MAINE TURNPIKE AUTHORITY

MAINE TURNPIKE

CONTRACT DOCUMENTS

CONTRACT 2020.05

NEW GLOUCESTER/WEST GARDINER
BARRIER TOLL PLAZA ORT EQUIPMENT UPDATES
MILE 67.0 SB & NB AND MILE 100.0 SB & NB

NOTICE TO CONTRACTORS

PROPOSAL

CONTRACT AGREEMENT

CONTRACT BOND

FINAL LIEN AND CLAIM WAIVER AND AFFIDAVIT

SPECIFICATIONS

MAINE TURNPIKE AUTHORITY

SPECIFICATIONS

The Specifications are divided into two parts:
Part I, Supplemental Specifications and Part II, Special Provisions.

The Maine Turnpike Supplemental Specifications are additions and alterations to the 2014 Maine Department of Transportation Standard Specifications. See Subsection 100.1.

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MAINE TURNPIKE AUTHORITY

NOTICE TO CONTRACTORS

Sealed Proposals will be received by the Maine Turnpike Authority for:

CONTRACT 2020.05

NEW GLOUCESTER/WEST GARDINER
BARRIER TOLL PLAZA ORT EQUIPMENT UPDATES
MILE 67.0 SB & NB AND MILE 100.0 SB & NB

at the office of the Maine Turnpike Authority, 2360 Congress Street, Portland, ME, until 10:00 a.m., prevailing time as determined by the Authority on February 20, 2020 at which time and place the Proposals will be publicly opened and read. Bids will be accepted from Contractors **prequalified** by the Maine Department of Transportation for Highway and Bridge Construction Projects with an electrical subcontractor **prequalified** by the Maine Department of Transportation for Traffic Signals and Lighting Projects. All other bids may be rejected. This Project includes a wage determination developed by the State of Maine Department of Labor.

The work shall consist of removing the top three inches of the ORT concrete roadway slab in New Gloucester, replacing it with a three inch concrete wearing surface and reinstalling new toll sensor loops into the new concrete wearing surface. The work will also include the relocation of existing ORT toll equipment, installation of new toll equipment on the existing spaceframes at both the New Gloucester and West Gardiner Barrier Toll Plazas, replacing the lane use signals at the New Gloucester Barrier Toll Plaza cash lanes, and all other work incidental thereto in accordance with the Plans and Specifications.

Plans and Contract Documents may be examined by prospective Bidders weekdays between 8:00 a.m. and 4:30 p.m. at the office of the Maine Turnpike Authority, 2360 Congress Street, Portland, Maine. **The half size Plans** and Contract Documents may be obtained from the Authority upon payment of Seventy-Five ($75.00) Dollars for each set, which payment will not be returned. Checks shall be made payable to: Maine Turnpike Authority. The Plans and Contract Documents may also be downloaded from a link on our website at
http://www.maineturnpike.com/Projects/Construction-Contracts.aspx

For general information regarding Bidding and Contracting procedures, contact Nate Carll, Purchasing Manager, at (207) 482-8115. For information regarding Schedule of Items, plan holders list and bid results, visit our website at **http://www.maineturnpike.com/Projects/Construction-Contracts.aspx**. For Project specific information, fax all questions to Nate Carll, Purchasing Manager, at (207) 871-7739 or email ncarll@maineturnpike.com. Responses will not be prepared for questions received by telephone. Bidders shall not contact any other Authority staff or Consultants for clarification of Contract provisions, and the Authority will not be responsible for any interpretations so obtained.

All work shall be governed by the Specifications entitled "State of Maine, Department of Transportation, Standard Specifications, Revision of November 2014", "Standard Details, Revision of November 2014" and "Best Management Practices for Erosion and Sediment Control", latest issue. Copies and recent updates to these publications can be downloaded at http://www.maine.gov/mdot/contractors/publications/ .

Proposals must be accompanied by an original bid bond, certified or cashier's check payable to the Maine Turnpike Authority in an amount not less than Five (5%) Percent of the Total Amount in the Proposal, but not less than $500.00. The Bidder to whom a Contract is awarded will be required to furnish a Surety Corporation Bond, satisfactory to the Authority, on the standard Contract Bond form of the Authority, for a sum not less than the Total Amount of the Proposal.

Proposals must be made upon the Proposal Forms furnished by the Authority separately with the Contract Documents, and must be enclosed in the sealed special addressed envelope provided therefore bearing the name and address of the Bidder, the name of the Contract, and the date and time of Proposal opening on the outside.

A pre-bid conference will be held on February 6, 2020 at 10:00 a.m. at the Maine Turnpike Authority, 2360 Congress Street, Portland, Maine.

The Authority reserves the unqualified right to reject any or all Proposals and to accept that Proposal which in its sole judgment will under all circumstances serve its best interest.

MAINE TURNPIKE AUTHORITY

Nate Carll
Purchasing Manager
Maine Turnpike Authority
Portland, Maine

MAINE TURNPIKE AUTHORITY

MAINE TURNPIKE

PROPOSAL

CONTRACT 2020.05

NEW GLOUCESTER/WEST GARDINER
BARRIER TOLL PLAZA ORT EQUIPMENT UPDATES
MILE 67.0 SB & NB AND MILE 100.0 SB & NB

MAINE TURNPIKE AUTHORITY

PROPOSAL

CONTRACT 2020.05

NEW GLOUCESTER/WEST GARDINER
BARRIER TOLL PLAZA ORT EQUIPMENT UPDATES
MILE 67.0 SB & NB AND MILE 100.0 SB & NB

TO MAINE TURNPIKE AUTHORITY:

The work shall consist of removing the top three inches of the ORT concrete roadway slab in New Gloucester, replacing it with a three inch concrete wearing surface, and reinstalling new toll sensor loops into the new concrete wearing surface. The work will also include relocating existing ORT toll equipment, installation of new toll equipment on the existing spaceframes at both the New Gloucester and West Gardiner Barrier Toll Plazas, replacing the lane use signals at the New Gloucester Barrier Toll Plaza cash lanes, and all other work incidental thereto in accordance with the Plans and Specifications.

This Work will be done under a Contract known as Contract 2020.05 according to the Plans and Specifications which are on file in the office of the Maine Turnpike Authority, 2360 Congress Street, Portland, Maine.

On the acceptance of this Proposal for said Work, the undersigned will give the required bond with good security conditioned for the faithful performance of said Work, according to said Plans and Specifications, and the doing of all other work required by said Specifications for the consideration herein named and with the further condition that the Maine Turnpike Authority shall be saved harmless from any and all damages that might accrue to any person, persons or property by reason of the carrying out of said Work, or any part thereof, or by reason of negligence of the undersigned, or any person or persons under his employment and engaged in said Work.

The undersigned hereby declares that he/she has carefully examined the Plans, Specifications and other Contract Documents, and that he/she will contract to carry out and complete the said Work as specified and delineated at the price per unit of measure for each scheduled item of Work stated in the Schedule of Prices as follows:

It is understood that the TOTAL AMOUNT stated by the undersigned in the following Schedule of Prices is based on approximate quantities and will be used solely for the comparison of bids, and that the quantities stated in the Schedule of Prices for the various items are estimates only and may be increased or decreased all as provided in the Specifications.

SCHEDULE OF BID PRICES
CONTRACT NO. 2020.05
NEW GLOUCESTER / WEST GARDINER BARRIER TOLL PLAZA
ORT TOLL EQUIPMENT UPDATE
MM 67.0 / MM 100.0

Item No	Item Description	Units	Approx. Quantities	Unit Prices in Numbers		Bid Amount in Numbers	
				Dollars	Cents	Dollars	Cents
202.12311	MILLING CONCRETE ORT SLAB - TOP 3"	Square Yard	420				
202.202	REMOVING PAVEMENT SURFACE	Square Yard	140				
403.208	HOT MIX ASPHALT, 12.5 MM NOMINAL MAXIMUM SIZE	Ton	20				
409.15	BITUMINOUS TACK COAT RS-1 OR RS-1h - APPLIED	Gallon	10				
502.262	STRUCTURAL CONCRETE ROADWAY SLAB WEARING SURFACE	Cubic Yard	40				
503.90	SYNTHETIC FIBER REINFORCEMENT	Pound	120				
504.91	MOUNTING BRACKET ASSEMBLIES	Lump Sum	1				
515.202	CLEAR PROTECTIVE COATING FOR CONCRETE SURFACES	Square Yard	420				
515.23	EPOXY OVERLAY	Square Yard	55				
627.18	12 inch SOLID WHITE PAVEMENT MARKING LINE	Linear Foot	1,900				
627.712	WHITE OR YELLOW PAVEMENT MARKING LINE	Linear Foot	7,000				

CARRIED FORWARD:

Item No	Item Description	Units	Approx. Quantities	Unit Prices in Numbers		Bid Amount in Numbers	
				Dollars	Cents	Dollars	Cents
			BROUGHT FORWARD:				
627.73	TEMPORARY 6 INCH PAVEMENT MARKING TAPE	Linear Foot	7,800				
627.731	TEMPORARY 6 INCH BLACK PAVEMENT MARKING TAPE	Linear Foot	1,000				
627.77	REMOVING EXISTING PAVEMENT MARKING	Square Foot	8,800				
627.78	TEMPORARY PAVEMENT MARKING LINE, WHITE OR YELLOW	Linear Foot	8,400				
629.05	HAND LABOR, STRAIGHT TIME	Hour	10				
631.10	AIR COMPRESSOR (INCLUDING OPERATOR)	Hour	10				
631.11	AIR TOOL (INCLUDING OPERATOR)	Hour	10				
631.36	FOREMAN	Hour	10				
631.51	BUCKET TRUCK	Hour	20				
631.52	SCISSOR LIFT	Hour	20				
631.53	ELECTRICIAN	Hour	20				
631.54	ELECTRICIAN'S APPRENTICE	Hour	20				

CARRIED FORWARD:

Item No	Item Description	Units	Approx. Quantities	Unit Prices in Numbers		Bid Amount in Numbers	
				Dollars	Cents	Dollars	Cents
BROUGHT FORWARD:							
643.711	LANE USE SIGNAL	Each	6				
652.30	FLASHING ARROW	Each	4				
652.312	TYPE III BARRICADES	Each	8				
652.33	DRUMS	Each	200				
652.35	CONSTRUCTION SIGNS	Square Foot	1,600				
652.361	MAINTENANCE OF TRAFFIC CONTROL DEVICES	Lump Sum	1				
652.41	PORTABLE-CHANGEABLE MESSAGE SIGN	Each	4				
652.45	TRUCK MOUNTED ATTENUATOR	Calendar Day	24				
655.031	REMOVE AND RESET REAR VCARS MOUNT	Each	12				
655.04	INSTALLATION OF SENSOR LOOPS	Lump Sum	1				
655.05	INSTALLATION OF AVI ANTENNAS	Each	16				
655.08	OPUS MOUNT INSTALLATION	Each	24				

CARRIED FORWARD:

Item No	Item Description	Units	Approx. Quantities	Unit Prices in Numbers		Bid Amount in Numbers	
				Dollars	Cents	Dollars	Cents
			BROUGHT FORWARD:				
655.11	#10 AWG WIRE	Linear Foot	12,000				
655.12	#12 AWG WIRE	Linear Foot	13,000				
655.141	4PR/24 (CATEGORY5E) SHIELDED CABLE	Linear Foot	10,000				
655.151	LMR 600 CABLE	Linear Foot	2,400				
655.17	IVIS HOMERUN LOOP CABLE (IMSA 50-2 #14)	Linear Foot	200				
655.171	E-6 READER SYNC CABLE (IMSA 50-2 #18)	Linear Foot	2,000				
655.206	1" GALVANIZED RIGID METAL CONDUIT	Linear Foot	500				
655.208	3" GALVANIZED RIGID METAL CONDUIT	Linear Foot	1,000				
655.210	3/4" LIQUID TIGHT METALLIC FLEXIBLE CONDUIT	Linear Foot	600				
655.30	12" X 12" X 6" GALVANIZED STEEL JUNCTION BOX	Each	36				
655.31	18" X 18" X 6" GALVANIZED STEEL JUNCTION BOX	Each	16				
655.52	1" GALVANIZED RIGID METAL CONDUIT CONDULETS	Each	32				

CARRIED FORWARD:

Item No	Item Description	Units	Approx. Quantities	Unit Prices in Numbers		Bid Amount in Numbers	
				Dollars	Cents	Dollars	Cents
BROUGHT FORWARD:							
655.55	3" GALVANIZED RIGID METAL CONDUIT CONDULETS	Each	30				
659.10	MOBILIZATION	Lump Sum	1				
TOTAL:							

Acknowledgment is hereby made of the following Addenda received since issuance of the Plans and Specifications: _____

_____

_____

Accompanying this Proposal is an original bid bond, cashiers or certified check on _____ Bank, for _____, payable to the Maine Turnpike Authority. In case this Proposal shall be accepted by the Maine Turnpike Authority and the undersigned should fail to execute a Contract with, and furnish the security required by the Maine Turnpike Authority as set forth in the Specifications, within the time fixed therein, an amount of money equal to Five (5%) Percent of the Total Amount of the Proposal for the Contract awarded to the undersigned, but not less than $500.00, obtained out of the original bid bond, cashier's or certified check, shall become the property of the Maine Turnpike Authority; otherwise the check will be returned to the undersigned.

The performance of said Work under this Contract will be completed during the time specified in Subsection 107.1.

It is agreed that time is of the essence of this Contract and that I (we) will, in the event of my (our) failure to complete the Work within the time limit named above, pay to Maine Turnpike Authority liquidated damages in the amount or amounts stated in the Specifications.

The undersigned is an Individual/Partnership/Corporation under the laws of the State of _____, having principal office at _____, thereunto duly authorized.

_____ *(SEAL)*

_____ *(SEAL)*

Affix Corporate Seal
or Power of Attorney
Where Applicable _____ *(SEAL)*

By: _____

Its: _____

Information below to be typed or printed where applicable:

INDIVIDUAL:

_____	_____
(Name)	(Address)

PARTNERSHIP - Name and Address of General Partners:

_____	_____
(Name)	(Address)
_____	_____
(Name)	(Address)
_____	_____
(Name)	(Address)
_____	_____
(Name)	(Address)

INCORPORATED COMPANY:

_____	_____
(President)	(Address)
_____	_____
(Vice-President)	(Address)
_____	_____
(Secretary)	(Address)
_____	_____
(Treasurer)	(Address)

MAINE TURNPIKE AUTHORITY

CONTRACT AGREEMENT

CONTRACT 2020.05

NEW GLOUCESTER/WEST GARDINER
BARRIER TOLL PLAZA ORT EQUIPMENT UPDATES
MILE 67.0 SB & NB AND MILE 100.0 SB & NB

This Agreement made and entered into between the Maine Turnpike Authority, and sometimes termed the "Authority", and _____

_____

herein termed the "Contractor":

WITNESSETH: That the Authority and the Contractor, in consideration of the premises and of the mutual covenants, considerations and agreements herein contained, agree as follows:

FIRST: The parties hereto mutually agree that the documents attached hereto and herein incorporated and made a part hereof collectively evidencing and constituting the entire Contract to the same extent as if herein written in full, are the Notice to Contractors, the Accepted Proposal, the Specifications, the Plans, this Agreement, the Contract Bond and all Addenda to the Contract Documents duly issued and herewith enumerated:

_____

_____

SECOND: The Contractor for and in consideration of certain payments to be made as hereafter specified, hereby covenants and agrees to perform and execute all of the provisions of this Contract and of all documents and parts attached hereto and made a part thereof, and at his own cost and expense to furnish and perform everything necessary and required to construct and complete, ready for its intended purpose, in accordance with the Contract and such instructions as the Engineer may give, acceptable to the Authority, in the times provided, all of the Work covered and included under Contract No. _____ covering _____ as herein described.

THIRD: In consideration of the performance by the Contractor of his covenants and agreements as herein set forth, the Authority hereby covenants and agrees to pay the Contractor according to the Schedule of Prices set forth in the Proposal with additions and deductions as elsewhere herein provided in the times and in the manner stated in the Specifications. This Agreement shall insure to the benefit of, and shall be binding upon the parties hereto, and upon their respective successors and assigns; but neither party hereto shall assign or transfer his interest herein in whole or in part without the consent of the other, except as herein provided.

IN WITNESS WHEREOF the parties to this Agreement have executed the same in quintuplicate.

AUTHORITY -

MAINE TURNPIKE AUTHORITY

By: _____

Title: CHAIRMAN

Date of Signature: _____

ATTEST:

_____
Secretary

CONTRACTOR -

_____
CONTRACTOR

By: _____

Title: _____

Date of Signature: _____

WITNESS:

_____

MAINE TURNPIKE AUTHORITY

CONTRACT BOND

CONTRACT 2020.05
NEW GLOUCESTER/WEST GARDINER
BARRIER TOLL PLAZA ORT EQUIPMENT UPDATES
MILE 67.0 SB & NB AND MILE 100.0 SB & NB

KNOW ALL MEN BY THESE PRESENTS that _____

of _____ in the County of _____ and State of _____

as Principal, and _____ a Corporation duly organized under the

laws of the State of _____ and having a usual place of business in _____

_____

As Surety, are held and firmly bound unto the Maine Turnpike Authority in the sum of _____Dollars ($_____.___), to be paid to said Maine Turnpike Authority, or its successors, for which payment, well and truly to be made, we bind ourselves, our heirs, executors, successors and assigns jointly and severally by these presents.

The condition of this obligation is such that the Principal, designated as Contractor in the foregoing Contract No. _____ shall faithfully perform the Contract on his part and satisfy all claims and demands incurred for the same and shall pay all bills for labor, material, equipment and all other items contracted for, or used by him, in connection with the Work contemplated by said Contract, and shall fully reimburse the Obligee for all outlay and expense which the Obligee may incur in making good any default of said Principal, then this Obligation shall be null and void; otherwise it shall remain in full force and effect.

Signed and sealed this _____ day of _____, A.D., 202___

Witnesses: CONTRACTOR

_____ _____ *(SEAL)*

_____ _____ *(SEAL)*

_____ _____ *(SEAL)*

SURETY

_____ _____ *(SEAL)*

_____ _____ *(SEAL)*

_____ _____ *(SEAL)*

(Surety must attach copy of Power of Attorney showing authority of Office or Agent to execute bonds)

FINAL LIEN AND CLAIM WAIVER AND AFFIDAVIT

Upon receipt of the sum of _____, which sum represents the total amount paid, including the current payment for work done and materials supplied for Project No. _____, in _____, Maine, under the undersigned's Contract with the Maine Turnpike Authority.

The undersigned, on oath, states that the Final Payment of _____ is the final payment for all work, labor, materials, services and miscellaneous (all of which are hereinafter referred to as "Work Items") supplied to the said Project through _____and that no additional sum is claimed by the undersigned respecting said Project.

The undersigned, on oath, states that all persons and firms who supplied Work Items to the undersigned in connection with said Project have been fully paid by the undersigned for such Work Items or that such payment will be fully effected immediately upon receipt of this payment.

In consideration of the payment herewith made, the undersigned does fully and finally release and hold harmless the Maine Turnpike Authority, and its Surety, if any, from any and all claims, liens or right to claim or lien, arising out of this Project under any applicable bond, law or statute.

It is understood that this Affidavit is submitted to assure the Owner and others that all liens and claims relating to the Work Items furnished by the undersigned are paid.

_____
(Contractor)

By: _____

Title: _____

State of MAINE

County of _____

I, _____, hereby certify on behalf of _____
(Company Officer) *(Company Name)*

its _____, being first duly sworn and stated that the foregoing representations are
(Title)

are true and correct upon his own knowledge and that the foregoing is his free act and deed in said capacity and the free act and deed of the above-named

_____

.

(Company Name)

The above-named, _____, personally appeared before me this ____ day of _____ and swears that this is his free act and deed.

(SEAL)

_____
Notary Public

My Commission Expires: _____

MAINE TURNPIKE AUTHORITY

SPECIFICATIONS

PART I – SUPPLEMENTAL SPECIFICATIONS

(Rev. November 10, 2016)

Supplemental Specifications available on the Maine Turnpike Authority website

MAINE TURNPIKE AUTHORITY

SPECIFICATIONS

PART II – SPECIAL PROVISIONS

CONTRACT 2020.05

NEW GLOUCESTER/WEST GARDINER
BARRIER TOLL PLAZA ORT EQUIPMENT UPDATES
MILE 67.0 SB & NB AND MILE 100.0 SB & NB

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MAINE TURNPIKE AUTHORITY

SPECIFICATIONS

PART II - SPECIAL PROVISIONS

All work shall be governed by the Maine Department of Transportation Standard Specifications, Revision of November 2014, except for that work which applies to sections of the Maine Department of Transportation Standard Specifications which are amended by the Maine Turnpike Supplemental Specifications and the following modifications, additions and deletions.

General Description of Work

The work shall consist of removing the top three inches of the ORT concrete roadway slab in New Gloucester, replacing it with a three inch concrete wearing surface, and reinstalling new toll sensor loops into the new concrete wearing surface. The work will also include the relocating existing ORT toll equipment, installation of new toll equipment on the existing spaceframes at both the New Gloucester and West Gardiner Barrier Toll Plazas, replacing the lane use signals at the New Gloucester Barrier Toll Plaza cash lanes, and all other work incidental thereto in accordance with the Plans and Specifications.

