



County of San Diego

Public Pool Plan Review and Construction Guide



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INTRODUCTION

The purpose of this document is to provide guidance for the County of San Diego, Department of Environmental Health (DEH) - Food and Housing Division (FHD) Plan Check requirements for construction or major renovation of a Public Swimming Pool facility. The procedures and information provided in this document are intended to assist you in a step-by-step manner and to provide a checklist of items necessary for a successful plan check process from the initial plan submittal to the final plan check inspection. These guidelines, while attempting to cover common situations and circumstances, are not all inclusive and are subject to change without notice. The appropriate state laws and codes are to be referenced for specific requirements and details.

What codes pertaining to Public Swimming Pool facilities are administered by DEH?

DEH is charged as the enforcing agency of public swimming pools under a number of codes and regulations identified collectively as the "Pool Code" including the California Health & Safety Code, the California Code of Regulations (CCR, Title 22), the California Building Code (CBC, Title 24), California Electrical Code and the San Diego County Code of Regulatory Ordinances (Title 6). Guidance documents from the California Conference of Directors of Environmental Health (CCDEH), Recreational Health Technical Advisory Committee, and The Council for the Model Aquatic Health Code (CMAHC) who formulate "The Model Aquatic Health Code (MAHC)" may also be considered in the construction of pools.

Section 3103B.1 of Title 24, Part 2, Chapter 31 B of the California Building Code states that a person proposing to construct, renovate or alter a pool, ancillary facilities or equipment and appurtenances shall submit plans and specifications detailing compliance with this chapter to the enforcing agent for review and written approval prior to commencing construction. Persons intending to change or replace units shall first be cleared by the enforcing agent before substitution, if not using an exact duplicate of the units being changed or replaced. A local building department shall not issue a permit for a public pool or ancillary facility until the plans have been approved by the enforcing agent.

What public pools need to submit plans?

A public pool is defined as an artificial basin, chamber or tank constructed or prefabricated with impermeable surfaces that is used, or intended to be used, for public swimming, diving or recreational activities, but does not include individual therapeutic tubs or baths where the main purpose is the cleaning of the body. Any manmade lake or swimming lagoon with a sand beach or sand bottom is not a public pool. Spray grounds with recirculated water intended for human interaction are a type of public pool. Only private pools intended for use by occupants of not more than three residential units are exempt from these provisions.

CCR, Title 22 section 65503 details the scope of public pools for plan approval as required by DEH-FHD and includes ancillary structures and equipment provided and maintained in connection with pools, including but not limited to:

- (1) Dressing rooms
- (2) Drinking fountains
- (3) Fencing and enclosures
- (4) Recirculation equipment including pumps, filters and disinfection systems
- (5) Pool decks
- (6) Safety equipment
- (7) Shower rooms
- (8) Locker rooms

- (9) Toilet facilities
- (10) Water treatment systems
- (11) Heating including solar heating systems

When are the plans submitted?

Plans must be submitted and approved by DEH-FHD prior to the start of construction. Plans, specifications and data submitted for formal approval of a public pool must be an accurate record of the proposed construction and contain sufficient information to demonstrate that the proposed public pool, or modifications thereof, will meet the standards contained in the Pool Code to be "sanitary, healthful and safe".

After DEH has approved your plans, you will also have to obtain approvals from the local building department. By law, a DEH plan approval is needed before the local building department or the local Fire Marshall may issue a building permit.

How do you contact us and where are we located?

5500 Overland Avenue Suite 110, San Diego, CA 92123

Counter hours: 8:00 AM - 4:30 PM Monday-Friday

Plan Check Scheduling (858) 505-6660

Plan Check Technical Line (858) 505-6659

Plan Check Website <http://www.sdcountyplancheck.org>

Department Website <http://www.sdcdeh.org>

Thank you for carefully reading this plan check guide before your plan submittal. If you have any additional questions, please contact the Plan Check Program at (858) 505-6659 to speak to a Plan Check Specialist.

PLAN SUBMISSION AND REVIEW PROCESS

Plan approval must be obtained from the County of San Diego, Department of Environmental DEH-FHD Plan Check before constructing, altering, or renovating a public pool or spa including ancillary facilities, equipment, appurtenances, gates, and enclosures. The following is required to process and obtain approval to build or renovate a public pool facility.

PLAN SUBMISSION

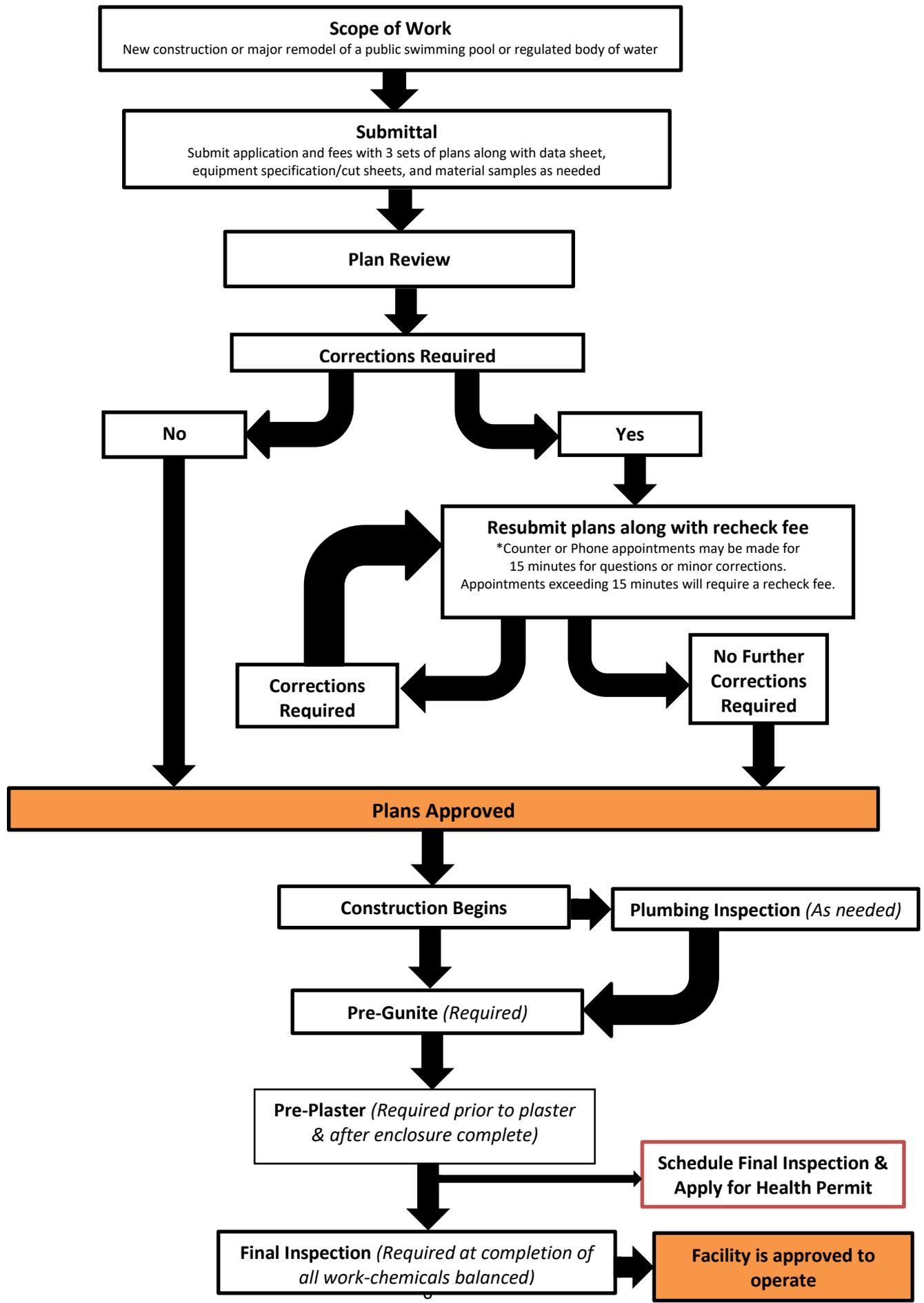
1. Submit three (3) sets of detailed plans and specifications. Complete an application for Plan Review and pay the required plan check fees. A set of electronic (digital) plans in Adobe PDF format may be submitted for review. The application and plan check fee(s) must be submitted in person or via mail or online.
2. An online application may be made for plan review. The [DEH Pool Plan Check](#) page has information to apply online for the application submission and fee payment. Login or register at [Accela Citizen Access](#) for an account. Contact DEH Plan Check at (858) 505-6659 or FHDPlanCheck.LUEG@sdcounty.ca.gov for assistance or upon applying online.
3. The plans must include sufficient information to demonstrate compliance with the California Health and Safety Code and all applicable regulations in order to be approved.
4. Plans may be prepared by an architect, draftsman, consultant, contractor or other qualified individual. All plans must be drawn to a minimum scale of 1/4" per foot for most public pools and 1" per foot for spa pools in a professional manner encompassing all applicable requirements of this construction guide.
5. Plans will be approved or rejected within twenty (20) working days after receipt and the applicant will be notified. Rejected plans (plans that are incomplete or require significant change) will have two (2) sets returned for revision. Three (3) complete sets must again be submitted for review or one (1) digital set before approval will be granted; an additional fee will be required.
6. Upon approval, two (2) sets of plans will be returned to the applicant, and the third (3rd) set will be kept on file until construction has been completed. An approved set of plans must be maintained at the construction site until the final inspection has been made, this includes a hard copy at the site if digital plans were submitted and approved.
7. Any changes to DEH approved plans require additional review and approval. Application and fee may again apply.
8. Before beginning construction, a building permit must be obtained from the appropriate Building and Safety agency. Pursuant to the California Code of Regulations, Section 3103B1, building permits for pool facilities are not to be issued until plan approval has been obtained from DEH.

NOTE: An approved plan is valid for 2 years from the date submitted. After such time, the plan is VOID.

Application Process

Plan Review

Inspections



PLAN SUBMITTAL INFORMATION

The plans shall show and identify:

The exact name and address of the proposed public pool, the name of contractor and contact person, the name of the public pool ("business") owner, telephone numbers and email addresses.

NOTE: Contractors who build or repair swimming pools must be licensed and qualified for the project assigned. (See [Appendix 7](#))

Plans shall be drawn to scale using indelible ink or print and shall include:

- ◆ A site or plot plan showing the proposed location of the pool and/or spa on the property. The site or plan shall be drawn to a stated scale showing distance to all ancillary facilities (toilets, showers), fencing, property lines, and all adjacent structures. Where applicable, indicate the travel distance in feet from the pool to the living quarters on the property that are farthest from the pool.
- ◆ A plan (including top and side views) of the pool and spa pool drawn to scale (1/4" = 1 foot for most pools and/or 1" = 1 foot for spas) including all plumbing, skimmers, return inlets, suction outlets, light fixtures, depth markers, stairs, ladders, fill line, and handrails. Show all measurements and dimensions.
 - Pool/spa stair, handrail and ladder profile diagrams.
 - Show schematic diagram of pool equipment and related plumbing and valve details. Show all pipe sizes and direction of flow. Indicate any proposed 90 or 45 degree elbow piping, valves, gauges, flow meters, pumps, filters, heaters, chemical feeders, etc.
- ◆ Specifications: Dimensions, surface area, volume (in gallons), occupancy, and flow rate in gallons per minute (gpm). Attach pool and spa specification sheets.
- ◆ Enclosure details (i.e., fence, gates, building, walls or structures surrounding the pool area). Show a profile of the fence with measurements to scale. (See [Appendix 1](#))
- ◆ Pool deck details (including finishes), as well as details of deck drainage.
- ◆ A landscape plan showing all trees, walls, columns, rock formations, structures, and fence line. NOTE: Landscape plans will be used to ensure a five (5) ft. clear span on the exterior side of fence. Private property (patios), trees etc. cannot encroach onto span. Show a profile view of each structure to scale near enclosure.
- ◆ Occupancy:
 - Swim pools: one pool user per 20 square feet.
 - Spa pools: one pool user per 10 square feet.
- ◆ Floor plan and finish schedules for ancillary structures (restrooms and showers, locker rooms, equipment room).

Note on the plans whether the proposed pool is served by a public water system or by individual water wells and type of sewage disposal system.

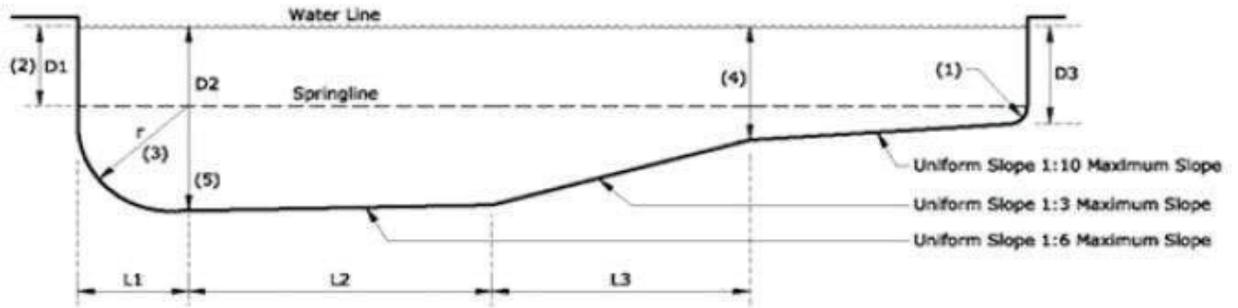
If an onsite water well is the potable water source and/or a sewage disposal system is to be installed or impacted by the proposed work, approval and permits must be obtained from DEH Land & Water Quality Division at (858) 565-5173.

POOL PROFILE VIEW

Longitudinal section plan through the center line of the pool must provide the following information (See Figure 31B-3 below from Pool Code):

- ◆ Pool length and depth dimensions. Pool depth dimensions must be from the operating water level to the bottom of the pool.
- ◆ Distance from shallow end wall to point break in the bottom slope from shallow to deep water or to the main drain if there is no break in the bottom slope.
- ◆ Distance from break in bottom slope to main drain, if applicable.
- ◆ Distance from main drain to deep end well.
- ◆ Depth at shallow end wall and deep end wall.
- ◆ Depth at break in bottom slope, if applicable.
- ◆ Depth at main drain (maximum pool depth).
- ◆ Depth at entire base of any pool steps (must be uniform in depth at entire base of each pool step).
- ◆ Indicate depth markers on the pool deck to match depth markers on the wall. If this pool has a maximum depth of 6 ft. or less, indicate no diving markers on the deck adjacent to all deck depth markers.
- ◆ Pool stairs and ladder profile view that includes height of step risers and width of step treads.
- ◆ Location and dimensions of hand rail(s) at pool stairs. Include hand rail profile view. Indicate height of upper railing surface above deck, coping or other handhold and pool steps.
- ◆ Sectional view of coping.
- ◆ Contrasting waterline tile line on pool wall below coping at waterline which shall be the midpoint of the operating range of skimmers or at the top edge of the overflow rim.
- ◆ Diving board (if any) with distance diving board extends over the pool and depths below the diving board.

