation and Water Treatment

4.7.1 Recirculation Systems and Equipment

4.7.1.1 General R&F

4.7.1.1.1 Equipped and Operated R&F

All AQUATIC FACILITIES shall be equipped and operated with a recirculation and filtration system capable of meeting the provisions outlined in MAHC Section 4.7.

4.7.1.1.2 Component Installation R&F

The installation of the recirculation and the filtration system components shall be performed in accordance with the designer's and manufacturers' instructions.

4.7.1.1.3 Recirculation System R&F

A water RECIRCULATION SYSTEM consisting of one or more pumps, pipes, return INLETS, suction outlets, tanks, filters, and other necessary equipment shall be provided.

4.7.1.2 Combined Aquatic Venue Treatment R&F

4.7.1.2.1 Maintain and Measure R&F

When treatment systems of AQUATIC VENUES are combined, the design shall include all appurtenances to maintain and measure the required water characteristics including but not limited to flow rate, pH, and disinfectant concentration in each venue/feature.

4.7.1.2.2 Secondary Disinfection R&F

If SECONDARY DISINFECTION is required for an INCREASED RISK AQUATIC VENUE as per MAHC Section 4.7.3.3.1.2, then SECONDARY DISINFECTION shall be required for all treatment systems that are combined with the INCREASED RISK AQUATIC VENUE.

4.7.1.2.3 Isolate R&F

Each AQUATIC VENUE of a combined venue treatment system shall be capable of being isolated for maintenance purposes.

4.7.1.3 Inlets **R&F**

4.7.1.3.1 General **R&F**

4.7.1.3.1.1 Hydraulically Balanced **R&F**

The RECIRCULATION SYSTEM shall be designed with sufficient flexibility to achieve a HYDRAULIC APPORTIONMENT that will ensure the following:

- 1) Effective distribution of treated water, and
- 2) Maintenance of a uniform DISINFECTANT residual and pH throughout the AQUATIC VENUE.

4.7.1.3.1.1.1 Alternative Design Justification **R&F**

Alternative designs shall be allowed based on adequate engineering justification.

4.7.1.3.1.2 Inlets **R&F**

Effective distribution of treated water shall be accomplished by either a continuous PERIMETER OVERFLOW system with integral INLETS or by means of directionally adjustable INLETS adequate in design, number, and location.

4.7.1.3.1.3 Adequate mixing **R&F**

POOLS shall use wall and/or floor INLETS to provide adequate mixing.

4.7.1.3.1.3.1 Greater Than 50 Feet Wide **R&F**

For POOLS greater than 50 feet wide (15.24 m), floor INLETS shall be required

4.7.1.3.1.4 Other Inlet Types **R&F**

All other types of INLET systems not covered in this section shall be subject to approval by the AHJ with proper engineering justification.

4.7.1.3.1.5 Hydraulically Sized **R&F**

INLETS shall be hydraulically sized to provide the design flow rates for each POOL area of multi-zone POOLS based on the required design TURNOVER RATE for each zone.

4.7.1.3.2 Floor Inlets **R&F**

4.7.1.3.2.1 Uniformly Spaced **R&F**

Floor INLETS shall be

spaced to effectively distribute the treated water throughout the POOL, and

- 1) flush with the bottom of the POOL.

4.7.1.3.2.1.1 Distance **R&F**

Distance between floor INLETS shall be no greater than 20 feet (6.1 m).

4.7.1.3.2.1.2**Row****R&F**

A row of floor INLETS shall be located within 15 feet (4.6 m) of each side wall.

4.7.1.3.2.2**Spaced****R&F**

Floor INLETS, used in combination with wall INLETS, shall be spaced no greater than 25 feet (7.6 m) from nearest side walls.

4.7.1.3.3**Wall Inlets****R&F****4.7.1.3.3.1****Effective Mixing****R&F**

Wall INLET velocity shall mix the water effectively.

4.7.1.3.3.2**Adjustable****R&F**

INLETS shall be directionally adjustable to provide effective distribution of water.

4.7.1.3.3.3**Inlet Spacing****R&F**

Wall INLETS shall be spaced no greater than 20 feet (6.1 m) apart.

4.7.1.3.3.3.1**Corner****R&F**

INLETS shall be placed within 5 feet (1.5 m) of each corner of the POOL.

4.7.1.3.3.3.2**Skimmers****R&F**

INLETS shall be placed at least 5 feet (1.52 m) from a SKIMMER;

4.7.1.3.3.3.3**Isolated****R&F**

INLETS shall be placed in each recessed or isolated area of the POOL.

4.7.1.3.3.4**Directional Flow****R&F**

Wall INLETS that are part of a manufactured gutter system do not need to be designed to provide directional flow.

4.7.1.3.3.5**Dye Testing****R&F**

Dye testing may be required by the AHJ to evaluate the mixing characteristics of the RECIRCULATION SYSTEM.

4.7.1.3.3.5.1**Failed Test****R&F**

If dye test reveals inadequate mixing in the POOL after 20 minutes, the RECIRCULATION SYSTEM shall be adjusted or modified to assure adequate mixing.

4.7.1.4**Perimeter Overflow Systems/Gutters****R&F****4.7.1.4.1****General****R&F****4.7.1.4.1.1****Skimming****R&F**

All POOLS shall be designed to provide SKIMMING for the entire POOL surface area with engineering rationale provided by the design professional.

4.7.1.4.1.1.1**Around Entire Pool****R&F**

For POOLS that require a perimeter overflow system, the POS shall extend around the entire POOL perimeter

4.7.1.4.1.2**Zero-depth Entry****R&F**

ZERO DEPTH ENTRY POOLS shall have a continuous overflow trench that terminates as close to the side walls as practical including any zero depth portion of the POOL perimeter.

4.7.1.4.1.2.1**Ends****R&F**

Where a POS cannot be continuous, the ends of each section shall terminate as close as practical to each other.

4.7.1.4.2**Gutter Size and Shape****R&F****4.7.1.4.2.1****Continuous Water Removal****R&F**

The gutter system shall be designed to allow continuous removal of water from the POOL'S upper surface at a rate of at least 125 percent of the approved total recirculation flow rate chosen by the designer.

4.7.1.4.2.2**Inspection****R&F**

Gutters shall permit ready inspection, cleaning, and repair.

4.7.1.4.3**Gutter Outlets****R&F****4.7.1.4.3.1****Design Capacity****R&F**

Drop boxes, converters, return piping, or FLUMES used to convey water from the gutter shall be designed to

- 1) prevent flooding and BACKFLOW of skimmed water into the POOL, and
- 2) handle at least 125 percent of the approved total recirculation flow.

4.7.1.4.4**Surge Tank Capacity****R&F****4.7.1.4.4.1****Net Surge Capacity****R&F**

All POS shall be designed with an effective net surge capacity of not less than 1 gallon for each square foot (41 L/m²) of POOL surface area.

4.7.1.4.4.1.1**Surge Components****R&F**

Surge shall be provided within a surge tank, or the gutter or filter above the normal flow line, or elsewhere in the system.

4.7.1.4.4.2**Tank Capacity****R&F**

The tank capacity specified shall be the net capacity.

4.7.1.4.4.3**Tank Levels****R&F**

The design professional shall define the minimum, maximum, and normal POOL operating water levels in the surge tank.

4.7.1.4.4.3.1**Marked****R&F**

The surge tank's minimum, maximum, and normal POOL operating water levels shall be marked on the tank so as to be readily visible for inspection.

4.7.1.4.4.4**Overflow Pipes****R&F**

Surge tanks, shall have overflow pipes to convey excess water to waste via an air gap or other approved BACKFLOW prevention device.

4.7.1.4.5**Tolerances****R&F****4.7.1.4.5.1****Venue Perimeter****R&F**

Gutters shall be level within a tolerance of plus or minus 1/16 inch (1.6 mm) around the perimeter of the AQUATIC VENUE.

4.7.1.4.6**Makeup Water System****R&F****4.7.1.4.6.1****Automatic Makeup****R&F**

Automatic makeup water supply equipment shall be provided to maintain continuous skimming of POOLS with POS.

4.7.1.4.6.2**Air Gap****R&F**

Makeup water shall be supplied through an air gap or other approved BACKFLOW prevention device.

4.7.1.5**Skimmers****R&F**

SKIMMERS and Alternative Gutter Technologies Using In-Pool Surge Capacity

4.7.1.5.1**General****R&F****4.7.1.5.1.1****Manufactured****R&F**

The use of manufactured direct suction SKIMMERS shall be in accordance with the manufacturer's recommendations.

4.7.1.5.1.2**Provided****R&F**

Where SKIMMERS are used, at least one surface SKIMMER shall be provided for each 500 square feet (46 m²) of surface area or fraction thereof.

4.7.1.5.1.2.1**Conditions****R&F**

Additional SKIMMERS may be required to achieve effective skimming under site-specific conditions (e.g., heavy winds and/or CONTAMINANT loading) and/or to comply with all applicable building CODES.

4.7.1.5.1.3**Hybrid Systems****R&F**

Hybrid systems that incorporate SKIMMERS in the overflow gutters to provide for in-POOL surge shall meet all of the requirements specified for each system (*with the exception of the surge or balance tank since the surge capacity requirement will be alternately met by the in-POOL surge capacity*).

4.7.1.5.1.3.1 Surge Weirs R&F

The number of surge weirs shall be based on the individual surge weir capacity and the operational apportionment of the design recirculation flow rate.

4.7.1.5.1.3.1.1 Locations R&F

The location of the required number of surge weirs shall be uniformly spaced in the gutter sections.

4.7.1.5.1.4 Design Capacity R&F

The SKIMMER SYSTEM, when used, shall be designed to handle up to 100% of the total recirculation flow rate chosen by the designer.

4.7.1.5.1.5 Pool Width Limitations R&F

POOLS using SKIMMERS shall not exceed 30 feet (9.1 m) in width.

4.7.1.5.2 Skimmer Location R&F

4.7.1.5.2.1 Effective R&F

SKIMMERS shall be so located as to provide effective skimming of the entire water surface.

4.7.1.5.2.2 Steps and Recessed areas R&F

SKIMMERS shall be located so as not to be affected by restricted flow in areas such as near steps and within small recesses.

4.7.1.5.2.3 Wind Direction R&F

Wind direction shall be considered in number and placement of SKIMMERS.

4.7.1.5.3 Skimmer Flow Rate R&F

4.7.1.5.3.1 NSF 50 R&F

The flow rate for the SKIMMERS shall comply with manufacturer data plates or NSF/ANSI 50 including Annex K.

4.7.1.5.4 Control R&F

4.7.1.5.4.1 Weir R&F

Each SKIMMER shall have a weir that adjusts automatically to variations in water level over a minimum range of 4 inches (10 cm).

4.7.1.5.4.2 Trimmer Valve R&F

Each SKIMMER shall be equipped with a trimmer valve capable of distributing the total flow between individual SKIMMERS.

4.7.1.5.5 Tolerances R&F

4.7.1.5.5.1 Skimmer Base R&F

The base of each SKIMMER shall be level with all other SKIMMERS in the POOL within a tolerance of plus or minus ¼ inch (6 mm).

4.7.1.5.6 Testing R&F

4.7.1.5.6.1 Flotation Tests R&F

Flotation tests should be performed annually to ensure effective skimming and proper adjustment of flow distribution between SKIMMERS.

4.7.1.6 Submerged Suction Outlet R&F

4.7.1.6.1 General R&F

4.7.1.6.1.1 Conform R&F

Submerged suction outlets, including sumps and covers, shall conform to the requirements of ANSI/APSP-16 2011.

4.7.1.6.2 Number and Spacing R&F

4.7.1.6.2.1 Hydraulically Balanced R&F

A minimum of two HYDRAULICALLY BALANCED filtration system outlets are required in the bottom.

4.7.1.6.2.1.1 Located on the Bottom R&F

One of the outlets may be located on the bottom of a side/end wall at the deepest level

4.7.1.6.2.1.2 Connected R&F

The outlets shall be connected to a single main suction pipe by branch lines.

4.7.1.6.2.1.3 Valved R&F

The branch lines shall not be valved so as to be capable of operating independently.

4.7.1.6.2.2 Spaced R&F

Outlets shall be equally spaced from the POOL side walls.

4.7.1.6.2.3 Located R&F

Outlets shall be located no less than 3 feet (91 cm) apart, measuring between the centerlines of the suction outlet covers.

4.7.1.6.3 Tank Connection R&F

4.7.1.6.3.1**Gravity Drains****R&F**

Where gravity outlets are used, the main drain outlet shall be connected to a surge tank, collection tank, or balance tank/pipe.

4.7.1.6.4**Flow Distribution and Control****R&F****4.7.1.6.4.1****Design Capacity****R&F**

The main drain system shall be designed at a minimum to handle recirculation flow of 100% of total design recirculation flow rate. The branch pipe from each main drain outlet shall be designed to carry 100% of the recirculation flow rate.

4.7.1.6.4.1**Three or More Drains****R&F**

Where 3 or more main drain outlets are connected by branch piping in accordance with MAHC Section 4.7.1.6.2.1.1 through 4.7.1.6.2.1.3, the design flow through each drain outlet may be as follows;

- 1) Q_{\max} for each drain = $Q(\text{total recirculation rate}) / (\text{number of drains less one})$
- 2) $Q_{\max} = Q_{\text{total}} / (N - 1)$

4.7.1.6.4.2**Proportioning Valve****R&F**

The single main drain suction pipe to the pump shall be equipped with a proportioning valve(s) to adjust the flow distribution between the main drain piping and the surface overflow system piping.

4.7.1.6.5**Flow Velocities****R&F****4.7.1.6.5.1****Standards****R&F**

Flow velocities shall meet ANSI/APSP-16 2011 based on 100% design flow through each main drain cover.

4.7.1.7**Piping****R&F****4.7.1.7.1****Design****R&F****4.7.1.7.1.1****Materials****R&F**

Piping system components in contact with swimming POOL water shall be of non-toxic material, resistant to corrosion, able to withstand operating pressures, chemicals, and temperatures.

4.7.1.7.1.2**Standards****R&F**

Piping and piping system component materials shall be suitable for potable water contact and shall meet NSF/ANSI STANDARD 61 and NSF/ANSI STANDARD 14 as applicable.

4.7.1.7.1.2.1**Certified****R&F**

Piping and piping system component materials shall be certified by an ANSI-accredited certification organization.

4.7.1.7.2 Velocity in Pipes R&F

4.7.1.7.2.1 Discharge Piping R&F

RECIRCULATION SYSTEM piping shall be designed so that water velocities do not exceed 8 feet (2.4 m) per second on the discharge side of the recirculation pump unless alternative values have proper engineering justification.

4.7.1.7.2.2 Suction Piping R&F

Suction piping shall be sized so that the water velocity does not exceed 6 ft/s.

4.7.1.7.2.3 Additional Considerations R&F

Gravity piping shall be sized with consideration of available system head or as demonstrated by detailed hydraulic calculations at the design recirculation flow rate.

4.7.1.7.3 Drainage and Installation R&F

4.7.1.7.3.1 Temperature Variations R&F

Provisions shall be made for expansion and contraction of pipes due to temperature variations.

4.7.1.7.3.2 Drainage R&F

Provisions shall be made for complete drainage of all POOL piping for winterization.

4.7.1.7.3.3 Supported R&F

All piping shall be supported continuously or at sufficiently close intervals to prevent sagging and settlement.

4.7.1.7.4 Piping and Component Identification R&F

4.7.1.7.4.1 Clearly Marked R&F

All exposed piping shall be clearly marked to indicate function.

4.7.1.7.4.2 Flow Direction and Source R&F

All piping shall be clearly marked to indicate type or source of water and direction of flow with clear labeling and/or color coding.

4.7.1.7.4.3 Valves R&F

All valves shall be clearly marked to indicate function with clear labeling and/or color coding.

4.7.1.7.4.4 Schematic Displayed R&F

A complete easily readable schematic of the entire POOL RECIRCULATION SYSTEM shall be openly displayed in the mechanical room or available to maintenance and inspection personnel.

4.7.1.7.5 Testing R&F

4.7.1.7.5.1 Static Water Pressure Test R&F

Suction and supply POOL piping shall be subjected to a static hydraulic water pressure test for the duration specified by the design engineer and/or AHJ.

4.7.1.7.5.2 Greater R&F

New and renovated suction and supply POOL piping shall be able to maintain the greater of the two following amounts of pressure:

- 1) 25% greater than the maximum design operating pressure of the system, or
- 2) 25 psi (172 KPa).

4.7.1.8 Strainers and Pumps R&F

4.7.1.8.1 Strainers R&F

4.7.1.8.1.1 Strainer / Screen R&F

All filter recirculation pumps, except those for vacuum filter installations, shall have a strainer/screen device on the suction side to protect the filtration and pumping equipment.

4.7.1.8.1.2 Materials R&F

All material used in the construction of strainers and screens shall be:

- 1) Nontoxic, impervious, and enduring,
- 2) Able to withstand design stresses, and
- 3) Designed to minimize friction losses

4.7.1.8.2 Pumping Equipment R&F

4.7.1.8.2.1 Variable Frequency Drives R&F

Variable frequency drives (VFDs) may be installed to control all recirculation and feature pumps.

4.7.1.8.2.2 Total Dynamic Head R&F

The recirculation pump(s) shall have adequate capacity to meet the recirculation flow design requirements in accordance with the maximum total dynamic head required by the entire RECIRCULATION SYSTEM under the most extreme operating conditions (e.g., clogged filters in need of backwashing).

4.7.1.8.2.3 Required Flow Rate R&F

The pump shall be designed to maintain design recirculation flows under all conditions.

4.7.1.8.2.4 Vacuum Limit Switches R&F

Where vacuum filters are used, a vacuum limit switch shall be provided on the pump suction line.

4.7.1.8.2.5 Maximum R&F

The vacuum limit switch shall be set for a maximum vacuum of 18 inches (46 cm) of mercury.

4.7.1.8.2.6 Pump Priming R&F

All recirculation pumps shall be self-priming or flooded-suction.

4.7.1.8.2.7 NPSH Requirement R&F

All recirculation pumps shall meet the minimum NPSH requirement.

4.7.1.8.3 Operating Gauges R&F

4.7.1.8.3.1 Vacuum Gauge R&F

A compound vacuum-pressure gauge shall be installed on the pump suction line as close to the pump as possible.

4.7.1.8.3.2 Suction Lift R&F

A vacuum gauge shall be used for pumps with suction lift.

4.7.1.8.3.3 Installed R&F

A pressure gauge shall be installed on the pump discharge line adjacent to the pump.

4.7.1.8.3.4 Easily Read R&F

Gauges shall be installed so they can be easily read.

4.7.1.8.3.5 Valves R&F

All gauges shall be equipped with valves to allow for servicing under operating conditions.

4.7.1.9 Flow Measure and Control R&F

4.7.1.9.1 Flow Meters R&F

A flow meter accurate to within +/- 5% of the actual design flow shall be provided for each filtration system.

4.7.1.9.1.1 Certified R&F

Flow meters shall be certified in accordance with NSF/ANSI Standard 50.

4.7.1.9.2 Valves R&F

All pumps shall be installed with a manual adjustable discharge valve to provide a backup means of flow control as well as for system ISOLATION.

4.7.1.10 Flow Rates / Turnover Times

R&F

4.7.1.10.1 Maximum Allowable

R&F

All AQUATIC VENUES shall comply with the following maximum allowable TURNOVER times show in MAHC Table 4.7.1.10: "Maximum Allowable Turnover Times."

4.7.1.10.2 Calculated

R&F

The TURNOVER time shall be calculated based on the total volume of water divided by the flow rate through the filtration process.

4.7.1.10.2.1 Unfiltered Water

R&F

Unfiltered water shall not factor into TURNOVER time.

DRAFT

Table 4.7.1.10: Aquatic Venue Maximum Allowable Turnover Times R&F

Type of Aquatic Venue	Turnover Maximum	States with these Values in their Codes
Activity Pools	2 hours or less	FL, WI
Diving Pools	8 hours or less	IL,KY,MS,OR, UT, MD, MO-KC,
Interactive Play*	0.5 hours or less	WI, MT, OH, AL-Baldwin, GA, MO-STL, , NE
Lazy River	2 hours or less	MT, IL, IA, WI, MI
Plunge Pools	1 hour or less	IA, MA, MI, MT, NE, NH, WI, AL-Baldwin, OR, SC, TN
Runout Slide	1 hour or less	IA, UT, TN, SC, WI, NE, GA-Fulton, DE
Wading Pools*	1 hour or less	CO, GA, IN, IA, MI,MT,NH, OR, SC, TN, WA, FL, DE, MO-St. Charles, NE, TX, UT
Wave Pools	2 hours or less	IN, IA, SD, WI, AL-Baldwin, MT, NY, SD
All Other Pools	6 hours or less	MOST

*Shall have secondary disinfection systems

Spa, Therapy*, Exercise Pools (from WI, SC similar)		
Temperatures	Load (gals/person)	Turnover Maximum
≤ 72-93 °F	> 2500	4 hours or less
≤ 72-93 °F	> 450	2 hours or less
≤ 72-93 °F	≤ 450	1 hour or less
≤ 93-104 °F	All	0.5 hours or less

*Shall have secondary disinfection systems

4.7.1.10.3 Turnover Variance

R&F

The AHJ may grant a TURNOVER time variance for AQUATIC VENUES with extreme volume or operating conditions based on proper engineering justification.

4.7.1.10.4 Turnover Times

R&F

TURNOVER times shall be calculated based solely on the flow rate through the filtration system.

4.7.1.10.4.1 Required

R&F

The required TURNOVER time shall be the lesser of the following options:

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- 1) the specified time in MAHC Table 4.7.1.10, or
- 2) the time required for individual components (e.g., 3 SKIMMERS with flow rates set by the manufacturer and an additional 20% for the main drains could exceed the minimum value in the table).

4.7.1.10.4.2 Total Volume R&F

The total volume of the POOL system shall include the POOL and any surge/balance tank.

4.7.1.10.4.3 Supply Water R&F

Supply water to attractions (e.g., slides, LAZY RIVERS, and tube rides) may be reused prior to filtration provided the DISINFECTANT and pH levels of the supply water are maintained at required levels.

4.7.1.10.5 Secondary Disinfection R&F

SECONDARY DISINFECTION SYSTEMS (e.g. UV or Ozone) for INTERACTIVE WATER PLAY VENUES shall be installed on the total recirculation flow.

4.7.1.10.5.1 Reuse Ratio R&F

The ratio of INTERACTIVE WATER PLAY FEATURE water to filtered water shall be no greater than 3:1 in order to maintain the efficiency of the FILTRATION SYSTEM.

4.7.1.10.6 Flow Turndown System R&F

For AQUATIC FACILITIES that intend to reduce the recirculation flow rate below the minimum required design values when the POOL is unoccupied, the flow turndown system shall be designed as follows in MAHC Section 4.7.1.10.6.1 to 4.7.1.10.6.7.

4.7.1.10.6.1 Flowrate R&F

The system flowrate shall not be reduced more than 25% lower than the minimum design requirements and only reduced when the POOL is unoccupied.

4.7.1.10.6.1 Clarity R&F

The system flowrate shall be based on ensuring the minimum clarity required under MAHC 5.7.4.5 is met before opening to the public.

4.7.1.10.6.1 Disinfectant Levels R&F

The turndown system shall be required to maintain required DISINFECTANT and pH levels at all times.

4.7.1.10.6.2 Increase R&F

When the turndown system is also used to intelligently increase the recirculation flow rate above the minimum requirement (e.g., in times of peak use to maintain water quality goals more effectively), the following requirements shall be met at all times:

- 1) Velocity requirements inside of pipes (per MAHC Section 4.7.1.7.2), and
- 2) Maximum filtration system flows.

4.7.2 Filtration

4.7.2.1 All Filters

R&F

4.7.2.1.1 Required

R&F

Filtration shall be required for all AQUATIC VENUES that recirculate water.

4.7.2.2 Granular Media Filters

R&F

4.7.2.2.1 General

R&F

4.7.2.2.1.1 Valves and Piping

R&F

The granular media filter system shall have valves and piping to allow ISOLATION, venting, complete drainage (for maintenance or inspections), and backwashing of individual filters.

4.7.2.2.1.2 Influent Pressure Gauge

R&F

Filtration accessories shall include the following items:

- 1) Influent pressure gauge,
- 2) Effluent pressure gauge or other means to view backwash water clarity,
- 3) Backwash sight glass, and
- 4) Manual air relief system.

4.7.2.2.1.3 Listed

R&F

All filters shall be certified to NSF/ANSI 50 by an ANSI-accredited certification organization.

4.7.2.2.2 Filter Location and Spacing

R&F

4.7.2.2.2.1 Installed

R&F

Filters shall be installed with adequate clearance and facilities for ready and safe inspection, maintenance, disassembly, and repair.

4.7.2.2.2.2 Media Removal

R&F

A means and access for easy removal of filter media shall be required.

4.7.2.2.3 Filtration and Backwashing Rates

R&F

4.7.2.2.3.1 Operate

R&F

High-rate granular media filters shall be designed to operate at no more than 15 gpm/ft² (29.3 m/h) when a minimum bed depth of 15 inches (38 cm) is provided per manufacturer.

4.7.2.1.3.1.1

Less than 15 Inch Bed Depth

R&F

When a bed depth is less than 15 inches (38 cm), filters shall be designed to operate at no more than 12 gpm/ft² (29.3 m/h).

4.7.2.2.3.2 Backwash R&F

The granular media filter system shall be designed to backwash each filter at a rate of at least 15 gallons per minute per square foot (36.7 m/h) of filter bed surface area, unless explicitly prohibited by the filter manufacturer and/or approved at an alternate rate as specified in the NSF/ANSI 50 listing.

4.7.2.2.4 Filter Media Depth Requirements R&F

4.7.2.2.4.1 Minimum R&F

The minimum depth of filter media cannot be less than the depth specified by the manufacturer.

4.7.2.2.5 Differential Pressure Measurement R&F

4.7.2.2.5.1 Gauges R&F

Influent and effluent pressure gauges shall have the capability to measure up to a 20 psi (138 KPa) increase in the differential pressure across the filter bed in increments of 1 psi (6.9 KPa) or less.

4.7.2.2.6 Coagulant Injection Equipment R&F

4.7.2.2.6.1 Installed R&F

If coagulant feed systems are used, they shall be installed with the injection point located before the filters and for pressure filters, on the suction side of the recirculation pump(s) with electrical interlocks in accordance with MAHC Section 4.7.3.2.1.3.

4.7.2.3 Precoat Filters R&F

4.7.2.3.1 General R&F

4.7.2.3.1.1 Listed R&F

All precoat, filters (i.e., pressure and vacuum) shall be certified to NSF/ANSI 50 by an ANSI-accredited certification organization.

4.7.2.3.1.2 Appropriate Media R&F

Filters should be used with the appropriate filter media as recommended by the filter manufacturer for maximum clarity and cycle length for AQUATIC VENUE use.

4.7.2.3.1.2.1 Certified and Sized R&F

Filter media shall be certified to NSF/ANSI Standard 50 by an ANSI-accredited certification organization and within the size specifications provided by the filter manufacturer and NSF/ANSI 50.

4.7.2.3.1.2.2 Alternate Types R&F

Alternate types of filter media shall be permitted in accordance with the filter manufacturer's recommendation for AQUATIC VENUE use.

4.7.2.3.1.2.3**NSF Standard****R&F**

Alternate types of filter media shall be in accordance with NSF STANDARD 50.

4.7.2.3.2 Filtration Rates**R&F****4.7.2.3.2.1 Vacuum Precoat****R&F**

The design filtration rate for vacuum precoat filters shall not be greater than either:

- 1) 2.0 gallons per minute per square foot (4.9 m/h), or
- 2) 2.5 gpm/sf (6.1m/h) when used with a continuous precoat media feed (commonly referred to as "body-feed").

4.7.2.3.2.2 Pressure Precoat**R&F**

The design filtration rate for pressure precoat filters shall not be greater than 2.0 gallons per minute per square foot (4.9 m/h) of effective filter surface area.

4.7.2.3.2.3 Calculate**R&F**

The filtration surface area shall be calculated as the measured surface area of the septum plus 1/8 inch layer of precoat media.

4.7.2.3.3 Precoat Media Introduction System**R&F****4.7.2.3.3.1 Precoat Process****R&F**

The precoat process shall follow the manufacturer's recommendations and requirements of NSF/ANSI Standard 50.

4.7.2.3.4 Continuous Filter Media Feed Equipment**R&F****4.7.2.3.4.1 Manufacturer Specification****R&F**

If equipment is provided for the continuous feeding of filter media to the filter influent, the equipment shall be used in accordance with the manufacturer's specifications.

4.7.2.3.4.2 Filter Media Discharge**R&F**

All discharged filter media shall be handled in accordance with local and state laws, rules, and regulations.

4.7.2.4 Cartridge Filters**R&F****4.7.2.4.1 Listed****R&F**

Cartridge filters shall be installed in accordance with the filter manufacturer's recommendations and certified to NSF/ANSI 50 by an ANSI-accredited certification organization.

4.7.2.4.2 Filtration Rates R&F

The design filtration rate for surface-type cartridge filter shall not exceed 0.30 gallons per minute per square foot (0.20 L/s/m²).

4.7.2.4.3 Elements R&F

Filter cartridges shall be supplied and sized in accordance with the filter manufacturer's recommendation for AQUATIC VENUE use.

4.7.2.4.4 Spare Cartridge R&F

One complete set of spare cartridges shall be maintained on site in a clean and dry condition.

4.7.3 Disinfection and pH control**4.7.3.1 Chemical Addition Methods R&F****4.7.3.1.1 Disinfection and pH R&F**

DISINFECTION and pH control chemicals shall be automatically introduced through the RECIRCULATION SYSTEM.

4.7.3.1.1.1 Controller Used R&F

A chemical controller, as specified in MAHC Section 4.7.3.2.10 shall be provided and used for MONITORING and control of disinfectant and pH feed equipment.

4.7.3.1.1.2 Feeder R&F

DISINFECTION and pH control chemicals shall be added using a feeder that meets the requirements outlined in MAHC Section 4.7.3.2.

4.7.3.2 Feed Equipment R&F**4.7.3.2.1 General R&F****4.7.3.2.1.1 Feeders & Devices R&F**

The POOL shall be equipped with chemical feed equipment such as flow-through chemical feeders, electrolytic chemical generators, mechanical chemical feeders, chemical feed pumps, and AUTOMATED CONTROLLERS that is tested and certified by an ANSI-accredited certification organization in conformance with NSF.ANSI 50.

4.7.3.2.1.2 Maintained R&F

All chemical feed equipment shall be maintained in good working condition.

4.7.3.2.1.3 Controls and No or Low Flow Deactivation R&F

All chemical feeders shall be provided with an automatic means to be disabled through an electrical interlock with at least two of the following:

- 1) Recirculation Pump Power,

- 2) Flow Meter/Flow switch in the return line,
- 3) Chemical Control Power and Paddle Wheel or Flow Cell on the chemical controller.

4.7.3.2.1.4 Installation R&F

The chemical feeders shall be installed according to the manufacturer's instructions.

4.7.3.2.1.4.1 Protective Cover R&F

A physical BARRIER shall be installed between chemical feed pumps supplying acid or liquid hypochlorite solution and other POOL components to shield staff and equipment from chemical sprays from leaking connections.

4.7.3.2.2 Sizing of Disinfection Equipment R&F

4.7.3.2.2.1 Sizing R&F

Feeders shall be capable of supplying disinfectant and pH control chemicals to the AQUATIC VENUE to maintain the minimum required DISINFECTION levels at all times in accordance with the MAHC.

4.7.3.2.2.2 Chlorine Dosing R&F

All CHLORINE dosing and generating equipment including erosion feeders, or in line electrolytic and brine/batch generators, shall be designed with a capacity to provide the following:

- 1) Outdoor AQUATIC VENUES (unstabilized): 4.0 lbs of FAC/day/10,000 gals. of POOL water;
- 2) Indoor AQUATIC VENUES: 2.5 lbs FAC/day/10,000 gals. of POOL water.

4.7.3.2.2.3 Rates R&F

The rates above are suggested minimums and in all cases the engineer shall validate the feed and production equipment specified.

4.7.3.2.3 Introduction of Chemicals R&F

4.7.3.2.3.1 Separation R&F

The injection point of disinfection chemicals shall be located before any pH control chemical injection point with sufficient physical separation of the injection points to reduce the likelihood of mixing of these chemicals in the piping during periods of interruption of recirculation system flow.

4.7.3.2.3.2 Backflow R&F

Means of injection shall not allow BACKFLOW into the chemical system from the POOL system.

4.7.3.2.3.3 Coagulants R&F

Coagulants shall be metered and injected through a pump system prior to the filters per the manufacturer's recommended rate

4.7.3.2.4 Compressed Chlorine Gas R&F

4.7.3.2.4.1 Prohibited R&F

Use of compressed CHLORINE gas shall be prohibited for new construction and after SUBSTANTIAL ALTERATION to existing AQUATIC FACILITIES.

4.7.3.2.5 Types of Feeders R&F

4.7.3.2.5.1 Liquid Solution Feeders R&F

Liquid solution feeders shall include positive displacement pumps such as peristaltic pumps, diaphragm pumps, and piston pumps.

4.7.3.2.5.1.1 Feed Rates R&F

Feed rates shall be locally adjusted on the pumps and also on/off controlled using chemical controllers.

4.7.3.2.5.2 Erosion R&F

Erosion feeders may be pressure, pressure differential, or spray erosion types.

4.7.3.2.5.2.1 Dry Chemical Feeders R&F

Dry chemicals shall be granules or tablets.

4.7.3.2.5.2.2 Located R&F

Feeders shall have ISOLATION valves on each side of the feeder to be closed before opening the unit.

4.7.3.2.5.2.3 Source Water R&F

Erosion feeders shall use AQUATIC VENUE water post-filtration as the source water unless approved by feeder manufacturer.

4.7.3.2.5.3 Gas Feed Systems R&F

Carbon dioxide and ozone are the only gas feed systems permitted in AQUATIC FACILITIES.

4.7.3.2.5.4 Ventilation R&F

Proper ventilation shall be required for all gas systems.

4.7.3.2.5.5 Alarms R&F

Where CO₂ cylinders are located indoors, a monitor and alarm shall be provided to alert PATRONS/operator of high CO₂ and/or low O₂ levels.

4.7.3.2.5.6 UV Systems R&F

Where used, ultraviolet light (UV) systems shall be installed in the RECIRCULATION SYSTEM after the filters .

4.7.3.2.5.6.1**Bypass****R&F**

A bypass pipe that is valved on both ends shall be installed to allow maintenance on the UV unit while the POOL is in operation.

4.7.3.2.5.6.2**Interlock****R&F**

UV system operation shall be interlocked with the recirculation pump so that power to the UV system is interrupted when there is no water flow to the UV unit.

4.7.3.2.5.6.3**Strainer****R&F**

An inline strainer shall be installed after the UV unit to capture broken lamp glass or sleeves.

4.7.3.2.6 Salt Electrolytic Chlorine Generators, Brine Electrolytic Chlorine or Bromine Generators **R&F**

4.7.3.2.6.1**Salt Electrolytic Chlorine Generators****R&F**

In-line generator(s) or brine (batch) generator(s) shall be permitted on AQUATIC VENUES.

4.7.3.2.6.2**In-line Method****R&F**

In-line generators shall use POOL-grade salt dosed through an electrolytic chamber into the POOL to introduce CHLORINE into the POOL vessel.

4.7.3.2.6.3**Batch method****R&F**

Brine (Batch) generators shall produce CHLORINE through an electrolytic cell.

4.7.3.2.6.3.1**Chlorine Production****R&F**

CHLORINE shall be produced from brines composed of POOL-grade salt.

4.7.3.2.6.4**TDS Readout****R&F**

Electrolytic generators shall have a TDS or salt (NaCl) readout and a low salt indicator.

4.7.3.2.6.5**Feed Rate****R&F**

The feed rate shall be adjustable from zero (0) to full range.

4.7.3.2.6.6**Capacity****R&F**

The generator(s) shall be capable of providing a CHLORINE dosage equivalent to 100% of the total daily facility requirement.

4.7.3.2.6.7**UL Certified****R&F**

The generator unit shall be UL listed and third party certified in accordance with UL 1081 (for electrical/fire/shock SAFETY).

4.0	Design and Construction	CODE
	132	
4.7.3.2.6.8	Interlock	R&F
The generator(s) shall be interlocked per MAHC Section 4.7.3.2.1.3.		
4.7.3.2.6.9	Installed	R&F
The generator units shall be installed according to the manufacturer's instructions.		
4.7.3.2.6.9.1	Saline Content	R&F
The saline content of the POOL water shall be maintained in the required range specified by the manufacturer.		
4.7.3.2.7	Feeders for pH Adjustment	R&F
4.7.3.2.7.1	Provided	R&F
Feeders for pH adjustment shall be provided on all AQUATIC VENUES.		
4.7.3.2.7.2	Approved Substances	R&F
Approved substances for pH adjustment shall be muriatic (hydrochloric) acid, sodium bisulfate, carbon dioxide, sulfuric acid, sodium bicarbonate, and soda ash.		
4.7.3.2.7.2.1	Prohibited	R&F
Sodium hydroxide use shall be prohibited.		
4.7.3.2.7.3	Positive Displacement	R&F
pH adjustment feeders shall be positive displacement type.		
4.7.3.2.7.4	Adjustable	R&F
pH adjustment feeders shall be adjustable from zero to full range.		
4.7.3.2.7.5	Marked	R&F
Reservoirs shall be clearly marked and labeled with contents.		
4.7.3.2.8	Automated Controllers	R&F
4.7.3.2.8.1	Required	M&T
AUTOMATED CONTROLLERS shall be installed for MONITORING and turning on or off a chemical feeder at all AQUATIC VENUES.		
4.7.3.2.8.1.1	Installed	M&T
AUTOMATED CONTROLLERS shall be required within one year from time of adoption of this CODE.		
4.7.3.2.8.2	NSF Standard	R&F
All automated chemical controllers for pH and disinfectant MONITORING/control shall be certified to NSF/ANSI 50 by an ANSI-accredited certification organization.		

4.7.3.2.8.3 Operation Manuals R&F

Operation manuals or other instructions that give clear directions for cleaning and calibrating AUTOMATED CONTROLLER probes and sensors shall be provided in the same room as the AUTOMATED CONTROLLER.

4.7.3.2.8.4 Interlocked R&F

The AUTOMATED CONTROLLERS shall be interlocked per MAHC Section 4.7.3.2.1.4.

4.7.3.2.8.5 Set Point R&F

A set point shall be used to target the disinfectant level and the pH level

4.7.3.3 Secondary Disinfection Systems

4.7.3.3.1 General Requirements DWQ

4.7.3.3.1.1 ANSI Certified DWQ

SECONDARY DISINFECTION SYSTEMS shall be certified to ANSI/NSF 50 by an ANSI-Accredited third-party testing and certification organization approved by the AHJ.

4.7.3.3.1.2 Required Facilities DWQ

The new construction or SUBSTANTIAL ALTERATION of the following INCREASED RISK AQUATIC VENUES shall be required to use a SECONDARY DISINFECTION SYSTEM after adoption of this CODE:

- 1) AQUATIC VENUES designed primarily for DIAPER-AGED CHILDREN (children <5 years old), such as
 - a. wading POOLS,
 - b. INTERACTIVE WATER PLAY VENUES with no standing water, and
- 2) Therapy POOLS.

4.7.3.3.1.3 Other Aquatic Venues DWQ

Optional SECONDARY DISINFECTION SYSTEMS may be installed on other AQUATIC VENUES not specified in MAHC Section 4.7.3.3.1.2.

4.7.3.3.1.4 Labeled DWQ

If installed and labeled as SECONDARY DISINFECTION SYSTEMS, then they shall conform to all requirements specified under MAHC Section 4.7.3.3.

4.7.3.3.1.5 Conform DWQ

If not labeled as SECONDARY DISINFECTION SYSTEMS, then they shall be labeled as SUPPLEMENTAL TREATMENT SYSTEMS and conform to requirements listed under MAHC Section 4.7.3.4.

4.7.3.3.2 3-log Inactivation and Oocyst Reduction DWQ

4.7.3.3.2.1 3-log Inactivation DWQ

SECONDARY DISINFECTION SYSTEMS shall be designed to achieve a minimum 3-log (99.9%) reduction in the number of infective *Cryptosporidium parvum* OOCYSTS per pass through the SECONDARY DISINFECTION SYSTEM.

4.7.3.3.2.2 Installation DWQ

The SECONDARY DISINFECTION SYSTEM shall be located in the treatment loop (post filtration) and treat a portion (up to 100%) of the recirculation flow prior to return of the water to the AQUATIC VENUE OR AQUATIC FEATURE.

4.7.3.3.2.3 Manufacturer's Instructions DWQ

The SECONDARY DISINFECTION SYSTEM shall be installed according the manufacturer's directions.

4.7.3.3.2.4 Minimum Flow Rate Calculation DWQ

The flow rate (Q) through the SECONDARY DISINFECTION SYSTEM shall be determined based upon the total volume of the AQUATIC VENUE OR AQUATIC FEATURE (V) and a prescribed dilution time (T) for reducing the number of assumed infective *Cryptosporidium* OOCYSTS from an initial total number of 100 million (10^8) OOCYSTS to a concentration of 1 OOCYST/100 ml.

4.7.3.3.2.5 Equation DWQ

Accounting for a 3 log (99.9%) reduction of infective *Cryptosporidium* OOCYST through the SECONDARY DISINFECTION SYSTEM with each pass, the SECONDARY DISINFECTION SYSTEM flow rate (Q) shall be:

$$Q = V \times ((14.8 - \ln(V)) / (60 \times T)), \text{ where:}$$

- Q = SECONDARY DISINFECTION SYSTEM flow rate (gpm)
- V = Total water volume of the AQUATIC VENUE OR AQUATIC FEATURE, including surge tanks, piping, equipment, etc. (gals)
- T = Dilution time (hrs.)

4.7.3.3.2.6 Time for Dilution Reduction DWQ

The dilution time shall be the lesser of 9 hours or 75% of the uninterrupted time an AQUATIC VENUE is closed in a 24 hour period.

4.7.3.3.2.7 Flow Rate Measurements DWQ

Where a SECONDARY DISINFECTION SYSTEM is installed, a means to confirm the required flow rate to maintain a minimum 3 log (99.9%) reduction of infective *Cryptosporidium* OOCYST at the minimum flow rate as prescribed above.

4.7.3.3.2.7.1 Flow Rate Defined DWQ

The flow rate shall be as defined in MAHC Section 4.7.3.3.2.6.

4.7.3.3.3 Ultraviolet Light Systems DWQ

4.7.3.3.3.1 Third Party Validation DWQ

UV equipment shall be third party validated in accordance with the practices outlined in the US EPA Ultraviolet Disinfectant Guidance Manual dated November, 2006, publication number EPA 815-R-06-007.

4.7.3.3.3.1.1 Validation standard DWQ

The US EPA Ultraviolet Disinfectant Guidance Manual shall be considered a recognized national STANDARD in the MAHC.

4.7.3.3.3.2 Suitable for Intended Use DWQ

UV Systems and all materials used therein shall be suitable for their intended use and be installed:

- 1) in accordance with the MAHC,
- 2) as certified by an ANSI-Accredited third-party testing and certification organization, and
- 3) as specified by the manufacturer.