Plans

The drawings included in these Contract Documents, and referred to as the Plans, show the general character of the work to be done under this Contract. They bear the general title "Maine Turnpike Authority - Contract 2020.05 – New Gloucester/W. Gardiner Barrier Toll Plaza ORT Equipment Updates". The right is reserved by the Resident to make such minor corrections or alterations in the Plans as he deems necessary without change in the unit prices on the Schedule of Prices of the Proposal.

101.2 Definition

Holidays

The following is added after Memorial Day in the Supplemental Specifications:

Independence Day 2020 (Fourth of July)	12:01 p.m. (Noon) preceding Thursday to 6:00 a.m. the following Monday.
Christmas Day 2020	12:01 p.m. (Noon) preceding Wednesday to 6:00 a.m. the following Monday.
New Year's Day 2021 (Fourth of July)	12:01 p.m. (Noon) preceding Wednesday to 6:00 a.m. the following Monday.

103.4 Notice of Award

The following sentence is added:

The Maine Turnpike Authority Board is scheduled to consider the Contract Award on February 27, 2020.

104.3.8 Wage Rates and Labor Laws

Section 104.3.8 Wage Rates and Labor Laws has been amended as follows:

The fair minimum hourly rates determined by the State of Maine Department of Labor for this Contract are as shown on the following pages:

THIS DOCUMENT MUST BE CLEARLY POSTED AT ALL CONSTRUCTION SITES FUNDED IN PART WITH STATE FUNDS

State of Maine
Department of Labor
Bureau of Labor Standards
Augusta, Maine 04333-0045
Telephone (207) 623-7906

Wage Determination - In accordance with 26 MRS §1301 et. seq., this is a determination by the Bureau of Labor Standards, of the fair minimum wage rate to be paid to laborers and workers employed on the below titled project.

2020 Fair Minimum Wage Rates
Heavy & Bridge Cumberland & Kennebec County

Occupation Title	Minimum Wage	Minimum Benefit	Total	Occupation Title	Minimum Wage	Minimum Benefit	Total
Asphalt Raker	$16.00	$0.00	$16.00	Laborers (Helpers & Tenders)	$18.79	$3.52	$22.31
Backhoe Loader Operator	$26.00	$8.85	$34.85	Laborer - Skilled	$20.00	$4.08	$24.08
Boom Truck (Truck Crane) Operator	$27.81	$6.75	$34.56	Line ErectorPower/Cable Splicer	$24.55	$5.05	$29.60
Bricklayer	$24.50	$4.47	$28.97	Loader Operator - Front-End	$23.00	$3.81	$26.81
Bulldozer Operator	$22.00	$4.70	$26.70	Mechanic- Maintenance	$21.50	$3.83	$25.33
Carpenter	$25.00	$5.40	$30.40	Mechanic- Refrigeration	$27.00	$4.21	$31.21
Carpenter - Rough	$22.06	$4.04	$26.10	Millwright	$31.32	$5.52	$36.84
Cement Mason/Finisher	$18.00	$0.72	$18.72	Painter	$22.00	$2.74	$24.74
Communication Equip Installer	$24.50	$2.83	$27.33	Pipe/Steam/Sprinkler Fitter	$30.05	$17.36	$47.41
Comm Trans Erector-Microwave Cell	$21.43	$2.96	$24.39	Pipelayer	$28.00	$6.47	$34.47
Crane Operator =>15 Tons)	$30.25	$8.17	$38.42	Plumber (Licensed)	$26.00	$4.50	$30.50
Diver	$0.00	$0.00	$0.00	Plumber Helper/Trainee	$19.00	$2.98	$21.98
Earth Auger Operator	$26.65	$6.12	$32.77	Propane/Natural Gas Serv/Install	$32.00	$9.23	$41.23
Electrician - Licensed	$32.00	$8.73	$40.73	Rigger	$23.00	$7.10	$30.10
Electrician Helper/Cable Puller	$18.00	$4.55	$22.55	Roller Operator - Earth	$16.43	$2.69	$19.12
Excavator Operator	$26.50	$4.16	$30.66	Roller Operator - Pavement	$20.25	$3.56	$23.81
Fence Setter	$18.00	$1.30	$19.30	Screed/Wheelman	$18.50	$2.45	$20.95
Flagger	$13.00	$0.00	$13.00	Sheet Metal Worker	$26.56	$6.03	$32.59
Grader/Scraper Operator	$22.00	$2.16	$24.16	Truck Driver - Light	$16.00	$0.44	$16.44
Industrial Truck (Forklift) Operator	$29.07	$6.63	$35.70	Truck Driver - Medium	$19.00	$1.97	$20.97
Ironworker - Ornamental	$22.30	$22.37	$44.67	Truck Driver - Heavy	$20.00	$1.79	$21.79
Ironworker - Structural	$21.00	$4.55	$25.55	Truck Driver - Tractor Trailer	$27.00	$6.81	$33.81

The Laborer classifications include a wide range of work duties. Therefore, if any specific occupation to be employed on this project is not listed in this determination, call the Bureau of Labor Standards at the above number for further clarification.

Welders are classified in the trade to which the welding is incidental.

Apprentices – The minimum wage rate for registered apprentices are those set forth in the standards and policies of the Maine State Apprenticeship and Training Council for approved apprenticeship programs.

Title 26 §1310 requires that a clearly legible statement of all fair minimum wage and benefits rates to be paid the several classes of laborers, workers and mechanics employed on the construction on the public work must be kept posted in a prominent and easily accessible place at the site by each contractor and subcontractor subject to sections 1304 to 1313.

Appeal – Any person affected by the determination of these rates may appeal to the Commissioner of Labor by filing a written notice with the Commissioner stating the specific grounds of the objection within ten (10) days from the filing of these rates.

A true copy

Attest: Scott R. Cotnoir
Scott R. Cotnoir
Wage & Hour Director
Bureau of Labor Standards

Expiration Date: 12-31-2020

104.4.6 Utility Coordination

This Subsection is amended by the addition of the following:

These Special Provisions outline the arrangements which have been established by the Authority for coordination of the work to be accomplished by the utilities. The scope and schedule of utility relocation work is noted herein. The Contractor shall plan and conduct his work accordingly.

General

Utility working days are Monday through Friday, conditions permitting. Times are estimated on the basis of a single crew for each utility. Any times and dates mentioned are estimates only and are dependent upon favorable weather, working conditions, and freedom from emergencies. The Contractor shall have no claim against the Authority if they are exceeded.

The Contractor must comply with all OSHA regulations pertaining to work adjacent to utility wires. The Contractor shall plan and conduct his work accordingly.

Existing utilities at the site include Maine Turnpike Authority. The Contractor will coordinate with The Authority for contracting Dig Smart to locate their facilities.

Maine Turnpike Authority (MTA)
2360 Congress Street, Portland, Maine 04102
ATTN: Shawn Laverdiere
Tel: (207) 829-3767
Email: SLaverdiere@maineturnpike.com

104.4.7 Cooperation With Other Contractors

This Subsection is amended by the addition of the following:

The Maine Turnpike will have the following adjacent work during this Contract:

2018.15 Bridge Rehabilitation - Cobbosseecontee Stream Overpass Mile 99.2.

107.1 Contract Time and Contract Completion Date

This Subsection is amended by the addition of the following:

All work shall be completed on or before April 16, 2021.

107.1.1 Substantial Completion

This Subsection is amended by the addition of the following:

- The West Gardiner ORT Toll Equipment Updates shall be complete and open to traffic by July 24, 2020. The System Integrator is allowed 42 calendar days for testing and commissioning both Northbound and Southbound ORT zones, which will begin when the last ORT toll zone installation is complete. The contractor must account for the 42 calendar days that is required by the System Integrator for testing and commissioning of the ORT Zones in their schedule. During this period, the contractor will continue to be responsible for maintaining the maintenance of traffic control devices, and then removing the maintenance of traffic control devices to re-open the ORT lanes.

- The Lane Use Signal replacement work at the New Gloucester Toll Plaza identified in all six cash lanes shall only occur when the ORT lanes are open to traffic. The contractor shall only close one cash lane in each direction at a time. This work shall be complete by August 28, 2020.

- The New Gloucester ORT concrete wearing surfaces and ORT Toll Equipment Updates shall commence on September 8, 2020 and be complete and open to traffic by March 5, 2021. The System Integrator is allowed 42 calendar days for testing and commissioning both Northbound and Southbound ORT zones, which will begin when the last ORT toll zone installation is complete. The contractor must account for the 42 calendar days that is required by the System Integrator for testing and commissioning of the ORT Zones in their schedule. During this period, the contractor will continue to be responsible for maintaining the maintenance of traffic control devices (including pavement markings), removing the maintenance of traffic control devices including temporary pavement markings, and installing permanent pavement markings to re-open the ORT lanes.

Substantially complete shall be defined by the Authority as the following:

- The entire project shall be fully opened to traffic, including final acceptance of the toll equipment installation and the Toll Plazas being fully functional.

- All temporary traffic control removed from the Maine Turnpike and all lanes on the Maine Turnpike shall be open to traffic.

Supplemental Liquidated damages on a calendar day basis in accordance with Subsection 107.8 shall be assessed for each calendar day that substantial completion is not achieved.

107.4.6 Prosecution of Work

The Contractor shall submit to the Authority a construction schedule which shall document that the Contractor has the necessary labor and equipment to work immediately and continuously at the project site once the work area is closed to traffic. The intent of this specification is to minimize the amount of time for plaza disruption while providing the Contractor sufficient time to complete the work in a diligent manner and reopen the plaza by the project's Substantial Completion date.

107.4.7 Limitations of Operations

The Contractor shall adhere to the following limitations:

- Maintain access and egress from plazas for turnpike employees at all time.
- Once the ORT lanes or Cash lanes are closed to traffic, the work shall commence immediately and remain continuous until the lanes are reopened to traffic.
- The Contractor shall be responsible for removing snow from the entire work zone for the duration that the ORT lanes area closed to traffic. This shall be done in a timely manner to prevent melt water in the traffic shift locations and to facilitate the ORT testing and commissioning period.
- The New Gloucester ORT lanes shall remain open to traffic from May 21, 2020 to September 7, 2020.

SPECIAL PROVISION

SECTION 202

REMOVING STRUCTURES AND OBSTRUCTIONS

(Milling Concrete ORT Slab)

202.01 Description

The following paragraph is added:

This work shall consist of furnishing all labor, materials and equipment required to mill the top 3 inches of the concrete ORT roadway slabs by use of a power-operated milling machine equipped with a fine milling drum that has an 8 mm maximum tool spacing. The top 3 inches of concrete wearing surface shall be removed from curb to curb for the entire length of both northbound and southbound ORT roadway slabs. Additional care shall be taken to avoid damaging the conduit stub-ups in the ORT roadway slabs. Prior to milling, the Contractor shall remove the concrete within a one foot square centered around the stub-ups by hand using a maximum 35-pound chipping hammer. The conduit stub-up shall be cut and temporarily capped at an elevation below the 3" mill depth, temporarily backfill the lowered pipe with sand or similar material to secure the conduit during the milling operation. Immediately after milling the concrete ORT slabs, the lane sensor conduits below grade shall be adequately flushed with water to ensure the conduits are not compromised with hardened slurry and all rinse water shall be removed. Any damage or blockage to the lane sensor conduits due to the concrete slab demolition operation, shall be repaired by the contractor. Any portions of the slab along the perimeter that cannot be removed with the milling machine shall be removed by hand using a chipping hammer maintaining the 3" depth of removal. Any existing concrete damaged by the Contractor, which is not specified to be milled, shall be repaired at the Contractor's expense. Areas of deterioration in the concrete roadway slab, as determined by the Resident, shall be repaired utilizing the appropriate pay items listed in the Contract Documents. Any alternate methods to the above description shall be submitted to the Resident for approval prior to commencing work.

202.07 Method of Measurement

The following sentences are added:

The area of the roadway slab milled will be measured by the square yard with no deductions made for the areas occupied by existing conduit stub-ups.

202.08 Basis of Payment

The following paragraphs are added:

All work for milling the concrete ORT roadway slab will be paid for at the contract unit price per square yard. Payment will be full compensation for all labor, materials and equipment

required to complete the milling of the concrete ORT roadway slab including, but not limited to, temporarily lowering and capping the stub-ups, areas that cannot be removed by a milling machine and require removal by utilizing a maximum 35 pound chipping hammer,

Any repair of concrete damaged by the Contractor as determined by the Resident shall not be paid for separately but will be incidental to this Contract item.

Payment will be made under:

Pay Item		Pay Unit
202.12311	Milling Concrete ORT Slab - Top 3”	Square Yard

SPECIAL PROVISION

SECTION 401

HOT MIX ASPHALT PAVEMENT

Section 401 of the Maine Turnpike Authority 2016 Supplemental Specifications is modified as follows:

401.01 Description

The following paragraph is added:

A Quality Control Plan (QCP) is required.

401.02 Materials

Section 401.02 is deleted in its entirety and replaced with the following:

Aggregates for HMA Pavements Coarse Aggregate and fine aggregate for HMA pavements shall be graded such that when combined in the proper proportions, including filler if required, the resultant blend will meet the composition of mixture for the type of pavement specified. Materials shall meet the requirements specified in Section 700 – Materials:

Asphalt Cement	702.01
Aggregates for HMA Pavement	703.07
RAP for HMA Pavement	703.08
HMA Mixture Composition	703.09

Mainline Surface HMA Coarse aggregate: The material retained on the No. 4 sieve, shall consist of angular fragments obtained from crushed quarry stone and be free of dirt or other objectionable materials. Coarse aggregate shall have a Micro-Deval value of 15.0 percent or less as determined by AASHTO T 327. The crushed stone shall have a maximum of 1.5% material finer than the No. 200 mesh when tested in accordance with AASHTO T-11. Flat and elongated particles shall not exceed a maximum of 8% at a 5:1 ratio in accordance with ASTM D-4791. Coarse aggregate angularity shall be a minimum of 95/90 in accordance with AASHTO T-335.

Mainline Surface HMA Fine aggregate: The material passing the No. 4 sieve, shall be crushed manufactured sand free from dirt, clay balls, or other objectionable material. Natural sand may be incorporated into the mix at a rate no greater than 10 percent by weight of total aggregate. The unconfined void content of the fine aggregate blend shall be a 45 minimum value when tested in accordance with AASHTO T-304, method A. AASHTO T-176 sand equivalent value shall be 45 minimum.

Asphalt Low Modulus Joint Sealer: Asphalt Low Modulus Joint Sealer shall be a modified asphalt and rubber compound designed for sealing and improving the strength and performance of the base asphalt cement and shall conform to ASTM D6690 Type IV and the following specifications:

Cone Penetration	90-150
Flow @ 60°C [140ºF]	3.0mm [1/8 in] max
Bond, non-immersed	Three 12.7mm [½ in] specimens pass 3 cycles @ 200% extension @ -29°C [-20ºF]
Resilience, %	60 min
Asphalt Compatibility, ASTM D5329	pass*

* There shall be no failure in adhesion, formation of any oily exudate at the interface between the sealant and asphaltic concrete or other deleterious effects on the asphaltic concrete or sealant when tested at 60°C [140ºF].

The contractor shall provide the Resident or authorized representative with a copy of the material manufacturer's recommendations pertaining to heating, application, and reheating prior to the beginning of operations or the changing of materials.

Section 401.03 Composition of Mixtures

Section 401.03 is deleted in its entirety and replaced with the following:

HMA pavement mixtures for base, intermediate, shim and local road bridge projects shall be a currently approved MDOT design unless otherwise noted. A maximum of 20% RAP may be used. VMA shall meet the requirements listed in Table 1.

HMA pavement mixtures for Mainline surface paving projects shall conform to the following requirements:

The Contractor shall compose the Hot Mix Asphalt Pavement with aggregate, Performance Graded Asphalt Binder (PGAB), and mineral filler if required. HMA shall be designed and tested according to AASHTO R35 and the volumetric criteria in Table 1. The Contractor shall size, uniformly grade, and combine the aggregate fractions in proportions that provide a mixture meeting the grading requirements of the Job Mix Formula (JMF). The Contractor may use a maximum of 15 percent reclaimed asphalt pavement (RAP) in any mainline surface course.

The Contractor shall submit a job mix formula (JMF) developed for each specified mixture at least 30 days prior to placement.

The JMF shall establish a single percentage of aggregate passing each sieve size within the limits shown in Subsection 703.09. The mixture shall be designed and produced, including all production tolerances, to comply with the allowable control points for the particular type of mixture as outlined in Subsection 703.09. The JMF shall state the original source, gradation, and percentage to be used of each portion of the aggregate and mineral filler if required. It shall also state the proposed PGAB content, the name and location of the refiner, the supplier, the source of PGAB submitted for approval, the type of PGAB modification if applicable, and the location of the terminal if applicable.

In addition, the Contractor shall provide the following information with the proposed JMF:

- Properly completed JMF indicating all mix properties (Gmm, VMA, VFB, etc.).
- Stockpile Gradation Summary.
- Test reports for individual aggregate consensus properties
- Design Aggregate Structure Consensus Property Summary.
- Design Aggregate Structure Trial Blend Gradation Plots (0.45 power chart).
- Trial Blend Test Results for at least three different aggregate blends.
- Selected design aggregate blend.
- Test results for the selected design aggregate blend at a minimum of three binder contents.
- Test results for final selected blend compacted to $N_{max.}$
- Specific Gravity for the PGAB to be used.
- Recommended mixing and compaction temperatures from the PGAB supplier.
- Data Sheets (SDS) For PGAB.
- Asphalt Content vs. Air Voids trial blend curve.
- Test report for Contractor's Verification sample.
- Summary of RAP test results (if used), including count, average and standard deviation of binder content and gradation.

At the time of JMF submittal, the Contractor shall identify and make available the stockpiles of all proposed aggregates at the plant site. There must be a minimum of 150 ton for coarse aggregate stockpiles, 75 ton for fine aggregate stockpiles before the JMF may be submitted. The Authority shall obtain samples for laboratory testing. The Contractor shall also make available to the Authority the PGAB proposed for use in the mix in enough quantity to test the properties of the asphalt and to produce samples for testing of the mixture. Before the start of paving, the Contractor and the Authority's representative shall test a production sample in the Contractor's laboratory for evaluation. If the Authority finds the mixture acceptable, an approved JMF will be forwarded to the Contractor. The Authority will then notify the Contractor that paving may commence. The first day's production shall be monitored, and the approval may be withdrawn if the mixture exhibits undesirable characteristics such as checking, shoving or displacement. The Contractor shall be allowed to submit aim changes within 24 hours of receipt of the first Acceptance test result for an individual JMF. Adjustments will be allowed of up to 2% on the percent passing the 2.36 mm sieve through the 0.075 mm and 3% on the percent passing the 4.75

mm or larger sieves. Adjustments will be allowed on the %PGAB of up to 0.2 percent. Adjustments will be allowed on GMM of up to 0.010.

Approved mix designs from the previous calendar year may be carried over, however no aim changes will be granted for a carryover mix design and the initial design must not be older than the previous paving season.

The Contractor shall submit a new JMF for approval each time a change in material source or materials properties is proposed. The same approval process shall be followed. The cold feed percentage of any aggregate except natural sand may be adjusted up to 10 percentage points from the amount listed on the JMF, however no aggregate listed on the JMF shall be eliminated. Natural sand may be adjusted up to 5 percent from the amount listed on the JMF but shall not exceed 10% by weight of total aggregates. The cold feed percentage for RAP may be reduced up to five percentage points from the amount listed on the JMF and shall not exceed the percentage of RAP approved in the JMF or for the specific application.

TABLE 1
VOLUMETRIC DESIGN CRITERIA

Design ESAL's (Millions)	Required Density (Percent of G_{mm})			Voids in the Mineral Aggregate (VMA)(Minimum Percent) Nominal Maximum Aggregate Size (mm)				Voids Filled with Binder (VFB) (Minimum %)	Fines/Eff. Binder Ratio
	$N_{initial}$	N_{design}	N_{max}	19	12.5	9.5	4.75		
10 to <30	≤89.0	96.0	≤98.0	13.5	14.5	15.5	15.5	65-80	0.6-1.2

As part of the JMF submittal, there are Hamburg Wheel Tracker requirements, the Contractor shall provide the Authority the test results in accordance with AASHTO T324. The results shall be generated by a third-party independent testing laboratory as approved by the Authority. The test results for each individual specimen as well as the average shall meet the requirements of Table 1A

TABLE 1A
HAMBURG WHEEL TRACKER REQUIREMENTS

Specified PG Binder Grade	Test Temperature (ºC)	Maximum Rut Depth (mm)	Minimum Number of Passes	Minimum Allowable SIP*
64-28	45	12.5	20,000	15,000
64E-28	45	8.0	20,000	15,000
70E-34	45	6.3	20,000	15,000

Section 401.031 Warm Mix Technology

Add the following to the end of the first paragraph:

Weather and seasonal limitations as outlined in section 401.06 may be reduced by a maximum 5ºF with the use of WMA except for HMA being placed over bridge deck membrane.

