Meeting of the Board of Directors

March 28, 2022 - 1:30 p.m.

THEA Headquarters
1104 E. Twiggs Street
First Floor Board Room
Tampa, FL 33602

For any person who wishes to address the Board, a sign-up sheet is provided at the Board Room entrance. Presentations are limited to three (3) minutes. When addressing the Board, please state your name and address and speak clearly into the microphone. If distributing backup materials, please furnish 10 copies for the Authority Board Members and staff. Any person who decides to appeal any decisions of the Authority with respect to any matter considered at its meeting or public hearing will need a record of the proceedings and, for such purpose, may need to hire a court reporter to ensure that a verbatim record of the proceedings is made, which record includes the testimony and evidence upon which an appeal is to be based.

I. Call to Order and Pledge of Allegiance

II. Public Input/ Public Presentations

III. Consent Agenda

A. Approval of the Minutes from the February 21, 2022, Board of Directors Meeting

B. Board Member Travel
TEAMFL – May 12-13, 2022

C. Ferrovial Task Order to Reface Signs at Gandy to better delineate ramp designations - $12,505.90

D. Ferrovial Task Order to install fencing at the east side of THEA drainage area on Whiting - $5,350

E. Kapsch Task Order for transition services for Access Control System - $59,100

IV. Discussion/Action Items

A. Planning & Innovation – John Weatherford, Chairman – *Bob Frey, Staff*

1. Selmon Greenway

Purpose: Due to the development in Downtown Tampa, we are seeing increases in the usage and needs along the Greenway corridor. The developments in the Channel District and USF-Medical School are presenting opportunities for THEA to continue to enhance connectivity and increase the quality of life along our corridor and facilities. This item consists of a Task Work Orders under the Miscellaneous Trails, Parks, & Community Enhancements Contract to collaborate and design the next segment of the Selmon Greenway to connect to the Channel District at Meridian Avenue.

Design – Morgan Street to Meridian Avenue via Cumberland Avenue – This corridor provides a direct pedestrian connection between the CAMLS Medical Center and the USF Medical School in the Channel District, as well as parking for each facility. This project will connect the Greenway Enhancements at Lee Roy Selmon Park exiting at Morgan Street and connecting to Meridian Avenue via Cumberland Avenue. This Task Work Order will require facilitation with the City of Tampa, local developers, and THEA to determine needs, identify opportunities for collaboration, develop concepts, design plans and create basic construction documents. The goal is to develop an RFP that creates a safe, innovative, and usable pedestrian corridor consistent with the local environment.

Funding: Greenway Design (Morgan to Meridian) - $125,000 Capital Budget

Action: Request Board approval for THEA staff to execute a Task Work Order with Kimley Horn & Associates in the amount not to exceed $125,000 for Selmon Greenway Planning and Design.

2. Whiting Street Supplemental Amendment

Purpose: As part of the Whiting Street PD&E analysis, several changing conditions and state requirements regarding the study area necessitate additional analysis and mitigation activities, specifically:

- Conducting a cultural/historic evaluation of a wider area, specific to the CSX railroad tracks.
- Implementation of the agreed upon cultural mitigation plan for the historic Ardent Mills site regarding the Whiting Street project impacts.
- Analysis of an expanded number of drainage scenarios collaborating with the City of Tampa and assessing the impacts to the Whiting Street project.

This item consists of one task work order being authorized as a Change Order to the current Project Development and Environment Contract with Lochner Engineering.

Funding: $178,000 Capital Budget

Action: Request Board approval for THEA staff to amend the current contract with Lochner Engineering in the amount not to exceed $178,000 for Cultural Resource Assessment/Mitigation and Drainage Scenario Analysis.

B. Operations & Maintenance – **Bennett Barrow, Chairman** – *Brian Pickard, Staff*

1. **Intelligent Transportation Systems (ITS) Fiber Data Collection and Characterization, Final Selection**

   Purpose: To procure design-build services to deliver ITS Fiber Data Collection and Characterization throughout the Expressway Corridor. The scope includes reviewing existing inventory files and as-built plans, setting up a data collection application, geolocating the fiber optic network with all connected technologies, and setting up an information housing database. Shortlist was approved on January 31, 2022.

   Funding: Capital Budget

   Action: Approve the selection of Precision Contracting Services and a bid proposal price of $279,955 and authorize staff to negotiate and execute a contract for designing and delivering ITS Fiber Data Collection and Characterization. Contract execution is subject to final review and approval of THEA General Counsel.

2. **Access Control System in Support of the REL Services Contract Purpose:** Authorize signature of the contract with Teledyne Flir to provide a new Access Control System in Support of the REL. Teledyne Flir was selected in accordance with THEA Procurement Services and the contract negotiations were finalized for an amount of $1,723,989. The selection of Teledyne Flir was approved by the Board on November 15, 2021.

   Funding: Capital Budget - $1,723,989

   Action: Requests the Board to authorize the Executive Director execute a contract with Teledyne Flir in the amount of $1,723,989 for Access Control System of the REL. Contract is subject to review and approval of THEA General Counsel.

C. Finance & Budget - Ken Hagan, Chairman – *Jeff Seward, Staff*

1. **Traffic and Revenue Forecast Update -** *Presentation – Jeff Seward; Phil Eshelman, Stantec*

   Purpose: THEA's Traffic and Revenue consultant will provide an update on current year revenues, pandemic impact, and estimates on FY2023 traffic and revenues which are the basis for both the annual Revenue Sufficiency Certificate and the FY2023 budget.

2. **Revenue Sufficiency Resolution 668**

   Purpose: Pursuant to Section 5.07(E) of the THEA's Master Bond Resolution, THEA is obligated to review the financial condition of the Expressway System and the Bonds in order to estimate whether the Net System Revenues for the following year will be sufficient to comply with the coverage requirements with respect to Net System Revenues as specified in Section 5.07(B) of the Master Bond Resolution. THEA has received a Revenue Sufficiency Certificate prepared by its Traffic Engineer (Stantec) who has determined that Net System Revenues will be sufficient to comply with the provision stated above for the Fiscal Year ending June 30, 2023.
   Funding: There is no required funding for this item.
   Action: Request Board approval of Resolution No. 668 making a positive determination regarding the sufficiency of Net System Revenues pursuant to its Master Bond Resolution.

3. **2012D Bond Refunding Opportunity**

   Purpose: THEA's financial advisor will provide an overview of refunding opportunities for THEA's 2012D Taxable Refunding Revenue Bonds.

   Funding: There is no required funding for this item.

   Action: Request Board approval for THEA to proceed with a bank term loan from the lowest bidder to refund the outstanding Series 2012D Bonds.

V. Staff Reports

A. Finance Update – *Jeff Seward*

B. Planning & Innovation – *Bob Frey*

C. Operations & Maintenance – *Brian Pickard*

D. Toll Operations – *Emma Antolinez*

E. Communications – *Sue Chrzan*

VI. Executive Reports

A. Executive Director – *Greg Slater*

1. Updates

2. Contract Renewal Report/Contract Closeout Report

3. Summary of Board Workshop
Request next steps action item from the Board

B. General Counsel – *Amy Lettelleir*

C. Chairman – *Vincent Cassidy*

1. Upcoming Meetings

- Board Workshop – April 11, 2022
- Board Meeting – April 25, 2022
- Board Workshop (CPMP & Budget) – May 9, 2022

VII. Old Business

IX. New Business

X. Adjournment

Item III.A.
Minutes from February 21, 2022

Tampa-Hillsborough County Expressway Authority
Minutes of the February 21, 2022, Board Meeting
1104 E. Twiggs Street
Tampa, FL 33602

The Tampa-Hillsborough County Expressway Authority held a public meeting at 1:30 p.m. on February 21, 2022, at THEA Headquarters, 1104 E. Twiggs Street in Tampa Florida. The following were present:

BOARD:

Vincent Cassidy, Chairman
Daniel Alvarez, Secretary
Secretary David Gwynn, Member
Bennett Barrow, Vice Chairman
Mayor Jane Castor, Member
Commissioner Ken Hagan, Member

STAFF:

Greg Slater
Amy Lettelleir
Sue Chrzan
Bob Frey
Brian Pickard
Jeff Seward
Emma Antolinez
Charlene Ponce
Chaketa Mister
Julie Aure
Shari Callahan
Krystina Steffen
Judith Villegas
Gary Holland
Debbie Northington
Anna Quinones
Shannon Bush
Brian Ramirez

OTHERS:

Todd Josko, Ballard Partners
Carlos Ramos, Ballard Partners
David Hubbard, HNTB
Jim Drapp, HNTB
Al Steward, HNTB
Rick Patterson, Raymond James
Joseph Stanton, NMRS
Sally Dee, Playbook
Matthew Sansbury, RBC
Stefanie McQueen, HDR

I. Call to Order and Pledge of Allegiance

Chairman Cassidy called the meeting to order at 1:30 pm, followed by the Pledge of Allegiance and invocation.

II. Public Input/ Public Presentations

There were no public presentations.

III. Consent Agenda

The Chairman continued with the Consent Agenda and approvals.

A. Approval of the Minutes from the January 31, 2022, Board of Directors Meeting

B. Increase in Funding to EXP U.S. Services Inc. Contract CEI services for Twiggs Street Improvements from Nebraska Avenue to Meridian Avenue - $30,000.

The Chairman asked for a motion to approve the consent items. Daniel Alvarez moved approval, seconded by Bennett Barrow. The motion carried unanimously.

IV. Discussion/Action Items

A. Operations & Maintenance – Bennett Barrow, Chairman – *Brian Pickard, Staff*

1. South Selmon Capacity Enhancement Task Order Request

Mr. Brian Pickard presented a task order request for the South Selmon Capacity Enhancement. The request is to utilize THEA's General Engineering Consultant (GEC), HNTB, to assist staff with developing the concept plans in 3D, assist staff in procuring a Design-Build contractor, and procure the CEI Team with a focus on 3D design and construction for the South Selmon Capacity Project. The cost is $300,000 and will come from the capital budget.

The request is for the Board to authorize the Executive Director to execute a task order with HNTB to help develop 3D concept plans and assisting in the procurement of a contractor and CEI.

The Chairman asked for a motion to approve. Bennett Barrow moved approval, seconded by Daniel Alvarez. The motion carried unanimously.

Chairman Cassidy asked if there would be additional requests related to this project in the next month or so. Mr. Pickard stated there would not.

2. CSX Agreement and Funding

Mr. Pickard presented the CSX agreement and funding for the East Selmon Slip Ramp Project. He noted the purpose is to execute an agreement with CSX and pay for preliminary engineering costs, flagger costs, CSX inspection services, and to fund that agreement. Funding will come from the capital project budget.

The request is for the board to authorize payment to CSX in an amount not to exceed $385,000 for the CSX preliminary engineering, flagger, and inspection costs related to the East Selmon slip ramp project near the 22nd Street ramp.

The Chairman asked for a motion to approve. Daniel Alvarez moved approval, seconded by Bennett Barrow. The motion carried unanimously.

Mr. Slater commented on the previous item - the South Selmon Capacity Enhancement project - clarifying that there will be two more items coming to the board within the next year or so, but nothing in the near term.

B. Budget and Finance – Ken Hagan, Chairman - *Jeff Seward, Staff*

1. Budget Amendment

Mr. Jeff Seward presented a budget amendment to provide $543,000 of funding for unanticipated/unbudgeted operating expenditures for FY2022. He reviewed each line item in the amendment, which included funding for Toll Operations to address the backlog in image review and a general consultant for Toll Operations support. Temporary staffing (procurement and finance) and an ITS Manager, as well as travel/professional development were also included. Funding for the request would come from general revenue.

To put the request into context, Mr. Seward also presented THEA Financials, including Toll Revenue, Expenditures, Cash & Investments, and Investment Income. He also presented FY2022 Budget to Actual Revenue Comparisons.

Chairman Cassidy asked how THEA is tracking today versus pre-COVID. Mr. Seward noted about 7% better.

Mr. Seward requested the board approve a budget amendment in the amount of $543,000 for unanticipated/unbudgeted operating expenditures for FY2022.

The Chairman asked for a motion to approve. Daniel Alvarez moved approval, seconded by Bennett Barrow.

The Chairman asked about the fall off from December 2021 to January 2022 and whether it was a surprise to the agency. Mr. Seward responded that it was not. The Chairman then asked for clarification on the image review backlog and whether the need to hire a vendor is indicative of the current vendor's inability to perform. Mr. Seward replied it is not.

The mayor asked about the cause of the backlog. Mr. Seward explained that there is an increase in toll-by-plate transactions; more and more individuals are opting to not get a transponder; and we're seeing a greater transitory population throughout the state of Florida. Additionally, the technology that is used for the evaluation of the toll-by-plate is done through optical character recognition. The quality of the plate images that are collected has degraded over the years based on different fonts, different types of tags, the appearance of some of the vanity plates, backgrounds on the plates, etc. Staffing has also been an issue, which is being addressed.

The Chairman asked if we know whether the Toll-by-Plate traffic is primarily visitors or local residents. Secretary Gwynn mentioned FDOT/FTE is experiencing similar issues.

The Chairman asked if there is any revenue attached to the backlog that wasn't forecast. Mr. Seward noted that the Toll-by-Plate transactions are going up, and at the same time the use of transponders is decreasing. THEA is looking at the differential between SunPass and Toll-by-Plate.

The Chairman then asked if any of these openings for staffing have anything to do with not currently having a Director of Toll Operations. Mr. Seward said they did not. Finally, the Chairman asked for clarification on the ITS Manager position. Mr. Seward explained that THEA's current ITS staff is internal and is focused on THEA Headquarters. The ITS Manager position referenced is external – all ITS related activities outside of this building (1104 E. Twiggs Street).

Board member Bennett Barrow asked Mr. Seward if, at the next meeting, he could add the 2019 actual numbers to his update.

Board member Daniel Alvarez suggested a campaign to incentivize the use of transponders. He also asked about the travel and professional development number presented in the budget amendment and whether it was high enough. Mr. Seward responded that it was. Mr. Slater pointed out that this is just for now to the end of the fiscal year. Mr. Alvarez asked about temporary staffing and if that number represented time and hours of work for staff we already have or to add new staff. Mr. Seward clarified that there are two elements to that number. First is an $80,000 Task Order for a temporary Procurement Manager, and second is $20,000 to make up for an underbudget for a temporary Controller.

Mr. Slater reiterated that the procurement position is vacant. Regarding the tolling issue, he noted that this is something that is being tackled nationwide. The debate in the industry right now is the customer-focused component. If customers are saying they don't want transponders, do we think more about how to meet them where they are and will that require more resources, or do we embark on a campaign.

Mr. Alvarez asked about the reasons it's trending away from transponders. Mr. Slater mentioned a variety of reasons he's heard but noted that the more interoperability we have the better.

The Chairman asked staff to find out if there has been a reduction in the use of transponders in Florida.

The motion carried unanimously.

V. Staff Reports

A. Operations and Maintenance

Mr. Pickard provided an overview of the East Selmon Slip Ramp Project, noting completion of both the west and east ends of the project is expected to be completed in the summer of 2023. He also reported that THEA successfully completed its cyber security awareness training, with 100% participation.

B. Toll Operations

Ms. Antolinez gave an update on toll transaction counts for January 2022 compared to FY2019, as well as totals for the month. She noted that we closed January down 5% from 2019 but up 20% from 2021.

Chairman Cassidy pointed out that the same December to January fall off was not reflected in these numbers as in the budget numbers. Ms. Antolinez noted that these are toll transactions. He asked if they equate to revenue. Secretary Gwynn pointed out that sometimes it's a simple matter of how many weekdays were in a month.

Ms. Antolinez continued, noting that when the extension is included, we are up 4% from 2019 and 32% from 2021. Year to year we are up 39%.

She reported a 26.4% increase in total accounts year to year and a 39.8% increase in toll transactions year to year. The average daily traffic comparisons for January 2022 are also up with a 25.4% increase in the West Group and a 13% increase in the East Group + REL.

Ms. Antolinez reviewed the traffic counts for Selmon West Extension, which continue to exceed expectations.

C. Communications – Ms. Chrzan provided an update on communication efforts. She reported THEA has been actively promoting its new Executive Director, Greg Slater, and introducing him into the community. Bay News 9 featured a story about him, which ran 35 times – this resulted about $40K in earned media. Tomorrow night, THEA is hosting a public hearing on the Whiting Street PD&E.

Ms. Chrzan discussed last month's board presentation by Dr. Sisinnio Concas regarding THEA's Economic Impact and that she and her team have been working hard to get the word out.

She also reported:

- The Selmon extension has now won 10 awards.
- The Selmon STEM Scholarship Bridge Building Competition was held 2/19/2022 at USF
- Former Executive Director Joe Waggoner is a finalist for the Christine Burdick Downtown Person of the Year Award
- CV Pilot was featured in Roads & Bridges Magazine

VI. Executive Reports

A. Executive Director – *Greg Slater*

1. Contract Renewal and Expiration Report

Before giving the report on contract renewals, Mr. Slater updated the board on his efforts to acclimate and embed himself into the community. He briefly discussed efforts to fill key vacancies. He noted that THEA is closely watching the financial market and interest rates, as well as monitoring the Infrastructure Bill.

Mr. Slater took a moment to congratulate Anna Quiñones for completing the IBTTA Leadership Program, and he welcomed back Lisa Pessina, THEA's Controller.

He then reported on one contract renewal with Public Trust Advisory for investment advisory services. The contract is for three years with an additional two, one-year renewal options. THEA is exercising the first of the two one-year renewals.

Chairman Cassidy noted it would be helpful for the board to understand the extent of THEA's contracts that might be exposed to inflationary factors. Mr. Slater agreed and advised that THEA is currently working the inflationary factors into our estimates and putting that out there as part of our budget.

B. General Counsel – *Amy Lettelleir*

Ms. Lettelleir followed up on Mr. Slaters comment as well as the mayor's question from the prior board meeting about capitalizing on lower interest rates. She noted the current refunding of THEAs 2012 D Bonds is coming up and that will save us about 4.5%. This can be done in the bond market or a bank loan.

She also discussed cash optimization, in which case we might defease some of our 2017 bonds, and subsequently get into the tax-exempt market. This will all be brought back to the board in March for review and approval.

C. Chairman – *Vincent Cassidy*

1. Upcoming Meetings

- Board Workshop – March 14, 2022
- Board Meeting – March 28, 2022

The Chairman encouraged Board members to attend the upcoming workshop and to reach out to staff for a briefing ahead of time.

VII. Old Business

No old business

VIII. New Business

No new business

IX. Adjournment

With no further discussion, the meeting adjourned at 2:10 pm.

APPROVED: _____ ATTEST**:** _____

Chairman: Vince Cassidy **Executive Director: Greg Slater**

DATED THIS 28th DAY OF MARCH 2022.

Item III.B.
Board Member Travel

THEA TRAVEL REQUEST FORM

TRAVELER NAME: Vince Cassidy

DEPARTMENT: Board of Directors

TRAVEL DATES & TIMES - FROM: Thursday, May 12, 2022 TIME: 3:00 ☐ AM ☑ PM

TO: Friday, May 13, 2022 TIME: 5:00 ☐ AM ☑ PM

PURPOSE OF TRAVEL: TEAMFL Meeting

DESTINATION: Fort Myers

TRAVEL G/L ACCOUNT #:

CPMP PROJECT #:

NAME OF CONFERENCE: TEAM FL

No.	Expense	Expense Estimate	Actual Expense	
			P-Card Payment	Request for Payment (A/P)
1.	Registration Fee: 0	$	$	$
2.	Hotel:No. of Nights 1 X $ 250.00 (Rate)	$ 250.00	$	
3.	Air Fare:	$	$	
4.	Airline Baggage Fee:	$		
5.	*Per Diem and Meals:	$ 75.00		$
6.	Privately-owned Vehicle: 248 miles X 0.560 ¢/mile	$ 138.88		
7.	THEA Vehicle Usage (Fuel) miles	$		
8.	Auto Rental: No. of Days X $	$ 0.00		
9.	Shuttle/Other Conveyance to & from Airport/Hotel:	$		
10.	Parking: No. of Days 2 X $ 50.00 (Rate)	$ 100.00		
11.	Other/Miscellaneous Expenses:	$		
	Total	$ 613.88	$	$

SUPPORTING DOCUMENTATION & CONFERENCE/TRIP AGENDA ATTACHED

1.	Traveler Signature:		Date:
2.	Supervisor:		Date:
3.	Department Director:		Date:
4.	Executive Director:		Date:
5.	Director of Finance:		Date: 3-3-22

~~ Only forms with original signatures will be processed by Finance ~~

Charlene Ponce

Subject: TEAMFL May 12-13, 2022

Join TEAMFL for:

THE ROAD AHEAD

Thursday, May 12 - Friday, May 13, 2022

Luminary Hotel & Co. | Marriott Autograph Collection
Fort Myers, FL

Register and book your room early so we can properly prepare for our conference. If you determine later that you are unable to attend, cancel up to 5 days prior to the event for a full refund.

*Discounted room rates are only available through April 20th.
Book your room today to save.

Item III.C.
Ferrovial Task Order to Reface Signs at Gandy

SIGN NAME	205A	QTY	2	SIGN NUMBER	STATION(S)
PANEL		BORDER		OH-8	426+52
WIDTH	16'-0"	WIDTH	2"	OH-9	435+56
HEIGHT	13'-6"	RADII	12"		
LEGEND	Black/White	COLOR	White		
COLOR	Green				

SYMBOL(S)	ANGLE	X	Y	WID	HT
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ARDOWN	0	80	7.9	32	22

SIGN NUMBER	NUMBER OF POSTS	CLEARANCE Edge Of Lane	COLUMN SIZE		AVERAGE LENGTH

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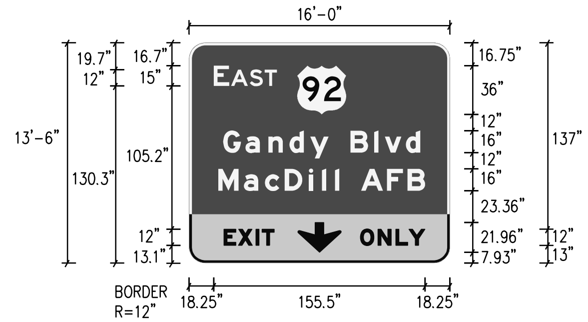
PHOTOMETRIC CURVE			VOLTAGE		



BORDER
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TH=2"

Panel Style: guide_exp_advance_a.ssi
M.U.T.C.D.: 2009 Edition

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COLOR	Green				

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	0	130.2	78.1	36	48
ARDOWN	0	101	12.1	32	22

SIGN NUMBER	NUMBER OF POSTS	CLEARANCE Edge Of Lane	COLUMN SIZE		AVERAGE LENGTH

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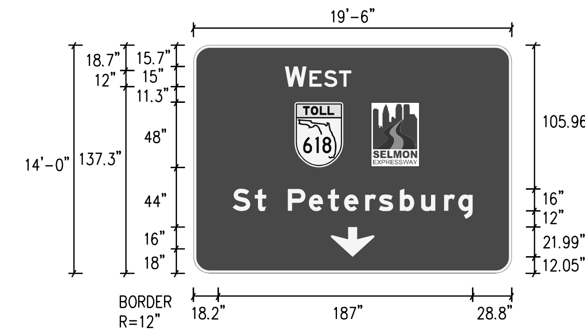
PHOTOMETRIC CURVE			VOLTAGE		



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Panel Style: guide_exp_advance_a.ssi
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REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
		- - -

SHEET NO.

