

*St. Louis County Department of Public Works
Division of Building Permits*

GUIDELINE FOR PRIVATE SWIMMING POOL MASTER PLANS

(Both Above-Ground and In-Ground Private Pools)

This guideline is intended to provide the Pool Manufacturer, Supplier, Installer and/or Pool Designer with submittal information and the basic code requirements that need to be incorporated into pool construction documents (plans) presented for private pool master plan set-up.

Several years ago, St. Louis County developed a master plan system whereby the construction plan documents for residential projects such as private swimming pools could be pre-approved, kept on file, and assigned a Master Plan Number to be referenced on subsequent application requests for permit.

This system gives the Pool Manufacturers/Suppliers of Above-Ground Pools the opportunity to provide their customers, the individual homeowners and pool installers, a method to obtain their permits more easily and quicker. A significant marketing tool for the manufacturer/supplier, the master plan system eliminates the burden on the applicant to submit sealed and signed plans, calculations and specifications every time a permit application is filed. Likewise, the In-Ground Pool Contractors can utilize the system for the same basic reasons.

A building permit is required for all swimming and bathing pools in which the water depth equals or exceeds 24", pool wall depth equals or exceeds 26", or the volume of the pool equals or exceeds 5000 gallons.

MASTER PLAN SYSTEM AND NUMBERS

As swimming pool plans are submitted and approved, each Pool Manufacturer or Pool Company will be assigned a Pool Manufacturer's or Pool Company's number. Each Above-Ground Pool shape having the same structural wall design will receive a master plan number with size as the variable or option. The Missouri Registered Design professional shall provide all the necessary details on the in-ground pool plans that will enable us to issue a single master plan to address all the custom shapes desired by the pool contractor. The plan view shall clearly indicate the shape of the in-ground pool may vary from site to site. Any features such as spas, fountains, sloping entries, underwater seats, etc. must be detailed showing how the feature is integrated into the pool design in order to be included with the master plan. Different structural types of pools (Examples: concrete vs. fiberglass) will require separate master plan numbers. It is anticipated some pool suppliers will have only one masterplan since they install only one type of pool. The numbering system works as follows:

MASTER PLAN #	845	-	11	-	01
	Pool Manufacturer or Pool Company's Number		Year plan was approved		The 1 st Masterplan (Type) for a Pool Manufacturer or Company.

Above-Ground Pool Masters will be set up under the Manufacturer's Name (or Pool Brand Name) for use by anyone who purchases or installs that particular pool. Retail suppliers and pool installers should band together to encourage the Manufacturer to master their pools for use by everyone. In-Ground Pool Masters will be set up under the Pool Contractor's Name for their exclusive use only. Thus In-Ground Pool Construction Documents (Plans) must include the phrase "Swimming Pool Master Plan for (insert name of pool company)" within title block.

PRIVATE POOL MASTER PLAN - BASIC SUBMITTAL REQUIREMENTS

- Four (4) sets of sealed, signed, and dated pool construction documents (plans) drawn to scale including the following as applicable to Above-Ground and In-Ground Pools shall be furnished:
 - a. Pool (footprint) shape configuration plan(s).
Exception: In-ground pool plans specifically developed for custom shape design flexibility from site to site.
 - b. Side elevation(s) for Above-Ground Pools.
 - c. Foundation/structural wall section(s).
 - d. Cross sections through the pool (both longitudinal and transverse) indicating slope of sidewalls and floor and water depth throughout. Include cross sections for both Diving and Non-diving Pools.
 - e. Sections and/or details of the ladders, steps, handrails, drains, diving boards, filters, structural supports and reinforcing, skimmers or gutters, underwater lights, etc.
 - f. Water supply system, drainage and water disposal system, filtering/recirculating and electrical system diagrams including grounding detail.
 - g. Material and performance specification notes.
 - h. Deck plans, elevations, deck and guardrail details, gate detailing, etc. for pre-fabricated decks that are included with an Above-Ground Pool Structure.
 - i. Elevations, sections, and details for barrier guards mounted on top of the Above-Ground Pool Structure.
 - j. Power safety cover details and specifications (if applicable).
- One (1) set of sealed, signed, and dated structural calculations verifying that the pool structure has been engineered and designed to withstand the expected forces shall be included with the plan submittal.

