



I-4 / Turnpike Direct Connect | Contract E8Q38 | FPID 43716625201, 43798715201



***Direct
Connect***

TECHNICAL PROPOSAL VOLUME 1 OF 3

Submitted August 17, 2017





Table of Contents

Section 1: Project Approach.....	1
Section 2: Plans and Technical Special Provisions	16

Section 1

Project Approach



INTRODUCTION

Superior Construction Company Southeast, LLC (SUPERIOR) and GAI Consultants, Inc. (GAI) (**The SUPERIOR Team**) are pleased to submit this Technical Proposal, which demonstrates our in-depth knowledge of the Turnpike/I-4 Express Lane Direct Connect Ramps project. We have focused our efforts on developing Alternative Technical Concepts (ATCs) enhancing constructability while also adding value, reducing cost, and protecting FTE's customers.

The SUPERIOR Team understands the unique aspects of this interchange better than any other team, with key staff having lead efforts on the last two major projects in the corridor:

- ▶ **Turnpike/I-4 Operational Improvements (FPID 429331-1).** GAI was the Engineer-of-Record and Prime Engineer for the last improvements to this interchange, which included the addition of the southbound (SB) Turnpike to I-4 ramp bridge, extensive widening, and accommodation of Florida Gas Transmission (FGT) through the interchange.
- ▶ **Turnpike Mainline Widening (FPID 406091-1).** John Saunders, the SUPERIOR Team's Design Project Manager, served as the Project Manager for the design of these improvements, which included widening of the Turnpike Mainline to eight lanes throughout the length of this project, significant ramp modifications, coordination with both FGT and AT&T, and replacement of the Ramp A bridge over the Turnpike Mainline.

The current iteration of improvements to this vital corridor and interchange has its own challenges, including:

- ▶ **Multiple Entities.** Proactive coordination with FTE, FDOT District 5, and I-4 Mobility Partners (I4MP) will be required at all times, most importantly during work within and approaching the I-4 Right-of-Way. Restrictions regarding work site availability in many ways governs our approach to the project. The SUPERIOR Team's modified interchange alignment focuses on increasing the portion of the improvements completed outside the I-4 corridor (I4MP Zone 1), thus greatly reducing interaction with I4MP and the associated schedule risks.
- ▶ **Early Milestones.** The project involves several early milestones, including work at the Consulate Dr. Interchange and the introduction of All Electronic Tolling (AET) for all collection points within the project. Our Schedule, Maintenance of Traffic (MOT) Plan, and Construction Approach prioritize these important milestones, providing schedule certainty.

- ▶ **FGT Involvement.** The SUPERIOR Team is intimately familiar with the challenges of working with FGT and the need to avoid impacts to their facilities. GAI has worked on five projects with FGT over the past five years, including two Design-Build projects. Impacts to FGT were avoided in all cases through close coordination, design innovations and partnership.

In addition, SUPERIOR is currently working on two projects with heavy FGT involvement - Wekiva Parkway Section 2A and 6. SUPERIOR is exceeding all FGT requirements for construction adjacent to their gas lines, implementing an increased factor of safety to confidently protect these facilities, avoiding all impacts.

The SUPERIOR Team submitted 17 ATCs, of which three were approved. We will implement two of these ATCs, taking full advantage of the benefits each provide.

ATC #1: Re-align Direct Connect Ramps

- A** Enhancing safety and operations with increased 50 MPH design speed (compared to 45 MPH RFP Concept)
- B** Reducing interaction with I4MP by limiting I-4 median work
- C** Utilizing all concrete superstructure to reduce maintenance, simplify constructability, improve consistency, reduce contract time, impacts to the traveling public and future maintenance
- D** Allowing an innovative I-4 MOT plan that permits construction of concrete straddle caps that improve aesthetics and reduce maintenance
- E** Maintaining a profile that does not require bridge drainage
- F** Achieving a reliable, expedited schedule by constructing more of the improvements outside the I-4 envelope
- G** Reducing contract time and future maintenance by constructing a shorter bridge
- H** Building for the future by accommodating the ultimate Turnpike 10-lane section

ATC #2: Maintain Existing Profile of TPK SB Exit Ramp

- I** Widening and resurfacing in lieu of full reconstruction, reducing construction time and improving safety
- J** Lessening impacts to customers through a straightforward construction plan
- K** Deleting costly MSE walls
- L** Accommodating high truck volumes between heavy systems movements throughout all phases of construction
- M** Maintaining full time toll collection during construction
- N** Providing 10' maintenance access at ROW pinch point

Figure 1 - SUPERIOR Concept



SUPERIOR ATCs

The SUPERIOR Team focused our ATC enhancements on refinement of the concept design in lieu of wholesale changes, building upon your prior investments. Our two primary ATCs achieve these goals, adding value and addressing critical issues such as constructability, schedule, and maintainability.

ATC #1: Re-align Direct Connect Ramps

Turnpike/I-4 Interchange

The centerpiece of the project is the interchange with I-4, which in many respects defines the critical path for both design and construction. Through approved ATC #1, the SUPERIOR Team has taken a holistic approach to establishing an optimal roadway alignment, considering all elements of constructability and impacts to motorists. Our solutions include:

- A Providing a 50 MPH Design Speed.** The SUPERIOR Team's alignment provides horizontal geometry for a 50 MPH design speed, (compared to the 45 MPH shown within the RFP). The wider shoulders and larger horizontal curve radii increases safety for your customers. This value-added enhancement improves safety since the connection of two express lane systems will inherently encourage increased speeds.
- B Building more out of traffic.** Our concept design shifts the alignment to the southwest, allowing more construction to occur in the infield of the interchange. This eliminates a significant amount of bridge over I-4 (**18,640 SF less than the RFP concept**), replacing it with easily accessible off-line construction.
- C Concrete superstructure.** Our design incorporates concrete girders (FIBs) for the entire structure allowing for shorter spans and more strategic pier placement.
- D Maintaining clearance.** All vertical clearances are maintained throughout the alignment, with more than 16.5' provided, including at a critical location where the ramp bridge crosses the Turnpike NB Mainline.
- E Simplifying MOT.** Our alignment allows for a simplified MOT scheme increasing mobility and shortening construction time over the I-4 envelope and within the 14MP work zone.
- F Matching the RFP Concept tie-ins.** Horizontal and vertical tie-ins at I-4 and the Turnpike Mainline match those shown in the RFP, assuring compatibility and compliance with agreements reached between FTE, 14MP, and FDOT D5.
- G Maximizing work within the available "zones".** The single greatest challenge of the project is to meet schedule constraints associated with availability of work areas (as defined in Attachment 35 of the RFP). By minimizing the amount of work needed in the I-4 corridor, the SUPERIOR Team is able to stage construction activities and reduce the scope of work to be performed within the final 13-month window.
- H Compatibility with AET.** All proposed improvements within the interchange meet FTE's General Tolling Requirements (GTR). Construction phasing allows for the early implementation of the system per RFP requirements.
- I Future Ten-Lane.** The SUPERIOR Team's design fully takes into account the future 10-laning as demonstrated within the ATC submissions.

Figure 2 - ATC #1

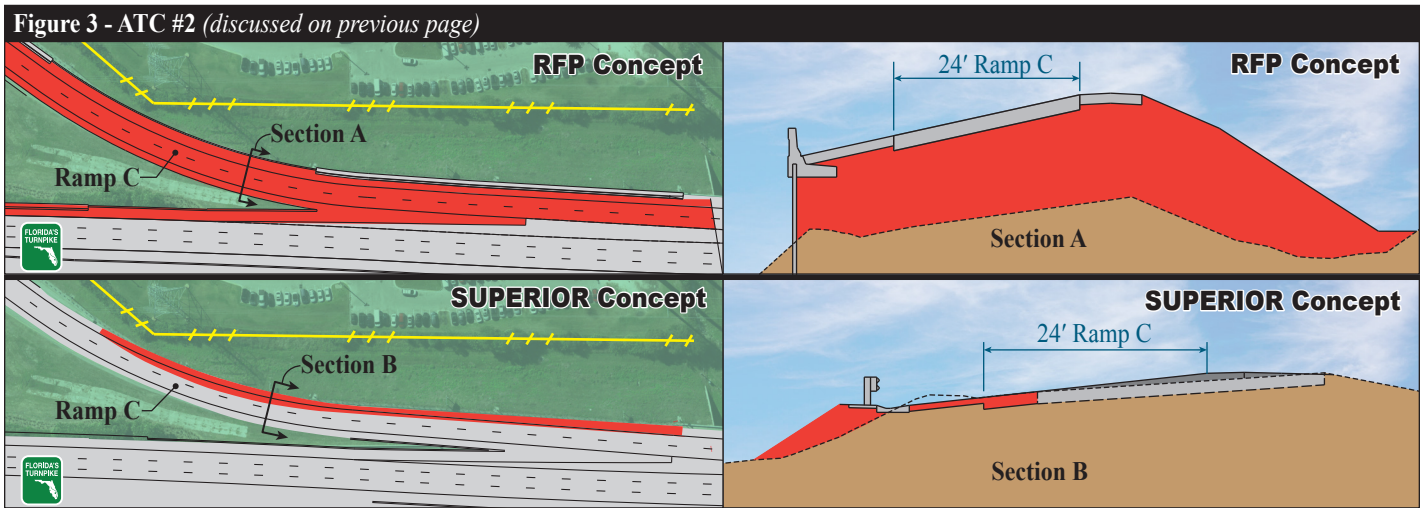


ATC #2: Maintain Existing Profile of TPK SB Exit Ramp

Another major enhancement at the interchange involves the SB Turnpike to I-4 exit ramp, providing two lanes to meet capacity demand and improve operations. **The SUPERIOR Team's ATC #2 replaces the RFP Concept's full reconstruction section with a widening, milling and resurfacing design that greatly expedites construction and eliminates significant impacts to your customers and the traveling public.** As illustrated in **Figure 3 on the following page**, this design accomplishes all of the operational goals while:

- ▶ **Simplifying MOT.** The SUPERIOR Team's design reduces temporary pavement, traffic shifts/diversions, lane closures and overall construction time.
- ▶ **Eliminating Reprofilng.** Safety is enhanced by maintaining the existing profile, drop-offs and grade differences are eliminated throughout construction (see **Figure 3**).
- ▶ **Eliminating walls.** Maintenance is reduced by eliminating more than 4,000 sq. ft. of MSE walls. Only a small section of gravity wall is needed in order to provide a 10' maintenance access around the ROW "pinch point".
- ▶ **Maintains gore point.** Driver expectancy is maintained by keeping the painted gore in essentially the same place as existing.
- ▶ **Eliminating Reconstruction.** More than **4,200 SY of pavement reconstruction is removed** by converting to milling and resurfacing.

Figure 3 - ATC #2 (discussed on previous page)



DESIGN

While the project includes more than 5 miles of milling, resurfacing, and implementation of express lanes, the hallmark of the project is the work at the Turnpike/I-4 interchange. This important improvement – providing a direct connection between FTE and FDOT D5 express lane systems – will enhance movements throughout Central Florida, providing a reliable level of service between these vital facilities. The primary design and construction element of this improvement is the new direct connect ramp bridge.

