BUILT WORLD
ENTERPRISE

March 2023 Alumni Newsletter

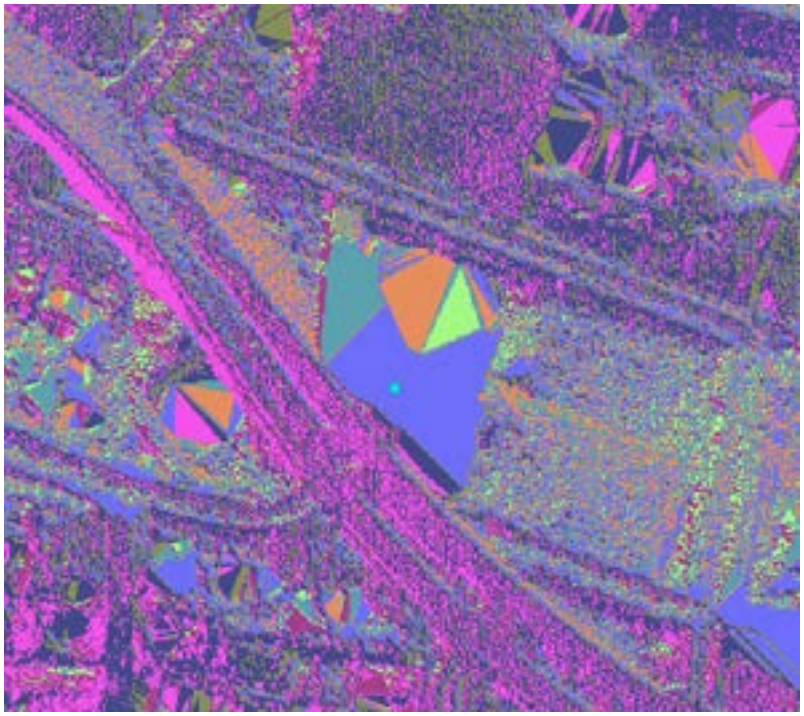
Built World Enterprise Members!

Built World Enterprise would like to welcome our new members Nadia Stauffer, Jonathan Wright, Jenna Cook, Anna Rose, Blake Cain, Jakob Christiansen, Jack Moon and Zachary Whitton.

Project Updates

Steel Bridge

Thomas, Liam, Matt M, Matt B, Josh, Olivia, Jonathan, Blake and Anna have been working on fabricating the bridge this semester. They were challenged with incorporating an arch into the bridge. Through many hours of problem solving they were able to figure out how to attach the arch within tolerance. This allowed them to finish fabrication on February 22nd and are now working with their build team to get ready for the competition.

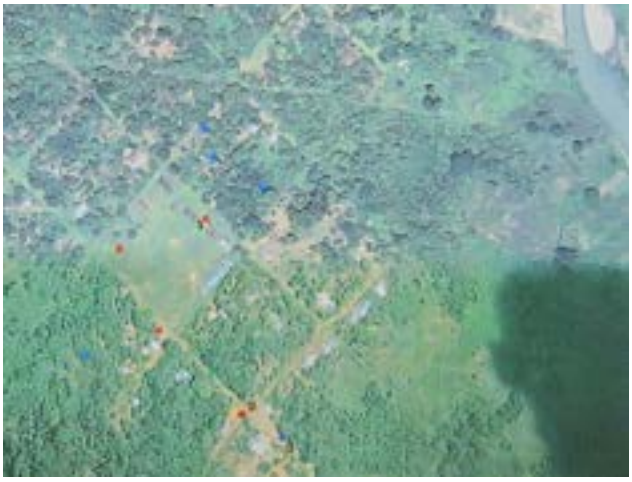


EPA Rainworks

Brock and Joe are currently working on stormwater management practices for the Administration Building parking lot here on Michigan Tech's campus. They have started to use ArcGIS to delineate the watershed around the parking lot and this definite watershed will help with calculations regarding the total amount of rainfall the parking lot will see. The picture to the left is their ArcGIS work.

