AQUATIC TRENDS AND CONSIDERATIONS FOR CITY OF DURHAM AQUATIC MASTER PLAN

Presented by:
RATIO and Counsilman-Hunsaker
August 2016
RATIO offers a wealth of experience in the higher education, community, life sciences, workplace, lifestyle and cultural marketplaces.


Staff of over 100 Professionals.

Studios in Indianapolis, Champaign, Chicago, and Raleigh.
45 Years of Experience

27 Team Members
  • Swimmers
  • Pool Managers
  • Waterpark Enthusiast

4 Locations: St. Louis, LA, Denver, Dallas
1000+ Aquatic Facility Design
200+ Aquatic Facility Studies
30+ Athletic Business Awards
PROCESS OVERVIEW
Aquatic Master Planning Process

- Phase 1 - Data collection
- Phase 2 – Conceptual Plan Options
- Phase 3 – Conceptual Plan Recommendations
- Phase 4 – Final Master Plan
COMMUNITY UNDERSTANDING
<table>
<thead>
<tr>
<th>PHASE 2 CONCEPTUAL PLAN OPTIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prepare up to 3 Concept Plan Options (6-year plan)</td>
</tr>
<tr>
<td>Prepare up to 3 Concept Plan Options (10-15-year plan)</td>
</tr>
<tr>
<td>Prepare Preliminary Option of Probable Costs</td>
</tr>
<tr>
<td>Develop Analysis of Revenue Potential &amp; Expenses for Each Option</td>
</tr>
<tr>
<td>Provide Recommendations on Energy Efficiency &amp; Best Management Practices</td>
</tr>
<tr>
<td>Finalize Needs Analysis</td>
</tr>
<tr>
<td>Stakeholder Meetings</td>
</tr>
<tr>
<td>Create Promotional Documents for Advertisement</td>
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<tr>
<td>Advertise for Public Meetings &amp; Events</td>
</tr>
<tr>
<td><strong>Public Workshop #2 - Tool Box of Options</strong></td>
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<tr>
<td><strong>Deliverable: Conceptual Plan Options</strong></td>
</tr>
<tr>
<td>PHASE 3 CONCEPTUAL PLAN Recommendations</td>
</tr>
<tr>
<td>----------------------------------------</td>
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<tr>
<td>Present Conceptual Plans to Stakeholder Groups</td>
</tr>
<tr>
<td>Refine Recommended Concept Plans</td>
</tr>
<tr>
<td>Finalize Opinions of Probable Cost</td>
</tr>
<tr>
<td>Evaluate Service Areas for Each Concept Plan</td>
</tr>
<tr>
<td>Prepare Matrix for Site Selection</td>
</tr>
<tr>
<td>Provide Economic Development Guidance (P.25, alternative funding strategies, bond issue strategy)</td>
</tr>
<tr>
<td>Provide Case Studies (projects resulting from alternative funding strategies)</td>
</tr>
<tr>
<td>Create Promotional Documents for Advertisements</td>
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<tr>
<td>Advertise for Public Meetings &amp; Events</td>
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<tr>
<td><strong>Public Open House - Reveal the Plan</strong></td>
</tr>
<tr>
<td>Deliverable: Final Recommended 5-Yr. Concept Plan</td>
</tr>
<tr>
<td>Deliverable: Final Recommended 10-15 Yr. Concept Plan</td>
</tr>
<tr>
<td>Deliverable: Opinion of Probable Cost for Each</td>
</tr>
<tr>
<td>Deliverable: Recommended Facility Service Area for Each</td>
</tr>
<tr>
<td>Deliverable: Matrix of Site Selection Criteria</td>
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</table>
## PHASE 4
### FINAL MASTER PLAN

<table>
<thead>
<tr>
<th>Task</th>
<th>Duration</th>
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<tbody>
<tr>
<td>Prepare Final Master Plan Report</td>
<td></td>
</tr>
<tr>
<td>Prepare Presentation of the Master Plan &amp; Public Process for City Council</td>
<td></td>
</tr>
<tr>
<td>Create Promotional Documents for Advertisement</td>
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<tr>
<td>Advertise for Public Meetings &amp; Events</td>
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</tr>
<tr>
<td><strong>Public Meeting #4</strong>&lt;br&gt;(presentation to City Council at work session)</td>
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<tr>
<td>Refine Master Plan</td>
<td></td>
</tr>
<tr>
<td><strong>Deliverable: Final Master Plan Report</strong></td>
<td></td>
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<tr>
<td>Meetings with City Staff</td>
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</table>
Existing Facilities