Structures Design

The SUPERIOR Team worked extensively with FTE to secure approval of ATC #1, revising the alignment of the flyover bridge and allowing more of the flyover bridge to be built off-line. **This results in 18,640 sq. ft. less structure within the I-4 envelope than required by the RFP alignment.** Our revised profile allows for a single vertical curve (compared to two within the RFP Concept) and crossing of the Turnpike-to-I-4 ramps outside of mainline I-4 traffic. Fewer constraints are placed on pier locations, allowing for a more flexible design – **ultimately resulting in our ability to construct the bridge using precast concrete Florida I-Beams (FIBs).** This provides consistent aesthetics between the I4MP bridges and the direct connect structure, maintaining a “green beam” theme throughout the interchange compared to mixing weathering steel and concrete colors required by the I-4 aesthetic guidelines.

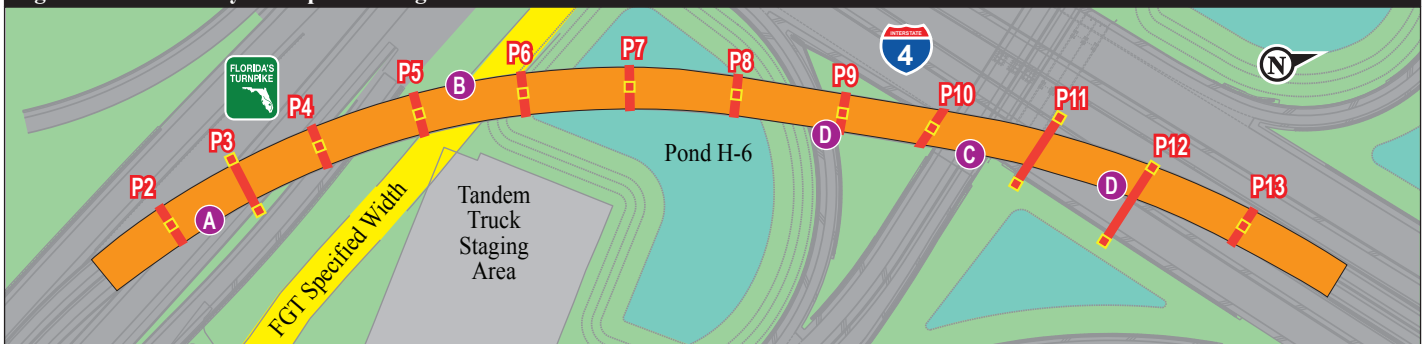
The SUPERIOR Team has developed a preliminary FIB span arrangement, shown in **Figure 4** below. **The innovative use of higher strength 10,000 psi concrete with this alignment enables the SUPERIOR Team to use FIBs in the curved spans without the need for additional modification to the bridge width.**

The benefits of the FIB superstructure over structural steel include a shorter procurement process, simplicity of construction, and lower overall cost to FTE. The superstructure will also utilize easy to maintain poured rubber expansion joint seals, 42" single slope shoulder barriers, and a 32" single slope median barrier with opaque visual barrier.

Bridge ends will be supported on traditional end bents with wrap around MSE walls. Intermediate supports will consist of hammerhead and straddle piers.

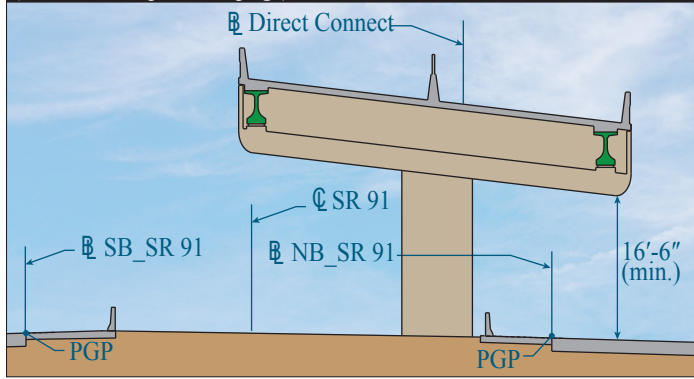
The SUPERIOR Team has performed detailed vertical clearance analyses and determined the minimum 16.5' requirement will be met at every location along the profile. The most critical location is at Pier 2 where the ramp bridge crosses over the NB entrance ramp to the Turnpike (see **Figure 5 on the following page**). An inverted tee hammerhead has been chosen at this location and Pier 13 to ensure sufficient vertical clearance. The remaining hammerhead piers will use a traditional cap configuration.

Figure 4 - Preliminary FIB Span Arrangement



Constraint	SUPERIOR Solution
A TPK NB Mainline, On Ramp, and Future 10-Lane Section	Utilize an inverted tee hammerhead, an inverted tee straddle pier, and an eccentric hammerhead pier cap to optimize column placement.
B FGT Specified Width	Provide a clear span over the FGT Easement & rotate pier footings parallel to the easement to reduce span length.
C Ramp D1 Bridge and MSE Walls	Utilize skewed piers and an eccentric footing to reduce span length and avoid potential conflicts with the existing structure.
D I-4 and Off Ramp	Utilize skewed piers, straddle piers, and rotate pier footings to optimize column placement.

Figure 5 - Clearance at Pier 2 over Turnpike NB Entrance Ramp
(discussed on previous page)



Straddle piers will be cast-in-place concrete, taking advantage of our innovative MOT Plan which allows for the diversion of I-4 EB traffic to WB I-4 Express lanes temporarily during nighttime operations. This approach allows our straddle piers to be cast-in-place concrete providing a low-maintenance, durable solution to this complex project element and maintains aesthetic consistency associated with all-concrete sub and superstructure. SDG 2.10.A requires a 1.05 Redundancy Factor for flexural and axial effects on concrete straddle piers over traffic, and a 1.0 Redundancy Factor for all other components of our proposed flyover bridge. **The SUPERIOR Team will exceed this requirement by applying a factor of 1.10 for all concrete straddle piers, and 1.05 for all hammerhead piers, thus providing FTE with enhanced structural capacity and reliability above and beyond the basic code requirements.** The straddle piers are Category 2 Structures that will be peer reviewed by team member BCC Engineering in accordance with PPM 26.12.

As demonstrated within our ATC submissions, we have also reviewed the existing stormwater permits and verified that the excess capacity in Pond H-6 is more than adequate to accommodate the SUPERIOR Team's proposed pier layout.

The end bents and piers will be supported on driven concrete piles. Where Ramp D1 bridge foundations extend under present or future lanes, they will be designed for live load surcharge. **100% PDA testing of all piles will be performed within the I-4 and Turnpike medians to provide assurance that re-strikes are not required and impacts to your customers and the traveling public are kept to a minimum.**

We have coordinated with I4MP and reviewed the current construction schedule that shows the bridge being demolished by December 2019. To avoid potential impacts to the schedule, **the SUPERIOR Team's pier placement plan avoids conflict with the existing Ramp D1 bridge, including the battered piles at the median piers.**

Other structures work on the project includes:

- ▶ Median barrier demolition and reconstruction, with associated approach slab, bridge deck, expansion joint, and load rating work at Bridge No. 750603 (Turnpike NB over I-4).
- ▶ New overhead sign structures.
- ▶ Evaluation of existing overhead sign structures for re-use.
- ▶ MSE and other retaining walls.
- ▶ New mast arm signal structures at Consulate Dr.
- ▶ Box Culvert work as recommended in RFP Section VI.E.3 and Attachment 33.
- ▶ Additional roadside structural improvements in accordance with RFP Section VI.T, including the failing joint patch on bridge 750626, construction of pier protection barrier walls at bridges 754097 and 754098, and other items noted therein.

Roadway Design

A large portion of the project is the resurfacing of the Turnpike Mainline, implementation of the ultimate express lanes and other roadside improvements itemized within the RFP. Other elements

include the conversion to AET (to be completed prior to July 1, 2020) and enhancements to the Consulate Dr. Interchange which must be operational within 12 months of the project's Notice-to-Proceed (NTP). The SUPERIOR Team's design schedule has been carefully formulated to meet all commitments while consolidating components when possible – taking advantage of available time to provide fewer submittals and ease the burden on FTE reviewers.

Operational Improvements at Consulate Dr.

The Consulate Dr. off-ramp was one of the first "SunPass Only" Ramps on the Turnpike Mainline, and upgrades to this toll site are long overdue. The existing toll site will be completely replaced with a new AET site and equipment shifted slightly to the north. The current facility will be fully removed and concrete pavement demolished.

Capacity improvements consisting of additional turn lanes and new mast arm signals will be built at the intersection of the SB off-ramp with Consulate Dr. These operational improvements will address local traffic concerns and improve flow through the interchange.

The SUPERIOR Team presented ATC #6 to salvage two of the three existing signal mast arms at the Consulate Dr. intersection. FTE conditionally approved this ATC pending coordination with Orange County Traffic Engineering. New signal poles installed at the intersection was highly desirable by the county and this ATC was not pursued further.

Resurfacing and Express Lanes

The southern project limits are adjacent to an ongoing construction project (FPID 411406-1) which is widening the Turnpike Mainline and implementing express lanes from Osceola Parkway to the north. Our project will extend the limits of the express lanes to I-4, accomplishing the conversion by narrowing lanes from 12' to 11' to introduce a 3' buffer between the general use lanes and new express lanes (which currently serve as the inside Mainline lanes). While only the inside lane (future express lane) drains to the median, the reduction of the three inside lanes to 11' will shift the crown point within the buffer area.

The proximity of the delineators to the inside travel lane, along with their tight spacing, can affect sight distance around curves. **The SUPERIOR Team will utilize 24" tall delineators** in these areas to allow motorists to see over them and improve visibility. This approach is being utilized elsewhere on the Turnpike system, including the Atlantic Ave. to Boynton Beach Blvd. widening currently under design by GAI.

Roadside Improvements

Our team has reviewed the Existing Roadway Condition Assessment Report (ERCAR), Design Variations, Design Exceptions, and Design Memoranda pertaining to the existing conditions along the Mainline. In general, deficiencies identified include out of date criteria adjustments (guardrail), repairing damaged items (endwalls, spalled concrete), missing object markers, and replacement of ground-mounted sign assemblies. All of these improvements will be detailed within the plans and specific remedies proposed as appropriate.

Pavement Design

The SUPERIOR Team submitted 9 ATCs to optimize the pavement design on the project, none of which were approved in favor of maintaining the RFP requirements. The RFP pavement design requirements will be adhered to, focusing on constructability, limiting drop-offs, and maintaining positive drainage throughout construction.

Of critical importance on the project are those areas where full depth pavement must be replaced as identified within FTE's pavement corings. In those locations, asphalt/base will be milled and replaced with a minimum of 7" of structural asphalt topped with FC-5. This will require a specific construction approach (discussed later in this document) and an MOT plan supporting it within the limited overnight work periods.

