

STATE OF DELAWARE

THIS COPY IS FOR INFORMATION
ONLY. YOU MUST PURCHASE
THE PROPOSAL IN ORDER TO
SUBMIT A BID.



DEPARTMENT OF TRANSPORTATION

BID PROPOSAL

for

CONTRACT T201347203.01

BR 3-151 AND 3-164 EMERGENCY REPAIR

SUSSEX COUNTY

ADVERTISEMENT DATE: APRIL 1, 2013

Completion Date 96 Calendar Days

SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION
DELAWARE DEPARTMENT OF TRANSPORTATION
AUGUST 2001

Bids will be received in the Bidder's Room (B1.11.01), Transportation Administration Center, 800 Bay Road,
Dover, Delaware until 2:00 P.M. local time April 23, 2013

**BR 3-151 AND 3-164 EMERGENCY REPAIR
SUSSEX COUNTY**

LOCATION

These improvements are located in SUSSEX County more specifically shown on the Location Map(s) of the enclosed Plans.

DESCRIPTION

The improvements consist of furnishing all labor and materials for THE WORK ON BRIDGES 3-151 (SEAFORD BRIDGE) AND 3-164 (CEDAR CREEK BRIDGE) and INVOLVES EMERGENCY REPAIRS TO THE BRIDGE MECHANICAL SYSTEM AND ELECTRICAL SYSTEM, and other incidental construction in accordance with the location, notes and details shown on the plans and as directed by the Engineer.

COMPLETION DATE

All work on this contract must be complete within 96 Calendar Days . The Contract time includes an allowance of 0 Weather Days.

It is the Department's intent to issue a Notice to Proceed such that work starts on or about May 8, 2013

ELECTRONIC BIDDING

This project incorporates a newer version of the electronic bidding system, Expedite 5.9a. Bidders wishing to use the electronic bidding option will find the installation file on the plan holders bid file disk. The installation file and instructions are also available at: http://www.deldot.gov/information/business/bids/const_proj_bid_info.shtml.



PROSPECTIVE BIDDERS NOTE:

1. No retainage will be withheld on this contract.
2. The Department has adopted an External Complaint Procedure. The procedure can be viewed on our website at; <http://www.deldot.gov/information/business/>, or you may request a copy by calling (302) 760-2555.
3. Make note of the new version of Electronic Bidding software as noted above.

**STATE OF DELAWARE
CONSTRUCTION ITEMS UNITS OF MEASURE**

English Code	English Description	Multiply By	Metric Code	Metric Description	Suggested CEC Metric Code
ACRE	Acre	0.4047	ha	Hectare	HECTARE
BAG	Bag	N/A	Bag	Bag	BAG
C.F.	Cubic Foot	0.02832	m ³	Cubic Meter	M3
C.Y.	Cubic Yard	0.7646	m ³	Cubic Meter	M3
EA-DY	Each Day	N/A	EA-DY	Each Day	EA-DY
EA-MO	Each Month	N/A	EA-MO	Each Month	EA-MO
EA/NT	Each Night	N/A	EA-NT	Each Night	EA/NT
EACH	Each	N/A	EA	Each	EACH
GAL	Gallon	3.785	L	Liter	L
HOUR	Hour	N/A	h	Hour	HOUR
INCH	Inch	25.4	mm	Millimeter	MM
L.F.	Linear Foot	0.3048	m	Linear Meter	L.M.
L.S.	Lump Sum	N/A	L.S.	Lump Sum	L.S.
LA-MI	Lane Mile	1.609	LA-km	Lane-Kilometer	LA-KM
LB	Pound	0.4536	kg	Kilogram	KG
MFBM	Thousand Feet of Board Measure	2.3597	m ³	Cubic Meter	M3
MGAL	Thousand Gallons	3.785	kL	Kiloliter	KL
MILE	Mile	1.609	km	Kilometer	KM
S.F.	Square Foot	0.0929	m ²	Square Meter	M2
S.Y.	Square Yard	0.8361	m ²	Square Meter	M2
SY-IN	Square Yard-Inch	0.8495	m ² -25 mm	Square Meter-25 Millimeter	M2-25 MM
TON	Ton	.9072	t	Metric Ton (1000kg)	TON
N.A.*	Kip	4.448	kN	Kilonewton	N.A.*
N.A.*	Thousand Pounds per Square Inch	6.895	MPa	Megapascal	N.A.*

*Not used for units of measurement for payment.