In-ground pool plans being set up for Master, allowing custom shape design flexibility from site to site, shall include a statement on the construction documents to the effect that the pool shape may be constructed in any configuration within given parameters. The Registered Design Professional shall determine and stipulate maximum dimensions relative to overall width, overall length, and pool depth (include both critical minimum and maximum horizontal and depth dimensions and other criteria for pools with diving boards) together with any other restrictions or criteria within reason that the Registered Design Professional deems appropriate relative to the shape design, structural integrity, safety, and construction of individual pools from the mastered base plan. The pool plans for this master set-up option should be a very comprehensive set of pool construction documents. We reserve the right to refuse this flexible custom shape master set-up option for any pool plan not considered workable or manageable by the Building Official because of inadequate detailing and information to cover the numerous possible shape configurations or for too many or unacceptable restrictions, etc. listed by the Registered Design Professional.

Do not include typical detailing for retaining walls, yard fences, etc. which will vary from site to site as part of your base master plan pool documents. However, code required performance criteria, such as for the filtration system, and prescriptive requirements should be incorporated as specification notes on the pool construction.

PROFESSIONAL ETHICS, RULES, AND SEALS **ON POOL CONSTRUCTION DOCUMENTS**

All Construction Plans and Calculations for both Above-Ground and In-Ground Private Pools must be prepared (or prepared under the immediate personal supervision), sealed, signed, and dated by a Missouri Registered Design Professional. Design Professionals not currently licensed in Missouri should file their application for registration to the Missouri Board for Architects, Engineers, & Land Surveyors (573-751-0047) immediately so as to not delay the new master plan set-up. Since we do not know who the pool manufacturers may be using for professional engineering services or whether they are or are not registered in Missouri it is the Pool Manufacturer, Supplier and/or Installer's responsibility to forward this information to the manufacturer and his professional to make sure that the professional has his/her Missouri Registration or is actively pursuing it. Plans with out-of-state seals will be accepted for the review process when, and only when, accompanied by a letter from the Design Professional that he/she has applied to the Missouri Board for his/her Missouri License. These plans and calculations will be reviewed but not approved for new master set-up until they are replaced by plans having the Design Professionals affixed Missouri Seal with signature and date.

Pool drawings and/or structural calculations having the affixed seal of more than one registered design professional will not be accepted without written explanation signed by both professionals describing the working relationship between the professionals. Multiple seals from different states of the same professional is acceptable. Each sheet of the swimming pool construction plans must be sealed by the Missouri Registered Design Professional with an original seal, handwritten signature, and date affixed to the cover sheet of each of the four (4) submittal sets after printing.

Structural calculations (one copy requested) must have the Missouri Registered Design Professionals original seal and handwritten signature with date on the cover or index sheet of the calculations.

CODES/STANDARDS IN EFFECT

2009 International Residential Code and Ordinance #24427
2009 International Building Code and Ordinance #24444
2009 International Mechanical Code and Ordinance #24438
2008 National Electrical Code and Ordinance #24439
2009 Uniform Plumbing Code and Ordinance #24441
ANSI/NSPI-3-99 Standard for Permanently Installed Residential Spas
ANSI/NSPI-4-99 Standard for Above-Ground/On-Ground Residential Swimming Pools
ANSI/NSPI-5-2003 Standard for Residential In-Ground Swimming Pools
ANSI/APSP 7-06 Standard for Suction Entrapment Avoidance in Swimming Pools, Wading Pools, Spas, and Hot Tubs

REQUIREMENTS THAT SHALL BE INCORPORATED
INTO THE POOL CONSTRUCTION PLAN DOCUMENTS

The following shall be detailed with notations on the drawings within the pool construction plan documents:

Structural Design

The pool structure shall be engineered and designed to withstand the expected forces to which the pool will be subjected including pressures of the adjacent earth and live and dead loads.

Wall Slopes

To a depth up to 2 feet 9 inches from the top, the wall slope shall not be more than one unit horizontal in five units vertical (1:5).