SIGN NAME	207A	QTY	2	SIGN NUMBER	STATION(S)
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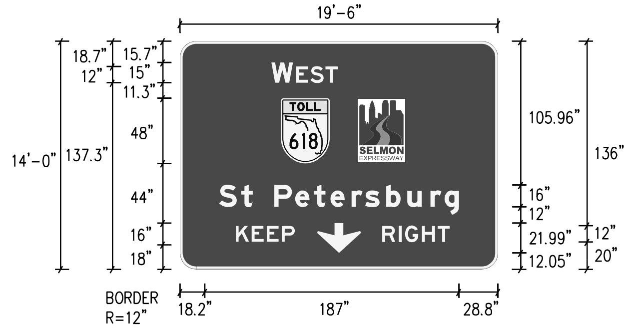
HEIGHT	14'-0"	RADII	12"		
LEGEND	White	COLOR	White		
COLOR	Green				

SYMBOL(S)	ANGLE	X	Y	WID	HT
	0	74.2	78	36	48
	0	130.2	78.1	36	48
ARDOWN	0	101	12.1	32	22

SIGN NUMBER	NUMBER OF POSTS	CLEARANCE Edge Of Lane	COLUMN SIZE		AVERAGE LENGTH

NO. OF LIGHT FIXTURES		FIXTURE SPACING		WATT	
PHOTOMETRIC CURVE			VOLTAGE		



Panel Style: guide_exp_advance_a.ssi
M.U.T.C.D.: 2009 Edition

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COPY		S	t		P	e	t	e	r	s	b	u	r	g		L
SPACE	28.8	16.3	8.3	16	15.4	13.9	12	15.5	10.1	15.5	15.5	17	10.4	10.6	28.8	176.5
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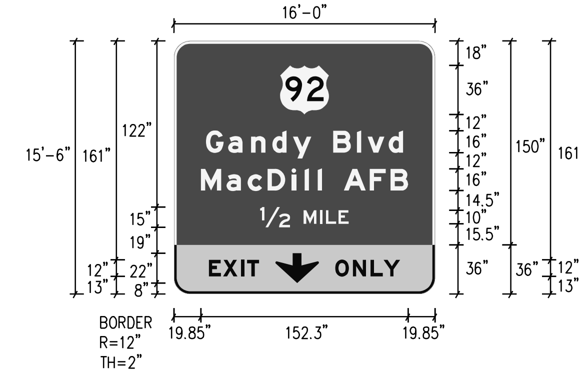
HEIGHT	15'-6"	RADII	12"		
LEGEND	Black/White	COLOR	White		
COLOR	Green				

SYMBOL(S)	ANGLE	X	Y	WID	HT
M1_4	0	78	132	36	36
ARDOWN	0	74.6	8	32	22

SIGN NUMBER	NUMBER OF POSTS	CLEARANCE Edge Of Lane	COLUMN SIZE		AVERAGE LENGTH

NO. OF LIGHT FIXTURES		FIXTURE SPACING		WATT	
PHOTOMETRIC CURVE			VOLTAGE		



Panel Style: guide_exp_advance_a.ssi
M.U.T.C.D.: 2009 Edition

COPY		G	a	n	d	y		B	l	v	d		L	
SPACE	23.5	16.3	17	15.5	15.2	13.6	16	17.4	7.8	15.5	10.6	23.5	145	
COPY		M	a	c	D	i	l	l		A	F	B		L
SPACE	19.8	18.9	15.5	14.6	17.8	9.6	9.6	3.2	16	19	15.2	13	19.8	152.3
COPY		1/2		M	I	L	E		L					
SPACE	63.5	22	10	12	4.4	9.2	7.5	63.5	65.1					
COPY		E	X	I	T		L							
SPACE	25.6	10.6	13	4.6	8.9	129.4	37							
COPY		O	N	L	Y		L							
SPACE	118.6	13	13.1	9.6	12.1	25.6	47.8							
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REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
		- - -

SHEET NO.

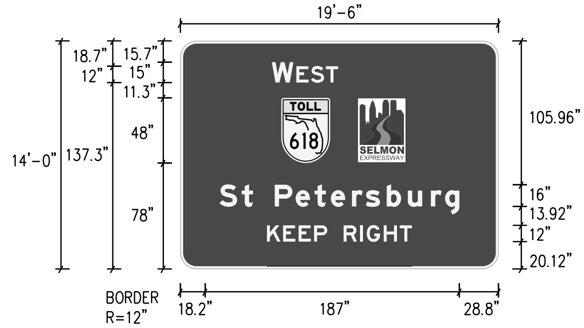
mputnam 11/18/21 13:16:16 J:\50832\TECHPROD\Selmon West Extension (Gandy Connector)\Pavement Marking Shields\A2

SIGN NAME	207A	QTY	2	SIGN NUMBER	STATION(S)
PANEL		BORDER		OH-10	426+52
WIDTH	19'-6"	WIDTH	2"	OH-9	435+56
HEIGHT	14'-0"	RADII	12"		
LEGEND	White	COLOR	White		
COLOR	Green				

SYMBOL(S)	ANGLE	X	Y	WID	HT
	0	74.2	78	36	48
	0	130.2	78.1	36	48

SIGN NUMBER	NUMBER OF POSTS	CLEARANCE Edge Of Lane	COLUMN SIZE		AVERAGE LENGTH

NO. OF LIGHT FIXTURES		FIXTURE SPACING		WATT	
PHOTOMETRIC CURVE			VOLTAGE		



Panel Style: guide_exp_advance_a.ssi
M.U.T.C.D.: 2009 Edition

COPY		W		E	S	T		L															
SPACE	67.2	15.9	2.2	10.7	11	9	118	48.8															
COPY		S	t		P	e	t	e	r	s	b	u	r	g		L							
SPACE	28.8	16.3	8.3	16	15.4	13.9	12	15.5	10.1	15.5	15.5	17	10.4	10.6	28.8	176.5							
COPY		K	E	E	P		R	I	G	H	T		L										
SPACE	63.7	11.9	11.4	11.4	9.7	12	12.1	4.9	12.5	11.8	9	63.6	106.7										
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SIGN NAME		QTY		SIGN NUMBER	STATION(S)
PANEL		BORDER			
WIDTH		WIDTH			
HEIGHT		RADII			
LEGEND		COLOR			
COLOR					

SYMBOL(S)	ANGLE	X	Y	WID	HT

SIGN NUMBER	NUMBER OF POSTS	CLEARANCE Edge Of Lane	COLUMN SIZE		AVERAGE LENGTH

NO. OF LIGHT FIXTURES		FIXTURE SPACING		WATT	
PHOTOMETRIC CURVE			VOLTAGE		

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REVISIONS

DATE	BY	DESCRIPTION	DATE	BY	DESCRIPTION

STATE OF FLORIDA
DEPARTMENT OF TRANSPORTATION

ROAD NO.	COUNTY	FINANCIAL PROJECT ID
		- - -

SHEET NO.

MATCH LINE SEE SPM PLAN (37)

0 10 40
Feet

OH-8

STA. 426+52
℄ SELMON SB RAMP
GSWS (3, 4, 10), CS (3)

700-3-203	2 EA
700-3-206	
700-3-207	2 EA
700-4-135	

SIGN 212A
19'-6" X 14'-0"

EXIT-1B
11'-6" X 2'-6"

SIGN 206
16'-0" X 11'-0"

EXIT-1A
11'-6" X 2'-6"

SIGN 205A
16'-0" X 13'-6"

8" WHITE WITH W/R RPM'S EVERY 20'

6" YELLOW WITH Y/R RPM'S EVERY 40'

℄ SELMON SB RAMP

6" WHITE (10'-30' SKIP) WITH W/R RPM'S EVERY 40'

12" WHITE WITH W/R RPM'S EVERY 20'

6" WHITE WITH W/R RPM'S EVERY 40'

6" WHITE (3'-9' DOTTED) WITH W/R RPM'S EVERY 24'

MATCH LINE STA. 425+40.00 SEE SPM PLAN (30)

426 427 428 429 430 SELMON SB RAMP N 15° 41' 38" E 4

12' 12' 12'

+52 +51

SELMON EXPRESSWAY

6" YELLOW

6" YELLOW WITH Y/R RPM'S EVERY 40'

526 527 528 529 530 N 16° 56' 14" E 531

15' SELMON NB RAMP 15'

12' 12' RAMP C 12'

+12

MATCH LINE STA. 431+00.00 SEE SPM PLAN (32)

END PROJECT
STA. 526+18.74 =
STA. 79+25.96, 0.45' (RT)
℄ SURVEY SELMON EXPRESSWAY

6" WHITE WITH W/R RPM'S EVERY 40'

12" WHITE WITH W/R RPM'S EVERY 20'

℄ SURVEY SELMON EXPRESSWAY

6" WHITE (3'-9' DOTTED) WITH W/R RPM'S EVERY 24'

℄ SELMON NB RAMP

FLORIDA HIGHWAY PATROL DIAL *FHP (347)
TO REMAIN

Lee Roy Selmon Expressway
TO REMAIN

THE LAWTON CHILES TRAIL
TO REMAIN

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

AECOM Technical Services, Inc.
7650 West Courtney
Campbell Causeway
Tampa, FL 33607-1462
C.A. No. 8115
Patrick B. Nevah, P.E. No. 72369

TAMPA HILLSBOROUGH EXPRESSWAY AUTHORITY

ROAD NO.	COUNTY	THEA PROJECT NO. FDOT FINANCIAL PROJECT ID
SR 618 SR 600	HILLSBOROUGH	O-17-00217 439023-1-52-01

SPM PLAN SHEET (31)

SHEET NO.

mputnam 11/18/21 13:36:45 J:\50832\TECHPROD\Selmon West Extension (Gandy Connector)\Pavement Marking Shields\

TO BE REMOVED

700-3-601	
700-3-603	2 EA
700-3-627	
700-3-628	
700-4-620	

OH-9

STA. 435+56
℄ SELMON SB RAMP
GSWS (3, 4, 10), CS (4)

700-3-203	2 EA
700-3-206	
700-3-207	2 EA
700-4-135	

W13-2
36"X48"
+00 700-1-12

EXIT 50 MPH

EXIT 1B
92 WEST
Gandy Blvd.
St. Petersburg
¼ MILE

EXIT 1A
92 EAST
Gandy Blvd.
Macdill A. F. Base
½ MILE

SIGN 207A
19'-6" X 14'-0"

EXIT-1B
11'-6" X 2'-6"

SIGN 206
16'-0" X 11'-0"

EXIT-1A
11'-6" X 2'-6"

SIGN 205A
16'-0" X 13'-6"

0 10 40
Feet

MATCH LINE STA. 431+00.00
SEE SPM PLAN (31)

℄ SELMON SB RAMP

6" WHITE (10'-30' SKIP)
WITH W/R RPM'S EVERY 40'

6" WHITE (3'-9' DOTTED)
WITH W/R RPM'S EVERY 24'

6" WHITE WITH W/R
RPM'S EVERY 40'

+56

EAST WEST
TOLL
618
92
92
92

SELMON EXPRESSWAY SB

6" YELLOW

6" YELLOW WITH Y/R
RPM'S EVERY 40'

SELMON NB RAMP

RAMP C

SELMON EXPRESSWAY NB

+92

6" WHITE WITH W/R
RPM'S EVERY 40'

12" WHITE WITH W/R
RPM'S EVERY 20'

℄ SURVEY SELMON EXPRESSWAY

6" WHITE (10'-30' SKIP)
WITH W/R RPM'S EVERY 40'

6" WHITE

6" YELLOW

END LANE TRANSITION
END 6" YELLOW WITH Y/R
RPM'S EVERY 40'
BEGIN 6" YELLOW
STA. 536+77.29
℄ SELMON NB RAMP

W4-3R
48"X48"
700-1-12 +39

MATCH LINE STA. 436+60.00
SEE SPM PLAN (33)

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

AECOM Technical Services, Inc.
7650 West Courtney
Campbell Causeway
Tampa, FL 33607-1462
C.A. No. 8115
Patrick B. Nevah, P.E. No. 72369

TAMPA HILLSBOROUGH EXPRESSWAY AUTHORITY

ROAD NO.	COUNTY	THEA PROJECT NO. FDOT FINANCIAL PROJECT ID
SR 618 SR 600	HILLSBOROUGH	O-17-00217 439023-1-52-01

SPM PLAN SHEET (32)

SHEET NO.

0 10 40
Feet

MATCH LINE STA. 436+60.00
SEE SPM PLAN (32)

℄ SELMON SB RAMP

6" WHITE WITH W/R
RPM'S EVERY 40'

6" WHITE (3'-9' DOTTED)
WITH W/R RPM'S EVERY 24'

6" WHITE

END MILLING & RESURFACING
END PAVEMENT MARKINGS SB
MATCH EXISTING MARKINGS
STA. 93+79.16, 43.00' (LT)
℄ SURVEY SELMON EXPRESSWAY

437

438

12'

12'

12'

SELMON EXPRESSWAY SB

6" YELLOW

6" YELLOW

SELMON EXPRESSWAY NB

12'

12'

6" YELLOW

6" WHITE

6" WHITE (10'-30' SKIP)
WITH W/R RPM'S EVERY 40'

END PAVEMENT MARKINGS NB
STA. 92+00.00
℄ SURVEY SELMON EXPRESSWAY

SPEED LIMIT 55
TO REMAIN

℄ SURVEY SELMON EXPRESSWAY

END AREA 2
END CONSTRUCTION
STA. 94+17.00
℄ SURVEY SELMON EXPRESSWAY

MATCH LINE STA. 95+50.00
SEE SPM PLAN (42)

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

AECOM Technical Services, Inc.
7650 West Courtney
Campbell Causeway
Tampa, FL 33607-1462
C.A. No. 8115
Patrick B. Nevah, P.E. No. 72369

TAMPA HILLSBOROUGH EXPRESSWAY AUTHORITY

ROAD NO.	COUNTY	THEA PROJECT NO. FDOT FINANCIAL PROJECT ID
SR 618 SR 600	HILLSBOROUGH	O-17-00217 439023-1-52-01

SPM PLAN SHEET (33)

SHEET NO.

NOTE:
NO SPM WORK. SHEET
SHOWN FOR CONTINUITY

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION

AECOM Technical Services, Inc.
7650 West Courtney
Campbell Causeway
Tampa, FL 33607-1462
C.A. No. 8115
Patrick B. Nevah, P.E. No. 72369

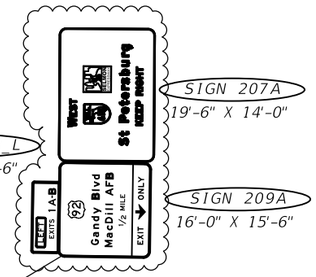
TAMPA HILLSBOROUGH EXPRESSWAY AUTHORITY

ROAD NO.	COUNTY	THEA PROJECT NO. FDOT FINANCIAL PROJECT ID
SR 618 SR 600	HILLSBOROUGH	O-17-00217 439023-1-52-01

SPM PLAN SHEET (42)

SHEET NO.

SOUTH HIMES AVENUE



SIGN 207A
19'-6" X 14'-0"

EXIT-1AB_L
14'-0" X 4'-6"

SIGN 209A
16'-0" X 15'-6"

0H-10
STA. 102+15, 0.96' RT
℄ SURVEY SELMON
GSWS (5, 6, 10), CS (5)

700-3-205	
700-3-207	2 EA
700-4-137	

0 10 40
Feet

SELMON EXPRESSWAY SB (SR 618)

℄ SURVEY SELMON

102 103 104 105 106 1

SELMON EXPRESSWAY NB (SR 618)

MATCH LINE SEE SPM PLAN (42)

REVISIONS			
DATE	DESCRIPTION	DATE	DESCRIPTION
09/07/18	1 UPDATED STA. OF 0H-10. ADDED ALIGNMENT AND SURVEY.		

AECOM Technical Services, Inc.
7650 West Courtney
Campbell Causeway
Tampa, FL 33607-1462
C.A. No. 8115
Patrick B. Nevah, P.E. No. 72369

TAMPA HILLSBOROUGH EXPRESSWAY AUTHORITY

ROAD NO.	COUNTY	THEA PROJECT NO. FDOT FINANCIAL PROJECT ID
SR 618 SR 600	HILLSBOROUGH	0-17-00217 439023-1-52-01

SPM PLAN SHEET (43)

SHEET NO.
S2-30

TURTLE INFRASTRUCTURE PARTNERS

MILLING CLEAN-UP GUARDRAIL MOWING

SERVING FLORIDA

To:	Ferrovial	Contact:	Scott Chase
Project Location:	Selmon Expressway	Bid Number	2.3.22

Item Description	Qty	Unit	Unit Price	Total Price
Provide all Labor,Equipment,Materials and MOT to perform the overlays on signs OH 8,OH 9 and OH 10	1	LS	$11,369.00	$11,369.00
			Total	$ 11,369.00

Notes:

*Bond is not included in the pricing.

*No retainage will be withheld.

*This quotation will be made part of our contract agreement for this project.

*This quotation is firm for 30 days from date of award. Please sign and return copy within 30 days

*Commencement of work on this project without signature or an executed contract agreement shall constitute acceptance of the prices, terms, and conditions set forth herein.

Sign Overlay at Gandy

2/15/2022

Subcontractor quote		$11,369.00
markup	10%	$ 1,136.90
Total		$12,505.90

Item III.D.
Ferrovial Task Order to Install Fencing at Whiting Street Drainage area

ferrovial
services

March 8, 2022

Tampa-Hillsborough Expressway Authority

ATTN: Brian W. Pickard, Director of Expressway Operations

1104 East Twiggs Street, Suite 300

Tampa, Florida 33602

RE: C/O Proposal – Turtle Ditch East End Fence

.

Brian:

It is our pleasure to submit this proposal for 6' Black vinyl chain link fence. Work will consist of Furnish and Install 6' Black vinyl chain link fence, line post, end bracing top rail. Line post will be core drilled in concrete Turtle Ditch East Fence. Location pre-determined by the Expressway Authority. Quote includes all needed material and labor. Does not include getting any permits if required to perform the work.

The work will be accomplished per THEA's Request. The cost for the proposed work is set at lump sum rate of $ 5,350.00

Please call me at 813-250-3616 with any questions or concerns.

Thanks,

Scott Chase

Project Manager

SC/

Item III.E.
Kapsch Task Order for
Transition Services for Access
Control System

MEMORANDUM

From: Terry Hannis

To: Shari Callahan

Re: Continuation of Services

Kapsch is aware that THEA requires support services from us for your current DYNAC system. We agree to extend our support services to THEA ensuring THEA will have emergency operational support as needed for the next 12 months. The monthly support fee will be $4,925 per month for a term of 12 months for a total of $59,100.

Item IV.A.1
Selmon Greenway

March 24, 2022

Ms. Anna Quinones
Project Manager
Tampa Hillsborough Expressway Authority
1104 East Twiggs Street, Suite 300
Tampa, FL 33602

Re: Miscellaneous Parks, Trails, & Community Enhancements
Task Order #4 – Selmon Greenway Enhancement Study – Cumberland Avenue Segment
Brorein from mid block between Madison & Jefferson Street, along Cumberland eastward to Meridian Avenue

Dear Ms. Quinones:

Kimley-Horn and Associates, Inc. ("Kimley-Horn" or "Consultant") is pleased to submit this scope of services to the Tampa Hillsborough Expressway Authority ("Client") for providing professional services for the proposed enhancements to the Selmon Greenway Enhancements Study -Cumberland Avenue Segment from Jefferson Street to Meridian Avenue in Tampa, Florida.

PROJECT UNDERSTANDING

The Client is seeking professional consulting services for the enhancement of the Selmon Greenway consistent with the prior design effort for the project corridor (from Florida Avenue to Jefferson Street).

The project limits for this segment of the project (Task #4) will be the Selmon Greenway from midblock on Brorein between Madison and Jefferson, extending east along Cumberland to Meridian.

Hardscape, Landscape, Civil, Wayfinding/Signage, Public Art, Irrigation, and Lighting improvements are anticipated. Our understanding of the project for the scope of services in this agreement are based upon the following assumptions:

1. This scope of services is based on the As-Built surveys and CAD files of the project area provided by the Client and the adjacent civil drawings along Cumberland for areas outside THEA ownership.

2. Off-site landscape or hardscape improvements are included in this conceptual study and will be coordinated with adjacent stakeholders and property owners., but coordination with the adjacent greenway improvements described above will be undertaken in this effort.

3. No new utility connections are proposed.

4. This task is limited to Schematic and Design Development Level plans for the project corridor. The final deliverable will be 60% Design Development Plans and renderings.

SCOPE OF SERVICES

TASK 1.0 – MEETINGS

It is anticipated that the following meetings will be required to allow for full coordination between THEA, project stakeholders, and the Design Team. For the following meetings it is assumed that two (2) Kimley-Horn Staff will be in attendance.

A. Kickoff Meeting (2 hours)
B. Meetings with stakeholders (Estimate six (6) at 2 hours each)
C. External Agency Meetings (Estimate four (4) at 2 hours each)
D. Coordination Meetings between Design Team and Client (Estimate eight (8) at 3 hours each)
E. Public Outreach Meeting (1 meeting at 4 hours)

TASK 2.0 – ASSIMILATION OF DATA / PRE-DESIGN

A. Code research of applicable City of Tampa ordinances and codes.
B. Base plan preparation from existing survey to be provided by Client and adjacent property development, including ROW survey of Cumberland Avenue with the project study area.
C. Two (2) Site visits to document and evaluate field conditions.
D. One (1) site visit to evaluate existing field conditions.

TASK 3.0 – SCHEMATIC DESIGN / 30% DOCUMENTS (SD)

Kimley-Horn will prepare a Schematic Design / 30% package to submit to the Owner for review and comment. Comments provided will be incorporated into the Design Development plans. SD plans will consist of the following:

1. Conceptual hardscape and site amenity design in hand sketch electronic PDF format identifying layout and materiality for exterior hardscape areas of the greenway and adjacent Cumberland Corridor within the project area.
2. Conceptual enhanced landscape plan in electronic PDF format for areas of the greenway and adjacent Cumberland Corridor within the project area. Landscape Schematic Design will identify the general landscape design aesthetic and plant palette.
3. Design imagery boards will be provided in electronic PDF format depicting the general design aesthetic of landscape, hardscape, signage, wayfinding, and lighting treatments as well as imagery of the proposed plant palette.
4. Preliminary 3D design sketches (up to four sketches) for the Greenway and adjacent Cumberland Corridor to best convey the design intent of the enhancements in Sketchup (.SKP) format. During the SD phase of the project, Kimley Horn will attend the following meetings:

- One (1) site visit
- Up to two (2) working design charrettes with the Design Team
- Up to four (4) conference calls

5. Kimley-Horn will prepare a preliminary opinion of probable construction costs based on the schematic design depicted.

TASK 4.0 – DESIGN DEVELOPMENT – 60% DOCUMENTS (DD)

Based on the Owner approved SD plans, Kimley-Horn will prepare Design Development – 60% Documents (DD) plans for the project. This plan set will be a design refinement of the approved schematic design and will be suitable for preliminary pricing that will consist of the following:

1. Preliminary enhanced landscape plan for the proposed improvement areas consisting of a conceptual layout of proposed planting types (trees, palms, shrubs areas, groundcover areas, and limits of sod) and proposed sizes.
2. Preliminary hardscape plans consisting of material and product selections and general layout for the following components:
   a. Site furnishings such as outdoor seating, trash receptacles, bike racks, and bollards;
   b. Retaining Walls
   c. Stairs and ramps
   d. Specialized pavement / hardscape areas
   e. Location of art element oppurtunites (actual art pieces to be selected by owner, not in this contract)
   f. Greenway signage, consistent with master plan design
   g. Wayfinding signage
   h. Specialty lighting layout
3. Schematic Irrigation Plan depicting limits of irrigation, irrigation type, and assumed point of connection data for coordination with the Design Team.
4. Lighting concept package and design narrative will be provided with images of proposed fixture types in coordination with the Client and the overall project design aesthetic.
5. Refined 3D design for project corridor within the project area, will be provided to the Client in Sketchup and Lumion. Up to ten (10) unique static views will be provided. Video animation and additional views may be provided as an additional service.
6. Updated opinion of probable construction costs.
7. During the DD phase of the project, Kimley Horn will attend up to two (2) meetings.

