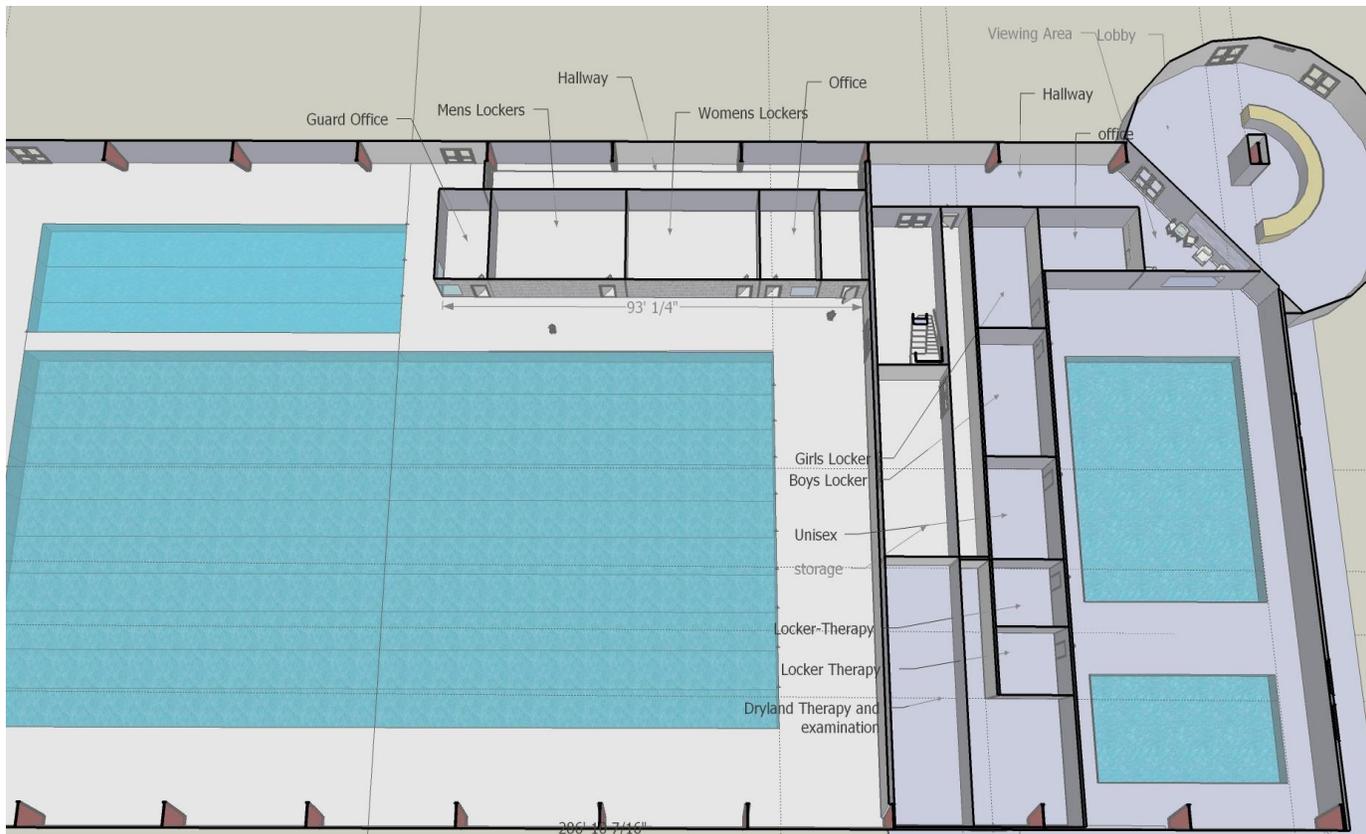




Aquatic Facilities: A Guide for Planning, Design, Operation, Programming



Listed below is the relative order of steps for the development of a private-sector facility. Some steps may need to be done sooner in the order than others depending on the unique nature of the project.

Validate the need for the type of facility you are planning to build. Never build a single use facility. Explore all possibilities for community service and aquatic programming.

- *Research the needs for the type of facility*
- *Discuss with community members*
- *Visit other sites in the area. What are the most successful models doing now? Who are the leaders? What are the successful types of organizations?*
- *Establish a Missions and Values Plan*
- *Identify user groups*
- *Collect census data*
- *Access recent demographic studies. Demographic study usually shows ~6% of population always looking for new ways to participate in lifestyle activities. Populations:*
 1. *Ages 60 and over – Interested in low impact exercise-recreational aquatics – rehab follow up and lifestyle aquatic wellness programs*
 2. *Ages 45-59 - interested in exercise of more than 1 type – recreational aquatics for themselves and children – likes extra amenities offered by the modern facility*
 3. *Ages 25-44 – interested in multiple forms of aquatics and recreation – cares about family based programs and healthy and safe recreation*
 4. *Ages 13-24 – interested in swimming and playing in the water – social interaction with peers is important*
 5. *Ages 0-12 – interested in what their parents introduce them to – skill & safety education is as important as play – organized activities are important*
- *Understand proposed programs and operations. Facility design should be program driven.*

Swim Center

Designer: Larry Byrne

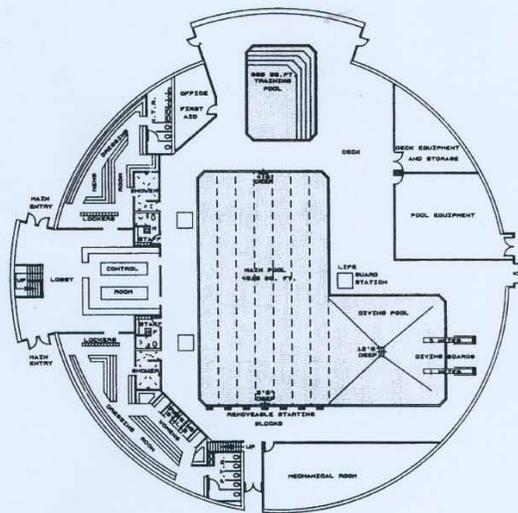
Description: 130 foot diameter dome with 13,270 square feet. The pool is 45' wide and 75' long. A Monolithic Dome could easily be built large enough to enclose an Olympic sized pool with spectator seating. Decking could be added on the second floor of this design for spectator bleachers.

The Monolithic Dome has some tremendous advantages for swimming facilities. Pools present unique construction problems. The constant humidity in the building affects most

building surface materials, causing severe damage. But concrete is waterproof and is only strengthened by humidity.

Another problem for conventional pool buildings: warm water vapor coming in contact with the cooler ceiling makes the ceiling drip cool water. But a Monolithic Dome's ceiling temperature is only slightly affected by outside temperatures. So, even in 98% humidity there is no dripping.

Swimming pools require a large clear span area. The Monolithic Dome is very economical for free span structures.



Below is a sample of the type of demographic information that is needed:

Summary Report
City Name: Colorado Springs, CO
City Code: 0816000
County Name: El Paso, CO
State Name: Colorado
CBSA Name: Colorado Springs, CO

| Description | Value | % Total | |
|---|---------------|---------|--|
| DEMOGRAPHIC OVERVIEW | | | |
| Population | 385,455 | 100.0 | |
| Households | 156,166 | 100.0 | |
| Total Household Income (\$) | 9,728,736,985 | 100.0 | |
| Median Household Income (\$) | 49,467 | N/A | |
| Median Age | 33.1 | N/A | |
| | | | |
| POPULATION BY RACE | | | |
| White Population | 299,391 | 77.7 | |
| Black Population | 26,602 | 6.9 | |
| Asian, Pacific Islander Population | 14,111 | 3.7 | |
| Other Population | 45,351 | 11.8 | |
| | | | |
| POPULATION BY ETHNICITY | | | |
| Hispanic Population | 54,552 | 14.2 | |
| White Non-Hispanic | 273,969 | 71.1 | |

Plan how the project will be funded. Where will the money come from and how will the debt reduction payments affect the budget?

- *New business – Expansion – Renovation – Phases ?*
- *Refinance – Borrow (personal investment – equity –*
- *Business partners - FUNDING !*
- *Fundraising study and plan*
- *Credit rating – (Equifax Experian TransUnion – FICO score)*
Credit Reports and Financial Statements
- *Strengths and plan to optimize (and) Weaknesses and plan to improve*
- *Budget (Source and Use of Funds Statement 1 year) Last 2 years of IRS filing – Equity Statement – etc*
- *Record keeping and Accounting system – Bank/Credit Union*

- *Estimate square footage needed and construction cost using a per sq ft \$ amount.*
- *Calculate income potential*
- *Calculate staffing needs*
- *Calculate expenses*
- *Develop preliminary 5 year pro-forma*

Contact a professional facilities planning advisor. The facilities planning advisor or team will assist you in identifying the community needs that your facility will fulfill. This process is what determines how many pools you will build and their size-shape-depth-and water temperatures. Remember – never build a single use facility. This is also the stage that you will identify your various client groups and what you need to service them. This is a different service than provided from an architectural design consultant, a consulting engineer, or a design & build firm. If the project will have any association with a school or a municipality you will probably need a professional Feasibility Study. Our department cannot do this in-house but if you contact us we can refer you to a preferred provider.

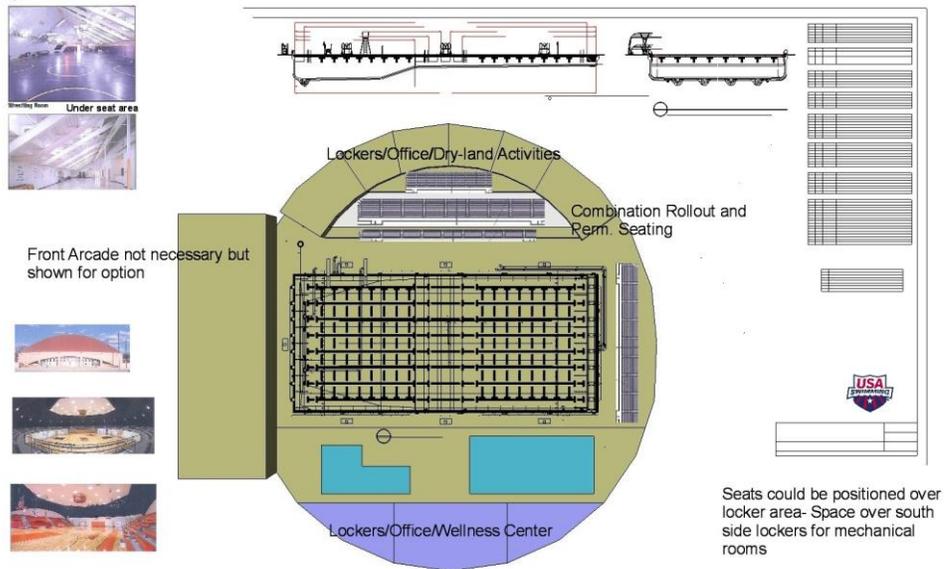
Location needs to be identified and be available. You will probably need a Real Estate agent to help you with the process –

- Zoning requirements
- Utilities availability
- Building feasibility assessments
- Geotechnical engineer or soil specialist – topographical study – water table study – seismic zone restrictions – water shed and retention requirements
- Traffic flow and other neighborhood issues – security issues
- Accessibility and expansion capability



Form a business plan and a sketch of a facility design. If you intend to seek financial assistance, you will need a grant application or business plan which is understandable and verifiable. Your business plan should include:

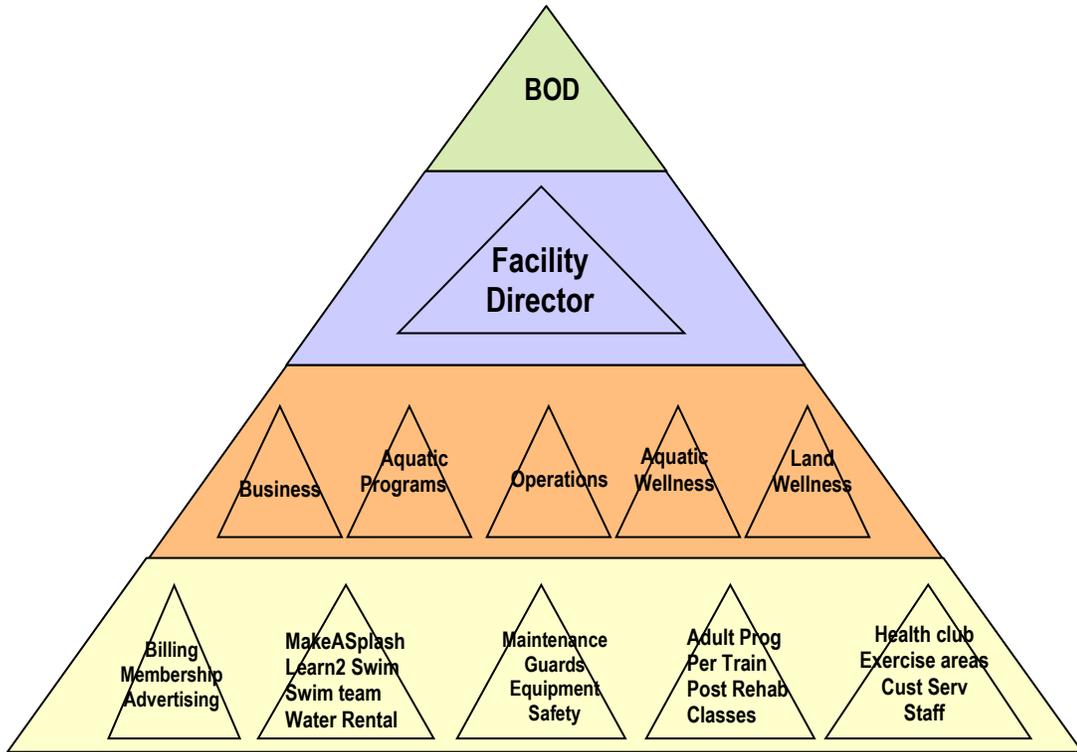
- Facility description – this should include sketches (not drawings) of exterior and interior of facility – basic design
- mission/purpose
- marketing strategy
- organization and management plan
- customer base descriptions
- potential market growth
- competition in area
- retail sales opportunities
- equipment requirements
- operational plan
- business advisors and board of directors – with short biographies
- pro-forma *
- assets and liabilities balance sheet
- sources of funds statement



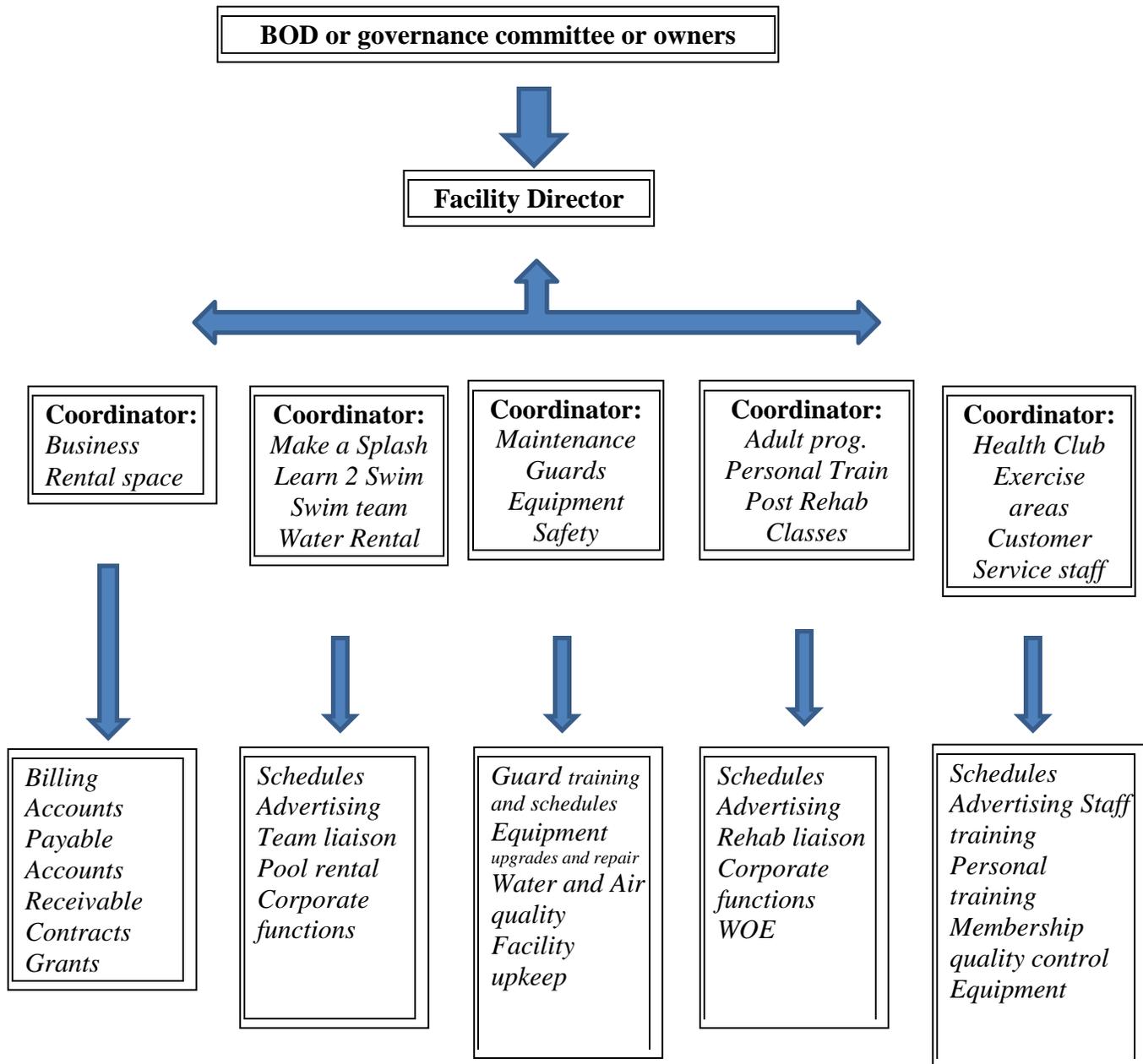
Write your overall management philosophy. Identify your company owners and board of directors. Answer the obvious questions such as how many employees you will have over given periods of time, how many of those will be directors, managers, coordinators, supervisors, support staff and what their experience and credentials need to be. For the key players you already have in place, provide summaries of their resumes highlighting pertinent experience, certifications, achievements, salary levels, and their areas of responsibility. For positions you are still trying to fill, summarize your minimum requirements for likely candidates along with the responsibilities of those positions. You may elect to contract those positions out to professionals who specialize in the area you need. You may find that contracting work out is the best solution initially. Be sure you include the credentials and track records of your contracted help and the time tables for hiring additional staff. Include a section on outside support, such as your CPA, your attorney, your banker, and your insurance broker. Also include any other outside resources such as your board of directors or management consultants.

If dealing with a non-profit board confirm that they have recently taken part in educational and planning programs like "Board roles and responsibilities", "Ethical practices and policies in the sector", "Risk management", "Board chair/CEO relations", and "Strategic planning". Their governance has to be solid for them to be an asset to the project. Look at your management plan critically and search for weaknesses in your organization Spell those weaknesses out and identify your plans to address them. Even if you don't see the weaknesses, it is very likely that your potential investors, partners, and clients will.

Organizational Chart - Set up an organizational chart. Having a visual illustration makes it easier for both you and your readers to understand the organization and see any possible gaps.



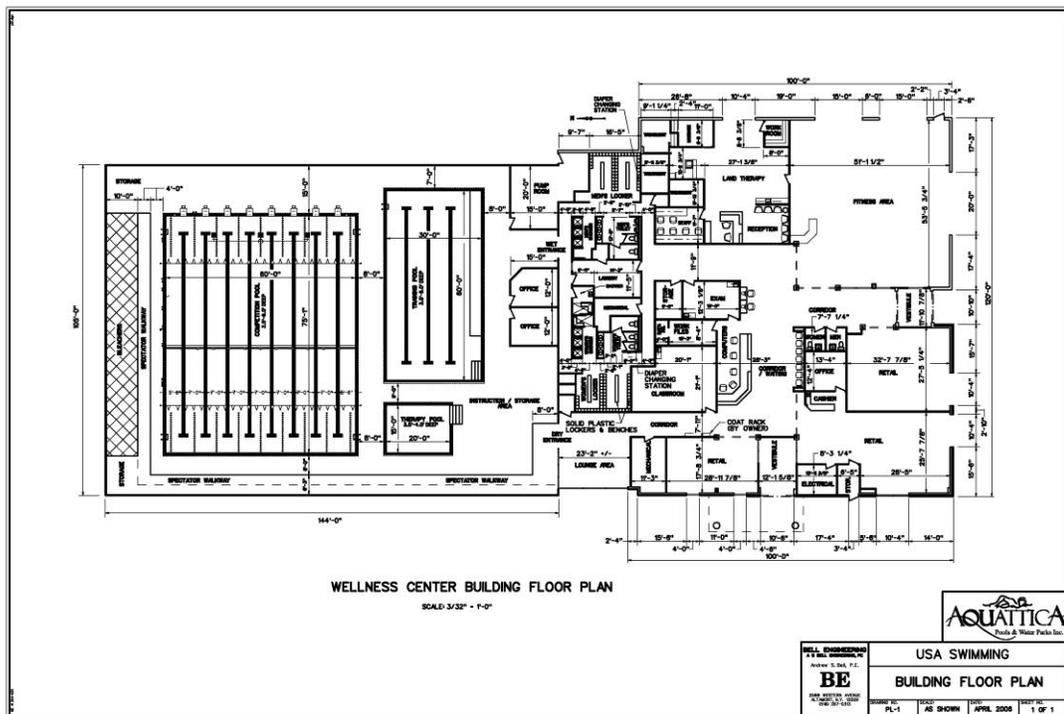
An example of a sustainable total aquatic programming staff flow chart



There may be phases to the business plan that will require job sharing or a combination of positions until the business grows enough to warrant a separate department or coordinator.

Staffing Costs - Include either a table or a description identifying your personnel costs. These costs will be used in your profit and loss (P&L) statement. You can break it down by individual, or department. Include the title, department or group salary level and then in a separate line add 25% to 30% to cover employee benefits, taxes, etc. (also referred to as your Payroll Burden.) Extend this table to cover then next 2-3 years showing an approximate 3% per year increase on the salary line.

Facilities - List your facility information in this section. Describe the type of space your business requires, the costs and lease length and terms, your time table expansion or moving to larger facilities, and any other pertinent information.



Miscellaneous - If a part of your strategy is to gain market share based on excellent or unique customer service, then you will want to include a section about your Customer Service plan. You may also want to include your Human Resources and Benefits plan to layout your strategy for getting and keeping top staff talent.

- Do any of your staff members have non-compete agreements they are bound to? Are there any other limitations that should be considered?
- Do your outside resources have experience in your particular industry?
- Do your outside resources or your existing management staff have experience with startups?

- Do you have stockholders or partners, and if so will they have any say so in management decisions?
- What role will your investors play?

Financials: Financial Plan & Needs Summary - If you're seeking funding for your business venture, you have some options. You can go to banks and other lending institutions and seek a business loan, or you can go in search of venture capitalists, or you can partner with a community service or business that would benefit from your services. Which source you choose, will depend on the amount of funding you need. The type of funding you need will dictate how your plan (especially the financial section) is written. Investors or partners will want to know how they are going to profit from this investment down the road, while lenders will want to see how you will be repaying their loan. Regardless of the source of funding, you'll need solid financial projections that cover all of the bases. For many, the financial portion of your business plan is its heart. If you think about it, why else are you going into business? You will fulfill a NEED you identified in the market and you WANT to make money doing it. Your potential investors, lenders, partners, are reading your plan to see if and when you're going to make that money.

What makes up the heart of your business plan is the profit and loss (or income) statement, the balance sheet, and a cash-flow statement. If your business is a startup, these will all be projections referred to as **pro forma* statements. If you're writing this for an existing business, then these statements will reflect your past business history and current financial situation. One way to go about this is to break your financials down into monthly projections for the first year, then quarterly for the second and third year, then extend the 4th & 5th years to annual projections. Since this is a very critical part of your business plan, make sure you follow Generally Accepted Accounting Standards, and that your financial statements are all prepared correctly. It is well worth the expense to hire an accountant to review or prepare them. If you have an accountant prepare the financials, make sure you completely understand the process and what the terms and figures mean. Potential investors & partners will feel more comfortable investing in a company whose owners have a good understanding of the financial aspects of the business.

Financial Needs Summary Before you throw numbers and spread sheets at your prospects, summarize your financial needs. If you are seeking investors, this is where you will indicate how much cash you need to begin operations and how the funds will be used. How much will have to be spent on computer equipment, office furniture, etc? You can break these down into "operating projections" or "capital needs" but have as much documentation as possible to back up this information

Financials: Revenue Model, Assumptions and Comments

Revenue model. This will describe the various programs you will be putting in place and how each will bring in money. If you've come up with a unique program be sure to describe it clearly. (You may also want to make sure you have confidentiality forms signed and any of your terminology copywrite or trademark protected)

Assumptions, Explain the techniques you used to arrive at the information in your financial statements. For instance, you may want to state that all services and program fees are assumed to be cash based. If a retail aspect is included that certain inventory levels are maintained and paid for on specific terms and the sales commissions are based on x% of sales totals, etc. You can also include information about the general outlook of aquatics. This can be a bulleted list of short statements, or written in paragraph form. In other words describe how you plan to do business. For your own internal use, it is helpful to put together an assumptions spreadsheet that lists individual salaries (including costs of benefits), marketing expenses, other known budgeted business expenses, as well as revenue projections. This spreadsheet can help you identify when your expenses are going to peak due to marketing activity and planned hiring schedules. This tool will help you track spending and do efficient budget preparation later on.

Search for the Design & Build team. The consultant(s) will need to communicate with the architect/engineer/design & build firm so you may want to include them in this process. It would be a good idea to contact the Facilities Development Department at USA Swimming www.usaswimming.org/facilities to get some referrals to their professional providers. These companies have “cutting edge” products and information that can offer you better product at best prices. Secure a copy of your state's “code” on swimming pool construction and design from your Department of Public Health. Codes for competitive pools and community pools and therapy pools and hot tubs/spas will vary considerably.

Secure financing – Whether you raise money from existing business capital, a commercial loan or from other sources such as grants, private philanthropic organizations or the community, you must have guaranteed financing before going any further. Financing the initial building cost is only a portion of the plan for success. Operational funding is always as important and usually where entities struggle.

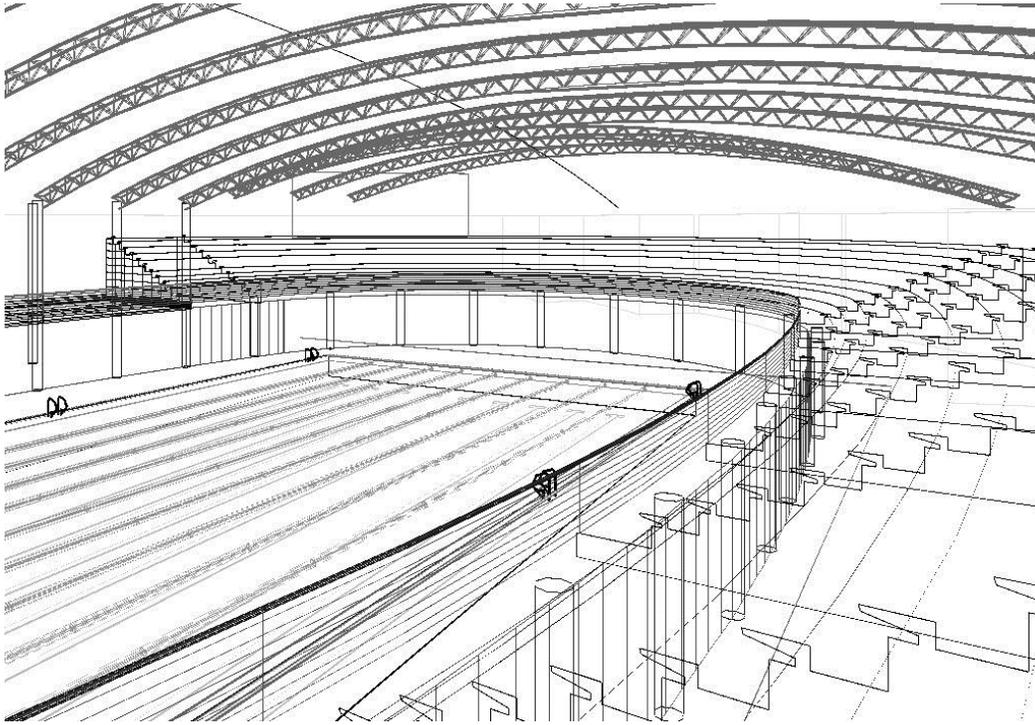
Legal - Contracts – Escrows – Formation of Business both State & Federal- Insurance - Taxes – Governance

Contract the firm to make preliminary drawings and cost estimates. This is the solidification of you team or advisors which will

probably include:

- Consultants
- Owners

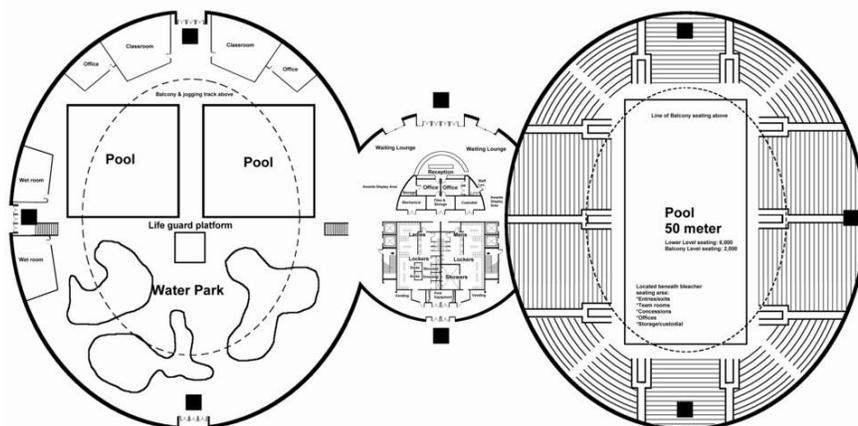
- Community Partners
- Architect
- Engineers
- Builders & Contractors
- Equipment manufacturers and distributors
- Local Health Department



Review the plans and conduct a “needs vs. wants” process to make sure project is serviceable to your plan and within desired budget. Compare the price per square foot construction cost with similar projects in the area. What will be included in your project ?

- Community pool for vertical exercise – 87 degrees minimum – 4’ average depth - can also be a lessons pool and overflow Therapy pool
- Therapy Pool for Aquatic Physical Therapy – 88 to 90 degrees – 4’ average depth - can also be used as a community hydro-pool and a warm tank for divers
- Hot tub (s) – 100 degrees to 103 degrees – 30” average depth - can also be used for some specific types of Therapy or rehab
- Competition pool (s) – 82 degrees – 6’ to 4’ average depth – can also be used for lap pool for exercise
- Diving pool – 87 degrees – 12’ average depth – can also be used for scuba lessons and lifesaving classes and syncro classes
- Leisure pool
- Zero-Beach pool
- Current Channel – Lazy River
- Waterslides
- Water Vortex
- Spray pools – wading pools

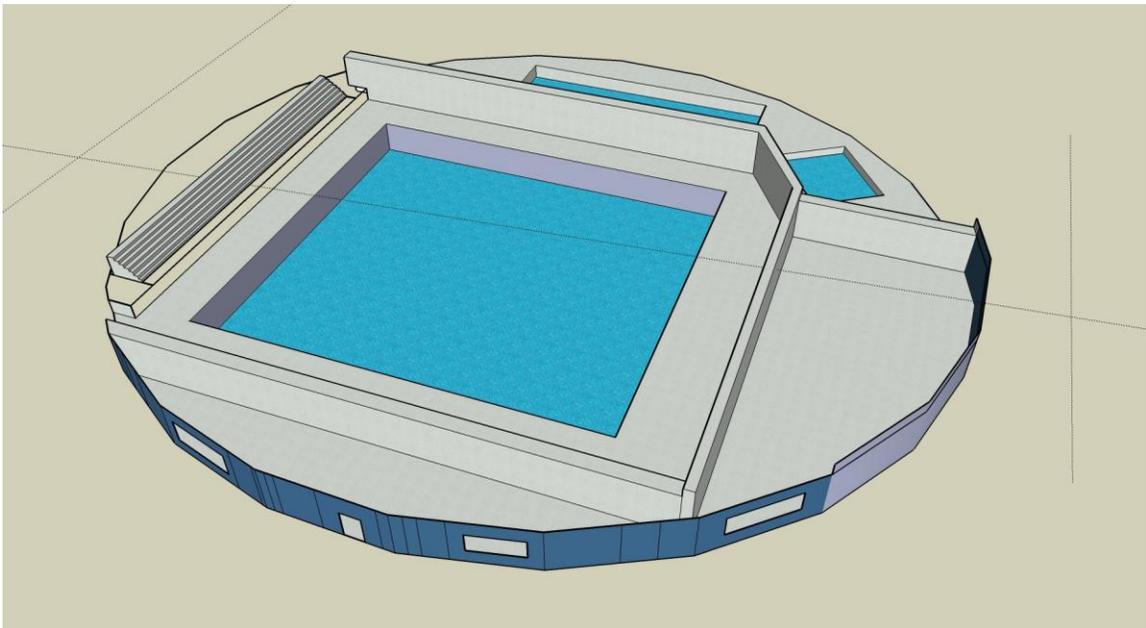
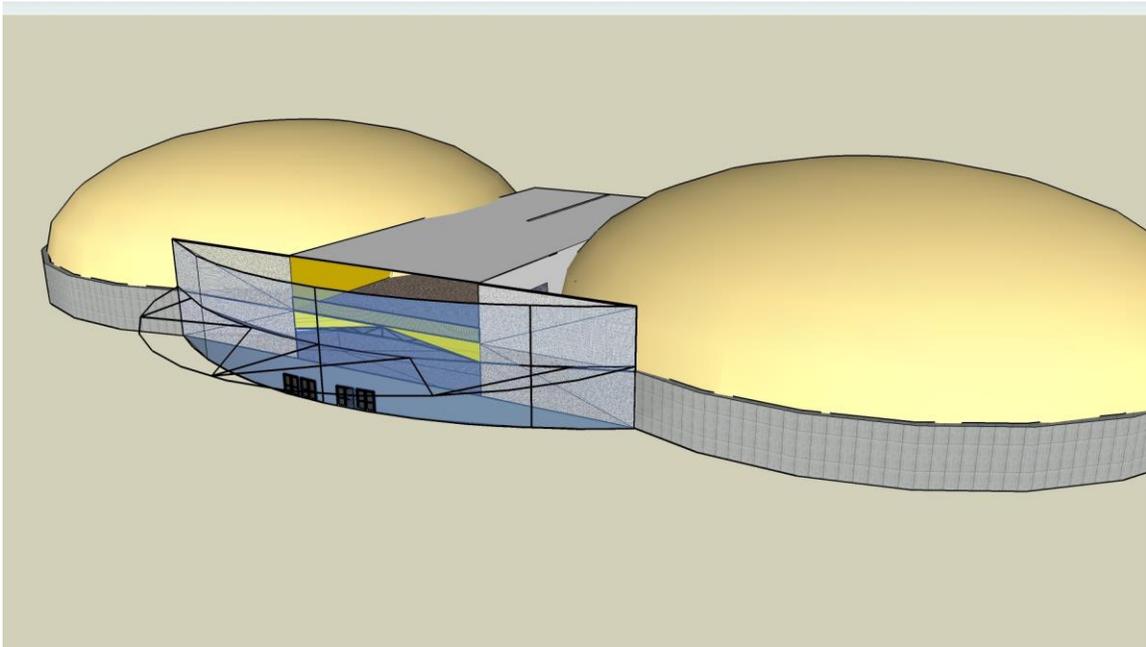
Develop different levels of equipping that fit specialty needs and a variety of budgets. Plan for success and expansion. Initial building cost are usually 300% less expensive than “add-it-later” cost. Plan for the basics then add the frills later if necessary.



Lower Level Plan
D. Thomas Kincaid Architect

■ Point of entry / egress

0 50 Feet



Contract the firm to create construction plans and working documents. Submit plans for swimming pool construction and equipment to the Department of Public Health for review and approval. After this approval process any changes that affect safety or operation of the pool must also be approved.

- Construction diagrams or drawings including floor plans, site plans, structural details, elevations, grading, pool orientation, utilities.
- Detailed construction plans (blueprints) including inlets, drains, hydrostatic relief valves, gutters, surge chambers, piping, decks, hose bibs, water fountains, walls, ladders-ramps-steps, rails, lights, diving boards, starting blocks, bulkheads, lifts, filtration & circulation equipment, locker rooms and fixtures.
- Schematic diagrams including pool piping, electric, mechanical, plumbing, and cross-sectional and longitudinal views of all pools.
- Specifications are the written instructions for the builders that provide technical information for the work that is to be done. They describe materials, size, type of equipment, standards of workmanship, material quality, options and alternatives and acceptable substitutions, installation methods or procedures, and inspection and testing requirements. These are more detailed and take precedence over the actual drawings.
- Change request and change orders
- Models and or aerial photos



Pre-bid and Bid process. Submit plans for bidding to contractors. Make sure that all of the contractors have previous experience constructing pools.

