

USA Swimming Measuring and Certifying Competition Pools

July 2010



Thank you for your interest in measuring competitive pools. This document is intended to provide pool measurement background information and measuring protocol to USA Swimming Local Swimming Committees (LSC's), facility operators, volunteers, surveyors and engineers that are considering, or preparing for, pool measurement and certification. The pool measurement requirements and tolerances provided in this document are usable to both professionals and laymen.

This document is divided into 5 parts.

Part 1- is a comprehensive Question and Answers section which will provide you information on the most commonly asked pool certification and measurement subjects.

Part 2 - provides an overview of general background information on pool measurement requirements. This section also provides guidelines and suggested protocol for measuring the length of lanes using a portable laser measuring device.

Part 3 - provides professional surveying/engineering firms with a suggested protocol to measure lane length using "Total Station" surveying equipment. This section may also be used by volunteers with appropriate engineering or surveying background and knowledge who may wish to commission or undertake a measurement project.

Part 4 - are the parts of the USA Swimming Rules and Regulations that are applicable to pool dimensional standards and are provided for ease of reference. It is intended that this part be updated whenever the rules change, however if the version date is more than one year old, the current rules should be referred to either in the printed book or on the USA swimming Web site.

Part 5 - is the pool certification form.

As members of the competitive swimming community, we all must embrace the concept of equal competitive conditions for all athletes. In addition, having a certified pool significantly reduces the risk of exceptional performances by athletes being nullified by unacceptable pool measurement being found after the swim.

Please start by looking at the comprehensive question and answer section which will provide you information on the most commonly asked measurement subjects.

If there is anything we can do to help you get your facility on its way to having a competition certified pool please ask.

Sincerely,

USA Swimming – Facilities Development Department mnelson@usaswimming.org

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Part 1 - Questions and Answers

Questions and Answers - General

Q. I don't see a requirement in the USA Swimming Rule Book to have all pools measured. Does my pool have to be measured in order to host a USA Swimming competition?

A. Although routine measurement and certification is not currently required under USA Swimming rules, it should be considered a best practice to have current certified measurements for all competitive pool on file with USA Swimming. World, American, U.S. Open, and National Age Group Records require that the pool be certified. If the potential record was swum in an uncertified pool and the pool was subsequently measured and found not to meet the length standards, the potential record would not be accepted.

Q. Our facility does not ever host competition where athletes could potentially set records. Why should we get our pool certified?

A. Competitive swimming is based not only on head to head competition, but competition against the clock. The USA Swimming Rules and Regulations measurement standards are intended to ensure that swimmers achieving an official time, do so under as close to identical competitive conditions as possible.

Q. What happens if we go through the measurement process and a discrepancy is found?

A. During the comprehensive measurement process, it is possible that a range of issues may be found with the pool. These issues may include one or more lanes not meeting length requirements, starting blocks being too high, backstroke flags being improperly positioned, etc. Some of the "fixes" to these pool specification issues are relatively easy and inexpensive. Other problems can be prohibitively expensive to address. USA Swimming maintains a staff of trained consultants that can help your facility come up with a plan to address the discrepancies.

Q. OK, we measured our pool and some or all of the lanes are about 1" short. It's only an inch....what's the big deal?

A. One inch may not seem like a large discrepancy. Competitive swimming times are measured in hundredths of a second. Rankings and qualifications for higher levels of competition frequently are determined by .01 second. Consider a 500 yard Freestyle race (20 lengths). Over the course of a race, a swimmer competing in a pool 1" short would be swimming a race 20" shorter than a swimmer in a certified pool. In a 1650 yard Freestyle race, that distance would jump to 66"! For a swimmer capable of swimming 500 yards in 5:00 minutes the advantage would be 0.33 seconds. For a 17:00 minute 1650 yard swimmer the advantage could be 1.13 seconds.

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Q. We measure our pool and it comes up short....now what? Can we still hold our meets?

- A. If the pool measures short, it is going to be up to the Local Swimming Committee (LSC) to determine what the status of that pool will be for competitive swimming. The times achieved in a pool that does not meet the minimum length requirements of the rules cannot be put into the database and used for proof of time or athlete recognition programs (National Top 10, National Age Group Records, etc). A Local Swimming Committee could choose to allow competitions to be held in those pools and use times achieved from that pool to be used for its' purposes – for instance to qualify for meets within the LSC boundaries.

Should an LSC decide to allow competition in non-conforming pools and times achieved in those competitions be used for LSC purposes, it is strongly recommended that the following statement be included in the Meet Information.

“The competition course measurement does not comply with USA Swimming Rule 103.3. Times from this competition will not be loaded into the SWIMS database and will not be used for any USA Swimming proof of time or national recognition program purposes.”

Q. Years ago, our pool was measured and certified. It has been resurfaced twice since then. Do we have to get re-measured?

- A. Probably; however it depends on the pool. If the pool has something resembling a rigid metal wall/gutter ring that was not changed and the pool surface material does not extend past the rigid metal, re-measuring may not be necessary. If the pool has the original gutter tile exposed and the new pool surface does not extend past the original tile, re-measuring may not be necessary. If the original pool measurement indicates sufficient excess length to allow a thin skim coat of surface material, re-measuring may not be necessary. In cases such as these, the projection of the new surface could be checked using a 4 ft long, precision, aluminum builders box level. If, when the level is vertical with 2' 7" below the surface, it does not contact the original pool metal edge or gutter there may be a need to re-measure and recertify. NOTE: If there is any doubt re-measure.

It is recommended that re-measurement and recertification by an independent licensed Surveyor or a qualified Professional Engineer in accordance with the guidelines in Parts 3 and 4 be included as a condition in any competition pool resurfacing or refurbishing contract.

Questions and Answers – Measurement

Q. I have heard we have to empty our pool in order for it to be measured. What a waste of water?

- A. Pools do not have to be emptied in order to be measured. In fact, depending on the construction type, emptying the pool may result in inaccurate measurement.