4.7.3.3.3.3 Installation DWQ

The UV equipment shall be installed after the filtration and before addition of primary disinfectant.

4.7.3.3.3.3.1 Labeled DWQ

UV equipment shall be labeled with the following design specifications: maximum flow rate, minimum transmissivity, minimum intensity, minimum dosage, and maximum gallons of water disinfected by the unit.

4.7.3.3.3.3.2 Strainer Installation DWQ

A simple strainer shall be fitted downstream of the UV system to prevent any glass returning to the AQUATIC VENUE in the event of accidental breakage of the quartz sleeve.

4.7.3.3.3.4 Comply with all Codes DWQ

The UV equipment, electrical components, wiring and installation shall comply with all CODES in force where the unit is to be installed.

4.7.3.3.3.5 Electronically Interlocked DWQ

The equipment shall be electrically interlocked with feature pump(s) or automated feature supply valves, such that when the UV equipment fails to produce the required dosage as measured by automated sensor, the water features do not operate.

4.7.3.3.3.5.1 Operation DWQ

UV systems shall not operate if the RECIRCULATION SYSTEM is not operating.

4.7.3.3.3.6 Calibrated UV Sensors DWQ

The UV equipment shall be complete with calibrated UV sensors, which record the output of all the UV lamps installed in a system.

4.7.3.3.3.6.1 Multiple Lamps DWQ

Where multiple lamps are fitted, sufficient sensors shall be provided to measure each lamp.

4.7.3.3.3.6.2 Fewer Sensors DWQ

If the design utilizes fewer sensors than lamps, the location of lamps and sensors shall be such that the output of all lamps is adequately measured.

4.7.3.3.3.7 Equipment Audit DWQ

In order to ensure that equipment supplied meets all the requirements of the STANDARD the manufacturer shall maintain a quality assurance system audited on a regular basis to a recognized quality STANDARD.

4.7.3.3.3.7.1 Accreditation DWQ

An ISO9000:2000 accreditation or listings of NSF Standard 50 are both acceptable methods of meeting this equipment requirement.

4.7.3.3.3.8 Automated Shut Down DWQ

The automated shut down of the UV equipment for any reason shall initiate a visual alarm or other indication which will alert staff on-site or remotely.

4.7.3.3.3.8.1 Signage DWQ

Signage instructing staff or PATRONS to notify facility management shall be posted adjacent to the visual indication.

4.7.3.3.3.8.2 Not Staffed DWQ

If the AQUATIC FACILITY is not staffed, the sign shall include a means to contact management whenever the AQUATIC FACILITY is in use.

4.7.3.3.3.9 Reports and Documentation DWQ

The UV equipment shall be supplied with the appropriate validation reports and documentation for that equipment model.

4.7.3.3.3.10 Manufacturer 3-log Inactivation Chart DWQ

This documentation will include a graph or chart indicating the dose at which a 3-log inactivation is guaranteed for the system in question.

4.7.3.3.3.10.1 RED Bias DWQ

This dose shall be inclusive of validation factors and REDUCTION EQUIVALENT DOSE (RED) BIAS.

4.7.3.3.3.10.2 System Performance Curves DWQ

System performance curves that do not include such factors are not considered validated systems.

4.7.3.3.3.11 Minimum RED DWQ

Validation records shall include the graph indicating the minimum intensity reading required at the operational flow for the minimum RED required to achieve 3-log reduction.

4.7.3.3.3.11.1 Minimum Intensity Shown DWQ

Where systems are validated to a specific dose, the graph shall show the minimum intensity reading required at the operational flow for that dose.

4.7.3.3.3.12 Recommended Validation Protocol DWQ

Based on the recommended validation protocol presented in the US EPA Disinfection Guidance Manual, UV reactors certified by ÖNORM and DVGW for a *Bacillus subtilis* RED of 40mJ/cm² shall be granted 3-log *Cryptosporidium* and 3-log *Giardia* inactivation credit as required in this CODE.

4.7.3.3.4 Ozone Disinfection DWQ

4.7.3.3.4.1 3-log Inactivation DWQ

SECONDARY DISINFECTION SYSTEMS using ozone shall provide the required inactivation of *Cryptosporidium* in the full flow of the SECONDARY DISINFECTION SYSTEM after any side-stream has remixed into the full flow of the SECONDARY DISINFECTION SYSTEM.

4.7.3.3.4.2 Third Party Validation DWQ

Ozone systems must be validated by an ANSI-accredited third party testing and certification organization to confirm that they provide a minimum 3 log (99.9%) inactivation of *Cryptosporidium* in the full SECONDARY DISINFECTION SYSTEM flow after any side-stream has remixed into the full SECONDARY DISINFECTION SYSTEM flow and prior to return of the water to the AQUATIC VENUE OR AQUATIC FEATURE recirculation treatment loop.

4.7.3.3.4.3 Suitable for Use DWQ

Ozone systems and all materials used therein shall be suitable for their intended use, and shall be installed:

- 1) in accordance with all applicable requirements,
- 2) as certified by an ANSI-Accredited third-party testing and certification organization, and
- 3) as specified by the manufacturer.

4.7.3.3.4.4 Ozone System Components DWQ

An ozone system shall be a complete system consisting of the following (either skid-mounted or components):

- 1) Ozone generator
- 2) Injector / injector manifold
- 3) Reaction tank (contact tank) / mixing tank / degas tower
- 4) Degas valve (if applicable, to vent un-dissolved gaseous ozone)
- 5) Ozone destruct (to destroy un-dissolved gaseous ozone)
- 6) ORP monitor / controller
- 7) Ambient ozone monitor / controller
- 8) Air flow meter / controller
- 9) Water BACKFLOW prevention device in gas delivery system.

4.7.3.3.4.5 Appropriate Installation DWQ

These components (or skid) shall be installed as specified by the manufacture to maintain the required system validation as noted above.

4.7.3.3.4.6 ORP Monitor DWQ

The ozone generating equipment shall be designed, sized, and controlled utilizing an ORP (OXIDATION reduction potential) monitor / controller (independent of and in addition to any halogen ORP monitor/controller).

4.7.3.3.4.6.1 Placed Downstream DWQ

The device shall be placed in the AQUATIC VENUE and AQUATIC FEATURE recirculation water downstream of the ozone side-stream loop and before the halogen feed location.

4.7.3.3.4.6.2 Minimum ORP Reading DWQ

The minimum ORP reading shall be no less than 600 mV measured directly after (1 to 5 feet) the ozone side-stream remixes into the full flow of the RECIRCULATION SYSTEM.

4.7.3.3.4.6.3 Maximum ORP Reading DWQ

The maximum ORP reading shall be no greater than 900 mV.

4.7.3.3.4.7 Installation and Injection Point DWQ

The ozone system injection point shall be located in the AQUATIC VENUE return line after the filtration and heating equipment, prior to the primary disinfectant injection point.

4.7.3.3.4.7.1 Injection and Mixing DWQ

The injection and mixing system shall not prevent the attainment of the recirculation rate required elsewhere in this CODE.

4.7.3.3.4.7.2 Gas Monitor/ Controller DWQ

An ambient ozone gas monitor/controller shall be utilized to disable the ozone system in the event of an ozone gas leak.

4.7.3.3.4.8 Comply with Uniform Fire Code DWQ

Ozone system installations shall comply with Annex G of the Uniform Fire Code or Section 3705 of the International Fire Code and any other CODES, STANDARDS or requirements as mandated by the AHJ.

4.7.3.3.4.9 Air Space Testing DWQ

At the time the ozone generating equipment is installed, again after 24 hours of operation and annually thereafter, the air space within 6 (six) inches of the AQUATIC VENUE water shall be tested to determine compliance of less than 0.1 PPM (MG/L) gaseous ozone.

4.7.3.3.4.9.1 Results DWQ

Results of the test shall be maintained on site for review by the local enforcing agency.

4.7.3.3.4.10 Automatic Shut Down DWQ

Automatic shutdown shall occur under any condition that would result in the ozone system not operating within the established parameters needed to achieve 3-log inactivation of *Cryptosporidium* (i.e. low feed gas supply, loss of vacuum or pressure, high dew point in feed air, water in ozone gas delivery line).

4.7.3.3.4.10.1 Electrically Interlocked DWQ

The equipment shall be electrically interlocked with AQUATIC FEATURE pump(s) or automated feature supply valves, such that when the ozone equipment fails to produce the required dosage as measured by ORP, the AQUATIC FEATURES do not operate.

4.7.3.3.4.11 ORP Reading Alarm or Visual Indication DWQ

If the ORP reading for the ozone system drops below 600 mV (regardless of the cause) a visual alarm or other indication shall be initiated that will alert staff on-site or remotely.

4.7.3.3.4.11.1 Signage DWQ

Signage to notify facility management shall be present adjacent to the visual alarm.

4.7.3.3.4.12 Regular Audits DWQ

In order to ensure that ozone system supplied meets all the requirements of the STANDARD the manufacturer shall maintain a quality system audited on a regular basis to a recognized quality STANDARD.

4.7.3.3.4.12.1 Listed DWQ

Ozone equipment shall be listed to NSF/ANSI Standard 50.I.

4.7.3.3.4.13 Reports and Documentation DWQ

The ozone system shall be supplied with the appropriate validation reports and documentation for that equipment model.

4.7.3.3.4.13.1 3-log Inactivation Chart DWQ

This will include a graph or chart or other documentation which clearly indicates the required operating parameters for which a 3-log inactivation is guaranteed for the system in question.

4.7.3.3.4.13.2 Inclusive DWQ

This dose shall be inclusive of validation factors.

4.7.3.3.4.13.3 System Performance Curves DWQ

System performance curves that do not include such factors are not considered validated systems.

4.7.3.4 Supplemental Treatment Systems

4.7.3.4.1 General Requirements DWQ

4.7.3.4.1.1 Optional DWQ

AQUATIC VENUES that do not require SECONDARY DISINFECTION SYSTEMS may install SUPPLEMENTAL TREATMENT SYSTEMS for the purpose of enhancing overall system performance and improving water quality.

4.7.3.4.1.2 Not Required DWQ

SUPPLEMENTAL TREATMENT SYSTEMS shall not be required on any AQUATIC VENUES.

4.7.3.4.1.3 Does not meet Secondary Disinfection System Requirements DWQ

It shall be clearly noted in the AQUATIC FACILITY operating instructions that these SUPPLEMENTAL TREATMENT SYSTEMS do not meet the requirements of a SECONDARY DISINFECTION SYSTEM, and as such, are only considered SUPPLEMENTAL TREATMENT SYSTEMS.

4.7.3.4.1.4 No 3-log Inactivation Required DWQ

SUPPLEMENTAL TREATMENT SYSTEMS shall meet all of the requirements of this CODE, except:

- 1) They do not need to achieve a 3-log (99.9%) inactivation of *Cryptosporidium parvum* as required in MAHC Section 4.7.3.3,
- 2) They do not need to be able to reduce the total number of infective OOCYSTS to 1 OOCYST per 100 ml as required in MAHC Section 4.7.3.3, and
- 3) Except as noted in MAHC Sections 4.7.3.4.2 and 4.7.3.4.3 below.

4.7.3.4.1.5 Clearly Labeled DWQ

Each system shall be clearly labeled, "Supplemental Water Treatment System—Does Not meet the requirements for Secondary DISINFECTION."

4.7.3.4.2 Ultraviolet Light DWQ

4.7.3.4.2.1 UV as Supplemental Treatment Requirement DWQ

When UV is used as a SUPPLEMENTAL TREATMENT SYSTEM, all requirements of MAHC Section 4.7.3.3.3.2 thru 4.7.3.3.3.4 shall be met.

4.7.3.4.2.3 Water Features DWQ

Water features do not need to be shut off if the UV system does not produce the required dosage.

4.7.3.4.2.4 Exempt DWQ

The equipment is exempt from the validation requirements of MAHC Section 4.7.3.3.1.1.

4.7.3.4.3 Ozone DWQ

4.7.3.4.3.1 Ozone as Supplemental Treatment Requirement DWQ

When ozone is used as a SUPPLEMENTAL TREATMENT SYSTEM all requirements of MAHC Section 4.7.3.3.4.3 thru 4.7.3.3.4.9 shall be met.

4.7.3.4.4 Copper / Silver Ion Systems DWQ

4.7.3.4.4.1 Only EPA-Registered Disinfectants DWQ

Only those systems that are EPA-REGISTERED for use as disinfectants in AQUATIC VENUES or SPAS in the United States shall be permitted.

4.7.3.4.4.2 Suitable DWQ

Copper/silver systems, and all materials used therein, shall be suitable for their intended use.

4.7.3.4.4.3 Installed DWQ

Copper/silver systems, and all materials used therein, shall be installed in accordance with all applicable requirements and manufacturer's instructions

4.7.3.4.5 Ultraviolet Light / Hydrogen Peroxide Systems DWQ

4.7.3.4.5.1 Prohibited DWQ

Ultraviolet Light / Hydrogen Peroxide combination systems shall be prohibited.

4.7.3.5 Water Quality Testing Devices and Kits

4.7.3.5.1 Compliance

WATER QUALITY TESTING DEVICES and kits shall be certified to NSF/ANSI 50 by an ANSI-accredited certification organization.

4.7.3.5.2 Water Clarity Device M&T

Note: For info regarding water clarity devices, refer to MAHC Section 5.7.6.

4.7.3.6 Microbiological Testing Equipment M&T

4.7.3.6.1 EPA-Approved M&T

Microbiological testing equipment and methods shall be EPA-Approved, EPA-Accepted, EPA-Equivalent, conforming to the latest edition of STANDARD Methods for the

Examination of Water and Wastewater, or certified to NSF/ANSI 50 by an ANSI-accredited certification organization.

4.7.4 Water Replenishment System

4.7.4.1 Pool Wastewater R&F

Waste streams generated by POOLS shall be properly discharged in accordance with MAHC Section 4.11.6.

4.7.4.2 Discharge and Measure R&F

A means of intentionally discharging and measuring the volume of both discharged AQUATIC VENUE water and filter backwash wastewater (or alternate means of achieving the same result) shall be installed.

4.7.4.2.1 Alternate System R&F

An alternate system capable of removing an equivalent amount of small organic compounds and salts shall also be acceptable.

4.7.4.2.1.1 Product Water R&F

If applicable, the return water from the alternate system shall maintain salt and total organic carbon concentrations that are less than or equal to tap water.

4.7.4.2.3 Discharge R&F

This system shall be designed to discharge (or treat and reuse) AQUATIC VENUE water at a rate of up to 4 gallons (15 L) per BATHER per day per AQUATIC VENUE.

4.7.5 Spas

4.7.5.1 General R&F

4.7.5.1.1 Requirements R&F

SPAS shall conform to the design, operation, and maintenance requirement of AQUATIC VENUES except as required below.

4.7.5.2 Flow Rates/Turnover Times R&F

4.7.5.2.1 Maximum Allowable R&F

All SPAS as defined in the MAHC shall be designed to have a maximum allowable TURNOVER time of 0.5 hour or less.

4.7.5.2.2 Turnover Time Variance R&F

The AHJ may grant a TURNOVER time variance for AQUATIC VENUES with extreme volume or operating conditions based on proper engineering justification.

4.7.5.2.3 Turnover Times R&F

TURNOVER times shall be calculated based solely on the flow rate through the filtration system.

4.7.5.3 Filtration System Inlets R&F

4.7.5.3.1 Minimum R&F

SPAS shall have a minimum of two adjustable filter system INLETS spaced at least 3 feet (0.91 m) apart and designed to distribute flow evenly.

4.7.5.4 Jet System Inlets R&F

4.7.5.4.1 Air Flow R&F

Air flow shall be permitted through the jet system and/or when injected post-filtration.

4.7.5.4.2 Skimmer R&F

Submerged suction SKIMMERS shall be allowed provided that the manufacturer's recommendations for use are followed.

4.8 Decks and Equipment

4.8.1 Decks

4.8.1.1 General Standards for All Decks

4.8.1.1.1 Constructed D&C

DECKS shall be constructed in conformance with all applicable provisions of this chapter.

4.8.1.1.2 Lifeguard Placement and Safety Considerations LG

DECKS shall be designed to allow for QUALIFIED LIFEGUARD placement per the zone of PATRON surveillance in MAHC Section 6.3.2.1.1 and SAFETY areas and equipment in MAHC Section 4.6.5.1.

4.8.1.1.2.1 Deck Clearance LG

DECKS shall have a minimum of 4 feet of clearance from AQUATIC VENUE edge to fencing or other obstruction to allow for QUALIFIED LIFEGUARD transit, roaming, or change of positioning to maximize viewing of the zone of PATRON surveillance as well as execution of water extrication.

4.8.1.1.2.2 Access Points LG

Access points shall be provided to QUALIFIED LIFEGUARDS to transit to QUALIFIED LIFEGUARDS positions.

4.8.1.1.2.3 Patron Zone Surveillance LG

The designer and owner shall consider impact on PATRON zone surveillance when determining placement of structural, operational, and theming elements. These elements shall include but are not limited to chairs, fencing, and AQUATIC FEATURES.

4.8.1.1.3 Joints or Gaps **D&C**

Conditions between adjacent DECK materials, components, and concrete pours shall not have open joints or gaps larger than 3/16 inches wide (5 mm), nor a maximum difference in vertical elevation of ¼ inches (6.4 mm).

4.8.1.1.3.1 Vertical Elevation **D&C**

Any change in vertical elevation is considered an edge condition.

4.8.1.1.3.2 Fillers **D&C**

Open joints or gaps larger than 3/16" (5 mm) wide or with vertical elevations exceeding 1/4" (6.5 mm) shall be rectified using appropriate fillers.

4.8.1.1.3.3 Sealants **D&C**

The use of fillers such as caulk or sealant in joints or gaps shall be permitted for expansion and contraction and shall not be in violation of MAHC Section 4.8.1.1.2.

4.8.1.1.4 Rounded edges **D&C**

All DECK edges shall be beveled, rounded, or otherwise relieved to eliminate sharp corners.

4.8.1.1.5 Minimize Cracks **D&C**

Joints in DECKING shall be provided to minimize the potential for CRACKS due to a change in elevation, for movement of the slab and for shrinkage control.

4.8.1.1.6 Concrete Decking **D&C**

Where concrete is used as a DECK material, it shall be installed in accordance with the latest edition of the American Concrete Institute (ACI) Standards and in accordance with local building CODES.

4.8.1.2 Standards for Perimeter Decks **D&C****4.8.1.2.1 Impervious** **D&C**

Finish materials for the PERIMETER DECK shall be suitable for the POOL environment, non-toxic, and substantially impervious.

4.8.1.2.2 Watertight Expansion **D&C**

Continuous watertight EXPANSION JOINT material shall be provided between PERIMETER DECKS and POOL coping.

4.8.1.2.2.1 Expansion Joint **D&C**

Where applicable, the EXPANSION JOINT shall be designed and constructed so as to protect the coping and its mortar bed from damage as a result of movement of adjoining DECK.

4.8.1.2.3 Watertight Expansion **D&C**

All conditions between adjacent concrete PERIMETER DECK pours shall be constructed with watertight EXPANSION JOINTS.

4.8.1.2.3.1 Joint Measurements **D&C**

Joints shall be at least 3/16 inches (5 mm) in continuous width.

4.8.1.2.3.2 Vertical Differential **D&C**

The maximum allowable vertical differential across a joint shall be ¼ inches (6.5 mm).

4.8.1.3 Drains **D&C**

Also refer to MAHC Section 4.11.3.

4.8.1.3.1 Slope **D&C**

DECKS shall be sloped away from the AQUATIC VENUE and in accordance with Table 4.8.1.2 below:

Table 4.8.1.2: Minimum slopes for drainage	
SURFACE	MINIMUM SLOPE*
Smooth finishes; such as tile, hand-finished concrete & lightly-broomed concrete	1/8 inch per foot
Moderately textured finishes; such as exposed aggregate or medium-broomed concrete	1/4 inch per foot
Heavily textured finishes, such as brick	3/8 inch per foot (where permitted)

**Note: Accessibility: Where DECK areas serve as ACCESSIBLE ROUTES or portions thereof, slopes in any direction shall not exceed ADA requirements.*

4.8.1.3.1.1 All Water **D&C**

All water, including water originating in the POOL, that touches areas defined as DECK shall drain effectively to either perimeter areas or to DECK drains.

4.8.1.3.1.2 Remove Wastewater **D&C**

Drainage shall remove POOL water that splashes outside of the AQUATIC VENUE and beyond a POOL gutter system, DECK cleaning water, and rain water without leaving standing water.

4.8.1.3.2 Placement D&C

The placement of DECK drains, where provided, shall effectively carry water away from the AQUATIC VENUE and off of the DECK without ponding.

4.8.1.3.3 Cross Connection Control D&C/RM

There shall be no direct connection between the DECK drains and the sanitary or storm sewer system, or the AQUATIC VENUE gutter or RECIRCULATION SYSTEM. If the AHJ requires an outdoor POOL to have DECK drains that discharge to a storm sewer system, ground surface, or holding pond, they shall be plumbed through an air-gap, BACKFLOW preventer or other approved device as allowed by the AHJ.

4.8.1.3.3.1 No Drain D&C

DECK drains shall not drain to the POOL, POOL gutter, or RECIRCULATION SYSTEMS.

4.8.1.3.4 Drain Bodies D&C

Drain receptacles shall consist of non-CORROSIVE or corrosion-resistant materials.

4.8.1.3.5 Drain Covers D&C

Drain covers shall be suitable for bare foot traffic with openings no greater than one-half inch and easily removable with a simple tool to facilitate regular cleaning.

4.8.1.4 Materials / Slip Resistance D&C**4.8.1.4.1 General D&C**

PERIMETER DECK and POOL DECK shall be constructed with a uniform, and easily cleaned, surface such as concrete.

4.8.1.4.2 Slip Resistance D&C/RM

All DECKS shall have slip-resistant textured finishes, which are not conducive to slipping under contact of bare feet in wet or dry conditions.

4.8.1.4.3 Carpet D&C

Carpet and artificial turf shall be prohibited materials for PERIMETER DECK and POOL DECK.

4.8.1.4.4 Wood D&C

Wood shall be a prohibited material for use as PERIMETER DECK.

4.8.1.4.5 Dry Deck D&C

DRY DECK shall be easily maintained and not create a public health hazard.

4.8.1.4.5.1 Not Required D&C

DRY DECK is not required to be hard-paved or impervious

4.8.1.4.5.2 Wood Decking D&C

Wood DECKING is a permitted material for dry DECK.

4.8.1.4.6 Landscaping

D&C

Loose plant material or bedding is not permitted within PERIMETER DECKS. Stable materials are permitted as allowed by MAHC Section 4.8.1.5.

4.8.1.5 Deck Size / Width

D&C

4.8.1.5.1 Perimeter Deck

D&C

4.8.1.5.1.1 Width

D&C

PERIMETER DECKS shall be 4 feet (1.22 m) minimum in unobstructed width around the POOL perimeter as prescribed in this section.

4.8.1.5.1.1.1 Circulation Path

D&C

PERIMETER DECK may serve as part of the CIRCULATION PATH.

4.8.1.5.1.1.2 Flush with Pool Wall

D&C

PERIMETER DECK areas shall be flush with POOL walls/copings except where special conditions exist, such as elevated beam or parapet, raised transfer walls, or as permitted by other sections of this CODE.

4.8.1.5.1.2 Perimeter Decking

D&C

PERIMETER DECKS shall be provided around 100% of the AQUATIC VENUE perimeter except where special conditions exist as permitted by other sections of this CODE.

4.8.1.5.1.3 Unguarded Aquatic Venues

D&C

For Unguarded POOLS: PERIMETER DECKS shall be provided in compliance with at least one of two options:

- 1) Provide PERIMETER DECK around 100% of the of the POOL perimeter; or
- 2) Provide PERIMETER DECK such that the entire perimeter and depth of the POOL is readily reachable by a pole and hook from the PERIMETER DECK.

4.8.1.5.1.4 Spectator Seating

D&C

For Spectator Seating, refer to MAHC Section 4.6.7 for additional requirements.

4.8.1.5.2 Fixed Equipment

D&C

4.8.1.5.2.1 Unobstructed Deck

D&C

Unobstructed DECK area 4 feet (1.22m) minimum in width shall be provided for access around

- 1) diving equipment,
- 2) special feature stairways (such as a WATERSLIDE),
- 3) lifeguard stands,

- 4) diving boards,
- 5) similar DECK equipment, and
- 6) structural columns.

4.8.1.5.2.2 Circulation Path D&C

This area may overlap the CIRCULATION PATH.

4.8.1.5.2.3 Queuing Space D&C

Where reasonably anticipated, queuing space shall be provided at applicable equipment to minimize encroachment into the CIRCULATION PATH.

4.8.1.5.2.4 Free Space D&C

Free area around equipment may consist of PERIMETER DECK and/or POOL DECK, as applicable.

4.8.1.5.3 Circulation Path D&C

4.8.1.5.3.1 Conformance D&C

A continuous and unobstructed CIRCULATION PATH shall be provided in conformance with ADA requirements for an ACCESSIBLE ROUTE.

4.8.1.5.3.2 Equipment and Furniture D&C

DECK furniture shall not intrude upon the CIRCULATION PATH.

4.8.1.5.3.3 Connect D&C

CIRCULATION PATH(s) shall connect all site amenities, entrances and exits as required by ADA.

4.8.1.5.3.4 Deck Types D&C

CIRCULATION PATHS may consist of any combination of permitted DECK types.

4.8.1.6 Wing Walls or Peninsulas D&C

4.8.1.6.1 No Perimeter Deck D&C

WING WALLS or PENINSULAS less than 18 inches (0.45 m) in width shall not be considered a part of the PERIMETER DECK.

4.8.1.6.1.1 Use by Lifeguards D&C

A WING WALL or PENINSULA greater than 18 inches (0.45 m) wide but less than 48 inches (1.2 m) wide may be used by QUALIFIED LIFEGUARD personnel but shall not be considered as part of the PERIMETER DECK.

4.8.1.6.1.2 Slip Resistant D&C

Any WING WALL or PENINSULA intended to be accessed by QUALIFIED LIFEGUARDS shall be constructed of slip-resistant materials.

4.8.1.6.2 Perimeter Overflow System D&C

WING WALLS or PENINSULAS project into the POOL area and inside the perimeter overflow system.

4.8.1.6.2.1 Impractical D&C

If it is impractical to design a perimeter overflow into the WING WALL or PENINSULA due to width or height, then the overflow system may bypass the WING WALL or PENINSULA.

4.8.1.6.3 Pool Perimeter D&C

WING WALLS and PENINSULAS shall be considered part of the POOL.

4.8.1.6.3.1 Calculating D&C

WING WALLS and PENINSULAS shall not be accounted for in calculating the POOL perimeter.

4.8.1.6.4 Normal Operating Water Level D&C

WING WALLS and PENINSULAS shall be at or above the normal operating water level of the POOL.

4.8.1.6.5 Deck Drainage D&C

DECK drainage is not required for WING WALLS or PENINSULAS as they are considered part of the POOL.

4.8.1.6.5.1 Crowned D&C

The tops shall be crowned to prevent standing water and sloped to the POOL or overflow system.

4.8.1.6.6 Vertical Depth Markers D&C

Vertical depth markers shall be provided around WING WALLS and PENINSULAS in accordance with MAHC Section 4.5.19.

4.8.1.7 Islands D&C

4.8.1.7.1 Minimum Clearance D&C

An ISLAND not more than 18 inches (0.45 m) in width shall be designed to discourage a person from walking on the ISLAND by not providing stairs, ladders, or bridges to the ISLAND.

4.8.1.7.2 Slip Resistant D&C

The surface of ISLANDS intended for foot traffic shall be slip resistant.

4.8.1.7.3 Lifeguards D&C

An ISLAND 18 inches (0.45 m) to 48 inches (1.2 m) wide may be allowed for use only by QUALIFIED LIFEGUARDS.

4.8.1.7.4 Vertical Depth Markers **D&C**

Vertical depth markers shall be provided around ISLANDS in accordance with MAHC Section 4.5.19 and visible from all sides.

4.8.1.7.5 Horizontal Depth Markers **D&C**

Horizontal depth markings and warning signs shall also be required per MAHC Section 4.5.19 if the ISLAND is designed for BATHER use.

4.8.1.7.6 Bridge or Stairway **D&C**

An ISLAND designed for BATHER traffic shall be accessible by bridge, ramp, ladder, or stairway from the POOL.

4.8.1.7.7 Minimum Clearance **D&C**

All bridges SPANNING a POOL or any other structures not intended for interactive play shall have a minimum clearance of 7 feet (2.1 m) from the bottom of the POOL to any structure overhead.

4.8.1.7.8 No Guard Rails **D&C**

Any bridge shall have a minimum 42 inch (1.1 m) high BARRIER on both sides.

4.8.1.8 Heated Decks **D&C**

4.8.1.8.1 Freeze Protection **D&C**

Where heated DECKS are provided for the purpose of freeze protection, the extent of heated area shall minimally include the entire required PERIMETER DECK and required CIRCULATION PATH(s).

4.8.1.8.2 Clearly Delineated **D&C**

Heated DECK paths must be clearly delineated with respect to un-heated DECKS.

4.8.1.9 Hose Bibbs **D&C**

4.8.1.9.1 General **D&C**

Domestic water source points shall be provided in sufficient quantity, spacing and type to easily wash down PERIMETER DECK and POOL DECK areas using a hose of adequate length.

4.8.1.9.2 Backflow Prevention **D&C**

All hose bibbs shall be equipped with BACKFLOW prevention devices.

4.8.2 Diving Boards and Platforms **D&C**

4.8.2.1 Diving Envelope **D&C**

4.8.2.1.1 Conforms **D&C**

Diving boards are permitted only when the diving envelope conforms to the STANDARDS of the certifying agency that regulates diving at the facility. Such certifying agencies include:

- 1) National Collegiate Athletic Association (NCAA),
- 2) the National Federation of State High School Associations (NFSHSA),
- 3) the Federation Internationale de Natation Amateur (FINA), or
- 4) U.S.A. Diving, Inc.

4.8.2.1.2 Non-Competitive Diving

D&C

If the AQUATIC VENUE does not have competitive diving, then the diving envelope must conform to the diving envelope STANDARDS of MAHC Table 4.8.2.2.4.1: Diving Platform Areas, MAHC Figure 4.8.2.2.4.2: Diving Platform Longitudinal Section, and MAHC Figure 4.8.2.2.4.3: Diving Platform Cross Section.

4.8.2.2 Steps and Guardrails

D&C

4.8.2.2.1 Higher than 21 Inches

D&C

Diving stands higher than 21 inches (0.5 m) measured from the DECK to the top of the butt end of the board or platform shall have steps or a ladder and handrails.

4.8.2.2.2 Self-Draining Treads

D&C

Steps or ladder treads shall be self-draining, corrosion resistant, non-slip, and designed to support the maximum expected load.

4.8.2.2.3 Short Platforms

D&C

Diving stands or platforms that are 1 meter (3.38 ft) or higher must be protected with guard rails at least 30 inches (0.76 m) above the board, extending at least to the edge of the water along with intermediate rails.

4.8.2.2.4 Tall Platforms

D&C

Diving stands or platforms that are 2 meters (6.6 ft) or higher must have guard rails with the top rail at least 36 inches (0.9 m) above the board and a second rail approximately half the distance from the platform to the upper rail.

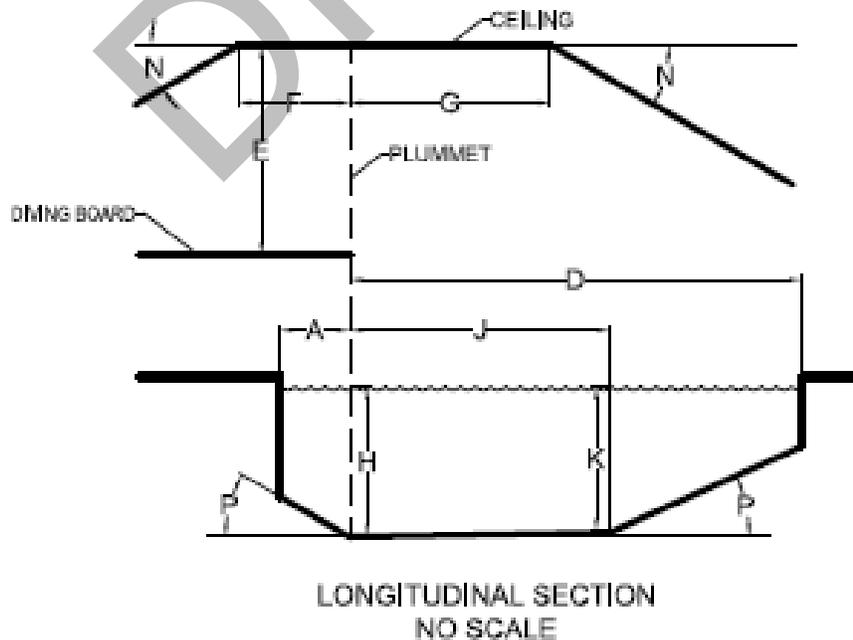
Table 4.8.2.2.4.1: Diving Platform Areas

D&C

PUBLIC SWIMMING POOLS						
Table 1						
Diving Areas						
Letters below refer to Figure 1		Board height-meters	0.5 Meter	0.75 Meter	1.0 Meter	3.0 Meters
		Board height (feet)	1'8"	2'6"	3'4"	9'11"
		Board length (feet)	10'0"	12'0"	16'0"	16'0"
		Board width (feet)	1'8"	1'8"	1'8"	1'8"
		Minimum dimensions in feet				
A	Distance from plummet back to pool wall	3'0"	4'6"	6'0"	6'0"	
B	Distance from plummet to pool wall at side	10'0"	10'0"	10'0"	11'6"	
C	Distance from plummet to adjacent plummet	8'10"	8'10"	8'10"	8'6.5"	
D	Distance from plummet to pool wall ahead	26'0"	27'10"	29'7"	33'8"	
E	Height, board to ceiling at plummet & distances F and G	16'0"	16'0"	16'0"	16'0"	
F	Clear overhead distance behind and each side of plummet	8'0"	8'0"	8'0"	8'0"	
G	Clear overhead distance ahead of plummet	16'0"	16'0"	16'0"	16'0"	
H	Depth of water at plummet	9'6"	10'9"	12'0"	12'6"	
J	Distance ahead of plummet to depth K	12'0"	14'3"	16'6"	19'9"	
K	Depth at distance J ahead of plummet	8'9"	10'0"	11'3.375"	12'2"	
L	Distance at each side of plummet to depth M	8'0"	8'1.5"	8'3"	9'11"	
M	Depth at distance L on each side of plummet	9'1"	10'4"	11'7.5"	12'2"	
N	Maximum slope to reduce height E	30°	30°	30°	30°	
p	Maximum floor slope to reduce depth ahead of K, to the sides of M, or back to pool wall behind H	3:1	3:1	3:1	3:1	

Figure 4.8.2.2.4.2: Diving Platform Longitudinal Section

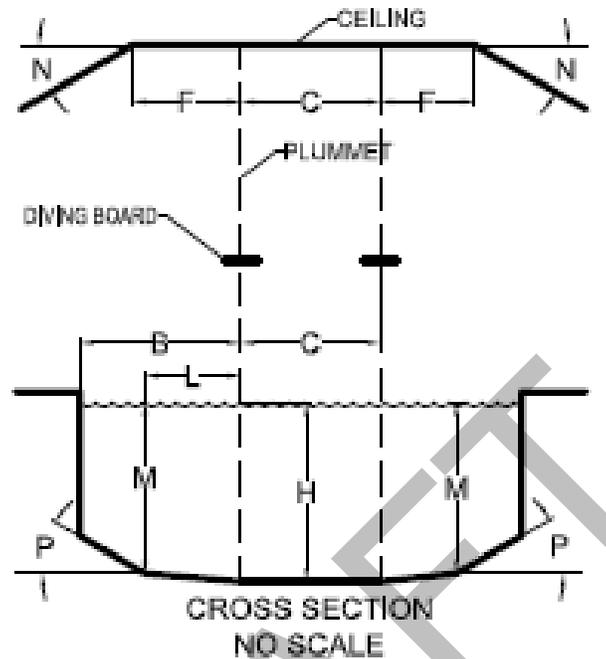
D&C



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Figure 4.8.2.2.4.3: Diving Platform Cross Section

D&C



4.8.3 Starting Platforms

D&C

4.8.3.1 Conform to Standard Codes

D&C

Starting platforms shall be installed and conform to applicable SAFETY STANDARDS established by

- 1) Federation Internationale de Natation (FINA),
- 2) U.S.A. Swimming,
- 3) National Collegiate Athletic Association (NCAA),
- 4) National Federation of State High Schools Associations (NFSHSA),
- 5) YMCA, or
- 6) other sanctioning body.

4.8.3.2 Competitive Training and Competition

D&C

Starting platforms shall only be used for competitive swimming competition and training.

4.8.3.2.1 Supervision

D&C

Starting platforms shall only be used under the direct supervision of a coach or instructor.

4.8.3.2.2 Removed or Restricted

D&C

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Starting platforms shall be removed if possible or prohibited from use during all recreational or non-competitive swimming activity.

4.8.3.3 Minimum Water Depth **D&C**

Starting platforms shall be installed in a minimum water depth of 4 feet (1.2 m).

4.8.3.4 Leading Edge **D&C**

The leading edge of starting platforms shall have a maximum height of 30 inches (0.8 m) above the water surface.

4.8.3.5 Slip Resistant **D&C**

Starting platforms shall have slip resistant tread surfaces

4.8.3.6 Secure and Stable **D&C**

Starting platforms shall be installed and secured per manufacturer's recommendations at all times when in use.

4.8.4 Deck Slides

4.8.5 Lifeguard- and Safety-Related Equipment

4.8.5.1 Safety Equipment Required at all Aquatic Facilities

4.8.5.1.1 Emergency Communication Equipment **RM/LG**

The AQUATIC FACILITY or each AQUATIC VENUE, as necessary, shall have a functional telephone or other communication device that is hard wired and capable of directly dialing 911 or function as the emergency notification system. The telephone or communication system or device shall be conspicuously provided and accessible to AQUATIC VENUE users such that it can be reached immediately

4.8.5.1.1.1 Alternate Communication Systems **LG**

Alternate systems or devices are allowed with approval of the AHJ in situations when a telephone is not logistically sound, and an alternate means of communication is available, which meet the requirements of MAHC Section 5.8.5.2.1.2.

4.8.5.1.1.2 Internal Communication **LG**

The AQUATIC FACILITY design shall include a method for staff to communicate in cases of emergency.

4.8.5.1.1.3 Signage **RM**

A sign shall be posted at the telephone providing dialing instructions, address and location of the AQUATIC VENUE location, and the telephone number.

4.8.5.1.1.4 Replacement Cables **RM**

Replacement communication cables shall not be installed closer than 6 feet (1.8 m) horizontally to the nearest inner edge of a BODY OF WATER.

4.8.5.1.1.4.1**Permanent BARRIER****RM**

Exception (a): A communication cable may be used within 6 feet of the nearest edge of a BODY OF WATER if a permanent floor, wall, ceiling, or roof exists between the BODY OF WATER and any part of the cord that is within 6 feet (1.8 m) of the BODY OF WATER.

4.8.5.1.1.4.2**Enclosed Conduit****RM**

Exception (b): A communication cable may be used within 6 feet (1.8 m) of the nearest edge of a BODY OF WATER where the cable is completely enclosed in rigid conduit, intermediate conduit, or electrical metallic tubing for the entire length that is within 6 feet (1.8 m) horizontally of the nearest inner edge of a BODY OF WATER

.4.8.5.1.2 First Aid Equipment**4.8.5.1.3 Signage****4.8.5.2 Safety Equipment Required at Aquatic Facilities with Lifeguards****4.8.5.2.1 Lifeguard Chair and Stand Placement****LG**

The designer shall consider impact on PATRON zone surveillance for placement of chairs and stands designed to be permanently installed so as to provide an unobstructed view of the PATRON surveillance zones

4.8.5.2.2 Lifeguard Chair and Stand Design**LG**

The chairs/stands must be designed:

- 1) With no sharp edges or protrusions;
- 2) To be made of sturdy, durable, and UV resistant materials;
- 3) Provide enough height to elevate the lifeguard to an eye level above the heads of the BATHERS; and
- 4) Provide safe access and egress for the lifeguard.

4.8.5.2.3 UV Protection for Chairs and Stands**LG**

When provided, permanently installed chairs/stands, where QUALIFIED LIFEGUARDS can be exposed to ultraviolet radiation, shall include protection from such ultraviolet radiation exposure.

4.8.6 Barriers and Enclosures**4.8.6.1 General Requirements****D&C****4.8.6.1.1 Enclosures****D&C**

All AQUATIC FACILITIES, CHEMICAL STORAGE SPACES, and POOL mechanical spaces shall have SECURE PERIMETER ENCLOSURES preventing unauthorized entry.

4.8.6.1.2 Barriers **D&C**

A SECURE PERIMETER may consist of any combination of building envelopes, site walls, or fencing as provided for in this section.

4.8.6.1.3 Patron Accessibility **D&C**

BARRIERS shall be provided between CHEMICAL STORAGE, POOL, mechanical spaces, and areas accessible to the public, in accordance with local building CODES.

4.8.6.2 Construction Requirements **D&C**

4.8.6.2.1 Local Code **D&C**

BARRIERS shall be constructed in accordance with the CODE of the AHJ.

4.8.6.2.2 No Enticements **D&C**

ENCLOSURES shall discourage climbing by not allowing nearby structures to simplify climbing over it, such as: light poles, site furnishings, overhanging tree limbs or other obvious footholds or handholds.

4.8.6.2.3 Discourage Climbing **D&C**

ENCLOSURES shall be constructed in such a way as to discourage climbing.

4.8.6.2.3.1 Horizontal Mid-Rails **D&C**

Horizontal mid-rails shall not be permitted.

4.8.6.2.3.3 Mesh Fencing **D&C**

Chain-link fencing constructed of 1 ¾ inches (44 mm) mesh shall be permitted.

4.8.6.2.4 Building Emergency Exit **D&C**

AQUATIC VENUE ENCLOSURES shall not block or encumber a required emergency egress path from other structures.

4.8.6.2.4.1 Pathways **D&C**

Where a required emergency egress path enters an area occupied by an outdoor AQUATIC VENUE, emergency exit pathways from the building(s) shall continue on DECK of least equally unencumbered width, and continue to the ENCLOSURE and through gates.

4.8.6.2.4.2 Exit Pathways **D&C**

Exit pathways shall be separated from AQUATIC VENUES not in operation.

4.8.6.2.4.3 Enclosure Requirements **D&C**

Such separation shall meet the requirements of an ENCLOSURE.

4.8.6.2.4.4**Seasonal Separation****D&C**

Seasonal separation may be employed at seasonally operated POOLS, subject to the same physical requirements of permanent ENCLOSURES.

4.8.6.2.4.4.1**Exception****D&C**

Exception: Unguarded AQUATIC VENUE are not required to provide separated paths of egress, but must maintain unencumbered exit paths to and through the ENCLOSURE.

4.8.6.2.5**Upper Level Balconies****D&C**

Upper level building balconies shall not come to within ten feet horizontally of any POOL edge without a BARRIER of its own that is at least equal in height to that of the required POOL ENCLOSURE.

4.8.6.2.5.1**Exception****D&C**

Exception: For spectator areas, refer to MAHC Section 4.6.10 for further information.