The SUPERIOR Team will perform a cross-slope analysis. All necessary corrections will be completed using variable-depth milling and asphalt overbuild as necessary.

Black base has been used for any areas without 3' of base clearance for ramps and 2' of base clearance for the shoulders and tandem-truck turning area. Appropriate base types will be proposed and resilient modulus reduction factors applied in accordance with FDOT's Flexible Pavement Design Manual requirements.

Drainage Design

GAI fully understands the drainage challenges at this interchange and to the extent existing ponds are "maxed out" to meet current permit demands. Implementing the proposed pond improvements along the east side of the Turnpike Mainline may present challenges with FGT, due to the reduction of clearance over their line as a result of the roadway expansion. GAI permitted the previous ponds and worked closely with FGT to negotiate a mutually-agreeable solution; the SUPERIOR Team will take a similar approach through the 90% FGT Submittal process, supplementing the efforts currently underway between FTE and the utility.

Direct Connect Flyover Ramp

Stormwater spread on the Direct Connect Flyover Ramp alignment developed by the SUPERIOR Team in approved ATC #1 has similar characteristics and performance as the Concept Flyover Ramp, requiring no inlets on the bridge structure itself. As part of our shoulder widening to increase the design speed, the amount of calculated spread is up to 5' further from the travel lanes than within the RFP concept design. This provides an additional layer of safety preventing stormwater from entering the curved through lanes at higher-than-required storm events (near 50" per hour vs. the required 4" per hour).

Pond Capacity

We have reviewed the SFWMD permit, completed thorough design analysis and determined that the existing stormwater pond in the southeast corner of the interchange (Pond H) will accommodate up to four bridge piers without requiring adjustments to the pond size. The SUPERIOR Team's ATC #1 alignment results in only two piers being constructed within Pond H (See **Figure 6**), requiring a simple permit modification to demonstrate pond capacity remains sufficient after construction of the piers.

Figure 6 - Piers in Pond H-6



Turnpike Southbound Exit Off Ramp C

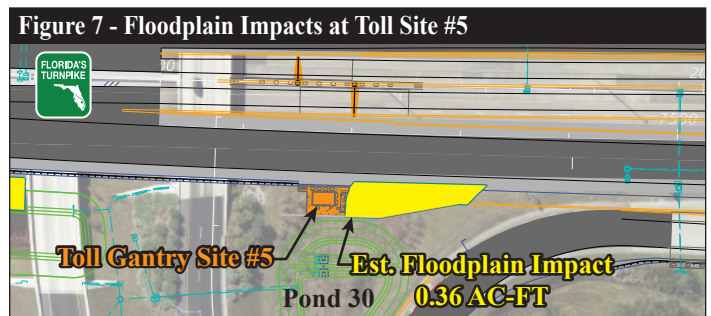
The SUPERIOR Team's ATC #2 modifies the two-lane off ramp configuration to allow milling, resurfacing, and widening in lieu of full ramp reconstruction. This results in the gore and profile grade of the ramp remaining in approximately the same location as existing. Surface drainage must be considered as part of this modification, including hydroplaning, shoulder gutter capacity and barrier wall/travel lane shoulder spread capacity south of the gore.

- ▶ **Hydroplaning Computation.** TPPPH Chapter 2.1.5 requires three percent cross slopes for both exit lanes of the SB off-ramp (Ramp C) since this is a new 2-lane ramp. The proposed physical gore location will be shifted towards the south and the gore pavement increased to a maximum of 27' (STA 489+84). The hydroplaning analysis completed by the SUPERIOR Team indicates the driver expectation speed during a 4"/hr. rainfall event is 40 MPH, matching the design speed for the ramp.
- ▶ **Spread.** The 10-year storm event calculations in accordance with the TPPPH Manual and the FDOT Drainage Manual Table 3.9.1 meets the criteria of keeping one-half of travel lane clear of spread. The SUPERIOR Team has determined that two additional shoulder gutter inlets will be required in addition to the four existing shoulder gutter inlets being replaced.

- ▶ **Barrier Wall Inlet Capacity and Spread.** An existing barrier wall inlet is located along the SB Mainline south of the new gore location. The additional barrier lengthening will increase the pavement area draining to the existing barrier wall inlet. Spread and inlet calculations completed by the SUPERIOR Team illustrate that spread does not encroach into the travel lane and the capacity of the existing barrier wall inlet is satisfactory.

Floodplains

The RFP Drainage Report identified four segments within the project limits impacting floodplains, three of which are due to installation of toll gantries and one as a result of the planned Pond 30 expansion. However, the SUPERIOR Team has found an additional floodplain impact at Toll Site #5 (See **Figure 7**).



Although this additional floodplain impact was not accounted for in the RFP concept, the remaining capacity within the existing Floodplain Compensation Areas will provide sufficient volume. A cup-for-cup approach will be utilized for compensation as previously agreed upon by SFWMD and documented within the pre-application meeting minutes.

The SUPERIOR Team is aware of the status of all permits being acquired by FTE, as well as those permits secured by I4MP. We will build upon this knowledge to establish a permitting schedule that obtains all jurisdictional permit approvals in concert with our proposed design and construction schedule.

Pipe and Box Culvert Repairs

GAI has significant recent experience in the design of maintenance repairs for existing facilities such as the double-cell 10' x 7' concrete box culvert, Bridge Culvert No. 750601/750488 that is co-maintained by FTE and FDOT D5 as noted in the ERCAR report. Desilting, temporary diversion of stormwater and treating exposed rebar with corrosion inhibiting material when repairing the interior box culvert concrete surface will be specified.

Environmental Design/Permitting

Portions of the wetlands and surface waters associated with the project corridor were delineated as part of the ERCAR and these jurisdictional limits will be utilized wherever possible. Should impacts be unavoidable in areas not delineated during the ERCAR or the current permitting effort, wetland limits will be established following the 2010 Final Supplement to the Corps of Engineers Wetlands Delineations Manual (1987) and the Unified Wetland Delineation Methodology for the State of Florida dated July 1, 1994.

The new Direct Connect ramps and bridge will increase impervious area and require permitting with SFWMD. Wetland impacts associated with the proposed SB toll plaza at STA. 5510 and with the modifications to Ramp D (from I-4 to Turnpike NB) of the interchange will require permitting with both the SFWMD and the USACE. These impacts will be addressed through a modification of ERP permit 48-01443-P from the SFWMD under application 170413-2, and a NWP 14 verification (SAJ-2017-01152-(NW-MAO)) issued by the USACE on July 6, 2017. Mitigation will be required by the SFWMD, and will likely be accomplished through FTE purchase of mitigation bank credits from one of several mitigation banks that serve the Shingle Creek basin.

A qualitative listed species survey was completed for those species with potential to occur within the project limits as shown in the ERCAR report dated February 13, 2017. No federally or state-listed species were observed within the project area, and suitable habitat was not present within the project limits for most of the listed species. Foraging habitat for wood storks may be affected by the proposed shoulder modifications to Ramp D, but impacts should not be more than 0.5 acre, yielding a “No Effect” determination for wood storks. We will conduct updated surveys, as necessary, to ensure conditions have not changed or listed species have not migrated into and/or become established within the project limits.

Geotechnical Investigation Plan

The SUPERIOR team has thoroughly reviewed the RFP and geotechnical data to preliminarily assess the subsurface conditions within the proposed project area. Based on this review and our geotechnical experience in the area, we will develop a comprehensive geotechnical investigation plan which will be performed during the design phase to provide the assurance all work is performed in accordance with FDOT and FHWA requirements as well as all requirements in the RFP. **This approach will allow our team to take full responsibility for the geotechnical design.** Based on this review of the geotechnical information we have identified the following anticipated project specific issues and provided the corresponding solutions outlined below:

- ▶ Potential for hard/refusal pile driving conditions in the upper 15' – *perform to a depth of 15' to facilitate pile driving.*
- ▶ Presence of near surface organic materials (muck) – *remove muck in accordance with FDOT Standard Index 500 to facilitate construction and promote drainage.*
- ▶ Potential for uplift forces on piles beneath tall piers – *verify side friction using PDA and CAPWAP.*
- ▶ Potential for vibrations to impact existing structures including toll structures – *perform pre-/post construction surveys, monitor structures for vibrations and settlement during construction, and reduce construction-generated vibration levels as required.*

Bridge borings will be performed to make certain at least one boring is located at each structure foundation unit and built to a minimum depth of at least 20' below the tips of the piles. Any organic or unsuitable soils will be fully delineated and shown for removal in accordance with FDOT Standard Index 500. Laboratory testing will be performed so at least 1 test per 25' of boring is taken. Prior to starting our geotechnical exploration we will meet with FTE's Geotechnical Engineer to verify our investigation is in compliance with FDOT and RFP requirements.

Protection of Structures

Settlement, vibration and noise monitoring will also be critical components during pile driving, roadway compaction, sheeting installation, excavations and other vibration-inducing events. A Settlement and Vibration Monitoring Plan (SVMP) will be prepared to address vibration threshold limits as well as to identify areas requiring pre/post-construction surveys and monitoring. As part of the SVMP, any excavations (drilled shafts, utility cuts, etc.) planned adjacent to or near an existing structure (MSE walls, roadways, utilities, etc.) will be evaluated to ensure no settlement/distress occurs to the existing structure.

Geotechnical Load Test Program

A comprehensive load test program will be developed to include PDA testing at each bent/pier location in accordance with FDOT requirements. The PDA data will be utilized to develop accurate pile lengths and driving criteria. Installation of the production piles will be supervised and certified by the geotechnical foundation engineer of record. **The SUPERIOR Team will use PDA testing for all production piles within the Turnpike and I-4 medians eliminating re-strikes and the need for additional lane closures.** In other locations, if rebound conditions are encountered during pile driving operations, set-checks with the PDA will be performed

to verify pile capacity to ensure the capacity of the piling meets or exceeds the required NBR. All foundation installation operations will be monitored by an FTE/FDOT certified inspector.

Minimizing Impacts Through Design

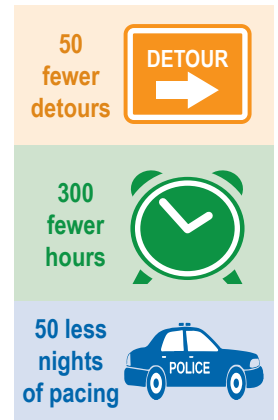
The SUPERIOR Team consistently focuses on avoiding impacts wherever possible:

Minimizing Impacts to the Environment

The SUPERIOR Team will develop a comprehensive erosion control plan preventing sediment from exiting the project site. Special attention will be paid in basins that discharge to Shingle Creek. Up-front species surveys will be completed in advance of construction mobilization to identify relocations and/or protection measures before a single boot hits the ground.

Minimizing Impacts to the Public

A significant part of the SUPERIOR Team's design approach centers around minimizing impacts to the public through strategic staging of work and innovative MOT concepts. Our innovative I-4 diversion design will reduce potential detours by 50 and associated significant impact to surface streets. The I-4 lane closures will also be reduced by 300 hours (due to more efficient construction afforded by wider construction windows) and 50 nights of traffic pacing operations associated with bridge construction virtually eliminated.