Preliminary Landscape Architectural DD plans will be submitted to the Design Team and Owner for review and coordination. DD plans will be revised up to one (1) time with Final DD plans to be submitted to the Owner for approval..

ADDITIONAL SERVICES

Any services not specifically provided for in the above scope will be billed as additional services and performed at our then current hourly rates. Additional services we can provide include, but are not limited to, the following:

1. Site survey
2. Permitting services beyond those specifically listed.
3. Construction Documents
4. Additional responses to agency comments, beyond those identified in the scope of services above.
5. Revisions to the plans or preparation of applications for permit modification based on Owner, Client, or design team requested revisions.
6. Services required by additional governmental regulations, which might be put into effect after the date of this agreement.
7. Electrical design.
8. Structural design.
9. Meetings beyond those indicated in scope of services.
10. MOT Plans
11. Value engineering services.
12. Arboriculture services.
13. Construction Phase Services

INFORMATION PROVIDED BY CLIENT

We shall be entitled to rely on the completeness and accuracy of all information provided by the Client or the Client's consultants or representatives. The Client shall provide all information requested by Kimley-Horn during the project, including but not limited to the following:

1. Copies of all available information pertinent to services for the project.
2. Updated Master Plan documents electronic .DWG and .PDF format.
3. Site plan / survey / as-built survey in electronic .DWG format. For project corridor.

FEE AND EXPENSES

Kimley-Horn will perform the services in TASK 1.0 through 4.0 for the cost plus max consistent with the attached manhour breakdown that will not exceed $125,000. All permitting, application, and similar project fees will be paid directly by the Client.

Payment will be due within 25 days of your receipt of the invoice and should include the invoice number and Kimley-Horn project number.

PROJECT WORK PLAN PERSON-HOUR ESTIMATE

THEA - Task 4 - Selmon Greenway Enhancements - Cumberland Avenue

Project Name: Segment (Jefferson to Meridian)
Project Number:
Date Prepared 3/23/2022
Estimated By: David J. Flanagan, PLA, ASLA

Estimated Project Duration:
Design, Permitting, & Bidding: months
Construction: months
Total: 0 months

KHA Task # Subtask ID Number	KHA Task Name Subtask Name/Description	Chief Engineer	Project Manager	Landscape Architect	Engineer 2	Engineer 1	Landscape Designer	Engineer Intern	Secretary/ Clerical	Total Labor Hours	KHA Labor Total	Other Direct Cost	Subcons Cost	Subcons Cost Markup 5%	Total Fee
		285.91	**212.91**	**139.16**	**175.41**	**158.55**	**112.53**	**121.66**	**104.55**						
1.0	**Meetings**														
	Kick-Off meeting		2	2						4	$704				$704
	Meetings with stakeholders		12	12						24	$4,225				$4,225
	External Agency Meetings		8	8						16	$2,817				$2,817
	Coordination Meetings (Design Team and Client)		24	24					2	50	$8,659				$8,659
	Public Outreach Meetings		4	4						8	$1,408				$1,408
	Project Management/Task Management		8							8	$1,703				$1,703
										0	$0				$0
										0	$0				$0
	Subtotal Task 1 (Hours)	0	58	50	0	0	0	0	2	110	$19,516	$0	$0	$0	**$19,516**
2.0	**Assimilation of Data / Pre-Design**														
	Code Research			8			8			16	$2,014				$2,014
	CAD base prep (Brorein and Cumberland- Jefferson to Meridian)			24			24			48	$6,041				$6,041
	Site Visit and Field Documentation		8	16			16			40	$5,730				$5,730
	Project Management/Task Management		4	4			8			16	$2,309				$2,309
	QA/QC		2	2					2	6	$913				$913
										0	$0				$0
										0	$0				$0
	Subtotal Task 2 (Hours)	0	14	54	0	0	56	0	2	126	$17,006	$0	$0	$0	**$17,006**
3.0	**Schematic Design (30% Design Documents)**														
	Conceptual Hardscape Design		12	24			24			60	$8,595				$8,595
	Conceptual Landscape/Streetscape Design		12	24			24			60	$8,595				$8,595
	Design Imagery and Enhancment Design		8	16			16			40	$5,730				$5,730
	3D Modeling and Rendering of Corridor		12	32			32			76	$10,609				$10,609
	Design Review and coordination with Client		8	8						16	$2,817				$2,817
	Prelim OPCC		8	8			8			24	$3,717				$3,717
	Project Management/Task Management		8	8					4	20	$3,235				$3,235
	QA/QC		6	6						12	$2,112				$2,112
										0	$0				$0
	Subtotal Task 3 (Hours)	0	74	126	0	0	104	0	4	308	$45,411	$0	$0	$0	**$45,411**
4.0	**Design Development (60% Design Documents)**														
										0	$0				$0
	DD Hardscape Design		16	24			24			64	$9,447				$9,447
	DD Landscape/Streetscape Design		16	24			24			64	$9,447				$9,447
	3D Modeling and Rendering updates		16	32			32			80	$11,461				$11,461
	Design Review and coordination with Client		8	8						16	$2,817				$2,817
	DD OPCC		8	8			8			24	$3,717				$3,717
	Project Management/Task Management		8	8					4	20	$3,235				$3,235
	QA/QC		8	8						16	$2,817				$2,817
										0	$0				$0
										0	$0				$0
										0	$0				$0
	Subtotal Task 4 (Hours)	0	80	112	0	0	88	0	4	284	$42,940	$0	$0	$0	**$42,940**
									Project Total	**828**	**$124,872**	**$0**	**$0**	**$0**	**$124,872**

Item IV.B.2
Whiting Street
Supplemental Amendment

Scope of Services
Supplemental Agreement 3
Contract O-00519

Tampa Hillsborough Expressway Authority (THEA)
Whiting Street Project Development & Environment (PD&E) Study

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I. ADDITIONAL PROJECT DEVELOPMENT & ENVIRONMENT TASKS

A. Alternative Stormwater Management Facilities Siting (Whiting Street Area)

The CONSULTANT will assess alternative stormwater management facility (SMF) locations within the area of proposed Whiting Street improvements. These alternative locations should reduce project-related impacts to the Seven One Seven Public Parking parcel and should utilize existing parcels presently owned by THEA. Impacts to THEA owned parcels located within the northwest and southwest quadrants of the proposed Whiting Street/North Meridian Avenue intersection should be avoided.

Alternative SMF locations shall be of adequate size to meet all state and federal stormwater treatment requirements. The CONSULTANT will also coordinate and attend one pre-application meeting with the Southwest Florida Water Management District (SWFWMD). The purpose of this meeting will be to present the selected SMF alternative and obtain comments and recommendations from the SWFWMD.

The selected alternative sites shall be included in the draft Pond Siting Report (PSR) developed for the project and presented at the project's Public Hearing.

B. Pond Sites Cultural Resources Assessment Survey Addendum

The CONSULTANT will develop an addendum to the project's previously completed and approved Cultural Resource Assessment Survey (CRAS). This addendum shall identify and assess all stormwater management facilities associated with the selected pond siting alternative and not contained within the footprint of the original CRAS. Upon review and approval by THEA, the CONSULTANT shall submit the CRAS addendum to the Florida Division of Historical Resources (FDHR) for their review and concurrence. The CONSULTANT shall coordinate with FDHR, as needed, to address any comments or concerns they may have with the CRAS addendum.

C. Assessment of Anticipated Impacts to Historic & Archaeological Resources and Development of Mitigative Actions to Offset Anticipated Impacts

The CONSULTANT will assess potential impacts to historic and archaeological resources resulting from construction of the proposed project. This assessment shall utilize information contained in the previously approved project CRAS and CRAS addendum described under Task B above. Information collected shall be presented in a Determination of Effects Case Study Report (Case Study). Utilizing information within the Case Study, the CONSULTANT shall also develop mitigative actions which can be used to offset anticipated impacts to historic and archaeological resources. These mitigative actions shall also be identified and outlined in the Case Study.

The Case Study shall be submitted to the FDHR for their review and concurrence. The CONSULTANT shall coordinate with FDHR, as needed, to address any comments or concerns they may have with the Case Study or proposed mitigative actions.

D. Additional Contamination Screening Assessments

The CONSULTANT will assess additional potential contamination sites in excess of those originally estimated as part of project negotiations. A total of fifty-five (55) additional sites shall be assessed and a risk ranking developed. These assessed sites shall be included in the Contamination Screening Evaluation Report (CSER) developed for the project and presented at the project's Public Hearing.

E. Additional Air and Noise Assessments

As a result of changes in the anticipated future condition traffic volumes, the CONSULTANT will reassess potential air and noise related impacts associated with the proposed project. This analysis will include use of revised traffic volumes resulting from coordination with THEA and FDOT. Any changes in anticipated impacts will be reflected in revisions to the Air Quality Technical Memorandum and Noise Study Report.

II. IMPLEMENTATION OF WHITING STREET CULTURAL RESOURCES MITIGATION PROGRAM

A. Ardent Mills (8HI15084)

As identified and outlined through consultation with SHPO/FDHR as part of the Whiting Street PD&E Study, the CONSULTANT will develop a pictorial and narrative history of the historic Ardent Mills site (8HI15084). Documentation collected and developed shall include a limited number of large format photographs as well as digital photographs that will capture the current site appearance, available historic photographs, a written history, and oral and/or video interviews with previous employees or persons with recollections of the mill operation. Information will be compiled as a written document and will also include a CD with all relevant files in a digital format.

Once complete, this history will be submitted to the Florida Memory repository at The State Archives of Florida in Tallahassee, and to the John F. Germany Public Library Florida History Room and Tampa Bay History Center in Tampa.

B. Florida Central & Peninsular Railroad (8HI11987)

As identified and outlined through consultation with SHPO/FDHR as part of the Whiting Street PD&E Study, the CONSULTANT will develop a pictorial and narrative history of the historic Florida Central & Peninsular Railroad (8HI11987). Documentation collected and developed shall include a limited number of large format photographs as well as digital photographs that will capture the current site appearance, available historic photographs, and a written history of the resource. Information will be compiled as a written document and will also include a CD with all relevant files in a digital format.

Once complete, this history will be submitted to the Florida Memory repository at The State Archives of Florida in Tallahassee, and to the John F. Germany Public Library Florida History Room and Tampa Bay History Center in Tampa.

C. State Historical Marker

As identified and outlined through consultation with SHPO/FDHR as part of the Whiting Street PD&E Study, the CONSULTANT will prepare text for a State Historical Marker that is two-sided with the history of Ardent Mills on one side of the marker and the history of the Florida Central & Peninsular Railroad on the other side of the marker. The marker text will be submitted to the State Historical Marker Council for approval, and THEA will be responsible for erecting the marker at the location approved by the State Historical Marker Council after construction of the Whiting Street project. Specific guidance and requirements for the marker application is available at https://dos.myflorida.com/historical/preservation/historical-markers/.

This task includes Marker Preparation and attendance at a State Historic Marker Meeting. This task does not include the cost or installation of the actual marker.

D. Project Coordination

The CONSULTANT will coordinate with SHPO/FDHR and the State Historical Marker Council as necessary to address questions and ensure adequate information is provided to allow for the review and approval of the proposed mitigative actions.

III. CULTURAL RESOURCES ASSESSMENT FOR CSX RAILROAD TRACKS REMOVAL

A. Cultural Resource Assessment Survey (CRAS)

The CONSULTANT will conduct a Cultural Resource Assessment Survey (CRAS) of the CSX Railroad Tracks, also known as the Florida Central & Peninsular Railroad, a linear resource that is eligible for inclusion in the National Register of Historic Places (National Register). The segment of the railroad associated with this survey extends from the south side of Jackson Street northward to the north side of the Selmon Expressway, a distance of approximately 1,500 feet. All tasks associated with this survey will comply with Chapter 267, Florida Statutes (F.S.).

A desktop analysis of the project area will be undertaken. This analysis will include a review of the Florida Master Site File (FMSF), and the state inventory of known archaeological sites and historic resources, to identify previous surveys; previously recorded archaeological sites that are listed, eligible, or considered eligible for listing in the National Register; and resources with potential or confirmed human remains. An analysis of pertinent environmental variables will also be conducted to determine the potential for significant archaeological resources within the proposed work areas. This analysis will include a review of historic maps and aerials, as well as soil maps and 7.5' U.S. Geological Survey (USGS) topographical maps. County property appraiser data will be reviewed to identify any potential historic resources within or adjacent to

the parcels. Following the desktop analysis, a reconnaissance survey will be conducted to document existing conditions.

The results of the desktop analysis and reconnaissance survey will be documented in the CRAS report.

B. Determination of Effects Documentation

The area of concern, which includes the significant railroad tracks from the south side of Jackson Street northward to the north side of the Selmon Expressway, will be documented and effects to the linear resource will be assessed according to the Criteria of Adverse Effects. Chapter 267, F.S. does not expressly outline effects criteria, the potential effects that the improvements may have on the identified National Register– eligible historic resources were evaluated according to Criteria of Adverse Effect included within Section 106 of the *National Historic Preservation Act of 1966*. The results of this assessment may be included within the CRAS Report, and this will be submitted to the State Historic Preservation Officer (SHPO)/Florida Division of Historical Resources (FDHR) for concurrence with the findings.

C. Mitigation Measures

The CONSULTANT will assist with consultation involving the SHPO/FDHR to resolve project effects to the railroad and develop mitigation measures. Based on the previous work related to the railroad as part of the *Section 106 Determination of Effects Case Study Report for the THEA Whiting Street PD&E Study, Hillsborough County, Florida,* Janus Research will work to coordinate the mitigation measures that were recommended.

D. Project Coordination

The CONSULTANT will coordinate with SHPO/FDHR as necessary to address questions and ensure adequate information is provided to allow for the review and approval of the proposed project.

IV. ALTERNATIVE POND SITING ASSESSMENTS FOR WHITING STREET AREA

A. Existing Conditions Assessment

The CONSULTANT will conduct an existing conditions assessment of the project area. For the purposes of this assessment, the project area shall include the area associated with the proposed Whiting Street Improvements, and the adjacent parcels generally referred to as the Water Street Development. This assessment will build upon the information previously collected as part of the Whiting Street PD&E Study's Pond Siting Report and Location Hydraulics Report Technical Memorandum. Information collected will include, but not be limited to, identification of existing drainage basins and patterns, stormwater outfall points, existing drainage systems and their size/capacity, etc. The CONSULTANT will also coordinate with the Water Street Development to determine if any excess stormwater treatment is available within their existing or proposed treatment systems.

B. Outfall Assessment

Using information collected as part of Task II.A., the CONSULTANT will assess and determine the available capacity of existing outfall points within the project area. The results of this assessment will be used to determine the maximum rate and/or volume of stormwater that can be discharged from the project area at each outfall point.

C. Development of Stormwater Management Alternatives

Using information collected under Tasks II.A. and II.B., the CONSULTANT will develop stormwater management alternatives which address the treatment and attenuation (if needed) requirements of both the proposed Whiting Street improvements and the proposed development associated with the Water Street Development project. For this task, it is assumed that no more than ten (10) alternatives will be developed. It is also assumed that 100 percent of the overall project area will be comprised of impervious surfaces. This will allow for a worst-case scenario assessment.

D. Coordination with Stakeholders

The CONSULTANT shall coordinate with project stakeholders, including THEA, the City of Tampa, and Strategic Property Partners (owners of the Water Street Development), as needed to obtain information, discuss design constraints, identify potential alternatives, and present project information.

V. CONTRACT MANAGEMENT

The CONSULTANT will ensure that all documents and other deliverables are thoroughly reviewed prior to submittal. The CONSULTANT will also coordinate with THEA to present project deliverables and provide THEA adequate time to review and comment on draft documents.

VI. PROGRESS MEETINGS

The CONSULTANT will attend additional progress meetings associated with the time extension of the contract.

VII. COMPENSATION

Payment for the work accomplished will be in accordance with **Exhibit A** of this Supplemental Agreement. The CONSULTANT's Project Manager will monitor the cumulative invoiced billings to ensure the reasonableness of the billings compared to the work accomplished and accepted by THEA. THEA's Project Manager will decide whether work of sufficient quality and quantity has been accomplished by comparing the reported Scope of Services percent complete against actual work accomplished.

EXHIBIT A

STAFF HOURS AND FEE ESTIMATE

2.0 ENGINEERING ANALYSIS AND REPORTS

Estimator:

Project Development and Environment (PD&E) Study for Whiting Street (Supplemental #3)

HI-0141-P-04

Representing	Print Name	Signature / Date

NOTE: Signature Block is optional, per District preference

Task No.	Task	Units	# of Units	Hours / Unit	Hours	Comments
NOTE: * subject to QC						
2.1	**Field Review**	LS	1	0	0	
2.2	**Survey Coordination**					
	Aerial Photography	*LS*	*1*	*0*	*0*	
	Survey Coordination	*LS*	*1*	*0*	*0*	
				2.2 Survey Coordination Total	**0**	
2.3	**Geotechnical**					
	Soils	*LS*	*1*	*0*	*0*	
	Geotechnical Coordination	*LS*	*1*	*0*	*0*	
				2.3 Geotechnical Total	**0**	
2.4	**Traffic**					
	Traffic Data	*LS*	*1*	*0*	*0*	
	Traffic Analysis					
	*- Design Traffic **	*LS*	*1*	*0*	*0*	
	*- Traffic Operational Analysis **	*LS*	*1*	*0*	*0*	

2.0 ENGINEERING ANALYSIS AND REPORTS

Task No.	Task	Units	# of Units	Hours / Unit	Hours	Comments
	*- Design Traffic Documentation **	*LS*	*1*	*0*	*0*	
	*Traffic Data for Noise Analysis **	*LS*	*1*	*0*	*0*	
				2.4 Traffic Total	**0**	
2.5	**Safety**					
	Crash Data	*LS*	*1*	*0*	*0*	
	*Safety Analysis **	*LS*	*1*	*0*	*0*	
				2.5 Safety Total	**0**	
2.6	**Utilities and Railroads**					
	Data Collection	*EA*	*1*	*0*	*0*	
	*Analysis and Report **	*LS*	*1*	*0*	*0*	
				2.6 Utilities and Railroads Total	**0**	
2.7	**Needs**					
	Transportation Plans	*LS*	*1*	*0*	*0*	
	*Planning Consistency Form **	*LS*	*1*	*0*	*0*	
	*Analysis of Existing Conditions **	*LS*	*1*	*0*	*0*	
	*Purpose and Need **	*LS*	*1*	*0*	*0*	
				2.7 Needs Total	**0**	
2.8	**Corridor Analysis ***	LS	1	0	0	
2.9	**Roadway**					
	Existing Roadway Characteristics	*LS*	*1*	*0*	*0*	
	*Typical Section Analysis **	*EA*	*1*	*0*	*0*	
	*Corridor Analysis**	*LS*	*1*	*0*	*0*	
	*Roadway Design Alternatives **	*LS*	*1*	*0*	*0*	
	*Access Management **	*LS*	*1*	*0*	*0*	
	*Identify Construction Segments **	*LS*	*1*	*0*	*0*	
				2.9 Roadway Total	**0**	
2.10	**Structures**					
	Existing Structure Characteristics	*EA*	*1*	*0*	*0*	
	*Structures Typical Section Analysis **	*EA*	*1*	*0*	*0*	

2.0 ENGINEERING ANALYSIS AND REPORTS

Task No.	Task	Units	# of Units	Hours / Unit	Hours	Comments
	*Structures Design Alternatives **	*EA*	*1*	*0*	*0*	
				2.10 Structures Total	**0**	
2.11	**Drainage**					
	*Floodplain and Environmental Permit Data Collection**	*LS*	*1*	*0*	*0*	
	*Floodplain Compensation Analysis**	*LS*	*1*	*0*	*0*	
	*Pond Siting Analysis and Report**	*LS*	*1*	*190*	*190*	Lochner **Task I.A**. - Lochner - Revisions to preferred pond sites and site locations, analysis of revised pond sites, revisions to report = 32 hours **Task IV.A**. - Lochner - existing conditions assessment = 18 hours **Task IV.B**. - outfalls assessment, attenuation requirements = 40 hours **Task IV.C**. - stormwater management alternatives (10 total x 10 hours) = 100 hours
	Pond Siting Meetings	*LS*	*1*	*56*	*56*	Lochner **Task I.A**. - Lochner - Prep for SWFWMD meeting, coordination, attend meeting - 8 hours **Task IV.D**. - coordination (THEA, City of Tampa, SPP) - 6 meetings x 4 hours (prep., meeting, notes) x 2 people = 48 hours
	*Location Hydraulic Report**	*LS*	*1*	*0*	*0*	
	Environmental Look Around (ELA) Meeting	*LS*	*1*	*0*	*0*	
				2.11 Drainage Total	**246**	
2.12	**Concept Plans**					
	*Base Map **	*Sheet*	*1*	*0*	*0*	
	*Alternative Concept Plan **	*Sheet*	*1*	*0*	*0*	
	*Preferred Alternative **	*Sheet*	*1*	*0*	*0*	
				2.12 Concept Plans Total	**0**	
2.13	**Typical Section Package ***	LS	1	0	0	

2.0 ENGINEERING ANALYSIS AND REPORTS

Task No.	Task	Units	# of Units	Hours / Unit	Hours	Comments
2.14	**Design Exception and Variations**					
	Identify Design Exceptions and Variations	*LS*	*1*	*0*	*0*	
	*Prepare Design Exception and Variation Package(s) **	*EA*	*1*	*0*	*0*	
				2.14 Design Exception and Variation Total	**0**	
2.15	**Multimodal Accommodations ***	EA	1	0	0	
2.16	**Park and Ride Lots**	EA	1	0	0	
2.17	**Maintenance of Traffic***	LS	1	0	0	
2.18	**Comparative Analysis and Evaluation Matrix ***	LS	1	0	0	
2.19	**Selection of Preferred Alternative(s) ***	LS	1	0	0	
2.20	**Value Engineering Study**	EA	0	0	0	
2.21	**Risk Management**	LS	1	0	0	
2.22	**Construction Cost Estimates ***	LS	1	0	0	
2.23	**Right of Way Cost Estimates**					
	*Notes and Maps for Estimate **	*LS*	*1*	*0*	*0*	
	*Preparation Cost Estimate **	*LS*	*1*	*0*	*0*	
				2.23 Right of Way Cost Estimates Total	**0**	
2.24	**Preliminary Engineering Report (PER)**					
	*Draft **	*LS*	*1*	*0*	*0*	
	*Final **	*LS*	*1*	*0*	*0*	
				2.24 Preliminary Engineering Report (PER) Total	**0**	
2.25	**Other Engineering Services**					
	*Capacity Improvements at Intersections **	*LS*	*1*	*0*	*0*	
	*Conceptual Design of Park **	*LS*	*1*	*0*	*0*	
	*Mobility Hub **	*LS*	*1*	*0*	*0*	
	*Existing Signage Inventory **	*LS*	*1*	*0*	*0*	
				2.25 Other Engineering Services Total	**0**	
				Engineering Analysis and Report Subtotal	**246**	
				Hours Subject to QC	**190**	