LONGITUDINAL SECTION



TRANSVERSE SECTION AT D2

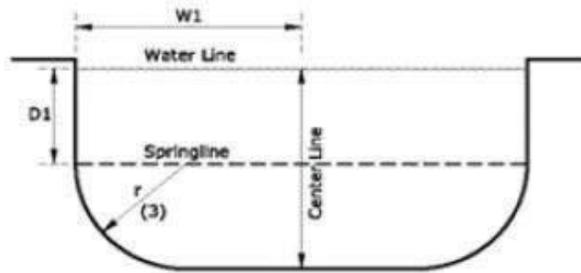


Figure 31B-3 Depths and Clearances for Pools without Diving Boards

Table 31B-3A Pools with Maximum Water Depth ≤ 6' 0"

Dimension	Depth of Water			Length of Section			
	D1	D2	D3	L1	L2	L3	W1
Minimum	2'6"	-	0'0"	3'6"	3'0"	3'0"	6'0"
Maximum	-	6'0"	3'6"	-	-	-	-

Table 31B-3B Pools with Maximum Water Depth > 6' 0"

Dimension	Depth of Water			Length of Section			
	D1	D2	D3	L1	L2	L3	W1
Minimum	2'6"	>6'0"	0'0"	3'6"	3'0"	3'0"	7'6"
Maximum	-	-	3'6"	-	-	-	-

Notes for Figure 3B and Tables

- (1) Radius at the shallow end shall be a maximum of 1'0".
- (2) Springline D1 shall extend to the break in slope between the shallow area and the deep area.
- (3) Maximum radius shall equal D2 minus D1 dimensions.
- (4) Where there is a break in slope, the break shall be located at a water depth equal to 4'6".
- (5) Each pool shall be provided with a main drain submerged suction outlet typically located at the bottom of the pool at the deepest point that conducts water to a recirculating pump. Suction outlet shall be split 3 ft. apart.

POOL TOP VIEW

Provide the following information on the plans:

- ◆ Length and width of pool.
- ◆ Submit a complete pool plumbing plan. Show location, pipe size and type of each section of pipe as well as the length of all pool plumbing. Include skimmer(s), main drain and other suction outlets, showing split lines, equalizer lines, fill lines, return lines and return inlets.
- ◆ Details of the pool filtration return plumbing system that is designed to hydraulically obtain uniform flow through each return inlet (e.g., a continuous return loop system).
- ◆ Details of pool skimmer plumbing system designed to hydraulically obtain uniform flow through each skimmer (e.g., in a two-skimmer system, a "T" connection for the skimmer suction line between the two skimmers will result in uniform flow or a skimmer suction line continuous loop system).
- ◆ Slip-resistant tiles 4 to 6 inch wide of contrasting color, along the bottom of the pool where the water depth is 4½ feet. (Pools with a maximum water depth of 5 feet or less do not require a marking line)
- ◆ Stairs, ladders, and handrails.
- ◆ Location of depth markers.
- ◆ Contrasting tile on stairs and benches of spas when used.
- ◆ Contrasting waterline tiles.
- ◆ Fill line location.
- ◆ Pool light location(s), wattage, and type.
- ◆ State on plans that an "Emergency Shut-off Switch" will be installed to turn off all suction pumps on a single switch for spa pools. Identify the location on plans.
- ◆ Diving board (if any) location and distance from board center to side walls or other diving boards (show top and side views for diving board(s)). See the pool code for dimension requirements for pools with diving boards.

POOL / SPA STRUCTURAL DETAILS

Pools shall conform to the requirements of Title 24 Building Standards, Title 22, California Administrative Code and any other applicable codes.

a. Structure

- ◆ All swimming pools shall be constructed of reinforced concrete or a material equivalent in strength and durability. The shape of any swimming pool shall be such that the circulation of pool water and control of swimmers' safety are not impaired.

b. Slope

- ◆ The slope shall be no greater than 1 foot vertically in 10 feet horizontally. All slopes shall be continuous and uniform. Pools less than 6 feet deep are not permitted to have a break in slope.
- ◆ Pools with depths of 6 feet or greater shall have a deep end slope no greater than 1 foot vertically in 3 feet horizontally commencing from the break.

c. Dimensions

- ◆ All swimming pools with depths greater than 6 feet shall have a minimum width of 15 feet for pools. For pools with depths less than or equal to 6 feet at the main drains, 12 feet minimum width is acceptable. At no point shall the body of the pool be less than 12 feet in width.
- ◆ Swim-outs, islands, pool benches, Baja benches, recessed areas or projections are NOT permitted. Exception: Benches shall be permitted in a spa pool providing that the water depth over the bench does not exceed 24 inches.
- ◆ Water depth at the shallow end of the pool shall not exceed 3 ½ feet.

d. Finish

- ◆ All swimming pools shall be finished with white plaster or other approved plaster-like finish materials that can withstand repeated brushing, scrubbing, and cleaning procedures. If tile is used as a pool or spa finish, a sample of the tile must be submitted to DEH for approval. Designs, emblems, or logos or lettering shall NOT be permitted on the pool shell.
- ◆ For pool shell finish material other than white plaster, submit commercial blend samples of the product at least 6" X 6" in size for evaluation along with the manufacturer's specifications that indicates the proposed finish is engineered for commercial swimming pool use.
- ◆ Finishes shall be non-slip and non-abrasive. For fiberglass finishes, clearly state that horizontal surfaces (steps, bench and bottom) will be non-skid to a depth of 3 ½ feet. Non-skid surface to be applied in a uniform manner and non-abrasive equivalent to a #200 grit surface.
- ◆ Non-plaster pool finishes such as vinyl liners are not accepted.

e. Handholds

Coping is the term used to identify the stone or concrete material used to cap the pool shell wall and typically used as a handhold.

- ◆ Public pools shall be provided with handholds (perimeter overflow system, bull-nosed coping or cantilevered decking) around the entire perimeter installed not greater than 9 inches above the waterline.
- ◆ Provide a section view of coping/cantilevered decking, drawn to scale. Handholds must overhang the waterline tile at least 1 inch, but not more than 2 inches and must not exceed 2 ½ inches in thickness. Pool coping must be slip-resistant.

Note: Handholds are not required for wading pools.

- ◆ For instruction or competitive swimming, a handhold at water level similar to the rim of a perimeter overflow system is required.
 - ◆ DEH may accept other handholds for spa pools, special purpose pools and rim-flow pools such as C-701 coping. (See Appendix 2)
- f. Depth Marking Line**
- ◆ Pools greater than 5 feet in depth shall have a straight line of slip resistant tile, minimum of 4 inches and not greater than 6 inches wide and of contrasting color, installed where the water depth is four and one half (4 ½) feet.
 - ◆ Depth marking line must be tile; paint is not acceptable.
- g. Depth Markers Tiles**
- ◆ Install depth markers on both sides of the pool at the minimum and maximum depths; on both ends of the pool; both sides at the shallowest and deepest part of the pool; at the break in the bottom slope from the shallow to deep portions; along the perimeter of the pool at distances not to exceed 25 feet. (See Appendix 4).
 - ◆ Depth markers must be positioned to indicate the water depth accurate to the nearest 6 inches as measured at the waterline.
 - ◆ Depth markers shall be located on the coping or the deck as close as possible on the vertical surface of pool and no more than 3 feet from the pool water.
 - For pools with skimmer systems the vertical depth markers shall be high at the waterline which typically will result in the depth markers being submerged approximately 50 percent; pools with perimeter overflow- at face of cantilevered coping, at the back wall above the gutter, or immediately below the waterline; pools with rim flow gutters- immediately below the waterline.
 - For pools with perimeter overflow systems where coping cantilevers over the gutter depth markers may be positioned at the face of the cantilevered coping, the back wall above the gutter or immediately below the waterline which will result in the depth markers being completely submerged; or for pools with rim flow gutters, depth markers shall be positioned immediately below the waterline which will result in the depth markers being completely submerged.
 - ◆ Depth markers on coping or deck must be slip resistant and durable to withstand repeated weathering.
 - ◆ The depth markers shall have numerals a minimum of 4 inches in height and be of a color contrasting with the background. Abbreviations of FT and IN may be used in lieu of feet and inches.
 - ◆ Metric units may be provided in addition to but not in lieu of units of feet and inches.
 - ◆ Spa or wading pools shall have a minimum of two (2) depth markers.
- h. “No Diving” Markers**
- ◆ Pools 6 feet in depth or less shall install universal no diving markers (which is a red circle with a slash through it superimposed over the image of a diver) on the deck directly adjacent to the required depth markers.
- i. Lane markings**
- ◆ Slip resistant lane lines at the bottom of the pool if used shall not exceed 12 inches in width.
- j. Pool Entry: Steps, Stairs, Ramp and Ladders**
- A means of entry and exit to and from the pool shall consist of steps, recessed steps with grab rails, ladders, or stairs, or a combination of them. Also, ramps may be placed in accordance with the building standards for accessibility.
- ◆ Stairs/Ramps: Stairs or ramps are required at the shallow end of all pools when the depth

exceeds 1 foot. All pools with multiple shallow ends shall have stairs or ramp at each shallow end. A second means of entry and exit shall be provided in the deep portion of a pool having a depth greater than 4 ½ feet. When the pool width exceeds 30 feet, such means of entry and exit shall be provided at each side, not more than 100 feet apart.

- ◆ Each step of a stair shall have the same dimensions with a tread not less than 12 inches wide, except that if the top step is curved convexly, the top step tread shall not be less than 21 inches wide as measured at the point of maximum curvature. (See [Appendix 3](#) for stair, step and handrail dimensions). Risers shall be uniform and shall not exceed 12 inches in height. The width of a standard step shall not be less than 24 inches.
 - Finished step tread and riser construction shall have dimensional tolerances of plus or minus ½ inch.
- ◆ At least one handrail shall be provided for stairs, extending from the deck to not less than a point above the top of the lowest step and with the upper railing surface not less than 28 inches above the deck. Additional handrails are needed for every 12 feet of stair width.
 - Spas shall be provided with two handrails extending from the deck to not less than a point above the top of the lowest step. The steps shall be located where the deck is at least 4 feet wide.
- ◆ Ladders and recessed steps shall have a minimum tread of 5 inches, width of 14 inches, and shall be designed to be readily cleaned. Risers shall be uniform and not exceed 12 inches in height. The first riser shall be measured from the deck. (See [Appendix 3](#))
- ◆ Ladders shall be corrosion-resistant and shall be equipped with slip-resistant tread surfaces. Ladders shall be rigidly installed and shall provide a clearance of not less than 3 inches or more than 5 inches between any part of the ladder and the pool wall.
- ◆ Hand/grab rails for ladders and recessed steps shall be provided at the top of both sides and shall extend over the coping or edge of the deck for each ladder and step-hole. Hand/grab rails shall be anchored securely. The horizontal clearance space between hand/grab rails shall be not less than 18 inches and not more than 24 inches.
 - **NOTE:** All metal components within 5 feet of the water's edge of the pool including handrails, ladders, diving board jigs (the part that goes in the concrete), slides, pool lights with metal components, etc. must be electrically bonded and approved per the requirements of the local building department.

k. **Zero depth entry**

Zero depth entry pools, also called beach entry pools, are designed with a sloped entry into a pool from deck level into the interior of the pool as a means of access and egress. More elaborate zero depth entry pools often include sand to make the pool seem more like a beach. The 4 foot deck clearance is maintained and a means to keep pool clear of sand.

- ◆ Deck level perimeter overflow system consisting of a gutter or trench with a grate cover shall be provided at the water's edge across the entire zero depth portion of the pool. It shall be at an elevation which allows effective skimming at the trench at all times.
- ◆ Zero depth entries shall have a maximum floor slope of 1:12 out to 5 ft.
- ◆ Slip-resistant tile no greater than 2" by 2" may be install along the entry to the waterline to facilitate cleaning. A minimum 2" by 2" contrasting color band at the water line must be provided. Up to 6 inches of contrasting color band below the water line may be provided.
- ◆ To ensure adequate disinfection in the area with zero depth entry, an adequate number of floor inlets should be provided in areas less than 18 inches deep. Alternative designs can be evaluated with adequate engineering justification and the successful

completion of a water circulation dye test conducted in accordance to testing procedures listed in the MAHC.

I. Lighting

- ◆ Underwater white incandescent light is required in a public pool (exception: wading pools). The light must be at least 0.5 watts per square foot of pool or spa surface area.
- ◆ Illumination shall enable a lifeguard or other persons to determine whether (1) a bather is lying on the bottom of the pool, and (2) the pool water conforms to the definition of "clear pool water".
- ◆ All dry-niche light fixtures, and all underwater wet-niche light fixtures operating at more than 15 volts in public swimming pools must be protected by a ground fault circuit interrupter in the branch circuit, and all light fixtures in public swimming pools must have encapsulated terminals.
- ◆ Only approved underwater lighting fixtures shall be used and no lighting fixtures shall be installed for operations at more than 150 volts between conductors.
- ◆ All electrical work required for compliance shall be performed by a contractor licensed to perform electrical work.
- ◆ Alternative lighting systems which use 15 volts or less or use no electricity in the pool or on the pool deck, such as LED, (light emitting diode) or fiber optic systems, may be utilized if the applicant demonstrates to reasonable certainty equivalency to incandescent lighting.
- ◆ Pool deck areas shall be provided with lighting so that persons walking on the deck can identify hazards. Lighting fixtures shall be aimed towards the deck area and away from the pool surface insofar as practical. Pool deck surface lighting levels are minimum of 10 horizontal foot-candles. Provide deck lighting illumination plan with all units in foot candles.
- ◆ Outdoor public pools open for use from 30 minutes before sunset to 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 foot-candles.
 - All portions of the pool, including the bottom and drain(s), are readily visible as required in MAHC. Numbers can be less than MAHC and IESNA so long as the illumination plan is drafted by a lighting or electrical engineer.

RECIRCULATION EQUIPMENT

All new and replacement pool-related equipment shall comply with the applicable requirements established by the NSF/ANSI 50-2012 performance standard. Indicate equipment make and model numbers on the plans and provide manufacturer's specification sheets for all pool equipment, fittings, grates and backflow preventers. For specification sheets that include more than one item or model, clearly indicate on the sheets the selected item(s), and/or model(s).

All equipment, including gauges and flow meter, shall be positioned so as to be readily accessible without requiring persons to climb over or remove obstacles to make repairs or inspections.

m. Pumps

- ◆ For each pump, indicate the manufacturer's make and model number, horsepower, and pump performance curve.
- ◆ A minimum turnover rate of six (6) hours is required for a pool.
- ◆ A minimum turnover rate of one half (1/2) hour is required for a spa pool.
- ◆ A minimum turnover rate of one (1) hour is required for a wading pool.
- ◆ A minimum turnover rate of one-half (1/2) hour is required for spray grounds.
- ◆ A minimum turnover rate of two (2) hours is required for a medical pool.

A Variable Speed Pool Pump (VS) reduces a pump motor's revolutions per minute (RPM) thereby reducing the energy consumed operating that motor. The lower you run the RPM, the more drastic and noticeable the reduction in energy consumption and cost. VS pumps typically output more volume of water than single speed pumps. Since the more powerful models can go up to 3 HP, pipe sizing of the pool is one of the determining factors on which VS pump to use. Also, the VS pump cannot exceed the maximum flow rating for the filter and while running at the lowest possible RPM setting, achieve the flow rate for the required turnover of the pool.