Our ATC #1 significantly reduces the amount of work to be completed over and within the I-4 envelope, working in overland/in-field areas instead. This will greatly reduce the exposure of FTE's customers to construction activities and also reduce overall construction time.

Our ATC #2 facilitates widening and resurfacing of the Turnpike SB exit ramp to I-4 in lieu of the full reconstruction of this ramp required by the RFP design. This will greatly reduce impacts to your customers and maintain tolling operations throughout construction.

Minimizing Impacts to Structures

During design, the SUPERIOR Team will identify potential vibration receptors and complete a detailed site survey to determine any vibration-sensitive businesses that surround the project area. This information will be carried forward into our MOT plan, assuring that critical hours of operation do not conflict with planned pile driving or vibratory roller use.

Traffic Control Plan Design

The SUPERIOR Team's MOT plan will allow for the efficient construction of the project while providing a safe work zone for motorists and construction personnel. Our MOT plan will adhere to the Turnpike specific requirements of the TPPPH in addition to the PPM and Design Standards. Implementation of this traffic control plan will require close coordination with multiple project stakeholders including FTE, FDOT D5, I4MP, Orange County and the City of Orlando. Coordination will also be needed with local business interests such as Universal Studios, Sea World, and the I-Drive Chamber of Commerce, all of whom have interest in mobility through this interchange.

Tie-in to I-4

Considerable coordination and schedule timing must occur with I4MP and FDOT D5 to orchestrate construction within the I-4 Right-of-Way. Heavy restrictions on access to work areas and lane closures further complicates available means and methods that must be used to build this project safely and on-time.

Figure 8 - Traffic Pacing

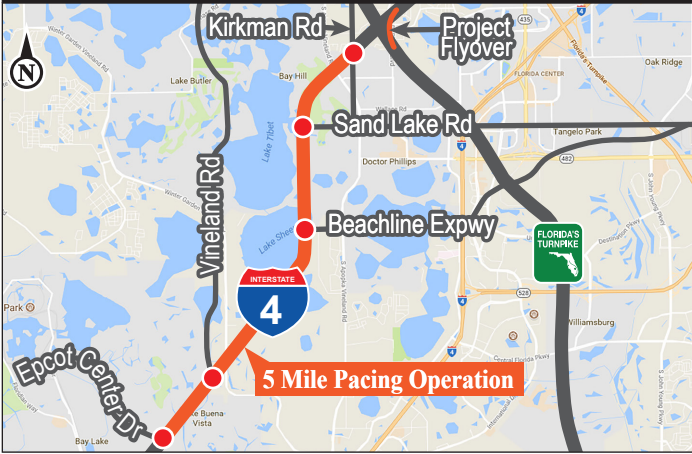
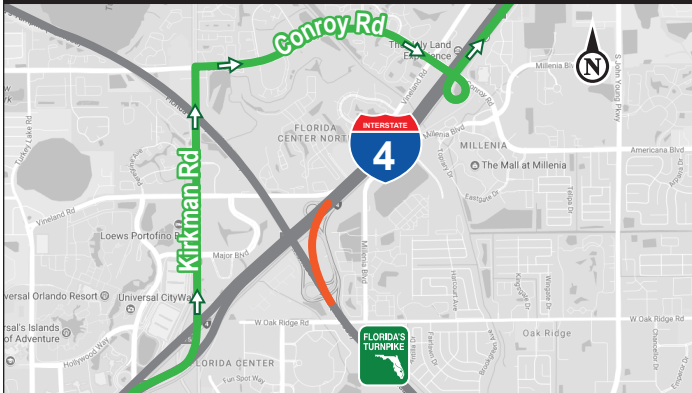


Figure 9 - Detour Route



The SUPERIOR Team's ATC #1 flyover alignment calls for the installation of beams and straddle piers over EB I-4, NB Turnpike and several ramps. There are ways of managing the installation of these elements including conventional traffic pacing and detours or the utilization of SUPERIOR's innovative alternative design solutions:

- ▶ **Traffic Pacing.** Traffic pacing is identified in the RFP as the primary means to install beams and the proposed straddle bents. However, the proximity of surrounding interchanges (see Figure 8) makes pacing on I-4 extraordinarily difficult, impactful to users and a safety challenge. Pacing is an inefficient operation for this type of work (allowing for only 20-30 minutes clear, safe work space) and will result in more than 50 nights of pacing in order to complete the work – adding time, cost, and inconvenience to motorists.
- ▶ **Detours.** Detours (which are not specifically disallowed within the RFP) are available, and one of the most logical is illustrated in Figure 9. Use of these detours would be restricted to (at least) times where double lane closures are allowed on I-4 (12:00AM to 5:30AM)

resulting in a relatively short window of work after detours are set up and traffic diverted. The detour of this traffic onto local roads will also place undue burden on the surface roadway system, even during overnight hours, since I-4 experiences a steady volume of traffic throughout the night.

While traffic pacing and detours are acceptable solutions for FTE, they provide less than desirable impacts to paying FTE customers and road users. The SUPERIOR Team's solution for maintaining traffic provides an innovative diversion of traffic that greatly reduces impacts to traffic, expedites construction activities and increases overall safety.

▶ **The SUPERIOR Team's Innovative Alternative – Shift EB traffic onto WB Express Lane pavement.** This alternative, illustrated in Figure 10, allows for an overnight lane shift of I-4 EB traffic onto the unused WB express lanes having been constructed by the I4MP prior to December 2019. This alternative has tremendous benefits, including:

- Maintenance of two EB lanes at all times, providing a longer lane closure period (8:30PM to 6:00AM) where meaningful work can be completed.
- Increased mobility as the elimination of traffic pacing or detours allows for continuous flow of I-4 traffic without impacting motorists.
- Increased safety and production as workers have a completely open, barrier separated work zone.
- Improved quality related to extended work period.
- Minimizes impacts to I4MP by reducing the amount of time that the newly constructed express lanes are restricted.

Tie-in to Turnpike Mainline

To create the space needed for the Turnpike tie in, Ramp D must first be shifted, followed by the NB and SB lanes. Once these two steps are complete, construction of the Turnpike tie-in may proceed outside of traffic. The SUPERIOR Team's MOT plan at this location and throughout the project will maintain a 10' paved outside shoulder for both directions of traffic on the Turnpike (see Figure 11).

Figure 11 - MOT at Turnpike Tie-in Phasing

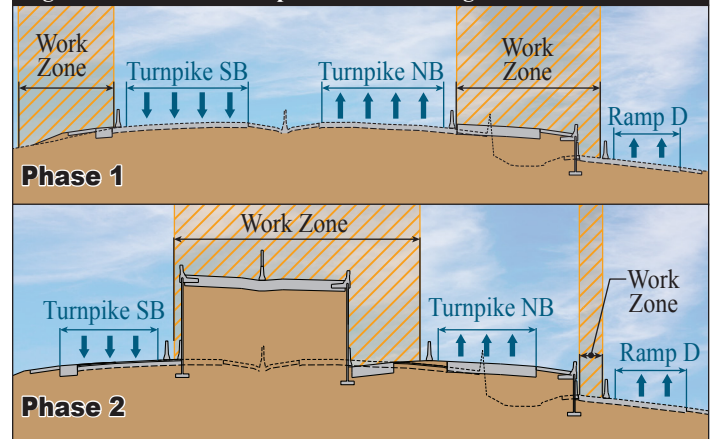
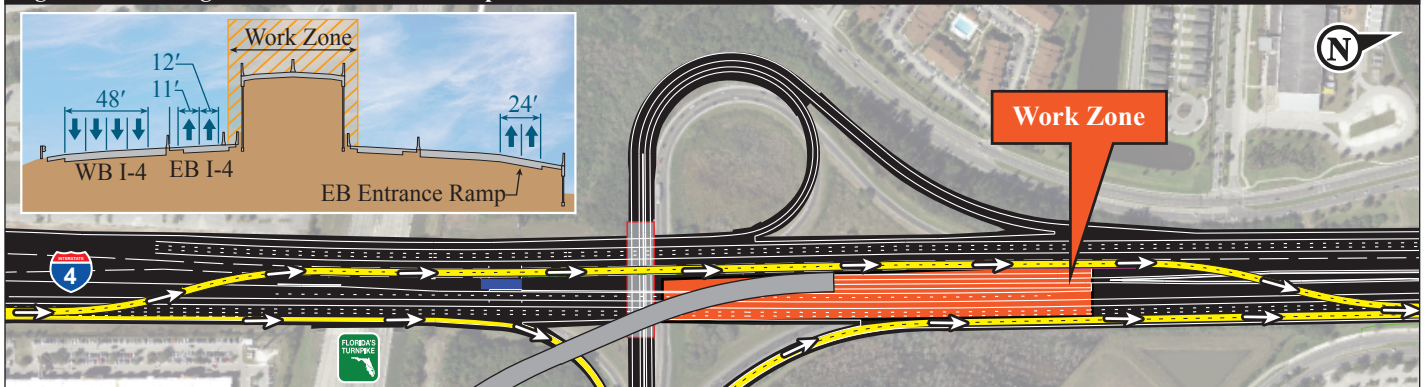


Figure 10 - Shifting I-4 EB traffic onto WB Express Lane



Maintenance of Tolls

Throughout construction in the Turnpike/I-4 Interchange, the SUPERIOR Team will maintain cash tolling as required by the RFP, and will not interfere with operations in the tandem truck staging lot. **SUPERIOR's ATC #2 for the SB Turnpike Exit Ramp (Ramp C) greatly simplifies MOT and reduces impacts to the ramp toll plaza.**

Toll Plaza Construction on the NB Entrance Ramp at I-4

The SUPERIOR Team has developed a traffic control plan that maintains the cash toll lanes and at least one exclusive Sun Pass lane at the Ramps C and D toll plazas until July 1, 2020. By eliminating the reconstruction and associated complex traffic shifts on Ramp C, ATC #2 greatly simplifies maintaining the Ramp C toll plaza. For Ramp D, most major work occurs downstream of the existing toll plaza. ATC #1 is designed so the new Ramp D may be built outside the existing ramp and so the shifting of the northbound Turnpike lanes during Phase 2 does not conflict with the middle and right lanes of the Ramp D toll plaza. Traffic coming out of the toll plaza will be shifted onto the new Ramp D and remain in that configuration until the toll plaza is ready to be removed. These design and construction innovations allow the Ramps C and D toll plazas to remain in operation until the new AET systems are ready to be activated per the RFP timeline. This is a considerable time savings since removal of the plazas is not on the critical path. It also avoids resorting to temporary toll booths.

Consulate Dr.

Work on Consulate Dr. will largely be basic widening and shoulder work. Stopping and intersection sight distances will be carefully considered during design as will maintenance of existing signal timing and actuation.

