

Spring 2021

Trans World Radio - Culvert Design

Warner C. Hockenberry

Gabriel J. Tiday

Darren J. Heisey

Logan J. Horst

Seth M. Kline

See next page for additional authors

Follow this and additional works at: <https://mosaic.messiah.edu/engr2021>



Part of the [Engineering Commons](#)

Permanent URL: <https://mosaic.messiah.edu/engr2021/2>

Sharpening Intellect | Deepening Christian Faith | Inspiring Action

Messiah University is a Christian university of the liberal and applied arts and sciences. Our mission is to educate men and women toward maturity of intellect, character and Christian faith in preparation for lives of service, leadership and reconciliation in church and society. This content is freely provided to promote scholarship for personal study and not-for-profit educational use.

Authors

Warner C. Hockenberry, Gabriel J. Tiday, Darren J. Heisey, Logan J. Horst, Seth M. Kline, Daniel O. Thomas, and J Scott Heisey

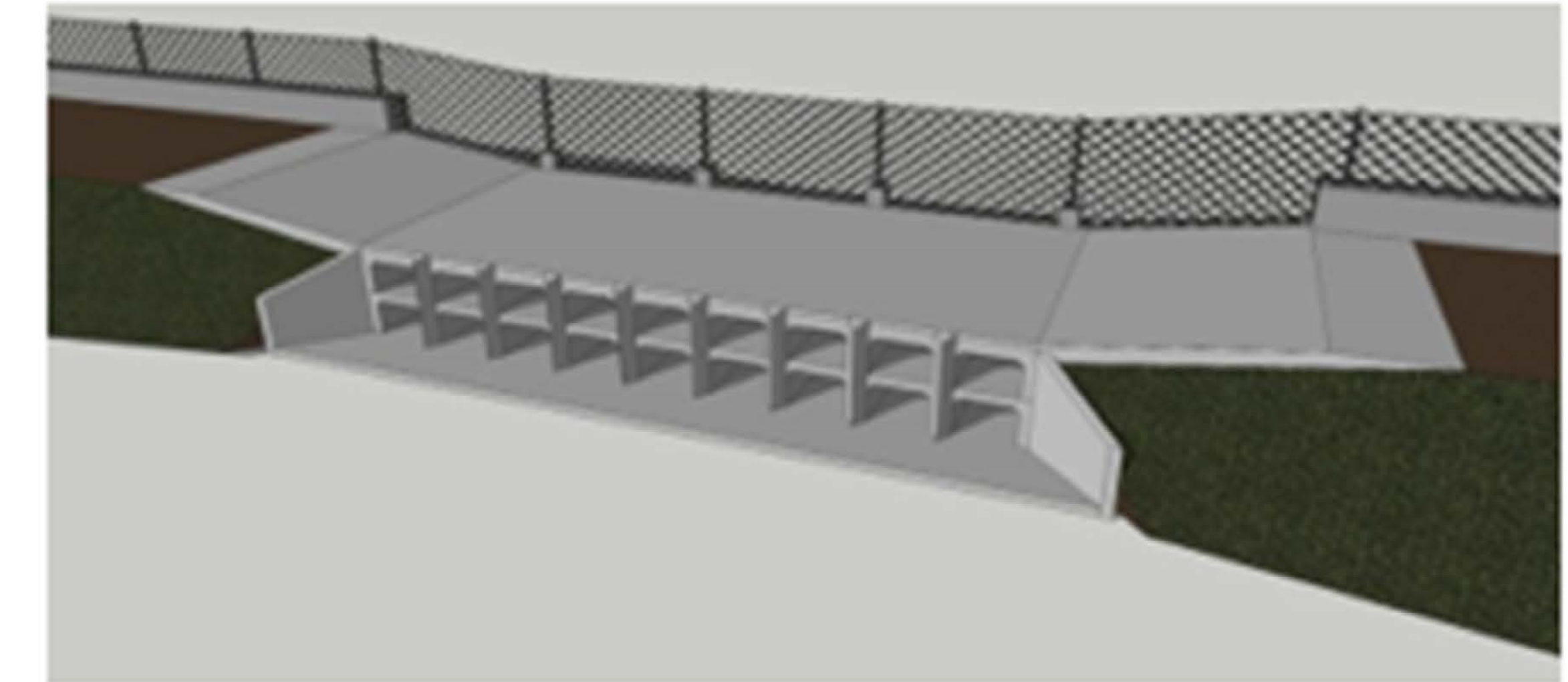
Trans World Radio Culvert Design

For The School of Science, Engineering and Health Symposium

Warner Hockenberry and Gabe Tiday

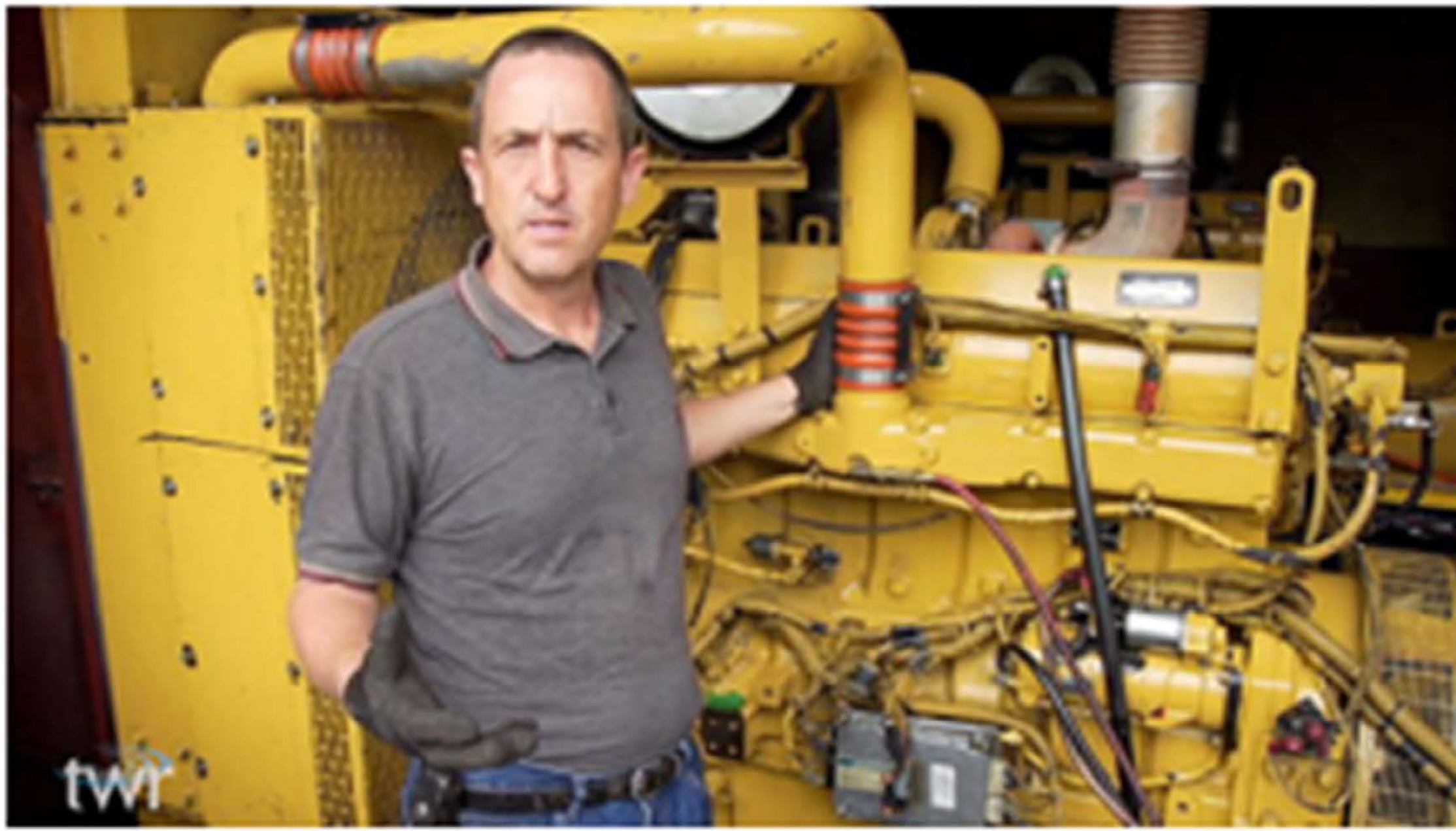


Speaking Hope to the World



Client:

This work is being done for Garth Kennedy, head of the Trans World Radio site, TWR, in Benin.



Task:

Our job was to design two culverts for the TWR compound in Benin, Africa. The culverts needed to be able to handle the weight of a backhoe and have enough capacity to withstand a ten-year storm.

Conclusion:

Using structural design and security requirements, the size of each barrel was determined. Using topography of the surrounding landscape and rainfall data, a design flow was calculated. From these two parameters, a number of barrels required was calculated for both the northern and southern culvert.

Introduction:

The TWR site is increasing security because it has expensive equipment. As a fence is put up around the perimeter, water becomes diverted. A culvert must be put in place to convey the water that would be diverted by the installation of the walls. The culvert barrels are sized such that it would be uncomfortable for a person to crawl through them. A culvert must be put in place at both the north and south end.



Acknowledgments:

Daniel Thomas – Student Project Manager
Darren Heisey – Senior Team Member
Gabe Tiday – Junior Team Member
Warner Hockenberry – Junior Team Member
Scott Heisey – Project Manager
Steve Lockwood – Consultant
Logan Horst – Sophomore Volunteer
Seth Kline – Freshman Volunteer

Further Information:

For more information email Dan Thomas, the SPM, at dt1239@messiah.edu



Disclaimer

The work presented in this document has been provided solely for educational and edification purposes. All materials are composed by students of Messiah University and are not certified by any means. They do not constitute professional consultation and require the examination and evaluation by a certified engineer through any product development process. The contents documented are the produced work by the student design team but do not necessarily represent the as-built or as-assembled state of a complete and tested design; faculty, staff, and other professionals involved in our program may have augmented the student engineering work during implementation, which may not be recorded within this document.

Messiah University, the Collaboratory, nor any party related to the composition of this document, shall be liable for any indirect, incidental, special, consequential, or punitive damages, or any loss of profits or revenues, whether incurred directly or indirectly, or other intangible losses, resulting from your access to or use of the provided material; any content obtained from the provided material, or alteration of its content.