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Pool Tip #16: Effective Pool Barriers

Effective barriers are needed to prevent unattended children from gaining access to a pool or pool area when the pool is temporarily closed between class sessions or for the evening, or shut down for the winter season or for lengthy repairs. A commercial pool should be surrounded by a fence, wall, building, or other barrier that completely encloses the pool area and prevents trespassing or foot traffic through the area. Other protective devices such as alarms and surveillance equipment, safety covers, posting of meaningful signage, and the institution of security patrols may also be effective in deterring trespassers. Pool owners should be reminded that barriers are not a substitute for active supervision. Unattended children should never be permitted in the pool area. Direct supervision by a responsible lifeguard, teacher, parent or other adult possessing swimming and basic rescue skills is the only sure way to prevent pediatric submersion accidents, drowning and other serious accidents around a pool.

Barriers should be installed in compliance with local codes and industry recommendations in order to lessen unauthorized entry into the pool area. Because of the obvious need to restrict access to pools in order to protect the public, barrier code requirements have been adopted by most communities. State and county health and safety codes, building codes promulgated by associations such as the: Building Officials Code Administration (BOCA), the International Conference of Building Officials (ICBO), Southern Building Code Conference, Congress of Building Officials of America (CABLE); and model codes developed by agencies or organizations such as the National Spa & Pool Institute (NSPI) or the U. S. Consumer Product Safety Commission have all clearly defined what they consider to be effective barriers. However, no device or combination of barriers is fail-safe nor do they guarantee protection.

A properly installed pool barrier fence should not have any openings, external footholds or handholds, indentations or protrusions, or horizontal members which would make it easy to climb. The fence should be installed in a way that prevents other objects, building walls or permanent structures from being used to climb into the pool area. It should not be possible for a young child to slip through any holes or spaces in the fence, or between the bottom of the fence and the ground. Fences and gates should be constructed so that there is less than 2 inches of space between the bottom of the barrier and the ground or pool deck. There should be no holes or spaces in the fence where children could slip through. Vertical members in the barrier should not be more than 4 inches apart, and should not permit a block or sphere 4 inches in diameter to pass through. On ornamental iron fences, the distance between the tops of

horizontal members should be greater than 45 inches apart to make them difficult to climb.

In his evaluation of data collected by the U. S. Consumer Product Safety Commission in studies of the physical measurements of over 8,000 randomly selected children living in the U. S., Elliott Stephenson reported in an article entitled "Unsafe Guardrails: The Silent & Inviting Trap" published in the July/August 1993 issue of Fabricator, that approximately one half of all 13 to 18 month old children can successfully pass through a 5 inch wide opening, but that none of the children over one year old could pass through a 4 inch wide opening. Measurement of head size and chest depth of the children in the study showed that approximately 95% of all 10 year olds have head widths of less than 6 inches. The chest depth of 95% of the 7 year olds tested was less than 6 inches. Study results indicate a need to space vertical members in barrier fences no more than 4 inches apart. Fences with openings of 5 or 6 inches or more will not prevent young children from squeezing their bodies through the openings in the fence.

Gates in a pool barrier fence should open outward away from the pool and should be at least as high as the required height of the fence. The gate should self-close and positively self-latch from any open position. Test the gates by opening them and allowing them to close and latch from several different distances with varying amounts of force. Regardless of whether the gate is let go slowly from a few inches or slammed with a great deal of force from several feet, the gate should always close completely and stay latched. Access gates should be locked when the pool is not in use or supervised and the locking mechanism should be mounted on the inside of the gate, located at least 4 feet off the ground, and more than 6 inches below the top of the gate. To prevent access to the latch from the exterior of the gate, the latch should be protected by a rigid webbing, shield or plate with openings no greater than 1/4 inch diameter, and installed to either side, below, and above the latch to the top of the gate.

Safety covers which meet strict performance standards (set in the U.S. by the American Society for Testing and Materials in ASTM standard F1346-91) can be installed to prevent access to pool or spa water. The covers have a continuous connection between the pool and deck and are installed in a track, rail or guides, or otherwise locked or secured into the deck. They are capable of supporting a 400 pound per square foot load. Safety covers bear an identification label indicating the name of manufacturer and installer and compliance with ASTM safety cover standards. They are provided with automatic auxiliary pumps or designed in a way which prevents the accumulation of standing water on top of the cover.

Emergency exit doors leading from the pool deck should remain unlocked at all times. Crash bars on the doors should be tested to make sure they are operational.

Invisible infrared or light beam alarms can be installed to detect unauthorized entry onto a pool deck, before an intruder has a chance to get in to the water. Sensors

can be installed to transmit a radio frequency to receivers, or light to photoelectric cells. When a human body passes through the beam within the detection range, infrared energy is emitted or a break in the light beam occurs and an alarm is triggered.

Pool alarms can be installed to warn of unauthorized entry into the pool itself or to warn that children or pets have accidentally fallen into a pool. Underwater electronic sensors and medallions, pressure wave tubes, floating surface wave motion devices, or sonar devices can be purchased and easily installed. Most are self-contained and battery operated, and are either permanently mounted, float on the water surface, or are temporarily installed on the edge of the deck. The various sensors either detect an electronic signal emitted by the wearer of a special medallion, detect pressure changes which occur when an object falls into the water, react to wave motion or changes in water surface tension, or perceive a breach in a sonar beam between ultrasonic transducers installed on the walls of the pool below the water surface. To be effective, alarms should be activated as soon as the pool is closed for the day and no longer directly supervised, and continuously during seasons of the year when the pool is not in operation and open for use by swimmers.