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Q. Can't we just pull out a tape measure and do it ourselves?

A. Unfortunately, using a tape measure in a pool environment is very complex and difficult and should only be done by a licensed Professional Surveyor. There are issues of tape material, calibration, sag, the effect of temperature on the tape, and the vertical range of certification which makes getting an accurate reading troublesome. Even Professional Surveyors are unlikely to use tapes to measure and certify lane lengths as required by USA Swimming.

Q. I see inexpensive laser measuring devices available at home improvement stores. Can we use them?

A. Probably! Provided the device is acceptably accurate, a suitable measuring protocol is followed and the certification is supervised and signed off by a licensed surveyor or by a professional engineer who understands surveying and the limitations of the equipment and protocol used. Indoor pools are generally not a problem. Outdoor pools can be difficult to measure during high light situations. Look in Part 2 of this document for more detailed information.

Q. We have a pool with a moveable bulkhead. What are the measurement requirements?

A. Bulkhead pools provide special challenges. After the bulkhead is set in position and after lane lines have been tightened, the lane lengths of all lanes must be verified. Before and after each session, the Referee must verify that the bulkhead pins are still in position. If a potential record time is achieved in a session of the meet, the lane in which the potential record was set must be measured and attested to by a licensed surveyor or professional engineer before the pool conditions change – including loosening of any lane lines attached to the bulkhead and removal of timing pads.

Questions and Answers – Reporting

Q. Where can I get the forms to fill out for pool measurement?

A. The pool certification forms can be found in Part 5 of this document. The forms can also be found on the USA Swimming Website under:

Member Resources/For Everyone/Consulting Services/Facilities. Scroll down to “What’s Related”. Click on “Pool Certification” and then select “Pool Certification Form”.

Follow the directions for submission.

After the documents have been reviewed and accepted USA Swimming will add the pool to the list of certified pools which can be found under:

Member Resources/For Everyone/Consulting Services/Facilities. Scroll down to “What’s Related”. Click on “Pool Certification” and then select “List of Certified Pools”.

Q. We are still confused and need help!

A. Call Mick Nelson at USA Swimming. 719-866-3522 E-mail mnelson@usaswimming.org
He is there to help.

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Part 2 - Lane Length and Pool Certification

Overview and “Handheld” Laser Measurement

1 Lane Length

Requirement – 103.3.1

Long Course: 50m (164' 0½")

Short Course: 25 yd or 25m (82' 0¼")

Tolerance against length: minus **0mm**, plus 30mm (1³/₁₆"*)

Measurement Range: At all of both end walls in a vertical plane extending 0.3 meters (12") above and 0.8 meters (2' 7½") below the surface of the water.

** Although an “over” tolerance is specified, for most competition it is not an important consideration provided lanes are not excessively long. For a pool to be considered “fast” and for high level meets the length of each lane with touch pads in place should be well inside the “maximum” tolerance, but not shorter than the minimum length.*

Practical length certification requirements:

Measurement of each lane strictly in accordance with the above requirement is not realistically possible in operational conditions, however, certification that the length is not less than the minimum requirement can be given by sampling the minimum lane length in at least two locations in each lane by someone who has the training and experience to understand the limitations of the measuring equipment and methodology that is used.

Suggested measurement locations are:

1. The edges of the “T” cross bar on each side of the lane centerline, or,
2. The center line and a fixed distance from the lane divider on one side of each lane and both sides of one of the outside lanes.

Lane lengths may be measured with or without pads in place. If the lengths are measured without pads the thickness of the pad, or pads, must be subtracted from the measured length. As a guide, the thickness of each properly mounted pad varies from 5mm (0.016ft, ³/₁₆") for a thin pad (Daktronics) to 15mm (0.05ft, ⁵/₈") for thick pads (Colorado, Omega).

Note: “Thick” pads, in good condition and mounted properly and flush against the wall, can be 10mm thick.

FINA sets a 10mm thickness limit in their facility rules.

Use of “straight edge” devices that extend 0.8 m (2' 7½") below, and 0.3 m (1') above, the normal water level and set to vertical with a 1:2000 (0.0005 inch per inch or 0.5mm per m) precision bubble level will allow measurement between the furthest projecting points in the vertical line at each end. (See Figure 1)

The length error potential if similarly precise straight edges are used at each end is between minus (-)1mm and plus (+)1mm. Note: The error potential for “handyman” type levels is more than ± 5mm (¼"); which is not acceptable in “close” situations.

Note: Relative variation from the horizontal or from the perpendicular measuring location at each end in a short course (yd or m) pool of 3" (75mm), or 4" (100mm) in a long course pool, will result in an additive error of about 0.2 mm for each deviation.

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The use of laser length measuring devices with a precision of $\pm 0.5\text{mm}$ over 50 m is recommended. The measuring device should be set against a fixed reference point on a stable platform attached to one of the vertical straight edges and aimed at a stable target attached to the other vertical straight edge at the other end. Care should be taken to correct the measurement to adjust for any offsets created by the set up. See Figure 1 and Figures I, Ia, Ib and Ic in Part 3.

Note: The use of steel surveyor's tapes by anyone other than a professional surveyor is not recommended. Steel tape measurement requires a properly calibrated tape, sophisticated corrections for temperature and tension, in addition to the "location errors" noted above, and special field techniques and equipment.

Vinyl, fiberglass, cloth or any other tapes are not accurate or stable enough for measurement for lane length certification.

Measurement Methodology

Refer to Figure 1 in Part 2 for a suggested methodology for using small laser measuring devices to certify and recertify lanes in a single pool location. This methodology requires a small investment in equipment (laser, levels and support frame) and training of users, but has little or no cost associated with verification and recertification measurement, particularly if a volunteer surveyor, engineer or other professional oversees the measurement.

