



TECHNICAL PROPOSAL
Section 1 - Project Approach



I-10 WIDENING FROM I-295 TO I-95

Financial Project Number(s): 439100-1-52-01 & 439100-1-56-01
Federal Aid Project Number(s): D217-128-B
Contract: E2Y63 | Submitted July 11, 2019



Figure 1 - AW Team Approach Highlights



INTRODUCTION

The Design-Build Team of Archer Western Construction and GAI Consultants (The AW Team) is pleased to present this technical proposal for the widening of I-10 from I-295 to I-95 in Jacksonville. I-10 is a major urban commuter route that is expected to see significant traffic growth in the coming years. The AW Team will:

Maintain Existing Traffic Operations. This project requires a plan that reduces the number of traffic shifts and phases while maximizing public and worker safety. Normally, concrete widening on a project like this would be accomplished by shifting traffic onto the existing inside shoulder and then constructing all of the proposed outside widening behind temporary barrier wall. Given the sharp curves and narrow shoulders on I-10, such an approach would result in long sections of the heavily traveled interstate having no shoulder refuge, reduced sight distance and increased potential drainage problems. It also results in confusing "ghost striping", where the evidence of water blasted old stripes conflicts with newly placed stripes. **The AW Team has developed a construction approach that minimizes these challenges by keeping the traffic in its existing configuration and maintaining a 10' shoulder refuge for the majority of the project. Traffic shifts that result in a reduced shoulder (< 10') will be limited to 1,000' in length and two weeks in duration.**

Assure 60" of S+ Material Underneath all Proposed Concrete Pavement. During the proposal phase of this project, the AW Team completed 30 additional soil borings in the existing outside concrete shoulder to determine the extent the existing soils meet FDOT's S+ soil requirements to a minimum depth of 60" below the concrete. This in-depth field research allows the AW Team to better understand where subgrade excavation will be needed and plan our work accordingly.

Complete I-295 Interchange Improvements in Early Works. The project scope includes operational and safety improvements to the I-295/I-10 interchange. **The AW Team understands the importance of these improvements to safety**, particularly where the radius of the I-10 EB exit to I-295 is increased to reduce roll-over crashes. The AW Team commits to expediting these improvements in a standalone, "Early Works" plan set and completing construction early in the project. 90% Early works plans will be submitted within 60 days of NTP, with construction completed within 9 months of RFC plan release by FDOT. This will allow the traveling public to take advantage of this newly constructed permanent facility as soon as possible.

Maintain Cedar River flow. Cedar River is a 100 year floodway, and upstream flooding has been a persistent problem. As such, reconstruction

of the bridge culvert that carries this river underneath I-10 must not hinder it's ability to convey floodwaters. Our detailed construction plan allows for full culvert capacity during major rain events with only limited notice and preparation. In addition, the precast cell solution to construction expedites work, allowing the AW Team to bring the final configuration on-line more quickly than a traditional cast-in-place methodology.

Coordinate Seamlessly with the I-10/I-95 Operational Improvements Project. The AW Team is uniquely positioned to work with FDOT to coordinate the I-10 Widening design and construction with the ongoing I-10/I-95 Interchange project currently under construction by this very same team. This will allow the AW Team to seamlessly harmonize Maintenance-of-Traffic (MOT) and construction operations. It also provides an opportunity to realize savings, evidenced in the Team's recent coordination with the Department to adjust signing plans to better accommodate each project and limit any throw-away costs.

Highlights of the AW Team's approach are shown below and on **Figure 1**:

Improve Constructability and Safety

- 1 Complete I-295 ramp work early in the schedule
- 2 Reduce major traffic shifts for any movement over Cedar River
- 3 Construct the Day Ave tunnel replacement in two phases
- 4 Use drilled shafts for median bridge widening to reduce impacts to cross-street traffic and enhance worker safety
- 5 ATC #6A: Eliminate bridge widening over Stockton Street
- 6 Continue to work in the corridor as an extension of the AW Team's I-10/I-95 operational improvements project
- 7 Rely on AW Team's recent District 2 experience with Carbon Fiber wrapping for bridge beam strengthening
- ★ Maintain 10' shoulder throughout vast majority of construction
- ★ Minimize MOT shifts for I-10 widening, avoiding temporary striping, Stopping Sight Distance (SSD), and drainage concerns
- ★ Provided supplemental borings during the proposal phase that identify locations where full depth (60") subgrade replacement is required

Reduce Environmental Impacts

- 8 Maintain flow in the 100 year floodway at Cedar River during construction
- 9 Avoid impacts to the very deep, existing 54" and 60" storm sewer trunk lines adjacent to I-10 between Cassat Ave. and Lane Ave.
- 10 Accommodate eagle nesting season within the project schedule
- ★ Eliminate 2,800'—more than 50%—of roadside linear ponds shown in the RFP concept



Reduce Impacts to stakeholders

- 11 ATC #5: Avoid need to extend the McCoy Creek culvert
- 12 ATC #6A: Realign I-10 to increase offset to W.W. Gay Building
- 13 ATC #6A: Realign I-10 to eliminate WB outside widening of the CSX overpass, reducing railroad (RR) impacts
- 14 Profile the Day Ave. tunnel to ensure positive drainage

Operational Improvements

- 15 ATC #5: Realign I-10 WB to keep existing SSD, a significant safety improvement over the RFP concept
- 16 ATC #5: Realign I-10 WB, maintaining the US 17 SB Exit gore as-is and reducing associated traffic impacts
- 17 ATC #12B: Realign WB entrance ramp to I-10 from Cassat Ave. eliminating ramp reconstruction and increasing design speed
- 18 AW's I-10/I-95 Project ATCs facilitated and simplified connections to the proposed I-10 widening improvements
- ★ As a value added, the AW Team will install 17 thermoplastic pavement route shields in addition to the ones required by the RFP

DESIGN

ALTERNATIVE TECHNICAL CONCEPTS (ATC'S) AND DESIGN INNOVATIONS

The AW Team has worked with Department staff on developing several ATCs in an effort to improve safety, enhance operations, promote constructability and reduce impacts to stakeholders and the environment. These ATC's have been incorporated into our design with all conditions of approval addressed.

ATC #5 | I-10 WB Realignment (McDuff Ave. to King St. Overpass)

The RFP concept plan widens I-10 WB to the inside at the SB US 17 exit terminal, requiring reconstruction of a section of SB US 17 and the gore terminal. The RFP realignment reduces the radius of the exit curve and thus shortens the SSD on SB US 17.