4.8.6.2.6**Windows****D&C**

Windows on a building that forms part of a POOL ENCLOSURE shall have a maximum opening width not to exceed 4 inches.

4.8.6.2.6.1**Opened****D&C**

If they are designed to be opened, they shall also be provided with a non-removable screen.

4.8.6.2.7**Height****D&C**

For the purposes of this section, height is measured from finished grade to the top of the BARRIER on the side outside of the AQUATIC VENUE ENCLOSURE.

4.8.6.2.7.1**Change in Grade****D&C**

Where a change in grade occurs at a BARRIER, height is measured from the uppermost grade to the top of the BARRIER.

4.8.6.2.7.2**Fencing Requirements****D&C**

ENCLOSURES shall not be less than 6 feet (1.83 m) in height.

4.8.6.2.7.3**Other Barriers****D&C**

All Other BARRIERS (Not Serving as ENCLOSURES): Except where otherwise noted, all other BARRIERS shall not be less than 42 inches in height.

4.8.6.3**Gates and Doors****D&C****4.8.6.3.1****Self-Closing and Latching****D&C**

All primary public access gates or doors serving as part of an AQUATIC VENUE ENCLOSURE shall be self-closing and self-latching from any open position.

4.8.6.3.1.1**Locked****D&C**

All gates or doors shall be capable of being locked from the exterior.

4.8.6.3.1.2**Emergency Egress****D&C**

They shall be designed in such a way that they do not prevent egress in the event of an emergency.

4.8.6.3.1.3**Exception****D&C**

Gates or doors used solely for after-hours maintenance shall remain locked at all times not in use by staff.

4.8.6.3.1.4**Propping Open****D&C**

Propping open perimeter ENCLOSURE gates or doors shall be prohibited.

4.8.6.3.2**Gates****D&C**

Gates shall be at least equal in height at top and bottom to the BARRIER of which they are a component.

4.8.6.3.3**Turnstiles****D&C**

Turnstiles shall not form a part of a POOL ENCLOSURE.

4.8.6.3.4**Exit Gates or Doors****D&C**

Quantity, location, and width(s) for EXIT GATES or doors shall be provided consistent with local building and fire CODES and applicable accessibility guidelines.

4.8.5.3.5**Swing Outward****D&C**

EXIT DOORS or gates shall swing away from the AQUATIC VENUE ENCLOSURE except where emergency egress CODES require them to swing into the AQUATIC VENUE ENCLOSURE.

4.8.5.3.6**Absence of Local Building Codes****D&C**

Where local building CODES do not otherwise govern, at least one EXIT GATE OR DOOR shall be required for each logical AQUATIC VENUE area including individual POOLS or grade levels or both.

4.8.6.3.7**Unguarded Pools****D&C**

For unguarded AQUATIC VENUES, self-latching mechanisms must be located not less than 3 ½ feet above finished grade.

4.8.6.3.7.1**Operable by Children****D&C**

For unguarded AQUATIC VENUES, self-latching mechanisms shall not be operable by small children on the outside of the AQUATIC VENUES ENCLOSURE.

4.8.6.3.8**Other Aquatic Venues****D&C**

For all other AQUATIC VENUES, EXIT GATES or doors shall be constructed so as to prevent unauthorized entry from outside of the POOL ENCLOSURE.

4.8.6.4 Indoor Pools **D&C**

4.8.6.4.1 Enclosure **D&C**

Building walls enclosing an indoor AQUATIC VENUE shall serve as the AQUATIC VENUE ENCLOSURE.

4.8.6.4.1.1 Local Building Code **D&C**

Local building CODES for construction requirements in indoor applications shall have jurisdiction.

4.8.6.4.1.2 Further Information **D&C**

For further information regarding indoor CHEMICAL STORAGE rooms and AQUATIC VENUE mechanical rooms, refer to MAHC Section 4.9.

4.8.6.4.2 Securable **D&C**

Indoor AQUATIC VENUES shall be securable from unauthorized entry from other building areas as well as the exterior.

4.8.6.4.3 Indoor and Outdoor Aquatic Venues **D&C**

Where separate indoor and outdoor AQUATIC VENUES are located on the same site, an AQUATIC VENUE ENCLOSURE shall be provided between them.

4.8.6.4.3.1 Year-Round Operation **D&C**

Exception: Where all AQUATIC VENUES are operated continuously 12 months a year on the same schedule.

4.8.6.4.4 Wall Separating **D&C**

For a passage through a wall separating the indoor portion of a AQUATIC VENUE from an outdoor portion of the same AQUATIC VENUE, the overhead clearance of the passage to the AQUATIC VENUE floor shall be at least 6 feet 8 inches (2.03 m) to any solid structure overhead.

4.8.6.5 Multiple Aquatic Venues **D&C**

4.8.6.5.1 One Enclosure **D&C**

Except as otherwise required in this CODE, one ENCLOSURE may surround multiple AQUATIC VENUES at one facility.

4.8.6.5.2 Wading Pools **D&C**

WADING POOLS do not need to be separated from other WADING POOLS by a BARRIER. Reference MAHC Section 4.12.9.

4.8.7 Pool Cleaning Systems

4.8.7.1 No Hazard D&C

The cleaning system provided shall not create an entanglement or suction entrapment hazard or interfere with the operation or use of the AQUATIC VENUE.

4.8.7.2 Common Cleaning Equipment D&C

If there are multiple AQUATIC VENUE at one AQUATIC FACILITY, that AQUATIC FACILITY may use common cleaning equipment.

4.8.7.3 Integral Vacuum Systems D&C

Use of INTEGRAL VACUUM SYSTEMS shall be prohibited.

4.8.7.4 GFCI Power D&C

Where PORTABLE VACUUM cleaning equipment is used, they shall be powered by circuits having GROUND-FAULT CIRCUIT INTERRUPTERS.

4.8.7.5 Separation of Receptacles D&C

Separation between receptacles shall be spaced so that all areas of the AQUATIC VENUE can be cleaned using a PORTABLE VACUUM without the use of extension cords.

4.8.7.6 Low Voltage D&C

Any ROBOTIC CLEANERS shall utilize low voltage for all components that are immersed in the POOL water.

4.8.7.7 GFCI Connection D&C

Any ROBOTIC CLEANER power supply shall be connected to a circuit equipped with a ground fault interrupter, and should not be operated using an extension cord.

4.8.7.8 Power Cord D&C

The power supply power cord length shall be shorter than the distance between the receptacle and the edge of the closest AQUATIC VENUE.

4.9 Filter/Equipment Room

4.9.1 Equipment Room D&C

4.9.1.1 General Requirements D&C

4.9.1.1.1 Nonabsorbent Material D&C

The equipment ENCLOSURE, area, or room floor shall be of concrete or other suitable material having a smooth slip resistant finish and shall have positive drainage, including a sump pump if necessary.

4.9.1.1.2 Floor Slope D&C

Floors shall have a slope toward the floor drain adequate to prevent standing water at all times.

4.9.1.1.3 Opening D&C

The opening to the EQUIPMENT ROOM or area shall be designed to provide access for all anticipated equipment.

4.9.1.1.4 Hose Bibb D&C

At least one (1) hose bibb with BACKFLOW preventer shall be located in the EQUIPMENT ROOM.

4.9.1.1.4.1 Installed D&C

Hose bibbs shall be installed in accordance with the International Plumbing Code or accessible within an adequate distance of the EQUIPMENT ROOM so that a hose can service the entire EQUIPMENT ROOM.

4.9.1.2 Construction D&C

4.9.1.2.1 Size D&C

The size of the equipment ENCLOSURE, room, or area shall provide working space to perform routine operations and equipment service.

4.9.1.2.1.1 Adequate Storage Space D&C

EQUIPMENT ROOMS also intended for STORAGE use shall have adequate space provided for such STORAGE, without reducing the working spaces.

4.9.1.2.2 Lighting D&C

Equipment ENCLOSURES, rooms or areas shall be lighted to provide 30 foot candles (320 lux) of illumination at floor level in accordance with IES guidelines.

4.9.1.3 Electrical D&C

4.9.1.3.1 Conform to NEC D&C

All electrical wiring shall conform to the edition of NEC adopted by the AHJ.

4.9.1.3.2 Conform to NRTL D&C

Equipment, components, and their application and installation shall conform to the National Recognized Testing Laboratories (NRTL) listing.

4.9.1.4 Ventilation D&C

4.9.1.4.1 Code Conformance D&C

EQUIPMENT ROOM ventilation shall address

- 1) COMBUSTION requirements,

- 2) heat dissipation from equipment,
- 3) humidity from surge or balance tanks,
- 4) ventilation to the outside, and
- 5) air quality.

4.9.1.5 Markings D&C

4.9.1.5.1 Piping Identified D&C

All piping in the EQUIPMENT ROOM shall be permanently identified by AQUATIC VENUE and AQUATIC FEATURE and use.

4.9.1.5.1.1 Provided D&C

Identification shall be provided for:

- 1) main drains and SKIMMERS,
- 2) filtered water,
- 3) make-up water,
- 4) backwash water,
- 5) CHLORINE (OR DISINFECTION) feeds,
- 6) acid (or pH) feeds,
- 7) compressed air lines,
- 8) gutters, and
- 9) POOL heating lines.

4.9.1.5.2 Piping Marked D&C

All piping shall be marked with directional arrows as necessary to determine flow direction.

4.9.1.5.3 Valves Identified D&C

All valves shall be clearly identified with a brass tag, plastic laminate tags or permanently affixed alternate.

4.9.1.5.4 Valves Described D&C

Valves shall be described as to their function and referenced in the operating instruction manual and wall-mounted piping diagram shall be provided.

4.9.1.6 Equipment Rooms Containing Combustion Equipment D&C

4.9.1.7 Separation from Chemical Storage Spaces D&C

4.9.1.7.1 Equipment D&C

4.9.1.7.1.1 Contaminated Air D&C

Combustion equipment, air-handling equipment, and electrical equipment shall not be exposed to air contaminated with CORROSIVE chemical fumes or vapors.

4.9.1.7.1.2 Equipment Restrictions **D&C**

Spaces containing combustion equipment, air handling equipment, and/or electrical equipment and spaces sharing air distribution with spaces containing such equipment shall not at the same time be used as CHEMICAL STORAGE SPACES.

4.9.1.7.1.2.1 Listed and Labeled **D&C**

Exception 1: Equipment listed and labeled for use in that atmosphere shall be acceptable, where approved by the AHJ.

4.9.1.7.1.3 Isolated **D&C**

Spaces containing combustion equipment, air-handling equipment, and/or electrical equipment and spaces sharing air distribution with spaces containing such equipment shall be isolated from CHEMICAL STORAGE SPACE air.

4.9.1.7.2 Doors and Openings **D&C**

4.9.1.7.2.1 Between Equipment and Chemical Storage **D&C**

A door or doors shall not be installed in a wall between such EQUIPMENT ROOMS and an interior CHEMICAL STORAGE SPACE.

4.9.1.7.2.2 No Openings **D&C**

There shall be no ducts, grilles, pass-throughs, or other openings connecting such EQUIPMENT ROOMS to CHEMICAL STORAGE SPACES, except as permitted by the International Fire CODE.

4.9.1.7.2.3 Natatorium Air **D&C**

Spaces containing combustion equipment, air-handling equipment, and/or electrical equipment and spaces sharing air distribution with spaces containing such equipment shall be isolated from NATATORIUM air.

4.9.1.7.2.3.1 Listed Equipment **D&C**

Exception 1: Equipment listed for the atmosphere shall be acceptable.

4.9.1.7.2.4 No Openings **D&C**

There shall be no ducts, grilles, pass-throughs, or other openings connecting such spaces to a NATATORIUM.

4.9.1.7.2.4.1 Air Handlers **D&C**

Note: Ducts which connect the NATATORIUM to the duct connections of air handlers shall not be construed as connecting the air-handler space to the NATATORIUM.

4.9.1.7.2.4.2 HVAC Equipment **D&C**

Exception 1: HVAC equipment which is rated for NATATORIUM atmosphere and which serves only that NATATORIUM shall be acceptable.

4.9.1.7.2.5 Openings / Gaps **D&C**

Where building construction leaves any openings or gaps between floors and walls, or between walls and other walls, or between walls and ceilings, such gaps shall be permanently sealed against air leakage.

4.9.1.7.3 Natatorium Access D&C

4.9.1.7.3.1 Floor Slope D&C

Where a door or doors must be installed in a wall between an EQUIPMENT ROOM and a NATATORIUM, the floor of the EQUIPMENT ROOM shall slope back into the EQUIPMENT ROOM in such a way as to prevent any equipment-room spills from running under the door into the NATATORIUM.

4.9.1.7.3.1.1 Four Inches D&C

Exception 1: This requirement may be met by a floor all of which is at least four inches below the level of the nearest part of the NATATORIUM floor.

4.9.1.7.3.1.2 Dike D&C

Exception 2. This requirement may be met by a continuous dike not less than four inches high located entirely within the EQUIPMENT ROOM, which will prevent spills from reaching the NATATORIUM floor.

4.9.1.7.3.1.3 Floor Drains D&C

Note: Equipment-room floor drains may be required.

4.9.1.7.3.2 Automatic Closer D&C

Such door or doors shall be equipped with an automatic closer.

4.9.1.7.3.2.1 Maintained to Close Reliably D&C

The door, frame, and automatic closer shall be installed and maintained so as to ensure that the door closes completely and latches without human assistance.

4.9.1.7.3.3 Automatic Lock D&C

Such door or doors shall be equipped with an automatic lock.

4.9.1.7.3.3.1 Restrict Access D&C

Such lock shall require a key or combination to open from the NATATORIUM side.

4.9.1.7.3.3.2 One Hand D&C

Such lock shall be so designed and installed as to be opened by one hand from the inside of the room under all circumstances, without the use of a key or tool.

4.9.1.7.3.4 Warning Sign D&C

Such doors shall be equipped with permanent signage warning against unauthorized entry.

4.9.1.7.3.5 Gasket D&C

All sides of such doors shall be equipped with a gasket.

4.9.1.7.3.1.5 Prevent Air Passage

The gasket shall be so installed as to prevent the passage of air, fumes, or vapors when the door is closed.

4.9.1.7.3.6 Not Relief D&C

This section shall not be construed as granting relief from MAHC Section 4.9.1.8.2.1.

4.9.1.8 Other Equipment Room Guidance D&C

4.9.1.8.1 Access Space D&C

Where ventilation, air filtration, or space dehumidification, heating, or cooling for a NATATORIUM is by mechanical equipment located in an EQUIPMENT ROOM, adequate access space shall be provided to allow for inspection and service.

4.9.1.8.1.1 Size Requirements D&C

The access spaces shall be the greater of:

- 1) Those required by OSHA, NEC, National Fuel Gas Code, or other official requirements; or
- 2) The equipment-manufacturers' recommendations.

4.9.1.8.2 Adequate Space D&C

Where ventilation, air filtration, or space heating or cooling for a NATATORIUM is beside mechanical equipment located in an EQUIPMENT ROOM, adequate space for required straight lengths of duct shall be provided as the greater of those described in AMCA 201, SMACNA Duct Manual, ACCA Manual SPS Sec. 13, or the equipment manufacturer's recommendations.

4.9.1.8.3 Minimize Hazards D&C

Where an EQUIPMENT ROOM contains equipment requiring regular service or maintenance, the room shall be so designed and constructed as to minimize the hazards of such maintenance and service.

4.9.1.8.3.1 Ladder Installed D&C

Where a ladder will be required for service or maintenance of equipment, other permanently installed equipment shall not be so located as to interfere with the use of the ladder.

4.9.1.8.3.2 Alternative Access D&C

Where a ladder cannot be safely or practically used to service equipment where any serviceable component is more than 6.5 feet (1.98 m) above the floor, a mezzanine floor, platform, or other arrangement for safe access shall be provided.

4.9.1.8.3.2.1 Exception D&C

Exception 1: Where otherwise specifically allowed by OSHA.

4.9.1.8.3.2.2

Stricter Requirements

D&C

Exception 2: Where OSHA or other applicable CODES or STANDARDS have stricter requirements, those stricter requirements shall prevail.

4.9.1.8.4 Refrigeration Equipment

D&C

Where refrigeration equipment such as an air-conditioner or dehumidifier is located indoors in a building intended for occupation, arrangements for refrigerant relief (if any) shall be according to the INTERNATIONAL MECHANICAL CODE or other applicable CODE.

4.9.2 Chemical Storage Spaces

D&C

Note: Nothing in this section shall be construed as providing relief from applicable requirements of fire CODES, mechanical CODES, electrical CODES, etc.

4.9.2.1 Outdoor / Indoor Storage

D&C

4.9.2.1.1 Stored Outdoors

D&C

POOL chemicals, acids, fertilizers, salt, de-icing chemicals, oxidizing cleaning materials, other CORROSIVE or oxidizing chemicals, and pesticides should be STORED outdoors in a well-ventilated protective ENCLOSURE.

4.9.2.1.2 Minimize Vapors

D&C

Where such materials must be stored in a building intended for occupation, the transfer of chemical fumes and vapors from the CHEMICAL STORAGE SPACE to other parts of the building shall be minimized.

4.9.2.1.3 Dedicated Space

D&C

At least one space dedicated to CHEMICAL STORAGE SPACE shall be provided. This space need not be an INTERIOR SPACE.

4.9.2.1.4 Safe Spaces

D&C

The number of required CHEMICAL STORAGE SPACES shall be as necessary to allow safe STORAGE of the chemicals present.

4.9.2.1.5 Additional Space

D&C

Where the listing, labeling, or MSDS of chemicals indicates incompatibility of STORAGE with other chemicals present, other CHEMICAL STORAGE SPACE(S) shall be provided.

4.9.2.1.6 Eyewash

D&C

In all rooms in which POOL chemicals will be STORED, an emergency eyewash station shall be provided.

4.9.2.1.6.1 Outside

D&C

Eyewash stations may be provided outside of the CHEMICAL STORAGE SPACE as an alternative.

4.9.2.1.6.2 AHJ Requirements D&C

If more stringent requirements are dictated by the AHJ, then those shall govern and be applicable.

4.9.2.2 Construction D&C

4.9.2.2.1 Foreseeable Hazards D&C

The construction of the CHEMICAL STORAGE SPACE shall take into account the foreseeable hazards.

4.9.2.2.2 Protected D&C

The construction of the CHEMICAL STORAGE SPACE shall, to the extent practical, protect the STORED materials against tampering, wild fires, unintended exposure to water, etc.

4.9.2.2.3 Floor D&C

The floor or DECK of the CHEMICAL STORAGE SPACE shall be protected against substantial chemical damage.

4.9.2.2.4 Minimize Fumes D&C

The construction and operation of a CHEMICAL STORAGE SPACE shall minimize the transfer of chemical fumes into any INTERIOR SPACE of a building intended for occupation.

4.9.2.2.5 Surfaces D&C

Any walls, floors, doors, ceilings, and other building surfaces of an interior CHEMICAL STORAGE SPACE shall join each other tightly.

4.9.2.2.6 No Openings D&C

There shall be no permanent or semi-permanent opening between a CHEMICAL STORAGE SPACE and any other INTERIOR SPACE of a building intended for occupation.

4.9.2.3 Exterior Chemical Storage Spaces D&C

4.9.2.3.1 Outdoor Equipment D&C

Equipment listed for outdoor use may be located in an exterior CHEMICAL STORAGE AREA as permitted.

4.9.2.3.2 Fencing D&C

Outdoor CHEMICAL STORAGE SPACES not joined to a wall of a building shall be completely enclosed by fencing that is at least 6 feet (1.83 m) high and meets the non-climbability requirements of MAHC Section 4.8.5.2.3.

4.9.2.3.3 Gate D&C

Fencing shall be equipped with a self-closing and self-latching gate having a permanent locking device.

4.9.2.4 Chemical Storage Space Doors **D&C**

4.9.2.4.1 Signage **D&C**

All doors opening into CHEMICAL STORAGE SPACES shall be equipped with permanent signage:

- 1) Warning against unauthorized entry, and
- 2) Specifying the expected hazards, and
- 3) Specifying the location of the associated MSDS forms.

4.9.2.4.2 Emergency Egress **D&C**

Where a single door is the only means of egress from a CHEMICAL STORAGE SPACE, the door shall be equipped with an emergency-egress device.

4.9.2.4.3 Interior Door **D&C**

Where a chemical-STORAGE space door must open to an INTERIOR SPACE, spill containment shall be provided to prevent spilled chemicals from leaving the CHEMICAL STORAGE SPACE.

4.9.2.4.4 Equipment Space **D&C**

Where a CHEMICAL STORAGE SPACE door must open to an INTERIOR SPACE, the door shall not open to a space containing combustion equipment, air-handling equipment, or electrical equipment.

4.9.2.4.4.1 Corrosive **D&C**

Such door shall be acceptable where all equipment thus exposed is listed for the CORROSIVE atmosphere.

4.9.2.4.5 Interior Opening **D&C**

Where a CHEMICAL STORAGE SPACE door must open to an INTERIOR SPACE, such door shall have all of the following requirements outlined from MAHC Sections 4.9.2.4.5.1 to 4.9.2.4.5.7.2

4.9.2.4.5.1 Corrosion-Resistant **D&C**

Such doors shall be constructed of corrosion-resistant materials.

4.9.2.4.5.2 Automatic Lock **D&C**

Such doors shall be equipped with a corrosion-resistant, automatic lock to prevent unauthorized entry.

4.9.2.4.5.2.1 Key or Combination **D&C**

Such lock shall require a key or combination to open from the outside.

4.9.2.4.5.2.2**Opened****D&C**

Such lock shall be so designed and installed as to be capable of being opened by one hand from the inside of the CHEMICAL STORAGE SPACE without the use of a key or tool.

4.9.2.4.5.3**Supported****D&C**

Such doors shall be supported on corrosion-resistant hinges, tracks, or other supports.

4.9.2.4.5.4**Air Leakage****D&C**

Such doors shall be equipped with suitable gaskets or seals on the top and all sides to minimize air leakage between the door and the door frame.

4.9.2.4.5.5**Floor****D&C**

Such doors shall be equipped with a floor or threshold seal to minimize air leakage between the door and the floor or threshold.

4.9.2.4.5.6**Automatic Closer****D&C**

Such doors shall be equipped with an automatic door closer that will completely close the door and latch without human assistance.

4.9.2.4.5.6.1**Air Pressure****D&C**

The door closer shall be able to close the door completely against the specified difference in air pressure.

4.9.2.4.5.7**Limit Switch****D&C**

Such doors shall be equipped with a limit switch and an alarm that will sound if the door remains open for more than thirty (30) minutes.

4.9.2.4.5.7.1**Alarm****D&C**

This alarm shall have a minimum output level of 85 dbA at 10 feet.

4.9.2.4.5.7.2**Loss of Air Pressure****D&C**

Where an open door will result in loss of air-pressure difference, this requirement can be met by the audible alarm required under MAHC Section 4.9.2.5.2.4.

4.9.2.5**Interior Chemical Storage Spaces****D&C****4.9.2.5.1****No Air Movement****D&C**

There shall be no transfer grille, pass-through grille, louver, or other device or opening that will allow air movement from the CHEMICAL STORAGE SPACE into any other INTERIOR SPACE of a building intended for occupation or into another CHEMICAL STORAGE SPACE.

4.9.2.5.2**Electrical Conduit System****D&C**

Interior CHEMICAL STORAGE SPACES that share any building surface (wall, floor, ceiling, door, etc.) with any other INTERIOR SPACE shall be equipped with a ventilation system

that operates continuously and insures that all air movement is from all other INTERIOR SPACES and toward the CHEMICAL STORAGE SPACE.

4.9.2.5.2.1 Additional Interior Space D&C

Interior CHEMICAL STORAGE SPACES that share an electrical conduit system with any other INTERIOR SPACE shall be equipped with a ventilation system that operates continuously and insures that all air movement is from all other INTERIOR SPACES and toward the CHEMICAL STORAGE SPACE.

4.9.2.5.2.2 Pressure Difference D&C

This pressure difference shall be maintained by a continuously operated exhaust system used for no other purpose than to remove air from that one CHEMICAL STORAGE SPACE.

4.9.2.5.2.3 Separate Exhaust System D&C

Where more than one CHEMICAL STORAGE SPACE is present, a separate exhaust system shall be provided for each CHEMICAL STORAGE SPACE.

4.9.2.5.2.3.1 Airflow Rate D&C

The exhaust airflow rate shall be the greater of:

- 1) the OSHA requirements for working in such enclosed spaces, or
- 2) the amount needed to maintain the concentration of vapors or fumes below the PEL for the expected exposure time (defined by 29 CFR 1910.1000 (OSHA)) for each stored chemical, or
- 3) the amount specified by INTERNATIONAL MECHANICAL CODE Sec. 502, or
- 4) the amount specified by the Uniform Mechanical Code Sec. 403.7, or
- 5) the amount needed to maintain the specified pressure difference.

4.9.2.5.2.4 Alarm D&C

Function of this exhaust system shall be monitored continuously by an audible differential-pressure alarm system which shall sound if the specified differential air pressure is not maintained for a period of thirty minutes.

4.9.2.5.2.4.1 Minimum Output D&C

This alarm shall have a minimum output level of 85 dbA at 10 feet (3 m).

4.9.2.5.2.4.2 Manual Reset D&C

The specified alarm shall require manual reset to silence it.

4.9.2.6 Air Ducts in Interior Chemical Storage Spaces D&C

4.9.2.6.1 No Air Movement D&C

No duct shall allow air movement from the CHEMICAL STORAGE SPACE into any other INTERIOR SPACE of a building intended for occupation or into any other CHEMICAL STORAGE SPACE.

4.9.2.6.2 Chemical Storage D&C

Air ducts shall not enter or pass through an interior CHEMICAL STORAGE SPACE.

4.9.2.6.2.1 Corrosion-Resistant D&C

Exception 1: A corrosion-resistant duct used for no other purpose than to exhaust air from the CHEMICAL STORAGE SPACE shall be acceptable.

4.9.2.6.2.1.1 Building Exterior D&C

This duct must exhaust to the exterior by ending at a point on the exterior of the building, at least 20 feet from any air intake for breathing air, cooling air, or combustion air and

4.9.2.6.2.2 Makeup Air D&C

Exception 2: A duct used for no other purpose than to supply makeup air to the CHEMICAL STORAGE SPACE shall be acceptable.

4.9.2.6.2.2.1 Building Exterior D&C

This duct must end at a point on the exterior of the building, at least 20 feet from any air intake for breathing air, cooling air, or combustion air.

4.9.2.6.2.3 Other Ducts D&C

Exception 3: Any other ducts specifically allowable by applicable building and mechanical CODES where such ducts are corrosion-resistant and joint-free to the extent feasible shall be acceptable.

4.9.2.7 Pipes and Tubes in Interior Chemical Storage Spaces D&C

4.9.2.7.1 Not Enter D&C

Pipes and tubes shall not enter or pass through an interior CHEMICAL STORAGE SPACE.

4.9.2.7.1.1 Service D&C

Exception 1: As required to service devices integral to the function of the CHEMICAL STORAGE SPACE, such as pumps, vessels, controls, freeze protection, and SAFETY devices.

4.9.2.7.1.2 Automatic Fire Suppression D&C

Exception 2: As required to allow for automatic fire suppression where required.

4.9.2.7.1.3 Drainage D&C

Exception 3: As required for drainage.

4.9.2.7.2 Devices D&C

Piping, tubes, drain bodies, grates, and attachment and restraint devices shall be corrosion-resistant and rated for the chemical environment(s) present including floor drain bodies and grates.

4.9.2.7.3 Wall Penetrations **D&C**

All wall penetrations shall be sealed air-tight and shall be commensurate with the rating of the wall assembly.

4.9.2.7.3.1 Sealing Materials **D&C**

Sealing material(s) shall be compatible with the wall assembly and the chemical environment(s) present.

4.9.2.8 Combustion Equipment in Interior Chemical Storage Spaces **D&C****4.9.2.8.1 Installed** **D&C**

No COMBUSTION DEVICE or appliance shall be installed in a CHEMICAL STORAGE SPACE, or in any other place where it will be exposed to the air from a CHEMICAL STORAGE SPACE.

4.9.2.8.1.1 Exception **D&C**

Exception 1: A COMBUSTION DEVICE or appliance which meets all of the following requirements shall be acceptable:

The device or appliance is required for one or more processes integral to the function of the room, such as space heat.

- 1) The device is listed for such use.
- 2) The device as installed is acceptable to the AHJ.

4.9.2.9 Electrical Equipment in Chemical Storage Spaces **D&C****4.9.2.9.1 Comply** **D&C**

Electrical equipment and wiring methods used for or in CHEMICAL STORAGE SPACES shall comply with MAHC Section 4.9.2.

4.9.2.10 Ozone Rooms **D&C****4.9.2.10.1 Only Ozone Equipment** **D&C**

An OZONE EQUIPMENT ROOM shall not be used for STORAGE of chemicals, solvents or any combustible materials, other than those required for the operation of the re-circulation and ozone generating equipment.

4.9.2.10.2 Emergency Ventilation **D&C**

Rooms which are designed to include ozone equipment shall be equipped with an emergency ventilation system capable of 6 air changes per hour.

4.9.2.10.2.1 Exhaust Intake **D&C**

The exhaust intake shall be located approximately six inches from the floor, on the opposite side of the room from the make-up air intake.

4.9.2.10.2.2 On Command D&C

The emergency ventilation system shall be so arranged as to run on command of an ozone-leak alarm or on command of a manual switch.

4.9.2.10.2.3 Manual Switch D&C

The manual emergency ventilation switch shall be located outside the room and near the door to the ozone room.

4.9.2.10.3 Below Grade D&C

Ozone rooms which are below grade shall be equipped with forced-draft ventilation capable of 6 air changes per hour.

4.9.2.10.3.1 Exhaust Intake D&C

The exhaust intake shall be located approximately six inches from the floor, on the opposite side of the room from the make-up air intake.

4.9.2.10.3.2 Arranged D&C

Such ventilation system shall be so arranged as to:

- 1) Run automatically concurrent with the ozone equipment and for at least a time allowing for 15 air changes after the ozone equipment is stopped,
- 2) Run upon activation of the ozone detection and alarm system, and
- 3) Run on command of a manual switch.

4.9.2.10.3.3 Manual Ventilation Switch D&C

The manual ventilation switch shall be located outside the room and near the door to the ozone room.

4.9.2.10.4 Signage D&C

A sign shall be posted on the exterior of the entry door, stating "DANGER - GASEOUS OXIDIZER – OZONE" in lettering not less than 4 inches high.

4.9.2.10.5 Alarm System D&C

Rooms containing ozone generation equipment shall be equipped with an audible and visible ozone detection and alarm system.

4.9.2.10.5.1 Requirements D&C

The alarm system shall consist of both an audible alarm capable of producing at least 85 decibels, and a visible alarm consisting of a flashing light mounted in plain view of the entrance to the OZONE-EQUIPMENT ROOM.

4.9.2.10.5.2 Sensor D&C

The ozone sensor shall be located at a height of 18-24 inches above floor level and shall be capable of measuring ozone in the range of 0-2 parts per million (ppm).

4.9.2.10.5.3**Ozone Concentration****D&C**

The alarm system shall alarm when the ozone concentration equals or exceeds 0.1ppm in the room.

4.9.2.10.5.4**Activation****D&C**

Activation of the alarm system shall shut off the ozone generating equipment and turn on the emergency ventilation system.

4.9.2.11**Gaseous Chlorination Space****D&C****4.9.2.11.1 Adequate Size****D&C**

A gaseous-chlorination space shall be large enough to house the chlorinator, CHLORINE STORAGE tanks, and associated equipment as required.

4.9.2.11.2 Secure Tanks**D&C**

A gaseous-chlorination space shall be equipped with facilities for securing tanks.

4.9.2.11.3 Not Below Grade**D&C**

A gaseous-chlorination space shall not be located in a basement or otherwise be below grade.

4.9.2.11.4 Compressed-Chlorine Gas**D&C**

Where installed indoors, compressed-CHLORINE gas STORAGE containers and associated chlorinating equipment shall be in a separate room constructed to have a fire rating of not less than 1-hour.

4.9.2.11.5 Entry Door**D&C**

The entry door to an indoor gaseous-CHLORINE space shall open to the exterior of the building or structure.

4.9.2.11.5.1 Pool or Deck**D&C**

The entry door to an indoor gaseous-CHLORINE space shall not open directly towards a POOL or DECK.

4.9.2.11.6 Inspection Window**D&C**

An indoor gaseous-CHLORINE space shall be provided with a shatterproof gas-tight inspection window.

4.9.2.11.7 Ventilation**D&C**

Indoor gaseous-chlorination spaces shall be provided with a spark-proof ventilation system capable of 60 air changes per hour.

4.9.2.11.7.1 Exhaust-air Intake**D&C**

The exhaust-air intake of the ventilation system shall be taken at a point within six inches of the floor, and on the opposite side of the room from the makeup-air intake.

4.9.2.11.7.2 Discharge Point**D&C**

The exhaust-air discharge point shall be

- 1) Outdoors, and
- 2) Above adjoining grade level, and
- 3) At least ten feet from any operable window, and
- 4) At least ten feet from any adjacent building.

4.9.2.11.7.3 Make-up Intake**D&C**

The make-up air intake shall be within six inches of the ceiling of the space and shall open directly to the outdoors.

4.9.2.11.7.4 PPE Available**D&C**

Personal protective equipment, consisting of at least a gas mask approved by NIOSH for use with CHLORINE atmospheres, shall be stored directly outside one entrance to an indoor gaseous-chlorination space.

4.9.2.11.7.5 SCBA Systems**D&C**

A minimum of two (2) SCBA systems shall be on hand at all times and two (2) QUALIFIED OPERATORS are to be involved in the changing of the tanks.

4.9.2.11.7.6 Stationed Outside**D&C**

One of the QUALIFIED OPERATORS should be stationed outside of the chemical room where the QUALIFIED OPERATOR inside can be seen at all times.

4.9.2.11.7.7 Emergency Telephone**D&C**

An emergency direct line telephone shall be located by the door.

4.9.2.12 Windows in Chemical Storage Spaces**D&C****4.9.2.12.1 Not Required****D&C**

Windows in CHEMICAL STORAGE SPACES are not required by this CODE.

4.9.2.12.2 Requirements**D&C**

Where a window is to be installed in an interior wall, ceiling, or door of a CHEMICAL STORAGE SPACE, such window shall have the following components:

- 1) tempered or plasticized glass,
- 2) a corrosion-resistant frame, and
- 3) shall not be operable or capable of being opened.

4.9.2.12.3 Exterior Window**D&C**

Any CHEMICAL-STORAGE SPACE window in an exterior wall or ceiling shall

- 1) Be mounted in a corrosion-resistant frame, and

- 2) Be so protected by a roof, eave, or permanent awning as to minimize the entry of rain or snow in the event of window breakage.

4.9.2.13 Sealing and Blocking Materials D&C

4.9.2.13.1 Minimize Leakage D&C

Materials used for sealing and blocking openings in an interior CHEMICAL STORAGE SPACE shall minimize the leakage of air, vapors, or fumes from the CHEMICAL STORAGE SPACE.

4.9.2.13.2 Compatible D&C

Materials used for sealing and blocking openings in an interior CHEMICAL STORAGE SPACE shall be compatible for use in the environment.

4.9.2.13.3 Fire Rating D&C

Materials used for sealing and blocking openings in an interior CHEMICAL STORAGE SPACE shall be commensurate with the fire rating of the assembly in which they are installed..

4.10 Hygiene Facilities

4.10.1. General

4.10.1.1 Required at Adoption HYG

All design provisions shall be required for new construction or SUBSTANTIAL ALTERATION to an existing AQUATIC FACILITY, except the following MAHC sections which shall be required for all AQUATIC FACILITIES at time of adoption:

- 1) 4.10.4.5: DIAPER-CHANGING STATIONS,
- 2) 4.10.4.6.5: Soap Dispensers, and
- 3) 4.10.4.6.9: Trash Can

4.10.1.2 Hygiene Facilities HYG

AQUATIC FACILITIES shall provide HYGIENE FACILITIES that include, at a minimum, toilets, urinals, showers, DIAPER-CHANGING STATIONS, and other HYGIENE FIXTURES, as specified herein.

4.10.1.3 Code HYG

HYGIENE FACILITIES shall be constructed in accordance with applicable state and local CODES or as modified herein.

4.10.1.4 State & Local Code HYG

The minimum number of toilets, urinals, and other HYGIENE FIXTURES provided, excluding showers, shall be the greater of the following two options:

- 1) In accordance with applicable state and local CODES, or
- 2) Based upon maximum OCCUPANT LOAD of each AQUATIC VENUE.

4.10.1.5 Bather Load **HYG**

BATHER LOAD shall be based on square footage of surface water or, if no standing water is present, the surface area of an AQUATIC VENUE.

4.10.1.5.1 Square footage **HYG**

BATHER LOAD for all AQUATIC VENUES shall be calculated as defined in MAHC Section 4.6.2.1.7.

4.10.2 Location**4.10.2.1 Distance** **HYG**

Except as required in 4.10.2.2, a drinking fountain, toilet, HAND WASH STATION, and DIAPER-CHANGING STATION shall be located no greater than 300 feet (91 m) walking distance from each AQUATIC VENUE.

4.10.2.2 Diaper-Aged Children **HYG**

An AQUATIC VENUES designed primarily for use by DIAPER-AGED CHILDREN shall have a drinking fountain, toilet, HAND WASH STATION, and DIAPER-CHANGING STATION located no greater than 200 feet (61m) walking distance and in clear view from the nearest entry/exit of the AQUATIC VENUE.

4.10.3 Design and Construction **HYG****4.10.3.1 Floors** **HYG**

The floors of HYGIENE FACILITIES and dressing areas serving AQUATIC FACILITIES shall have a smooth, hard, easy-to-clean, impervious-to-water, slip-resistant surface.

4.10.3.2 Floor Base **HYG**

A hard, smooth, impervious-to-water, easy-to-clean base shall provide a sealed, covered juncture between the wall and floor and extend upward on the wall at least 6 inches (15 cm).

4.10.3.3 Floor Drains **HYG**

Floor drains shall be installed in HYGIENE FACILITIES and dressing areas where PLUMBING FIXTURES are located.

4.10.3.3.1 Opening Grill Covers **HYG**

Floor drain opening grill covers shall be ½-inch (1cm) or less in width or diameter.

4.10.3.3.2 Sloped to Drain **HYG**

Floors shall be sloped to drain water or other liquids.

4.10.3.3.3 ADAAG **HYG**

Where DECK areas serve as ACCESSIBLE ROUTES or portions thereof, slopes in any direction shall not exceed ADAAG Guidelines and MAHC Sections 4.8.1.3.1.

4.10.3.4 Partitions and Enclosures HYG

Partitions and ENCLOSURES adjacent to HYGIENE FACILITIES shall have a smooth, easy-to-clean, impervious surface.

4.10.3.5 Hose Bibb HYG

At least one hose bibb or other potable water source capable of connecting a hose shall be located in each HYGIENE FACILITY to facilitate cleaning.

4.10.4 Plumbing Fixture Requirements**4.10.4.1 General HYG****4.10.4.1.1 Protected HYG**

PLUMBING FIXTURES shall be installed and operated in a manner to adequately protect the potable water supply from back siphonage or BACKFLOW in accordance with local, state or federal regulation.”

4.10.4.1.2 Easily Cleaned HYG

PLUMBING FIXTURES shall be designed so that they may be readily and frequently cleaned, SANITIZED, and disinfected.

4.10.4.1.3 Toilet Counts HYG

Total toilet or urinal counts shall be in accordance with applicable state and local CODES or as modified herein.

4.10.4.1.4 Hand Wash Sink HYG

Hand wash sink counts shall be in accordance with applicable state and local CODES or as modified herein.

4.10.4.2 Cleansing Showers HYG**4.10.4.2.1 Count HYG**

Total male and female CLEANSING SHOWER count shall be the greater of the following two options:

- 1) In accordance with applicable state and local CODES, or
- 2) Based on the BATHER LOAD of the AQUATIC VENUE.

4.10.4.2.2 Minimum HYG

Minimum total CLEANSING SHOWER count shall be equal to 1 CLEANSING SHOWER per 40 BATHERS for every AQUATIC FACILITY.

4.10.4.2.3 Distributed HYG

CLEANSING SHOWERS shall be evenly distributed between sexes, as applicable.

4.10.4.2.4 Minimum**HYG**

AQUATIC FACILITIES shall have a minimum of 1 CLEANSING SHOWER per sex.

4.10.4.2.5 Location**HYG**

CLEANSING SHOWERS shall be located in a HYGIENE FACILITY near the entrance and within clear view of the AQUATIC VENUE.

4.10.4.2.6 Enclosed**HYG**

Entryways to private or group CLEANSING SHOWER areas shall be enclosed by a door or curtain.

4.10.4.2.6.1 Doors**HYG**

Shower doors shall be of a smooth, hard, easy-to-clean material.

4.10.4.2.6.2 Curtains**HYG**

Shower curtains shall be of a smooth, easy-to-clean material.

4.10.4.2.7 Soap**HYG**

CLEANSING SHOWERS shall be supplied with soap and a soap dispenser adjacent to the shower.

4.10.4.2.8 Exemption**HYG**

AQUATIC VENUES located in lodging and residential settings shall be exempt from MAHC Section 4.10.4.2.

4.10.4.3 Rinse Showers**HYG****4.10.4.3.1 Minimum and Location****HYG**

A minimum of 1 RINSE SHOWER shall be provided on the DECK near an entry point to the AQUATIC VENUE.

4.10.4.3.2 Temperature**HYG**

Water used for RINSE SHOWERS may be at ambient temperature

4.10.4.3.3 Floor Sloped**HYG**

Floors of RINSE SHOWERS shall be sloped to drain wastewater away from the AQUATIC VENUE and meet local applicable CODES.

4.10.4.3.4 Large Aquatic Facilities**HYG**

RINSE SHOWERS in AQUATIC FACILITIES greater than 7500 square feet of water surface area shall be situated adjacent to each AQUATIC VENUE entry point or arranged to encourage BATHERS to use the RINSE SHOWER prior to entering the AQUATIC VENUE.

4.10.4.3.5 Beach Entry**HYG**

A minimum of 4 showerheads per 50 feet of beach entry AQUATIC VENUES shall be provided as a RINSE SHOWER.

4.10.4.3.6 Lazy River

HYG

A minimum of 2 RINSE SHOWERS shall be provided at each entrance to a LAZY RIVER AQUATIC VENUE.

4.10.4.3.7 Waterslide

HYG

A minimum of 1 RINSE SHOWER shall be provided at each entrance to a waterslide queue line.

4.10.4.4 All Showers

4.10.4.4.1 Exceptions

HYG

AQUATIC FACILITIES with 7500 square feet of water area or more may be flexible in the number of CLEANSING SHOWERS they provide based on their BATHER LOAD:

- 1) 25% of the required showers shall be CLEANSING SHOWERS,
- 2) 25% of the required showers shall be RINSE SHOWERS, and
- 3) the remaining 50% may be either cleansing or RINSE SHOWERS.

4.10.4.5 Diaper-Changing Stations

HYG

4.10.4.5.1 Each Facility

HYG

All AQUATIC FACILITIES allowing use by DIAPER-AGED BATHERS shall have at least one DIAPER-CHANGING STATION in each male and female HYGIENE FACILITY or make available a unisex DIAPER-CHANGING STATION.

