

**CITY OF EL PASO, TEXAS
AGENDA ITEM
DEPARTMENT HEAD'S SUMMARY FORM**

CITY CLERK DEPT.
2018 JUL 31 PM 7:26

DEPARTMENT: Capital Improvement

AGENDA DATE: August 7, 2018

CONTACT PERSON/PHONE: Sam Rodriguez, P.E., City Engineer, (915) 212-1845

DISTRICT(S) AFFECTED: 2, 4, & 8

STRATEGIC GOAL: No. 7: Enhance and Sustain El Paso's Infrastructure Network

SUBJECT:

That the City Engineer is authorized to approve a Change Order to the Dyer Corridor RTS project, Contract No. 2016-832 with Jordan Foster Construction, LLC., in the amount of THREE HUNDRED ELEVEN THOUSAND FORTY NINE AND 40/100 DOLLARS (\$311,049.40) for the additional cost related to the LED lighting components needed for the station canopy shelters and pylon signs; and that the City Manager be authorized to establish the funding sources and make any necessary budget transfers.

BACKGROUND / DISCUSSION:

The Dyer Rapid Corridor Transit System (RTS) project contains station canopy shelters that require the furnishing and installation of colored LED lights, 60W drivers and associated components/hardware to provide a completed lighting solution for the canopy shelters and pylon signs. The contract documents for this project did not include detailed specifications for the necessary lighting components which has resulted in the need for a change order. The contractor and city have negotiated and have agreed on a fair and reasonable cost for these lighting components. This change order is within project budget. CID is also currently working with the Legal Department to evaluate recovering a portion of the cost from the engineering consultant over this work.

PROTEST

☒ No protest received for this requirement.

☐ Protest received.

COUNCIL REPRESENTATIVE BRIEFING:

Was a briefing provided? ☐ Yes or ☒ No

If yes, select the applicable districts.

- ☐ District 1
- ☐ District 2
- ☐ District 3
- ☐ District 4
- ☐ District 5
- ☐ District 6
- ☐ District 7
- ☐ District 8
- ☐ All Districts

AMOUNT AND SOURCE OF FUNDING:

Total = \$311,049.40
\$110,188.05 - FTA
\$137,717.76 - FHWA
\$63,143.59 - City

CITY CLERK DEPT.
2018 JUL 31 PM2:24

BOARD / COMMISSION ACTION:

N/A

*****REQUIRED AUTHORIZATION*****

DEPARTMENT HEAD:

FOR SAM RODRIGUEZ *[Signature]*
07

RESOLUTION

CITY CLERK DEPT.
2018 JUL 31 PM 2:25

BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF EL PASO:

That the City Engineer is authorized to approve a Change Order to the Dyer Corridor RTS project, Contract No. 2016--832 with Jordan Foster Construction, LLC., in the amount of THREE HUNDRED ELEVEN THOUSAND FORTY NINE AND 40/100 DOLLARS (\$311,049.40) for the additional cost related to the LED lighting components needed for the station canopy shelters and pylon signs; and that the City Manager be authorized to establish the funding sources and make any necessary budget transfers.

ADOPTED THIS _____ DAY OF _____ 2018.

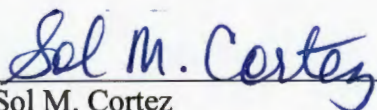
CITY OF EL PASO:

Dee Margo,
Mayor

ATTEST:

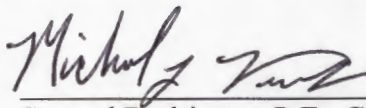
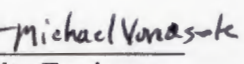
Laura D. Prine, City Clerk

APPROVED AS TO FORM:



Sol M. Cortez
Senior Assistant City Attorney

APPROVED AS TO CONTENT

fs Samuel Rodriguez, P.E., City Engineer
Capital Improvement Department

CITY OF EL PASO CONSTRUCTION CHANGE ORDER

CONSTRUCTION CHANGE ORDER NO.: **8**

DATE: **July 24, 2018**

☒

SCOPE CHANGE

PROJECT: **Dyer Corridor Rapid Transit System**

SOLICITATION NO.: **2016-832**

☒

CONSTRUCTION CHANGE

Original Contract Amount:	\$	12,087,564.05
Net Change by previous Change Orders:	\$	772,803.67
Net Change by previous Construction Quantity Notices:	\$	-
Amount of this Construction Change Order:	\$	311,049.40
New Amended Contract Amount:	\$	13,171,417.12
Change Order Percentage:		8.97%

Contract Time to Substantial Completion	330
Total days added due to Change Orders and CQN's	0
Total days added for this Change Order	0
New Contract Time to Substantial Completion:	330
Current Substantial Completion Due Date	2/6/2018

CONTRACTOR NAME: **Jordan Foster Construction**

Please provide a detailed scope of work of the change order (see back for reason/justification):