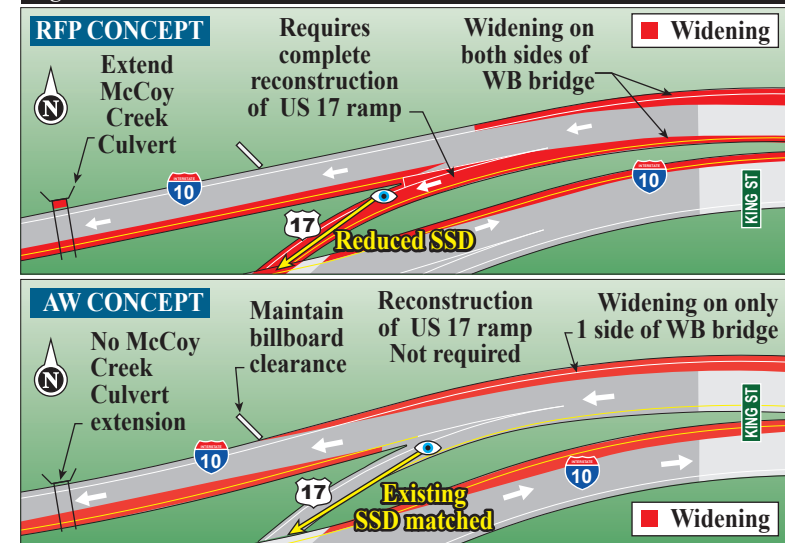
The AW Team developed an alternative alignment in ATC #5 with the following benefits (see **Figure 2**):

- Maintains the existing SSD
- Avoids reconstruction of the US 17 exit gore and several tight shifts and temporary pavement that would be required to maintain traffic
- Eliminates the need to extend the McCoy Creek culvert and any associated environmental concerns

ATC #6A | I-10 EB and WB Realignment (Stockton St. to US 17)

The RFP horizontal alignment in Appendix G for this section of I-10 results in a total of seven separate bridge widenings over King Street,

Figure 2 - ATC #5



CSX RR, and Stockton St. The AW Team developed an alternate alignment (ATC #6A) that eliminates three bridge widenings and greatly simplifies construction while yielding the following benefits (see **Figure 3** on page 3):

- Realigns I-10 to consolidate CSX overpass widening to the EB only, completely eliminate the Stockton St. overpass widening and limiting the WB King St. overpass widening to one side. The ATC widens four bridges vs. seven as indicated in the RFP concept.
- Significantly reduces need for substandard inside shoulders along EB and WB I-10 between US 17 and Stockton St.
- Simplifies and reduces work and associated construction time over CSX RR
- Shifts the alignment of I-10 away from the W.W. Gay Facility, which partially encroaches FDOT R/W

ATC #12B - I-10 WB Entrance Ramp from Cassat Ave. (Ramp G)

The horizontal alignment and associated vertical profile proposed in the RFP results in significant ramp reconstruction. The AW Team developed an alternate alignment as shown in ATC #12B with the following benefits (see **Figure 4** on page 3):

- Eliminates full reconstruction of the existing ramp, reducing construction time and associated impacts
- Eliminates the "hump" in the RFP ramp vertical profile, increasing the design speed from 45 to 50 mph
- Saves costs by reducing pavement replacement and temporary asphalt
- Avoids impacts to the recently installed, deep 54" drainage line
- Maintains landscape opportunity areas

Figure 3 - ATC #6A

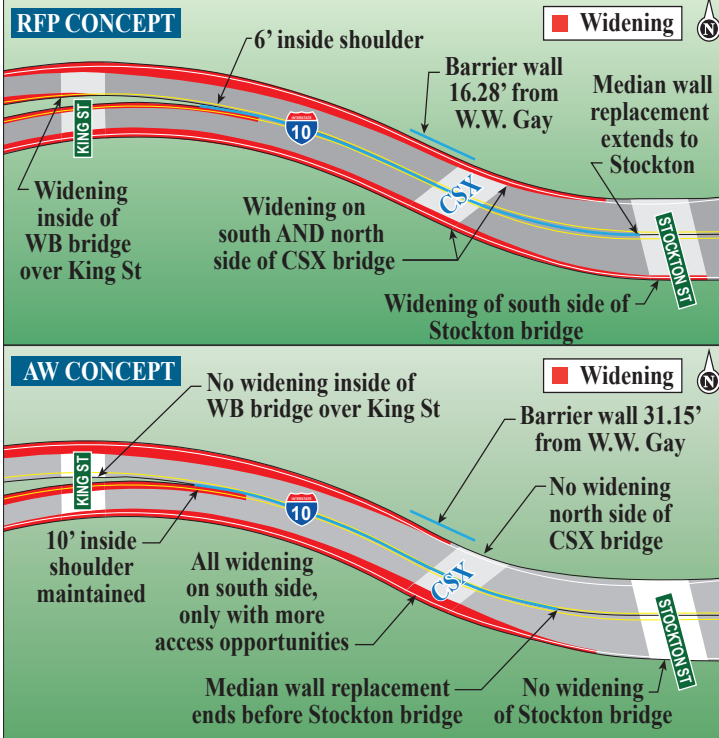
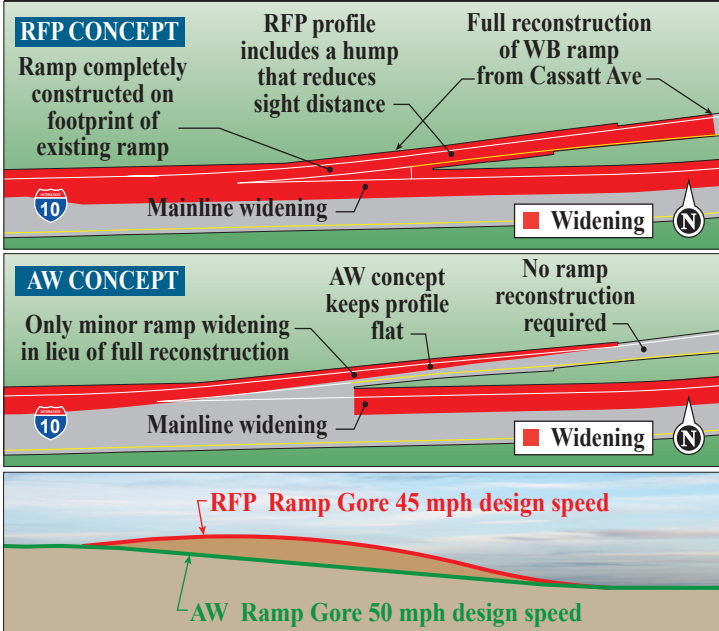


Figure 4 - ATC #12B



PAVEMENT DESIGN

Per the RFP, the concrete pavement design for the widening on I-10 will include 9" of concrete pavement atop 60" of special select soil, consistent with the criteria put forth in Standard Plans Index 120-001. At the time the original roadway was constructed, only 48" of this special subgrade was required. No soil boring data for the existing shoulder was provided in the RFP, resulting in uncertainty as to the extent of full depth (60") subgrade replacement limits.

To reduce the potential risk to both the Department and the AW Team, we conducted intensive field research, performing borings along the shoulder up and down both sides of the alignment. Through this data, it was clear that the areas of high fill did in fact have more than 60" of suitable material. Near the natural ground, however, the AW Team

discovered numerous locations where 48" and shallower depths were in place. These limits are detailed, along with boring data, on the included roll plots.

The result of this analysis is that approximately 26,650' of existing subgrade may remain in place, requiring only simple slab replacement at the proper cross slope. This greatly reduces impacts to the public, expedites construction, and allows the AW Team to maintain 10' shoulders for the vast majority of the project throughout all phases of construction.

ROADWAY

The AW Team will build two new lanes on I-10 EB from Cassat Ave. to I-95 and two new lanes on I-10 WB from I-95 to I-295. These new lanes will tie into the improvements the AW Team is currently constructing in the I-95 interchange. This primarily outside widening will include modifications to the ramp terminals along the corridor, including the WB connection to US 17. The project also includes operational improvements at the I-10/I-295 interchange consisting of modifications to the I-10 EB exit to I-295, and extension of the merge lane for I-10 WB entering I-295 SB. Improvements to intersecting cross streets include expanded sidewalks, intersection improvements and resurfacing. Sound walls will be installed throughout the corridor.