2.0 ENGINEERING ANALYSIS AND REPORTS

Task No.	Task	Units	# of Units	Hours / Unit	Hours	Comments
2.26	**Quality Assurance / Quality Control**	LS	%	5%	10	
ENGINEERING ANALYSIS AND REPORT TOTAL HOURS					**256**	

3.0 ENVIRONMENTAL ANAYLSIS AND REPORTS

Estimator:

Project Development and Environment (PD&E) Study for Whiting Street (Supplemental #3)
HI-0141-P-04

Representing	Print Name	Signature / Date

NOTE: Signature Block is optional, per District preference

Task No.	Task	Units	# of Units	Hours / Unit	Hours	Comments
NOTE: * subject to QC						
SOCIOCULTURAL EFFECTS						
3.1	**Social Resources**					
	*Land Use Changes *	*LS*	*1*	*0*	*0*	
	*Social *	*LS*	*1*	*0*	*0*	
	*Economic *	*LS*	*1*	*0*	*0*	
	*Mobility *	*LS*	*1*	*0*	*0*	
	*Aesthetics *	*LS*	*1*	*0*	*0*	
				3.1 Social Resources Total	**0**	
3.2	**Sociocultural Effects Evaluation Report***	LS	1	0	0	
3.3	**Relocation Potential**					
	*Review and Impact Determination *	*LS*	1	0	0	
	*Conceptual Stage Relocation Plan *	*LS*	1	0	0	
				3.3 Relocation Potential Total	**0**	
CULTURAL RESOURCES						
3.4	**Archaeological and Historical Resources**					
	Research Design Methodology *As Required*	*LS*	*1*	*0*	*0*	

3.0 ENVIRONMENTAL ANAYLSIS AND REPORTS

Task No.	Task	Units	# of Units	Hours / Unit	Hours	Comments
	*Cultural Resource Assessment Survey (CRAS) **	*LS*	*1*	*190*	*190*	**Task IIIA-IIID: JANUS TASKS (126 hours)** A desktop analysis of the project area will be undertaken. This analysis will include a review of the Florida Master Site File (FMSF), and the state inventory of known archaeological sites and historic resources, to identify previous surveys; previously recorded archaeological sites that are listed, eligible, or considered eligible for listing in the National Register; and resources with potential or confirmed human remains. An analysis of pertinent environmental variables will also be conducted to determine the potential for significant archaeological resources within the proposed work areas. This analysis will include a review of historic maps and aerials, as well as soil maps and 7.5' U.S. Geological Survey (USGS) topographical maps. County property appraiser data will be reviewed to identify any potential historic resources within or adjacent to the parcels. Following the desktop analysis, a reconnaissance survey will be conducted to document existing conditions. The Results of the desktop analysis and reconnaissance survey will be documented in the CRAS report. The area of concern, which includes the significant railroad tracks from the south side of Jackson Street northward to the north side of the Selmon Expressway, will be documented and effects to the linear resource will be assessed according to the Criteria of Adverse Effects. Chapter 267, F.S. does not expressly outline effects criteria, the potential effects that the improvements may have on the identified National Register–eligible historic resources were evaluated according to Criteria of Adverse Effect included within Section 106 of the National Historic Preservation Act of 1966. The results of this assessment may be included within the CRAS Report, and this will be submitted to the State Historic Preservation Officer (SHPO)/Florida Division of Historical Resources (FDHR) for concurrence with the findings. The CONSULTANT will assist with consultation involving the SHPO/FDHR to resolve project effects to the railroad and develop mitigation measures. Based on the previous work related to the railroad as part of the Section 106 Determination of Effects Case Study Report for the THEA Whiting Street PD&E Study, Hillsborough County, Florida, Janus Research will work to coordinate the mitigation measures that were recommended. **Task IIIA-IIID: LOCHNER TASKS (64)** Lochner shall coordinate with Janus, provide information needed for mitigation development, and review documents and reports developed. Lochner shall also attened meetings with FDHR, THEA, KCA, etc. as needed.
	CRAS Addendum or Technical Memorandum for Pond Sites	*LS*	*1*	*24*	*24*	Task 1.B: Janus-develop pond site addendum
	Determination of Eligibility (DOE) As Required	*LS*	*1*	*0*	*0*	
	*Case Study Report **	*LS*	*1*	*150*	*150*	**Task 1.C**: Janus - development of case study report (134 hours) **Task 1.C** : Lochner - document review, submittals (16 hours)
	*Memorandum of Agreement (MOA) **	*LS*	*1*	*56*	*56*	**Task 1C**: Janus - development of mitigatve actions, FDHR coordination, and agreement (48 hours) **Task 1C**: Lochner - document review, FDHR coordination, submittals (8 hours)
	Historic Resources, Section 4(f) Evaluation	*LS*	*1*	*0*	*0*	
	Section 106 Consultation Meetings	*LS*	*1*	*0*	*0*	

3.0 ENVIRONMENTAL ANAYLSIS AND REPORTS

Task No.	Task	Units	# of Units	Hours / Unit	Hours	Comments
	Mitigation Implementation (Whiting Street and CSX Rail Removal)	*LS*	*1*	*394*	*394*	**Task IIA-IID: Janus (330 Hours)** **Task 1. Pictorial and narrative history of Ardent Mills - 180 hours:** A pictorial and narrative history of Ardent Mills will be submitted to the Florida Memory repository at The State Archives of Florida, John F. Germany Public Library Florida History Room, and Tampa Bay History Center. This documentation shall include limited large format and digital photographs of current appearance, historic photographs, written history, and oral or video interviews with previous employees or persons with recollections of the mill operation. **2. Pictorial and narrative history of the Florida Central & Peninsular Railroad: 90 hours** A pictorial and narrative history of the Florida Central & Peninsular Railroad will also be prepared and submitted to the Florida Memory repository at The State Archives of Florida, Main Tampa Library, and Tampa Bay History Center. This shall include photographs of current appearance, historic photographs, and written history. **3. State Historical Marker - 60 hours** State Historical Marker will be produced that is two-sided with the history of Ardent Mills on one side of the marker and the history of the Florida Central & Peninsular Railroad on the other side of the marker. The marker text will be submitted to the State Historical Marker Council for approval, and THEA will be responsible for erecting the marker at the location approved by the State Historical Marker Council. -Marker Preparation and Support at State Historic Marker Meeting for both Ardent Mills and Railroad (**this does NOT include the costs of the actual marker**). **Task IIA-IID: LOCHNER TASKS (64 hours)** Lochner shall coordinate with Janus, provide information needed for mitigation development, and review documents and reports developed. Lochner shall also attened meetings with FDHR, State Historical Marker Council, etc. as needed.
	Section 106 Public Involvement	*LS*	*1*	*0*	*0*	
	Cultural Resource Committee Meetings	*LS*	*1*	*0*	*0*	
	3.4 Archaeological and Historical Resources Total				**814**	
3.5	**Recreational, Section 4(f)**					
	*Section 4 (f) Determination of Applicability **	*EA*	*0*	*0*	*0*	
	*Section 4(f) "*de minimus*" Documentation **	*EA*	*0*	*0*	*0*	
	*Section 4 (f) Evaluation **	*EA*	*0*	*0*	*0*	
	3.5 Recreational, Section 4(f) Total				**0**	
NATURAL RESOURCES						
3.6	**Wetlands and Essential Fish Habitat**					
	Data Collection - Wetlands	*LS*	*1*	*0*	*0*	
	Data Collection - Essential Fish Habitat Assessment	*LS*	*1*	*0*	*0*	
	*Conceptual Mitigation Plan **	*LS*	*1*	*0*	*0*	
	*Analysis & Report - Essential Fish Habitat **	*LS*	*1*	*0*	*0*	
	*Evaluation & Report - Wetlands **	*LS*	*1*	*0*	*0*	
	3.6 Wetlands and Essential Fish Habitat Total				**0**	

3.0 ENVIRONMENTAL ANAYLSIS AND REPORTS

Task No.	Task	Units	# of Units	Hours / Unit	Hours	Comments
3.7	**Water Quality ***	LS	1	0	0	
3.8	**Special Designations ***	LS	1	0	0	
3.9	**Wildlife and Habitat**					
	Data collection	*LS*	*1*	*0*	*0*	
	*Analysis and report * *	*LS*	*1*	*0*	*0*	
	*Conservation Measures and Mitigation Plan * *	*LS*	*1*	*0*	*0*	
				3.9 Wildlife and Habitat Total	**0**	
3.10	**Identify Permit Conditions ***	LS	1	0	0	
3.11	**Farmlands ***	LS	1	0	0	
PHYSICAL EFFECTS						
3.12	**Noise**					
	Methodology Meeting	*LS*	*1*	*0*	*0*	
	Traffic Data Review	*LS*	*1*	*0*	*0*	
	Elevation Data	*LS*	*1*	*0*	*0*	
	Land Use Field Review/Outdoor Advertising Identification	*LS*	*1*	*0*	*0*	
	Field Measurement and Model Validation	*LS*	*1*	*0*	*0*	
	Outdoor Advertising Identification	*LS*	*1*	*0*	*0*	
	Construction Noise and Vibration	*LS*	*1*	*0*	*0*	
	*Analysis and Noise Abatement Evaluation**	*LS*	*1*	*12*	*12*	**Task IE**: CMT - revisions to noise analysis (12 hours)
	*Noise Report **	*LS*	*1*	*0*	*0*	
				3.12 Noise Total	**12**	
3.13	**Air Quality**					
	*Screening Analysis **	*LS*	*1*	*2*	*2*	**Task IE**: CMT - revisions to air quality screening analysis (2 hours)
	*Air Quality Modeling * (As Required)*	*LS*	*1*	*0*	*0*	
				3.13 Air Quality Total	**2**	
3.14	**Construction Impact Analysis ***	LS	1	0	0	

3.0 ENVIRONMENTAL ANAYLSIS AND REPORTS

Task No.	Task	Units	# of Units	Hours / Unit	Hours	Comments
3.15	**Contamination**					
	Field Data	*LS*	*1*	*28*	*28*	**Task ID**: CMT - field review of an additional 55 contamination sites (55 x 0.5) = 28 hours)
	*Analysis/Report *	*LS*	*1*	*116*	*116*	**Task ID**: CMT - assessment of an additional 55 contamination sites (55 x 2 = 110 hours) **Task ID**: Lochner - document review, submittals (6 hours)
				3.15 Contamination Total	**144**	
ENVIRONMENTAL REPORTS						
3.16	**Class of Action Determination ***	LS	1	0	0	
3.17	**CATEX Type II * (if not part of 3.19 - Class of Action Determination)**	LS	1	0	0	
3.18	**PEIR * (if not part of 3.19 - Class of Action Determination)**	LS	1	0	0	
3.19	**Environmental Assessment ***	LS	1	0	0	
3.20	**FONSI ***	LS	1	0	0	
3.21	**Draft EIS ***	LS	1	0	0	
3.22	**Final EIS ***	LS	1	0	0	
				Environmental Analysis and Report Subtotal	**972**	
				Hours Subject to QC	**944**	
3.23	**Quality Assurance / Quality Control**	LS	%	5%	47	
				ENVIRONMENTAL ANALYSIS AND REPORT TOTAL HOURS	**1019**	

4.0 MISCELLANEOUS SERVICES

Estimator:

Project Development and Environment (PD&E) Study for Whiting Street (Supplemental #3)

HI-0141-P-04

Representing	Print Name	Signature / Date

NOTE: Signature Block is optional, per District preference

Task No.	Task	Units	# of Units	Hours / Unit	Hours	Comments
4.1	**Contract and Project Files**	LS	1	16	16	**Task V**: Lochner - 16 hours
4.2	**Project Management Meetings and Coordination**	LS	8	2	16	**Task VI**: Lochner - 16 hours
4.3	**Additional Services**					
	4. Roadway Analysis	*LS*	*1*	*0*	*0*	
	5. Roadway Plans	*LS*	*1*	*0*	*0*	
	6a. Drainage Analysis	*LS*	*1*	*0*	*0*	
	6b. Drainage Plans	*LS*	*1*	*0*	*0*	
	8. Environmental Permits	*LS*	*1*	*0*	*0*	
	27. Survey	*LS*	*1*	*0*	*0*	
	28. Photogrammetry	*LS*	*1*	*0*	*0*	
	29. Mapping	*LS*	*1*	*0*	*0*	
	32. Noise Update	*LS*	*1*	*0*	*0*	
	35. Geotechnical	*LS*	*1*	*0*	*0*	
				4.3 Additional Services Total	**0**	
				MISCELLANEOUS TOTAL HOURS	**32**	

PROJECT DEVELOPMENT & ENVIRONMENT
PROJECT DATA

Financial Project Identification Number: HI-0141-P-04

Federal Aid Project Identification Number: N/A

Project Description: Project Development and Environment (PD&E) Study for Whiting Street (Supplemental #3)

County: Hillsborough

Begin Milepost: _____ **End Milepost:** _____ **Project Length:** _____ **Miles**

THEA Project Manager: Anna Quinones

Prepared By: [ ] THEA [X] Consultant [ ] Final

Consultant Name: H. W. Lochner, Inc.

SUMMARY

1.0 PUBLIC INVOLVEMENT	0
2.0 ENGINEERING ANALYSIS AND REPORTS	256
3.0 ENVIRONMENTAL ANALYSIS AND REPORTS	1019
4.0 MISCELLANEOUS	32
PROJECT TOTAL HOURS	**1307**

PROJECT DEVELOPMENT & ENVIRONMENT
PROJECT DATA

Name of Consultant: **H. W. Lochner, Inc.**

udy for Whiting Street (Supplemental #3)

HI-0141-P-04

		Project Staff Hours													
Activity No.	**Activity**	**H. W. Lochner, Inc.**	**Adams Traffic**	**AREHNA**	**ECHO UES**	**IAA**	**Janus**	**CMT**	**Tindale Oliver**	**WSP**	**Sub 9**	**Sub 10**	**Sub 11**	**Sub 12**	**Total Hours**
1	Public Involvement	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	Engineering Analysis & Report	256	0	0	0	0	0	0	0	0	0	0	0	0	256
3	Environmental Analysis & Reports	166	0	0	0	0	695	158	0	0	0	0	0	0	1019
4	Miscellaneous	32	0	0	0	0	0	0	0	0	0	0	0	0	32
Project Total		**454**	**0**	**0**	**0**	**0**	**695**	**158**	**0**	**0**	**0**	**0**	**0**	**0**	**1,307**

Notes: 1. Staff hours for consultant come directly from each discipline's worksheet.

2. Staff hours for subconsultants are to be entered manually into columns D through O.

3. For workbooks prepared by subconsultants, their project hours will be totaled in column C.

PROJECT DEVELOPMENT & ENVIRONMENT
PROJECT DATA

ESTIMATE OF WORK EFFORT FOR TECHNICAL PROPOSALS - FIRM TOTAL

Financial Project Number: HI-0141-P-04 Project Name: Project Development and Environment (PD&E) Study for Whiting S

FAP Number: N/A Date: 3/17/2022 Name of Consultant: H. W. Lochner, Inc.

WORK ACTIVITY	Hours from "Summary" sheet	EMPLOYEE CLASSIFICATION																		TOTAL STAFF HOURS RANGE		ON CADD
	Firm Total	Project Manager 3	Principal Engineer	Chief Engineer 1	Chief Engineer 2	Senior Engineer 1	Senior Engineer 2	Engineer 1	Engineer 2	Engineering Intern	Senior Engineering Technician	Technician Aid	Chief Scientist	Environmental Specialist	Transportation Data Scientist	GIS Specialist	Graphics Designer	Contract Coordinator	Secretary / Clerical			
	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours			PERCENT
Public Involvement	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Engineering Analysis & Report	256	0	0	26	0	128	51	51	0	0	0	0	0	0	0	0	0	0	0	256	282	
Environmental Analysis & Reports	166	113	0	0	0	0	0	0	0	0	0	0	53	0	0	0	0	0	0	166	183	
Miscellaneous	32	24	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	0	32	35	
TOTALS	454	137	0	26	0	128	51	51	0	0	0	0	61	0	0	0	0	0	0	**454**	**500**	
																			FIRM TOTAL	**454**	**500**	

Notes:
1. This worksheet provides the distribution of a firm's total staff hours for a project.
2. Total Staff Hours (column O) may not match staff hours from Summary worksheet (column B) due to rounding. Staff hours ca lculated for employee classifications are to be adjusted so totals in columns B and O match.
3. Formulas under "Total Staff Hours Range" (columns O & P) may be adjusted to provide desired range.

Field Survey Estimate:

4-man crew days

ESTIMATE OF WORK EFFORT FOR TECHNICAL PROPOSALS - FIRM TOTAL

Financial Project Number: HI-0141-P-04 Project Name: Project Development and Environment (PD&E) Study for Whiting S

FAP Number: N/A Date: 3/17/2022 Name of Consultant: H. W. Lochner, Inc.

Staff Hour Distribution Percentages - Firm Total

	Hours from "Summary" sheet Firm Total	Project Manager 3	Principal Engineer	Chief Engineer 1	Chief Engineer 2	Senior Engineer 1	Senior Engineer 2	Engineer 1	Engineer 2	Engineering Intern	Senior Engineering Technician	Technician Aid	Chief Scientist	Environmental Specialist	Transportation Data Scientist	GIS Specialist	Graphics Designer	Contract Coordinator	Secretary / Clerical	Total
Public Involvement	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%
Engineering Analysis & Report	256	0.0%	0.0%	10.0%	0.0%	50.0%	20.0%	20.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.00%
Environmental Analysis & Reports	166	68.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	32.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.00%
Miscellaneous	32	75.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	25.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.00%

PROJECT DEVELOPMENT & ENVIRONMENT
PROJECT DATA

ESTIMATE OF WORK EFFORT AND COST - PRIME CONSULTANT

Name of Project: Project Development and Environment (PD&E) Study for Whiting Street (Supplemental #3)
County: Hillsborough
FPN: HI-0141-P-04
FAP No.: N/A

Consult. Name: H. W. Lochner, Inc.
Consult. No. enter consultants proj. number
Date: 3/17/2022
Estimator: insert name

Staff Classification	Total Staff Hours From "SH Summary - Firm"	Project Manager 3	Principal Engineer	Chief Engineer 1	Chief Engineer 2	Senior Engineer 1	Senior Engineer 2	Engineer 1	Engineer 2	Engineering Intern	Senior Engineering Technician	Technician Aid	Chief Scientist	Environmental Specialist	Transportation Data Scientist	GIS Specialist	Graphics Designer	Contract Coordinator	Secretary / Clerical	SH By Activity	Salary Cost By Activity	Average Rate Per Task
		$85.72	$100.00	$86.37	$100.00	$61.51	$61.31	$39.20	$47.05	$32.69	$37.13	$17.00	$66.49	$30.00	$61.90	$31.17	$40.25	$29.87	$20.47			
Public Involvement	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	#DIV/0!
Engineering Analysis & Report	256	0	0	26	0	128	51	51	0	0	0	0	0	0	0	0	0	0	0	256	$15,245	$59.55
Environmental Analysis & Reports	166	113	0	0	0	0	0	0	0	0	0	0	53	0	0	0	0	0	0	166	$13,210	$79.58
Miscellaneous	32	24	0	0	0	0	0	0	0	0	0	0	8	0	0	0	0	0	0	32	$2,589	$80.91
Total Staff Hours	454	137	0	26	0	128	51	51	0	0	0	0	61	0	0	0	0	0	0	454		
Total Staff Cost		$11,743.64	$0.00	$2,245.62	$0.00	$7,873.28	$3,126.81	$1,999.20	$0.00	$0.00	$0.00	$0.00	$4,055.89	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00		**$31,044.44**	**$68.38**

Check = $31,044.44

Survey Field Days by Subconsultant

4 - Person Crew:

Notes:
1. This sheet to be used by Prime Consultant to calculate the Grand Total fee.
2. Manually enter fee from each subconsultant. Unused subconsultant rows may be hidden.

SALARY RELATED COSTS:			$31,044.44
OVERHEAD:	161.89%		$50,257.84
OPERATING MARGIN:	34.00%		$10,555.11
FCCM (Facilities Capital Cost Money):	0.22%		$68.30
EXPENSES:	7.13%		$2,213.47
SALARY RELATED SUBTOTAL:			**$94,139.16**
Survey (Field - if by Prime)	0.00	4-man crew days ($ - / day	$0.00
SUBTOTAL - PRIME			**$94,139.16**
Subconsultant: Adams Traffic			$0.00
Subconsultant: AREHNA			$0.00
Subconsultant: ECHO UES			$0.00
Subconsultant: IAA			$0.00
Subconsultant: Janus			$68,624.33
Subconsultant: CMT			$15,018.14
Subconsultant: Tindale Oliver			$0.00
Subconsultant: WSP			$0.00
SUBTOTAL ESTIMATED FEE:			**$177,781.63**
Optional Services			$0.00
GRAND TOTAL ESTIMATED FEE:			**$177,781.63**

ESTIMATE OF WORK EFFORT FOR TECHNICAL PROPOSALS - FIRM TOTAL

Financial Project Number: HI-0141-P-04 Project Name: Project Development and Environment (PD&E) Study for Whiting Street (Supplei

FAP Number: N/A Date: 3/17/2022 Name of Consultant: Janus Research, Inc.

WORK ACTIVITY	Hours from "Summary" sheet	EMPLOYEE CLASSIFICATION												TOTAL STAFF HOURS RANGE		ON CADD
	Firm Total	Chief Scientist	Chief Archaeologist	Senior Archaeologist	Archaeologist	Senior Scientist	Scientist	Graphic Designer	Staff Classification 8	Staff Classification 9	Staff Classification	Staff Classification 11	Staff Classification 12			
	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours			PERCENT
Public Involvement	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Engineering Analysis & Report	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Environmental Analysis & Reports	695	28	42	125	0	320	146	34	0	0	0	0	0	695	765	
Miscellaneous	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
TOTALS	695	28	42	125	0	320	146	34	0	0	0	0	0	**695**	**765**	
									Field Survey Estimate:			FIRM TOTAL		**695**	**765**	
									4-man crew days							

Notes:
1. This worksheet provides the distribution of a firm's total staff hours for a project.
2. Total Staff Hours (column O) may not match staff hours from Summary worksheet (column B) due to rounding. Staff

ESTIMATE OF WORK EFFORT FOR TECHNICAL PROPOSALS - FIRM TOTAL

Financial Project Number: HI-0141-P-04 Project Name: Project Development and Environment (PD&E) Study for Whiting Street (Supplei

FAP Number: N/A Date: 3/17/2022 Name of Consultant: Janus Research, Inc.