4.10.4.5.2 Sink

HYG

The adjacent hand wash sink shall be installed and operational within 1 year from the date of the AHJ's adoption of the MAHC.

4.10.4.5.3 Portable

HYG

If a hand sink is not available adjacent to the DIAPER-CHANGING STATION, a portable HAND-WASH STATION shall be available adjacent to the station at all times.

4.10.4.5.4 Conform

HYG

DIAPER-CHANGING UNITS shall conform to either of the following STANDARDS:

- 1) ASTM standard F2285-04 "Consumer Performance Standards for Commercial Diaper-changing stations," or
- 2) The STANDARDS for diaper-changing surfaces in the most current version of Caring for Our Children: National Health and Safety Performance Standards: Guidelines for Out-of-Home Child Care Programs.

4.10.4.5.5 Unisex **HYG**

If only a unisex HYGIENE FACILITY is provided, it must have a DIAPER-CHANGING STATION that conforms to MAHC Section 4.10.4.5.

4.10.4.5.6 Trash Can **HYG**

A covered, hands-free, plastic-lined trash receptacle or diaper pail shall be located directly adjacent to the DIAPER-CHANGING UNIT.

4.10.4.5.7 Sanitizing Surface **HYG**

An EPA-registered SANITIZER shall be provided for maintaining a clean and SANITIZED DIAPER-CHANGING UNIT surface before and after each use.

4.10.4.6 Non-Plumbing Fixture Requirements **HYG****4.10.4.6.1 Easy to Clean** **HYG**

All HYGIENE FIXTURES and appurtenances in the dressing area shall have a smooth, hard, easy-to-clean, impervious-to-water surface and be installed to permit thorough cleaning.

4.10.4.6.2 Glass **HYG**

Glass, excluding mirrors installed in the HYGIENE FACILITY, shall not be permitted in HYGIENE FACILITIES.

4.10.4.6.3 Mirrors **HYG**

Mirrors shall be shatter resistant.

4.10.4.6.4 Lockers **HYG**

If lockers are provided, they shall be set either on a solid base at least 6 inches (15cm) high or on legs at least 6 inches high and far enough apart to allow for cleaning and drying underneath the locker.

4.10.4.6.5 Soap Dispensers **HYG**

Soap dispensers shall be securely attached adjacent to hand washing sinks and at each CLEANSING SHOWER.

4.10.4.6.5.1 Dispenser Materials **HYG**

The dispensers shall be of all metal, plastic or other shatterproof materials that can be readily and frequently cleaned.

4.10.4.6.6 Dryers/Paper Towels **HYG**

Hand dryers or paper towel dispensers shall be provided and securely attached adjacent to hand washing sinks.

4.10.4.6.6.1 Materials **HYG**

Hand dryers and paper towel dispensers shall be of all metal, plastic or other shatterproof materials that can be readily and frequently cleaned.

4.10.4.6.7 Toilet Paper Dispensers **HYG**

Toilet paper dispensers shall be securely attached to wall or partition adjacent to each toilet.

4.10.4.6.8 Female Facilities **HYG**

In female HYGIENE FACILITIES, covered receptacles adjacent to each toilet shall be provided for disposal of used feminine hygiene products.

4.10.4.6.9 Trash Can **HYG**

A minimum of one hands-free trash receptacle shall be provided in areas adjacent to hand washing sinks.

4.10.5 Provision of Suits, Towels, and Shared Equipment **HYG****4.10.5.1 Adequate Space** **HYG**

AQUATIC FACILITIES supplying reusable suits, towels, and/or shared equipment shall provide adequate equipment and space for cleaning, sanitizing, drying, and storing of these materials.

4.10.6 Foot Baths **HYG****4.10.6.1 Prohibited** **HYG**

FOOT BATHS shall be prohibited.

4.10.7 Sharps **HYG****4.10.7.1 Container** **HYG**

If razors or other sharps are supplied by the AQUATIC FACILITY, a sharps container approved by local, state or federal regulations shall be provided within the HYGIENE FACILITY.

4.11 Water Supply/ Wastewater Disposal**4.11.1 Water Supply** **D&C****4.11.1.1 Public Water System** **D&C**

Water serving an AQUATIC FACILITY shall be supplied from a potable water source.

4.11.1.1.1 Other Sources **D&C**

Other water sources such as lakes or springs may be approved to serve an AQUATIC FACILITY by the AHJ.

4.11.1.1.2 Condensate/ Reclaimed Water **D&C**

Use of condensate water, collected rain water, or other reclaimed water for water serving an AQUATIC VENUE is prohibited.

4.11.1.1.2.1 Condensate Use

Condensate water may be used for irrigation or other non-potable uses.

4.11.1.1.3 Exception**D&C**

Exceptions to MAHC Section 4.11.1.1.2 may be made by the AHJ with evidence that such water has met all EPA potable water quality STANDARDS.

4.11.1.2 Sufficient Capacity**D&C**

The water supply shall have sufficient capacity to simultaneously serve all PLUMBING FIXTURES.

4.11.1.2.1 Refill Pool**D&C**

The water supply shall have sufficient capacity and pressure to refill the AQUATIC VENUE to the operating water level after backwashing filters and after any splashing or evaporative losses within one hour if the AQUATIC VENUE is operational at the time of the backwash.

4.11.2 Fill Spout**4.11.2.1 Hazard****D&C**

If a fill spout is used at an AQUATIC VENUE, the fill spout shall be located so that it is not a SAFETY hazard to BATHERS.

4.11.2.2 Shielded**D&C**

A fill spout should be shielded so the possibility of it becoming a trip hazard is minimized.

4.11.2.3 Open End**D&C**

The open end of fill spouts shall not have sharp edges or protrude more than 2 inches (50 mm) beyond the edge of the POOL.

4.11.2.4 Air Gap**D&C**

The open end shall be separated from the water by an air gap of at least 1.5 pipe diameters measured from the pipe outlet to the POOL.

4.11.3 Cross-Connection Control**4.11.3.1 Protected****D&C**

The potable water supply serving an AQUATIC VENUE shall be protected against BACKFLOW consisting of either of the following:

- 1) An acceptable air gap consisting of a vertical distance of not less than 2 pipe diameters of the water supply pipe or 6 inches (150 mm), whichever is greater, over the lowest free-flowing discharge point of the receiving pipe, tank, or vessel.

Splash guards that are open to the atmosphere may be used around the air gap, or

- 2) Where permitted, an approved reduced pressure zone (RPZ) BACKFLOW preventer installed according to the plumbing CODE and the AHJ.

4.11.4 Deck Drains and Rinse Showers

4.11.4.1 Sloped

D&C

The walkway or DECK around an AQUATIC VENUE shall be properly sloped to DECK drains or to the edge of the DECK to prevent the accumulation of standing water.

4.11.4.2 Discharge

D&C

If DECK drains are provided, the drains shall discharge to the sanitary or storm sewer or as otherwise allowed by the agency having jurisdiction and according to applicable plumbing CODES.

4.11.4.3 Area or Linear

D&C

DECK drains may be either area drains or linear drains. See MAHC Section 4.8.1.3 for DECK drain area, and other requirements.

4.11.4.4 Rinse Showers

D&C

RINSE SHOWER drains shall discharge to the sanitary or storm sewer as allowed by the agency having jurisdiction and according to applicable plumbing CODES.

4.11.5 Sanitary Wastes

4.11.5.1 Discharged

D&C

Wastewater from all PLUMBING FIXTURES in the entire AQUATIC FACILITY shall be discharged to a municipal sanitary sewer system if available.

4.11.5.2 On-Site Sewer System

D&C

If a municipal sanitary sewer system is not available, all wastewater shall be disposed to an on-site sewer system that is properly designed to receive the entire wastewater capacity.

4.11.6 Pool Wastewater

4.11.6.1 Discharged

D&C

Wastewater from an AQUATIC VENUE, including filter backwash water, shall be discharged to a sanitary sewer system having sufficient capacity to collect and treat wastewater or to an on-site sewage disposal system designed for this purpose.

4.11.6.1.1 Storm Water Systems and Surface Waters

D&C

Wastewater shall not be directed to storm water systems or surface waters without appropriate permits from the AHJ or the U.S. EPA.

4.11.6.1.2 Recovery and Reuse**D&C**

A water recovery and reuse system may be submitted to the AHJ for review and approval.

4.11.6.2 Ground Surface**D&C**

If a municipal sanitary sewer system is not available, wastewater from an AQUATIC VENUE may be discharged to the ground surface at a suitable location as approved by the AHJ, as long as the wastewater does not cause erosion, and does not create a threat to public health or SAFETY, a nuisance, or unlawful pollution of public waters.

4.11.6.3 Capacity**D&C**

The wastewater disposal system shall have sufficient capacity to receive wastewater without flooding when filters are cleaned or when the AQUATIC VENUE is drained.

4.11.6.4 Separation Tank for Precoat Media Filters**D&C**

A separation tank shall be provided prior to discharge for backwash water from precoat filters using diatomaceous earth (DE) as a filter medium.

4.11.6.4.1 Discharged**D&C**

For precoat filters using perlite or cellulose as a filter medium, the backwash may be discharged to the sanitary sewer unless directed otherwise by the local AHJ.

4.12 Specific Venues**4.12.1 Spas****4.12.1.1 Additional Provisions****D&C**

In addition to the general AQUATIC VENUE requirements stated in this CODE, SPAS shall comply with the additional provisions or reliefs of this section.

4.12.1.2 Maximum Water Depth**D&C**

The maximum water depth in SPAS shall be 4 feet (1.22 m) measured from the designed static water line except for SPAS that are designed for special use and purposes and approved by the AHJ.

4.12.1.2.1 Exercise Spas**D&C**

The water depth for exercise SPAS shall not exceed 6 feet 6 inches (2.0 m) measured from the designed static water line.

4.12.1.2.2 Seating**D&C**

The maximum submerged depth of any seat or sitting bench shall be 28 inches (0.7 m) measured from the water line.

4.12.1.3	Handholds	D&C
<p>A SPA shall have one (1) or more suitable, slip-resistant handhold(s) around the perimeter and not over 12 inches (0.3 m) above the water line.</p>		
4.12.1.3.1	Options	D&C
<p>The handhold(s) may consist of bull-nosed coping, ledges or DECKS along the immediate top edge of the SPA; ladders, steps, or seat ledges; or railings.</p>		
4.12.1.4	Stairs	D&C
<p>Interior steps or stairs shall be provided where SPA depths are greater than 24 inches (0.6 m).</p>		
4.12.1.4.1	Handrail	D&C
<p>Each set of steps shall be provided with at least one handrail to serve all treads and risers.</p>		
4.12.1.4.2	Seating	D&C
<p>Seats or benches may be provided as part of these steps.</p>		
4.12.1.4.3	Approach Steps	D&C
<p>Approach steps on the exterior of a SPA wall extending above the DECK shall also be required unless the raised SPA wall is 19 inches (0.5 m) or less in height above the DECK and it is used as a transfer tier or pivot-seated entry.</p>		
4.12.1.5	Perimeter Deck	D&C
<p>A 4 foot (1.22 m) wide, continuous, unobstructed PERIMETER DECK shall be provided on two consecutive or adjacent sides or fifty percent or more of the SPA perimeter.</p>		
4.12.1.5.1	Lower Ratio	D&C
<p>The AHJ could consider a lower ratio upon review of an appropriate SAFETY PLAN that addresses adequate access.</p>		
4.12.1.5.2	Coping	D&C
<p>The PERIMETER DECK may include the coping.</p>		
4.12.1.5.3	Recessed	D&C
<p>SPAS may be located adjacent to other AQUATIC VENUES as long as they are recessed in the DECK.</p>		
4.12.1.5.4	Elevated Spas	D&C
<p>Elevated SPAS may be located adjacent to another AQUATIC VENUE as long as there is an effective BARRIER between the SPA and the adjacent AQUATIC VENUE.</p>		
4.12.1.5.5	Minimum Distance	D&C

If an effective BARRIER is not provided, a minimum distance of 4 feet (1.2 m) between the AQUATIC VENUE and SPA is required.

4.12.1.6 Depth Marking **D&C**

A minimum of two depth markers shall be provided regardless of the shape or size of the SPA.

4.12.1.7 Temperature **D&C**

Water temperatures shall not exceed 104°F (40°C).

4.12.1.8 Drain **D&C**

A means to drain the SPA shall be provided to allow frequent draining and cleaning.

4.12.1.9 Air Induction System **D&C**

An air induction system, when provided, shall prevent water back up that could cause electrical shock hazards.

4.12.1.9.1 Intake **D&C**

Air intake sources shall not permit the introduction of toxic fumes or other CONTAMINANTS.

4.12.1.10 Timers **D&C**

The agitation system shall be connected to a minute timer that does not exceed fifteen minutes located out of reach of a BATHER in the SPA.

4.12.1.11 Emergency Shutoff **D&C**

All SPAS shall have a clearly labeled emergency shutoff or control switch for the purpose of stopping the motor(s) that provide power to the RECIRCULATION SYSTEM and hydrotherapy or agitation system shall be installed readily accessible to the BATHERS, in accordance with section 680 of the NEC.

4.12.2 Water Slides and Catch Pools

4.12.2.1 Design and Construction **D&C**

4.12.2.1.1 Additional Provisions **D&C**

In addition to the general AQUATIC FACILITY requirements stated in this CODE, WATER SLIDES and CATCH POOLS shall comply with the additional provisions or reliefs of this section.

4.12.2.1.2 Recognized Standards **D&C**

The following recognized design and construction STANDARDS for WATER SLIDES shall be adhered to:

- 1) ASTM F2376-08 Standard Practice for Classification, Design, Manufacture, Construction, and Operation of Water slide Systems:
- 2) ASTM F2469-09 Standard Practice for Manufacturer, Construction, Operation, and Maintenance of Aquatic Play Equipment;
- 3) World Water Park Considerations for Operating Safety. 2004. A handbook for Risk Management and Operating Safety at Waterparks.
- 4) EN 1069-1:2010 Water slides – Part 1: Safety Requirements and test methods
- 5) EN 1069 -2: 1020 Water slides – Part 2: Operation and Risk Management.

4.12.2.1.3 Structural Design

D&C

The structural design of a WATER SLIDE and the materials used in its construction shall conform with appropriate structural engineering practices.

4.12.2.1.4 Durable Structure

D&C

The structural design of a WATER SLIDE and the materials used in its construction shall provide a sound, durable structure that will safely sustain all the dead loads, live loads, liquid hydrostatic, and earth pressures encountered.

4.12.2.2 Flumes

D&C

4.12.2.2.1 Surfaces

D&C

FLUME surfaces shall be inert, nontoxic, smooth and easily cleaned.

4.12.2.2.2 Curves and Turns

D&C

All curves and turns in a FLUME shall be:

- 1) Designed so that the impact of users with the walls of the FLUME does not present a hazard;
- 2) Banked so that the forces on the BATHERS keep them safely inside the FLUME under all foreseeable circumstances of operation. Riders must not become airborne unless the waterslide manufacturer allows such activity; and
- 3) Designed so that user should not impact the FLUME itself in such a way that causes injury, such as from a rapid change in direction or becoming inverted in the FLUME.

4.12.2.2.3 Curved Sections

D&C

In curved sections of a FLUME, the design of the wall of the FLUME shall cause the outward thrust of the body of the BATHER to be dissipated towards the centerline of the FLUME.

4.12.2.2.4 Dips

D&C

All FLUME VALLEYS and DIPS shall have proper drainage, SAFETY measures that insure a rider cannot fall from the FLUME, and a means of egress in the event the ride malfunctions.

4.12.2.2.5 Flume Walls

D&C

The walls of any FLUME shall be designed so that the continuous and combined action of hydrostatic, dynamic and static loads, as well as normal environmental deterioration do not damage the FLUME bed to the extent of creating a structural failure that presents a hazard of injury to users or that requires frequent patch repairs that may weaken the structural integrity of the FLUME.

4.12.2.3 Flume Exits

D&C

4.12.2.3.1 Catch Pool

D&C

The exit of any FLUME must be designed to ensure that BATHERS enter the CATCH POOL or slide RUNOUT at a safe speed and angle of entry.

4.12.2.3.2 Intersection

D&C

If a WATER SLIDE has two or more FLUMES and there is a point of intersection between the centerlines of any two FLUMES, the distance between that point and the point of exit for each intersecting FLUME must not be less than the slide manufacturer's recommendations.

4.12.2.4 Exit into Catch Pools

D&C

4.12.2.4.1 Water Level

D&C

WATER SLIDES shall be designed to terminate at or below water level, except for DROP SLIDES or unless otherwise permitted by the WATER SLIDE manufacturer.

4.12.2.4.2 Perpendicular

D&C

WATER SLIDES shall be perpendicular to the wall of the AQUATIC VENUE at the point of exit unless otherwise permitted by the WATER SLIDE manufacturer.

4.12.2.4.3 Exit System

D&C

WATER SLIDES shall be designed with an exit system which shall be in accordance with the WATER SLIDE manufacturer's recommendations and provides for safe entry into the CATCH POOL OR WATER SLIDE RUNOUT.

4.12.2.4.3.1 Other Methods

D&C

Other methods shall be acceptable as long as safe exit velocities and proper body position are assured under normal use.

4.12.2.4.4 Flume Exits

D&C

The FLUME exits shall be in accordance with the WATER SLIDE manufacturer's recommendations.

4.12.2.4.5 Point of Exit

D&C

The distance between the point of exit and the side of the AQUATIC VENUE opposite the BATHERS as they exit, excluding any steps, shall not be less than the WATER SLIDE manufacturer's recommendations.

4.12.2.5	Catch Pools	D&C
4.12.2.5.5	Steps	D&C
If steps are provided instead of exit ladders or RECESSED STEPS with grab rails, a handrail shall be provided at the steps opposite the point of exit from each FLUME.		
4.12.2.5.6	Landing Area	D&C
If the WATER SLIDE FLUME shall end in a swimming POOL, the landing area shall be divided from the rest of the AQUATIC VENUE by a float line or as approved by the AHJ.		
4.12.2.6	Decks	D&C
A PERIMETER DECK shall be provided along the exit side of the CATCH POOL.		
4.12.2.7	Means of Access	D&C
A walkway, steps, stairway or ramp shall be provided between the CATCH POOL and the top of the FLUME. Refer to MAHC Section 4.8.1.		
4.12.2.8	Slide Run-outs	D&C
4.12.2.8.1	Egress	D&C
WATER SLIDE RUN-OUTS, if used, shall have a planned means of egress, unless one or both of the walls of the RUN-OUT are not more than 12 inches (0.3 m) in height.		
4.12.2.8.2	Designed	D&C
WATER SLIDE RUN-OUTS shall be designed in accordance with the slide manufacturer's recommendations.		
4.12.2.9	Drop Slides	D&C
4.12.2.9.1	Landing Area	D&C
There shall be a slide landing area in accordance with the slide manufacturer's recommendations.		
4.12.2.9.2	Infringe	D&C
This area shall not infringe on the landing area for any other slides, diving equipment, or any other minimum AQUATIC VENUE clearance requirements.		
4.12.2.9.3	Steps	D&C
Steps shall not infringe on this area.		
4.12.2.9.4	Water Depth	D&C
The minimum required water depth shall be a function of the slide drop height above the water surface.		
4.12.2.9.5	Manufacturer's Recommendation	D&C

The minimum required water depth shall be in accordance with the slide manufacturer's recommendations.

4.12.2.10 Pool Slides

D&C

4.12.2.10.1 Designed for Safety

D&C

All slides installed as an appurtenance to a public swimming POOL or water attraction shall be designed, constructed, and installed to provide a safe environment for all PATRONS utilizing the facility.

4.12.2.10.1.1 Standards

D&C

POOL SLIDES shall be designed and constructed in accordance with applicable ASTM and CSPC STANDARDS.

4.12.2.10.2 Injury

D&C

POOL SLIDES are to be assembled, arranged, and finished in a smooth and consistent manner to inhibit the possibility of injury.

4.12.2.10.3 Non-Toxic

D&C

Components used to construct a POOL SLIDE shall be non-toxic and compatible with the environment contacted under normal use.

4.12.2.10.4 Access

D&C

Access to the inclined sliding surface shall be gained by use of steps, ladders, stairs, or ramps.

4.12.2.10.4.1 Treads

D&C

Treads shall be slip resistant.

4.12.2.10.4.2 Ladders

D&C

Ladders shall be constructed with full treads not rungs (similar to ladders acceptable for ingress/egress into POOLS).

4.12.2.10.5 Handrails

D&C

Handrails for ladders shall be sturdy, 1-1.9 inch outside diameter, extend no more than 18 inches above the slide entrance platform, and designed to prevent entrapment.

4.12.2.10.6 Water Depth

D&C

Water depth at the slide terminus shall be determined by the slide manufacturer.

4.12.2.10.7 Pool Edge

D&C

Clear space shall be maintained to the POOL edge and other features per manufacturer requirements.

4.12.2.10.7.1 Terminus End

D&C

The terminus end of the slide shall be protected through the use of a float line, WING WALL, PENINSULA or other similar impediment to prevent collisions with other BATHERS.

4.12.2.10.7.2 Prevent Bather Access **D&C**

Netting or other structures shall be provided to prevent BATHER access underneath POOL SLIDES where sufficient clearance is not provided.

4.12.2.11 Signage **D&C**

4.12.2.11.1 Warning Signs **D&C**

Warning signs in accordance with manufacturer's recommendations shall be provided.

4.12.3 Wave Pools

4.12.3.1 General **D&C**

4.12.3.1.1 Additional Provisions **D&C**

In addition to the general swimming POOL requirements stated in this CODE, WAVE POOLS shall comply with the additional provisions or reliefs of this section.

4.12.3.2 Access **D&C**

4.12.3.2.1 Access Point **D&C**

BATHERS must gain access to the WAVE POOL at the shallow or beach end.

4.12.3.2.1.1 Sides **D&C**

The sides of the WAVE POOL shall be protected from unauthorized entry into the WAVE POOL by the use of a fence or other comparable BARRIER.

4.12.3.2.1.2 Handrails **D&C**

Handrails as required by ADA for accessible entries shall be designed in such a way that they do not present a potential for injury or entrapment with WAVE POOL PATRONS.

4.12.3.2.2 Handholds **D&C**

WAVE POOLS shall be provided with handholds at the static water level or not more than 6 inches above the static water level.

4.12.3.2.2.1 Continuous **D&C**

These handholds shall be continuous around the WAVE POOL's perimeter with the exception of at the ZERO DEPTH BEACH ENTRY, water depths less than 24 inches (0.6 m), if this area is roped off not allowed for BATHER access.

4.12.3.2.2.2 Self Draining **D&C**

These handholds shall be self-draining.

4.12.3.2.2.3 Flush **D&C**

Handholds shall be installed so that their outer edge is flush with the WAVE POOL wall.

4.12.3.2.2.4 Entangled

D&C

The design of the handholds shall ensure that body extremities will not become entangled during wave action.

4.12.3.2.3 Steps and Handrails

D&C

RECESSED STEPS shall not be allowed along the walls of the WAVE POOL due to the entrapment potential.

4.12.3.2.4 Ladders

D&C

Side wall ladders shall be utilized for egress only and shall be placed so they do not project beyond the plane of the wall surface.

4.12.3.2.5 Requirements

D&C

The egress requirements in MAHC Sections 4.5.4.1, 4.5.4.1.2, and 4.5.4.3 do not apply to WAVE POOLS.

4.12.3.2.6 Float Line

D&C

WAVE POOLS shall be fitted with a float line located to restrict access to the caisson wall if required by the WAVE POOL equipment manufacturer

4.12.3.3 Safety

D&C

4.12.3.3.1 Life Jackets

D&C

Proper STORAGE shall be provided for life jackets and all other equipment used in the WAVE POOL that will allow for thorough drying to prevent the growth of mold.

4.12.3.3.2 Shut-Off Switch

D&C

A minimum of two emergency shut-off switches to disable the wave action shall be provided, one on each side of the WAVE POOL.

4.12.3.3.2.1 Labeled and Accessible

D&C

These switches shall be clearly labeled and readily accessible to QUALIFIED LIFEGUARDS.

4.12.3.3.3 No Diving Sign

D&C

SAFETY rope and float lines typically required at shallow to deep water transitions shall not apply to WAVE POOLS.

4.12.3.3.4 Caution Signs

D&C

Caisson BARRIERS shall be provided for all WAVE POOLS that prevent the passage of a four (4) inch ball.

4.12.4 Therapy Pools**D&C****4.12.4.1 Additional Provisions****D&C**

In addition to the general AQUATIC VENUE requirements stated in this CODE, THERAPY POOLS shall comply with the additional provisions or reliefs of this section and MAHC Section 4.7.3.3.1.2 on SECONDARY DISINFECTION.

4.12.4.2 Slope**D&C**

Floor slope may exceed 1 foot (0.3 m) in 12 feet (3.66 m) for water shallower than 5 feet (1.5 m).

4.12.4.2.1 Break Points**D&C**

Break points in floor slope shall be identified with a contrasting band consistent with MAHC Section 4.5.5.2.

4.12.4.3 Hydrotherapy**D&C**

Hydrotherapy or jet systems shall be independent of the recirculation, filtration, and heating systems.

4.12.4.4 Special Equipment**D&C**

Special equipment may be allowed by the AHJ with proper justification.

4.12.5 Lazy Rivers**4.12.5.1 General****D&C****4.12.5.1.1 Additional Provisions****D&C**

In addition to the general swimming AQUATIC VENUE requirements stated in this CODE, LAZY RIVERS shall comply with the additional provisions or reliefs of this section.

4.12.5.1.2 Protrusions**D&C**

Handrails, steps, stairs and propulsion jets for LAZY RIVERS shall not protrude into the river.

4.12.5.2 Access and Egress**D&C****4.12.5.2.1 Means****D&C**

Means of access/egress shall be provided at 150 foot (45.7 m) intervals around the LAZY RIVER.

4.12.5.2.2 Handhold**D&C**

A handhold in compliance with MAHC Section 4.5.6 shall be required on at least one side of the LAZY RIVER.

4.12.5.2.3 Deck**D&C**

A DECK shall be provided along the entire length of the LAZY RIVER.

4.12.5.2.3.1 Alternate Sides **D&C**

The DECK shall be allowed to alternate sides of the LAZY RIVER.

4.12.5.2.3.2 Obstructions **D&C**

Obstructions around the perimeter of the LAZY RIVER, such as bridges or landscaping, shall be allowed provided they do not impact lifeguarding, sight lines, or rescue operations.

4.12.5.2.4 Bridges **D&C**

All bridges SPANNING a LAZY RIVER shall have a minimum clearance of both 7 feet (2.13 m) from the bottom of the LAZY RIVER and 4 feet (1.22 m) above the water surface to any structure overhead.

4.12.5.3 Water Quality **D&C**

4.12.5.4 Safety **D&C**

4.12.6 Moveable Floors

4.12.6.1 General **D&C**

4.12.6.1.1 Additional Provisions **D&C**

In addition to the general swimming AQUATIC VENUE requirements stated in this CODE, MOVEABLE FLOORS shall comply with the additional provisions or reliefs of this section.

4.12.6.1.2 Water Treatment **D&C**

The MOVEABLE FLOOR design shall not impede the effectiveness of the water treatment system.

4.12.6.1.3 Underneath **D&C**

MOVEABLE FLOORS shall allow inspection, cleaning and maintenance of the area underneath.

4.12.6.2 Slip Resistance **D&C**

4.12.6.2.1 Shallow Water **D&C**

The surface of the MOVEABLE FLOOR shall be slip resistant if it is intended for installation in water depths less than 5 feet (1.5 m).

4.12.6.3 Safety **D&C**

4.12.6.3.1 Not Continuous **D&C**

A strategy for preventing PATRONS from transitioning to deeper water when a MOVEABLE FLOOR is not continuous over the entire surface area of the AQUATIC VENUE shall be provided.

4.12.6.3.2 Underside

D&C

The underside of the MOVEABLE FLOOR shall not be accessible to BATHERS.

4.12.6.3.3 Entrapment

D&C

The design of a MOVEABLE FLOOR shall protect against BATHER entrapment between the MOVEABLE FLOOR and the POOL walls and floor.

4.12.6.3.4 Hydraulic Fluid

D&C

If the MOVEABLE FLOOR is operated using hydraulics, the hydraulic compounds shall be listed as safe for use in POOL water in case there is a hydraulic leak.

4.12.6.4 Movement

D&C

4.12.6.4.1 Speed

D&C

The speed of a MOVEABLE FLOOR shall be less than or equal to 1.5 feet/min (0.457 m/min).

4.12.6.4.2 Use

D&C

Use of the MOVEABLE FLOOR portion of the POOL shall not be open to BATHERS when the floor is being raised or lowered.

4.12.6.4.2.1 Exception

D&C

Exception 1: The MOVEABLE FLOOR shall only be used for accessibility purposes under direct supervision.

4.12.6.5 Water Depth and Markings

D&C

4.12.6.5.1 Displayed

D&C

A floor depth indicator shall be provided that displays the CURRENT POOL water depth.

4.12.6.5.2 Warning Markings

D&C

Warning markings stating "MOVEABLE FLOOR" shall be provided at 25 foot (7.62 m) intervals around the perimeter of the MOVEABLE FLOOR.

4.12.7 Bulkheads

4.12.7.1 Additional Provisions

D&C

In addition to the general AQUATIC VENUE requirements stated in this CODE, BULKHEADS shall comply with the additional provisions or reliefs of this section.

4.12.7.3	Entrapment	D&C
The bottom of the BULKHEAD shall be designed so that a BATHER cannot be entrapped underneath or inside of the BULKHEAD.		
4.12.7.4	Placement	D&C
The BULKHEAD placement shall not interfere with the required water circulation in the POOL.		
4.12.7.5	Fixed	D&C
BULKHEADS shall be fixed to their operational position(s) by a tamper-proof system.		
4.12.7.6	Gap	D&C
The gap between the BULKHEAD and the POOL shall be 1.5 inches (38 mm).		
4.12.7.7	Handhold	D&C
The BULKHEAD shall be designed to afford an acceptable handhold as required in MAHC Section 4.5.6.		
4.12.7.8	Entrances and Exits	D&C
The proper number of entrances/exits to the POOL as required by MAHC section 4.5.4 shall be provided when the BULKHEAD is in place.		
4.12.7.9	Guard Railings	D&C
Guard railings at least 34 inches (860 mm) tall shall be provided on both ends of the BULKHEAD.		
4.12.7.10	Width	D&C
The width of the walkable area (total BULKHEAD width) of a BULKHEAD shall be greater than or equal to 3 feet and 3 inches (1.0 m).		
4.12.7.10.1	Starting Platforms	D&C
If starting platforms are installed, the width of the walkable area (total BULKHEAD width) of a BULKHEAD shall be greater than or equal to 3 feet and 9 inches (1140 mm).		
4.12.8 Interactive Water Play Venues		
4.12.8.1	Additional Provisions	D&C
In addition to the general AQUATIC VENUE requirements stated in this CODE, INTERACTIVE WATER PLAY VENUES shall comply with the additional provisions or reliefs of this section.		
4.12.8.2	Surface	D&C
INTERACTIVE WATER PLAY VENUES shall have a slip-resistant and easily cleanable surface.		
4.12.8.2.1	Manufactured Surfacing	D&C

Any manufactured surfacing shall be deemed suitable by the manufacturer for aquatic and chlorinated environments.

4.12.8.3 Sloped

D&C

The INTERACTIVE WATER PLAY VENUE shall be properly sloped so that only water from the AQUATIC FEATURES flows back to the reservoir.

4.12.8.3.1 Adjacent Areas

D&C

Areas adjacent to the INTERACTIVE WATER PLAY VENUE shall be sloped away from the collection drains.

4.12.8.3.2 Water Collection

D&C

The slope of the INTERACTIVE WATER PLAY VENUE shall be sufficient to prevent standing water from collecting on the pad.

4.12.8.4 Drains

D&C

The size, number and locations of the INTERACTIVE WATER PLAY VENUE drains shall be determined and specified so as to assure water does not accumulate on the INTERACTIVE WATER PLAY VENUES.

4.12.8.4.1 Gravity

D&C

Flow through the drains to the INTERACTIVE WATER PLAY VENUE COLLECTION TANK shall be under gravity.

4.12.8.4.2 Direct Suction Outlets

D&C

Direct suction outlets from the INTERACTIVE WATER PLAY VENUE shall be prohibited.

4.12.8.5 Grate Openings

D&C

Openings in the grates covering the drains shall not exceed ½ inches (13 mm) wide.

4.12.8.5.1 Tools

D&C

Gratings shall not be removable without the use of tools.

4.12.8.6 Treatment Tank

D&C

The INTERACTIVE WATER PLAY VENUE COLLECTION TANK shall be designed to provide ready access for cleaning and inspections, and be capable of complete draining.

4.12.8.6.1 Access Hatch

D&C

The access hatch or lid shall be locked or require a tool to open.

4.12.8.7 Deck Area

D&C

Eight feet (2.44 m) of DECK area shall be provided between a INTERACTIVE WATER PLAY VENUE and any landscaped area unless the landscaping is elevated above the DECK in a planter.

4.12.8.7.1 Deck Surface **D&C**

The DECK shall be of a uniform, easily cleaned, impervious material and be protected from surface runoff.

4.12.8.8 Barrier **D&C**

A BARRIER shall be provided to separate an INTERACTIVE WATER PLAY VENUE from another BODY OF WATER within the same facility unless the INTERACTIVE WATER PLAY VENUE is separated by a distance of at least 15 feet (4.57 m) from other BODIES OF WATER.

4.12.8.9 Enclosures **D&C**

If a facility only consists of a INTERACTIVE WATER PLAY VENUE, then the requirements for an ENCLOSURE shall not apply.

4.12.8.10 Hazard **D&C**

SPRAY FEATURES shall be designed and installed to be seen clearly, so as not to be a hazard to PATRONS due to water velocity from the SPRAY FEATURE discharge, or other SAFETY hazards.

4.12.8.11 Maximum Velocity **D&C**

Maximum velocity at the orifice of the SPRAY FEATURE nozzle shall not exceed 20 feet (6.1 m) per second.

4.12.8.12 Signage **D&C**

Depth markings and warning signs are not required for INTERACTIVE WATER PLAY VENUES.

4.12.8.13 NEC Requirements **D&C**

NEC swimming POOL requirements shall apply to Interactive water play venues.

4.12.9 Wading Pools and**4.12.9.1 Additional Provisions** **D&C**

In addition to the general AQUATIC VENUE requirements stated in this CODE, WADING POOLS shall comply with the additional provisions or reliefs of this section.

4.12.9.2 Barrier **D&C**

A BARRIER shall be provided to separate a WADING POOL from other POOLS unless the WADING POOL is separated by a distance of 15 feet (4.57 m) from other BODIES OF WATER.

4.12.9.2.1 Complete Enclosure **D&C**

The BARRIER shall not be required to be a complete ENCLOSURE of the WADING POOL provided the shortest distance of travel between the WADING POOL around the BARRIER to the other POOL is a minimum of 15 feet (4.57 m).

4.12.9.2.2 Shallow Water **D&C**

WADING POOLS near other WADING POOLS are not required to be separated by a BARRIER.

DRAFT

Model Aquatic Health Code

5.0 Operation and Maintenance

5.1 Plan Submittal

5.1 Operating Permits

5.1.1 Owner Responsibilities

5.1.1.1 Operating Permit Required

REG

Prior to opening an AQUATIC VENUE to the public, the AQUATIC FACILITY owner shall apply to the AHJ for a permit to operate an AQUATIC VENUE by:

- 1) Submitting a permit application,
- 2) Paying the applicable fees, and
- 3) Showing compliance with the CODE.

5.1.1.2 Separate

REG

A separate permit is required for each AQUATIC VENUE.

5.1.1.3 Prior to Issuance

REG

Before a permit (license) is issued, the AQUATIC FACILITY owner shall supply information showing that:

- 1) The AQUATIC VENUE is in compliance with the requirements of this CODE,
- 2) All required application fees have been paid, and
- 3) The AQUATIC VENUE has been approved by the AHJ.

5.1.1.4 Permit Details

REG

The permit shall be issued in the name of the owner for the calendar year, or if a seasonal AQUATIC FACILITY, for the period during the calendar year the facility will be in operation.

5.1.1.5 Permit expiration

REG

Operating permits shall terminate according to AHJ calendar schedule.

5.1.1.6 Permit Renewal

REG

The AQUATIC FACILITY owner shall renew the permit to operate annually using forms and paying permit fees prescribed by the AHJ prior to the scheduled expiration of an existing permit to operate an AQUATIC VENUE.

5.1.1.7 Permit Denial

REG

The permit (license) to operate may be withheld, revoked or denied by the AHJ for noncompliance of the AQUATIC FACILITY with the requirements of this CODE

5.1.1.8 Owner Responsibilities **REG**

The owner of an AQUATIC FACILITY is responsible for the facility being operated, maintained, and managed in accordance with the requirements of this CODE.

5.1.2 Operating Permits**5.1.2.1 Permit Location** **REG**

The operating permit shall be posted in a location conspicuous to the public on the premises of the AQUATIC FACILITY.

5.1.2.2 Operating Without a Permit **REG**

Operation of an AQUATIC VENUE without a permit is prohibited.

5.1.2.3 Required Closure **REG**

The AHJ may order an AQUATIC VENUE without a permit to close until the AQUATIC FACILITY has obtained a permit.

5.2 Inspections**5.2.1 Preoperational Inspections****5.2.1.1 Terms of Operation** **REG**

The AQUATIC FACILITY may not be placed in operation until an inspection approved by the AHJ shows compliance with the requirements of this CODE.

5.2.1.2 Multiple Inspections **REG**

Where more than one annual pre-operational inspection is required for an AQUATIC FACILITY before it can be approved for operation, the AHJ shall assess a re-inspection fee for each additional inspection after the initial inspection.

5.2.2 Exemptions**5.2.2.1 Applying for Exemption** **REG**

An AQUATIC FACILITY seeking an initial exemption or an existing AQUATIC FACILITY claiming to be exempt according to applicable regulations shall contact the AHJ for application details/forms.

5.2.2.2 Change in Exemption Status **REG**

An AQUATIC FACILITY that sought and received an exemption from a public regulation, shall contact the AHJ if the conditions upon which the exemption was granted change so as to eliminate the exemption status.

5.2.3 Variances

5.2.3.1 Variance Authority REG

The AHJ may grant a variance to the requirements of this CODE.

5.2.3.2 Applying for a Variance REG

An AQUATIC FACILITY that seeks a variance shall apply in writing with the appropriate forms to the AHJ.

5.2.3.2.1 Application Components

The application shall include but not be limited to:

- 1) A citation of the CODE section to which the variance is requested;
- 2) A statement as to why the applicant is unable to comply with the CODE section to which the variance is requested;
- 3) The nature and duration of the variance requested;
- 4) A statement of how the intent of the CODE will be met and the reasons why the public health or SAFETY would not be jeopardized if the variance was granted, and
- 5) A full description of any policies, procedures or equipment that the applicant proposes to use to rectify any potential increase in health or SAFETY risks created by granting the variance.

5.2.4 Variance Requests

5.2.4.1 Revoked REG

Each variance is revoked when the permit attached to it is revoked.

5.2.4.2 Not Transferable REG

A variance is not transferable unless otherwise provided in writing at the time the variance is granted.

5.2 Materials

5.3 Equipment Standards

5.4 Aquatic Venue Operation and Facility Maintenance

5.4.1 Closure and Reopening

5.4.1.1 Short Closures FMO

5.4.1.1.1 Short Closures FMO

The water in an AQUATIC VENUE closed for seven days or less shall be recirculated and treated to assure water quality parameters meet the criteria of this CODE.

5.4.1.1.2 Safe Condition FMO

The AQUATIC VENUE closed for seven days or less shall be maintained free of hazards to workers and secured during off hours.

5.4.1.2 Long Closures FMO**5.4.1.2.1 Drain / Cover FMO**

The water in an AQUATIC VENUE with uncontrolled access and closed for more than seven days shall be drained or an approved SAFETY cover that meets ASTM F1346-91 shall be installed.

5.4.1.2.2 Long Closures FMO

The water in an AQUATIC VENUE with uncontrolled access closed for more than seven days that is not drained shall be recirculated and treated to assure water quality parameters meet the criteria of this CODE.

5.4.1.2.3 Reopening FMO

An owner or operator of an AQUATIC VENUE closed for more than seven days shall verify that the AQUATIC VENUE meets all criteria of this CODE before reopening the AQUATIC VENUE.

5.4.2 Preventive Maintenance Plan**5.4.2.1 Written Plan FMO****5.4.2.1.1 Preventive Maintenance Plan Available FMO**

A written comprehensive preventive maintenance plan shall be available at the AQUATIC FACILITY for each AQUATIC VENUE.

5.4.2.1.2 Contents FMO

The AQUATIC FACILITY preventive maintenance plan shall include details and frequency of owner's or operator's planned routine facility inspection, maintenance or servicing, and recirculation and water treatment component replacement.

5.4.2.2 Facility Documentation FMO**5.4.2.2.1 Original Plans and Specifications Available FMO**

A copy of the approved plans and specifications shall be available at the AQUATIC VENUE for each AQUATIC FACILITY constructed after the adoption of this CODE.

5.4.2.2.2 Equipment Inventory FMO

A comprehensive inventory of all mechanical equipment associated with each AQUATIC VENUE shall be available at the AQUATIC FACILITY.

5.4.2.2.3 Inventory Details FMO

This inventory shall include:

- 1) Equipment name and model number,
- 2) Manufacturer and contact information,
- 3) Local vendor/supplier & technical representative, if applicable, and
- 4) Replacement or service dates and details.

5.4.2.2.4 Equipment Manuals

FMO

Operation manuals for all mechanical equipment associated with each AQUATIC VENUE shall be available at the AQUATIC FACILITY.

5.4.2.2.4.1 No Manual

FMO

If no manufacturer's operation manual is available, then the AQUATIC FACILITY should create a written document that outlines STANDARD operating procedures for maintaining and operating the piece of equipment.

5.4.3 General Operations

5.5 Aquatic Venue Structure

5.5.1 Shape

5.5.2 Access Ladders

5.5.3 Color and Finish

5.5.4 Walls

5.5.5 Depth Markings

5.5.6 Pool Shell Maintenance

5.5.6.1 Cracking

D&C

5.5.6.1.1 Types of Cracks

D&C

CRACKS exhibiting any of the following characteristics shall be evaluated by a structural engineer:

- 1) CRACKS with vertical displacement;
- 2) CRACKS of varying width;
- 3) CRACKS concentrated to a specific area;
- 4) CRACKS exposing any reinforcement;
- 5) CRACKS obviously recurring from previous patches;
- 6) CRACKS in corners;
- 7) CRACKS drawing a defined line; and
- 8) Surface CRACKING over 1/8 inch (3.2mm) in width.

5.5.6.1.2 Document Cracks **D&C**

Surface CRACKS under 1/8 inch (3.2mm) wide shall be documented and monitored for any movement or change including opening, closing, and/or lengthening.

5.5.6.1.3 Sharp Edges **D&C**

Any sharp edges shall be removed.

5.6 Indoor/Outdoor Environment

5.6.1 Lighting **FMO**

5.6.1.1 Lighting Maintained **FMO**

5.6.1.1.1 Light Levels **FMO**

Lighting systems, including emergency lighting, shall be maintained in all PATRON areas and maintenance areas, to ensure the required lighting levels are met as specified in MAHC Section 4.6.1.