• Long Meadow Pool – 1963 (53 years)
• Forest Hills Pool – 1926 (90 years)
• Hillside Pool – 2000 (16 years)
• Edison Johnson Aquatic Center – 1993 (23 years)
• Campus Hills Aquatic Center – 1990 (26 years)
• East End Park Sprayground – 1999 (17 years)

Typical life of an aquatic center is 30-50 years. Major renovations are required every 10-15 years in order to keep up with changes in demographics and community expectations.
Types of Obsolescence

Physical Obsolescence
• Aging Facility
• Codes and Standards

Functional Obsolescence
• Definition of Aquatics
• User Expectations
Change in Codes and Standards

- New Knowledge
  - Chloramines
  - RWI’s
- Modern Technologies
  - LEED
  - Reduced Maintenance
- Industry Expectations
  - Regulatory Agencies (NCAA, FINA, etc.)
  - User Environment
Change in Experience

- Entertainment value
- Extreme
- Creature comforts
- Activity specific design solutions
- Increased customer service
- Active and Passive Recreation
AUDIT RECAP

• **Long Meadow Pool, Forest Hills Pool** - both exceed industry standard lifespans.

• **Hillside Pool** - can potentially extend its lifespan up to 25 years with appropriate leak repairs.

• **Edison Johnson Aquatic Center, Campus Hills Aquatic Center** - dehumidification units should be replaced.

• **East End Park Sprayground** – Some repairs recommended

• $2,374,225 total in recommended repairs and renovations.
DEMOGRAPHICS
2015

POPULATION
• 3 Miles – 92,100
• 3-5 Miles – 91,200
• 5-10 Miles – 172,700
• 10-15 Miles
• 15 - 25 Miles
## MARKET AREA POPULATION BY DISTANCE

<table>
<thead>
<tr>
<th>Radius</th>
<th>Population</th>
<th>Average Annual Change</th>
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<tbody>
<tr>
<td></td>
<td>Number (000's)</td>
<td>Percent of Total</td>
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<tr>
<td>0 to 3 Miles</td>
<td>84.5</td>
<td>6.4%</td>
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<tr>
<td>3 to 5 Miles</td>
<td>80.2</td>
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<tr>
<td>5 to 10 Miles</td>
<td>152.1</td>
<td>11.5%</td>
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<tr>
<td><strong>Subtotal</strong></td>
<td><strong>316.9</strong></td>
<td><strong>23.9%</strong></td>
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<tr>
<td>10 to 15 Miles</td>
<td>244.2</td>
<td>18.5%</td>
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<tr>
<td>15 to 25 Miles</td>
<td>762.1</td>
<td>57.6%</td>
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<tr>
<td><strong>Subtotal</strong></td>
<td><strong>1,006.3</strong></td>
<td><strong>76.1%</strong></td>
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<tr>
<td>Total (0-25 Miles)</td>
<td>1,323.2</td>
<td>100.0%</td>
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</table>

**Durham, NC**

<table>
<thead>
<tr>
<th></th>
<th>Number (000's)</th>
<th>Percent of Total</th>
<th>Number (000's)</th>
<th>Percent of Total</th>
<th>Number (000's)</th>
<th>Percent of Total</th>
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<tbody>
<tr>
<td></td>
<td>227.4</td>
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<td>254.6</td>
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<td>271.2</td>
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</table>

**Source:** Alteryx
DEMOGRAPHICS

DRIVE TIME
• 5 Minutes
• 10 Minutes
• 15 Minutes
• 20 Minutes
• 30 Minutes
### MARKET AREA AGE DISTRIBUTION

<table>
<thead>
<tr>
<th>Age Groups</th>
<th>0 to 3 Miles</th>
<th>3 to 5 Miles</th>
<th>5 to 10 Miles</th>
<th>10 to 15 Miles</th>
<th>15 to 25 Miles</th>
<th>Durham, NC</th>
<th>U.S. Age Population</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>#</td>
<td>%</td>
<td>#</td>
<td>%</td>
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<td>%</td>
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<tr>
<td>Age 0-4</td>
<td>6,649</td>
<td>7.2%</td>
<td>6,886</td>
<td>7.5%</td>
<td>11,289</td>
<td>6.5%</td>
<td>15,316</td>
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<tr>
<td>Age 5-9</td>
<td>5,603</td>
<td>6.1%</td>
<td>6,162</td>
<td>6.8%</td>
<td>10,617</td>
<td>6.1%</td>
<td>17,579</td>
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<tr>
<td>Age 10-14</td>
<td>4,918</td>
<td>5.3%</td>
<td>5,684</td>
<td>6.2%</td>
<td>9,906</td>
<td>5.7%</td>
<td>17,981</td>
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<td>Age 15-19</td>
<td>9,139</td>
<td>9.9%</td>
<td>4,877</td>
<td>5.3%</td>
<td>8,500</td>
<td>4.9%</td>
<td>20,966</td>
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<tr>
<td>Subtotal</td>
<td>26,309</td>
<td>28.6%</td>
<td>23,609</td>
<td>25.9%</td>
<td>40,312</td>
<td>23.3%</td>
<td>71,842</td>
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<td>Age 20-24</td>
<td>10,449</td>
<td>11.4%</td>
<td>5,624</td>
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<td>10,622</td>
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<td>23,084</td>
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<tr>
<td>Age 25-29</td>
<td>8,496</td>
<td>9.2%</td>
<td>8,944</td>
<td>9.8%</td>
<td>15,711</td>
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<tr>
<td>Age 30-34</td>
<td>7,862</td>
<td>8.5%</td>
<td>8,782</td>
<td>9.6%</td>
<td>15,100</td>
<td>8.7%</td>
<td>19,520</td>
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<td>Age 35-39</td>
<td>6,295</td>
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<td>7,049</td>
<td>7.7%</td>
<td>13,225</td>
<td>7.7%</td>
<td>19,701</td>
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<td>Age 40-44</td>
<td>5,798</td>
<td>6.3%</td>
<td>6,428</td>
<td>7.0%</td>
<td>12,979</td>
<td>7.5%</td>
<td>20,688</td>
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<tr>
<td>Age 45-49</td>
<td>5,283</td>
<td>5.7%</td>
<td>5,602</td>
<td>6.1%</td>
<td>11,601</td>
<td>6.7%</td>
<td>19,790</td>
</tr>
<tr>
<td>Age 50-54</td>
<td>5,162</td>
<td>5.6%</td>
<td>5,566</td>
<td>6.1%</td>
<td>11,640</td>
<td>6.7%</td>
<td>18,816</td>
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<tr>
<td>Age 55-59</td>
<td>4,718</td>
<td>5.1%</td>
<td>5,177</td>
<td>5.7%</td>
<td>11,240</td>
<td>6.5%</td>
<td>16,530</td>
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<tr>
<td>Age 60-64</td>
<td>3,885</td>
<td>4.2%</td>
<td>4,463</td>
<td>4.9%</td>
<td>10,110</td>
<td>5.9%</td>
<td>13,307</td>
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<tr>
<td>Age 65-69</td>
<td>2,507</td>
<td>2.7%</td>
<td>3,167</td>
<td>3.5%</td>
<td>7,617</td>
<td>4.4%</td>
<td>9,986</td>
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<tr>
<td>Age 70-74</td>
<td>1,689</td>
<td>1.8%</td>
<td>2,115</td>
<td>2.3%</td>
<td>4,740</td>
<td>2.7%</td>
<td>6,352</td>
</tr>
<tr>
<td>Age 75-79</td>
<td>1,256</td>
<td>1.4%</td>
<td>1,612</td>
<td>1.8%</td>
<td>3,103</td>
<td>1.8%</td>
<td>3,878</td>
</tr>
<tr>
<td>Age 80-84</td>
<td>1,050</td>
<td>1.1%</td>
<td>1,299</td>
<td>1.4%</td>
<td>2,217</td>
<td>1.3%</td>
<td>2,716</td>
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<tr>
<td>Age 85+</td>
<td>1,301</td>
<td>1.4%</td>
<td>1,804</td>
<td>2.0%</td>
<td>2,458</td>
<td>1.4%</td>
<td>2,790</td>
</tr>
<tr>
<td>TOTAL:</td>
<td>92,051</td>
<td>100.0%</td>
<td>91,241</td>
<td>100.0%</td>
<td>172,675</td>
<td>100.0%</td>
<td>268,057</td>
</tr>
</tbody>
</table>

| Median Age | 30.5 | 34.2 | 36.7 | 35.1 | 35.8 | 33.3 | 37.0 |

Source: Alteryx

Age distribution is another population characteristic used to determine the type and level of use of any type of program. Aquatic facilities primarily serve two age groups; families with young children and aging senior population.
### MARKET AREA INCOME