Floor Slopes

The slope of the floor on the shallow side of the transition point shall not exceed one unit vertical to seven units horizontal (1:7). The transition point between shallow and deep water shall not be more than 4 feet deep.

Surface Cleaning

All swimming pools shall be provided with a recirculating skimming device or overflow gutters to remove scum and foreign matter from the surface of the water. Where skimmers are used for private pools, there shall be at least one skimming device for each 800 square feet of surface area or fraction thereof. The equipment shall be sized to provide a turnover of the pool water at least once every 12 hours. The system shall be designed to give the proper turn over rate based on the manufacturer's specified maximum flow rate of the filter, in clean media condition of the filter.

Water Velocity

Water velocity in branch piping serving a minimum of 2 suction outlets shall be designed for a maximum of 3 feet per second. This will result in a maximum velocity of 6 feet per second if 1 of the 2 suction outlets is blocked. The water velocity between the tee of the branch piping and the pump shall not exceed 8 feet per second. The tee serving the branch piping between 2 or more suction outlets on a pump system shall be located between the suction outlets so the head loss in each branch run is essentially equal.

Walkways (if provided)

Curbs or sidewalks (if provided) around any swimming pool shall have a slip-resistant surface for a width of not less than 1 foot at the edge of the in-ground pool, and shall be so arranged as to prevent return of surface water to the pool. The perimeter surface (paved, concrete or unpaved surfaces) extending out from the edge of the pool measured 3' horizontally from the inside face-of-wall of the in-ground pool shall be bonded in accordance with Section 680.26(B)(2)(a) or (2)(b) of the National Electric Code (NEC)/2008.

Steps and Ladders

At least one entry/exit shall be provided from the shallow area of the private pools. Two entries/exits, one from the shallow area and one from the deep area, are required from pools with a depth of water equaling or exceeding 5'. Pools with a deep area equaling or exceeding 5' and a width exceeding 30', shall have an entry/exit on each side of the deep area in addition to the entry/exit in the shallow area.

Stairs for private pools shall have a maximum riser height of 12", a minimum horizontal tread depth of 8", and a minimum surface area of two hundred forty (240) square inches. All treads shall have a slip resistant surface. A minimum of one handrail, 1" to 1 3/4" inches in diameter, is required to serve a stair with a tread depth less than 10". When stairs are located in water depth over 48", the lowest tread shall be no less than 48" below the deck and visually set apart and located outside the wall of the pool.

Stairs recessed into the sidewall of the pool may be constructed with a tread depth of 5" and a tread width of 12". Handrails, grabrail, or handhold are required on each side of a recessed stair

Ladders shall have slip resistant treads with a minimum tread depth of 2" and a uniform height between ladder treads of a minimum of 7" and a maximum of 12". The clear distance between the ladder handrails located on both sides of the ladder shall be a minimum of seventeen inches (17") and a maximum of twenty-four inches (24").

Stairs for decks, pool area access, etc. outside of the pool basin or tank walls shall have a maximum riser height of 8 1/4", a minimum horizontal tread depth of 9" measured from nosing to nosing, and proper handrails/guardrails.

Handholds

Handholds shall be provided 8' on center around the pool edge in any area where the water depth exceeds 4 feet. A handhold is decking, coping, ledge, rocks, etc. within 12" of the waterline. Ladders, stairs and underwater seats and ledges are also considered a handhold.

Diving Boards

Minimum water depths, slopes, and distances for diving hoppers for pools with diving boards, based on board height above water, shall comply with ANSI/NSPI-5 2003 (Figure 3 and Table 1). The Missouri Registered Design Professional shall provide sectional views of the pool addressing the pool type, minimum depths, minimum widths at points, and the minimum lengths between points

Entries, exits, pool stairs, ladders, underwater benches, and other accessories shall be located outside the minimum window envelope detailed in Figure 6 ANSI/NSPI-5 2003 when the pool is designed for diving equipment.

Barriers Mounted on Wall of Above-Ground Pools or Guardrails for Pre-fab Decks

Refer to the attached sheet entitled "Pool Barrier Sections" for guard rail and other barrier requirements.

