



# MetaWorld Civil Consulting

*The New Era of Engineering*

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## ENGINEERING PORTFOLIO

MetaWorld Civil Consulting is a company that is authorized by the Florida Board of Professional Engineers to perform Engineering Services. Our team is equipped with a State Licensed Professional Engineer (P.E.), as well as a Ph.D. and Certified Consulting Meteorologist (C.C.M.), who has a Bachelor's Degree in Irrigation Engineering. We boast decades of experience in sustainable development as Civil Engineers and Environmental Consultants.

### LAND DEVELOPMENT

Our team members have served as the Lead Engineer on several private land development projects. Two of those projects have won awards for best management practices; the Austin Business Journal 2010 Best Multi-Family Project (Gables Park Plaza- Phase I) and 2009 Best Rehab/Development Project (Concordia University Texas Campus Relocation). We have experience in residential, commercial, institutional and multi-use land developments; and we are familiar with the process from conception, to design and permitting, and through construction.

### INFRASTRUCTURE DESIGN

Members of our team have served as the Lead Engineer on major public and private infrastructure improvement projects. We have experience in upgrades of public water, wastewater and drainage infrastructure necessary to accommodate new land developments; as well as roadway and drainage improvement projects as a consultant to public entities. Most notable of these projects are the I-4 / I-95 Ramp Skid Hazard Safety Project and the Clyde Morris Boulevard at Aeronautical Boulevard Intersection Project. Nearly every land improvement project requires either new infrastructure or the upgrade of existing infrastructure. Our team is well equipped to design for the infrastructure requirements of any project.

### ENVIRONMENTAL CONSULTING & SUSTAINABLE DEVELOPMENT

Sustainable Development and Environmental Responsibility have been the underlying theme of our management team's experience for over three decades. Our team members have been involved in researching, teaching and consulting government and institutional entities in application of Eco-friendly practices and environmental impacts of development; as well as designing Stormwater Treatment ponds and Erosion Control Plans for all types of land improvements. Some of the more notable projects in this discipline include the Agricultural Application of Saline Wastewater (Irrigation Season Water Balance) Project, the Climatic Impacts of the Proposed Jordanelle Reservoir (Roadway Elevation Determination) Project and the Harnessing of Wind and Solar Energy Investigation Grant. At MetaWorld Civil Consulting, one of our main objectives will always be to continue promoting practices that are conducive to responsible development.



I-4 / I-95 Interchange - Daytona Beach, FL



Gables at 5th & Pressler - Austin, TX



Concordia University - Austin, TX



Green Energy Harvesting Investigation - Central Utah



## I-4/I-95 RAMP SKID HAZARD SAFETY PROJECT DAYTONA BEACH, FL

This project was a safety project for two ramps of the I-4 / I-95 interchange that experience high crash rates (the southbound I-95 to westbound I-4 and eastbound I-4 to northbound I-95 ramps). Both ramps were experiencing high crash rates, largely the result of skidding off the roadway or over-correcting after skidding. Upon review of accident data and site conditions it was determined that there were a number of measures that needed to be taken in order to adequately address the safety issues. Members of our staff were responsible for the engineering and permitting of all tasks required of this project, as well as served as the contact point for in-field construction inquiries.

The provided data indicated that one of the issues involved in this problem was that the existing superelevation rates on both ramps were insufficient for the design speed; as such this was brought to standard where feasible. Another issue involved with this are was that rain fall run-off was pushing large amounts of water directly over the roadway surface. This issue was addressed by using a porous granite friction coarse, which allowed water to run-off beneath the surface of the roadway while still providing traction. The final major defect contributing to the high accident count was the lane configuration of the eastbound to northbound ramp.

Initially, the configuration of the ramp was strongly apposed by the FDOT, upon presentation however, it was determined that this change would not negatively impact traffic and would positively impact the accident rate. Our staff was also able to receive acceptance from the FDOT to close both ramps at night during construction, despite being initially denied. The persistence to permit this construction method not only saved the public money, but it got a crucial safety improvement completed in weeks rather than months, and it was a safer project for the construction crew. Ultimately, the area now experiences far fewer accidents than before and it was done as efficiently as possible.



## CONCORDIA UNIVERSITY AUSTIN, TX

This project was the recipient of the Austin Business Journal Best Rehab / Development Project of 2009 Award. The project was for the relocation of Concordia University and consisted of roughly 60 acres of land improvements. As a part of this project, an existing research campus was acquired by the university, and additions were made to it. Those additions were a baseball field complete with dugouts, bleachers, concessions building and restrooms; a field house, two student housing buildings and mechanical building, a pump station, and parking to meet the needs of a university.

Our staff was responsible for the engineering and permitting of all civil site aspects including site layout and grading, drainage and pond design, wet utility design, road and sidewalk design and erosion control measures. Our staff also served as the point of contact for in-field construction inquiries.

One of the unique challenges involved in this land improvement was the fact that construction had to be complete by the opening of fall classes, which placed it under an extremely abbreviated schedule. Additionally, the old campus was scheduled to be demolished at the end of spring classes, so any slip up would have cost the University greatly. Another complication was the fact that all of the earthwork required excavation of hard rock, and therefore construction times would be longer than typical.

As a result of the scheduling requirements and extended excavation times, it was required to obtain an excavation permit prior to having the final design permitted. Although risky, it was the only way to permit the design and get it constructed time. With an amazing work effort and strict adherence to a forecasted schedule, the site was constructed prior to that start of classes.