<table>
<thead>
<tr>
<th>Radius</th>
<th>Per Capita Incomes</th>
<th>Median Household Incomes</th>
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<tbody>
<tr>
<td></td>
<td>Dollars</td>
<td>Index</td>
</tr>
<tr>
<td>0 to 3 Miles</td>
<td>$21,294</td>
<td>0.80</td>
</tr>
<tr>
<td>3 to 5 Miles</td>
<td>$29,676</td>
<td>1.12</td>
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<tr>
<td>5 to 10 Miles</td>
<td>$44,474</td>
<td>1.68</td>
</tr>
<tr>
<td>10 to 15 Miles</td>
<td>$42,330</td>
<td>1.60</td>
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<tr>
<td>15 to 25 Miles</td>
<td>$33,484</td>
<td>1.27</td>
</tr>
<tr>
<td>Durham, NC</td>
<td>$30,286</td>
<td>1.14</td>
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<tr>
<td>Total U.S.</td>
<td>$26,464</td>
<td>1.00</td>
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</table>

Source: Alteryx

To a certain degree, the likelihood of residents to engage in aquatics depends on their ability to pay for admission and program fees.
1950 – 1990 PLANNING CRITERIA

- Old NRPA Standard - One Pool per 20,000 Population (Neighborhood Pool Concept)

- Typical Pool: 4-8 Lap Lanes, Diving Board, Wading Pool

- Admission $.50 to $1.00

- Most Used by Children and Lap Swimmers
ALONG CAME THE WATERPARK....

• Pointe Mallard - Decatur, AL
  1st Wave Pool 1970
• Wet’n Wild - Orlando, FL 1977
• Hyland Hills Water World - CO 1979
• Municipal Recreation Pools Started Incorporating Features from Waterparks to Create Family Aquatic Centers
• 1990’s St. Charles, MO Built Three Family Aquatic Centers
CURRENT PLANNING CRITERIA 1990 - PRESENT

• New Standards – One Pool per 50,000 or More Population (Community Pool Concept)

• Typical Pool: More Fun Amenities (Water Slides, Lazy Rivers, and Children’s Play Structures)

• Admission $5.00 and Up

• Most Used by Families with Children - Something for Everyone!
Aquatic User Groups

- Recreation
- Instructional
- Competition
- Wellness and Therapy
AQUATIC FIELDS OF PLAY

6 25-Yard Lanes

Similar to Campus Hills and Edison Johnson Pools

25-Yard By 25-Meter

11 25-Yard Lanes

10 25-Meter Lanes

50-Meter by 25-Yard

8 or 10 (50-Meter Lanes)

17-22 (Cross Course

25-Yard Lanes)
WELLNESS AND THERAPY

• Fastest Growing Aquatic User Group
• Dedicated Pools
• Therapy Programs
• Water exercise classes
• Water Aerobics classes
• Fitness Classes
LESSONS – LEARN TO SWIM, INSTRUCTION

- Learn to swim
- Water safety instruction, Lifeguard instruction
- Life safety skills
- Survival swimming
- Scuba
- Other aquatic skills
RECREATION

- Tots
- Families
- Teens
- “Family Aquatic Center”
A PROPOSED GOLD STANDARD

• One Indoor/Outdoor Centralized Mega Recreation Center Facility w/ Indoor Competition and Wellness Pools for every 100,000 to 400,000 residents

• Provide one recreational use outdoor family aquatic center with Fun Amenities (Water Slides, Lazy Rivers, and Children’s Play Structures) plus lap lanes for every 50,000 to 100,000 residents.
NATIONWIDE RECREATION AQUATIC TRENDS

• Use of *Splash Pads* to Replace Smaller Neighborhood Pools
  **Costs $300K to $1M**

• Replacement of Old Style Recreation Pools with Bigger and Better *Family Aquatic Centers*
  **Costs $3M to $15M**
WHAT IS A SPLASH PAD?

• An interactive children’s water play area characterized by 0” to 6” of water with vertical water sprays, geysers, water tunnels, spray cannons, etc.
• Other terms: “Water Sprayground”, “Interactive Fountain”, and Water Play Area
• Lifeguard and fencing not required
WHAT IS A FAMILY AQUATIC CENTER?