- Announce opportunity to bid
- Pre-bid meeting at site
- Distribute construction documents with schedule or drawings and

- specifications will be given to proposed bidders
- Bid package – invitation to bid, instructions on how to submit bid, how the contract will be awarded, conditions for bid rejection, sample proposal forms, conditions of contract, time frame for project with penalties.
- Review and accept or reject bids, negotiate fees, award contract. *Terms of payment and deposits must be spelled out in detail.*
- Consider alternatives if the bid process is not going well (e.g. Negotiated Bid or Design Build)

Construction phase. Oversee as much of the construction as possible with emphasis on all of the equipment installation. If any changes are made make sure you consult with your team of advisors. Things that will be addressed are:

- Permits, fees, liability bond, insurance, clean-up, temporary facilities, security, tax, plan check, sub-contractors, summary of work, responsibilities, items furnished by owner, work to be performed after project in a different phase, pertinent codes, abbreviations and symbols, reports, storage, protection of materials and equipment.
- Site work: Clearing, grading, excavating, drainage, utilities, roads, landscaping, demolition, earthwork, clean-up
- Concrete: Formwork, reinforcing, material, water-tight, finish, deck, grout
- Masonry: Material, reinforcing, grouting, placement of rigs, mortar, stone
- Metals: Structural, steel, metal, joist, ornamental – specialty Type 304 & 316 stainless requirements
- Carpentry: Millwork, casework, walls, framing, rough carpentry, finish carpentry, adhesives, wood and plastics
- Moisture protection: Roofing, weatherproofing, insulation
- Hardware: Doors, windows, glass, skylights, retractable – sliding – opening
- Finishes: Drywall (wet & dry), tile (slip resistant), flooring, interior and exterior painting, plaster, tile, carpeting, acoustic ceilings, wall coverings
- Specialties: Toilet accessories, visual boards, lockers, signage, clocks, security and safety equipment systems, prefabricated products, pest control, fireplaces, flagpoles, telephones, televisions, radio, speakers
Equipment: Athletic, exercise, therapy, audio visual, theater, spas, saunas, steam room, tanning, snack bar and concession/vending, cabinets, kitchen, office equipment
Furnishings: Seating, artwork, drapery, blinds, shades, carpeting, furniture, plants
Special: Competitive pool(s), Therapy pool(s), Recreation pool(s), Community pool(s), filtration and circulation, heating, dehumidifying, air conditioning, ventilation and air exchange, water treatment, courts, health clubs, specialty rooms
Access: Stairs, ramps, elevators, escalators, lifts, hoist
Mechanical Systems: Water supply, fixtures, sprinklers, heating, air

conditioning, waste water, fountains, plumbing, air handling
Electrical Systems: Lighting, communication systems, controls

Develop a policies and procedures manual including –

- Job descriptions
 - Licenses and training and certification standards
 - Employee responsibilities
 - Testing procedures
 - Business auditing procedures and compliance plan
 - Dress code and uniform guidelines
 - Use of facilities by staff
 - Performance evaluation process
 - Employee benefits, insurance
 - Resources and equipment support
 - Absence, vacations, sick leave, substitution, schedule changes, breaks
 - Payroll information
 - Employee protection policies regarding accidents, universal precautions, protective gear, chemical, biohazard, electrical safety
 - Closing procedures for weather, natural disasters, fire, chemical spills, power outages
 - Aquatic and therapy practices and protocols
 - Maintenance practices and operating procedures, for pools and major equipment
 - Risk management program
 - Facility rules for all areas
 - Accountability – payment controls and loss prevention controls
 - Mission statement
 - Map & directions to facility
 - Phone and communications listings
 - General program information and services provided
 - Service principles
 - Hours of operation
 - Admissions requirements & rental information
 - Facility description
 - Facility diagram with emergency action plan
 - List of employees – their titles and short bio's
 - Copies of all forms used at or by the facility

- Records and reports summary: Including but not limited to – Employee procedures, Operating manuals and procedures, Chemical safety procedures, Evacuation procedures and emergency plans, Safety literature and posters, Release forms, Request for leave of absence, Work schedule sheet, Daily deposit sheet, Pool rental agreements, Contracts, Fee waiver forms, Accident report form and victim and witness statement forms, Incident or occurrence report form, Agreement to participate form, Liability release forms and

waivers, Patient-member-client assessment, Refusal of emergency medical treatment form, Blood/bodily fluids contact report, Notice to guest, Verification of employee certification and licenses, Employee training log, Staff audit forms, Daily pool logs, Chemical logs, Daily maintenance and safety check list, Seasonal and preventative maintenance check list, Inventory forms, Equipment disposal forms, Maintenance request forms, Code compliance checklist, Marketing brochures and advertising flyers, Phone call log,

Develop hours of operation, programming, scheduling, and equipment needs to meet the needs of your clients.

- Resource planning and development
- Leisure component – Family access
- Therapy or Rehab access and water temp
- Swim Lessons temp and access
- Community programs – Fitness and aquatic exercise – Aquatic Therapy and Rehab - Arthritis- Masters Swimming – Lap Swimming- Swim Team - temperature & access
- Special Needs programs – temperature and access

Staff – Management Structure: Staff Positions and Management

- Hire your project manager
- Get your technical staff in place
- Set up a management team that has good experience and track records in marketing, finance and operations. It can make the difference in whether your business plan works or doesn't work. Most businesses fail because of weaknesses in their management staff.

Minimum Staff Positions The staff you'll need to run your business will depend on the type and size of your business, and the programs and services you are offering. As a general guideline you'll need:

- Technical staff to develop and build your product or service
- Staff who can manage your finances
- Staff who can market your product
- Staff who can oversee your operations
- Administrative staff

Identify the positions and hire the staff that you will need.

- Facility Director
- Aquatic Coordinator
- Special Programs Coordinator
- Customer service staff such as tech's or lifeguards
- Coaches and Personal trainers

- Instructors
- Office Coordinator
- Receptionist
- Housekeeping
- Maintenance

In house training programs and necessary certifications can take time so start this process soon enough (4-6 months before opening). All employees must have training in Basic Water Safety, CPR, First Aid, and Risk Management. They must participate in scheduled rescue drills and emergency action plans. Certification and in-service-training is important. There are many organizations who offer this type of course so due diligence is important when deciding what company or organization to use.

Initiate the marketing and public relations campaign to launch your program. Some of this needs to be done 6 months (or earlier) prior to the opening of the facility.

Inspections - many building and health inspectors will have to give their “stamp of compliance” before you can open for business. The Department of Public Health, the local Fire Department, the insurance inspectors, and others will also do periodic follow-up checks once the facility is open.

Schedule an official Grand Opening. This is usually scheduled after the facility has been open a few weeks. Be sure to invite all of the people who have had anything to do with all phases of the process including the design and build phase, plus community leaders, corporate leaders, and the people in the community who will be your “word-of-mouth” advertisers. This usually involves a few hundred people so put on a great show. Some facilities like to hold a VIP Grand Opening on a Saturday followed by a Public Grand Opening on a Sunday. All of your staff need to be present to answer questions and act as host.

Needs, feasibility and programs analysis

Programming Precedes Design – Feasibility assessment identifies needs and wants.

Often it is necessary to try to supply figures that prove a community can build and sustain a specific size of facility. For a smaller community this could be an 8 lane 25 yard pool with other auxiliary pools for programming. For larger communities this is usually some form of a 50 meter pool with recreation and leisure pools for community use.

The key word here is “prove” which is subjective at best. What is being asked is that someone supplies economic impact numbers and then do a feasibility study. Each study, if correctly done, must be area specific. The demographics of Miami Florida vary greatly from those of Seattle Washington but on paper, the raw numbers look similar. The needs of each community will be based on what exist there now and what national trends they are not currently fulfilling. The delivery system of the actual programs plays as important of a part as the size and scope of facility.

It is not a solid approach for the proper planning of a project to compare facilities that are in existence today and then try to prove that scenario can be duplicated anywhere else. There is much more to it than that, and most city officials will consider a person or group who tries to oversimplify this process as totally non-credible. Once so tagged, your opportunity for bringing the correct information is gone.

Every city/municipality, school, university, etc. that is truly considering embarking on a project will require a detailed and complete feasibility study be done. These studies are formal documents and cost money. They are done by professionals with allot of their time and resources invested. The entity contracted to supply information needs to understand Total Aquatic Programming and make that the primary force for the proper design for multiple pools.

The resources to continue the model for NEW RECREATIONAL FACILITIES we have had in this country for over 60 years are rapidly disappearing. Most of us enjoyed access to some form of COMMUNITY facility while growing up. Whether it was a school, YMCA/YWCA, or City Parks & Rec., it was always there for us. We never thought much about how it got there or how it afforded to stay open. Times have changed.

- Citizens are taxed close to the limit
- Utilities cost have skyrocketed over the past 15 years – especially since 2002
- Insurance cost have drastically increased because of inadequate risk-management
- Staffing and operational cost are escalating
- Building materials are going up more often than yearly – sometimes monthly
- Finding real-estate that is affordable is a monumental task

If we compare what it cost to build a facility now to what it was just 20 years ago, the results are eye-opening. An indoor facility that was 12,000 square feet could be built

with a pre-engineered steel building and concrete pools for around \$900,000. Price today – at least triple that.

What is more attention-getting is that the overall operational cost of that facility has gone from around \$60,000 a year to \$160,000 a year. Since January of last year Chlorine products have incurred a 30% price increase and a similar price increase for natural gas seems certain.

So even if there are school dollars, or community dollars available, boards and committees shy away from the high cost of operating large pools. It has to be shown that the entire community has a need and a use for a specific pool(s) or they probably will not get built.

This is where feasibility studies and economic impact studies are worth their weight in gold. Some things to expect from a feasibility expert who understands Total Aquatic Programming:

- Meetings to present and discuss the project goals, objectives, scope, and schedule.
- Discussion of base assumptions which will be expanded to provide the framework for continued analysis and strategy development.
- Confirmation on lines of communication, points of contact, level of involvement by the club leaders and staff.
- Provider will collect, log, and review any data and information to facilitate a thorough understanding of the project background.
- Provider will be in close and constant contact with the designated project manager throughout the project.
- A market analysis will be performed to document the needs and identify the target market and core service offerings of the proposed facility.
- Market definition will occur through an iterative process to identify key issues, needs, and vision for the project.
- Analysis of the major direct and indirect competitors will be compared against the activities and programs identified in the Market Definition.
- Work sessions with key stakeholders to document their needs and other issues.
- Examine the demographics of the area. Trends will be documented based on growth, stable, or decline status and frequency of participation by each demographic characteristic. These figures will drive the revenue projections
- Identify the recommended core program markets based on the input and analysis performed during this task. The outcome of this task will be used to establish a concept development plan including financial performance and partnership/management alternatives.

Following the decision on advancing the project, Provider will prepare a concept development plan that translates the market and program needs into facility, land, operations and partnering plans.

- Provider will lead the effort to translate the core program market and facility needs into a space allocation program including sizing requirements and component relationships and interaction including site analysis.
- Provider will prepare a development plan including concept and location development and will prepare budgetary construction cost estimates and final space/land needs to establish the Final Development and Operational Plan.
- The financial analysis will be performed in conjunction with the concept development task. This translates concepts into hard numbers that establish the baseline for decision-making.
- Provider will establish operational standards and costs for the proposed facility based on full operations. This will include hours of operation, maintenance standards, staffing levels needed, technology requirements and customer service requirements based on established and agreed upon outcomes.
- Provider will evaluate partnership and management alternatives opportunities and develop a strategy to support formal agreements.
- Based on the operational plan for the facility and debt service, Provider will develop a pricing strategy for each of the appropriate services with the desired outcome of a self-sufficient facility. Pricing strategies will also include program fees, lease fees, rental space, concession pricing, and catering pricing for both prime time and non-prime time use. This will be converted into a five year pro forma and operating budget. These options will include a combination of options partnerships/sponsorships, revenue generation and other available resources.
- Following the agreement on the development plan and recommendations, Provider will prepare the final report documenting all findings, analysis and recommendations to support implementation. This will include the vision, mission, goals and objectives for the facility along with the strategies, actions, pricing strategies, target market, programming plan, management/staffing plan, partnering/management plan, funding recommendations, priorities/timelines and performance measurements. This plan should be one that generates excitement and encourages reading and promotion. Electronic files of the report and associated support material will be delivered for final reproduction and distribution.

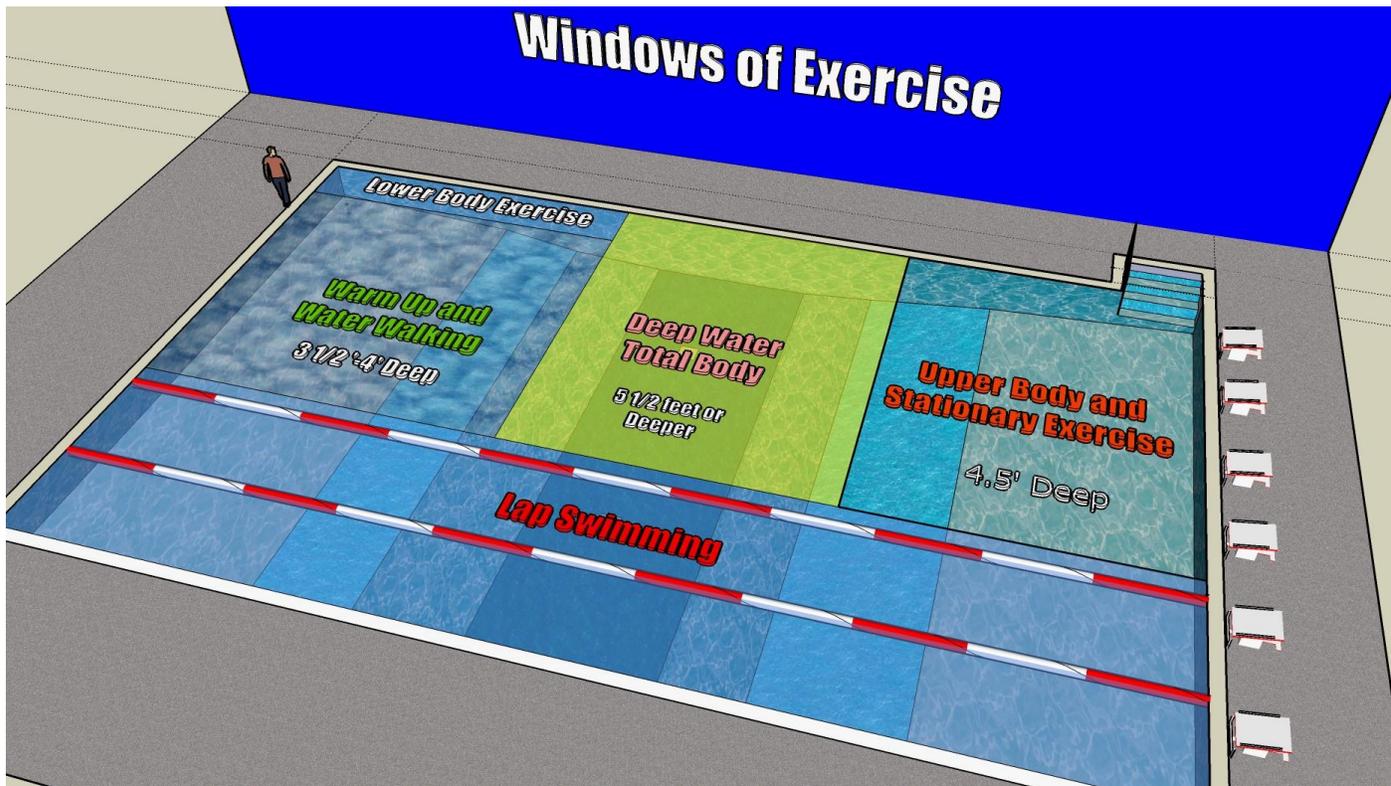
Excerpt from a programming feasibility study Scenario - Programming day

The pool(s) must pay for themselves when the doors are open to members or the public. It is not practical (in most cases) to expect the pool to be open more than 16 hours a day on during the week and usually more abbreviated hours on the weekend. With that concept as our base line we will assume that the pool is going to be open 90 hours out of the 168 clock hours in a week.

The pumps and filters and HVAC systems still have to work 168 hours and that needs to be paid for. So the basic premise is that we have 168 hours worth of utilities expense and 90 hours worth of staffing expense. The 90 hours may actually be more if there is night time cleaning crews contracted.

Therefore – when looking at the “operational expense” for a facility, we must take into account our actual PROGRAMMING hours that can be income producing. All facilities would come closer to financial sustainability if they could offer lots of water space from 4PM to 8PM and much smaller space from 5AM to 4PM. Since this is not practical, one plan is to increase revenue producing programs during the non-peak hours.

We are going to use a single 6 lane 25 yard pool model since that is more prevalent than the 2 or 3 pool model which operates at a much higher income potential. If more pools with various water temperatures are available, the model can be modified or expanded. We are also going to discuss programming only for months when kids are in school during the day.



Consider the 4 pillars of aquatic programming for income streams:

1. Learn to Swim and water safety
2. Adult water exercise
3. Rehab and Therapy
4. Swim team and bridge programs

Open swim is not considered “programming” although it generate some income. It will not be used in our discussion since we want predictable income programs in the pool.

1. Learn to swim programs successfully operate by offering lessons in 3 categories:

- a. Private or custom classes = cost example \$38 per student per 30 minutes in sets of 8 lessons
- b. Semi-private or 2:1 classes = cost example \$19 per student 2 per 30 minute class in sets of 8 lessons
- c. Small group classes 4-5-6:1 = cost example \$9 per student 4-6 per 30 minute class in sets of 8 lessons

The target market for these lessons is:

1. Home schooled students between the hours of 9AM and 3 PM (\$1140 per week)
2. Day care centers between the hours of 9AM and 1PM (\$760 per week)
3. Private schools that may be in close proximity to the pool and can incorporate swimming into their PE curriculum. (\$380 per week)
4. Special needs children
- d. School age classes in all 3 categories on Saturday 8Am to 5 PM. (\$1216 per Saturday)

Projected weekly income for the Learn-to swim classes = (\$3496 per week)

2. Adult exercise programming throughout week using window of exercise format (contact snelson@usaswimming.org)
Monday through Friday 7AM to 4PM and Saturday 8AM to 5PM.
 - a. Fees based on monthly membership/access = 250 members @ \$49 per month (\$12,250 per month) (\$2849 per week)
 - b. Private aquatic personal training 30 minute sessions @35 per 30 minutes (\$280 per week)
3. Rehab and Therapy based on water rental ½ lane @ \$30 per hour Monday through Friday 8AM to 4 PM Based off 20 hours per week ½ lane (\$600 per week)
4. Swim team and Masters based off water rental for 6 lanes 25 yards @ \$14 per lane hour
 - a. Monday Wednesday Friday morning 5:30 AM to 6:30 AM (\$252 per week)
 - b. Monday through Friday afternoon 4:00 PM to 8:00 PM (\$2920 per week)
 - c. Saturday morning 8AM to 11AM (\$252 per week)

Projected weekly income from competitive swimming = (\$3424 per week)

Programming weekly income summary

1. Learn to swim = \$3496 per week
2. Adult exercise = \$3129 per week
3. Aquatic rehab = \$600 per week
4. Competitive swimming = \$3424 per week

Weekly income estimate = \$10,649

The typical weekday would go something like this:

- 5AM morning competitive swimmers arrive and are in the water from 5:30 to 6:30 AM
- 7AM the adult exercisers arrive and different groups come and go until 4PM
- 8AM the therapy ½ lane is open and stays open (if scheduled) until 4 PM
- 9AM swim classes start and go through 3PM as scheduled
- 3:30PM competitive swimmers start arriving and train through 8PM in their different groups

Legal and business considerations

Step #1: PREPARATION

The first step is to ask yourself why you want to be a business owner. You will be the focal point of this venture and you need to be very clear about your motives. Why do you want to leave the mainstream and plunge into the unknown? Secondly, make sure you personally can handle the task: emotionally, physically, socially and financially, before you begin. Be sure to consider family involvement and obligations. The business can become all consuming and success is not guaranteed.

| Advantages of Individually Owned Programs | Disadvantages of Individually Owned Programs |
|---|--|
| Continuity and consistency of vision & purpose. | Greater financial risk for owner. |
| Organization, program, and leadership stability. | Faces typical start-up costs and challenges of any small business. |
| Owner(s) enjoys typical advantages of self-employment. | Revenues are taxable, depending on the structure of the business. |
| Owner(s) has potential for greater compensation and ability to build equity over long-term. | Owner and partners may be personally liable for business debts. |
| Sole proprietorship and partnership | More limited financial resources. |

| | |
|--|---|
| relatively simple and inexpensive to create. | |
| Additional challenges beyond coaching | Sometimes more difficult for privately owned teams to foster volunteer support. |
| Involvement in all aspects of the program | Involvement in all aspects of the program |

1. **What does your picture of success look like?** Sharing administrative time with daily “hands on” responsibilities is a challenge. You have to have a personal vision and a passion for you goal. There has to be an underlying motivation for you to want to be the expert in charge.
 - a. There are two forms of motivation: internal and external. Your internal motivation realizes what the business will accomplish short term. Your external motivation defines how the business will affect other people.
 - b. It doesn’t exist unless you write it down –even if only on a post-it-note! Write down your internal motivation phrase, and share it with others. It provides you with direction and self-confidence. When people hear and understand your objective, they can become motivated to help you.
 - c. Then record your external motivation phrase, describing what you want to accomplish with your leadership. What problems does it solve and who will benefit and how. People have a “self-interest” in benefits, and they'll become advocates for your plan.

2. **Share the vision** – when your clients or the people you work with hear your idea or plan, they should immediately ask themselves "How will I or someone I know benefit from this idea?" To motivate others to help you succeed, you need to develop a “vision message" that helps people immediately recognize the value you offer. Use the “elevator pitch” concept. If you only have a minute-or-so riding with someone on an elevator, how will you convey your message? Your vision message has to be a brief, powerful message that's based on the benefit you offer to your clients. They will then become an advocate and share your vision. To develop the message:
 - a. First, write down how you will help your clients. **Bold** any action key words – these can become your Values.
 - b. Use these Values to form a short statement that focuses on the key benefit you will provide.

3. **There is no substitute for experience** –

Organizations pay a lot of money to professional consultants to find out what people really want and how they want it. You can help yourself by researching and visiting existing businesses. Not necessarily internet searches (although they are valuable in their own right), get out and talk to people (those who have succeeded) to discover what really works. This real-world information you gather will save you time, money and frustration.

- a. In addition, research recent articles written about swim schools and clubs
- b. Investigate the marketplace and report the latest trends and best strategies.
- c. Find new resources, outstanding ideas and new contacts that will help you grow.
- d. Try to keep your unique ideas at the forefront – don't lose the good ones.

4. Record your planning – Use a log book (daily planner) and creating a paper trail tracking all meeting dates, attendees and discussions. This will be a great resource later on. A sample of things you may want to be very detailed on:

- a. Things you discover for which insurance is either too costly or unavailable.
- b. Types of corporate or business structures you are considering.
- c. Consult a lawyer early in the startup process, and obtain advice on how to best protect your business.
- d. For helpful information contact your local SBA office or chamber of commerce and contact your nearest SCORE chapter www.score.org/

SCORE "Counselors to America's Small Business" is a nonprofit association dedicated to educating entrepreneurs and the formation, growth and success of small business nationwide. SCORE is a resource partner with the U.S. Small Business Administration (SBA).

5. Don't sell used-cars – No quick one-liners – No “trying to convince”.

Develop a one page script. When you speak positively about your vision it inspires others to help you succeed rather than question your abilities. Your one-pager can quickly generate trust by showing key supporters the value you offer and how you will successfully deliver on your promises. In your script:

- a. Confirm your passion and share your past successful experiences
- b. Focus on the benefits you bring to your new venture
- c. Show how it will work
- d. Reference where it is now working
- e. Share a brief biography of yourself
- f. Give all of your contact information.

Your one-pager becomes the foundation for all of your planning. It can be used to open conversations or when speaking to potential clients.

6. No one said this was going to be EASY. - As you begin developing your plan, you will uncover unforeseen pitfalls and setbacks. This doesn't mean you are no longer passionate about vision, it means "welcome to the real world". Never ignore a problem – they seldom go away by themselves. This is what planning is all about.

- a. Review everything you have accomplished, and list any opportunities you uncovered.
- b. Write down any challenges you've discovered, and mark them either solvable (if there's a way to counter them) or "to be decided later" TBDL.
- c. Create action steps to manage any TBDL challenges by connecting with someone you trust. Ask that person how he or she would overcome the challenge and turn it into an opportunity.
- d. Create your own system for taking advantage of and the actions you will take to counter any challenges. Promise yourself to work through any challenges you encounter.

7. Always plan to improve your plan - Passion can cloud judgment.

Automatically thinking that you know what is best for others can be a pitfall. Rather than lead by committee, try gathering your supporters into focus groups. They can provide honest and objective feedback on how to improve your methods. It's important to obtain these fresh ideas early in your planning process. Think of your focus group as a business meeting. Open by reading your one-pager and then ask for honest feedback:

- a. "How can I improve my idea?"
- b. "Is my vision appropriate?"

During the session, keep an open mind and don't defend yourself. Write down every idea. Afterward, analyze the ideas, and keep and implement those that are most useful. To continually discover new ways to improve every aspect of your planning you may need to hold more than one focus group.

8. Evaluate the Cost of Doing Business – You cannot lead if you do not understand every aspect of what it takes to operate the business. If all you want to do is manage or all you want to do is coach, you need to re-evaluate your plans. This does not mean that you will always be working 80 hours a week but you will have to spend some extra time in the trenches to understand how to win the battles.

9. Create Your Strategy – you do not need to persuade people they need something, you need to tell the right people about the benefit your plan provides.

- a. What is the unique benefit you offer?
- b. Create a list of who needs that benefit.
- c. Implement your favorite idea. Choose one program you would love to change or add. Test it. If the idea works, do it again. If it doesn't, try another.

10. Value Received Pricing - Set prices for success. The service must be priced to entice clients and cover your overhead, operational, labor and marketing costs. And most important, you need to make a profit. To do that:

- a. Define your personal financial goals. Your goals impact your pricing strategy. Do you want to have a lot of money in reserve or do you want to fund club development activities?
- b. Investigate market trends. Pricing is subject to market forces and client demands. Obtain information to help you predict your market in terms of growth prospects and trends.
- c. Obtain competitive information. Clients price shop. Make sure you provide special features for which clients are willing to pay more, but your price has to be reasonably competitive.
- d. Cover the cost of doing business. At first, you may be using your "best guess" cost estimates. As the business grows, track your real costs of doing business, and reflect them in the pricing structure.

Try to learn from others experiences – what to do and what not to do:

VALUE RECEIVED PRICING – V R P Establishing prices for an aquatic program - First and foremost we simply must break the mold that has been carried over from the past.

PAST METHOD #1 PRICE TAKERS/PRICE MAKERS

There must be a difference between the *PRICE MAKERS* and the *PRICE TAKERS*. Can you imagine the confusion and financial destiny of the store that allowed the customer to pay whatever they thought was “fair” for bread and milk. Or the insurance company that lets you pay whatever you can afford for health insurance. Yet, in the recent past and even currently, the people who are going to use the service are the one's setting the fees. While for some swim clubs run by a volunteer parent board this may be an admirable undertaking, it is not an effective way to conduct a business.

PAST METHOD #2 COMPARATIVE PRICING

The swim school or pool down the street charges this many dollars so we can charge so many dollars more or less. If you are in business to collect fees rather than offer service, then this is probably the system that set your original pricing. However – the pool down the street is probably in as much of a tentative financial situation as you are so why copy averageosity? Plan to offer a superior service and set your pricing so you can afford to do so.

PAST METHOD #3 TRADITIONAL PRICING

We've always charged this much so that is what we have to go with ! This is propagated by the fear that customers will leave if prices are noticeably raised. This mind set does not take into account that utility prices have doubled in the last 20 years or that construction that used to cost \$28 a square foot now cost \$128 a square foot. We also have new equipment and technology that is necessary if a business will compete. Salary requirements are up over 30% the past 20 years not to mention benefits. Traditional pricing simply cannot keep up.

PAST METHOD #4 SHARED FUNDING PRICING

This is perhaps the most common and most dangerous form of pricing. It assumes that the patron or client is not responsible for paying their fair share of the cost of running a facility. This is common in a municipality or university/school setting. Somewhere along the line the actual cost of building the facility became synonymous with the cost for programming. This is a sure fire formula for negative cash flow and eventual facility financial failure. If tax dollars or activity fees build a facility – that is what they accomplished. The facility is now there for the community to use. Programming must be designed so that the operational cost of the facility and staffing of the programs is paid for as a separate “business”. Even non-profit businesses should not lose money. Operational subsidies are becoming a thing of the past.

Value Received Pricing - This is where we all need to be headed. The facilities and programs that are currently using this structure are financially self sustaining. Many Park Districts have adopted a form of this pricing over the past few years. It is really a very simple and extremely effective method. It is based on the following premises when compared to your local or regional competition:

1. You will hire a more prepared and competent staff and make sure you advertise their certifications and or licenses.
2. You will make sure your facility offers more and better amenities that offer your clients advantages not available elsewhere.
3. You will make “customer service” your motto and train staff accordingly.
4. You will offer the best programs available anywhere and make sure your clients and staff believe this and deliver.
5. You will make sure your facility is always super clean, super accessible, and super friendly

When establishing a PRICE for a specific program you must consider all aspects of the facility. Below is an example of programs using **Value Received Pricing**:

Programming :

| | | | | |
|---|----------|----------|-----------|-----------|
| Necessary income to support indoor facility | per hour | per week | per month | per year |
| 12,000 sq ft facility | \$152 | \$6,080 | \$26,144 | \$313,728 |

Necessary Program Annual

| | | | | |
|-----------------------|-------------|---------------|-------------|--------------|
| Income: | Competitive | Learn2swim | Community | TherapyRent |
| 12,000 sq ft facility | \$99,000 | \$60,000 | \$88,200 | \$90,000 |
| | 100x\$99mth | based on fees | 150x\$49mth | \$50-\$70 hr |

Based on **VRP** (*Value Received Pricing*) for 12,000 square ft. facility as an example

Postulate: Any single program must be able to generate enough income to cover 50% of the per hour rate.

Assumption: In a multiple pool setting at least 2 separate programs will be conducted simultaneously.

Program Pricing Analysis: Learn-to-swim

| | | | |
|--|--|------------------|----------------------|
| Program Expense: | | | |
| Pool rental per hour | | \$35 | |
| Instructors compensation | | \$15 | |
| Benefits based on 25% | | \$4 | |
| Insurance based on 3 million liability | | \$3 | |
| Staff certification & Continuing Ed | | \$1 | |
| Capital fund contribution | | \$5 | |
| Program Profit | | \$5 | |
| Equipment maintenance and replacement | | \$1 | |
| Advertising and Marketing | | \$2 | |
| Program overhead | | \$5 | |
| | Expense Sub Total > | \$76 | Income per hr needed |
| Income | Based on the hypothetical sub total: | Per 1/2 hour fee | |
| | 1:1 Aquatic personal training or private lessons | \$38 | |
| | Semi-private (spotlight) | \$19 x 2 | |
| | Small group (3 or 4) | \$12.50 x 3 | |

Profit margin increases as multiple sessions are conducted by multiple instructors as pool income is based per hour rather than per program.

Program Pricing Analysis: Continuum/Community

| | | |
|--------|--|------------------|
| Income | Based on the hypothetical sub total: | Per 1/2 hour fee |
| | 1:1 Aquatic personal training or private lessons | \$38 |
| | Water Rental | \$35 |
| | Programming - monthly \$49 | \$49 |

Program Pricing Analysis: USA Swim Team

| Income | Based on the hypothetical sub total: | Per 1/2 hour fee |
|--------|---|------------------|
| | 1:1 Aquatic personal training or private lessons | \$38 |
| | Water Rental | \$35 |
| | Programming - monthly \$99 and up | \$99 |
| | Registration-seasonal (Based on 3 seasons @ \$100 each) per month = | \$25 |

In summary learn to swim lessons would be priced as follows:

\$38 per 1/2 hour for each private lesson

\$19 per 1/2 hour for each person for each semi-private lesson

\$9.50 per 1/2 hour for each person for each 4 person group lesson

In summary Community sessions would be priced as follows:

\$38 per 1/2 hour for each personal training session

\$35 per 1/2 hour for each class shared by number of participants

\$49 per month per person for "window of exercise" aquatic access

In summary USA Swim team would be priced as follows:

\$38 per 1/2 hour for each private stroke lesson

\$99 and up per person for monthly training

\$25 and upper person per month amortized seasonal registration

In summary "water rental" options for therapy or other instances would be priced as follows:

\$50 to \$70 per hour for a designated pool plus a per person price for parties and special functions.

Each facility will have their own nuances and opportunities for positive price variations. Once VRP is understood and used for a while these can be easily addressed. All programs however must be held accountable to the VRP bottom line.

An important part of **Value Received Pricing** is the Staff Education and Excellence component.

Income and Growth are important but what about all the things that support programs to make them sustainable, popular, and profitable?

The #1 support mechanism for any successful program is your employees. Of particular importance is:

- Education of your employees
- Delegation of responsibility to employees
- Trust and rewards to employees

- Acknowledgement of their importance
- Having the proper titles, job descriptions, and number of employees to service customers

In return you can expect:

- Best anywhere service for your clients
- Exceptional new program development
- Pricing that supports sustainability
- Operational efficiency and effectiveness including safety and ascetics
- Retention
- Growth that does not infringe on existing programs or operations

BOTTOM LINE – It is your employees that make the difference. They are the reason you have customers and generate profits. Employees create sustainability and success.

The business **LEADER** will need to focus 70% of their effort and time on employee support and development. It may be hard to grasp but employees are just as important as clients. They are interdependent. You focus on your employees and let them focus on the clients.

Methods:

- Develop and market a unique **CULTURE**. Your employees must understand all aspects of this so they can implement it throughout all programs.
- Market your core values of the business. Beat your own drum. Blow your own horn.
- Diversity is important. Train your employees in leadership, coaching, teaching, mentoring. Every employee should be able to step into any role and do a competent job.
- Communication is much more than a “catch word”. If you do not constantly improve your own and your staff’s skills and methods, you will not survive.
- Spend dollars investing in your staff’s professionalism. Protect your investment with understandable and fair policies.
- Have passion, commitment, and professionalism. Lead by example and then expect it of your employees.
- Set goals and become a master of Objectives, Strategies, and Tactics with your staff. Goals need to be identified in 3 main categories:
 - Growth and success of the business (profitability)
 - Dedication and development of the staff (professionalism)
 - Customer satisfaction and retention (programming)

Employees need to manage the programming and customer service and the manager needs to lead the employees. The ultimate goal of all programs should be to improve the quality of lifestyle of the client. Once this is accomplished in any form or stage, the

leader, staff, and clients all need to celebrate one milestone of success. All people like to accomplish something and then be acknowledged. This process becomes part of the CULTURE of the business. Acknowledgement works coming from the TOP DOWN. It can be destructive the other direction.

Objectives Strategies Tactics

It's all about POTENTIAL. Don't make it more complicated than that.

Objectives – *What do you want to accomplish?* You can be afraid of failing and still function. You have to lay it on the line here and now. Your objective or goal needs to be both qualitative (when) and quantitative (how much). An objective is not: “grow the business” that is a dream. “During the next 6 months we want to increase our client base by 20% with 90% retention” – that is an objective.

Strategies – *The plan or map to get there.* Many times an objective needs to sit and be “tossed around” as an idea before the time is right. When the strategy develops, then it is time to move. You've always heard TIMING IS EVERYTHING.

Tactics – The *who – when – how* - phase. This is the success fail zone. This is the phase we do not usually spend near enough time doing follow-ups and lending support. Action does not happen – remember Inertia? Someone has to be made accountable and given the resources and guidance to make good things happen.

Pricing is not #1 - Effective managers and program directors understand this phenomenon and help the staff-team recognize that it is especially critical in tough economic times to help customers visualize the difference between price and cost.

They direct the staff team to focus on value.

Price must not become the major issue and it should be the last issue on the table and not the first. If people understand their value propositions and can communicate that value while providing real solutions then price does not become the deciding factor.

- **Remember:**
 - Price isn't part of your value proposition
 - The art of selling has nothing to do with price
 - Value trumps price
 - Value is determined by the customer --- not you

Most companies have created the mythical term “added value”. It's a term that many have never really understood. It usually is a bunch of gibberish containing very little value. If I asked you individually to describe what added value is, some of you probably would have a hard time with it.

Value is defined as the dominant benefit you provide that helps your customer produce more, benefit from, and/or profit from or satisfy a need.

This is a selling approach that focuses on helping the customer solve their problems without regard to “making a sale”. That means everyone must be part of the sale!

Most Important – often ignored by the staff-team

- “What words create the greatest engagement or stimulate questions from the customer? Don’t sell rather answer questions
- “What is the customer really interested in?

The Value Proposition if used properly can;

- ELIMINATE or reduce competition.
- Set forth things that make you the only choice.
- Create competitive advantage

Once again – It’s staff-team education and training. Believe you are the best then become the best.

The Commodity Perception & Value Propositions

If you can’t separate features and benefits from the real value you create for your customers, you will not overcome the “Commodity Perception”. Remember, if you can’t overcome the commodity perception, then price becomes the major determining factor your customer will use in his buying decision. On the other hand, if you can identify your real value propositions and make them clear to your customers by providing solutions, price is rarely an issue.

Value added must become not only a common term but it must become engrained in your culture. Every decision you make should consider the question WIIFMC? (What’s in it for my customer) Take a good look at your own business and at your competitors. What do you offer that adds value to what you sell? Ideally, it will be added value that your competitors cannot easily duplicate in their own offerings, and it will not add to the cost of the basic product or service. It will be based on your true core competencies.

How Do We Sell Our Value Proposition?

- Separate selling from problem solving
- Take all of your industry experience and knowledge to understand the customers need
- Present alternative solutions—define your value propositions in terms of WIIFTC and let the Customer decide
- Apply your knowledge and experience to the customer’s point of view.