## AERONAUTICAL BLVD. & CLYDE MORRIS BLVD. INTERSECTION IMPROVEMENTS DAYTONA BEACH, FL

This project was an extremely challenging project for the introduction of a new intersection providing access to Embry Riddle Aeronautical University (ERAU) along Clyde Morris Boulevard. The project included widening an FDOT facility to a width sufficient for the intersection, signalization design and the approval



of a SignalWarrant Analysis. Permitting this improvement was particularly difficult as the intersection improvements did not meet FDOT Guidelines and the amount of inter-agency coordination required was far above the average improvement.

This project was particularly unique because of its location, the parties involved and the fact that the proposed work was by a private entity on an FDOT facility and required the dedication of land for Right of Way. Additionally, the project required the extension of dual 60" culverts under and FDOT facility, a difficult permitting task. Our staff was responsible for the engineering and permitting of roadway and intersection improvements, signal design and utility coordination.

The new intersection is located at the border between the Daytona Beach International Airport and ERAU, near a Runway Protection Zone. It is also located within Daytona Beach city limits, but is being maintained by Volusia County. As such, the project required diligent and effective coordination between the University, the County, the City, the FDOT, the FAA, the Army Corps. of Engineers and all private utility companies.

Furthermore, the new intersection did not meet signal spacing guidelines nor did it meet guidelines for the amount of traffic needed to construct dual turn lanes; thus making the permitting of this improvement all the more difficult. Upon presentation from our staff and diligent coordination, the new intersection and signal was warranted due to its effectiveness in alleviating a known and documented traffic safety issue on the roadway. This project is permitted and currently under construction.



## GABLES - PARK PLAZA AUSTIN, TX

This project was the recipient of the Austin Business Journal Best Multi-Family Project of 2010 Award. The project was a joint venture between the City of Austin and Gables Residential, and consisted of roughly five acres of mixed use land improvement centrally located in downtown Austin. The development included design of four roadways and a round-about intersection that were to be dedicated as Right of Way to the City.

Our staff as responsible for the engineering and permitting of all civil site aspects including site layout and grading, drainage and pond design, wet utility design, road and sidewalk design and erosion control measures.

This project encountered a number of permitting challenges as it was bound by a Rail Road Right of Way, a City Power Plant and a FEMA floodplain. It was also required that a Conditional Letter of Map Revision by Fill (CLOMR-F) be filed to FEMA. That means that the land being developed will be filled in to the point where it is no longer at an elevation that is within the flood-plain, and therefore the FEMA flood-plain map required revision and development was permissible on that land.

At the end of the day, the project was an excellent example of utilizing space in the best possible manner; as it combines lush, strategically placed greenery that disguises the drainage ponds, extravagant buildings, an incredibly efficient round-about intersection, wonderful vehicular and pedestrian connectivity, and was permitted and constructed in a former flood zone. Today, this project is a focal point of tourism for the City of Austin, as it connects to Austin's only pedestrian bridge over the Colorado River (affectionately known to the local population as Lady Bird Lake in Austin). This is an area that is also highly traveled as it is a core part of the Music and Film festivals held in Austin every year.



## AGRICULTURAL USE OF SALINE WASTEWATER CENTRAL UTAH

Since 1987, MetaWorld Civil's staff has been contracted by the Utah Power Company to consult them regarding the most efficient and environmentally sustainable use of their saline wastewater. Saline wastewater is a by-product of coal power plants. If this wastewater is not effectively managed, it could contaminate water supplies and destroy agricultural fields. Proper management requires consistent monitoring and effective application of the wastewater.



Our staff was responsible for recommending the distribution of saline wastewater, monitoring the effects on the soil and groundwater, and updating as necessary. Seemingly simple, this task is incredibly complex. If the wastewater sits too long in the pond, it begins to contaminate the soil and eventually reaches the groundwater. If it is distributed too quickly, the results could be contamination elsewhere, or the killing of crops if used for irrigation. The complexity of managing the wastewater included not only preserving soil and water both where the wastewater was stored and where it was distributed, it also involved determining the proper crops that could be harvested using saline wastewater without negative impacts resultant from the use of said crops.

It was determined that if distributed properly, saline wastewater could be used to irrigate and cultivate alfalfa, which could be used to feed cattle without negative impacts to the plant, soil or animal; due to alfalfa's natural ability to break down the waste. The fact that the monitoring and distribution of this wastewater has been the responsibility our staff members for over two and a half decades attests to our knowledge and effectiveness in sustainable development.



## IMPACTS OF THE PRO- POSED JORDANELLE RESERVOIR WASATCH COUNTY, UT

The Jordanelle Reservoir is a 360,000+ acre-foot reservoir commissioned by the United States Bureau of Reclamation. The reservoir has a surface area greater than 3,300 acres and required the realignment of two state highways (US 40 and US 189). The improvement also includes large areas of artificial wetlands to mitigate the impacts.

Due to the size of the reservoir, the climate in the area and the proximity to state routes, it was imperative to be aware of the probable impacts. Members of our team were commissioned to forecast the fog that would be resultant of the new reservoir, and consult as to the required elevation of US 40 and US 189 such that the fog does not interfere with vehicular traffic.

Ultimately, the reservoir was constructed and the roads placed at an elevation where motorists could safely travel without visibility restrictions due to fog. Since that time, the Jordanelle State Park has been opened in the area and is offers a unique blend of recreational and protected land.

This portfolio is a sample of some of our consulting capabilities. For more information regarding MetaWorld Civil Consulting, LLC please feel free to reach us through our website ([www.metaworldcivil.com](http://www.metaworldcivil.com)) or through any of the following methods:

