The Quad Problem

Task Card

Group Accountability: Each group must determine the best design given the constraints.

Individual Accountability: Each group member must describe in detail their group's design while providing a sound mathematical rationale.

A University wants to construct a walkway system for their campus's Quad, which is a rectangle plot of grass with dimensions 600 feet by 800 feet. The University wants to keep as much grass as possible, so they don't want to add any more than 3000 linear feet of walkway. However, they also want the walkway to be efficient and useful to the students. As we all know, if the walkway isn't useful, students will simply cut across the grass, kill it, make mud, track it through buildings, increase cleaning expenses, and make the quad look bad.

The University determined that they want students to be able to travel from any point on the perimeter of the quad to any other point on the perimeter of the quad by walking less than 1200 feet using the walkway system. If they have to travel more than 1200 feet, they reasoned, the chances that they will cut through the grass increases dramatically. There is already a walkway on the perimeter, so the only thing the new walkway system has to add is what cuts through the grass.

What is the best design that fits these constraints?