Value can be added through process, technical support, design assistance, inventory management, cost effectiveness, training and leveraging your core competencies. However, to create real competitive advantage you must have a staff that understands and executes best practices that focus on profitable growth and increased market share. That does not mean that every staff person has to be a super star but it does mean that your

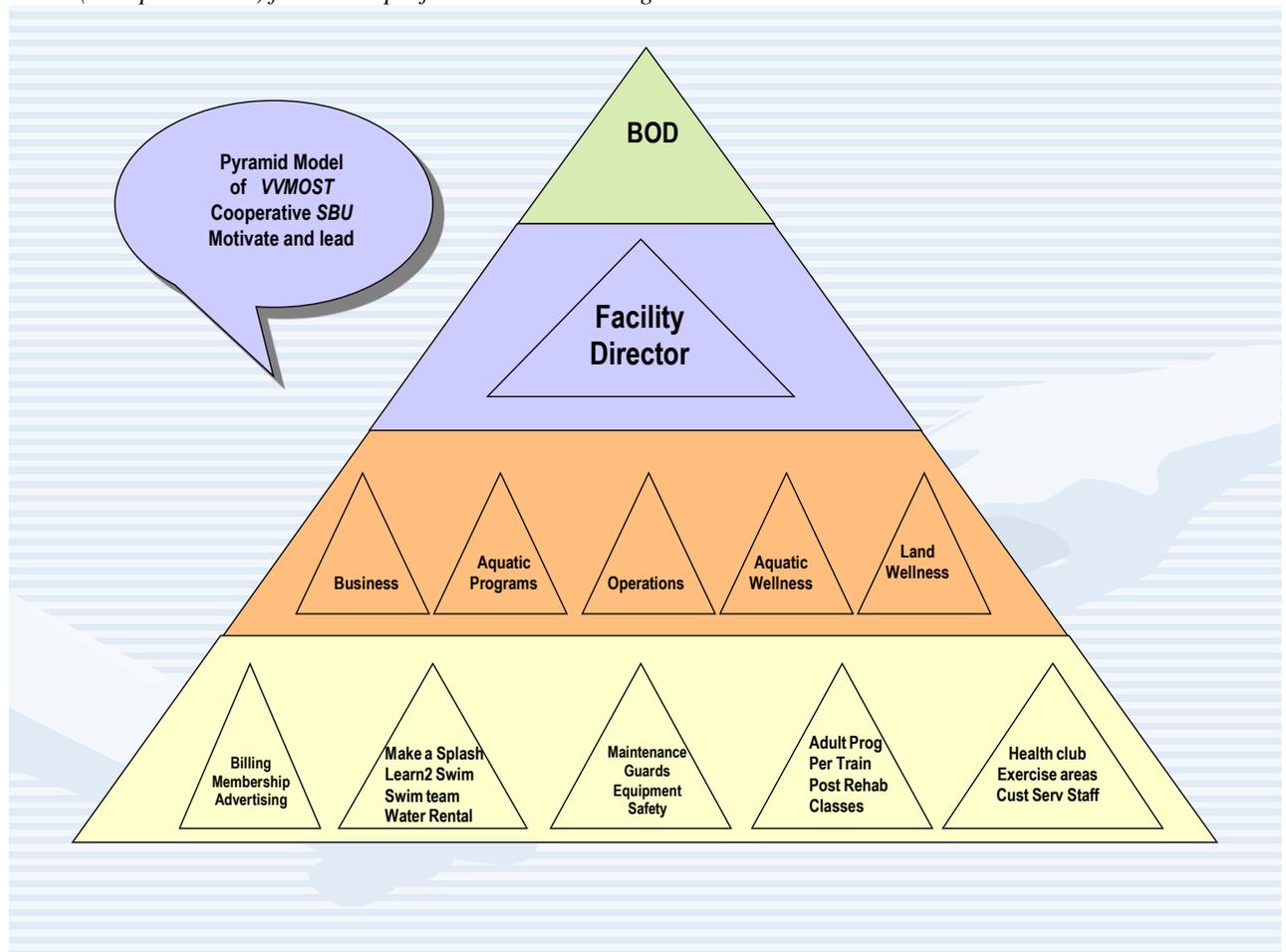
staff have to understand value added, your value propositions and be able to teach the customer the difference between price and cost.

Answer the following questions as thought stimulators.

1. Can you educate the difference between price vs. cost? What makes the low price – high cost?
2. How committed are you to your industry?
3. How well do you know your customers objectives
4. How adept are you at identifying indecision
5. Are you more concerned with your customer's success?
6. How well do you accept personal responsibility for failures?
7. Do you know your four largest markets?
8. What are the 3 largest sources of indecision in your customers lives?
9. What are your customers' WANT and NEED?
10. What are you doing with that knowledge?

Discuss these questions with your key staff in a brain storming session or during one on one coaching sessions and you may uncover opportunity for improved results.

Taken (with permission) from excerpts from the CEO Strategist.



The above is merely a sample for a multiple pool facility that focuses on Total Aquatic Programming. The number and salary range of the staff will be totally dependent on the size and location of the facility and the business plan emphasis on specific programming.

Aquatic Profession Career Progressions

| | Title | Qualifications & Certifications <i>(new cert courses are currently being written) *</i> | Salary Range <i>(does not include bonus structure)</i> |
|---|--|--|--|
|  | Aquatic Program Aid Tech Life Guard | CPR – AED – First Aid – Water Safety Within 1 st 6 months Specialty certs within 1 st year Pool operators certification within 1 st 18 months | \$8.00 - \$9.90 per hour - Flex time |
|  | Aquatic Specialist (Instructor – Coach – Coordinator) | CPR – AED – First Aid – Water Safety – CPO – Specialty Certifications within 1 st 6 months | \$10.00 - \$15.90 per hour Flex time + benefits |
|  | Aquatic Manager* (Supervisor) | CPR – AED – First Aid – Water Safety – CPO– Specialty Certifications & Education | \$16.00 - \$19.90 Full time or Flex time + benefits |
|  | Aquatic Director* | CPR – AED – First Aid – Water Safety – CPO - Specialty Certifications & Education | \$20.00 – up Full time + benefits |
|  | Aquatic CEO* | CPR – AED – First Aid – Water Safety – CPO - Plus seminars – conferences – experience – Industry leadership | Salary& benefits commensurate with responsibility and experience |

For more information about VRP or programming e-mail Sue Nelson USA Swimming Programming Specialist snelson@usaswimming.org

Putting it in perspective:

per time or day

| | |
|--|----------|
| The average family of 4 (2 adults and 2 children) pay \$33 for tickets into a theater plus \$25 at concessions stand | \$58 |
| The same family pays over \$100 for a dinner at a mid-priced sit down restaurant like Red Lobster or a local steak house | \$100 |
| Open bowling cost \$4.50 per line with most people bowling 3 games 4 people x 3 games plus shoe rental and a soda to drink | \$70 |
| Entertainment eateries like Chucky Cheese, Mr. Biggs, Itz, etc. charge a family of 4 for admissions, game coupons, and buffet around | \$76 |
| A round of golf for 4 people with cart at a public golf course cost around This does not include snack bar. | \$220 |
| For a family of 4 to do a take-out chicken family dinner and go to a public park for a picnic | \$32 |
| For a family of 4 to go to the Zoo Does not include concessions or pay-as-you-go attractions inside | \$54 |
| For a family of 4 to go to an amusement park like 6 flags Does not include concessions or pay-as-you-go attractions | \$148 |
| For a family of 4 to visit and tour a cave or similar attraction | \$54 |
| For a family of 4 to belong to a health club (based off monthly fee) | \$90-140 |
| For a family of 4 to have an all day pass for a pool | \$18-22 |

The pool = best deal in AMERICA and we tend to give it away.

11. Organize and Present – Planning sheets define the action steps and resources associated with key day-to-day business activities. They enable you to identify, develop and test your business planning which saves you time and frustration. They will be the start of your "operations manual" - the policies and procedures for running the business. Writing everything down shows people how you will conduct business, which makes it easier for them to have confidence in you. Develop your own planning sheets using these steps:

- a. Name the plan and put it at the top of each page--for example, "learn-2-swim program"
- b. Create a three-column table beneath the name of the plan. The first column lists the action steps necessary to complete the plan, the second shows the person who is responsible, and the third states the expected time frame for completing each step.
- c. Create planning sheets for every area of your business as appropriate.

d. In addition, improve your planning sheets by periodically reviewing them with staff and supporters.

EXAMPLE PLANNING SHEETS

| Objective – What you want to accomplish | Strategy – How you will accomplish it | Tactic – Who will do it and when |
|--|--|---|
| 1. Marketing – develop flyers for team services. | 1. Who are we and what do we do flyer. 2. What sets us apart from others. 3. How do you try out and sign up. | 1. Person to develop draft of flyer 2. Person to decide final form of flyer 3. Date for finished sample |
| 2. Communications – develop meeting documents or power point to explain your services. | 1. Establish what kind of meetings you need to conduct. 2. Identify the key people you need to meet with. | 1. Make contact with appropriate people 2. Set dates and place for meeting 3. Follow up plan |
| 3. Create a “fees for service” plan. | 1. Develop fees for team 2. Develop fees for other services | 1. Review fee structure with advisors 2. Incorporate into all literature |

12. Live a Business Action Plan –This is really the start of a whole new process. Similar to a business plan, the business action plan synthesizes your research and describes what you will do. It identifies the necessary steps you will take to keep the momentum going.

- a. Start your plan by clearly defining your goals.
- b. State your plans main benefit.
- c. Review your one-pager
- d. Break your plan into sections by outlining the operational and administrative areas of the business, including legal, marketing, pricing, finance and internal process controls.
- e. In each section, explain the work, research and market testing you've completed to date.
- f. Conclude each section by specifically stating the next action steps you will take to create results.

Your business action plan continually evolves as the club evolves and grows. It monitors and allows you to evaluate what has worked to date--resulting in continued success.

Step #2 - PLANNING

The things you need before deciding to venture into team ownership:

1. Know the demographics and culture of the area you are considering
2. Be an experienced certified professional in aquatic programming
3. Develop a rock solid business plan
4. Have a good personal FICO credit score
5. Have a long term renewable contract for use of a pool(s)
6. Have completed the appropriate courses for professional certification
7. Prepared yourself to not only lead clients but also staff and parents
8. Formed a professional team of advisors including an attorney, accountant, business advisor, etc.

Know your area.

- If you have the means to do a demographical study do it or contract it.
- Visit everyone in area who offers a similar service to see what they do.
- You can also draw upon the knowledge of successful programs in other areas.

Know your clients.

- Do you want to service children and adults ?
- Do you want to service special needs populations ?
- Are outreach programs a consideration ?
- Do you want to offer Learn to Swim ?
- Competitive Swimming ?
- Community Aquatics ?
- Aquatic Exercise for Adults ?
- Lap swimming ?
- Water Polo, Synchronized Swimming, Fin Swimming, Diving, Underwater Hockey, Etc.

You have to know everything possible about your potential clients. You need to access demographics for your area – use the 20 minute drive rule of thumb..... We can generally say that for a swim club to have a good chance for financial and community service success, the following is a place to start:

- 50,000 population draw within a 20 minute drive = At least a 6 lane 25 yard pool with access 60 minutes in the early morning and 3 hours access after school hours plus some weekend hours.
- 75,000 population draw within a 20 minute drive = At least an 8 lane 25 yard pool with access 90 minutes in the early morning and 3 hours access after school hours plus some weekend hours.

- 100,000 population draw within a 20 minute drive = At least a 10 lane 25 yard pool with access 90 minutes in the early morning and 4 hours access after school hours plus some weekend hours.
- 150,000 or more population draw within a 20 minute drive = A 23 lane 25 yard pool (50 meters long = 23 short course lanes wide) with access 90 minutes in the early morning and 4 hours access after school hours plus some weekend hours.

If the lanes don't match up with your needs you may be able to use fewer lanes and just request more hours to rent. This has to be done right the first time. Many facilities have programming needs and it is first-come first served when renting water. Pay a fair price for water time. You may be able to negotiate a "sweetheart deal" for lane rental only to find that someone else has offered the pool owner more and your contract will not be renewed.

The demographics of a highly populated community near or in a metropolitan area can drastically fluctuate within a 20 minute drive. In a rural area the demographics may be almost identical 20 minutes in any direction. This is why there are not "set guidelines" only "rules of thumb". However – one thing is apparent! There is plenty of room in densely populated areas to consider using more than one pool. It is common for a team to start off with less than 100 swimmers, but the goal should be to reach or exceed 100 swimmers as soon as possible.

Know your business plan.

- How much can you charge for your chosen services ?
- How much is your overhead ?
- What size of staff do you need ?
- What type of business are you going to form – a non-profit – a sub-S corp.- a sole proprietorship – and LLC - etc ?

Writing a good business plan for your business requires time, commitment, and understanding of the planning process, and a good business plan template. To successfully create an effective business plan and strategy document, you should commit to setting aside several hours of uninterrupted time each week for several weeks (hold the phone calls!). Be sure to include the following seven sections in your business plan

1) **Executive summary** - Write the Executive Summary last but it goes first in the plan. Summarize the most important points of your plan (e.g., income [sales] forecasts and growth strategies; why you need funding & what you will use the funds for; highlight the products or services you will sell, market growth and trends, key personnel). Keep it brief and simple: You can copy and paste many of the sentences and charts already included throughout your business plan.

2) **Mission statement** - Write a few words explaining why you are in business. Focus on the needs you satisfy for your customers, employees and you or your investors. Infuse your mission statement with enthusiasm. Many ideal Mission Statements are 17 words or less. It's tempting to roll up your sleeves and plunge right into the details of your business: evaluating products, studying market segments, and sizing up your competition. Yet it's possible to get so caught up in the process of planning a business that you lose sight of what you're planning for.

Before you get lost in the details, take a step back. Outline a clear vision and a coherent set of values for your organization. Develop a mission statement and use it to define short-term goals and priorities. Once you have a clear road map for your business, you can plan your journey with more confidence. Mission statements are more than just decorative sign on your pool or office wall. A good mission statement makes decisions much easier.

3) Company history (or plans) and description

- What is or will be the legal form of your business, where is it located, what's its history, if any?
- List current or anticipated goods or services you provide.
- Also list future goods or services you plan to introduce.
- What is your competitive advantage?
- Explain why people or businesses would rather spend with you than other organizations.

4) **Market analysis**

- What markets are you serving?
- Define your demographics by types of people (e.g. young families with small children, middle to high income families, etc.)
- What is the size of business (e.g. a club with fewer than 10 employees, independent contractors if legal)
- What is the geography (e.g., local area, regional/county)?
- What's the size/population of your potential market? Use U.S. Bureau of the Census or trade association data to estimate your market size.
- What are the current or recent trends driving demand?
- Identify the changing demographics (e.g., people living longer, smaller families, more businesses being formed), life or business styles (e.g., more people living alone, more businesses outsourcing non-core functions) or tastes (changing color preferences or favorite types of sports) affecting your market.
- What are the industry distribution and buying patterns? (e.g., coaching – trainers)
- Services can be delivered one-on-one, or via tele-classes and workshops.
- Products that can be sold in retail outlets, or the Internet.

- Do people buy based on price, trust, reputation of the company, or perceived quality?
- Who are your competitors, direct or indirect? For example, Health Clubs compete with YMCA's for their customers' time and dollars.

5) **Marketing plan**

- What is your marketing mix?
- How will you generate leads? Networking, direct mail, a web site, publishing a newsletter, press releases ~ detail what marketing campaigns you will launch and when.
- Marketing budget. Estimate marketing campaigns costs and write out a monthly or quarterly budget.
- Pricing strategy. Are you going to be the low cost leader, the "best value" or the most expensive/highest quality on the market?

6) **Management summary and personnel plan**

- Who will be the CEO/President/Director
- Who will do your Marketing and Sales?
- Who will lead or direct your programs? Size of staff.
- Who will be the business administrator?
- Who will produce the products or services, and sell to customers?
- Write out a job description for each critical function.
- Create a policy & procedures manual or handbook.
- If you are working solo, schedule time to perform all management or production functions. You might choose a time each day, or a day each week to do bookkeeping, marketing, sales, product development, or you can break each day into segments. Eventually you will want to identify employees, contractors or consultants who will perform these jobs for you.
- How much will you pay each staff position?
- What are the legally required and other benefits you will provide?
- Create a personnel budget, and your plan to schedule regular reviews to ensure that all functions are being performed as delegated.

7) **Financial statements**

- Include a Balance Sheet, Profit & Loss statements (historical and projections), a Breakeven Analysis and Cash Flow projections.
- Get financial templates from business planning or accounting books, web sites or software programs.
- A great book that contains business plan financial statement examples is *The Business Planning Guide: Creating a Plan for Success in Your Own Business*, by David H. Bangs, Jr. Another good source is *Accounting for Dummies*, by John A. Tracy, CPA.

The U.S. Small Business Administration also has good instructions for creating business plan financial statements. Go to www.sba.gov and click on “Business Plans” underneath “Starting Your Business.”

You'll find some sections of your business plan more challenging than others.

Don't hesitate to ask for business planning help from a local small business development counselor, accountant, market researcher or business coach.

Contact your nearest SCORE chapter www.score.org/ and get all the help they can provide. It is free.

Your personal credit score reflects your ability to manage money. If it is not at an acceptable level you need to work at cleaning it up. Eventually you will need some sort of cash on hand to start your coach-owned team/business.

Focus on completing one business plan section at a time, and you'll eventually complete the seven pieces needed for your “blueprint for success.”

The business plan is YOURS. Gather enough information from outside sources to make sure it is both professional and accurate, but don't be afraid to be creative with the presentation. Customize it so it reflects what you expect your end product to be.

AND

As you develop your business plan, it's easy to make mistakes or leave out important elements. Here are a few of the most common business planning pitfalls and some tips on how to avoid them:

A budget isn't the same thing as a plan. You can't create a solid business plan without a budget and a financial forecast. But a budget should be the product of all the other elements in your plan. If you don't have a clear picture of your industry, customers, competitors, and market conditions before you develop a budget, your numbers aren't likely to reflect reality.

Don't ignore your customers. This may sound obvious, but too many entrepreneurs assume they know exactly what their customers need without bothering to ask. Take the time to learn about your customers, and build your business plan around their needs and desires

Don't shortchange the competition. If you assume your team will be the only game in town or if you fail to take existing competitors seriously, you're asking for trouble. Your competitors can be a great source of information about what works and what doesn't.

Be prepared to take risks. Creating a business plan isn't about avoiding risk; it's about understanding and managing risk. That's why a good business plan anticipates possible challenges and includes a variety of scenarios for meeting those challenges. There's a difference between a calculated risk and recklessness, and your plan can help you make that distinction.

Get a second (or third) opinion. The most experienced entrepreneur can still benefit from a different point of view. Even if you're the only person involved in your business, find someone who can study your plan objectively and point out possible weaknesses you might have missed.

Expect the unexpected. Every business plan needs some wiggle room to allow for unexpected changes. Part of this involves creating budgets and marketing plans with some built-in flexibility; but adapting to change also requires you to accept that you might have to modify or even abandon business practices that worked well in the past.

Don't forget what makes you unique. A cookie-cutter business plan might help you get started, but it won't help you succeed. And while it helps to look at your competitors, don't model your business after them. After all, you're in business to beat the competition. Learn from your competitors' strengths, but also learn how to spot their weaknesses and use them to improve your own business plan.

What's the point? Building a business involves hard work and struggle. But it should also include a clear set of rewards, both for you and your staff. When you set goals in your business plan, include some concrete motivation that goes beyond the satisfaction of a job well done.

Don't skip the plan! Of course, the biggest mistake of all is failing to create a business plan in the first place. Planning is hard work, and there's no guarantee it will make your business succeed. But a good plan is still the best way to turn your vision into a realistic, coherent business.

Know your marketing plan.

- How will you let people know you are in business ?
- What sets you apart from your competition ?
- How much can you spend developing and distribution brochures?

Know your facility – secure the pool.

- What are the limitations of the facility you plan to use ?
- Is it indoors or outdoors ?
- What are the water depths ?
- Can the water temperature be adjusted to service different populations ?
- What are the available hours for facility use ?
- Who is responsible for air quality and water quality ?
- What type and duration of contract do you have for the pool ?

Dealing with your pool or staff contracts may be unpleasant and tedious but it's important to get it right. Having a contract puts you in a good position should the worst case scenario occur.

There are web based resources that can save time and money on common legal matters and that have been created by top attorneys. Simply answer a few questions online and your documents will be prepared quickly. This is not a viable replacement for your personal attorney but a great place to get initial or additional information.

Before signing a contract, take the time to read and understand it. If you are unclear of any provisions in the contract seek advice. Your attorney should always be involved.

Record any variations to the contract for both you and the other parties benefit. Most contracts set out how these are to be recorded and documented. Changes should not be made to an existing contract's terms without seeking expert advice. If it is not "in writing" it may as well not exist.

Understand the dollars - Make sure you know how the contract handles payment for services, benefits, insurance, and both parties' responsibilities.

Information contained in the contract may be daunting and confusing. It is vitally important however, that you understand your rights and other rights and obligations. It is imperative that you read all the documents carefully and retain a copy of the signed contract.

The points below may help you in understanding your contract documents:

- There can be numerous documents that make up a contract. These documents may vary, depending on the sort of contract you use. These are called addendums or exhibits and will be attached to the main contract pages.
- Whatever documents you need to supply will be stated within the contract itself. Your attorney should be able to supply the correct kind of contract but if you have any doubts, contact your business advisor.
- Your contract documents may contain words that you need clarification on. Your contract should provide you with a definition, meaning or interpretation of particular words within your contract. These are usually denoted by italics or bold font.
- Most contracts will contain a dispute resolution clause. This should be referred to if there is a dispute or disagreement between parties. .

Essential items - Before signing anything, you need to check that:

- The starting date, duration, and renewal date are clearly stated.
- The names and any of their controlling companies or organizations are listed.
- A detailed description that list each parties obligations and expectations of the work or service that needs to be carried out, including special requirements or conditions.
- Benefits and Insurance and any other compensation.
- A grievance policy and arbitration structure.

- The organizational structure and who you are responsible to and for. Is there a CEO or a BOD? What are your detailed responsibilities to them and who governs the decision making process?
- Any 'provisional sum' or 'bonuses' are clearly stated in the schedules and are understood. E.g. Meet clean up expense – program success profit sharing – cost of living yearly increase – maintenance reimbursement
- Reimbursement for extraordinary business expenses
- Dress code and apparel expectations
- Cell phone and computer policies – who's equipment and who pays for service?
- Professional dues and organizational membership reimbursement.
- An acknowledgement that both parties have read and understood all procedures relating to the contract.

The contract usually comes into force on the day the last party signs the contract and that signing is communicated to the other party. This is called the "contract date".

Once the contract is signed by both parties, you usually have to complete a number of tasks set out in the contract (for example: background check – deposits) before the contract can go into effect. .

Cooling off Period - Some states have a cooling off period by law. You may have the right to withdraw from the contract before the period expires.

Non Compete agreement – if this is included in your contract, read it carefully and make sure you understand what restrictions you are agreeing to.

Suggested clause - The pool owners must inform the programmers no later than 6 months prior to the ending date of contract, if there are going to be changes in the contract. With no formal notification to the contrary, the coach-owner will automatically consider the contract renewed for that next equivalent contract time period with a maximum 3% increase per year for pool rental over the length of the contract.

WHAT type of business should I form?

You will have a few choices and you need to pick wisely. There are advantages and disadvantages to every type of corporation or business structure. You have to find the best fit for you.

1. Being CEO of your club and president of the 501.C.3 Not for Profit Corporation that is the club/team. You do not have to "own" the water to accomplish this, but must contractually control the water hours and space for a guaranteed period of time. Eternity would be nice - 20 years acceptable – 2 to 3 year increments more likely. You personally cannot totally control or own this type of corp. It is Board Governed and you have to be an astute politician and administrator to keep this working.

2. Being CEO of your club and president of the 501.C.3 Not for Profit Corporation that is the club/team and being president or owner of a Sub-S or LLC for Profit Corporation that owns the contract for the facility you rent. A 501.C.3 Not for Profit Corporation cannot legally own real estate or buildings or pools in some states. If you own the field you control the game. The Sub-s can also hold a retail sellers license for swim shop related business – selling to the swimmers on the team.

While not for profits have their advantages, please keep in mind NO ONE CAN OWN a not-for-profit 501.c.3 corp.

501.c.3 Exemption from tax on corporations, certain trusts, etc.

Corporations, and any community chest, fund, or foundation, organized and operated exclusively for religious, charitable, scientific, testing for public safety, literary, or educational purposes, or to foster national or international amateur sports competition (but only if no part of its activities involve the provision of athletic facilities or equipment), or for the prevention of cruelty to children or animals, no part of the net earnings of which inures to the benefit of any private shareholder or individual, no substantial part of the activities of which is carrying on propaganda, or otherwise attempting, to influence legislation (except as otherwise provided in subsection (h)), and which does not participate in, or intervene in (including the publishing or distributing of statements), any political campaign on behalf of (or in opposition to) any candidate for public office.

Different people will expound the virtues and advantages of one form of business and the pitfalls of another. Opinions are personal, but "facts" are "facts". You need to seek out coaches who have done it one way and those who have done it the other. Get all of the case history you can, not in a deck-side conversation, but in detail.

3. A for profit swim team under a Sub-s or LLC. This may be your best avenue if you want to have true ownership.

EXAMPLE - See table below for a quick overview

| Type of Business | Who owns and directs | Coach's | Parent's | Other |
|---|--|--|--|---|
| 501.c.3 | Board owned – cannot be individually owned. All equity is controlled by BOD. | Hired by BOD – paid by BOD. Contract very important. | Usually make up the BOD as officers – annual voting according to by-laws Business officer collects all fees and pays all salaries & bills. | Coach may be on BOD with vote or ad-hoc with voice only. Fundraising may be tax-deductible for donors. |
| Sub-s or LLC | Can be coach owned. | Coach/owner hires all staff and sets business philosophy. | Usually a booster club or a working committee structure lead by coach. Parents can form a separate non-profit with coach on BOD as officer. | The booster club can raise funds that may be non-taxable through a general non-profit or go to the expense of getting a separate 501.c.3 so donations may be tax-deductible |
| Sole-proprietorship or partnership | Simplest form of a business. Single ownership – no employees, only independent contractors No IRS initial cost to form on www. | One man show for a small club or 2 coaches form a partnership. All profits are claimed on coach's individual tax return. | Volunteer committees – no voice no governance. | No tax-deductible fundraising opportunities – business strictly for profit. |

When deciding on what type of business form you will need to get all of the professional advice you can.....

1. Use free on-line resources to find out what is involved in forming both federal and state recognized businesses. You can save a lot of fees by doing this research yourself.
2. Contact a lawyer you know who will not charge you office rates for advice. The lawyer needs to be in your area and know the 501.C.3 rules for your state. Certain attorneys specialize in corporate tax law - all the better. Find out "HOW" to form the Corporation, how long it will take, and how much it will cost you in application and attorney fees. Don't start filling out any of the packet/application until you are sure you are going to follow through with the project.
3. Contact a second and third lawyer if you don't get complete information or if you detect a pessimistic attitude from your first choice. Contacting an attorney is much like deciding on a Doctor. It can be intimidating and you can easily forget who's working for whom.
4. Contact an accountant and explain your plans to them. Get an overall picture of your personal vs. business responsibilities, commitments, and finances. The same selection process should be used for the accountant that you used for the attorney. Find one who is helpful and knowledgeable about 501.C.3's and Sub-S 's. Don't let them convince you it can't be done.
5. Visit an existing successful program that has been operating for at least 5 years. Ask to see their corporate structure papers, by-laws, contracts, tax forms, account ledgers, and anything else they can share with you. Visit as many programs as possible, but ONLY those similar to the one you are planning. Visiting a Park District sponsored Not for Profit Club will not help much if you are going to do this as an individual.
6. Contact a banker* that you know and brainstorm with him as to what is required for a business loan. Ask for their advice about a Pro-forma, although your accountant will be the one to actually do a Pro-forma to take to the bank. (A Pro-forma is a 5-year plan {guess} as to the amount and sources of all of your income and the same for expenses)

*Note – We use the term banker as a general term. Commercial banks may not be the best source of financing. Just because "home loans" interest rates are at a historical low doesn't mean "business loans" are at the same rates. If "home loans" are at 6% you can expect a commercial loan to be between 8% and 9%. 30% equity is usually necessary.

7. Contact an insurance agent who can answer questions about liability with renting or liability and full coverage if owning a facility. Get some cost estimates for your area from more than one source then get the same for similar areas throughout the country. Contact USA Swimming to get details about what

coverage comes with USA Swimming membership so your agent can get you the best pricing.

Remember patience? Are you sure you want to be in the swim business?

It's human nature to get impatient. If you've ever bought a house, you know what we mean:

- You find it.
- You want it.
- You need it more than anything.
- You go through the long drawn out procedure seeing if you can afford it.
- You wait & wait on "other people" to do their thing.
 - The bank to approve financing-which doesn't always mean they give you the money now.
 - The current residents to vacate the premises.
 - The contractor to get started.
 - The real estate agent
 - Title search
 - The appraiser
- Close.

You can expect similar experiences when starting a new business.

Not to “preach” but – Make sure you personally can handle the task - Emotionally - Physically - Socially - and Financially – before you begin. If you are married: Him & Her = YOU. Never forget that. Communication is vital, support is necessary; sharing the setbacks is as unavoidable as sharing the successes are essential. This is such an important area. Do a lot of soul searching and talking with your spouse. If they are totally committed to a separate career, then you may have some lonely times ahead. If they are partially interested in the project, you need to be sure the obstacles you encounter along the way are not the only things you talk about. Swimming is a "sore subject" with many families because we who love it don't share enough of the "good times" and the positives with others.

If you can't accomplish your goal by yourself, either reset your goal, or, partners may be a solution. BEWARE! You may be coming full circle and creating the same situation you are now trying to escape. You are your own counselor.

Along this same line of thinking, you really need to ask yourself why you want to be a team owner. This is certainly not the NFL where ownership carries prestige and great financial rewards. This may be the most important question and should not necessarily be the last one you ask. In fact, this is the key to it all and you'd better find a real honest answer before you commit to anything. YOU are the focal point, the nucleus of this venture. Why do you want to leave the "mainstream" and plunge into the unknown? Do you realize that coaching may quickly become secondary to running the business?

May we suggest some of the answers and also recommend you come up with your own answers.....

1. You still believe in the American Dream & Entrepreneurs.
2. You want to wake up every morning controlling your own destiny.
3. You are a workaholic and a borderline lunatic.
4. You are the best coach anywhere and want the freedom to prove it.
5. You love kids and swimming is in your blood.
6. Your marriage is on solid ground and you want to see just how much it can really take.
7. You are no longer satisfied with only coaching. You want to try your hand at public relations, politics, repair man, office manager, and consultant.
8. You want to see your kids grow up, even if it is on the deck of a swimming pool.
9. You want to be proud of your accomplishments and know they are truly yours.
10. You actually like the challenge of balancing parents and swimmers and staffs needs and wants and feel you can motivate and lead for the benefit of all.

Step #3 – The PROCESS

Owning your own team does not mean you are your own boss. It means that every client, usually parents of swimmers, are now your boss and can leave your team at anytime which means you were fired. Your goal needs to be growth of the team and retention and that requires a daily effort by each and every staff member. You cannot do this all by yourself, you will need competent well trained and well paid staff.

There are a lot of “other” areas that you will need to become an expert in:

- Interviewing and hiring staff and writing practical job descriptions
- Benefit and insurance packages for you and your staff
- Staff travel reimbursement and continuing education expense
- Organizing practice groups and requirements to be in that group
- Seasonal planning
- Staff coaching philosophy and continuity from entry level to senior
- Detailed marketing strategies – both inter-team and within the community
- Data collection and tracking
- Billing and fee structures – accounts receivable and payable
- Annual on-time filing of all IRS – State - and legal documents
- Web based information and program flyers and handbooks
- Parent booster clubs
- Scheduling – calendars – meet entries – communications in general

Business and operating plans

Writing a good business plan for your business requires time, commitment, and understanding of the planning process, and a good business plan template. To

successfully create an effective business plan and strategy document, you should commit to setting aside several hours of uninterrupted time each week for several weeks (hold the phone calls!). Be sure include the following seven sections in your business plan:

1) Executive summary

Write the Executive Summary last.

Summarize the most important points of your plan (e.g., income [sales] forecasts and growth strategies; why you need funding & what you will use the funds for; highlight the products or services you will sell, market growth and trends, key personnel). Keep it brief and simple: You can copy and paste many of the sentences and charts already included throughout your business plan.

2) Mission statement

Write a few sentences explaining why you are in business. Focus on the needs you satisfy for your customers, employees and you or your investors. Infuse your mission statement with enthusiasm. Many ideal Mission Statements are 25 words or less.

3) Company history and description

- What's the legal form of your business, where is it located, what's its history, if any?
- List current goods or services you provide.
- Also list future goods or services you plan to introduce.
- What is your competitive advantage?
- Explain why people or businesses would rather spend with you than other companies.

4) Market analysis

- What markets are you serving?
- Define your demographics by types of people (e.g., mothers with small children, young professional men, high income families)
- What is the size of business (e.g., companies with fewer than 10 employees, Fortune 500 companies, independent professionals)
- What is the geography (e.g., local area, national, international, Internet).
- What's the size/population of your potential market? Use U.S. Bureau of the Census or trade association data to estimate your market size.
- What are the trends driving demand?
- Identify the changing demographics (e.g., people living longer, smaller families, more businesses being formed), life or business styles (e.g., more people living alone, more businesses outsourcing non-core functions) or tastes (changing color preferences or favorite types of sports) affecting your market.

- What are the industry distribution and buying patterns? E.g., coaching services can be delivered one-on-one, or via tele-classes and workshops. Products can be sold in retail outlets, home shopping events or the Internet.
- What are the most common methods of distribution in your industry?
- Do people buy based on price, trust, reputation of the company, or perceived quality?
- Who are your competitors, direct or indirect? For example, Health Clubs compete with YMCA's for their customers' time and dollars.

5) Marketing plan

Marketing mix.

- How will you generate leads? Networking, direct mail, a web site, publishing a newsletter, press releases ~ detail what marketing campaigns you will launch and when.
- Marketing budget. Estimate marketing campaigns costs and write out a monthly or quarterly budget.
- Pricing strategy. Are you going to be the low cost leader, the "best value" or the most expensive/highest quality on the market?

6) Management summary and personnel plan

- Who will be the CEO/President/Director
- Who will do your Marketing and Sales?
- Who will lead or direct your programs?
- Who will be the business administrator?
- Who will produce the products or services, and sell to customers?
- Write out a job description for each critical function.
- Create a policy & procedures manual.

If you are working solo, schedule time to perform all management or production functions. You might choose a time each day, or a day each week to do bookkeeping, marketing, sales, product development, or you can break each day into segments. Eventually you will want to identify employees, contractors or consultants who will perform these jobs for you.

- How much will you pay?
- What are the legally required and other benefits you will provide?
- Create a personnel budget, and schedule regular reviews to ensure that all functions are being performed as delegated.

7) Financial statements

- Include a Balance Sheet, Profit & Loss statements (historical and projections), a Breakeven Analysis and Cash Flow projections.
- Get financial templates from business planning or accounting books, web sites or software programs.

The U.S. Small Business Administration also has good instructions for creating business plan financial statements. Go to www.sba.gov and click on “Business Plans” underneath “Starting Your Business.”

You'll find some sections of your business plan more challenging than others. Don't hesitate to ask for business planning help from a local small business development counselor, accountant, market researcher or business coach. Focus on completing one business plan section at a time, and you'll eventually complete the seven pieces needed for your “blueprint for success.”

The business plan is YOURS. Gather enough information from outside sources to make sure it is both professional and accurate, but don't be afraid to be creative with the presentation. Customize it so it reflects what you expect your end product to be.

EXAMPLE OUTLINE for POWER POINT PRESENTATION

SLIDE 1 Newco Learn to Swim Aquatic Center Business Plan

SLIDE 2 Mission Statement

- A clear statement of your company's long-term mission. Try to use words that will help direct the growth of your company, but be as concise as possible.
- Incorporate the 3 D's if possible
 - Drowning prevention
 - Diversity inclusion
 - Dedication to fitness

SLIDE 3 The Team

- List key management by name
- Include previous accomplishments to show these are people with a record of success
- Summarize number of years of experience in this field

SLIDE 4 Market Summary

- Market: past, present, & future:
 - Review those changes in market share, leadership, players, market shifts, costs, pricing, or competition that provide the opportunity for your projects success.

SLIDE 5 Opportunities

- Problems and opportunities:

–State consumer problems, and define nature of product/service opportunities created by those problems.

SLIDE 6 Business Concept

- Summarize key technology, concept or strategy on which your business is based

SLIDE 7 Competition

- Summarize competition
- Outline your facilities competitive advantage

SLIDE 8 Goals & Objectives

- Five-year goals
 - State specific measurable objectives
 - State market share objectives
 - State revenue/profitability objectives

SLIDE 9 Financial Plan

- High-level financial plan that defines financial model, pricing assumptions, and reviews yearly expected sales and profits for the next three years.
- Use several slides if needed to cover this material appropriately.

SLIDE 10 Resource Requirements

- Technology requirements
- Personnel requirements
- Resource requirements
 - Financial, distribution, marketing, etc.
- External requirements
 - Products/services/technology required to be purchased outside company

SLIDE 11 Risks & Rewards

- Risks
 - Summarize risks of proposed project
- Addressing risk
 - Summarize how risks will be addressed
- Rewards
 - Estimate expected pay-off, particularly if seeking funding

SLIDE 12 Key Issues

- Near term
 - Isolate key decisions and issues that need immediate or near-term resolution
- Long term
 - Isolate issues needing long-term resolution
 - State consequences of decision postponement
- If you are seeking funding, state specifics



The **Aquatic Window of Exercise** What can you do in one hour?

Purpose:

1. Create an Aquatic Fitness Center
2. Offer hours flexible for clients
3. Multiple programs at one time
 - ❖ multi-generations
 - ❖ able body & special needs
 - ❖ vertical & horizontal programs
4. Provides career opportunities for current staff
5. Increased income – predictable and progressive
6. An opportunity to improve customer service

Pool demographics:

1. 25 yard 6 or 8 lane pool 3 ½' to 4' foot at each end of the pool



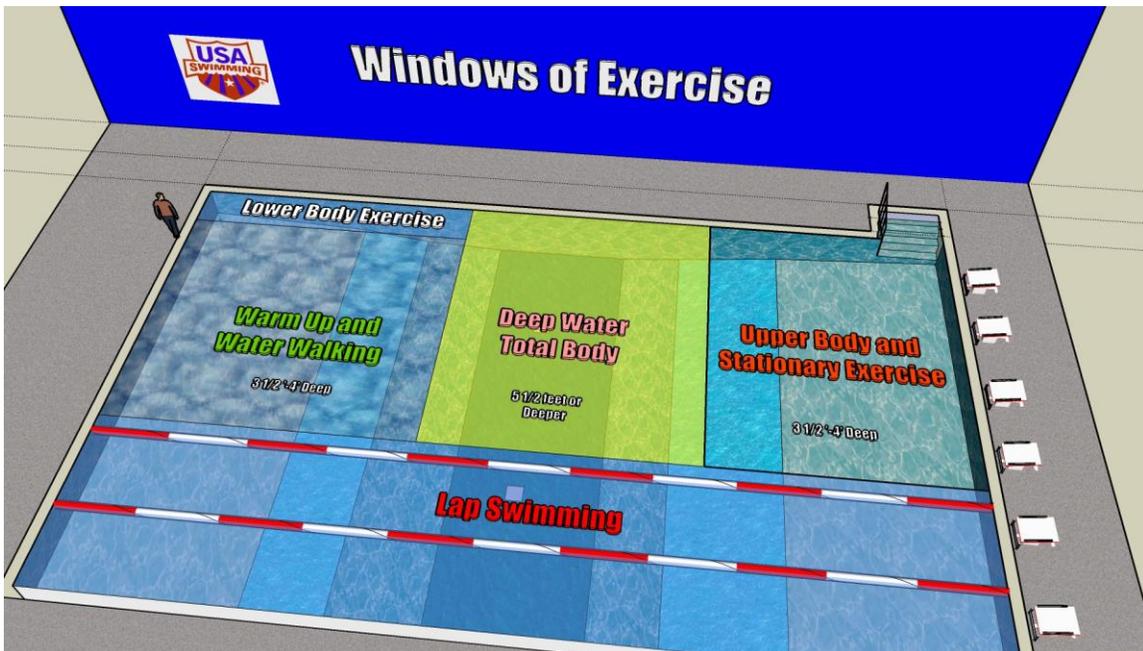
2. gradual slope to 5 foot in the middle
3. ramp and step entry into water

Window of Exercise Program:

1. Hours – 5:30am – 4:00pm
2. 2 lane open for swimming
3. Rest of pool open for vertical programs
4. Independent aquatic exercise
 - ❖ water walking program
 - i. body awareness & alignment training
 - ii. body core training
 - iii. special condition group
 - ❖ IAP – Independent Aquatic Programs
 - i. Ai Chi
 - ii. strength training
 - iii. aerobic
 - ❖ Mini Clinics
 - i. safety instruction & education for clients who do not want APT – Aquatic Personal Training
 - ii. social interaction
 - iii. support group



- ❖ Pool Chats
 - iv. health & wellness awareness
 - v. connection to the medical community
- ❖ Aquatic Personal Training
 - i. adults
 - ii. children with special needs
 - iii. caregiver



POOL RENTAL AGREEMENT - SAMPLE

Agreement made this _____ day of _____, 19____
by and between _____ a _____
("Company") and _____ a _____ (Individual or Org.).