Refer to Part 3 for a suggested methodology for using a "total station" surveying instrument to certify a fixed wall pool or to certify and recertify lanes in moveable bulkhead pools. This method usually requires a professional surveyor and a survey crew and can be expensive if used to recertify lanes in moveable bulkhead pools.

Part 3 also includes suggested adaptations to the equipment for lane length measurement in pools with differing end wall configurations.

Both methodologies require an understanding of the limitations of the equipment being used and the errors introduced into the measurement by the equipment and users.

Reporting

- Report the shortest of the measured lengths in each lane to the nearest:
 - $\frac{1}{8}$ th inch (0.01ft, 0.003m, 3mm) for 25 yd pools
 - 0.003 m (3mm, 0.01ft, $\frac{1}{8}$ th inch) for 50m and 25m pools.

Preferably report the shortest lane length both with and without touch pads.

Note whether touch pads were in place during measurement or a thickness is assumed.

Also note:

- the type of touch pads used or assumed (thick or thin) and,
- any features of the pool that might affect the lane length if touch pads are used, e.g. retaining strips for vinyl liners, bumps or projections into the pool, transitional curves less than 800mm below the surface, etc.

Note: FINA requires end walls of pools and touch-pads, if used, to extend to 0.3 m (1 ft) above the water surface at both ends. USA Swimming and other swimming organizations in the USA do not require the end walls or touch pads to extend above the water surface. USA Swimming, however, considers any projection into the pool in the range 0.3 m above to 0.8 m below the water surface to define the lane length.

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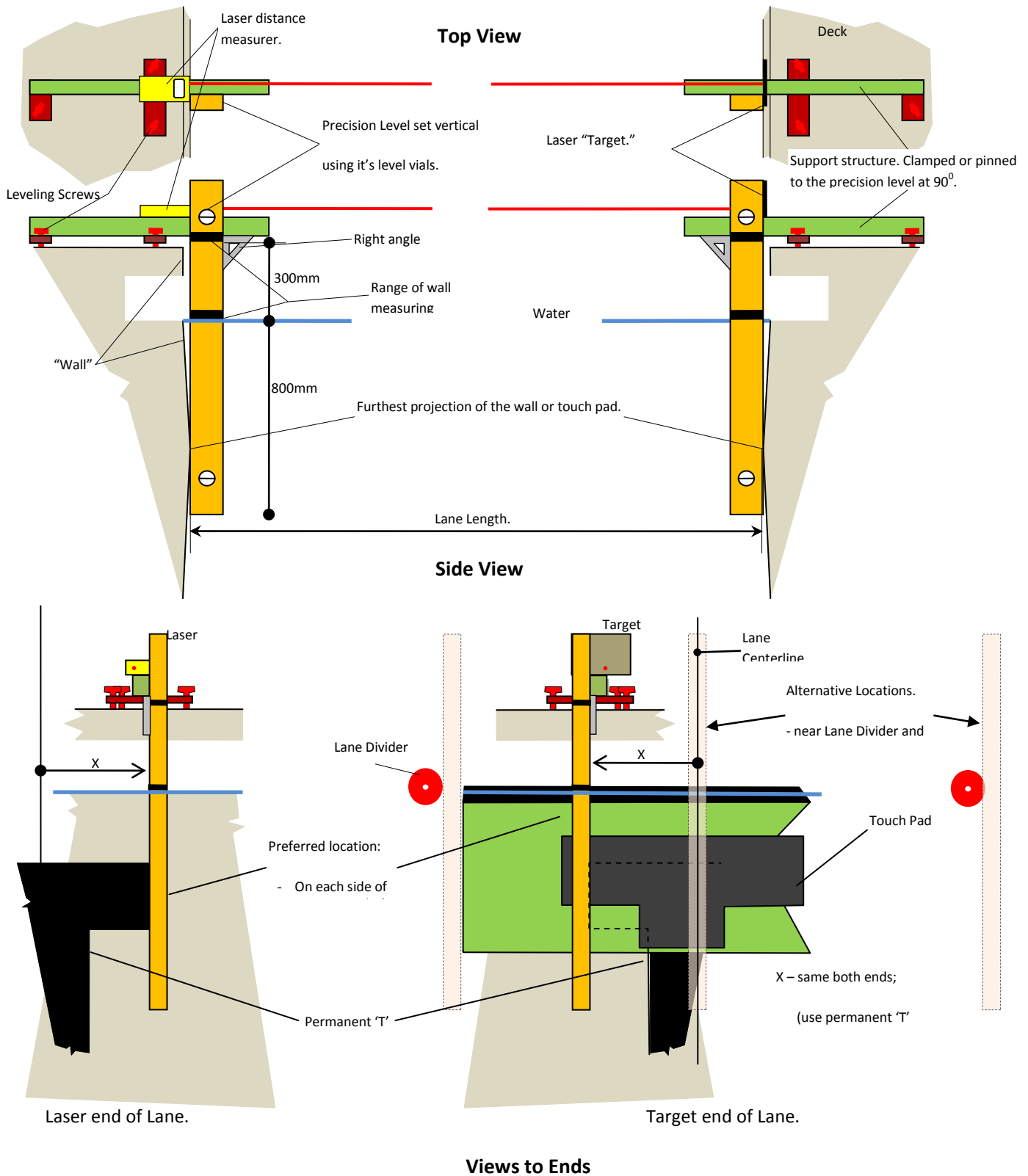


Figure 1
Using "Hand Held" Laser Measuring Equipment

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2 Water Depth

Measurement Methodology

- Measure Course depth using a stiff, wide metal retracting tape measure (when less than 2 meters) at 1m and 5m from each end and mid length of lanes. Measure each lane in the shallowest location across the full width of the lane. Measure from the water surface level at the time and, if necessary, adjust to the normal water level or overflow control level.

Note: If there are shallower locations between the 1m and 5m transect in each lane measure the depth and note the location and include the information in the report.