5.6.1.1.2 Main Drain Visible **FMO**

The AQUATIC FACILITY shall not be open if light levels are such that the main drain is not visible from POOLside.

5.6.1.1.3 Underwater Lighting **FMO**

Underwater lights shall be operational and maintained as designed.

5.6.1.1.4 Cracked Lenses **FMO**

CRACKED lenses that are physically intact on lights shall be replaced before the AQUATIC VENUE reopens to BATHERS.

5.6.1.1.5 Intact lenses **FMO**

The AQUATIC VENUE shall be immediately closed if CRACKED lenses are not intact and the lenses shall be replaced before re-opening.

5.6.1.2 Glare **FMO**

5.6.1.2.1 Assessments **FMO**

The QUALIFIED OPERATOR shall assess glare conditions throughout operating hours to ensure the AQUATIC VENUE bottom and objects in the POOL are clearly visible.

5.6.1.2.2 Reduction **FMO**

Windows and lighting equipment shall be adjusted to minimize glare and excessive reflection on the water surface.

5.6.1.2.1 Good Condition **RM**

Lighting equipment shall be maintained in good condition and at the levels established in MAHC Section 4.6.1.

5.6.1.2.2 Light levels

RM

Light levels shall be maintained as designed.

5.6.1.3 Underwater Lighting

5.6.1.3.1 Hours

RM

Night swimming shall be considered one half hour before sunset to one half hour after sunrise.

5.6.1.4 Water Surface

5.6.1.5 Emergency Lighting

5.6.1.5.1 Tested and Maintained

RM

Emergency lighting shall be tested and maintained according to manufacturer's recommendations.

5.6.2 Indoor Aquatic Facility Ventilation

5.6.2.1 Purpose

VEN

AIR HANDLING SYSTEMS shall be maintained and operated by the owner/operator to protect the health and SAFETY of the facility's PATRONS.

5.6.2.2 Original Characteristics

VEN

AIR HANDLING SYSTEMS shall be maintained and operated to comply with all requirements of the original system design, construction and installation.

5.6.2.3 Indoor Facility Areas

VEN

The ventilation operation and maintenance requirements shall apply to an INDOOR AQUATIC FACILITY including the AQUATIC VENUES, the surrounding BATHER and spectator/stadium seating area, but does not include mechanical rooms, bath and locker rooms, and any associated rooms which have a direct opening to the AQUATIC FACILITY.

5.6.2.4 Ventilation Procedures

VEN

THE INDOOR AQUATIC FACILITY owner/operator shall develop and implement a program of STANDARD AIR HANDLING SYSTEM operation, maintenance, cleaning, testing, and inspection procedures with detailed instructions, necessary equipment and supplies, and oversight for those carrying out these duties, in accordance with the AIR HANDLING SYSTEM design engineer and/or manufacturer's recommendations.

5.6.2.4.1 System Operation

VEN

The AIR HANDLING SYSTEM shall operate continuously, including providing the required amount of outdoor air.

5.6.2.4.1.1 Operation Outside of Operating Hours **VEN**

The exception is that the amount of outdoor air may be reduced by no more than 50% during non-use periods as long as acceptable air quality is maintained.

5.6.2.5 Manuals/Commissioning Reports **VEN**

The QUALIFIED OPERATOR shall maintain a copy of the AIR HANDLING SYSTEM design engineer and/or manufacturer original operating manuals, and commissioning reports, updates and specifications for any modifications at the facility.

5.6.2.6 Ventilation Monitoring **VEN**

The QUALIFIED OPERATOR shall monitor, log and maintain AIR HANDLING SYSTEM set-points and other operational parameters as specified by the AIR HANDLING SYSTEM design engineer and/or manufacturer.

5.6.2.7 Air Filter Changing **VEN**

The QUALIFIED OPERATOR(S) shall replace or clean, as appropriate, AIR HANDLING SYSTEM air filters in accordance with the AIR HANDLING SYSTEM design engineer and/or manufacturer's recommendations, whichever is most frequent.

5.6.2.8 Combined Chlorine Reduction **VEN**

The QUALIFIED OPERATOR shall develop and implement a plan to minimize combined CHLORINE compounds in the INDOOR AQUATIC FACILITY from the operation of AQUATIC VENUES.

5.6.2.9 Building Purge Plan **VEN**

The QUALIFIED OPERATOR shall develop an air quality action plan with procedures for PURGING the INDOOR AQUATIC FACILITY for chemical emergencies or other indicators of poor air quality.

5.6.2.10 Records **VEN**

The owner shall maintain documents at the INDOOR AQUATIC FACILITY to be available for inspection, recording the following:

- 1) A log recording the set points of operational parameters set during the commissioning of the AIR HANDLING SYSTEM and the actual readings taken at least once daily;
- 2) Maintenance conducted to the system including the dates of filter changes, cleaning, and repairs;
- 3) Dates and details of modifications to the AIR HANDLING SYSTEM; and
- 4) Dates and details of modifications to the operating scheme.

5.6.3 Electrical**5.6.3.1 Electrical Repairs****FMO****5.6.3.1.1 Local Codes****FMO**

Repairs or alterations to electrical equipment and associated equipment shall preserve compliance with the NEC, or with applicable local CODES prevailing at the time of construction, or with subsequent versions of those CODES.

5.6.3.1.2 Immediately Repaired**FMO**

All defects in the electrical system shall be immediately repaired.

5.6.3.1.3 Wiring**FMO**

Electrical wiring, whether permanent or temporary, shall comply with the National Electrical CODE (NEC) Article 225 and Article 680 and other applicable sections, or with applicable local CODE.

5.6.3.2 Electrical Receptacles**FMO****5.6.3.2.1 New Receptacles****FMO**

The installation of new electrical receptacles shall be subject to electrical-construction requirements of this CODE and applicable local CODE.

5.6.3.2.2 Repairs**FMO**

Repairs or maintenance to existing receptacles shall maintain compliance with the NEC, especially NEC Article 680.22, and with CFR 1910.304(b) (3) (ii).

5.6.3.2.3 Replacement**FMO**

Replacement receptacles shall be of the same type as the previous ones, e.g. grounding-type receptacles shall be replaced only by grounding-type receptacles, with all grounding conductors connected and proper wiring polarity preserved.

5.6.3.2.4 Substitutions**FMO**

Where the original-type of receptacle is no longer available, a replacement and installation shall be in accordance with applicable local CODE.

5.6.3.3 Ground-Fault Circuit Interrupter**FMO****5.6.3.3.1 Manufacturer's Recommendations****FMO**

Where receptacles are required to be protected by GFCI devices, the GFCI devices shall be tested following the manufacturer's recommendations.

5.6.3.3.2 Permanent Facilities**FMO**

For permanent AQUATIC FACILITIES, required GFCI devices shall be tested monthly as part of scheduled maintenance.

5.6.3.3.3 Testing**FMO**

Required GFCI devices shall be tested as part of scheduled maintenance on the first day of operation, and monthly thereafter, until the BODY OF WATER is drained and the equipment is prepared for STORAGE.

5.6.3.4 Grounding**FMO****5.6.3.4.1 Maintenance and Repair****FMO**

Maintenance or repair of electrical circuits or devices shall preserve grounding compliance with the NEC, especially Article 250 Grounding and Bonding, Article 680 Swimming Pools, Fountains, and Similar Installations, and Chapter 3, or with applicable local CODES.

5.6.3.4.2 Grounding Conductors**FMO**

Grounding conductors that have been disconnected, except for minor repairs, shall be re-inspected by the local building CODE authority prior to AQUATIC VENUE being used by BATHERS.

5.6.3.4.3 Damaged Conductors**FMO**

Damaged grounding conductors and grounding electrodes shall be repaired immediately.

5.6.3.4.4 Damaged Conductor Repair**FMO**

Damaged grounding conductors or grounding electrodes, associated with recirculation or DISINFECTION equipment or with underwater lighting systems, shall be repaired by a QUALIFIED PERSON.

5.6.3.4.5 Public Access**FMO**

The public shall not have access to the AQUATIC VENUE until such grounding conductors or grounding electrodes are repaired by a QUALIFIED PERSON.

5.6.3.4.6 Venue Closure**FMO**

The AQUATIC VENUE with damaged grounding conductors or grounding electrodes, that are associated with recirculation or DISINFECTION equipment or with underwater lighting systems, shall be closed until repairs are completed and inspected by the AHJ.

5.6.3.5 Bonding**FMO****5.6.3.5.1 Local Codes****FMO**

Maintenance or repair of all metallic equipment, electrical circuits or devices, or reinforced concrete structures shall preserve bonding compliance with the NEC, or with applicable local CODES.

5.6.3.5.2 Bonding Conductors**FMO**

Bonding conductors shall not be disconnected except where they will be immediately reconnected.

5.6.3.5.3 Disconnected Conductors FMO

The AQUATIC VENUE shall not be used by BATHERS while bonding conductors are disconnected.

5.6.3.5.4 Removable Covers FMO

Removable covers protecting bonding conductors, e.g. at ladders, shall be kept in place except during bonding conductor inspections, repair or replacement.

5.6.3.5.5 Scheduled Maintenance FMO

Bonding conductors, where accessible, shall be inspected semi-annually as part of scheduled maintenance.

5.6.3.5.6 Corrosion FMO

Bonding conductors and any associated clamps shall not be extensively corroded.

5.6.3.5.7 Continuity FMO

Continuity of the bonding system associated with RECIRCULATION SYSTEM OR DISINFECTION equipment or with underwater lighting systems shall be inspected by the AHJ following installation and any major construction around the AQUATIC FACILITY.

5.6.3.6 Extension Cords FMO

5.6.3.6.1 Temporary Cords and Connectors FMO

Temporary extension cords and power connectors shall not be used as a substitute for permanent wiring.

5.6.3.6.2 Minimum Distance from Water FMO

All parts of an extension cord shall be restrained at a minimum of 6 feet (1.8m) away when measured along the shortest possible path from a BODY OF WATER during times when the AQUATIC FACILITY is open.

5.6.3.6.3 Exception FMO

An extension cord may be used within 6 feet (1.8m) of the nearest edge of a BODY OF WATER if a permanent wall exists between the BODY OF WATER and the extension cord.

5.6.3.6.4 GFCI Protection FMO

The circuit supplying an extension cord shall be protected by a GFCI device when the extension cord is to be used within 6 feet (1.8m) of a BODY OF WATER.

5.6.3.6.5 Local Code FMO

An extension cord incorporating a GFCI device may be used if that is acceptable under applicable local CODE.

5.6.3.6.6 Compliance FMO

The use of extension cords shall comply with CFR 1910.304.

5.6.3.7 Portable Electric Devices FMO

5.6.3.7.1 Near Water FMO

Portable line-powered electrical devices, such as radios or drills, shall not be used within 6 feet (1.8m) horizontally of the nearest inner edge of a BODY OF WATER, unless connected to a GFCI-protected circuit.

5.6.3.8 Communication Devices and Dispatch Systems FMO

5.6.3.8.1 Compliance FMO

The maintenance and repair of Communication Devices and DISPATCH Systems shall preserve compliance with the NEC.

5.6.4 Facility Heating

5.6.4.1 Facility Heating FMO

5.6.4.1.1 Maintenance and Repair FMO

Maintenance, repairs, and alterations to facility-heating equipment shall preserve compliance with applicable CODES.

5.6.4.1.2 Defects FMO

Defects in the facility-heating equipment shall be immediately repaired.

5.6.4.1.3 Temperature FMO

Air temperature of a NATATORIUM shall be controlled to the original specifications or in the absence of such, maintain the dew point of the INTERIOR SPACE less than the dew point of the interior walls at all times so as to prevent damage to structural members and to prevent biological growth on walls.

5.6.4.1.4 Combustion Device FMO

Items shall not be stored within the COMBUSTION DEVICE manufacturer's specified minimum clearance distance.

5.6.4.2 Water Heating FMO

5.6.4.2.1 Maintenance and Repair FMO

Maintenance, repairs, and alterations to POOL-water heating equipment shall preserve compliance with applicable CODES.

5.6.5 First Aid Room**5.6.6 Emergency Exit****5.6.6.1 Emergency Exit Routes****RM**

Emergency exit routes shall be established for both INDOOR FACILITIES and OUTDOOR FACILITIES and be maintained so that they are well lit, unobstructed, and accessible at all times.

5.6.7 Plumbing**5.6.7.1 Water Supply****FMO****5.6.7.1.1 Water Pressure****FMO**

All plumbing shall be maintained in good repair with no leaks or discharge.

5.6.7.1.2 Availability**FMO**

Potable water shall be available at all times to PATRONS.

5.6.7.2 Drinking Fountains**FMO****5.6.7.2.1 Good Repair****FMO**

Drinking fountains shall be in good repair.

5.6.7.2.2 Clean**FMO**

Drinking fountains shall be clean.

5.6.7.2.3 Catch Basin**FMO**

Drinking fountains shall be adjusted so that waste water does not go outside the catch basin.

5.6.7.2.4 Backflow**FMO**

Drinking fountains shall be adjusted so that waste water does not fall back into the drinking water stream.

5.6.7.2.5 Water Pressure**FMO**

Drinking fountains shall have sufficient water pressure to allow correct adjustment.

5.6.7.3 Waste Water**FMO****5.6.7.3.1 Waste Water Disposal****FMO**

AQUATIC VENUE waste water, including backwash water and cartridge cleaning water, shall be disposed of in accordance with local CODES.

5.6.7.3.2 Drainage**FMO**

Waste water and backwash water shall not be returned to an AQUATIC VENUE or the AQUATIC FACILITY'S water treatment system.

5.6.7.3.3 Filters FMO

Filters shall be backwashed, cleaned and maintained according to the manufacturer's instructions.

5.6.7.3.4 Drain Lines FMO

Filter backwash lines, DECK drains, and other drain lines connected to the AQUATIC FACILITY or the AQUATIC FACILITY RECIRCULATION SYSTEM shall be discharged through an approved air gap.

5.6.7.3.5 No Standing Water FMO

No standing water shall result from any discharge, nor shall they create a nuisance, offensive odors, stagnant wet areas, or create an environment for the breeding of insects.

5.6.7.4 Water Replenishment

5.6.7.4.1 Volume R&F

Removal of water from the POOL and replacement with make-up water shall be performed as needed to maintain water quality.

5.6.7.4.2 Discharged R&F

A volume of water totaling at least to 4 gallons (15 L) per BATHER per day per facility shall be either

- 1) Discharged from the system, or
- 2) Treated with an alternate system meeting the requirements of MAHC Section 4.7.4.2.1 and reused.

5.6.7.4.2.1 Backwash Water R&F

The required volume of water to be discharged may include backwash water.

5.6.7.4.3 Multi-System Facilities R&F

In multi-RECIRCULATION SYSTEM facilities, WATER REPLENISHMENT shall be proportional to the number of BATHERS in each system.

5.6.8 Solid Waste

5.6.8.1 Storage Receptacles FMO

5.6.8.1.1 Good Repair and Clean FMO

Outside waste and recycling containers shall be maintained in good repair and clean condition.

5.6.8.1.2 Storage FMO

Outside waste and recycling containers shall be stored as specified in this CODE.

5.6.8.1.3 Areas FMO

Outside waste and recycling STORAGE areas shall be maintained in good repair and clean condition.

5.6.8.2 Disposal FMO**5.6.8.2.1 Frequency FMO**

Solid waste and recycled materials shall be removed at a frequency to prevent attracting vectors or causing odor.

5.6.8.2.2 Local Code Compliance FMO

Solid waste and recycled materials shall be disposed of in compliance with local CODES.

5.6.9 Decks**5.6.9.1 Food Preparation and Consumption FMO****5.6.9.1.1 Preparation FMO**

Food preparation and cooking shall only be permitted in designated areas as specified in this CODE.

5.6.9.1.2 Eating FMO

PATRONS shall not eat while in or partially in the AQUATIC VENUE water.

5.6.9.1.3 Drinking FMO

PATRONS shall not drink while in or partially in the AQUATIC VENUE water except in designated areas.

5.6.9.2 Glass FMO**5.6.9.2.1 Containers FMO**

Glass food and beverage containers shall be prohibited in PATRON areas of AQUATIC FACILITIES.

5.6.9.2.2 Tables FMO

Glass tables shall not be used in an AQUATIC FACILITY.

5.6.9.3 Deck Maintenance FMO**5.6.9.3.1 Free From Obstructions FMO**

The PERIMETER DECK shall be maintained free from obstructions, including PATRON seating, to preserve space required for lifesaving and rescue.

5.6.9.3.2 Diaper Changing **FMO**

Diaper changing shall only be done at a designated DIAPER-CHANGING STATION.

5.6.9.3.2.1 Prohibited **FMO**

Diaper changing shall be prohibited on the DECK.

5.6.9.3.3 Vermin **FMO**

DECK areas shall be cleaned daily and kept free of debris, vermin, and vermin harborage.

5.6.9.3.4 Original Design **FMO**

DECK surfaces shall be maintained to their original design slope and integrity.

5.6.9.3.5 Standing Water **FMO**

DECK areas shall be free from standing water.

5.6.9.3.6 Drains **FMO**

DECK drains shall be cleaned and maintained to prevent blockage and pooling of stagnant water.

5.6.9.3.7 Wet Areas **FMO**

Wet areas shall not have absorbent materials that cannot be removed for cleaning and DISINFECTION daily.

5.6.9.3.8 Circulation Path **FMO**

Fixed equipment, loose equipment, and DECK furniture shall not intrude upon the AQUATIC VENUE CIRCULATION PATH.

5.6.10 Aquatic Facility Maintenance

5.6.10.1 Diving Boards and Platforms **FMO**

5.6.10.1.1 Slip-Resistant Finish **FMO**

The finish and profile of surfaces of diving boards and platforms shall be maintained to prevent slips and falls.

5.6.10.1.2 Loose Bolts and Cracked Boards **FMO**

Diving boards shall be inspected daily for CRACKS and loose bolts with CRACKED boards removed and loose bolts tightened immediately.

5.6.10.2 Steps and Guardrails **FMO**

5.6.10.2.1 Immovable **FMO**

Steps and guardrails shall be secured so as not to move during use.

5.6.10.2.2 Maintenance FMO

The profile and surface of steps shall be maintained to prevent slips and falls.

5.6.10.3 Starting Platforms FMO**5.6.10.3.1 Good Repair FMO**

The profile and surface of starting platform steps shall be in good repair to prevent slips, falls, and pinch hazards.

5.6.10.3.2 Restrictions FMO

Starting platforms shall only be used for competitive swimming competition and training and shall only be used under the direct supervision of a coach or instructor.

5.6.10.3.2.1 Covers or Cones FMO

Covers or cones shall be used to prohibit access and designate when use of permanent starting platforms is prohibited.

5.6.10.3.2.2 Removable Blocks FMO

Starting platforms designed to be removable shall be removed at all times when use is prohibited.

5.6.10.4 Water Slides FMO**5.6.10.4.1 Maintenance FMO**

WATERSLIDES shall be maintained and operated to manufacturer's/designer's specifications.

5.6.10.4.2 Slime and Biofilm FMO

Slime and biofilm layers shall be removed on all accessible slide surfaces.

5.6.10.4.3 Flow Rates FMO

Slide water flow rates shall be checked before AQUATIC VENUE opening to be within designer or manufacturer's specifications.

5.6.10.4.4 Disinfectant DWQ

WATERSLIDE lines susceptible to holding stagnant water shall maintain disinfectant throughout the lines as per MAHC Section 5.7.3.1.1.3.

5.6.10.5 Fencing and Barriers FMO**5.6.10.5.1 Maintenance FMO**

Required fencing, BARRIERS, and gates shall be maintained at all times.

5.6.10.5.2 Tested Daily FMO

Gates, locks and alarms, if required, shall be tested daily prior to opening.

5.6.10.6 Aquatic Facility Cleaning FMO

5.6.10.6.1 Cleaning FMO

The AQUATIC VENUE shall be kept clean of debris, organic materials, and accessible slime/biofilm areas in the water and on surfaces.

5.6.10.6.2 Vacuuming FMO

Vacuuming shall only be done when the AQUATIC VENUE is closed.

5.6.10.6.3 Port Openings FMO

Vacuum port openings shall be covered with an approved device cover when not in use.

5.6.10.6.3.1 Damaged FMO

POOLS with missing or damaged vacuum port openings shall be closed and repairs made before re-opening.

5.6.10.6.4 Slime and Biofilm FMO

All accessible surfaces shall be scrubbed and cleaned as necessary to minimize the formation of slime and biofilm layers.

5.7 Recirculation and Water Treatment

5.7.1 Recirculation Systems and Equipment

5.7.1.1 General R&F

5.7.1.1.1 Continuous Operation R&F

All components of the filtration and RECIRCULATION SYSTEMS shall be kept in continuous operation (twenty-four (24) hours per day).

5.7.1.1.2 Flow R&F

Flow through the various components of a RECIRCULATION SYSTEM shall be balanced according to the provisions outlined in MAHC Section 5.7.1 to maximize the clarity and SAFETY of a POOL.

5.7.1.1.3 Gutter/ Skimmer Pools R&F

For gutter or SKIMMER POOLS with main drains, the required recirculation flow shall be as follows during normal operation:

- 1) at least 80% of the flow through the perimeter overflow system and
- 2) no greater than 20% through the main drain.

5.7.1.2 Combined Venue Treatment R&F

5.7.1.2.1 Each Pool R&F

Each individual POOL in a combined treatment system shall meet the required TURNOVER times and achieve all water quality criteria (including, but not limited to, pH, disinfectant concentration, and clarity/turbidity).

5.7.1.3 Inlets R&F

5.7.1.4 Surface Skimming Devices R&F

5.7.1.4.1 Perimeter Overflow R&F

The perimeter overflow systems shall be kept clean and free of debris that may restrict flow.

5.7.1.4.2 Automatic Fill R&F

The automatic fill system shall maintain the water level at an elevation such that the gutters must overflow continuously around the perimeter of the POOL.

5.7.1.4.3 Automatic Fill R&F

The automatic fill system shall maintain SKIMMER water levels near the middle of the SKIMMER openings.

5.7.1.4.4 Flow R&F

The flow through each SKIMMER shall be adjusted as often as necessary to maintain skimming action that will remove all floating matter from the surface of the water.

5.7.1.4.5 Strainer Baskets R&F

The strainer baskets for SKIMMERS shall be cleaned as necessary to maintain proper skimming.

5.7.1.4.6 Weirs R&F

Weirs shall remain in place and in working condition at all times.

5.7.1.4.6.1 Broken or Missing Weirs R&F

Broken or missing SKIMMER weirs shall be replaced immediately.

5.7.1.4.6 Flotation Test R&F

A flotation test may be required by the AHJ to evaluate the effectiveness of surface skimming.

5.7.1.5 Submerged Drains/Suction Outlet Covers or Gratings R&F

5.7.1.5.1 Replaced R&F

Loose, broken, or missing suction outlet covers and sumps shall be secured or replaced immediately and installed in accordance with the manufacturer's requirements.

5.7.1.5.1.1 Closed R&F

POOLS shall be closed until the required repairs can be completed.

5.7.1.5.4 Documentation R&F

The manufacturer's documentation on all outlet covers and sumps shall be made part of the permanent records of the facility.

5.7.1.6 Piping R&F

5.7.1.7 Strainers & Pumps R&F

5.7.1.7.1 Strainers R&F

Strainers shall be in place and cleaned as required to maintain pump performance.

5.7.1.7.2 Close/Open Procedures R&F

Facilities shall follow procedures for closing and re-opening whenever required as outlined in MAHC Section 5.4.1.

5.7.1.8 Flow Meters R&F

5.7.1.8.1 Maintained R&F

Flow meters shall be maintained in proper working order.

5.7.1.9 Flow Rates / Turnovers R&F

5.7.1.9.1 Operated R&F

All AQUATIC VENUES shall be operated at the designed flow rate to provide the required TURNOVER RATE 24-hours per day except as allowed in MAHC Section 4.7.1.10.

5.7.2 Filtration

5.7.2.1 Granular Media Filters R&F

5.7.2.1.1 Filtration Rates R&F

High-rate granular media filters shall be operated at no more than 15 gpm/ft² (m/h) when a minimum bed depth of 15 inches (38 cm) is provided per manufacturer.

5.7.2.1.1.1 Less than 15 Inch Bed Depth R&F

When a bed depth is less than 15 inches (38cm), filters shall operate at no more than 12 gpm/ft².

5.7.2.1.2 Backwashing Rates R&F

The granular media filter system shall be backwashed at a rate of at least 15 gallons per minute per square foot (36.7 m/h) of filter bed surface area, unless explicitly prohibited by the filter manufacturer.

5.7.2.1.3 Clear Water R&F

Backwashing should be continued until the water leaving the filter is clear.

5.7.2.1.4 Backwashing Frequency R&F

All filters shall be backwashed at least every two weeks.

5.7.2.1.4.1 Backwashing R&F

Backwashing of each filter shall be performed at a differential pressure increase over the initial clean filter pressure (*as recommended by the filter manufacturer*) unless the system can no longer achieve the design flow rate.

5.7.2.1.4.2 Backwash Scheduling R&F

Backwashes shall be scheduled to take place when the POOL is closed for use or unless operators follow the procedure specified in MAHC Section 5.7.2.1.4.2.1.

5.7.2.1.4.2.1 Backwashing While Open to Bathers R&F

If the filter is backwashed while the AQUATIC FACILITY is open to BATHERS, then one of the following two procedures shall be performed after the normal backwashing procedure is completed and prior to the filter being placed back in normal operation:

- 1) The filter flow shall be redirected to drain for a period of time sufficient to displace the volume of water inside of the filter or 1 minute per foot of bed depth above the laterals at the required filtration rate, whichever is greater, or
- 2) The backwash flow rate shall be reduced to a rate of no greater than 5 gpm/ft² (12.2 m/h) for a period of time sufficient to displace the volume of water inside of the filter.

5.7.2.1.5 Filter Media Inspections R&F

Sand or other granular media shall be inspected for proper depth and cleanliness at least one time per year.

5.7.2.1.5.2 Representative Filters R&F

The QUALIFIED OPERATOR shall inspect sand or other granular media filters for proper depth and cleanliness at least once per year, replacing the media when necessary to restore depth or cleanliness.

5.7.2.1.6 Vacuum Sand Filters R&F

Vacuum sand filters shall be backwashed prior to a vacuum increase of 10 inches (254 mm) of mercury above the initial reading or as recommended by the manufacturer.

5.7.2.1.6.1 Air Release Valve R&F

The manual air release valve of the filter shall be opened as necessary to remove any air that collects inside of the filter as well as following each backwash.

5.7.2.1.7 Filtration Enhancing Products R&F

Products used to enhance filter performance shall be used according to manufacturers' recommendations.

5.7.2.2 Precoat Filters **R&F**

5.7.2.2.1 Appropriate **R&F**

The appropriate media type and quantity as recommended by the filter manufacturer shall be used.

5.7.2.2.1.1 Approved **R&F**

The media shall be certified to NSF/ANSI 50 by an ANSI-accredited certification organization for use in the filter.

5.7.2.2.2 Precoating **R&F**

Precoating of the filters shall be required in closed loop (precoat) mode to minimize the potential for media or debris to be returned to the POOL unless filters are certified to NSF/ANSI 50 by an ANSI-accredited certification organization to return water to the POOL during the precoat process.

5.7.2.2.3 Operation **R&F**

Filter operation shall be per manufacturer and certified to NSF/ANSI 50 by an ANSI-accredited certification organization.

5.7.2.2.3.1 Uninterrupted Flow **R&F**

Flow through the filter shall not be interrupted when switching from precoat mode to filtration mode, which could result based on the order of opening and closing valves unless the filters are certified to NSF/ANSI 50 by an ANSI-accredited certification organization to return water to the POOL during the precoat process.

5.7.2.2.3.1.1 Flow Interruption **R&F**

When a flow interruption occurs on precoat filters not designed to bump, the media must be backwashed out of the filter and a new precoat established according to the manufacturer's recommendations.

5.7.2.2.3.2 Maximum Precoat Media Load **R&F**

Systems designed to flow to waste while precoating shall use the maximum recommended precoat media load permitted by the filter manufacturer to account for media lost to the waste stream during precoating.

5.7.2.2.4 Cleaning **R&F**

The filter shall be cleaned/backwashed per manufacturer's instructions.

5.7.2.2.5 Continuous Feed Equipment **R&F**

Continuous filter media feed equipment tank agitators shall run continuously.

5.7.2.2.5.1**Batch Application****R&F**

Filter media feed may also be performed via batch application.

5.7.2.2.6**Bumping****R&F**

Bumping a precoat filter shall be performed in accordance with the manufacturer's recommendations.

5.7.2.2.7**Filter Media****R&F**

Precoat filter media shall meet the filter manufacturer's recommendation for POOL use and shall be certified to NSF/ANSI 50 by an ANSI-accredited certification organization.

5.7.2.2.7.1**Diatomaceous Earth****R&F**

Diatomaceous earth (DE), when used, shall be added to precoat filters in the amount of 1 to 2 pounds (0.45 to 0.91 kg) per 10 square feet of filtration surface area unless more is recommended by the filter manufacturer and the filter is certified to NSF/ANSI 50 by an ANSI-accredited certification organization for a higher precoat media dosage rate.

5.7.2.2.7.2**Perlite****R&F**

Perlite, when used, shall be added to precoat filters in a minimum amount of 0.5 to 1 pounds (0.23 to 0.45 kg) per 10 ft² (0.93 m²) of filtration surface area unless more is recommended by the filter manufacturer and the filter is certified to NSF/ANSI 50 by an ANSI-accredited certification organization for a higher precoat media dosage rate.

5.7.2.3**Cartridge Filters****R&F****5.7.2.3.1****NSF Standards****R&F**

Cartridge filters shall be operated in accordance with the filter manufacturer's recommendation and shall be certified to NSF/ANSI 50 by an ANSI-accredited certification organization.

5.7.2.3.2**Filtration Rates****R&F**

The maximum operating filtration rate for any surface-type cartridge filter shall not:

- 1) Exceed the lesser of either the manufacturer's recommended filtration rate or 0.375 gallons per minute per square foot (0.26 L/s/m²) or
- 2) drop below the design flow rate required to achieve the TURNOVER RATE for the AQUATIC VENUE.

5.7.2.3.3**Filter Elements****R&F**

Active filter cartridges shall be exchanged with clean filter cartridges and fouled cartridges cleaned in accordance with the filter manufacturer's recommendations whenever the filtration rate drops below 0.30 gallons per minute per square foot (0.20 L/s/m²).

5.7.2.3.3.1**Cleaning Procedure****R&F**

When the filter element manufacturer has no established cleaning procedure, the cleaning procedures found in MAHC Section 5.7.2.3.3.2 and 5.7.2.3.3.3 shall be used.

5.7.2.3.3.2 Filter Housing Cleaning R&F

The following procedures shall be implemented to clean the filter housing:

- 1) Drain filter housing to waste;
- 2) Remove the filter cartridges from the housing;
- 3) Clean the inside of the filter with a brush and mild detergent to remove biofilms and algae;
- 4) Rinse thoroughly; and
- 5) Mist the housing walls with CHLORINE bleach.

5.7.2.3.3.3 Cartridge Cleaning R&F

The procedures outlined in this section shall be implemented to clean the filter cartridges when there is no cleaning procedure established by the filter manufacturer.

5.7.2.3.3.3.1 Rinse Thoroughly R&F

The cartridge shall be rinsed to remove as much dirt and debris as possible by washing inside and out with a garden hose and spray nozzle.

5.7.2.3.3.3.2 Pressure Washer R&F

A pressure washer shall not be used to backwash cartridge filters.

5.7.2.3.3.3.3 Degrease R&F

Cartridge filters shall be degreased each time they are cleaned per the procedures outlined in this section.

5.7.2.3.3.3.3.1 Soak R&F

Soak the cartridge overnight in one of the following solutions:

- 1) A cartridge filter cleaner/degreaser per instructions on product label, or
- 2) A solution of water with 1 Cup of tri-sodium phosphate (TSP) per 5 gallons of water, or
- 3) 1 Cup of automatic dishwashing detergent per 5 gallons of water.

5.7.2.3.3.3.3.2 Acid R&F

Muriatic acid or products with acid in them shall never be used prior to degreasing.

5.7.2.3.3.3.3.3 Rinse R&F

The degreased cartridges shall be removed from the degreaser solution and thoroughly rinsed.

5.7.2.3.3.3.4 Sanitize R&F

To remove or prevent biofilms, algae, and bacteria growing on the cartridge, 1 quart of household bleach shall be added per 5 gallons of clean water and soak one hour before rinsing.

5.7.2.3.3.3.5**Rinse****R&F**

The clean cartridge shall be removed from the sanitization soak water and rinsed thoroughly with a hose.

5.7.2.3.3.3.6**Dry****R&F**

After the filter is cleaned, degreased, and SANITIZED, it shall be allowed to dry completely before being reintroduced to the POOL.

5.7.2.3.4 Spare Cartridge**R&**

One full set of spare cartridges shall be maintained on site in a clean and dry condition.

5.7.3 Disinfection**5.7.3.1 Primary Disinfectants****DWQ****Acceptable Disinfectants****DWQ**

Only the primary disinfectants outlined in MAHC Section 5.7.3.1 of this CODE shall be acceptable for use in AQUATIC VENUES.

5.7.3.1.1 Chlorine (Ca/Na/Li Hypochlorite)**DWQ****5.7.3.1.1.1 EPA Registered****DWQ**

Only CHLORINE products that are EPA-REGISTERED for use as SANITIZERS or disinfectants in AQUATIC VENUES or SPAS in the United States are permitted.

5.7.3.1.1.2 Minimum FAC Concentrations**DWQ**

Minimum FAC concentrations shall be maintained at all times in all areas as follows:

Not Using Cyanuric Acid**DWQ**

AQUATIC VENUES **not** using cyanuric acid: 1.0 PPM (MG/L)

Using Cyanuric Acid**DWQ**

AQUATIC VENUES using cyanuric acid: 2.0 PPM (MG/L)

Spas**DWQ**

SPAS: 3.0 PPM (MG/L)

5.7.3.1.1.3 Waterslides**DWQ**

Waterslide lines susceptible to holding stagnant water shall maintain disinfectant throughout the lines as per MAHC Section 5.7.3.1.1.2.

5.7.3.1.2 Bromine DWQ

5.7.3.1.2.1 EPA Registered DWQ

Only bromine products that are EPA-REGISTERED for use as SANITIZERS or disinfectants in AQUATIC VENUES or SPAS in the United States shall be permitted.

Note: Bromine-based disinfectants may be applied to AQUATIC VENUES and SPAS through the addition of an organic bromine compound (1,3-Dibromo-5,5-dimethylhydantoin (DBDMH) or 1-bromo-3-chloro-5,5-dimethylhydantoin (BCDMH)).

5.7.3.1.2.2 Minimum Bromine Concentrations DWQ

Minimum bromine concentrations shall be maintained at all times in all areas as follows:

- 1) All AQUATIC VENUES: 3.0 PPM (MG/L)
- 2) SPAS: 4.00 PPM (MG/L)

5.7.3.1.3 Stabilizers DWQ

5.7.3.1.3.1 Cyanuric Acid (CYA) DWQ

Cyanuric acid or stabilized CHLORINE products shall **not** be used at the following for all new construction, SUBSTANTIAL ALTERATION, or DISINFECTION equipment replacements after the effective date of this CODE:

- 1) SPAS; and
- 2) Therapy POOLS.

5.7.3.1.3.1.1 Replacement Times DWQ

These AQUATIC VENUES shall no longer use cyanuric acid or stabilized CHLORINE products no later than 4 years after adoption of this CODE.

5.7.3.1.3.1.2 Outdoor Aquatic Venues DWQ

The cyanuric acid level at AQUATIC VENUES shall remain at or below 100 PPM (MG/L).

5.7.3.1.4 Compressed Chlorine Gas R&F

5.7.3.1.4.1 Safety Requirements R&F

Facilities using compressed CHLORINE gas shall provide SAFETY precautions per the following MAHC sub sections.

5.7.3.1.4.1.1 Separate Enclosure R&F

The chlorinators and any cylinders containing CHLORINE gas used therewith shall be housed in an ENCLOSURE separated from other EQUIPMENT ROOMS, including the swimming POOL, corridors, dressing rooms and other space with a door so installed as to prevent gas leakage and equipped with an inspection window.

5.7.3.1.4.1.2 Secured R&F

CHLORINE cylinders shall be secured from falling.

5.7.3.1.4.1.3 **Cylinders in Use** **R&F**

Cylinders in use shall be secured on a suitable platform scale.

5.7.3.1.4.1.4 **Vent to Exterior** **R&F**

A separate vent opening to the exterior shall be provided.

5.7.3.1.4.1.5 **Fan** **R&F**

An electric motor-driven fan shall take suction from near the floor level of the ENCLOSURE and discharge at a suitable point to the exterior above the ground level.

5.7.3.1.4.1.5.1 **Fan Switch** **R&F**

The fan switch shall be able to be operated from outside of the ENCLOSURE.

5.7.3.1.4.1.6 **Trained Operator** **R&F**

Any person who operates such chlorinating equipment shall be trained in its use.

5.7.3.1.4.1.7 **Stop Use** **R&F**

Facilities shall stop the use of CHLORINE gas if specific SAFETY equipment and training requirements, along with local CODE considerations, cannot be met.

5.7.3.1.5 **Salt Electrolytic Chlorine Generators, Brine Electrolytic Chlorine or Bromine Generators** **R&F**

5.7.3.1.5.1 **Pool Grade Salt** **R&F**

Only POOL grade salt shall be used.

5.7.3.1.5.2 **Maintained** **R&F**

Salt levels shall be maintained per the equipment manufacturer.

5.7.3.1.5.3 **Cleaning** **R&F**

Cleaning of electrolytic plates shall be performed as recommended by the manufacturer.

5.7.3.1.5.4 **Corrosion Protection** **R&F**

Corrosion protection systems shall be maintained in the POOL basin.

5.7.3.2 **Secondary or Supplemental Treatment Systems** **DWQ**

5.7.3.2.1 **Ultraviolet Light** **DWQ**

5.7.3.2.1.1 **Operate with Recirculation System** **DWQ**

UV systems shall only operate while the RECIRCULATION SYSTEM is operating.

5.7.3.2.1.2 3-log Inactivation DWQ

Secondary UV systems shall be operated and maintained not to exceed the maximum validated flow rate and meet or exceed the minimum validated output intensity needed to achieve the required dose for a 3-log inactivation.

5.7.3.2.1.3 Free Available Chlorine and Bromine Levels DWQ

Use of UV does not modify any other water quality requirements.

5.7.3.2.1.4 Calibrated Sensors DWQ

UV sensors shall be calibrated at a frequency in accordance with manufacturer recommendations.

5.7.3.2.1.5 Records DWQ

Records of calibration shall be maintained by the facility.

5.7.3.2.1.6 Record and Store Data DWQ

The equipment shall be capable of recording and storing operational data within internal memory in order to meet record keeping requirements as defined elsewhere in this CODE.

5.7.3.2.2 Ozone DWQ

5.7.3.2.2.1 3-log Inactivation DWQ

Ozone systems shall be operated and maintained according to the manufacturer's instructions to maintain the required design performance.

5.7.3.2.2.2 Residual Ozone Concentration DWQ

Residual ozone concentration in the AQUATIC VENUE water shall remain below 0.1 PPM (MG/L).

5.7.3.2.2.3 Free Available Chlorine and Bromine Levels DWQ

Use of ozone does not modify any other water quality requirements.

5.7.3.2.2.4 Standard Operating Manual DWQ

A printed STANDARD operating manual shall be provided containing information on the operation and maintenance of the ozone generating equipment, including the responsibilities of workers in an emergency.

5.7.3.2.2.5 Employees Trained DWQ

All employees shall be properly trained in the operation and maintenance of the equipment.

5.7.3.2.3 Copper/Silver Ions DWQ

5.7.3.2.3.1 EPA Registered DWQ

Only those systems that are EPA-REGISTERED for use as SANITIZERS or disinfectants in AQUATIC VENUES or SPAS in the United States are permitted.

5.7.3.2.3.2 Concentrations DWQ

Copper and silver concentrations shall not exceed 1.3 ppm for copper and 0.10 ppm for silver for use as disinfectants in AQUATIC VENUES and SPAS in the United States.

5.7.3.2.3.3 Free Available Chlorine and Bromine Levels DWQ

FREE AVAILABLE CHLORINE or bromine levels shall be maintained in accordance with MAHC Section 5.7.3.1.1 or 5.7.3.1.2, respectively.

5.7.3.3 Other Sanitizers, Disinfectants, or Chemicals DWQ

Other SANITIZERS, disinfectants, or chemicals used must not create a hazardous condition or compromise disinfectant efficacy when used with required bromine or CHLORINE concentrations. Water quality must still meet all criteria set forth in this CODE.

5.7.3.3.1 Chlorine Dioxide DWQ

CHLORINE dioxide shall only be used for remediation for water quality issues when the AQUATIC VENUE is closed and BATHERS are not present.

5.7.3.3.1.1 Safety Considerations DWQ

SAFETY training and SAFETY precautions related to use of CHLORINE dioxide shall be in place.

5.7.3.3.2 Clarifiers, Flocculants, Defoamers DWQ

Clarifiers, flocculants, and defoamers shall be used per manufacturer's instructions.

5.7.3.4 pH

5.7.3.4.1 pH levels DWQ

The pH of the water shall be maintained between 7.2 and 7.8.

5.7.3.5 Feed Equipment

All chemical feed systems must be dedicated to a single chemical and clearly labeled to prevent the introduction of incompatible chemicals. They shall:

- 1) be installed so it cannot operate in low or no flow circumstances.
- 2) incorporate failure-proof features so the chemicals cannot feed directly into the AQUATIC VENUE, the venue piping system, water supply system, or AQUATIC VENUE ENCLOSURE under any type of failure, low flow, or interruption of operation of the equipment to prevent BATHER exposure to high concentrations of AQUATIC VENUE treatment chemicals.

5.7.3.5.1 Chemical Feeders R&F

Chemical feeders shall be installed such that they are not over chemical STORAGE containers, other feeders, or electrical equipment.

5.7.3.5.2 Dry Chemical Feeders R&F

Chemicals shall be kept dry to avoid clumping and potential feeder plugging for mechanical gate or rotating screw feeders.

5.7.3.5.2.1 Cleaned and Lubricated R&F

The feeder mechanism shall be cleaned and lubricated to maintain a reliable feed system.

5.7.3.5.3 Venturi Inlet R&F

Adequate pressure shall be maintained at the venturi INLET to create the vacuum needed to draw the chemical into the RECIRCULATION SYSTEM.

5.7.3.5.4 Erosion Feeders R&F

Erosion feeders shall only have chemicals added that are approved by the manufacturer.

5.7.3.5.4.1 Opened R&F

A feeder shall only be opened after the internal pressure is relieved by a bleed valve.

5.7.3.5.4.2 Maintained R&F

Erosion feeders shall be maintained according the manufacturer's instructions.

5.7.3.5.5 Liquid Solution Feeders R&F

For liquid solution feeders, spare feeder tubes (or tubing) shall be maintained onsite for peristaltic pumps.

5.7.3.5.6 Checked Daily R&F

Tubing and connections shall be checked on a daily basis for leaks.