Power Safety Covers (if applicable)

Power safety cover plans and details shall be included as part of the pool construction documents when proposed as a possible option to the house wall barrier requirements. Power safety covers shall be tested and labeled under ASTM F 1346-91 (2003).

The following shall be incorporated into the pool construction documents as performance and prescriptive type specifications or general notes to qualify as a swimming pool master plan:

- Pool Location (Separation from other structures and lot lines)

Without site specific structural analysis by a Missouri Registered Design Professional the swimming pool wall shall be located a minimum of ___ feet away from any buildings/structures having a basement, a minimum of ___ feet away from any buildings/structures without basement, and a minimum of ___ feet away from any retaining walls so as to not induce additional surcharge loading on the foundation of the existing buildings, retaining wall structures, or overstress the walls of an in-ground pool due to surcharge loads from an adjacent building foundation or retaining wall

(Note: The above distances shall be established by the pool designer based on his/her pool structural analysis/design so as to not induce additional surcharge loading on existing buildings/structures foundations. Separate distances may be given for both the shallow and deep end of the pool if desired.)

The swimming pool wall shall be set back from the lot lines as required by the following whichever is most restrictive:

- Yard building line set-backs as regulated by the Zoning Code of St. Louis County or the Municipality in which it is located, or
- Located not less than 6 feet from any rear or side property line or 10 feet from any street property line.

Retaining Walls

Retaining wall(s) surrounding the pool require a separate building permit(s). Some designs allow for the use of the residential master plan system for retaining walls. Walls carrying the surcharge load of the pool shall be site specifically designed by a Missouri Registered Design Professional with 4 sets of sealed plans and 1 set of structural calculations. Note that walls retaining soil away from an in-ground pool may require the pool walls to be site specifically designed in the same manner. Please see the Residential Retaining Wall Handout found under the Documents and Residential Guides tab at <http://www.stlouisco.com/Portals/8/docs/Document%20Library/Public%20Works/code%20enforcement/guides/residential/Ret-Wall.pdf>.

Grades

Surrounding grades shall be such as to prevent surface water from entering in-ground pools; or, surrounding grades shall be leveled to set the above-ground pool structure. *(Select the appropriate statement depending on the type of pool.)*

No alteration of the existing stormwater drainage pattern of the area is permitted without prior approval of the appropriate site grading review agency.

Discharge Water

The pool shall be constructed and equipped to allow the pool to be completely emptied of water. All discharged water must be to a location that does not create a nuisance to adjoining property. Pool drains to empty the pool shall not be connected to the sanitary sewer system.

Entrapment Protection

This section shall only apply to pools with submerged suction outlets. This guideline promotes the use of skimmers and gutters as the sole means of returning surface water to the pump for recirculation.

All submerged outlet covers/grates shall comply with ASME/ANSI A112.19.8-2007 and be labeled as such or labeled "VGB 2008".

Submerged suction outlets and piping shall be installed in accordance with ANSI/APSP 7-2006. A single unblockable submerged suction outlet is permitted if installed per Section 5.5 of this Standard. Two submerged suction outlets piped in parallel to a single suction line shall be located 3 feet apart (measured center to center from the suction pipes) or be located on separate planes. Refer to Section 4.4 of this standard for maximum water velocity in the piping. See Section 4.6 of this standard for minimum flow ratings for each submerged cover/grate.

Water Supply

A back flow prevention device must be installed on the hose bibb used to fill the pool or in the water supply piping if the pipe discharge is below the maximum pool water level. Installation of the device on the supply piping must be done by a Licensed Master Plumber.

Water Treatment

Private swimming pools shall be designed and installed so that there is a pool water turnover through an approved filtration system at least once every 12 hours.

Electrical

All electrical equipment, components or apparatuses shall be U.L. listed and identified for the purpose they are to be used.

The installation shall comply with Article 680 of the 2008 National Electrical Code (NEC). All electrical work must be performed by a Licensed Electrical Contractor.