Turnpike Mainline Milling and Resurfacing

The milling and resurfacing of the Turnpike Mainline will be managed mainly through Index 600 treatments, but will require careful planning particularly with respect to maintaining positive drainage and managing elevation differences between lanes. In addition, materials necessary to enact our planned I-4 diversion will be kept at the ready to help manage any incident that could impact I-4 through the project limits.

Signing & Pavement Marking

The RFP concept design calls for the installation of an overhead cantilever sign for flyover ramp traffic traveling from I-4 WB to the Turnpike SB Express Lanes. The location and configuration of this sign would require a riser of more than 20' in order to bring the sign foundation up to grade with the proposed bridge deck. This is a relatively expensive option and detracts significantly from the aesthetics alongside the Turnpike mainline. **The SUPERIOR Team has developed a solution to install this sign in a span configuration, mounted atop extended hammerheads** (see **Figure 12**). This custom design creates a clean, easily constructed solution.



The remaining proposed guide signing improvements (including Toll Rate and Express Lane signage) are consistent with the Conceptual Signing Plan provided by FTE within the reference documents and subsequent addenda. The SUPERIOR Team has reviewed and will account for the

existing signs that will require replacement/upgrading as documented in the Existing Roadway Conditions Assessment Report and Section VI.T of the RFP.

Like other design components on this project, the signing and pavement markings installations require extensive coordination with the Turnpike project to the south (FPID 411406-1). This will include addressing sign relocations, replacements, overlays, and/or removals between the two projects necessary to assure an efficient and safe guidance and transition through the Turnpike/I-4 System-to-System Interchange and the proposed express lane connections.

Signing and pavement marking coordination will also be required during design with adjacent projects FPID 432193-1 (I-4 Managed Lanes) and FPID 433633-1 (Sand Lake Rd./Turnpike Interchange). All final signing and pavement markings will be in accordance with TPPP, Traffic Engineering Manual, and PPM requirements. The limits of the high-performance express lane buffer delineators, will be clearly specified on the plans.

Signalization

The signalization improvements associated with this project include the replacement of the mast arm signals at FTE's SB Off-Ramp intersection with Consulate Dr.. The existing signal controller assembly will remain and the new signals will be reconnected as required in the RFP.

Orange County is installing Adaptive Signal Control on Consulate Dr., which will require relocation and modification as well as maintenance during construction. We will closely coordinate this work with the maintaining agency and the Turnpike Traffic Operations Office as necessary.

ITS

The approach to this project will be to provide a well-coordinated fully functioning Intelligent Transportation System (ITS). The project includes replacement of existing devices if affected by construction and installation of new ITS components to serve the express lanes system, widening, advanced warning, and on/off ramp systems. The potential ITS elements that may be affected include CCTV, MVDS, DMS, TTS, Fiber Optic Backbone, Local Hub Cabinets, Conduits, Power Subsystem, including standby Backup System, and miscellaneous ITS components.

One of the primary tasks under the ITS component is design, construction and configuration of new ITS devices as required for new express lanes operations, management, and support systems for toll operations. All new ITS devices including traffic monitoring CCTV, confirmation CCTV, Toll and Lane Status DMS sign, freeway DMS signs, MVDS, Fiber Optic Backbone and miscellaneous ITS components will follow the RFP requirements, FDOT and FTE's latest design standards and specifications, and Minimum Technical Requirements (MTR). Per RFP requirements, all DMS signs will be located per the ITS Master Plan. There is an existing 96 Count SM FOC backbone running along the west side of the Turnpike Mainline. We also understand the importance of the current ITS system in the operations of the corridor, a Maintenance of Communication (MOC) plan will be prepared to maintain the existing ATMS/ ITS systems in operation until the new system is in place.

The proposed ITS design will comply with the Regional ITS Architecture and Rule 940 as applicable. A mock up will be set up to include all field network devices and test and identify any underlying issues thus ensuring the network communication is properly configured and integrated for the entire project. This approach ultimately results in streamlining the installation, integration and testing activities during construction.

During construction, proper schedule and ITS deployment will be implemented to ensure there is no loss of communication to the existing ITS System. Plans will be developed to show sequence of construction and a seamless integration with adjacent projects.

The SUPERIOR Team will utilize drone technology to verify camera locations and ultimate visibility. **By using drones in lieu of "bucket trucks", fewer shoulder and lane closures are required and fine-tuning of camera locations becomes simplified - resulting in a better overall system with fewer impacts to customers.**

The coordination will be conducted with the local power company to designate locations to provide new and adjusted electrical service as required for the project. The ITS standard operating voltage will be based on the MTR requirements. The standby power system will be designed at the power service-entrance locations with diesel fuel tanks and automatic transfer switches. The appropriate power transformers will be used at the power service-entrance locations in case of standard commercial power service being unavailable. If necessary, ITS field element step-down transformers will be installed to provide appropriate operating voltage. The proposed ITS will be designed for grounding, surge protection devices (SPD), and lightning protection in accordance with the specifications, NEC, UL 1449 listed SPDs and UL96A. In addition, ITS Generator standby power System along with the electrical power service-entrance equipment will be installed within the same area of Gantry Generators and power service equipment allowing for cost savings, ease of maintenance and access.

Lighting

The lighting scope of work includes removal of the existing lighting system along the Turnpike Mainline and all ramps at the I-4 interchange. New conventional and underdeck lighting systems will be implemented using LED technology. As part of project requirements, the existing high mast lighting will be replaced with a new conventional lighting system within the project limits, and shielding will be added as needed to minimize glare from entering adjacent residences. All lighting components will be identified and documented during our field reviews including circuits originating outside the scope of work that feed lighting loads within the project limits. Lighting levels will be maintained through the use of temporary lighting and maximizing the use of existing lighting.

Tolls

The tolling design approach is to locate the toll gantries at the same locations documented within the RFP Conceptual Plans and Toll Siting Memorandum. Our approach is to proceed with the Pass/Fail status of each tolling point as presented in the Memorandum. The proposed design will utilize non-accessible cantilever gantries. There is currently not much design and construction history on the cantilever gantries, so our team will look for lessons learned from other FTE projects for implementation on this project. All site infrastructure and access requirements will meet the 2016 GTR Addendum No. 1 criteria. The tolling design will be

coordinated with all other disciplines to ensure no metal or pipes carrying fluids will be located under or within 10' of the tolling pavement, loop pull boxes or equipment building. The Maintenance of Communication Plan will ensure communications through FTE's fiber to meet the tolling communication requirements within the GTR. Typical inspections (in addition to building permit inspections) and TEC testing at each site, including end to end for the express lanes will be coordinated with FTE Tolls and with the selected equipment provider throughout construction. The traffic control plans will address the MOT for TEC testing requirements.

Consulate Dr.

The new Consulate Dr. toll facility will be in place and operational within the first year of the construction. It will function for SunPass Only as it does now until the AET conversion date, at which time the signing will be updated for toll-by-plate.

I-4 Ramp Plazas

Coordination with FTE Tolls will be utilized throughout the maintenance of traffic phases for different traffic patterns and the new toll plaza testing period. We plan to completely construct the proposed ramp toll facilities and have them ready for the AET conversion on July 1, 2020.

Incident Management Plan

The SUPERIOR Team is cognizant of the need for a well thought out Incident Management Plan (IMP), recognizing not only the inevitability of incidents, but also the extensive special event schedule that FTE provides access to throughout Central Florida. We will prepare and coordinate pre-established, well thought-out detour routes that can be enacted immediately in the event of an unexpected incident. SUPERIOR will keep necessary detour signing on-site and be prepared to place them in the field, working with FHP and local emergency officials to execute the plan.

Our Emergency Action Plan will be consistent with the FDOT's Emergency Management Program and Hurricane Response Action Plan and will provide a hotline to all stakeholders and police. We will work closely with local officials and accommodate a hurricane evacuation in our Traffic Control Plan design.

Aesthetics

This project and the I-4 Ultimate project appear as one to the average road user, and should intuitively look the same. While both projects adhere to the same aesthetic standards, **the SUPERIOR Team's plan provides the most consistent aesthetic approach possible, using similar materials throughout the interchange to provide uniform color and texture.** This seamless integration between the two projects is best illustrated in **Figure 13**, which renders both the steel and concrete options.

Figure 13 - Aesthetics



Utility Coordination and Design

There are 19 Utility Agencies/Owners who are located within the project limits, two with significant involvement:

AT&T Corporation

The SUPERIOR Team has an excellent understanding of the existing AT&T Corporation ducts and manholes which are located (by easement) in the existing NB median shoulder of the roadway. Relocation of their facility will need to take place to avoid proposed foundations. Although the adjustment of the conduit and manholes may be simple, the actual length of fiber cable will probably exceed the impacted area.

The SUPERIOR Team has coordinated with AT&T representatives and confirmed relocating the existing conduits has been programmed, but they are waiting to work with the selected DB Team to complete their relocation and adjustment design. AT&T suggested there could be as many as six months in the design and procurement of the necessary supplies, and confirmed there is no reimbursement requested for this work. **The SUPERIOR Team will work closely with this stakeholder to open up the work zone early to facilitate relocation of their facilities without impacts to the project schedule.**

Florida Gas Transmission Company (FGT)

The SUPERIOR Team has spoken several times with FGT regarding the locations of the existing gas transmission mains crossing through the project. **Our design will not impact FGT facilities throughout design or construction.**

A key concession in the global agreement is to allow FGT a 90-day review period of the “90%” plans prior to finalizing the project’s design. GAI has firsthand knowledge with these submittals, and will expedite roll plots of the concept plans and foundations to FGT to allow for their review within two months of NTP. This action provides adequate time to address any comments raised as part of this review.

Surveying, Mapping and Subsurface Utility Engineering Services (SUE)

Survey support on this project will include merging of existing survey/SUE information with new information, such as DTMs within obscured areas and newly constructed areas (I-4 Ultimate, etc.), 3D Laser scans of existing bridge structures/roadways where needed, and verifying existing survey information. SUE support will require accurately locating the existing subsurface utilities, which includes the Turnpike owned facilities, the FGT lines running along the corridor as well as any public and private utilities located within the project limits.

One unique aspect of this project will be a consistently changing topography as the I-4 Ultimate Project takes final shape around our work zone. The SUPERIOR Team will take routine stock of changed conditions and commission additional “spot surveys” throughout the life of the project to assure accurate base data and a design that is compliant with its ever-changing surroundings.

Design considerations which improve recycling and reuse opportunities

The SUPERIOR Team consistently looks for ways to lessen impacts to the environment, including re-use of materials wherever possible. In the case of this project:

- ▶ SUPERIOR’s ATC #2 widens and resurfaces the SB off-ramp from the Turnpike to I-4 in lieu of full ramp reconstruction preserving this existing roadway base and pavement.
- ▶ Pavement designs will be optimized to allow for recycled asphalt use in the shoulders.
- ▶ Removed luminaires, many of which are in “like new” condition, will be returned to FTE for use by maintenance forces elsewhere on the system.

