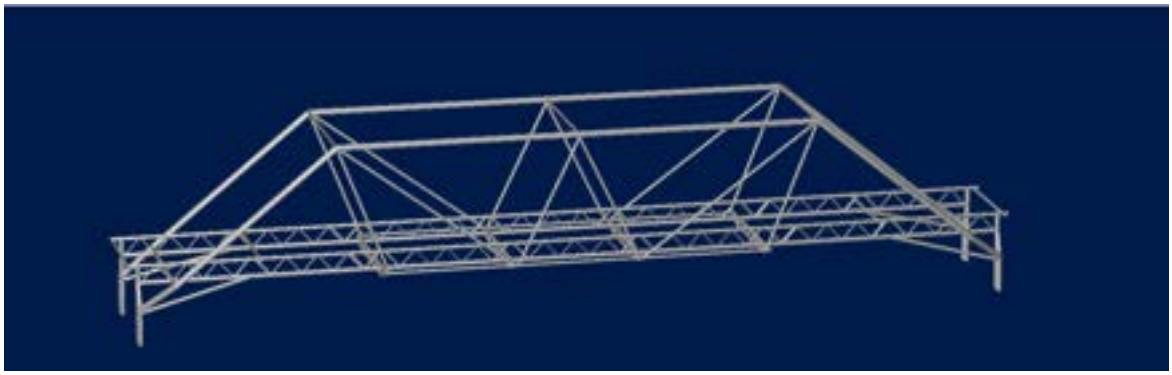
BUILT WORLD
ENTERPRISE

December 2022 Alumni Newsletter

Fall 2022 Built World Enterprise Members!

Project Updates

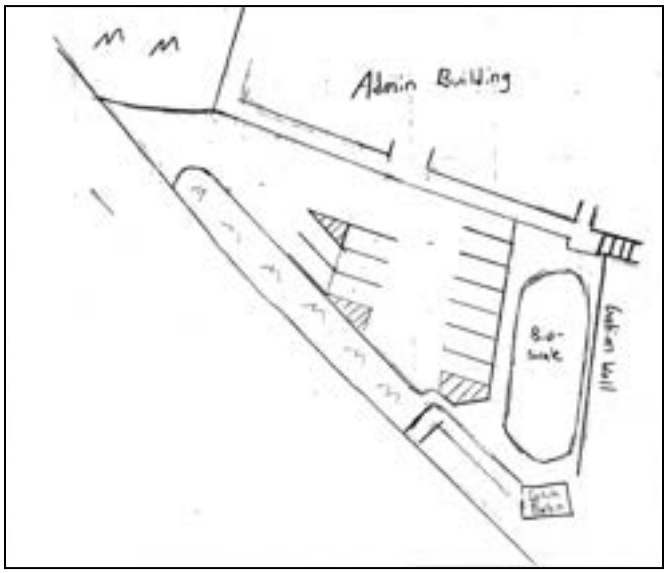
Steel Bridge

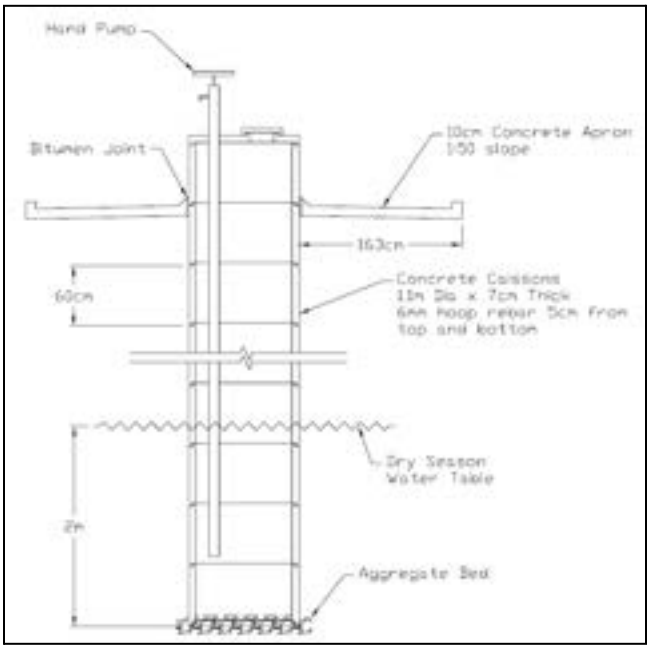


Thomas, Liam, Matt M, Matt B, Josh and Olivia have finished designing their bridge for the San Diego Wildlife Refuge. They had challenges with including an arch, as well as their constraints and deflections in their design. However, after modeling their design in Ram and Solidworks they have finalized on a design and are now starting fabrication.