TEMPORARY TRAFFIC CONTROL PLAN (TTCP)

The AW Team's approach to traffic control focuses on maintaining the quality of existing traffic operations, minimizing phases and traffic shifts, establishing safe ingress/egress to the work zone and coordinating with on-going adjacent projects. An extensive geotechnical investigation has allowed the AW Team to develop a TTCP for the proposed concrete pavement widening on I-10 that accomplishes all of these goals.

Early Works – Early works construction will include the modifications to the I-295 interchange and the intersection of McDuff and US 17.

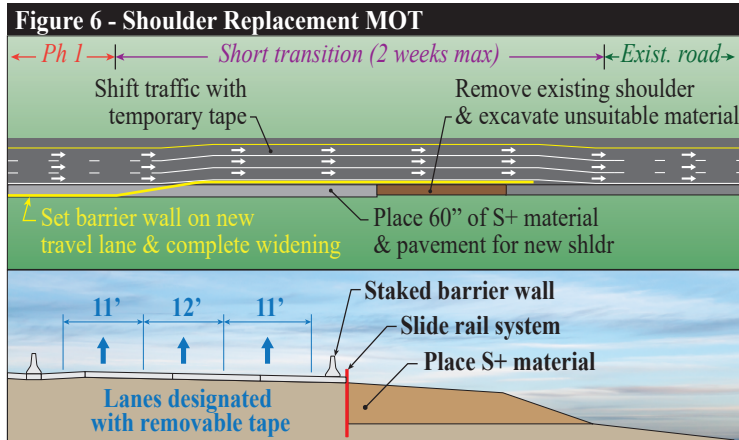
Phase 1 – Phase 1 will begin with replacing the existing concrete shoulders with full depth pavement at the correct cross slope. In areas where existing soil meets FDOT's S+ requirements to a depth of 60", a slab replacement under night time lane closures will be utilized (see Figure 5). This is similar to the AW Team's I-95 project in Downtown Miami, where 264,000 SY of concrete pavement is being replaced.

Figure 5 - MOT When Existing Material Meets S+ Requirements



In locations where there is insufficient existing S+ material, traffic will be shifted onto the inside shoulder so excavations may be safely completed

behind a barrier wall (see **Figure 6**). These shifts will occur in 1,000' long segments, with no shift lasting longer than two weeks. This will allow for easily removable temporary tape pavement markings and avoid ghost striping. The short segments also limit the amount of time and distance that drivers will not have a full width shoulder. As the shoulder replacement operation is completed, a temporary barrier wall will be set on the newly installed slabs and the remainder of the work will be completed behind it.

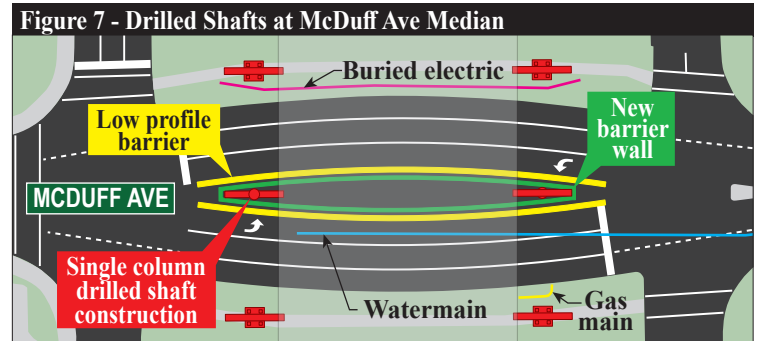


Phase 2 – With widening complete, I-10 traffic will be shifted to the outer new lanes while median work is completed.

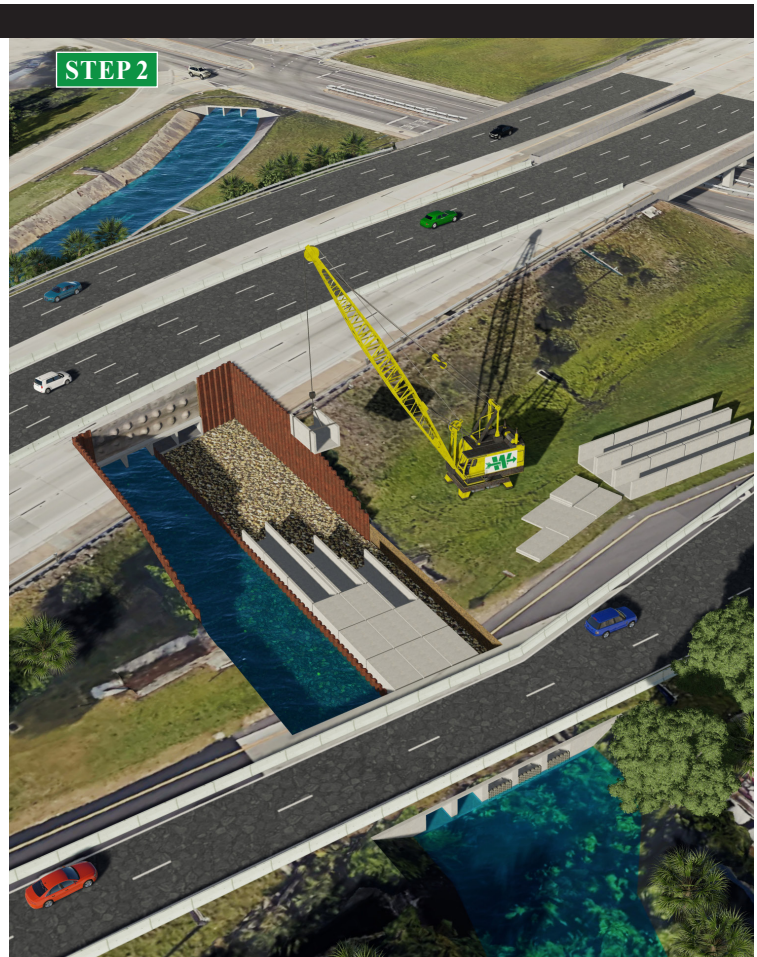
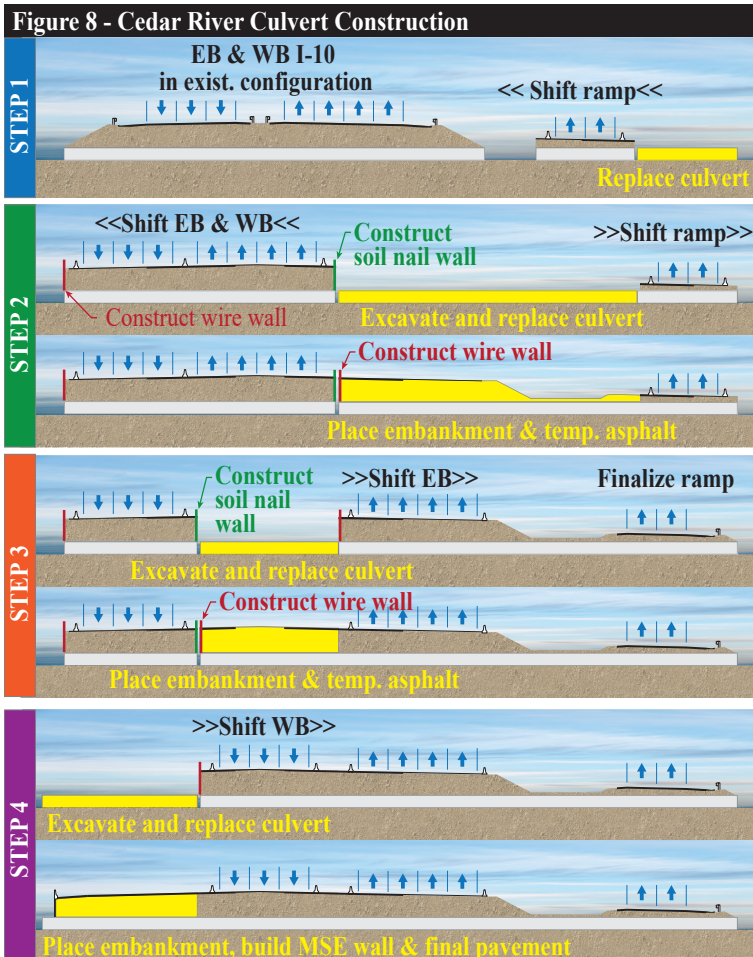
TTCP Ramps/Cross Roads/Culverts – The AW Team understands the restrictions on reducing the number and length of turn lanes on ramps and cross roads during construction. The AW Team's approved alignment changes in ATC's #5 and #12B significantly reduce traffic impacts by