All overhead conductors must be a minimum of 10 feet horizontally from the inside edge of the pool. An above-ground pool with a deck would extend the 10 foot measurement to the outside edge of the deck. If this horizontal measurement is reduced, the overhead wires must be a minimum of 22'-6" measured in any direction to the maximum water level, base of diving board or any platform or deck. Refer to the NEC if the overhead conductors are not messenger supported (Triplex) as these dimensions are increased. Ameren Electric should be consulted for anything other than service drop conductors as the N.E.S.C. Code which governs Ameren Electric's facilities is usually more restrictive than the NEC.

Underground wiring is not permitted under the pool or within 5 feet horizontally of the pool wall. If space limitations prevent wiring from being routed beyond 5 feet from the pool edge, wiring may be permitted if installed by a method listed in Article 680.10 of NEC.

Light outlets or light fixtures shall not be less than 5 feet horizontally from the edge of the pool unless no part of the fixture is less than 12 feet above the maximum water level. Light outlets and light fixtures less than 10 feet horizontally from the edge of the pool must be ground fault circuit interrupter (GFCI) protected.

Underwater light fixtures must be protected by a GFCI unless the light fixture operates at less than 15 volts and is supplied by a transformer meeting the requirements of NEC 680.23.

Receptacle(s) supplying water pump or loads directly related to circulation and the sanitary system shall be located between 6' and 10' from the edge of the pool. This receptacle(s) must be the single, locking and grounding type and be protected by a G.F.C.I.

At least one general receptacle that is ground fault protected must be located a minimum of 6' from the edge of the pool but not more than 20'. All receptacles located within 20' of the edge of the pool must be G.F.C.I. protected.

All metal parts of the pool, structural reinforcing steel and electrical equipment associated with the pool shall be bonded and grounded in accordance with NEC Article 680. In addition, the perimeter walking surface (unpaved surfaces as well as poured concrete and other types of paved surfaces) within 3 feet of the inside wall of all pools, regardless of the method of pool construction, shall be bonded as specified in NEC Article 680 Section 26.

Mechanical

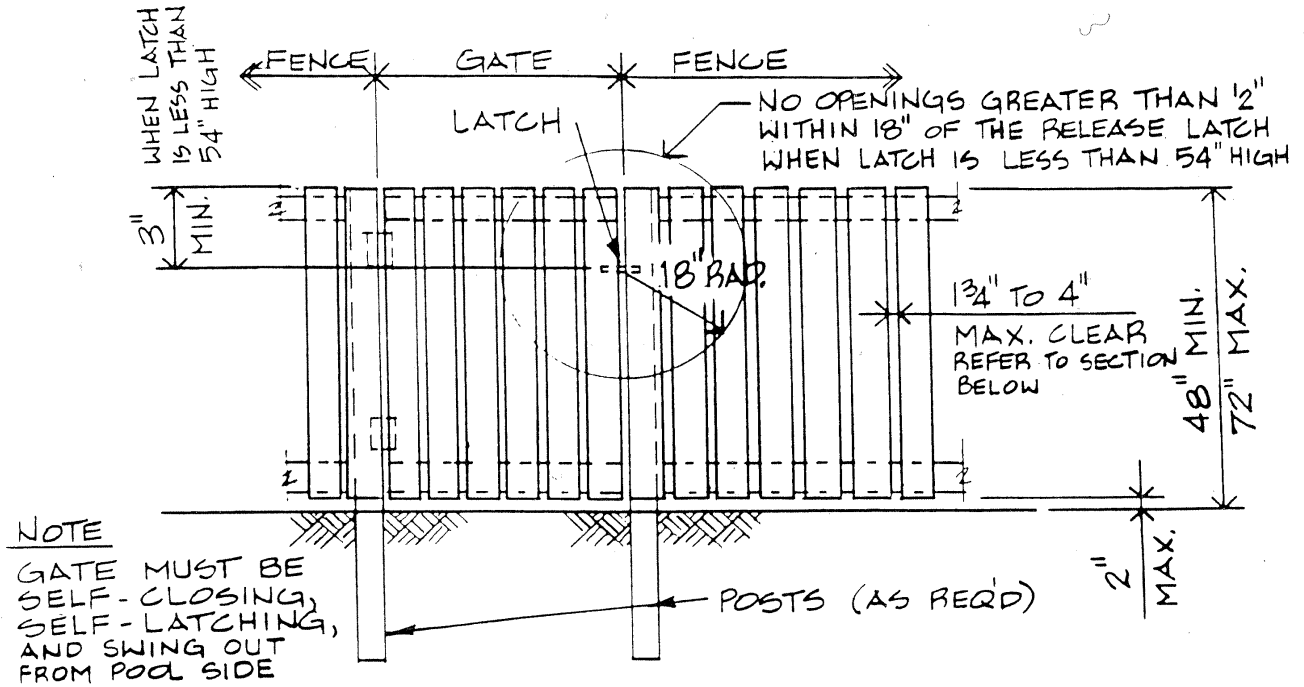
Pool heating systems must comply with the manufacturer's installations instructions and Section M2006 and Chapter 24 of the 2009 International Residential Code (IRC). All mechanical work must be done by a licensed Mechanical Contractor authorized to do mechanical work.