CONSTRUCTION

Safety

Safety is SUPERIOR’s top priority on every project, and it is especially important on system-to-system interchanges with heavily-traveled interstate roadways. Our experience throughout the state on similar, high-profile projects enables us to identify and address potential hazards in advance of construction. **SUPERIOR’s 2017 EMR of 0.50 demonstrates proper planning and training leads to better safety results as our rate of workplace incidents is 50% better than industry standard.** Along with our key initiatives for worker safety, the safety of the traveling public is equally important.

Several highlights of our construction approach to eliminate hazards and enhance public and worker safety include:

Public Safety

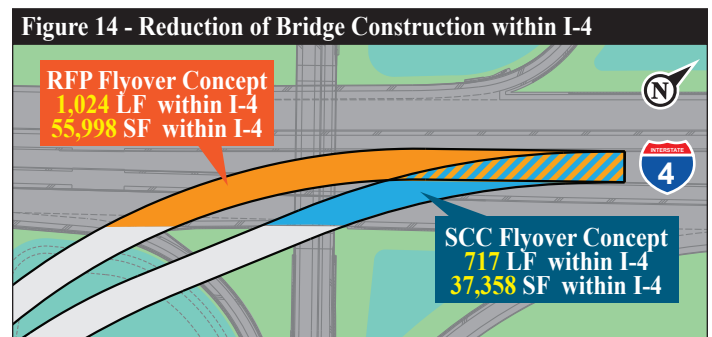
- ▶ Our Work Plan will identify construction access points minimizing construction vehicles entering or exiting the Turnpike Mainline and I-4.
- ▶ Our simplified bridge construction and modified alignment translates into increased public safety by reducing the amount of work in the medians of the Turnpike Mainline and I-4.
- ▶ Existing configuration of and access to the Tandem Truck parking area will not be modified during construction.
- ▶ We are committed to meeting all FGT requirements.
- ▶ Our MOT plan will be attentive to the tolling site personnel access to the booths until the AET conversion is complete.

Worker Safety

- ▶ Providing full-time Health Safety & Environmental Manager, Frank Ortega, to ensure a consistent and cohesive safety approach.
- ▶ Project Specific Safety Plan – Addresses the requirements for working on a heavily-traveled interstate.
- ▶ Construction Hazard Analysis – Work plans to identify and resolve potential safety hazards.
- ▶ Field Supervisors provided iPads with Safety App leveraging technology to keep safety at the forefront of every construction activity.
- ▶ Weekly and Monthly Toolbox Safety Meetings.
- ▶ Employee new hire and subcontractor orientation.

Structures Construction

Construction of the Direct Connect Flyover structure entails many challenges due to its shared interface with I4MP. As outlined throughout this proposal, the SUPERIOR Team’s ATC #1 greatly reduces the amount of bridge construction over and within the I-4 envelope (See **Figure 14**), increasing construction safety, accelerating schedule and reducing impacts to the public. The work performed over traffic will be carefully planned. The SUPERIOR Team’s innovative I-4 diversion concept and selective detours will be deployed when required to maximize safety and increase construction efficiency. Deliveries of piles and beams will be conducted during these detours, or off-peak hours under allowable lane closures.



Foundations

The flyover will be supported by concrete piles. Prior to beginning driving operations, our Pile Installation Plan will be submitted for review and approval. A fixed template will be used to ensure certain piles are installed to the allowable tolerance. We will perform PDA testing on 100% of the piles at critical locations, including EB1, P2, P3, P4, P11, P12, P13, and EB14. Several foundations will require temporary shoring to facilitate footing construction. Sheet pile with either grouted or helical anchors could be used for this purpose.

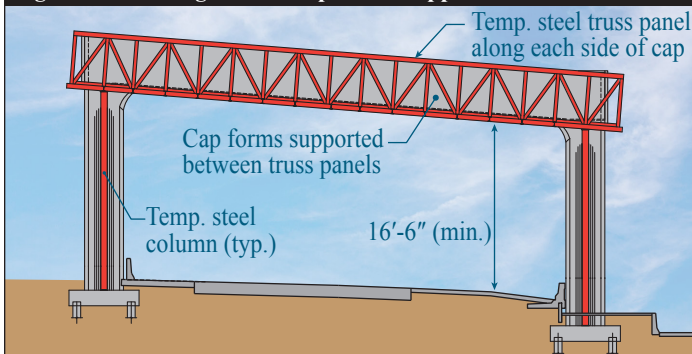
Substructure

End bents for the flyover will be constructed behind MSE retaining walls. Concrete barrier wall will be used to protect work activities at intermediate pier locations near traffic.

A hammerhead design will be used at most intermediate piers. A cast-in-place concrete straddle cap will be constructed at P3, P11, and P12 with P3 being an inverted tee style (See **Figure 15**). The concrete will be placed in stages taking advantage of its self-supporting properties, allowing for a more efficient falsework construction.

An important part of the straddle pier construction is the forming system that will allow the SUPERIOR Team to construct the cast-in-place caps. **The cap forms will be supported by a temporary steel through-truss form support system which will span the full length between concrete columns.** The trusses will bear on temporary columns placed on the permanent footings, adjacent to the permanent concrete columns. This system will allow safe and efficient construction of the concrete straddle cap without the impacts of intermediate shoring (See **Figure 16**)

Figure 16 - Through Truss Cap Form Support



Superstructure

The flyover structure consists of simple span FIBs. Prestressed concrete beams greatly simplify construction and reduce material lead time as compared to steel girders. We will survey the beam camber prior to erection ensuring design parameters are met. Unit 1 beam erection will begin with Span 4 and progress towards Span 1 (See **Figure 17**). Unit 2 beam erection will begin with Span 5 and progress towards Span 8. Unit 3 beams will be set first in Span 10, and then in Span 9. Unit 4 beam erection will begin with Span 11 finishing off with Span 13. All temporary bracing will be designed and inspected by a Professional Engineer. This erection sequence has been carefully planned to allow

Figure 17 - Girder Erection

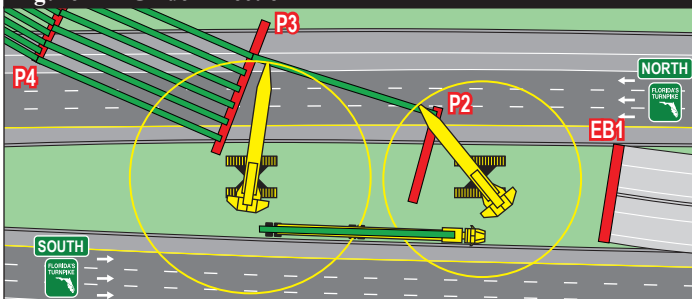
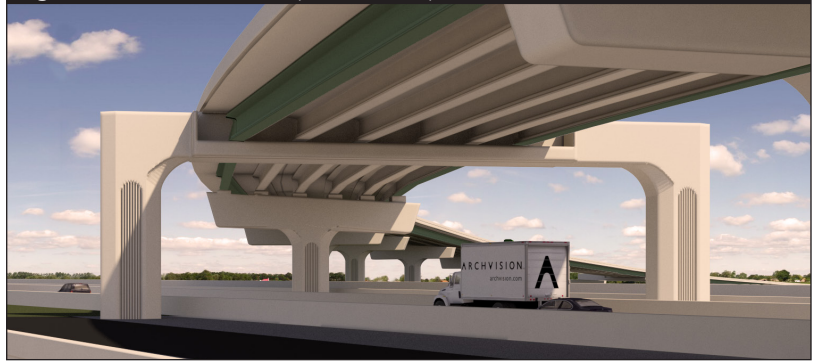


Figure 15 - Pier 3 Straddle (Inverted Tee)



the proper footprint required for cranes and delivery trucks. Ground improvements will be required at select locations to support crane pads and delivery trucks. Please refer to our 11x17 structure plans for our preliminary beam erection plan. Concrete deck placing operations will occur during detours as required.

Mass Concrete

The flyover will have component proportions qualifying as mass concrete. Our team will develop a model using the Schmidt Method for the different mixes and temperature variations occurring on the project. A mass concrete plan will be developed based on this model outlining means and methods to keep the temperature differential from exceeding 35°F. Typical temperature control measures include using a FDOT approved concrete mix design, proper curing, insulated forms, insulating blankets, water, and wet burlene mats. Quality control and monitoring used for this project will be developed for each location and the information carefully recorded. FDOT and ACI guidelines will be used for the approved mass concrete plan.

MSE Retaining Walls

Permanent MSE retaining walls will be constructed with imported select backfill. Our phased construction approach will mitigate the effects of embankment settlement. Precast coping and traffic rail will be used for high-quality and expedited construction.

Roadway Construction

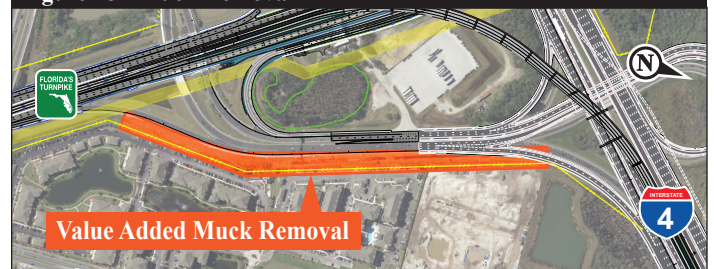
Clearing and Grubbing

Very little vegetation remains within the limits of construction. The limited amount of material that must be removed will be taken offsite for disposal to avoid hazards associated with onsite grinding adjacent to traffic.

Muck Removal

Our Team's familiarity with the interchange includes full knowledge of the stormwater issues FTE has encountered along the right side of the Turnpike to I-4 ramp. This is largely due to discharge from adjacent development, downstream maintenance concerns, and the presence of a surficial muck layer within the ditches and linear ponds. **The SUPERIOR Team proposes to include value-added muck removal through this area, backfilling with clean soil to promote percolation and solve this decades-long problem within the constrained available ROW** (See **Figure 18**).

Figure 18 - Muck Removal



Earthwork

Most embankment operations will require A-3 Select fill material to backfill the MSE walls. Fill placed within 4' of the MSE walls will be compacted with smaller equipment to avoid movement of the wall panels during compaction. To ensure that the project is not delayed, we have identified three sources of suitable fill material for this project. Additional sampling and testing will be completed prior to the material arriving onsite for acceptance testing and placement.

Asphalt Paving

The following are some of the highlights of our asphalt paving approach:

- ▶ The final lift of Mainline friction course will be placed utilizing a material transfer vehicle (MTV), more commonly known as a shuttle-buggy. Advantages of utilizing a MTV include: reduced mix segregation due to “re-mixing” of asphalt and the continuous paver movement. The continuous paver movement and the elimination of the paver contact to the dump trucks results in a smoother riding surface and deficiency reduction.
- ▶ Where possible, our paving operation will ensure that its longitudinal paving joints fall outside of the line of RPM placement to reduce delamination of the RPMs at the paving joints.