Company: List the name of the Company that owns the pool(s): _____

Organization: List the type of organization (501.c.3 or Sub-S or LLC) and attach their constitution and or by-laws as exhibit #1. that will be renting the pool(s)

In consideration of the mutual terms, conditions and covenants hereinafter set forth, Company and Organization agree as follows:

1. The Company hereby will rent the pool(s) and auxiliary areas as described in exhibit #2 attached during the following time frames and according to the following schedules:

2. The term of this Agreement shall commence on _____. After the first thirty (30) days of the term, either party may, without cause, terminate this Agreement by giving _____ 30 days' written notice to the other.

3. Organization shall pay to Company and Company shall accept from the Organization as compensation for all rentals to be provided pursuant to this Agreement, the sum of \$__ per hour. Organization is responsible for all and any taxes.

4. Organization shall limit their programs and services to the following:

No services or programs shall compete with such programs as the Company already operates. The Company shall not rent to any other organizations that offer similar programs or services as that of the organization without prior approval of the Organization.

5. The Company guarantees that the facilities offered for rent will be kept clean, safe, ADA accessible, and operated in accordance with the State's Health and Safety codes and those of the State's Swimming Pool governing entity. If at any time the air or water quality should be brought into question, the matter will be immediately resolved to the satisfaction of the Organization and the governing safety and health entities.

6. The Company shall be required to maintain adequate and proper insurance. If the Organization will be required to carry additional insurance, it is herein listed:

7. Organization and may engage in other business activities provided, however, that Organization shall not during the term of this Agreement solicit Company's employees or accounts on behalf of Organization or another entity.

8. If Organization becomes unable to continue renting pursuant to this Agreement by reason of illness, incapacity or death, or dissolution of the Organization, compensation shall cease upon the happening of the event.

9. Neither party may assign this Agreement without the express written consent of the other party.

10. Organization is an independent entity and nothing contained in this Agreement shall be deemed or interpreted to constitute the Organization as a partner, agent or employee of the Company, nor shall either party have any authority to bind the other.

11. It is agreed between the parties that there are no other agreements or understandings between them relating to the subject matter of this Agreement. This Agreement supersedes all prior agreements, oral or written, between the parties and is intended as a complete and exclusive statement of the agreement between the parties. no change or modification of this Agreement shall be valid unless the same be in writing and signed by the parties.

12. All notices required or permitted to be given hereunder shall be in writing and may be delivered personally or by Certified Mail - Return Receipt Requested, postage prepaid, addressed to the party's last known address.

13. This Agreement shall be construed in accordance with and governed by the laws of the State of _____.

INTENDING TO BE LEGALLY BOUND, the parties hereto have caused this Agreement to be executed as of the date first above written.

BY _____
(Company)

(Name/Please Print)

(Date)

BY _____
(Independent contractor)

(Name/Please Print)

(Date)

INDEPENDENT CONTRACTOR AGREEMENT

Template

Agreement made this _____ day of _____, 19____ by and between _____ a _____ ("Company") and _____ a _____ ("Independent Contractor").

Independent Contractor is an individual willing to provide certain skills and abilities to the Company that the Company has need for.

In consideration of the mutual terms, conditions and covenants hereinafter set forth, Company and Independent Contractor agree as follows:

- 1. The Company hereby employs the independent contractor as an independent contractor, and the Independent contractor hereby accepts employment.
- 2. The term of this Agreement shall commence on _____. After the first thirty (30) days of the term, either party may, without cause, terminate this Agreement by giving _____ 30 days' written notice to the other.
- 3. Company shall pay to Independent Contractor and Independent Contractor shall accept from the Company as compensation for all services to be provided pursuant to this Agreement, the sum of \$__ per class or \$__ per training session. Independent Contractor is responsible for any and all taxes. Independent Contractor will also receive a \$__ finder's fee for each client brought to (Name of business). Company shall reimburse Independent Contractor for insurance. Company shall not reimburse for any travel or related expenses.
- 4. Independent Contractor shall provide on an "as needed" basis the following services:

Independent Contractor shall devote such time, attention and energies as required to fulfill the requirements of the program.

- 5. Independent Contractor is an Independent Contractor and may engage in other business activities provided, however, that Independent Contractor shall not during the term of this Agreement solicit Company's employees or accounts on behalf of Independent Contractor or another entity.
- 6. If Independent Contractor becomes unable to perform services pursuant to this Agreement by reason of illness, incapacity or death, compensation shall cease upon the happening of the event.
- 7. Neither party may assign this Agreement without the express written consent of the other party.
- 8. Nothing contained in this Agreement shall be deemed or interpreted to constitute the Independent Contractor as a partner, agent or employee of the Company, nor shall either party have any authority to bind the other.
- 9. It is agreed between the parties that there are no other agreements or understandings between them relating to the subject matter of this Agreement. This Agreement supersedes all prior agreements, oral or written, between the parties and is intended as a complete and exclusive statement of the agreement between the parties. no change or modification of this Agreement shall be valid unless the same be in writing and signed by the parties.
- 10. All notices required or permitted to be given hereunder shall be in writing and may be delivered personally or by Certified Mail - Return Receipt Requested, postage prepaid, addressed to the party's last known address.
- 11. This Agreement shall be construed in accordance with and governed by the laws of the State of _____.

INTENDING TO BE LEGALLY BOUND, the parties hereto have caused this Agreement to be executed as of the date first above written.

BY _____

(Company)

(Name/Please Print)

(Date)

BY _____
(Independent contractor)

(Name/Please Print)

(Date)



The **AQUATICS FACILITY** can be the focal point for your entire community.

The keys are:

- **Planned programming**
- **Design innovation**

SAMPLE SURVEY Our community is being considered as a site for a new aquatic facility. Some design and service options need to be evaluated before initial planning begins. We would appreciate you taking the time to fill out this survey.

Age _____ Male or Female _____ Single or Married _____

Children living at home _____ Ages _____

Household annual income (*circle one*) ---

--- under \$50,000 --- \$50,000 to \$100,000 --- \$100,000 to \$150,000 --- over \$150,000

Can you swim ? (*circle one*) YES NO

Do you have a fear of being in or around the water ? (*circle one*) YES NO

How many people in your household --- Can Swim _____ Can't swim _____

Have you ever been in the water for rehabilitation purposes ? (*circle one*) YES NO

How many times a year do you play in the water ? _____

Have you ever been in a Hot Tub or Spa ? (*circle one*) YES NO

Did you enjoy it ? (*circle one*) YES NO Do you own a Hot Tub ? (*circle one*) YES NO

Do you own a pool ? (*circle one*) YES NO

Do you belong to a club that offers access to a pool or Spa ? (*circle one*) YES NO

Do you swim for improved health ? (*circle one*) YES NO How many times a week ? _____

Do you water walk or do vertical aquatic exercise for health ? (*circle one*) YES NO

Do you swim Masters ? (*circle one*) YES NO

If a new aquatic facility were to come to our community what **features** would you most like to see ? Please circle number in importance from **5** to **1** with **1** being the least important and **5** being the most important.

- A pool that has easy access and with water that is warm enough so I do not shiver when getting in. 5 4 3 2 1

- A pool that is cool enough for me to do aggressive aerobic exercise or lap swimming. 5 4 3 2 1
- A pool that will allow me to stand at a comfortable depth so I feel safe being in the water without being a good swimmer. 5 4 3 2 1
- A facility that has multiple pools with different temperatures varying depths and ramps and stairs for easy access. 5 4 3 2 1
- A facility that offers some sort of warm water Aquatic Rehab. 5 4 3 2 1
- A facility that has a competitive size pool. 5 4 3 2 1
- A facility that has recreational aspects like water slides and lazy rivers and spray features and diving boards. 5 4 3 2 1
- A facility that offers a certified swim lessons program. 5 4 3 2 1
- A facility that has locker rooms with modern amenities and easy access – ADA approved. 5 4 3 2 1
- A facility that has a land exercise area with modern machines such as treadmills, elliptical cross trainers, bikes, and weights. 5 4 3 2 1
- A facility that has certified professional staff for all programs and personal training/coaching/instruction. 5 4 3 2 1
- A facility that has a concession area. (juice bar – coffee bar) 5 4 3 2 1
- A facility that offers both a membership option and a program fee option. 5 4 3 2 1
- A facility that offers community aquatic programs for all ages. 5 4 3 2 1
- A facility that is open year round. 5 4 3 2 1



Members/Facilities handbook sample:

Hometown USA Center WaterWellness Programs & H-USA Land Fitness Programs

Sample letter to members

Dear Prospective Member,

Thank you for becoming a Member of Hometown USA Center (H-USA). Over the next year you will get the chance to see why so many have chosen us as their personal Health & Wellness Center.

Making health and fitness a part of your lifestyle can be a difficult task. We are here to make you feel as comfortable as possible by answering any questions you may have to help you learn about Land Exercise and Water-Wellness.

The following information is being provided to inform you of the privileges and responsibilities of your Membership. Our goal is to provide you with the most professional service in an atmosphere that instills motivation and satisfaction.

H-USA is a true wellness center and fitness facility in an ever changing and rapidly growing industry and can not anticipate every circumstance or question during our day-to-day operation. Therefore, the information contained herein is subject to change without notice and the interpretation of the management is final.

Facility Hours

| | <u>Land Fitness Program</u> | <u>Platinum Program</u> | <u>Gold Program</u> |
|-------------|--------------------------------|---|---|
| <i>MON</i> | 5:30 AM to 8:30 PM | 5:30 AM to 8:30 PM | 8:00 AM to 5:00 PM |
| <i>TUE</i> | 5:30 AM to 8:30 PM | 5:30 AM to 8:30 PM | 8:00 AM to 5:00 PM |
| <i>WED</i> | 5:30 AM to 8:30 PM | 5:30 AM to 8:30 PM | 8:00 AM to 5:00 PM |
| <i>THUR</i> | 5:30 AM to 8:30 PM | 5:30 AM to 8:30 PM | 8:00 AM to 5:00 PM |
| <i>FRI</i> | 5:30 AM to 8:30 PM | 5:30 AM to 8:30 PM | 8:00 AM to 5:00 PM |
| <i>SAT</i> | 10:00 AM to 4:00 PM | 10:00 AM to 4:00 PM | <i>NOT AVAILABLE</i> |
| <i>SUN</i> | <i>CLOSED</i> | <i>CLOSED</i> | <i>CLOSED</i> |
| | Closed ALL National Holidays | Facility opens 10 minutes prior to start times listed | Facility locks promptly at close times listed above |
| | Check calendar for actual days | | |

Facility Features:

- Blacktopped entrance with parking for over 110 vehicles. Two ADA approved entrances - West and South. The West entrance has a drive through "Drop Off Area"
- The "Land Fitness Area" features state-of-the-art exercise fitness equipment for toning and strengthening and a large variety of Cardiovascular machines. CardioTheater system with DirecTV Satellite feed of over 80 channels of education, entertainment, sports and music programming.
- WaterWay Therapy – Outpatient Aquatic Physical Therapy Services and Post Rehab programming for a wide variety of diagnoses as well as related injuries and ailments.
- Fitness Evaluations and Personal Training for land and aquatic based programs with Certified Professional Staff providing education, training and instruction for all H-USA Members.
- Warm water fitness and Post-Rehab pool for lap swimming, water walking, and vertical exercising as well as Post-Rehab and CareGiver Programming
- 20' x 40' varying depth warm water Teaching and Rehab with hydro-therapy features
- Locker/Shower/Changing Rooms for both Men & Women. Over 90 lockers of various types available in each of the areas. Both dressing areas have ADA showers as well as a separate private "caregiver" specialty dressing and shower room.
- Privately owned wholesale/retail outlets for
- Carpeted locker and dressing area along with non-slip tile in the shower and toilet area.
- USA Competitive Swim Team
- Nationally renowned Learn to Swim Program... SwimAmerica
- Land Therapy and Rehab Services.
- Vending and Viewing Area overlooking the pools and Aquatic Center.
- Conference and Meeting Room
- H-USA offers Gift Certificates for all types of occasions. Gift Certificates can be used for:
 - 1.) Membership
 - 2.) Monthly Programming
 - 3.) Aquatic or Land based Personal Training
 - 4.) Watsu's

Stop by the Front Desk to inquire about a custom designed Gift Certificate for someone special.

H-USA offers Member Referral Rewards of up to \$25.⁰⁰. To Qualify for Member Rewards:

- 1.) Be a H-USA **Active** Program Member...
- 2.) Bring a friend or Family Member in for a Facility Tour...
- 3.) If that prospective member pays the Annual Membership Fee and 2 Months Monthly Programming, you receive a \$25.⁰⁰ H-USA Gift Certificate.
(Some Restrictions Apply)

Hometown USA and WaterWay at a Glance

The 30,000 square foot Center and WaterWay Therapy offers you one of the most modern and uniquely designed facilities in the country.

- Easy access off main street, including blacktop parking lot for 110 cars.
- Two main wheel-chair accessible entrances to the single level facility
- 2,000 square feet of Retail Storefronts
- 3,000 square feet of Classroom, Viewing Area, and Meeting Room
- 3,000 square feet of Land Wellness Area featuring Cardio and Strength Equipment and Cardio Theater audio/visual featuring Direct TV
- 2,800 square feet of Land based Physical Therapy
- 1,000 square feet of Land based Occupational Therapy / Work Conditioning
- 2,500 square feet of Changing Area rooms with carpeted locker room and privacy showers
- 5,000 square feet of wide halls and common area and with a convenient centrally located Outpatient Offices and Front Desk Area.
- 1,200 square feet of Aquatic rehab features (Specialty Pool).
- 12,000 square feet (2 pools-250,000 gallons) of temperature controlled water dedicated to Aquatic exercise, lap swimming and Aquatic Therapy. The Large pool is 82 feet wide by 75 feet long with stand-up depth in all parts of the pool. The Teaching pool is 30' feet wide by 60' feet long and incorporates varying depths.
- Cutting-edge Aquatic Therapy equipment and hydro-therapy jets. All pools are in the same building, same level, and wheel chair/handicapped accessible.
- 300 square feet of separate privacy Showering and Changing Areas for spouses or caregivers of opposite sex for assisted dressing before and after pool use.

H-USA Membership Information and Definitions

| <u>Membership Types</u> | <u>Definition</u> |
|-----------------------------|---|
| Single Membership | A person 16 years or older |
| Couples Membership | 2 people, 16 years or older, living at the same address |
| Corporate Membership | Ask for details at Front Desk |

| <u>Membership Types</u> | <u>Single Individual Adult</u> | <u>Couple</u> |
|---------------------------------|--------------------------------|---------------------|
| H-USA Annual Memberships | \$55. 50 | \$95. 50 |

| <u>H-USA Monthly Programming</u> Platinum Wave Options | <u>Single Individual Adult</u> | <u>Couple</u> |
|--|---|--|
| <i>Platinum Wave Premium</i> <i>Premiere Programming Package</i> Weekdays: 5:30 am – 8:30 pm Saturday: 10:00 am – 4:00 pm | \$49. ⁵⁰ Land, water, aquatic exercise equipment use and 2 FREE Personal Training Sessions | \$89.50 Couples Discount only applicable v Members in an active H-USA Monthl |
| <i>Platinum Land only</i> Weekdays: 5:30 am – 8:30 pm Saturday: 10:00 am – 4:00 pm | \$29. ⁵⁰ Land Access only includes showers and dressing areas | \$49.50 Couples Discount only applicable v Members in an active H-USA Monthl |

| <u>H-USA Monthly Programming</u> Gold Wave Options | <u>Single Individual Adult</u> | <u>Couple</u> |
|--|--|--|
| <i>Gold Wave</i> <i>Basic value package with</i> <i>water and land access</i> Mon - Fri: 8:00 am – 5:00 pm No weekend access | \$39. ⁵⁰ Land and Water access | \$69.50 Couples Discount only applicable v Members in an active H-USA Monthl |
| <i>Gold Land only</i> Mon - Fri: 8:00 am – 5:00 pm No weekend access | \$24. ⁵⁰ Land Access only includes showers and dressing areas | \$44.50 Couples Discount only applicable v Members in an active H-USA Monthl |

| <u>H-USA Member Services</u> | <u>Daily/Monthly</u> | <u>Yearly</u> |
|--|---|---|
| <i>Locker Rental</i> | \$.50 per day \$12.00 per month | \$120. ⁰⁰ per year |
| <i>Towel Service</i> | \$3. ⁵⁰ per month | \$32.50 per year |
| Personal Training Aquatic or Land based | \$35. ⁰⁰ per session by appointment only | |
| <i>Watsu Sessions</i> | <u>In-Active Member Cost</u> 15 - 30 min Watsu = \$40. ⁰⁰ 35 - 60 min Watsu = \$70. ⁰⁰ <u>Active Member Cost</u> 15 - 30 min Watsu = \$30. ⁰⁰ 35 - 60 min Watsu = \$60. ⁰⁰ | |
| Guest Fees See definitions page 8 | \$10. ⁰⁰ per visit | \$4. ⁰⁰ per person on Wednesday Night Family S Water access only |

Watsu (whose name comes from “WATER shiatSU”) is, at its simplest level, a floating massage. With the help of your Watsu Practitioner, you will float comfortably in a pool of warm water while your muscles are massaged, your joints mobilized, tissues stretched, energy pathways opened, and your whole body is swayed gently through the water. Most people find Watsu to be “blissfully relaxing”. Physical Therapists, Massage Therapists, Aquatic Therapists and other bodywork practitioners all over the world use it for treating stress, chronic back pain, orthopedic problems, arthritis, sleep disorders, fibromyalgia, and a host of other conditions. It’s extraordinary – and something you have to experience personally to truly appreciate the Aquatic Relaxation Chamber and Watsu.

| <u>Miscellaneous</u> | <u>Definition</u> |
|----------------------|---|
| In Area Guest | Guest living in the County Area, accompanied by an active member. (\$10. ⁰⁰ per day- max month) |
| Out of Area Guest | Guest living outside the County Area, accompanied by an active member. (\$10. ⁰⁰ per day) |
| Corporate Programs | All employees of any participating Corporation receive a 25% discount on an Individual Membership and Programming Fees only. Discount does not apply to spouse or family. D does not apply to Personal Training, Watsu, or Locker/Towel service. |
| H-USA Employee / BOD | Complimentary Annual Couples Membership and Platinum Wave Program for the individual a full time employee. This does not include Locker Rental, Towel Service, or Personal Training |
| Children | A person under the age of 16. Children may not be Members of H-USA which by definition Adult Fitness Facility. Children may have access to special Aquatic Programs as long as their parents are current members of H-USA. Children may not use the Land Fitness area with a H-USA Personal Trainer or USA-S coach. |

| <u>Basic Program Types</u> | <u>Definition</u> |
|-------------------------------|---|
| H-USA Water-Wellness Programs | Independent Aquatic Exercise & Post-Rehab/Caregiver Programs |
| H-USA Land-Wellness Programs | Land based cardio, strength training and Personal Training |
| Water-Wellness Foundation | Aquatic Therapy for special needs children (501.c.3 non-profit- org.) |
| Swim America | Private Learn-to-Swim Program (501.c.3 non-profit-org.) |
| USA Swim Club | Competitive Swim Club (501.c.3 non-profit-org.) |

| <u>Specialty Program Types</u> | <u>Definition</u> |
|--------------------------------|---|
| <i>Family Night Swim</i> | <p><i>Wednesday Nights (5:30 pm – 6:30 pm)</i></p> <p>A Single Membership allows the adult member free access. A Couples Membership allows the 2 adult members free access. A child may attend if actively enrolled in one of the above Basic Programs. (Parent may required for safety) Guest may attend with member present (\$4.⁰⁰ Guest Fee – no Teaching pool Land Fitness access)</p> |

Where Do I Belong?

Platinum Wave Program: Specifically designed for the Post-Rehab patient or the Member who requires total access to the Facility and Member Services. Excellent Program for the Member new to Aquatic or Land Exercise or the patient being discharged from therapy. (See *Membership Info* for more details)

| | |
|---|-----------|
| Land Fitness Land Area: | Mon - Sat |
| Post-Rehab Exercise Pool: | Mon - Sat |
| Aquatic Exercise/Facility Equipment | |
| Safety Orientation and Health Screening | |
| 2 FREE Personal Training Sessions | |
| Monthly/Yearly Locker discounts | |
| Access to MiniClinics and WaterWellness Workshops | |
| Special Discounts at Retail stores | |

Gold Wave Program: Our basic value package ideal for the Lap Swimmer or WaterWalker. This water access only program is for the Member wanting weekday facility access to the pools only. (See *Membership Info* for more details)

| | |
|---|-----------|
| Life Fitness Land Area: | Mon - Fri |
| Post-Rehab Exercise Pool: | Mon - Fri |
| Facility Equipment Only | |
| Safety Orientation | |
| Access to MiniClinics and WaterWellness Workshops | |

Land Fitness Land Program: The Perfect "Health Club" program option. For the Member who likes to stay dry and exercise. You will not find a better deal anywhere. (See *Membership Info* for more details)

| | |
|--|------------------|
| Land Fitness Land Area: | Mon – Fri or Sat |
| Basic Orientation: | Mon – Thur. |
| Personal Training by appointment | |
| Access to MiniClinics and Wellness Workshops | |

The following pages contain Hometown USA Center's Policies, Procedures and Member Protocols. As an Adult Fitness Facility and Member of the Medical Fitness Association, H-USA strives to make all Policies and Procedures fair and just. By reading the following pages, each H-USA Member agrees to adhere to all stated Policies, Procedures and Protocols as well as any restrictions that may apply.

Questions and clarifications of any H-USA Policy and Procedure can be obtained via the Facility Manager, Aquatic Programs Manager, or Aquatic Rehab Manager.

Land Fitness Area Policies and Procedures

- 1.) H-USA Members are required to check-in at the Front Desk prior to accessing the facility. A Basic Orientation is required before using any equipment.
- 2.) You must be at least 16 years old to utilize any Fitness equipment. A younger person is required to work with a Personal Trainer.
- 3.) No children are allowed in the Land Fitness Area.
- 4.) Appropriate workout attire required. Jeans, sharp objects in pockets and improper footwear may damage equipment and create an unsafe workout.

- 5.) Only water in plastic bottles (with caps) are allowed in Land Fitness Area. All other food and drink may be consumed in the Viewing Area. (Including gum)
- 6.) Please allow other Members to work through, if you are doing multiple sets. Do not just sit on the station.
- 7.) Please return all equipment to the proper area. Please use a towel to wipe sweat from machines.
- 8.) No swearing or inappropriate language.
- 9.) Therapy Services and patients utilize the Land Fitness Area. Please be considerate and respect their privacy
- 10.) H-USA Members without a locker will place their bags under or on top of the coat racks by the locker rooms.
- 11.) Please ask for assistance for any Audio/Video needs. H-USA Staff only are allowed behind the desk.
- 12.) Please check with Front Desk concerning Personal Training Policies.
- 13.) As with all areas of H-USA, please be considerate when using any perfumes, colognes, deodorants.

Aquatic Program Policies and Procedures

- 1.) Members are required to check in at the Front Desk via scanning H-USA Membership ID Card.
- 2.) A Safety Orientation is required for all new Aquatic Program Members.
- 3.) Members must be a minimum of 16 years old to utilize Pools and Spas.
- 4.) H-USA closes promptly at 8:30 pm, so balance your workout schedule appropriately.
- 5.) The State Department of Public Health requires any and all H-USA Members to shower before entering Pools and/or Spas. Swim caps are required for hair over 4 inches long.
- 6.) Aquatic Exercise Equipment is reserved for Platinum Wave Members only. For all other H-USA Programs, general facility aquatic equipment is available.
- 7.) Aquatic apparel other than a normal swim suit must be pre-approved before entering pool.
- 8.) Plastic Water Bottles ONLY are allowed in pool area. Other nutritional items may be consumed in Viewing Area.
- 9.) Lap Swimmers are limited to "Lap Swimming" Lanes (this includes, but is not limited to: kicking, swimming, snorkeling. No "swimming" is allowed in any other part of any pools.

Therapy Spa Policies and Procedures (If available)

- 1.) A Therapy Spa Orientation is required before using any of the spas. If you are uncertain what a "button or dial" does, or of the bottom configuration/footing in the spa, please ask a Tech assistance. Each spa has an "Emergency/Assistance Button" on the handrail of the stairs. for

- 2.) No one under the age of 16 is allowed in the Therapy Spas unless pre-approved
- 5.) The Illinois Department of Public Health requires any and all H-USA Members to shower before entering Pools and/or Therapy Spas. No oils or lotions or make-up may be worn into the pool or spas.
- 6.) Each Therapy Spa has a different temperature setting. Please be aware of the Health Risk involved with hot water immersion. All spas have the same seating, jet, and bottom configuration and the jet controls operate the same.
- 6.) Enter spas via stairs only. NO climbing over sides.
- 7.) Only water in plastic bottles (with caps) are allowed in Therapy Spa Room. All other food and drink may be consumed in the Viewing Area. (Including gum)
- 8.) Family Night Swim guests do not have access to Therapy Spas.
- 9.) Proper attire must be worn. No Aqua Shoes in Therapy Spas and no street shoes in Therapy Spa Room.
- 10.) Please ask for assistance to change channels or to the adjust the volume on the TV.
- 11.) Some of the individual jets have adjustable faceplates for water intensity control. Ask a Tech to provide assistance in adjusting these jets.
- 12.) If a Therapy Spa is covered please select a different Therapy Spa to use. Occasionally one of the Spa's is undergoing routine maintenance and is closed for a day.

Locker, Shower and Changing Area Policies and Procedures

- 1.) All lockers are kept locked at all times. Please do not leave your key in your locker. Lost keys will cost \$5.00 to replace and will take 72 hours. Members will have temporary access for that time period.
- 2.) Please do not put stickers, name tags, write on or in any other way customize / decorate the inside or outside of the locker.
- 3.) Please do not get talcum/baby powder on the carpet or tile. This presents a health and safety hazard. If you must use powder stand on your towel and then fold the towel so the powder does not get on the floor.
- 4.) Do not attempt to stand on the benches. They are for sitting and changing only.
- 5.) If you have "Towel Service" you may pick up a "Pool Towel" from staff in the pool area
- 6.) Please do not leave H-USA Towels in the Locker Room. Please return the used towels to the Laundry Room door.
- 7.) Towel Service is by the year or by the month. If you forget your towel, you may ask for one at the Front Desk, however you will be charged for Towel Service for that month.
- 8.) Please do not leave wet suits, wet towels, or dripping equipment in your locker. We will remove items that are causing a problem and notify the Member.
- 9.) Lockers can be rented by the year, by the month, or by the day. Lockers are discounted for Platinum Members.

- 11.) A 100% water soluble shower gel is provided for each shower and is required by the Illinois Department of Public Health to be used before entering pools or spas. You may use your own shampoo/conditioner after exiting the Pool, however, we ask that you do not use these or any other products (bar soap, lotions, cleansers, oils etc...) before entering the Pool.
- 13.) Please do not use the Koala Changing Station for children over 40 lbs.
- 14.) No coats, boots or umbrellas in the Locker Rooms. Please use the racks located in the hallway or in the Viewing Area.
- 15.) Locker Rental is not required. All Bags must to be kept on the Pool Deck. Do not leave any belongings in Locker Room.
- 16.) Lockers are for individuals and cannot be shared by more than one family / account. (2 per locker maximum)
- 17.) No cell phone use is allowed in shower room. Keep them in your bag, purse, or pocket until you get to a public area in the facility.

Adult Based Fitness Facility Minors and Children Policy

- 1.) Children under the age of 16 years old may not be in the facility unless enrolled in one of the following Programs: Outpatient Aquatic PT, SwimAmerica Program, or the USA Swim Club Program, Fitness Land Program (PT Only), Aquatic Personal Training.
- 2.) There will be no running, rowdy behavior or excessive noise allowed anywhere in the facility.
- 3.) Children with adults must stay in the Viewing Area. (See Posted Policy)
- 3.) No children are allowed in or around the Land Fitness Area.
- 4.) No children may be in the Changing/Showering Area unless accompanied by an adult.
- 5.) Hometown USA Center is Adult Membership based. One of our promises to our Members is the privacy to workout in a controlled and relaxed environment. This includes but is not limited to, providing an environment free of excessive noise from children or children being present during their workout.
- 6.) We firmly believe that the USA Swim Team and Learn to Swim programs are assets to our facility. We also believe that parents are responsible for their children. We ask that parents keep their children under control according to the above policy. Children will be children, and parents need to be parents.

Accounts Payable And Receivable Policy and Procedure

- 1.) Annual Memberships are valid from the day of sign up through the corresponding day of the following year. (12 consecutive months)
- 2.) All H-USA Monthly Programming is valid for a 30 day period. (i.e. Member makes a payment and checks-in for the first time on May 18th. The Member now has access from 5/18/08 – 6/18/08)
- 3.) H-USA does not require any yearly contract for services, however, utilizing the facility via 1 check-in within a 30 day period, is the same as utilizing the entire month (24 check-ins).
- 4.) H-USA does not require payment for NOT utilizing the facility with in a 30 day period. An Account Status will still be mailed to keep the member informed of their account activity and payment schedule.

- 5.) All statements are mailed the first week of the month and are due prior to your validation date. Please check your statements carefully.
- 6.) Dues such as Annual Membership, Locker Fees, Guest Fees, Towel Fees, Personal Training, etc. may affect the total of your monthly statement. Please wait for the statement and pay the amount shown. If you have any questions please do not hesitate to contact: _____
- 7.) Payment for Services:
- A.) Members may pay via personal check, money order, or Visa/MasterCard. (mail or drop box) We do not accept cash payments for services or fees.
 - B.) Members may place credit card on file at the office and H-USA will automatically bill your card when your statement comes due. (Signature authorization required)
 - C.) Accounts more than 30 days past due will be contacted via the H-USA Billing Office. If the payment is not received within 7 days after contact a \$15.00 Administrative Surcharge will be added to the account.
- 8.) After 60 days past due, the Member will no longer have access to the Facility, Programs or Services until the account has been brought to a "\$0" balance.
- 9.) H-USA has a \$28.00 Returned Check Fee for all checks returned for any reason.
- 10.) Daily Guest Fees are \$10.00 per day for use of the entire facility. Land Fitness Area, Pools, Lockers/Shower/Changing Area. The guest must be a H-USA Member or be with a H-USA Member.
- 11.) Wednesday Night Swim allows H-USA Members to bring Guests to the pool only. The cost is \$4.00 per person and H-USA Member is required to be present. Use of the Spas or Land Fitness Area is not included in the Family Night Guest Fee.
- 12.) H-USA Members taking advantage of the "Couples Discount" are subject to the following requirements. Both Members must be ACTIVE for the discount to apply that 30 day period. If only one Member is active, the non discounted rate applies and will be billed accordingly.
- 13.) Personal Training sessions may be contracted and paid for via the following:
- A.) Payment may be made on the day of service via check or Visa/MasterCard.
 - B.) Members may place credit card on file at the office and H-USA will automatically bill your card before when your statement comes due. (Signature authorization required)
 - C.) Pre-payment of PT sessions is recommended
 - D.) A maximum of 8 Personal Training (land or water) sessions can be charged to an account before a payment in full is required.
- 14.) Members signing up for the Platinum Wave Program must remain active in the program for at least 180 days or the remaining Complimentary Personal Training sessions will be billed back to the account at \$35 per session.
- 15.) All Discount Employees are required to submit an Employment Verification Form before any Discount may be applied.
- 16.) No merchandise from retail stores any services from the swim team may be charged to you H-USA account. These are totally separate businesses with separate billing policies and procedures.

Seminars... Workshops... Meetings...Functions And Special Events

Hometown USA Center offers a 550 square foot Conference Room, ergonomic chairs, conference tables and Audio Visual equipment. The room comfortably seats 25 board-room style and 35 classroom style. The room is available for H-USA Members to reserve under the following conditions:

- 1.) Rental rates are \$35.⁰⁰ for the first hour and \$20.⁰⁰ per hour or any part of an hour thereafter.
- 2.) Available Hours: Monday - Friday 7:00 am - 7:00 pm. Saturday 10:00 am to 3:30 pm.
- 3.) Advance reservations for the room are required along with a \$35.⁰⁰ non-refundable deposit which will be credited towards the rental rate.
- 4.) No food or beverage (other than water) is allowed in the Conference Room. A Concessions/Vending area across the hall from the meeting room that seats 16 people.
- 5.) Outside catering must be pre-approved.
- 6.) Renters are subject to a exit inspection of the Conference Room and will be held liable for any and all damage that occurs.
- 7.) Renting the Conference Room does not automatically give attendees Pool, Spa, or Membership privileges. A Guest Package can be arranged with the Front Desk so the attendees can swim, soak in the Therapy Spas, use the Pools or work out in the Life Fitness Area on the lunch break or after the meeting.

Corporate Health & Wellness Plan Annual Membership Fee Structure:

- 1.) The "Corporation" may become a Corporate Member for the Annual Fee of \$500.⁰⁰ .
- 2.) Once the Annual Membership has been paid, Member Registration Forms must be completed for all Prospective Members.

OR

- 1.) The "Corporation" can elect to have the individual be responsible for their own Annual Membership Fee. With this option, the Individual Annual Membership Fee (\$55.⁰⁰) and the Couple Membership - Fee (\$95.⁰⁰)
 - A.) 10 - 25 Members: 15% Discount
 - B.) 26 - 50 Members: 25% Discount
 - C.) 50 + Members: 50% Discount

Monthly Programming Fee Structure:

- 1.) The "Corporation" may be responsible for Monthly Programming Fees for each employee. A Monthly Invoice is sent directly to the "Corporation".
- 2.) Each "Corporate Employee" may be responsible for Monthly Programming Fees. A Monthly Invoice is sent directly to the "Corporate Employee".
(All H-USA Accounts Receivable Policies apply)
 - A.) 10 - 25 Members: 15% Discount
 - B.) 26 - 50 Members: 25% Discount
 - C.) 50 + Members: 50% Discount

Additional Corporate Health and Wellness Information:

- 1.) Discounts do not apply to Locker / Towel Rental, Personal Training.
- 2.) Discounts do not apply to Team Swimming / SwimAmerica Programming.
- 3.) A Corporate Spouse may be included in the Membership privileges but does not count towards the discount total.
- 4.) All Corporate Memberships are required to undergo a Re-Evaluation every 6 months to make discount adjustments.
- 5.) All invoices are mailed the 1st week of the month. A \$15.00 per member surcharge will be assessed for accounts over 30 days past due. Accounts over 45 days past due will automatically inactivate the individual's membership. The corporation will be responsible for the Member account if delinquent.
- 6.) Each Corporate Member will be allowed to:
 - A. Choose a Programming Package (A Coordinator is available to aid in this decision)
 - B. Receive 1 FREE consultation with Certified Personal Trainer
 - C. Sign up for Locker or Towel Service
 - D. Receive a mandatory Safety Orientation as related to the following:
 - 1.) Spas
 - 2.) Cardio Equipment
 - 3.) Strength and Conditioning Equipment
 - 4.) Pools and Aquatic Exercise Equipment

| Programs Pillars | Monthly Net Income | Numbers | Annual Sub Total | Extension Annual | Cost | % @ 3 YEARS |
|-------------------------|--------------------|-----------------------------------|------------------|------------------|----------------------------|---|
| L2S Small Group | \$6200 | 160 | \$74,000 | | \$9 Per Les \$36 Per M | |
| L2S Spotlight | \$7900 | 96 | \$95,000 | | \$19 Per Les \$76 Per M | |
| L2S Custom | \$1400 | 36 | \$17,000 | \$186,000 | \$38 Per Les \$152 PerM | 20%  |
| Therapy Rental | \$9000 | 2080 hrs | \$104,000 | \$104,000 | \$35 per ½ hour | 10%  |
| Facility Memberships | \$4000 | 880 | \$48,000 | \$48,000 | \$55 Per Yr \$99 Per Yr | |
| WOE Programs | \$28,300 | 480 | \$340,000 | | \$59 Per Mth average | |
| AqPersonal Training | \$5200 | 137 | \$62,000 | | \$38 per ½ hour | |
| Misc services | \$7200 | 480 | \$86,000 | \$488,000 | Lockers Towels Etc | 50%  |
| Rental Team and Parties | \$14,400 | 8 lanes 5 hours a day 6 days week | \$173,000 | \$173,000 | \$14 per SC Lane per hour | 20%  |

\$951,000

OTHER THINGS SECTION – Important things for any aquatic facility

HVAC Introduction

When designing a structure to enclose a swimming pool a complete understanding of what is happening inside this structure is required for proper control of the atmosphere inside this structure for occupancy comfort, occupancy health and structure preservation. Some of what will be explained will be helpful to the architectural design team and others sections will cover items that will guide the mechanical HVAC design team.

Many owners, designers and facility operators are under the misconception that a properly designed HVAC system can clean the air when chloramine odors become an issue. HVAC Systems are not air scrubbers. If you design the HVAC system to be an air scrubber to take care of the chloramine issue no one will ever be able to afford to operate this facility to say nothing about paying for the initial building cost.

One thing must be understood by all. When you are investing in an indoor swimming facility you cannot and must not compromise on the design of the system that provides the temperature and humidity control, the ventilation system and the water treatment system. These mechanical system must all work together to provide the best indoor air and water quality in the facility. If one of these systems is compromised in any way the other system will be affected and cannot correct the issue caused by the malfunctioning system.