Section 401.04 Temperature Requirements

No vehicular loads shall be permitted on newly completed pavement until adequate stability has been attained and the material has cooled sufficiently to prevent distortion or loss of fines. The newly paved area may be opened to traffic after the internal temperature of the pavement has cooled to 120° F. The Resident will test the internal temperature of the pavement and shall be the sole judge as to the opening to traffic. The period of time before opening to traffic may be extended at the discretion of the Resident. The lane closure may not be removed until the internal temperature has cooled to 120° F.

Section 401.06 Weather and Seasonal Limitations

The first paragraph shall be deleted and replaced with:

The Contractor may place Hot Mix Asphalt Pavement for use other than a traveled way wearing course, provided that the air temperature as determined by an approved thermometer (placed in the shade at the paving location) is 40°F or higher and the area to be paved is not frozen. The Contractor may place Hot Mix Asphalt Pavement as traveled way wearing course, provided the air temperature determined as above is 50°F or higher. For the purposes of this Section, the traveled way includes truck lanes, ramps, approach roads and auxiliary lanes. The atmospheric temperature for all courses on bridge decks shall be 50°F or higher.

Section 401.08 Hauling Equipment Trucks for Hauling HMA

Add the following paragraph:

The undercarriage of haul units actively hauling HMA to the site shall be relatively free of dust / mud agglomerations. Haul units found to be contaminating the paving surface shall be removed from the site and cleaned prior to returning.

Section 401.09 Pavers

Add the following to the end of the fourth paragraph:

The forward operating speed of the paver shall be limited based on the course being placed. A shim or leveling course shall have a maximum speed of 50 feet per minute (fpm). Any base, intermediate, or surface course shall have a maximum paver speed of 40 fpm. The limited speed is not to be calculated on an average basis over time but shall be the actual limitation at any moment during the paving operation.

Section 401.091 Material Transfer Vehicle (MTV)

The first paragraph shall be deleted and replaced with:

When required by Special Provision Section 403, the paver shall be supplied mixture by a material transfer vehicle (Roadtec SB2500 or approved equal) capable of receiving and storing bituminous mixture from haul trucks, remixing, and delivering the mix to the paver hopper in a consistently uniform manner.

The fourth paragraph shall be deleted and replaced with:

The MTV shall be designed so that the mix receives additional mixing action.

Section 401.111 Layout

The contractor shall layout the site prior to any pavement course or final striping. Layout shall be achieved by physical measurements obtained every 50’ along the length to be paved or striped. The contractor shall transfer the measurements to the pavement surface every 50’ and apply a paint mark at each location. The marks shall then be connected by a smoothed string line and subsequent paint marks applied along the string at no greater than 10’ intervals. The Resident will inspect the layout line before associated activities may begin.

Section 401.165 Longitudinal Joint Density

The first paragraph shall be deleted and replaced with:

When noted in Special Provision Section 403, the Authority will measure the pavement density of longitudinal joints between adjoining mainline travel lanes in both the unconfined and confined condition as determined by the days paving operation.

The eighth paragraph shall be deleted and replaced with:

The minimum density of the completed pavement shall be 92.0 percent of the theoretical maximum density obtained. Two consecutive failing tests shall result in production shut down. Prior to resuming paving operations, the contractor quality control unit shall satisfy the Authority that the paving operation will produce joint densities in compliance with the Specifications.

The eleventh paragraph and associated table shall be deleted and replaced with:

Payment reduction will be applied to each sublot that has a density lower than 92.0% as outlined below.

PERCENT COMPACTION	PERCENT PAY
92.0 or greater	100
91.9 to 90.0	95
89.9 to 88.5	90
88.4 or less	80

Section 401.17 Joints

The fourth paragraph shall be deleted and replaced with:

When required by Special Provision Section 403, Mainline Longitudinal joints shall be constructed as notched-wedge joint and constructed in a manner that will best ensure joint integrity.

Section 401.18 Quality Control

The following shall be added to section c. Quality Control Technician(s) QCT:

The QCT shall be on site during paving operations performing quality control activities. QCT's shall not act as equipment operators, trainers or laborers.

Section 401.191 Inspection/Testing

In paragraph nine delete and replace Item #8 with:

8. Secure High-Speed Internet Access

401.21 Method of Measurement

The second paragraph shall be deleted and replaced with:

A reduction in payment will occur when the voids, asphalt content, and density are other than the limits specified below for 100 percent payment. The payment reduction for voids and PGAB content and density will be based upon each sublot (500 tons) of production as specified in Subsections 401.162, 401.163, 401.164, and 401.165. The Contractor may request one retest for each failing sublot for core density only. The original core density and the recut core density shall be averaged together to determine payment for the sublot. No retest will be allowed for voids or asphalt content. The Contractor shall pay $250.00 for each additional core tested. Pavement restoration will not be measured separately for payment but shall be incidental to the respective pay item.

SPECIAL PROVISION

SECTION 403

HOT MIX ASPHALT PAVEMENT

Course	HMA Grading	Item Number	Total Thickness	No. of Layers	Complimentary Notes
Mainline Mill and Fill and Shim and Overlay					
Wearing	**12.5mm**	**403.208**	**1.5”**	**1**	**C,I**

COMPLEMENTARY NOTES

A. The required PGAB for this mixture shall be **64E-28.**
B. RAP may not be used.
C. The Maine DOT will conduct the job mix verification. The aggregate qualities shall meet the design traffic level of 3 to <10 million ESALS for mix placed under this contract. Minimum and Maximum PGAB content limits from 401.21 shall not apply.
D. The MTA will conduct the job mix verification. The aggregate qualities shall meet the design traffic level of 10 to <30 million ESALS for mix placed under this contract. The design verification, Quality Control, and Acceptance tests for this mix will be performed at **75 gyrations**. (N design)
E. A material transfer vehicle (MTV) shall be used for the placement of Hot Mix Asphalt wearing surface on all roadways including acceleration and deceleration lanes and all ramps.
F. Joints shall be constructed as the “notched wedge” type in accordance with Subsection 401.17.
G. Joint density will be measured in accordance with Subsection 401.165.
H. PGAB shall conform to the provisions of 403.02 – Polymer Modified PGAB for HMA
I. The contractor shall furnish a quality control technician equipped with an approved densometer to ensure density requirements are met.
J. Hydrated Lime shall be incorporated into the mixture.
K. The antistrip additive Zycotherm manufactured by Zydex Industries shall be incorporated into the PGAB at a rate of 0.1%.

SPECIAL PROVISION

SECTION 409

BITUMINOUS TACK COAT

409.01 Description

This Subsection is deleted and replaced with the following:

This work consists of furnishing and applying one uniform application of Emulsified Asphalt RS-1 or RS-1h conforming to the specifications of AASHTO M-140. The application rate shall be 0.04 gal/yd^2.

409.05 Equipment

Add "or as determined by the Resident", after the words "gal/yd^2]" in the fourth line of the second paragraph of this Subsection.

409.06 Preparation of Surface

The following paragraph is added:

All existing pavement and shoulder areas on which bituminous concrete mixtures are to be placed shall receive a tack coat. The surface area where the tack coat is to be applied shall be dry and cleaned of all dirt, sand, and loose material. Cleaning shall be accomplished by use of revolving brooms or mechanical sweepers. Undesirable material not removed by the above means shall be cleaned by hand sweeping or scraping, or a combination of both. Small areas otherwise inaccessible may be swept with hand brooms. The tack coat shall be applied only when the existing surface is dry.

409.08 Method of Measurement

The following paragraphs are added:

Measurement will be based on delivery slips made out in duplicate by the Contractor and signed by the Resident, or his representative, at the point of delivery. One of these slips shall be retained by the Resident and one by the Contractor. Delivery slips shall be furnished by the Contractor and shall provide space for identifying the vehicle and driver, for stating the volume of material carried, the source of the material, the date, and the Resident or his representative's signature.

Material included in the delivery slips and not used or rejected shall be deducted from the amount being measured for payment. Each day's delivery slips shall be reconciled by the Contractor and the Resident within 24-hours.

Cleaning of the surface area where tack coat is to be applied shall be incidental to Item 409.15, Bituminous Tack Coat - Applied.

409.09 Basis of Payment

The following pay items are added:

Pay Item		Pay Unit
409.15	Bituminous Tack Coat RS-1 or RS1h – Applied	Gallon

SPECIAL PROVISION

SECTION 502

STRUCTURAL CONCRETE

This Subsection of the Supplemental Specifications shall apply in its entirety and shall be amended with the following:

502.01 Description

The following paragraph is added:

This work shall consist of providing MTA Class AAA Deck concrete with the addition of three (3) pounds of synthetic structural fiber per cubic yard (CY) for the New Gloucester Lane ORT slab rehabilitation. Contractor concrete placement method shall be submitted for review and approval. The contractor should note that the original plaza plans are available and placement method should be similar unless reason for an alternative method is justified and approved.

502.18 Method of Measurement

The limits to be used in determining the quantities of the structural concrete items will be as follows:

Structural Concrete Roadway Slab Wearing Surface - The limits will be the entire concrete portion of both northbound and southbound New Gloucester ORT slabs, as indicated on the plans.

502.19 Basis of Payment

No direct payment will be made for concrete admixtures with the exception of Synthetic Fiber Reinforcement, which shall be paid for under its respective Pay Item, 503.90.

Payment will be made under:

Pay Item		Pay Unit
502.262	Structural Concrete Roadway Slab Wearing Surface	Cubic Yard

SPECIAL PROVISION

SECTION 503

REINFORCING STEEL

(Synthetic Fiber Reinforcement)

503.01 Description

The following paragraph shall be added:

This work shall consist of furnishing synthetic fiber reinforcement to be used as temperature and shrinkage reinforcement in the structural concrete pavement slabs.

503.02 Materials

The following sentence shall be added:

Synthetic fibers shall be STRUX 90/40 as manufactured by W. R. Grace & Co. or an approved equal.

The following Subsection shall be added:

Dosage

The dosage rate for synthetic fibers shall be three pounds per cubic yard of concrete.

503.10 Method of Measurement

The following sentence shall be added:

Synthetic fiber reinforcement will be measured by the pound.

503.11 Basis of Payment

Payment will be made under:

Pay Item		Pay Unit
503.90	Synthetic Fiber Reinforcement	Pound

SPECIAL PROVISION

SECTION 504

STRUCTURAL STEEL

(Mounting Bracket Assemblies)

504.01 Description

The following paragraphs are added:

This work shall consist of fabricating and erecting Mounting Bracket Assemblies for the support of ORT equipment to be furnished by others in accordance with the Plans and as directed by the Engineer.

Fabrication and Erection of the Mounting Bracket Assemblies shall be completed in accordance with Subsections 504.01 through 504.13 and with Subsections 504.57 through 504.64.

504.02 Materials

The following paragraphs are added:

The Mounting Bracket Assemblies shall be constructed of hot dip galvanized Unistrut Brand materials, manufactured by Unistrut Corporation, or an approved equal.

Nuts, washers, and all miscellaneous hardware, unless otherwise noted, shall be stainless steel conforming to ASTM A276. All bolts shall be furnished with nuts and lock washers.

Any components of the Mounting Bracket Assemblies that are in contact with aluminum elements shall be stainless steel; or provisions shall be made to isolate galvanized components from direct contact with aluminum parts using stainless steel sheet metal separators or Teflon pads.

Materials not specifically covered in the Plans and Specifications shall be in accordance with the AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaries, and Traffic Signals, 5th edition, with 2010 and 2011 Interims, and shall be subject to approval by the Engineer.

504.03 Drawings

The first sentence of the first paragraph is deleted and replaced with the following:

The Contractor shall submit design computations, fabrication drawings, erection plans, and other necessary working drawings in accordance with Subsection 105.07, Working Drawings.

HIGHWAY BRIDGE FABRICATION

Subsections 504.14 through 504.39 are deleted and replaced with the following:

Ends of sections shall be cut true and smooth, free from burrs and ragged breaks. Material shall be handled in a manner that prevents nicks, gouges or other damage from chains, wire ropes or other handling devices during all phases of fabrication.

All connections between the mounting bracket assemblies and the supporting space frame shall be bolted. No welding will be permitted for field assembly or erection of the mounting bracket assemblies.

All surfaces of the completed mounting bracket assemblies shall be hot dip galvanized. Any repair of zinc coatings damaged by handling and erection shall be kept to a minimum. Damaged galvanized coatings shall be repaired in accordance with ASTM A780.

504.41 Methods and Equipment

This Subsection is deleted and replaced with the following:

The erection of the mounting bracket assemblies shall be in accordance with the Plans, as approved by the Engineer, and with these Specifications.

Attention is directed to Special Provision Section 652 regarding maintenance and protection of traffic during work adjacent to, or over active roadways. Work adjacent to, or over active roadways will not be permitted unless appropriate traffic control measures are in place and have been approved by the Resident.

504.65 Method of Measurement

The following Subsection is added:

The specified quantity of Mounting Bracket Assemblies will be measured as one lump sum, satisfactorily fabricated, installed and accepted by the Resident.

504.66 Basis of Payment

This Subsection is deleted and replaced with the following:

Mounting Bracket Assemblies will be paid for at the Contract Lump Sum price for the respective pay items. Payment will be full compensation for all materials, fabrication, installation, equipment, labor and incidentals necessary for furnishing and erecting the Mounting Bracket Assemblies.

Payment will be made under:

Pay Item		Pay Unit
504.91	Mounting Bracket Assemblies	Lump Sum

SPECIAL PROVISION

SECTION 515

PROTECTIVE COATING FOR CONCRETE SURFACES

(Clear Concrete Protective Coating)

This Section is deleted in its entirety and replaced with the following:

515.01 Description

The work shall include the surface preparation and application of a clear protective coating on the concrete wearing surfaces to protect the new slab surfaces in accordance with the Plans, Specifications and the manufacturer's published recommendations.

515.02 Materials

The penetrating sealer shall be Stand Off SLX100 Water & Oil Repellent, as manufactured by ProSoCo, Inc., or an approved equal. The sealer shall have the following properties:

Active Substance:	modified alkyl alkoxy silane
Active Content:	> 90%
Form:	clear liquid
VOC:	< 3.5 pounds per gallon

The product shall comply with regulations limiting the Volatile Organic Compound (VOC) content of architectural and industrial maintenance coatings.

The Contractor shall submit the ProSoCo's product data sheets, material safety data sheets and recommended instructions for application of the Stand Off SLX100.

Materials shall be delivered to the site in original packages or containers bearing the manufacturer's labels and identification.

515.021 Substitute Materials

The Contractor shall submit a written request for approval of proposed substitute material naming the proposed manufacturer and product. This request shall be accompanied by:

1. Test data from an independent testing laboratory stating that the proposed substitute meets or exceeds the specified requirements as listed and has been tested in accordance with the specified test standards.
2. Documentation that the proposed material has a proven record of performance when used in the intended application as confirmed by actual field tests and successful installations in place on at least five similar projects.

3. Certification that if two or more types of products are intended to be used as part of a system, they will be supplied by the same manufacturer to ensure compatibility of materials, and to maintain single source manufacturer responsibility.

The Resident reserves the right to require additional testing to evaluate any proposed substitute product at no additional cost to the Authority. The Resident's decision as to the acceptability or non-acceptability of the proposed product shall be final.

515.03 Surface Preparation

All caulking, epoxy overlay, and joint sealant shall be installed prior to application of the sealer. On new surfaces to be treated, all voids shall be dressed by dry rubbing to remove form marks and blemishes to present a neat appearance. Concrete and masonry surfaces shall be cleaned free of dust, surface dirt, oil, efflorescence and contaminants to ensure penetration of the sealer. The surface may be slightly damp at the time of treatment.

The Contractor may use, when required, appropriate cleaning materials recommended by the sealer manufacturer in conjunction with high pressure water for cleaning the concrete or masonry.

515.04 Application

The Contractor shall apply the clear concrete protective coating in strict accordance with the manufacturer's published recommendations.

The application shall not be conducted when surface and air temperatures are below 40^{o}F or above 100^{o}F. The work shall not be conducted when there is a chance of the surface temperature falling below 40^{o}F in the 24-hours following application.

The treatment shall not be applied during rain to wet surfaces or when there is a chance of rain within 24-hours after application. After treatment, surfaces should be protected from rain for not less than 48-hours. It shall not be applied when winds are sufficient to carry airborne chemicals to unprotected surfaces.

Prior to applying the sealer, the Contractor shall protect all surrounding non-masonry/non-concrete surfaces, landscape and lawn areas, and surfaces not designated for treatment, from contact with the penetrating sealer, and prevent overspray of the penetrating sealer caused by wind drift.

The Contractor shall ensure that all safety equipment, facilities and precautions recommended by the product manufacturer are furnished and/or strictly adhered to.

The sealer material shall be applied in the manner and with the equipment recommended by the product manufacturer. Coverage will vary depending on condition, texture and porosity of the surfaces. Pre-testing is required.

Sealer shall be applied as packaged without dilution or alteration. The sealer shall be applied with low pressure (20 psi) airless spray equipment or with a heavily saturated brush or roller unless otherwise permitted by the Resident. Sufficient material shall be applied to thoroughly saturate the surface making sure to brush out excess material that does not penetrate.

When the sealer is applied to horizontal surfaces, it shall be applied in a single saturating application with sufficient material and applied so the surface remains wet for one to two minutes before penetration into the concrete. Surface residues, pools and puddles shall be broomed-out thoroughly until they completely penetrate into the surface.

When the sealer is applied to vertical and sloped surfaces, it shall be applied in a "wet-on-wet" application for best results on most porous materials. In the case of extremely dense concrete, it may be necessary to restrict the amount of material applied to one saturating application in order to prevent surface darkening. Apply from the bottom up with sufficient material to thoroughly coat the surface and create a slight rundown below the spray pattern. Allow the first application to penetrate the concrete surface, and within a few minutes after the first coat appears dry, reapply in the same saturating manner.

When the sealer is applied to vertical and sloped surfaces, it shall be applied in two applications, 10 minutes apart, with a low pressure (20 psi) airless sprayer.

515.05 Method of Measurement

Clear Protective Coating for Concrete Surfaces will be measured for payment by the square yard, satisfactorily applied and accepted.

515.06 Basis of Payment

Clear Protective Coating for Concrete Surfaces will be paid at the Contract unit price per square yard which price shall be full compensation for all labor, materials, equipment and incidentals required for furnishing and applying the clear concrete protective coating as shown on the Plans, in accordance with these Specifications or as approved by the Resident.

Surface preparation, vegetation removal, and protection of surfaces not designated for treatment will not be measured separately for payment but shall be incidental to the Clear Concrete Protective Coating item.

Payment will be made under:

Pay Item		Pay Unit
515.202	Clear Protective Coating for Concrete Surfaces	Square Yard

SPECIAL PROVISION

SECTION 515

PROTECTIVE COATING FOR CONCRETE SURFACES

(Epoxy Overlay)

515.01 Description

The first paragraph is amended to read:

This special provision describes furnishing and applying two layers of a two-component polymer overlay system in accordance with what is shown on the Plans or as approved by the Resident. The total thickness of the overlay system shall be 1/4 inch.

515.02 Materials

The following paragraph is added:

Furnish materials specifically designed for use over concrete. Pre-qualified polymer liquid binders are as follows:

Product Trade Name	Manufacturer or Supplier	Telephone
Mark-163 Flexogrid	PolyCarb, Inc.	(866) 765-9227
Sikadur 22 Lo-mod	Sika Corporation	(248) 569-5665
E-Bond 526 Lo-Mod*	E-Bond Epoxies, Inc.	(954) 566-6555
Propoxy DOT Type III	Unitex	(816) 231-7700
Sure Level Epoxy (J-57)	Dayton Superior	(888) 977-9600
ICO Flexi-Coat	International Coatings, Inc.	(800) 624-8919
Flexolith	Euclid Chemical Co.	(800) 321-7628

*MTA preferred product

The following Subsection is added:

515.021 Polymer Resin

The polymer resin base and hardener shall be composed of two-component, 100 percent solids, 100 percent reactive, thermosetting compound with the following properties:

Property	Requirements	Test Method
Gel Time [A]	15 - 45 minutes @ 75° F	ASTM C881
Viscosity [A]	7 - 70 poises	ASTM D2393, Brookfield RVT, Spindle No. 3, 20 rpm
Shore D Hardness [B]	60-75	ASTM D2240
Absorption [B]	1% maximum at 24 hour	ASTM D570
Tensile Elongation [B]	30% - 70% @ 7 days	ASTM D638
Tensile Strength [B]	>2000 psi @ 7 days	ASTM D638

Flexural Strength [B]	>4500 psi @ 7 days	ASTM D790
Chloride Permeability [B]	<100 coulombs @ 28 days	AASHTO T277

[A] Uncured, mixed epoxy binder [B] Cured, mixed epoxy binder

The following Subsection is added:

515.022 Aggregates

Furnish natural or synthetic aggregates that have a proven record of performance in applications of this type. Furnish aggregates that are non-polishing, clean, free of surface moisture, fractured or angular in shape; free from silt, clay, asphalt, or other organic materials; and meet the following properties and gradation requirements:

Aggregate Properties:

Property	Requirement	Test Method
Moisture Content	≤0.2%	ASTM C566
Hardness	≥6.5	Mohs Scale
Fractured Faces	100% with at least 1 fractured face & 80% with at least 2 fractured faces of material retained on No.16	ASTM 5821

Gradation:

Sieve Size	% Passing by Weight
No. 4	100
No. 8	30 – 75
No. 16	0 – 5
No. 30	0– 1

The following Subsection is added:

515.023 Required Properties of Overlay System

The required properties of the overlay system are listed in the table below:

Property	Requirement [A]	Test Method
Minimum Compressive Strength at 8 Hrs. (psi)	1,000 psi @ 8 hours 5,000 psi @ 24 hours	ASTM C 579 Method B, Modified [B]
Thermal Compatibility	No Delaminations	ASTM C 884
Minimum Pull-off Strength	250 psi @ 24 hours	ACI 503R, Appendix A

[A] Based on samples cured or aged and tested at 75°F
[B] Plastic inserts that will provide 2-inch by 2-inch cubes shall be placed in the oversized brass molds.