EPA Rainworks

Brock and Joe are improving the stormwater management of the Administration building on the Michigan Tech campus. Their competition has been pushed back this year, so they are rethinking their original design and are researching different green infrastructure designs as their competition isn't happening this year. One challenge they have is the watershed they are using. They spoke with professionals and realized they were modeling it wrong and will need to recalculate it.



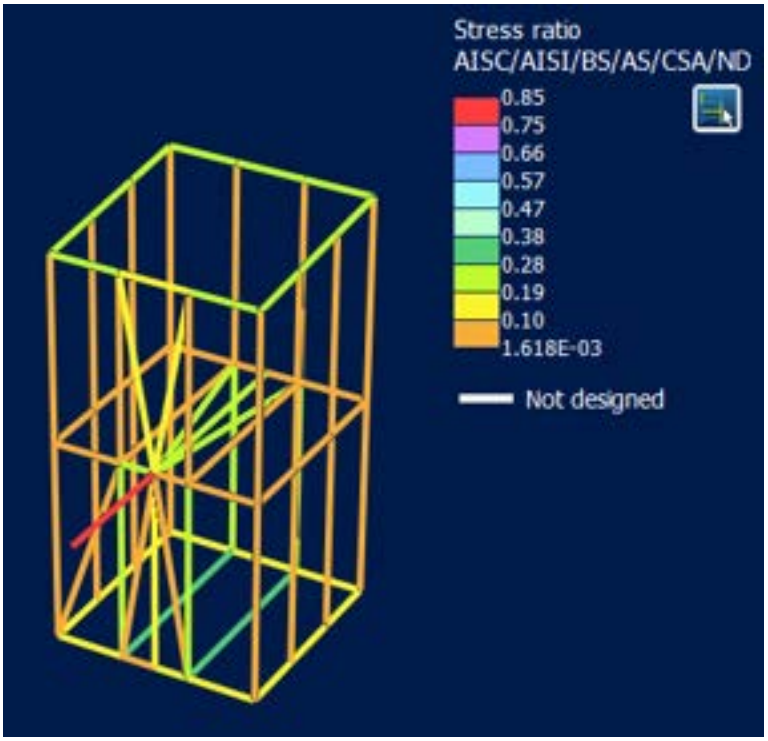


EWB

Dylan and Tania are working with the Engineers Without Borders club this semester. They initially planed on installing a solar-powered pumping system to a well, with hopes of finding a way to store the water and keep it clean when the well goes dry for 4 months. However, they are now trying to find a new aquifer to use when it is the dry season.