Pool Area and Yard Enclosures/Barrier

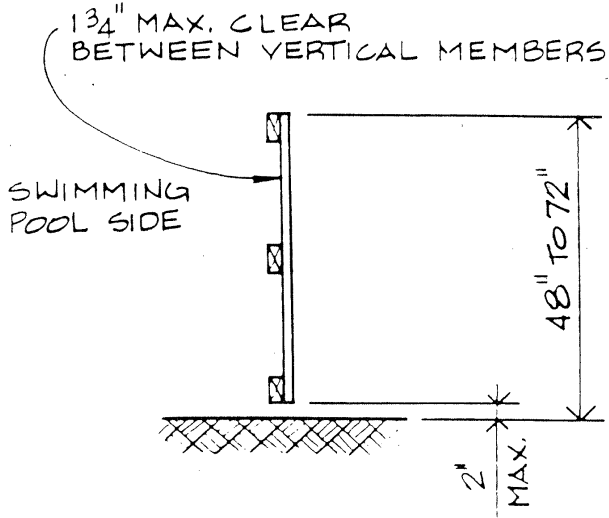
The pool must be protected on all sides by an enclosure/barrier that complies with the International Residential Code (IRC)/2009. Detailed plans and information regarding the enclosure/barrier that is to be provided at each specific site must be furnished to the Building Official at the time of application for permit.

NOTE:

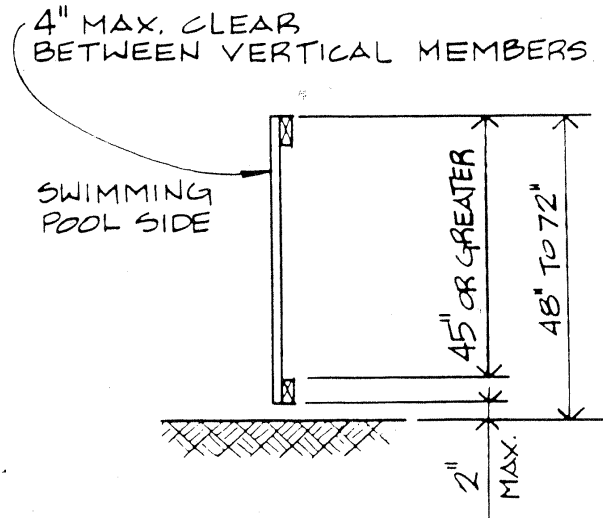
While the aforementioned items cover the major points for compliance relative to plan preparation/review of most swimming pool master plans with the Residential Building Code and the Electrical Code, other items on the plans which are not in compliance with Code requirements, or those needing clarification, will be indicated by the Plan Reviewer. Compliance with this list does not necessarily meet all Code Requirements that may pertain to a particular pool design/installation and/or that a Plan Reviewer may expect to see on a set of pool master plans. It is the Registered Design Professional's responsibility to review the Codes thoroughly and incorporate all pertinent code requirements into the pool construction documents. It should also be emphasized that many Code requirements are met throughout the field construction or installation inspection process and are not necessarily reflected within the approved plan documents.



POOL GATE AND BARRIER ELEVATION



HORIZONTAL MEMBERS SPACED LESS THAN 45"



HORIZONTAL MEMBERS SPACED 45" OR GREATER.

POOL BARRIER SECTIONS