The owner and design team must put operating cost of the mechanical systems as a secondary item and not as the primary reason for making decisions. If the facility creates structural degrading issues and or unhealthy air quality no saving in operating cost will justify the loss of membership income or replacement building costs.

It is the belief of this author that if you have a complete understanding of what is happening inside this structure you will be able to determine what type of system will best fit your facility. Although most mechanical systems can be applied in any geographic location some systems or combination of technology may work better than others.

The first thing to remember is the one item that is most important in this type of facility is WATER. Without water you cannot swim. Without swimming you do not need a pool. Without a pool you do not need the rest of this chapter.

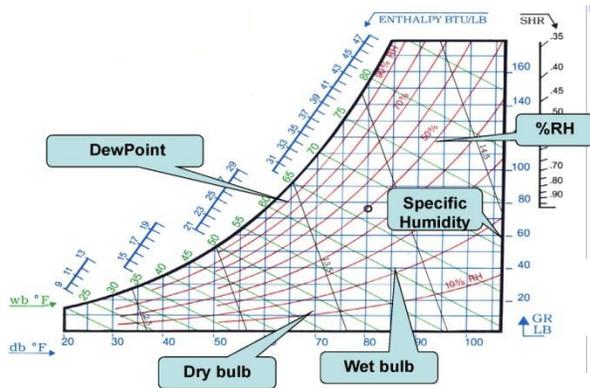
The second thing to remember is that WATER is your biggest enemy. Water can destroy your structure in a very short period of time. The purpose of this chapter is to learn how to control this enemy in the most efficient method.

Design Issues

Condensation is the major issues in this environment. This is when water vapor changes from a gaseous state to a liquid state. We must prevent visible condensation and concealed condensation from happening. In order to understand how this happens we

need a basic understanding of psychometrics. We will need to understand five common terms when dealing with a psychometric chart.

1. Dry bulb temperature -- this is the sensible temperature of the air. What can be read from a common thermometer.
2. Relative humidity – expresses the moisture content of air as a percentage of saturation.
3. Wet-bulb temperature – the wet bulb temperature is taken by surrounding the sensor with a wet wick and measuring the temperature as the water evaporates from the wick. As the water evaporates from the wick, it draws heat required for evaporation from the thermometer bulb, cooling the thermometer in proportion to the amount of evaporation.
4. Dew point temperature – this is the temperature which moisture will condense and form visible water. The colder the air the less moisture it can hold. The warmer the air the more moisture it can hold.
5. Specific Humidity – to define the specific amount of moisture in the air, we use its weight compared to the weight of air. The weight is measured in grains, and there are 7,000 grains in a pound of air.



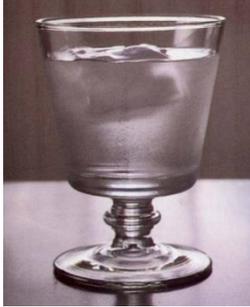
- Dew point = horizontal lines
- Dry Bulb = vertical lines
- Wet Bulb = sloped lines
- Specific humidity = scale on vertical right
- % Relative humidity = curved lines

We need to have a complete understanding of dew point. As defined this is the temperature at which moisture will condense from the air. To best understand this three pictures of a glass filled with water are shown.

The first picture the surface of the glass is clear. This means the glass temperature is above the dew point temperature.



The next picture you can start to see the water forming on the surface of the glass. For this purpose we will say the glass surface temperature is equal to the dew point.



The last picture the glass surface is below the dew point and condensate has formed on the surface.



Why is this important? The integrity of the building depends on this understanding. This will also cause fog as shown in the next picture inside the facility.



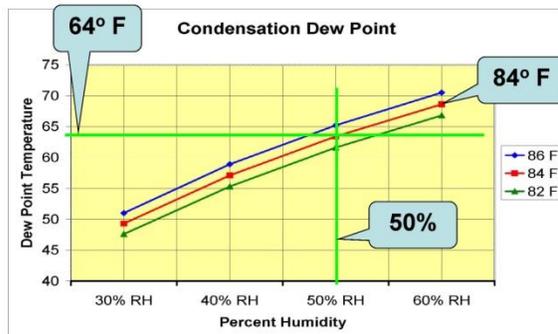
If allowed to form on surfaces the building will deteriorate as shown in the next couple of pictures.



In cold climates this can also form as ice on the outside of the exterior wall as shown in the next picture.



In a typical indoor pool inside temperature will range from 78°F to 86°F dry bulb. Below is a chart with three plotted curves with values derived from the psychrometric chart. This graph allows you to plot the dew point temperature at inside temperatures of 82°Fdb, 84°Fdb and 86°Fdb and relative humidity values from 30% to 60%. An example is shown at 84°Fdb and 50% RH showing that the dew point is 64°F.



What this example means is all surfaces inside the pool room must be kept above the dew point temperature of 64°F to prevent visible condensation. It is a common design practice to add 5°F to this temperature as a safety factor.

It is the architect's responsibility to design wall and ceiling components with this surface temperature in mind to assist the HVAC design engineer in preventing moisture from forming inside the structure.

The formula;

$$T_s = T_i - (K \times (1/R)) \times (T_i - T_o)$$

Will allow you to calculate the surface temperature of a structural component.

When;

T_s = Surface Temperature

T_i = Indoor Space Temperature

T_o = Outdoor Temperature

R = Total R-value of the structural component

K = Indoor air film coefficient

= 0.68 for Vertical surface

= 0.95 for horizontal roof or skylight

= 0.76 for 45° roof or skylight

If we apply this to a window that we have selected you will find that windows are rated with U factors. You must also be careful because the listed U value of windows is an average on the window assembly. Some components may have a greater value than the listed U value. In this example we will use a U value of 0.4. We will use the U value to calculate the R value in the formula.

$$R = 1/U = 1/0.4 = 2.5$$

In this example we will have an indoor temperature of 84°Fdb and an outdoor temperature of 0°Fdb.

This will give us a 61.2°F surface temperature on this window.

We have already established that the dew point inside the pool room at 84°F and 50%RH is 64°F. So this means condensation will occur on the glass surface if we do not warm the glass surface above the dew point.

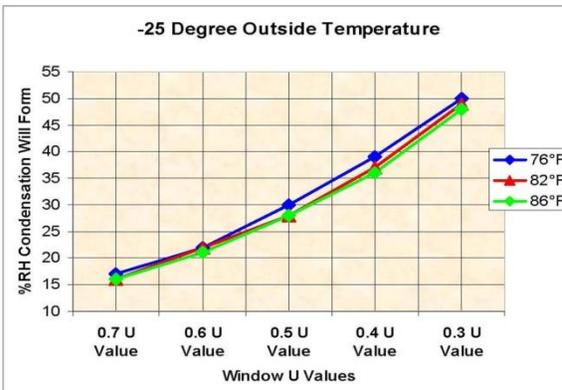
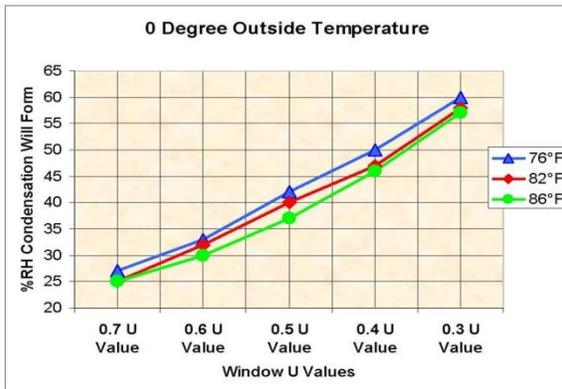
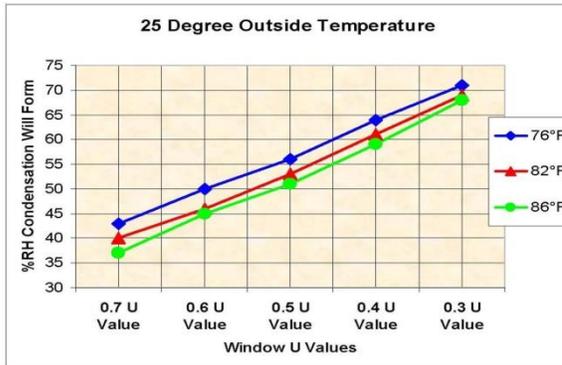
This picture shows what will happen if the surface temperature is not increased.



For those of you who are more comfortable with percent humidity the next three graphs will let you plot the U value at three different indoor temperature on each graph and read

the per cent humidity on the left side. Each graph is at a different outside temperature. The graphs are for +25°F, 0°F and -25°F outside temperatures.

When plotting a 0.4 U value window at 82°F on each of these graphs you will find RH values of 60%, 46% and 36%. This means whenever the inside RH gets above these values at the respective outside condition, condensation will form on the window surface unless the window surface is warmed above the inside dew point.



You will soon realize that in an indoor pool environment you will commonly see dew points between 62°F and 66°F. So this means in order to prevent condensation you will

need to design a proper duct distribution system to circulate warmer than 66°F air across these surfaces.

This is fairly easy to accomplish on window surfaces. The problem now becomes how do you do this through the complete wall or ceiling cavity?

It will be impossible to keep the entire wall cavity above dew point. To prevent this we need to understand where to place a vapor barrier.

Vapor Barriers

A vapor barrier is a material or film that prevents moisture from penetrating through the material or film. Moisture will travel from a high moisture content to a low moisture content air. This is where we apply our knowledge of specific humidity. As previously defined this is in terms of grains/lb of air.

If we pick an indoor design condition of 84°Fdb and 55%RH we will find the air has a grain/lb content of 96.6 at 0 feet of elevation. We now know that when the outside temperature is below the moisture content of 96.6 grains the moisture inside the structure will be trying to get outside. If we are in a cold climate and below freezing outside and a proper vapor barrier is not installed moisture will be present inside the wall cavity and this will start to freeze at some point in the wall cavity. Once the freezing occurs inside the wall cavity the remaining insulation value is lost and the problem will get worse.

The question of where the vapor barrier should go on the inside surface or outside surface of the wall can change depending on the geographic area the project is located. In most cases when designing an indoor pool the vapor barrier will need to be on the inside surface. The picture shown shows white chalking on the outside of the brick building. This building is located in a warm dry climate. The white chalking is the moisture inside the pool room penetrating the brick since no vapor barrier was installed inside.



Do not get fooled that the moisture will only travel to the outside of the building. The interior adjacent rooms are typically maintained at 75°F and say 40% RH. This condition has a grain / lb content of 51.8 so the moist air in the pool room will travel to the other interior rooms. All pool room partitions need a vapor barrier. All windows and doors need to have a very tight seal to prevent moisture migration.

The duct distribution system must be isolated from other zones in the building. If registers and grilles from another zone is connected to the pool room moisture will be carried to these other area and potentially cause problems.

Locker rooms, staff offices, storage rooms should not be part of the pool room mechanical HVAC system.

Moisture Load

Now that we have an understanding of moisture, where is the moisture coming from. In an indoor pool environment we have three areas that create moisture.

1. Evaporation from people
2. Moisture content from the ventilation air
3. Evaporation from the water surface

People breathe out moisture and release water vapor when perspiring. You can refer to any commercial heat loss heat gain program and find moisture values lists in terms of latent btu for people performing different types of tasks. The more active a person is the more moisture or latent btu's they release.

The ASHRAE, (American Society Heating Refrigeration and Air Conditioning Engineers), Fundamentals Handbook is one such source of this information. One footnote in this publication is worth noting. In the case of an indoor pool the space temperature is usually maintained above 80°F dry bulb. When this condition occurs the moisture values shown in latent btu are increased by 20% and the sensible values are reduced by 20%. In the case of spectators the value listed is 155 btu per person. Adding 20% to this value we need to use 186 btu per person when performing our calculations.

If we had a spectator area that contained 400 spectators we would have 400×186 or 74,400 btu per hour of moisture being introduced into the space. Each pound of moisture contains 1,050 btu so in this example we would have 70.86 pounds of moisture. A gallon of water weighs 8.33 pounds so we can convert this example to 8.5 gallons of moisture being added into this space every hour the spectators are present.

Ventilation Air

Ventilation air is generally required by local codes. Many local municipalities and states have adopted either the ASHRAE 62.1 ventilation standard or the International Building Code requirements. We will only be discussing the ASHRAE 62.1 standard in this chapter but the moisture calculation method can be applied to both once you have determined the amount of ventilation air for the project.

Table 6.1 in this standard recommends 0.48 cfm per square foot of water surface area plus the area of the wet deck plus another factor of your choosing applied to the remaining square footage of floor area. The wet deck is not defined and is up to the design engineer of record for the project to determine how many square feet of wet deck is present. Typically this is an area from 3 to 6 foot area around edge of the pool. If a bleacher area is also present you need to add an additional 7.5 cfm per spectator plus 0.06 cfm per square foot of bleacher area.

Example:

50 foot x 75 foot pool = 3,750 sq ft

300 spectators

400 square feet of bleacher area

Room square footage=75 ft x 100 ft =7,500 sq ft

Ventilation CFM =

Pool Area plus wet deck, assume 6 ft wet deck around pool

So;

$62 \times 87 \times 0.48 \text{ cfm} = 2,589 \text{ cfm}$

Spectators = $300 \times 7.5 \text{ cfm} = 2,250 \text{ cfm}$

Bleacher area = $400 \times 0.06 = 24 \text{ cfm}$

Remaining floor area

$7,500 - 5,394 - 400 = 1,706 \times 0.06 = 102 \text{ cfm}$

Total ventilation air required;

$2,589 + 2,250 + 24 + 102 = \mathbf{4,965 \text{ cfm}}$

This is the minimum amount of ventilation air required. It is up to the design engineer to use this amount or add addition cfm as a safety factor to his calculation.

This is also what needs to be introduced into what they call the breathing zone. This is the area in the building located from the floor level to maximum distance of 6 feet from the floor surface.

Now that we have the amount of ventilation air you need to introduce into the pool room we need to calculate the amount of moisture this air will introduce into the space.

The ASHRAE 62.1 Standard also recommends when controlling humidity in a building you should use the Dehumidification Weather data for this calculation. ASHRAE publishes weather data in three formats, cooling, dehumidification and evaporative. Cooling weather data is used when calculating the sensible cooling load or load to control the space temperature, evaporative weather data is used to calculate evaporation for sizing cooling towers and dehumidification is used when calculating moisture loads in ventilation air. Each one of these listings has three values and for most pool applications the 1% values is recommended. What this means is the values listed are for 99% of the time during the year. You can expect these values to be exceeded 1% of the year.

The following formula will be used in calculating the moisture content of the ventilation air.

$\text{Lb/hr} = \text{cfm} \times (\text{grains of outdoor air} - \text{grains of indoor air}) / 1555$

Assumptions:

Project location: Atlanta GA

Indoor design: 82°Fdb – 55%RH – 93.9 grns/lb

1% ASHRAE Dehumidification Weather Data:

80.1°Fdb – 73.3°Dew Point – 129.1 grns/lb

Ventilation air = 5,000 cfm

$$\begin{aligned} \text{Lb/hr} &= 5,000 \times (129.1 - 93.9) / 1555 \\ &= 113.18 \text{ lbs/hr of moisture} \\ &= 113.18 / 8.33 \text{ lbs/gallon} = 13.6 \text{ gallons/hr} \end{aligned}$$

On a design day we will be introducing 13.6 gallons per hour of moisture into the pool room.

Evaporation

The third item introducing moisture into the pool room is the pool itself. This is caused by the vapor pressure differential between the surface of the water and the air just above the water surface.

Imagine as shown in the pictures below a cool morning at the pond or lake in late summer or a heated outdoor pool on a cool morning.



| Type of Facility | Air Temperature | Water Temperature |
|------------------|-----------------|-------------------|
| Recreational | 75°F to 85°F | 75°F to 85°F |
| Therapeutic | 80°F to 85°F | 85°F to 95°F |
| Competition | 78°F to 85°F | 76°F to 82°F |
| Diving | 80°F to 85°F | 80°F to 90°F |
| Elderly Swimmers | 84°F to 90°F | 85°F to 90°F |
| Hotel | 82°F to 85°F | 92°F to 86°F |
| Whirlpool / Spa | 80°F to 85°F | 97°F to 104°F |

Imagine this fog as the water evaporating off the surface of your indoor pool. This is happening all the time just the rate of evaporation depends on the temperature of the water, the temperature of the air above the water surface and the humidity level of the air above the water surface.

This is when you must discuss with design team which includes the owner and operator of the facility what temperatures they want to maintain. The following table can be used as a guide but you must never assume what the owner wants to maintain. The incorrect assumptions made at this point will affect the size of the load and the equipment you select for the project.

One of the most common formulas used to calculate the evaporation for a water surface is listed in the ASHRAE Application Handbook. The basic formula listed is;

$$W_p = 0.1A(p_w - p_a)F_a$$

Where:

W_p = evaporation of water in lb/hr

A = area of water surface

P_w = saturation pressure at water surface
temperature in Hg

P_a = saturation pressure at room dew point
temperature in Hg

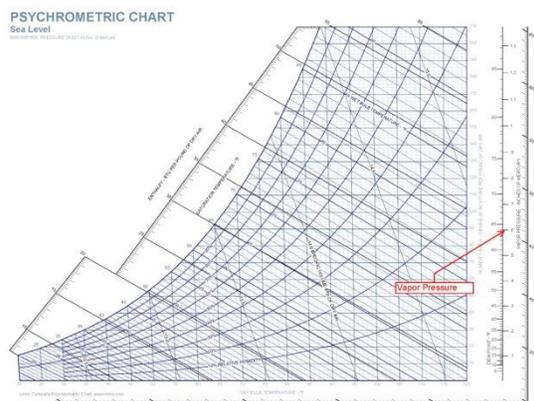
F_a = Activity factor

The ASHRAE Application Handbook also publishes activity factors as listed in the table below. This adjustment to the formula realizes that less used pools create a different vapor pressure differential. The greater the activity the greater the evaporation from the water surface.

| Type of Pool | Activity Factor |
|-------------------------|-----------------|
| Baseline (Un-occupied) | 0.5 |
| Residential | 0.5 |
| Condominium | 0.65 |
| Therapy | 0.65 |
| Hotel | 0.8 |
| Public, School, YMCA | 1 |
| Whirlpools, Spas | 1.0 to 1.5 |
| Wavepools, water slides | 1.5 or more |

Table 2 - From ASHRAE 2007 Applications Handbook

The values of P_w and P_a are found on the psychrometric chart in the location shown below.



The P_a is based on the dew point temperature of the air above the water surface. The P_w is the water temperature.

One caution with this formula is that it assumes air is moving across the surface of the water at 25 feet per minute. If this formula is used caution must be taken of supply registers and grilles location as not to increase the evaporation rate. Later in this chapter we will discuss the affects of air movement across the surface of the water.

Example:

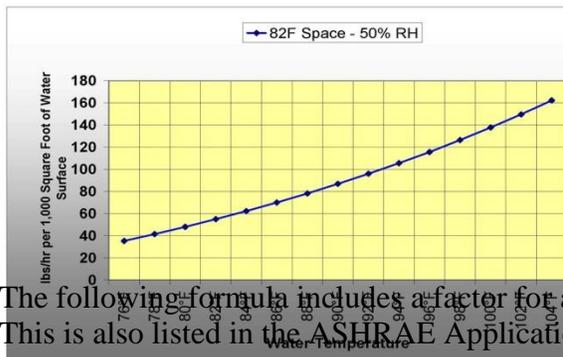
Pool Surface = 3,750 sq ft
 Space Condition = 82°Fdb – 55% RH
 64.3°F dew point
 Water = 80°F
 Activity Factor = 1.0 Public Pool

$$W_p = 0.1 \times 3,750 (1.176 - .6065) \times 1$$

$$= 213.6 \text{ lb/hr evaporation}$$

You will soon realize that if the air temperature is constant the warmer the water the more the evaporation rate increases.

The next graph shown this increase curve when the space temperature remains constant at 82°F and 50% RH

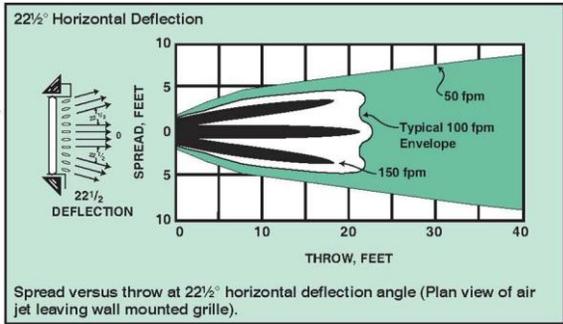


The following formula includes a factor for air movement over the surface of the water. This is also listed in the ASHRAE Applications Handbook.

$$W_p = A/Y \times (p_w - p_a) \times (95 + 0.425V)F_a$$

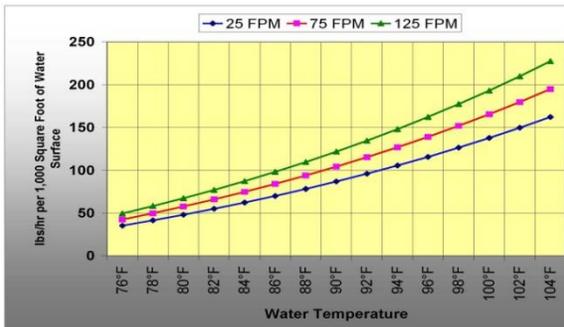
Y = latent heat required to change water to vapor at surface water temperature. This value is listed for the industry in the Air Conditioning Heating and Refrigeration Institute, (AHRI) Indoor Pool Standard at 1,061 btu/lb

For illustration purposes the next picture is from a Titus register design sheet which shows air velocities as it leave the face of the grille.



As you can see it ranges from 150 feet per minute to 50 fpm. When you apply air velocities of 75 fpm to this formula you will experience a 20% increase in water evaporation. At a rate of 125 fpm the increase will be approximately 29%.

This graph plots the evaporate rates at the three mentioned velocities for space conditions of 82°Fdb and 50% relative humidity.



So caution must be used in your air distribution design and location. If you are designing to move air across the surface of the water to remove chloramines you must adjust your moisture loads accordingly or you will not be able to maintain the conditions in the space.

Sensible Heating and Cooling Loads

Indoor pools are unique in design because they have such a large latent load as compared to most other building types. This chapter is only detailing the latent / moisture effect of this building type however sensible loads are the other half of the equation in order to select the proper size and type of equipment.

A standard sensible load should be performed using the most current ASHRAE or ACCA procedures. This will include three basic load areas, envelope loads, internal loads and system loads. Building envelope loads may include;

roof/ceiling loads, interior and or exterior wall loads, floor loads, windows, doors, skylights and infiltration loads. Internal loads may include lighting and any other heat causing equipment in the space. System loads will include heat loss or gain from the duct

system and blower motor heat. Blower motor heat is often allowed for in the equipment specifications and a separate calculation is not required.

Since the pool water will be heated by another source any negative or positive effect of the water to sensible load is ignored.

The sensible load should be calculated at its peak sensible dry bulb load for the geographic area the project is located. The room dry bulb design conditions for an indoor pool are much different than the rest of the building you must remember to adjust these factors before performing your calculations from the rest of the building.

Humidity Control Methods

Humidity control is the most important factor when selecting equipment for the indoor pool environment. Sensible heating and cooling is also the most important factor when selecting equipment. The type of equipment must be able to maintain both peak sensible and peak latent loads at each peak load which will not be coincidental. The space must be maintained between 50 and 60% relative humidity for proper building protection and occupant comfort and typically in the 80°Fdb to 86°Fdb temperature range.

Certain geographic areas the outside air maybe used to accomplish this but monthly detailed calculation must be done to help evaluate the effects of the outside air. Just because the project is in a dry climate outside air alone may not be the best solution.

When the climate is dry you may over dry the space. Relative humidity levels below 45% RH will cause the water to evaporate at a much faster rate. This will cause the need for more water makeup which in turn will increase the water treatment cost. The savings in initial equipment cost may be far exceeded with the higher water treatment cost. Space humidity levels lower than 45% will also cause swimmer discomfort known as vaporative cooling effect. This happens when a swimmer gets out of the water and the moisture on the skin evaporates at a fast rate causing a chilling effect. If the project is in a northern area the cost to heat this air before it enters that space will be great and will prove to be expensive to operate.

One of the most common methods of maintaining space conditions is the use of a refrigeration based dehumidifier. These are similar to a standard HVAC system but should not be confused with the standard system. The standard refrigeration based systems are only design to handle space sensible temperatures. They will handle some latent loads but since this type of equipment is only activated by a sensible temperature controller the latent load would have to be coincidental. I hope by now you have begun to realize that this is not the case in this type of environment.

The basic refrigeration based dehumidification system will maintain both sensible and latent loads if the proper size is selected. A refrigeration based dehumidifier will also include a condenser reheat coil which is a means of capturing energy within the unit. These systems bring the air to a temperature below the air's dew point, therefore causing

the moisture to condense on the coil. Once it has condensed on the coil it is drained off to a drain so it will not re-evaporate back into the system air. The heat from the refrigeration process is reused to heat the air back up to space conditions therefore not requiring new energy.

You will find many variations of this type of equipment available with various means of additional energy recovery. Caution must be taken and a detailed evaluation must be done based on geographical location and utility costs to determine the best system for your project. You must also keep in mind that whatever component is used it must be protected from this corrosive environment.

The space must also be kept in a negative pressure at all times. It is common practice to keep a building in a positive pressure to reduce infiltration loads and prevent moisture from migrating inside in hot and humid climates. In this environment the negative pressure will prevent the moisture from migrating to the rest of the building preventing mold and fungi growth. It will also prevent chloramine odors from migrating to the rest of the building. For this reason every project must have an exhaust fan larger than the amount of ventilation air being introduced to the space.

Air Distribution

The air distribution system is as important as the properly sized dehumidifier. If you cannot get the dry and heated or cooled air to the space the system will not work. We previously discussed the condensation temperature of surfaces and soon discovered that most surfaces in this type of environment will create moisture during some timeframe of the year. We need the air distribution system to cover all of these surfaces. We discussed earlier that the typical dew point is around 65°F. If we are maintain 82°F space temperature all we need to do is re-circulate the space air across these surfaces and no condensation will occur.

The basic function you need to remember is that hot air rises and cold air falls. If you design a distribution system that supplies the air from above, the registers must be sized to create enough exit velocity to reach the floor. This may sound simple enough to do but you also must keep the velocity low enough as not to cause uncomfortable drafts for the swimmers and spectators. You also do not want to have a high velocity of this dry air going across the pool water surface which will cause more evaporation unless you have compensated for the added latent load.

You should discuss this with the architect to make sure he or she is aware of your goal to cover all surfaces to prevent the formation of visible condensation. If the architect specifies windows with large deep sills or sky lights with deep cavities these should be changed because you will never be able to keep visible condensation from these areas. During the cooling season the cold air will fall and will have a much easier time to reach the floor level but may not get the proper mix at the ceiling / roof level. Remember the dew point inside the space is around 62°F the air temperature in the cooling mode is typically in this temperature area or lower. The discharge air from the registers much

mix with the space air which is in the 80's above this dew point before it hits the window surfaces or visible condensation may occur.

The return air registers should be located both high to prevent the natural process of moisture from migrating to the warmest and highest point. This will cause building deterioration if not properly handled. A low return register should also be included to help prevent air stratification at the deck zone area. All registers and grilles both supply and return must be ducted back to the air handler equipment. The use of ceiling return plenums should never be used in this type of environment. The mentioned heating and cooling air movement issues are the reason that the air distribution fan should remain on at all times. This will prevent air stratification and the proper mix in the entire space.

Design Summary

- Discuss with design team and owner operators to determine what indoor space temperature and water temperature is desired.
- Obtain minimum R and U values from architect to determine minimum surface temperature for condensation.
- Ensure that the proper vapor barrier is included and installed properly with no breaks.
- Determine the correct amount of ventilation air required for proper indoor air quality and to meet local code requirements.
- Use the correct dehumidification weather data to determine moisture load from the ventilation air
- Total all moisture / latent loads
 - People latent load
 - Ventilation air latent load
 - Water surface latent load
- Infiltration latent load can be ignored if vapor barrier is properly installed.
- Total all sensible loads
 - Building envelope
 - People sensible
 - Ventilation Air Sensible
 - Other Sensible, lighting, etc..
- Select equipment to meet both sensible and latent peak loads.
- Design proper air distribution system to prevent air stratification and visible condensation.
- Ensure a proper equipment and building commissioning occurs.
- Include a quarterly maintenance contract to maintain equipment as part of your operating expense

What is Design-Build?

Design-build is a [construction](#) project delivery system where, in contrast to "[design-bid-build](#)" (or "design-tender"), the design and construction aspects are contracted for with a single entity known as the design-builder or design-build contractor. The design-builder is usually the [general contractor](#), but in many cases it is also the design professional ([architect](#) or [engineer](#)). This system is used to minimize the project risk for an owner and to reduce the delivery schedule by overlapping the design phase and construction phase of a project. Where the design-builder is the contractor, the design professionals are typically retained directly by the contractor. This is one of the oldest forms of construction since developing from the "Master Builder" approach in ancient times.

Design-build focuses on combining the design, permit, and construction schedules in order to streamline the traditional design-bid-build environment. Most people believe the design-build methodology does not shorten the time it takes to complete the individual tasks of creating construction documents (working drawings and specifications), acquiring building and other permits, or actually constructing the building. However, many tasks can be and are often done simultaneously to shorten the time period of traditional Design-Bid-Build. Instead, a design-build firm will strive to bring together design and construction professionals in a collaborative environment to complete these tasks at the same time.

Typically the hallmark of a Design/Build project is that one organization is responsible for both design and construction of the project. If this organization is a contractor, the process is known as "*Contractor-led Design-Build*". If the organization is a design firm, the process is known as "*Design-led Design-Build*". In either case, the organization employed by the owner rarely handles both aspects of design and construction in-house. In fact, the organization often subcontracts with on-site personnel (if design-led) as well as architects and engineers (if contractor-led).

Potential problems of Design-Build

Potential problems of the design-build process include:

- Premature cost estimating,
- a short-cut design process,
- decreased accountability by the service provider, and
- Correction of work.

[Cost estimating](#) for a design-build project is sometimes difficult because design documents are often preliminary and may change over the course of the project. As a result, design-build contracts are often written to allow for unexpected situations, and the price of the completed project may vary greatly from the original estimate.

The uncertainty of the early estimate requires the owner to rely a great deal on the integrity, acumen, and competence of the design-builder. As the certainty of estimate

decreases, the reputation of the design-build firm becomes more important. Estimates should be accurate, and reasonably verifiable in order to minimize risk.

The **short-cut design process** may restrict regulatory review efforts to a potentially cursory overview. Projects may be designed as they are built, thus providing those with the responsibility of oversight little to no time at all to review completed plans and [specifications](#). Projects completed before they may be reviewed can be forced into costly [change orders](#) to bring the project into compliance with regulatory requirements. It may here be noted that the "design-bid-build" method frequently results in a trip "back to the drawing board" based on the tendency of many architects lack of familiarity with actual current costs related to the realization of a built project.

The **short-cut design process** may also create an ill-defined scope of the work. Since the purpose of the design documents is to describe the project's desired outcome, an abbreviated design process can result in leaving out some details of the quality, workmanship, and/or desired aesthetic attributes of the project, thus making it impossible to hold the builder accountable for the desired level of quality.

Decreased accountability- The design-builder is given a great deal of control over the entire process of both how the project is configured, and how it is completed. With no third-party observer such as an independent architect to administer the process, the unscrupulous design-builder may sacrifice the quality of materials and systems such as HVAC, lighting, plumbing, and even structural elements in order to pad his own profits at the expense of the owner.

Correction of work- Since the owner may not have the expertise to evaluate the quality of portions of the work, he/she must trust the design-builder to properly design a facility that will meet the needs of the Owner, and to execute the design properly, according to codes, and consistent with industry-standard specifications. Unless the builder agrees with the owner's assessment of the situation, the owner may have no means to insist on **correction of work** done improperly but to go to some form of formal dispute resolution such as litigation, or arbitration.

In exchange for the ability to save money, the owner assumes the risk and responsibility to review contract documents, such as plans, specifications, and agreements for services, and to hold the design-builder accountable to design and deliver a quality product. By contrast, under the typical [design-bid-build](#) or [negotiated project delivery system](#) the architect is in a better position to reject work not performed according to the standards he set forth in the plans and specifications.

Several organizations provide standardized form contracts for design-builders to use, but it is not unusual for the design-builder to provide its own contractual documents. Architectural societies, such as the American Institute of Architects, warn that when non-standard documents are used, great caution should be exercised because they may be untested, or may be written to favor one party or the other; therefore, qualified legal council should be employed to review all contracts before signing.

Benefits of Design-Build

It is important to note that the design-build method, while not focused on saving the owner construction costs, nonetheless often saves the owner money on the overall project. The combined effects of carrying a construction loan (which typically carries a higher interest rate than permanent financing) and an earlier useful on-line date usually yields considerable overall profitability to the project and may make seemingly unfeasible projects into genuine opportunities.

The compression is an important aspect of the implementation of this system. Other attributes include:

- **enhanced communication** between the service provider and the client,
- **increased accountability** by the service provider,
- **single source** project delivery, and
- a **value based** project feedback system

Enhanced communication

Because the design parameters of a project are being developed along with the budgetary goals construction methodologies and budget conditions being weighed simultaneously, a project is more likely to be realized than with pure design approach. The owner has greater access to the "team" working on project development as the project is being developed. This efficiency is not a negative "short cut" as a rule, but rather the keystone to the success of the Design & Build model.

Accountability

Rather than compartmentalize the level of responsibility of the classic design-bid-build, design-build provides an integrated solution for the owner or client. This moves projects away from the "finger-pointing" that is often commonplace in contemporary construction projects, and allows the owner to look to one entity with any questions or concerns.

Single Source

Instead of having several contractors and consultants, an owner has just one entity to deal with. Design revisions, project feedback, budgeting, permitting, construction issues, change orders, and billing can all be routed through the design-build firm. This single point of contact allows a certain degree of flexibility for the owner. Most design-builders will leverage that flexibility for the owner's benefit by continually refining the construction program to maximize the owner's value at the completion of the project.

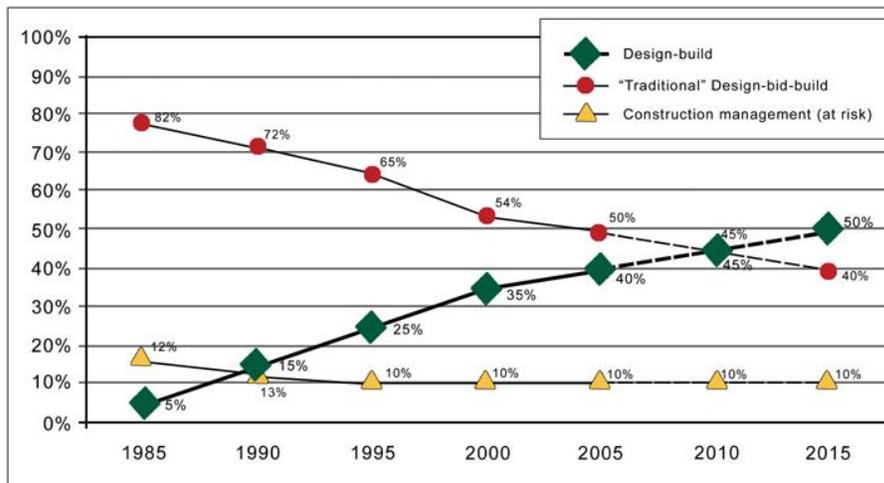
Value-based project feedback

Typically, in order for a contractor to bid on a project, very specific details relating to the methods and materials must be given to avoid any ambiguity and to make an "apples to

apples" comparison of bids. In a design-build context, the owner, the owner's other consultants, and the design-builder can work together to determine what methods and materials will maximize the owner's value. In instances where marginally more expensive materials, designs, or construction methods might yield a higher return on investment for the owner than those of lower cost, the owner is free to adjust the project's program without having to re-bid the entire project.

Almost 70% of traditional contracts end up over budget, compared to D&B which is only around 25-30% over budget. The overage of a D&B project is generally owner driven whereas the overage in the more traditional method tends to be a result of the budget disconnect to which many architects and other design professionals are prone.

Non-Residential Design and Construction in the United States



In conclusion the design-build methodology will:

| | |
|--------------------|--|
| Establish Cost | Secure a project cost before the start of detailed design. |
| Reduce Cost | Decrease the overall project cost as compared to other procurement methods (design-bid-build, construction management, etc.). |
| Establish Schedule | Secure a project schedule before the start of detailed design. |
| Shorten Duration | Decrease the overall project completion time as compared to other procurement methods (design-bid-build, construction management, etc.). |
| Reduce Claims | Decrease litigation due to separate design and construction entities. |

| | |
|-----------------------------------|--|
| Large Project Size/ Complexity | The project's sheer magnitude is too complex to be managed through multiple contracts. |
| Constructability/ Innovation | Introduce construction knowledge into design early in the process. |

Successful Design-Build starts with Project Management:

PROJECT MANAGEMENT

PROJECT MANAGEMENT CONSTRUCTION MANAGEMENT AND ENGINEERING

A Project Manager in conjunction with a Design/Bid/Build or Design/Build “Team” will plan and coordinate construction projects. The Team will enable the county to bring these important projects to fruition by maintaining the overall control of a project, at all key points. The process of control is key and the utmost to the successful completion.

The ability to control the:

- Project Programming
- Project Design
- The ensuing budget
- Construction Team
- Project Schedule

Allows for a single point of control and stream lined decision making with Owners approvals. This process will put the major decision making process in the hands of the professionals who are committing to and responsible for delivering the product and leave the Owner free to deal with the overall project concept, funding and financing as appropriate. The Team will manage, coordinate, and supervise the construction process from the initial project inception to programming and conceptual development stages through final construction on a timely and economical basis. Developing the designs for building and aquatic centers projects, they oversee the organization, scheduling, and implementation of the project to execute those designs. They are responsible for coordinating and managing people, materials, and equipment; budgets (construction and operating), schedules, and contracts; and safety of employees and the general public. The Team will evaluate and determine appropriate construction methods and the most cost effective plan and schedule. They divide all required construction site activities into logical steps, budgeting the time required to meet established deadlines. This may require sophisticated estimating and scheduling techniques and use of computers with specialized software. They oversee the selection of trade contractors to complete specific pieces of the project—which could include everything from structural metalworking and plumbing to painting and carpet installation. The Team determines the labor requirements and, in some cases, supervises or monitors the hiring and dismissal of workers. They oversee the

performance of all trade contractors and are responsible for ensuring that all work is completed on schedule.