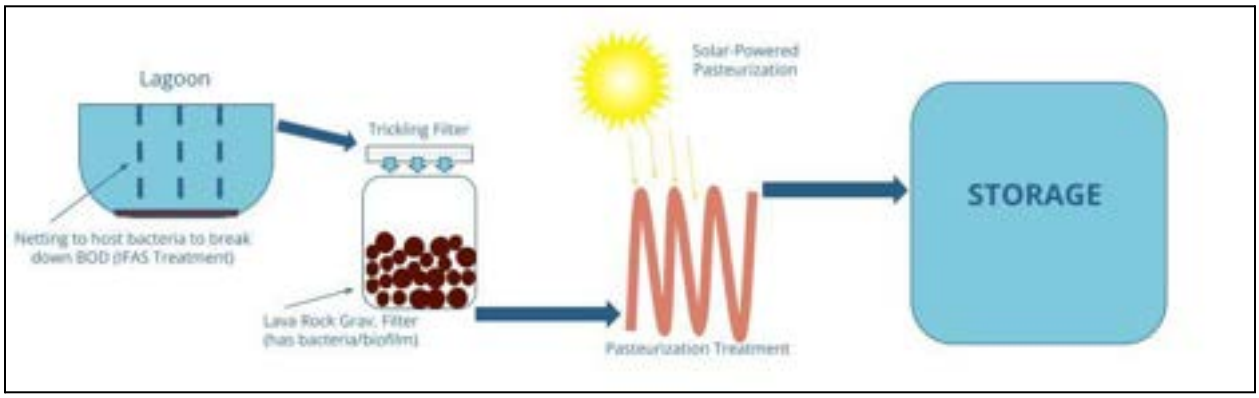
ASCE Timber Strong

Ryan, Christian, John, Max, Parker and Ondrea are designing and building a 2-story wood light-framed building that has a member that can hold 150 pounds.. The team is designing on NX and RAM to better design and understand the forces they are working with. They are having troubles getting the deformation that is needed for the competition.



WERC Team 1

Francine, Morgan and Eden are creating a system to treat wastewater in rural communities so they can reuse their water. WERC team 1 is planing on having an IFAS lagoon that leads to a trickling filter and will end with pasterurization. The team is working on modeling and doing calculations of removals to ensure they will meet the standards they have to.



WERC Team 2

Jake, Clark, Allison and Averi are working on detecting and quantifying microplastics in reservoirs in real-time (30 minutes). Currently, the team is looking at using hydrocyclones to separate the algae from the microplastics then using microscopy and Image J to quantify the microplastics in the sample.

Donating

If you would like to help fund any teams you can donate by going to this website, and donating to the student leadership fund. To ensure your donations go to BWE email Dr. Morse at anmorse@mtu.edu, or when donating select “add another destination” then select “other” and say Built World Enterprise.

Senior Design Projects

Matt M.

Matt is working on the Sweetwater River Bridge site design. He is using the Steel Brige project and building upon it. He has been planning how the Steel Bridge design would be implemented in real life. He will be making designing the engineering plans that will include installation, erosion control research, and a plan to protect endangered or protected species.


Steel Bridge 22-23

Analysis Calculations

General Information: [+] = Tension, [-] = Compression

(Optimized Span Length)

(Approx. Maximum Allowable Deflection)

Optimize Individual Member Load Stage 1:

Truss Member 2 Top Chord:

(Non-Slender)

Continue with Section E3:

(Worst Case Scenario Top Chord Stress)

(Axial Load Experienced Within Member)

(E3-4)

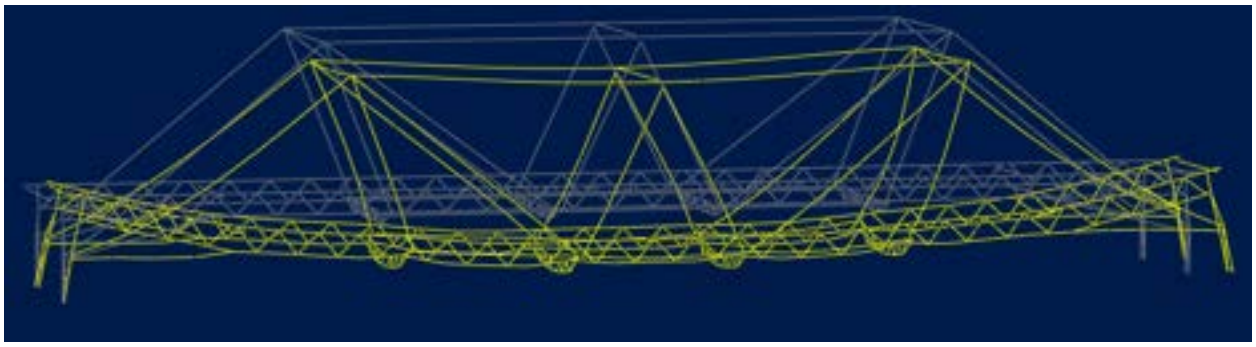
Use E3-3.

(LRFD)

1 of 2

Liam

Liam has been diving deeper into the design analysis of the Steel Bridge designs this year. He has done optimization calculations for all the bridges to asses which designs would work best. He has also gone in and modeled the designs to ensure they are feasible.



Thomas

Thomas has also been focusing on the design process for Steel Bridge. He designed 5 bridges in RAM Elements and did connection calculations using MathCAD. He is currently working in Solidworks and writing his project report.

If you are interested in any of the projects this year and would like to offer any insight please feel free to reach out to us!

Michigan Technological University

Social Media

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