The following Subsection is added:

515.024 Approval of Polymer Overlay System

Submit product data sheets and specifications from the manufacturer, and a certified test report to the Resident for approval.

For materials not pre-qualified, in addition to the above submittals, submit product history/reference projects and a certified test report from an independent testing laboratory showing compliance with the requirements of the specification.

Product data sheets and specifications from the manufacture consists of literature from the manufacturer showing general instructions, application recommendations/methods, product properties, general instructions, or any other applicable information.

Construction

Conduct a pre-installation conference with the manufacturer's representative prior to construction to establish procedures for maintaining optimum working conditions and coordination of work. Furnish the Resident a copy of the recommended procedures and apply the overlay system according to the manufacturer's instructions. The manufacturer's representative familiar with the overlay system installation procedures shall be present at all times during surface preparation and overlay placement to provide quality assurance that the work is being performed properly.

Store resin materials in their original containers in a dry area. Store and handle materials according to the manufacturer's recommendations. Store all aggregates in a dry environment and protect aggregates from contaminants on the jobsite.

515.03 Surface Preparation

The following paragraphs shall be added:

Determine an acceptable machine that provides a surface a profile meeting CSP 5 according to the International Concrete Repair Institute Technical Guideline No. 03732. If the Resident requires additional verification of the surface preparation, test the tensile bond strength according to ACI 503R, Appendix A of the ACI *Manual of Concrete Practice*. The surface preparation will be considered acceptable if the tensile bond strength is greater than or equal to 250 psi or the failure area at a depth of 1/4 inches or more is greater than 50 percent of the test area. Continue adjustment of the machine and necessary testing until the surface is acceptable to the Resident or a passing test result is obtained.

Prepare the entire surface using the final accepted adjustments to the machine as determined above. Thoroughly blast cleans with hand-held equipment any areas inaccessible by

the equipment. Do not perform surface preparation more than 24-hours prior to the application of the overlay system.

Just prior to overlay placement, clean all dust, debris, and concrete fines from the concrete surface including vertical faces of curbs and barrier walls up to a height of one inch above the overlay with compressed air. When using compressed air, the air stream must be free of oil. Any grease, oil, or other foreign matter that rests on or has absorbed into the concrete shall be removed completely.

The Resident may consider alternate surface preparation methods per the overlay system manufacture's recommendations. The Resident will approve the final surface profile and cleanliness prior to the Contractor placing the epoxy overlay.

515.04 Application

The following paragraphs are added:

Perform the handling and mixing of the epoxy resin and hardening agent in a safe manner to achieve the desired results according to the manufacturer's instructions. Do not apply the overlay system if any of the following exists:

a. Ambient air temperature is below 50^{o}F;

b. Concrete surface temperature is below 50^{o}F;

c. Moisture content in the concrete exceeds 4.5 percent when measured by an electronic moisture meter or shows visible moisture after two-hours when measured in accordance with ASTM D4263;

d. Rain is forecasted during the minimum curing periods listed under C.5 ;

e. Materials component temperatures below 50^{o}F;

f. Concrete age is less than 28 days unless approved by the Resident.

After the concrete surface has been prepared or during the overlay curing period, only necessary surface preparation and overlay application equipment will be allowed on the concrete surface. Begin overlay placement as soon as possible after surface preparation operations.

The polymer overlay shall consist of a two-course application of epoxy and aggregate. Each of the two courses shall consist of a layer of epoxy covered with a layer of aggregate in sufficient quantity to completely cover the epoxy. Apply the epoxy and aggregate according to the manufacturer's requirements. Apply the overlay using equipment designed for this purpose. The application machine shall feature positive displacement volumetric metering and be capable of storing and mixing the polymer resins at the proper mix ratio. Disperse the aggregate using a standard chip spreader or equivalent machine that can provide a uniform, consistent coverage of aggregate. First course applications that do not receive enough aggregate before the epoxy gels shall be removed and replaced. A second course applied with insufficient aggregate may be left in place but will require additional applications before opening to traffic.

After completion of each course, cure the overlay according to the manufacturer's instructions. Follow the minimum cure times as prescribed by the manufacturer. Remove the excess aggregate from the surface treatment by sweeping, blowing, or vacuuming without tearing or damaging the surface; the material may be re-used if approved by the Resident and manufacturer. Apply all courses of the overlay system before opening the area to traffic. Do not allow traffic on the treated area until directed by the Resident.

After the first layer of coating has cured to the point where the aggregate cannot be pulled out, apply the second layer. Prior to applying the second layer, broom and blow off the first layer with compressed air to remove all loose excess aggregate.

Prior to opening to traffic, clean all debris and polymer from the roadway. If required by the Resident, a minimum of three days following opening to traffic, remove loosened aggregates from the concrete and approach pavement.

The following Subsection is added:

515.041 Application Rates

Apply the epoxy overlay in two separate courses in accordance with the manufacturer's instructions, but not less than the following rate of application.

Course	Minimum Epoxy Rate [A] (GAL/100 SF)	Aggregate [B] (LBS/SY)
1	2.5	10+
2	5.0	14+

[A] The minimum total applications rate is 7.5 GAL/100 SF.
[B] Application of aggregate shall be of sufficient quantity to completely cover the epoxy.

The following Subsection is added:

515.042 Minimum Curing Periods

As a minimum, cure the coating as follows:

	Average temperature of concrete surface, epoxy and aggregate components in °F					
Course	60-64	65-69	70-74	75-79	80-84	85+
1	4 hrs.	3 hrs.	2.5 hrs	2 hrs	1.5 hrs.	1 hr.
2 *	6.5 hrs.	5 hrs.	4 hrs.	3 hrs.	3 hrs.	3hrs.

*Cure course 2 for eight hours if the air temperature drops below 60° F during the curing period.

515.05 Method of Measurement

The following sentence is added:

The Authority will measure Epoxy Overlay in area by square yards completed and accepted, in accordance with the Plans.

515.06 Basis of Payment

The following sentence is added:

Payment is full compensation for preparing the surface; for tensile bond testing; for providing the overlay; for cleanup; for sweeping/vacuuming and disposing of excess materials; and for labor, equipment, tools, and incidentals necessary to complete the work.

Payment will be made under:

Pay Item		Pay Unit
515.23	Epoxy Overlay	Square Yard

SPECIAL PROVISION

SECTION 627
PAVEMENT MARKINGS

(Temporary 6 Inch Pavement Marking Tape)
(Temporary 6 Inch Black Pavement Marking Tape)

627.01 Description

The following sentence is added:

This work shall also consist of furnishing, placing, maintaining and removing temporary pavement marking tape at locations shown on the Plans or as directed by the Resident.

This work shall also consist of furnishing, placing, maintaining and removing temporary black pavement marking tape at locations shown on the Plans or as directed by the Resident. Temporary 6 Inch Black Pavement Marking Tape shall be used to cover conflicting existing pavement marking paint.

627.02 Materials

The following paragraph is added:

Temporary pavement marking tape shall be Stamark Wet Reflective Removable Pavement Marking Tape Series 710 as manufactured by 3M of St. Paul, Minnesota or an approved equal.

Temporary pavement marking tape shall be Stamark Removable Black Line Mask Tape Series 715 as manufactured by 3M of St. Paul, Minnesota or an approved equal.

627.04 General

The following paragraphs are added:

Work under this item shall be in accordance with the manufacturer's recommendations. A factory representative from 3M shall be present for the first application of all temporary pavement marking tape to insure proper application and product performance.

The pavement markings shall be applied mechanically to clean dry pavement as recommended by the manufacturer and approved by the Resident.

Temporary pavement markings shall consist of applying six inch solid white, six inch broken white, and six inch yellow reflectorized pavement marking tape for traffic maintenance during construction as shown on the Plans or as directed by the Resident.

Temporary pavement marking tape that loses reflectivity, becomes broken, dislodged or missing during the life of the Contract shall be replaced by the Contractor at no additional cost to the Authority.

627.06 Application

The following paragraphs are added:

For application of the tape, when the pavement temperature is below 50°F, heat shall be applied to the pavement surface, if deemed necessary by the factory representative or as directed by the Resident, at no additional cost to the Authority. Proper primer for the temperatures shall be used as directed by the manufacture.

The pavement mark tape shall be rolled over with a vehicle once application is complete and then scored every 20 feet when placed in long runs to prevent full length unraveling.

627.08 Removing Lines and Markings

The following sentence is added:

Removal of temporary pavement marking tape shall be accomplished without the use of heat, solvents, grinding or sandblasting and in such a manner that no damage to the pavement results.

627.09 Method of Measurement

The following paragraph is added:

Temporary Pavement Markings - Tape will be measured for payment by the linear foot. The measurement of broken lines will not include the gaps.

627.10 Basis of Payment

The following paragraphs are added:

Payment for the Temporary Pavement Markings - Tape will be made at the Contract bid price per linear foot, which price shall include furnishing, installing, maintaining and removing the temporary tape and all materials, labor, equipment and incidentals necessary to accomplish the work. Replacement of Temporary Pavement Markings - Tape, as described above, will be incidental and no separate payment will be made.

Payment for the Temporary 6 Inch Black Pavement Marking Tape will be made at the Contract bid price per linear foot installed, which price shall include furnishing, installing, maintaining and removing the temporary tape and all materials, labor, equipment and incidentals necessary to accomplish the work. Replacement of 6 Inch Black Temporary Pavement Marking Tape, as described above, will be incidental and no separate payment will be made.

Payment will be made under:

Pay Item		Pay Unit
627.73	Temporary 6 Inch Pavement Marking Tape	Linear Foot
627.731	Temporary 6 Inch Black Pavement Marking Tape	Linear Foot

SPECIAL PROVISION

SECTION 627

PAVEMENT MARKINGS

(White or Yellow Pavement Marking Line)

627.01 Description

The following sentences are added:

This work shall consist of furnishing and placing the final pavement markings at locations as shown on the Plans or as directed by the Resident.

The following sentence is added:

This work shall consist of furnishing and placing pavement marking paint and temporary pavement marking paint at locations as shown on the Plans or as directed by the Resident.

627.02 Materials

The following is added before the last paragraph:

The paint for pavement markings shall be 100% acrylic waterbase paint.

627.04 General

The following is added to the third paragraph:

Dotted white lines (DWL) shall consist of alternate 3 foot painted line segments and 9 foot gaps.

Permanent pavement marking paint shall be applied at the end of each work week prior to opening the work area to traffic or as approved by the Resident.

Temporary pavement marking paint and temporary pavement markers shall be applied daily prior to opening the work area to traffic during non-work hours or as approved by the Resident.

627.08 Removing Lines and Markings

The last sentence is deleted and is not replaced.

627.09 Method of Measurement

The second and third sentences in the second paragraph are deleted and replaced with the following:

The measurement of broken white lines, both permanent and temporary and dotted white lines, will include the gaps when painted. Temporary painted pavement marking lines will be measured for payment by the linear foot.

627.10 Basis of Payment

This Subsection is deleted and replaced with the following:

The accepted quantity of white or yellow pavement marking lines will be paid at the Contract price per linear foot. This price shall include all labor and materials to furnish, and install the paint line.

The accepted quantity of broken and dotted white pavement marking lines will be paid at the Contract price per linear foot. This price shall include all labor and materials to furnish and install the paint line.

The accepted quantity of temporary white or yellow pavement marking lines will be paid at the Contract price per linear foot. This price shall include all labor and materials to furnish, install and maintain the paint marking.

Payment will be made under:

Pay Item		Pay Unit
627.712	White or Yellow Pavement Marking Line	Linear Foot

SPECIAL PROVISION

SECTION 631

EQUIPMENT RENTAL

631.02 General

The following sentences are added:

Bucket truck - Approved one man, able to reach 30 feet high bucket truck with 10 feet lateral extension.

Scissor Lift - Hydraulic scissors lift with a minimum capacity of three workers.

Electrician - Licensed by State of Maine.

Electrician's Apprentice - Enrolled in an accredited program.

631.08 Basis of Payment

The following paragraphs are added:

Such related costs such as use of hand tools, meal and room expenses, benefits, insurance, retirement, travel time, overtime, overhead and profit will not be measured separately for payment but shall be incidental to the unit price for the bid item.

Note: For extra materials required for miscellaneous work the General Contractor shall be allowed 15 percent overhead and profit on the cost of materials and rental equipment (not covered by miscellaneous unit items). Rates for Subcontractor owned equipment required to perform miscellaneous work, not otherwise provided for in the Contract, shall be negotiated.

The General Contractor will be allowed 10 percent overhead and profit on the subcontractor's cost of materials, and subcontractors rented equipment (not covered by miscellaneous unit items). The General Contractor shall include his markup on the Subcontractor's labor in the pay items.

The labor hour bid items shall include labor and labor burdens, benefits, supervision, transportation, travel time and allowances, overnights, small tools and equipment, subcontractor overhead and profit, and General Contractor overhead and profit. Time will be measured from the start of work to the stoppage of work at the project site; less the time taken for lunch. No deduction of time will be taken for the standard morning "coffee break".

Payment will be made under:

Pay Item		Pay Unit
631.51	Bucket truck	Hour
631.52	Scissor Lift	Hour
631.53	Electrician	Hour
631.54	Electrician’s Apprentice	Hour

SPECIAL PROVISION

SECTION 643

TRAFFIC SIGNALS

(Lane Use Signal)

643.01 Description

The following paragraph is added:

This work shall consist of supply and installation of lane use signals (Non-Flashing). This work shall also include removal and disposal of existing lane use signal, with exception to salvaging the existing LED Lamps which shall be delivered to the MTA Sign Shop in Cumberland.

All equipment, installation of equipment and other incidental work shall conform to the latest applicable provisions of: NEC, MUTCD, NESC, NEMA, and the ITE Standards for traffic control equipment. All work shall be done to the satisfaction of the Resident. The meaning of specific terms shall be as defined in MUTCD, NESC, and the ITE Standards for traffic control equipment.

643.02 Materials

The following sentence is added:

The lane use signal heads shall be Trans-Tech DOT2424RG-175 or approved equal. See Appendix A for technical product details.

643.03 Installation

The following paragraph is added:

The new lane use signal housing and LED signal shall be installed and wired over the center of the new lane. New Pelco (or equal) mounting brackets may be needed and will be incidental to the installation of the new lane use signal. The canopy suspended ceiling panels will need to be removed to access the backside of the fascia panel for securing the PELCO mounting brackets. The suspended ceiling panels will need to be reinstalled after the lane use signal installation is complete. The contractor shall provide a 1 year warranty on all material and workmanship related to the installation of the new lane use signal.

643.04 Method of Measurement

Lane use signals will be measured by each unit, installed and accepted.

643.05 Basis of Payment

Lane Use Signals will be paid for at the Contract unit price each which payment shall be full compensation for removal and disposal of the existing lane use signals, salvaging the LED

bulbs and transporting to the MTA Cumberland Maintenance Facility, the furnishing and installation of new lane use signals, PELCO mounting brackets and all other materials, labor, tools, equipment and incidentals necessary to complete the work, including removal and reinstallation of the suspended ceiling panels.

Payment will be made under:

Pay Item		Pay Unit
643.711	Lane Use Signal	Each

SPECIAL PROVISION

SECTION 652

MAINTENANCE OF TRAFFIC

(Specific Project Maintenance of Traffic Requirements)

This Specification describes the specific project maintenance of traffic requirements for the New Gloucester ORT Equipment Upgrades and the West Gardiner ORT Equipment Upgrades.

The following minimum traffic requirements shall be maintained. These requirements may be adjusted based on the traffic volume when authorized by the Authority.

Maine Turnpike Traffic Control Requirements

A maintenance of traffic control plan has been developed to facilitate construction at the New Gloucester Barrier Toll Plaza. This maintenance of traffic control plan maintains two lanes of travel in each direction, utilizing lane shifts to divert traffic into the cash lanes. Temporary single lane closures will be utilized to implement the two-lane shift and also to remove the two-lane shift and restore the existing pavement markings.

Loading/unloading trucks shall not be closer than six feet from an open travel lane when being loaded or unloaded within the work zone.

The West Gardiner maintenance of traffic will consist of a long-term standard left lane closure (northbound and southbound) to close the ORT lanes and divert all traffic into the cash lanes while the Toll Equipment Updates are in progress. Once the ORT lanes are closed to traffic and traffic is diverted to the cash lanes, work activities shall be continuous until the equipment updates are complete.

For both New Gloucester and West Gardiner NB and SB approaches, a PCMS shall be utilized to provide a message that the ORT Zones are closed. The message for the PCMS shall be provided by the MTA.

Temporary Toll Plaza Lane Closures

The Contractor is permitted to close one toll lane (cash or electronic toll collection) at a time in each direction when replacing the canopy mounted lane use signals. The ORT lanes shall be open to traffic when the Contractor closes the adjacent cash or electronic toll collection lane to replace the canopy mounted lane use signals. Once a toll lane is closed, work shall proceed continuously until the work is complete minimizing the disruption to fare collections at the toll plaza.

Plaza lanes shall remain open for cash or electronic toll collection at all times except when the Contractor is performing work in or near toll lanes such that appropriate access to the lane entry

or departure is constrained by Contractor activities, or adjacent to or directly over the plaza lanes. A plaza lane closure is required when danger to the traveling public, other Authority contractors or Authority employees may exist. The potential of any material falling onto the roadway shall be considered a potential danger. This shall include, but not necessarily be limited to, demolition debris, water, tools, equipment and material.

A plaza lane closure will be required whenever men or equipment will be present in a plaza lane or when regular vehicular access into or out of a toll lane is impeded by the Contractor. The Authority may also require adjacent lanes to be closed to protect the traveling public or Authority employees. Temporary plaza lane closures are allowed from 07:00 pm to 05:00 am. These hours may be adjusted by the Resident based on the daily traffic volumes. Plaza lane closures not completely removed by the time specified will be subject to a rental fee of $500.00 per 10 minutes for every 10 minute increment beyond the specified ending time for each lane. Temporary plaza lane closures will not be allowed during periods of inclement weather as determined by the Authority and will not be allowed on Saturday, Sundays, and Holidays. The Authority reserves the right to order removal of approved temporary plaza lane closures.

Requests for temporary traffic lane closures shall be submitted to the Resident for approval. The Resident is required to receive approval from the Maine Turnpike Authority's Plaza Supervisor for all plaza lane closures. The request shall be submitted to the Plaza Supervisor by the Resident at least one working week prior to the day of the requested plaza lane closure. All requests must be received by 12:00 p.m. noon to be considered as received on that day. Requests received after 12:00 p.m. shall be considered as received the following day. The Contractor shall plan the work accordingly.

Wide load lanes (Toll Plaza Lanes 1 and 10) may be closed to accommodate replacement of the Lane Use Signals with prior approval by the Authority. The temporary wide load lane closures must be scheduled two weeks in advance, and occur outside of the various Holiday restrictions. Message boards will be utilized to advise the travelling public of the wide load restriction. Message board locations and applicable messages will be provided by the Authority.

Mainline Northbound (New Gloucester) May 22, 2020 to December 3, 2020					
			Equipment Moves	**Temporary Lane Closures**	**Temporary Shoulder Closures**
Days of Week:	Monday through Thursday				
Time of Day:	6:00 a.m. to 3:00 p.m.		Allowed	Allowed	Allowed
Days of Week:	Friday				
Time of Day:	6:00 a.m. to 2:00 p.m.		Allowed	Allowed	Allowed

Mainline Southbound (New Gloucester) May 22, 2020 to December 3, 2020					
			Equipment Moves	**Temporary Lane Closures**	**Temporary Shoulder Closures**
Days of Week:	Monday through Thursday				
Time of Day:	8:00 a.m. to 6:00 p.m.		Allowed	Allowed	Allowed

Mainline Northbound (New Gloucester) March 2020 to May 21, 2020 December 4, 2020 to March 2021					
			Equipment Moves	**Temporary Lane Closures**	**Temporary Shoulder Closures**
Days of Week:	Monday through Thursday				
Time of Day:	6:00 a.m. to 6:00 p.m.		Allowed	Allowed	Allowed
Days of Week:	Friday				
Time of Day:	6:00 a.m. to 3:30 p.m.		Allowed	Allowed	Allowed

Mainline Southbound (New Gloucester) March 2020 to May 21, 2020 December 4, 2020 to March 2021					
			Equipment Moves	**Temporary Lane Closures**	**Temporary Shoulder Closures**
Days of Week:	Monday through Friday				
Time of Day:	8:00 a.m. to 6:00 p.m.		Allowed	Allowed	Allowed

There shall be a minimum of one lane of mainline traffic maintained in each direction at all times. A minimum travelway width of 14 feet is required for all open lanes during construction operations. The minimum lane widths provided by pavement markings shall be 11 feet wide.