Staff Hour Distribution Percentages - Firm Total

	Hours from "Summary" sheet Firm Total	Chief Scientist	Chief Archaeologist	Senior Archaeologist	Archaeologist	Senior Scientist	Scientist	Graphic Designer	Staff Classification 8	Staff Classification 9	Staff Classification 10	Staff Classification 11	Staff Classification 12	Total
Public Involvement	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%
Engineering Analysis & Report	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%
Environmental Analysis & Reports	695	4.0%	6.0%	18.0%	0.0%	46.0%	21.0%	5.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.00%
Miscellaneous	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%

ESTIMATE OF WORK EFFORT AND COST - SUBCONSULTANT

Name of Project: Project Development and Environment (PD&E) Study for Whiting Street (Supplemental #3)
County: Hillsborough
FPN: HI-0141-P-04
FAP No.: N/A

Consult. Name: Janus Research
Consult. No. enter consultants proj. number
Date: 3/17/2022
Estimator: insert name

Staff Classification	Total Staff Hours From "SH Summary - Firm"	Chief Scientist	Chief Archaeologist	Senior Archaeologist	Archaeologist	Senior Scientist	Scientist	Graphic Designer	Engineer 2	Engineering Intern	Graphics Designer	Contract Coordinator	Secretary / Clerical	SH By Activity	Salary Cost By Activity	Average Rate Per Task
		$92.00	$37.73	$28.75	$14.50	$48.33	$22.64	$21.70	$0.00	$0.00	$0.00	$0.00	$0.00			
Public Involvement	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	#DIV/0!
Engineering Analysis & Report	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	#DIV/0!
Environmental Analysis & Reports	695	28	42	125	0	320	146	34	0	0	0	0	0	695	$27,263	$39.23
Miscellaneous	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	#DIV/0!
Total Staff Hours	695	28	42	125	0	320	146	34	0	0	0	0	0	695		
Total Staff Cost		$2,576.00	$1,584.66	$3,593.75	$0.00	$15,465.60	$3,305.44	$737.80	$0.00	$0.00	$0.00	$0.00	$0.00		**$27,263.25**	**$39.23**

Check = $27,263.25

SALARY RELATED COSTS:			$27,263.25
OVERHEAD:	107.48%		$29,302.54
OPERATING MARGIN:	35.00%		$9,542.14
FCCM (Facilities Capital Cost Money):	0.00%		$0.00
EXPENSES:	9.23%		$2,516.40
SALARY RELATED SUBTOTAL:			**$68,624.33**
Survey (Field - if by Sub) 0.00	4-man crew days @	$ - / day	$0.00
SUBTOTAL - SUBCONSULTANT			**$68,624.33**
Optional Services			$0.00
SUBCONSULTANT TOTAL ESTIMATED FEE:			**$68,624.33**

Note:
1. This sheet to be used by Subconsultant to calculate its fee.

ESTIMATE OF WORK EFFORT FOR TECHNICAL PROPOSALS - FIRM TOTAL

Financial Project Number: HI-0141-P-04 Project Name: Project Development and Environment (PD&E) Study for Whiting Street (Supp

FAP Number: N/A Date: 3/17/2022 Name of Consultant: CMT (formerly KB Environmental)

WORK ACTIVITY	Hours from "Summary" sheet	EMPLOYEE CLASSIFICATION												TOTAL STAFF HOURS RANGE		ON CADD
	Firm Total	Project Manager	Chief Scientist	Senior Scientist	Engineering Technician	Staff Classification 5	Staff Classification 6	Staff Classification 7	Staff Classification 8	Staff Classification 9	Staff Classification	Staff Classification 11	Staff Classification 12			
	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours	Hours			PERCENT
Public Involvement	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Engineering Analysis & Report	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Environmental Analysis & Reports	158	0	8	150	0	0	0	0	0	0	0	0	0	158	174	
Miscellaneous	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
TOTALS	158	0	8	150	0	0	0	0	0	0	0	0	0	**158**	**174**	
												FIRM TOTAL		**158**	**174**	

Notes:
1. This worksheet provides the distribution of a firm's total staff hours for a project.
2. Total Staff Hours (column O) may not match staff hours from Summary worksheet (column B) due to rounding. Staff

Field Survey Estimate:
_____ 4-man crew days

ESTIMATE OF WORK EFFORT FOR TECHNICAL PROPOSALS - FIRM TOTAL

Financial Project Number: HI-0141-P-04 Project Name: Project Development and Environment (PD&E) Study for Whiting Street (Supp

FAP Number: N/A Date: 3/17/2022 Name of Consultant: CMT (formerly KB Environmental)

Staff Hour Distribution Percentages - Firm Total

	Hours from "Summary" sheet Firm Total	Project Manager	Chief Scientist	Senior Scientist	Engineering Technician	Staff Classification 5	Staff Classification 6	Staff Classification 7	Staff Classification 8	Staff Classification 9	Staff Classification 10	Staff Classification 11	Staff Classification 12	Total
Public Involvement	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%
Engineering Analysis & Report	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%
Environmental Analysis & Reports	158	0.0%	5.0%	95.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.00%
Miscellaneous	0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.00%

ESTIMATE OF WORK EFFORT AND COST - SUBCONSULTANT

Name of Project: Project Development and Environment (PD&E) Study for Whiting Street (Supplemental #3)
County: Hillsborough
FPN: HI-0141-P-04
FAP No.: N/A

Consult. Name: CMT (formerly KB Environmental)
Consult. No. enter consultants proj. number
Date: 3/17/2022
Estimator: insert name

Staff Classification	Total Staff Hours From "SH Summary - Firm"	Project Manager	Chief Scientist	Senior Scientist	Engineering Technician	Senior Engineer 1	Senior Engineer 2	Engineer 1	Engineer 2	Engineering Intern	Graphics Designer	Contract Coordinator	Secretary / Clerical	SH By Activity	Salary Cost By Activity	Average Rate Per Task
		$0.00	$71.77	$35.92	$23.50	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00			
Public Involvement	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	#DIV/0!
Engineering Analysis & Report	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	#DIV/0!
Environmental Analysis & Reports	158	0	8	150	0	0	0	0	0	0	0	0	0	158	$5,962	$37.74
Miscellaneous	0	0	0	0	0	0	0	0	0	0	0	0	0	0	$0	#DIV/0!
Total Staff Hours	158	0	8	150	0	0	0	0	0	0	0	0	0	158		
Total Staff Cost		$0.00	$574.16	$5,388.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00		**$5,962.16**	**$37.74**

Check = $5,962.16

Note:
1. This sheet to be used by Subconsultant to calculate its fee.

SALARY RELATED COSTS:			$5,962.16
OVERHEAD:	109.90%		$6,552.41
OPERATING MARGIN:	35.00%		$2,086.76
FCCM (Facilities Capital Cost Money):	0.131%		$7.81
EXPENSES:	6.86%		$409.00
SALARY RELATED SUBTOTAL:			**$15,018.14**
Survey (Field - if by Sub) 0.00	4-man crew days @	$ - / day	$0.00
SUBTOTAL - SUBCONSULTANT			**$15,018.14**
Optional Services			$0.00
SUBCONSULTANT TOTAL ESTIMATED FEE:			**$15,018.14**

Item IV.B.1

ITS Fiber Data Collection and Characterization - Final Selection

TAMPA-HILLSBORUGH COUNTY EXPRESSWAY AUTHORITY

MODIFIED FORM 375-020-17
CONTRACTS ADMINISTRATION
THEA - 05/17

BID PROPOSAL FORM INTELLIGENT TRANSPORTATION SOLUTIONS (ITS) FIBER DATA COLLECTION AND CHARACTERIZATION

Let by: Tampa-Hillsborough County Expressway Authority

Precision Contracting Services, Inc.

(Name of Bidder. Note: Void if used by any bidder other than one this Form issued to)

TAMPA-HILLSBOROUGH EXPRESSWAY AUTHORITY (THEA) PROJECT NO.: O-02121

THEA CONTRACT NO.:

DATE OF BID PROPOSAL: March 14, 2022

DATE BIDS DUE: March 14, 2022

DATE OF AWARD: April 1, 2022

DATE OF CONTRACT EXECUTION: April 4, 2022

Bid Tabulation				
Pay Item	**Quantity**	**Unit**	**Unit Price ($)**	**Total ($)**
ITS Fiber Data Collection and Characterization	1	Lump Sum	$ 279,955.00	$ 279,955.00

LUMP SUM BID PRICE: ***(in Words)***

Two Hundred Seventy Nine Thousand Nine Hundred and Fifty Five DOLLARS

CONTRACT CALENDAR DAYS: 270

% Small Business Enterprise Proposed: TBD

PROPOSAL
FOR ABOVE PROJECT(S)

The Bidder's Proposal must meet the requirements and design and construction criteria as stated in the THEA Request for Proposal for the Intelligent Transportation Solutions (ITS) Fiber Data Collection and Characterization. Materially unbalanced Bids are subject to rejection.

Item IV.B.2
Access Control System in Support of the REL Services Contract

Tampa Reversible-Lane Control System

Scope of Work & Preliminary Schedule

FLIR

THEA Scope of Responsibilities

The successful delivery of a solution will require that THEA provide:

1. Network equipment, infrastructure and administration suitable for the high-availability Cameleon ACS solution (which may entail redundant switches). Teledyne will provide detailed VMWare, Dell and Cameleon network requirements.
2. Inventory spreadsheet of video, gate, sign and other devices including locations, communication parameters, passwords, etc.
3. Power for the computing cluster.
4. 8U of rack space.

Teledyne FLIR Scope of Work

Teledyne FLIR will implement a reversible-lanes Access Control System to satisfy the requirements of *Access Control System in Support of Selmon Expressway Reversible Express Lanes RFP No. O-01121*. The work will be broken down into the following tasks:

1 Internal Project Management

1.1 Internal Project Management

Teledyne-FLIR internal management for the duration of the project and support. Support will be for a period of 5 years following the completion of acceptance testing.

2 Design and Development

2.1 System Design

2.1.1 Kickoff Meeting, Existing System Review, and Management Plan Review

Description: One-day onsite meeting to review the existing system and the management plan.

2.1.2 25% Design and Review 25% Design

Description: Virtual meeting to present and review the system design progress.

2.1.3 50% Design and Review 50% Design

Description: Virtual meeting to present and review the system design progress.

2.1.4 90% Design and Review 90% Design

Description: Virtual meeting to present and review the system design progress.

2.1.5 Update Concept-of-Operations Document

Description: Document writing, editing and approval.

Deliverable: Concept-of-Operations Document

2.1.6 Write Requirements Traceability and Verification Matrix

Description: Document writing, editing and approval.

Deliverable: RT&V Matrix

2.1.7 Write Operations Plan

Description: Document writing, editing and approval.

Deliverable: Operations Plan

2.1.8 Write Implementation Plan

Description: Document writing, editing and approval.

Deliverable: Implementation Plan

2.1.9 Write Maintenance Plan

Description: Document writing, editing and approval.

Deliverable: Maintenance Plan

2.1.10 Write Functional Specification for Toll Interface

Description: Document writing, editing and approval.

Deliverable: Toll Interface Functional Spec

2.1.11 Write Functional Specification for PLC Interface

Description: Document writing, editing and approval.

Deliverable: PLC Interface Functional Spec

2.1.12 Write Functional Specification for Video Distribution to outside agencies

Description: Document writing, editing and approval.

Deliverable: Video Distribution Functional Spec

2.2 Write Test Plans

2.2.1 Write Factory Acceptance Test Plan

Description: Document writing, editing and approval.

Deliverable: Factory Acceptance Test Plan

2.2.2 Write Mock System Test Plan

Description: Document writing, editing and approval.

Deliverable: Mock System Test Plan

2.2.3 Write Acceptance Test Plan

Description: Document writing, editing and approval.

Deliverable: Acceptance Test Plan

2.2.4 Write Toll Interface Test Plan

Description: Document writing, editing and approval.

Deliverable: Toll Interface Test Plan

2.2.5 Write PLC Interface Test Plan

Description: Document writing, editing and approval.

Deliverable: PLC Interface Test Plan

2.2.6 Write Video Distribution Test Plan

Description: Document writing, editing and approval.

Deliverable: Video Distribution Test Plan

2.3 Project-Specific Cameleon Development

2.3.1 Project-Specific Driver/API Code Development (Toll Interface)

Description: **Description**: Coding, verification & validation

Deliverable: Toll Driver

2.3.2 Project-Specific Driver/API Code Development (PLC Interface)

Description: Coding, verification & validation

Deliverable: PLC Driver

2.3.3 Interface Documentation (Toll Interface)

Description: Coding, verification & validation

Deliverable: Toll Interface Manual

2.3.4 Interface Documentation (PLC Interface)

Description: Coding, verification & validation

Deliverable: PLC Interface Manual

2.3.5 Unit Testing, Problem Resolution, Validation and Packaging

Description: Process of creating driver software installers, including compilation, testing, packaging, and upload to Box server.

Deliverable: zip file(s) containing the driver installers

2.4 Project-Specific Cameleon Configuration

2.4.1 Base Configuration

Description: Configuring Cameleon as a commercial-off-the-shelf software to the specific needs of the project.

Deliverable: User-Interface Demo for Review

2.4.2 Failsafe Operations and Exception Handling Configuration

Description: Configuring Cameleon as a commercial-off-the-shelf software to include the Failsafe Operations and Exception Handling requirements of the project, especially interlocks and alarms.

Deliverable: Interlock Report

2.4.3 Configure Additional Project-Specific Elements

Description: Configuring Cameleon as a commercial-off-the-shelf software to cover any project requirements not included in 2.4.2 and 2.4.2 above.

Deliverable: to be determined

2.4.4 Unit Testing, Problem Resolution, Validation and Packaging

Description: Process of creating configuration installers, including compilation, testing, packaging, and upload to Box server.

Deliverable: zip file(s) containing the Final Configuration

2.5 System Documentation

2.5.1 Create Project-Specific Operators Manual

Description: Document writing, editing and approval.

Deliverable: Operators Manual

2.5.2 Create Project-Specific Administrators Manual

Description: Document writing, editing and approval.

Deliverable: Administrators Manual

2.5.3 Create Project-Specific Maintenance Manual

Description: Document writing, editing and approval.

Deliverable: Maintenance Manual

2.5.4 Final Design and Network Diagram

Description: Document writing, editing and approval.

Deliverable: Design Drawings, Network Diagram

2.5.5 Hardware Documentation and Warranties

Description: Document writing, editing and approval.

Deliverable: Hardware Doc and Warranties

3 Deployment

3.1 Hardware/Software Procurement and Supply

3.1.1 Cameleon ITS Software

Description: Perpetual licenses for use of Cameleon ITS for the Project

Deliverable: Cameleon Licenses

3.1.2 Web RTC Video Software

Description: Perpetual Licenses for the Project

Deliverable: Streaming Licenses

3.2 Pre-Integration Testing

3.2.1 Factory Acceptance Testing (at Teledyne-FLIR Facility)

Description: Simulation-mode testing in Teledyne-FLIR Facility

Deliverable: Completed Test Document

3.2.2 Mock System Testing (at THEA Facility)

Description: Simulation-mode testing in THEA Facility.

Deliverable: Completed Test Document

3.3 System Integration

3.3.1 Install ACS Head-End Hardware and Software

Description: On-site hardware and software installation

Deliverable: Hardware installed and running on site

3.3.2 System Integration

Description: Connecting field equipment to the new system

Deliverable: Completed Test Document

3.3.3 System Testing, Problem Resolution and Re-Testing

Description: Testing and troubleshooting connected field equipment

Deliverable: Completed Test Document

3.3.4 Traffic Management Expenses

Description: Ramp closures while testing gate and sign operation

3.4 System Acceptance

3.4.1 Conduct Final Acceptance Test, Problem Resolution and Re-Testing

Description: Testing and troubleshooting system operation.

Deliverable: Completed Test Document

4 Training

4.1 Provide Training

4.1.1 Create Training Materials

Description: Document writing, editing and approval.

Deliverable: Training Document

4.1.2 Provide Training (2 trips - each 1 week on site - 2 people)

Description: Demonstrate system operation to users and administrators

Deliverable: Training

5 Hardware

5.1 High-availability computing cluster

5.1.1 Procurement

Description: Process of obtaining quotes, ordering and paying for hardware

Deliverable: Compute cluster hardware delivered to Flir

5.1.2 Set up and testing

Description: setting up hardware for simulation mode testing and burn in

Deliverable: Compute cluster hardware configured and burned in

5.1.3 Inventory, Handling and Shipping

Description: packing, insurance, shipping documentation

Deliverable: Hardware delivered to Tampa

5.1.4 Installation on Site

Description: installation on site

Deliverable: Hardware working in Tampa

6 Warranty

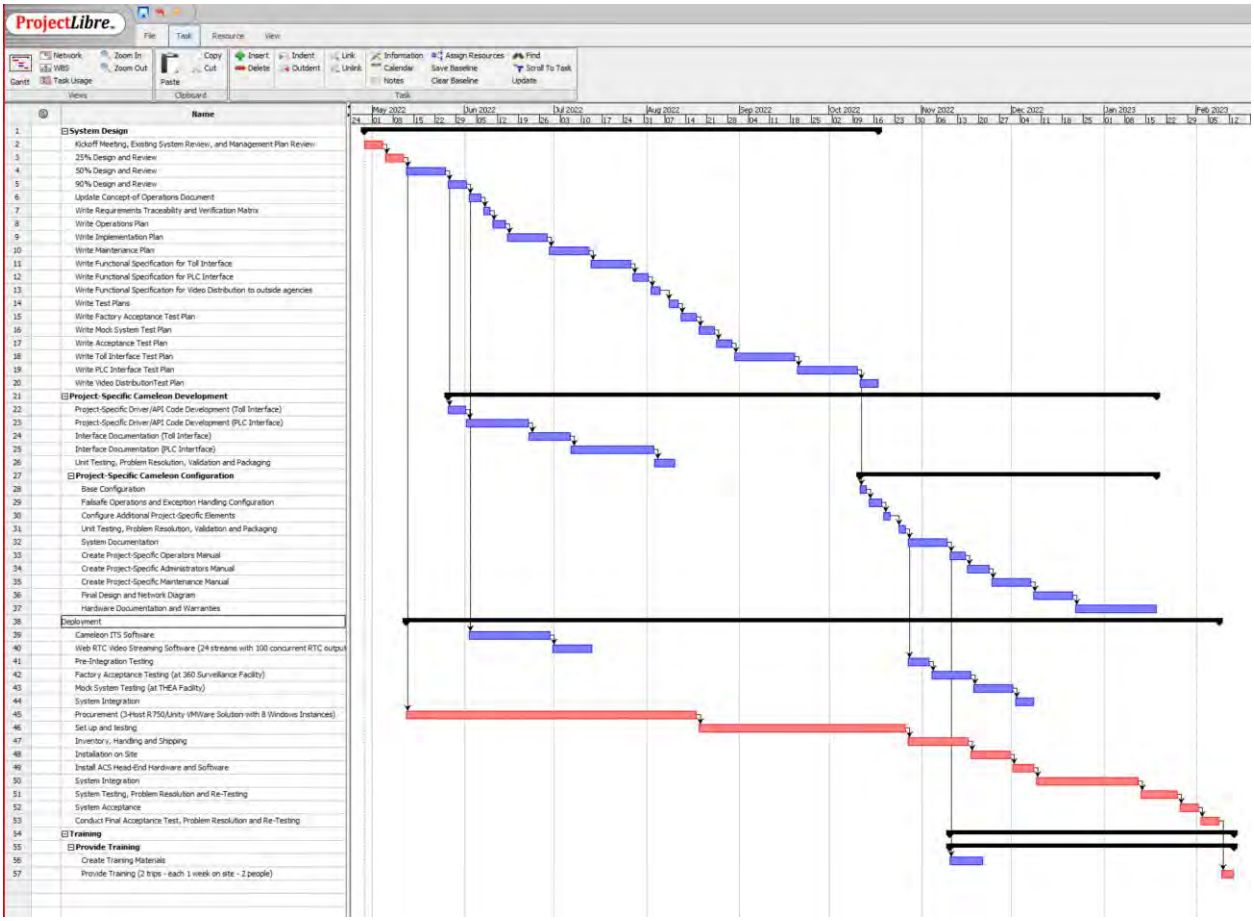
6.1 Hardware Warranty: 5 years Dell ProSupport (next business day on-site service)

6.2 Cameleon Software Assurance: remote support and upgrades - 5 years starting from date of system acceptance and including up to three 1-week trips (if needed). See attached brochure for software assurance details.

6.3 WebRTC Software Support: remote support and upgrades - 5 years starting from date of system acceptance.

Schedule

A preliminary project schedule is presented below and will be updated when a contract is in place. It was calculated based on the assumptions that notification to proceed will be in late April and that hardware components will be delivered to us within 50 days of our placing the order. Hardware delivery is on the critical path, so the actual completion dates will be very sensitive to supply-chain disruption.



