

## PROJECT OVERVIEW

The Warrenton Aquatic and Recreation Facility is located on Old Waterloo Road in the town of Warrenton, Virginia. This building will be an indoor swimming facility for not only competition purposes, but for leisure also. To do this the building incorporates exercise facilities, a competition pool, leisure pool, administrative office space, and snack bars. The project is being delivered by the traditional Design-Bid-Build with a CM Agent representing the owner, Warrenton Public Works.

## PROJECT SYSTEMS DESCRIPTION

### ARCHITECTURE

#### FUNCTION

The new building is designed to provide a recreation facility for the town of Warrenton. It will consist of a competition swimming pool with spectator seating, leisure pool complete with waterslide and lounge areas, juice bars, fitness rooms, and office space to run the facility. It also features a cylindrical entrance vestibule on the upper floor as its main entrance which enhances this aesthetically pleasing building.

#### DESIGN

The architecture of the building combines different types of building materials to enhance the building's appearance. The light beige brick on the exterior walls cover the main building while the vivid red brick defines the cylindrical entrance vestibule. On top of the building, the standing seam metal roof is colored to be consistent with the metal shingles



on top of the exterior walls as well as the architectural exposed steel members that support the roof. The base of the building is covered in a stone veneer that matches the surrounding site's retaining walls. The interior spaces are naturally lit by large, light glazed window systems that will give the building an open feeling.

## **BUILDING ENVELOPE**

The building envelope consists of multiple materials on each exterior wall. These walls primarily consist of CMU block backing with a stone veneer base followed by brick veneer and metal shingles above. The walls also use aluminum framed, glazed curtain



wall window system, cast stone sills, and architectural steel to complete its structure. To compliment this, the architect chose three types of roofing systems to accommodate the buildings needs. The bulk of the roof consists of a standing seam metal system on all the sloped and curved roofs, while a built-up roof

resides on the upper, flat roofs. Also incorporated into the building is a small green roof located in the plaza area just outside the entrance vestibule that will be covered with grass.

## **CONSTRUCTION DESCRIPTION**

The construction of the Warrenton Aquatic & Recreation Facility has some challenging tasks to be completed to ensure that the project runs smoothly and is a success. Construction starts in January of 2006 with excavation of the site in order to place the concrete foundation. The steel superstructure and metal roof and floor decks are set before the concrete is pumped in to complete the floor systems in the main building. To top out the competition and leisure pool areas, a series of eight 101'6" prefabricated

steel roof trusses will be set via mobile crane, which had to be shipped in halves and welded on site before being placed. The trusses were prefabricated to speed up installation, ensure proper assembly in a controlled environment, and also to reduce safety hazards during installation. After the roof is in place, the buildings CMU walls and brick façade will be put into place using hydraulic scaffolding as well as the MEP rough-in will be taking place. The pool areas are the last portion of the building to be constructed. Their concrete pours will be in the winter months of 2007, so the building will have to have temporary heating to ensure proper construction. Because the leisure pool has so many curves and turns, elevation and location points will be set by modern surveying equipment for proper placement. The 19 month construction is planned to end in July with building turnover planned for the first of August.

### **MECHANICAL SYSTEM DESCRIPTION**

The climate conditions in the building are supplied by four air handling units (AHU) and three energy recovery units (PHU & HRU). These units are housed in both penthouses while AHU-4 and HRU-1 are located in the lower level mechanical room. The two AHU's in Penthouse 2 service single zones only (Fitness (4800cfm) and Multi-Purpose Rooms(5500cfm)) while the PHU's are used primarily to save energy and supply heating and cooling to the competition and leisure pool areas (38,000cfm). The



remaining air handler services the administration area of the building (14,575cfm). Also, hot water unit heaters are used to heat the penthouse areas while duct mounted reheat coils and air terminal units are being used to control air temperature in the common areas of the building. A series of fifteen pumps ranging in size from 20-1400gpm are used to supply water to the aforementioned air units. This water will come from five separate boilers during heating months and two chillers during the summer to cool the building.