A computerized drowning detection system, sold under the brand name Poseidon, has also recently been introduced to the U.S. market. The system utilizes a central processor, overhead and underwater digital video cameras which watch swimmer behavior constantly, a fiberoptic network, flashing lights and buzzers, touch sensitive displays which allow supervisors to zoom in on any area of the pool, and alarm pagers worn by lifeguards or supervisors. The computer, using mathematical algorithms and proprietary technologies developed by the manufacturer, can process the video in real time, record the events, identify unusual situations and can detect someone who is immobile or slowly sinking to the bottom of the pool, indicating a possible drowning, all within 10 seconds. The alarms sound, lights flash, and pagers alert supervisors to the exact coordinates in the pool where the victim is located and the elapsed time in seconds since detection.

For a deterrent to be effective, regular inspection of barriers and proper preventative maintenance is also crucial. Blocking open or forgetting to lock doors or gates, not maintaining fences according to manufacturers' recommendations, ignoring or disabling alarms, or not installing covers, will render any barrier system useless.

Commercial Pool Barrier Checklist

Pool: _____ Inspection Date _____

Inspector: _____

- _____ 1. Barriers and fences are installed and maintained in compliance with local codes and industry recommendations in order to lessen unauthorized entry into the pool area, and prevent young children from gaining access to the pool and thereby reducing the likelihood of pediatric submersion accidents.
- _____ 2. The facility is fenced or otherwise secured. Fence height: _____ (> 5')
- _____ 3. Perimeter fences do not block the view of the pool.
- _____ 4. If plants such as Pyracantha (firethorn evergreen shrubs) are used on the outside of the fence as an additional barrier, they do not obstruct the vision of the pool from the exterior.
- _____ 5. The fence does not have any external footholds or handholds or horizontal members to make it easy to climb.
- _____ 6. The fence is installed in such a way to prevent other objects, trees, building walls or permanent structures from being used to climb into the pool area.
- _____ 7. Walls or solid barriers constructed of cement block or brick, if installed, do not contain indentations or protrusions closer than 48 inches apart.
- _____ 8. On ornamental iron fences, the distance between the tops of horizontal members is greater than 48 inches apart.
- _____ 9. With chain link fences less than 6 feet in height, wire mesh, slats, barbed wire, or other means approved by local building officials is used to prevent the openings in the fence from being used as a climbing surface.
- _____ 10. The size of holes in the chain link fence do not exceed 1.75 inches.

- _____ 11. There is less than 2 inches of space between the bottom of the barrier and the ground or pool deck.
- _____ 12. There are no holes or spaces in the fence where children could slip through.
- _____ 13. Vertical members in the barrier are not more than 4 inches apart. A block or sphere 4 inches in diameter cannot pass through.
- _____ 14. A barrier is installed between a dwelling or public meeting room and the pool.
- _____ 15. If no physical barrier is installed between a dwelling and the pool, resettable alarm is installed on all sliding doors and windows which open to the pool area.
- _____ 16. If the pool is not secured with a 4-sided fence, all windows, hinged or sliding doors on the building leading directly to the pool have latching devices installed out of the reach of small children, at least 40, and preferably 60 inches above the floor.
- _____ 17. Gates in the fence or doors open outward away from the pool.
- _____ 18. Gates are at least as high as the required height of the fence.
- _____ 19. Access gates or doors can be locked when the pool is not in use or supervised.
- _____ 20. A key-operated lock, keypad or key card system which is integral to the gate or door is installed.
- _____ 26. The locking mechanism is mounted on the inside of the gate, and located at least 3-1/2 feet off the ground, and more than 6 inches below the top of the gate.
- _____ 21. To prevent access to the latch from the exterior of the gate, the latch is protected by a rigid webbing, shield or plate installed to either side, below, and above the latch to the top of the gate. The shield does not have openings greater than 1/4 inch in diameter.
- _____ 22. The gate or door closer is adjusted to allow the gate or door to self-close and positively self-latch from any open position.
- _____ 23. Emergency exit doors are unlocked, and crash bars are operational when the pool is open for use.

- _____ 24. The pool enclosure has at least one gate which does not require a key for egress. Unless all gates or doors are equipped with panic hardware or remain open and unlocked during all hours of operation, those gates and/or doors which will allow egress without a key shall be clearly and conspicuously labeled in letters at least 4 inches high as an "EMERGENCY EXIT".
- _____ 25. Alarms have been installed to detect unauthorized entry onto the pool deck.
- _____ 26. Pool alarms have been installed to warn of unauthorized entry into the pool itself.
- Alarm type: _____ Underwater electronic sensors and medallions
 _____ Pressure wave tubes
 _____ Floating surface wave motion devices
 _____ Sonar devices
- _____ 27. Video surveillance cameras are installed and are monitored or reviewed regularly.
- _____ 28. A drowning detection system has been installed, is being monitored, and is operating properly.
- _____ 29. Signs are posted indicating the hours of pool operation and when the pool is closed. Signs clearly indicate who may enter the premises, at what times and under what conditions.
- _____ 30. If the pool is closed for the season or for an extended amount of time, safety covers which meet performance standards set by the American Society for Testing and Materials in ASTM standard F1346-91 are installed to prevent access to pool or spa water.

Date Corrective Action Taken