- Complete an operational time and speed setting form (See [Appendix 6](#)). When available, use the pump's lockout flowrate and timer set to provide at least the minimum required turnover rate and length of time the pump is running which is whenever the pool is open for use and any additional time to maintain the pool water clean and clear. Label the flowrate on or near the pump in permanent ink.

A Variable Frequency Drive Pump (VFD) precisely controls the speed (RPM) of the pump by changing the frequency of the electricity delivered to the motor.

- This pump must be set such that the required turnover rate is not diminished. Determine what flowrate at 60 ft. total dynamic head (TDH) the pump has been set at.

n. Filters

Include on the plans:

- ◆ Filter type.
- ◆ Manufacturer's make and model number.
- ◆ Square footage of filter area.

Filters must be sized according to the following filter media rates:

Diatomaceous earth	2 gpm/sq. ft.
Rapid sand	3 gpm/sq. ft.
High rate sand	15-20 gpm/sq. ft.
Cartridge	0.375 gpm/sq. ft.

Diatomaceous earth filters must backwash through a separation tank with a sight glass between filter and separation tank. All filters shall backwash to sanitary sewer through a permanently plumbed air gap separation. A sight glass is required on sand filters when the air gap is not visible from the filter location.

- ◆ Material cleaned from filters and backwash water from any recirculation system shall be disposed in an acceptable manner that will not create a nuisance. Backwash water shall not be returned to a pool. Pipes carrying wastewater from pools including pool drainage and backwash from filters shall be installed as indirect waste.
- ◆ If no sanitary sewer line is available for backwash, a disposal pit or drywell or alternate method of disposal may be approved by the local Building and Safety Department or Regional Water Quality Control Board.
- ◆ Where direct observation of the backwash discharge is not visible to the operator during backwash operations, a sight glass shall be installed on the wastewater discharge line.
- ◆ For cartridge filter cleaning, a janitorial sink or approved wash down area equipped with potable water shall be provided in the pool equipment area with permanently installed drainage piping discharging to the public sewer or wastewater system approved by the enforcing wastewater agency. The filter vessel shall be capable of being drained and shall be equipped with an indirect drain for the purpose of draining the entire contents of the filter vessel.
- ◆ A spare cartridge filter shall be maintained on site in a clean and dry condition. Replace cartridge filters per manufacturer's instructions.

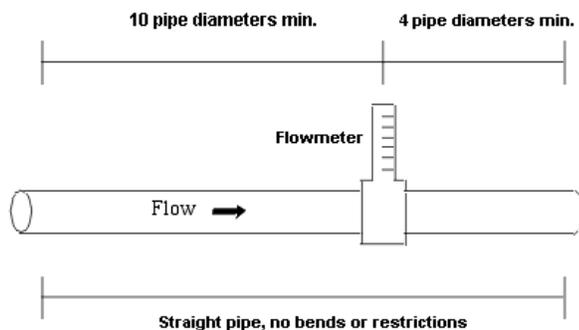
o. Gauges

A pressure and vacuum gauge (See [Appendix 5](#)) shall be provided for each pump system. Each gauge shall have a scale range approximately 1 ¼ times the maximum anticipated working pressure or vacuum and shall be accurate within 2 percent of scale.

- ◆ The pressure gauge usually found on top of the filter is an influent pressure gauge placed before the filter, after the pump. This gauge shall be marked with the clean start-up pressure reading. An effluent pressure gauge is not required.

p. Flowmeter

- ◆ Provide the manufacturer's make and model number; location on piping; and flowmeter pipe size rating.
- ◆ An approved flowmeter meeting the NSF/ANSI 50-2012 performance standard shall be provided on each recirculation system and installed on the return line per the manufacturer's written instructions with increments in the range of normal flow. Digital flowmeters are highly recommended.
- ◆ Ensure that the appropriate flow meter is sized for the pipe and is installed at the proper location on a pipe to provide an accurate reading.

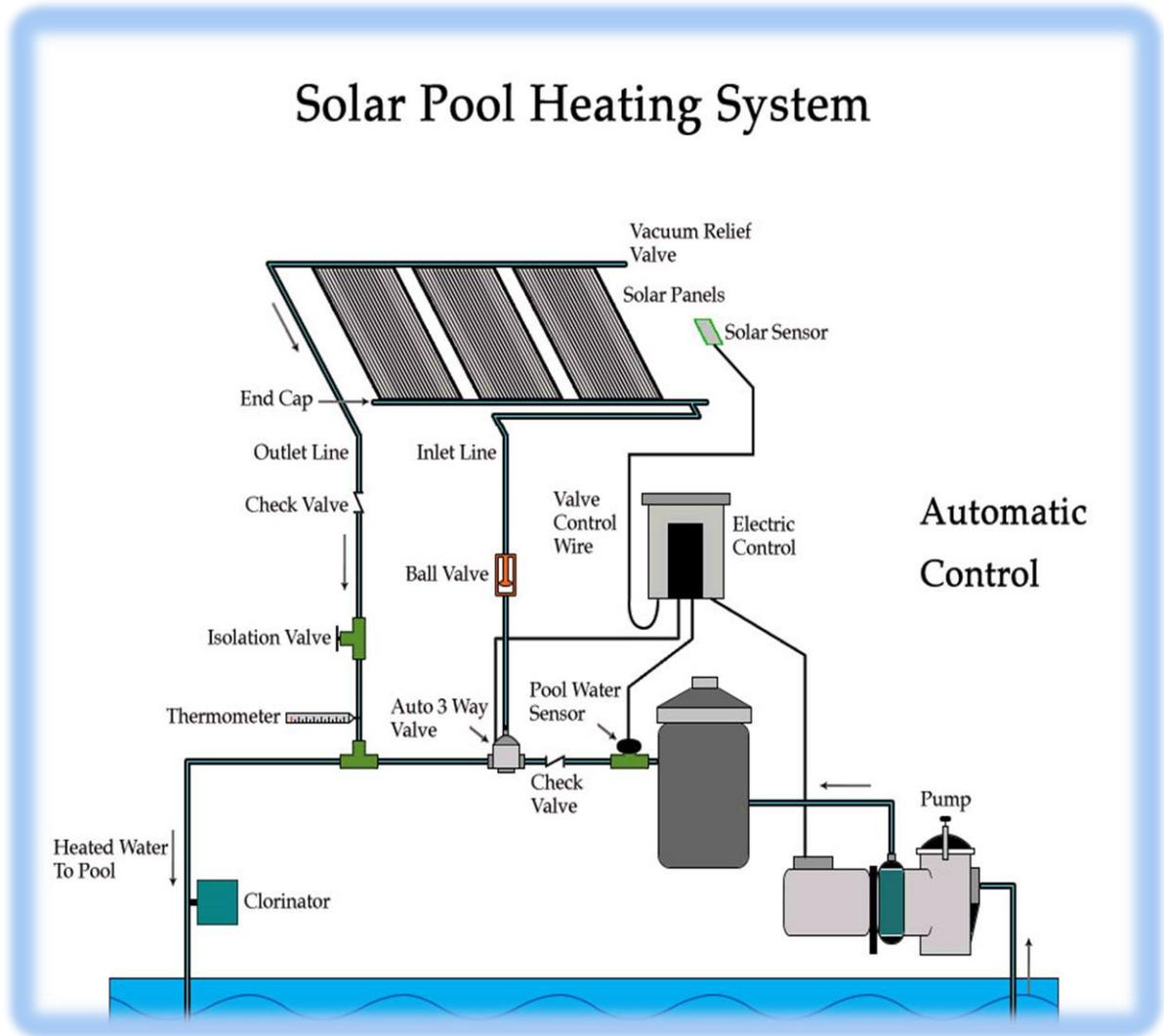


q. Disinfectant Feeders

An approved automatic disinfectant feeder listed to NSF/ANSI 50 is required. Provide the manufacturer's make and model number and the disinfectant feed rate. The method to adjust the feed rate must be accurate within 10 percent of feed rate at any setting.

- ◆ The disinfectant feeder shall be capable of supplying not less than the equivalent of 3 pounds of 100 percent available chlorine per day per 10,000 gallons of pool water capacity. A visible means of determining the rate of flow through the device shall be provided for each disinfectant feeder.
 - ◆ The automatic disinfectant feeder must maintain at least the minimum amount of disinfectant residuals as required in section 65529(b) of CCR Title 22 whenever the pool is open for use and must be constructed with an adjustable output rate device to allow for repeated adjustments without loss of output rate accuracy and adjusted by an automatic chemical monitoring and control system that regulates, at a minimum, pH and disinfectant.
 - ◆ Provide the make and model number of an approved chemical monitoring and control system that meets the applicable requirements established by the NSF/ANSI 50 performance standard. This unit must be interlocked with the recirculation pump by an approved method.
- r. Salt Electrolytic Chlorine Generators, Brine Electrolytic Chlorine or Bromine Generators**
- ◆ Only pool grade salt that has been certified, listed, and labeled to either NSF/ANSI Standard 50 or NSF/ANSI Standard 60 by an ANSI-accredited certification organization, and/or have an EPA FIFRA registration shall be used.
 - ◆ The saline concentration of the pool water shall be maintained in the required range specified by the manufacturer.
 - ◆ Cleaning of electrolytic plates shall be performed as recommended by the manufacturer.
 - ◆ Corrosion protection systems shall be maintained in the pool basin.
 - ◆ A qualified individual should maintain disinfectant generators in good working order. If a maintenance engineer or equivalent is not part of the on-site facility staff, a backup disinfectant feeder is needed.
- s. Gas Chlorine Special Requirements**
- Chlorine gas has 100 percent available chlorine; however, in its gas form, chlorine is highly toxic. The cost of maintaining equipment, rising insurance premiums, training requirements and high toxicity levels has significantly reduced its use. The EPA is requiring Restricted Use Pesticide classification for the use of chlorine gas in public/commercial swimming pools. If considering the use of gas chlorine, contact DEH-FHD Plan Check for specific requirements.
- t. Heaters**
- Commercial heaters designed for heating public pools may be gas, electric, include a heat exchanger or heat pump. Plans shall show details of heater installation including valves, thermometer, pipe sizes, and material specifications. When running the heater, a bypass valve is typically positioned so that not all flow is directed into the heater and allows isolation or removal of the heater from the system when needed. Pools equipped with heaters shall have a fixed thermometer mounted in the pool recirculation line downstream from the heater outlet. Heated water is required for spa pools.
- u. Solar Heating Requirements**
- Solar heating systems typically used in conjunction with other heating systems shall comply with the following requirements:
- ◆ On a new pool/spa the solar heating system shall be designed with plumbing to the pool independent of the recirculation system.
 - ◆ Solar heating system suction outlets shall comply with recirculation requirements. Suction outlets must be split a minimum of 3 feet apart through a "T" fitting a minimum

- of 3 feet apart and be covered with approved drain covers.
- ◆ Suction outlets shall not be positioned within 5 feet of any pool inlet fitting.
- ◆ The installation of a solar heating system on a new or existing pool shall not interfere with the required turnover rate nor exceed the maximum pipe flow velocities.
- ◆ Solar heating equipment shall comply with applicable requirements established by the NSF/ANSI 50- 2012 performance standard.



Typical Solar Installation on new pool.

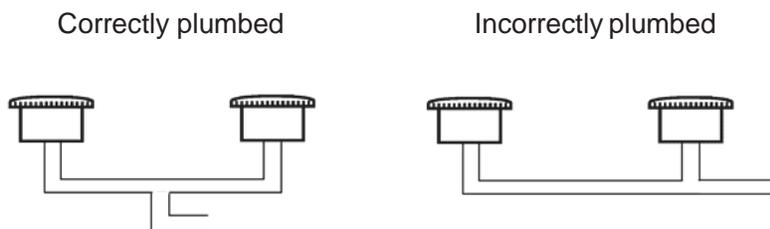
RECIRCULATION SYSTEM PLUMBING

a. Pool Piping

- ◆ Plans must indicate the type of pool piping that is proposed (PVC schedule 40 or 80, copper etc.).
- ◆ All plumbing shall be sized so that flow velocity does not exceed:
 - 6 feet per second in pump suction or copper piping.
 - 8 feet per second in any portion of the return system.

b. Main Drain

- ◆ Each pool shall be provided with a main drain submerged suction outlet typically located at the deepest point of the bottom of a pool that conducts water to a recirculating pump.
- ◆ Each pump on a pools system shall be connected to at least 2 suction outlets. The suction outlets shall be hydraulically balanced and symmetrically plumbed through one or more “T” fittings and shall be separated by a distance of at least 3 feet apart in any dimension between the suction outlets.
 - Does not apply to “Unblockable Drain” that has minimum dimensions of 18 inches by 23 inches.
- ◆ The velocity of the suction piping installed between the suction outlets shall not exceed 3 feet per second.
- ◆ The main drains shall be on a separate, dedicated suction line and not interconnected with the skimmer suction lines until they converge in the equipment area (using an ASME/ANSI approved valve).

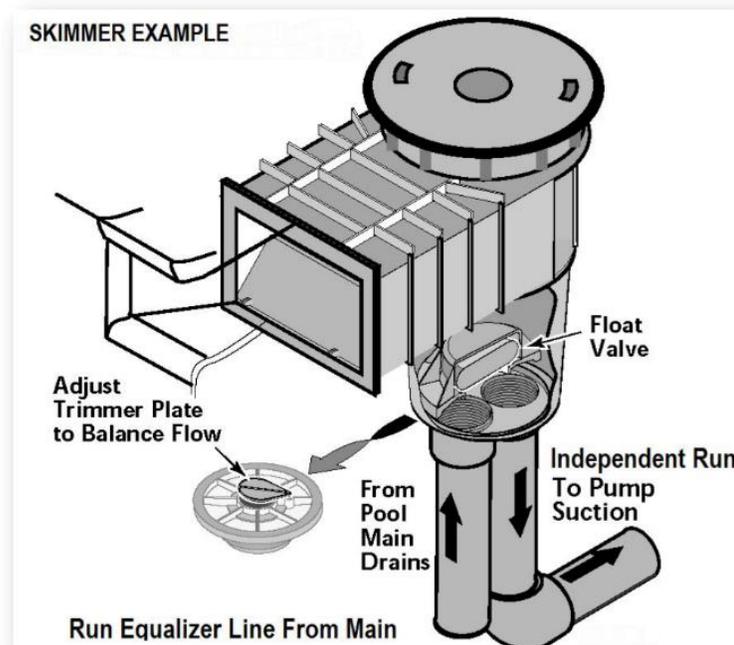


c. Suction Outlet Covers

- ◆ All suction outlet covers must be ANSI/APSP-16 compliant, minimally rated for the designed flowrate of the pump, and removable only with tools. Expirations for suction outlet covers/fittings must be adhered to.
- ◆ If the suction outlet covers require a sump, the depth of the sump shall be as specified by the cover manufacturer or 1.5 times the pipe diameter, whichever is greater.
- ◆ If the drain and/or suction covers do not require a sump, documentation of such from the manufacturer must be provided with the plans.