Costing

Task	Access Control System in Support of Selmon Expressway Reversible Express Lanes RFP No. O-01121 Task Description	Deliverable	SubTask Totals	Task Totals
1	**Internal Project Management**			
1.1	Internal Project Management (1 year + 5 years support)		$ 59,280	$ 59,280
2	**Design and Development**			
2.1	**System Design**			
2.1.1	Kickoff Meeting, Existing System Review, Management Plan Review			
2.1.2	25% Design and Review	25% Design		
2.1.3	50% Design and Review	50% Design		
2.1.4	90% Design and Review	90% Design		
2.1.5	Update Concept-of Operations Document	Concept of Operations document		
2.1.6	Write Requirements Traceability and Verification Matrix	RT&V Matrix	$ 122,154	
2.1.7	Write Operations Plan	Operations Plan		
2.1.8	Write Implementation Plan	Implementation Plan		
2.1.9	Write Maintenance Plan	Maintenance Plan		
2.1.10	Write Functional Specification for Toll Interface	Toll Interface Functional Spec		
2.1.11	Write Functional Specification for PLC Interface	Toll Interface Functional Spec		
2.1.12	Write Functional Specification for Video Distribution to outside agencies	Video Distribution Functional Spec		
2.2	**Write Test Plans**			
2.2.1	Write Factory Acceptance Test Plan	Factory Acceptance Test Plan		
2.2.2	Write Mock System Test Plan	Mock System Test Plan		
2.2.3	Write Acceptance Test Plan	Acceptance Test Plan	$ 36,480	
2.2.4	Write Toll Interface Test Plan	Toll Interface Test Plan		
2.2.5	Write PLC Interface Test Plan	PLC Interface Test Plan		$ 327,980
2.2.6	Write Video DistributionTest Plan	City of Tampa Interface Test Plan		
2.3	**Project-Specific Cameleon Development**			
2.3.1	Project-Specific Driver/API Code Development (Toll Interface)	Toll Driver		
2.3.2	Project-Specific Driver/API Code Development (PLC Interface)	PLC Driver		
2.3.3	Interface Documentation (Toll Interface)	Toll Interface Manual	$ 67,506	
2.3.4	Interface Documentation (PLC Intertface)	PLC Interface Manual		
2.3.5	Unit Testing, Problem Resolution, Validation and Packaging			
2.4	**Project-Specific Cameleon Configuration**			
2.4.1	Base Configuration	User-Interface Demo for Review		
2.4.2	Failsafe Operations and Exception Handling Configuration	Interlock Table	$ 76,000	
2.4.3	Configure Additional Project-Specific Elements			
2.4.4	Unit Testing, Problem Resolution, Validation and Packaging	Cameleon config CCC file		
2.5	**System Documentation**			
2.5.1	Create Project-Specific Operators Manual	Operators Manual		
2.5.2	Create Project-Specific Administrators Manual	Administrators Manual		
2.5.3	Create Project-Specific Maintenance Manual	Maintenance Manual	$ 25,840	
2.5.4	Final Design and Network Diagram	Design Drawings, Network Diagram		
2.5.5	Hardware Documentation and Warranties	Hardware Doc and Warranties		
3	**Deployment**			
3.1	**Software Licensing**			
3.1.1	Cameleon ITS Software (ITS Base + 580 Upgrade for a total of 600)	Licenses	$ 132,496	
3.1.2	Web RTC Video Streaming Software (24 input streams with 100 concurrent WebRTC outputs)	Licenses	$ 58,500	
3.2	**Pre-Integration Testing**			
3.2.1	Factory Acceptance Testing (at 360 Surveillance Facility)		$ 41,882	
3.2.2	Mock System Testing (at THEA Facility)	Completed Test Document		
3.3	**System Integration**			$ 682,240
3.3.1	Install ACS Head-End Hardware and Software			
3.3.2	WebRTC Configuration			
3.3.3	System Integration	Completed Test Document	$ 384,418	
3.3.4	System Testing, Problem Resolution and Re-Testing	Completed Test Document		
3.3.5	Traffic Management Expenses (lane closures @ $1800 per 10 hr shift)			
3.4	**System Acceptance**			
3.4.1	Conduct Final Acceptance Test, Problem Resolution and Re-Testing		$ 64,944	
4	**Training**			
4.1	**Provide Training**			
4.1.1	Create Training Materials	Training Document	$ 40,218	$ 40,218
4.1.2	Provide Training (2 trips - each 1 week on site - 2 people)	Training		
5	**Hardware**			
5.1	**High-availability computing cluster**			
5.1.1	Dell R750 Server (QTY 3)	Hardware ordered	$ 69,906	
5.1.2	Dell Unity XT 480 Storage Array (QTY 1)	Hardware ordered	$ 127,475	
5.1.3	Windows Server 2019 Licensing	Hardware ordered	$ 9,211	
5.1.4	VMWare vSphere Enterprize Plus for 3 dual-CPU servers	Hardware ordered	$ 51,404	$ 334,063
5.1.5	VMWare vCenter Standard	Hardware ordered	$ 14,619	
5.1.6	Misc. hardware and test equipment	Hardware ordered		
5.1.7	Set up and testing	Hardware delivered to Flir	$ 61,449	
5.1.8	Inventory, Handling and Shipping	Hardware delivered to Tampa		
5.1.9	Installation on Site	Hardware Installed on site		
6	**System Warranty Services**			
6.1	**Warranty and Software Assurance**			
6.1.1	Cameleon Software Assurance (remote support and upgrades - 5 years)			$ 280,207
6.1.2	WebRTC warranty for 5 years		$ 280,207	
6.1.3	On-site support visits to supplement Software Assurance (maximum three 1-week trips)			
Project Total			**$ 1,723,989**	**$ 1,723,989**

Software Assurance Brochure

cameleon
SOFTWARE ASSURANCE

The old cliché about change being constant is true for both your organization and for the Cameleon suite of applications. We're always adding new features, capabilities and support for a growing list of device types and manufacturers. As your surveillance system grows and changes, you need expert help to get the greatest ROI out of your equipment. The Cameleon Software Assurance program helps you do just that. Unlock the full potential of your Cameleon application.

ADAPT YOUR SYSTEM WITH CONFIDENCE

When you participate in a Cameleon Software Assurance program, you get the combined experience of the entire FLIR team. Our commitment to customer service is evidenced in our helpful and friendly expert staff, ready to walk you through any problem or concern you may have. In addition, we house a host of online resources to answer common questions and include free software upgrades, patches and driver packs. Priority technical support and remote configuration assistance are available to premium Cameleon Software Assurance program members.

FLIR®

KEEP UP WITH INNOVATION

Choose the best solution for today and the future. Cameleon adds new functionality to its products on a regular basis and each new update introduces innovative capabilities to improve product efficiency. A Software Assurance program gives you access to the latest product updates so you can take advantage of future innovation, both from Cameleon and from other technology partners. Running on the most recent version puts you in a position to take advantage of innovation in other system components, such as cameras and storage devices.

ADAPT TO CHANGING NEEDS

Then entire suite of Cameleon software applications have been designed to both integrate and grow with many different types of hardware and third party applications. With an interactive point-and-click view of your entire site, the scalable architecture of Cameleon meets all your security and surveillance needs.

PREDICTABLE COST

At some point you will have to make the decision to either allow your system to become outdated or find and allocate an unknown amount of money to upgrade. The Cameleon Software Assurance program takes away the surprise, allowing you to plan ahead with a fixed fee in your annual budget. This gives you access to the latest generation of technical innovation without any additional or hidden cost.

COVERAGE LEVELS

PREMIUM

- Support coverage Monday to Friday 8:00am to 5:00pm (PST), excluding major holidays
- Unlimited telephone, email and online technical support
- Logon access to online knowledge base and FAQ's
- Free access to all interim and major releases, patches and device drivers within your product category*
- Access to dedicated technical support developers
- Priority response and resolution of issues
- Remote configuration and troubleshooting assistance via internet**

STANDARD

- Support coverage Monday to Friday 8:00am to 5:00pm (PST), excluding major holidays
- Unlimited telephone, email and online technical support
- Logon access to online knowledge base and FAQ's
- Free access to all interim and major releases, patches and device drivers within your product category*
- Access to dedicated technical support developers

*Bug fixes are made in the current product version, not to earlier versions that are still supported.

**System must have internet connectivity and client must provide access

Note: Software Assurance Programs do not include any time on site or new/custom development

4218 Commerce Circle
Victoria, BC V8Z 6N6 Canada
PH: + 1 888 242 4291
PH: + 1 250 388 7232

www.FLIR.com

Hardware Specification Sheets

Dell EMC PowerEdge R750

Spec Sheet

General purpose server optimized to address the most demanding workloads

The Dell EMC PowerEdge R750, is a full-featured enterprise server, delivering outstanding performance for the most demanding workloads.

Innovate at scale with challenging and emerging workloads

The Dell EMC PowerEdge R750, powered by the 3rd Generation Intel® Xeon® Scalable processors is a rack server to address application performance and acceleration. The PowerEdge R750, is a dual-socket/2U rack server that delivers outstanding performance for the most demanding workloads. It supports 8 channels of memory per CPU, and up to 32 DDR4 DIMMs @ 3200 MT/s speeds. In addition, to address substantial throughput improvements the PowerEdge R750 supports PCIe Gen 4 and up to 24 NVMe drives with improved air-cooling features and optional Direct Liquid Cooling to support increasing power and thermal requirements. This makes the PowerEdge R750 an ideal server for data center standardization on a wide range of workloads including; Database and Analytics, High-performance computing (HPC), Traditional corporate IT, Virtual Desktop Infrastructure, and AI/ML environments that require performance, extensive storage and GPU support.

Increase efficiency and accelerate operations with autonomous collaboration

The Dell EMC OpenManage systems management portfolio tames the complexity of managing and securing IT infrastructure. Using Dell Technologies' intuitive end-to-end tools, IT can deliver a secure, integrated experience by reducing process and information silos in order to focus on growing the business. The Dell EMC OpenManage portfolio is the key to your innovation engine, unlocking the tools and automation that help you scale, manage, and protect your technology environment.

- Built-in telemetry streaming, thermal management, and RESTful API with Redfish offer streamlined visibility and control for better server management
- Intelligent automation lets you enable cooperation between human actions and system capabilities for added productivity
- Integrated change management capabilities for update planning and seamless, zero-touch configuration and implementation
- Full-stack management integration with Microsoft, VMware, ServiceNow, Ansible and many other tools

Protect your data assets and infrastructure with proactive resilience

The Dell EMC PowerEdge R750 server is designed with a cyber-resilient architecture, integrating security deeply into every phase in the lifecycle, from design to retirement.

- Operate your workloads on a secure platform anchored by cryptographically trusted booting and silicon root of trust
- Maintain server firmware safety with digitally signed firmware packages
- Prevent unauthorized configuration or firmware change with system lockdown
- Securely and quickly wipe all data from storage media, including hard drives, SSDs and system memory with System Erase

PowerEdge R750

The Dell EMC PowerEdge R750 offers compelling performance, high-speed memory and capacity, I/O bandwidth and storage to address data requirements – Ideal for:

- Traditional corporate IT
- Database and Analytics
- Virtual Desktop Infrastructure
- AI/ML and HPC

Feature	Technical Specifications
Processor	Up to two 3rd Generation Intel Xeon Scalable processors, with up to 40 cores per processor
Memory	• 32 DDR4 DIMM slots, supports RDIMM 2 TB max or LRDIMM 8 TB max, speeds up to 3200 MT/s • Up to 16 Intel Persistent Memory 200 series (BPS) slots, 8 TB max • Supports registered ECC DDR4 DIMMs only
Storage controllers	• Internal controllers: PERC H745, HBA355I, S150, H345, H755, H755N • Boot Optimized Storage Subsystem (BOSS-S2): HW RAID 2 x M.2 SSDs 240 GB or 480 GB • Boot Optimized Storage Subsystem (BOSS-S1) HW RAID 2 x M.2 SSDs 240 GB or 480 GB • External PERC (RAID): PERC H840, HBA355E
Drive Bays	Front bays: • Up to 12 x 3.5-inch SAS/SATA (HDD/SSD) max 192 TB • Up to 8 x 2.5-inch NVMe (SSD) max 122.88 TB • Up to 16 x 2.5-inch SAS/SATA/NVMe (HDD/SSD) max 245.76 TB • Up to 24 x 2.5-inch SAS/SATA/NVMe (HDD/SSD) max 368.84 TB Rear bays: • Up to 2 x 2.5-inch SAS/SATA/NVMe (HDD/SSD) max 30.72 TB • Up to 4 x 2.5-inch SAS/SATA/NVMe (HDD/SSD) max 61.44 TB
Power Supplies	• 800 W Platinum AC/240 mixed mode • 1100 W Titanium AC/240 mixed mode • 1400 W Platinum AC/240 mixed mode • 2400 W Platinum AC/240 mixed mode
Cooling Options	Air cooling, optional processor liquid cooling
Fans	• Standard fan/High performance SLVR fan/High performance GOLD fan • Up to six hot plug fans
Dimensions	• Height – 86.8 mm (3.41 inches) • Width – 482 mm (18.97 inches) • Depth – 758.3 mm (29.85 inches) - without bezel 772.14 mm (30.39 inches) - with bezel
Form Factor	2U rack server
Embedded Management	• iDRAC9 • iDRAC Service Module • iDRAC Direct • Quick Sync 2 wireless module
Bezel	Optional LCD bezel or security bezel
OpenManage Software	• OpenManage Enterprise • OpenManage Power Manager plugin • OpenManage SupportAssist plugin • OpenManage Update Manager plugin
Mobility	OpenManage Mobile
Integrations and Connections	OpenManage Integrations • BMC Truesight • Microsoft System Center • Red Hat Ansible Modules • VMware vCenter and vRealize Operations Manager OpenManage Connections • IBM Tivoli Netcool/OMNIbus • IBM Tivoli Network Manager IP Edition • Micro Focus Operations Manager • Nagios Core • Nagios XI
Security	• Cryptographically signed firmware • Secure Boot • Secure Erase • Silicon Root of Trust • System Lockdown (requires iDRAC9 Enterprise or Datacenter) • TPM 1.2/2.0 FIPS, CC-TCG certified, TPM 2.0 China NationZ
Embedded NIC	2 x 1 GbE LOM
Network Options	1 x OCP 3.0 (x8 PCIe lanes)
GPU Options	Up to two double-width 300 W, or four single-width 150 W, or six single-width 75 W accelerators
Ports	Front Ports • 1 x Dedicated iDRAC Direct micro-USB • 1 x USB 2.0 • 1 x VGA Rear Ports • 1 x USB 2.0 • 1 x Serial (optional) • 1 x USB 3.0 • 2 x RJ-45 • 1 x VGA (optional for liquid cooling configuration) Internal Ports • 1 x USB 3.0
PCIe	Up to 8 x PCIe Gen4 slots (up to 6 x16) with support for SNAP I/O modules
Operating System and Hypervisors	• Canonical Ubuntu Server LTS • Citrix Hypervisor • Microsoft Windows Server with Hyper-V • Red Hat Enterprise Linux • SUSE Linux Enterprise Server • VMware ESXi For specifications and interoperability details, see Dell.com/OSsupport.
OEM-ready version available	From bezel to BIOS to packaging, your servers can look and feel as if they were designed and built by you. For more information, visit Dell.com/OEM.

Recommended support and services

Dell ProSupport Plus for critical systems or Dell ProSupport for premium hardware and software support for your PowerEdge solution. Consulting and deployment offerings are also available. Contact your Dell representative today for more information. Availability and terms of Dell Services vary by region. For more information, visit Dell.com/ServiceDescriptions.

Dell Technologies on Demand

Consume technology, infrastructure and services any way you want with Dell Technologies on Demand, the industry's broadest end-to-end portfolio of flexible consumption and as-a-Service solutions. For more information, visit: www.delltechnologies.com/ondemand.

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Feb 2021

DELL Technologies

Spec Sheet

DELL EMC UNITY XT STORAGE SERIES

Simplify the path to IT transformation and unlock the full potential of your data capital with the new Dell EMC Unity XT storage arrays that feature up to 2X more IOPS, more memory, and up to 50% more drives than previous Dell EMC Unity models. These All-Flash and Hybrid storage systems with dual-active controller architecture and enterprise-class features are designed for performance, optimized for efficiency with up to 5:1 data reduction, and built to simplify your multi-cloud journey.

Architecture

Based on the powerful family of Intel Xeon™ processors, Dell EMC's Unity XT storage systems implement an integrated architecture for block, file, and VMware VVols with concurrent support for native NAS, iSCSI, and Fibre Channel protocols. Each system leverages dual storage processors, full 12 Gb SAS back end connectivity and Dell EMC's patented multicore architected operating environment to deliver unparalleled performance & efficiency. Additional storage capacity is added via Disk Array Enclosures (DAEs).

Physical Specifications

	380F/380	480F/480	680F/680	880F/880
Min/Max Drives	6/500	6/750	6/1000	6/1500
Array Enclosure	A 2U Disk Processor Enclosure (DPE) with twenty five 2.5" drives			
Drive Enclosure (DAE - Disk Array Enclosure)	All-Flash (F) models support 2.5" drives in 2U twenty five drive and 3U eighty drive trays. Hybrid models support 2.5" drives in 2U twenty five drive and 3U eighty drive trays; and 3.5" drives in 3U fifteen drive trays.			
Standby Power System	Dell EMC Unity systems are powered by 2 power supplies (PS) per DPE/DAE. Each power supply can provide power to the entire module if the peer PS has been removed or is faulted. DPE power during a power failure is provided by a Battery Back Up (BBU) module. BBU is located within the SP enclosure and provides power to a single module (power zone)			
RAID Options	1/0, 5, 6			
CPU per Array	2 x Intel CPUs, 12 cores per Array, 1.7GHz	2 x dual-socket Intel CPUs, 32 cores per Array, 1.8GHz	2 x dual-socket Intel CPUs, 48 cores per Array, 2.1GHz	2 x dual-socket Intel CPUs 64 cores per Array, 2.1GHz
System Memory/Cache per Array	128 GB	192 GB	384 GB	768 GB
Max FAST Cache per Array*	Up to 800 GBs	Up to 1.2 TBs	Up to 3.2 TBs	Up to 6.0TBs
Total Cache[A]	Up to 928 GBs	Up to 1.39 TBs	Up to 3.58 TBs	Up to 6.76 TBs
Max Mezzanine cards per Array[B]	NA	2	2	2
Max IO Modules per Array[C]	4	4	4	4

	380F/380	480F/480	680F/680	880F/880
Embedded SAS IO Ports per Array	4 x 4 lane 12Gb/s SAS ports for BE (back end) Connection	4 x 4 lane 12Gb/s SAS ports for BE Connection	4 x 4 lane 12Gb/s SAS ports for BE Connection	4 x 4 lane 12Gb/s SAS ports for BE Connection
Optional SAS IO ports per Array	NA	8 x 4 lane or 4 x 8 lane 12Gb/s SAS ports (for BE Connection)	8 x 4 lane or 4 x 8 lane 12Gb/s SAS ports (for BE Connection)	8 x 4 lane or 4 x 8 lane 12Gb/s SAS ports (for BE Connection)
Base 12 Gb/s SAS BE Buses per Array	2 x 4 Lane	2 x 4 Lane	2 x 4 Lane	2 x 4 Lane
Max 12 Gb/s SAS BE Buses per Array	2 x 4 Lane	6 x 4 Lane; or 2 x 4 lane and 2 x 8 lane	6 x 4 Lane; or 2 x 4 lane and 2 x 8 lane	6 x 4 Lane; or 2 x 4 lane and 2 x 8 lane
Max FE (front end) Total Ports per Array (all types)	24	24	24	24
Max Initiators per Array	1,024	2,048	2,048	4,096
Max FC Ports per Array	20	16	16	16
Embedded 10GbaseT Ports per Array	4	NA	NA	NA
Embedded CNA ports per Array	4 ports: 8/16 Gb FC[D], 10Gb IP/iSCSI, or 1Gb RJ45	NA	NA	NA
1 Gbase-T/iSCSI Max Total Ports per Array	24	24	24	24
10/25 GbE/iSCSI Max Total Ports per Array	24 – 10GbE 16 – 25GbE	24	24	24
Max Raw Capacity[E]	2.4 PBs	4.0 PBs	8.0 PBs	16.0 PBs
Max SAN Hosts	512	1,024	1,024	2,048
Max Number of Pools	20	30	40	100
Max Number of LUNs per Array	1,000	1,500	2,000	6,000
Max LUN Size	256 TB	256 TB	256 TB	256 TB
Max file systems per Array	1000	1500	2000	4000
Max File System Size	256 TB	256 TB	256 TB	256 TB
Max attached snapshots per Array (Block)	1000	1500	2000	6000
IOPS[F] (All Flash Models 380F – 880F)	up to 600K	up to 1.68M	up to 2.36M	up to 2.56M
OS Support	See the Dell EMC Simple Support Matrix on dellemc.com			

[A] Specific to Hybrid Arrays
[B] One Mezzanine card per Storage Processor (SP), mirrored.
[C] Two IO Modules per Storage Processor (SP), mirrored.
[D] 16Gb available in both single mode and multimode.
[E] Maximum raw capacity will vary based on drive sizes available at time of purchase.
[F] 100% sequential Reads, 4K block size, thick LUNs. Based on internal testing (June 2019). Your results may vary.

Connectivity

Connectivity options via Mezzanine cards and IO modules for both the file for NFS/SMB connectivity and the block storage for FC and iSCSI host connectivity (see above table for number of modules supported per SP).

Connectivity Options		
Type	**Description**	**Details**
Mezzanine card or IO Module	Four-Port 10Gbase-T Module (File & Block)	Four port 10Gbase-T Ethernet IP/iSCSI module with four 10Gbase-T Ethernet ports with copper connection to Ethernet switch
Mezzanine card or IO Module	Four-Port 10 Gb/s Optical Module (File & Block)	Four port 10GbE IP/iSCSI module with choice of SFP+ optical connection or active/passive twinax copper connection to Ethernet switch
Mezzanine card or IO Module	Four-Port 25 Gb/s Optical Module (File & Block)	Four port 10GbE IP/iSCSI module with choice of SFP+ optical connection or passive twinax copper connection to Ethernet switch
IO Module	Four-Port 32 Gb/s Fibre Channel Module (Block only)	Four port FC module with four ports auto-negotiating to 4/8/16 or 8/16/32 Gbps; uses single mode or multimode optical SFP and OM2/OM3/OM4 cabling to connect directly to host HBA or FC switch
IO Module	Four-Port 12 Gb/s SAS V3.0 Module*	Four port SAS module, used for back-end storage (DAE) connectivity to Storage Processors. Each SAS port has 4 lanes/port @ 12Gbps, delivering 48Gbps nominal throughput. Also available specifically for the 80 drive DAE is 8 lane connectivity utilizing a pair of SAS ports to deliver high bandwidth for added performance.
	* For 480F/480, 680F/680 and 880F/880 models	

Maximum Cable Lengths

Shortwave optical OM4: 125 meters (16 Gb) 190 meters (8 Gb), 400 meters (4 Gb), and 500 meters (2 Gb)

Back-end (Drive) Connectivity

Each storage processor connects to one side of each of two redundant pairs of four-lane x 12 Gb/s Serial Attached SCSI (SAS) buses, providing continuous drive access to hosts in the event of a storage processor or bus fault. All models require four “system” drives and support a platform specific maximum number of disks (see Physical Specifications table above). 107 GBs per system drive on the Dell EMC Unity XT 380 models and 150 GBs on the Dell EMC Unity XT 480, 680, and 880 models is consumed by the operating environment software and data structures.

Disk Array Enclosure (DAE)			
	25 X 2.5” Drive DAE	80 X 2.5” Drive DAE	15 X 3.5” Drive DAE (Hybrid Arrays only)
Drive Types Supported	FLASH & SAS	FLASH & SAS	NL-SAS
Controller Interface	12 Gb SAS	12 Gb SAS	12 Gb SAS

Supported Media									
System Category	Type	Usage/ Purpose	Nominal Capacity	Formatted Capacity*	Interface	DPE 25 Drive	25 X 2.5” Drive DAE	80 X 2.5” Drive DAE	15 X 3.5” Drive DAE
All-Flash	SSD (SAS)	All-Flash	800 GB	733.5 GB	12 Gb SAS	✓	✓	✓	
All-Flash	SSD (SAS)	All-Flash	1.92 TB	1751.9 GB	12 Gb SAS	✓	✓	✓	

All-Flash	SSD (SAS)	All-Flash	3.84 TB	3503.9 GB	12 Gb SAS	✓	✓	✓	
All-Flash	SSD (SAS)	All-Flash	7.68 TB	7006.9 GB	12 Gb SAS	✓	✓	✓	
All-Flash	SSD (SAS)	All-Flash	15.36 TB	14014.9 GB	12 Gb SAS	✓	✓	✓	
Hybrid	SSD (SAS)	FAST Cache & Mixed Pool	400 GB	366.7 GB	12 Gb SAS	✓	✓	✓	
Hybrid	SSD (SAS)	Mixed Pool	800 GB	733.5 GB	12 Gb SAS	✓	✓	✓	
Hybrid	SSD (SAS)	Mixed Pool	1.6 TB	1467.45 GB	12 Gb SAS	✓	✓	✓	
Hybrid	SSD (SAS)	Mixed Pool	3.2 TB	2919.9 GB	12 Gb SAS	✓	✓	✓	
Hybrid	SSD (SAS)	All-Flash	7.6 TB	7006.9 GB	12 Gb SAS	✓	✓	✓	
Hybrid	10K HDD (SAS)	Mixed Pool	600 GB	536.7 GB	12 Gb SAS	✓	✓	✓	
Hybrid	10K HDD (SAS)	Mixed Pool	1.2 TB	1100.5 GB	12 Gb SAS	✓	✓	✓	
Hybrid	10K HDD (SAS)	Mixed Pool	1.8 TB	1650.8 GB	12 Gb SAS	✓	✓	✓	
Hybrid	7.2K HDD (NL-SAS)	Mixed Pool	4.0 TB	3668.6 GB	12 Gb SAS				✓
Hybrid	7.2K HDD (NL-SAS)	Mixed Pool	6.0 TB	5505.0 GB	12 Gb SAS				✓
Hybrid	7.2K HDD (NL-SAS)	Mixed Pool	12.0 TB	10948.7 GB	12 Gb SAS				✓

*GB = Base2 GiB (GiB = 1024x1024x1024)
All drives are 520 bytes/sector.
All drives are non-SED. Data at Rest Encryption is done via the storage controller

Dell EMC Unity OE Protocols and Software Facilities

Support is provided for a wide variety of protocols and advanced features available via various software suites, plug-ins, drivers and packs.

