

Zachary Heilman  
Thesis PowerPoint Outline  
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## Intro

1. The Mirenda Center for Sport Spirituality and Character Development
2. Location: Philadelphia Pennsylvania (Aston PA)
3. Neumann University Sports facility

## Body

4. Existing Mechanical –Air Source Heat Pump
5. RTU1 - Fitness Center
6. RTU2 - Office Space
7. RTU3 - West Auxiliary Gym
8. RTU4 - East Auxiliary Gym
9. RTU5 -West Main Gym
10. RTU6 – East Auxiliary Gym
11. Depth – Ground Coupled Heat Pump
12. Sizing Well Field (no water flow)
13. Rule of Thumb at 150 ft/ ton
14. Ashrae Applications 137 ft/ton
15. Aquifer Groundwater Data 10 ft depth USGS
16. Life Cycle Cost Comparison
17. 400 tons of cooling
18. Duration Curve
19. Hybrid 200 tons plus cooling tower
20. \$ savings PAYBACK
21. Energy Saving
22. Located Under The Tennis Court
23. Mezzanine Breadth - Purpose to Recapture Lost Conditioned Space
24. Structural Design of Mezzanine

## Conclusion

25. Recommendation