RECIRCULATION SYSTEM SKIMMERS

- ◆ Provide skimmer manufacturer's make and model number on plan.
- ◆ 1 skimmer is required for every 500 square feet of pool surface area, or an adequate number to meet 100% of pump flow at the manufacturer's maximum flow rating, whichever is greater.
- ◆ Skimmers shall have a trim plate or external valve to be individually adjustable for the rate of flow.
- ◆ Skimmer equalizer suction outlets if used shall be connected to at least two suction grate assemblies that meet the ANSI/APSP-16 2011 performance standard and are located at least 3 feet (915 mm) apart in any dimension between the suction outlets. Skimmers shall have an equalizer line check valve to prevent suction through the equalizer line when water levels are normal. Skimmer lines cannot be connected to a main drain. An automatic water level control shall be on pools without equalizer line.
- ◆ Each skimmer is required to have a removable and cleanable screen or basket to trap large solids. The screen or basket shall be accessible through an opening in the deck above the skimmer.
- ◆ Skimmers shall be provided with an air-lock protective device that shall not permit leakage of air into the recirculation suction piping system. This device shall not leak more than 3 gpm of water during normal operation.
- ◆ Skimmers shall be capable of continually withdrawing not less than 100% of the recirculation pump's maximum flow rate at 60 TDH. Skimmers shall be operated to continuously remove floating debris.
- ◆ Skimmers shall have a weir which automatically adjusts to variations of the water level less than 4 inches.
- ◆ Prevailing wind conditions will need to be considered when determining the location of skimmer(s).
- ◆ Skimmers cannot be used on a pool with a water surface area of 5,000 square feet or greater. See requirements for perimeter overflow systems.



PERIMETER OVERFLOW SYSTEMS

a. Perimeter Overflow

- ◆ **Requirement:** A perimeter overflow system is required on all pools with a surface area of 5,000 square feet or more. The gutter system shall be designed to allow continuous removal of water from the pool's upper surface at a rate of at least 100 percent (preferably 125 percent) of the recirculation rate. The gutter shall be designed to serve as a handgrip and to prevent entrapment of arms or legs. It shall permit ready inspection, cleaning and repair.
- ◆ **Location:** The overflow system must be integrated with the pool structure and extend completely around the pool parallel to the pool deck except where an entry or exit may require interruption.
- ◆ **Channel Detail:** The overflow channel shall be not less than 3 inches deep, the section shall not diverge with depth, and the width of the bottom shall be not less than 3 inches. The opening beneath the coping into the overflow system shall be a minimum of 4 inches beneath the coping in any direction measured radially from the inner edge of the overflow channel lip.
- ◆ **Channel Lip:** The overflow channel lip shall not be more than 12 inches below the level of the deck. The lip edge shall be rounded and shall not be thicker than 2 ½ inches nor thinner than 1 inch from the top 2 inches.
- ◆ **Channel Covering:** Covered overflow channels shall be permitted provided the openings do not exceed ½ inch in the smaller dimension.
- ◆ **Channel Outlets:** Outlet spacing and channel bottom slope shall be hydraulically designed by an engineer or architect who has experience working on public pools.
- ◆ **Channel Outlet Covers:** Overflow channel outlets covers shall be accessible for cleaning and maintenance. Openings of the channel outlet covers shall not pass a ½ inch sphere in the smaller dimension.
- ◆ **Channel Drain Piping:** Channel drain piping shall provide drainage of the overflow system, carry overflow water to a surge basin and return to skimming within 10 minutes after being flooded by a sudden displacement of the pool water by pool users.
- ◆ **Surge Storage Capacity:** A perimeter overflow system shall be provided with a minimum surge storage of not less than 1 gallon per square foot of pool water surface area. Surge storage shall be permitted in the surge basin, perimeter overflow channel and in the channel drain piping returning to the surge basin.
 - Exception: A professional engineer or architect licensed in the State of California who has experience working on public swimming pools may design an alternate method of construction for overflow drain piping and shall stamp plans and certify "The drainage of the overflow system, shall carry overflow water to the surge storage chamber or basin, and shall establishment hydraulic equilibrium in the pool and return to skimming within 10 minutes after being flooded by a sudden large use of the pool by pool users."
- ◆ **Surge Basin:** The surge basin shall be designed to have easy access for cleaning and inspection. The basin shall have at least one ladder access and shall have at least one 3-foot by 3-foot access opening. Lids shall be locked or require a tool to open.
 - The surge basin shall be equipped with an automatic make up water fill

device through an air gap or be protected by an approved backflow prevention device in accordance with Chapter 6 of the California Plumbing Code.

- o Show any overflow piping on the plans. Indicate whether it will drain to the sanitary sewer or an approved onsite septic system. The overflow pipe will be permitted only if it is connected to the sewage indirectly through an approved air gap or air break.

b. Rim Flow Gutter

- ◆ **Rim Flow Pool:** A perimeter overflow system in which the overflow rim is at the same elevation with the deck designed by professional engineer or architect licensed in the State of California who has experience working on public swimming pools.

RECIRCULATION SYSTEM INLETS

a. Returns

- ◆ Return inlets are fittings through which recirculated water enters the pool.
- ◆ 2 return lines are required for the first 10,000 gallons and 1 return line for each additional 10,000 gallons, or fractional part thereof. Return line piping shall be hydraulically sized and designed to provide an equal flow of water at each inlet.
- ◆ Inlet fittings shall be located no less than 18 inches below the waterline, except for a spa pool or wading pool. Inlet fittings must be separated by at least 10 feet and shall be located to ensure uniform circulation.
- ◆ Inlet fittings should be at least 5 feet from any skimmers or suction drains.
- ◆ Pools greater than 40 feet in width or 3,000 square feet in surface area shall have floor-mounted return inlets. All floor inlet fittings shall be located to provide uniform circulation and shall be installed flush with the surface of the pool bottom.
- ◆ Additional floor or wall inlets may be required to ensure uniform circulation throughout the entire pool.
- ◆ Provisions shall be made for adjusting the volume of flow through each inlet. Wall inlets shall be capable of adjusting the direction of flow generally via eyeball fittings and to produce sufficient velocity to impart a substantial circulatory movement to the pool water in conjunction with skimmers.

b. Water Supply

- ◆ Each pool shall be supplied with potable water by means of a permanently installed pipeline from a public water supply system permitted by the California Department of Public Health or from a source approved by DEH Land & Water Quality Division. There shall be no direct connection between any potable water supply system and the pool or its piping system unless protected by an approved backflow prevention device.
 - o If an auto-fill device or automatic makeup water flow controls are used, a manual override control shall be provided to maintain the proper pool water level. Backflow preventer must be designed for use under pressure (e.g., pressure vacuum breaker or reduced pressure zone device (RPZ)).

c. Hydrostatic Relief Devices

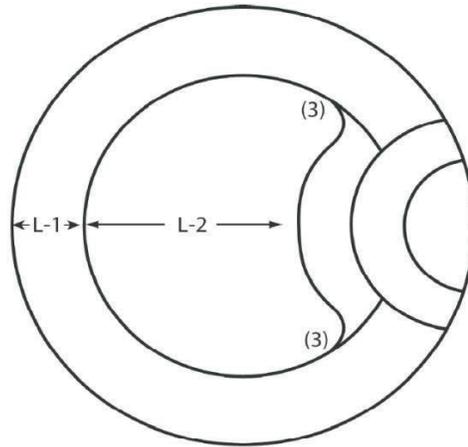
- ◆ in circumstances where the water table exerts hydrostatic pressure to uplift the pool when empty or drained, Hydrostatic Relief Devices shall be installed as required by the local plumbing codes. When used in conjunction with a safety vacuum release system, the hydrostatic relief device must meet the manufacturer's installation requirements for the safety vacuum release system.

SPA POOL DETAILED REQUIREMENTS

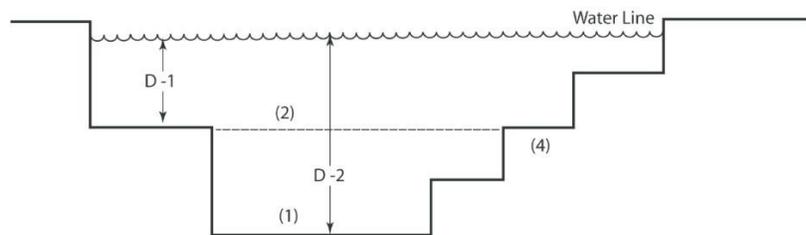
Spa pools shall meet all the requirements of a swim pool, except as follows:

- ◆ A 'Spa Pool' means a pool that incorporates a water jet system, an aeration system, or a combination of the two systems used in conjunction with heated water.
- ◆ The water surface area of a spa shall not exceed 250 square feet and the water depth shall not exceed 4 feet.
- ◆ The water depth over the benches shall be uniform and shall not exceed 24 inches. The bench shall be level with a step tread.
- ◆ Spa benches must be a minimum of 12 inches but not more than 24 inches in width. The clearance between parallel benches in a spa must be at least 24 inches. The floors of spas are required to have a minimum length and width, or diameter of 24 inches.
- ◆ 2 hand rails shall be provided extending from the deck to not less than a point above the top of the lowest step. Step risers shall not exceed 12 inches in height. The steps shall be located where the deck is at least 4 feet wide.
- ◆ A spa pool shall have a minimum of two depth markers. Slip-resistant depth markers are also required on the deck along with no diving tiles.
- ◆ The spa pool aeration and/or jet system shall be completely separate from the recirculation system.
- ◆ A spa pool shall be physically separate from any other pool, and there shall be no commingling of water between a spa pool and another pool.
- ◆ A single clearly labeled emergency shut off switch which controls both the recirculation system and the aeration and/or jet system shall be installed adjacent to the spa pool. It shall be located at least 5 feet away from the spa, and visible within the enclosure.
- ◆ The maximum allowable water temperature in a spa pool shall be 104°F.
- ◆ A continuous unobstructed 4 feet wide, slip-resistant, non-abrasive deck area of concrete or concrete like material must be provided flush with the top of the spa pool and extend around 50% or more of its perimeter. Where the deck is not 4 feet it shall be one foot or less.
- ◆ Spa steps must be located where the deck is at least 4 feet wide. If the pool deck is raised above ground level, it must have a protective railing extending around the entire perimeter, including areas not requiring a 4 foot deck.
- ◆ Landscape planters, flower beds, or similar unpaved areas are not approved within 4 feet of a spa pool unless such areas are behind a solid wall at least five feet in height as measured from the outside.
- ◆ A minimum of two return inlets will be required in a spa.
- ◆ Cold plunges are permitted under the following conditions:
 - The maximum size is 49 square feet and the maximum depth is 4 feet.
 - The cold plunge must be built in conjunction with a hot spa.
 - The cold plunge must have a refrigeration system or other means to cool the water.
 - Recirculation system requirements must comply with hot spa standards.

TOP VIEW



TRANSVERSE SECTION



Dimension	Depth of Water		Length of Sections	
	D1	D2	L1	L2
Minimum	-	24"	12"	24"
Maximum	24"	48"	24"	-

WADING POOL DETAILED REQUIREMENTS

A wading pool is a pool intended to be used for wading by small children and has a maximum depth of 18 inches at the deepest point.

- ◆ Bottom slope does not exceed 1 foot in 10 feet.
- ◆ Separate circulation system designed for 1 hour turnover rate
- ◆ Skimmer shall not have glazed tile on horizontal plane.
- ◆ If within the same enclosure as a standard swimming pool, a separate fence at least 4 feet enclosing the wader is suggested when the wader is closer than 15 feet to an adjacent body of water. 4 foot deck and 6 foot separation between bodies of water requirements apply.
- ◆ Wading pools with children's activities may be considered if all requirements for wading pools are met in addition to the following:
 - The filter circulation system is separate from any feature pump circulation system.
 - Separate circulation system is designed for ½ hour turnover rate.
 - Valves provided to control water flow to the features in accordance with the manufacturers' specifications.
 - A lifeguard must be on duty during operating hours.

SPRAY GROUNDS DETAILED REQUIREMENTS

"Spray Ground" means a public pool with no standing water in the splash zone and consists of a surge basin with a recirculation system from which water is directed through water features for contact with pool users. Spray grounds are also known as spray or splash pads, wet decks, or interactive water features.

- ◆ All parts of the spray ground shall be designed and constructed so that there are no safety hazards.
- ◆ A walking surface shall extend a minimum of 4 feet wide around the perimeter of the splash zone of a spray ground.
- ◆ The recirculation system shall be in operation at all times that the spray ground is open for use and shall have a minimum of four turnover cycles prior to opening for proper disinfection and filtration.
- ◆ There shall be no standing water within the splash zone.
- ◆ Nozzles that spray from the ground level shall be flush with the ground with openings no greater than ½ inch. Spray ground water features that extend above the ground must be clearly visible.
- ◆ The splash zone shall be sloped so that only water from the spray ground water feature flows back to the surge basin. Areas adjacent to the splash zone shall be sloped away from the spray ground to deck drains or other acceptable surface water disposal systems.
- ◆ All foggers and misters that produce finely atomized mists shall be supplied directly from a potable water source and not from the surge basin.
- ◆ When multiple pumps are used the control systems for the spray ground water feature pump and recirculation system pump shall be electrically interconnected so that when the recirculation pump is off the spray ground water feature pump also is off.
- ◆ The spray ground shall have a surge basin or treatment tank constructed of materials which are inert, corrosion resistant, nontoxic and watertight including materials such as concrete, fiberglass, high density polyethylene, stainless steel or other materials as approved by the enforcing agent which can withstand all anticipated loadings under full and empty conditions as determined by a licensed engineer or architect who has

- experience working on public pools.
- ◆ The total volume of the surge basin shall be at least 4,000 gallons or a minimum of three times the gallons per minute flow rate of all the spray ground pumps and the recirculation pump combined, whichever is higher.
 - ◆ The turnover time shall be one-half hour or less.
 - ◆ The suction intake for the spray ground or water feature pump in the surge basin shall be located adjacent to the recirculation return line.
 - ◆ When separate pumps are used, the suction intake for the recirculation pump shall be located in the lowest portion of the surge basin and on the opposite side from the suction intake for the spray ground pump.
 - ◆ The surge basin shall be designed to have easy access for cleaning and inspection. The basin shall have at least one ladder access and shall have at least one 3-foot by 3-foot access opening. Lids shall be locked or require a tool to open.
 - ◆ The surge basin shall be equipped with an automatic make up potable water fill device through an air gap or be protected by an approved backflow prevention device in accordance with Chapter 6 of the California Plumbing Code.
 - ◆ Ultraviolet (UV) light disinfection shall be used to supplement disinfection methods required in this chapter unless another treatment process is provided that has been determined by a nationally recognized testing laboratory to be capable of providing at least the equivalent level of reduction of cryptosporidium as the ultraviolet light disinfection system specified in this section. The ultraviolet light disinfection unit shall comply with the applicable requirements established by the NSF/ANSI 50-2010 performance standard.
 - ◆ An accurately calibrated ultraviolet light intensity meter that has been properly filtered to restrict its sensitivity to the disinfection spectrum shall be installed in the wall of the disinfection chamber at the point of greatest water depth from the light source.
 - ◆ The ultraviolet light unit shall be located on the recirculation system and shall be installed to provide treated water directly to the spray features. The UV equipment shall not be located in a side stream flow and shall be located to treat all water returning to water features.
 - ◆ The ultraviolet light disinfection system must be equipped with an automatic shutdown system that inactivates the spray ground and the water feature pump if the ultraviolet dosage rate drops below 40 mJ/cm².
 - ◆ Artificial lighting shall be provided at all spray ground pads which are used at night or which do not have adequate natural lighting so that all portions of the spray pad and deck may be seen easily. Lighting that may be exposed to the feature pool water shall be installed in accordance with the manufacturer's specifications and the California Electrical Code.
 - ◆ A means of diverting runoff from the splash zone shall be installed on the spray ground drainage piping before the surge basin to divert water to the storm drainage system when the spray ground is not in operation.
 - ◆ A removable and cleanable catch screen or basket shall be installed on the spray ground drainage system before it enters the reservoir to prevent larger debris from collecting in the surge basin.
 - ◆ Overhead electrical wires should be located at least 20 feet away from any spray pad, measured horizontally. No unprotected electrical circuits or wiring shall be located within 10 feet of any spray pad.
 - ◆ All grates located in areas accessible to patrons must be secured down to prevent patrons from inadvertently accessing suction outlets, mechanical components, and other potential safety hazards. Both the design and operational procedures should

- ◆ assure that trip hazards are prevented.
- ◆ For the purposes of the Pool Code, sprayed water that drains immediately to a sanitary sewer shall not be considered as a regulated public pool.

