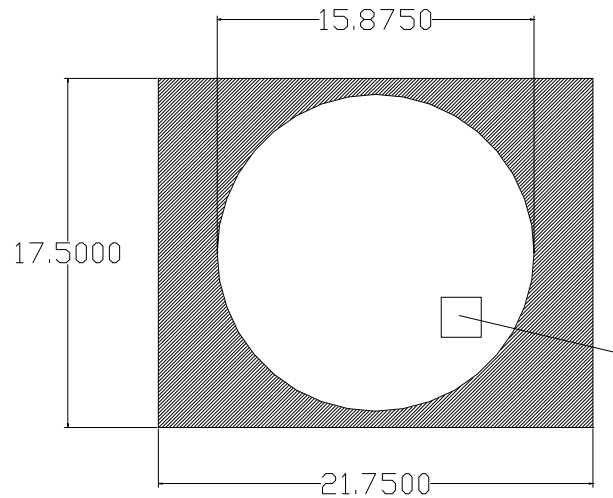


500.101.03 Fall 2001 Design of a Spaghetti Stadium "Dome"

Objective

You are designing a scale model for a stadium. The base footprint for your stadium (minimum diameter = 15.875 in. or 403mm) and the maximum pressure that it must sustain (0.5 psi or 3.4 kPa) have been determined. Your design should be the most aesthetically pleasing structure that carries a 0.5 psi demand pressure using the least amount of building materials (spaghetti. and epoxy) while enclosing the greatest possible volume.



Geometric Limitations

Your stadium "dome" must be testable. Therefore, its footprint must rest in the shaded area in the drawing to the right (note dimensions are in inches in the drawing). The actual dome tester is in the laboratory and may be measured at your convenience. Additionally, the height of your dome should be no greater than 9 in. (229 mm). The "clear" volume enclosed by your stadium is based on should be at least 270 in³ (4400 cm³) this is based on a cone with a radius of 8 in. and a height of 4 in. – smaller enclosed volumes are allowed, but will negatively impact the "economic" ranking of the stadium.

Dome Design / Build / Test Contest

Progress: Group meetings with Dr. Schafer	20
Capacity ¹ : Surpassing 0.5 psi with dome	30
Efficiency ² : (Strength / 0.5 psi)·(1 lb / weight)	10
Economic ² : (Interior Volume / V*)·(1 lb / weight) and strength > 0.5psi	10
Aesthetics ² : as determined by the average given by your classmates	10
Effort ² : as determined by the average score given by your classmates	10
Teamwork: Intra-group grading (double-checked by Dr. Schafer - my final say)	10
	100

¹ All teams with domes that surpass 0.5 psi in loading will be exempted from the final.

² Two teams, selected from the winning teams in efficiency, economic, aesthetics, and effort will be selected to be exempted from presentations, and will act as the 'judges' in the presentations

* the mini

Deadlines and Scheduling

by Mon. 29 Oct - 3 Sketches from each member on possible stadiums and 1 group meeting

Tues. 30 Oct – 2 sketches from each group shown during regular lab time

Wed 31 Oct – in class testing of spaghetti trusses that you build, test at end of class

Mon 5 Nov – Design meetings and dome construction *in Latrobe 15*

Tues 6 Nov – Mousetrap build and dome construction *in Latrobe 15*

Wed 7 Nov – Design meetings and dome construction *in Latrobe 15*

Mon 12 Nov – CLEANUP *in Latrobe 15*

Monday, November 12, 9pm - Dinnertime (pizza) grading and testing of domes

THE LAB IS IN LATROBE 15 – ENTER THROUGH LATROBE 11

1 KEYMASTER FROM EACH GROUP MAY GET A KEY FOR A \$10 DEPOSIT TO MARIANNE IN THE CIVIL ENGINEERING OFFICE (NE CORNER OF LATROBE, #)