All stoppages, equipment moves, lane closures and shoulder closures are subject to Subsection 101.2, Definition, and Section 107.3.3, Sundays and Holidays.

Temporary mainline or toll lane closures shall be removed if construction is not ongoing. Unattended lane closures are not allowed unless included in the Contract language or approved by the Resident as a long-term traffic control operation.

SPECIAL PROVISION

SECTION 652

MAINTENANCE OF TRAFFIC

(Truck Mounted Attenuator)

Section 652 of the Maine Turnpike Authority 2016 Supplemental Specifications is modified as follows:

652.1 Description

The following paragraph is added:

When a pay item for a Truck Mounted Attenuator (TMA) is included in the contract at least one TMA will be required on the project and its use will be required. The truck mounted attenuator should be utilized in lane closures and other construction operations where workers are exposed to traffic and not protected by other positive means. The Contractor shall manage the utilization and operation of the TMA and if at least one is not used as described above then it will be considered a Traffic Control Plan violation and result in a reduction of payment as outlined in Section 652.

652.2.1 Truck Mounted Attenuator

This section is deleted in its entirety and replaced with the following:

The truck mounted attenuator system shall conform to the following requirements:

- Truck and attached attenuator shall conform to the NCHRP Report 350, Test Level 3 criteria.
- A mounted revolving amber light or amber strobe light with 360-degree visibility.
- An arrow light bar fixed to the vehicle.
- The attenuator shall be mounted to a vehicle with a minimum weight of 10,000 lbs.

652.3.7 Operations

This section is deleted in its entirety and replaced with the following:

The Contractor shall manage the operation of the truck mounted attenuator. The truck mounted attenuator should be utilized in lane closures and other construction operations where workers are exposed to traffic and not protected by positive means. The operation of the vehicle shall be in accordance with the Manual of Uniform Traffic Control Devices and the manufacturer's recommendation.

Installation: The chart below identifies the distance from the work zone or hazard where the TMA shall be deployed. If the work zone is within a marked lane closure, the barrier truck distances shall apply and if the work is mobile, then shadow truck distances shall apply. The TMA shall not be located in the buffer zone. When used as a barrier, the barrier truck shall be parked in low gear with brakes applied and the front wheels turned away from the work zone and the adjacent traffic lane. For placement details, reference the Manual of Uniform Traffic Control Devices (MUTCD).

Weight of Truck	Barrier Truck Distance from Work Zone of Hazard	Shadow Truck Distance from Work Vehicle or Work Zone
10,000 lbs	250 ft	300 ft
15,000 lbs	200 ft	250 ft
>24,000 lbs	150 ft	200 ft

652.7 Method of Measurement

The last paragraph is deleted and replaced with:

Truck mounted attenuator shall be measured for payment by the calendar day for each calendar day that a unit is used on a travel lane or shoulder on the project, as approved by the resident.

652.8.2 Basis of Payment

The last two paragraphs are deleted and replaced with:

The Truck Mounted Attenuator(s) will be paid for at the Contract unit price per calendar day for each TMA used. This price shall include all costs associated with the use of the vehicle. Payment shall include operator, fuel, truck, maintenance, flashing lights, arrow board and all other incidentals necessary to operate the vehicle.

Payment will be made under:

Pay Item		Pay Unit
652.45	Truck Mounted Attenuator	Calendar Day

SPECIAL PROVISION

SECTION 655

ELECTRICAL WORK

655.01 Description

All work shall be governed by the Standard Specifications except for that work which applies to those sections of the Standard Specifications which are amended by the following modifications, additions and deletions.

Specifically, for the electrical work (in addition to standards specified in individual work sections), the following standards are imposed, as applicable to the work in each instance:

- NEC, National Electrical Code (NFPA No. 70)
- NFPA No. 101, Life Safety Code
- ANSI C 2, National Electrical Safety Code
- ANSI C 73, Dimensions of Attachment Plugs and Receptacles
- NECA standards for installation
- NEMA standards for materials and products
- UL, Underwriters Laboratories

The Contractor will warranty the material supplied by them and their workmanship for a minimum of one (1) year from acceptance of the project.

655.02 General Provisions

RELATED DOCUMENTS

General provisions of this Contract, including General Provisions and Special Provisions, apply to work of this section.

SUMMARY

This Section specifies several categories of provisions for electrical work, including:

1. Certain adaptive expansions of requirements specified in the Special Provisions.
2. General performance requirements within the electrical systems as a whole.
3. General work to be performed as electrical work, because of its close association.

SUMMARY OF ELECTRICAL WORK

General Outline: The facilities and systems of the electrical work can be described (but not by way of limitation) as follows:

1. Installation of electrical control and power distribution systems, including the electrical connections to new equipment.

2. Installation of toll revenue collection systems hardware.

3. Installation of temporary and interim provisions.

Permits and Fees: This work shall include the procurement of and payment for any and all permits and fees required for the performance of the electrical work including those that may be required from local utilities for services.

COORDINATION OF ELECTRICAL WORK

Refer to Part II, Special Provisions for general coordination requirements applicable to the entire work. It is recognized that the Contract documents are often diagrammatic in showing certain physical relationships, which shall be established within the electrical work, and in its interface with other work including utilities and mechanical work, and that such establishment is the exclusive responsibility of the Contractor.

Arrange electrical work in a neat, well organized manner with conduit and similar services running parallel with primary lines of the building construction, and with a minimum of 7'0" overhead clearance where physical limitations permit.

Locate operating and control equipment properly and in accordance with the NEC, to provide easy access, and arrange entire electrical work with adequate access for operation and maintenance.

Coordination of Options and Substitutions: Where the Contract documents permit the selection from several product options, and where it becomes necessary to authorize a substitution, the Contractor shall not proceed with purchases until coordination of all interface requirements has been checked and satisfactorily established. Substitutions are subject to approval by the Authority or designated representative per the requirements of the Contract documents.

SUBMITTALS FOR ELECTRICAL WORK

For electrical work, submittals are required for each category of items listed below.

- Shop Drawings, Product Data, Certifications, Test Reports, Warranties, Guarantees, Installation Drawings, and Work Checklist in Appendix H.
- Installation Drawings shall be modified and submitted to reflect any changes during installation of electrical equipment.

The Contractor, prior to forwarding shop drawings and product data to the Resident, shall check all conditions, make all corrections and sign and date each set. No shop drawings will be

reviewed by the Resident without the signature of the Contractor, which shall signify that he has checked the submittals.

PRODUCTS, ELECTRICAL WORK

Refer to Divisions 600 and 700 of the Standard Specifications for general requirements on products, materials and equipment. The following provisions expand or modify the requirements as applicable to electrical work:

Compatibility: Provide products, which are compatible with other products of the electrical work and with other work requiring interface with the electrical work, including electrical connections and control devices. For exposed electrical work, coordinate colors and finishes with other work.

FLOOR AND WALL PENETRATIONS

Where electrical materials penetrate walls or floors that are a part of a fire separation or assembly, the opening shall be effectively sealed to maintain separation integrity. Openings shall be closed using General Electric RTV850 Silicone RTV Foam, or approved equal to form a fire rated, water-tight seal, and be installed with automatic mixing only. The penetration seal materials shall pass ASTM E 814 (UL 1479) Standard Method of Fire Tests for Through Penetration Fire Stops up to the required fire resistance.

Where conduits penetrate a wall, floor or ceiling that is part of a weatherproof barrier, a non-shrink weatherproof type grout and or Sika 1A caulking shall be used, in accordance with manufacturer's installation instructions.

All work, materials, labor to fireproof or waterproof conduit penetrations shall be incidental to the various pay items.

EXCAVATING FOR ELECTRICAL WORK

The work of this article is defined to include whatever excavating and back-filling is necessary to install the electrical work. Coordinate the work with other excavating and back-filling in the same area, including de-watering; flood protection provisions, and other temporary facilities. Coordinate the work with other work in the same area, including other underground services (existing and new), paving, and concrete work. Coordinate with weather conditions and provide temporary facilities needed for protection and proper performance of installations, excavating and back-filling.

General Standards: Except as otherwise required, comply with the applicable provisions of Divisions 600 and 700 of the Standard Specifications for information related to electrical-work excavating and back-filling. Refer instances of uncertain applicability to the Resident for resolution before proceeding.

ELECTRICAL WORK CLOSEOUT

Construction Equipment: After completion of performance testing with the Authority's representative, remove Contractor's tools, test facilities, construction equipment and similar devices and materials used in execution of the work but not incorporated in the work.

ELECTRICAL SYSTEM TEST

The Contractor shall submit certification of the adequacy of each power and/or communications circuit for the following sub-systems, where applicable:

- ORT Lane Controller Cabinets
- Cash Lane Controller (LC) System
- Automatic Vehicle Identification (AVI) Readers
- Automatic Vehicle Identification (AVI) Antennas
- Digital Video Audit System (DVAS)
- Traffic Control Pedestal (TCP)
- Vehicle Capture and Recognition System (VCARS)
- Canopy Override Switch (COS)
- Manual Lane Terminal (MLT)
- Receipt Printer (RP)
- OPUS

Verification of the electrical system should be done by turning on/off assigned circuit breakers prior to attachment of equipment to validate panel schedule and that proper voltage is present at termination.

COMMUNICATIONS SYSTEMS

Provide outlets, wireways, device plates, etc., in conformance with the applicable sections of this specification, as may be required.

Wireways shall be in accordance with "Wireways" part of the Technical Specifications and NEC and the following special conditions:

- Minimum size shall be 1-inch unless otherwise noted.

- No more than two standard factory 90-degree bends per 100 feet or three 90 degree 24-inch radius bends are permitted and these bends must adhere to minimum manufacturers bend radius's on data cables.

655.03 Electrical Wireways

RELATED DOCUMENTS

General provisions of the Contract, including General Provisions and Special provisions, apply to work of this section.

SUMMARY

The requirements of this section apply to electrical wireway work specified elsewhere in these Specifications.

The types of electrical wireways required for the project may include the following:

- Electrical metallic tubing.
- Intermediate metal conduit.
- Liquid tight metallic flexible conduit.
- Galvanized rigid metal conduit.
- Nonmetallic conduit. (PVC)
- Surface metal wireways or Non-metallic wireway.

QUALITY ASSURANCE

Manufacturers: Firms regularly engaged in manufacture of electrical wireways of types and capacities required, whose products have been in satisfactory used in similar service for at least three years

Contractor: A firm with at least three years of successful installation experience on projects with electrical wiring installation work similar to that required for the project. Under this definition, Contractor can also be a subcontractor to the General Contractor for the Project.

NEMA Compliance: Comply with applicable portions of National Electrical Manufacturers Association standards pertaining to nonmetallic duct and fittings for underground installation.

UL Labels: Provide electrical wireways, which have been listed and labeled by Underwriters Laboratories.

NEC Compliance: Comply with National Electrical Code (NFPA No. 70) as applicable to construction and installation of electrical wireways.

PRODUCT DELIVERY, STORAGE AND HANDLING

Provide color-coded end-cap thread protectors on exposed threads of threaded metal conduit. Handle conduit and tubing carefully to prevent bending and end-damage and to avoid scoring finish. Store pipe and tubing inside and protect from weather. When necessary to store outdoors, elevate well above grade and enclose with durable, watertight wrapping.

MATERIALS AND COMPONENTS

For each electrical wireway system required, provide a complete assembly of conduit or tubing with fittings including, but not necessarily limited to, connectors, nipples, couplings, elbows, expansion fittings, supports, and other components and accessories as needed to form a complete system for the type required.

Metal Conduit, Tubing and Fittings: Provide metal conduit, tubing and fittings of type, grade, size and weight (wall thickness) required for each service. Where type and grade are not indicated, provide proper selection determined to fulfill wiring requirements, and comply with National Electrical Code for electrical wireways.

Rigid Steel Conduit: FS WW-C-581 and ANSI C80.1.

Intermediate Steel Conduit: FS WW-C-581 and ANSI C80.1.

EMT- Electrical Metallic Tubing: FS WW-C-563A, ANSI C80.3 and UL 797. Installation shall comply with NEC Article 348. Provide high quality, hot dip galvanized, electrical metallic tubing conduit and fittings of type, size and weight (wall thickness) required for each application. EMT shall only be used in enclosed areas that are not subject to possible collision or interference. Where type and grade are not indicated, provide proper selection determined to fulfill wiring requirements, and comply with National Electrical Code. Rain-tight compression type connectors shall be used in all cases. Set-screw type conduit connections or fittings shall not be used.

Galvanized Rigid Metal Conduit Fittings: FS W-F-408, Type and Classes as required.

Liquid-tight Flexible Metal Conduit: Provide liquid-tight flexible metal conduit comprised of single strip, continuous, flexible interlocked, double-wrapped steel, galvanized inside and outside; forming smooth internal wiring channel; with liquid-tight jacket of flexible polyvinyl chloride (PVC).

Liquid-tight Flexible Metal Conduit Fittings: FS W-F-406, Type as required.

Nonmetallic Conduit and Fittings (PVC): Provide nonmetallic conduit and fittings of type, size and weight (wall thickness) required for each service. Where type and grade are not indicated, provide proper selection determined to fulfill wiring requirements, and comply with National Electrical Code for electrical wireways, and with type selected in accordance with applicable standards.

Metallic or Nonmetallic (PVC) Surface Mounted Wireways: Provide wireways for surface mounting as required. Wireways shall be of rectangular cross section of size as required by the National Electrical Code (NFPA No. 70) for conductor fill. Wireways shall be of a design to accommodate wiring devices required. All wireway fittings shall be manufacture provided and not field fabricated.

Conduit and Tubing and Wireway Accessories: Provide conduit, tubing and wireway accessories including straps, hangers, angles expansion and deflection fittings as recommended by conduit, tubing and wireway manufacturers.

Mounting strut materials and hardware: Provide corrosion-resistant hot-dip galvanized strut members and stainless-steel hardware for all equipment and cabinet mounting applications.

INSTALLATION

Install conduit and tubing products as required, in accordance with manufacturer's written instructions, applicable requirements of NEC and National Electrical Contractors Association's

"Standard of Installation", and in accordance with recognized industry practices to ensure that products serve intended function.

Complete the installation of electrical wireways before starting installation of cables within wireways.

Where conduit is installed in earth, it shall be Polyvinyl Chloride (PVC) conduit as specified in the Plans.

PVC conduit shall be used in concrete slabs on grade and where noted in the Plans. Metallic conduit is not permitted in the concrete slabs or in substitution of any PVC conduit locations specified on the Plans without specific authorization by the Authority.

Wherever possible, install horizontal wireway runs above water and steam piping.

Install surface metal wireways and accessories as required on elevations. Carefully coordinate with interior finishes and furnishings.

At any point where a conduit crosses an expansion joint, or where movement between adjacent sections of conduit can be expected, bronze or alloy expansion fittings shall be installed equal to Type AX as made by the O.Z. Electrical Manufacturing Co., Inc., or equivalent by Hope or Spring City unless such locations are within conduit specified as non-metallic. Such locations shall be handled with a non-metallic equivalent or as specified in Plans.

The Contractor shall submit a proposed method of attaching all ancillary components to the space frame to the Resident for approval. The proposed attachment method shall not require drilling, welding or other attachment methods that will damage the space frame or its galvanized coating. Any areas of galvanized coating that are damaged by the Contractor during installation of ancillary components shall be repaired in accordance with ASTM A780.

655.04 Wires and Connectors

RELATED DOCUMENTS

The general provisions of the Contract, including General Provisions and Special Provisions, apply to the work specified in this section.

SUMMARY

The requirements of this section apply to the wire work specified elsewhere in these Specifications.

The applications for wire and connectors required on the project may include the following:

- Power distribution circuitry.
- Lighting circuitry.
- Appliance and equipment circuitry.

QUALITY ASSURANCE

Manufacturers: Firms regularly engaged in the manufacture of electrical products of the types and ratings required, whose products have been in satisfactory use in similar service for at least three years.

Contractor: A firm with at least three years of successful installation experience on projects with electrical wiring installation work similar to the work required for the project. Under this definition, Contractor can also be a subcontractor to the General Contractor for the Project.

NEC Compliance: Comply with National Electrical Code (NFPA 70) as applicable to construction and installation of electrical cable, wire and connectors.

UL Labels: Provide electrical cable, wire and connectors, which have been listed and labeled by Underwriters Laboratories.

NEMA/ICEA Compliance: Comply with National Electrical Manufacturers Association/Insulated Power Cable Authorities Association Standards publications pertaining to materials, construction and testing wire cable, where applicable.

PRODUCT DELIVERY, STORAGE AND HANDLING

Provide factory-wrapped water-proof flexible barrier material for covering wire and cable on wood reels, where applicable; and weather resistant fiberboard containers for factory-packaging of cable, wire and connectors, to protect against physical damage in transit. Do not install damaged cable, wire or connectors. Damaged materials must be removed from project site as soon as possible after damage is discovered.

Store wire and connectors in factory-installed coverings in a clean, dry indoor space which provides protection against the weather and elements.

MANUFACTURERS

Provide products produced by one of the following or approved equal (for each type of cable, wire and connectors):

Cable and Wire:

- Anaconda Wire and Cable Co.
- Belden Corp.
- General Cable Corp.
- Phelps Dodge Cable and Wire Co.
- Wire and Cable Dept., General Electric Co.
- Rome Cable Corp.

Connectors:

- AMP Inc.
- Burndy Corp.

- Minnesota Mining and Mfg. Co.
- OZ/Gedney Co.
- Thomas & Betts Co.

WIRE AND CONNECTORS

Except as otherwise required, provide wire and connectors of manufacturer's standard materials, as required by published product information and designed and constructed as recommended by the manufacturer as required for the installation.

Wire: Provide factory-fabricated wire of the size, rating, material and type as required for each service. Where not indicated, provide proper selection as determined by Installer to comply with installation requirements and with NEC standards. Select from only the following types, materials, conductor configurations, insulations, and coverings for 120/208 Volt circuits for a 3-phase system:

UL Type: THW. (Sizes #6 AWG wire and larger)
UL Type: THHW. (Sizes up to #4 AWG wire)
UL Type: USE. (Underground installation)
Material: Copper.

Conductors: (AWG wire 20 to AWG wire 16).

Note: All low voltage signal conductors (including CAT5e and CAT6 data cables) shall be stranded. Conductors for underground, below grade, or in conduit to lane devices shall be shielded and Outdoor (CMX) rated. Interior building communications cables may be plenum rated for interior wall or cable tray applications.

Concentric-lay-stranded (standard flexibility) (AWG wire 14 and larger).

Interconnection for data communication shall be performed with cables that shall be submitted for approval. The general cable types are designated on the Plans/ Specifications. Minimum bend radius should meet the requirements of the manufacturer and the requirements of the system.

Wire shall be color-coded as noted in the wiring schedules provided in the Plans.

Lead-in cables to extend loop detectors shall be IMSA Type 50-2. Loop lead-in cables shall be manufactured with a size of #14 AWG.

AVI Multi-Protocol Reader sync cables shall be IMSA Type 50-2. Sync cables shall be manufactures with a size of #18 AWG – 16 strand with a twisted pair configuration. The outer jacket shall be black low-density polyethylene.

Klik-Its (Power & Tel Enterprise Part #C8820) shall be used at all loop wire splice locations. All splices must be twisted, soldered and shrink-wrap waterproofed before enclosure is placed.

Authority's preference is to use home run cables. The use of shielded cable is acceptable, provided neither end is grounded.

All cable labeling shall be coordinated with the requirements of the Authority's Toll System Integrator (SI).

INSTALLATION

Install electrical wire and connectors as required, in accordance with the manufacturer's written instructions, the applicable requirements of NEC and the National Electrical Contractors Association's "Standard of Installation", and in accordance with recognized industry practices to ensure that products serve the intended functions.

Coordinate cable and wire installation work with electrical wireway and equipment installation work, as necessary for proper interface.

All wire and cable shall be in first class condition when installed. Lo-leak lubricants manufactured for the purpose of a pulling lubricant may be used when necessary.

All wires shall be continuous from outlet and there shall be no unnecessary slack in the conductors.

FIELD QUALITY CONTROL

Prior to energizing, check wire for continuity of circuitry and for short circuits with ohmmeter type testing equipment. The Contractor shall correct any malfunctions when they are detected.

Subsequent to wire hook-ups, energize circuitry and demonstrate functioning in accordance with requirements.

655.05 Electrical Boxes and Fittings

RELATED DOCUMENTS

The general provisions of the Contract, including General Provisions and Special Provisions, apply to the work specified in this section.

SUMMARY

The types of electrical boxes and fittings required for the project may include the following:

- NEMA 4X Cabinet for ORT AVI Readers
- Outlet boxes
- Junction boxes
- Pull boxes
- Floor boxes
- Conduit bodies

- Bushings
- Locknuts

QUALITY ASSURANCE

Manufacturers: Firms regularly engaged in the manufacture of electrical units of types and sizes required, whose products have been in satisfactory use in similar service for at least three years.

Contractor: A firm with at least three years of successful installation experience on projects with electrical installation work similar to that required for the project. Under this definition, Contractor can also be a subcontractor to the General Contractor for the Project.

NEC Compliance: Comply with National Electrical Code (NFPA 70) as applicable to construction and installation of electrical boxes and fittings.

U.L. Labels: Provide boxes and fittings, which have been listed and labeled by Underwriters Laboratories.