SPECIALIZED ADD-ONS

This section relates to features which are added to swimming pools that are considered for general recreational use.

Diving Boards and Platforms

- ◆ Diving boards and platforms shall be anchored to the pool deck, constructed of corrosion resistant material, designed and constructed to be easily cleanable and finished with a durable slip resistant material.
- ◆ Diving boards or platforms greater than 18 inches in height above the deck shall be provided with a ladder or stairs for access.
- ◆ Hand rails shall be provided at all ladders and stairs leading to diving boards or platforms more than 1 meter above the water. Diving boards and platforms that are over 1 meter above the water shall have guard rails on both sides of the diving board or platform that extend to a point on the platform directly above the water's edge. Guard rails shall be 36 inches above the diving board or platform.
- ◆ See the pool code for dimension requirements for pools with diving boards. Platforms and diving boards shall conform to the USA Diving Rules and Codes, Part 1, Subpart A and Appendix B.
- ◆ **Note:** Pools with diving boards and platforms may be specifically designed for competition only and not for general recreational use.

Bulkheads

A bulkhead is a floating movable partition that physically separates a pool into two different sections. Typically, a bulkhead is used to shorten the overall length of a pool, which generally increases the pool's versatility. For example, a 75 meter competition pool can be shortened to allow it to be used for 50 meter competition. Bulkheads that are designed to move typically rest on the pool gutter. There are either skid plates or wheels on the bottom of the bulkhead that roll along the pool gutter lip. Many of the bulkheads that are designed to move have the ability to be filled with air to minimize the weight impact when moving the structure. Some are completely buoyant. Other manufacturers provide a power-driven solution. When the bulkhead reaches its new position, it is secured in place with a mechanism to confirm the proper dimension for the activity. If air was used to move the bulkhead it would be removed to add stability to the structure during programming. Bulkheads are typically constructed of fiberglass, PVC, or stainless steel. Issues that may impact material selection may include ability to easily move the weight of the bulkhead, durability and maintenance requirements. The following is needed for bulkhead approval on a new or existing public pool:



- ◆ An adequate number of lifeguards shall be provided at all times the pool is in operation.
- ◆ The bulkhead shall be removable.
- ◆ The bulkhead shall be designed, installed and operated so that the possibility of entrapment is reduced to a minimum. The bulkhead shall be installed so that either:
 - The bulkhead extends down to the pool floor and openings between the bulkhead and pool floor and walls is at least 3 inches but not greater than 5

- inches OR
 - There is at least 4 feet of clearance between the bottom of the bulkhead and the pool floor and openings between the bulkhead and pool walls are at least 3 inches but not greater than 5 inches.
- ◆ If a bulkhead is operated with an open area underneath, the following conditions are required:
 - No one shall be allowed to swim beneath the bulkhead.
 - A line of contrasting color at least 4 inches wide shall mark the bottom edge of the bulkhead.
 - The bottom of the bulkhead shall be designed so that a pool user cannot be entrapped underneath the bulkhead.
- ◆ The bulkhead shall be at least 4 feet in width and finished on top with a durable, slip-resistant material.
- ◆ The distance from the normal water level to the top of the bulkhead shall conform to the requirements in the California Code of Regulations (CCR), Title 24.
- ◆ The bulkhead placement shall not interfere with the required water circulation in the pool.
- ◆ The bulkhead shall be designed to afford a handhold as required in the CCR, Title 24.
- ◆ The proper number of entrances/exits to the pool as required in the CCR, Title 24 shall be provided when the bulkhead is in place.
- ◆ The pool manager and staff shall be trained in the proper operation and maintenance of the bulkhead and the procedures shall be part of the pool operations manual.
- ◆ Proper operation of the bulkhead shall be monitored during all hours of operation.

Spray & Water features

Sprays or similar features shall be permitted only in water depths not exceeding 2 feet, typically for pools with zero depth entry or wader pools as defined in the California Health & Safety Code. Such features are more for esthetics than as play features. Ensure the following:

- ◆ The pool must be situated in a commercial, supervised setting, no residential apartments or common interest developments.
- ◆ The spray devices must be designed, constructed and installed so that they do not create a safety hazard. Nozzles that spray must be flush with the pool wall, with openings no less than one-half inch.
- ◆ Jets placed in sidewalls of pool shall be located above the water line.
- ◆ Depth of water to be two feet maximum where jets enter pool and outlets to be spaced not less than 3 feet apart.
- ◆ Jets shall not converge into the pool water such that the view of the pool bottom is obscured or project beyond the two feet depth.
- ◆ The height of the water column shall not exceed 6 feet.
- ◆ The spray jet suction pump to be on a separate loop from the pool recirculation pump but electrically interconnected so that the spray jet cannot be on independent of the recirculation pump.
- ◆ The feature pump should be no more than a single speed ½ HP to ensure a low velocity spray.
- ◆ When pool water is used for spray features, it shall be disinfected before use. A separate point-source chlorinator to be placed in the discharge line of the spray jet pump. If a chlorinator pump is used, then it is to turn on and off with the spray jet pump. Ultraviolet (UV) light disinfection in accordance with spray grounds may be used to supplement the disinfection method.

Water features such as waterfalls are typically allowable at that portion of a spa pool where the 4 foot deck is not provided. The following shall apply:

- ◆ Pool to be situated in a commercial, supervised setting, no residential apartments or common interest developments.
- ◆ Feature may use up to 20% of the return water from the filter system, however all waters used in the feature shall not be counted toward attaining the designed turnover rate. Return piping system shall be designed and capable of handling the additional feature flow when the feature is turned off.
- ◆ Features that require more than 20% of the flow rate shall be supplied by an additional pump that drafts from a suitable collector tank. All water features that utilize water from the pool shall be designed to return the water to the pool.
- ◆ Features shall be interlocked with the jet pump, not the recirculation pump.
- ◆ Where the feature plumbing lines are susceptible to holding stagnant water, feature pump shall be started with sufficient time prior to opening to flush such plumbing lines with treated water from a point source chlorinator.
- ◆ Design shall allow that water does not cascade along vertical surfaces to prevent biofilm growth.
- ◆ Surfaces shall be smooth and easily cleanable. Slime and biofilm layers shall be removed routinely on all accessible surfaces.

Moveable Floors Systems

Moveable floor systems adjust the vertical height of a swimming pool floor to allow for varying depths by use of engineered controls as indicated in the Model Aquatic Health Code.

- ◆ The moveable floor design shall not impede the effectiveness of the water treatment system.
- ◆ Moveable floors shall allow for inspection, cleaning and maintenance of the area underneath the floor where pool water resides when the floor is elevated.
- ◆ The surface of the moveable floor shall be slip resistant if it is intended for installation where the water depth will be less than 5 feet.
- ◆ A strategy must be identified to ensure that pool users will be prevented from transitioning to deeper water when a moveable floor is not continuous over the entire surface area of the pool.
- ◆ The underside of the moveable floor shall not be accessible to pool users.
- ◆ The design shall protect against bather entrapment and/or entanglement between the moveable floor and the pool walls and floor.
- ◆ If the proposed 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.
- ◆ The speed of a moveable floor shall be less than or equal to 1.5 feet per minute.
- ◆ Use of the moveable floor portion of the pool shall not be open to users when the floor is being raised or lowered.
- ◆ A floor depth indicator shall be provided that displays the current pool water depth.
- ◆ Warning markings stating "Moveable Floor" shall be provided at each 25 foot interval around the perimeter of the moveable floor.
- ◆ Handrails positioning shall not create tripping hazards or deck obstructions.

SPECIAL PURPOSE POOLS

Special Purpose Pool is a pool constructed exclusively for a specific, supervised purpose or use, such as instruction, competition or medical treatment. A special purpose pool may be exempted from construction standards that are not applicable to the proposed use. Any proposed construction that deviates from Title 24 will be evaluated based on nationally recognized standards and conditions deemed necessary for the safe operation of proposed design. With the exception of activity pools in a waterpark setting, special purpose pools shall not be used for general recreational use and shall be separately enclosed from standard pools.

Examples:

- ◆ Therapy or medical treatment
 - Requires two hour turnover.
- ◆ Competition
 - Shallow end may be excluded.
- ◆ Instruction
 - Ladders, stairs or steps may be exempted.
 - Training bars or exercise bars are allowable.
- ◆ Scuba Diver training tank

RECREATIONAL WATERPARK & ATTRACTIONS

In addition to the Pool Code, The California Division of Occupational Safety and Health (DOSH), Amusement Ride and Tramway Unit shall set and enforce standards for aquatic rides and devices. Also see Guidelines from the California Conference of Directors of Environmental Health (CCDEH), Recreational Health Technical Advisory Committee. National standards for water features are featured in the 2018 Model Aquatic Health Code (MAHC) and are being developed by ASTM International (ASTM), originally known as the American Society for Testing and Materials.

Before initiating detailed plans and specifications, a pre-design consultation meeting should be scheduled with the designer, owner or representative of the facility and DEH to review the conceptual proposal. Specifications for the design of features and attractions shall be provided from the manufacturer.

Water parks with wave pools, lazy rivers, water course rides, speed slides, inner tube rides, child amusement lagoons, specialty design features, and other activity pools with play toy structures of certain designs require a report by an engineer certifying the design of the water feature is consistent with safety engineering practices and industrial standards. The certifying engineer shall have experience in safety design, including ergonomic aspects of biomechanics of recreation waterpark facilities. Turnover rates of 2 hours or less are advised for water recreation attractions and specialized pools. Lifeguards and/or attendants shall be required for these attractions.

Slide Types

A "Slide" means an aquatic feature where users slide down from an elevated height into water.

- ◆ "Pool Slide" means a slide having a configuration 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 and all other non-flume slides that are mounted on the pool deck.
- ◆ "Speed slides" are generally steep straight slides. Speed slides are generally designed with a run-out to provide protection for bathers on entry to water. Instructions to bathers are required to ensure proper entry to the slide and placement of feet and legs to prevent injury.
- ◆ "Waterslide" includes conventional flumes or tubes that runs into a landing pool or runout through a fabricated channel with flowing water with slopes averaging less than 12 percent. The last 10 feet of the flume or tube perpendicular to the pool is designed to create a reduced exit speed. Speed sufficient to keep a timid slider from stopping in the ride. They are designed to be used one person at a time with proper spacing to prevent collisions between sliders. Head first sliding is not allowed on these rides. See the CCDEH guidance document on waterslides.
- ◆ "Drop Slide" means a slide that drops bathers into the water from a height above the water versus delivering the user to the water entry point. Generally short straight slides that may be from 6 to 15 feet in height that drop at a predetermined height above pool water level. Depth requirements vary in accordance with the particular design.

Landing Pools

Waterslide landing pools sometimes referred to as plunge pools are the bodies of water intended and designed to receive a bather emerging from the waterslide flume for the purpose of terminating the slide action and providing a means of exit to a deck or walkway area.

- ◆ The exit of any flume shall be designed to ensure that users enter the landing pool or

slide runout at a safe speed and angle of entry.

- ◆ If steps are provided instead of exit ladders or recessed steps with grab rails, they shall be installed at the opposite end of the landing pool from the flume exit with a handrail.
- ◆ The minimum landing pool operating water depth at the slide flume terminus shall be three feet. This depth shall be maintained for a minimum distance of 10 feet in front of the slide terminus from which point the plunge pool floor may have a constant upward slope to allow a minimum water depth of two feet at the base of the steps. The floor slope shall not exceed one foot in 10 feet.
- ◆ The landing pool dimension between any slide flume terminus and the opposite side of the pool shall be a minimum of 20 feet excluding steps.
- ◆ The slide flume terminus shall be designed by the design engineer who can demonstrate to the department's satisfaction that riders will be adequately slowed prior to discharge so as to prevent injury or harm to the rider upon impact with the plunge pool water. The slide terminus shall be flush with the pool wall and located at or below the pool water level.
- ◆ The minimum distance between any landing pool side wall and the outer edge of any slide terminus shall be five feet. The minimum distance between adjacent slide flumes shall be six feet.
- ◆ A minimum length of slide flume of 10 feet shall be perpendicular to the landing pool wall at the exit end of the flumes.

Surf Pool

Any pool designed to generate waves dedicated to the activity of surfing on a surfboard or analogous surfing device commonly used in the ocean and intended for sport as opposed to general play intent for wave pools.

Lazy Rivers

"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 pool users over a defined path. A lazy river may include play features and devices. A lazy river may also be referred to as a tubing pool, leisure river, leisure pool or a current channel.

- ◆ Handrails, steps, stairs and propulsion jets for lazy rivers shall not protrude into the river.
- ◆ Means of access/egress shall be provided at each 150 foot interval around the lazy river.
- ◆ A handhold in compliance with the pool code shall be required on at least one side of the lazy river but shall not include horizontal bars and/or recessed handholds.
 - Exception: Handholds shall not be required where users are required to be in or on a tube while in the lazy river.
- ◆ All bridges spanning a lazy river shall have a minimum clearance of both 7 feet from the bottom of the lazy river and 4 feet above the water surface to any structure overhead.

Wave Pool

A pool designed to simulate breaking or cyclic waves for purposes of general play and that is not primarily designed for standup surfing or bodyboarding.

- ◆ A perimeter deck shall be provided where bathers gain access to the wave pool at the shallow or beach end and in locations where access is required for lifeguards.
- ◆ 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.
- ◆ Recessed steps shall not be allowed along the walls of the wave pool due to the entrapment potential.