The Team directs and monitors the progress of construction activities, sometimes through construction supervisors or other construction managers. They oversee the delivery and use of materials, tools, and equipment; and the quality of construction, worker productivity, and safety. They are responsible for obtaining all necessary permits and licenses and, depending upon the contractual arrangements, direct or monitor compliance with building and safety codes and other regulations. They may have several subordinates, such as assistant managers or superintendents, field engineers, or crew supervisors, reporting to them depending on the magnitude of the project. They regularly review engineering and architectural drawings and specifications to monitor progress and ensure compliance with plans and schedules. They track and control construction costs against the project budget to avoid cost overruns. Based upon direct observation and reports by subordinate supervisors, managers may prepare daily reports of progress and requirements for labor, material, machinery, and equipment at the construction site. They meet regularly with owners, other constructors, trade contractors, vendors, architects, engineers, and others to monitor and coordinate all phases of the construction project.

Field Supervisor

The Field Supervisor is responsible for supervision of the field staff and he reports directly to the Project Manager. All project communications are directed through him, he serves as principal liaison with the construction contractors. He establishes and sustains direct communications with the outside agencies involved in the project, to assure that adequate coordination of the work is maintained. In addition to any special services, which the client may require, he is responsible for performing the following duties:

- Supervision of inspection personnel.
- Ensure compliance with all applicable Federal, State, Local rules and regulations and municipal contract provisions.
- Monitor progress of all trades and ensure adequate coordination of the work.
- Obtaining clarifications and interpretations of contract documents.
- Recommend acceptance or rejection of the work.
- Review contractor payment requisitions for approval.
- Ensure that the work is performed in a safe and workmanlike manner.
- Evaluate all change order proposals and provide recommendations to the County.
- Maintain sufficient records of all disputed work to resolve potential claims.
- Attend regular job meetings and issue minutes for same.
- Maintain all standard field records including Daily Diary, Correspondence Log, and Shop Drawing/Sample Log, Material Delivery Tickets, Test Schedules and Results, Record Drawings,
- Perform Substantial Completion Inspection and provide punch list and updates through final Inspection and acceptance.
- Ensure compliance with Contract Closeout Procedures, including warranties, guarantees, maintenance and operation manuals and completion of Final Punch list.

He will help to:

- Analyze construction plans and monitor construction to ensure possible problems are identified and any necessary changes are recommended and implemented.
- Exercise judgment and initiative in supervising and coordinating the activities of Inspectors and Construction Aides to ensure compliance with specifications, plans or procedures.
- Review field record management to facilitate proper current and final estimate payments to the contractor.
- Maintain professional human relations with contractor, public, etc. to facilitate cooperation and coordination of the project.

Inspectors

Construction and building inspectors examine the construction, alteration, or repair of buildings and other structures to ensure compliance with building codes and ordinances, zoning regulations, and contract specifications. Building codes and standards are the primary means by which building construction is regulated in the United States for the health and safety of the general public. Inspectors make an initial inspection during the first phase of construction, and follow-up inspections throughout the construction project to monitor compliance with regulations. However, no inspection is ever exactly the same. In areas where certain types of severe weather or natural disasters—such as earthquakes or hurricanes—are more common, inspectors monitor compliance with additional safety regulations designed to protect structures and occupants during these events.

There are many types of inspectors.

Building inspectors inspect the structural quality and general safety of buildings. Some specialize in such areas as structural steel or reinforced concrete structures. Before construction begins, plan examiners determine whether the plans for the building or other structure comply with building code regulations and if they are suited to the engineering and environmental demands of the building site. Inspectors visit the worksite before the foundation is poured to inspect the soil condition and positioning and depth of the footings. Later, they return to the site to inspect the foundation after it has been completed. The size and type of structure, as well as the rate of completion, determine the number of other site visits they must make. Upon completion of the project, they make a final, comprehensive inspection. In addition to structural characteristics, a primary concern of building inspectors is fire safety. They inspect structures' fire sprinklers, alarms, and smoke control systems, as well as fire exits. Inspectors assess the type of construction, building contents, adequacy of fire protection equipment, and risks posed by adjoining buildings.

Electrical inspectors examine the installation of electrical systems and equipment to ensure that they function properly and comply with electrical codes and standards. They visit worksites to inspect new and existing sound and security systems, wiring, lighting, motors, and generating equipment. They also inspect the installation of the electrical

wiring for heating and air-conditioning systems, pool equipment, appliances, and other components.

Mechanical inspectors inspect the installation of the mechanical components of commercial kitchen appliances, heating and air-conditioning equipment, gasoline and butane tanks, gas and oil piping, and gas-fired and oil-fired appliances. Some specialize in boilers or ventilating equipment as well.

Plumbing inspectors examine plumbing systems, including private disposal systems, water supply and distribution systems, plumbing fixtures and traps, and drain, waste, and vent lines.

The owner of a building or structure under construction employs specification inspectors to ensure that work is done according to design specifications. They represent the owner's interests, not those of the general public. Insurance companies and financial institutions also may use the services of specification inspectors. Details concerning construction projects, building and occupancy permits, and other documentation generally are stored on computers so that they can easily be retrieved, kept accurate, and updated. For example, inspectors may use laptop computers to record their findings while inspecting a site. Most inspectors use computers to help them monitor the status of construction inspection activities and keep track of issued permits.

Many inspectors also use a paper checklist to detail their findings. Although inspections are primarily visual, inspectors may use tape measures, survey instruments, metering devices, and test equipment such as concrete strength measurers. They keep a log of their work, take photographs, file reports, and, if necessary, act on their findings. For example, construction inspectors notify the construction contractor, superintendent, or supervisor when they discover a code or ordinance violation or something that does not comply with the contract specifications or approved plans. If the problem is not corrected within a reasonable or specified period, government inspectors have authority to issue a "stop-work" order.

Many inspectors also investigate construction or alterations being done without proper permits. Inspectors who are employees of municipalities enforce laws pertaining to the proper design, construction, and use of buildings. They direct violators of permit laws to obtain permits and submit to inspection.

CPM Scheduling and the Critical Path

The goal of CPM scheduling is to accurately forecast the work activities to be done in a complicated construction project, indicating their duration and the time frame and sequence in which they will be done. This modeling of the planned construction process is developed into a "network" of activities, which reflects the plan for the job at a given point in time. The basic CPM scheduling process involves three key components - developing a list of tasks or activities, assigning durations to each activity, and then connecting the activities to each other in a logical order, using specific types of relationships. The software does all the hard work of calculating when each item of work

can be performed given its relationships with the other work activities in the project's schedule network.

The CPM schedule calculation process determines the series of activities that takes longer to finish than any other series of activities. This set of activities is the "critical path" of the schedule and it establishes the minimum duration for the project. Activities on the critical path must be completed on time or the overall project end date will move later. In a building construction schedule, the critical work activities generally include the major building components and the materials, which take the longest to get, like steel, stone, and windows. The critical work will also usually include the last or most difficult area of the building to finish; which is why you may find "balance HVAC" on your project's critical path.

The project team should always carefully review the activities on the critical path and their relationships to other activities. The CPM scheduling software also calculates the amount of time that you can postpone working on non-critical work activities without impacting the project end date. This time is known as "float" or "slack time." Float values change over time depending on the progress of other work on the project. Keep an eye on the "near critical" activities in the schedule, activities whose float is within one to three weeks of the critical path. Slippage in these activities will result in them becoming critical, sometimes taking even longer than the original critical path. It is not unusual for the critical path to shift several times throughout the life of a project.

Construction management

Construction Project Management is the overall planning, co-ordination and control of a project from inception to completion aimed at meeting a client's requirements in order to produce a functionally and financially viable project that will be completed on time within authorized cost and to the required quality standards. Project management is the process by which a project is brought to a successful conclusion. Construction project management (CPM) is project management that applies to the construction sector (3rd Forum "International Construction Project Management" 26th/27 June 2003 in Berlin).

The Construction Management Association of America (CMAA) (a primary US construction management certification and advocacy body) says the 120 most common responsibilities of a Construction Manager fall into the following 7 categories: Project Management Planning, Cost Management, Time Management, Quality Management, Contract Administration, Safety Management, and CM Professional Practice which includes specific activities like defining the responsibilities and management structure of the project management team, organizing and leading by implementing project controls, defining roles and responsibilities and developing communication protocols, and identifying elements of project design and construction likely to give rise to disputes and claims.

The functions of construction project management typically include the following^[1] :

1. Specifying project objectives and plans including delineation of scope, budgeting, scheduling, setting performance requirements, and selecting project participants.
2. Maximizing resource efficiency through procurement of labor, materials and equipment.
3. Implementing various operations through proper coordination and control of planning, design, estimating, contracting and construction in the entire process.
4. Developing effective communications and mechanisms for resolving conflicts.

Project control (PC): The PC function is concerned with gathering data regarding project progress, producing progress reports, monitoring time, cost, and quality. Compared to the CPM function, the PC function can be characterized to be passive, whereas a construction project manager needs to take action.

Project leader (PL): The PL is responsible for achieving the project's objectives. He is the manager "in line".

Project director (PD): The PD is the leader of a big project that can be broken down in sub-projects (e.g. Channel tunnel). He can also be the head of a PM organization. OR: The OR is the representative of the owner. This function can be provided either internally or externally.

DC: Document Control - A key function of a Project Manager.

FBOT: finance build operate transfer

BOT: build operate transfer

DBOT: design build operate transfer

BOO: build own operate

EPC: engineering procurement construction

PFI: private finance initiative

GC: general contractor

According to the American Council for Construction Education (the academic accrediting body of construction management educational programs in the U.S.), the academic field of construction management encompasses a wide range of topics. These range from general management skills, to management skills specifically related to construction, to technical knowledge of construction methods and practices. There are many schools offering Construction Management programs, including some that offer a Masters degree.

Typically the construction industry includes three parties: an owner, a designer (architect or engineer), the builder (usually called the general contractor). Traditionally, there are

two contracts between these parties as they work together to plan, design, and construct the project. The first contract is the owner-designer contract, which involves planning, design, and construction administration. The second contract is the owner-contractor contract, which involves construction. An indirect, third-party relationship exist between the designer and the contractor due to these two contracts.

An alternate contract or business model replaces the two traditional contracts with three contracts: owner-designer, owner-construction project manager, and owner-builder. The construction project management company becomes an additional party engaged in the project to act as an advisor to the owner, to which they are contractually tied. The construction manager's role is to provide construction advice to the designer, on the owner's behalf, design advice to the constructor, again on the owner's behalf, and other advice as necessary.

Design, Bid, Build Contracts

The term "Design, Bid, Build" describes the prevailing model of construction management in which the general contractor is engaged through a tender process after the designs have been completed by the architect or engineer. Recently a different business model has become more popular. Many owners - particularly government agencies have let out contracts which are known as Design-Build contracts. In this type of contract, the construction team is known as the design-builder. They are responsible for taking a concept developed by the owner, completing the detailed design, and then pending the owner's approval on the design, they can proceed with construction. Virtual Design and Construction technology has enabled much of the ability of contractors to maintain tight construction time

There are two main advantages to using a design-build contract. First, the construction team is motivated to work with the design team to develop a design with constructability in mind. In that way it is possible for the team to creatively find ways to reduce construction costs without reducing the function of the final product. The owner can expect a reduced price due to the increased constructability of the design.

The other major advantage involves the schedule. Many projects are given out with an extremely tight time frame. By letting out the contract as a design-build contract, the contractor is established, and early mobilization and construction activities are able to proceed concurrently with the design. Under a traditional contract, construction cannot begin until after the design is finished, the project is bid and awarded, and the team can mobilize. This type of contract can take months off the finish date of a project.

Agency CM

Construction Cost Management is a fee-based service in which the Construction Manager (C.M) is responsible exclusively to the owner and acts in the owner's interests at every stage of the project. The construction manager offers advice, uncolored by any conflicting interest, on matters such as:

- Optimum use of available funds;
- Control of the scope of the work;
- Project scheduling;
- Optimum use of design and construction firms' skills and talents;
- Avoidance of delays, changes and disputes;
- Enhancing project design and construction quality;
- Optimum flexibility in contracting and procurement.
- Cash flow Management.

Comprehensive management of every stage of the project, beginning with the original concept and project definition, yields the greatest possible benefit to owners from Construction Management. As time progresses beyond the pre-design phase the CM's ability to effect cost savings diminishes. The Agency CM can represent the owner by helping to select the design team as well as the construction team and manage the design preventing scope creep, helping the owner stay within a pre-determined budget by performing Value Engineering, Cost/Benefit Analysis and Best Value Comparisons. The Agency CM can even provide oversight services for a CM At-Risk contract.

CM At-Risk

CM at-Risk is a delivery method which entails a commitment by the construction manager to deliver the project within a Guaranteed Maximum Price (GMP), in most cases. The construction manager acts as consultant to the owner in the development and design phases, (often referred to as "Preconstruction Services"), but as the equivalent of a general contractor during the construction phase. When a construction manager is bound to a GMP, the most fundamental character of the relationship is changed. In addition to acting in the owner's interest, the construction manager must manage and control construction costs to not exceed the GMP, which would be a financial hit to the CM company.

CM "At Risk" is a global term referring to a business relationship of Construction contractor, Owner and Architect / Designer. Typically, a CM At Risk arrangement eliminates a "Low Bid" construction project. A GMP agreement is a typical part of the CM and Owner agreement somewhat comparable to a "Low Bid" contract, but with a number of adjustments in responsibilities required by the CM. Aspects of GMP agreements will be elaborated below. The following are some primary aspects of the most potential benefits of a CM At Risk arrangement:

Budget management: Before design of a project is completed (6 months to 1½ years of coordination between Designer and Owner), the CM is involved with estimating cost of constructing a project based on hearing from the designer and Owner (design concept) what is going / desired to be built. Upon some aspect of desired design raising the cost estimate over the budget the Owner wants to maintain, a decision can be made to modify the design concept instead of having to spend a considerable amount of time, effort and money re-designing and/or modifying completed construction documents, OR, the Owner decides to spend more money or obtain higher financial support for the project. To

manage the budget before design is done, construction crews are mobilized, CM is spending tens of thousands per week just having onsite management, major items are purchased, etc., etc....is an extremely more efficient use of everyone's time, effort, Architect / Designer's costs, and the CM's General Conditions costs, AND delivering to the Owner a design within his budget.

A CM At-Risk contract maximizes the awareness among Owner, Architect / Designer and CM of all parties needs, expectations in order to perform their part of the project in the most efficient manner.

PROJECT METHODOLOGY

The PM will provide pre-construction services: estimates, value engineering, constructability reviews as well as inspection, supervision, management, coordination and administration of construction projects so that the construction work is properly executed, completed in a timely fashion and conform to the requirements of the construction documents and good construction practice. We will work with the county to conduct the bid process from competitive bidding to award and enter into contracts for general construction work, plumbing work, electrical work, and HVAC work to complete construction projects.

- Initial Job Coordination
- Coordination between and Design personnel
- Coordination between Agency and Building personnel
- Scheduling Coordination Approach
- Review of existing conditions
- Review of existing permits
- Preparation of Construction Documents by the Design Consultant
- Constructability Review
- Preparation of Detail Estimate
- Evaluate impact of Asbestos and Lead abatement on Schedule
- Value Analysis
- Preparation of Bidder's List
- Bid Packages
- Permits and Agency Approvals
- Pre-Bid Site Tour
- Procedure Manual Development
- Master Site Staging Plan
- Construction Phase

Pre-Construction Services

The PM/CM provides complete preconstruction services that encompass the diverse needs of this project. These include design review, constructability review, estimating, value engineering, scheduling, cost control, project control, and claims mitigation, in addition to other services. We firmly believe that careful planning is critical to the

success of construction-phase operations, as well as the ability to adhere to budget and schedule constraints.

The team will work towards a seamless transition from the preconstruction to the construction stage. Our project staff will be involved from the onset of this assignment, and continue their efforts throughout, to ensure continuity and build upon valuable knowledge gained during the preconstruction effort. Our staff has the requisite experience to review designs and performance constructability reviews in each of the project categories.

Design Review

The team will assist in the design review of any of the proposed projects and tasks. The following general criteria will be used in identifying each design review stage. Complete, thorough design checks that include constructability reviews to eliminate or reduce construction ambiguities. These will help control cost growth with minimal changes and potential disputes. Proper attention and time spent here is what the total quality management process is all about. The CME team will provide a check and balance on the design process and coordination of the design for continuity across contracts. Design review conferences will be arranged as required with the Project Manager and staff, and the A/E to resolve questions of intent or conflicts.

The A/E's deliverables including drawings, specifications, cost estimates, design calculations, along with other supporting information will be reviewed for timeliness, constructability and conformance to scope and design criteria.

Interface with Other Agencies

Very often project requirements dictate the need to interface with various governing agencies. These agencies could include Landmark Preservation, DEP, DEC, as well as others. The PM will review the individual project needs and determine which applications, if any, must be made to the appropriate agencies to ensure that all requirements of those agencies are met.

Quality Control

Quality control before construction will center around design phase reviews of plans and specifications for constructability and cost-effectiveness. We will interface with the design consultant on such items as systems feasibility and practicality, selection of materials, availability of required labor, time requirements for procurement and installation, scheduling, construction procedures, selection of systems and components, and sit use. They may or may not perform the design work as required. We review controlled inspection reports and provide NCR (non conformance reports) to assure the project specified is the project built.

Document Control

To ensure the design review process is performed in a timely and systematic manner, the PM will establish a document control protocol.

Construction Services

During construction, the PM will continue to be responsible for the schedule control, cost control and reporting systems that make up our basic project control system. Accurate and readable cost and progress reports will be produced monthly or on a schedule established by the client. We will regularly convene meetings to coordinate the efforts of the architect/engineer, the contractor, and other consultants and to monitor contract compliance. In the field, we will perform quality control and inspection, contract administration, change order administration, disputes and claims management, occupancy and acceptance procedures, and safety monitoring. We will also carry out programs to achieve smooth labor and tenant relations. This is a critical issue when dealing with fire safety systems.

Constructability Reviews

Your team should approach a constructability review with the mission statement that almost all construction claims are inherent in the contract documentation. A key aspect of our quality control work during the detailed design phase will be constructability reviews. These are organized reviews of the contract documents by a multi-disciplinary team to reduce conflicting design information, allowing rational bidding and decreasing the need for changes during construction. CME can significantly lower project costs by uncovering problems in design before they occur in the field. Importantly, we understand that the schedule does not allow for potential problems to cause delays.

Value Engineering

The PM's approach to value engineering is reflective of the fact that public works projects must last with little maintenance for a long time and for the life cycle costs. We believe that jeopardizing the quality and long term life of a project in an effort to solely reduce first cost is not always the best solution. Our preconstruction team understands this concept and applies it. The Pm must understand, as most, that for value engineering to work, it must be applied within the first 20-30% of the design effort since redesign costs following value analysis engineering recommendations can be costly. Our team also understands that value engineering is iterative process and may be required throughout the design phase. Careful review of project costs during the design phase by our pre-construction team will determine this requirement.

Scheduling

The team emphasizes the critical path method (CPM) of scheduling as the working Management tool for planning. In order for the schedule to be useful, we first prepare a baseline schedule that accurately reflects the scope of work and the contractor's plan to perform the work. It incorporates each activity on the school calendar that must be addressed.

Schedule Control

Early in planning and design, The PM should develop the control systems to manage the design construction process. The project master schedule will be the controlling document and the basic tool for measuring performance against plan. The master

schedule will integrate all essential events - current and projected - and identify tasks, responsibilities, milestones and phases of major actions for each project participant. During the preconstruction phase, we will produce detailed schedules for feasibility studies, consultant selection, preliminary and final design, permitting, and the fire department approval process.

Document Management

Document control system streamlines the administration of construction contracts by recording, storing and organizing all job-site activities. It tracks submittals, requests for information, approved and pending changes to contracts, subcontracts, and purchase orders to accommodate the probability that changes will occur. This document control system is also used as a working tool for our professional managers and the entire project team to track and resolve potential cost and scheduling issues immediately. The PM's document control system should be designed to create and archive records in support of each contract.

The Bidding Phase - Bid Preparation

The project management team will begin planning the bid process from the earliest stages of preconstruction. We will package the contract to consider project timing, long-lead requirements, realistic schedules, and interface with other contracts. We know that, generally, the smaller the contract, the more price competition is generated the more contractors, the more coordination is needed and the more concurrent contracts. The faster the project is likely to be completed. We have also found, however, that the likelihood of claims rises with the number of project participants. To address this problem we may recommend that various tasks will be packaged into groups of five. The Pm should actively stimulate the interest of qualified contractors in bidding on the work, prepare lists of selected bidders, pre-qualify contractors and conduct conferences to acquaint contractors with the bid documents. Responding to contractor questions and monitoring responsiveness to bidders throughout the process are crucial. They will evaluate the bids and select the prime contractors and subcontractors.

Construction Phase Services

The PM will organize the team of engineers, architects and construction professionals and working with the owner/client will have direct control over cost, time and quality. Simply put the PM's objective is to get the job done right and on time. Preconstruction meetings are held with each of the prime contractors to orient them to the project and to introduce the administrative procedures that will be instituted project wide. As the project continues, regular meetings with the contractors are held to coordinate the work, review progress and to control site conditions.

Contract Administration

The PM's job-site engineers will check that contractors submit shop drawings and other documents as scheduled and that they are returned as scheduled. In case of delay will take prompt action. Document clarification is a continuous part of administering construction contracts. We will track the dates the clarification is requested, issued, received and sent

back to the contractor. The computerized document control system describes the clarification and establishes a due date for the designer's response. This system also has a tickler file to keep the process current for the construction manager. We have developed project control software to control documents according to owners' requirements. Information retrieval is streamlined using computer-generated reports. Subjects can include outstanding issues, project history, and submittal response history, cost status for each project element and change orders that have been issued but not yet signed by the contractor.

Cost Control and Scheduling

Throughout the project, the PM/CM prepares and maintains a cost reporting and forecasting system to track project costs and schedules and keep the client informed of revisions and changes that could impact project costs. Our monthly reports will document total expenditures and schedule updates facilitating project management and will provide a master project schedule and the ability to anticipate potential problem areas and resolve them quickly. We will help keep costs in check with sound estimating and budgeting, a realistic decision-making process, tight financial controls, realistic payment breakdowns and an effective management information system for monitoring project costs.

Quality Assurance

The PM must continually strive to improve the quality of construction in place. Our team will constantly provide construction management services that meet your quality expectations. The PM will actively pursue a program of providing the highest quality by continuously monitoring the QA/QC so that the team and the contractors do the job right the first time. Quality assurance management begins with our team's understanding of the needs and the designers' intent and requirements.

Change Orders

The PM works with the architect during the design phase to achieve documents that minimize change orders during construction. Our team endeavors to anticipate, recommend and manage required changes in the work, and to secure fair and reasonable costs for those changes. Changes made during the construction phase can have a major impact on cost and time and must, therefore, be minimized, and expedited when they occur.

After construction has commenced and the on-site construction management team is in place, the primary responsibility for change order management rests with the on-site construction manager and his support team. Whether we are acting in the construction management capacity or overseeing the on-site construction management as your project manager, we will be responsible for coordinating the specific information required to evaluate the change. We track and monitor any cost or schedule impact events as they occur, and direct the contractors on pricing and how to proceed with the work.

Safety Program

The team regards safety as the highest priority on all of our construction sites. Trade contractors are required to submit their safety program after notice of award, in

accordance with the provisions of the contract documents and our professional trained managers review these reports to compliance with standard industry safety practices. The CME team audits each contractor's progress in order to monitor compliance. We also set up a format for collecting data from safety audits and the results of safety meetings. This information will be reported to the client

Reporting

The PM will generate reports that compare budget to actual costs, analyze cash flow and identify trends, and present budget and schedule forecasts. Our reporting systems will be tailored to the project and will include summaries and graphics. Our reports will be designed to provide information at the different levels of detail required by the various project participants and decision-makers.

Field Services

The field services staff will manage construction contracts so that completion is accomplished in accordance with contractual requirements. We will provide for clarification of discrepancies and resolution of questions of fact, monitor the contractor's performance and serve as the focal point for construction. We take a comprehensive and aggressive approach to mastering the interrelationships of details inherent in a major construction effort.

Disputes and Claims Management

During construction, management of dispute and claims remains critical. We will make disputes less likely by rigorously implementing procedures and practices born of our extensive experience in construction management and claims resolution. These include timely responses to the contractor, proper project controls, accurate documentation, and fair and reasonable field administration. Our scheduling provides data to evaluate a potential claim. Our management information system tracks correspondence, requests for information, submittals, change orders, field instructions, and deficiency notices – complete and accurate project information to help ward off claims. Early recognition of a possible claim gives a head start on data-gathering and allows enough time to take action.

Start-up and Acceptance Procedures

Acceptance procedures achieve a smooth transition from construction to approval by all parties. These procedures will be incorporated into the master schedule months before construction completion to coordinate everyone's needs, prepare punch lists, carry-out final inspections, train maintenance staff in using operations and maintenance manuals and create turnover procedures. Before the final recommendation to accept and close-out a project and before final payments to contractors, we will review required releases of claims. During initial use of a facility, we usually monitor compliance with the contract regarding post-acceptance items and services, so that critical guarantees and warranties are not voided.

Labor Relations and Community Relations

A well-run and well-maintained project is a safe project and promotes labor harmony

and makes the project a good neighbor. Safety requires that good housekeeping rules be observed and that violations, however minor, be immediately identified and rectified. The Project Manager will also monitor implementation of the safety program throughout construction.

Project Close-Out

Starting with the contract documents, The Project Manager sets up the close out of the Project before any contractors are allowed to begin work. To facilitate a smooth and timely close-out of the project, together with the architect, coordinates the preparation of punch lists, indicating nay items of work remaining or deficient non conformance reports This process ensures that these items are completed and/or corrected in an expeditious manner. The project team assembles the guarantees and warranties required by the contract documents an forwards them to the client. We pay particular attention to the following:

- “As Built” Documents
- Submission and approval of O & M manuals
- Cleaning up all shop drawings “Approved as “noted” and submission of them
- Punch list completion
- Substantial completion
- Final completion

These items are subject to the approval of the architect, and submitted to the client and the architect for their records upon final completion of the project.

Facility site selection starts with basics

Successful site selection begins with the basics - traffic flow, market analysis, property size, zoning restrictions, among other factors. But, site selection considerations for a aquatic center/sports and fitness differ widely from those for warehouse properties etc. Learn the basics - and then venture into site selection.

Successful Site Selection basics:

Property size

Locale

Traffic flow

Visibility

Target market

Competition

Restrictions

A five-phase process can take your project from defining the key attributes for its success to picking the optimal PLACE and site to do business.

You have always heard the classic real estate line “location, location, location.”

Obviously we all want to have our aquatic center sites in the right place. Why is it that so many groups go about the process of finding the perfect location improperly? Let’s look at some underlying causes and then outline what I think is the best solution.

Defining the Company’s Goals

Establishing Project Objectives and Timelines

Putting the “Deals” in Perspective

Search Mission

Examine the competition within the targeted area. This takes hard work, a local map, a copy of self-storage Yellow Pages, a computer to do an electronic search, a camera and lots of driving around. By plotting the locations of stores on a map, you’ll quickly spot market holes where you can concentrate your efforts.

An Internet search can help you identify existing stores. Many of today’s search programs will return not only a listing of facility names, addresses and phone numbers, but will locate them on a map and provide website links. Double-check the Yellow Pages ads against these electronic searches to make sure you’ve compiled a complete list.

Recon

With map in hand, a pad and pen, your camera and a cup of coffee, start the process of driving by every facility on the map. Take a few notes about your impressions of curb appeal, signage, landscaping and vehicle ingress and egress. These points will help you understand the strengths and weaknesses of those you’ll be competing against for market share.

Take the time to personally visit facility offices. You can either mystery shop them as a potential customer or just introduce yourself and explain what you’re doing. Obtaining rental rates and occupancy is important, but you should also be observing the quality of the office and the managers’ professionalism. Again, take brief notes of your impressions. Finding a market void is your first step; only then worry about the price of the land. The real estate economics may end up precluding you from building. However, while price can never be totally ignored, don’t worry about it at the beginning of your search.

Market holes open for any number of reasons, primarily zoning considerations. Existing municipal zoning may exclude the development of self-storage in most categories or

require a special-use permit. This can even be true in what appears to be a retail/commercial area

Planning & Zoning Land Price Demographics Calculating Feasibility

How much land is needed to build a pool?

The following estimates are provided as a “starting place” not as the definitive answer to the question.

Once you understand what is needed, you may be able to do your own calculations. This at least will help you decide what parcels of land are not suitable.

Our basic example is a 6 or 8 lane 25 yard pool with a smaller teaching pool. This facility – with supporting land amenities – will fit in a building approximately **130’ x 90’** wide. Since the pool is a rectangle, the building usually mirrors that shape. Pre-engineered steel buildings come in standard 90’ widths so this works well in the initial planning. If the land is more “square” than rectangular, or the climate extreme, a circular monolithic concrete dome building can be considered.

There has to be a buffer zone around the building otherwise vehicles will be hitting it. So add 8’ for perimeter landscaping next to the building. That takes our land footprint to **146’ x 106’**

Zoning regulations will usually not allow building right up to the property lines – there must be “set-backs”. Different cities have different regulations but usually the “set-backs” are 15’ to 20’. Sometimes a road or parking area is allowed to be constructed closer than structure set-backs. For this example we are going to use 30’ setbacks. That takes our land footprint to **206’ x 166’**

Ideally you will want a one way circle drive around the building. The standard width for this is 35’. This allows 2 lanes for traffic plus passenger drop off/pick up areas. That takes our land footprint to **276’ x 236’**

Parking area will also be decided by local zoning code usually based on the square footage of the building. For a building like this you should plan for at least 50 permanent parking spaces. Assuming parking is at one end of the building, this takes our foot print to **376’ x 236’**

Any time you change the natural state of a piece of land, there is a lot of planning that goes with it. When it rains or snows, water that used to set on the land and eventually be absorbed will now run off and end up on a neighboring piece of land. This of course is not allowed. Therefore water retention and flow direction is a major part of land use. Dry ponds are one way to handle water retention but they use up land. Depending on the elevation changes of the land and the soil composition, water retention and flow needs can make the footprint **‘576’ x 236’** or some similar variation. .

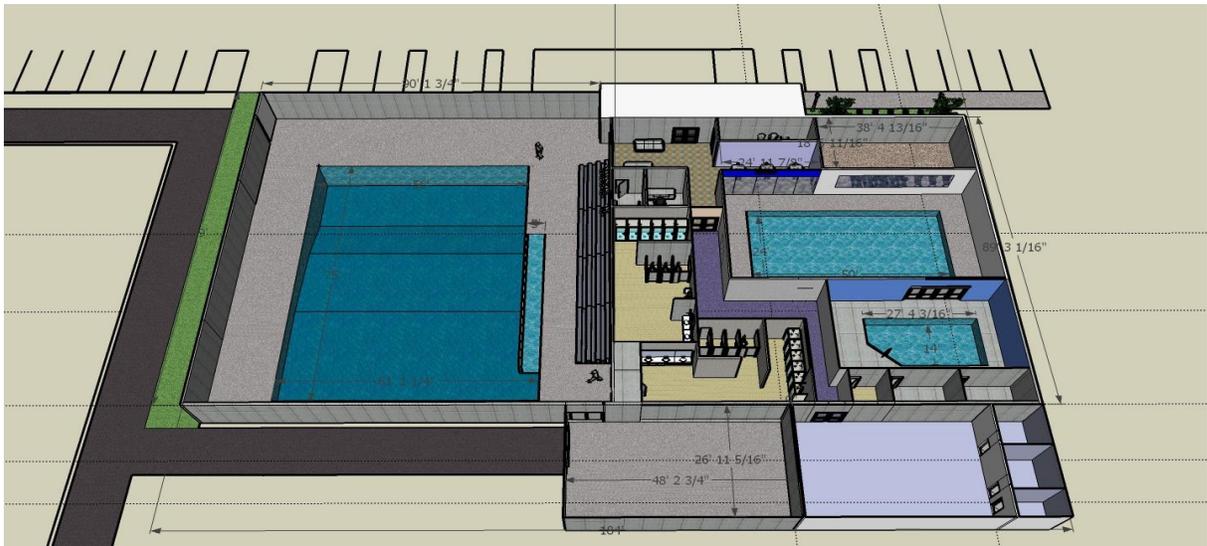
The following things need to be carefully considered before any land is purchased:

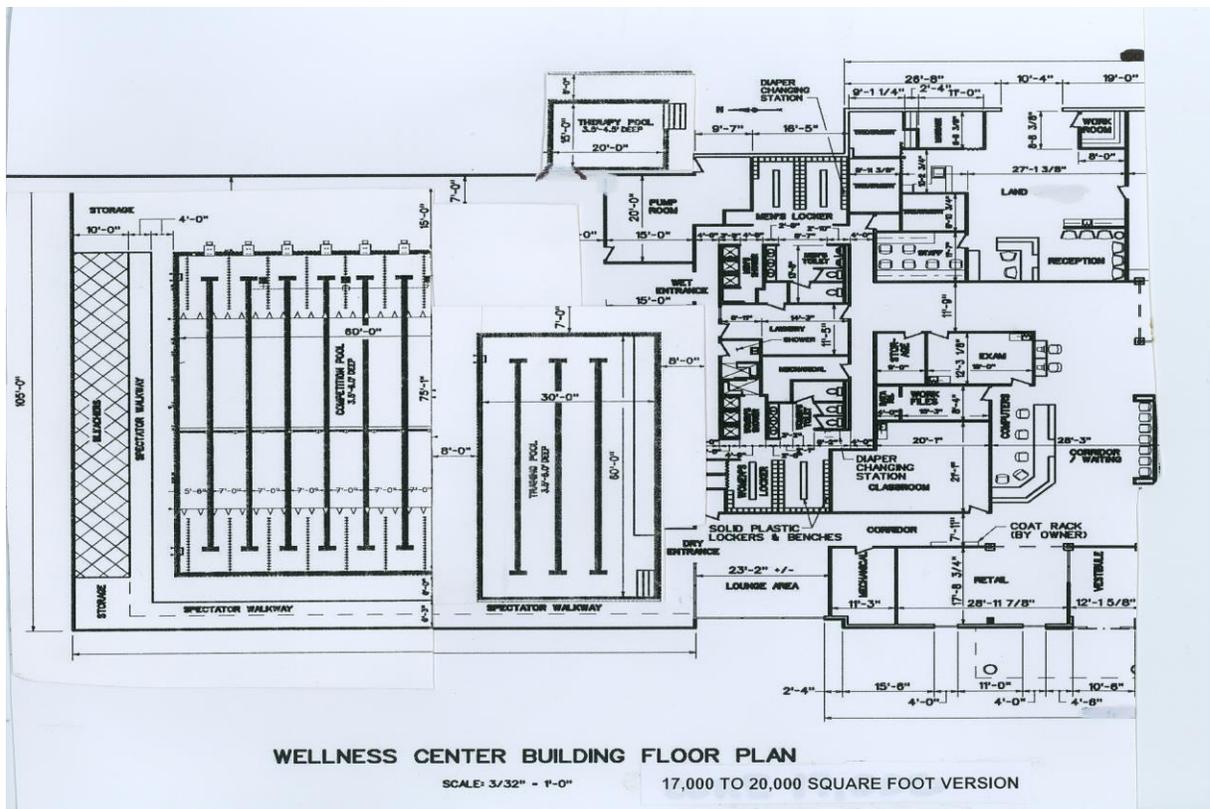
- Zoning requirements – local codes and terminology vary considerably
- Utilities availability – electrical, water, sewers, gas, etc. This is a commercial building and has special needs
- Building feasibility assessments – rectangle – circular – square buildings
- Geotechnical engineer or soil specialist – topographical study – water table study – seismic zone restrictions – water shed and retention requirements
- Traffic flow and other neighborhood issues – security issues
- Accessibility and expansion capability

Also understand what an acre of land means. An acre is about 90% of a football field (excluding end zones).

An acre is 43,560 square feet but that does not establish the SHAPE of the land. So the above example would require about 3 acres of land – again depending on shape of land. Usually the more rectangular the better.

If we were to discuss an example for a 50 meter pool in lieu of a 25 yard main pool the land would increase to approximately 700' x 270' or about 4.5 acres. That would not include and room for expansion.





The big box – warehouse - or mall type swimming school has become more popular in the last few years. There are quite a few examples of coaches or instructors who are experiencing success with this model.....

Bob Hubbard’s swim schools in Phoenix..... www.hubbardswim.com/





Mike Troy's Gold Medal Swim School - www.goldmedalswimschool.com/



Swim Kids USA - www.swimkidsaz.com/



Aqua Tots Swim School - www.aqua-tots.com/



Hubbard's new school under construction



Houston Swim Club and one of their L2S centers – in strip mall –
www.houstonwimclub.com/





Lori Klatt Swim America – www.swimamericaresno.com new L2S facility and separate tumbling facility in same strip mall.



Joseph He and wife who have built a swim school and team pool next to a motel. The attended the 1st BAP and 2nd Conference. www.calphin.com



This is a GREAT facility that has 1500 kids signed up for Lessons and 80 on the team. They built almost exactly what we presented at the BAP conf. including the small Health Club which is maxed out at 100 members. They are 2 years ahead on their business plan and considering building another one across town.

Summer's Swim Academy - www.summers-swim.com Business is 30+ years in existence. Effective use of 2 x oval above ground pools sunk 1/2 way in ground and then a deck built around. Building is galvanized frame with 8 mil clear plastic sheeting stretched on inside and 8 mil black on roof over the clear. Probably only Texas and maybe 2 other states would allow this by code but it works.