5.7.3.5.6.1 Routed R&F

All chemical tubing shall be routed in PVC piping to support the tubing and to prevent leaks in areas where operating staff walk.

5.7.3.5.6.1.1 Size R&F

The double containment PVC pipe shall be of sufficient size to allow for easy replacement of tubing.

5.7.3.5.6.1.2 Turns R&F

Any necessary turns in the piping shall be designed so as to prevent kinking of the tubing.

5.7.3.5.7 Gas Feed Systems R&F

The CHLORINE Institute requirements for safe STORAGE and use of CHLORINE gas shall be followed.

5.7.3.5.8 Carbon Dioxide R&F

Carbon dioxide feed shall be permitted to reduce pH.

5.7.3.5.8.1 Controlled R&F

Carbon dioxide feed shall be controlled using a gas regulator.

5.7.3.5.8.2 Alarm Monitor R&F

CO₂/O₂ monitor and alarm shall be maintained in working condition. .

5.7.3.5.8.3 Forced Ventilation R&F

Carbon dioxide is heavier than air, so forced ventilation shall be maintained in the STORAGE room.

5.7.3.6 Testing for Water Circulation and Quality

5.7.3.6.1 Available M&T

WATER QUALITY TESTING DEVICES (WQTDs) for the measurement of disinfectant residual, pH, alkalinity, CYA (if used), and temperature, at a minimum, shall be available on site.

5.7.3.6.1.1 Expiration Dates M&T

WQTDs utilizing reagents shall be checked for expiration at every use and the date recorded.

5.7.3.6.2 Store M&T

WQTDs shall be stored in accordance with manufacturer's instructions.

5.7.3.6.3 Temperature M&T

Chemical testing reagents shall be maintained at proper manufacturer specified temperatures.

5.7.3.6.4 Calibration M&T

WQTDs that require calibration shall be calibrated in accordance with manufacturer's instructions and the date of calibration recorded.

5.7.3.7 Automated Controllers M&T

5.7.3.7.1 Use of Controller RM

A controller capable of measuring the disinfectant residual (free available CHLORINE or bromine) or surrogate such as ORP) shall be used to maintain the disinfectant residual in AQUATIC VENUES.

5.7.3.7.2 Sampling**M&T**

The sample line for all probes shall be upstream from all primary, secondary, and supplemental DISINFECTION injection ports or devices.

5.7.3.7.3 Monitor**M&T**

AUTOMATED CONTROLLERS shall be monitored at start of operating day to ensure proper functioning.

5.7.3.7.3.2 In Person**M&T**

AUTOMATED CONTROLLERS shall be monitored in person by visual observation.

5.7.3.7.4 Activities**M&T**

MONITORING shall include activities recommended by manufacturers, including but not limited to alerts and leaks.

5.7.3.7.5 Replacement Parts**M&T**

Only manufacturer-approved OEM replacement parts shall be used.

5.7.3.7.6 Calibration**M&T**

AUTOMATED CONTROLLERS shall be calibrated per manufacturer directions.

5.7.3.7.7 Ozone System**M&T**

Ozone Systems shall be monitored and data recorded at a frequency consistent with MAHC Table 5.7.3.7.7.

Table 5.7.3.7.7: Ozone System Monitoring Frequency**M&T**

<i>Parameter</i>	<i>Monitoring Frequency</i>	<i>Recording Frequency</i>
Power Draw	Continuous	Every 4 hours
ORP	Continuous	Every 4 Hours

5.7.3.7.8 UV Systems**M&T**

UV systems shall be monitored and data recorded at a frequency consistent with MAHC Table 5.7.3.7.8.

Table 5.7.3.7.8: UV System Monitoring and Calibration Frequency M&T

<i>Parameter</i>	<i>Monitoring Frequency</i>	<i>Recording Frequency</i>
Power Draw	Continuous	Every 4 hours
Flow rate	Continuous	Every 4 hours
Set-Point Intensity	Continuous	Every 4 hours
Water Temperature (MP Medium Pressure)	Continuous	Daily
UV Lamp On/Off Cycles	Continuous	Weekly (Total cycles/week)
Iron, Calcium hardness	Weekly (if fouling is prevalent)	Weekly
UVT (UV Transmittance) Analyzer Calibration	Weekly	Weekly
Calibration of Intensity	Annual	At time of calibration
Calibration of Flow Meter	Per manufacturer's requirements	At time of calibration

5.7.4 Water Sample Collection and Testing

5.7.4.1 Sample Collection

M&T

The QUALIFIED OPERATOR shall acquire a water sample for testing from the in-line sample port when available.

5.7.4.1.1 Same Volume

M&T

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If an AQUATIC VENUE has more than one RECIRCULATION SYSTEM, the same sample volume shall be collected from each in-line sample port and tested separately.

5.7.4.1.2 No Port M&T

If no in-line sample port is available, the QUALIFIED OPERATOR shall acquire water samples from the POOL according to MAHC Section 5.7.4.3.

5.7.4.2 Routine Samples M&T

If routine samples are collected from in-line sample ports, the QUALIFIED OPERATOR shall also acquire water samples from the bulk water of the POOL at least once per day.

5.7.4.2.1 Midday Collection M&T

Daily bulk water samples shall be collected in the middle of the POOL operational day, according to the procedures in MAHC Section 5.7.4.3.

5.7.4.2.2 Compared M&T

Water quality data from these POOL samples shall be compared to data obtained from in-line port samples to assess potential water quality variability in the POOL.

5.7.4.3 Bulk Water Sample M&T

The QUALIFIED OPERATOR shall use the following procedure outlined in MAHC sections 5.7.4.3.1 to 5.7.4.3.5 for acquiring a water sample from bulk water of the POOL.

5.7.4.3.1 Below Surface M&T

All samples shall be obtained from at least 18 inches (45.7 cm) below the surface of the water.

5.7.4.3.2 Water Depth M&T

The sample shall be obtained from a section of the POOL that has a water depth of between 3 to 4 feet (91.4 cm to 1.22 m) when available.

5.7.4.3.3 Between Inlets M&T

The sample shall be obtained from a location between water INLETS.

5.7.4.3.4 Rotate M&T

Sampling locations shall rotate around the shallow end of the POOL.

5.7.4.3.5 Deepest Area M&T

The QUALIFIED OPERATOR shall include the deepest area of the AQUATIC VENUE in the water sampling rotation once per week.

5.7.4.3.3 Aquatic Venue Water Chemical Balance DWQ

5.7.4.3.3.1 Total Alkalinity Levels DWQ

Total alkalinity shall be maintained in the range of 60 to 180 PPM (mg/L).

5.7.4.3.3.2 Combined Chlorine (Chloramines) DWQ

Combined CHLORINE (chloramines) in water shall remain below 0.4 PPM (mg/L).

5.7.4.3.3.3 Calcium Hardness DWQ

Calcium hardness shall not exceed 1000 PPM (mg/L) and maintained per MAHC Section 5.7.4.4.

5.7.4.3.3.4 Algaecides DWQ

Algaecides may be used in an AQUATIC VENUE provided:

- 1) The product is labeled as an algaecide for AQUATIC VENUE or SPA use.
- 2) The product is used in strict compliance with label instructions.
- 3) The product is registered with the US EPA and applicable state agency.

5.7.4.3.4 Source (fill) Water DWQ

5.7.4.3.4.1 Owner Responsibilities DWQ

The owner of a public AQUATIC VENUE, public SPA, or special use AQUATIC VENUE shall ensure that the water supply for the facility meets one of the following requirements:

- 1) The water comes from a public water system as defined by the applicable rules of the AHJ in which the facility is located; or
- 2) The water meets the requirements of the local AHJ for public water systems; or
- 3) The AHJ has approved an alternative water source for use in the AQUATIC FACILITY.

5.7.4.4 Saturation Index for Aquatic Venues DWQ

5.7.4.4.1 Water Balance Determination DWQ

Water balance can be determined by using the Langelier SATURATION INDEX, Ryznar Stability Index, or other indices that are based on calculated values of:

- 1) total alkalinity,
- 2) pH,
- 3) calcium hardness,
- 4) total dissolved solids, and
- 5) water temperature.

5.7.4.4.2 Langelier Saturation Index DWQ

Maintaining individual values in the range allowed in this CODE will indicate balanced water using the Langelier SATURATION INDEX or other indices.

5.7.4.5 Water Temperature

5.7.4.5.1 Minimize Risk and Protect Safety RM

Water temperatures shall be considered and planned for based on risk, SAFETY, priority facility usage, and age of participants, while managing water quality concerns.

5.7.4.5.2 Maximum Temperature RM

The maximum temperature for an AQUATIC VENUE is 104° F (40°C).

5.7.5 Water Quality Chemical Testing Frequency

5.7.5.1 Chemical Levels M&T

Free available CHLORINE (FAC), combined available CHLORINE (CAC), or total bromine (TB), and pH shall be tested at all AQUATIC VENUES prior to opening each day.

5.7.5.2 Manual Disinfectant Feed System M&T

FAC or TB and pH shall be tested prior to opening to the public and every two hours at all AQUATIC VENUES using a MANUAL DISINFECTANT FEED SYSTEM.

5.7.5.3 Automatic Disinfectant Feed System M&T

FAC (or TB) and pH shall be tested prior to opening and every four hours at all AQUATIC VENUES using an automated disinfectant feed system

5.7.5.4 In-Line ORP Readings M&T

In-line ORP readings shall be recorded at the same time the FAC (or TB) and pH tests are performed.

5.7.5.5 Total Alkalinity M&T

Total Alkalinity (TA) shall be tested weekly at all AQUATIC VENUES.

5.7.5.6 Calcium Hardness M&T

Calcium hardness shall be tested monthly at all AQUATIC VENUES.

5.7.5.7 Cyanuric Acid M&T

Cyanuric acid shall be tested monthly at all AQUATIC VENUES utilizing cyanuric acid.

5.7.5.7.1 Tested M&T

Cyanuric acid shall be tested 24 hours after the addition of cyanuric acid to the AQUATIC VENUE.

5.7.5.7.2 Stabilized Chlorine M&T

If AQUATIC VENUES utilize stabilized CHLORINE as its primary disinfectant, the operator shall test cyanuric acid every two weeks.

5.7.5.8 Total Dissolved Solids M&T

Total dissolved solids (TDS) shall be tested quarterly at all AQUATIC VENUES.

5.7.5.9 Water Temperature M&T

For heated AQUATIC VENUES, water temperature shall be recorded at the same time the FAC (or TB) and pH tests are performed.

5.7.5.10 Salt M&T

If in-line electrolytic chlorinators are used, salt levels shall be tested at least weekly or per manufacturer's instructions

5.7.6 Water Clarity**5.7.6.1 Reference Point M&T**

All AQUATIC VENUES shall comply with MAHC Section 5.7.6 to serve as a reference point for assessing adequate water clarity.

5.7.6.2 Marker Tile M&T

The AQUATIC VENUE bottom shall be visible at all times.

5.7.6.2.1 Observation M&T

To make this observation, a 4 in x 4 in square (103 cm²) marker tile or main suction outlet in a contrasting color to the POOL surface shall be located at the deepest part of the POOL.

5.7.6.2.2 Pools Over 10 Feet Deep M&T

For POOLS >10 ft deep, an 8 in x 8 in square (413 cm²) marker tile or main suction outlet in a contrasting color to the POOL surface shall be located at the deepest part of the POOL.

5.7.6.3 Visible M&T

This reference point shall be visible at all times at any point on the DECK up to 30 feet away in a direct line of sight from the disc or main drain.

5.7.6.3.1 Spas M&T

For SPAS, this test shall be performed when the water is in a non-turbulent state and bubbles have been allowed to dissipate.

5.8 Decks and Equipment**5.8.1 Spectator Areas****5.8.1.1 Cross-Connection Control RM****5.8.1.1.1 Deck Drains RM**

Cross connection devices such as check valves shall be in good working order, and shall be tested as required by the AHJ.

5.8.1.2 Materials/Slip Resistance **RM**

5.8.1.2.1 Clean and Good Repair **RM**

Surfaces shall be clean and in good repair.

5.8.1.2.2 Risk Management **RM**

The finish and profile of DECK surfaces shall be maintained to prevent slips and falls.

5.8.1.2.3 Tripping Hazards **RM**

Tripping hazards shall be avoided.

5.8.1.2.3.1 Protect **RM**

If tripping hazards are present, they shall be repaired or promptly barricaded to protect PATRONS/employees.

5.8.1.3 Deck Size/Width

5.8.2 Diving Boards and Platforms

5.8.3 Starting Blocks

5.8.4 Deck Slides

5.8.5 Lifeguard-and Safety Related Equipment

5.8.5.1 Equipment Inspection and Maintenance **LG**

AQUATIC FACILITIES shall not be open to users unless the equipment listed under MAHC Section 5.8.5 is present and in a safe and working condition.

5.8.5.2 Safety Equipment Required at All Aquatic Facilities

5.8.5.2.1 Communication Equipment

5.8.5.2.1.1 Functioning Communication Equipment **LG**

The AQUATIC FACILITY shall have equipment for staff to communicate in cases of emergency.

5.8.5.2.1.2 Hard-Wired Telephone for 911 Call **LG**

The AQUATIC FACILITY or each AQUATIC VENUE, as necessary, shall have a functional telephone or other communication system or device that is hard wired and capable of directly dialing 911 or function as the emergency notification system. The telephone or communication system or device shall be conspicuously provided and accessible to AQUATIC VENUE users such that it can be reached immediately.

5.8.5.2.1.3 Alternate Communication Systems LG

Alternate functional systems or devices are allowed with approval of the regulatory authority in situations when a telephone is not logistically sound, and an alternate means of communication is available, which meet the requirements of MAHC Section 5.8.5.2.1.2.

5.8.5.2.2 First Aid Equipment**5.8.5.2.2.1 Location for First Aid LG**

The AQUATIC FACILITY shall have designated locations for emergency and first aid equipment.

5.8.5.2.2.2 First Aid Supplies LG

An adequate supply of first aid supplies shall be continuously stocked and include, at a minimum, as follows:

- 1) A First Aid Guide,
- 2) Absorbent compress,
- 3) Adhesive bandages,
- 4) Adhesive tape,
- 5) Sterile pads,
- 6) Disposable gloves,
- 7) Scissors,
- 8) Elastic wrap,
- 9) Emergency blanket,
- 10) CPR mask, and
- 11) Blood borne pathogen spill kit.

5.8.5.2.3 Signage**5.8.5.2.3.1 Sign Indicating First Aid Location LG**

Signage shall be provided at the AQUATIC FACILITY or each AQUATIC VENUE, as necessary, which clearly identifies the following:

- 1) first aid location(s)
- 2) emergency telephone(s) or approved communication system or device

5.8.5.2.3.2 Emergency Dialing Instructions LG

A permanent sign providing emergency dialing directions and the AQUATIC FACILITY address shall be posted and maintained at the emergency telephone, system or device.

5.8.5.2.3.3 Management Contact Info LG

A permanent sign shall be conspicuously posted and maintained displaying contact information for emergency personnel and AQUATIC FACILITY management.

5.8.5.2.3.4 Hours of Operation LG

A sign shall be posted stating the operating hours of the AQUATIC FACILITY and stating that unauthorized use of the AQUATIC FACILITY outside of these hours is prohibited.

5.8.5.3 Safety Equipment Required at Aquatic Facilities with Lifeguards

5.8.5.3.1 UV Protection for Chairs and Stands LG

When a chair or stand is provided and QUALIFIED LIFEGUARDS can be exposed to ultraviolet radiation, the chair or stand shall be equipped with or in a location with protection from such ultraviolet radiation exposure

5.8.5.3.2 Spinal Injury Board LG

At least one spinal injury board constructed of material easily SANITIZED/disinfected shall be provided.

5.8.5.3.2.1 Spinal Injury Board Components LG

The board shall be equipped with a head immobilizer and sufficient straps to immobilize a person to the spinal injury board.

5.8.5.3.3 Rescue Tube Immediately Available LG

Each QUALIFIED LIFEGUARD conducting PATRON surveillance with the responsibility of in-water rescue in less than 3 feet (0.9 m) of water shall have a rescue tube immediately available for use.

5.8.5.3.4 Rescue Tube on Person LG

Each QUALIFIED LIFEGUARD conducting PATRON surveillance in a water depth of 3 feet (0.9 m) or greater shall have a rescue tube on his/her person in a rescue ready position.

5.8.5.3.5 Identifying Uniform LG

QUALIFIED LIFEGUARDS shall wear attire that readily identifies them as members of the AQUATIC FACILITY'S lifeguard staff.

5.8.5.3.6 Signal Device LG

A whistle or other signaling device shall be immediately available for each QUALIFIED LIFEGUARD conducting PATRON surveillance for communicating to users and/or staff.

5.8.5.3.7 Sun Blocking Methods LG

All AQUATIC FACILITIES where QUALIFIED LIFEGUARDS can be exposed to ultraviolet (UV) radiation shall train lifeguards about the use of protective clothing, hats, sun-blocking umbrellas, and sunscreen application and re-application using or exceeding SPF Level 15 to protect exposed skin areas.

5.8.5.3.7.1 Lifeguards Responsible LG

QUALIFIED LIFEGUARDS are responsible for protecting themselves from UV radiation exposure.

5.8.5.3.8 Polarized Sunglasses LG

When glare impacts the ability to see below the water's surface, QUALIFIED LIFEGUARDS shall wear polarized sunglasses while conducting PATRON surveillance

5.8.5.3.9 Personal Protective Equipment LG

Personal protective devices including a one way valve resuscitation mask and non-latex one-use disposable gloves shall be immediately available to all QUALIFIED LIFEGUARDS.

5.8.5.3.10 Rescue Throwing Device LG

AQUATIC FACILITIES with one QUALIFIED LIFEGUARD shall provide and maintain a Coast Guard approved aquatic rescue throwing device as per the specifications of MAHC Section 5.8.5.4.1.

5.8.5.3.11 Reaching Pole LG

AQUATIC FACILITIES with one QUALIFIED LIFEGUARD shall provide and maintain a reaching pole as per the specifications of MAHC Section 5.8.5.4.2.

5.8.5.4 Safety Equipment Required at Aquatic Facilities without Lifeguards**5.8.5.4.1 Throwing Device LG**

AQUATIC VENUES whose depth exceeds 2 feet of standing water shall provide and maintain a Coast Guard approved aquatic rescue throwing device, with at least a quarter-inch thick rope whose length is 50 feet (15.2 m) or 1.5 times the width of the POOL, whichever is less.

5.8.5.4.1.1 Throwing Device Location LG

The rescue throwing device shall be located in the immediate vicinity to the AQUATIC VENUE and be accessible to BATHERS.

5.8.5.4.2 Reaching Pole LG

AQUATIC VENUES whose depth exceeds 2 feet of standing water shall provide and maintain a reaching pole of 12 foot (3.7 m) to 16 foot (4.9 m) in length, non-telescopic, non-conductive, light in weight, and with a securely attached Shepherd's Crook with an aperture of at least 18 inches (45.7 cm).

5.8.5.2.4.1 Reaching Pole Location LG

The reaching pole shall be located in the immediate vicinity to the AQUATIC VENUE and be accessible to BATHERS.

5.8.5.4.3 CPR Posters LG

Cardiopulmonary Resuscitation (CPR) posters shall be posted conspicuously at all times.

5.8.5.4.4 Imminent Hazard Sign LG

A sign shall be posted outlining the required IMMEDIATE HEALTH HAZARD closure items of an AQUATIC FACILITY as defined in this CODE per MAHC 6.6.4 and a telephone number to report the problem to the owner/operator.

5.8.5.4.5 Sign for Conditions when Qualified Lifeguard is Required **LG**

For any AQUATIC VENUE with standing water, a sign shall be posted signifying a QUALIFIED LIFEGUARD is not on duty and that the following rules apply:

- 1) Persons under the age of 14 cannot be in the facility without direct adult supervision meaning the child shall be in adult view at all times, and
- 2) Youth and childcare groups, training, lifeguard courses, and swim lessons are not allowed without a QUALIFIED LIFEGUARD.

5.9 Filter/Equipment Room

5.9.1 Chemical Storage

5.9.1.1 Local Codes RM

Chemical STORAGE shall be in compliance with local building and fire CODES.

5.9.1.2 OSHA and EPA RM

Chemical handling shall be in compliance with OSHA and EPA regulations.

5.9.1.3 MSDS RM

For each chemical, STORAGE, handling and use of the chemical shall be in compliance with the manufacturer's Material Data Safety Sheets (MSDS) and labels.

5.9.1.4 Access Prevention RM

AQUATIC VENUE chemicals shall be stored to prevent access by unauthorized individuals.

5.9.1.5 Protected RM

AQUATIC VENUE chemicals shall be stored so that they are protected from getting wet.

5.9.1.6 No Mixing RM

AQUATIC VENUE chemicals shall be stored so that if the packages were to leak, no mixing of incompatible materials would occur.

5.9.1.6.1 MSDS RM

Material Data Safety Sheets (MSDS) shall be consulted for incompatibilities.

5.9.1.7 Ignition Sources RM

Possible ignition sources (e.g., welding equipment), including but not limited to gasoline, diesel, natural gas, or gas-powered equipment such as lawn mowers, motors, grills,

POOL heaters, or portable stoves shall not be stored or installed in the CHEMICAL STORAGE AREA.

5.9.1.8 Smoking RM

Smoking shall be prohibited in the CHEMICAL STORAGE AREA.

5.9.1.9 Lighting RM

Lighting shall be at minimum 30 footcandles (323 lux) to allow operators to read labels on containers throughout the chemical STORAGE area and pump room.

5.9.1.10 PPE RM

Personal Protective Equipment (PPE) shall be available as indicated on the chemical MSDS's.

5.9.1.11 Storage RM

Chemicals shall be stored away from direct sunlight, temperature extremes, and high humidity.

5.9.1.12 Single Container RM

A single container of a particular chemical that has been opened and that is currently in use in the pump room may be kept in a staging area of the pump room only if the chemical(s) will be protected from exposure to heat and moisture.

5.9.1.13 Separate RM

The chemical STORAGE area shall be separate from the equipment room.

5.9.1.13.1 Waiver RM

For AQUATIC FACILITIES that do not currently have a CHEMICAL STORAGE AREA separate from the equipment room, this requirement may be waived at the discretion of the local public health and/or fire officials if the chemicals are protected from exposure to heat and moisture and no imminent health or SAFETY threats are identified.

5.9.1.14 Warning Signs RM

Warning signs in compliance with NFPA or HMIS ratings shall be posted on CHEMICAL STORAGE AREA doors.

5.9.2 Chemical Handling RM

5.9.2.1 Identity RM

Containers of chemicals shall be labeled, tagged, or marked with the identity of the material and a statement of the hazardous effects of the chemical according to OSHA and/or EPA materials labeling requirements.

5.9.2.1.1 Labeling RM

All AQUATIC VENUE chemical containers shall be labeled according to OSHA and/or EPA materials labeling requirements.

5.9.2.2 NSF Standard RM

The chemical equipment used in controlling the quality of water shall be certified to NSF/ANSI 50 and used only in accordance with the manufacturer's instructions.

5.9.2.3 Measuring Devices RM

Chemicals shall be measured using a dedicated measuring device where applicable.

5.9.2.3.1 Clean and Dry RM

These measuring devices shall be clean, dry and constructed of material compatible with the chemical to be measured to prevent the introduction of incompatible chemicals.

5.9.2.4 Chemical Addition Methods R&F

5.9.2.4.1 Automatically Introduced R&F

DISINFECTION and pH control chemicals shall be automatically introduced through the RECIRCULATION SYSTEM.

5.9.2.4.1.1 Manual Addition R&F

SUPERCHLORINATION or shock chemicals and other POOL chemicals other than DISINFECTION and pH control may be added manually to the POOL.

5.9.2.4.1.2 Absence of Bathers R&F

Chemicals added manually directly into the AQUATIC VENUE shall only be introduced in the absence of BATHERS.

5.9.2.4.2 Safety Requirements R&F

Whenever required by the manufacturer, chemicals shall be diluted (or mixed with water) prior to application and as per the manufacturer's directions.

5.9.2.4.2.1 Added R&F

Chemicals shall be added to water when diluting as opposed to adding water to a concentrated chemical.

5.9.2.4.2.2 Mixed R&F

Each chemical shall be mixed in a separate, labeled container.

5.9.2.4.2.2.1 Never Mixed Together R&F

Two or more chemicals shall never be mixed in the same dilution water.

5.10 Hygiene Facilities

5.10.1 General

5.10.2 Location [N/A]

5.10.3 Bathhouse Design

5.10.4 Plumbing Fixture Requirements

5.10.4.1 General Requirements

5.10.4.1.1 Cleaned and Sanitized HYG

HYGIENE FACILITY fixtures, dressing area fixtures, and furniture shall be cleaned and SANITIZED daily and more often if necessary with an EPA-approved product and more often if necessary to provide a clean and sanitary environment.

5.10.4.1.2 Mold and Mildew HYG

HYGIENE FACILITY floors, walls, and ceilings shall be kept clean and free of visible mold and mildew.

5.10.4.1.3 Hand Wash Station HYG

HAND WASH STATIONS shall include the following items:

- 1) Hand wash sink,
- 2) Adjacent soap with dispenser,
- 3) Hand drying device or paper towels and dispenser, and
- 4) Trash receptacle.

5.10.4.2 Cleansing Showers HYG

5.10.4.2.1 Cleaned and Sanitized HYG

CLEANSING SHOWERS shall be cleaned and SANITIZED daily and more often if necessary with an EPA-approved product and more often if necessary to provide a clean and sanitary environment.

5.10.4.3 Rinse Showers HYG

5.10.4.3.1 Cleaned HYG

RINSE SHOWERS shall be cleaned daily and more often if necessary with an EPA-approved product and more often if necessary to provide a clean and sanitary environment.

5.10.4.3.2 Easy Access HYG

RINSE SHOWERS shall be easily accessible.

5.10.4.3.3 Not Blocked**HYG**

Equipment and furniture on the DECK shall not block access to RINSE SHOWERS.

5.10.4.3.4 No Soap**HYG**

Soap dispensers and soap shall be prohibited at RINSE SHOWERS.

5.10.4.4 All Showers**HYG****5.10.4.5 Diaper-Changing Stations****HYG****5.10.4.5.1 Cleaned****HYG**

DIAPER-CHANGING STATIONS shall be cleaned and SANITIZED daily and more often if necessary to provide a clean and sanitary environment.

5.10.4.5.1.1 Maintained**HYG**

They shall be kept in good condition and free of visible contamination.

5.10.4.5.2 Sanitizer**HYG**

EPA-registered SANITIZER shall be provided in the form of either of the following:

- 1) A solution in a spray dispenser with paper towels and dispenser, or
- 2) SANITIZER wipes contained within a dispenser.

5.10.4.5.2.1 Covers**HYG**

If disposable DIAPER-CHANGING UNIT covers are provided in addition to SANITIZER, they shall cover the DIAPER-CHANGING UNIT surface during use and keep the unit in clean condition.

5.10.4.5.3 Portable Hand Wash Station**HYG**

If a portable HAND WASH STATION is provided for use it shall be operational and maintained in good condition at all times.

5.10.4.6 Non-Plumbing Fixture Requirements**HYG****5.10.4.6.1 Paper Towels****HYG**

If paper towels are used for hand drying, a dispenser and paper towels shall be provided for use at HAND WASH STATIONS.

5.10.4.6.2 Soap**HYG**

Soap dispensers at HAND WASH STATIONS and CLEANSING SHOWERS shall be kept full of liquid or granular soap.

5.10.4.6.2.1 Bar Soap**HYG**

Bar soap shall be prohibited.

5.10.4.6.3 Trash**HYG**

Trash receptacles shall be emptied daily and more often if necessary to provide a clean and sanitary environment.

5.10.4.6.4 Floor Coverings**HYG**

Non-permanent floor coverings (including but not limited to mats and racks) shall be removable and maintained in accordance with MAHC Section 5.10.4.1.1.

5.10.4.6.4.1 Wood**HYG**

Wooden racks, duckboards, and wooden mats are prohibited on HYGIENE FACILITY and dressing area flooring.

5.10.4.7 Sharps**HYG****5.10.4.7.1 Biohazard Action Plan****HYG**

A biohazard action plan shall also be on file as required by local, state or federal regulations and as part of the AQUATIC FACILITY SAFETY PLAN.

5.10.4.7.2 Disposed**HYG**

Sharps within approved containers shall be disposed of as needed by the AQUATIC FACILITY in accordance with local, state, or federal regulations.

5.10.5 Provision of Suits, Towels, and Shared Equipment**5.10.5.1 Towels****HYG**

All towels provided by the AQUATIC FACILITY shall be washed with detergent in warm water, rinsed, and thoroughly dried after each use.

5.10.5.1.1 Washed and Dried**HYG**

Towels shall be washed and thoroughly dried at the warmest temperature listed on the fabric label.

5.10.5.1.2 Suits**HYG**

Suits provided by the AQUATIC FACILITY shall be washed in accordance with the fabric label or manufacturer's instructions.

5.10.5.2 Receptacles**HYG**

Non-absorbent, easily cleanable receptacles shall be provided for collection of used suits and towels.

5.10.5.3 Shared Equipment-Cleaned and Sanitized**HYG**

Equipment provided by the AQUATIC FACILITY that comes into contact with BATHER's eyes, nose, ears, and mouth (including but not limited to snorkels, nose clips, and goggles) shall be cleaned, SANITIZED, and stored in a manner to prevent biological growth.

5.10.5.4 Other Equipment HYG

Other shared equipment provided by the facility, including but not limited to fins, kickboards, tubes, and noodles, shall be cleaned, scrubbed, and stored in a manner to prevent biological growth.

5.10.5.5 Good Repair HYG

Shared equipment shall be maintained in good repair.

5.10.5.6 Used Equipment HYG

Used and un-SANITIZED shared equipment shall be kept separate from cleaned and SANITIZED shared equipment.

5.10.5.6.1 Receptacles HYG

Non-absorbent, easily cleanable receptacles shall be provided for collection of used shared equipment.

5.11 Water Supply/ Wastewater Disposal

5.12 Special Requirements for Specific Venues

5.12.1 Water Slides

5.12.1.1 Signage FMO

Warning signs shall be provided in accordance with manufacturer's recommendations.

5.12.2 Wave Pools

5.12.2.1 Life Jackets FMO

Life jackets shall be provided free for use by BATHERS who request them.

5.12.3 Moveable Floors

5.12.3.1 Starting Platforms FMO

The use of starting platforms in the area of a MOVEABLE FLOOR shall be prohibited when the water depth is shallower than the minimum required water depth of 4 ft (1.2 m). Use may only occur as per MAHC Section 5.6.10.3.2.

5.12.3.2 Diving Boards FMO

When a MOVEABLE FLOOR is installed into a DIVING POOL, diving shall be prohibited unless the DIVING POOL depth meets criteria set in MAHC Section 4.8.2.1.1.

5.12.4 Bulkheads

5.12.4.1 Open Area

FMO

If a BULKHEAD is operated with an open area underneath, no one shall be allowed to swim beneath the BULKHEAD.

5.12.5 Interactive Water Aquatic Venues

5.12.5.1 Cracks

FMO

CRACKS in the Interactive water AQUATIC VENUE shall be repaired when they may be a potential for leakage, present a tripping hazard, a potential cause of lacerations, or impact the ability to properly clean and maintain the Interactive water AQUATIC VENUE area.

5.12.5.2 Cleaning

FMO

When cleaning the Interactive water AQUATIC VENUE CONTAMINANTS shall be removed or washed to the sanitary sewer. If no sanitary sewer drain is available then debris shall be washed/rinsed to the nearest DECK drain or removed in a manner that prevents CONTAMINANTS from reentering the spray ground.

5.12.6 Wading Pools

5.12.7 Spas

5.12.7.1 Required Operation Time

R&F

SPA filtration systems shall be operated 24 hours per day except for periods of draining, filling, and maintenance.

5.12.7.2 Drainage

R&F

SPAS shall be drained, cleaned, and water replaced when needed to maintain water quality, but at least once every week.

5.12.7.3 Water Replacement

R&F

Water shall be replaced at the required interval as outlined in MAHC Section 5.12.7.2 or as calculated as follows in MAHC section 5.12.7.3.1, whichever interval is shorter.

5.12.7.3.1 Calculated

R&F

The water replacement interval (in days) shall be calculated by dividing the SPA volume (in gallons) by 3 and then dividing by the average number of users per day.

5.12.7.4 Scrubbed

R&F

SPA surfaces, including interior of SKIMMERS, shall be scrubbed or wiped down, and all water drained prior to refill.

DRAFT

6.0 Policies and Management

6.0.1 Staff Training

All QUALIFIED OPERATORS, maintenance staff, QUALIFIED LIFEGUARD staff, or any others who are involved in the STORAGE, use, or handling of chemicals shall receive training prior to access of chemicals, and receive at least an annual review of procedures thereafter for the following topics discussed in MAHC Section 6.1.1.1 to 6.1.1.5:

6.0.1.1 Storage and Handling RM

Procedures for chemical STORAGE and handling outlined in this CODE.

6.0.1.2 PPE Procedures RM

STANDARD Precautions, Personal Protective Equipment (PPE), and other measures to minimize exposure to chemicals as required by OSHA. This shall include staff training in PPE and respiratory protective devices.

6.0.1.3 Spill Procedures RM

Spill Procedures and Emergency Response outlined in this CODE.

6.0.1.4 OSHA Requirements RM

Federal OSHA Requirements: Hazard Communication STANDARD (Employee Right-to-Know) and MSDS. Know the location and availability of the written program.

6.0.1.5 Chemical and MSDS Lists RM

Know workplace chemicals list and MSDS.

6.0.1.6 Training Plan RM

Employers shall have a training plan in place and implement training for employees on chemicals used at the AQUATIC FACILITY before their first assignment and whenever a new hazard is introduced into the work area.

6.0.1.6.1 Training Topics

The training shall include at a minimum:

- 1) How to recognize and avoid chemical hazards;
- 2) The physical and health hazards of chemicals used at the facility;
- 3) How to detect the presence or release of a hazardous chemical;
- 4) Required PPE necessary to avoid the hazards
- 5) Use of PPE;
- 6) Chemical spill response, and
- 7) How to read and understand the chemical labels or other forms of warning including MSDS sheets.

6.0.1.7	Training Records	RM
Records of all training should be recorded and maintained on file.		
6.0.1.8	Body Fluid Exposure	RM
Employees assigned to roles which have the potential for an occupational exposure to bloodborne pathogens, pathogens that cause recreational water illnesses, or other pathogens shall be trained to recognize and respond to body fluid (blood, feces, vomit) releases in and around the AQUATIC VENUE area.		
6.0.1.9	Exposure Control Program	RM
Employers shall have an Exposure Control Program for bloodborne pathogens as required by OSHA 1910.1030.		
6.0.1.10	PPE Provided and Disposed	RM
PPE shall be provided and properly disposed.		
6.1 Operator Training		
6.1.1 Operator Qualifications and Certification		
6.1.1.1	Qualifications	OT
A QUALIFIED OPERATOR shall have completed an operator training course that is recognized by the AHJ.		
6.1.1.2	Training Documentation	OT
A QUALIFIED OPERATOR shall have a current certificate or written documentation acceptable to the AHJ showing completion of an operator training course.		
6.1.1.2.1	Certificate Available	OT
Originals or copies of such certificate or documentation shall be available on site for inspection by the AHJ for each QUALIFIED OPERATOR employed at or contracted by the site, as specified in this CODE.		
6.1.1.2.2	Originals	OT
Originals shall be made available upon request by the AHJ.		
6.1.2 Essential Topics in Qualified Operator Training Courses OT		
6.1.2.1	Course Content	OT
All operator training courses recognized by the AHJ shall include, at a minimum, the following teaching elements:		
<ol style="list-style-type: none"> 1) Water DISINFECTION 2) Water chemistry 		

- 3) Mechanical systems
- 4) Health and safety operations.

6.1.2.1.1 Water Disinfection

OT

Water DISINFECTION including:

- 1) Water DISINFECTION
- 2) CT or Concentration X Time values
- 3) CHLORINE
- 4) Cyanuric acid (CYA)
- 5) Bromine
- 6) BREAKPOINT
- 7) SUPERCHLORINATION
- 8) HYPERCHLORINATION
- 9) Combined CHLORINE
- 10) SECONDARY DISINFECTION
- 11) SUPPLEMENTAL DISINFECTION

6.1.2.1.1.1 Disinfectants

OT

DISINFECTANT types including:

- 1) Descriptions of different types of DISINFECTANTS,
- 2) Their unique physical (e.g., shape or state [solid, liquid, or gas]) and chemical properties (e.g., how it reacts with acids or bases),
- 3) How they disinfect and impact water chemistry and MONITORING systems,
- 4) How to calculate dosing,
- 5) How they are used safely, and
- 6) The advantages or disadvantages of using each DISINFECTANT.

6.1.2.1.1.2 CT Values

OT

CT or Concentration X Time Values including:

- 1) How to calculate the amount of time needed to inactivate PATHOGENS at a given concentration of a DISINFECTANT, and
- 2) The importance and reasons for maintaining appropriate water pH and temperature.

6.1.2.1.1.3 Bromine

OT

Bromine including:

- 1) Definition of bromine as an element,
- 2) Its use as a residual disinfectant and oxidizer in water,
- 3) Bromine chemistry,
- 4) The DISINFECTION role of hypobromous acid.
- 5) On site generation,
- 6) PH meter requirements to prevent false readings, and

7) Bromine reuse.

6.1.2.1.1.4 Chlorine OT

CHLORINE including:

- 1) Definition of CHLORINE as an element,
- 2) Its use as a residual disinfectant and oxidizer in water,
- 3) CHLORINE chemistry and the role of PH,
- 4) The DISINFECTION role of hypochlorous acid,
- 5) Unstabilized products (sodium hypochlorite, calcium hypochlorite, lithium hypochlorite, and CHLORINE gas),
- 6) Stabilized products (sodium dichloro-s-triazinetrione and sodium trichloro-s-triazinetrione),
- 7) Safe chemical handling, and
- 8) On-site CHLORINE generation.

6.1.2.1.1.5 Cyanuric Acid OT

Cyanuric acid (CYA) including reasons for and against use and recommended concentrations.

6.1.2.1.1.6 Breakpoint/ Super-Chlorination OT

BREAKPOINT CHLORINATION including how to achieve it through calculation of chemical dosing to reach the desired free CHLORINE level and its relationship to reducing and controlling formation of combined CHLORINE including guidance for how to perform BREAKPOINT CHLORINATION in indoor aquatic settings.

6.1.2.1.1.7 Hyperchlorination OT

HYPERCHLORINATION including procedures for implementation of fecal/vomit/blood contamination response.

6.1.2.1.1.8 Combined Chlorine OT

Combined CHLORINE including:

- 1) How different combined CHLORINE and DISINFECTION BY-PRODUCTS are formed in the water and air,
- 2) The maximum acceptable level of combined CHLORINE,
- 3) How methods such as water replacement, BREAKPOINT CHLORINATION, ultraviolet light, ozone, ventilation, and use of other oxidizers can reduce combined CHLORINE level,
- 4) The advantages and disadvantages of each, and
- 5) Possible health effects of combined CHLORINE products in the air, particularly in indoor AQUATIC FACILITIES.

6.1.2.1.1.9 Secondary Disinfection OT

SECONDARY DISINFECTION systems including:

- 1) How ozone and ultraviolet disinfectants are used in conjunction with residual disinfectants to inactivate pathogens, and
- 2) Sizing guidelines/dosing calculations, safe use, and advantages and disadvantages of each method.

6.1.2.1.1.10 Supplemental Disinfection

OT

SUPPLEMENTAL DISINFECTION including other DISINFECTION chemicals or systems on the market and their effectiveness in water treatment.

6.1.2.1.2 Water Chemistry

OT

Course work for water chemistry shall include:

- 1) Source water
- 2) Water balance
- 3) SATURATION INDEX
- 4) Water clarity
- 5) pH
- 6) Total alkalinity
- 7) Calcium hardness
- 8) Water temperature
- 9) Total dissolved solids
- 10) Water treatment systems
- 11) Water testing

6.1.2.1.2.1 Source Water

OT

Source water including requirements for supply and pre-treatment.

6.1.2.1.2.2 Water Balance

OT

Water balance including:

- 1) Effect of unbalanced water on DISINFECTION, AQUATIC FEATURE surfaces, mechanical equipment, and fixtures, and
- 2) Details of water balance including pH, total alkalinity, calcium hardness, temperature, and total dissolved solids (TDS).

6.1.2.1.2.3 Saturation Index

OT

SATURATION INDEX including calculations, ideal values, and effects of values which are too low or too high.

6.1.2.1.2.4 Water Clarity

OT

Water clarity including:

- 1) Reasons why water quality is so important
- 2) Causes of poor water clarity,
- 3) Maintenance of good water clarity, and

- 4) Closure requirements when water clarity is poor.

6.1.2.1.2.5**pH**

OT

pH including:

- 1) How pH is a measure of the concentration of hydrogen ions in water,
- 2) Effects of high and low pH on PATRONS and equipment,
- 3) Ideal pH range for PATRONS and equipment,
- 4) Factors that affect pH,
- 5) How pH affects disinfectant efficacy, and
- 6) How to decrease and increase pH.

6.1.2.1.2.6**Total Alkalinity**

OT

Total alkalinity including:

- 1) How total alkalinity relates to pH,
- 2) Effects of low and high total alkalinity,
- 3) Factors that affect total alkalinity,
- 4) Ideal total alkalinity range, and
- 5) How to increase or decrease total alkalinity.

6.1.2.1.2.7**Calcium Hardness**

OT

Calcium hardness including:

- 1) Why water naturally contains calcium,
- 2) How calcium hardness relates to total hardness and temperature,
- 3) Effects of low and high calcium hardness,
- 4) Factors that affect calcium hardness,
- 5) Ideal calcium hardness range, and
- 6) How to increase or decrease calcium hardness.

6.1.2.1.2.8**Temperature**

OT

Water temperature including:

- 1) How low and high water temperatures increase the likelihood of corrosion and scaling, respectively, and
- 2) Its effect on DISINFECTION, its health effects, and other operational considerations,
- 3) Its health effects, and
- 4) Other operational considerations.

6.1.2.1.2.9**Total Dissolved Solids**

OT

Total dissolved solids (TDS) including:

- 1) Why the concentration of TDS increases over time,
- 2) Association with conductivity and organic CONTAMINANTS, and

- 3) Key TDS levels as they relate to starting up an AQUATIC FACILITY and galvanic corrosion.

6.1.2.1.2.10 Water Treatment Systems

OT

Water treatment systems including:

- 1) Descriptions of system use, MONITORING, calibration and maintenance of automatic controllers,
- 2) Descriptions of common types of liquid, dry chemical, and gas mechanical feeders,
- 3) CHLORINE, bromine, and ozone generators,
- 4) Ultraviolet light systems,
- 5) Unique features of feeders, generators, and systems,
- 6) How to generally operate and maintain them,
- 7) Advantages and disadvantages of different feeders, ultraviolet light systems, and ozonator types, and
- 8) Alternate treatment methods.