- ◆ A wave pool operator shall provide a United States Coast Guard-approved Type II or Type III life vest that is free and available for use by a non-swimmer or a child under 48 inches in height. A wave pool operator shall also provide a United States Coast Guard-approved Type II or Type III life vest that is free and available for use to any other patron at the request of the patron.
- ◆ An audible signal shall be provided and used prior to resuming wave action to warn patrons of impending waves. That audible signal may be of any duration but shall sound within 15 seconds immediately prior to resuming the breaking wave action. The audible signal shall be loud enough so that it can be heard by all patrons of the wave pool but shall not exceed 90 decibels.
- ◆ Lifeguards shall be assigned to guard a wave pool. An emergency stop for the wave equipment shall be easily accessible to the lifeguards.

Guidance for water toys at splash pads

1. Low profile water toys that protrude above the surface of the splash pad that produce flow streams, including aqua domes, spray loops, water cannon, sea shells and the like shall conform to the following:
 - ◆ The diameter of the piping shall be at least 4 inches to prevent a climbing hazard.
 - ◆ All exposed hardware and any other sharp projections, if they exist, shall be covered to prevent injuries to bathers.
 - ◆ The water velocity at any nozzle shall be restricted to 20 feet per second.
 - ◆ If there are nozzles, they must not stick out in a way that could cause injuries to bathers.
2. Water toys that protrude above the surface of the splash pad that produce flow streams from above, including dumping buckets, dumping bells, thunder domes, pelicans, aqualiens, rain forest, raining flowers and the like shall conform to the following:
 - ◆ The velocity at the nozzles shall be restricted to 20 feet per second.
 - ◆ The nozzles shall not stick out in a way that could cause injuries to bathers.
 - ◆ All exposed hardware and any other sharp projections if they exist shall be covered to prevent injuries to bathers.
 - ◆ The height of the water column shall not exceed 6 feet.
 - ◆ The holes in the floor fitting shall not exceed 5/16 inches.
 - ◆ There shall be eight feet of clearance between the pad bottom and the water feature to prevent injuries to bathers.

ANCILLARY FACILITIES

DECKING

A continuous and unobstructed 4 foot minimum width deck that is made of slip resistant, cleanable, nonabrasive concrete or like material must be provided flush with the top of the pool and extend completely around the pool. The deck width shall be measured from the poolside edge of the coping lip. Indicate on plans.

Exception: a deck at least 4 feet in width shall extend around 50 percent or more of the perimeter of a spa pool.

- a. The deck area shall further extend 4 feet on both sides and rear of any diving board, fixed disabled access assistance device or slide and their appurtenances.
- b. Complete pool deck and deck drainage plans. The deck must slope a minimum of one eighth (1/8) inch per foot but no more than one quarter (1/4) inch per foot away from the pool to a deck drainage system and shall be constructed and finished to prevent standing water.
- c. Multiple pools within the same enclosure shall be separated by a distance of at least 6 feet.
- d. Deck coverings or other materials that are not equivalent to concrete in strength, durability and slip resistance and are not able to withstand repeated brushing, scrubbing or cleaning procedures shall not be installed or used within 4 feet of the pool. All deck surfaces must have a coefficient of friction value of .42 or greater. Sample material may be required for other than broom finished concrete.
- e. Construction joints where pool or spa coping meets the deck shall be watertight and shall not allow water to pass through to the underlying ground. Apply mastic as needed.
- f. The maximum voids between adjoining concrete slabs or between concrete slabs and expansion joint material shall be three-sixteenths (3/16) inch of horizontal clearance
- g. Landscaping and planters are not to be located within 4 feet of any pool. Avoid using plants or trees which shed in close proximity to the pool.
- h. Deck drains, when used, shall be no more than 25 feet apart, and no single drain shall serve more than a 400 square feet area. Continuous trench-style drains may be designed to handle areas greater than 400 square feet. There shall be no direct connection between the pool deck drains and the sewer or plumbing drainage systems.
- i. When the pool is to be used at night, pool deck areas and emergency egress areas shall be provided with lighting so that persons walking on the deck can identify hazards. Lighting fixtures shall be aimed towards the deck area and away from the pool surface insofar as practical.
- j. A hose bib, with a non-removable hose bib vacuum breaker or other approved backflow prevention device, is required in the pool area. The hose bib shall be located so that all portions of the pool deck may be reached with 75 foot length of hose attached to the hose bib
- k. A handicap lift built into the deck or transfer wall next to the pool or spa for accessibility shall meet the standards of the local building official. For the purpose of the Pool Code:
 - ◆ Device shall be installed where there is at least 4 feet of continuous walkway behind the lift or transfer wall at the pool or spa.
 - ◆ Deck reinforcement and installation shall be according to manufacturer's specifications.
- l. Pavers for swimming pool decks may be allowed if the following requirements are met:
 - ◆ The pavers must be slip-resistant with a wet coefficient of friction of 0.6 or more.
 - ◆ Pavers adjacent to the pool must be set in mortar on a concrete foundation from

the edge of the pool extending at least 4 feet to form the continuous walkway. Deck drainage requirements apply.

- ◆ The pavers must be free of jagged edges, have maximum horizontal voids of 3/16" and have maximum vertical elevation difference of 1/4".
 - ◆ The joints must be of mortar or other permanent inorganic material to prevent washout.
 - ◆ Joints where pavers or flagstone meet coping are required and must be water-tight.
 - ◆ Brick on sand or sand used as grout are not approvable.
- m. Shade structures requirements over a pool or spa:
- ◆ The shade structure shall slope to the deck drains and away from draining into the pool.
 - ◆ The overhead clearance of the shade structure shall be a minimum of 8ft over the deck.
 - ◆ The shade fabric shall allow water to pass through and not pond on the shade.
 - ◆ If the shade structure drainage affects the water quality, it shall be removed.
 - ◆ The supporting posts or columns shall be located at least 4 feet from the pool edge.
 - ◆ If there is a bird problem, steps shall be taken to discourage birds from landing on the shade structure.
 - ◆ The shade structure shall have a maintenance schedule and be cleaned at least weekly.
 - ◆ **NOTE:** Be wary of placing overhead structures above pool deck including any lines, building roofs, overhead walkway or balconies closer than 8 ft. of the pool deck.

ENCLOSURE (See Appendix 1)

The pool shall be enclosed by one (1) of the following: a permanent fence, portion of a building, wall or other approved durable enclosure. The enclosure shall have a minimum effective perpendicular height of 5 feet as measured from the outside of the enclosure from finish grade to the top of the enclosure. A pool enclosure higher than 5 feet is recommended. Areas outside of the enclosure must be a public area.

EQUIPMENT ROOM

- a. Pool equipment shall be enclosed such that all equipment installed for recirculation, filtration and disinfection of pool water shall be limited to persons authorized by the pool owner or operator.
- b. Pool equipment shall be mounted on a continuous slab of concrete or other equivalent easily cleanable and nonabsorbent material as approved.
- c. Floors shall be sloped a minimum of 1/4 inch per foot to a drain.
- d. A hose bibb shall be provided in the equipment area with appropriate non-removable hose bibb vacuum breaker.
- e. Allow for storage to safely store chemicals off the floor and to avoid mixing and getting wet.

PUBLIC TOILET FACILITIES, SHOWERS, DRESSING AREA

- a. Separate toilet facilities shall be provided for each gender at the public pool site.
 - ◆ Exception: They may be omitted when pool users have access to such toilet facilities either in living quarters located not more than 300 feet in travel distance from the pool or in an adjacent building such as a recreational facility, clubhouse, or cabana.
 - Gender neutral accommodations are acceptable where toilet facilities may

otherwise be omitted.

- b. Shower and dressing facilities shall be provided for users of a pool.
 - ◆ Shower and dressing facilities may not be required when pool users have access to such facilities in adjacent living quarters.
- c. Using a factor of one pool user per 15 square feet of pool water surface area and/or spray ground splash zone area, the following shall be provided:
 - ◆ One (1) toilet for every 60 women or less;*
 - ◆ One (1) toilet and one urinal for every 75 men or less;*
 - ◆ One (1) shower for every 50 pool users;
 - ◆ One (1) lavatory for every 80 pool users.

***Note:** while separate toilet facilities are called for, these may be designated as gender neutral if only one toilet and one toilet with urinal is called for in accordance with California Codes.

- d. Floors finishes must consist of a hard nonabsorbent surface, such as concrete, unglazed ceramic tile or other approved material which extends upwards onto the wall at least 5 inches with an integral covered base. Concrete floors shall be sealed with an approved sealer; paints are unacceptable. Floors shall be slip resistant and shall be sloped not less than ¼ inch per foot to floor drains. Carpeting and other similar artificial floor covering is not permitted in toilet or shower rooms.
- e. Restroom walls and ceilings shall be smooth, non-absorbent and easily cleanable.
- f. 4 feet of approved wainscot (fiberglass reinforced polyester [FRP], ceramic tile, cement plaster or the equivalent) is required on walls in the restrooms; Full height on shower walls shall be so covered.
- g. Hot and cold water shall be provided to lavatories and showers. A means to limit the hot water to 110°F shall be provided to prevent scalding. This temperature limit control shall not be adjustable by the pool user.
- h. Showers shall be provided with soap from soap dispensers or containers. When showers are required, bather showers contrasted with rinse showers are anticipated.
- i. For toilet facilities, toilet tissue, handwashing soap, and paper towels or hot air blowers, shall be provided in permanently installed dispensing devices.
- j. A diaper changing station and a minimum of one waste receptacle shall be provided for each toilet facility.
- k. All doors and windows shall be arranged to prevent viewing of the interior from any portion of the building used by the opposite sex and from view from the outdoors. View screens are permitted for this purpose.

Drinking Fountain

One guarded jet drinking fountain shall be provided for the first 250 pool users and an additional fountain shall be provided for each additional 200 pool users or fraction thereof.

- ◆ Exception: Drinking fountains shall not be required when drinking water is available at adjacent living quarters, or in an adjacent building such as a bathhouse, cabana, clubhouse or recreational facility. In general drinking fountain is requisite when public toilet facilities are necessary.

VENTILATION

Indoor pools, dressing rooms and toilet rooms shall be ventilated to the requirements in Chapter 4 of the California Mechanical Code.

Indoor Swimming Pool Ventilation

The American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) defines ventilation rates for buildings, and these rates form the basis of virtually all building codes. In the case of swimming pools, the major objective of the ventilation system is to balance the indoor relative humidity levels with energy consumption, whilst ensuring that airborne pollutants are effectively removed by a process of dilution. The preferred relative humidity level of the air in an indoor swimming pool is between 50 to 60%. Permitting the air to hold more moisture than the suggested 60% causes excessive condensation, which usually accelerates corrosive attacks on materials, and encourages the growth of molds and fungi.

The ventilation rate for an indoor swimming pool, as set by ASHRAE, is designed to provide acceptable indoor air quality for the average pool using chlorine as its primary disinfection process. The rate is also designed for average conditions. In the case of high occupancy public pools, the rate is liable to be somewhat inadequate.

ASHRAE stipulates that pools with no spectator areas should be ventilated at the rate of between 4 to 6 air changes per hour. Spectator areas should be ventilated at a rate of between 6 to 8 air changes per hour. The exhaust air from the pool is potentially rich in moisture and in chloramines and trihalomethanes. For this reason, it is sensible not to use this as a source of return air for showers and locker rooms. Ideally the pool area should be operated under a negative air pressure of 0.05 to 0.15 inches of water, relative to the adjacent areas. Also, the exhaust grilles should be located as closely as is possible to the warmest water in the building, especially if there are spa pools installed. In addition to ventilation, indoor pools will have acoustical treatment provided.

SAFETY EQUIPMENT & SIGNS

Approved Safety Equipment

- ◆ A 12 foot minimum fixed length rescue pole with a permanently attached body hook.
 - A short length may be proposed for a spa to effectuate rescue
- ◆ A 17 inch minimum exterior diameter life ring with attached rope of 3/8 inch diameter, long enough to span the maximum width of the pool. Rope store to prevent kinking or fouling.
- ◆ For pool greater than 75 feet in length or 50 feet in width, provide safety equipment on two opposing sides of pool.

Signs

All signs shall have clearly legible letters or numbers not less than 4 inches high, unless otherwise specified, affixed to a wall, pole, gate or similar permanent structure in a location visible to all pool users. Post the following safety signs:

- ◆ **No lifeguard.** Where no lifeguard service is provided a sign shall be posted "NO LIFEGUARD ON DUTY." The sign shall also state in letters at least 1 inch high "Children under the age of 14 shall not use pool without a parent or adult guardian in attendance."
 - Exception: "No lifeguard sign" requirement does not apply to spray grounds that have no standing water.
- ◆ **Pool user capacity.** A sign shall indicate the maximum number of pool users permitted for each pool.
 - **Spa pool.** The pool user capacity of a spa pool shall be based on one pool user for every 10 square feet of pool water surface area.
 - **Other pools.** The pool user capacity for all other pools shall be based on one pool user for every 20 square feet of pool water surface area.
 - Exception: Pool user capacity requirements and signs do not apply to wading pools or spray grounds.
- ◆ **Artificial respiration and cardiopulmonary resuscitation sign.** Illustrated diagram with text at least ¼ inch high of artificial respiration and cardiopulmonary resuscitation (CPR) procedures.
- ◆ **Emergency sign.** Emergency telephone number 9-1-1 with numbers not less than 4 inches. The number of the nearest emergency services and the name and street address of the pool facility in lettering at least 1 inch high.
- ◆ **No diving sign.** "NO DIVING" sign posted conspicuously in the pool area for pools less than 6 feet in depth.
- ◆ **No use after dark.** Where pools were constructed for which lighting was not required, a sign with clearly legible letters not less than 4-inches high shall be posted in a prominent place near each entrance to the pool area. This sign shall state "NO USE OF POOL ALLOWED AFTER DARK".
- ◆ **Keep closed.** "KEEP GATE CLOSED" or "KEEP DOOR CLOSED" sign on exterior side of gates/doors leading into pool enclosure areas.
- ◆ **Diarrhea.** A sign in letters at least 1 inch high and in a language or diagram that is easily readable shall be posted to be visible from each entrance which states that persons having currently active diarrhea or who have had active diarrhea within the previous 14 days shall not be allowed to enter the pool water.

- ◆ **Warning sign for a spa.** Warning sign for spa use at least 1 inch high stating "Caution":
 - 1) Elderly persons, pregnant women, infants and those with health conditions requiring medical care should consult with a physician before entering the spa.
 - 2) Unsupervised use by children under the age of 14 is prohibited.
 - 3) Hot water immersion while under the influence of alcohol, narcotics, drugs or medicines may lead to serious consequences and is not recommended.
 - 4) Do not use alone.
 - 5) Long exposure may result in hyperthermia, nausea, dizziness or fainting.
- ◆ **Emergency shut off.** "Emergency shut off switch" for spa in letters at least 1 inch high posted at the emergency shut off switch.
- ◆ **Spray grounds and splash pads.** A sign posted at each spray ground, visible from any part of the spray ground, stating "CAUTION: WATER IS RECIRCULATED. DO NOT DRINK."
- ◆ **Wave pool.** A sign in letters at least 1 inch high shall be posted that describes the requirements for wave pools found in Section 115952 (a through c), California Health and Safety Code.