Reporting

- Report depths rounded down to the nearest 0.1ft (1 ¼") or "greater than 6 ft", if deeper.

3 Lane Width

Measurement Methodology and Reporting

- Measure the width of each lane from lane rope anchor to lane rope anchor at both ends using a stiff, wide metal retracting tape measure. Report the width of each lane (both ends if different) to the nearest 0.1ft (1 ¼").

4 Starting Platform Height

Measurement Methodology

- Measure Starting block heights from the water surface to the top front edge of each block that is in place and, if necessary, adjust to the normal water level or overflow control level. Note the location of each starting platform front edge and backstroke start hand grips relative to a vertical projection of the pool end wall or timing pad face.

Reporting

- Report starting platform heights to the nearest 0.02ft (¼"). Note any platforms that are deficient:
 - too low or too high. Note: max height for m pools is 2' 5 ½" – max for yd pools is 2' 6"!
 - front edge or backstroke handgrips project into the pool past the end wall. Also advise owner of any that are significantly back from the end wall.

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5 Backstroke Flag Support Location

Measurement Methodology

- Measure the location of the center of each support pole or pole hole, cable or hook from the nearest end wall with a 5 m (16' 5"), or longer, steel tape.

Reporting

- Report the distance from the end wall to the center of each support to the nearest 0.01m (1cm) for m pools and ½" for yard pools.

Note any locations where the supports are more than:

- 50mm (.05 m) from the specified location of 5m from the end wall for m pools, or
- 2" (50 mm) from the specified location of 5 yds for yd pools.

6 15m Marks

- Using a 15 m long steel tape, or other measuring device, mark the 15m locations on the sides of each racing course. Pool operators should be encouraged to make these reference marks permanent so that proper location of 15m markers in each lane can be verified by officials.

7 Midpoint Rope

- In 50m courses note if there are midpoint rope anchor posts or post holes and that they are located 25m from the end walls.

Reporting

- Report if the anchors are in place and if they are mis-located by more than 0.1m (10 cm, 4").

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PART 3

A Suggested Procedure for Measuring and Certifying Competitive Swimming Pools for lane lengths using “Total Station” surveying equipment.

Measurement and Certification.

Equipment:

- a surveying “total station” reading angular measurement to 5 seconds, or better, and distances to an accuracy of better than 2 mm (1 mm preferred) over 50 m. Set to read horizontal distance to the center of the prism pole.
- Tripod for the Total Station
- reflecting prism or target
- 4 ft long prism pole
- bubble level with sensitivity better than 10 minutes of arc for 2mm of bubble movement, to “plumb” the prism pole for readings
- wide, retracting, tape measure for measuring lane widths, platform height and pool depth and for setting measuring reference marks
- metric/imperial (min 15 m long) tape for measuring backstroke flag locations and for measuring or setting 15 m reference marks
- electrical tape or waterproof marker to set reference marks on the prism pole and, possibly, on the pool deck and walls
- notebook to record data
- Portable computer and software (spreadsheet, surveying or other “math”, and word processing) to reduce and present collected data.

Lane Lengths

Measurement may be made either with or without timing touch pads in place.

Measurement Methodology

- Measurement location. There are two options – a) fixed offsets on each side of the lane centerline, or b) the centerline and edge of each lane. The choice will depend on the accessibility to the lane center line if starting platforms are in place.
 - a) Mark each lane in two locations at each end approximately 0.5 m (18 to 21 inches) each side of the lane center line. Set the marks at the same relative locations, \pm 25mm (1 inch), at each end of the lane. As an alternative, the outside of the end of lane “T’s” painted on the end walls may be used if they are the same at each end of each lane.

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- b) Mark the center of each lane and a point approximately 0.1 m (4 inches) just inside the lane divider at both ends of the outside lanes. Choose either the lane 1 or lane 8 side of all the internal lanes for a side mark at each end 0.1 m from the lane divider.
- Mark the prism pole at 0.8m (2' 7½") from the non prism end (ignore any base cone); and again at 1.1m (3' 7½") from the end. These reflect the below and above water level lane length measurement limits. See fig. I.
 - Set and level the total station on its tripod approximately midway along the length of one side of the pool. Include the appropriate prism offset into the total station setup. See fig. II.
 - Select a permanent mark for a reference angle verification backsite and record the angle. The angle will only be used to verify the Total Station setup has not changed during data collection. It is not required for calculations. See fig. II.
 - At the first end of lane location have the assistant place the prism pole (with prism) on the first reference location with the 0.8m mark at the water level and set it vertical using the prism pole bubble level. The pole, when vertical, will be set so that one edge is resting on the pool wall closest to the other end of the lane in that location. This may be below or above the water line. See fig. II. If the pole, when vertical, rests on a point more than 0.3 m (one ft) above the water surface, supplemental measurements will need to be taken. See "Notes".
 - When the pole is vertical, use the total station to take the horizontal angle (relative to the total station setup zero) to the center of the prism and the horizontal distance to the center of the prism pole. Record the angle and distance. (Note: Read and record the slope distance and vertical angle if the total station only measures the slope distance. Calculate the horizontal distance for use in the "cosine rule" calculations.) See fig. II.
 - Move the prism pole to the second location in the lane and take and record the angles and distances. Repeat the process for each marked location in a circuit around the pool.
 - When the circuit is completed, return to the reference mark and verify that the angle is at or close to the initial reading. A variation of less than 10 seconds of arc from the original reading should be acceptable.
 - Leave the instrument set up and calculate the length of each lane between the corresponding points at each end using a calculator, proprietary program or spreadsheet developed for the purpose. (See "calculation", below.)
 - If there are major variations in length between lanes, verify the data entry for the lanes in question (typically transposed numbers or incorrectly matched lane locations). Supplemental readings may be required on some lanes if recording of total station data is suspect.

