

# ENTRY FORM



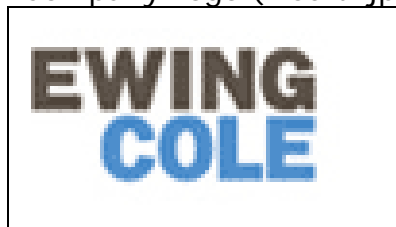
## DVASE 2010 Excellence in Structural Engineering Awards Program

### PROJECT CATEGORY (check one):

New Building under \$30M	<input checked="" type="checkbox"/>	Other Structures Under \$10M	
New Building over \$100M	<input type="checkbox"/>	Other Structures Over \$10M	
New Building \$30M - \$100M	<input type="checkbox"/>	Free Style	

Approximate construction cost of facility submitted:	\$18M
Entry Fee:	<b>FREE</b>
Name of Project:	Atlanticare Oncology Center, Atlantic County
Location of Project:	Egg Harbor Township, NJ
Date construction was completed (M/Y):	June 2009
Structural Design Firm:	EwingCole
Affiliation:	<b>All entries must be submitted by DVASE member firms or members.</b>
Architect:	EwingCole
General Contractor:	P. Agnes

Company Logo (insert .jpg in box below)



Provide a concise project description in the following box (one page maximum).  
Include the significant aspects of the project and their relationship to the judging

AtlantiCare completed the construction of their new two-story, 40,000 square foot Oncology Center in June of 2009. The facility is located within AtlantiCare's 25-acre Health Park in Egg Harbor Township, NJ and includes two linear accelerators, a CT Simulator, a CyberKnife, PET/CT, MRI, HDR Brachytherapy, 12 chemotherapy infusion stations, pharmacy, exam rooms, conference and classrooms.

This facility is actively pursuing LEED for New Construction Silver certification and is registered in the US Green Building Council program. Low roof levels of the steel frame were designed to accommodate environmentally and patient friendly balcony gardens consisting of stone ballast and green roof elements.

The two-story steel superstructure consists of a light-weight concrete slab on metal deck supported by composite steel beams framing to wide flange girders and columns. Portions of the supported floor were depressed to easily integrate the lead shielding to isolate certain pieces of medical equipment. The roof is a combined system of normal-weight concrete slab on metal deck and standard metal roof deck supported by composite and non-composite steel beams framing to wide flange girders and columns. The portion of the roof that contains a concrete slab on deck houses the rooftop mechanical equipment serving the entire facility. This specific roof construction was selected to mitigate noise and vibration to the spaces below. This area is enclosed by a steel-framed screen assembly to enhance the building exterior and minimize the exposure of mechanical equipment.

A couple of creative structural steel elements that complimented the architectural design were the North canopy and the steel sunscreen element incorporated into the South elevation. The North canopy, as can be seen in the attached photo consisted of single cantilevered wide flange columns with double-cantilevered tapered steel wide flange shapes extended off of those central columns. The canopy, in its final state, was clad in the center portion for weather protection to patients, open on one end to allow foliage to grow through the canopy and a portion was covered with glass. To accommodate all of these features, strict deflection tolerances needed to be maintained during the structural analysis and design. A steel sunscreen element was introduced along the South elevation to work with the façade. A HSS member was hung from the steel above and plate elements then cantilevered three feet away from the building to help shape the screen.

Three major pieces of medical equipment were anchored at opposite ends of this facility and each required very different structural designs. The two linear accelerators were located within a large cast-in-place concrete vault that was separated from the main building by an expansion joint. The design parameters, including the wall layout, wall thickness and ceiling thickness to name a few were closely coordinated with the project architect and physicist to ensure protection from any radiation exposure. Thermocouples were specified to be used by the testing and inspection agency in monitoring the mass concrete pours to ensure proper temperatures and temperature ranges were maintained during the curing process. This controlled process will help reduce concrete cracking, which could potentially create a path for radiation to escape. Trial mixes were batched ahead of the mass concrete pour to measure the density of the concrete and the temperature increase during the curing process. This information was used to monitor the actual mass concrete pour to determine if heating or cooling mechanisms shall be applied to the concrete forms in order to maintain a specific delta between the exterior and interior concrete surfaces of the mass concrete walls.

The other major piece of equipment in this oncology center is a CyberKnife robotic radiosurgery system. The location for this equipment was located in a space on the ground floor originally designated as a future MRI but during construction, the Owner decided to move forward with a change to a CyberKnife. This created a very complex structural condition at the foundation level.

A finite element analysis was conducted to analyze the effect of the CyberKnife and its high-density block shielding of the adjacent, already constructed concrete spread footings to ensure allowable bearing pressures weren't exceeded as well as design the mat for the CyberKnife to sit on. Very limited amounts of already finished spaces had to be disturbed to build this system and the high-density block shielding was finished by placing strategically designed openings in the floor above to allow the nesting of the blocks below and within the steel-frame.

The architectural façade is composed of a combination of EIFS, brick, butt-glazed glass curtainwall, trespas panels and punched windows. To accommodate the details of this intricate design, a number of different structural elements were designed to support the system.

criteria.

Please attach your photos as previously described in the call for entries document and insert captions for the photos in the following boxes.



Photo 1: Cantilevered steel North entrance canopy during erection and the final product.



Photo 2: grand lobby atrium and stair during construction and the final product.



Photo 3: Linear accelerator vaults integrated with steel frame of overall building.



Photo 4: South façade showing sunscreen elements being constructed.




Photo 5: Linear accelerator foundations and wall forms being erected.



By signing, signatory agrees to the following and represents that he or she is authorized to sign for the structural design firm of record:

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Submitted by:

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