NEMA Compliance: Comply with National Electrical Manufacturers Association standards as applicable to nonmetallic fittings for underground installation.

NECA Standard: Comply with applicable portions of the National Electrical Contractors Association's "Standard of Installation".

MANUFACTURERS

Provide products produced by one of the following or approved equal (for each type of box and fitting):

ORT Control Cabinet:

- Hammond Manufacturing (provided by SI and installed by the Contractor)

Interior Outlet Boxes:

- Appleton Electric Co.
- Arrow Conduit and Fittings Corp.
- National Electric Products Co.
- OZ/Gedney Co.
- Steel City, Midland-Ross Corp.

Junction and Pull Boxes:

- Arrow-Hart, Inc.
- General Electric Co.
- OZ/Gedney Co.
- Square D Co.
- Unitil

Conduit Bodies:

- Appleton Electric Co.
- Crouse-Hinds Co.
- Killark Electric Mfg. Co.
- Pyle-National Co.

Bushings, Knockout Closures and Locknuts:

- Allen-Stevens Conduit Fittings Corp.
- Allied Metal Stamping, Inc.
- Appleton Electric Co.
- Carr Co.
- Raco, Inc.
- Steel City, Midland-Ross Corp.
- Thomas and Betts Co., Inc.

MATERIALS

ORT Control cabinet: shall be provided by the Authority's Toll System Integrator (SI) and installed by the Contractor. The following information is provided to assist the Contractor with planning for the associated conduit and wiring work. The ORT Control Cabinet shall have the following dimensions:

Height 6'-0"
Width 6'-0"
Depth 1'-6"

FABRICATED MATERIALS

Interior Outlet Boxes: Provide galvanized steel interior outlet wiring boxes, of the type, shape and size, including depth of box, to suit each respective location and installation; constructed with stamped knockouts in back and sides, and with threaded holes with screws for securing box covers or wiring devices.

Interior Outlet Box Accessories: Provide outlet box accessories as required for each installation, including mounting brackets, wallboard hangers, extension rings, fixture studs, cable clamps and metal straps for supporting outlet boxes, compatible with outlet boxes being used and meeting requirements of individual wiring situations. Choice of accessories is Installer's option. All covers for outlet boxes to be stainless steel.

Junction and Pull Boxes: Provide galvanized sheet steel, PVC or concrete junction and pull boxes as called for in the Plans with screw-on covers; of the type shape and size, to suit each respective location and installation; with welded seams and equipped with stainless steel nuts, bolts, screws and washers.

Conduit Bodies: Provide galvanized cast-metal conduit bodies, of the type, shape and size, to suit each respective location and installation, constructed with threaded conduit ends, removable cover, and corrosion-resistant screws.

Bushings, Knockout Closures and Locknuts: Provide corrosion-resistant punched-steel box knockout closures, conduit locknuts and malleable iron conduit bushings of the type and size to suit each respective use and installation.

Mounting strut materials and hardware: Provide corrosion-resistant hot dipped galvanized members and stainless-steel hardware for all equipment mounting applications. Where strut material is exposed to the weather, and less than 10 feet off the ground, struts shall be stainless

steel. If any galvanized strut member or hardware is cut or the galvanizing is compromised, the affected area shall be wire brushed and cleaned to bare metal and the area shall be given two coats of cold galvanizing (following application instructions).

INSTALLATION OF BOXES AND FITTINGS

Install all equipment cabinets in compliance with NEC requirements, in accordance with the manufacturer's written instructions, and with recognized industry practices to ensure the boxes and fittings serve the intended purposes. Contractor shall coordinate all associated conduit, wiring and related work with the Resident and SI to confirm appropriate placement in coordination with ORT Control cabinet installation. Given the final installation of the ORT Control cabinets will likely take place several weeks following the placement of the cabinets in the plaza tunnel, the Contractor shall work with the Resident to provide adequate protection of the cabinets until they are mounted in their final location.

Install electrical boxes and fittings in compliance with NEC requirements, in accordance with the manufacturer's written instructions and with recognized industry practices to ensure that the boxes and fittings serve the intended purposes:

Provide weatherproof outlets for interior and exterior locations exposed to weather or moisture.

Provide knockout closures to cap unused knockout holes where blanks have been removed

Locate boxes and conduit bodies to ensure accessibility of electrical wiring.

All boxes shall be rigidly secured in position unless otherwise directed by the Resident.

Where standard boxes are not suitable, provide boxes of special design to suit space and function.

Conduit bushings shall be used on the end of all pipes terminated in a raceway or boxes.

The Contractor shall submit a proposed method of attaching all ancillary components to the space frame to the Resident for approval. The proposed attachment method shall not require drilling, welding or other attachment methods that will damage the space frame or its galvanized coating. Any areas of galvanized coating that are damaged by the Contractor during installation of ancillary components shall be repaired in accordance with ASTM A780.

655.06 Wiring Devices

RELATED DOCUMENTS

The general provisions of the Contract, including General Provisions and Special Provisions, apply to the work specified in this section.

SUMMARY

Wiring devices are defined as single discrete units of electrical distribution systems, which are intended to carry but not utilize electric energy.

The types of electrical wiring devices required for this project include the following:

- Receptacles
- Switches
- Wall plates
- Plugs
- Connectors
- Breakers

QUALITY ASSURANCE

Manufacturers: Firms regularly engaged in manufacture of wiring devices, of types and ratings required, whose products have been in satisfactory use in similar service for at least three years.

Contractor: A firm with at least three years of successful installation experience on projects with electrical installation work similar to that required for the project.

NEC Compliance: Comply with National Electrical Code (NFPA No. 70) as applicable to construction and installation of electrical wiring devices.

UL Labels: Provide electrical wiring devices, which have been tested, listed and labeled by Underwriters Laboratories.

NEMA Compliance: Comply with National Electrical Manufacturers Association standards for general- and specific-purpose wiring devices.

MANUFACTURERS

Provide products produced by one of the following:

- Arrow-Hart, Inc.
- Bell Electric Co.
- Bryant Electric Co.
- Crouse-Hinds Co.
- Cutler-Hammer, Inc.
- General Electric Co.
- Gould, Inc.
- Harvey Hubbell Inc.
- Pass and Seymour, Inc.
- Slater Electric, Inc.
- Square D Co.
- Hunt Electronics
- Lutron
- Intermatic
- Paragon
- Unitil

FABRICATED DEVICES

Provide factory-fabricated wiring devices, in type and electrical rating for the service required.

Receptacles: Comply with NEMA Stds. Pub. No. WD1 and as follows:

General-Duty Duplex: Provide duplex general-duty type, spec. grade, receptacles, 2-pole, 3-wire grounding, with green hexagonal equipment ground screw, ground terminals and poles internally connected to mounting yoke, 15-ampere, 125-volts, with metal plaster ears, screw terminal connectors, NEMA configuration 5-15R unless otherwise required.

Heavy-Duty Duplex: Provide duplex type, spec. grade, receptacles, 2-pole, 3-wire grounding, with green hexagonal equipment ground screw, 20-ampere, 125-volts, with metal plaster ears, screw terminal connectors, NEMA configuration L5-20R unless otherwise required. Provide twist lock outlets as required for the UPS connections, twist locks to be L5-20R.

Switches: Comply with NEMA Stds. Pub. No. WD1 and as follows:

Provide general-duty flush toggle switches, 20-ampere, 120/277VAC, with mounting yoke insulated from mechanism, equipped with plaster ears, and side-wired screw terminals as follows:

Single pole switches	Double pole switches
Three Way switches	Four Way switches

Breakers: Breakers shall be compatible with panel circuits. All breakers necessary will be incidental to the Contract pay items.

WIRING DEVICE ACCESSORIES

Wall Plates: Provide single switch and duplex outlet wall plates for wiring devices, with ganging and cutouts as required, provide with metal screws for securing plates to devices, screw heads colored to match finish of plate, and wall plates possessing the following additional construction features:

Material and Finish: 0.04-inch thick, satin finished stainless steel.

INSTALLATION OF WIRING DEVICES

Install wiring devices where required, in accordance with manufacturer's written instructions, applicable requirements of NEC and National Electrical Contractors Association's "Standard of Installation", and in accordance with recognized industry practices to ensure that products serve intended function.

Delay installation of devices until wiring is completed.

Install receptacles and switches only in electrical boxes that are clean and free from excess building materials, debris, etc.

PROTECTION OF WALL PLATES AND RECEPTACLES

Upon installation of wall plates and receptacles, Contractor shall use caution regarding the use of convenience outlets. At time of completion, replace those items which have been damaged, including those burned and scored by faulty plugs.

TESTING

Test wiring devices to ensure electrical continuity of grounding connections, and after energizing circuitry, to demonstrate compliance with requirements.

655.07 Grounding

SUMMARY

Furnish labor and material to provide grounding facilities for the entire electrical installation as required by all inspecting and jurisdictional authorities as herein specified. The following are included, but not limited to, as items requiring grounding:

- Electrical service neutral conductor.
- Neutral conductor of all transformer secondary.
- Conduits, boxes and other conductor enclosures. Neutral or identified conductor of interior wiring system.
- Distribution panels, power and lighting panel boards.
- Non-current - carrying parts of fixed equipment, such as transformers, motors, starters, control cabinets, disconnects, lighting fixtures, stand-by generator, etc.
- Metallic cabinets and auxiliary systems cabinets.

EQUIPMENT

Furnish and install all boxes and/or access plates required for installation and inspection of grounding connections to cold water piping system or other made electrodes.

Provide brass identifying tags on all ground clamps.

INSTALLATION

Ground connections made to metallic cold-water piping system at such locations as will be readily available for inspection. Provide jumper connections around all meters and shut off devices.

Where cold water piping is not available for ground connections, use other available or made electrodes as described in NEC Sections 250-81 or 250-83.

Conduit Grounding: All grounding bushings within all enclosures, including equipment enclosures, shall be wired together and connected internally to the enclosure grounding lug or grounding bus with bare copper conductor. Grounding conductors sized in accordance with NEC shall be used with all grounding bushings.

Equipment Grounding: All electrical equipment shall be grounded. Most other equipment will be furnished with grounding pads or grounding lugs. All ground connections shall be cleaned immediately prior to connection. The Contractor shall provide all grounding material required but not furnished with the equipment.

No grounding conductor shall be smaller than 12 AWG wire unless it is a part of an acceptable cable assembly.

SPECIAL PROVISION

SECTION 655

ELECTRICAL

(VCARS Mount Installation)

Description

The Contractor shall relocate the existing rear VCARS units and mounting bracketry from the existing location and move it to the proposed location 21’-2” offset from the Primary AVI antenna array. The relocation will require the existing VCARS units to be demounted and once the VCARS bracket is relocated, the VCARS will be reinstalled with new power and data wiring and new liquid-tight flex conduit and fittings. The Contractor must leave three feet of clearance between the bottom of the space frame and the top of the mounting pipe for the VCARS unit unless directed otherwise.

Basis of Payment

Measurement and payment for all work associated with the VCARS mount installation as shown on the Plan drawings and described herein will be per each item. All materials, labor and hardware are incidental to the pay item.

Payment will be made under:

Pay Item		Pay Unit
655.031	Remove and Reset VCARS Mount	Each

SPECIAL PROVISION

SECTION 655

ELECTRICAL

(Installation of Sensor Loops)

Description

The Contractor shall sawcut concrete pavement slab as directed by the Resident and according to Plans and detailed manufacturer's instructions provided prior to installation. Given the proprietary nature of the loop installation requirements, the manufacturer's instructions will only be provided to the awarded Contractor. Loop installation will involve multiple sawcuts within the limits indicated on the Plans and per manufacturer provided templates. Templates for loop cutting outlines shall be provided by the SI. No loop installation activities shall be done without the SI representative on-site. The SI will install the sensor loops, provide the required materials for sealing the loops, and terminate the loop sensor wiring using Klik-Its provided by the Contractor (see Special Provision Section 655 Electrical Work Subsection 655.04 Wire and Connectors). The Contractor shall be responsible for obtaining and operating required sawcutting equipment. The Contractor shall be responsible for cleaning the saw cut substrate in preparation of the SI installing the loop sensors.

NOTE: All dust must be contained so that no silica reaches Authority employees or patrons. This may be accomplished by using wet saws, advanced air filter systems or by other means meeting applicable OSHA requirements. The Contractor shall provide the Resident a 5-day notice prior to any sawcutting activities.

Basis of Payment

Payment to be made as lump sum for all work associated with sawcutting for installation of Sensor loops shown on Plan drawings; including but not limited to, furnishing Klik-Its wire connectors for each individual lane sensor. Sawcutting of concrete, removal and disposal of slurry from wet system sawcutting and substrate cleaning will be incidental to the item.

Payment will be made under:

Pay Item		Pay Unit
655.04	Installation of Sensor Loops	Lump Sum

SPECIAL PROVISION

SECTION 655

ELECTRICAL

(Installation of AVI Antennas)

Description

The contractor shall demount the four existing AVI antennas in each of the four designated ORT Zones and transport all sixteen of them to Transcore's warehouse located at 190 Riverside Street, Suite 38 in Portland. The Contractor shall also pick up the replacement AVI antennas and mounting equipment at Transcore's warehouse as coordinated by the Resident. The Contractor shall install antennas and mounts in accordance with the SI instructions. Antenna wires (LMR 600 cable) shall be installed and looped, the SI will terminate equipment wiring while the Contractor is onsite. If the SI requires additional work during termination and testing the Contractor must be present to assist.

Basis of Payment

Measurement and payment for work associated with the installation of AVI antennas as shown on the Plan drawings and described herein will be per each item. The Contractor will not pay for the purchase of antennas or presence of the SI to terminate and tune equipment.

Payment will be made under:

Pay Item		Pay Unit
655.05	Installation of AVI Antennas	Each

SPECIAL PROVISION

SECTION 655

ELECTRICAL

(OPUS Mount Installation)

Description

The Contractor shall mount a three-inch nominal diameter round Galvanized Ridged Metal Conduit using U-bolts, with the lowest point of its hood flange 17’-6” above the roadway surface. The Contractor must leave six inches of clearance between the bottom of the space frame and the top of the mounting pipe for the OPUS unit.

The OPUS Mount Installation will also include the installation of the OPUS power supply cabinets and TDK Lambda 48V Transformers in the plaza tunnel as indicated in the plan set. The power supply cabinet, TKD Lambda 48V Transformers, and OPUS Scanners will be provided by the SI and the Contractor shall provide all necessary incidentals to mount and provide 120VAC power to the cabinet from the cash lane clean power panel and 48 VDC power from the cabinet to the space frame.

Basis of Payment

Measurement and payment for all work associated with the OPUS mount installation as shown on the Plan drawings and described herein will be per each item. It shall include mounting hardware, in accordance with Special Provisions Section 655 Electrical Work, and labor to install the System Integrator furnished cabinet, 48V Transformers and OPUS Scanners.

Payment will be made under:

Pay Item		Pay Unit
655.08	OPUS Mount Installation	Each

SPECIAL PROVISION

SECTION 655

ELECTRICAL

(AWG Wire)

Description

This task shall include the providing and installation of the AWG wire, as described herein for clean and dirty power wiring, for grounding wires (where applicable) and other locations called for in the Plans and Specifications. All wire installed in conduit must be burial grade, suitable for wet locations.

Basis of Payment

Measurement and payment for the installation of the AWG wire as described herein will be per foot, to the nearest 10-foot interval per run. It shall include the furnishing, installation, routing, termination, splices and connection of the wire per the wiring schedule.

Payment will be made under:

Pay Item		Pay Unit
655.11	#10 AWG Wire	Linear Foot
655.12	#12 AWG Wire	Linear Foot

SPECIAL PROVISION

SECTION 655

ELECTRICAL

(4pr/24 (Category 5e) Shielded Cable)

Description

This task shall include the providing and installation of the Category 5e cable shown on the Plan drawings and described herein.

Cable: 4 pair, 24 AWG, Category 5e, twisted pair cable. Conductor material shall be bare copper, inner jacket material shall be PVC, cable shall be insulated, shielded and NOT gel filled. Must be Outdoor rated suited for harsh conditions 4pr/24 category 5e cable, as approved.

Basis of Payment

Measurement and payment for the installation of the 4pr/24 category 5e cable will be by linear foot to the nearest 10-foot interval per cable run. It shall include the furnishing, installation and routing of the cable per the wiring schedule.

Payment will be made under:

Pay Item		Pay Unit
655.141	4pr/24 (Category 5e) Shielded Cable	Linear Foot

SPECIAL PROVISION

SECTION 655

ELECTRICAL

(LMR 600 Cable)

Description

This task shall include providing and installation of the LMR 600 cable shown on the Plan drawings and described herein. The SI will terminate the LMR 600 Cable with the RF Male RFN-1006-9L2 and RF Female-RFN-1029-2L2 or equivalent. The male terminal end is at the antenna and the female terminal end is at the AVI Reader.

Cable: LMR 600 cable, as approved.

Basis of Payment

Measurement and payment for the installation of the LMR 600 cable will be by linear foot to the nearest 10-foot interval. It shall include the furnishing, installation, routing of the cable per the wiring schedule and terminating.

Payment will be made under:

Pay Item		Pay Unit
655.151	LMR 600 Cable	Linear Foot

SPECIAL PROVISION

SECTION 655

ELECTRICAL

(IVIS Homerun Loop Cable (IMSA 50-2 #14))

Description

This task shall include the providing and installation of the IVIS homerun loop cable (IMSA 50-2 #14) shown on the Plan drawings and described herein.

Cable: IMSA 50-2 #14 cable loop detector wire shall be as follows:

- Conductors: Solid or stranded tin copper
- Insulation: Polyethylene
- Conductor Configuration: Twisted pair
- Shield: Aluminum/Mylar tape
- Outer Jacket: Low-density polyethylene

Cable shall have two conductors, #14 AWG, 19 strand. Cable must be direct burial grade suitable for installation in the tunnel, beneath the roadway, within the barrier and any other locations shown on the Plan or described within the design documents. All loop sensor homerun cables shall have tape with length markings.

Basis of Payment

Measurement and payment for the installation of the IMSA 50-2 #14 cable will be by linear foot to the nearest 10-foot interval. It shall include the furnishing, installation and routing of the cable per the wiring schedule.

Payment will be made under:

Pay Item		Pay Unit
655.17	IVIS Homerun Loop Cable (IMSA 50-2 #14)	Linear Foot

SPECIAL PROVISION

SECTION 655

ELECTRICAL

(E-6 Reader Sync Cable (IMSA 50-2 #18))

Description

This task shall include the providing and installation of the E-6 Reader Sync Cable (IMSA 50-2 #18) shown on the Plan drawings and described herein.

Cable: IMSA 50-2 #18 cable wire shall be as follows:

- Conductors: Solid or stranded tin copper
- Insulation: Polyethylene
- Conductor Configuration: Twisted pair
- Shield: Aluminum/Mylar tape
- Outer Jacket: Low-density polyethylene

Cable shall have two conductors, #18 AWG. Cable must be direct burial grade suitable for installation in the tunnel, beneath the roadway, within the barrier and any other locations shown on the Plan or described within the design documents. All E-6 Reader sync cables shall be of similar length and have tape with length markings for each cable.

Basis of Payment

Measurement and payment for the installation of the IMSA 50-2 #18 cable will be by linear foot to the nearest 10-foot interval. It shall include the furnishing, installation and routing of the cable per the wiring schedule.

Payment will be made under:

Pay Item		Pay Unit
655.171	E-6 Reader Sync Cable (IMSA 50-2 #18)	Linear Foot

SPECIAL PROVISION

SECTION 655

ELECTRICAL

(Galvanized Rigid Metal Conduit)

Description

This task shall include providing and the installation of Galvanized Rigid Metal Conduit (RMC) as shown on the Plan drawings and described herein. All fittings shall be threaded, or approved compression type (approved by the engineer and compatible with the conduit), and waterproof. Conduit shall be installed and grounded per NEC regulations. All supports shall be hot dipped galvanized or stainless steel (approved by the engineer and compatible with the conduit).

Basis of Payment

Measurement and payment for furnishing and installing the Galvanized RMC as shown on the plan drawings, where necessary, and described herein will be per foot. It shall include the furnishing, installing, supporting and connection of the conduit and misc. hardware necessary for the installation.

Payment will be made under:

Pay Item		Pay Unit
655.206	1” Galvanized Rigid Metal Conduit	Linear Foot
655.208	3” Galvanized Rigid Metal Conduit	Linear Foot

SPECIAL PROVISION

SECTION 655

ELECTRICAL

(LIQUID TIGHT METALLIC FLEXIBLE CONDUIT)

This task shall include providing and the installation of Liquid Tight Metallic Flexible Conduit as shown on the Plan drawings and described herein. All conduit shall be watertight with flexible PVC coating over galvanized steel flex tubing. Conduit shall be installed and grounded per NEC regulations. All supports for shall be hot dipped galvanized or stainless steel. Connections shall be specialized fittings to be compatible with adjoining conduit and watertight.

Basis of Payment

Measurement and payment for installing the Liquid Tight Metallic Flexible Conduit as shown on the Plan drawings and described herein will be per linear foot actually furnished, installed, and accepted at the Contract price per linear foot. This price shall include the cost of: furnishing and installing the conduit; pull string, fittings, groundings and bonding; test cleaning interiors of conduits and all materials, labor, equipment and incidentals necessary to complete the work.