eliminating the need to reconstruct several ramps and associated gores, including the heavily traveled I-10 WB exit to SB US 17 and the entrance ramp from Cassat Ave. to I-10 WB (Ramp G).

To reduce impacts to traffic on the side roads, foundations for piers in the medians of several roads, including Cassat Ave. and McDuff Ave. will be single drilled shafts that transition directly to columns. This avoids having to excavate and construct a pile cap within the constrained working space (see **Figure 7**).



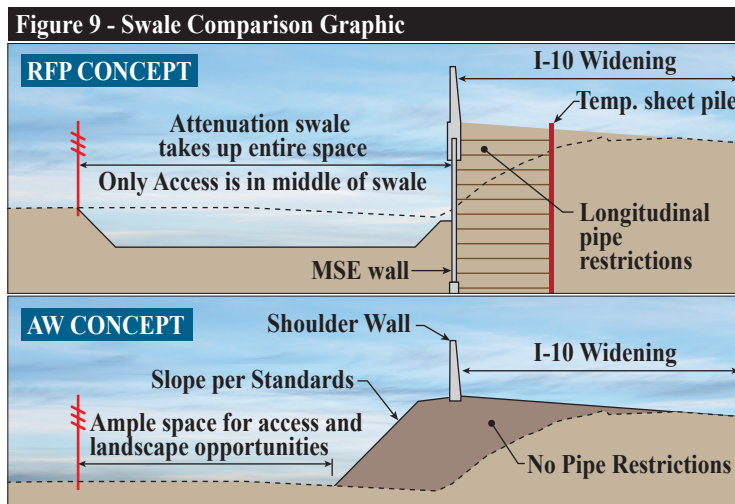
The replacement of the Cedar River bridge culvert will be completed by systematically shifting the I-10 mainline and EB exit ramp lanes so the culvert may be built in stages from south to north without impeding the floodway. The MOT plan has been developed so no single movement (I-10 EB, I-10 WB or Ramp D) has more than two temporary alignments throughout the process. **Not only does this minimize traffic shifts during construction, each shift will occur in conjunction with the placement of a lift of asphalt on I-10 so traffic is always shifted to new pavement with fresh markings** (see **Figure 8**).



DRAINAGE

The existing stormwater system is a complex mixture of open and closed systems that serve FDOT, City of Jacksonville and private properties. Having studied these systems extensively, as well as SJRWMD ERP Application 156963-1 (issued May 2019), the AW Team will modify the existing permit and drainage system to convey stormwater to treatment facilities and outfalls. Additional inlets along the barrier walls and in the median areas will be placed to meet spread criteria.

The AW Team has refined pond controls for both the Cedar River and McCoy's Creek outfalls. Seasonal high water elevations allow a 12" and 6" reduction to pond tailwater conditions for the Cedar River and McCoy Creek drainage systems, respectively. *The drainage control refinements have allowed the removal of 2,800 LF of proposed attenuation swales adjacent to I-10 and avoids impacts to the recently installed 54" and 60" storm drain lines on the north side of the corridor.* Eliminating swales reduces FDOT's maintenance and associated costs (see **Figure 9**).



The existing bridge culverts that carry the Cedar River under Ramp D and I-10 west of Lane Ave. will be replaced with a single quintuple 9'x7' structure. Cedar River, being in the 100 year floodway, requires a construction approach that maintains flow with a no rise condition upstream per FEMA requirements. The AW Team's approach to accomplishing this is detailed within the construction section.

PERMITTING

The existing SJRWMD and ACOE permits for the replacement of the existing bridge culverts over the Cedar River authorize the impacts to 1.60 acres of wetlands and 4.26 acres of upland cut ditches within the project boundaries and provides compensation for these impacts through mitigation bank credits. Pond CR 1 and CR 2 construction activities will be scheduled around eagle nesting season (October 1 - May 15) due to the adjacent occupied nest. Activities within the primary (330') and secondary (660') protection zones will comply with USFW policies and other listed species, including the eastern indigo snake, will be protected.

The WB bridge over King St. includes asbestos-containing material, and the Day Ave. pedestrian tunnel contains lead based paint. The AW Team will proactively work with the Department's CAR contractor to remediate these contaminants and maintain the project schedule.

STRUCTURES

The project requires widening/retrofitting bridges at 10 locations that consist of prestressed AASHTO beams founded on driven piles. Based on existing inspection reports and load ratings, all bridges are in good condition and suitable for widening with the exception of the bridge over

Cassat Ave. Similar to the design completed by design partner WSP and inspected by GAI for the I-295 bridges over Scott Mill Rd., the critical beams will be strengthened using externally bonded Carbon Fiber Reinforced Polymer (CFRP). This will provide additional shear capacity and increase the load rating of these beams to satisfactory levels.

The bridge widenings will maintain existing bridge orientations, skews and span lengths. The widenings will utilize driven piles or drilled shafts. All existing bridges have substandard vertical clearances and require Variations (already obtained by the Department) to allow the existing clearances to remain. The AW Team will maintain existing clearances using standard FIB girders or, in the case of Cassat Ave., Nelson St., McDuff Ave. and King St., modified prestressed beams.

The Day Ave. tunnel will be replaced by an 8'x7' box culvert with the top slab of the culvert utilized as the riding surface. By elevating the top of the proposed box culvert to the roadway level, we have eliminated the impact to nearby utilities (see **Figure 10**). The AW Team will also develop a profile that prevents water from draining into the tunnel.

RETAINING WALLS

Construction of MSE walls where long straps are required is challenging due to the proximity to existing travel lanes that must remain open to traffic. This requires the use of critical temporary retaining walls which will be carefully designed and detailed within the plans. Where perched walls are allowed by the RFP, reduced strap lengths will be used to eliminate this need for temporary walls. Retaining wall construction will be sequenced to avoid the need to excavate in front of retaining walls for items such as drainage structures – minimizing unexpected settlement and improving service life. Proposed ITS and existing utilities will be proactively coordinated to minimize conflicts.

Undercut walls will be required to provide space for the new sidewalks under all bridges on I-10 over intersecting cross roads with the exception of Ellis St. The AW Team will use straightforward and reliable soldier pile and lagging wall construction with a structural concrete face to support the embankment underneath the bridge. The approach is discussed in detail in the construction section.