• **Change Item No. 01:** Contractor shall provide the necessary equipment, manpower, tools, expertise, coordination, and incidentals to furnish and install the approved **Purple LED lights (150 Lights per Reel)** on the proposed station canopies and pylon structures. The LED lights shall be in conformance with the approved product submittal and as directed in the mock-up meeting held with Sun Metro on July 20, 2017. The change item totals an **INCREASE** in the contract amount of **\$152,294.80** based on an estimated quantity of **19,960 LF** at a negotiated unit price of **\$7.63/LF**. The negotiated unit price shall be an **incremental cost** to the current bid unit price. There will be **no contract time increase** on this change item. The estimated linear feet of LED lights is distributed as follows:

- BB1 162 - ILLUM 2 CANOPY SIDE LIGHT FIXTURE	5,808 LF x \$7.63/LF = \$44,315.04 (City's ROW)
- BB2 146 - ILLUM 2 CANOPY SIDE LIGHT FIXTURE	11,652 LF x \$7.63/LF = \$88,904.76 (TxDOT's ROW)
- BB4 002 - ILLUM 2 CANOPY SIDE LIGHT FIXTURE	2,500 LF x \$7.63/LF = \$19,075.00 (Spare Material)

• **Change Item No. 02:** Contractor shall provide the necessary equipment, tools, expertise, coordination, and incidentals to furnish the approved **Power Supply Driver** as required for the proposed LED lights on the station **Canopies**. The change item totals an **INCREASE** in the contract amount of **\$74,094.00** based on an estimated quantity of **932 EA** at a negotiated unit price of **\$79.50/EA**. There will be **no contract time increase** on this change item. The estimated power supply drivers are distributed as follows:

- BB1 162 - ILLUM 2 CANOPY SIDE LIGHT FIXTURE	273 EA x \$79.50/EA = \$21,703.50 (City's ROW)
- BB2 146 - ILLUM 2 CANOPY SIDE LIGHT FIXTURE	548 EA x \$79.50/EA = \$43,566.00 (TxDOT's ROW)
- BB4 002 - ILLUM 2 CANOPY SIDE LIGHT FIXTURE	111 EA x \$79.50/EA = \$8,824.50 (Spare Material)

• **Change Item No. 03:** Contractor shall provide the necessary equipment, tools, expertise, coordination, and incidentals to furnish the approved **Power Supply Driver** as required for the proposed LED lights on the **Pylon** structures. The change item totals an **INCREASE** in the contract amount of **\$9,540.00** based on an estimated quantity of **120 EA** at a negotiated unit price of **\$79.50/EA**. There will be **no contract time increase** on this change item. The estimated power supply drivers are distributed as follows:

- BB1 164 - ILLUM 4 PYLON LIGHT FIXTURE	7 EA x 6 EA/PYLON x \$79.50/EA = \$3,339.00 (City's ROW)
- BB2 148 - ILLUM 4 PYLON LIGHT FIXTURE	11 EA x 6 EA/PYLON x \$79.50/EA = \$5,247.00 (TxDOT's ROW)
- BB4 003 - ILLUM 4 PYLON LIGHT FIXTURE	2 EA x 6 EA/PYLON x \$79.50/EA = \$954.00 (Spare Material)

• **Change Item No. 04:** Contractor shall provide the necessary equipment, manpower, tools, expertise, coordination, and incidentals to **Install, Mount and Wire** the required Power Supply Drivers for the proposed station canopies. The change item totals an **INCREASE** in the contract amount of **\$43,958.20** based on the following breakdown:

- BB1 166 - ARCH 1 CANOPY (6 x 37)	6 EA x \$2,151.80/EA = \$12,910.80
- BB1 167 - ARCH 2 CANOPY (6 x 46)	4 EA x \$2,459.20/EA = \$9,836.80
- BB1 168 - ARCH 3 CANOPY (9 x 46)	4 EA x \$2,459.20/EA = \$9,836.80
- BB1 169 - ARCH 4 CANOPY (6 x 27)	4 EA x \$1,844.40/EA = \$7,377.60
- BB4 004 - ARCH 1 CANOPY (6 x 37)	1 EA x \$2,151.80/EA = \$2,151.80
- BB4 005 - ARCH 1 CANOPY (6 x 27)	1 EA x \$1,844.40/EA = \$1,844.40

There will be **no contract time increase** on this change item.

- SEE NEXT PAGE.

CONSECUTIVE CALENDAR DAYS ADDED TO COMPLETION TIME: **0**

TOTAL CHANGE ORDER AMOUNT: \$ **311,049.40**

CONTRACTOR

I, John Goodrich, of Jordan Foster Construction, agree and accept the terms and conditions of this change order.