Direction of Flow

- ◆ The direction of flow for the recirculation equipment shall be labeled clearly with directional symbols such as arrows on all piping in the equipment area.
- ◆ Where the recirculation equipment for more than one pool is located onsite, the equipment shall be marked as to which pool the system serves.
- ◆ Valves and plumbing lines shall be labeled clearly with the source or destination descriptions.

Pool Test Kit

A test kit for measuring the disinfectant residual, pH, and, if used, cyanuric acid concentration shall be provided at the public pool. The chlorine or bromine test kit shall be the diethyl-p-phenylenediamine (DPD) type or otherwise be capable of testing free-halogen residual. Chlorine test kits shall be capable of testing for free chlorine and total chlorine, such that combined chlorine concentrations can be determined.

Automated monitoring and control devices may be used in addition to the test kit.

LIFEGUARDS & REQUIRED EQUIPMENT

Lifeguard service shall be provided for any public swimming pool in which a direct fee is charged for use. Lifeguards are typically present when providing swimming lessons, coaching or overseeing water-contact sports. Wave pools and other activity pools also require lifeguards.

- a. For public pools with lifeguard personnel on duty, the pool operator of each public pool area shall have the following additional safety equipment:
 - ◆ A Red Cross 10-Person Industrial First Aid Kit or the equivalent.
 - ◆ An operating telephone.
 - ◆ A backboard and head immobilizer.
 - ◆ An Automated External Defibrillator (AED) unit [starting 2019]. An AED will be required at K-12 schools with pools regardless of lifeguard service.

CCDEH GUIDELINES-PUBLIC POOL COVERS

Floating Pool Covers

- ◆ The pool must be segregated from all dwelling units by an approved fence or enclosure.
- ◆ The pool must be under the supervision of management personnel or other responsible person(s) who has sole access to the pool area when it is not open for use. The pool area must be locked to prevent any usage of the pool when the cover is in place. The pool may not be reopened for use until the pool cover has been removed from the pool and properly stored by the responsible party.
- ◆ The pool cover, when not in use, must be completely removed, rolled up, and stored at least four feet away from the pool. In the case of spa pools, the cover must be physically removed from the immediate premises to prevent bathers from re-covering the spa pool.
- ◆ The pool cover must meet current American Society for Testing and Materials (ASTM) labeling requirements.

Safety Covers

- ◆ Submit plans to DEH detailing the types of suction outlet cover(s) that are being proposed.
- ◆ The pool cover must meet current American Society for Testing and Materials (ASTM) requirements for safety covers.
- ◆ The cover must be installed and used according to manufacturer's instructions.
- ◆ Provisions must be made for the stair handrail and deep end ladder so that they are retractable when the cover is in place.

Requirements for specific types of safety covers:

Stretch Covers

- Tie down anchors must be designed so that they are fully recessed into the deck and not a tripping hazard.
- The pool must be under the supervision of management personnel or other responsible person(s) who has sole access to the pool area when it is not open for use. The responsible party must remove and store the pool cover before opening the pool for use.

On Deck Unit with on Deck Track

- All retracting mechanisms and their associated housing must be located a minimum of 4 feet back from the pool edge.
- Tracks located on the deck surface must be designed to prevent tripping and not exceed a height of 5/8 inch. The track must be of contrasting color to the deck surface. The track must be installed far enough away from the coping so as not to interfere with the handhold of the coping. Screws used to secure the track to the deck must be countersunk.
- The activating switch must be installed so that the operator has a clear view of the entire pool surface.
- The cover shall be designed such that the person operating the cover must hold the control switch the entire time the cover is running.
- Provisions must be made to ensure that only responsible parties have keys to operate the pool cover mechanism. Children should not be allowed to operate the pool cover mechanism.

Sub-surface unit with under coping track

- The cover must completely retract into the housing unit.
- When the cover is retracted, the housing cover must be completely flush with the pool deck and form a handhold that extends 1 to 2 inches over the edge of the pool and not exceed 2½ inches in thickness.
- The track located under the coping must be designed and installed so that the total thickness of the coping does not exceed 2½ inches.
- The sub-surface housing compartment must drain to an approved disposal system through an air gap. It must not be directly connected to any sewer or deck drain system.
- The activating switch must be installed so that the operator has a clear view of the entire pool surface.
- The cover shall be designed such that the person operating the cover must hold the control switch the entire time the cover is running.
- Provisions must be made to ensure that only responsible parties have keys to operate the pool cover mechanism. Children should not be allowed to operate the pool cover mechanism.

Canopy Type

- Columns and all supporting mechanisms for the canopy must be located at least 4 feet back from the pool edge when the cover is retracted.
- The activating switch must be installed so that the operator has a clear view of the entire pool surface.
- The cover shall be designed such that the person operating the cover must hold the control switch the entire time the cover is running
- Provisions must be made to ensure that only responsible parties have keys to operate the pool cover mechanism. Children should not be allowed to operate the pool cover mechanism.

FIELD CONSTRUCTION INSPECTIONS

Requests for inspections should be made at least 1-2 weeks in advance. Contact the plan check specialist listed on your plan approval letter to schedule an inspection. The construction of the pool or spa pool must conform to the latest set of DEH approved plans.

✓ **PLUMBING INSPECTION**

Typically, this inspection is for large pools with exposed plumbing, including return lines in the floor of the pool. All piping that is installed in trenches, shall be inspected prior to backfilling. This inspection is also necessary for major plumbing repairs completed as part a pool renovation.

✓ **PRE-GUNITE INSPECTION**

The pre-gunite inspection is conducted after rebar has been installed and prior to applying pneumatically placed concrete. During this inspection, dimensions, slope, radii, skimmers, plumbing, main drains (placement and split), pipe sizes, lights, deck, structure clearance, water supply, and waste water disposal are all verified as installed in accordance to the DEH approved plans.

✓ **PRE-PLASTER INSPECTION**

The pre-plaster inspection is conducted after the gunite is applied but prior to the application of the final surface of the pool shell. Dimensions, slope, radii, drain covers, coping, waterline tile, depth marker tiles with no diving markers and tile line, deck slope, fencing, gates, deck drains, steps, handrails, ladders, waste water disposal, skimmer openings, recirculation equipment, sight glass, ancillary facilities, and hose bibb installation are all verified as installed in accordance with the DEH approved plans. Safety equipment is verified during this inspection. Upon approval to plaster, the pool is filled with water requiring that the enclosure and recirculation equipment be compliant at this inspection.

✓ **FINAL INSPECTION**

Upon completion of all construction, including all previous corrections; permanent utilities (electric, gas, potable water, sewage disposal) must be provided. Pool chemistry must be properly balanced, all recirculation equipment operational, all safety equipment and signage in place.

When more than 4 inspections are necessary to approve a new pool facility to operate, additional fees for supplemental inspections will be assessed.

The owner/operator will apply for an annual Environmental Health Permit prior to the final construction inspection. The application along with applicable permit fees, are due at the time of final inspection.

Final construction must be approved by DEH-FHD Plan Check prior to the issuance of a health permit and the opening of a public pool facility or the use of remodeled areas.

Appendix 1

POOL ENCLOSURE REQUIREMENTS

Enclosure/Fencing:

- Pool enclosures shall be constructed over hard or permanent material equivalent to concrete and shall present a 5 foot barrier minimum.
- The enclosure shall be designed and constructed so that it cannot be readily climbed by small children. Horizontal and diagonal member designs, which might serve as a ladder for small children, are prohibited. Horizontal members shall be spaced at least 48 inches apart.
- Fence to be a continuous vertical barrier, either solid, or with openings, holes or gaps in the enclosure, doors and/or gates which shall not allow the passage of a 4 inch diameter sphere.
- Planters or other climbable structures shall not be permitted immediately adjacent to the fence.
- Masonry or stone columns must be a minimum 5 feet tall, smooth, and non-climbable.
- Chain link may be approved provided that the openings are not greater than 1 ¾ inches measured horizontally. Also, where the barrier is composed of diagonal members, the maximum opening formed by the diagonal members shall be no more than 1 ¾ inches.
- Fencing and gates must be constructed out of a durable material such as wood, metal, masonry, plexiglass, or vinyl. Fencing and gates must be installed so they are stable and secure.

Gates:

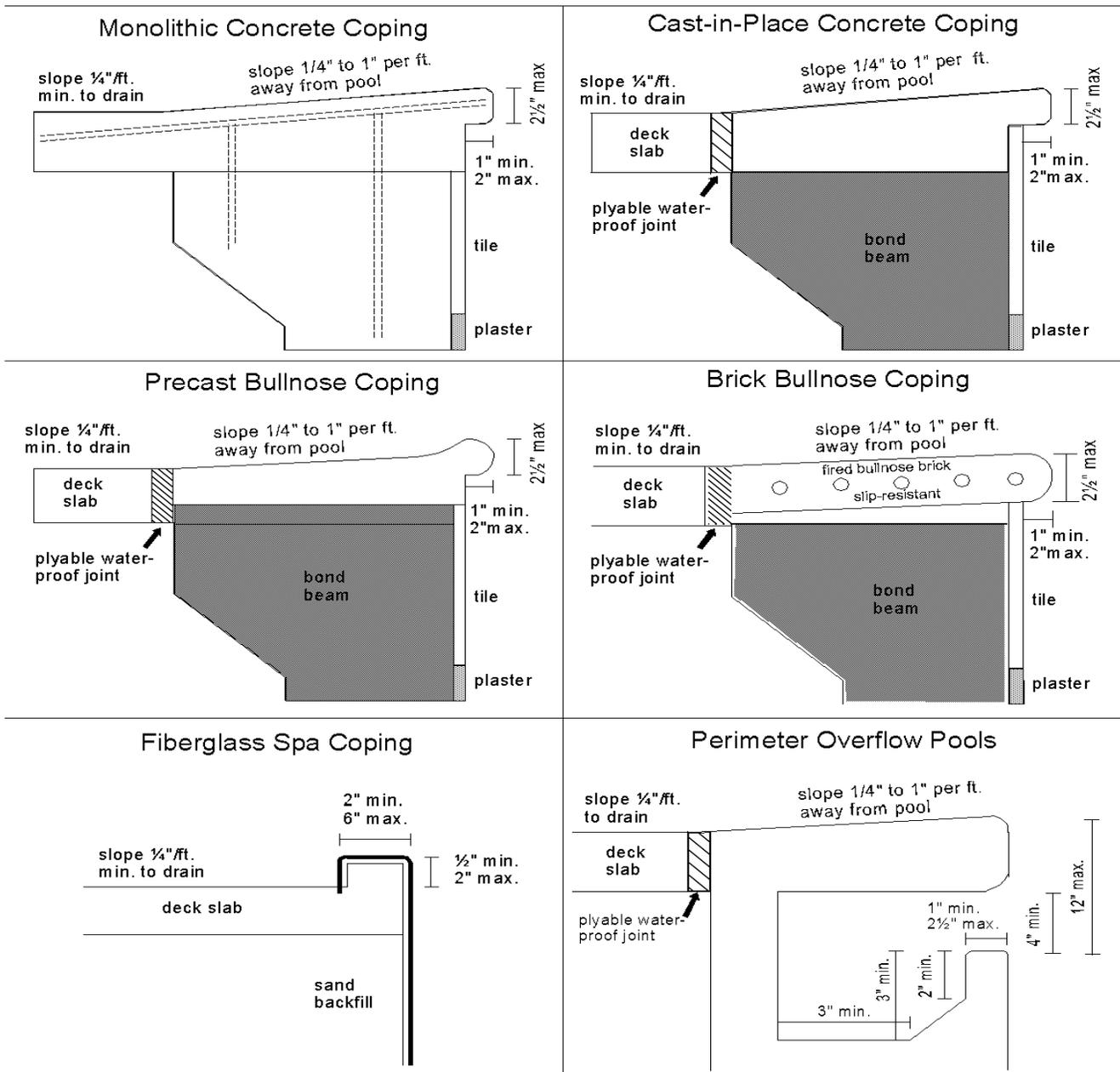
- The enclosure shall be designed and constructed so that all persons will be required to pass through common pool enclosure gates or doors in order to gain access to the pool area. All gates and doors exiting the pool area shall open into a public area or walkway accessible by all patrons of the pool.
- Gates and doors shall open outward away from the pool except where otherwise prohibited by law.
- Gates and doors shall be equipped with self-closing and self-latching devices. The self-latching device shall be designed to keep the gate or door securely closed.
- Hand activated door or gate opening hardware shall be located at least 42 inches but no higher than the ADA maximum height requirements above the deck or walkway. A gate locking mechanism using a key cylinder, keypad or swipe unit card must be installed to meet these requirements.
- Primary entry gates for pool user entry shall be single gates. Where double gates or multiple gates are needed at least one leaf shall be secured in place and the adjacent leaf shall be secured with a self-latching device.
- The pool enclosure shall have at least 1 means of egress without a key for emergency purposes. Unless all gates or doors are so equipped, those gates and/or doors which allow egress without a key shall be clearly and conspicuously labeled in letters at least 4 inches high "EMERGENCY EXIT."
- Gates and doors shall be capable of being locked during times when the pool is closed.

REQUIREMENTS ASSOCIATED WITH PUBLIC POOL ENCLOSURES

With regards to new construction, the pool plans submitted by the swimming pool contractor will in most cases be generic in detailing the enclosure and differ from that submitted by the landscape architecture. It is mandatory that the pool owner and contractor coordinate to ensure the enclosure requirements above are met. This includes the following:

- a. Submit a plot plan of the property drawn to scale indicating the topography, arrangement and location of present and proposed buildings and structures including the equipment room and location of the proposed swimming pool(s), pool enclosure and deck.
- b. Submit a landscape plan of the area within 5 feet of the exterior of pool enclosure. This is a non-climbable zone. Planters or other structures, trees, vegetation such as bushes and shrubbery, pipes, hose bibs, conduits, utility meters, window ledges, ledges on buildings, columns, pedestals, posts or other structures shall not encroach into the 5 foot setback from the enclosure.
- c. Show clearances to scale from pool edge to pool enclosure and clearances outside of pool enclosure. The area 5 feet outside of the pool enclosure shall be a common area open to the public.
- d. Doors, patio walls, openable windows, or gates of living quarters or associated private premises shall not be permitted as part of the pool enclosure. The pool will be ordered closed if the window that is part of the pool enclosure is made operable, whether that change is made by the pool operator or the occupant of the residence or required by another regulatory authority.
- e. A balcony that protrudes into a non-climbable zone of an enclosure must be fitted with a balustrade that complies with the requirements of a pool fence. Similarly, a stairwell shall be designed so that it is not within the 5 foot clear span so that the railing or balustrade will not need to comply with Title 24 requirements.
- f. Any objects or structures that could be climbable or provide a surface that could be stood on shall not be permitted to be placed to encroach upon the 5 foot clear span area of the enclosure.
- g. Clearly show and label the entire enclosure around the pool area on the plans. Show a scaled profile view of all fences, gates and doors. Outline the entire enclosure with a yellow marker on a set of plans. Include dimensions, elevations and appropriate cross sections as needed.
- h. Prior to or during the time the pool is to be excavated, trees situated at the pool site should be removed so that they will not be within the pool enclosure. Sand and similar play non-aquatic areas shall not be designed to be within the pool enclosure.
- i. Glass objects shall not be permitted in a swimming pool enclosure.
- j. Prior to installing an enclosure around a pool or spa, contact your local building official in order to determine their requirements. Whenever there is a difference between local building codes and health codes, the more stringent requirement will be enforced.

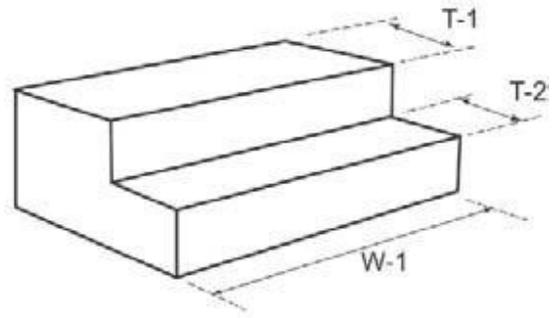
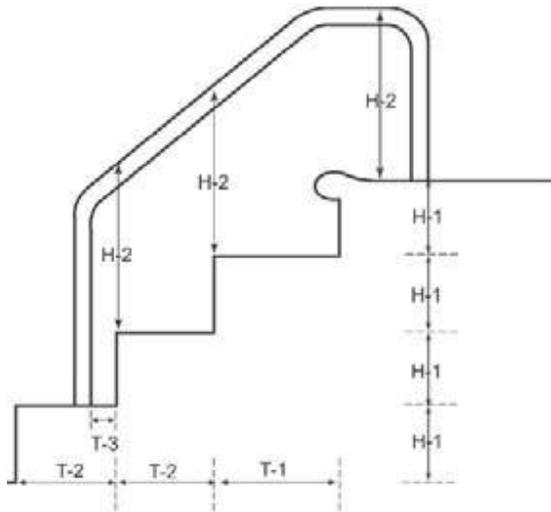
APPROVED HANDHOLDS



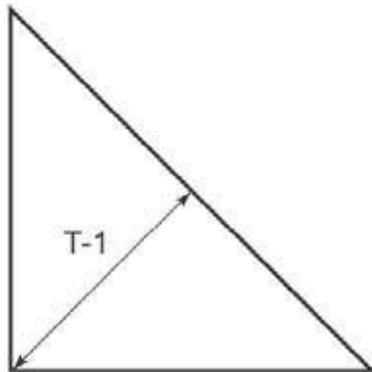
C-701 Handhold

Appendix 3

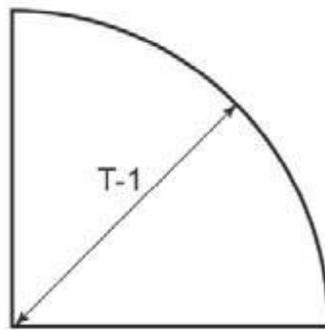
STAIR & HANDRAIL DIMENSIONS



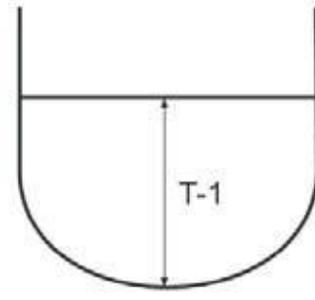
Standard Step



Triangular Step



Convex Step

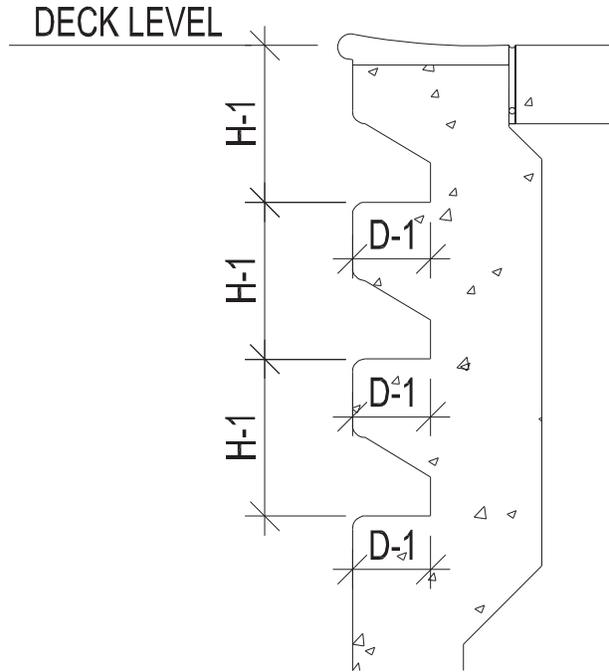


Concave Step

DIMENSIONS	T-1 STANDARD	T-1 TRIANGULAR, CONCAVE, CONVEX	T-2	T3	W-1	H-1	H2
Minimum	14"	21"	12"	3"	24"	6"	28"
Maximum	18"	24"	16"	---	---	12"	36"

Six inch minimum radius at "pinch points".

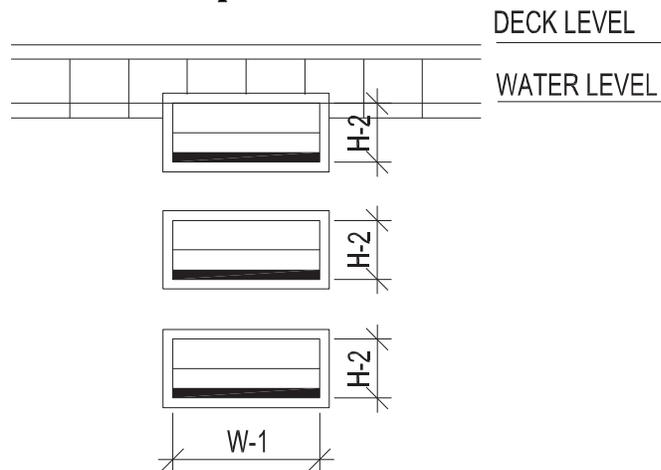
RECESSED STEP DIMENSION



Recessed Step Dimensions: Side View

DIMENSIONS	H-1	H-2	W-1	D-1
<i>Minimum</i>	6"	5"	14"	5"
<i>Maximum</i>	12"	---	---	---

Recessed Step Dimensions: Front View



Appendix 4

DEPTH MARKERS

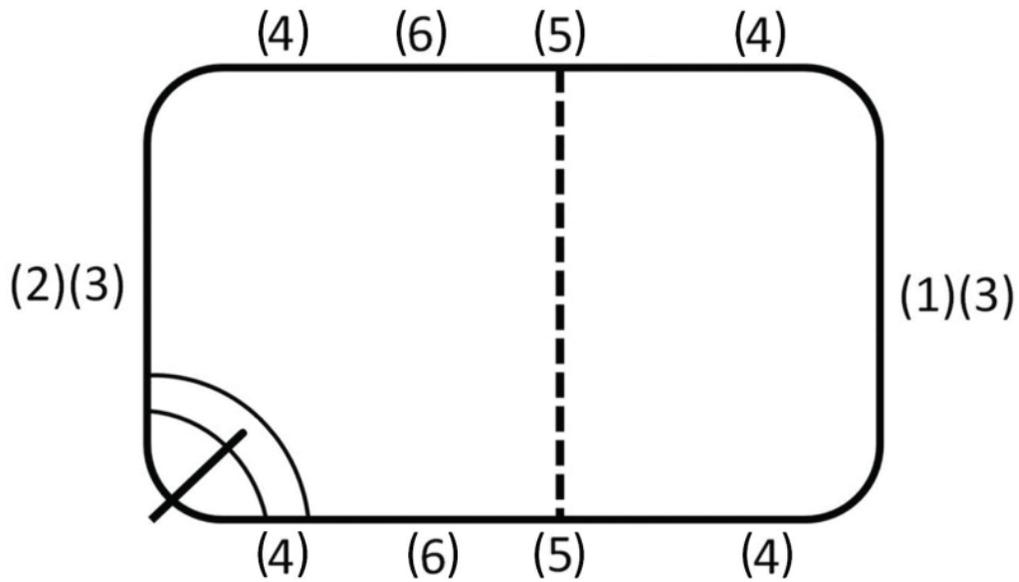


Figure 31B-8 Pool Code - Depth Marker Locations

Notes for Figure 31B-8

1. *Maximum depth.*
2. *Minimum depth.*
3. *Each end of pool.*
4. *Both sides at the shallowest and deepest part of pool.*
5. *At the break in the bottom slope between the shallow and deep end.*
6. *Along the perimeter of the pool at distances not to exceed 25 feet.*

Appendix 5

USE OF GAUGES TO ENSURE PROPER PUMP FUNCTION

Environmental Health and pool professionals rely on the information that vacuum, and pressure gauges provide whenever:

- ◆ A new pool is constructed,
- ◆ A pump is replaced on an existing pool, or
- ◆ Additional features are added to an existing pool.

The California Building Standards Code, Title 24, Chapter 31B, requires a pressure and vacuum gauge to be installed on every public pool pump system. These requirements are regulated and enforced by local Environmental Health agencies. The pressure gauge is used to measure return pressure in pounds per square inch (PSI) and the vacuum gauge is used to measure suction in inches of mercury (Hg).

The pressure and vacuum gauge readings are necessary to calculate the Total Dynamic Head (TDH) of a pool system. TDH is:

- ◆ The amount of resistance when fluid is moving in a hydraulic system.
- ◆ The pressure required to overcome elevation differences and friction losses in order to produce a required pressure output.
- ◆ Required to properly determine the correct pool pump size and its ability to circulate water through the pool's hardware and plumbing system.

When pool water flows through the recirculation system, resistance to that flow is created in the pipes, valves, fittings, pool filter and anything in the flow path.

To calculate TDH:

Step	Action
1	Ensure the filter is backwashed before beginning.
2	Read the pressure and vacuum gauges and record the PSI and inches Hg.
3	Multiply the vacuum gauge reading by 1.13 to convert to feet of water.
4	Multiply the pressure gauge reading by 2.31 to determine pump head in feet of water.
5	Add both figures to determine the TDH.

Example: 12 inches Hg read at vacuum gauge and 25 PSI read at pressure gauge.

$$12 \times 1.13 = 14 \text{ feet of water}$$

$$25 \times 2.31 = 58 \text{ pump head in feet of water}$$

$$14 + 58 = 72 \text{ TDH}$$

After determining the TDH, a pump performance curve (TDH versus flowrate) for the proposed pump is calculated to determine the relative flowrate (gallons per minute) that the selected pump is capable of delivering. EHS will determine if this flowrate meets the required limits based on the minimum turnover time and the maximum flow velocity of the pipe.



Pressure Gauge

Vacuum Gauge FAQ's



Vacuum Gauge

Q: What is the purpose of the vacuum and pressure gauges?

A: The readings from the vacuum and pressure gauges are used to determine the Total Dynamic Head (TDH) on the pool system. TDH may be used to verify the pool pump and filter are correctly configured on an existing pool.

Q: Which pumps are required to have a vacuum gauge?

A: All booster and recirculation pumps are required to have a vacuum gauge.

Q: My Safety Vacuum Release System (SVRS) has a vacuum reading. Does this meet the requirement?

A: Pumps with an adjustable Vacless SVRS meet the requirement as they do not require a separate gauge. The reading may be taken from the Vacless gauge. Other SVRS devices do not meet the requirement as the reading may not be as accurate as a standard vacuum gauge.

Q: Where should the vacuum and pressure gauges be inserted?

A: The pressure and vacuum gauges are inserted into the two drain plug ports at the base of the pump housing.

- The vacuum gauge is inserted on the suction side of the pump, usually below the strainer basket.
- The pressure gauge is inserted on the pressure side of the pump, usually under the impeller. The "Pool Code" no longer requires an influent gauge for the filter. However, if that gauge exists, it may be used in lieu of the pressure gauge attached to the pump.

Things to Remember:

- Most pumps operate around 8 Hg.
- A zero rating is rare and may indicate the gauge is not working properly. If a gauge is installed in the wrong location the reading may also be zero.
- If the needle on a gauge is fluctuating up and down, it may mean the pump has lost its prime or the SVRS has tripped.
- Some pumps may have a compound gauge that reads the pressure (PSI) and the vacuum (Hg). A compound gauge installed on the suction side of a pump will read the vacuum only.
- Some gauges will read negative inches Hg. There is no need to write a negative symbol; a vacuum is negative pressure.

Appendix 6

**OPERATIONAL TIME AND SPEED SETTINGS
(RPM DATA SHEET)**

NOTE: Use one form for each Variable Speed & SVRS Pump

FACILITY NAME: _____

FACILITY ADDRESS: _____

OWNERS NAME: _____

During operational hours set the RPM to maintain the flow rate between ____ GPM and ____ GPM.

PROGRAMMED OPERATIONAL HOURS	SPEED SETTINGS (RPM)	FLOW RATE (GPM)

Signature: _____ Date: _____

Print Name: _____ Title: _____

**A COPY OF THIS SHEET MUST BE MAINTAINED IN A PROTECTIVE COVERING
ON SITE IN THE EQUIPMENT ROOM**

Appendix 7

QUALIFIED INDIVIDUALS FOR POOL CONSTRUCTION WORK

LICENSE TYPE*	LICENSE DESIGNATION
C53	Swimming Pool Contractor
C61/D35	Pool and Spa Maintenance Contractor
C36	Plumbing Contractor
C35	Lathing and Plastering Contractor

*Contractor may perform work as listed in license description below.

See website: [Licensing Classifications - CLSB](#)

Authority cited: Sections 7008 and 7059, Reference: Sections 7058 and 7059 (Business and Professions Code)

C53

A swimming pool contractor constructs swimming pools, spas or hot tubs, including installation of solar heating equipment using those trades or skills necessary for such construction. This is the license needed for new pool construction.

C61/D35

A pool and spa maintenance contractor installs, replaces or repairs pool motors, pumps, filters, gas heaters and any above ground piping in connection with pools; includes electrical switches, breakers, pool lights, diving boards, existing solar systems that heat pools, pool and spa acid baths and applies vinyl liners to existing surfaces.

C36

A plumbing contractor provides a means for a supply of safe water, ample in volume and of suitable temperature for the purpose intended and the proper disposal of fluid waste from the premises in all structures and fixed works. This classification includes but is not limited to:

- All gas appliances, flues and gas connections for all systems including suspended space heating units. This does not include forced warm air units;
- Water and gas piping from the property owner's side of the utility meter to the structure or fixed works;
- Installation of any type of equipment to heat water, or fluids, to a temperature suitable for the purposes listed in this section, including the installation of solar equipment for this purpose; and
- The maintenance and replacement of all items described above and all health and safety devices such as, but not limited to, gas earthquake valves, gas control valves, back flow preventers, water conditioning equipment and regulating valves.

C35

A lathing and plastering contractor coat surfaces with a mixture of sand, gypsum plaster, quick-lime or hydrated lime and water, or sand and cement and water, or a combination of such other materials that create a permanent surface coating, including coatings for the purpose of soundproofing and fireproofing. These coatings are applied with a plasterer's trowel or sprayed over any surface which offers a mechanical means for the support of such coating and will adhere by suction. This contractor also installs lath (including metal studs) or any other material prepared or manufactured to provide a base or bond for such coating.