GEOTECHNICAL INVESTIGATION PLAN

The AW Team has thoroughly reviewed the RFP and the provided geotechnical data to assess the subsurface conditions within the project corridor. To refine the limits of suitable subgrade for concrete pavement, we performed a supplemental geotechnical exploration. Thirty additional borings were performed in the concrete shoulder area of I-10 and analyzed. **A complete supplemental geotechnical investigation plan was developed to provide assurance all work will be performed in accordance with FDOT and FHWA requirements, as well as all requirements in the RFP including Section VI.C.** This approach will allow the AW Team to take full responsibility for the geotechnical design.

GROUND IMPROVEMENT PLAN

The concept borings, as well as our Team's supplemental proposal phase borings were reviewed to help determine the need for a ground improvement program. Due to the planned fill heights, pre-loading of the sandy soils is anticipated in order to allow the elastic settlements to dissipate. Also, in the area of the Cedar River culvert improvements, some organic soils (A-8) were encountered that will be removed in accordance with Standard Plan Index 120-002.

TEST LOAD PROGRAMS

For driven piles, PDA testing at each bent/pier location will be performed in accordance with FDOT requirements. The PDA data will be utilized in

conjunction with WEAP and CAPWAP software programs to develop accurate pile lengths and driving criteria to facilitate the installation of production piles. In locations where MOT requirements limit construction space and shift durations, such as for the median piers on Cassat Ave. and McDuff Ave., the AW Team will utilize drilled shaft foundations. This will not only reduce noise, vibration and duration of the foundation construction, it will also improve MOT and lessen the effect of construction to the public in a heavily traveled corridor. For bridge drilled shafts, a test shaft program will be developed in accordance with FDOT criteria including the construction of a method shaft. Installation of all production piles and drilled shafts will be supervised by the Geotechnical Foundation Design Engineer of Record (GFDEOR) and monitored by certified CTQP inspectors. Upon completion of each foundation member a foundation certification letter will be provided by the AW Team's geotechnical foundation EOR.

SIGNING AND PAVEMENT MARKING

Many of the existing overhead sign structures within this section of the I-10 corridor will be impacted by the widening and ramp modifications, and will be replaced per Appendix K. New overhead signs will be arrow-per-lane type for the I-10/I-95 and the I-10/I-295 interchanges. Continued coordination with the AW Team's I-10/I-95 Interchange project will ensure adequate signage is maintained. Route shield pavement markings will be added to the EB approach to the interchange. *As a value added, the AW Team will install 17 thermoplastic pavement route shields in addition to the ones required by the RFP. As shown in the roll plots, these shields will be located at the I-10 WB exit to US 17 and the I-10 WB exit to I-295.*

SIGNALS

The proposed roadway design will impact several of the existing signals at ramp terminals on local streets. Impacts have been identified at the I-10 interchanges with Lane Ave and Cassat Ave, and the intersection of Cassat Ave. and Lenox Ave. Affected poles at these locations will be replaced in kind using mast arm and strain pole assemblies. Pedestrian signals will be evaluated and upgraded to countdown signals as needed.

LIGHTING

The existing median light poles will be replaced with LED shoulder lighting. The AW Team's phasing plan will allow the existing lighting system to remain in operation while the new system is installed and placed into service. The new luminaires will be positioned over the shoulders to reduce impacts to traffic during maintenance. Any existing poles to remain will be upgraded with LED luminaires. Pedestrian pathways under I-10, including the Day Ave. tunnel, will have 24-hour, vandal resistant lighting to improve safety. Existing service points and load centers will be inspected and upgraded as necessary, and new load centers will be positioned to ease maintenance access.

ITS

The AW Team's District 2 ITS experience includes projects such as I-10/I-95 Operational Improvements, Overland Bridge Replacement, and I-295 Express Lanes East. As part of FDOT's SunGuide ITS Phase II, the existing ITS system is one of the earlier phases to be deployed, and will be upgraded per the RFP. Key issues include:

- **Maintenance of Communication (MOC):** The AW Team will coordinate device relocations to assure service is maintained throughout construction. This includes developing a cut-over plan for switching over to new devices and maintaining the DMS signs.
- **CCTV and MVDS Coverage:** The AW Team will thoroughly review the corridor to ensure full CCTV and MVDS coverage. Repeating an

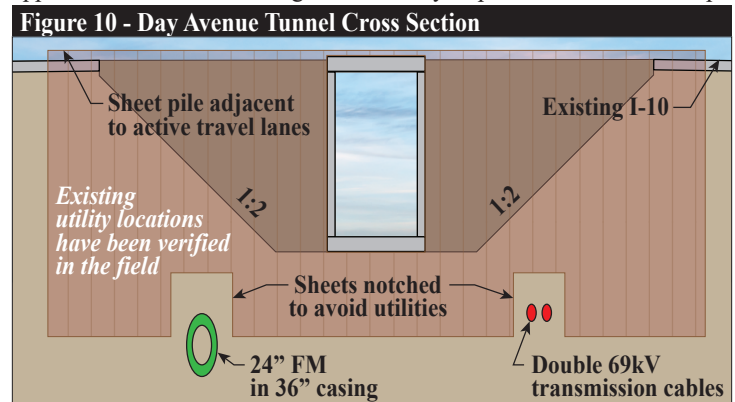
innovation pioneered on the I-10/I-95 project, the AW Team will use a drone to take aerial video to determine optimal camera positioning.

As a value-added benefit, a passive monitoring system for the Day Ave. pedestrian tunnel using vandal-proof motion activated CCTV cameras and a Digital Video Recorder (DVR) will be installed to discourage anti-social activities. Monitoring of this system will be coordinated with the Jacksonville Sheriff's Office.

UTILITIES

The AW Team has met with all impacted Utility Agencies/Owners (UAOs) and developed a preliminary Utility Conflict Matrix. The coordination efforts and relocation work will be scheduled early and will run concurrently with design and construction to avoid project delays. Prior to preparing utility work schedules, agreements, and certifications, our assigned Utility Coordination Manager, Bob Baxter, will hold field meetings, plan review discussions, and one-on-one conflict resolution meetings with UAOs. The AW Team will explore design options that avoid relocation of utilities first, and quickly coordinate relocation plans if needed within the boundaries of the construction schedule.

The AW Team has already obtained field locates for the double 69 kV buried transmission lines and the 24" force main next to the Day Ave. tunnel (see **Figure 10**). *These early utility locates confirm that reconstruction of the tunnel in its current location can be completed without impacting these major utilities.* Other areas of concern for utilities are the multiple bridge widenings. The new foundations must be positioned to minimize impacts to utilities along the cross roads. The use of drilled shafts, described above, reduces the foundation footprints and will minimize impacts to utilities. The AW Team's added utility relocations, optimized drainage design and innovative bridge foundation approach have eliminated significant utility impacts in the RFP concept.



DESIGN COORDINATION

The AW Team has demonstrated firsthand to FDOT how its internal coordination and collaboration avoids design and construction issues, while maintaining aggressive schedules on all complex Design Build projects. The keys to the coordination plan include:

- **I-10/I-95 Operational Improvements Project:** Only the AW Team can provide seamless coordination with the ongoing I-10/I-95 Project.
- **Pre-Proposal and Proposal Workshops:** For nearly nine months, the AW Team has worked collaboratively conducting weekly intensive workshop sessions to develop optimized alternatives that improve traffic operations, streamline contractibility, and maintain planned operations.
- **Permitting Agency Coordination:** Continuous communication regarding environmental permit strategy will ensure no delays to our design and construction schedule.
- **Component Plans married to Project Schedule:** Plan component submittals will be devised to support the actual construction schedule with focus on delivery of specific plan groups to maintain field progress.