Signature: _____

Date: 7/30/18

CITY OF EL PASO (OWNER)

I, Sam Rodriguez, P.E. of the City of El Paso hereby authorize and direct the Contractor to proceed with additional work as described in this form.

Signature: _____

Date: _____

Sam Rodriguez, P.E. - City Engineer

CM

CITY OF EL PASO CONSTRUCTION CHANGE ORDER-Pg. 2

CONSTRUCTION CHANGE ORDER NO.: 8

DATE: July 24, 2018

X SCOPE CHANGE

PROJECT: Dyer Corridor Rapid Transit System

SOLICITATION NO.: 2016-832

X CONSTRUCTION CHANGE

Project Number PCP11MT040-NH 2014 (453)

Class Various

Department Various

Fund Various

Account 580270

PCP11MT040-NH

Project Number 2014 (453)

Class Various

Department Various

Fund Various

Account 580270

PURCHASE ORDER # 1700000181

CONTRACTOR NAME: Jordan Foster Construction

Please provide a detailed scope of work of the change order:

• **Change Item No. 05:** Contractor shall provide the necessary equipment, manpower, tools, expertise, coordination, and incidentals to furnish and install the required 16 Gauge Wire for the proposed station canopies and pylon structures. The change item totals an **INCREASE** in the contract amount of **\$26,000.00** based on an estimated quantity of **25,000 LF** at a negotiated unit price of **\$1.04/LF**. There will be **no contract time increase** on this change item. The estimated linear feet of 16 Gauge Wire is distributed as follows:

- BB1 166 - ARCH 1 CANOPY (6 x 37) 6 EA x 1,200 LF/EA x \$1.04/LF = \$7,488.00
 - BB1 167 - ARCH 2 CANOPY (6 x 46) 4 EA x 1,300 LF/EA x \$1.04/LF = \$5,408.00
 - BB1 168 - ARCH 3 CANOPY (9 x 46) 4 EA x 1,600 LF/EA x \$1.04/LF = \$6,656.00
 - BB1 169 - ARCH 4 CANOPY (6 x 27) 4 EA x 1,000 LF/EA x \$1.04/LF = \$4,160.00
 - BB4 004 - ARCH 1 CANOPY (6 x 37) 1 EA x 1,200 LF/EA x \$1.04/LF = \$1,248.00
 - BB4 005 - ARCH 1 CANOPY (6 x 27) 1 EA x 1,000 LF/EA x \$1.04/LF = \$1,040.00

• **Change Item No. 06:** Contractor shall provide the necessary equipment, manpower, tools, expertise, coordination, and incidentals to furnish and install the required LED Light Couplers for the proposed station canopies and pylon structures. The change item totals an **INCREASE** in the contract amount of **\$5,162.40** based on an estimated quantity of **2,160 EA** at a negotiated unit price of **\$2.39/EA**. There will be **no contract time increase** on this change item. The estimated quantity of LED Light Couplers is distributed as follows:

- BB1 166 - ARCH 1 CANOPY (6 x 37) 6 EA x 96 EA/PYLON x \$2.39/EA = \$1,376.64
 - BB1 167 - ARCH 2 CANOPY (6 x 46) 4 EA x 120 EA/PYLON x \$2.39/EA = \$1,147.20
 - BB1 168 - ARCH 3 CANOPY (9 x 46) 4 EA x 132 EA/PYLON x \$2.39/EA = \$1,261.92
 - BB1 169 - ARCH 4 CANOPY (6 x 27) 4 EA x 96 EA/PYLON x \$2.39/EA = \$917.76
 - BB4 004 - ARCH 1 CANOPY (6 x 37) 1 EA x 96 EA/PYLON x \$2.39/EA = \$229.44
 - BB4 005 - ARCH 1 CANOPY (6 x 27) 1 EA x 96 EA/PYLON x \$2.39/EA = \$229.44

No Time Extension will be added to this Contract Change at this time. Time extension will be added as a separate Change Order once a time impact analysis has been completed.

PROVIDE REASON/JUSTIFICATION FOR CHANGE ORDER:

• **Change Item No. 01:** A meeting was scheduled on July 20, 2017 to evaluate the proposed LED lighting mock up prepared by the Contractor. The change in LED lights will provide the purple color and intensity as requested by Sun Metro.

• **Change Item No. 02 - 06:** The Construction Drawings and Specifications failed to address the associated power supply drivers, wiring and components as required by the LED lighting in the station canopies and pylon structures. The installation of these supplies is mandatory for the LED light functionality.

