

### ROLE OF ENTRANT'S FIRM IN THE PRJOECT

Sain Associates was contracted in 2020 to provide civil engineering, traffic engineering, and surveying for site preparation and construction of a 190,000 S.F. building and parking for over 7,200 vehicles. The overall site was approximately 191 acres. Our scope of services included all civil engineering design and permitting, under a fast-track schedule, with limited time to obtain permits and construct the project. The overall project involved mass grading several hundred thousand cubic yards and filling over approximately 1,600 linear feet of jurisdictional streams on the site, which posed a scheduling challenge due to permitting timelines. The overall civil engineering scope included Traffic Study (which recommended off-site roadway improvements on Morgan Road), Layout Plans (including all pavement, sidewalks, and storage parking), Grading Plans (including bridging the stream), Storm Drainage Plans (including stormwater management), Utility Plans (including sanitary sewer main extension to serve the buildings), Erosion Control Plans and SWPPP Package (for permitting with ADEM), and Jefferson County Road Widening Plans. Most importantly, we had to design and obtain permits to meet the client's construction schedule, which required innovative ideas to work around the existing streams and avoid a permit from the US Army Corps of Engineers.



Aerial View of Completed Distribution Facility

### ROLE OF OTHER CONSULTANTS PARTICIPATING IN THIS PROJECT

Sain Associates assembled a team of professionals to prepare the required design elements. The subconsultants on the team included:

- Robert P. Kirk & Associates, PC – Landscape Architect
- Barnett Jones Wilson, LLC – Structural Slab Design

### ENTRANT'S CONTRIBUTION TO THE PROJECT:

#### *Uniqueness and/or innovative application of new or existing techniques*

Sain Associates provided an innovative design approach that preserved the existing jurisdictional streams beneath the site by bridging across the streams with reinforced concrete slabs. These slabs were designed to support up to 35' of fill and bear on the natural compacted soils on both sides of the stream. In some areas, the stream width was up to 16' wide, so the concrete bridge structure was quite thick. Sain provided a detailed layout of the precast reinforced concrete bridge slabs, and they were cast on the job site and set in place by cranes. Providing this design strategy allowed us to preserve the existing stream beds and avoid a permit from the US Army Corps of Engineers.



Larger planks had to be handled and set in place carefully.

### Social, Economic, and Sustainable Development Considerations

The site design was sustainable because it preserved the existing streams in-place while allowing the site to be filled around and over them. Furthermore, the storm drainage for this project provided an extensive SWWPP design package which exceeded the State of Alabama design requirements required by ADEM. Moreover, the grading plan was designed to balance cut and fill of approximately 800,000 cubic yards of earthwork material, which did not require hauling material off-site, which would have increased carbon emissions for dump truck trips from the site.



Some portions of the stream were much narrower and well-defined.

### Complexity

This project was extremely complex from a civil engineering perspective, as it relates to completing the design, permitting, and construction within the tight schedule defined by the client. This project involved overall site planning to figure out how to fit a 190,000 square foot building, 500 parking spaces, and 7,000 spaces for car storage on a steeply sloped site. The site had to be graded to balance earthwork cuts and fills with a varied depth of topsoil, which also had to be managed. Furthermore, the site was bordered by Shades Creek, which had over 10 square miles of drainage flowing through it. We designed the stormwater management to match the pre-existing conditions within 0.5% for the 25 and 100-year storms.

### Successful fulfillment of client/owner needs

Our client's schedule for opening the facility required fast-tracking the civil design so that the site was under construction while the facility was still being designed. This required extensive coordination between our team, the City of Bessemer, Jefferson County, ADEM, and the US Army Corps of Engineers. We were able to avoid an extensive Individual Permit from the Corps of Engineers by spanning the streams to leave them in place. If we had not developed this innovative design strategy, we would have had to wait approximately 14 months to obtain an Individual Permit, which did not meet the client's schedule.

In addition, we designed widening for turn lanes into the site from Morgan Road, which required existing roadside utilities to be relocated. Widening and utility relocations had to be coordinated with AT&T and Alabama Power Company and approved by the Jefferson County Department of Roads and Transportation. We were able to obtain all required permits, and the project was completed on schedule.

During this project, the COVID-19 pandemic shut down most businesses. However, contractors and engineers were "Essential Services" and continued to work. We were able to finish the project with our team working remotely from home, with our files being stored on a remote server.

### Future value to the engineering profession and enhanced public awareness/enthusiasm of the role of engineering

We value engineered a cost-effective approach that involved using pre-cast reinforced concrete planks that could bear on the soil around the stream banks and be placed over the stream without disturbing it. Our team will consider this same cost-saving method for future projects.

## SUMMARY:

This project is worthy of special recognition because we had to be very innovative and committed to meeting the project schedule as COVID-19 interrupted life as we knew it. We performed our design using remote desktops, which allowed our team to work from home with minimal delay due to COVID-19. We frequently work on fast-track design-build projects such as this one, and we stayed on our design schedule despite the shutdown. In addition to COVID-19, we had to work around an extraordinary length of natural streams flowing across the site. For most projects, we would have had to wait 14-16 months to obtain an Individual Permit from the US Army Corps of Engineers, but we were able to avoid this process by preserving and leaving these streams in place. As a result of this strategy, we were also able to provide over \$500,000 in cost savings by preserving the streams and avoiding mitigation. So, in summary, we met an extremely demanding design schedule by using innovative design strategies while working remotely.