Notes: In some pools there may be projections into the pool that could affect the lane length measurements, such as:

- A curb or coping more than 1 ft above the water surface that project further in to the pool than the general line of the wall. An offset piece 1.1m (3' 7½") long can be clamped to the prism pole to bypass the projection. (See fig. 1a). The width of the offset piece should be added (times 2, if used at both ends) into the lane length

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calculation. Additionally, starting platforms should be checked to ensure the leading edges line up with the pool end wall; not the edge of the coping.

- A thin retaining strip that holds a vinyl liner in place. These are typically about $\frac{3}{4}$ inches wide, project about a $\frac{1}{2}$ inch into the pool and extend around the pool about 4" to 8" below the surface. If a touch pad is used it will be moved further into the pool. If a touch pad is not used it is very unlikely to have an impact on the effective length of the lane. Figures 1b and 1c show how these situations can be measured.
- Care should be taken to note any projections into the pool that may affect the placement of touch pads, if they'll be used. If a projection will affect pad placement a measurement should be taken over it and the corresponding location at the other end. If it is a small projection, say less than 2 or 3 square inches in area and projecting less than an inch and it will not impact location of a touchpad, it may not need to be measured, but should be noted.

Calculation

The "cosine rule" is used to calculate the distance between the centers of the prism pole at the corresponding locations at each end of the lane. Adjustments are made for the diameter of the prism pole, touch pads and other conditions which affect the measurement. See Figure II.

Reporting

In 25 yard pools lane lengths may be reported in feet to the nearest .01 ft or in feet and inches to the nearest $\frac{1}{8}$ inch (0.01 ft). Metric pools must be reported in meters to the nearest 5 mm (3mm is suggested). Report the shortest of any lengths calculated for each lane and the type of touch pads (thick or thin) assumed or used, and if they were in place during measurement.

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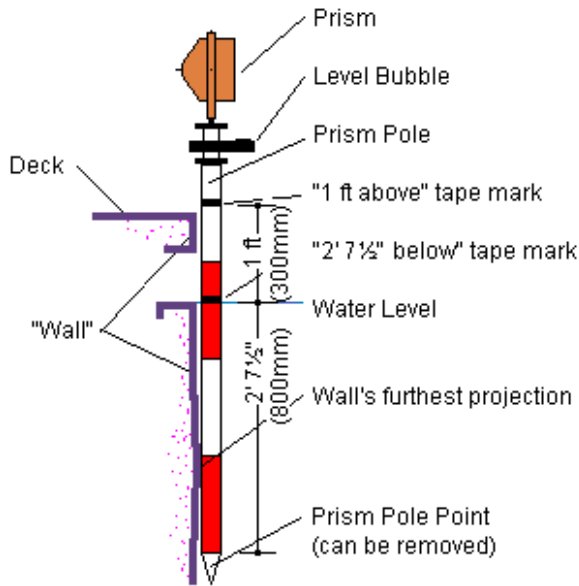