Sea Star Swim School. Another example of a very good business plan that partners learn to swim with gymnastics. www.seastarswimming.com/ Corner building strip mall type structure



Pearland Swim Academy – USA Coach owned –this is an above ground Kayak pool that was simply erected and boxed in. It sits on-the-ground (slab) in a strip mall type building. Would not be allowed in most states but a very effective use of \$ to build. www.pearlandswimacademy.com/



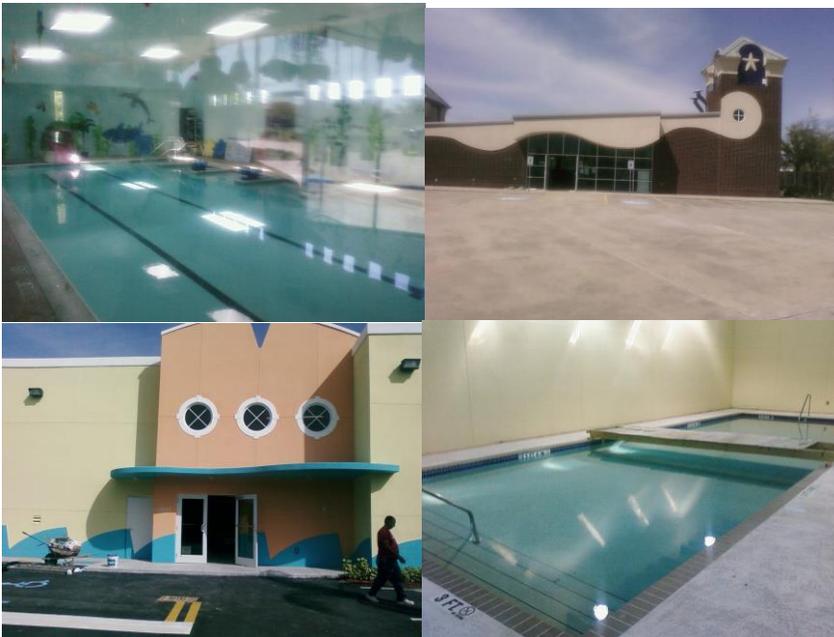
All sites understand the value of a “front end retail business”. These net between \$50K and \$100K annual profit. This takes a space allocation of between 800 and 1000 square feet of building





Dance and Gymnastics and Scuba are also good fits for inclusion at these sites. Mike Troy's facility was the only 25 yard pool. All of the others designed their "large" pool approx. 50' x 30'. This saves a lot of square footage for the building and still allows all types of aquatics except for team.

They are all beginning to have challenges with air and water quality. They use everything from Ozone to Calcium Hypochloride to Sodium Chloride to Salt generated Saline pools. No one seemed completely satisfied with their current operational cost and efficiency. Medium Pressure UV through ETS is on its way in for this area's pools. Phoenix is Chloraminating their city water so problems are inevitable.







The type or brand of pool used will depend on the local and state codes. What is allowed in Texas is not allowed in New Jersey.

Many schools have started out by using a high end residential above ground pool then building a box/deck around it. That is the most economical way I codes allow it.



If codes require a true commercial pool the best pool for an on the ground application is the stainless steel Myrtha Pool.



They can be built any size to meet any spec. Contact for Myrtha is:

Myrtha Pools
Mike Mintenko
719-237-9019
Mike.mintenko@myrthapoolsusa.com

If the code requirements fall somewhere between a commercial pool and a residential pool there are other manufacturers who supply on-the-ground pools.

If you are considering installing an on-the-ground pool in an existing building, you need to be aware of some basic requirements and do some research to find out what is allowed and what you need. Some things to consider:

- Zoning (approval can take 2-3 months)
- Parking (you never can have too much)
- Electrical service (you will need at least 240/100 amp service - check with your aquatic engineer)
- Plumbing (you will need enough showers and stools to meet state codes)
- Septic (you will need sewers large enough to handle the surge when the filters are backwashed - or be allowed to use cartridge filters that do not require backwashing)
- Humidity control and HVAC (allow at least 3 months for design and equipment ordering)
- Permitting and local codes (allow at least 4 months for this process – usually longer)

Many existing buildings will be hesitant to allow a pool because of the excess humidity. This can be handled 2 ways

- Install a Desert Aire pool room dehumidification system. The \$ for this depends on your location and the size of building. This can range from \$80K up. You can contact:

Desert Aire – N120 W18485 Freistadt Road - Germantown, WI 53022
hmilliken@desert-aire.com <http://www.desert-aire.com>
Harry Milliken Office: 262-946-7400 Fax: 262-946-7401

- Install a vapor barrier type PVC building within the existing building so the pool is in a separate room. This allows a smaller area to be dehumidified and this “room” can be vented directly to the outside. It also protects the rest of the building form humidity. This type of building usually cost less than \$15 per square foot if it is going inside another structure. (allow 4 months for permitting and ordering)



Insulated Hardwall

Provided by SERG

- Exterior is 26ga. galvanized and powder coated galvalum.
- Inner core is high density EPS (expanded polystyrene).
- Lightweight and easy to install.
- Available in 2" to 12" thickness.
- R Value is 4.17 per inch of thickness.
- Able to withstand temperature cycling ensuring long-term performance.
- Provides a more efficient cover than standard coated fabric.



For information about this style of building contact:

Christopher Whitlow Event Resource Group

E - chris@eventrg.com C# 404.790.3315 www.sportingeventrg.com

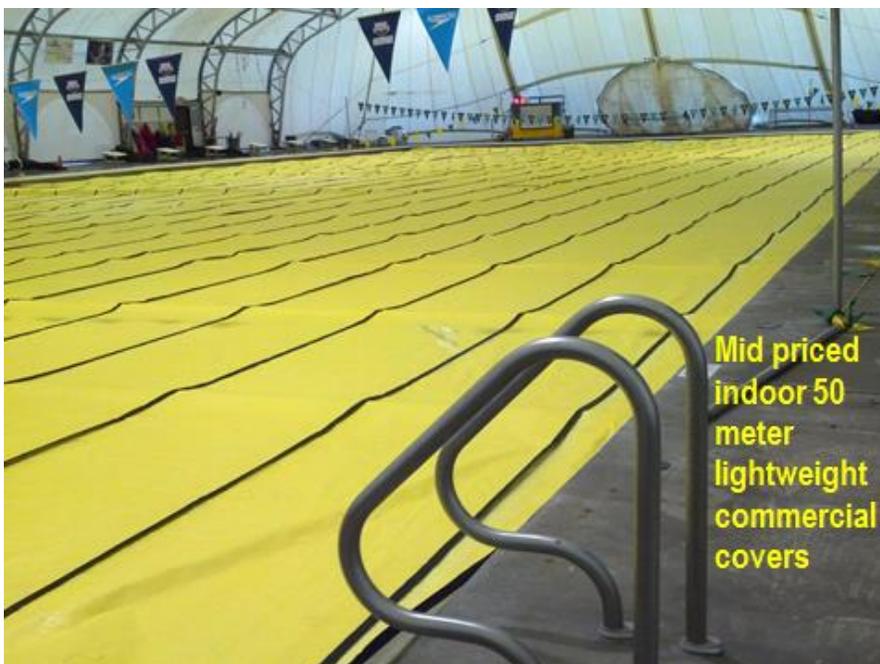


Saves on capital cost for HVAC and operational cost 6 months a year for water and building heat. \$1.5 million in utilities over 30 years

And you will always want the pool covered when not in use. This saves wear and tear on all equipment and save up to 40% on water heating, electricity, and pool chemicals.

Contact information for the new lightweight long lasting indoor pool covers is:

H2O BLANKETS, LLC - NATATORIUM ENERGY CONSERVATION - 770.913.0802
e- mail : harvco@mindspring.com www.h2oblankets.com



Same energy savings indoors or outdoors.
Stops evaporation – saves water and chemicals
Stops heat loss to air – pool heater cycles 60%
to 80% less overnight

Cover a 6 lane 25 yard pool
on a budget: 5 x 15' wide
covers going the width of pool
+ 5 x rollers along side.
Approximate cost less than
\$2,000 Pay for themselves in
less than 4 months.



Cover reel with
wheels to handle
2 ea 45' x 10' or 12'
covers = \$300 each
including freight

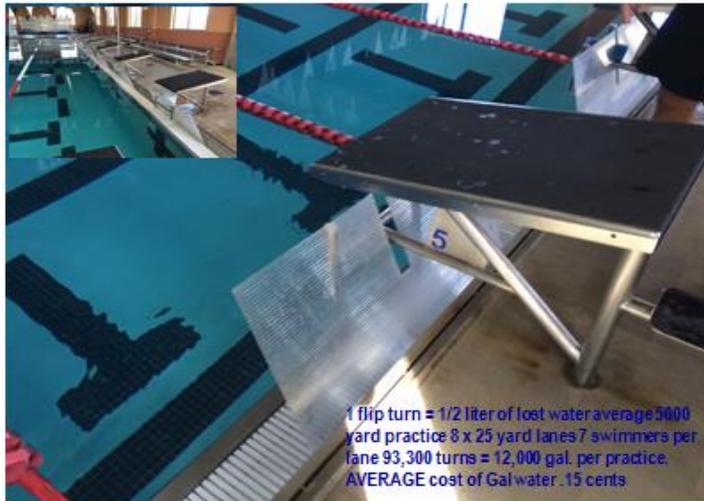


12 mil solar cover
20' x 40' then cut
into 2 x 10' covers
\$149.95 freight
included

Shop the web – best time to buy is in the fall and
winter – usually free freight and sales in Nov to
Feb. Key word search = “ pool solar covers”

As you can see there is really no “one best way” to approach this type of project. Keep all options open and do your research. Also realize that even on the “fast track” this process will take 4 to 6 months. If you need professional engineering assistance we suggest you contact one of our professional providers – that list is available by emailing mnelson@usaswimming.org

MORE - Other Information:



Flip Turn
Splash
Guard

~ 2' x 4'
Plexiglass

Can do
foam
edges

Removable

Room on
each side
to get in
and out of
water

Produce
locally

1 flip turn = 1/2 liter of lost water average 5000
yard practice 8 x 25 yard lanes 7 swimmers per
lane 93,300 turns = 12,000 gal. per practice.
AVERAGE cost of Gal water .15 cents

Save thousands of gallons daily ~\$6570 annually

Pool maintenance/renovations cost comparisons 6 or 8 lane 25yd pool:

Gunite or concrete or tile – plaster or paint: Re-plaster and seal and coat: \$39,000 + Time down: Drain 2 days + 7 days dry and prep surface + 10 days to renovate + 14 days cure surfaces + 2 days fill + 4 days re-heat = Total 39 days (reheat may take up to 27 days)

Loss of revenue = **\$58,500** Refill and reheat cost = **\$1,100**

Total cost for renovation every 5 to 7 years = **\$98,600 to \$169,000**

Liner pool: Re-line pool: \$42,000 + Drain 2 days + 5 days dry and prep surface + 10 days to renovate + 3 days fill + 4 days re-heat = Total 24 days

Loss of revenue = **\$45,600** Refill and reheat cost = **\$1,100**

Total cost for renovation every 8 to 12 years = **\$88,700**

Can you
afford
not to
consider
steel ?

Myrtha pool: No renovation cost for the first 12 to 15 years = **\$0**



Myrtha Pools®



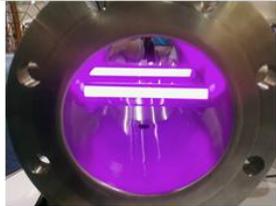
Mike Mintenko - Myrtha Pools 719-237-9019
 Mike.mintenko@myrthapoolsusa.com

Necessary supporting areas:

Pool filter room – each pool needs separate filter system and prefer being in same large room – watch ceiling height + I-beam pulley
Chemical room with separate feeder equipment and storage for chemicals – codes apply

These areas can not be designed with too much room.





A must for all indoor pools



Separate units for each pool



ADA
Laws
and
LIFTS

Logic
and
Safety



Ramps and Stairs are very important



Risers 6" or less + leading edge colored



Sometimes size of pool and space dictate stairs & lift only

Pool area for championship type events

- Decks – 20' wide minimum with 30' behind blocks
- Swimmers - aluminum bleacher seating on deck for 700
- 6' walkway clearance from edge of pool for officials
- Spectator foot traffic kept off deck per insurance rules
- Spectator seating for 1500 minimum
 - Dry restrooms conveniently located
 - Concessions conveniently located
 - Do not have to cross pool deck for access + (ADA)
 - HVAC air flow and CO2 sensors



Necessary supporting areas:

Deck accessible timing and meet operations room with clear view of scoreboard

Deck accessible storage rooms for lane line reels and touchpads and other large aquatic equip

Deck accessible officials room and hospitality room

Electronic score board



- M & F Main shower rooms (2) largest
- M & F Teen/Team shower room (2) – Spartan
- M & F Unisex (2 to 4) smaller
- M & F Public (dry) rest rooms – 2 to 6 depending on facility size
- M & F Staff locker room (2)
- On deck shower wall rinse stations





PROTECT-ALL is:

Waterproof

Slip-resistance even when wet.

Resistant to mildew and bacteria.

Easy to clean.

Environmentally-friendly.

Long-lasting.

www.protect-allflooring.com/waterparks

Necessary supporting areas:

Laundry area and staff break room area

Public vending area with chairs/tables

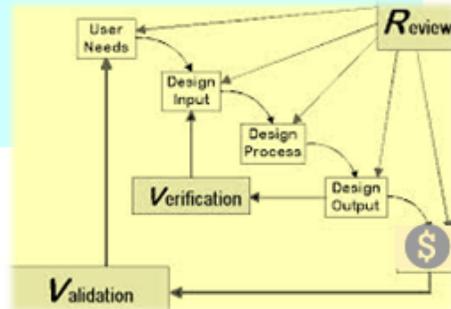
Meeting and conference room(s)

Offices and reception area



Top 5 design flaws that have to be corrected soon after opening:

- Slippery floors around pool and in shower-rooms
- Inadequate lighting
- Sound systems
- HVAC undersized or not doing the job
- Filter room equip



Based on demographics and experience the big pool "can" be

Up to 25,000 people in community
 club size = 50-75 swimmers
 6 lane 25 yards - MAX = 48 ag + 36 teen + 24 sr+ =
108 in 5 hours prime time



Up to 50,000 people in community
 club size = 75 to 150 swimmers
 8 lane 25 yards - MAX = 64 ag + 48 teen + 40 sr+ =
152 in 5 hours prime time



Over 50,000 less than 100,000 people in community
 club size up to 200 swimmers
 10 lane 25 yards - MAX = 80 ag + 60 teen + 60 sr+ =
200 in 5 hours prime time



Over 100,000 people in community
 club size over 250 swimmers
 22 lane 25 yards - MAX = 176 ag + 132 teen + 110 sr+ =
418 in 5 hours prime time



• **ECONOMIC IMPACT** *almost every city has an EI formula*

| Invitational type USA Meet economic impact (per meet) | |
|---|------------------|
| Swimmers | 600 |
| Spectators with swimmers | 900 |
| Total input per day | 1500 |
| Days for meet | 2&1/2 or 3 |
| Total input for meet | 11250 |
| \$ spent by families | |
| Restaurants | \$202,500 |
| Motels | \$88,000 |
| Misc | \$15,000 |
| Total predicted Economic impact per meet | \$305,500 |

• **SOCIAL SAVINGS IMPACT**

SSI can be greater but is seldom considered or presented fairly



IMPORTANT facts about owning, operating or using a pool/spa: Each area's water quality is different. If you try to treat water in the Midwest like a person treats a pool in Arizona or Florida, you will be in for an unpleasant surprise: **IT WON'T work**. Many areas have metal laden water with high nitrate content. Some also have a high sediment rate of suspended matter in the water. Be aware of what brand of chemicals are being used. The wrong brand in the wrong area can create a whole set of problems that is both time consuming and expensive to correct. Unfortunately the chemical manufacture will not alert you of what to look for.

There are 2 components to having CLEAR WATER. (1) Proper circulation (2) Proper chemicals

If the pump is not properly sized or the filter is not the proper size or type, green water or cloudy "murky" water may result. Many pools are designed (through "value engineering") with too small a pump and filter; some are up to 3 times too small for the pool. A professional pool company can size your filter to your pool. You may use chemicals with calcium as the inert ingredient, or you may need to learn about technical-grade sodium based chemicals and what buffers or binders they use. Every area of the country is different.

One of the 2 most important water tests you can do on a daily basis is pH: the RED indicator. If your pH is not between 7.3 and 7.6 none of the chemicals you put in the water, including chlorine, will work properly. To raise pH use soda ash; to lower pH use sodium bisulfate. Baking soda (sodium bicarbonate) will also raise pH or muriatic acid will lower pH in certain circumstances. Certain pH control chemicals can throw your total alkalinity out of balance and cause major problems. 45 minutes after adjusting the pH, test the water to see what was accomplished. Re-treat if the readings haven't changed. Add pH-adjusting chemicals through the skimmer, gutter or through an in-line feeder.



Test kit indicators (the clear liquid with the yellow lid for chlorine and the red liquid with the red lid for pH) are not good for more than 12 months. Replacement bottles and complete test kits are sold at the local pool dealer. Test strips do not work well or read accurately, so stay with the liquid 5-part test kit. In addition to the daily chlorine and pH test, test regularly for available chlorine, total alkalinity and cyanuric acid level. Most State Department of Public Health Swimming Pool Divisions require many more tests than just Chlorine and pH. All tests must be recorded and the pool logs kept on file.

The goal of pool water testing is to maintain a healthy, clean pool environment. Proper control of all the variables involved in pool chemistry is assured only by constantly monitoring the water, evaluating the findings, adding chemicals, and maintaining automatic chemical feeders to control proper water balance. There are many different types of test kits, some rated for residential pools and others for commercial applications. Electronic controllers that read, evaluate and mechanically adjust the pool water chemistry have simplified the testing and maintenance procedures associated with water chemistry balancing. However, in many

instances unique water qualities make these inaccurate and inconsistent. Regardless of the system used, all applicators must follow basic rules when testing water. Disinterest, sloppy instrument handling, hurried procedures, bad reagents, poor choice of sampling location or inaccurate measurements will lead to problems.

The following rules apply to all commercial chemical testing:

Most states require that pool water be tested at least twice a day with the results recorded on a daily operational sheet. Test at times when the pool is used during normal peak periods of use.

Make certain that the sample is representative of the pool water. Select a sample location that contains well-mixed pool water. Obtain sample from at least 6" below the water's surface. Do not collect the sample from in front of an inlet or from a surge tank.

Follow test kit instructions. Water testing is a precise process that demands accuracy in measuring amounts of reagents involved and in observing time and temperature requirements.

Rinse all solution tubes and equipment thoroughly after each use, both inside and outside. Do not rinse droppers or reagent bottles or let the droppers touch pool water. Do not handle the equipment or reagents with dirty hands. Rinse off any reagents that get on the skin.

Properly box or case the equipment, and store in a cool, clean, dry place. Do not interchange parts such as solution tubes, bottle caps or droppers. Reckless or inexact methods of water testing lead to inaccurate results and possibly an unsafe condition for people using the facility. Water must be kept in a healthy, clean and clear condition at all times.

Testing for Chlorine (2xdaily - minimum): There are three types of chlorine test readings: free, combined and total. Free chlorine plus combined chlorine equals total chlorine. Only the free chlorine is effective in killing bacteria or algae. The combined chlorine is bound with other elements (contaminants) and needs further chlorine additions (oxidizer) to release it. Orthotolidine testing (OTO) reveals only the amount of total chlorine found in the pool water and does not distinguish between free available and combined chlorine levels. If the amount of combined chlorine reads higher than that of the free chlorine, problems are present. Ideally the free chlorine level should be kept around 1.5. Any higher may result in water and air problems. If using a UV system this reading may be decreased to 1.0 or less. Check with you state Dept. of Public Health Swimming Pool Division for their requirements.

DPD Testing (bi-weekly minimum): The quality and type of test kits vary. DPD testing kits are used to test for free available chlorine (F.A.C.), combined available chlorine (C.A.C.) commonly called chloramines and total available chlorine (T.A.C.). If there is a chloramine problem or pH problem swimmers will complain of red, irritated eyes and strong odors. This is a very serious health hazard and must be immediately addressed.

NOTE: Liquid reagents have an 8 to 12 month shelf life. The accuracy of the test is likely to decrease if reagents are stored inaccurately or for long periods of time. Keep in a cool dry place out of the sunlight.

Testing pH (2xdaily): The pH of water is usually tested by matching reagent colors against a colorimetric standard. The reagent generally used for swimming pool water is phenol red, which has a pH range of 6.8 to 8.4 and a corresponding color range of yellow to red. There are 2 distinct types of phenol red: A "J" solution (residential) and a #4 solution (commercial). Knowing the pH of pool water is essential for properly controlling all the water chemistry parameters. Test pH at least daily, or 2 times a day when the disinfectant residual is checked. Confirm that the pH is within the desired 7.3 - 7.5 range. Take water samples from the pool for testing the pH, not from a pipe tap or in the equipment room. pH can be lowered with Sodium Bisulfate or Muriatic Acid. pH can be raised with soda ash or sodium bicarbonate. Note: Remember when dissolving chemicals, add chemicals to water; never add water to chemicals.

Testing for Calcium Hardness Levels (monthly): Total hardness is the measure of calcium (Ca) and magnesium (Mg) in the water. Excessive hardness, the combination of calcium [Ca] and magnesium [Mg], causes calcium scale to build up on the walls and floor of plaster finished pools and spas and also on liners, tile and fiberglass. It also leaves scale build-up in heaters,

heat exchangers and other filtration components. Recognize that it is not the magnesium that forms the scale, only the calcium forms scale. When the hardness level drops too low, the water becomes aggressive and will cause corrosion, pitting of plaster, and dissolving grout. Control of scaling or aggressive water requires the calcium hardness level to be kept above 200 ppm and below 400 ppm. Calcium chloride (CaCl) is used to increase the hardness level.

Testing for Total Alkalinity (monthly): Alkalinity in water represents the amount of bicarbonates, carbonates, hydroxide and sometimes borates, silicates and phosphates. Total alkalinity is the resistance of water to changes in pH. The higher the total alkalinity, the more difficult it is to change the pH with soda ash or acid. Testing for total alkalinity is essential to make proper determinations of the saturation index as well as for bather comfort and ease of pH control. Total alkalinity (calcium carbonate) should be kept between 80-120 ppm for pools with inert liners, and between 100 to 125 ppm for pools with plaster finished surfaces. Pools with source water with alkalinity over 200 cannot use CO₂ for pH control.

Total Dissolved Solids (TDS) (monthly): Total dissolved solids (TDS) is the measurement of all materials dissolved in the water, i.e. calcium, dissolved organic and inorganic materials, carbonates, salts from chlorine residue, swimmer waste, soluble hair and body lotion, or anything in the pool that can be dissolved. The total dissolved solids (TDS) in a pool should not exceed 1,500 ppm. High TDS is common with spa water with high bather load, high chemical needs and a relatively small volume of water. TDS can only be corrected by dilution with water with low TDS or completely draining and refilling with fresh water. TDS levels require a special test kit.

Cyanuric Acid Testing (monthly): Cyanuric acid is commonly added to outdoor pools as a chlorine stabilizer or chlorine conditioner. The concentration of cyanuric acid must be monitored carefully to insure that the chlorine does not become over stabilized. Cyanuric acid products are not recommended for indoor pools and spas, since the need for chlorine protection from the sun is not a concern. However, many chemicals used in indoor pools and spas have small amounts of stabilizer (used as a binder or buffer in the manufacturer process) that can build up over time. The acceptable range of cyanuric acid is generally between 30-80 ppm. Tests are based on turbidity (cloudiness) or metal fallout. Cyanuric acid is also called stabilizer, conditioner and sun-screen. The only way to lower Cyanuric levels is to drain the pool or spa. Year round pools tend to have more challenges associated with iso-cyanurics than seasonal pool that drain their water and start fresh every year.

Copper Testing (monthly): Copper found in pool water contributes to staining of pool walls, water discoloration, and turns hair or nail cuticles of the pool users green or blue. Therefore, the recommended copper level is less than .02 ppm. If copper is present, maintaining a pH of 7.4 to 7.3 and a hardness of 350 ppm reduces the negative influences of copper.

Iron Testing (monthly): Dissolved iron is responsible for staining and color problems in pool water and on pool surfaces. The addition of chlorine in an adequate concentration helps to precipitate out the iron and allows the DE filter to remove it. Sand filters will usually just keep recirculating the iron until it either ends up on the bottom of the pool or goes back into suspension. Products that claim to "hold the iron in suspension" are expensive and do not work well.

Test Strips for Water Chemistry Levels (not allowed in most commercial applications): Test strips are available to determine chlorine and pH values as well as all other parameters of water chemistry. These test strips are easy to use but they are only useful as general guidelines and in the presence of high metal concentration in the water or water over 84 degrees they are not reliable.

Record Keeping: When performing water tests, keep a written record of the results. This information is helpful for understanding the dynamics of the pool's system. Over time, you may notice trends and be able to anticipate water needs and keep a tighter control on water quality. This information is also required by the State Department of Public Health.

Summary of Water Chemistry Testing: To insure proper water quality and sanitizing levels of any swimming pool or spa pool, you must have a working knowledge of all parameters affecting water chemistry and must be familiar with water testing equipment. Testing

equipment must be maintained in clean conditions, and fresh reagents used for achieving accurate results. You must record the results of testing activities.

Temperature: Water and air temperature should be monitored and recorded twice daily. There is an abundance of misinformation published about the relationship between air and water temperature. Do your homework and use common sense.

Filtration The water chemistry can be perfect but if the filtration or circulation is inadequate, there can still be problems. Proper filtration is 50% of the water clarity equation. There are 3 main types of filters:

Sand (40 microns)

Cartridge (15-20 microns)

DE (4 – 9 microns)

The smaller the size-number of microns the better the filtration. Assuming the pump is sized properly, DE is the most effective form of filtration. Filters must be cleaned on a maintenance schedule and media changed. Proper monitoring and maintenance is imperative. Many times water conditions warrant the use of more than one type of filter (e.g. sand filters can use cartridge filters as a scrubbing or polishing filter when installed after the filter/pump/heater and before water returns to the pool. A valved piping loop will allow the cartridge filter to be used when necessary.

Liquid chlorine has become a preferred method to treat pool water. Using cheap bleach from the store is not the same as using commercial liquid chlorine. Make sure the liquid chlorine being used has no stabilizers as a base or buffer. Read the label carefully and learn what the terms mean.

All chlorine's/bromine's are not the same, in fact, seldom are any 2 identical. Some use calcium, potassium or lithium for a base. Others use industrial or technical grade sodium. It is not the chlorine that makes one brand superior to another, but the base, the inert ingredients and the processing methods. Some of the chlorines on the market today are not suitable for pool use. So why are they sold? Possibly because people buy them and then buy the "corrective" chemicals to solve the problems they create. A large amount of the advertising for pool chemicals is false and the pool owner/manager is the one who suffers. Learn what chlorine will and won't do and stay with one brand that services the established needs.

The same advice holds true about algaecides, except there are even more products to choose from. Polymer based algaecides seem to work best and have no undue side effects. Again, watch out for the inert ingredients. Algaecides come in different concentrations, the more expensive bottle with the higher % of active ingredients may be the most economical to use in the long run. Also, there is **no such thing** as an "algaecide block" or an algaecide that you use once a month or less often. Stay away from products that promise easy answers.

Many times, **green water** is not caused by algae. It is usually caused by a chemical reaction that knocks the metals out of the water. Sometimes this can be the fault of the type/brand of chemicals used, other times the fault of the filter, then sometimes the problem can be more complex. Regardless of the cause, the problem cannot be solved by adding chlorine, bleach, muriatic acid, clarifiers, algaecides, shock or metal-out. These compound the problem and make it harder to correct. Get a water sample to the nearest reputable pool dealer so they can help correct the problem.

"Shocking" the pool can be best defined as "throwing money down the drain". The term "shock" has been misused more than any other in the pool industry. Procedures that are commonly called shocking are:

1. Adding an Oxidizer: (Potassium Peroxy Monosulphate; brand names Oxykleer or Oxybrite and others) to the water to convert the available chlorine to free chlorine
2. Breakpoint chlorination: raising the chlorine to 10.0 or above (superchlorination)
3. Hyperchlorination: raising the chlorine to 20.0
4. Adding chemicals to start your pool in the summer or close your pool for the winter.

Don't do any of these unless you are experienced with the process and know what is trying to be accomplished.

Note*: If chloramines are being formed in the water most Health Departments will advise Super or Hyper Chlorinating. This sometimes will work, but the pool will be closed down until the pool reaches a swimmable condition, usually 3.0 total chlorine count or less, then letting the water settle back down to 1.5. A more realistic approach is to find out why chloramines are being formed. It may be better to consider a type of filter that helps remove chloramines (DE or cartridge filters as compared to sand filters) or look into an UV (Ultra Violet) system that breaks down chloramines. The type or brand of chlorine being used also needs to be considered.

Never add chemicals to suspend the metals in the water or sequester the metals. Most of the metal inhibitive products do not work and they can actually stop the proper treatment for the water from working for up to a month. They are also very expensive, especially for large pools.

Stabilizing or sun screening the water can save some money over the summer season. Stabilizer is not necessary but it can make sodium based chlorines burn more effectively in the hot sunlight. Stabilizing is something not just done automatically every season because the chemical in stabilizer lasts for years in the water. If too much stabilizer is in the water nothing will take it out; the pool will have to be drained. Test the water for cyanuric acid content to see how much stabilizer is needed. Do not stabilize indoor pools.

To make pool accessories (hoses, vacuum heads, nets, games) last as long as possible, store them out of the direct sunlight when not in use. The ultra-violet rays of the sun cause deterioration of anything made from plastic-type material. Protect filter hoses and filter housing from as much sun as possible. Most commercial accessories and pool covers/liners are made with ultra-violet inhibitors in the material. They cost only slightly more than the standard pool accessory but will last noticeably longer.

When the pump/filter is on a timer to save electricity by turning off at night, the pool will experience a higher chemical usage. After the water has been setting un-filtered for 3 hours the chemical life has been cut in half. More than 3 hours it has been cut by 2/3. So saving \$2 in electricity may cost \$5 in pool chemicals. Lack of proper circulation is the main cause of improper oxidation of chemicals. In addition, pool pumps will last longer if allowed to run continuously.

When adding make up (fresh) water to a pool, add the water directly to the piping before the filter if possible. Adding the water in the pool may cause chloramine problems.

Many times, pool owners/managers are their own worst enemies. They talk to friends who own pools and they say someone else tried this or uses that and it works great; so they try it. **Don't do it!** Very seldom will a person admit to trying something that failed. Many of the "miracle treatments" are urban legends from the manufacturers or re-sellers. People can try a gimmick chemical four or five times and one time it may seem to help but it may have been just a coincidence. Here is some good advice to follow:

1. If something works for you, don't change it. Also, don't expect it to work the same for someone else.
2. Do exactly what your pool professional recommends. If you don't have confidence in your pool pro, change the place you do business. When you have a pool problem, tell your pool pro everything you did. Don't leave out the fact that you added some discount store chemicals. Without all of the facts, the proper solution may not be reached.
3. There is more to taking care of water than adding chlorine and vacuuming. Learn as much as you can, and never assume you know all of the answers. Ask your pool pro for assistance.
4. Never, never listen to the advice of a friend. Don't add stuff to your water unless a pro has recommended it and tested your water first.
5. Keep track of what is spent so at the end of the season you know how much it cost to operate the pool. This is the only way you can prove to yourself that not only is a specific brand of chemicals better and easier to use, but it actually saves money when looking at the entire pool season.
6. For water technician courses contact www.nspf.org or www.starfishaquatics.org/aquatech

NOTE! Many gimmick chemicals are introduced to the pool market each year. Before jumping in to anything new, do research. Most of these chemicals or treatment systems will damage pool equipment, cost more to use, and will not kill all types of dangerous bacteria. Resist the temptation to save a buck. If you feel uncomfortable about asking people in your area you can call your local Department of Public Health, Swimming Pool Division, or call USA Swimming Facilities Division at 719-866-3522 (e-mail mnelson@usaswimming.org). Most of the gimmick chemicals have already been banned for commercial use in pools and spas. Example: <http://aem.asm.org/cgi/reprint/69/5/2505.pdf>

DANGER, WARNING! RWI (Recreational Water Illness): This illness always been around but now it is being is being detected sooner. Chlorine, bromine and other chemicals do not kill it as quickly as needed especially when pH and other water balance factors are not correct.

Some of the causes:

- Changing children's diapers poolside while exposing the baby to pool water without showering after a diaper change
- Not washing hands after using restroom and not showering (with soap) before entering pool
- Swimming with diarrhea
- Aquatic shoes being worn to bathroom and then back to pool
- High-pressure deck washing blowing bacteria into pool water
- Swimming after using the toilet without proper cleaning

Identifying the ENEMY:

- Cryptosporidiosis: Parasite is resistant to germicides and bactericides and can live in the pool water for up to a week; highly contagious; transmitted by swallowing water and people contact; causes dehydration, weight loss, stomach cramps, fever nausea and vomiting; no treatment.
- Escherichia coli (E-coli): Bacteria controlled by proper chlorination; transmitted by swallowing water; causes bloody diarrhea, abdominal cramps, and kidney failure; treated with antibiotics.
- Giardiasis: Parasite can last less than an hour in a properly chlorinated pool; the cooler the water the longer it can survive; transmitted by swallowing water; causes diarrhea, gas, stomach cramps, nausea and upset stomach; treated with prescription drugs.
- Hepatitis A: Virus is mildly resistant to germicides and bactericides and can live approximately 15 minutes in a properly chlorinated pool; transmitted by swallowing water; causes jaundice, fatigue, loss of appetite, diarrhea, fever, stomach pain; vaccine available but no treatment after the fact.
- Legionnaires' Disease / Pontiac Fever: Bacteria killed in less than a minute in a properly chlorinated pool;
- transmitted by inhaling mist from hot tubs or spray features; not contagious; causes fever, chills, cough, aches, fatigue, diarrhea, kidney malfunction; treatable if diagnosed in time.
- Naegleria Infection: Microbe that enters through nose and affects brain and spinal nerves; (rare) this amoeba lives less than a minute in a properly chlorinated pool; causes meningoencephalitis; prescription drugs available if immediately diagnosed.
- Norovirus Gastroenteritis: Virus that has a mild resistance to germicides and bactericides and can live approximately 30 minutes in a properly chlorinated pool; transmitted by swallowing water; causes nausea, vomiting, diarrhea, stomach cramps, flu like symptoms; no treatment specified; people usually recover on their own in 48 hours.
- Pseudomonas Dermatitis: Bacteria controlled by proper chlorination; hot tubs and pools; transmitted by direct skin contact with/in water; causes itching, rash, blisters; not contagious; clears up on it's own in about 48 hours.
- Salmonellosis: Bacteria controlled by proper chlorination; transmitted by swallowing water; causes diarrhea, fever, cramps; antibiotics available for more serious cases.
- Shigellosis: bacteria controlled by proper chlorination; transmitted by swallowing water; causes diarrhea, fever, cramps; treated with antibiotics.

Prevention:

- Post signs warning of the risk of swallowing or putting pool water in mouth
- Enforce showering rules and proper standards for cleanliness
- Test water 3 times a day (or more) for proper chlorine and pH readings
- Make sure all filter systems have fresh media and are properly cleaned on a regular schedule
- Add an Ultra Violet system to water treatment
- Include educational material in all policy and procedure manuals and patron flyers

Fresh Air – Fresh Water

There are a dozen or more opinions on water and air quality and almost all of them have some good points. Over half of the calls to the Facilities Development Department's have to do with poor air quality. The information listed below may help you investigate and solve your specific problem.

First & Foremost: Air quality and water quality are dependent on each other. Air quality is affected by:

- The amount of fresh air that is being introduced into the building every hour. (A 90% change of air every 20-25 minutes works well.)
- The condition of the air handling equipment filters. (The filters should be cleaned or changed every 3 months. There are micro-filters that filter out more air-borne contaminants than the standard fiberglass or paper filters.)
- The type of air handling system. (Do you have a Desert-Air type system that is regularly serviced?)
- Routine maintenance on all pieces of air handling equipment. (Vents and louvers must be checked and lubed at least 4 times a year to make sure they are working properly. Motor belts and fuses also need to be checked.)

If the air smells like chlorine – something is wrong. That acrid smell we sometimes associate with chlorine is usually ammonia. In the swimming pool industry the cause of this odor is called chloramines. Chloramines (combined chlorine) occur when free chlorine combines with ammonia and other nitrogen compounds. This combining process can be accelerated by perspiration, urine, saliva, body oils, lotions and some shampoos/soaps, fertilizers, and industrial or household cleaners. The odor is created when water is not properly balanced. The odor intensifies when swimmers agitate the water, as in kicking or general warm-up swimming. The odor is worse at water level but can be extremely irritating at deck level or in the viewing area. Many times eye irritation is also experienced. Sometimes the water may be hazy, but not always. Many times, the water will appear perfectly clear and the water test for free chlorine and pH reads normal yet there is still a problem with odor and eye irritation.

This has become a widespread problem in indoor pools. People with asthma can find themselves hospitalized if exposed to this type of pool condition for even a short period of time. Outdoor pools have plenty of fresh air and sunshine (ultra violet light) so they are not as susceptible to the chloramines problem.

Chloramines formation can be accelerated by:

- Improper showering before entering pool.
- Urination in the pool.
- A high level of aerobic activity and sweating in the water. (People sweat in the water during exercise.)
- Residues from ammonia based cleaning products that are used on decks or in shower rooms/lavatories.
- Residues from fertilizers used on landscaping (nitrogen based) that get tracked into building.
- Poor air circulation and lack of fresh air introduction into the pool building.
- Over use of "shocking" the pool for maintenance purposes.
- Improper use of certain brands of chemicals not suitable for local conditions.
- Chloramines added artificially by the local water company, a common practice in many cities.

What can be done about the issue of chloramines? The answer can be divided into two parts:

1. short-term solution
2. prevention

Short-term solutions: If chloramines are detected the most common solution is to "shock" the water. This means super-chlorination (break-point chlorination) or raising the level of chlorine in the pool to 10 parts per million. Normally a dry chlorine powder or liquid chlorine is used to achieve super-chlorination. Recent studies show that many times this is not as effective as hyper-chlorination which is raising the level of chlorine to 20 parts per million. These methods

may temporarily “burn out” chloramines but will also necessitate the pool being closed for a few days. More than the normal amount of fresh air will also have to be introduced during this process. Shocking the pool can create a whole new set of problems.

Some success has been realized with a non-chlorine shock additive. Adding an Oxidizer (Potassium Peroxy, Monosulphate = brand names Oxykleer or Oxybrite) to the water to convert the available chlorine to free chlorine can release the available chlorine to free chlorine. If this process is done in the evening, swimmers can usually be in the pool the next morning. Fresh air introduction is still important. There are some new enzyme chemicals that say they help chloramines, but no positive proven results have yet been reported.

Prevention:

Often more than one thing needs to be changed to alleviate the problem. The most common preventative methods are:

- Change the air circulation system to include more fresh air introduction and better turnover or more efficient closed system circulation and dehumidification.
- Evaluate the type and brands of chemicals being used to treat the pool water for both chlorine and pH control
- Evaluate the pool filtration system to see if a filter that filters down to a more effective micron rating (like DE at 4 microns) would help.
- Install a high quality activated carbon filter on the line that supplies fresh water from the city. All water needs to go through this filter before it goes into the pool or the re-circulating system. The carbon filter will remove most of the chloramines add by the municipality.
- Check the labels on all cleaning products to make sure they do not contain ammonia or are not nitrogen enriched.
- Have your staff attempt to get the users of the pool to take showers before entering which is usually required by state health codes.
- Install a medium pressure Ultra Violet (UV) water treatment system that cuts down on the amount of chlorine you have to use and also “breaks down” chloramines. (See information at end of this article about UV)

When does the pool water need to be changed? That depends on:

1. The size of the pool
2. The water temperature
3. The bather load
4. The type and brand of chemicals used
5. The type of filter and the turnover rate

In general, the smaller the pool the more frequently the water has to be changed. Hot Tubs in the 300-600 gallon range need to be drained and refilled at least monthly. Many State Health Departments require that exact schedule. Many specialty pools, such as lessons pools or therapy pools in the 1,500 to 5,000 gallon range need to be drained every 3-4 months. The warmer the water and the higher the bather load the more frequent the water needs to be changed.