LOCATION.	<u>i</u>
DESCRIPTION.	<u>i</u>
CONSTRUCTION ITEMS UNITS OF MEASURE.	<u>ii</u>
GENERAL NOTICES.	<u>1</u>
SPECIFICATIONS..	<u>1</u>
CLARIFICATIONS.	<u>1</u>
ATTESTING TO NON-COLLUSION.....	<u>1</u>
QUANTITIES.	<u>1</u>
PREFERENCE FOR DELAWARE LABOR.....	<u>1</u>
EQUALITY OF EMPLOYMENT OPPORTUNITY ON PUBLIC WORKS.	<u>1</u>
TAX CLEARANCE.	<u>2</u>
LICENSE.....	<u>2</u>
DIFFERING SITE CONDITIONS.....	<u>2</u>
PREVAILING WAGES.....	<u>3</u>
SUPPLEMENTAL SPECIFICATIONS.	<u>7</u>
SPECIAL PROVISIONS.	<u>9</u>
CONSTRUCTION ITEM NUMBERS.....	<u>11</u>
401502 - ASPHALT CEMENT COST ADJUSTMENT.	<u>12</u>
746662 - REPAIR BRIDGE ELECTRICAL SYSTEM.	<u>13</u>
763522 - COAST GUARD SPECIFIC CONDITIONS.	<u>26</u>
763539 - MECHANICAL REPAIR OF MOVABLE BRIDGE.	<u>28</u>
763643 - MAINTENANCE OF TRAFFIC – ALL INCLUSIVE.	<u>43</u>
UTILITY STATEMENT.	<u>49</u>
RIGHT OF WAY CERTIFICATE.....	<u>51</u>
ENVIRONMENTAL STATEMENT.	<u>53</u>
BID PROPOSAL FORMS.	<u>57</u>

GENERAL NOTICES

SPECIFICATIONS:

The specifications entitled "Delaware Standard Specifications, for Road and Bridge Construction, August, 2001", hereinafter referred to as the Standard Specifications, Supplemental Specifications, the Special Provisions, notes on the Plans, this Bid Proposal, and any addenda thereto shall govern the work to be performed under this contract.

CLARIFICATIONS:

Under any Section or Item included in the Contract, the Contractor shall be aware that when requirements, responsibilities, and furnishing of materials are outlined in the details and notes on the Plans and in the paragraphs preceding the "Basis of Payment" paragraph in the Standard Specifications or Special Provisions, no interpretation shall be made that such stipulations are excluded because reiteration is not made in the "Basis of Payment" paragraph.

ATTESTING TO NON-COLLUSION:

The Department requires as a condition precedent to acceptance of bids a sworn statement executed by, or on behalf of, the person, firm, association, or corporation to whom such contract is to be awarded, certifying that such person, firm, association, or corporation has not, either directly or indirectly, entered into any agreement, participated in any collusion, or otherwise taken any action in restraint of free competitive bidding in connection with such contract. The form for this sworn statement is included in the proposal and must be properly executed in order to have the bid considered.

QUANTITIES:

The quantities shown are for comparison of bids only. The Department may increase or decrease any quantity or quantities without penalty or change in the bid price.

PREFERENCE FOR DELAWARE LABOR:

Delaware Code, Title 29, Chapter 69, Section 6962, Paragraph (d), Subsection (4)b

"In the construction of all public works for the State or any political subdivision thereof, or by firms contracting with the State or any political subdivision thereof, preference in employment of laborers, workmen or mechanics shall be given to bona fide legal citizens of the State who have established citizenship by residence of at least 90 days in the State. Each public works contract for the construction of public works for the State or any political subdivision thereof shall contain a stipulation that any person, company or corporation who violates this section shall pay a penalty to the Secretary of Finance equal to the amount of compensation paid to any person in violation of this section."

EQUALITY OF EMPLOYMENT OPPORTUNITY ON PUBLIC WORKS:

Delaware Code, Title 29, Chapter 69, Section 6962, Paragraph (d), Subsection (7)

"a. As a condition of the awarding of any contract for public works financed in whole or in part by State appropriation, such contracts shall include the following provisions:

'During the performance of this contract, the contractor agrees as follows:

1. The contractor will not discriminate against any employee or applicant for employment because of race, creed, color, sex or national origin. The contractor will take positive steps to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, creed, color, sex or national origin. Such action shall include, but not be limited to, the following: employment, upgrading, demotion or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The contractor agrees to post in conspicuous places available to employees and applicants for employment notices to be provided by the contracting agency setting forth this nondiscrimination clause.

2. The contractor will, in all solicitations or advertisements for employees placed by or on behalf of the contractor, state that all qualified applicants will receive consideration for employment without regard to race, creed, color, sex or national origin.'

TAX CLEARANCE:

As payments to each vendor or contractor aggregate \$2,000, the Division of Accounting will report such vendor or contractor to the Division of Revenue, who will then check the vendor or contractor's compliance with tax requirements and take such further action as may be necessary to insure compliance.