Figure I

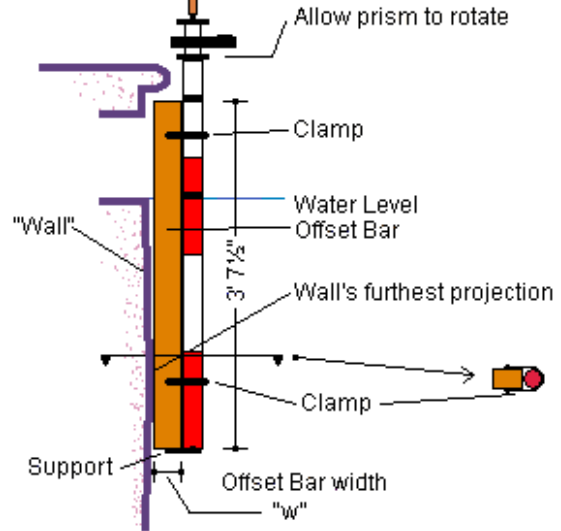


Figure I a

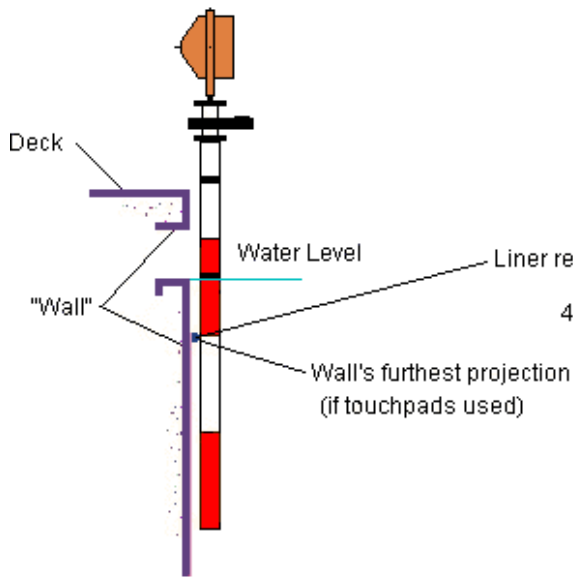


Figure I b

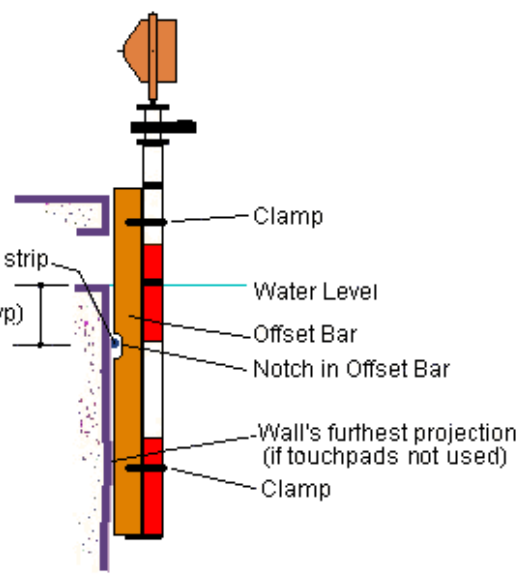
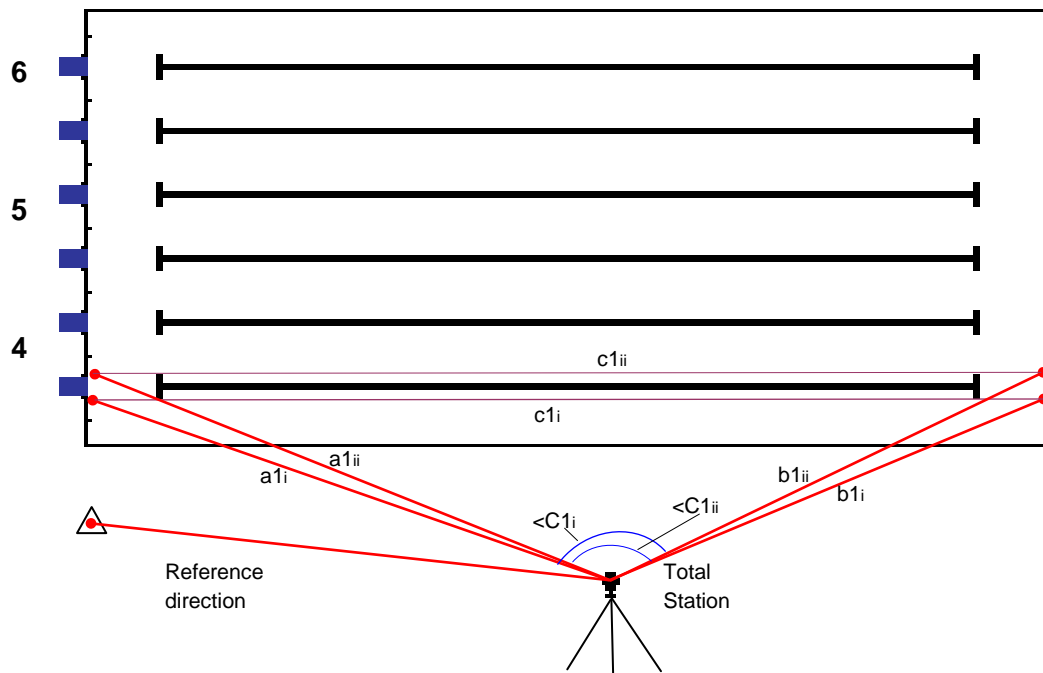


Figure I c

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$$L = c + p + \delta - n \cdot t = \text{Lane Length}$$

where

$$c = (a^2 + b^2 - 2 \cdot a \cdot b \cdot \cos(\angle C))^{1/2} - \text{“cosine rule”}$$

L = lane length with n touch pads in place.

a = horizontal distance from the total station to the center of the prism pole at one end

b = horizontal distance from the total station to the center of the prism pole at the other end

c = calculated distance between the center of the prism pole at each end of the lane

$\angle C$ = included angle between the readings for a and b which is equal the total station horizontal angle to “b” minus horizontal angle to “a”

p = prism pole diameter

δ = other adjustments – see discussion. Could include Offset Bar widths (-ve).

n = number of touch pads used in the calculation. “n” may be 0, 1 or 2. If touch pads are set in place when the measurements are taken, use n = 0 and include a note indicating the number of pads in place for the measurement.

t = touch pad thickness when in place (determined from face of wall to face of pad)

– when pads are in good condition and mounted properly, t is usually 10 to 15 mm for thicker pad types (Colorado, Omega, etc.) and 4 to 6 mm for thinner pad types (Daktronics).

Figure II

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Part 4 – Extracts from USA Swimming Rules and Regulations

2010 USA Swimming Rules require:

OFFICIAL GLOSSARY Swimming Words and Terms

WALL — vertical portion of the pool, contiguous surfaces of the deck and overflow gutter, the front portion of the starting block or platform, or the touchpad at the end of the course.

ARTICLE 103

FACILITIES STANDARDS

103.1 DEFINITIONS

- .1 /M/ = Indicates mandatory requirement for all competition.
- .2 /NC/ = Except as noted otherwise, indicates mandatory requirement for USA Swimming Championships and International Competition.
- .3 /LSC/ = Predicated on facility availability, LSC's may waive strict compliance with these requirements in sanctioning local competition.
- .4 Where dimensions are given, the dimension listed first shall govern and dimensions given in parenthesis are for reference only.

103.2 WATER DEPTH

- .1 /NC/ 2 meters (6 feet 7 inches) deep throughout the course.
- .2 /M/ Teaching Racing Starts – (effective May 1, 2009) Minimum water depth for teaching racing starts, prior to certification, in any setting from any height starting blocks or the deck shall be 6 feet (1.84 meters) **measured for a distance of 3 feet 3½ inches (1.0 meter) to 16 feet 5 inches (5.0 meters) from the end wall**. Teaching racing starts shall only take place under the direct supervision of a USA Swimming member coach and shall include:
 - A All racing start instruction until a swimmer has been certified by his or her USA Swimming member coach as proficient in performing a racing start, and
 - B Subsequent to certification, instruction which seeks to alter a swimmer's basic technique in performing a racing start. Subsequent to certification, practicing of racing starts may take place in water depth of four (4) feet (1.22 meters) and deeper.
- .3 /M/ Racing Starts – Minimum water depth for racing starts during practice and competition shall be measured for a distance **3 feet 3½ inches (1.0 meter) to 16 feet 5 inches (5.0 meters)** from the end wall. Starting requirements and height of starting block shall be:
 - A In pools with water depth less than 4 feet (1.22 meter) at the starting end, the swimmer must start from within the water;
 - B In pools with water depth 4 feet (1.22 meter) or more at the starting end, starting platforms shall meet the height requirements of 103.12.1.