EWB

Dylan and Tania have been preparing for a trip to Guatemala in May to work with two communities. They are preparing for an assessment in Fronterizo to collect data on their wells so they can be ready for an implementation trip the following summer. They are also developing the logistics for operations and maintenance of a spring box system that was implemented in Canton in 2022 by the previous EWB team.

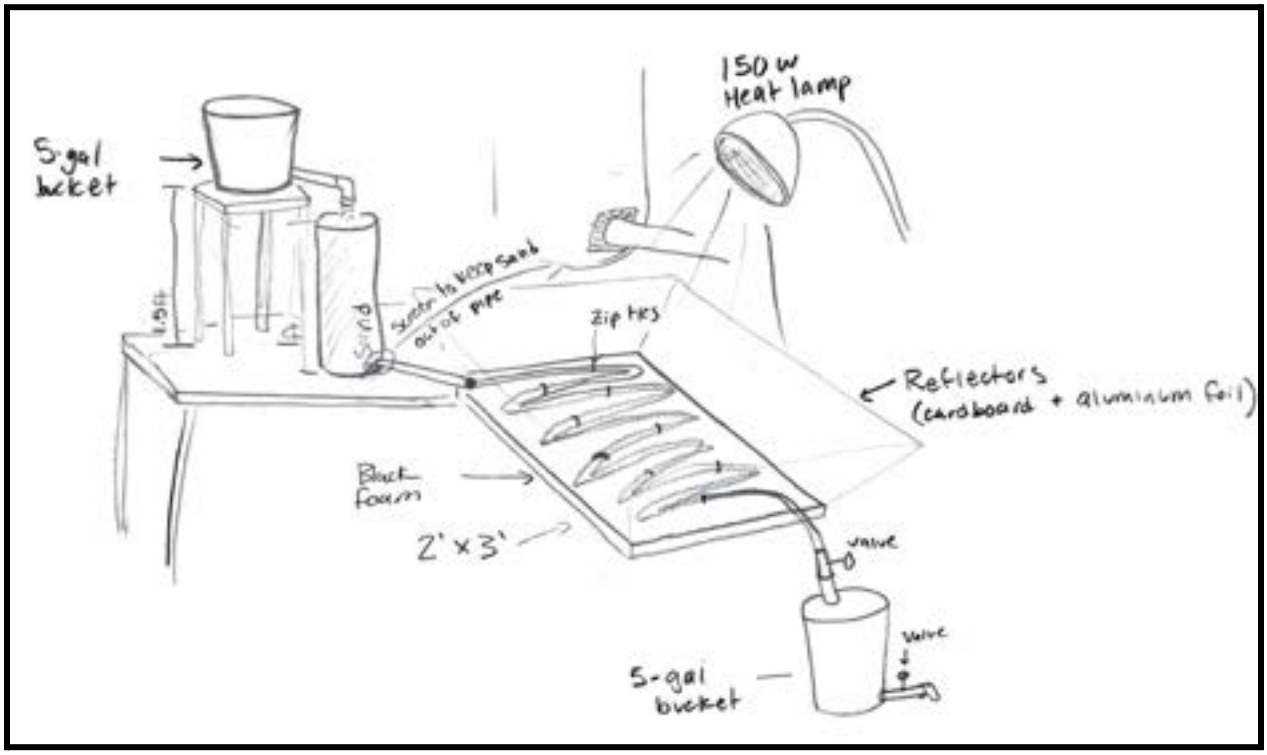


ASCE Timber Strong

Ryan, Christian, John, Max, Parker, Ondrea, Jakob, Jack and Zachary have been working this semester on collecting and planning out the building phase of the project. They are also working on finishing up a presentation and visual aid. They are excited to be going down to Western Kentucky University with help from their multiple sponsors, which they are very grateful for.