The chillers are two different types, one being an air-cooled system rated at 415 tons while the water-cooled system is rated at 98.3 tons. Finally, the two pools use a series of 12 pumps, circulating water anywhere from 200gpm (main drain) to 1750gpm (current channel) to meet the respective needs.

## **STRUCTURAL SYSTEM DESCRIPTION**

The structural system for the building starts at the foundation with both continuous and spread footings. These footings are made of 3500psi concrete while the slab-on-grade concrete floors are also made of 3500psi. The upper level and penthouse



floor systems are supported by W-shaped beams. The floor itself is a composite slab and deck system with concrete specified at 3000psi. Throughout the non-pool areas

load from the W-shaped beams and girders are transferred to the steel columns that support the gravity load while the moment frames resist the lateral load. The pool area columns are constructed of typical concrete columns with concrete masonry units for walls. Above the pool areas, anchor bolts on top of the concrete columns connect the 101'6" long roof trusses to the structural system (8 total) that support the standing seam metal roof above. Over the non-pool areas the roof also consists of standing seam metal but these areas are supported by W-shaped members instead of the large prefabricated trusses.

## **ELECTRICAL SYSTEM DESCRIPTION**

The electricity that is being brought into the Warrenton Aquatic and Recreation Facility is a 480/277V, 3-Phase 4 wire system. After entering the building the feeder goes

to a 3000A main distribution switchboard where it is split up to service the main building systems. The panel boards that are serviced from the main feeder supply power to the pool pumps, air handling units, future building expansion slots, and other local panel boards. To further supply power to the building, eight step-down transformers are used for panel boards that supply power to the elevators and typical lighting and receptacle spaces. A 30kva K13 transformer is used to step down the power for the facility's office space to control the unbalanced loads produced by computers. Finally, an 85 KW emergency generator supplies power to the elevator, fire alarm system, and emergency lighting in the event of an emergency.

### **LIGHTING SYSTEM DESCRIPTION**

The lighting inside of the Warrenton Aquatic and Recreation Center consists of metal halide, fluorescent, and incandescent lights. Most of these lights run off of 277V power with the exception of some specialty lighting that runs on 120V. The perimeter of the pool is interesting to note because the lighting is recessed in the walls, so to change the bulbs the pool will not have to be drained. Typical 32W T-8 fluorescent bulbs are used throughout the building in the locker rooms, fitness areas, and mechanical rooms, while metal halides are used in the entrance vestibule with the area above the pool being indirect metal halide lighting. The wattages for these lights typically range from 70W to 150W with the lights above the pool being 1000W.

### **FIRE PROTECTION DESCRIPTION**

The fire protection system for the building incorporates both ceiling and duct mounted smoke detectors as well as manual pull stations and heat detectors as protection triggering devices. To alert the population of an emergency, audio-visual devices will be used incorporating strobes and alarms. All of these systems are wired to both a central fire alarm controlled panel and an annunciator panel that have integral battery backup systems. To extinguish fires the building will use a wet-pipe sprinkler system that will be located on the upper floor and supplied with water through an outside stem and yoke valve.



## **BUILDING TRANSPORTATION DESCRIPTION**

The Warrenton Aquatic and Recreation facility employs one elevator to service the building. It is centrally located for ease of accessibility and is operated using an under-the-car single cylinder hydraulic system. The elevator cab is rated for 2500lbs and transports passengers at 100fpm. Three stair cases are also used to navigate through the building. These are located at the center of the building as well as the end of the west and south east corridors, respectively.

## **COMPETITION & LEISURE POOL DESCRIPTION**

The main attractions of the Warrenton Aquatic and Recreation Facility are the competition and leisure pools. Each pool is slab-on-grade concrete and is cast-in-place.

The competition pool is an 8 lane, 25 meter pool with timing devices for competition and also features two, one meter diving boards. The leisure area contains a 143'6" waterslide that is just under 20' tall,



spa, vortex pool, current channel, and a child amusement station. Both pools also have a handicap lift for ADA approved pool access as well as stairs, sloped grade entry, or ladders for easy pool access.