To facilitate resolution of ERC comments during the design phase, the AW Team will continue the practice of uploading revised plan sheets with responses to comments and directly engaging reviewers to ensure resolution. This approach was key to the timely and efficient resolution of comments on the I-10/I-95 Project.

DESIGN COORDINATION THAT MINIMIZE RELOCATION OF UTILITIES

The AW Team has already invested in significant utility location efforts, focusing in on critical areas such as the Day Avenue Pedestrian Tunnel. Strategies such as these confirm our ability to construct within the existing footprint and avoid relocation of the utility stakeholders’ facilities. In addition, we will continue to refine drainage and retaining wall designs to reduce direct impacts, and manage overhead conflicts through the use of low-headroom equipment and pile splicing where appropriate.

CONSTRUCTION COORDINATION PLAN MINIMIZING DESIGN CHANGES

The AW Team’s history of success has repeatedly demonstrated how its internal coordination and collaboration avoids design and construction issues. The keys to the coordination plan include:

- **Critical Component Pre-Bid Design Development:** The AW Team worked to identify and fully develop design components which represent the highest risk for changes during construction, addressing that risk within our design and construction plan.
- **Design Task Meetings with the District 2 team:** In addition to meeting RFP requirements, the AW Team will maintain continuous interaction with our FDOT design partners throughout project plan development.
- **Constructability Reviews:** Integrated constructability reviews between design and construction are completed prior to any design submittal.

DESIGN CONSIDERATIONS THAT MINIMIZE IMPACTS TO ADJACENT PROPERTIES AND STRUCTURES

The AW Team will strategically design elements to limit these impacts, including:

- Using drilled shafts at Cassat Ave., McDuff Ave. and Edgewood Ave. to simplify construction and minimize vibrations
- Complete an early works package that will allow for advanced construction of shoulder noise walls
- Participating in a site survey at the onset of the project to identify sensitive structures and tailor the design to minimize impacts

DESIGN CONSIDERATIONS THAT WILL REDUCE THE INTENSITY AND DURATION OF NOISE AND VIBRATIONS

A primary focus of our ATC development was to find ways to simplify construction and reduce overall time and associated impacts:

- ATC #5 – Reduces time to reconstruct the exit gore from I-10 WB to US 17
- ATC #6A – Eliminates three bridge widenings and associated pile driving and construction time
- ATC #12B – Eliminates reconstruction of the entire ramp at Cassat Ave, reducing construction time and noise
- Use of Drilled Shafts in lieu of piles at Cassat Ave., McDuff Ave. and Edgewood Ave.

AESTHETICS

The AW Team has reviewed the Project Aesthetic Requirements provided in RFP Appendix M and will meet all associated requirements. Having completed an equally ambitious aesthetics package for the I-10/I-95 Operational Improvement project, the AW Team is well positioned to work with critical stakeholders to bring this project’s aesthetic requirements from concept to reality.

CONSTRUCTION

Archer Western is one of the top highway and bridge design build contractors in Florida as well as the #1 bridge contractor in the USA according to ENR. AW’s construction team is the most experienced in District 2, having worked on 45% of the DB projects, including major projects, such as: I-95 Overland Bridge, I-295 Express Lanes and the adjacent I-10 Operational Improvements. All of these projects have a work mix similar to this project. Using this experience, the following sections describe the construction means and methods and how they will achieve the project needs and goals.

ROADWAY CONSTRUCTION

Clearing and Earthwork. All clearing operations will be performed in accordance with Specification 110 using standard equipment. Any trees within the project corridor to remain will be identified and delineated prior to clearing operations. The AW Team will closely coordinate removal operations for any contaminated soils with FDOT and will ensure all earthwork operations are performed in accordance with Standard Plans Index 120 and Specification 120. Embankment and MSE wall construction activities will be scheduled concurrently with pond excavation to maximize efficiency and reduce the amount of off-site borrow material required.

Having constructed major projects in urban Jacksonville with ash contamination (“The Big I”), the AW Team is aware of the importance of identifying and disposing of ash. All field personnel will receive specific ash training, and AW will work with FDOT’s CAR contractor on removal should any be identified. A Modified Special Provision (MSP) for Section 120 of the Specifications for any work to be performed within ash contaminated area will be prepared.

Concrete Pavement. AW has performed over 300 lane-miles of PCCP construction and widening in Florida and will employ techniques developed over time to minimize damage to the existing PCCP that is to remain. To minimize potential spalling of the existing pavement, high grade ramps (constructed with firm material such as limerock and/or asphalt millings) will be utilized to access the work areas rather than dropping off or climbing up the concrete face with equipment. AW will maximize the amount of new concrete pavement placed with the paver. Rubber tracks will be installed on the concrete paver to further reduce the risk of damage to the existing concrete. Plywood will be placed prior to running all other tracked equipment on the existing concrete. Finally, a vacuum/sweeper truck will be utilized to ensure that all concrete surfaces are kept clean. We will comply with RFP requirements for rehabilitation/replacement of existing concrete slabs.

Permanent Drainage. Most of the proposed drainage system will be constructed with conventional means and methods. Dewatering will be used when required with discharge from the pumps going to adequately-sized settling basins. For installations within MSE walls, locations will be closely coordinated with the wall manufacturer and plan notes added to ensure shop drawings for walls have been developed with the location of the pipes considered. Prior to trenching or excavating for pipes/structures and ponds, a work plan that addresses potential utility conflicts, dewatering requirements, OSHA standards and safety needs such as trench boxes will be established. New and existing inlets will be protected to prevent dirt and debris intrusion.

Temporary Drainage. To ensure motorist safety and to minimize impacts to adjacent property owners, the following strategies for temporary drainage will be applied during construction:

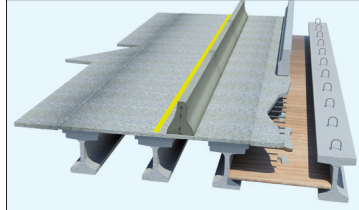
- Perform spread analysis for locations where temporary barrier wall will be installed and provide wider temporary shoulders as necessary to prevent runoff from encroaching onto the travel lanes.
- Maintain existing drainage patterns throughout construction to prevent downstream flooding, including meeting the FEMA no-rise flood criteria for the Cedar River (see detailed discussion on page 8).
- Use existing stormwater systems until new conveyance is brought online
- Existing pipes and inlets observed to be clogged or deficient will be cleaned out to provide proper flow.

STRUCTURES CONSTRUCTION

Foundations/Substructure. The primary foundation type will be driven prestressed concrete piles with drilled shafts being used at the medians of Cassat Ave., McDuff Ave. and Edgewood Ave. to reduce impacts to traffic, utilities, and expedite construction. Once foundations are complete, we will form and place the columns and caps.