Larger pools, such as lap pools and competitive pools can actually go years before needing to be drained. Because of the large surface area of these pools exposed to evaporation, new water is constantly being added. In effect the water is always in a state of renewal. There are pools with perfect water that have not been drained for 4 years or more. Be aware that draining the pool may cause more problems than it solves because of chlorinated city water that will be used to refill pool.

Some things that can shorten the life of the water and necessitate early draining:

1. Chemicals with non-soluble buffers or binders & poorly formulated “inert ingredients”
2. Poor quality filtration
3. Continually “shocking” pool to break up chloramines
4. Users not taking showers before entering pool
5. Chlorine generators using salt to produce chlorine

Problems cannot be ignored. Serious health and safety issues are involved. Everyone who works in an aquatic facility needs to be made aware of the importance of a clean and healthy environment.

Indoor pools are increasingly experiencing problems with “bad air”. HVAC (Heating Ventilating & Air Conditioning) systems are designed to control air temperature. Some of them are designed to control humidity, and air flow with fresh air mix when necessary. They are not air scrubbers, therefore the air quality is directly affected by the water quality; bad water = bad air! Now days “bad air” seems to be coming from chloramines in the water – not chlorine – but chloramines. This is a chlorine compound that cannot burn off in the water. Chloramines are released during evaporation and when the water is agitated. They smell like ammonia and can cause serious respiratory problems both for swimmers, staff around the pool, and spectators in the stands.

Many municipal water companies are artificially adding chloramines in excess of 1.5 ppm (parts per million) to the city drinking water supply. In these instances, we highly recommend that pools look into installing an activated carbon filter for their makeup water. This will drastically reduce the amount of chloramines being added to the pool on a daily basis when fresh water is added.

Explanation: Many major municipalities and surrounding areas have switched their drinking water disinfection from chlorine to chloramine. Chloramine, a chlorine-ammonia compound, is more stable in the water system than chlorine, and only slowly breaks down into chlorine and ammonia. While both methods, common nationwide, may sound ominous, there's little to worry about, except in special cases. Chloraminated water in dialysis (medical) fish tanks, and in certain business uses (swimming pools) will need to be specially filtered and treated. Chloraminated water can also cause rubber parts in plumbing, pumps, filters, and water heaters to degrade more quickly. Chloramine-resistant replacement parts may be available. Chloramine disinfection, however, professes to be preferable to chlorine for almost all uses: drinking, cooking, bathing, gardening, and pets. Your water's taste may improve, the carcinogens called trihalomethanes formed by chlorine will be reduced, and more pathogens will be removed due to chloramines' extra stability. As of January 1, the EPA has begun regulating chlorine, chloramines and byproduct levels in the drinking water of all communities, adding a nationwide level of oversight. Chlorine and chloramine levels are capped at 4 parts per million, but there is no cap set for ammonia. With some municipalities chloramine programs chloramine and chlorine levels are capped at 2 ppm and ammonia at 0.5 ppm. Others are well above this level. Chloramine and the small amount of ammonia produced in breakdown are neutralized in digestion, but chlorine can lead to eye and nose irritation, anemia, stomach discomfort, and damaged hair and skin. While the EPA's regulation, and chloramines' stability, should minimize all these symptoms, there are solutions if you're still worried or if you're one of the special cases mentioned above. Standard water filtration may not really reduce and definitely not eliminate chloramine and chlorine. While chlorine can be eliminated through boiling water or by letting it stand for a few days, neither method will eliminate chloramines. To eliminate chloramines in swimming pools, you will need a high quality granular

activated carbon filter for source water (make-up water) and a dechloraminating system like "medium pressure" Ultra Violet.

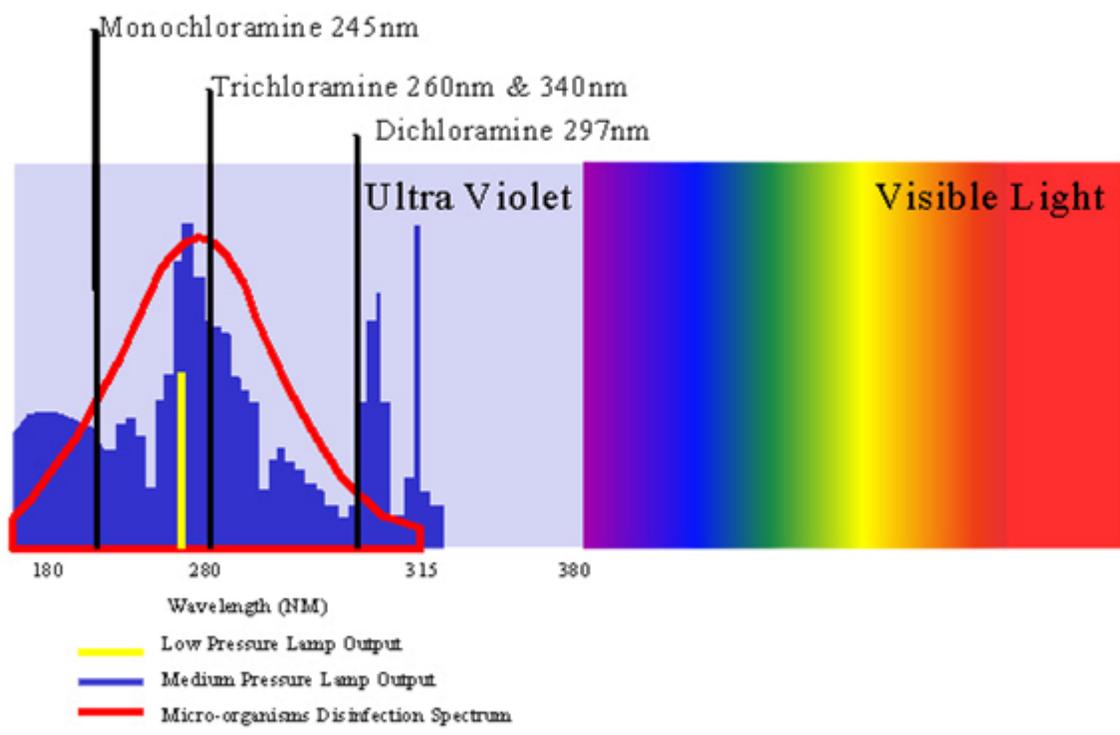
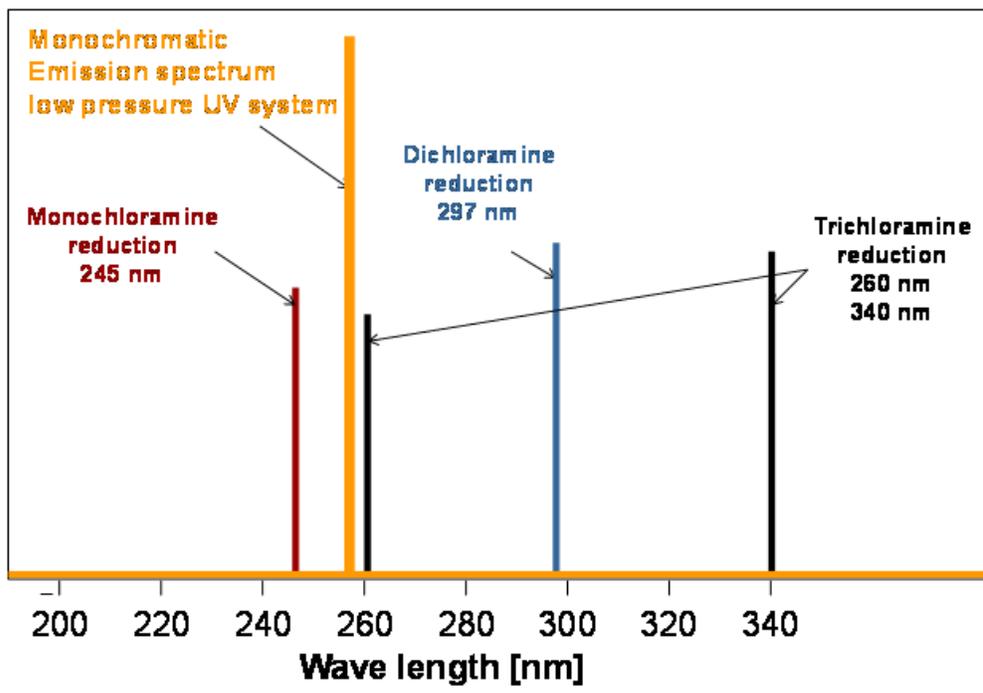
USA Swimming's Facility Development Department opinions on UV water treatment for chloramine destruction:

After attending the past 4 World Aquatic Health Conferences sponsored by NSPI and having a composite 60 plus years experience in the aquatic industry within the department, we are of the opinion that Medium Pressure UV may be the most effective system for broad spectrum chloramine destruction in indoor pools. We have reviewed well over 50 articles defining research and opinions comparing Low Pressure and Medium Pressure UV. There have been articles published in Aquatics International magazine, the NRPA newsletter, plus various other periodicals – a sampling attached. Until an unbiased independent research project is completed and we can review the protocols and conclusions, we can only strongly encourage you to do your own research as to which system fits your needs.

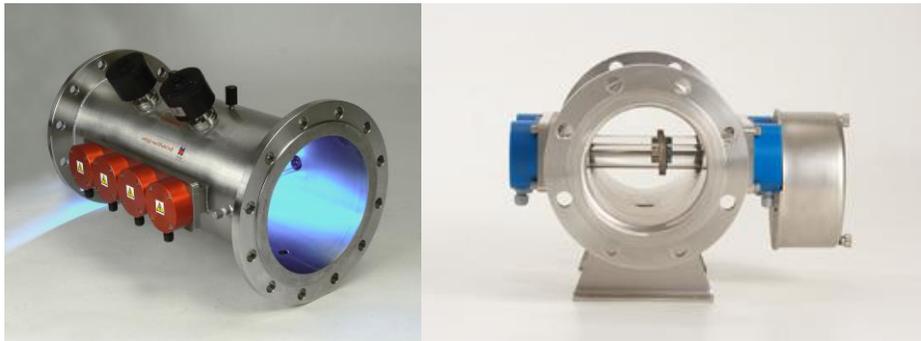
The most popular industry articles from the Medium Pressure contingent state that Low Pressure does not put out the wavelength to destroy di or trichloramines. According to the information, the Low Pressure system is only effective in eliminating monochloramines and thus will control the other 2. In our opinion, this is not likely what will happen. Water in a pool (if balanced perfectly) will pass through the UV system approximately every 6 hours. That means that the water in the pool has plenty of time to develop monochloramines therefore creating the di's and tri's during the time in the pool with the bathers. This will happen - it's very natural. When this water passes through the UV, the mono's might be destroyed but it leaves behind the di's and tri's which get returned to the pool. Current best information states that the di's and tri's are the worst culprits of odor, corrosion, and irritation.

Any time we see information about Low Pressure UV they make the case that their system cannot eliminate di's and tri's but rather will control them by reducing the monochloramines. Both Low Pressure and Medium Pressure are effective at killing bacteria – we just have not seen a comparison of effectiveness. Back to our main concern which is chloramines - di's and tri's will be created in the water in the pool when the chlorine bonds with organic material (hydrogen or nitrogen). The water in the pool will have many hours to form these compounds before ever seeing the UV system again. This is probably the best evidence why we think the Medium Pressure may be better. The presentations we reviewed gives the wavelengths required to destroy all 3 chloramines - and a Low Pressure lamp can only produce the wavelength to reduce the monochloramines. The Medium Pressure lamps produce all 3 wavelengths required.

Our current position is - why take a chance on eliminating only the monos when we all know di's and tri's are present and cause issues for an indoor facility? It's also important to note that 3 of the 4 suppliers (Astral, Hanovia, and ETS) of UV systems have chosen Medium Pressure units.



We have to use our best judgment when advising our members who are considering UV. We are not publishing articles to the general public – our research projects will not be completed until fall 2008. We stress that we are advising our members. We are open to reviewing any new information on this subject and are vigilant in our gathering of information. We do not recommend one manufacturer over another and even though we currently believe Medium Pressure may be the best solution to chloramine destruction, we encourage all of our clubs to do their own research on this controversial subject.



Water treatment is almost always the problem when the air is “bad”. Improperly balanced chlorinated pools can cause asthma, according to research from several sources. “Results show that nitrogen trichloride (produced by high levels of available Chlorine) is a cause of occupational asthma in swimming pool workers like lifeguards and swim instructors,” says Dr. K. Thickett of the Occupational Lung Diseases Unit at the Birmingham Heartlands Hospital.

The problem isn’t the chlorine, but what chlorine turns into when combined with organics. The organics are contributed by bathers in the pool in the form of sweat, dander, urine and other organics. The chlorine reacts with the organics and produces nitrogen trichloride, aldehydes, halogenated hydrocarbons, chloroform, trihalomethanes and chloramines. If these sound like dangerous chemicals, they are.

Solutions? Dr. John Marshall, of the Pure Water Association, an American consumer group campaigning for safer drinking water, states: “It shows we should be paying more attention to the chemicals we put in our water and we should be looking for other alternatives to high levels of chlorination.” There are options that are safe and non-toxic, such as treating water with ultra violet light. With medium pressure Ultra Violet systems there is a higher initial capital cost to the swimming pool compared to chlorine feeders. However, over the life of the pool Ultraviolet technologies reduce the on-going operating and maintenance costs. These costs can be significant. Chlorine is famous for destroying pool infrastructures, rusting out ventilation systems and destroying pool liners and coatings etc. UV poses no such problems. The UV pool will be much cleaner, which means dirt, grease, oils, organics and other materials will wind up in the filter system much faster than with highly chlorinated systems. If the filter and strainer maintenance is not stepped up accordingly, the pool recirculating system will slow down and the pool will actually look dirtier than with chlorine. However, proper maintenance of the filter system will solve this problem.

Part of the problem in adopting UV is that many engineers, architects, pool builders and designers are not familiar with the technology. Since engineering, architectural and other technical trainings have all been geared to chlorine, it takes re-education to now apply UV. Many people in these industries are reluctant to “shift gears” and take the time to educate themselves about the proper application of UV. Chlorine is a complex man-made chemical that found original use in the infamous mustard gas of the First World War. Chlorine is also an entrenched technology. It has been widely used in North America and was first adopted at the turn of the century. It is still the reigning champion of disinfection and has many supporters in the chemical and swimming pool industries.

It is the organics that cause problems when combined with chlorine. By reducing the organic load, the Europeans keep the chloramines (the cancer causing substances) at a very low level. In European swimming pool systems, the same thought process prevails. In German DIN standards, for example, the strategy is to use a large "surge pool" that the public doesn't even see to apply ozone or disinfection chemicals. The disinfection byproducts are then removed by various filtration processes prior to the water being returned to the pool with a slight dose of chlorine. Under these standards, swimming pool water is essentially treated to drinking water standards.

The North American model developed under much different circumstances than the European. In North America, chemicals were adopted wholeheartedly around the turn of the century as the answer to the larger, more expensive European models of water treatment. Engineers here found they could build water treatment plants and swimming pools at greatly reduced capital costs if they used what were then considered miraculous chemicals to treat water. And, for the most part, the systems did what they were designed to do and that was to kill micro-organisms that could lead to sickness and death. What they didn't anticipate was that chemicals like chlorine would have very serious byproducts that become health hazards themselves.

In North America we are now stuck with swimming pools that in Europe would be considered surge tanks. The challenge is to evolve UV technology that can retrofit a large installed base of swimming pools in an economical manner. These systems are now starting to appear in the marketplace in increasing numbers and the success rate of positive results is amazing. Once pool owners add medium pressure UV, they realize that they no longer have to put up with red eye, rashes, unbreathable air and the health consequences of over chlorinated pools.

As the technology becomes more prevalent, expect to see more expertise at the local pool builder or pool maintenance companies. However, many of these companies rely on repeat sales of chemicals. These companies are likely to be highly resistant to UV systems as after-sales revenues will drop. However, for pool maintenance companies that are being paid to keep pools clean, UV is great. They should spend less time maintaining pools, the pools will be cleaner and the water more appealing. In the future, as UV prices drop slightly as more consumers become educated, demand for systems will definitely increase.

UV does not replace chlorine but allows the running of a lesser residual chlorine reading and allows the chlorine to be used 100% for disinfecting rather than go into combination with other elements. Your State department of Public Health will have a copy of your states regulations and limitations for using UV in commercial pool applications. Each state may have different codes and getting them to lower their required minimum chlorine levels can be very challenging.

What is ultraviolet or UV? Ultraviolet light is part of the light spectrum, which is classified into three wavelength ranges:

- UV-C, from 100 nanometers (nm) to 280 nm
- UV-B, from 280 nm to 315 nm
- UV-A, from 315 nm to 400 nm.

UV-C light is germicidal, i.e. it deactivates the DNA of bacteria, viruses and other pathogens and thus destroys their ability to multiply and cause disease. It also breaks down chloramines that develop in indoor swimming pool water.

Specifically, UV-C light causes damage to the nucleic acid of microorganisms by forming covalent bonds between certain adjacent bases in the DNA. The formation of such bonds prevents the DNA from being unzipped for replication, and the organism is unable to reproduce. In fact, when the organism tries to replicate, it dies.

Ultraviolet technology is a non-chemical approach to assist disinfection. In this method of disinfection, nothing is added to the pool water except chlorine and pH control chemicals. This makes this process simple, inexpensive and requires very low maintenance. Ultraviolet purifiers utilize germicidal lamps that are designed and calculated to produce a certain dosage of ultraviolet (usually at least 16,000 microwatt seconds per square centimeter but many units actually have a much higher dosage.) The principle of design is based on a product of time and intensity; they must have a certain amount of both for a successful design.

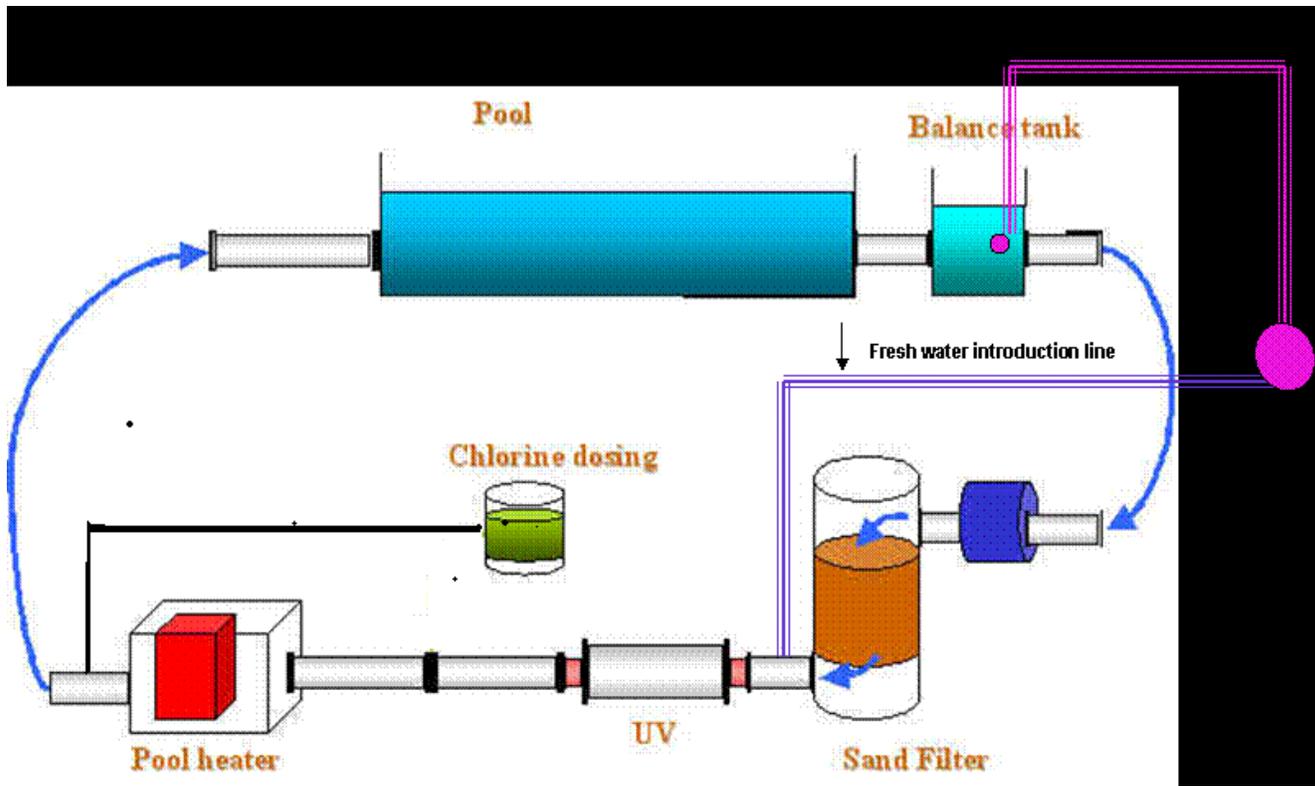
How do ultraviolet purifiers work? Short wave pressure mercury vapor tubes that produce ultraviolet wavelengths are installed in a water tight chamber. The UV system is installed after the pool filter and the return water to the pool is circulated 100% through the tube. Approximately 95% of the ultraviolet energy emitted is at the mercury resonance line of 254 nanometers. This wavelength is in the region of maximum germicidal effectiveness and is highly lethal to virus, bacteria and mold spores. Therefore, the water or air that passes through the chamber is exposed to the germicidal UV light and the genetic material of the micro-organisms is deactivated, which prevents them from reproducing.

The CDC and others are currently conducting tests for the effectiveness of UV in killing germs and breaking down chloramines. There are still discussions whether low pressure UV is as effective and efficient as medium pressure. Bottom line is that the initial UV test results are good and many pools that have installed UV have seen a 100% turn around in their air and water quality almost immediately. The Facilities Department of USA Swimming strongly recommends that all indoor pools have UV installed.

The Facilities Development Department of USA Swimming has identified 3 preferred providers for UV systems. You can contact us for information about these manufacturers and distributors. We have also developed a 20 minute CD power point with audio called the **Safe-WAY (Water Air & You)**.

E-mail mnelson@usaswimming.org for information.





Welcome to the FILTER ROOM literally the heart of the pool system. If the heart stops or malfunctions the pool does the same. You need to know the basic components of this room and not be intimidated by all of the mechanical stuff:





There are basically 5 parts to any filter room – from left upper corner clockwise:

- The heater
- The pump
- The filter
- The chemical treatment system
- and all of the valves and pipes

Since no 2 filter rooms are identical – most not even similar – you have to learn concept rather than try to memorize function. So here we go – ***pool circulation 101***.

The pool is full of water and it has to be treated both physically and chemically. This cannot be done in the same room as the pool therefore we have to transport the water out to a special room – treat it – then ship it back to the pool. This goes on 24/7 and should not be interrupted.

There are three ways to get the water from the pool to the filter room:

1. from the surface of the pool
2. from the bottom of the pool.
3. from a vacuum hose while cleaning the pool

#1 from the surface – this can be accomplished by port boxes or holes in the wall at the water level. These are called skimmers. They have baskets under the deck lid that trap hair and lint and large chunks of dirt. This protects piping from being clogged. Baskets have to be cleaned at least once a week.



It can also be accomplished by a trough along the outer top edge of the pool around the total perimeter. These are called gutters.



Both skimmers and gutters take surface water from the pool and get it to the filter system by piping. The larger pools usually have gutters. There are many types of gutters – some get the water off the surface more effective and efficiently than others – but their primary function is the same. Get the water to the filters.
 #2 from the bottom – always multiple drain boxes in the deepest part of the pool. These drains are connected to each other so no suction entrapment can occur.

Usually more water is circulated through the bottom or “main drains” than through the gutters or skimmers. The amount of water coming from each can be controlled by adjusting valves in the filter room.



#3 from a vacuum hose – this can be attached to a special fitting in the wall or through the skimmer box. This method of circulation is used only when cleaning the pool. Valves are usually turned in the filter room to decrease water flow from the main drains or surface and increase suction through the vacuum line. The proper amount of water must be getting to the pump which is why other lines are not “shut off” only partially closed by valve settings.

Once the water is transported from the pool to the filter room, 3 major things happen.

1. It is filtered which physically removes suspended matter in the water
2. It is chemically treated – this kills bacteria and organisms that don’t belong in pool water
3. It is heated
 - Optional - It can be treated with UV to insure organisms are neutralized and organic chloramines are broken down

The transport mechanisms are PVC pipes. The transport power is supplied by a pool pump comprised of a hair strainer basket, an impeller housing, and a motor. The transport direction/path is controlled by valves.

There are different types of valves found in a filter room. The most commonly used is a ball valve.



Normally when the handle of the valve is pointed with the pipe as pictured above the valve is open. If the valve is at a 45 degree angle to the pipe it is partially open and is controlling water flow – probably for balancing purposes. If the valve handle is 90 degrees across the pipe – it is closed.



In this picture numbering the valves from left to right – the 1st and 3rd valve are closed – the second valve is open – the 4th (larger valve) is 90% open.

On larger pipes – usually over 4" diameter - a $\frac{1}{4}$ or $\frac{1}{2}$ turn butterfly valve can be used. These come in a variety of sizes and styles. The #4 valve in the above picture is a butterfly valve.



Other types of valves in the filter room may be the common gate valve.



This usually turns the city (make up) fresh water supply off and on to fill the pool. Clockwise rotation of the handle closes the valve – counterclockwise rotation opens the valve and turns on the water. This is how the pool water level is controlled. Pool water level can be critical to proper operation of pool equipment.



There are also smaller valves that can bleed air from filters and control the flow of chemicals into PVC lines. The same rules apply about handle direction as related to off/on.

Some sand filters have multiport valves. They control the direction of the water through the filter and sometimes can change what pipes the water is directed through. These valves have multiple settings. For normal filtration, the valve needs to be set on FILTER as pictured below. Never move the valve handle while any pumps are on. All water pressure must be stopped. Other settings are

BACKWASH (for cleaning the filters)

RINSE (for repacking the sand after Backwashing but before going back to filtering)

CLOSED (all ports shut off)

RECIRCULATE (for by-passing the filter but still operating the pool – usually used for filter repairs)

WASTE (for draining the pool without the water going through the filter)



On larger pool you may find automatically operated valves. These do not have handles and are controlled by air switches or computers.



Since the gutters and skimmers have separate pipes from the main (bottom) drains, they will also have their own valves in the filter room. A single pump can draw water from multiple lines and then feed the water through the hair strainer basket and trough more lines into a filter.





Once the water is filtered the water can be routed through a heater that is thermostatically controlled. Large pools usually have gas heaters – small pools can have electric or gas.



After the heater the chemicals are introduced to the water. There are many ways this can be done. Most pools have automatic pumps controlling both chlorine and pH chemicals all controlled by a sensor unit that can adjust the pumps speed according to what the water needs. These need to be cleaned and manually checked regularly. These do not eliminate the necessity for testing water 3 times a day.



If Ultra Violet is used it needs to be after the filter but before the chemical introduction. At the end of all of this treatment the water is returned to the pool through some sort of inlet system. Sometimes the inlets are in the pool wall – sometimes in the pool bottom – sometimes in the lower exterior part of the pool gutter. Point is that the water gets back to the pool so the pool level stays consistent and clean water is always being fed in to pool. The turnover rate or the amount of time it takes to filter and treat all of the pool water should be at

least every 4-6 hours. Special use pools e.g. therapy pools or learn to swim pools can be designed with turnover rates as aggressive as every hour. Flow rates are controlled by pipe size, pump size, and filter size.

Behind the scenes at the Aquatic Facility Almost every business is a people business. Those responsible for making both the day-to-day and major decisions need to be as informed as possible about the environment where people will work and play in the water. Whether looking at a facility through the perspective of the potential buyer or renter, or through eyes of the person now responsible for the safety and well being of patrons, the premise is the same.

The first impression – As soon as someone walks into a facility, the impression-making will begin. Every area will be judged with 3 criteria in mind. In their priority of perceived importance to the patron:

1. Aesthetics
2. Safety
3. Functionality

Aesthetics – How the general areas of the facility LOOK and SMELL and FEEL.

Under LOOKS we include:

- Lighting
- Color schemes
- Cleanliness
- Signage and bulletin boards
- Furnishings – Fixtures – Equipment
- Staff apparel and presentation
- General facility layout
- Information and assistance areas well marked
- Trash receptacles well placed throughout the facility
- Clocks and TV's and Mirrors in logical and user-friendly locations
- Décor – pictures and colorful appropriate decorations

Under SMELLS we include:

- Chlorine odors
- Cleaning odors
- Bathroom and locker odors
- Health club odors
- Food odors

Under FEELS we include:

- Various room temperatures in different zones of the building
- Air flow or breezes people can feel
- Humidity
- How are entrances and fresh air coming into building handled?
- How is noise control and reduction handled?

Safety – How all areas of the facility meet codes and protect patrons.

- Are floors non-skid in proper areas and unobstructed in all public areas?
- Do all public areas comply with ADA codes?
- Are the “WET” and DRY” areas segregated and appropriately marked?
- Are chemicals stored properly in secured areas away from public access?
- Are NON-PUBLIC areas marked with warnings and doors kept locked?
- Are all emergency exits, fire extinguishers and alarms, AED’s, SHARPs containers, etc. easy to locate and clearly marked?
- Are the outside areas, entrances/exits, sidewalks, kept clear and clean?

Functionality – Does the building layout make sense to the average user? Are all amenities easy to find and use?

- Is the first thing people see inside the main entrance the information desk with a person to greet and help them?
- Do the members/users areas have controlled access so the general public cannot simply walk into them.
- Are there adequate bathrooms for the general public, members, family changing areas, caregiver and member areas, and wet and dry segregated shower/changing rooms?
- Do the pools have safe and convenient access in the form of stairs, ramps, lifts, etc.?
- Are pool decks kept clear of equipment and obstructions?
- Are there staff areas or stations that are easily accessible to the patrons?
- Are there dry viewing areas for aquatic activities so guest can watch members without getting wet or walking in wet areas?

Non-public areas – The safety and comfort of the staff is just as important as that of the members or patrons. The staff will be in the facility many more hours

per day/week than any member. Here are some of the things that need to be considered:

- Staff bathrooms and changing areas need to be segregated from the public. At least 2 are needed (Men's and Women's) and they should include a bathroom – showers – and lockers with changing area.
- Staff break rooms are suggested. This should include a couch, table and chairs, microwave, coffee maker, refrigerator, computer station with internet access, first aid station, TV, emergency radio, etc.
- Staff should have access to a washer and dryer in the facility.

Specialty areas – These are areas that only properly trained people should be in. They include:

- HVAC and building operational equipment rooms
- Electrical rooms
- Sprinkler system rooms
- Computer router rooms
- Storage rooms for cleaning equipment and cleaning chemicals
- Pool equipment and filter rooms
- Pool chemical treatment rooms
- Record storage areas and private offices

The POOL – The areas of a pool need to be understood from a practical operational standpoint.

- The tank itself. Most pools are constructed from:
 - Gunite or shockcrete - concrete that is sprayed from machine with a hose and nozzle. The surface is then plastered and a protective coating applied.
 - Concrete that is poured from a truck into forms that have been built – usually out of wood. Then the pool is painted to make it waterproof.
 - Fiberglass walls with a concrete bottom which is painted.
 - Steel walls with a protective coating or liner. A concrete bottom is usually incorporated into this design then coated like the walls.
 - Concrete block walls with a poured concrete bottom with a liner on walls and bottom.
 - Pre-cast concrete walls with a poured bottom with a liner for bottom and walls.
 - Gunite – concrete – steel with tile installed on walls and bottom



- The tank needs to be checked periodically for worn spots or cracks.
 - Gunite pools will need to be re-plastered or coated every 4-6 years
 - Concrete pools need to be repainted every 2-4 years and the same type of paint must be used as the original coating or the paint will peel.
 - Chlorinated rubber enamel paint
 - Epoxy (2 part) paint
 - Acrylic paint
 - How long the pool is allowed to dry before painting and cure after painting will determine how long it will be before repainting is necessary
 - Fiberglass will last 5 years or longer before maintenance is necessary. Many times fiberglass has problems with resin bubbles and spots in the walls.
 - Pools with liners can last from 10 -12 years before liner replacement is necessary.
 - Tile needs to constantly be inspected and re-grouting tile can be every 3-5 years. Water chemistry plays a big part in the life of the grout.

- Leaks can happen in any pool. The integrity of the circulation system is dependent on the plumber's quality of workmanship. The more pictures of piping runs taken during construction, the easier it will be to locate potential problem areas underground.
- The pool deck equipment should be made from Type 304 or Type 316 stainless steel. These steel pieces need to be cleaned every 3 to 4 months or when rust spots appear. The steel is usually not rusting but rather droplets of water evaporate and leave rust colored deposits which build up on the surface of the steel. If not cleaned this will pit the steel and permanently mar the finish.
For stainless steel – wipe down rail or pole with a scotch guard pad.



Then wipe poles with damp towel (good quality paper towels also will work).

Then apply a liquid silicone car wax – any brand will do as long as it is silicone based



Wipe away excess wax after a few minutes. This cleaning and recoating process is usually necessary 3-4 times a year.

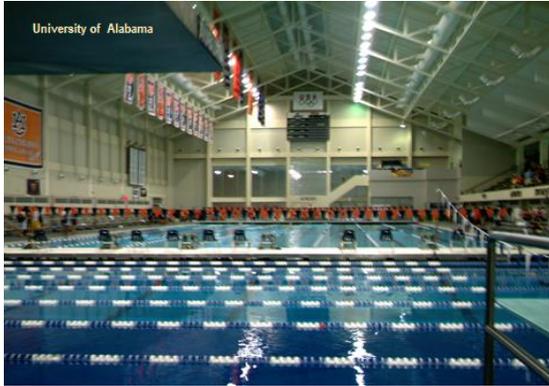
- Other equipment that needs to be periodically inspected and cleaned are:
 - Gutters and Skimmers
 - Diving boards, platforms, stairs, railings, etc.
 - Moveable bulkheads and their related equipment
 - Doors and all hardware and door jams
 - Safety equipment
- The filter room is the heart of the pool. All of the operational equipment needs to be inspected weekly and routine maintenance is an absolute necessity. \
 - The pool pump – will need to have the bearings lubricated on a maintenance schedule. Only a marine quality lubricant

should be used. The pump motor may need to be re-wound after a few years of service. The pool pump should be inspected annually by a professional.

- Pump strainer baskets need to be cleaned at least every time the filters are backwashed or cleaned. A back up strainer basket should be kept alongside the pump. The rubber gaskets and any o'rings should be lubricated with a silicone based lubricant. Never use Vaseline or WD-40 around chlorine water.
 - The pool filters need to be cleaned when appropriate. This is usually called backwashing and is monitored by pressure or vacuum gauges. The filter media will not last forever and usually is cleaned chemically every year and replaced every 3-4 years.
 - Pipes and valves need to be inspected every week or so. A leaky pipe or a sticking valve never fix themselves. Leaks are the sign of a potential major problem. Fix it immediately.
 - Pool heaters experience the most wear and tear of any equipment. The life expectancy of a pool heater is 3 to 5 years before a major overhaul is necessary. If you have a heater with titanium heat exchangers, then the repairs may be fewer and further between. The pool heaters need to be inspected by a professional every 6 months. Replace parts before they break.
 - Ultra Violet units – simply a necessity for indoor pools. The bulbs will burn out so you need to stock at least one back up bulb for each unit. These also need to be inspected by a professional every 6 months.
 - Automatic chlorinator units. These need to be cleaned every month and inspected every time the filter is backwashed. Spare parts need to be on the shelf so the equipment can be repaired immediately. Stay away from saline generators and ozone units. Stick with chlorine/bromine and Medium Pressure UV for indoor pools and just Chlorine for outdoor pools.
 - Shower and bathroom water heaters – these seem to go unnoticed until one stops working. Then it is a catastrophe. Have these inspected by a professional every year.
- HVAC – Heating Ventilation and Air Conditioning units. There will be at least 2 different types of units and multiple versions for each appropriate area.
 - Regular heating and air conditioning for dry areas and shower rooms.

- These need to be inspected yearly by a professional and the air filters need to be changed every 3 months.
 - If the units have exterior vents to bring in outside air these vents need to be cleaned every year and the armatures on the vents lubricated and inspected.
 - Back up fuses need to be stocked for all units.
 - Fan and blower motors need to be lubricated according to suggested maintenance schedules
 - Dehumidifiers and heat recovery systems for the aquatic environment.
 - These units are designed to dehumidify and control the temperature not scrub the air. The pool water must be kept in balance and free of chloramines for these units to work effectively. Clean water promotes fresh air. If there is a chlorine smell there is a problem with the water.
 - These units need to be inspected every 6 months (at the minimum). Filters, compressors, belts, etc. all need to be carefully monitored so the units remain 100% functional.
 - Ducts and vents need to be cleaned yearly and vents may need to be adjusted if necessary.
- Lighting – different situations may require phased lighting
 - Lighting in public areas should be adequate and meet codes. T-3 and T-8 lights are the new energy efficient recommendations. Indirect lighting has also become popular.
 - Lighting in the pool should have at least 2 phases separately controlled. Daily programming requires 30 to 50 ft. candles at deck level. Event lighting needs 75 to 100 ft. candles. Therefore banks of lights should be on separate switches/breakers so daily operations are on one bank of switches and event lighting on another that can be added to daily lighting requirements.
 - If a bulb is out it needs to be replaced immediately not “when someone can get to it”.





University of Alabama



Florida Univ. West



Lundquist Center - Atlanta GA.



Georgia Tech.



Greensboro NC



Triangle Aquatic Center - Cary NC



Pearland TX - Programming Pool



San Antonio NISD



TCU - Texas

In the last 2 years the Facilities Development Department has been instrumental in helping pools with solutions to over 120 air and water quality challenges, 65 renovations, 20 saving pool scenarios, 35 new pool design projects in the planning stages and 16 new pool openings. This makes our 10 year total of 118 new aquatic projects completed and open along with over 4200 members and industry questions answered.

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