Payment will be made under:

Pay Item		Pay Unit
655.210	¾" Liquid Tight Metallic Flexible Conduit	Linear Foot

SPECIAL PROVISION

SECTION 655

ELECTRICAL

(Galvanized Steel Junction Box)

Description

This task shall include providing and installing galvanized steel watertight junction boxes measuring 12” x 12” x 6” or 18” x 18” x 6” to provide an access point from rigid metal conduit to tolling equipment mounted to the space frame as shown in the Plan drawings. Junction boxes must be approved by Resident.

Basis of Payment

Measurement and payment for installing the junction boxes as shown on the Plan drawings and described herein will be per each item. It shall include the furnishing, installation, mounting of the box, and the drilling of holes into the box for conduits.

Payment will be made under:

Pay Item		Pay Unit
655.30	12” x 12” x 6” Galvanized Steel Junction Box	Each
655.31	18” x 18” x 6” Galvanized Steel Junction Box	Each

SPECIAL PROVISION

SECTION 655

ELECTRICAL

(Galvanized Rigid Metal Conduit Condulets)

Description

This task shall include the installation of Galvanized Rigid Metal Conduit Condulets where called for on the plans, or where called for on installation drawings. The condulets shall be hot dipped galvanized and waterproof, with threaded couplings or approved compression type couplings (if recommended by the manufacturer and compatible with adjoining conduit). Types of condulets include, but are not limited to "LB", "T", "LR", "LL". All openings shall have rubber gaskets.

Basis of Payment

Measurement and payment for installing the condulets as described herein will be per item. It shall include the furnishing and installation and of the condulet, and all associated hardware.

Pay Items are as follows:

Pay Item		Pay Unit
655.52	1" Rigid Metal Conduit Condulets	Each
655.55	3" Rigid Metal Conduit Condulets	Each

APPENDIX A

Direct-View LED Traffic Controller
DOT2424RG-175

PRODUCT NUMBER
5651

CABINET DIMENSIONS
24" H x 24" W x 5" D

ILLUMINATION SOURCE
Super bright, narrow viewing angle LEDs
Available in green, red, blue, amber, and white LEDs
Messages "blankout" when turned off, eliminating confusion
Long life, solid state lighting

ELECTRICAL
Integrated solid state power supply
Photocell for auto photodimming
Standard Voltage: 120 VAC, Optional Voltages: 9-36 V, 240 VAC, 277 VAC
Maximum amps per lighted message (at 120 V) shown in the table below
UL/CUL approved for wet locations

CONSTRUCTION
Faces: Single Faced Sign
Cabinet: (DOT): NEMA 4X Rated, 1/8" wall T5052 aluminum cabinet with continuously welded seams. Optional Visor
Door: Continuous hinge with a 1" x 1/4" silicone gasket and stainless steel tool free door latches
Face Material: Impact resistant, 1/4" thick smoke tinted polycarbonate

FINISH
Standard Cabinet Color: Black
Custom colors available upon request

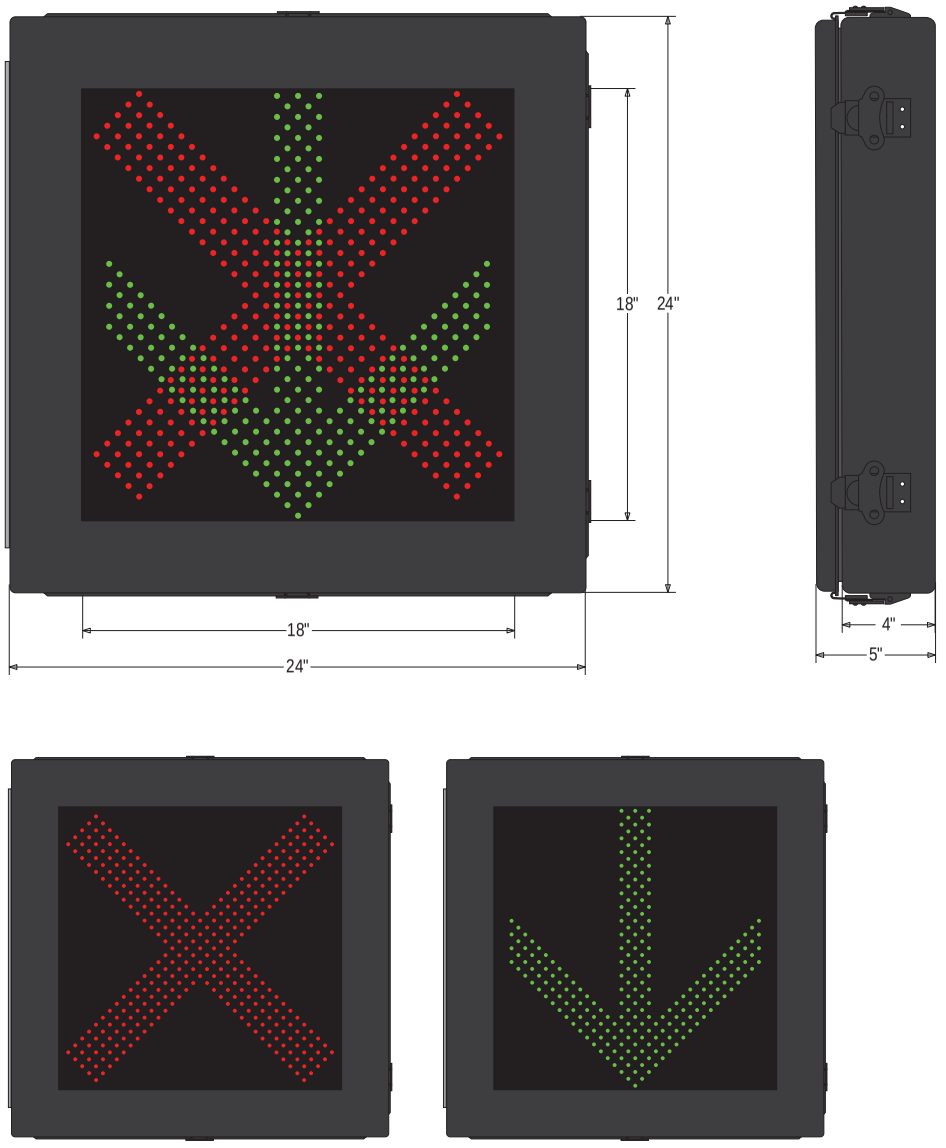
MESSAGE	COLOR	HEIGHT	AMPS
X	30° Red Round	18.0"	0.17
Down Arrow	30° Green Round	18.0"	0.13

Trans-Tech
4999 Pittsburgh Ave.
Erie, PA 16509
Phone: (888) 811-7010
Fax: (814) 836-8401
Email: sales@transportation-tech.com
Website: www.transportation-tech.com

Proudly Made in the USA

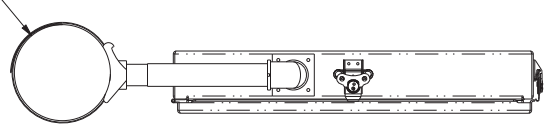
Product View

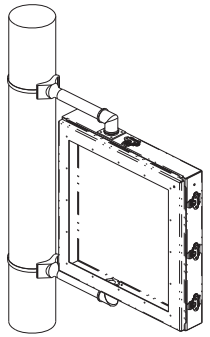
NOTE: Sign image may not exactly represent the finished product. For illustration purposes only.

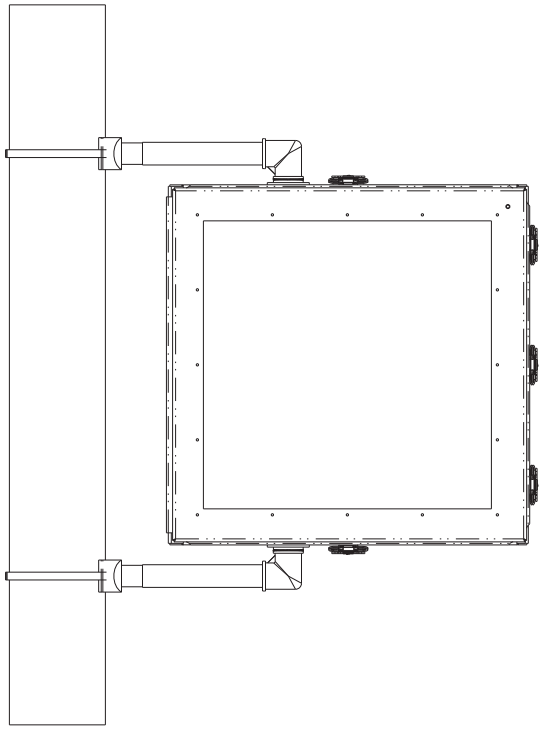


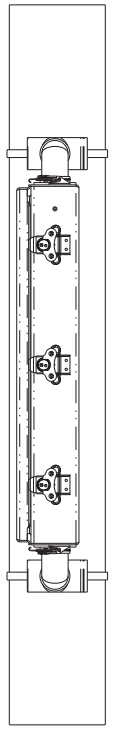
R-325
G-229

∅8" POST,
FOR ILLUSTRATION









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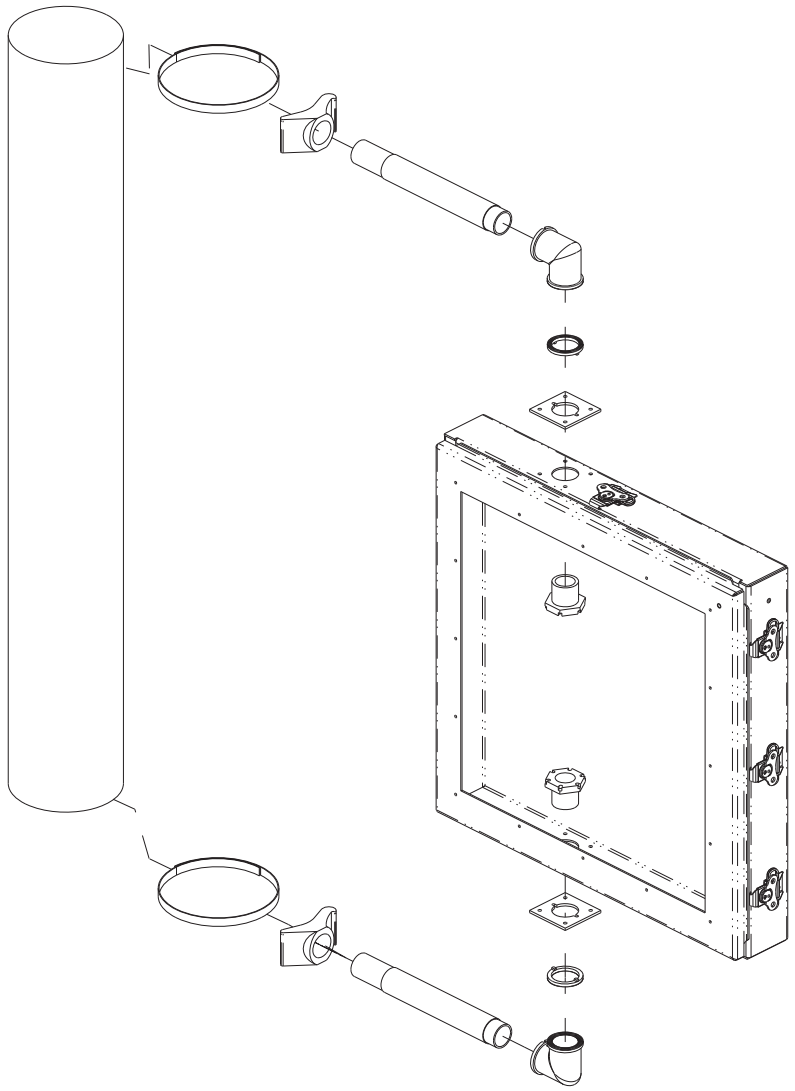
		Signal-Tech	JDG	PROD ID#:
			4985 Pittsburgh Ave Erie, PA 16509	CUST ID#:



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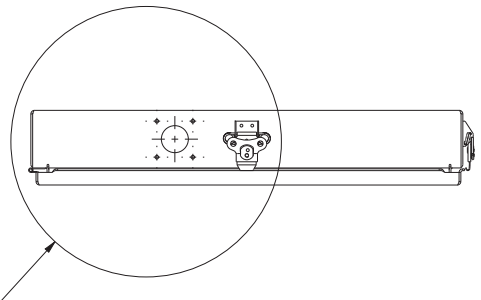
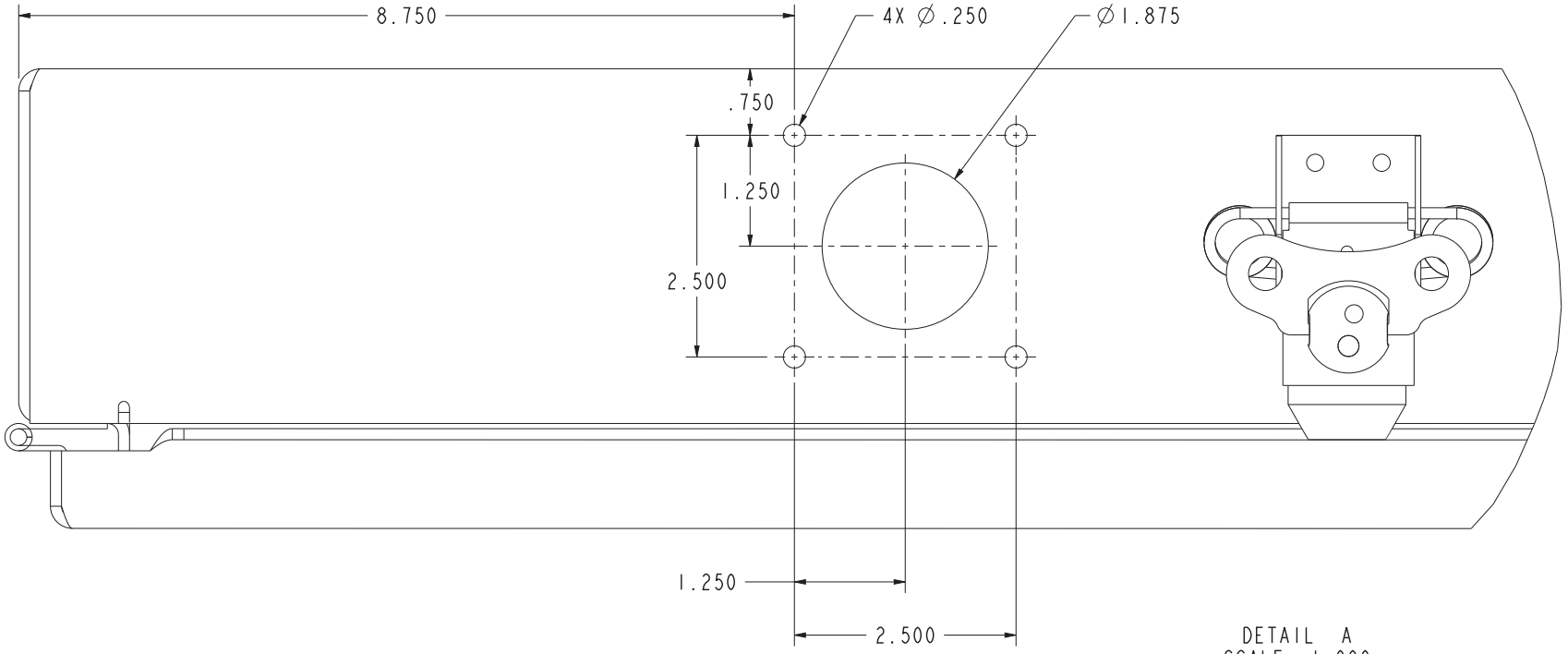
		Signal-Tech	JDG	PROD ID#:
			4985 Pittsburgh Ave Erie, PA 16509	CUST ID#:



SEE DETAIL A



DETAIL A
SCALE 1.000

TYP TOL: ±1/16" ANGLES: ± 2°		DATE: 10-MAR-11 SHEET 3 OF 3	3030 DOT, PELCO-MOUNTING	INV ID#:
		Signal-Tech	JDG	PROD ID#:
			4985 Pittsburgh Ave Erie, PA 16509	CUST ID#:

TDK·Lambda DPP120-240 Series

120W & 240W DIN Rail Mount Power Supplies

Features

- Low Cost
- 12V, 24V or 48V Outputs
- Auto-ranging input (no manual switching)
- Parallel Function Switch
- -40(2) to +71°C Operation

Key Market Segments & Applications

Industrial

RoHS

Specifications

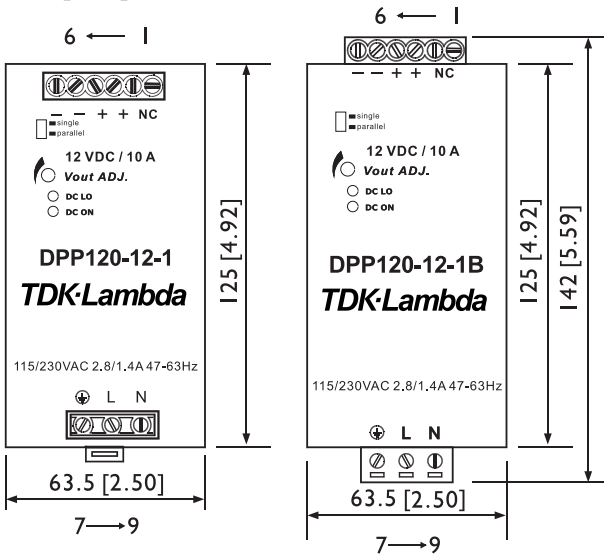
Model		DPP120-xx-1	DPP240-xx-1
AC Input Voltage range	VAC	93 - 132 / 186 - 264VAC, single phase. Auto select	
Input Frequency	Hz	47 - 63Hz	
DC Input Voltage range	VDC	210 - 370VDC*	
Inrush Current (115 / 230VAC)	A	24 / 48A	30 / 60A
Power Factor	-	Meets EN61000-3-2	
Input Current (115 / 230VAC)	A	2.8 / 1.4A	5.4 / 2.2A
Output Voltage Accuracy	%	-0, +1% of Nominal	
Line Regulation	%	±0.5%	
Load Regulation	%	±1% (±5% when set in parallel mode)	
Ripple and Noise (20MHz BW)	mV	50mV	100mV
Overcurrent Protection (Typ)	-	110 - 145%	
Overvoltage Protection	V	See model selector	
Overtemperature Protection	-	-	
Hold Up Time (230VAC input)	ms	> 30ms	
Parallel operation	-	Set in parallel (droop) mode - maximum of 3 units	
LED Indicators	-	Green LED = On, Red LED = DC Output Low	
DC Good Relay (24V model only)	-	0.3A rated normally open relay contacts, closes when output is above 17.6 - 19.4V	
Operating Temperature	°C	-40(2) to +71°C (Derate linearly 2.5%/°C from 61 to 71°C)	
Storage Temperature	°C	-40 to +85°C	
Operating Humidity	-	20 - 95% RH (non condensing)	
Cooling (1)	-	Convection	
Withstand Voltage	-	Input to Output 3kVAC for 1 min.	
Isolation Resistance	-	>100M at 25C & 70%RH, Output to Ground 500VDC	
Vibration (Operating)	-	IEC 60068-2-6 (Mounting by rail: Random wave, 10-500 Hz, 2G, ea. along X, Y, Z axes 10 min/cycle, 60 min)	
Shock (Operating)	-	IEC 60068-2-27 (Half sine wave, 4G, 22ms, 3 axes, 6 Faces, 3 times for each face)	
Safety Agency Approvals	-	UL508 Listed, UL60950-1, EN60950-1, CE	
Conducted & Radiated EMI	-	EN55022 class B	EN55022 class A
Weight (Typ)	g	920	1000
Size (WxHxD) (1)	in	2.5 x 4.92 x 4.59”	3.27 x 4.92 x 4.57”
Case material	-	Metal	
Warranty	yrs	Three years	

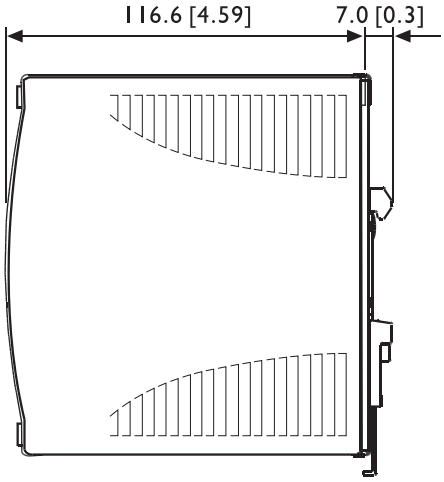
(1) Recommend 1” clearance on all sides
(2) DPP120 -35°C

*Safety certified for AC input only

Outline Drawing (DPP120)

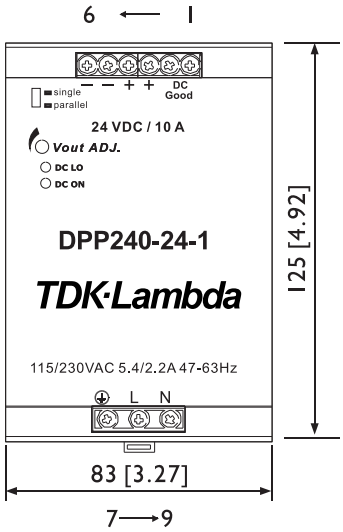
mm [inch]