Protocols and Facilities Supported		
Access-based Enumeration (ABE) for SMB protocol	Address Resolution Protocol (ARP)	Block Protocols: iSCSI, Fibre Channel (FCP SCSI-3)
Container Storage Interface (CSI) Driver	Controller based Data at Rest Encryption (D@RE), with self-managed keys	DFS Distributed File System (Microsoft) as Leaf node or Standalone Root Server
Direct Host Attach for Fibre Channel and iSCSI	Dynamic Access Control (DAC) with claims support	Fail-Safe Networking (FSN)
Internet Control Message Protocol (ICMP)	Kerberos Authentication	Key Management Interoperability Protocol (KMIP) compliant external key manager for D@RE
LDAP (Lightweight Directory Access Protocol)	LDAP SSL	Link Aggregation for File (IEEE 802.3ad)
Lock Manager (NLM) v1, v2, v3, and v4	Management & Data Ports IPv4 and/or IPv6	NAS Servers Multi-protocol for UNIX and SMB clients (Microsoft, Apple, Samba)
Network Data Management Protocol (NDMP) v1-v4, 2-way & 3-way	Network Information Service (NIS) Client	Network Status Monitor (NSM) v1 Network Status Monitor (NSM) v1
Network Time Protocol (NTP) client	NFS v3/v4 Secure Support	NT LAN Manager (NTLM)
Portmapper v2	REST API: Open API that uses HTTP requests to provide management	Restriction of Hazardous Substances (RoHS) compliance
RSVD v1 for Microsoft Hyper-V	Simple Home Directory access for SMB protocol	SMI-S v1.6.1 compatible Dell EMC Unity Block & File client
Simple Mail Transfer Protocol (SMTP)	Simple Network Management Protocol v2c & v3 (SNMP)	Virtual LAN (IEEE 802.1q)
VMware® Virtual Volumes (VVols) 2.0	VMware® vRealize™ Orchestrator (vRO) Plug-in	

Security & Compliance (applies to all Dell EMC Unity XT systems, except Dell EMC UnityVSA)
Department of Defense Information Network Approved Products List (DODIN APL) – Dell EMC Unity O.E. v5.1 Listed
Common Criteria
Controller based Data at Rest Encryption (D@RE) with self-managed keys
KMIP compliant external key manager for D@RE
FIPS 140-2 Level 1 validation
IPv6 and dual stack (IPv4) modes of operation
Native SHA2 certificate
Security Technical Implementation Guide /Security Requirements Guide (STIG/SRG)
TLS 1.2 support and TLS 1.0/1.1 disablement
File-Level Retention: Enterprise FLR-E and Compliance FLR-C with requirements for SEC rule 17a-4(f)

Software	
All Inclusive Base Software	Management Software: • Unisphere: Element Manager • Unisphere Central: Consolidated dashboard and alerting • CloudIQ: Cloud-based storage analytics • Thin Provisioning • Dynamic Pools - All-Flash Arrays (AFA) only • Data Reduction: Zero Detect/Deduplication/Compression (AFA and All-Flash Pools in Hybrid Arrays, Block & File) • Host Groups • Proactive Assist: Configure remote support, online chat, open a service request, etc. • Quality of Service (Block and VVols) • Dell EMC Storage Analytics Adapter for VMware® vRealize™ • File & Block Tiering / Archiving to Public/Private Cloud (Cloud Tiering Appliance) • File-Level Retention (FLR-E & FLR-C) Unified Protocols: • File • Block • VVols Local Protection: • Controller Based Encryption (optional), with self-managed or external key management • Local Point-In-Time Copies (Snapshots and Thin Clones) • AppSync Basic • Dell EMC Common Event Enabler; AntiVirus Agent, Event Publishing Agent Remote Protection: • Native Asynchronous Block & File Replication, including bandwidth throttling • Native Synchronous Block & File Replication, including bandwidth throttling • MetroSync Manager (optional software to automate synchronous file replication sessions) • Snapshot Shipping • Dell EMC RecoverPoint Basic Migration: • Native Block & File migration from Dell EMC VNX • SAN Copy Pull: Integrated Block migration from 3rd party arrays Performance Optimization for Hybrid Arrays: • FAST Cache • FAST VP
Interface Protocols	NFSv3, NFSv4, NFSv4.1; CIFS (SMB 1), SMB 2, SMB 3.0, SMB 3.02, and SMB 3.1.1; FTP and SFTP; FC, iSCSI and VMware Virtual Volumes (VVols) 2.0
Optional Solutions	• AppSync Advanced • Connectrix SAN • Data Protection Suite: Backup, Archive and Collaboration Software • Dell EMC RecoverPoint Advanced • Dell EMC RP4VM • PowerPath Migration Enabler • PowerPath Multipathing • Unity XT metro node • VPLEX
Note: For more details on software licensing, please contact your sales representative	

Virtualization Solutions

Dell EMC Unity offers support for a wide variety of protocol and advanced features available via various software suites and packs including but not limited to:

- OpenStack Cinder Driver: For provisioning and managing block volumes within an OpenStack environment
- OpenStack Manila Driver: For managing shared file systems within an OpenStack environment
- Dell EMC Virtual Storage Integrator (VSI) for VMware vSphere™: For provisioning, management, and cloning
- VMware Site Recovery Manager (SRM) Integration: Managing failover and failback making disaster recovery rapid and reliable
- Virtualization API Integration: VMware: VAAI and VASA. Hyper-V: Offloaded Data Transfer (ODX) and Offload Copy for File
- Ansible Module for Unity

Electrical Specifications

All power figures shown represent a worst case product configuration with max normal values operating in an ambient temperature environment of 20°C to 25°C.

The chassis power numbers provided may increase when operating in a higher ambient temperature environment.

Disk Processor Enclosure (DPE)				
	380F/380 DPE 25 2.5" SFF drives and four IO modules	480F/480 DPE 25 2.5" SFF drives and four IO modules	680F/680 DPE 25 2.5" SFF drives and four IO modules	880F/880 DPE 25 2.5" SFF drives and four IO modules
POWER				
AC Line Voltage	100 to 240 VAC ± 10%, single phase, 47 to 63 Hz			
AC Line Current (operating maximum)	10.07 A max at 100 VAC; 5.04 A max at 200VAC	10.6 A max at 100 VAC; 5.3 A max at 200VAC	11.72 A max at 100 VAC; 5.86 A max at 200VAC	14.41 A max at 100 VAC; 7.2 A max at 200VAC
Power Consumption (operating maximum)	1007 VA (970.5 W) max at 100 VAC; 1007 VA (970.5 W) max at 200 VAC	1060 VA (1050 W) max at 100 VAC; 1060 VA (1050 W) max at 200 VAC	1172 VA (1161 W) max at 100 VAC; 1172 VA (1161 W) max at 200 VAC	1440.77 VA (1411.96 W) max at 100 VAC; 1440.77 VA (1411.96 W) max at 200 VAC
Power Factor	0.95 minimum at full load, @ 100/ 200 VAC			
Heat Dissipation (operating maximum)	3.49 x 10^6 J/hr, (3,311 Btu/hr) max at 100 VAC; 3.49 x 10^6 J/hr, (3,311 Btu/hr) max (100V)	3.78 x 10^6 J/hr, (3,581 Btu/hr) max at 100 VAC; 3.78 x 10^6 J/hr, (3,581 Btu/hr) max 200VAC	4.18 x 10^6 J/hr, (3,960 Btu/hr) max at 100 VAC; 4.18 x 10^6 J/hr, (3,960 Btu/hr) max 200VAC	5.08 x 10^6 J/hr, (4,818 Btu/hr) max at 100 VAC; 5.08 x 10^6 J/hr, (4,818 Btu/hr) max 200VAC
In-rush Current	45 Apk "cold" per line cord, at any line voltage			
Startup Surge Current	120 Apk "hot" per line cord, at any line voltage			
AC Protection	15 A fuse on each power supply, single line	20 A fuse on each power supply, single line		
AC Inlet Type (High Line)	IEC320-C14 appliance coupler, per power zone			
AC Inlet Type (Low Line)	IEC320-C20 appliance coupler, per power zone			IEC320-C14 appliance coupler, per power zone*
Ride-through Time	10 ms min			
Current Sharing	± 5 percent of full load, between power supplies			
* Requires customer supplied step-up transformer				

DIMENSIONS				
Weight kgs/lbs	empty 24.60/54.11	empty 25.90/57.10	empty 25.90/57.10	empty 25.90/57.10
Vertical size	2 NEMA units	2 NEMA units	2 NEMA units	2 NEMA units
Height cm/inches	8.88/3.5	8.72/3.43	8.72/3.43	8.72/3.43
Width cm/inches	44.76/17.62	44.72/17.61	44.72/17.61	44.72/17.61
Depth cm/inches	61.39/24.17	79.55/31.32	79.55/31.32	79.55/31.32
Note: Power consumption values for DPEs and DAEs are based on fully populated enclosures (power supplies, drives and I/O modules).				

Disk Array Enclosure (DAE)			
	25 X 2.5” Drive DAE	80 X 2.5” Drive DAE	15 X 3.5” Drive DAE
POWER			
AC Line Voltage	100 to 240 VAC ± 10%, single phase, 47 to 63 Hz		
AC Line Current (operating maximum)	4.50 A max at 100 VAC, 2.40 A max at 200 VAC	13.18 A max at 100 VAC, 6.59 A max at 200 VAC	2.90 A max at 100 VAC, 1.60 A max at 200 VAC
Power Consumption (operating maximum)	453.0 VA/ 432.0 W max at 100 VAC 485.0 VA/ 427.0 W max at 200VAC	1318.0 VA/ 1233.0 W max at 100 VAC 1318.0 VA/ 1233.0 W max at 200VAC	287.0 VA/ 281.0 W max at 100 VAC 313.0 VA/ 277.0 W max at 200VAC
Power Factor	0.95 minimum at full load, @ 100V/200V		0.90 minimum at full load, @ 100V/200V
Heat Dissipation (operating maximum)	1.56 x 10^6 J/hr, (1,474 Btu/hr) max at 100 VAC 1.54 x 10^6 J/hr, (1,457 Btu/hr) max at 200 VAC	4.43 x 10^6 J/hr, (4,207 Btu/hr) max at 100 VAC 4.43 x 10^6 J/hr, (4,207 Btu/hr) max at 200 VAC	1.01 x 10^6 J/hr, (959 Btu/hr) max at 100 VAC 1.00 x 10^6 J/hr, (945 Btu/hr) max at 200 VAC
In-rush Current	30 Apk “cold” per line cord, at any line voltage	45 Apk “cold” per line cord, at any line voltage	30 A max “cold” for ½ line cycle, per line cord at 240 VAC
Startup Surge Current	40 Apk “cold” per line cord, at any line voltage	120 Apk “hot” per line cord, at any line voltage	25 Amps peak max per line cord, at any line voltage
AC Protection	15 A fuse on each power supply, single line		10 A fuse on each power supply, single line
AC Inlet Type	IEC320-C14 appliance coupler, per power zone		
Ride-through Time	12 ms minimum	10 ms minimum	30 ms minimum
Current Sharing	± 5 percent of full load, between power supplies		Droop Load Sharing
WEIGHT AND DIMENSIONS			
Weight kg/lbs	Empty: 10.0/22.1 Full: 20.23/44.61	Empty: 11.33/25 Full: 58.9/130	Empty: 14.5/32 Full: 30.8/68
Vertical size	2 NEMA units	3 NEMA units	3 NEMA units
Height cm/inches	8.46/3.40	13.21/5.20	13.33/5.25
Width cm/inches	44.45/17.5	44.70/17.6	44.45/17.5
Depth cm/inches	33.02/13	76.20/30	35.56/14
Note: Power consumption values for DPEs and DAEs are based on fully populated enclosures (power supplies, drives and I/O modules).			

Cabinets	
	Standard 40U Cabinet
AC Line Voltage	200 to 240 VAC ± 10%, single-phase, 47 to 63 Hz
Power Configuration	One, two, three or four power domains, each redundant
Power Inlet Count	Two, four, six, or eight (two per domain)
Plug Types	NEMA L6-30P or IEC309-332 P6 or IP57 (Australia)
Input Power Capacity	1 Domain: 4,800 VA @ 200 VAC, 5,760 VA @ 240 VAC 2 Domain: 9,600 VA @ 200 VAC, 11,520 VA @ 240 VAC 3 Domain: 14,400 VA @ 200 VAC, 17,280 VA @ 240 VAC 4 Domain: 19,200 VA @ 200 VAC, 20,040 VA @ 240 VAC
AC Protection	30 A site circuit breakers on each power branch
40U Cabinet Dimensions	Height - 75 in (190.8 cm); Width - 24.0 in (61.1 cm); Depth - 39.0 in (99.2 cm); Weight Empty – 380 lb (173 kg)

Operating environment

The Dell EMC Unity XT 480F/480 – 880F/880 models meet ASHRAE Equipment Class A3 and the 380F/380 models meet ASHRAE Equipment Class A4.

	Description	Specification
Recommended Range Operation	The limits under which equipment will operate the most reliably while still achieving reasonably energy-efficient data center operation.	18°C to 27°C (64.4°F to 80.6°F) at 5.5°C (59°F) dew.
Continuous Allowable Range Operation	Data center economization techniques (e.g. free cooling) may be employed to improve overall data center efficiency. These techniques may cause equipment inlet conditions to fall outside the recommended range but still within the continuously allowable range. Equipment may be operated without any hourly limitations in this range.	5°C to 35°C (50°F to 95°F) at 20% to 80% relative humidity with 21°C (69.8°F) maximum dew point (maximum wet bulb temperature). De-rate maximum allowable dry bulb temperature at 1°C per 300m above 950m (1°F per 547 ft above 3117 ft).
Improbable Operation (Excursion Limited)	During certain times of the day or year, equipment inlet conditions may fall outside the continuously allowable range but still within the expanded improbable range. Equipment operation is limited to ≤ 10% of annual operating hours in this range.	35°C to 40°C (with no direct sunlight on the equipment) at -12°C dew point and 8% to 85% relative humidity with 24°C dew point (maximum wet bulb temperature). Outside the continuously allowable range (10°C to 35°C), the system can operate down to 5°C or up to 40°C for a maximum of 10% of its annual operating hours. For temperatures between 35°C and 40°C (95°F to 104°F), de-rate maximum allowable dry bulb temperature by 1°C per 175m above 950m (1°F per 319 ft above 3117 ft).
Exceptional Operation (Excursion Limited) ASHRAE 4 only	During certain times of the day or year, equipment inlet conditions may fall outside the continuously allowable range but still within the expanded exceptional range. Equipment operation is limited to ≤ 1% of annual operating hours in this range.	40°C to 45°C (with no direct sunlight on the equipment) at -12°C dew point and 8% to 90% relative humidity with 24°C dew point (maximum wet bulb temperature). Outside the continuously allowable range (10°C to 35°C), the system can operate down to 5°C or up to 45°C for a maximum of 1% of its annual operating hours. For temperatures between 35°C and 45°C (95°F to 104°F), de-rate maximum allowable dry bulb temperature by 1°C per 125m above 950m (1°F per 228 ft above 3117 ft).
Temperature Gradient		20°C / hour (36°F / hour)
Altitude	Max Operating	3050m (10,000ft)

Statement of Compliance

Dell EMC Information Technology Equipment is compliant with all currently applicable regulatory requirements for Electromagnetic Compatibility, Product Safety, and Environmental Regulations where placed on market.

Detailed regulatory information and verification of compliance is available at the Dell Regulatory Compliance website. http://dell.com/regulatory_compliance

Learn more about Dell EMC Unity XT solutions

Contact a Dell EMC Expert

VMware vSphere

The leader in virtualized infrastructure and your first step to application modernization

AT A GLANCE

VMware vSphere® is the industry leading compute virtualization platform.

vSphere 7 has been rearchitected with native Kubernetes for application modernization. Developers can't afford infrastructure that slows them down – businesses rely on developers to rapidly develop and deploy applications to accelerate digital transformation. On the other hand, IT teams are challenged to deliver modern infrastructure that supports modern container-based application development, including the services and tools to build new applications.

Using vSphere 7, customers and partners can now deliver a developer-ready infrastructure, scale without compromise and simplify operations.

VMware delivers a simple Kubernetes implementation so that customers can run existing enterprise applications alongside containerized applications in a unified manner, while maintaining application portability.

vSphere with Tanzu helps customers modernize the 70M+ workloads running on vSphere and is the fastest way to get started with Kubernetes workloads on developer-ready infrastructure.

Why VMware vSphere®?

vSphere 7 is the biggest release of vSphere in over a decade. With the latest release, VMware vSphere® with VMware Tanzu™ enables millions of IT administrators across the globe to get started with Kubernetes workloads within an hour[1].

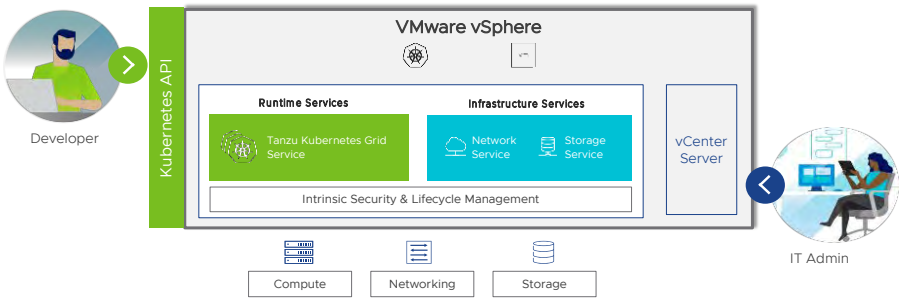

FIGURE 1: VMware vSphere with Tanzu[2]

vSphere 7 has been rearchitected with native Kubernetes to enable IT Admins to use vCenter Server® to operate Kubernetes clusters through namespaces. VMware vSphere with Tanzu allows IT Admins to operate with their existing skillset and deliver a self-service access to infrastructure for the Dev Ops teams; while providing observability and troubleshooting for Kubernetes workloads.

vSphere 7 provides an enterprise platform for both traditional applications as well as modern applications – so customers and partners can deliver a developer-ready infrastructure, scale without compromise and simplify operations.

Deliver Developer-ready Infrastructure: IT teams can use existing vSphere environments to set up an Enterprise-grade Kubernetes infrastructure at a rapid pace (within one hour), while enabling enterprise-class governance, reliability, and security. After this one-time setup, vSphere with Tanzu enables a simple, fast and self-service provisioning of Tanzu Kubernetes clusters within a few minutes[1]. Aligning DevOps teams and IT teams is critical to the success of modern application development; to bring efficiency, scale and security to Kubernetes deployments and operations. vSphere with Tanzu brings agile cloud operations to the IT admin to enable this transition into the role of Cloud Admin or SRE by delivering agility in day to day IT operations related to Kubernetes infrastructure.

Scale Without Compromise: vSphere can scale your infrastructure to meet the demands of high-performance applications and memory intensive databases including SAP HANA® and Epic® Caché Operational Database to name a few. With vSphere 7, a vSphere cluster can now support 50% more hosts compared to previous releases.

Simplify Operations: Simplified operations are delivered through key capabilities of vSphere 7 including elastic AI/ML infrastructure for sharing resources, simplified lifecycle management and intrinsic security across your hybrid cloud infrastructure.

KEY BENEFITS

- Deliver Developer-Ready Infrastructure
  - Drop-in Enterprise grade Kubernetes to existing vSphere infrastructure within an hour[1]
  - TKG service enables self-service provisioning of Kubernetes clusters within a few minutes and simplified operations of cloud native workloads
  - Application focused management allows IT admins to implement policy for namespaces, and manage access and quota allocation for developers
- Scale Without Compromise
  - Industry leading Monster VMs scale up to 24TB and 768 vCPUs
  - Increased cluster scale to support up to 96 hosts per cluster
- Boost Infrastructure and Data Security
  - Easier to enable encryption and advanced security with vSphere Native Key Provider
  - Confidential Containers for vSphere Pods on AMD systems protect modern applications in use
  - vSphere Product Audit Guides & FIPS validation ease compliance audits
- Simplify Operations
  - vSphere Ideas® to capture customer feedback and feature requests
  - vCenter connect® to manage on-premises and off-premises (cloud providers) servers using a single interface
  - Easier and less disruptive maintenance with Suspend-to-Memory and Desired Image Seeding

LEARN MORE

Learn how others are using vSphere:
Try online for free: *vSphere with Tanzu Hands-on Labs*.
Try online for free: *vSphere Hands-on Labs*.

For more information or to purchase VMware products, call 877-4-VMWARE (outside North America, +1-650-427-5000), visit vmware.com/products, or search online for an authorized reseller. For detailed product specifications and system requirements, refer to the vSphere documentation.

Key features and capabilities

- **TKG Service[2]:** Run the Tanzu Kubernetes Grid service directly on vSphere to simplify operation of Kubernetes on-premises by putting cloud native constructs at the IT Admin's fingertips. TKG allows IT admins to manage conformant Kubernetes, while providing developers self-service access to infrastructure. vSphere with Tanzu enables a simple, fast and self-service provisioning of Tanzu Kubernetes clusters within a few minutes[1].
- **Drop-in to existing infrastructure[2]:** Quickly deploy Kubernetes workloads on existing infrastructure with enterprise-grade governance, reliability, and security. Leverage existing networking infrastructure (or BYO networking) using vSphere Distributed Switch's (VDS) centralized interface to configure, monitor and administer switching access for VMs and Kubernetes workloads. Deploy existing block and file storage infrastructure (BYO storage) for containerized workloads. Choose your own L4 load balancing solution using HAProxy (commercial support offered directly by HAProxy) for Tanzu Kubernetes clusters.
- **Application focused management[2]:** Kubernetes makes vSphere better by providing DevOps teams (Platform Operators and SREs) with self-service access to infrastructure through Kubernetes APIs. vSphere makes Kubernetes better by empowering IT admins to use vCenter Server skills/tools to operate modern applications, alongside VMs, using namespaces as a unit of management. Using application focused management, IT admins can use vCenter Server to observe and troubleshoot Tanzu Kubernetes clusters alongside VMs, implement role-based access and allocate capacity to developer teams.
- **VM-ready AI**: For artificial intelligence (AI) projects, customers can incorporate the latest generation of NVIDIA GPUs, including the NVIDIA® Ampere A100, into their virtual environment. Multi-Instance GPU (MIG) allows a physical GPU to be partitioned into up to 7 instances shared across multiple users. These instances can be moved with vMotion to other hosts supporting the same GPU technology.
- **Monster VMs:** Improve scale for Monster VMs to support massive environments. Scale up to 24TB memory and support up to 768 vCPUs through Monster VMs, leaving other hypervisor vendors far behind in the category. Speed-up the ESXi scheduler and co-scheduling logic for large VMs using selective latency sensitivity setting for workloads, removal of bottlenecks in vCPU sleep/wakeup paths, and a reduced memory overhead.
- **Persistent Memory (PMEM) workload resilience:** Workloads using Persistent Memory (PMEM), such as SAP HANA, can take advantage of vSphere HA (High Availability) to minimize downtime and improve resilience. PMEM workloads can failover to other PMEM hosts within the cluster.
- **Lifecycle Manager (vLCM) enhancements:** Simplify software upgrades, patching, and firmware updates for vSphere, vSAN and NSX-T with a single tool. vLCM will also monitor for desired image compliance continuously and enable simple remediation in the event of any compliance drift. Desired image seeding simplifies configuration of desired state by replicating the configuration information based on a reference host so users do not need to manually configure the desired state, saving time and avoiding data entry errors.
- **vSphere Ideas®**: Submit feature requests right from the vSphere Client UI, track the status of the feature requests and look at all the other feature requests submitted by other users to vote for them, through the Ideas portal.
- **vCenter connect®:** Manage on-premises and off-premises (cloud providers) vCenter Servers in a single interface using the any to any vCenter connect capability.