• More Fun Features (Water Slides, Lazy Rivers, and Children’s Play Features)
• Zero Beach Entry to 3’-6” Depth Pool
• Teen Features (Drop Slides, Diving Boards, etc.)
• More Amenities (Shade, Seating, Concessions)
• Areas for Lesson Programming, Lap Swimming, and Recreation
Green Ideas
Water Efficiency
Regenerative Media Filtration

• Consider reusing pool wastewater from backwashing and deck drains for toilets.
• Use high efficiency fixtures and sensors to reduce potable water demand.
• Use filter system that uses less water
  • RMF filtration system
  • Less frequent backwash
  • High rate sand typical backwash 5000 gallons of water per filter
  • RMF Filter backwash - 200-600 gallons of water
  • Higher first dollar cost - $50,000+/filter
Energy & Atmosphere
Variable Frequency Drive Motors

• Install metering equipment for pool fill lines, waste lines, pump motors, pool heaters, pool chemistry controllers, etc.

• Maximize Pump & Motor efficiencies
  • SPCS
  • VFDs
Energy & Atmosphere
Geothermal / Solar Heating & Pool Covers

• Utilize a Pool Cover
• Specify Solar or Geothermal Pool Water Heating
  • Water source heat pump
    • Need source water from lake, canal, aquifer
    • 1st cost 25-30% more – drilling and unit cost
    • More efficient 15% of typical operating cost for gas
Example Facilities
Example 1: Sprayground

Aquatic Elements

- Aquatic playground featuring many interactive water features.
- Various sizes and attractions available
- No standing water
Example 2: Small Family Aquatic Center

Aquatic Elements
7,100 sq. ft. Multi-purpose Recreation Pool
- Six-eight lane 25-yard competition pool
- Play structure with water slides
- Several spray/splash features
- Small kiddie slide
- Large water slide
Example 3: Medium Family Aquatic Center

Aquatic Elements
17,000 sq. ft. Recreation Pool
- Open flume waterslide
- Closed tube waterslide
- Water vortex
- 430 ft. long lazy river
- Wet deck social space
- Water crossing feature
- Zero entry beach
- Bowl slide
- Interactive play structure
- 600 sq. ft. splash play area
Example 4: Large Family Aquatic Center

**Aquatic Elements**

- 50-meter competition pool
  - moveable bulkhead
  - 1 and 3-meter springboards
- 25-yard, eight lane fitness and instructional pool
- Therapeutic spa
- Children’s splash pad with interactive aquatic play features
- 12,500 sq. ft. leisure pool with multi-play structure with tipping bucket
  - 600-foot long lazy river
  - Three large waterslides including body, tube and speed slides
Example 5: Basic Indoor Pool

Aquatic Elements
5,400 sq. ft. Indoor Multi-Purpose Pool
- Six 25-yard lap lanes
- Intermediate depth lesson area with grand stair entry and underwater bench seating
- Shallow play area with terraced step entry, bubbler features, tot slide, children’s interactive play feature, and ADA compliant sloped entry
- New pool mechanical systems including pool heating and cooling capabilities

1,500 sq. ft. Outdoor Sprayground
- Complete with a variety of water features
Example 6: Small Indoor Pool

Aquatic Elements
7,500 sq. ft. Multi-Purpose Pool
- Zero beach entry
- Zip line
- Three 25-yard lap lanes
- Interactive play feature
- Current channel
- Waterslide
- Aquatic rock-climbing wall
- Wet deck

3,000 sq. ft. Outdoor Sprayground with numerous water features
Example 7: Medium Indoor Pool

Aquatic Elements
25 Yard Lap Pool
• 1-m diving
• Stair entry
2,300 sq. ft. Recreation Pool
• Waterslide
• Current channel
• Three stair entries
• Tot area with play features and water features
• Vortex
100 sq. ft. Spa
• Hydrotherapy bench
Example 8: Large Indoor Pool

Aquatic Elements

25 Yard by 25 Meter Competition Pool
- Two three-meter diving boards
- Spectator seating for 175

3,000 sq. ft. Leisure Pool
- 30 ft. high slide which exits the building in an enclosed tube
- 20 ft. high open-flume slide
- 300 sq. ft. spa
- Vortex
- Current channel
- Open shallow water area with zero-depth entry
- Interactive play features
Example 9: Indoor Competition Venue

Aquatic Elements
50 Meter Competition Pool
• Eight 9-ft. wide 50-meter lap lanes
• Twenty 25-yard cross course lanes
• Two 1-meter springboard dive stands

3,000 sq. ft. Recreation Pool
• Five 25-yard fitness lap lanes
• Underwater bench seating
• ADA accessible chair lift
• Stair and ramp entries
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RATIO and Counsilman-Hunsaker
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