6.1.2.1.2.11 Water Testing

OT

Water testing including:

- 1) How different methods (including but not limited to colorimetric, titrimetric, turbidimetric and electronic) test water to determine the following levels:
 - a. free available and total CHLORINE,
 - b. total bromine,
 - c. pH,
 - d. total alkalinity,
 - e. calcium hardness,
 - f. temperature,
 - g. TDS,
 - h. CYA,
 - i. metals, and
 - j. any other tests (including but not limited to salt concentrations, phosphates, nitrates, potassium monopersulfate Cu, Fe, and bacterial testing),
- 2) The advantages and disadvantages of each method,
- 3) How to maintain testing equipment,
- 4) How to collect water samples,
- 5) How to perform and interpret tests,
- 6) How frequently to test,
- 7) The steps of the dilution method, and
- 8) How to calculate combined CHLORINE levels.

6.1.2.1.3 Mechanical Systems

OT

Course work for mechanical systems shall include:

- 1) Calculations
- 2) Circulation
- 3) Main drains
- 4) Gutters and surface SKIMMERS
- 5) Mechanical system balance
- 6) Circulation pump and motor
- 7) Valve
- 8) Return INLETS
- 9) Filtration
- 10) Filter backwashing/cleaning

6.1.2.1.3.1**Maintenance Calculations****OT**

Calculations including:

- 1) Explanations of why particular calculations are important,
- 2) How to convert units of measurement within and between the English and metric systems,
- 3) How to determine the surface area of regularly and irregularly shape AQUATIC VENUES,
- 4) How to determine the water volume of regularly and irregularly shaped AQUATIC VENUES, and
- 5) Why proper sizing of filters, pumps, pipes, and feeders is important.

6.1.2.1.3.2**Circulation****OT**

Circulation including:

- 1) Why circulation is needed,
- 2) Factors that affect water flow,
- 3) How direct suction and overflow systems work,
- 4) How to calculate TURNOVER and flow rates,
- 5) How the following components of the circulation system relate to each other: main drains, gutters and surface SKIMMERS, circulation pump and motor, surge tanks, vacuum ports, valves, and return INLETS,
- 6) How to read flow meters,
- 7) How to safely operate pressurized systems after the pump,
- 8) Information on dye testing,
- 9) An understanding of total dynamic head (TDH),
- 10) How it is calculated,
- 11) How it is field-determined using vacuum and pressure gauges,
- 12) Its effect on pump flow, and
- 13) Cross connections.

6.1.2.1.3.3**Main Drains****OT**

Main drains including:

- 1) A description of the role of main drains,

- 2) Why they should not be resized without engineering and public health consultation,
- 3) The importance of daily inspection of structural integrity, and
- 4) Discussion on balancing the need to maximize surface water flow while minimizing the likelihood of entrapment.

6.1.2.1.3.4 Gutters & Surface Skimmers

OT

Gutters and surface SKIMMERS including:

- 1) Why it is important to collect surface water,
- 2) A description of different gutter types (at a minimum: scum, surge, and rim-flow),
- 3) How each type generally works,
- 4) The advantages and disadvantages of each, and
- 5) Description of the components of SKIMMERS (e.g., weir, basket, and equalizer assembly) and their respective roles.

6.1.2.1.3.5 Mechanical System Balance

OT

Mechanical system balance including:

- 1) An understanding of mechanical system balancing,
- 2) Methodology for setting proper operational water levels,
- 3) Basic hydraulics which affect proper functioning of the balance tank and AQUATIC VENUE,
- 4) Methods of setting and adjusting modulation valves,
- 5) Balance lines,
- 6) SKIMMERS,
- 7) Main drains,
- 8) The operation of the water make-up system,
- 9) Collector tanks/gravity drainage systems, and
- 10) Automatic controllers.

6.1.2.1.3.6 Circulation Pump & Motor

OT

Circulation pump and motor including:

- 1) Descriptions of the role of the pump and motor,
- 2) Self-priming and flooded suction pumps,
- 3) Key components of a pump and how they work together,
- 4) Cavitation,
- 5) Possible causes of cavitation, and
- 6) Troubleshooting problems with the pump and motor.

6.1.2.1.3.7 Valves

OT

Valves including descriptions of different types of valves (e.g., gate, ball, butterfly/wafer, multi-port, globe, modulating/ automatic, and check) and their safe operation.

6.1.2.1.3.8 Return Inlets

OT

Return INLETS including a description of the role of return INLETS and the importance of replacing fittings with those that meet original specifications.

6.1.2.1.3.9**Filtration****OT**

Filtration including:

- 1) Why filtration is needed,
- 2) A description of pressure and vacuum filters and different types of filter media,
- 3) How to calculate filter surface area,
- 4) How to read pressure gauges,
- 5) A general description of sand, cartridge, and diatomaceous earth filters and alternative filter media types to include, at a minimum, perlite, zeolite, and crushed glass.
- 6) The characteristic flow rates and particle size entrapment of each filter type,
- 7) How to generally operate and maintain each filter type,
- 8) Troubleshooting problems with the filter, and
- 9) The advantages and disadvantages of different filters and filter media.

6.1.2.1.3.10**Filter Backwashing/Cleaning****OT**

Filter backwashing/cleaning including:

- 1) Determining and setting proper backwash flow rates,
- 2) When backwashing/cleaning should be done and the steps needed for clearing a filter of fine particles and other CONTAMINANTS,
- 3) Proper disposal of waste water from backwash, and
- 4) What additional fixtures/equipment may be needed (i.e., sump, separation tank).

6.1.2.1.4 Health and Safety**OT**

Course work for health and SAFETY shall include:

- 1) Recreational water illness (RWI)
- 2) RWI prevention
- 3) Risk management
- 4) Record keeping
- 5) Chemical SAFETY
- 6) Entrapment prevention
- 7) Electrical SAFETY
- 8) Rescue equipment
- 9) Injury prevention
- 10) Drowning prevention
- 11) BARRIERS
- 12) Signage and depth markers
- 13) Facility sanitation
- 14) Emergency response
- 15) Surveillance and supervision

6.1.2.1.4.1**Recreational Water Illness**

OT

Recreational water illness (RWI) including:

- 1) How water can contain or become contaminated with parasites, bacteria, viruses, fungi, DISINFECTION BY-PRODUCTS, or unsafe levels of chemicals; and
- 2) The role of the operator in reducing risk.

6.1.2.1.4.2**Causes of RWIs**

OT

Common infectious and chemical causes of RWIs, including but not limited to:

- 1) Diarrheal illness (*Cryptosporidium*, *Giardia*, *Shigella*, and NOROVIRUS),
- 2) Skin rashes (*Pseudomonas aeruginosa*, molluscum contagiosum),
- 3) Respiratory illness (*Legionella*)
- 4) Neurologic infections (echovirus, *Naegleria*),
- 5) Eye/ear illness (*Pseudomonas aeruginosa*, adenovirus, *Acanthamoeba*,
- 6) Hypersensitivity reactions (*Mycobacterium avium complex*, Pontiac fever, endotoxins), and
- 7) Health effects of chloramines and DISINFECTION BY-PRODUCTS.

6.1.2.1.4.3**RWI Prevention**

OT

Recreational water illness (RWI) prevention including:

- 1) Methods of prevention of RWIs, including but not limited to chemical level control;
- 2) Why public health, operators, and PATRONS need to be educated about RWIs and collaborate on RWI prevention;
- 3) The role of showering,
- 4) The efficacy of swim diapers,
- 5) Formed-stool and diarrheal fecal incident response, and
- 6) Developing a plan to minimize PATHOGEN and other biological (e.g., blood, vomit, sweat, urine, and skin and hair care products) contamination of the water.

6.1.2.1.4.4**Risk Management**

OT

Risk management including techniques that identify hazards and risks and that prevent illness and injuries associated with AQUATIC FACILITIES open to the public.

6.1.2.1.4.5**Record Keeping**

OT

Record keeping including the need to keep accurate and timely records of the following areas:

- 1) Operational conditions (e.g., water chemistry, water temperature, filter pressure differential, flow meter reading, and water clarity),
- 2) Maintenance performed (e.g., backwashing, change of equipment),
- 3) Incidents and response (e.g., fecal incidents in the water and injuries), and
- 4) Staff training and attendance.

6.1.2.1.4.6**Chemical Safety**

OT

Chemical SAFETY including steps to safely store and handle chemicals including:

- 1) How to read labels and material safety data sheets,
- 2) How to prevent individual chemicals and inorganic and organic CHLORINE products from mixing together or with other substances (including water) or in chemical feeders, and
- 3) Use of personal protective equipment.

6.1.2.1.4.7 Entrapment Prevention

OT

Entrapment prevention including:

- 1) Different types of entrapment (e.g., hair, limb, body, evisceration/disembowelment, and mechanical),
- 2) How to prevent and/or decrease likelihood of entrapment, and
- 3) Requirements of the Virginia Graeme Baker POOL and SPA Safety Act.

6.1.2.1.4.8 Electrical Safety

OT

Electrical SAFETY including possible causes of electrical shock and steps that can be taken to prevent electrical shock (e.g., bonding, grounding, ground fault interrupters, and prevention of accidental immersion of electrical devices).

6.1.2.1.4.9 Rescue Equipment

OT

Rescue equipment including a description and rationale for the most commonly found rescue equipment including:

- 1) Rescue tubes,
- 2) Reaching poles,
- 3) Ring buoys and throwing lines,
- 4) Backboards,
- 5) First aid kits,
- 6) Emergency alert systems,
- 7) Emergency phones with current numbers posted, and
- 8) Resuscitation equipment.

6.1.2.1.4.10 Injury Prevention

OT

Injury prevention including basic steps known to decrease the likelihood of injury, at a minimum:

- 1) Banning the use of alcohol and glass containers at AQUATIC FACILITIES,
- 2) PATRON education, and
- 3) Daily visual inspection for hazards.

6.1.2.1.4.11 Drowning Prevention

OT

Drowning prevention including causes and prevention of drowning.

6.1.2.1.4.12 Barriers

OT

BARRIERS including descriptions of how fences, gates, doors, and SAFETY covers can be used to prevent access to water; and basics of design that effectively prevent access to water.

6.1.2.1.4.13 Signage & Depth Markers OT

Signage and depth markers including the importance of maintaining signage and depth markers.

6.1.2.1.4.14 Facility Sanitation OT

Facility sanitation including:

- 1) Steps to clean and disinfect all surfaces that PATRONS would commonly come in contact with (e.g., DECK, restrooms, and diaper-changing areas), and
- 2) Procedures for implementation of MAHC Section 6.5: *Fecal-Vomit-Blood Contamination Response*, in relation to responding to a body fluid spill on these surfaces.

6.1.2.1.4.15 Emergency Response Plan OT

Emergency response plan including:

- 1) Steps to respond to emergencies (at a minimum, severe weather events, drowning or injury, contamination of the water, chemical incidents), and
- 2) Communication and coordination with emergency responders and local health department notification as part of an EMERGENCY ACTION PLAN.

6.1.2.1.5 Operations OT

Course work for operations shall include:

- 1) Regulations
- 2) Local and state health Departments
- 3) AQUATIC FACILITY types
- 4) Daily/routine operations
- 5) Preventive maintenance
- 6) Weatherizing
- 7) AQUATIC FACILITY renovation and design
- 8) Heating
- 9) Air circulation
- 10) SPA and THERAPY POOL Issues

6.1.2.1.5.1 Regulations OT

Regulations including the application of local, regional, state, and federal regulations and STANDARDS relating to the operation of AQUATIC FACILITIES.

6.1.2.1.5.1.1 Immediate Closure OT

Course work shall also highlight reasons why an inspector or operator would immediately close an AQUATIC FACILITY.

6.1.2.1.5.2 Local & State Health Departments OT

Local and state health departments including stressing the importance of a good working relationship with the local and state health department.

6.1.2.1.5.3 Aquatic Facility Types OT

AQUATIC FACILITY types including common AQUATIC VENUE types and settings and a discussion of features and play equipment that require specific operation and maintenance steps.

6.1.2.1.5.4 Daily/Routine Operations OT

Daily/routine operations including listing and describing the daily inspection and maintenance requirements of an AQUATIC FACILITY including, but not limited items listed:

- 1) Walkways/DECK and exits are clear, clean, free of debris,
- 2) Drain covers, vacuum fitting covers, SKIMMER equalizer covers, and any other suction outlet covers are in place, secure, and unbroken,
- 3) SKIMMER baskets, weirs, lids, flow adjusters, and suction outlets are free of any blockage,
- 4) INLET and return covers and any other fittings are in place, secure, and unbroken,
- 5) SAFETY warning signs and other signage are in place and in good repair,
- 6) Entrapment prevention systems are operational,
- 7) Recirculation, DISINFECTION systems, controller(s), and probes are operating as required,
- 8) Secondary and/or supplemental DISINFECTION systems are operating as required,
- 9) Underwater lights and other lighting are intact with no exposed wires or water in lights,
- 10) Slime and biofilm has been removed from accessible surfaces of AQUATIC VENUE, slides, and other AQUATIC FEATURES,
- 11) Doors to nonpublic areas (chemical STORAGE, offices, etc.) are locked,
- 12) First aid supplies are stocked,
- 13) Emergency communication equipment and systems are operational,
- 14) Fecal/vomit/blood incident contamination response protocols, materials, and equipment are available,
- 15) Water features and amenities are functioning in accordance with the manufacturer's recommendations,
- 16) Fencing/BARRIERS, gates, and self-latching or other locks are tested and are intact and functioning properly, and BARRIERS do not have nearby furniture to encourage climbing,
- 17) Drinking fountains are clean and in functional condition,
- 18) Electrical devices are in good working condition and meet the requirements specified in the NEC and MAHC,
- 19) Alarms, if required, are tested and functioning properly,

- 20) Assessing glare conditions throughout operating hours to insure the bottom and objects in the POOL are clearly visible,
- 21) Play structures and diving boards are in good condition;
- 22) SAFETY equipment is in good condition, properly secured, accessible for intended use, and shall include at a minimum:
 - a. Rescue tubes,
 - b. Resuscitation masks,
 - c. First aid kits,
 - d. AED's,
 - e. Emergency oxygen,
 - f. Backboard, head immobilizer, straps,
 - g. Lifeguard stands,
- 23) Emergency shut-off systems (slides, water features, pumps, etc.) function properly;
- 24) Depth markings are clearly visible;
- 25) Lifelines and buoys are in place and in good working order;
- 26) Ladders are non-slip and rungs secured tightly;
- 27) Waterslides are in functional, safe condition;
- 28) Moveable fulcrum is adjusted properly to control spring in the board as necessary;
- 29) Moveable starting blocks are properly stored;
- 30) Access to permanent starting blocks is restricted or controlled when not in use by swim teams and prohibited when not in use by competitive swimming or swimming practice that is under direct supervision of an instructor or coach;
- 31) Railings are secure;
- 32) SVRS is functioning according to manufacturer's guidelines;
- 33) SKIMMER baskets and covers are clean and in place;
- 34) Water quality and clarity is MAHC compliant;
- 35) Water level is at an appropriate level;
- 36) Pumps retain the appropriate pressure;
- 37) Play structures are secure (consider water velocity and reference manufacturers recommended levels);
- 38) Verify required documentation and records are in place and signed by the appropriate personnel.

6.1.2.1.5.5 Preventive Maintenance

OT

Preventive maintenance including how to develop:

- 1) A preventive maintenance plan,
- 2) Routine maintenance procedures, and
- 3) Record keeping system needed to track maintenance performed.

6.1.2.1.5.6 Weatherizing

OT

Weatherizing including the importance of weatherizing and the steps to prevent damage to AQUATIC FACILITIES and their mechanical systems due to very low temperatures or extreme weather conditions (e.g., flooding).

6.1.2.1.5.7 Facility Renovation & Design OT

AQUATIC FACILITY renovation and design including:

- 1) Definitions of AQUATIC FACILITY renovation, remodeling, and SUBSTANTIAL ALTERATION,
- 2) When it is necessary to renovate,
- 3) When it is necessary to notify the AHJ of planned renovations and remodeling, and
- 4) Current trends in facility renovation and design.

6.1.2.1.5.8 Heating OT

Heating issues including:

- 1) Recommended water temperatures and limits,
- 2) Factors that contribute to the water's heat loss and gain,
- 3) Heating equipment options,
- 4) Sizing gas heaters, and
- 5) How to troubleshoot problems with heaters.

6.1.2.1.5.9 Air Circulation OT

Air circulation including:

- 1) AIR HANDLING SYSTEM considerations for an indoor AQUATIC FACILITY,
- 2) The importance of regulating humidity,
- 3) The need to maintain negative pressure,
- 4) How poor indoor air quality can affect PATRONS and staff, and
- 5) How to balance air change and energy efficiency.

6.1.2.1.5.10 Spa & Therapy Pool Issues OT

SPA and THERAPY POOL issues including:

- 1) Operational implications of smaller volumes of water and HOT WATER,
- 2) How to maintain water chemistry,
- 3) Typical water temperature ranges highlighting maximum temperatures,
- 4) Risks of hyperthermia and hypothermia,
- 5) Need for emergency shut-off switches, and
- 6) Frequency of cleaning, draining, and DISINFECTION.

6.1.3 General Requirements for Training Courses**6.1.3.1 Course Providers OT****6.1.3.1.1 Recognized Courses OT**

Providers of recognized operator training courses, if required by the AHJ to verify that the course meets the requirements and intent of this CODE, shall submit course information including:

- 1) Course development expertise
- 2) Course content
- 3) Course length
- 4) Instructor qualifications
- 5) Exam administration
- 6) Certificate procedures, and
- 7) Updates of information as changes are made.

6.1.3.1.2 Providers

OT

Operator courses shall be developed by individuals or organizations with expertise in AQUATIC FACILITY operation and maintenance and expertise in education or training as evidenced by combined work experience and training.

6.1.3.2 Course Content

OT

Training materials at a minimum, covering all of the essential topics as outlined in MAHC Section 6.1.2.1 shall be provided and used in operator training courses.

6.1.3.3 Course Length

OT

Course agenda or syllabus shall show amount of time planned to cover each of the essential topics.

6.1.3.4 Instructor Requirements

OT

Operator training course providers shall furnish course instructor information including:

- 1) Expertise in AQUATIC FACILITY operation and maintenance—as evidenced by work experience and/or training,
- 2) Completion of an operator training course, which at a minimum, covers all of the essential topics as outlined in MAHC Section 6.1.2.1, including passing the final exam,
- 3) Successful completion of an operator training instructor course, and
- 4) If the operator training course is online, procedures which make such an instructor available to answer students' questions during normal business hours.

6.1.3.5 Final Exam

OT

Operator training course providers shall furnish course final exam information including:

- 1) Final exam, which at a minimum, covers all of the essential topics as outlined in MAHC Section 6.1.2.1,
- 2) Final exam passing score criteria, and
- 3) Final exam security procedures.

6.1.3.5.1 Final Exam Administration

OT

Operator training course providers shall provide final exam administration, proctoring and security procedures including:

- 1) Checking student's government-issued photo identification, to ensure that the individual taking the exam is the same person who is given a certificate documenting course completion and passing of exam,
- 2) Final exam completion is without assistance or aids that may improve exam results, and
- 3) Final exam is passed, prior to issuance of a QUALIFIED OPERATOR certificate.

6.1.3.6 Course Certificates

OT

Operator training course providers shall furnish course certificate information including:

- 1) Procedures for issuing nontransferable certificates to the individuals who successfully complete the course work and pass the final exam,
- 2) Procedures for delivery of course certificates to the individuals who successfully complete the course work and pass the final exam,
- 3) Instructions for the participant to maintain their originally issued certificate, or a copy thereof, for the duration of its validity, and
- 4) Procedures for the operator training course provider to maintain an individual's training and exam record for a minimum period of five years after the expiration of the individual's certificate.

6.1.3.7 Continuing Education

OT

6.1.3.8 Certificate Renewal

OT

Operator training course providers shall furnish course certificate renewal information including:

- 1) Criteria for re-examination with a renewal exam that meets the specifications for initial exam requirements and certificate issuance specified in this CODE, or
- 2) Criteria for a refresher course with an exam that meets the specifications for the initial course, exam, and certificate issuance requirements specified in this CODE.

6.1.3.9 Certificate Suspension and Revocation

OT

Course providers shall have procedures in place for the suspension or revocation of certificates.

6.1.3.9.1 Evidence of Health Hazard

OT

Course providers may suspend or revoke a QUALIFIED OPERATOR'S certificate based on evidence that the QUALIFIED OPERATOR'S actions or inactions unduly created SAFETY and health hazards.

6.1.3.9.2 Evidence of Cheating

OT

Course providers may suspend or revoke a QUALIFIED OPERATOR'S certificate based on evidence of cheating or obtaining the certificate under false pretenses.

6.1.3.10 Additional Training or Testing OT

The AHJ may, at its discretion, require additional operator training or testing.

6.1.3.11 Certificate Recognition OT

The AHJ may, at its discretion, choose to recognize, not to recognize, or rescind a previously recognized certificate of a QUALIFIED OPERATOR based upon demonstration of inadequate knowledge, poor performance, or due cause.

6.1.3.12 Course Recognition OT

The AHJ may, at its discretion, recognize, choose not to recognize, or revoke a previously accepted course based upon demonstration of inadequate knowledge or poor performance of its QUALIFIED OPERATORS, or due cause.

6.1.3.13 Length of Certificate Validity OT

The maximum length of validity for QUALIFIED OPERATOR training certificate shall be 5 years.

6.2 Lifeguard Training**6.2.1 Lifeguard Qualifications**

A QUALIFIED LIFEGUARD shall:

- 1) Have successfully completed an AHJ-recognized lifeguard training course offered by an AHJ-recognized training agency,
- 2) Possess a current certificate for such training,
- 3) Have met all pre-service requirements, and
- 4) Participate in continuing in-service training requirements of the AQUATIC FACILITY

6.2.1.1 Course Content LG

Lifeguard Training Courses shall include but not be limited to:

- 1) Hazard identification and injury prevention,
- 2) Emergencies,
- 3) Cardiopulmonary resuscitation (CPR/AED),
- 4) First aid, and
- 5) Legal issues.

6.2.1.1.1 Hazard Identification and Injury Prevention LG

Hazard identification and injury prevention shall include:

- 1) Identification of common hazards or causes of injuries and their prevention,
- 2) Responsibilities of a QUALIFIED LIFEGUARD in prevention strategies,
- 3) Victim recognition
- 4) Victim recognition scanning strategies,
- 5) Factors which impede victim recognition,

- 6) Health and SAFETY issues related to lifeguarding, and
- 7) Prevention of voluntary hyperventilation and extended breath holding activities

6.2.1.1.2 Emergency Response Skill Set

LG

Emergency response content shall include:

- 1) Responsibilities of a QUALIFIED LIFEGUARD in reacting to an emergency,
- 2) Recognition and identification of a person in distress and/or drowning,
- 3) Methods to communicate in response to an emergency,
- 4) Rescue skills for a person who is responsive or unresponsive, in distress, or drowning,
- 5) Skills required to rescue a person to a position of SAFETY,
- 6) Skills required to extricate a person from the water with or without assistance, and
- 7) Components of an EMERGENCY ACTION PLAN (EAP) for AQUATIC VENUES.

6.2.1.1.3 CPR Skills

LG

Cardiopulmonary Resuscitation (CPR/AED) and other resuscitation skills shall be professional level skills that follow treatment protocols consistent with the current Emergency Cardiovascular Care Update (ECCU) and/or, the International Liaison Committee on Resuscitation (ILCOR) guidelines for cardiac compressions, foreign body restriction removal, and rescue breathing for infants, children, and adults.

6.2.1.1.4 First Aid

LG

First Aid training shall include:

- 1) Basic treatment of bleeding, shock, sudden illness, and muscular/skeletal injuries as per the guidelines of the National First Aid Science Advisory Board,
- 2) Knowing when and how to activate the EMS,
- 3) Rescue and emergency care skills to minimize movement of the head, neck and spine until EMS arrives for a person who has suffered a suspected spinal injury on land or in the water, and
- 4) Use and the importance of universal precautions and personal protective equipment in dealing with body fluids, blood, and preventing contamination according to current Occupational Safety and Health Administration (OSHA) guidelines.

6.2.1.1.5 Legal Issues

LG

Course content related to legal issues shall include but not be limited to:

- 1) Duty to act,
- 2) Standard of care,
- 3) Negligence,
- 4) Consent,
- 5) Refusal of care,

- 6) Abandonment,
- 7) Confidentiality, and
- 8) Documentation

6.2.1.2 Lifeguard Training Delivery

6.2.1.2.1 Standardized and Comprehensive LG

The educational delivery system shall include standardized and student and instructor materials to convey all topics including but not limited to those listed per MAHC Section 6.2.1.1.

6.2.1.2.2 Skills Practice LG

Physical training of lifeguarding skills shall include in-water and out-of-water skill practices led by an individual currently certified as an instructor by the training agency which developed the lifeguard course materials.

6.2.1.2.3 Shallow Water Training LG

If a training agency offers a certification with a distinction between “shallow water” and “deep water” lifeguards, candidates for shallow water certification shall have training and evaluation in the deepest depth allowed for the certification.

6.2.1.2.4 Deep Water Training LG

If a training agency offers a certification with a distinction between “shallow water” and “deep water” lifeguards, candidates for deep water certification shall have training and evaluation in at least the minimum depth allowed for the certification.

6.2.1.2.5 Sufficient Time LG

Course length shall provide sufficient time to cover content, practice, skills, and evaluate competency for the topics listed in MAHC Section 6.2.1.1.

6.2.1.2.6 Certified Instructors LG

Lifeguard Instructors: Courses shall be taught only by individuals currently certified as instructors by the training agency which developed the lifeguard course materials.

6.2.1.2.6.1 Minimum Prerequisites LG

Lifeguard training agencies shall develop minimum instructor prerequisites that include, but are not limited to those outlined in MAHC Section 6.2.1.2.6.2.

6.2.1.2.6.2 Completed Training LG

Prior to instructing lifeguard training, instructors are required to have successfully completed a lifeguard training course which complies with MAHC Section 6.2.1.1 and a lifeguard instructor training course which includes, at a minimum, the following:

- 1) Mastery and knowledge of lifeguard training course content;
- 2) Demonstration of the ability to effectively deliver lifeguard training course content;

- 3) An evaluation and feedback process to improve instructor candidate presentation skills/techniques;
- 4) Course management and administration procedures; and
- 5) Testing and evaluation procedures.

6.2.1.2.6.3 Instructor Renewal/Recertification Process LG

Lifeguard training agencies shall have a lifeguard instructor renewal/recertification process.

6.2.1.2.6.4 Quality Control LG

Training agencies shall have a quality control system in place for evaluating a lifeguard instructor's ability to conduct courses.

6.2.1.2.7 Training Equipment LG

All lifeguard training courses shall have, at a minimum, the following pieces of equipment available in appropriate student to equipment ratios during the course:

- 1) Rescue Tubes,
- 2) Backboard with head immobilizer and sufficient straps to immobilize the victim to the backboard,
- 3) CPR manikins(Adult and Child),
- 4) CPR mask,
- 5) Bag Valve Mask (Adult and Pediatric),
- 6) Disposable gloves,
- 7) AED Trainer with adult and pediatric training pads, and
- 8) First Aid Supplies for first aid training
- 9) Manikin cleaning supplies

6.2.1.3 Competency and Certification LG

6.2.1.3.1 Proficiency

Lifeguarding skills per MAHC Section 6.2.1.1 shall be tested, by a certified instructor, to a level of proficiency accepted by the training agency.

6.2.1.3.2 Requirements LG

Lifeguard training course providers shall have a final exam including but not limited to:

- 1) Written and practical exams covering topics outlined in MAHC Section 6.2.1.1,
- 2) Final exam passing score criteria including the level of proficiency needed to pass practical and written exams, and
- 3) Security procedures for proctoring the final exam to include:
 - a. Checking student's government-issued photo identification, to ensure that the individual taking the exam is the same person who is given a certificate documenting course completion and passing of exam, and
 - b. Final exam is passed, prior to issuance of a certificate

6.2.1.3.3 Instructor Physically Present LG

The instructor of record shall be physically present during the practical testing.

6.2.1.3.4 Certifications LG

Lifeguard and lifeguard instructor certifications shall be issued to recognize successful completion of the course as per the requirements of MAHC Section 6.2.1.1 through 6.2.1.4.3.3.

6.2.1.3.5 Number of Years LG

Length of valid certification shall be a maximum of two years for lifeguarding and first aid, and a maximum of one year for Cardiopulmonary Resuscitation (CPR/AED).

6.2.1.3.6 Documentation LG

Course documentation of training and certificates shall identify the following:

- 1) name
- 2) level of training,
- 3) expiration date,
- 4) restrictions on depth of water for which the lifeguard is qualified,
- 5) identifier of the instructor of record,
- 6) any other restrictions that maybe applied by the training agency,
- 7) identifier of the agency providing the certification

6.2.1.3.7 Expired Certificate LG

When a certificate is expired, the QUALIFIED LIFEGUARD shall retake the course or complete a challenge program.

6.2.1.3.7.1 Challenge Program LG

A QUALIFIED LIFEGUARD challenge program, when utilized, shall be completed in accordance with the training of the original certifying agency, by an instructor certified by the original certifying agency, and include but not be limited to:

- 1) Pre-requisite screening,
- 2) A final practical exam demonstrating all skills, in and out of the water required in the original lifeguard course for certification, which complies with MAHC Section 6.2.1.1, and uses the equipment specified in MAHC Section 6.2.1.2.7, and
- 3) Final written, proctored exam.

6.2.1.3.7.2 Certificate Renewal LG

Certificate renewal, when utilized, shall include the following:

- 1) Completion prior to certificate expiration,
- 2) Conducted in accordance with the training of the original certifying agency,
- 3) Taught by an instructor certified by the original certifying agency,

- 4) Conducted with a demonstration of skills, in and out of the water, required in the original course, which complies with MAHC Section 6.2.1.1, and uses the equipment specified in MAHC Section 6.2.1.2.7,
- 5) A final written, proctored exam, and
- 6) A final practical exam with a certified instructor present.

6.2.2 Aquatic Supervisor Training

6.2.2.1 Lifeguard Supervisor Candidate Prerequisites LG

LIFEGUARD SUPERVISOR candidate prerequisites shall include but not be limited to:

- 1) Successful completion of a lifeguard training course in the past,
- 2) Previous experience as a lifeguard of at least 3 months, and
- 3) Ability to effectively communicate verbally in English.

6.2.2.2 Lifeguard Supervisor Training Elements LG

LIFEGUARD SUPERVISOR training shall include, at a minimum, the following:

- 1) Activation and execution of EMERGENCY ACTION PLANS (EAPs),
- 2) CPR/AED and first aid training that complies with MAHC Sections 6.2.1.1.3 and 6.2.1.1.4 or present an unexpired certificate issued by an AHJ-approved agency documenting the required training has been completed,
- 3) Scanning and vigilance requirements and how to ensure that systems which accomplish these goals are in place and operational,
- 4) Development and evaluation of zones of PATRON surveillance responsibility diagrams for an AQUATIC VENUE,
- 5) MONITORING lifeguard performance as it relates to lifeguard and facility-specific training, including pre-service assessments,
- 6) Strategies to reduce risk and mitigate the health and SAFETY hazards to both the PATRONS and the staff,
- 7) Knowledge of the legal issues and responsibilities relating to lifeguarding as listed in MAHC Section 6.2.1.1.5, and
- 8) Knowledge of the proper use and maintenance of the equipment required per MAHC Section 5.8.5.

6.2.2.3 Lifeguard Supervisor Training Delivery

6.2.2.3.1 Standardized and Comprehensive LG

The educational delivery system shall include standardized student and instructor content and delivery to convey all topics including but not limited to those listed per MAHC Section 6.2.2.2.

6.2.2.3.2 Sufficient Time LG

Course length shall provide sufficient time to cover content, demonstration, skill practice, and evaluate competency for the topics listed in MAHC Section 6.2.2.2.

6.2.2.3.3 Certified Instructors **LG**

LIFEGUARD SUPERVISOR training courses shall be taught by trained LIFEGUARD SUPERVISOR instructors through a training agency or by the facility whose training programs meets the requirements specified in MAHC Section 6.2.2.

6.2.2.3.3.1 Minimum Prerequisites **LG**

Course providers shall develop minimum instructor prerequisites that include, but are not limited to:

- 1) Successful completion of a lifeguard training course in the past,
- 2) Successful completion of a LIFEGUARD SUPERVISOR training course that complies with MAHC Section 6.2.2.2,
- 3) Ability to effectively communicate in English,
- 4) Has completed a LIFEGUARD SUPERVISOR instructor training course which includes, at a minimum, the following:
 - a. Mastery and knowledge of LIFEGUARD SUPERVISOR training course content;
 - b. Demonstration of the ability to effectively deliver LIFEGUARD SUPERVISOR training course content;
 - c. An evaluation and feedback process to improve instructor candidate presentation skills/techniques;
 - d. Course management and administration procedures; and
 - e. Testing and evaluation procedures.

6.2.2.3.3.2 Quality Control **LG**

Course provider shall have a quality control system in place for evaluating a LIFEGUARD SUPERVISOR instructor's ability to conduct courses.

6.2.2.3.3.3 Lifeguard Supervisor Renewal & Recertification **LG**

LIFEGUARD SUPERVISOR training agencies shall have a LIFEGUARD SUPERVISOR instructor renewal/recertification process.

6.2.2.4 Competency and Certification**6.2.2.4.1 Lifeguard Supervisor Proficiency** **LG**

LIFEGUARD SUPERVISOR training course providers shall have a method to evaluate proficiency of the content in MAHC Section 6.2.2.2.

6.2.2.4.2 Lifeguard Supervisor Certifications **LG**

LIFEGUARD SUPERVISOR certifications shall be issued by the course provider to recognize successful completion of the course as per the requirements of MAHC Section 6.2.2.2.

6.3 Facility Staffing

6.3.1 Operators Requirements and Availability

6.3.1.1 On-Site Qualified Operator Requirements REG

6.3.1.1.1 At Adoption REG

The following MAHC sections shall be required for all AQUATIC FACILITIES at time of adoption:

- 1) 6.3.1.1: On-Site QUALIFIED OPERATORS, and
- 2) 6.3.1.2: Contracted Off-Site QUALIFIED OPERATORS.

6.3.1.1.2 Size and Use REG

A QUALIFIED OPERATOR shall be on-site or immediately available within two hours during all hours of operation at an AQUATIC FACILITY that has:

- 1) More than two AQUATIC VENUES; or
- 2) An AQUATIC VENUE of over 50,000 gallons of water; or
- 3) AQUATIC VENUES that include AQUATIC FEATURES with recirculated water; or
- 4) An AQUATIC VENUE used as a THERAPY POOL; or
- 5) An AQUATIC VENUE used to provide swimming training.

6.3.1.1.3 Bathers and Management REG

A QUALIFIED OPERATOR shall be on site or immediately available within two hours during all hours of operation at an AQUATIC FACILITY that is:

- 1) Permitted BATHER LOAD is greater than 200 BATHERS daily; or
- 2) Operated by a municipality; or
- 3) Operated by a school.

6.3.1.1.4 Compliance History REG

A QUALIFIED OPERATOR shall be available on-site or immediately available within two hours during all hours of operation at an AQUATIC FACILITY that has a history of CODE violations which in the opinion of the permit issuing official require one or more on-site QUALIFIED OPERATORS.

6.3.1.2 Contracted Off-site Qualified Operators REG

All other AQUATIC FACILITIES shall have an on-site QUALIFIED OPERATOR immediately available within two hours or a contract with a QUALIFIED OPERATOR for a minimum of weekly visits and assistance whenever needed.

6.3.1.2.2 Visit Documentation REG

Written documentation of these visits for contracted off-site QUALIFIED OPERATOR visits and assistance consultations shall be available at the AQUATIC FACILITY for review by the AHJ.

6.3.1.2.3 Documentation Details REG

The written documentation shall indicate the checking, MONITORING, and testing outlined in MAHC 6.4.1.2.2.1 and 6.4.1.2.5 and, when applicable, 6.4.1.2.2.2

6.3.1.2.4 Visit Corrective Actions REG

The written documentation shall indicate what corrective actions, if any, were taken by the contracted off-SITE QUALIFIED OPERATOR during the scheduled visits or assistance requests.

6.3.1.2.5 Onsite Responsible Supervisor REG

All AQUATIC FACILITIES without a full time, on-site QUALIFIED OPERATOR shall have a designated on-site RESPONSIBLE SUPERVISOR.

6.3.1.2.6 Onsite Responsible Supervisor Duties REG

The designated on-site RESPONSIBLE SUPERVISOR shall:

- 1) Be capable of testing and recording the water quality parameters required by this CODE;
- 2) Know how to make adjustments, as needed, to maintain required water quality parameters required by this CODE;
- 3) Know general maintenance procedures as required by daily operational verifications or adjustments required by this CODE;
- 4) Know when the AQUATIC FACILITY or individual AQUATIC VENUE should be closed; and
- 5) Know how and when to contact the contracted off-site QUALIFIED OPERATOR.

6.3.2 Aquatic Facilities Requiring Qualified Lifeguards

AQUATIC VENUES with standing water and with any of the following conditions listed in MAHC Section 6.3.2.1 shall be required to have a lifeguard(s) conducting PATRON surveillance at all times the AQUATIC VENUE is open.

6.3.2.1 List of Aquatic Facilities Requiring Qualified Lifeguards LG

Note: This list includes but shall not be limited to the following:

- 1) For new construction occurring from the date of acceptance of this CODE, any AQUATIC VENUE deeper than 5 feet (1.5 m) at any point.
- 2) Any AQUATIC VENUE that allows for unsupervised children under the age of 14 years.
- 3) Any AQUATIC VENUE while it is being used for the recreation of youth groups, including but not limited to childcare usage or school groups.

- 4) Any AQUATIC VENUE while it is being used for group training, including but not limited to competitive swimming and/or sports, lifeguard training, exercise programs, and swimming lessons.
- 5) Any AQUATIC VENUE with a configuration in which any point on the AQUATIC VENUE surface exceeds 30 feet from the nearest DECK.
- 6) Any AQUATIC VENUE with standing water and with an induced current or wave action including but not limited to WAVE POOLS, vortex AQUATIC VENUES, waterslide CATCH POOLS, and LAZY RIVERS.
- 7) Any AQUATIC VENUE which allows the usage of diving boards of any type or starting platform.

6.3.3 Safety Plan

All AQUATIC FACILITIES shall create and implement a SAFETY PLAN to include, but not be limited to the following elements:

- 1) Staffing Plan,
- 2) EMERGENCY ACTION PLAN,
- 3) Biohazard action plan
- 4) Pre-Service Training Plan, and
- 5) In-service Training Plan

6.3.3.1 Code Compliance Staff Plan

LG

Staffing Plans shall designate person(s) for the following responsibilities

- 1) Identifying and communicating health and SAFETY hazards,
- 2) Mitigating health and SAFETY hazards and closing the facility if needed,
- 3) Interfacing with the AHJ related to the requirements of this CODE,
- 4) Maintaining water quality and, if required, air quality,
- 5) Enforcing the AQUATIC FACILITY rules and regulations,
- 6) Responding to reported emergencies,
- 7) Supervising the SAFETY TEAM,
- 8) Conducting pre-service evaluations, and
- 9) Conducting in-service training.

6.3.3.1.1 Zone of Patron Surveillance

LG

When QUALIFIED LIFEGUARDS are used, the STAFFING PLAN shall include diagrammed zones of PATRON surveillance for each AQUATIC VENUE such that:

- 1) The QUALIFIED LIFEGUARD is capable of viewing the entire area of the assigned zone of PATRON surveillance,
- 2) The QUALIFIED LIFEGUARD is able to reach the furthest extent of the assigned zone of PATRON surveillance within 20 seconds,
- 3) Identify whether the QUALIFIED LIFEGUARD is in an elevated stand, walking, in-water and/or other approved position,
- 4) Identifying any additional responsibilities for each zone, and
- 5) All areas of each AQUATIC VENUE are assigned a zone of PATRON surveillance.

6.3.3.1.2 Rotation Procedures**LG**

When QUALIFIED LIFEGUARDS are used, the STAFFING PLAN shall include QUALIFIED LIFEGUARD rotation procedures such that:

- 1) Identifying all zones of PATRON surveillance responsibility at the AQUATIC FACILITY,
- 2) Operating in a manner so as to provide an alternation of tasks for each QUALIFIED LIFEGUARD conducting PATRON surveillance activities such that no QUALIFIED LIFEGUARD conducts PATRON surveillance activities for more than 60 continuous minutes,
- 3) Have a practice of maintaining coverage of the zone of PATRON surveillance during change of QUALIFIED LIFEGUARD,
- 4) Have period(s) of at least 10 minutes of non-PATRON surveillance activity for the purpose of providing an alternation of task.

6.3.3.1.3 Non-Patron Surveillance Activity**LG**

The non-PATRON surveillance activity does not include the time of rotation from zone to zone, but may include other activities such as breaks, maintenance, and ride dispatch.

6.3.3.1.4 Supervision Protocols**LG**

When QUALIFIED LIFEGUARDS are used, the STAFFING PLAN shall include lifeguard supervision protocols to achieve the requirements of MAHC Section 6.3.3.

6.3.3.2 Emergency Action Plan**LG**

EMERGENCY ACTION PLANS and operating procedures shall include but not be limited to:

- 1) Outline types of emergencies and IMMEDIATE HEALTH HAZARDS, as per MAHC Section 6.6.4;
- 2) Outline the methods of communication between responders, emergency services, and PATRONS;
- 3) Identify each anticipated responder;
- 4) Outline the tasks of each responder;
- 5) Identify required equipment for each task; and
- 6) Emergency closure requirements.

6.3.3.2.1 Coordination of Response**LG**

When one or more QUALIFIED LIFEGUARDS are used, the SAFETY PLAN and the EMERGENCY ACTION PLAN shall identify the best means to provide additional persons to rapidly respond to the emergency to help the initial rescuer.

6.3.3.3 Pre-Service Requirements**LG**

The Pre-Service Plan shall include:

- 1) Policies and procedure training specific to the AQUATIC FACILITY,
- 2) Demonstration of SAFETY TEAM skills specific to the AQUATIC FACILITY prior to active duty, and

3) Documentation of training.

6.3.3.3.1 Safety Team EAP Training LG

Prior to active duty all members of the SAFETY TEAM shall be trained on and receive a copy of and/or have a copy posted and always available, the specific policies and procedures for the following:

- 1) STAFFING PLAN,
- 2) EMERGENCY ACTION PLAN,
- 3) Emergency closure, and
- 4) Fecal, vomit, and blood contamination on surfaces and in the water as outlined in MAHC Section 6.5.

6.3.3.3.2 Safety Team Skills Proficiency LG

Prior to active duty, all members of the SAFETY TEAM shall demonstrate knowledge and skill competency specific to the AQUATIC FACILITY for the following criteria:

- 1) Understand their responsibilities and of others on the AQUATIC FACILITY SAFETY TEAM,
- 2) Ability to execute the EMERGENCY ACTION PLAN,
- 3) Know what conditions require closure of the facility, and
- 4) Know what actions to take in response to a fecal, vomit, or blood contamination on a surface and in the water as outlined in MAHC Section 6.5.

6.3.3.3.3 Qualified Lifeguard Emergency Action Plan Training LG

When QUALIFIED LIFEGUARDS are used, they shall be trained on and receive a copy of and/or have a copy of the EAP posted and always available at the AQUATIC FACILITY, the specific policies and procedures for the following:

- 1) Zone of PATRON Surveillance Plan,
- 2) Rotation Plan, and
- 3) Minimum Staffing Plan.