1. Based on internal VMware testing and expectations for a production environment, where appropriate networking settings are preconfigured for consumption.

2. Available only through the Tanzu Basic edition. Pre-requirements for 'vSphere with Tanzu' capabilities are that customers already have the vSphere Enterprise plus edition, and that they have upgraded to vSphere 7 Update 1.

VMware, Inc. 3401 Hillview Avenue Palo Alto CA 94304 USA Tel 877-486-9273 Fax 650-427-5001 www.vmware.com.

VMWARE vCENTER SERVER

Centrally Managed Virtual Infrastructure Delivered with Confidence

AT A GLANCE

VMware vCenter Server® provides a centralized and extensible platform for managing virtual infrastructure. vCenter Server manages VMware vSphere® environments, giving IT administrators simple and automated control over the virtual environment to deliver infrastructure with confidence.

KEY BENEFITS

- Reduce management complexity and time taken for large scale deployments
- Enable seamless hybrid cloud experience by providing unified visibility, manageability and operations across on-premises environment and a vSphere based public cloud
- Analyze and remediate issues quickly with visibility into vSphere virtual infrastructure
- Deliver the security and availability of vSphere through automated proactive management features such as automated load balancing and out-of-the-box automation workflows
- Extend virtualization capabilities using third-party ecosystem solutions
- vSphere 6.7 is 2x faster than vSphere 6.5 in terms of vCenter Operations per second
- 3x faster DRS related operations in vCenter Server Appliance 6.7
- 3x reduced memory usage with vCenter Server Appliance 6.7

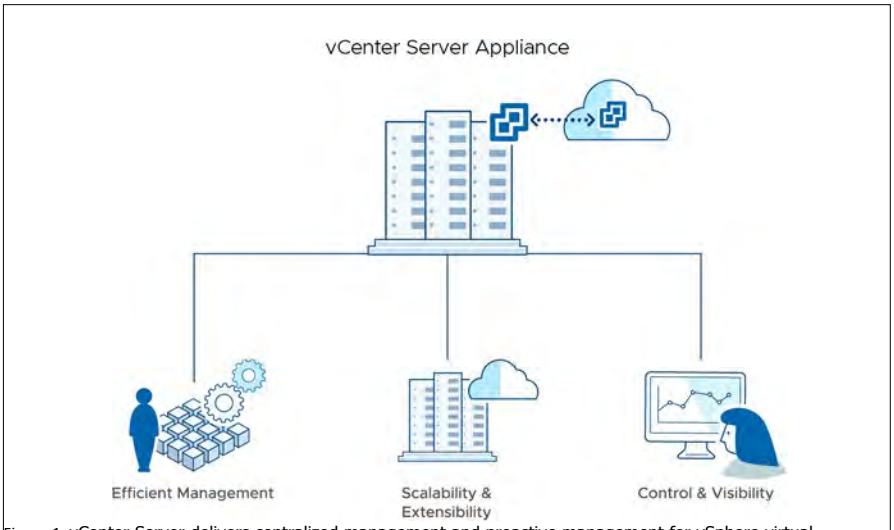

Figure 1: vCenter Server delivers centralized management and proactive management for vSphere virtual infrastructure.

What is VMware vCenter Server?

VMware vCenter Server provides centralized management of vSphere virtual infrastructure. IT administrators can ensure security and availability, simplify day-to-day tasks, and reduce the complexity of managing virtual infrastructure.

How Does vCenter Server Work?

Centralized Control and Visibility at Every Level

vCenter Server provides centralized management of virtualized hosts and virtual machines from a single console. It gives administrators deep visibility into the configuration of the critical components of a virtual infrastructure—all from one place.

With vCenter Server, virtual environments are easier to manage: a single administrator can manage hundreds of workloads, more than doubling typical productivity when managing physical infrastructure. As the vCenter Server Appliance™ is on Photon OS, there is no third-party dependency for patches and upgrades.

Virtual Infrastructure Delivered With Confidence

Consistently meeting business-critical application service-level agreements (SLAs) requires automated proactive management to maximize the capabilities of vSphere. Key capabilities enabled by vCenter Server include VMware vSphere vMotion®, VMware vSphere Distributed Resource Scheduler™, VMware vSphere High Availability (HA) and VMware vSphere Fault Tolerance. VMware vRealize Orchestrator™ also gives administrators the ability to create and easily implement best-practice workflows.

With automated proactive management, vCenter Server allows service levels to be met by dynamically provisioning new services, balancing resources and automating high availability.

Extensible Platform

The open plug-in architecture of vCenter Server supports a broad range of additional capabilities from VMware and its partners. Hundreds of VMware partners integrate with vCenter Server, enabling new capabilities such as capacity management, compliance management, business continuity and storage monitoring. The vCenter Server APIs also allow integration of physical and virtual management tools for maximum flexibility.

VMware vCenter Hybrid Linked Mode allows extensibility across the on premises data center and a vSphere based public cloud. Administrators now have a single pane of glass for management and visibility across their hybrid cloud environment.

How Is vCenter Server Used?

Enterprises face ever-increasing pressure to deliver IT infrastructure at the lowest total costs while consistently meeting SLAs. By using centralized and proactive management of virtual infrastructure, enterprises can ensure that IT consistently meets the needs of business.

vSphere is the industry-leading virtualization platform. It enables users to run business-critical applications with confidence and respond to business requirements faster, while operating at the lowest cost possible.

Key Features

Centralized Control and Visibility

HTML 5 Based vSphere Client – Responsive HTML5 based vSphere client provides bleeding edge functionality.

vCenter Single Sign-on – Simplify administration by allowing users to log in once and then access all instances of vCenter Server without further authentication.

Inventory Search – Have the entire vCenter Server inventory, including virtual machines, hosts, datastores and networks, at your fingertips.

Alerts and Notifications – Support new entities, metrics and events such as datastore and virtual machine–specific alarms. These alarms can trigger new automated workflows to remedy and preempt problems.

Native Backup and Restore – Out-of-the-box file based backup option with a simple user interface, removing reliance on third-party backup solutions to protect vCenter Servers and Platform Services Controllers.

Backup & Restore Scheduler – Schedule vCenter Server Appliance backups and control the number of backups retained. Use REST APIs to ease complexity of backup and restore.

Migration Tool – Allows both migration of data from a Windows vCenter Server 5.5 or 6.0 and an upgrade of vCenter Server Appliance.

vCenter Server High Availability – Protect the vCenter Server Appliance and related services with native High Availability and RTO of less than 10 minutes.

VMware vCenter Server Converge Tool – Migrate topology from vCenter Server Appliance with External PSC into vCenter Server Appliance with Embedded PSC with ease.

Proactive Management

Host Profiles – Standardize and simplify how you configure and manage VMware ESXi™ host configurations. Capture the blueprint of a known, validated configuration—including networking, storage and security settings—and deploy it to many hosts, simplifying setup. Host profile policies can also monitor compliance.

Resource Management for Virtual Machines – Allocate processor and memory resources to virtual machines running on the same physical servers. Establish minimum, maximum and proportional resource shares for CPU, memory, disk and network bandwidth. Modify allocations while virtual machines are running. Enable applications to dynamically acquire more resources to accommodate peak performance.

Dynamic Resource Allocation – vCenter Server continuously monitors utilization across resource pools and intelligently allocates available resources among virtual machines according to predefined rules that reflect business needs and changing priorities. The result is a self-managing, highly optimized and efficient IT environment with built-in load balancing.

Cross-vCenter Mixed Version Provisioning – Enable cross-vCenter provisioning operations such as vMotion, Full Clone and cold migrate, across different vCenter versions. Ideal for hybrid cloud solutions.

Automatic Restart of Virtual Machines with VMware vSphere HA – Automatically restart virtual machines that have failed without manual intervention.

Audit Trails – Maintain records of significant configuration changes and export reports for event tracking.

Unified Patch and Upgrade Management – Using the capabilities of VMware vSphere Update Manager™, enforce compliance to patch standards through automated scanning and patching of online ESXi hosts. With the integration of the vSphere Update Manager into the vCenter Server Appliance, deployment and configuration is a snap.

Appliance Management Interface – Simple user interface that shows network and database statistics, disk space, and health in addition to CPU and memory statistics for monitoring and operational tasks.

FOR MORE INFORMATION OR TO PURCHASE VMWARE PRODUCTS

CALL
877-4-VMWARE (outside North America, +1-650 -427-5000),

VISIT
http://www.vmware.com/products, or search online for an authorized reseller. For detailed product specifications and system requirements, refer to the product documentation.

vRealize Orchestrator (included) – Simplify management by automating more than 800 tasks using out-of-the-box workflows or by assembling workflows using an easy drag-and-drop interface.

Extensible Platform

Linked Mode – vCenter Server provides scalable architecture and visibility across multiple vCenter Server instances, with roles, permissions and licenses replicated across the infrastructure. You can log in, view and search the inventories of all vCenter Servers simultaneously.

Enhanced Linked Mode with Embedded PSC – Simplify the vCenter Server topology through vCenter with embedded platform services controller. Link multiple vCenters and have seamless visibility across the environment without the need for an external platform services controller or load balancers.

Hybrid Linked Mode – Enjoy unified visibility and manageability across an on-premises vSphere environment running on one version of vCenter Server Appliance and a vSphere-based public cloud environment, such as VMware Cloud™ on AWS, running on a different version.

APIs – Integration with ecosystem partners extends capabilities of the virtual infrastructure. New APIs enable deployment of vCenter Server based on a template.

VMware, Inc. 3401 Hillview Avenue Palo Alto CA 94304 USA Tel 877-486-9273 Fax 650-427-5001 www.vmware.com

Item IV.C.2
Revenue Sufficiency
Resolution

Stantec Consulting Services Inc.
475 5th Avenue, 12th Floor
New York, NY 10017

March 24, 2022

Attention: Jeff Seward
Director of Finance
Tampa-Hillsborough Expressway Authority
1104 E. Twiggs Street
Tampa, FL 33602

Dear Mr. Seward,

Reference: Toll Covenant Revenue Sufficiency Certification FY2023

Pursuant to Section 5.07 of the Master Bond Resolution (the "Master Resolution") for the Tampa-Hillsborough Expressway Authority (THEA), the Traffic Engineer is required to certify that Pledged Funds Estimated for the following year will be sufficient to comply with estimated payments as required by the terms of the Master Resolution. The tests to be conducted per the toll covenants in the Master Resolution are summarized in **Table 1**.

Table 1: Toll Revenue Sufficiency Tests Defined by Toll Covenants in the Master Resolution

Sufficiency Test			Toll Coverage Ratio Requirements	Source
Test ID	Name	Description		
Test (i)	Net System Revenue	Net System Revenues / Debt Service	1.30	Section 5.07(B)(i)
Test (ii)	System Gross Revenue	Gross Toll Revenue / Multiple Costs	1.00	Section 5.07(B)(ii)

Net System Revenues = Gross Revenue minus Operations, Maintenance and Administrative (OM&A) Costs
Multiple Costs include the following
- OM&A
- Required deposits to OM&A Reserve Account
- Required deposits to Debt Service Account in Sinking Fund
- Required deposits to Debt Service Reserve Account in Sinking Fund
- Required deposits to the Renewal and Replacement Fund
- All other payments required except any discretionary payments pursuant to Section 4.03(J)

In the summer of 2020, Stantec conducted an investment grade traffic and toll revenue study (2020 IG T&R Study) to support the Series 2020A and 2020B bond sales and included in the official statement dated August 27, 2020. For that bond sale Stantec developed three scenarios of potential T&R as a function of the uncertain recovery from the COVID-19 pandemic (the Pandemic). For financing and budgeting purposes, THEA selected the mid-duration scenario. That forecast has outpaced actual T&R for the full FY2021 and the first 6 months of FY2022. This forecast was updated in the Spring of 2022 to reflect the quicker than anticipated recovery.

Reference: Toll Covenant Revenue Sufficiency Certification FY2023

The forecast developed assumed the standard toll indexing to occur throughout the forecast which includes an annual increase of SunPass toll rates by 2.5 percent and application of the standard toll-by-plate (TBP) surcharge by vehicle class. This and other basic assumptions of the T&R analysis are contained within the 2020 IG T&R Study including all transportation improvements from the various work programs.

The Net System Revenue Test identified as test (i) in Section 5.07 (B) of the Master Resolution is presented in Table 2. Based on the Stantec estimates and the information provided, the Net System Revenues are estimated to meet the required coverage level in FY2023.

Table 2: Test (i): Net System Revenue ($000s)

Test (i): Net System Revenue ($000s)									
Fiscal Year	System Gross Toll Revenues	Other Income	System Gross Revenues	Operating Costs	Net System Revenues	Annual Debt Service	Toll Coverage Ratio	Toll Coverage Requireme	Pass
2022	$106,683	$1,465	$108,148	$20,542	$87,606	$38,476	2.28		
2023	$110,878	$922	$111,800	$22,453	$89,347	$38,475	2.32	1.3	Yes

Gross Toll Revenue: Stantec 2022 Revised T&R Forecast
Other Income: from THEA estimates including earnings on Investments (OM&A, R&R & GR Fund Earnings) and Misc. Income
Operating Costs: operations, maintenance and administrative expenses from THEA
Annual Debt Service: All outstanding Debt Service per 2020 Official Statement
Toll Coverage Ratio: Net System Revenues / Annual Debt Service

Reference: Toll Covenant Revenue Sufficiency Certification FY2023

The System Gross Revenue Test identified as test (ii) in Section 5.07 (B) of the Master Resolution is presented in Table 3. Based on the Stantec estimates and the information provided, the System Gross Revenue or pledged revenue is estimated to meet the required coverages in FY2023. The Costs, Deposits, and Other Payments were provided by THEA.

Table 3: Test (ii): System Gross Revenues ($000s)

Test (ii): System Gross Revenue ($000s)							
Fiscal Year	Pledged Revenue			Costs, Deposits & Other Payments	Toll Coverage Ratio	Toll Coverage Requirement	Pass
	Gross Toll Revenues	Other Income	System Gross Revenues				
2022	$106,683	$1,465	$108,148	$75,137	1.44		
2023	$110,878	$922	$111,800	$91,800	1.22	1.0	Yes

Gross Toll Revenue: Stantec 2022 Revised T&R Forecast
Other Income: from THEA estimates including earnings on Investments (OM&A, R&R & GR Fund Earnings) and Misc. Income
Costs, Deposits and Other Payments: from THEA estimates including those items below

- OM&A
- Required deposits to OM&A Reserve Account
- Required deposits to Debt Service Account in Sinking Fund
- Required deposits to Debt Service Reserve Account in Sinking Fund
- Required deposits to the Renewal and Replacement Fund
- All other payments required except any discretionary payments pursuant to Section 4.03(J)

Toll Coverage Ratio: System Gross Revenues / Costs, Deposits & Payments

The limits and disclaimers for these forecasts are presented after the signature.

Regards,

Stantec Consulting Services Inc.

Rick Gobeille
Senior Principal

Limits and Disclaimers

It is Stantec's opinion that the traffic and toll revenue estimates provided herein represent reasonable and achievable levels of traffic and toll revenues that can be expected to accrue on the Selmon Expressway over the forecast period and that they have been prepared in accordance with accepted industry-wide practice. However, as should be expected with any forecast, and given the uncertainties within the current economic climate, it is important to note the following assumptions which, in our opinion, are reasonable:

- This limited synopsis presents the highlighted results of Stantec's consideration of the information available as of the date hereof and the application of our experience and professional judgment to that information. It is not a guarantee of any future events or trends. The 2020 IG T&R Study provides full detail of the assumptions, which includes gradual lifting of restrictions related to the Pandemic with no regression to the previous stricter governmental constraints.
- The traffic and toll revenue estimates will be subject to future economic and social conditions, demographic developments and regional transportation construction activities that cannot be predicted with certainty.
- The estimates contained in this document, while presented with numeric specificity, are based on a number of estimates and assumptions which, though considered reasonable to us, are inherently subject to economic and competitive uncertainties and contingencies, most of which are beyond the control of THEA and cannot be predicted with certainty. In many instances, a broad range of alternative assumptions could be considered reasonable with the availability of alternative toll schedules, and any changes in the assumptions used could result in material differences in estimated outcomes.
- The standards of operation and maintenance on all of the Selmon Expressway (as defined in the 2020 IG T&R Study) will be maintained as planned within the business rules and practices.
- The general configuration and location of the Selmon Expressway and its interchanges will remain as discussed in the 2020 IG T&R Study.
- Access to and from the Selmon Expressway will remain as discussed in the 2020 IG T&R Study.
- No other new competing highway projects are assumed to be constructed or significantly improved in the project corridor during the project period, except those identified within the 2020 IG T&R Study.
- Major highway improvements that are currently underway or fully funded will be completed as planned.
- The Selmon Expressway will be well maintained, efficiently operated, and effectively signed to encourage usage.
- No reduced growth initiatives or related controls that would significantly inhibit normal development patterns will be introduced during the forecast period.
- There will be no future serious protracted recession during the forecast period.
- There will be no protracted fuel shortage during the forecast period.

- No local, regional, or national emergency will arise that will abnormally restrict the use of motor vehicles.

In Stantec's opinion, the assumptions underlying the study provide a reasonable basis for the analysis. However, any financial projection is subject to uncertainties. Inevitably, some assumptions used to develop the projections will not be realized, and unanticipated events and circumstances may occur.

RESOLUTION NO. 668

A RESOLUTION OF THE TAMPA-HILLSBOROUGH COUNTY EXPRESSWAY AUTHORITY (THE "AUTHORITY") MAKING A DETERMINATION REGARDING THE SUFFICIENCY OF NET SYSTEM REVENUES; AND PROVIDING AN EFFECTIVE DATE.

WHEREAS, the Tampa-Hillsborough County Expressway Authority (the "Authority") is an agency of the State of Florida, established in 1963 pursuant to Chapter 348, Part II, Florida Statutes (the "Act"); and

WHEREAS, the Authority has previously adopted its Amended and Restated Master Bond Resolution on November 19, 2012 (as the same may be amended and supplemented from time to time, the "Master Bond Resolution"); and

WHEREAS, capitalized terms used but not defined herein shall have the respective meanings set forth in the Master Bond Resolution; and

WHEREAS, the Authority is obligated pursuant to Section 5.07(E) of the Master Bond Resolution to review the financial condition of the Expressway System and the Bonds in order to estimate whether the Net System Revenues for the following year will be sufficient to comply with the coverage requirements with respect to Net System Revenues as specified in Section 5.07(B) of the Master Bond Resolution;

WHEREAS, the Authority has received a Revenue Sufficiency Certificate prepared by its Traffic Engineer who has determined that Net System Revenues will be sufficient to comply with the provisions stated above for fiscal year ending June 30, 2023;

NOW, THEREFORE, BE IT RESOLVED BY THE GOVERNING BOARD OF THE TAMPA-HILLSBOROUGH COUNTY EXPRESSWAY AUTHORITY THAT:

SECTION 1. SUFFICIENCY DETERMINATION. Based on the Authority's review of the financial condition of the Expressway System and the Bonds and upon the estimated Net System Revenues for the immediately succeeding Fiscal Year as set forth in the revenue sufficiency certificate, the Authority has determined that, based on the information currently available to the Authority, Net System Revenues will be sufficient to comply with the coverage requirements with respect to Net System Revenues as specified in Section 5.07(B) of the Master Bond Resolution.

SECTION 2. EFFECTIVE DATE. This Resolution shall take effect immediately upon its passage.

This Resolution was approved and adopted by the Tampa-Hillsborough County Expressway Authority on March 28, 2022.

TAMPA-HILLSBOROUGH COUNTY EXPRESSWAY AUTHORITY

By:_____
Vincent J. Cassidy
Chairman

ATTEST:

By:_____
Daniel Alvarez
Secretary

Approved as to form and legal sufficiency for the sole use and reliance of the Authority and its Board:

_____
Amy E. Lettelleir, Esquire
General Counsel

Item VI.A.2
Contract Renewals

Report month: March 2022

CONTRACT RENEWAL
and
EXPIRATION REPORT
(> $30,000)

Project Manager	Firm	Description of Services	Contract Effective Date	Contract Expiration Date	Term of Contract (Years)	Bid / Renew / End
Bob	**HDR**	**Misc. Planning & Traffic**	**9/11/2019**	**9/11/2022**	**3 Years + 2 additional one-year renewal option**	**Renew** (1st year renewal ~ 9/12/22 - 9/11/23)
Bob	**Yunex f/k/a Siemens**	**Misc. Emerging Technology Svcs.**	**9/6/2019**	**9/6/2022**	**3 Years + 2 additional one-year renewal option**	**Renew** (1st year renewal ~ 9/7/22 - 9/6/23)

Report month: March 2022

CONTRACT RENEWAL
and
EXPIRATION REPORT
(> $30,000)

Bob	**Kimley-Horn & Associates**	**Misc. Trails, Parks & Community Enhancement**	**10/1/2019**	**10/1/2022**	**3 Years + 2 additional one-year renewal option**	**Renew** (1st year renewal ~ 10/2/22 - 10/1/23)
Brian	**Burgess & Niple f/k/a ICON**	**Misc. Design & Construction Engineering Inspection (CEI)**	**10/10/2019**	**10/10/2022**	**3 Years + 2 additional one-year renewal option**	**Renew** (1st year renewal ~ 10/11/22 - 10/10/23)
Bob	**RS&H**	**Misc. Planning & Traffic**	**9/9/2019**	**9/9/2022**	**3 Years + 2 additional one-year renewal option**	**Renew** (1st year renewal ~ 9/10/22 - 9/9/23)

Report month: March 2022

CONTRACT RENEWAL
and
EXPIRATION REPORT
(> $30,000)

Bob	**Marlin Engineering, Inc.**	**Misc. Emerging Technology Svcs.**	**10/1/2019**	**10/1/2022**	**3 Years + 2 additional one-year renewal option**	**Renew** (1st year renewal ~ 10/2/22 - 10/1/23)
Bob	**WGI**	**Misc. Planning & Traffic**	**10/12019**	**10/1/2022**	**3 Years + 2 additional one-year renewal option**	**Renew** (1st year renewal ~ 10/2/22 - 10/1/23)