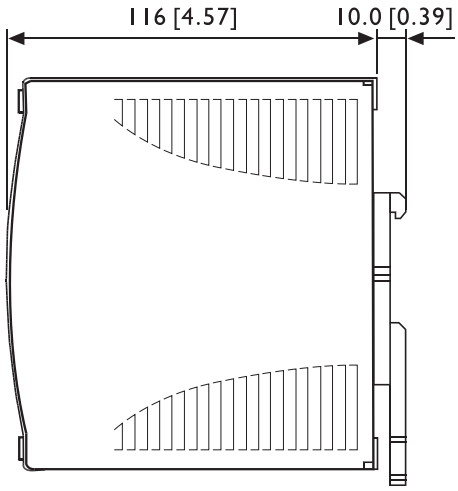




Outline Drawing (DPP240)

mm [inch]





Model Selector

Model	Voltage	Adjust. Range	Output Curr.	Over-voltage	Eff.
DPP120-12-1	12V	11.4 - 14.5V	10A	15 - 17.4V	84%
DPP120-24-1	24V	22.5 - 28.5V	5A	30 - 34.8V	86%
DPP120-48-1	48V	45 - 55V	2.5A	60 - 69.6V	87%
DPP240-24-1	24V	22.5 - 28.5V	10A	30 - 34.8V	89%
DPP240-48-1	48V	47 - 56V	5A	60 - 69.6V	90%

Other DIN Rail Products

DPP	15W to 100W
DPP480	480W single and three phase
DSP	10W to 100W low profile
DLP	75W to 240W single phase

For Additional Information, please visit
us.tdk-lambda.com/lp/products/dpp-series.htm

Terminal Assignments

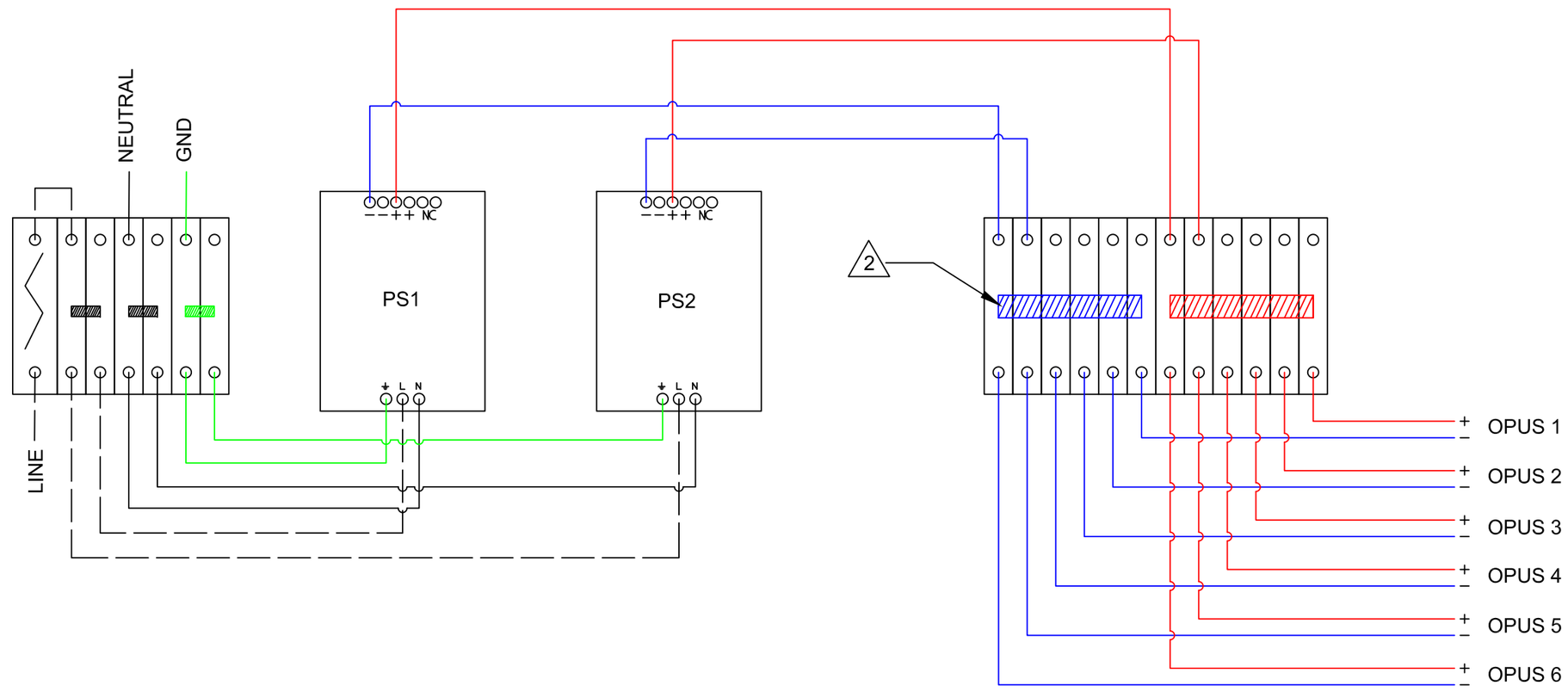
#	Function
1	DC Good relay
2	DC Good relay
3	+V
4	+V
5	-V
6	-V
7	Chassis ground
8	L
9	N

Snap-on Mounting: snap onto DIN Rail TS35/7.5 or TS35/15. (no tools required)

Options

Suffix	Description
Blank	Non detachable connectors
B	Detachable input and output connectors

NOTES:
1 SET EACH POWER SUPPLY TO RUN IN PARALLEL.
2 THE LOCATIONS OF THE JUMPER BARS ARE DEPICTED, SHOWING WHICH TERMINAL BLOCKS NEED CONNECTED.
3 THE "LINE" POWER WIRE IS RUN THROUGH THE FUSE HOLDER TERMINAL BLOCK WITH 10A FUSE BEFORE BEING CONNECTED TO THE MAIN TERMINAL BLOCKS.
4 AFTER INSTALLING ALL WIRING AND CONNECTING ALL CONNECTORS, USE CABLE TIES TO NEATLY LACE AND SECURE TO CABLE TIE POINTS WHERE AVAILABLE.



TOLERANCE UNLESS OTHERWISE SPECIFIED .XX ±.01 .XXX ±.005 ANGLES ±1.0° DIMENSIONS ARE IN INCHES	TRANSCORE, INFINITY DIVISION 55 EMERALD MOUNTAIN EXPRESSWAY WETUMPKA, ALABAMA 36093	CONFIDENTIAL AND PROPRIETARY 	DRAWING NUMBER: UTS-09001-01	REV: A
	REV. / DESCRIPTION / DATE / BY		TITLE: OPUS PS KIT WIRING DIAGRAM	
	A / INITIAL RELEASE - ANDREW JUDY / 7/18/2016 / BHB		SCALE: 1:1	SHEET DESCRIPTION:
			DATE: 7/15/16	DRAWN BY: A. JUDY
				PAGE: 1 OF 1

OPUS Wiring.dwg

PRODUCT DATA

CSI Code: 03 15 00

W. R. MEADOWS SEALTIGHT

NO. 323

AUGUST 2009
(Supersedes April 2004)

CERAMAR®

Flexible Foam Expansion Joint

DESCRIPTION

CERAMAR is a flexible foam expansion joint filler composed of a unique synthetic foam of isomeric polymers in a very small, closed-cell structure. Gray in color, CERAMAR is a lightweight, flexible, highly resilient material offering recovery qualities of over 99%. The compact, closed-cell structure will absorb almost no water.

USES

CERAMAR flexible foam expansion joint filler provides an excellent joint filler and back-up material for use in either horizontal or vertical applications where expansion and contraction movements must be accommodated. CERAMAR is compatible with all currently popular cold-applied sealants, caulks, and hot-pour joint sealing compounds. It is lightweight and easy to cut or form in the field without waste.

CERAMAR compresses easily for use with shrinkage-compensating concrete and it may be used to relieve stress and pressure in concrete pavements.

LEED INFORMATION

May help contribute to LEED credits:

- MR Credit 5.1: Regional Materials: 10% Extracted, Processed & Manufactured Regionally
- MR Credit 5.2: Regional Materials: 20% Extracted, Processed & Manufactured Regionally

FEATURES/BENEFITS

- May be sealed with hot- or cold-applied sealants.
- User friendly, lightweight, flexible foam ... forms or wraps around curved or circular surfaces.
- Cuts easily on the job with a razor knife ... no breakage or waste.
- Offers high resiliency and 99% recovery qualities ... low compression values ... non-extruding ... minimal water absorption.
- Resists ultraviolet degradation ... will not rot or deteriorate.
- Non-impregnated ... no staining or bleeding.
- Bonds easily with common cartridge adhesives.
- Non-gassing.

SPECIFICATIONS

- ASTM D 5249, Type 2
- ASTM D 1752, Sections 5.1 - 5.4, with compression requirement modified to 10 psi (7.03 g/mm^2) minimum and 25 psi (17.58 g/mm^2) maximum.
- ASTM D 7174-05

TECHNICAL DATA*

Compression, 50%	13 psi (9 g/mm^2) 89.6 kPa
Extrusion	0.1 inch (2.5 mm)
Recovery	99.21%
Water absorption, volume %	0.246

Test Method - ASTM D 545 [1/2" (12.7 mm) thick test specimen]
* All technical data is typical information, but may vary due to test methods, conditions, and operators.

CONTINUED ON REVERSE SIDE…

W. R. MEADOWS, INC.
P.O. Box 338 • HAMPSHIRE, IL 60140-0338
Phone: 847/214-2100 • Fax: 847/683-4544
1-800-342-5976
www.wrmeadows.com

PACKAGING

Furnished in standard sheets 48" (1.22 m) wide, 10' (3.05m) long. Also available in precut widths of 2" - 46" (50.8 mm - 1.17 m).

Thickness	Approx. Wt./100 ft.^{2}	Approx. Wt./100 m^2	Pcs. per Bundle	Shipping Wt./Bundle
1/4" (6.4 mm)	3.13 lb.	15.29 kg	100	160 lb. (72.58 kg)
3/8" (9.5 mm)	4.70 lb.	22.93 kg	100	240 lb. (108.86 kg)
1/2" (12.7 mm)	6.25 lb.	30.52 kg	75	250 lb. (113.40 kg)
3/4" (19.1 mm)	9.40 lb.	45.90 kg	50	240 lb. (108.86 kg)
1" (25.4 mm)	12.50 lb.	61.03 kg	40	260 lb. (117.94 kg)

APPLICATION

For horizontal applications, position CERAMAR against the forms, at interrupting columns and objects or adjacent to abutting structures, before placing the concrete. Vertical applications may call for CERAMAR to be placed between panels, panel-to-column joints, or in block wall joints prior to sealing. CERAMAR may be used with all hot- and cold-applied sealants.

PRECAUTIONS

Due to its light weight, CERAMAR will float and must be held in place by compression or with a sealant.

HEALTH AND SAFETY

Refer to Material Safety Data Sheet (MSDS) for complete health and safety information.

For most current data sheet, further LEED information, and MSDS, visit www.wrmeadows.com.

LIMITED WARRANTY

"W. R. MEADOWS, INC. warrants at the time and place we make shipment, our material will be of good quality and will conform with our published specifications in force on the date of acceptance of the order." Read complete warranty. Copy furnished upon request.

Disclaimer

The information contained herein is included for illustrative purposes only, and to the best of our knowledge, is accurate and reliable. W. R. MEADOWS, INC. cannot however under any circumstances make any guarantee of results or assume any obligation or liability in connection with the use of this information. As W. R. MEADOWS, INC. has no control over the use to which others may put its product, it is recommended that the products be tested to determine if suitable for specific application and/or our information is valid in a particular circumstance. Responsibility remains with the architect or engineer, contractor and owner for the design, application and proper installation of each product. Specifier and user shall determine the suitability of products for specific application and assume all responsibilities in connection therewith.

BUILDING TRUST

PRODUCT DATA SHEET

Sikaflex®-1c SL

HIGH PERFORMANCE, SELF-LEVELING, 1-PART POLYURETHANE SEALANT

PRODUCT DESCRIPTION

Sikaflex®-1c SL is a single component, self-leveling, premium-grade polyurethane sealant with an accelerated curing capacity. Meets Federal Specification TT-S-00230C, Type I, Class A. Meets ASTM C-920, Type S, Grade P, Class 25, use T, M, A, G, I.

USES

Sikaflex®-1c SL is used to seal horizontal expansion joints in concrete and cementitious slabs such as:

- Sidewalks
- Balconies
- Pavements
- Terraces
- Warehouses
- Factories
- Civil Structures
- Plazas
- Pitch Pans
- Canals and Water Treatment

CHARACTERISTICS / ADVANTAGES

- 1-component, no mixing
- Self-leveling, pourable
- Accelerated curing
- Can be applied to green concrete 24 hours after pour
- Can be applied to damp concrete 1 hour after getting wet
- Extremely elastic
- High durability
- Resists aging, weathering
- Excellent adhesion
- Convenient, easy-to-use packaging
- Jet fuel resistant
- Water Immersion Applications

PRODUCT INFORMATION

Packaging	10.1 fl. oz. moisture-proof composite cartridges, 24/case. 29 oz. moisture-proof composite cartridges,12/case. 5 gallon pails. (filled to 5 gal.) 50 gallon drums.
Color	Limestone
Shelf Life	10.1 oz. & 29 oz. cartridge: 1 year in original unopened packaging. 5 gallon pail & 50 gallon drum: 6 months in original unopened packaging.
Storage Conditions	Store at 40–95 °F (4–35 °C). Condition material to 65–75 °F before using.

Volatile organic compound (VOC) content	40 g/l

TECHNICAL INFORMATION

Shore A Hardness	40 ± 5	(21 days at 73 °F (23 °C) and 50 % R.H.) (ASTM D-2240)
Tensile Strength	150 psi	(21 days at 73 °F (23 °C) and 50 % R.H.) (ASTM D-412)
Tensile Stress at Specified Elongation	110 psi at 100 %	(21 days at 73 °F (23 °C) and 50 % R.H.) (ASTM D-412)
Elongation at Break	320 %	(21 days at 73 °F (23 °C) and 50 % R.H.) (ASTM D-412)
Elastic Recovery	>90 %	

Adhesion in Peel (73 °F (23 °C) and 50 % R.H.) (ASTM C-794)

Substrate	Peel Strength	Adhesion loss
Mortar	> 28 lbs.	0 %
Aluminium	>30 lbs.	0 %
Glass	> 37 lbs.	0 %

Movement Capability	±25 %	(73 °F (23 °C) and 50 % R.H.) (ASTM C-719)
Resistance to Weathering	Excellent	
Service Temperature	-40 °F (-40 °C) to 170 °F (77 °C)	

APPLICATION INFORMATION

Coverage

10.1 oz Cartridge: Yield in Linear feet

Width/Depth	1/4"	3/8"	1/2"
1/4"	24.3		
3/8"	16.2	10.8	
1/2"	12.1	8.1	6.1
3/4"	8.1	5.4	4.0
1"			3.0
1.25"			2.4
1.5"			2.0

29 oz Cartridge: Yield in Linear feet

Width/Depth	1/4"	3/8"	1/2"
1/4"	69.8		
3/8"	46.5	31.0	
1/2"	34.9	23.3	17.4
3/4"	23.3	15.5	11.6
1"			8.7
1.25"			7.0
1.5"			5.8

1 gallon: Yield in Linear feet

Width/Depth	1/4"	3/8"	1/2"
1/4"	307.9		
3/8"	205.3	136.8	
1/2"	153.9	102.6	77.0
3/4"	102.6	68.4	51.3
1"			38.5
1.25"			30.8
1.5"			25.7

Ambient Air Temperature	40–100 °F. Sealant should be installed when joint is at mid-range of its anticipated movement.

Substrate Temperature	40–100 °F. Sealant should be installed when joint is at mid-range of its anticipated movement.
Curing Rate	**Tack-free Time**: 1 to 2 hours **Final Cure**: 3 to 5 days

APPLICATION INSTRUCTIONS

SUBSTRATE PREPARATION

Clean all surfaces. Joint walls must be sound, clean,dry, frost-free, and free of oil and grease. Curing compound residues and any other foreign matter must be thoroughly removed. A mechanically roughened surface will also enhance bond. Sikaflex®-1c SL can be applied in green concrete after the concrete has cured for a minimum of 24 hours at 75°F. (23°C). For green concrete applications in control joints the concrete must be cut 8 hours (min.) prior to sealant installation and in expansion joint the forms must be removed 6 hours (min.) prior to sealant installation. For wet concrete applications all excess or standing water must be displaced and concrete must then dry for a minimum of 60 min prior to sealant installation. Install bond breaker tape or backer rod to prevent bond at base of joint.

APPLICATION METHOD / TOOLS

Recommended application temperatures: 40–100 °F. Preconditioning sealant to approximately 70 °F is necessary when working at extremes. For best performance, Sikaflex®-1c SL should be poured into joint when joint slot is at mid-point of its designed expansion and contraction. Pour sealant into joint slot in one direction and allow sealant to flow and level out as necessary. Tool as required, although minimum tooling is necessary. Joint dimension should allow for 1/4 inch minimum and 1/2 inch maximum thickness for sealant. Proper design is 2:1 width to depth ratio. Always use bond breaker tape or closed cell backer rod for support on horizontal joints.
Sikaflex®-1c SL can be applied in green concrete after the concrete has cured for a minimum of 24 hours at 75 °F. Control joints must be cut and open for min of 8 hours prior to application. Expansion joints must have forms removed a minimum of 4 hours prior to application. For damp concrete applications Sikaflex-1c SL can be applied 60 minutes after any and all water has been displaced.

LIMITATIONS

- Allow 1 week cure at standard conditions when using Sikaflex®-1c SL in total water immersion situations.
- When overcoating with water, oil and rubber based paints, compatibility and adhesion testing is essential.
- Rigid paints, coatings, or primers will crack over elastomeric sealant experiencing expansion or contraction.
- Maximum exposure level of chlorine is 5 ppm.
- In joints subject to movement - maximum depth of sealant must not exceed 1/2 in.; minimum depth is 1/4 in.
- Minimum depth of sealant for horizontal joints subject to traffic is 1/2 in.
- Maximum expansion and contraction should not exceed 25 % of average joint width.
- Do not cure in the presence of curing silicone sealants.
- Avoid contact with alcohol and other solvent cleaners during cure.
- Do not apply when moisture-vapor transmission condition exists from the substrate as this can cause bubbling within the sealant.
- Use opened cartridges the same day.
- The ultimate performance of Sikaflex®-1c SL depends on good joint design and proper application with joint surfaces properly prepared.
- Do not use in contact with bituminous/asphaltic materials.
- In green concrete applications sealing joints in poor or low strength concrete 24 hours after pour may impact ability of sealant to gain proper adhesion.
- In damp concrete applications all standing water and excess water must be eliminated prior to the 60 minute waiting time.

BASIS OF PRODUCT DATA

Results may differ based upon statistical variations depending upon mixing methods and equipment, temperature, application methods, test methods, actual site conditions and curing conditions.

OTHER RESTRICTIONS

See Legal Disclaimer.

ENVIRONMENTAL, HEALTH AND SAFETY

For further information and advice regarding transportation, handling, storage and disposal of chemical products, user should refer to the actual Safety Data Sheets containing physical, environmental, toxicological and other safety related data. User must read the current actual Safety Data Sheets before using any products. In case of an emergency, call CHEMTREC at 1-800-424-9300, International 703-527-3887.

LEGAL DISCLAIMER

- **KEEP CONTAINER TIGHTLY CLOSED**
- **KEEP OUT OF REACH OF CHILDREN**
- **NOT FOR INTERNAL CONSUMPTION**
- **FOR INDUSTRIAL USE ONLY**
- **FOR PROFESSIONAL USE ONLY**

Prior to each use of any product of Sika Corporation, its subsidiaries or affiliates ("SIKA"), the user must always read and follow the warnings and instructions on the product's most current product label, Product Data Sheet and Safety Data Sheet which are available at usa.sika.com or by calling SIKA's Technical Service Department at 1-800-933-7452. Nothing contained in any SIKA literature or materials relieves the user of the obligation to read and follow the warnings and instructions for each SIKA product as set forth in the current product label, Product Data Sheet and Safety Data Sheet prior to use of the SIKA product.

SIKA warrants this product for one year from date of installation to be free from manufacturing defects and to meet the technical properties on the current Product Data Sheet if used as directed within the product's shelf life. User determines suitability of product for intended use and assumes all risks. User's and/or buyer's sole remedy shall be limited to the purchase price or replacement of this product exclusive of any labor costs. **NO OTHER WARRANTIES EXPRESS OR IMPLIED SHALL APPLY INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. SIKA SHALL NOT BE LIABLE UNDER ANY LEGAL THEORY FOR SPECIAL OR CONSEQUENTIAL DAMAGES. SIKA SHALL NOT BE RESPONSIBLE FOR THE USE OF THIS PRODUCT IN A MANNER TO INFRINGE ON ANY PATENT OR ANY OTHER INTELLECTUAL PROPERTY RIGHTS HELD BY OTHERS.**

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