Full Depth Cracking Pavement Areas

There are four locations that have been identified with full depth cracking in the pavement cores. The specified repair for these areas requires full depth milling to allow for a minimum of 7" of asphalt placement 500' each side of the core location. Due to the limited work areas, limited work hours, and technical requirements of this asphalt it will be necessary to develop and implement a detailed sequence of construction that provides for a quality repair and also allows for the travel lanes to be open to traffic at the required time. The SUPERIOR Team has developed a detailed plan for this work that is summarized in the following steps and illustrated in **Figure 19**:

1. Mill existing travel lane to allow for 7" of structural asphalt
2. Place initial lift of SP to a depth of 2.5"
3. Once Initial lift is cooled, place 2nd lift of SP
4. Place sacrificial, temporary asphalt level with adjacent pavement
5. During mainline milling & resurfacing operations, mill sacrificial asphalt and place permanent structural and friction course as required

Minimizing Impacts Through Construction Environment

Environment

As part of the National Pollutant Discharge Elimination System (NPDES) permit, a Stormwater Pollution Prevention Plan (SWPPP) will be developed identifying potential sources of pollution that may affect the quality of stormwater discharges from the site.

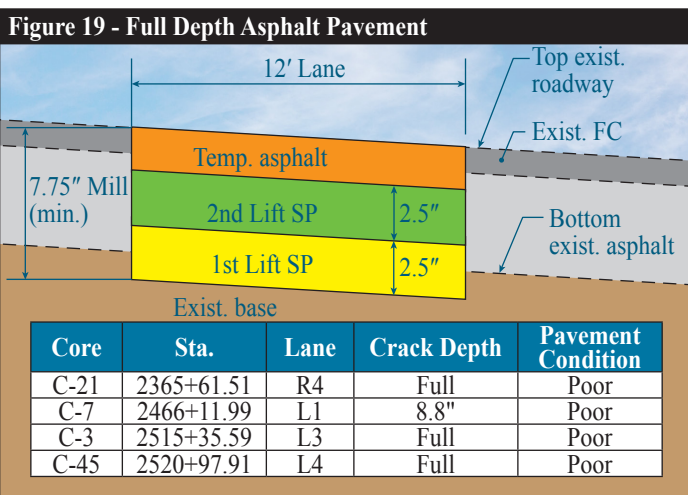
Silt fence and turbidity barriers will be installed before construction commences and maintained throughout the life of the project. We believe a diligent and proactive erosion control plan is essential to avoiding potential issues with wetlands and water quality. Specifically, our Team has evaluated the following elements of the project will be addressed with a dynamic and hands-on approach to protect natural resources and avoid permit compliance issues.

- ▶ A turbidity monitoring log documenting turbidity conditions will be maintained on a periodic basis and submitted to Turnpike and SFWMD.
- ▶ Slope protection will include temporary slope drains during embankment construction and will be sodded to provide a finished stable surface.
- ▶ Ponds and drainage ditches will be excavated and stabilized early to collect stormwater runoff and provide treatment.
- ▶ Dewatering activities will include the use of sock drains, and coarse aggregate to properly filter out suspended sediments.
- ▶ Dust suppression is accomplished via water tanker trucks.
- ▶ Temporary wash areas and berms prevent turbid site runoff.

The Traveling Public

Our Team has extensive experience working on interstate and urban interchange projects. As this project is located at the confluence of two of the busiest interstates in the country, the biggest impact to the public will be on I-4 and FTE. The SUPERIOR Team will develop a detailed plan detailing each aspect of construction, particularly the delivery of the following materials to minimize impacts and provide clarity for drivers:

- ▶ **Use of the Waze App.** The SUPERIOR Team will leverage the ongoing relationship between FDOT and Waze by **providing traffic updates to the “Waze” app to alert users to construction activities and traffic shifts.** This phone and GPS-based application has an ever-increasing customer base, and its audible alerts and map-based information can supplement existing ITS systems to convey information as they travel through the work zone.
- ▶ **Material Deliveries.** Delivery of embankment materials and concrete materials constitute the largest volume of construction related traffic. To ensure the safe and timely delivery of fill material, it will be critical for crews to have a detailed plan addressing the logistics for each source of dirt. This plan will consist of the installation and maintenance of truck access locations to facilitate safe access and egress.
- ▶ **Piling and Girders.** While these items will not be delivered at a high frequency, the size of these members dictate unique plans be developed and implemented. Deliveries are intended for use in the median of either I-4 or the Turnpike will utilize a planned staging area to allow crews to better prepare for the delivery and minimize impacts to traffic.
- ▶ **Pipe and Drainage Structures.** Unloading of materials will take place outside of the clear zones or behind the temporary barrier wall by strategically selecting staging area locations.



Drainage Construction

To ensure positive drainage during construction, existing flow patterns through the site will be maintained. Where construction operations impede existing flows, temporary pipes and structures will be utilized. Our design will incorporate reinforced concrete pipe (RCP) wherever possible.

Structures

The Team will develop and implement a detailed plan to monitor vibrations on the following structures:

- ▶ Existing Turnpike toll gantries
- ▶ Existing bridge structures
- ▶ Drainage and structures constructed by I4MP

Erosion/Sediment Control Approach

The SUPERIOR Team will implement Best Management Practices to prevent runoff throughout all phases of construction. A project specific SWPPP will be developed and strictly enforced. We will establish and maintain a commitment tracker to make certain all permit conditions and project commitments are upheld. Additional erosion and sediment control measures deployed are as follows:

- ▶ Our Environmental Manager, Pranav Agrawal, has the single responsibility of compliance with environmental requirements and reports solely to the Project Principal.
- ▶ Identify and flag environmentally sensitive areas by installing orange safety fences around their perimeter.
- ▶ Educate field personnel on proper methods of work while working next to environmentally sensitive areas.
- ▶ Obtain background turbidity readings in all wetland areas and stormwater outfall locations.
- ▶ Monitor turbidity levels to ensure compliance with permit requirements.
- ▶ Construction of stormwater facilities as early as possible.
- ▶ Use soil tracking devices at egress areas from the construction site.
- ▶ Inspect and report on stormwater pollution prevention measures at least weekly by FDEP-certified inspectors.
- ▶ Review stormwater pollution control measures with FTE/CEI staff on a weekly basis.
- ▶ Provide timely corrective action for the repair and replacement of erosion control measures.
- ▶ Maintain dust control under the supervision of SUPERIOR's Roadway Superintendent, Oscar Matson.

Maintenance of Traffic Approach

The SUPERIOR Team's approach to MOT places public and worker safety at the forefront. The design and construction staff have been working diligently throughout the technical proposal phase to develop a MOT plan maximizing mobility and reducing impacts to traffic. We provide a dedicated Worksite Traffic Supervisor (WTS) and crew responsible for installing and maintaining all temporary traffic control devices. Available on a 24-hour basis and on site during all set up and take down, the WTS will immediately correct, or cause to be corrected, any safety deficiencies. Minor infractions found during regular inspections will be rectified within 24 hours. Their sole responsibility is the safe implementation on the MOT plan. This effort being:

- ▶ Close coordination with I4MP
- ▶ Consistent communication with stakeholders
- ▶ Strict compliance with Index No. 600 for work zone protection
- ▶ Reliable data entry and use of Lane Closure Information System

Access Points

Median access point to Turnpike Mainline and I-4 will be strategically located at the east and south project limits respectively, to provide safe and efficient access to/from the project site for the project team. Access points will be installed properly with adequate acceleration and deceleration areas. These points will be sufficiently signed to warn motorists of vehicles entering and exiting the work zone. The SUPERIOR Team will organize off-site employee parking areas and utilize passenger vans or other selected vehicles to access the median work zones and significantly reduce the construction vehicle/public vehicle interface. Driving proficiency training will be regularly provided to ensure we access the median work zones in the safest manner possible.

On-Site Diversion

The SUPERIOR Team's innovative on-site diversion concept for I-4 eastbound traffic allows more work to be conducted further away from traffic. This greatly increases production while providing maximum mobility to the public. Safety is greatly enhanced for the public and our crews. More efficient construction operations will result in schedule savings translating to less impacts to the traveling public.

Incident Management Approach

SUPERIOR's MOT Superintendent, Mike Trail, will serve as the first point of contact for all emergency management agencies. Mr. Trail will ensure our onsite MOT professionals are prepared to assist with traffic management to the extent they are able during an incident. The following Incident Management protocol shall be executed when required.

- ▶ Call emergency response if injuries or life-threatening situation occur.
- ▶ Notify law enforcement of the location of the disabled vehicle.
- ▶ Notify appropriate SUPERIOR Management staff of the incident.
- ▶ Notify the FDOT Regional Traffic Management Center.
- ▶ Coordinate with FHP/law enforcement.

Close coordination between FDOT and our project staff will be maintained to ensure preparedness for tropical storms/hurricanes. FTE will be provided with a single point of contact to be used outside of normal business hours maintain 24/7 coverage.

The Turnpike/I-4 Interchange is a major interchange in the Florida infrastructure system. The SUPERIOR Team will develop and implement a comprehensive IMP addressing both planned and unplanned incident events. The plan will be submitted at the preconstruction conference and will address the various levels of incidents, what resources will be utilized, and a preliminary matrix of stakeholders for coordination activities. The goal of this plan is to help ensure that both I-4 and Turnpike are open to traffic during critical time frames and that communication with motorists and critical stakeholders is implemented and maintained.

Our emergency response plan will ensure our responses are timely. It will address responding to traffic incidents, vehicle crashes, obstructions to traffic as well as means for clearing disabled vehicles from travel lanes, assisting disabled motorists, removing nonhazardous spills and assisting other emergency responders as may be needed.

Other key elements of the Plan include:

- ▶ A call-back response time within 15 minutes and, if needed, a responsible representative on site within 45 minutes of being contacted by the Department.
- ▶ Direct communications with the D5 and Turnpike's Regional Transportation Management Center (RTMC) of all incidents along with status updates.
- ▶ Removal of all small non-hazardous debris from the roadways and paved shoulder areas, and proper disposal of all debris gathered during regular patrolling duties.
- ▶ Reporting of hazardous material spills to the Department and the designated Remediation Contractor as well as coordination and assistance as needed for its safe containment and/or removal.
- ▶ Immediate removal of all equipment and/or obstructions from the work zone along with the expeditious and safe opening of all travel lanes as may be necessary during an emergency in accordance with Turnpike and D5 procedures and their Hurricane/Evacuation Plan.
- ▶ Regular scheduling, coordination and attendance to all safety/emergency planning meetings as requested or required by the Department and/or local and state incident management teams.
- ▶ Coordination of hurricane preparedness/recovery plan activities with the Department and their designated hurricane recovery contractors and Emergency Response Managers. This may include preparation of a suitable staging area within project limits for the specific purpose of facilitating the Department's recovery efforts.