CONSECUTIVE CALENDAR DAYS ADDED TO COMPLETION TIME: 0

TOTAL CHANGE ORDER AMOUNT: \$ 311,049.40

Project Manager recommends approval:

Adrian H. 8/1/2018

Engineering Division Manager recommends approval:

L. J. G. Jr.

Financing Department approval:

(If Required)

REQUEST FOR PO INCREASE/DECREASE FOR CHANGE ORDER

X	INCREASE
	DECREASE

SOLICITATION NO.: 2016-832

PURCHASE ORDER # 1700000181

Account 580270

AS A RESULT OF THIS CHANGE ORDER, PLEASE MAKE THE FOLLOWING ADJUSTMENT TO THE PURCHASE ORDER:

[illegible]

\$ 311,049.40
(should match cost below)

Additional funding/direction:

TOTAL CHANGE ORDER AMOUNT: \$311,049.40

Project Manager

Engineering Division Manager recommends approval:

Contract Compliance



CAPITAL IMPROVEMENT DEPARTMENT

218 N. CAMPBELL, 2ND FLOOR

TEL: (915) 212-1800

CHANGE ORDER REVIEW

PROJECT:	Dyer Rapid Transit System	C.O. #	8
PROJECT NO.:	CSJ 0167-50-050; Sol. No. 2016-832	DATE:	July 25, 2018
CONTRACTOR:	Jordan Foster Construction, LLC	SUBJECT:	LED Lights
ATTENTION:	Matt Hardison		

CHANGE ORDER PROPOSAL REVIEW COMMENTS

• **Change Item No. 1 - 6:** A proposal for the furnishing and installation of approved purple LED lights (as requested by Sun Metro) and related work and components was received in the amount of \$311,049.40 on April 10, 2018. The Drawings and Specifications failed to address the associated power supply drivers and related components. In addition, the LED linear footage for the Pylon structure was under quantified from the actual footage required. After thorough negotiations with the Contractor and CID, the proposal was found to be a fair and reasonable. The approved contract change amount totals **\$311,049.40**.

Refer to Attachments.

BY:

Alex Avila

City of El Paso, Capital Improvement Department

DATE:

July 25, 2018



HNTB



SUMMARY OF CHANGE ORDER No. 08

Owner City of El Paso - Capital Improvement Department Contractor Jordan Foster Construction, Inc. Construction Manager ECM International Inc. Engineer of Record Huitt-Zollars, Inc.				Awarded Project Contract Amount \$ 12,087,564.05 Awarded Project Contract Time 330 days Notice to Proceed 3/13/2017 Project Estimated Completion Date 6/30/2018 Approved Revised Contract Amount \$ 13,116,706.48							
Change Item No.	Description	Estimated Quantity	Unit of Measure	Contractor's Proposal							
				Original Proposal		1st Revision		2nd Revision		Final & Approved Revision	
				Unit Price	GC's Proposal	Unit Price	GC's Proposal	Unit Price	GC's Proposal	Unit Price	GC's Proposal
01	Purple LED Lights - Furnish and Install approved Purple LED Lights (150 LED/reel) at Canopies and Pylons.	19,960.00	LF	7.63	152,294.80	7.63	152,294.80	-	-	7.63	\$ 152,294.80
02	Power Supply Drivers - Furnish and Install approved Power Supply Drivers at Canopies.	932.00	EA	79.50	74,094.00	79.50	74,094.00	-	-	7.63	\$ 74,094.00
03	Power Supply Drivers - Furnish and Install approved Power Supply Drivers at Pylons.	120.00	EA	79.50	9,540.00	79.50	9,540.00	-	-	7.63	\$ 9,540.00
04	Mount and Wiring for Drivers - Provide labor to install, mount and wire power supply drivers.	20.00	EA	2,197.91	43,958.20	2,197.91	43,958.20	-	-	7.63	\$ 43,958.20
05	16 Gauge Wire - Furnish and Install 16 Gauge Wire as required for LED lights and Power Supplies.	25,000.00	EA	1.04	26,000.00	1.04	26,000.00	-	-	7.63	\$ 26,000.00
06	LED Light Couplers - Furnish and Install LED light couplers.	2,160.00	EA	2.39	5,162.40	2.39	5,162.40	-	-	7.63	\$ 5,162.40
TOTAL				\$ -	\$ 311,049.40	\$ -	\$ 311,049.40	\$ -	\$ -	\$ -	\$ 311,049.40



7700 C.F. Jordan Drive
El Paso, TX 79912
P: 915.877.3333
F: 915.877.3999

A Foundation of Excellence.