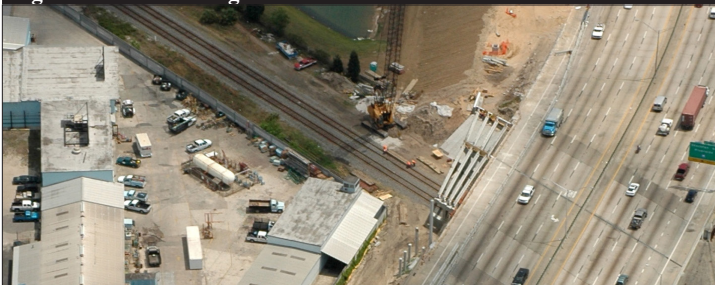
Superstructure. Our primary approach will be to maintain the existing bridge railing as long as practical and perform bridge demolition after the new pre-stressed beams have been set. A temporary wood deck will be placed as a floor between the existing exterior beam and new beam, and it will catch all debris from the demolition operation. This method prevents dust and debris from falling on the underlying roadway, provides a safe platform for the construction workers, and minimizes construction exposure (see **Figure 11**). In areas where this approach is not feasible due to the new beam location, a skip pan will be placed under the bridge to catch any potential debris.

Figure 11 - Demolition Safety



CSX. For Bridge 720195 over the CSX Railroad and crashwalls, the Team will follow CSX guidelines for construction, including 150% crane capacity and use of railroad flagmen. The AW Team has extensive experience working over and around railroads, including the previous widening of this bridge over the CSX railroad on our I-10/I-95 (Big "I") Interchange (see **Figure 12**).

Figure 12 - CSX Bridge Railroad Construction



Based on that experience, key issues include:

- Providing timely requests for flagmen.
- Providing the required "Construction Submission Criteria" for all operations per CSX requirements.
- Assuring workers obtain "On-Track" Contractor Roadway Worker Safety Training as required
- Incorporating compliance measures for RR Safety and Roadway Worker Protection into Weekly Safety Meeting and Daily "Tool Box Talks"

Undercut Walls. For the construction of bridge undercut walls, one of the most reliable wall types is a soldier pile and lagging wall. Due to low headroom underneath the existing bridge, piles will be installed in

short sections. H-piles will be positioned between the beams to maximize the section length. A small width section of the existing slope pavement in front of the end bent will be removed at a pile location and a short section of the H-pile will be installed by pushing it into the ground. Then another section of H-pile will be welded on top and the pile will be pushed further into the ground. This process will be continued until the pile reaches the design tip elevation and repeated until all H-piles are installed. Wood lagging spanning between the H-piles will be added as the slope in front of the wall is being removed. If anchoring is required, the soldier piles will be positioned to eliminate conflict with the existing end bent piles. A permanent structural concrete facing, with Aesthetic treatment per Appendix M of the RFP, will be attached to the H-piles with shear studs (see **Figure 13**).

Figure 13 - Undercut Walls



Cedar River Box Culvert. Construction of this critical element will start from the South end and proceed upstream to the North in phases designed to maximize construction limits while minimizing impacts to the traveling public. We will maintain the necessary flow through the work zone to ensure no upstream impacts due to rain events. Successful construction of the new culvert will begin with installing a weir system to divert flow from cells under construction. The weir elevation will be set to allow overtopping during major rain events (see **Figure 14**). This will allow for staged construction in the dry while at the same time keeping the full capacity of the existing culvert available for major rain events. The Cedar River is a floodway, and the AW Team is committed to meeting the FEMA no-rise flood criteria during construction.

Figure 14 - Cedar River Construction



As shown in **Figure 8 on page 4**, support of excavation in the form of temporary sheet pile walls or soil nail walls will minimize the excavation limits and provide erosion control while channeling the Cedar River through the work zone. Precast culvert sections will be utilized to expedite construction and minimize exposure during the various construction phases. Additionally, the subgrade between the newly installed precast boxes and the existing culvert will be stabilized to further prevent offsite turbid discharges during the construction. The AW team's experience in box culvert construction will minimize impacts to the travelling public as well as being an environmental steward and a partner to neighbors upstream and downstream of the work zone.

Day Ave. Pedestrian Tunnel. With pedestrians detoured per the RFP, the existing tunnel will be removed and replaced in 2 phases. Three sided precast sections will be used, with level up pours and the roof cast-in-place (CIP) to maintain the I-10 roadway cross-slope. CIP allows the lighting conduit to be embedded and tamper proof lights for improved aesthetics. **A continuous floor surface will be placed after construction is complete to eliminate floor joints.**

Noise Walls. Noise walls are primarily 8' barrier wall mounted with one 18' ground mounted wall. To reduce the impact to adjacent properties, construction time savings can be realized utilizing precast traffic barrier sound walls (see **Figure 15**).



Figure 15 - Precast Traffic Barrier Sound Walls

Bridge Strengthening. The bridge over Cassat Ave. will be strengthened as necessary to meet rating factors. This will primarily be accomplished with a carbon fiber reinforced polymer wrap applied to the beams. This work will be performed by a qualified specialty contractor per the Technical Special Provision.

MINIMIZING IMPACTS DURING CONSTRUCTION:

The AW Team’s design and construction solutions provide many methods to reduce impacts during construction. AW has a proven track record of being a good neighbor, resulting in a positive public image for FDOT and the entire project staff.

Minimize Disruptions to Traffic. The AW Team has developed a construction approach that, except for the Cedar River Culvert and Day Avenue Tunnel, keeps traffic in its existing alignment while the majority of roadway and bridge widenings are completed in the shoulder areas. This includes providing a 10' paved shoulder throughout the majority of the corridor. Once complete, traffic will be shifted to the permanent outside lanes while median work is completed. Additional steps to minimize disruptions to traffic include:

- Installing drilled shafts for median piers at Cassat Ave. and McDuff Ave. to speed construction and reduce the need for detours and lane closures.
- Maintaining existing lighting until the new lighting system is complete.
- Installing and activating new ITS equipment before removing existing.
- Providing an ADA compliant pedestrian walkway on at least one side of each cross road at all times.

New beams for standard FIB bridge widenings will be set prior to removing the existing overhang. This will allow a debris shield to be placed between the beams to protect traffic while the overhang is removed.

Minimize Detours. ATC #6A reduces the number of detours for beam setting over King St. and eliminates the need to detour Stockton St. for beam setting. While setting and removing signs over I-10 will require detours, it should be noted that two detours of I-10 have been done earlier this year for an emergency sign removal which proved to be highly successful.

Minimize Impacts to Other Projects. Close coordination with the ongoing I-10/I-95 Operational Improvements Project will be a major ongoing activity during design and construction. Since AW and GAI are completing that project, the AW Team is uniquely positioned to ease that coordination. In fact, this coordination has already begun with the AW Team and FDOT actively partnering to resolve conflicts between the signing plans on the two projects.

Minimizing Impacts to Adjacent Properties and the Environment.

The AW Team has a long history of successfully working with major stakeholders on previous projects, including W.W. Gay on the “Big I”. A Settlement and Vibration Monitoring Plan (SVMP) will be developed with input from the Department and major stakeholders as applicable, and submitted to FDOT as part of the 90% plans for approval. The SVMP will establish the maximum vibration levels that shall not be exceeded and will be updated throughout the Construction Period. The determination of the maximum vibration levels will consider multiple factors including construction methods/procedures, soil type/density, location of vibration-sensitive structures and the ages of the structures. The AW Team will be utilizing drilled shaft bridge foundations at several cross road structures including, Cassat Ave., McDuff Ave., and Edgewood Ave., thus eliminating vibration and noise concerns associated with driven piles and potential damages to existing utilities and adjacent structures. Potential measures for mitigating vibration issues include the use of lowering hammer energy, changing hammer type, pre-drilling through harder materials that transmit or amplify vibrations, and compacting fill and pavement components using the static mode on the rollers. For sheet piles or other piles being installed with a vibratory hammer, selecting the proper hammer, either high frequency with low amplitude or using the more variable speed hammers with the ‘zero-on’ and ‘zero-off’ feature, etc. can be utilized to mitigate vibrations.

The AW Team’s exemplary environmental track record testifies to the Team’s commitment to protecting the environment and preventing sedimentation and discharging turbid waters. Key environmental protection initiatives include:

- Performing clearing operations only in areas of imminent work activities offering a work environment with reduced dust and noise.
- Implementing a comprehensive Stormwater Pollution Prevention Plan and Best Management Practices.
- Working eagle nesting season into the pond construction schedule.
- Containing milling “rap” and paving-train leftovers in identified, protected areas and/or hauling off site.
- Conducting regular environmental compliance inspections.

Provide Worker Safety. AW places safety at the forefront of all work, as exemplified by its 2018 National Experience Modification Rating of 0.77. A Site Specific Safety Plan and Pre-Activity Work Plans will identify and resolve potential safety hazards specific to each work area and work task. All field management staff and foremen are OSHA 30 hour certified, and all field employees are OSHA 10 hour certified. The safety of FDOT and CEI personnel, as well as the public is also a key priority. A key safety initiative for this project is placing construction ingress/egress points on ramps or major side roads rather than adjacent to high speed travel ways. Major material deliveries will occur under night time lane closures.

Minimize Impacts to Existing Utilities. The AW Team is aware of the critical nature of timely utility coordination and relocation efforts on design-build projects. Continuing the coordination that has been developed with JEA and other UAOs over the years, the Team will hold regular utility meetings concurrent with the design development and throughout the construction duration. Approaches to resolving specific utility challenges include:

- Verification of utility locations where pile driving occurs nearby.
- Advance arrangements for temporary support of existing pole structures by UAOs.

- Development of an Emergency Action Plan that addresses the steps and processes for unforeseen utility events.
- Locating and marking the existing ITS fiber optic, lighting and signal underground facilities throughout the project to avoid impacts and ensure continuous operation.

WRITTEN SCHEDULE NARRATIVE

AW has excellent track record of finishing projects on time or ahead of schedule. The key to completing a successful project on schedule is to develop an accurate design, efficiently obtain permit modifications, and provide the resources to execute a comprehensive construction schedule that incorporates all work elements. The schedule adheres to the project’s goals and commitments, including TCP restrictions and Special Events. Components of the project schedule include:

- Critical Path** – Proper identification of the critical path and application of sufficient resources are crucial in keeping these activities on track. The AW Team will also focus immediately on the design and construction of the roadway improvements within the I-295 interchange and the intersection of US 17 and McDuff Ave.
- Design and Permitting Phase** – Immediately following the award, the AW Team will begin typical section and pavement design packages, development of Early Works plans (TTCP, erosion control, clear and grub and utility relocation) and permit modifications. Upon Notice to Proceed, we will hold design meetings, inventory existing ITS components and begin design survey and geotechnical investigations. Utility coordination will occur early in the design phase to reduce the potential for delays during construction. An 'Early Works' package for the I-295 ramp improvements will allow completion of this work early in the construction schedule.
- Construction** – Once RFC plans are approved and the required permits are in place, the AW Team will begin construction. Please refer to the TTCP section in this proposal and MOT Roll Plots for details regarding construction phasing.

INNOVATION

The AW Team has deployed several innovations to eliminate utility impacts. These include:

- Obtaining Vvh data for a 24" force main and two buried 69 kV transmission lines adjacent to the Day Ave. Tunnel to develop our replacement plan that avoids impacts to these facilities
- Adjusting pond outfall control and drainage redesign that allows removal of RFP attenuation ditches and reduction in MSE walls. In addition the change allows the existing 54" stormwater pipe line along I-10 to remain
- Use of single column piers and drilled shafts to reduce bridge foundation footprints and avoid utility impacts on major cross roads
- The AW Team's added utility relocations, optimized drainage design and innovative bridge foundation approach has reduced the number of utility conflicts from the RFP Concept plans by 60%

Innovations related to materials include:

- Precast sound wall segments to expedite construction
- Use of pre-cast bridge culvert sections to reduce the time spent working within the Cedar River channel
- As a value added, the AW Team will install 17 thermoplastic pavement route shields in addition to the ones required by the RFP
- Temporary tape will be used in lieu of paint for temporary transitions to avoid ghosting

Innovations related to workmanship for design and construction include:

- Providing a longer stopping sight distance for the I-10 WB exit to US 17 SB as presented in ATC #5
- Increasing the design speed of Ramp G as shown in ATC #12B
- Reducing need for MSE “wall zone” pipe by reducing MSE wall
- Improving maintenance by eliminating 2,800 LF of the treatment/attenuation swales within the I-10 ROW
- Eliminating the widening of the Stockton St. overpass
- Realigning I-10 as illustrated in ATC #6A to provide all widening on only one side over CSX. This reduces the amount of time spent in the CSX right of way

Innovations related to future expansion include:

- Single continuous Cedar River bridge culvert under I-10 and Ramp E will simplify future interstate widening
- Guide sign supports where future widening is contemplated are placed further from the roadway
- Drainage system that accounts for future widening of I-10 EB west of Cassat Ave.

VALUE ADDED

AW has a long history of providing high-quality, dedicated construction services to District 2. The AW Team’s approach to maintainability involves emphasis on construction quality, design detailing that inherently reduces maintenance costs, and a comprehensive value added warranty program. When combined, these elements provide FDOT with a project of lasting quality requiring minimal maintenance. As evidence in our design and construction, the **Value Added Table** provides extensive list of Broadened and Added Warranties.

Value Added Warranty Table				
Item	Duration (Yrs)		Threshold Level	Remedial Work
	Std.	AW		
Broadened Warranties				
Value Added Bridge Components (Expansion Joints, Coatings, Bearings, Bridge Lighting/ Electrical, and Drainage)	5	8	Spec. 475	Spec. 475
Added Warranties				
Roadway				
Value Added Concrete Pavement	5	8	Spec. 355	Spec. 355
Value Added Asphalt Pavement	3	5	Spec. 338	Spec. 338
Signage	1	5	Cracks, welds, arms, bases	*1, *6
Pavement marking	1	3	Missing RPM>20%	*7
Guardrail	1	3	Spec. 536	*1, *2
Retaining walls	1	7	Diff. Settlement > 4"	*1, *4
Drainage - storm sewer and pipe	1	7	Soil/Water Leaking	*1, *5
Structural concrete not on bridge	1	8	Spalls >1" depth	*1, *2
Structures				
Concrete defects - approach slabs, substructure & superstructure	1	7	Spalls >1" depth	*1, *3
Structural steel defects	1	5	Spec. 460	*1
Lighting				
All components (except below)	3	5	Spec. 715	
Luminaire components	5	5	Spec. 715/992	
Signals				
Signals	3	5	Spec. 650	
LED Lamps	1	3	Not working	*2
ITS				
All components	Varies	Varies +1	All ITS components will have a 1 year greater than Per Specifications or Manufacturer Warranty.	

*1 Work plans will be on a case-by-case basis
 *2 Repair/replace element failing to function properly
 *3 Repair cracks as per Spec. 400-21 and/or patch spalls with APL grout
 *4 Remove, repair and/or replace panels
 *5 Seal joints, pipe lining, and/or desilting
 *6 Determine cause and develop corrective action plan



gai consultants