Utility Coordination and Construction

Our Team's design contains very few potential utility conflicts. The most critical item is the proximity of construction operations to the FGT easement. While no permanent work conflicts with the gas main or easement, it will be necessary for certain pieces of bridge construction equipment to either cross the easement or work from within the easement on isolated events. We have met with Joseph Sanchez of FGT, are currently working with FGT on several DB projects, and are well aware

of their revised Engineering & Construction Specifications. We will provide equipment types and sizes to FGT for load calculations to ensure mitigation techniques are applied as necessary. On previous and current projects, this has included the use of crane mats and earth fill as shown in **Figure 20**. We will hold an individual pre-construction meeting with FGT staff to review their safety requirements when working over and around the pipeline. Heavy equipment will follow carefully delineated paths to avoid both underground and overhead utilities. Supplemental subsurface utility locating will be performed where the integrity of underground utilities may be jeopardized by the proximity of construction.

Figure 20 - Air Bridge over FGT



Written Schedule Narrative describing Design and Construction Phases and How They Meet the Project Goals

SUPERIOR has an excellent record of finishing projects on-time or ahead of schedule. The key to completing a successful project on-time, or early, is to develop an accurate and logical design, quickly obtain permit modifications, and execute a well-built construction schedule. The schedule must encompass all work elements, identify the critical path, and allow for mitigation of potential delays. Our schedule fully integrates permitting, utility relocations, and phased design submittals enabling construction to begin immediately following approval of specific component plans.

Design and Permitting Phase

This project is essentially “four jobs in one”, with each requiring its own approach to design schedule management:

- ▶ **Consulate Drive Improvements.** These improvements, committed to be completed within the first 12 months of construction, will be our first focus of effort on the project. Because of its limited scale, **it will be managed as a conventional plans package, with all components submitted simultaneously, reducing review efforts associated with multiple component plan submittals** (clearing and grubbing, etc). To expedite design of the signal mast arms, the SUPERIOR Team will work with FTE and Orange County to perform over-the-shoulder reviews to obtain concurrence on acceptable pole locations – allowing for early shop drawings on this long-lead-time item.
- ▶ **AET Conversions.** Existing plaza conversions to AET will also be an accelerated item in order to meet the July 1, 2020 deadline. Each site will be designed with and independent MOT plan that is not contingent (but is compatible) with other construction elements. These designs will be well-coordinated with FTE tolls staff, with the goal of completing design (and ultimate construction) to have gantries in place without resorting to an “AET Lite” configuration.
- ▶ **Mainline Milling and Resurfacing and ERCAR-identified improvements.** These plans will also be handled as a conventional design, **submitting the entire set of plans at one time instead of various components.** This will serve to consolidate reviews by FTE into fewer packages and preserve valuable resources.
- ▶ **The Flyover.** Plan components associated with the flyover will be staged for plans submission after 100% reviews on the other portions are complete. Similar to the other components, **the bridges for the flyover will be submitted as a single package, and not be segmented into foundation/substructure/superstructure submittals.** This is possible due to the nature of the project schedule constraints, as efficient construction of the flyover bridge will favor its entire construction towards the end of the project. As this is the only area where deviations from the existing permit are necessary, ample time exists for these modifications to be obtained in advance of construction.

Early Works

Due to the unique nature of the schedule constraints for this project, the SUPERIOR Team will focus early works efforts on advancing design activities expeditiously for key construction activities. Specific focus will be placed on plan submittals for the AET conversion activities that will allow for the full conversion on July 1, 2020. Early construction work on Turnpike and I-4 will not begin until such activities can continue uninterrupted so that impacts to traffic and paying FTE customers are minimized.

Construction Phase

All construction activities are based on a 5-day work week. This provides flexibility for optimization of the schedule, by shifting to a 6- or 7-day work week. Special events and standard holidays have been considered, and work requiring detours or lane closures has been scheduled according to the restrictions as listed in the RFP. We are committed to beginning Zone 1 work on or after December 1, 2019 and finishing by December 30, 2020. We will meet the 1,045-day contract schedule for this project.

INNOVATION

As evidenced within this document, our approach to delivering a successful project is built upon innovation in many forms:

Minimize or Eliminate Utility Relocations

There are only two significant utility owners that will be affected by this project:

- ▶ **FGT.** The SUPERIOR Team has a strong history of working alongside and coordinating with FGT to develop solutions that minimize impacts and relocations. Some of the innovative tactics used on this project include:
 - Use of an “Air Bridge” to span overtop of FGT’s lines.
 - Spanning FGT’s specified width while meeting 16.5’ clearances above their line.
 - Maintaining existing cover where ponds are reworked and where the NB entrance ramp crosses over FGT’s lines.
- ▶ **AT&T.** AT&T’s lines will be impacted as part of this project as they lie within the existing NB shoulder. Impacts to their facilities are minimized through:
 - An MOT Plan that opens a work zone for AT&T’s relocations early so their activities can be completed well in advance of flyover construction.
 - Early delineation and protection of their lines throughout the project limits.

Materials

The SUPERIOR Team has provided numerous innovations with respect to materials:

- ▶ **Concrete Beams.** Our approved ATC #1 allows for use of concrete beams in lieu of steel, reducing maintenance and inspection requirements.
- ▶ **10ksi Concrete.** Our use of 10 ksi concrete for prestressed beams provides enhanced capacity facilitating the use of low maintenance FIB’s through the curved alignment.
- ▶ **Concrete Straddle Caps.** The SUPERIOR Team’s innovative MOT approach along I-4 allows for construction of reliable, aesthetically consistent cast-in-place concrete straddle caps.

Workmanship

- ▶ **Significant Reduction of Bridge over the I-4 Corridor.** Elimination of 18,640 SF of bridge overtop the I-4 corridor greatly reduces overlap with I4MP construction and removes risk from the project.
- ▶ **ATC #2.** Our approved ATC#2 allows for minor widening and overbuild of the SB exit ramp from Turnpike, greatly simplifying construction, eliminating MSE walls, and reducing impacts to traffic during construction.

- ▶ **Innovative MOT Plan.** The SUPERIOR Team's innovative MOT plan saves construction time, reduces impacts, and enhances safety during work over I-4 lanes.
- ▶ **Through-Truss Cap Form Support.** The use of this construction method allows for safe casting of the pier cap without sacrificing vertical clearance to traffic when lanes are opened during peak periods.
- ▶ **100% PDA Testing.** Use of 100% PDA testing for piles within the I-4 and Turnpike corridors allows for reliable and efficient pile driving while limiting impacts to the traveling public.
- ▶ **Use of Drone for ITS Camera Testing.** Using a drone to evaluate camera locations in lieu of a bucket truck improves safety and allows for real-time optimization of camera placements in the field.

Enhance Design and Construction Aspects Related to Future Expansion of the Transportation Facility

- ▶ The SUPERIOR Team will meet all RFP requirements for accommodation of future 10-laning of the Turnpike Mainline. ITS systems will be designed with scalability in mind to limit future rework as feasible.

VALUE ADDED

Broadening Existing Threshold Requirements

We understand FTE's goals and expectations of a successful project with superior workmanship. Our proven record of quality design combined with our extended warranties and construction services should reassure the Department our final work product will be free from defects/deficiencies and perform as intended. Our goal is to meet/exceed your expected quality. We have broadened the extent of each of the three required warranty features. The SUPERIOR Team has also offered 15 additional value added features noted in the **Value Added Warranty Table**.

Exceeding Minimum Material Requirements

Our Team's commitment to quality incorporates many features to maximize durability and reduce maintenance of project components as illustrated in previous sections of this Technical Proposal. Most notably we are committed to providing 5,500 psi concrete for all superstructure concrete, exceeding the requirement of 4,500 psi.

Additional Value Added Features

Enhancements beyond simple RFP requirements are a hallmark of our approach, and include:

- ▶ **Increased Design Speed.** The SUPERIOR Team's design provides horizontal geometry to meet a 50 MPH Design speed in contrast to the 45 MPH provided within the RFP Concept. This improves safety along this high-speed express lane systems movement.
- ▶ **Enhanced Redundancy Factors.** Redundancy Factors required by SDG 2.10.A will be increased from 1.0 to 1.05 for all concrete hammerhead piers and from 1.05 to 1.10 for all concrete straddle piers.
- ▶ **Removal of muck from alongside Turnpike to I-4 Ramp.** Removal of surficial muck in this area improves the quality of drainage, conveyance, and stormwater treatment, solving a long-term maintenance and functionality issue within the interchange.

Value Added Warranty Table

Broadening the Extent of the Required Value Added Features	Duration (Years)		Measurable Standards	Remedial Work
	Standard	SUPERIOR		
Required Value Added By SUPERIOR				
Asphalt Pavement	3	5	Spec. 338	Table 338-1
Bridge Components	5	7	Spec. 475	Spec. 475
Concrete Pavement	5	7	Spec. 355	Spec. 355
Additional Value Added By SCC				
Roadway				
Roadway Signage	1	5	Spec. 700 & 994	*1, *6
Guardrail	1	5	Spec. 536	*1, *2
Roadway Drainage	1	5	Soil/Water leaking into structure	*1, *5
MSE Retaining Walls	1	5	Panel cracks & spalls	*1, *4
Structures				
Approach Slabs	1	7	Spalls > 1" Depth	*1, *3
Substructure – concrete	1	7	Spalls > 1" Depth	*1, *3
Superstructure – concrete	1	7	Spalls > 1" Depth	*1, *3
Prestressed Concrete Piling	1	7	Settlement	*1, *6
Prestressed Beams	1	7	Spec. 400-21	*1, *3
Post Tensioning	1	3	Spalls > 1" Depth	*1, *3
Neoprene Bearing Pads	1	7	Spec. 400	*1, *6
Lighting				
All components as per 725-1; exceptions as per 725-5.1	3	5	Not functioning	Spec. 725-5.3
Lamps, ballasts & photo-electric switches	2	3	Spec. 725	Spec. 725
Adhesion & color retention on painted light poles & bracket arms; other exceptions as per 725-5.2	5	6	Spec. 694	Spec. 725
ITS				
All ITS components	Var.	Std.+1	Spec. 783, 785, 786	Spec. 783, 785, 786
*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				

- ▶ **Design Submissions.** By consolidating design submissions and eliminating "components", the SUPERIOR Team simplifies reviews by FTE staff and reduces overall efforts.
- ▶ **Use of Waze App.** The SUPERIOR Team's strategic use of Waze informs drivers to construction activities, lane closures, and incidents.
- ▶ **Innovative MOT Plan.** The diversion approach for traffic control on I-4 greatly reduces the amount of inconvenience to the traveling public, eliminating an estimated 50 detours, 50 nights of pacing, and 300 fewer hours of lane closures.
- ▶ **Consistent Aesthetics.** By utilizing all-concrete structures, aesthetics of the interchange are consistent between FTE and I4MP construction without comingling of weathered steel beams/straddles and green-colored FIBs with consistent pier colors.

We have worked diligently with our designers, suppliers, and subcontractors to provide unprecedented coverage on 15 additional items. We offer additional value added features and warranties covering roadway, drainage, signals, signage, and ITS features listed in the **Value Added Warranty Table**. We have extended several of these warranties an additional 5 years.