April 16, 2018

0167-05-050 DYER RAPID TRANSIT SYSTEM
CHANGE ORDER NO. 8

ORIGINAL/FINAL PROPOSAL

Mr. Omar Moreno, P.E.
CID Grand Funded programs Director
City of El Paso
218 N. Campbell, 2nd Floor
El Paso, TX 79901

**RE: DYER CORRIDOR RAPID TRANSIT SYSTEM – LED PROPOSAL
TXDOT CSJ 0167-02-050**

Mr. Moreno,

Per the mockups that have been provided for the referenced project on the Canopy and Pylon LED's, our subcontractor proposed, the utilization of modified LED Lighting to address multiple issues prevalent on the Mesa RTS project. This proposal includes two separate items, 1 - to utilize the 150 White LED lighting and 2 - to utilize purple LED Lighting to achieve the desired colored effect Sun Metro required. Both proposals also include the connectors to address the twisted corners causing issue on the Mesa RTS as well as the associated drivers and wiring not reflected in the project plans and specifications. Also, JFC is willing to address the quantity underrun on the Pylon Lighting Linear Footage by transferring the quantity overrun on Canopy Lighting. This offer results in an approximate \$250,000.00 savings to the overall project. Please note, that if full quantities are not paid for both canopy and pylon LED lighting, the offer to transfer lighting is not applicable. Pricing for the white and purple LED lighting is shown below in lump sum with the delta increase to the existing unit pricing. Also attached is the subcontractor breakdown for the referenced items.

Subcontractor Pricing for White LED's: \$233,562.00

GC OH/P per Contract: \$ 11,678.10

Bond Cost @ 1%: \$ 2,452.40

Total: \$247,692.50

Delta per LF: \$ 12.41/LF

Subcontractor Pricing for Purple LED's: \$293,442.00

GC OH/P per Contract: \$ 14,672.10

Bond Cost @ 1%: \$ 3,081.14

Total: ~~\$311,195.24~~

Delta per LF: \$ 15.60/LF

**TOTAL CONTRACT
CHANGE + PRIME'S
MARKUP = \$311,049.40.**

If you have any questions in regards to this proposal or need additional information regarding the referenced White or Purple LED Lighting, please feel free to contact me directly.

Respectfully,

Matt Hardison
Sr. Project Manager
Jordan Foster Construction, LLC



■ AUSTIN

■ DALLAS

■ EL PASO

■ HOUSTON

■ SAN ANTONIO

Upgrade 150 Wh. LED's Per Plan to Custom Strips					
LED Linear Feet NO DRIVERS					
Item	Pylon	Canopy	JFC Unit Price	Impact Cost/LF	Total Impact
BASE BID I					
ILLUM 2	0	5808	\$ 22.00	\$ 4.20	\$ 24,393.60
ILLUM 4	280	0	\$ 120.00	\$ -	N/A
BASE BID II					
ILLUM 2	0	11652	\$ 22.00	\$ 4.20	\$ 48,938.40
ILLUM 4	440	0	\$ 120.00	\$ -	N/A
BASE BID IV					
ILLUM 2	0	2500	\$ 22.00	\$ 4.20	\$ 10,500.00
ILLUM 4	2	0	\$ 120.00	\$ -	
TOTAL IMPACT COST				\$ -	
					\$ 83,832.00

UPGRADE 150 PURPLE LED'S ONLY CUSTOM STRIPS

Item	Pylon	Canopy	JFC Unit Price	Impact Cost/LF	Total Impact
BASE BID I					
ILLUM 2	0	5808	\$ 22.00	\$ 7.20	\$ 41,817.60
ILLUM 4	280	0	\$ 120.00	\$ -	N/A
BASE BID II					
ILLUM 2	0	11652	\$ 22.00	\$ 7.20	\$ 83,894.40
ILLUM 4	440	0	\$ 120.00	\$ -	N/A
BASE BID IV					
ILLUM 2	0	2500	\$ 22.00	\$ 7.20	\$ 18,000.00
ILLUM 4	2	0	\$ 120.00	\$ -	

TOTAL IMPACT COST

143,712.00

NOT A BID ITEM	DRIVERS FOR 150 LED'S WHITE OR PURPLE MAXBrite				
Reference ONLY	Pylon	Canopy	JFC Unit Price	Impact Cost/LF	Total Impact
BASE BID I					
CANOPY	0	273	N/A	\$ 75.00	\$ 20,475.00
PYLON	14	0	N/A	\$ 75.00	N/A
BASE BID II					
CANOPY	0	548	N/A	\$ 75.00	\$ 41,100.00
PYLON	24	0	N/A	\$ 75.00	N/A
BASE BID IV					
CANOPY	0	111	N/A	\$ 75.00	\$ 8,325.00
PYLON	2	0	N/A	\$ 75.00	N/A

TOTAL IMPACT COST

\$ 69,900.00

LABOR AND MATERIALS TO INSTALL, ROUTE, MOUNT & DIAGRAM DRIVERS

Reference	LABOR HRS	UNITS	HOURLY	IMPACT
Add to either 150 LED	3 MEN	CANOPIES	RATE	COST
9' X 46' Canopies	80	4	\$ 29.00	\$ 9,280.00
6' X 46' Canopies	80	4	\$ 29.00	\$ 9,280.00
6' X 37' Canopies	70	7	\$ 29.00	\$ 14,210.00
6' X 27' Canopies	60	5	\$ 29.00	\$ 8,700.00