6.3.3.3.4 Qualified Lifeguard Skills Proficiency LG

When QUALIFIED LIFEGUARDS are used, they shall demonstrate knowledge and skill competency specific to the AQUATIC FACILITY for the following criteria:

- 1) Ability to reach the bottom at the maximum water depth of the venue to be assigned,
- 2) Ability to identify all zones of PATRON surveillance responsibility to which they could be assigned,
- 3) Ability to recognize a victim in their assigned zone of PATRON surveillance,
- 4) Ability to reach the furthest edge of assigned zones of PATRON surveillance within 20 seconds,
- 5) Water rescue skills outlined in MAHC Section 6.2.1.1.2,

- 6) CPR/AED and First Aid,
- 7) Ability to execute EMERGENCY ACTION PLAN,
- 8) Emergency Closure Issues, and
- 9) Fecal, Vomit and Blood Contamination Incident Response as outlined in MAHC Section 6.5.

6.3.3.3.5 CPR/AED and First Aid Certificate LG

The designated person(s) with CPR/AED and First Aid training shall present unexpired certificate(s) as per MAHC Section 6.2.1.1.3 and 6.2.1.1.4 prior to active duty.

6.3.3.3.5.1 Copies Maintained LG

Copies of certificates shall be maintained at the AQUATIC FACILITY and be available for inspection.

6.3.3.3.6 Documentation of Pre-service Training LG

Documentation verifying the pre-service requirements shall be completed by the person conducting the pre-service training, maintained at the facility for 3 full years, and be available for inspection.

6.3.3.3.6.1 Lifeguard Certificate LG

When QUALIFIED LIFEGUARDS are used, they shall present an unexpired certificate as per MAHC Section 6.2.1.3.4 prior to active duty.

6.3.3.3.6.2 Copies Maintained LG

Copies of certificates shall be maintained at the facility and be available for inspection.

6.3.3.4 In-Service Training LG

During the course of their employment, AQUATIC FACILITY staff shall participate in periodic in-service training to maintain their skills.

6.3.3.4.1 Documentation of In-service Training LG

Documentation verifying the in-service requirements shall be completed by the person conducting the in-service training, maintained at the AQUATIC FACILITY for 3 years, and available for inspection.

6.3.3.4.2 In-Service Documentation LG

Documentation shall include:

- 1) Names of those attending,
- 2) Content of training,
- 3) Date of training, and
- 4) Name of the Trainer(s)

6.3.3.4.3 In-Service Training Plan LG

The In-Service Plan shall include:

- 1) In-service training frequency,
- 2) Documentation of in-service training,
- 3) Maintenance of certifications, and
- 4) Demonstration of test-ready skills.

6.3.3.4.4 Maintain Certificates

LG

The designated person(s) with CPR/AED and First Aid training shall maintain certifications to show the following:

- 1) CPR/AED training is completed annually and certificates are unexpired, and
- 2) First Aid training certificates are unexpired.

6.3.3.4.5 Competency Demonstration

LG

When QUALIFIED LIFEGUARDS are used, they shall be able to demonstrate proficiency in the skills as outlined by MAHC Section 6.2.1 and have the ability to perform the following water rescue skills consecutively so as to demonstrate the ability to respond to victim and complete the rescue:

- 1) Reach the furthest edge of zones of PATRON surveillance within 20 seconds,
- 2) Recover a simulated victim including extrication to a position of SAFETY consistent with MAHC Section 6.2.1.1.2, and
- 3) Perform resuscitation skills consistent with MAHC Section 6.2.1.1.3.

6.3.3.5 AHJ Authority to Approve Safety Plan

LG

The AHJ shall have the authority, if they so choose, to require:

- 1) Submittal of the SAFETY PLAN for archiving and reference, or
- 2) Submittal of the SAFETY PLAN for review and approval prior to opening to the public.

6.3.3.5.1 Safety Plan on File

LG

The SAFETY PLAN shall be kept on file at the AQUATIC FACILITY.

6.3.3.5.2 Safety Plan Implemented

LG

The elements detailed in the SAFETY PLAN must be implemented and in evidence in the AQUATIC FACILITY operation and is subject to review for compliance by the AHJ at any time.

6.3.4 Staff Management

6.3.4.1 Staff Provided Prior to Aquatic Venue Use

LG

Prior to use of any AQUATIC VENUE, the AQUATIC FACILITY shall provide staff required per the provisions of the SAFETY PLAN as stated in MAHC Section 6.3.2.

6.3.4.2 Safety Team Responsibilities**LG**

SAFETY TEAM responsibilities shall include but not be limited to:

- 1) Enforcing the AQUATIC FACILITY rules and regulations by interfacing with PATRONS,
- 2) Respond to reported emergencies,
- 3) Identify health and SAFETY hazards and take action to mitigate or avoid the hazard,
- 4) Know where personal protective equipment is located and use it when required, and
- 5) Interface with the AHJ related to the requirements of this CODE.

6.3.4.3 Lifeguard Staff**6.3.4.3.1 Minimum Number of Lifeguards****LG**

Where QUALIFIED LIFEGUARDS are used, the AQUATIC FACILITY shall provide, prior to opening the AQUATIC FACILITY to the public, the minimum number of QUALIFIED LIFEGUARDS and staff required per the provisions of the SAFETY PLAN such that:

- 1) All zones of PATRON surveillance are staffed during operation,
- 2) Rotations can be conducted while all zones are staffed, and
- 3) Supervisor is present.

6.3.4.3.2 Lifeguard Responsibilities**LG**

QUALIFIED LIFEGUARD responsibilities shall include but not be limited to:

- 1) Monitor PATRONS within the zone of PATRON surveillance responsibility,
- 2) Enforce facility rules,
- 3) Respond to emergencies including water rescue, CPR, and First Aid,
- 4) Identify health and SAFETY hazards and take action to mitigate or avoid the hazard,
- 5) Maintain skills at a test-ready level of proficiency,
- 6) Wear the identifying uniform,
- 7) If needed for effective PATRON surveillance, wear corrective eyewear,
- 8) If exposed to UV, wear polarized sunglasses and SPF 15 or greater UV protection,
- 9) Know where personal protective equipment is located and use it when required.

6.3.4.3.3 Shallow Water Certified Lifeguards**LG**

QUALIFIED LIFEGUARDS certified for shallow water depths shall not be assigned to a BODY OF WATER in which any part of the water's depth is greater than the depth for which they are certified.

6.3.4.3.4 Direct Surveillance**LG**

QUALIFIED LIFEGUARDS assigned for the direct surveillance of BATHERS shall not be assigned other tasks that intrude on PATRON surveillance while performing PATRON surveillance activities.

6.3.4.3.5 Distractions LG

While conducting PATRON surveillance, QUALIFIED LIFEGUARDS shall not engage in social conversations or have on their person or lifeguard station cellular telephones, texting devices, mp3 players, or other similar non-emergency electronic devices.

6.3.4.4 Supervisor Staff LG

6.3.4.4.1 Lifeguard Supervisor Required LG

AQUATIC FACILITIES that are required to have two or more QUALIFIED LIFEGUARDS per the zone plan of PATRON surveillance responsibility in MAHC Section 6.3.2.1.1 shall have at least one person located at the AQUATIC FACILITY during operation designated as the LIFEGUARD SUPERVISOR who meets the requirement of section MAHC Section 6.2.2.

6.3.4.4.2 Designated Supervisor LG

One of the QUALIFIED LIFEGUARDS as per MAHC Section 6.3.3.5.1 may be designated as the LIFEGUARD SUPERVISOR in addition to fulfilling the duties of QUALIFIED LIFEGUARD. A QUALIFIED LIFEGUARD cannot be on duty with scanning responsibilities if they are acting as the LIFEGUARD SUPERVISOR.

6.3.4.4.2.1 Lifeguard Supervisor Duties LG

LIFEGUARD SUPERVISOR duties shall not interfere with the primary duty of PATRON surveillance.

6.3.4.4.3 Lifeguard Supervisor LG

LIFEGUARD SUPERVISOR responsibilities shall include but not be limited to:

- 1) Monitor performance of QUALIFIED LIFEGUARDS in their zone of PATRON surveillance responsibility,
- 2) Make sure the rotation is conducted in accordance with the SAFETY PLAN,
- 3) Coordinate staff response and PATRON care during an emergency,
- 4) Identify health and SAFETY hazards and communicate to staff and management to mitigate or otherwise avoid the hazard, and
- 5) Make sure the required equipment per MAHC Section 5.8.5 is in place and in good condition.

6.3.4.5 Emergency Response and Communications Plans RM

6.3.4.5.1 Emergency Response and Communication Plan RM

AQUATIC FACILITIES shall create and maintain an operating procedure manual containing information on the emergency response and communications plan including an EAP, Facility Evacuation Plan, and Inclement Weather Plan.

6.3.4.5.2 Emergency Action Plan RM

A written EAP shall be developed, maintained, and updated as necessary for the AQUATIC FACILITY.

6.3.4.5.3 Annual Review and Update RM

The EAP shall be reviewed with the AQUATIC FACILITY staff and management annually or more frequently as required when changes occur with the dates of the review recorded in the EAP.

6.3.4.5.4 Available for Inspection RM

The written EAP shall be kept at the AQUATIC FACILITY and available for emergency personnel/AHJ upon request.

6.3.4.5.5 Training Documentation RM

Documentation from employees trained in current EAP shall be available upon request.

6.3.4.5.6 Components RM

The EAP shall include at a minimum:

- 1) A diagram of the AQUATIC FACILITY;
- 2) A list of emergency telephone numbers;
- 3) The location of first aid kit and other rescue equipment (bag valve mask, AED if provided, backboard, etc.);
- 4) An emergency response plan for accidental chemical release
- 5) A fecal/vomit/blood CONTAMINATION RESPONSE PLAN as outlined in MAHC 6.5.1.

6.3.4.5.6.1 Accidental Chemical Release Plan RM

The accidental chemical release plan shall include procedures for response and cleanup, provision for training staff in these procedures, and a list of equipment and supplies for clean-up.

6.3.4.5.6.2 Remediation Supplies RM

The availability of equipment and supplies for remediation procedures shall be verified by the operator at least weekly.

6.3.4.5.7 Facility Evacuation Plan RM

A written Facility Evacuation Plan shall be developed and maintained for the facility.

6.3.4.5.7.1 Evacuation Plan Components RM

This plan shall include at a minimum:

- 1) Actions to be taken in cases of drowning, serious illness or injury, chemical handling accidents, weather emergencies, and other serious incidents; and
- 2) Defined roles and responsibilities for all staff.

6.3.4.5.8 Communication Plan**RM**

A communication plan must exist to facilitate activation of internal emergency response centers and/or community 911 as necessary.

6.3.4.5.8.1 Communication Plan Components**RM**

At a minimum, this plan shall include:

- 1) Provision and use of readily accessible, appropriate communication devices such as telephones, call boxes, and mobile devices;
- 2) Signage;
- 3) Procedures to be followed during staffed and unstaffed time periods;
- 4) Acceptable alternative communication during loss of power; and
- 5) Training of all personnel.

6.3.4.5.8.2 Notification Procedures**RM**

The communications plan shall include a plan for notification to Federal, State, and local agencies in case of a chemical spill that exceeds the EPA reportable quantity.

6.3.4.5.9 Inclement Weather Plan**RM**

AQUATIC FACILITIES shall have a contingency/response plan for localized weather events that may affect their operation (i.e. lightning, hurricanes, tornados, high winds, etc.).

6.3.4.5.9.1 Contingency Plan**RM**

Contingency plans shall include training for employees, evacuation procedures, and determining when it is acceptable to re-open a facility for operation.

6.3.4.6 Remote Monitoring Systems**6.3.4.6.1 Lifeguard-Based****RM**

Lifeguard-based remote SAFETY MONITORING systems shall not replace the need for QUALIFIED LIFEGUARDS.

6.3.4.6.1.1 No Substitute**RM**

Remote SAFETY MONITORING systems may be used to aid the operation but not as a substitute for staffing when critical areas such as blind spots in an AQUATIC VENUE or area of a slide cannot be viewed by QUALIFIED LIFEGUARDS/slide operators.

6.3.4.6.2 Operator-based**RM**

QUALIFIED OPERATOR-based remote water quality MONITORING systems shall not be a substitute for manual water quality testing of the AQUATIC VENUE.

6.3.4.6.3 Training**RM**

When QUALIFIED LIFEGUARD- or QUALIFIED OPERATOR-based remote MONITORING systems are used, AQUATIC FACILITY staff shall be trained on their use, limitations, and communication and response protocols for communications with the MONITORING group.

6.3.4.7. Employee Illness and Injury Policy RM

6.3.4.7.1 Illness Policy RM

Supervisors shall not permit employees who are ill with diarrhea to enter the water or perform in a QUALIFIED LIFEGUARD role.

6.3.4.7.2 Open Wounds RM

Supervisors shall permit employees with open wounds in the water or in a QUALIFIED LIFEGUARD role only if they have healthcare provider approval or wear a waterproof, occlusive bandage to cover the wound.

6.4 Facility Management

6.4.1 Operations

6.4.1.1 Operations Manual

6.4.1.1.1 Develop FMO

Each AQUATIC FACILITY shall develop an operations manual to keep at the AQUATIC FACILITY in both printed and electronic formats.

6.4.1.1.2 Include FMO

The manual shall at minimum include, but not be limited to the following items:

- 1) Basic information,
- 2) Chemical data, and
- 3) Operation and maintenance policies and instructions, including fecal/vomit and body fluid contamination response protocols, for each AQUATIC VENUE and AQUATIC FEATURE at the facility.

6.4.1.2 Preventive Maintenance and System Check Program and Recordkeeping

6.4.1.2.1 Operation Records FMO

AQUATIC FACILITIES shall keep records pertaining to the operation, maintenance, and management of the AQUATIC FACILITY on a minimum schedule as prescribed under MAHC sections 6.4.1.2 and these records shall be:

- 1) Kept for a minimum of three (3) years, and
- 2) Be available upon request by the AHJ.

6.4.1.2.1.1 Additional Documentation FMO

Local CODES may require additional records, documentation, and forms.

6.4.1.2.2 Operator Safety and Preventive Maintenance Inspection and Recordkeeping REG

The QUALIFIED OPERATOR or RESPONSIBLE SUPERVISOR shall make daily SAFETY and preventive maintenance inspections before the AQUATIC FACILITY opens during seasons or periods when the AQUATIC FACILITY is open and record the results in a log or form maintained at the AQUATIC FACILITY.

6.4.1.2.2.1 Daily Inspection Items

REG

The QUALIFIED OPERATOR'S daily AQUATIC FACILITY preventive maintenance inspections shall include:

- 1) Walkways/DECK and exits are clear, clean, free of debris,
- 2) Drain covers, vacuum fitting covers, SKIMMER equalizer covers, and any other suction outlet covers are in place, secure, and unbroken,
- 3) SKIMMER baskets, weirs, lids, flow adjusters, and suction outlets are free of any blockage,
- 4) INLET and return covers and any other fittings are in place, secure, and unbroken,
- 5) SAFETY warning signs and other signage are in place and in good repair,
- 6) Safety equipment as required by this CODE are in place and in good repair, including emergency instructions and phone numbers,
- 7) Entrapment prevention systems are operational,
- 8) Recirculation, DISINFECTION systems, controller(s), and probes are operating as required,
- 9) Secondary and/or supplemental DISINFECTION systems are operating as required,
- 10) Underwater lights and other lighting are intact with no exposed wires or water in lights,
- 11) Slime and biofilm has been removed from accessible surfaces of AQUATIC VENUE, slides, and other AQUATIC FEATURES,
- 12) Doors to nonpublic areas (chemical STORAGE, offices, etc.) are locked,
- 13) First aid supplies are stocked,
- 14) Emergency communication equipment and systems are operational,
- 15) Fecal/vomit/blood incident contamination response protocols, materials, and equipment are available,
- 16) Water features and amenities are functioning in accordance with the manufacturer's recommendations,
- 17) Fencing/BARRIERS, gates, and self-latching or other locks are tested and are intact and functioning properly, and BARRIERS do not have nearby furniture to encourage climbing,
- 18) Drinking fountains are clean and in functional condition,
- 19) Electrical devices are in good working condition and meet the requirements specified in the NEC and MAHC,
- 20) Alarms, if required, are tested and functioning properly, and
- 21) Assessing glare conditions throughout operating hours to insure the bottom and objects in the POOL are clearly visible.

6.4.1.2.2.2 Other Inspection Items

REG

The QUALIFIED OPERATOR'S other AQUATIC FACILITY preventive maintenance inspections shall also include:

- 1) Required GFCI devices shall be tested monthly,
- 2) Bonding conductors, where accessible, shall be inspected semi-annually.

6.4.1.2.3 Illness and Injury Incident Reports **REG**

6.4.1.2.3.1 Record **REG**

The QUALIFIED OPERATOR, LIFEGUARD SUPERVISOR, or OWNER/OPERATOR shall make a record of all complaints or reports of illness and injury, deaths, and all lifesaving activities that require resuscitation, CPR, Oxygen or AED use, or transportation of the victim to a medical facility.

6.4.1.2.3.2 Include **REG**

Illness and injury incident report information shall include

- 1) Date,
- 2) Time,
- 3) Names and addresses of the individuals involved,
- 4) Actions taken,
- 5) Equipment used, and
- 6) Outcome of the incident.

6.4.1.2.3.3 Notify **REG**

In addition to making such records, the operator shall notify the AHJ within 24 hours of the occurrence of such activities or complaints.

6.4.1.2.3.4 Lifeguard Assists **REG**

The AQUATIC FACILITY operator shall also record all lifeguard assists where the QUALIFIED LIFEGUARD enters the water or uses a reaching pole or other equipment to help a struggling PATRON.

6.4.1.2.3.4.1 Include **REG**

These records shall include the date, time, QUALIFIED LIFEGUARD, and PATRON names and reason that assistance was needed.

6.4.1.2.4 Chemical Inventory Log **RM**

A chemical inventory log shall be maintained on site to provide a list of chemicals received, used, and approximate quantities.

6.4.1.2.5 Daily Water Monitoring and Testing Records **FMO**

Daily monitoring and testing records shall include, but are not limited to the following:

- 1) pH, disinfectant residuals, and combined CHLORINE concentrations logged when measured,
- 2) Operating pressures of water recirculation pumps and filters and the corresponding rate of flow meter readings,
- 3) If used, cyanuric acid levels,
- 4) Maintenance and malfunctioning of equipment, including dates and time of all equipment calibration including WQTDs,
- 5) If heated, AQUATIC VENUE water temperature when DISINFECTANT and pH tests run,
- 6) The time of filter backwash or cleaning-logged weekly,
- 7) Calcium hardness,
- 8) Total alkalinity,
- 9) SATURATION INDEX,
- 10) Microbiological testing, if applicable, – dates/times samples were taken and results,
- 11) Any equipment failure, power outage or error resulting in the interruption of the circulation, filtration or DISINFECTION systems for more than one hour, and
- 12) The daily attendance at the AQUATIC FACILITY is to be recorded. In POOLS where attendance is not ordinarily recorded, a guest sign in book can be used to track attendance,
- 13) SECONDARY DISINFECTION SYSTEMS and SUPPLEMENTAL TREATMENT SYSTEMS as outlined in MAHC 5.7.3.8.6 and 5.7.3.8.7,
- 14) Evidence of expiration dates being checked on water quality reagents,

6.4.1.2.6 Requirements FMO

Check all information required in MAHC section 6.4.1.2.2 of this regulation before filling an AQUATIC VENUE with water, after periodic maintenance, and after POOL or filter cleaning procedures.

6.4.1.2.7 Staff Certifications on File

All required QUALIFIED LIFEGUARD, LIFEGUARD SUPERVISOR SAFETY personnel training, or QUALIFIED OPERATOR certificates shall be maintained at the AQUATIC FACILITY and made available to AHJ, staff, and POOL PATRONS upon request.

6.4.1.2.7.1 Multiple Facilities REG

A copy of the original certificate shall be made available when employees work at multiple AQUATIC FACILITIES.

6.4.1.2.8 Bodily Fluids Remediation Log FVB

6.4.1.2.8.1 Contamination incidents FVB

A Body Fluid Contamination Response Log shall be maintained to document each occurrence of contamination of the water or its immediately adjacent areas by formed or diarrheal fecal material, whole stomach discharge of vomit, and blood.

6.4.1.2.8.2 Standard Operating Procedures FVB

The log shall include a copy of the AQUATIC FACILITY'S STANDARD operating procedures for responding to these contamination incidents.

6.4.1.2.8.3 Required Information at Incident FVB

The log shall include the following information recorded at the time of the incident:

- 1) Person conducting response;
- 2) Supervisor on duty;
- 3) Date and time of incident response;
- 4) Specific area contaminated by incident;
- 5) BATHER LOAD in that BODY OF WATER at the time of incident (if applicable);
- 6) Incident specifics, including type and form of body fluid observed (for example, diarrheal or formed stool, vomitus, or blood);
- 7) Date and time when the area was closed to swimming;
- 8) Whether the POOL uses CHLORINE stabilizer and concentration at time of incident;
- 9) Free residual of disinfectant and pH at the time of incident; and
- 10) Remediation procedures used after the incident.

6.4.1.2.8.4 Required After Incident FVB

The log shall also have the following information recorded when remediation is complete:

- 1) Date and time of the reopening;
- 2) Free residual level of disinfectant, pH, and stabilizer concentration at the time of the reopening (if applicable); and
- 3) Total contact time (if applicable).

6.4.2 Patron-Related Management Aspects

6.4.2.1 Bather Load

6.4.2.1.1 User Guidelines RM

AQUATIC FACILITIES that typically operate with low BATHER occupancy shall have a plan in place to adjust to potential higher PATRON use.

6.4.2.1.2 Maximum Bather Load RM

Such plans shall not exceed the maximum designed BATHER LOAD.

6.4.2.2 Signage

6.4.2.2.1 Facility Rules RM

The operator shall post and enforce the AQUATIC FACILITY rules governing SAFETY and sanitation.

6.4.2.2.2 Conspicuous Place RM

Rules shall be posted in a conspicuous place near the entrance to the AQUATIC FACILITY area and the dressing room.

6.4.2.2.3 Lettering **RM**

The lettering shall be legible and at least 1 inch (12.5mm) (36 point type) high, with a contrasting background.

6.4.2.2.4 Sign Messages **RM**

Signage shall be placed at the entrance of the AQUATIC FACILITY ENCLOSURE that includes the following information, or text complying with the intent of the following information:

- 1) In case of an emergency dial 911
- 2) Hours of operation; AQUATIC FACILITY use prohibited at any other time (if facility is not a secured facility such as an apartment complex)
- 3) BATHER capacity
- 4) Pollution of AQUATIC VENUE prohibited
- 5) Do not swim if you have open wounds
- 6) Do not swim if you are ill with diarrhea or have had diarrhea within the past two weeks
- 7) Shower before entering
- 8) No glass or shatterable items in the AQUATIC VENUE or on the DECK
- 9) No voluntary hyperventilation or extended breath holding activities
- 10) No animals in the AQUATIC VENUE and no animals on the DECK (except service animals)
- 11) No Lifeguard on Duty: Children under 12 years must have adult supervision (if lifeguard is not provided)

6.4.2.2.4.1 No Diving Sign **RM**

AQUATIC VENUES without an approved diving well configuration shall have "NO DIVING", in four inch letters included with the above listed AQUATIC FACILITY rules and the international "No Diving" symbol.

6.4.2.2.4.2 Emergency Signage **RM**

Signage requirement #1: If emergency trained personnel are on site so that the response would be faster than calling 911 then this requirement may be amended to include on-site emergency staff contact information

6.4.2.2.4.3 Posters **RM**

Cardiopulmonary Resuscitation (CPR) and Recreational Water Illness Prevention posters shall be posted conspicuously in the AQUATIC FACILITY at all times.

6.4.2.2.4.4 Multi-Aquatic Venues **RM**

For multi-VENUE AQUATIC FACILITIES, all signage items in MAHC 6.4.2.2.4, or text complying with the intent of the information, shall be posted in full view at the entrance to the AQUATIC FACILITY.

6.4.2.2.4.5 Posted at Entrance**RM**

For multi-VENUE AQUATIC FACILITIES, MAHC 6.4.2.2.4 signage items numbers 3 through 8, and if applicable, 9, or text complying with the intent of the information, shall be posted at the entrance to each AQUATIC VENUE.

6.4.2.2.4.6 Spa Venue Signage**RM**

For multi-VENUE AQUATIC FACILITIES, SPAS signage shall include MAHC 6.4.2.2.4 signage items numbers 3 through 8 plus MAHC 6.4.2.2.6 signage requirements, or text complying with the intent of the information,

6.4.2.2.5 Movable Bottom Floor Signage**RM**

At a minimum, AQUATIC VENUES with moveable bottom floors shall have the following information, or text complying with the intent of the following information:

- 1) A sign for AQUATIC VENUE water depth in use shall be provided and clearly visible.
- 2) A "NO DIVING" sign shall be provided.
- 3) The floor is movable and AQUATIC VENUE depth varies.

6.4.2.2.6 Spa Venue Signs**RM**

At a minimum, SPAS shall have, in addition to the AQUATIC VENUE MAHC 6.4.2.2.4 requirements, the following information, or text complying with the intent of the following information:

- 1) Maximum water temperature is 104° F (40°F).
- 2) Children under age 5 and people using alcohol, narcotics or other drugs that cause drowsiness shall not use SPAS.
- 3) Pregnant women and people with heart disease, high blood pressure or other health problems should not use SPAS without prior consultation with a healthcare provider.
- 4) Children under 12 years of age shall be supervised by an adult.
- 5) Use of the SPA when alone is prohibited (if no lifeguards on site)

6.4.2.2.7 Hygiene Facility Signage**RM**

Signage shall be posted at the HYGIENE FACILITY exit used to access AQUATIC VENUES stating or containing information, or text complying with the intent of the following information:

- 1) Do not swim when ill with diarrhea.
- 2) Do not swim with open wounds and sores.
- 3) Shower before entering the water.
- 4) Check your child's swim diapers/rubber pants regularly.
- 5) Diaper changing on the DECK is prohibited.
- 6) Do not poop or pee in the water.
- 7) Do not swallow or spit water.

6.4.2.2.8 Diaper-Changing Station Signage

Signage shall be posted at DIAPER-CHANGING STATIONS stating:

- 1) Dispose of used disposable diapers in the diaper bucket or receptacle provided.
- 2) Dump contents from reusable diapers into toilets and bag diapers to take home.
- 3) Use the materials provided to clean/sanitize the surface of the diaper-changing station before and after each use.
- 4) Wash your hands and your child's hands after diapering.
- 5) Do not swim if ill with diarrhea.

6.4.2.3 User Guidelines

REG

6.4.2.4 Swimmer Empowerment Methods

6.4.2.4.1 Public Information and Health Messaging

VEN

The owner/operator shall develop and implement a public information and health messaging program to inform INDOOR AQUATIC FACILITY PATRONS of their impact on INDOOR AQUATIC FACILITY air quality.

6.4.2.4.2 Post Inspection Score

REG

The permit to operate and the results of the most recent AHJ inspection of the facility shall be posted for public view at the AQUATIC FACILITY.

6.4.2.4.3 Certificates Retained

REG

Originals or legible copies of required QUALIFIED OPERATOR, QUALIFIED LIFEGUARD, or SAFETY personnel training certificates shall be retained at the AQUATIC FACILITY and be readily available for review by the AHJ.

6.5 Fecal/Vomit/Blood Contamination Response

6.5.1 Contamination Response Plan

6.5.1.1 Contamination Response Plan

FVB

All AQUATIC FACILITIES shall have a response plan in the EMERGENCY ACTION PLAN for responding to formed-stool contamination, diarrheal-stool contamination, vomit contamination, and contamination involving blood.

6.5.1.2 Contamination Training

FVB

The CONTAMINATION RESPONSE PLAN shall include procedures for response and cleanup, provisions for training staff in these procedures, and a list of equipment and supplies for clean-up.

6.5.1.2.1 Minimum

FVB

A minimum of one person on-site while the AQUATIC FACILITY is open for use shall be:

- 1) Trained in the procedures for response to formed-stool contamination, diarrheal contamination, vomit contamination, and blood contamination; and
- 2) Trained in Personal Protective Equipment and other OSHA measures including the Bloodborne Pathogens Standard 29 CFR 1910.1030 to minimize exposure to bodily fluids that may be encountered as employees in an aquatic environment.

6.5.1.2.2 Informed**FVB**

Staff shall be informed of any updates to the response plan.

6.5.1.3 Equipment and Supply Verification**FVB**

The availability of equipment and supplies for remediation procedures shall be verified by the QUALIFIED OPERATOR at least weekly.

6.5.1.4 Plan Review**FVB**

The response plan shall be reviewed at least annually and updated as necessary.

6.5.1.5 Plan Availability**FVB**

The response plan shall be kept on site and available for viewing by the AHJ.

6.5.2 Water Contamination Response**6.5.2.1 Closure****FVB**

In the event of a fecal or vomit contamination in an AQUATIC VENUE, the QUALIFIED OPERATOR shall immediately close the POOL to swimmers until remediation procedures are complete. This includes the affected AQUATIC VENUE and other AQUATIC VENUES that share the same RECIRCULATION SYSTEM.

6.5.2.2 Physical Removal**FVB**

Contaminating material shall be removed (e.g., using a net, scoop, or bucket) and disposed of in a sanitary manner.

6.5.2.2.1 Clean / Disinfect Net or Scoop**FVB**

Fecal or vomit contamination of the item used to remove the contamination (e.g., the net or bucket) shall be removed by thorough cleaning followed by DISINFECTION (e.g., after cleaning, leave the net, scoop, or bucket immersed in the POOL during the DISINFECTION procedure prescribed for formed-stool, diarrheal-stool, or vomit contamination, as appropriate).

6.5.2.2.2 No Vacuum Cleaners**FVB**

Aquatic vacuum cleaners shall not be used for removal of contamination from the water or adjacent surfaces unless vacuum waste is discharged to a sanitary sewer and the vacuum equipment can be adequately disinfected.

6.5.2.3 Treated**FVB**

POOL water that has been contaminated by feces, vomit, or blood shall be treated as follows:

- 1) Check to ensure that the water's pH is 7.5 or lower and adjust if necessary;
- 2) Verify and maintain water temperature at 77°F (25°C) or higher;
- 3) Operate the filtration/RECIRCULATION SYSTEM while the POOL reaches and maintains the proper free CHLORINE concentration during the remediation process; and
- 4) Test the CHLORINE residual at multiple sampling points to ensure the proper free CHLORINE concentration is achieved throughout the POOL for the entire DISINFECTION time.
- 5) Use only non-stabilized CHLORINE products to raise the free CHLORINE levels during the remediation.

6.5.3* Pool Water Contamination Disinfection**6.5.3.1 Formed-Stool Contamination****FVB**

Formed-stool contaminated water shall have the free CHLORINE residual checked and the free CHLORINE residual raised to 2.0 mg/L (if less than 2.0 mg/L) and maintained for at least 25 minutes (*or an equivalent time and concentration to reach the CT VALUE*) before reopening the AQUATIC VENUE.

6.5.3.1.1 Pools Containing Chlorine Stabilizers**FVB**

In POOL water that contains cyanuric acid or a stabilized CHLORINE product, water shall be treated by doubling the inactivation time required under MAHC Section 6.5.3.1.

6.5.3.1.2 Measurement of Inactivation Time**FVB**

Measurement of the inactivation time required shall start when the AQUATIC VENUE reaches the intended free CHLORINE level.

6.5.3.2 Diarrheal-Stool Contamination**FVB**

Diarrheal-stool contaminated water shall:

- 1) Check the FREE CHLORINE RESIDUAL and then raise the FREE CHLORINE RESIDUAL to 20.0 mg/L and maintain for at least 12.75 hours (*or an equivalent time and concentration to reach the CT VALUE*) before reopening the AQUATIC VENUE, or
- 2) Circulate the water through a SECONDARY DISINFECTION SYSTEM to reduce the number of *Cryptosporidium* OOCYSTS in the AQUATIC VENUE below 1 OOCYST/100ml as outlined in MAHC Section 4.7.3.3.2.4.

6.5.3.2.1 Pools Containing Chlorine Stabilizers**FVB**

In POOL water that contains cyanuric acid or a stabilized CHLORINE product, water shall be treated by:

- 1) Lowering the pH to 6.5, raising the free CHLORINE residual to 40 mg/L using a non-stabilized CHLORINE product, and maintaining at 40mg/L for at least 30 hours or an equivalent time and concentration needed to reach the CT VALUE. Measurement of the inactivation time required shall start when the AQUATIC VENUE reaches the intended free CHLORINE level or,.
- 2) Circulating the water through a SECONDARY DISINFECTION SYSTEM to reduce the number of *Cryptosporidium* OOCYSTS in the AQUATIC VENUE below 1 OOCYST/100ml as outlined in MAHC Section 4.7.3.3.2.4 or,
- 3) Draining the AQUATIC VENUE completely

.6.5.3.3 Vomit-Contamination

FVB

Vomit-contaminated water shall have the FREE CHLORINE RESIDUAL checked and the FREE CHLORINE RESIDUAL raised to 2.0 mg/L (if less than 2.0 mg/L) and maintained for at least 25 minutes (*or an equivalent time and concentration to reach the CT VALUE*) before reopening the AQUATIC VENUE.

6.5.3.3.1 Pools Containing Chlorine Stabilizers

FVB

In POOL water that contains cyanuric acid or a stabilized CHLORINE product, water shall be treated by doubling the inactivation time required under MAHC Section 6.5.3.3.

6.5.3.3.2 Measurement of the Inactivation Time

FVB

Measurement of the inactivation time required shall start when the AQUATIC VENUE reaches the intended free CHLORINE level.

6.5.3.4 Blood-Contamination

FVB

Blood contamination of a well-maintained AQUATIC VENUES' water does not pose a public health risk to swimmers.

6.5.3.4.1 Operators Choose Treatment Method

FVB

Operators may choose whether or not they want to close the AQUATIC VENUE and treat as a formed stool contamination as in MAHC Section 6.5.3.1 to satisfy PATRON concerns.

6.5.3.5 Procedures for Brominated Pools

FVB

Formed-stool, diarrheal-stool, vomit, or blood-contaminated water in a brominated POOL shall have CHLORINE added to the POOL in an amount that will increase the FREE CHLORINE RESIDUAL to the level specified for the specific type of contamination for the specified time.

6.5.3.5.1 Bromine Residual

FVB

The bromine residual shall be adjusted if necessary before reopening the POOL.

6.5.4 Surface Contamination Cleaning and Disinfection

6.5.4.1 Limit Access

FVB

If a bodily fluid such as feces, vomit, or blood, has contaminated a surface in an AQUATIC FACILITY, facility staff shall limit access to the affected area until remediation procedures have been completed.

6.5.4.2 Clean Surface

FVB

Before DISINFECTION, all visible CONTAMINANT shall be cleaned and removed with disposable cleaning products effective with regard to type of CONTAMINANT present, type of surface to be cleaned, and the location within the facility.

6.5.4.3 Disposal

FVB

CONTAMINANT removed by cleaning shall be disposed of in a sanitary manner or as required by law.

6.5.4.4 Disinfect Surface

FVB

Contaminated surfaces shall be disinfected with a DISINFECTION solution outlined in MAHC Section 6.5.4.4.1 or 6.5.4.4.2.

6.5.4.4.1 Bleach Solution

FVB

A 5,000 mg/L bleach DISINFECTION solution, such as a 1:10 dilution of fresh household bleach with water.

6.5.4.4.2 EPA-Registered

FVB

An equivalent EPA REGISTERED disinfectant that has been approved for body fluids DISINFECTION.

6.5.4.5 Soak

FVB

The disinfectant shall be left to soak on the affected area for a minimum of 20 minutes or as otherwise indicated on the disinfectant label directions.

6.5.4.5.1 Remove

FVB

Disinfectant shall be removed by cleaning and shall be disposed of in a sanitary manner or as required by the AHJ.

6.6 AHJ Inspections

6.6.1 Inspection Process 6.6.1.1 Inspection Authority

REG

The AHJ shall have the right to inspect or investigate the operation and management of an AQUATIC FACILITY.

6.6.1.2 Inspection Scope**REG**

Upon presenting proper identification, an authorized employee or agent of the AHJ shall be permitted to enter any AQUATIC VENUE area, including the recirculation equipment and piping area, at any reasonable time for the purpose of inspecting the AQUATIC VENUE or AQUATIC FEATURES to do any of the following:

- 1) Inspect the AQUATIC VENUE,
- 2) Determine if there has been a violation of this CODE,
- 3) Verify compliance with previously written violation orders,
- 4) Secure samples or specimens,
- 5) Examine and copy relevant documents and records, or
- 6) Obtain photographic or other evidence needed to enforce this CODE.

6.6.1.2.1 Right**REG**

The AHJ shall have the right to do the following:

- 1) inspect, investigate, or evaluate for compliance with this CODE,
- 2) to review records, collect samples, make copies, take photographs,
- 3) to question any person, or
- 4) to locate, to identify, and to assess the condition of the AQUATIC FACILITY.

6.6.1.3 Based on Risk**REG**

An AQUATIC FACILITY'S inspection frequency may be amended based on a risk of recreational water injury and illness.

6.6.1.4 Inspection Interference**REG**

It is a violation of this CODE for a person to interfere with, deny, or delay an inspection or investigation conducted by the AHJ.

6.6.2 Publication of Inspection Forms**6.6.2.1 Inspection Form Publication****REG**

The AHJ may publish or post on the web the reports of AQUATIC FACILITY inspections.

6.6.3 Forms**REG****6.6.3.1 Applications****REG**

Upon receipt of the following properly completed forms, the AHJ shall approve or deny the following applications in accordance with the provisions in this CODE as long as the operation will not present a danger

- 1) Application for Aquatic Facility Exemption Status
- 2) Application for Approval of Aquatic facility Plans.
- 3) Application for Aquatic facility Operating Permit/Authorization.

- 4) Application for Annual Renewal or Reissuance of Aquatic facility Operating Permit
- 5) Application for Aquatic facility Variance

6.6.4 Imminent Health Hazards

6.6.4.1 Violations

REG

Any of the following violations are IMMEDIATE HEALTH HAZARDS which shall require immediate correction or immediate POOL closure:

- 1) Failure to provide adequate supervision and staffing of the AQUATIC FACILITY as prescribed in this CODE;
- 2) Failure to provide the minimum DISINFECTANT residual levels listed in various sections of this CODE
- 3) pH level below 6.5;
- 4) pH level above 8.0;
- 5) Failure to continuously operate the AQUATIC VENUE filtration and DISINFECTION equipment;
- 6) Use of an unapproved or contaminated water supply source for potable water use;
- 7) Unprotected overhead electrical wires within 20 feet horizontally of the AQUATIC VENUE;
- 8) Non GFCI protected electrical receptacles within 20 feet of the inside wall of the AQUATIC VENUE;
- 9) Failure to maintain an emergency lighting source;
- 10) Absence of all required lifesaving equipment on DECK;
- 11) AQUATIC VENUE bottom not visible;
- 12) Total absence of or improper depth markings at an AQUATIC VENUE;
- 13) Plumbing cross-connections between the drinking water supply and AQUATIC VENUE water or between sewage system and the AQUATIC VENUE INCLUDING filter backwash facilities;
- 14) Failure to provide and maintain an ENCLOSURE around the AQUATIC VENUE area that will inhibit unauthorized access to the AQUATIC VENUE;
- 15) Use of unapproved chemicals or the application of chemicals by unapproved methods to the AQUATIC VENUE water;
- 16) Broken, unsecured, or missing main drain grate or any submerged suction outlet in the AQUATIC VENUE;
- 17) Overcrowding of the AQUATIC VENUE that results in poor supervision of BATHERS;
- 18) Broken glass or sharp objects in AQUATIC VENUE or on DECK area; or
- 19) Any other item determined to be a public health hazard by the AHJ.

6.6.4.1.1 Low pH Violations

REG

If pH testing equipment doesn't measure below 6.5, pH level must be at or below the lowest value of the test equipment.

6.6.4.1.2 High pH Violations

REG

If pH testing equipment doesn't measure above 8.0, pH level must be at or above the highest value of the test equipment.

6.6.5 Enforcement

6.6.5.1 Placarding of Pool **REG**

Where an imminent public health hazard is found, the AQUATIC VENUE shall be placarded to prohibit use until the hazard is corrected in order to protect the public health or SAFETY of BATHERS.

6.6.5.2 Placard Location **REG**

When a placard is used, it shall be conspicuously posted at each entrance leading to the AQUATIC FACILITY and/or AQUATIC VENUE.

6.6.5.2.1 State Authority **REG**

When placed by the AHJ, the placard shall state the authority responsible for its placement.

6.6.5.2.2 Tampering with Placard **REG**

When placed by the AHJ, the placard shall indicate that concealment, mutilation, alteration or removal of it by any person without permission of the AHJ shall constitute a violation of this CODE and the Public Health Law.

6.6.5.3 Operator Follow-up **REG**

Within 15 days of the AHJ placarding an AQUATIC FACILITY, the operator of such AQUATIC FACILITY shall be provided with an opportunity to be heard and present proof that continued operation of the facility does not constitute a danger to the public health. If the IMMINENT HEALTH HAZARD(s) have been corrected, the operator can contact the AHJ prior to the hearing and request a follow-up inspection.

6.6.5.3.1 Hearing **REG**

The hearing shall be conducted by the AHJ.

6.6.5.4 Follow-up Inspection **REG**

The AHJ shall inspect the premises, within two working days of notification that the hazard has been eliminated, to remove the placards after verifying correction.

6.6.6 Enforcement Penalties **REG**

6.6.6.1 Liability and Jurisdiction **REG**

It shall be unlawful for any person to fail to comply with any of the regulations promulgated pursuant to this CODE.

6.6.6.1.1 Failure to Comply **REG**

Any person who fails to comply with any such regulation shall be in violation of this CODE.

6.6.6.1.2 Civil Penalty **REG**

For each such offense, violators shall be liable for a potential civil penalty.

6.6.6.1.3 AHJ Authority **REG**

The AHJ shall have authority to utilize civil penalty as a potential enforcement option.

6.6.6.2 Continued Violation **REG**

Each day, or any part thereof, during which a violation of this CODE exists or persists shall constitute a separate violation of this CODE.

6.6.6.3 Falsified Documents **REG**

Falsifying or presenting to the AHJ falsified documentation and or certificates shall be a civil violation as specified by the AHJ.

6.6.6.4 Enforcement Process **REG**

Upon determining that one or more violations of this CODE exists, the AHJ shall cause a written notice of the violation or violations to be delivered to the owner or operator of the AQUATIC FACILITY that is in violation of this CODE.

6.6.7 Public Nuisance

6.6.7.1 Public Nuisance **REG**

Any AQUATIC FACILITY constructed, operated, or maintained contrary to the provisions of this article is a public nuisance and dangerous to health.

6.6.8 Fees

6.6.8.1 Owner's Permit **REG**

The owner's permit application fee shall be paid prior to the issuance of the owner's permit for AQUATIC FACILITIES operating on a seasonal schedule.

6.6.8.1.1 Fees Waived **REG**

The AHJ may waive fees as appropriate.

6.6.8.2 Re-inspection Fees **REG**

The fees for pre-operational re-inspections are as established by the AHJ.