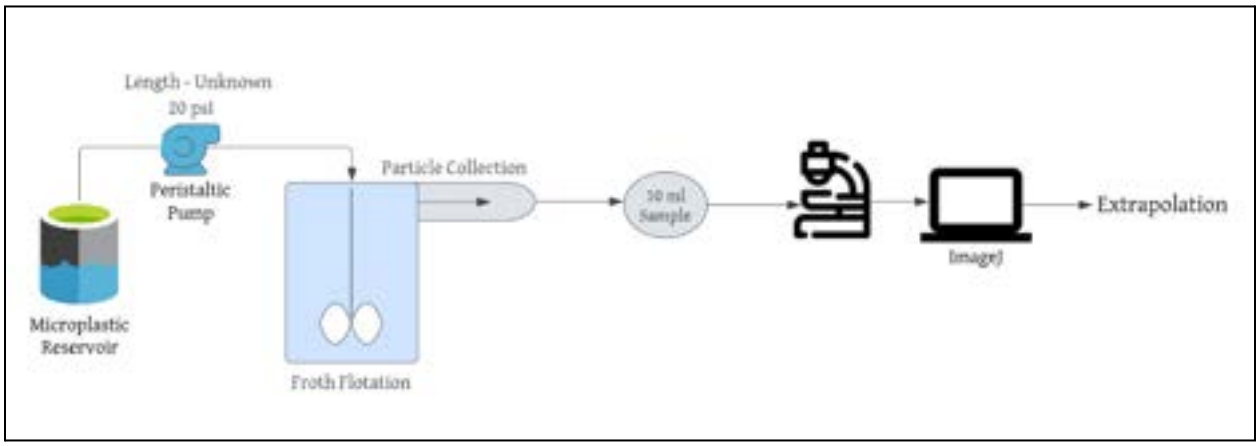
WERC Team 1

Francine, Morgan, Eden, Jenna and Nadia have been working hard this semester building their prototype for their wastewater treatment system. They have just finished building and are about to move on to their testing phase. Here, they will test their design for TSS, BOD, and total coliform removal. They have also been finishing up their report.



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 testing the use of froth floatation to separate microplastics from algae and bentonite clay. Once separated they will be using microscopy and ImageJ to quantify the microplastics in the sample. On top of lab work, the group is putting the final touches on their written report.



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 Bridge project and building upon it. He has been planning how the Steel Bridge design would be implemented in real life. He has been designing the engineering plans that 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)

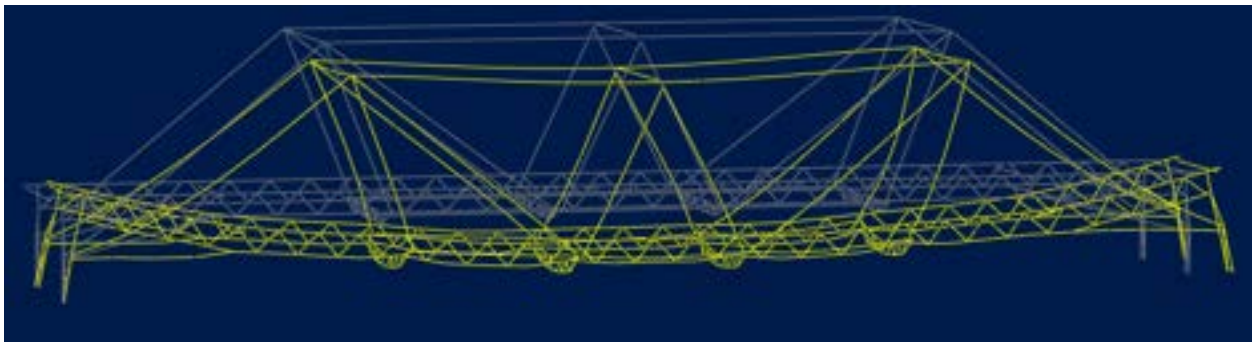
Use E3-3.

(LRFD)

1 of 2

Liam

Liam has been diving deeper into the design analysis of the Steel Bridge designs this year. He has completed optimization calculations for all the bridges to assess which designs would work best. He has also 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.

Jake

Jake is developing an engineering design that will theoretically be able to treat wastewater biosolids to Class A standards in colder climates.

Morgan

Morgan is creating an overview for the future of the Sustainability Demonstration House (SDH) yard. The plan will include irrigation, native plants, garden areas, and walkways.

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

Instagram: @bwe.mtu

Facebook: @Built World Enterprise