TOTAL IMPACT COST LABOR

\$ 41,470.00

Reference	LINEAR FT	UNITS	Impact Cost	IMPACT
16 GAUGE WIRE	PER CANOPY	CANOPIES	Per LF	COST
9' X 46' Canopies	1600	4	\$ 0.98	\$ 6,272.00
6' X 46' Canopies	1300	4	\$ 0.98	\$ 5,096.00
6' X 37' Canopies	1200	7	\$ 0.98	\$ 8,232.00
6' X 27' Canopies	1000	5	\$ 0.98	\$ 4,900.00

TOTAL IMPACT COST 18 Gauge Wire

\$ 24,500.00

Reference	UNITS	UNITS	Price Per	IMPACT
LED COUPLERS	PER CANOPY	CANOPIES	Connector	COST
9' X 46' Canopies	132	4	\$ 2.25	\$ 1,188.00
6' X 46' Canopies	120	4	\$ 2.25	\$ 1,080.00
6' X 37' Canopies	96	7	\$ 2.25	\$ 1,512.00
6' X 27' Canopies	96	5	\$ 2.25	\$ 1,080.00

TOTAL IMPACT COST LED COUPLERS

\$ 4,860.00

TRANSFER OVERAGE OF CANOPY LED'S TO PYLONS ONLY IF UPGRADE TO PURPLE

Description	UNITS	UNIT	PYLON	IMPACT
	PER Pylon	COST	QTY	COST
150 PURPLE LED'S	6	\$ 75.00	20	\$ 9,000.00

TOTAL IMPACT TBD

\$ 9,000.00

NOTE: THE DRIVERS FOR OVERAGE IS ONLY IF JFC ALLOWS TO TRANSFER LED'S TO PYLONS...

CHANGE ITEM No. 1
\$143,712.00 + PRIME'S
MARKUP = **\$152,294.80**

CHANGE ITEM No. 2
\$69,900.00 + PRIME'S
MARKUP = **\$74,094.00**

CHANGE ITEM No. 4
\$41,470 + PRIME'S
MARKUP = **\$43,958.20**

CHANGE ITEM No. 5
\$24,500 + PRIME'S
MARKUP = **\$26,000.00**

CHANGE ITEM No. 6
\$4,860 + PRIME'S
MARKUP = **\$5,162.40**

CHANGE ITEM No. 3
\$9,000 + PRIME'S
MARKUP = **\$9,540.00**



0167-05-050 DYER RAPID TRANSIT SYSTEM
CHANGE ORDER NO. 8

EVALUATION AND CORRESPONDENCE

July 24, 2018

Attn: Matt Hardison
Sr. Project Manager
Jordan Foster Construction, Inc.
7700 CF Jordan Drive
El Paso, TX 79912

RE: Dyer Rapid Transit System Project
Project No. NH 2014 (453)
TxDOT CSJ 0167-02-050
LED Lights and Drivers

Dear Mr. Hardison:

We have reviewed the available information provided by Jordan Foster Construction (JFC) in regards to the proposed power supply and LED lights needed for the Dyer RTS Canopies and Pylon structures. JFC has provided a proposal and mock ups addressing the end user's, Sun Metro, requests. We have investigated options and alternatives to provide a fair comparison to what the Contractor proposes. This outlines the background, analysis and suggested course of action.

Background

The Contract Documents included provisions for payment on the LED lights for the canopy and pylon structures under items *ILLUM 2 – CANOPY SIDE LIGHT FIXTURE* and *ILLUM 4 – PYLON LIGHT FIXTURE*. Estimated quantities included in the bid proposal are shown on Table 1.

Table 1 – Estimated Contract Quantities and Bid Prices

BASE BID	BID ITEM	ITEM No.	DESCRIPTION	UNIT OF MEASURE	APPROX. QTY.	UNIT PRICE	EXTENDED AMOUNT
BASE BID I (CITY's ROW)	162	ILLUM 2	CANOPY SIDE LIGHT FIXTURE	LF	5,808.00	22.00	127,776.00
	164	ILLUM 4	PYLON LIGHT FIXTURE	LF	280.00	120.00	33,600.00
BASE BID II (TXDOT's ROW)	146	ILLUM 2	CANOPY SIDE LIGHT FIXTURE	LF	11,652.00	22.00	256,344.00
	148	ILLUM 4	PYLON LIGHT FIXTURE	LF	440.00	120.00	52,800.00
BASE BID IV (SPARE MATERIAL)	2	ILLUM 2	CANOPY SIDE LIGHT FIXTURE	LF	2,500.00	22.00	55,000.00
	3	ILLUM 4	PYLON LIGHT FIXTURE	LF	2.00	120.00	240.00

The Contract Documents specify the use of LED luminaries manufactured by *ELITE LIGHTING*. Product number *LB200-6500K* is specified for both the canopy and pylon structures. The Contract was entered with different unit prices per linear feet of LED (\$22.00/LF vs \$120.00/LF).