Note: Local, state and municipal statutes, ordinances, rules and regulations, may have depth limitations in conflict with this section. The LSC and all Member Clubs should check for this at all times.

103.3 RACING COURSE DIMENSIONS

- .1 /M/ Length.
 - A Long Course: 50.00 meters (164 feet and ½ inch).
 - B Short Course: 25.00 yards or 25.00 meters (82 feet and ¼ inch).
 - C Dimensional Tolerance: Against the required length, a tolerance of plus (+) 0.03 meters (1 and 3/16ths of an inch) in a vertical plane extending 0.3 meters (12 inches) above and 0.8 meters (2 feet, 7 and ½ inches) below the surface of the water at all points of both end walls.
 - D When automatic officiating equipment touch pads are used at one or both ends, the course shall be of such length that ensures the required distance between the two touch pads or between either pad and the opposite end of the course.

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- E When the racing course is fixed by the use of movable bulkheads, such bulkheads shall be designed to resist lateral deflection due to tension exerted by the attachment of the lane dividers to ensure the required course distance in all lanes.
- F See Article 104, Rules for Swimming Records, for course measurements certification requirements.

.2 Width.

- A /NC/ Eight or ten lanes, minimum width of 2.5 meters (8 feet 2 ½ inches), from center line to center line of the lane dividers, with approximately 0.45 meters (1 foot 6 inches) of additional open water outside lanes 1 and 8 (or 10). Program Operations may waive this requirement for National Championships.
- B /LSC/ Minimum lane width for competitive swimming shall be 7 feet (2.13 meters).

103.4 /M/ RACING COURSE WALLS

- .1 **Permanent Course Walls** — Walls enclosing the racing course shall be parallel and vertical. The end walls shall be at a right angle to the water surface and shall be constructed of solid material with non-slip surface that extends no less than 0.8 meters (2 feet 7½ inches) below the water surface.
- .2 **Movable Bulkhead Course Walls** — If a continuous recessed hand grip is provided at or near the water surface in a movable bulkhead, the horizontal dimension of the recess perpendicular to the bulkhead should be not less than six inches (.15 meters) and designed in a manner to prevent the swimmer's fingers from contacting the back surface of the recess.

103.12 /M/ STARTING PLATFORMS

- .1 **Height.**
 - A **Long course and short course meters:** The front edge of the starting platform shall be no less than 0.50 meters (1 foot 8 inches) nor more than 0.75 meters (2 feet 5½ inches) above the surface of the water.
 - B **Short Course yards:** The front edge of the starting platform shall be not higher than 2 feet 6 inches (0.762 meters) above the surface of the water.
- .2 The front edge of the starting platform shall be flush with the face of the end walls.
- .3 The top surface of the starting platform shall be not less than 0.50 by 0.50 meters (1 foot 8 inches square) and shall slope not more than 10 degrees from the horizontal. It may have an adjustable setting back plate. The entire surface of the platform shall be faced with permanent non-slip material.
- .4 Backstroke starting grips: Starting platforms shall be equipped with firm starting grips located between 0.3 meters (12 inches) and 0.6 meters (24 inches) above water surface. The front edge of the grips shall be parallel to and flush with the face of the end wall.

103.14 /M/ BACKSTROKE FLAGS AND LINES

- .1 **Design:** At least three triangular pennants six (6) to twelve (12) inches in width at the base and twelve (12) to eighteen (18) inches in vertical length, of two or more alternating and contrasting colors shall be suspended on a firmly stretched line over each lane during all warmup periods and during competition for all backstroke, individual medley and medley relay events.
- .2 **Location:**
 - A Long course and short course meters: 5 meters (16 feet 5 inches) from each end of the course, a minimum of 1.8 meters (5 feet 11 inches) to a maximum of 2.5 meters (8 feet 3 inches) above the water surface.
 - B Short course yards: 15 feet (4.57 meters) from each end of the course, 7 feet (2.13 meters) above the water surface.
 - C Height shall be measured to the horizontal line from which the pennants are suspended.
- .3 /LSC/ For long course backstroke, individual medley, and medley relay events a firmly stretched ¼ inch line without flags or pennants shall be suspended at midpoint of the course.

103.18 AUTOMATIC OFFICIATING EQUIPMENT

- .3 /NC/ Touch Pads:
 - A Size and thickness: Recommended pad size shall be 6 feet 6 inches (2 meters) wide and not less than 2 feet (0.60 meters) deep. Minimum width of pads shall be 5 feet (1.52 meters). Thickness shall not exceed ⅜ of an inch (1 centimeter).
 - E At the facilities in which competition to select USA Swimming National Teams for the Olympic Games and World Championships is held, the touch pads must be minimum 0.9 meters (2 feet, 1¹⁷/₁₆ inches) high, 2.4 meters (7 feet, 10 ½ inches) wide and maximum one centimeter (⅜ of an inch) in thickness. Such pads shall be installed at end of the course and shall extend 0.3 meters each (11¹³/₁₆ inches) above and 0.6 meters

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(1 foot, 11 $\frac{5}{8}$ inches) below the water surface. The Program Operations Vice President may waive this requirement for National Championships.

ARTICLE 104 RULES FOR SWIMMING RECORDS

104.2 USA SWIMMING RECORDS

- .1 General Requirements and Conditions for Records
- .2 American and United States Open Records

C Special Requirements and Conditions

- (1) Records established outside of the United States shall be applied for on official record application forms. When an American Record results from a World Record performance outside the United States, it shall be accepted as such upon formal approval by FINA without further certification.
- (2) When a record is claimed, an official record application form shall be filled out, signed by the designated officials, and transmitted to Headquarters with all supporting data, including official meet results and the primary printout tape from the automatic timing equipment, within 14 days after the performance.
- (3) **Pool Certification**
 - (a) Record applications will not be accepted unless certification of course length accompanies them or is on file with USA Swimming.
 - (b) Pool certification shall be reported on the standard form available from the Executive Director.
 - (c) Certification data need only be filed once unless structural changes have occurred since original certification.
- (4) **Pool Measurement**
 - (a) The length of the course, measured and certified (signed and sealed) by a surveyor or other qualified professional licensed in the State or jurisdiction where the facility is located. Such measurements shall be stated in feet and inches and fractions of an inch, or in meters and centimeters.
 - (b) A statement of the conditions under which the course was measured must be included.
 - (c) Where a moveable bulkhead is used, course measurement of the lane in which the record was set must be confirmed at the conclusion of the session during which the time was achieved.

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Part 5 – Reporting Forms

The certification process for pools is on the USA Swimming web site, in the facilities section.

You can access the Pool Certification Page at the following link.

<http://www.usaswimming.org/DesktopDefault.aspx?TabId=1756&Alias=Rainbow&Lang=en-US>

All forms for Pool Certification can be found at the top of the page.

CERTIFIED POOLS LIST

Pools are listed by state and then the pool name rather than the city. The city is listed in the body of the table.

Pools can be measured with or without touchpads. If with touchpads at one end the notation will be (with pads 1E)

If with touchpads at both ends the notation will be (with pads 2E)

This list is updated every 3 to 4 weeks so after submittal and approval of forms the pool may not appear on the list immediately. For additional information or assistance please e-mail mnelson@usaswimming.org

Approved pools will be listed on the USA Swimming web site at in a PDF on the Pool Certification Page.



USA SWIMMING

MEASUREMENT CERTIFICATION OF PERMANENT RACING COURSE

City and State in which pool is located: _____

Name of Pool Owner or Operator: _____

Mailing Address: _____

City, State, Zip: _____

Pool Name: _____

Pool Address (if different from above): _____

City, State, Zip: _____

LSC: _____ (If you do not know the LSC [Click Here](#))

RELEVANT USA SWIMMING REGULATIONS

- Rule 103.2.3 Racing Starts – Minimum water depth for racing starts during practice and competition shall be measured for a distance 3 feet 3 ½ inches (1.0 meter) to 16 feet 5 inches (5.0 meters) from the end wall.
- Rule 103.3.1.C Dimensional Tolerance: Against the required length, a tolerance of plus (+) 0.03 meters (1 and ³/₁₆ths of an inch) in a vertical plane extending 0.3 meters (12 inches) above and 0.8 meters (2 feet, 7½ inches) below the surface of the water at all points of both end walls.
- Rules 103.3.1.D When automatic officiating equipment touch pads are used at one or both ends, the course shall be of such length that ensures the required distance between the two touch pads or between either pad and the opposite end of the course.
- Rule 104.2.2.C(4)(a) The length of the course, measured and certified (signed and sealed) by a surveyor or other qualified professional licensed in the State or jurisdiction where the facility is located. Such measurements shall be stated in feet and inches and fractions of an inch, or in meters and centimeters.
- Rule 104.2.2.C(4)(b) A statement of the conditions under which the course was measured must be included.
- Rule 104.2.2.C(4)(c) Where a moveable bulkhead is used, course measurement of the lane in which the record was set must be confirmed at the conclusion of the session during which the time was achieved..

NOTE: If two or more racing courses are offered in the same pool (i.e., 50m x 25y), a separate form for each course must be filed.

MEASUREMENTS (ANSWER ALL QUESTIONS)

Check off each item below:

This pool is: Long Course (50m); Short Course yds (25y); Short Course m (25m)

This pool is: indoors; outdoors

Touch pads: One end; Both ends; or No touch pads - are included in the measurement.

This pool has: Fixed End Walls; Moveable bulkheads at one or both ends.

Minimum Length of each Lane:

	LANE 1	LANE 2	LANE 3	LANE 4	LANE 5	LANE 6	LANE 7	LANE 8	LANE 9	LANE 10
Feet	ft	ft	ft	ft	ft	ft	ft	ft	ft	ft
Meters	m	m	m	m	m	m	m	m	m	m

WATER DEPTH (IN FEET)

	LANE 1	LANE _	LANE _	LANE _	LANE _	LANE _	LANE _	LANE _	LANE _	LANE _
Start 1m	00.0ft	ft	ft	ft	ft	ft	ft	ft	ft	ft
Start 5m	ft	ft	ft	ft	ft	ft	ft	ft	ft	ft
Mid length	ft	ft	ft	ft	ft	ft	ft	ft	ft	ft
Turn 5m	ft	ft	ft	ft	ft	ft	ft	ft	ft	ft
Turn 1m	ft	ft	ft	ft	ft	ft	ft	ft	ft	ft

*Minimum depth across lanes in each location. Include both outside lanes and at least every other inside lane.

In my opinion, the provisions of USA Swimming Rules 103.3.1 and 104.2.2 as outlined on the

previous page have been compiled with in subject pool, with the following exceptions:

Measurements were made on _____, 20____, at _____ AM/PM under normal competitive temperature conditions and to an accuracy of at least .01 feet (¹/₈ inch or 3mm) in short course pool and at least 5mm in long course pool.

At the time of measurement, I was not in the employ of the pool builder.

The following equipment was used for measurements:

Print Name: _____

Signature: _____

Title/Degree: _____

Address: _____

City, State, Zip: _____

Telephone: (_____) _____

Check one:

Registered Surveyor

Registered Engineer

License # _____

State: _____

Mail this completed form to:

FACILITIES DEVELOPMENT DEPARTMENT
USA SWIMMING
1 OLYMPIC PLAZA
COLORADO SPRINGS, CO 80909-5770

To receive a confirmation of receipt and acceptance, please CLEARLY PRINT your name and email address below:

Name: _____

E-mail: _____