Compensation has been claimed for the required power drivers, wiring and connectors. In addition, in the absence of a detailed technical specification, it is not clear on what components are included or excluded

from the bid unit price. We've performed an independent quantity takeoff for LED's required per station and pylon to provide further reference. Table 2 presents our findings.

Table 2 – Independent Quantity Takeoff of required LED linear feet for Stations.

Station #	Name	Direction	Canopy Size	*Estimated LF of LEDs (perimeter)	**Est LF of LEDs (HIP roof)	Total Est LF of LED
2	Campbell/San Antonio	Outbound	6' x 37'	395.0	134.0	529.0
	Kansas/San Antonio	Inbound	6' x 27'	198.0	-	198.0
3	Montana/ST Vrain	Inbound	6' x 37'	395.0	134.0	529.0
		Outbound	6' x 37'	395.0	134.0	529.0
4	Montana/Cotton	Inbound	6' x 37'	395.0	134.0	529.0
		Outbound	6' x 27'	198.0	-	198.0
6	Copia/Pershing	Inbound	6' x 27'	198.0	-	198.0
		Outbound	6' x 46'	480.0	170.0	650.0
7	Dyer/Van Buren	Inbound	6' x 46'	480.0	170.0	650.0
		Outbound	6' x 46'	480.0	170.0	650.0
8	Dyer/Broadus	Inbound	9' x 46'	508.0	182.0	690.0
		Outbound	6' x 46'	480.0	170.0	650.0
9	Dyer/Elletthorpe	Inbound	9' x 46'	508.0	182.0	690.0
		Outbound	9' x 46'	508.0	182.0	690.0
10	Dyer/Hercules	Inbound	9' x 46'	508.0	182.0	690.0
		Outbound	6' x 27'	198.0	-	198.0
11	Dyer/Hondo Pass	Inbound	6' x 37'	395.0	134.0	529.0
		Outbound	6' x 37'	395.0	134.0	529.0
Total LED's footage for Canopies						9,326.0

* Assumes the 6'x27' canopy requires three LED strips around the perimeter. All others require five strips.

** Assumes two LED strips all around hip roof base.

We have quantified approximately **9,326-linear feet of LED** in contrast to the bid proposal quantity of **17,460-linear feet**. An estimated 60-linear feet of LED lights is required per pylon which overruns the current estimated bid quantity of 40 LF/pylon.

A mockup meeting for the presentation of the proposed LED lights for canopies and pylons was initially held on July 27, 2017. Several items were upgraded from the current design to address to provide the desired color by Sun Metro. A proposal accounting the upgrades was presented on April 16, 2018. The proposal includes two color options of LEDs and includes a pricing for the wiring, connectors, drivers and upgrades as presented in the mockup for the satisfactory operation. Additionally, a cost impact for the overrun quantity of LEDs for the pylon structure. Table 3 and 4, summarizes the current proposal.

Table 3 – Summary of cost increase for White and Purple LEDs

WORK ITEM	LED COLOR	BID QUANTITY	BID UNIT PRICE (\$/LF)	PROPOSED COST INCREASE (\$/LF)	TOTAL COST INCREASE	TOTAL COST INCREASE WITH JFC's MARKUP
CANOPY LIGH FIXTURE	WHITE LED's	19,960.00	\$ 22.00	\$ 4.20	\$ 83,832.00	\$ 88,861.92
	PURPLE LED's	19,960.00	\$ 22.00	\$ 7.20	\$ 143,712.00	\$ 152,334.72

Table 4 – Contractor's proposal summary for LED work no included in the Contract

WORK ITEM	SCOPE OF WORK	TOTAL COST INCREASE	TOTAL COST INCREASE WITH JFC's MARKUP
CANOPY LIGH FIXTURE	LABOR FOR ROUTING, MOUNTING AND INSTALLING DIAGRAM DRIVERS	\$ 41,470.00	\$ 43,958.20
	MATERIAL COST FOR LED DRIVERS	\$ 69,900.00	\$ 74,094.00
	MATERIAL COST FOR 16 GAUGE WIRE	\$ 24,500.00	\$ 25,970.00
	MATERIAL COST FOR LED COUPLERS	\$ 4,860.00	\$ 5,151.60
PYLON LIGHT FIXTURE	QUANTITY OVERRUN	\$ 9,000.00	\$ 9,540.00
TOTAL			\$ 158,713.80

Analysis

LED Lights

The proposal that the Contractor provided on April 16, 2018 establishes the use of a different vendor for LEDs called MaxBrite (in lieu of Elite Lighting).

MaxBrite product provides the following characteristics:

MaxBrite 5MW-70K150-12

- Color: Pure White (7000 K).
- Voltage: 12 V.
- Lumens/foot: 153. (17 Lm/LED)
- Watts/foot: 2.16W. (36W per 16.4 ft reel)
- Life (hours): 50,000.
- 9 LEDS per feet (30 LEDS per meter).
- Drivers: 60W 12V driver powers one 20-foot run at 75% load capacity.

The proposal provided on April 16, 2018 establishes a \$3 USD increment per linear foot of LED for supplying Purple (\$7.20) in lieu of White (\$4.20), as desired by the end user, Sun Metro.

LED Drivers

At the estimated 9,326 total linear feet of LEDs established above, each requiring 2.16 Watt/ft according to the vendor spec, the total estimated number of 60W drivers needed would be 336 EA. Following the vendor's suggested best practice of running the drivers at 75%-85% of their capacity to increase the life-time, the total conservative estimated number of required drivers goes up to **448 EA**. The proposal provided on April 16, 2018 quotes **932 EA**. A similar estimate done for the Pylon drivers at 20 ft/driver, comes out to **3 drivers** per pylon. The proposal quotes **6 drivers** per Pylon.

As an alternative and due to space limitations, the use of 600-watt power supplies instead of the smaller 60-watt drivers may prove to be advantageous in terms of size, efficiency and installation costs. Going with the larger power supplies can reduce the total number of individual units needed, by close to a factor of ten (maintaining a comparable cost/watt), and with it, the overall real-estate and heat dissipation requirements. This may also positively affect the size and number of the heat extraction fans in the final design. One 600-

watt power supply driven at 80% of its capacity could drive eight separate circuits of 20 ft LEDs strips. In addition, the efficiency of a 600-watt power supply is normally higher than 90% under certain conditions, in contrasts to 86% for the smaller 60-watt drives. A typical profile of the 600 -watt power supply is 11" x 6" (see spec for Mean-Well model# HLG-600H-12) whereas, eight smaller MaxBrite 60 W drives will require an approximate area of 17" x 6", not including the required space in between each unit for convection cooling purposes.

The total required real-estate can increase to 19" x 12" or larger to drive 480W of LEDs. Given the nature of larger demand capacity power supplies, which are not constrained to a minimum power output, a recommendation could be to "fuse" each individual LED circuit and to limit their length size to 180 LEDs or 45 W each. See Figure 1 below:

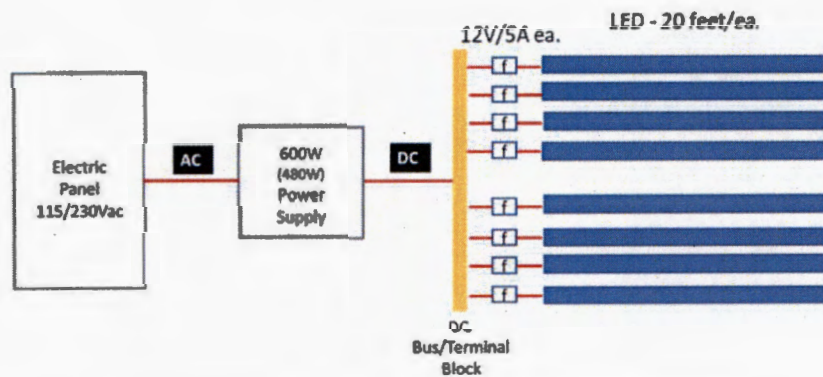


Figure 1 – Configuration of 600-watt Power Supplies

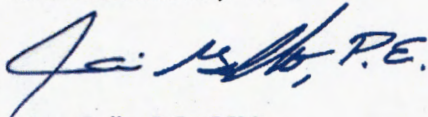
The above are recommendations only and JFC is directed to proceed with the shop drawings, wiring diagram, and procurement of a working system as displayed in the mockup presentation approved by the end user, Sun Metro. Furthermore, JFC has agreed to exhaust any canopy LED excess linear footage quantities up to the plan quantity, into the pylon LED installation.

Course of Action

ECM hereby requests for the Contractor to proceed with the fabrication of pylons/canopies contingent upon the following (the following action items are in accord with the conditions for the related Enclosure Units):

- ✓ Receipt of complete submittal addressing the LED system wiring plan for Engineer of Record's (EOR) review and approval including the driver placement and spacing layout per manufacturers recommendation.
- ✓ Receipt of complete product submittal/shop drawing for proposed cooling unit/heat dissipator incorporated into the pylon cabinet structure.
- ✓ Receipt of complete submittal including airflows and heat dissipation calculations for EOR's review and approval.
- ✓ Fabricate and install Pylon structure as per the mockup meeting held with CID and Sun Metro.
- ✓ Install Canopy LED lights as per mockup meeting held with CID and Sun Metro.

Sincerely,
ECM International, Inc.



Jaime Gallo, P.E., CCM
Sr. Construction Project Manager

Cc: Omar Moreno, P.E. (CID)
Alex Avila (CID)