LICENSE:

A person desiring to engage in business in this State as a contractor shall obtain a license upon making application to the Division of Revenue. Proof of said license compliance to be made prior to, or in conjunction with, the execution of a contract to which he has been named.

DIFFERING SITE CONDITIONS,

SUSPENSIONS OF WORK and SIGNIFICANT CHANGES IN THE CHARACTER OF WORK:

Differing site conditions: During the progress of the work, if subsurface or latent physical conditions are encountered at the site differing materially from those indicated in the contract or if unknown physical conditions of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in the work provided for in the contract are encountered at the site, the party discovering such conditions shall promptly notify the other party in writing of the specific differing conditions before they are disturbed and before the affected work is performed.

Upon written notification, the engineer will investigate the conditions, and if he/she determines that the conditions materially differ and cause an increase or decrease in the cost or time required for the performance of any work under the contract, an adjustment, excluding loss of anticipated profits, will be made and the contract modified in writing accordingly. The engineer will notify the contractor of his/her determination whether or not an adjustment of the contract is warranted.

No contract adjustment which results in a benefit to the contractor will be allowed unless the contractor has provided the required written notice.

No contract adjustment will be allowed under their clause for any effects caused on unchanged work.

Suspensions of work ordered by the engineer: If the performance of all or any portion of the work is suspended or delayed by the engineer in writing for an unreasonable period of time (not originally anticipated,

customary or inherent to the construction industry) and the contractor believes that additional compensation and/or contract time is due as a result of such suspension or delay, the contractor shall submit to the engineer in writing a request for adjustment within 7 calendar days of receipt of the notice to resume work. The request shall set forth the reasons and support for such adjustment.

Upon receipt, the engineer will evaluate the contractor's request. If the engineer agrees that the cost and/or time required for the performance of the contract has increased as a result of such suspension and the suspension was caused by conditions beyond the control of and not the fault of the contractor, its suppliers, or subcontractors at any approved tier, and not caused by weather, the engineer will make an adjustment (excluding profit) and modify the contract in writing accordingly. The engineer will notify the contractor of his/her determination whether or not an adjustment of the contract is warranted.

No contract adjustment will be allowed unless the contractor has submitted the request for adjustment within the time prescribed.

No contract adjustment will be allowed under this clause to the extent that performance would have been suspended or delayed by any other cause, or for which an adjustment is provided for or excluded under any other term or condition of this contract.

Significant changes in the character of work: The engineer reserves the right to make, in writing, at any time during the work, such changes in quantities and such alterations in the work as are necessary to satisfactorily complete the project. Such changes in quantities and alterations shall not invalidate the contract nor release the surety, and the contractor agrees to perform the work as altered.

If the alterations or changes in quantities significantly change the character of the work under the contract, whether or not changed by any such different quantities or alterations, an adjustment, excluding loss of anticipated profits, will be made to the contract. The basis for the adjustment shall be agreed upon prior to the performance of the work. If a basis cannot be agreed upon, then an adjustment will be made either for or against the contractor in such amount as the engineer may determine to be fair and equitable.

The term "significant change" shall be construed to apply only to the following circumstances:

- (A) When the character of the work as altered differs materially in kind or nature from that involved or included in the original proposed construction or
- (B) When a major item of work, as defined elsewhere in the contract, is increased in excess of 125 percent or decreased below 75 percent of the original contract quantity. Any allowance for an increase in quantity shall apply only to that portion in excess of 125 percent of original contract item quantity, or in case of a decrease below 75 percent, to the actual amount of work performed.

PREVAILING WAGES

Included in this proposal are the minimum wages to be paid various classes of laborers and mechanics as determined by the Department of Labor of the State of Delaware in accordance with Title 29 Del.C. §6960, relating to wages and the regulations implementing that Section.

Title 29 Del.C. §6960 stipulates;

- (b) Every contract based upon these specifications shall contain a stipulation that the employer shall pay all mechanics and laborers employed directly upon the site of the work, unconditionally and not less often than once a week and without subsequent deduction or rebate on any account, the full amounts accrued at time of payment, computed at wage rates not less than those stated in the specifications, regardless of

any contractual relationship which may be alleged to exist between the employer and such laborers and mechanics. The specifications shall further stipulate that the scale of wages to be paid shall be posted by the employer in a prominent and easily accessible place at the site of the work, and that there may be withheld from the employer so much of accrued payments as may be considered necessary by the Department of Labor to pay to laborers and mechanics employed by the employer the difference between the rates of wages required by the contract to be paid laborers and mechanics on the work and rates of wages received by such laborers and mechanics to be remitted to the Department of Labor for distribution upon resolution of any claims.

(c) Every contract based upon these specifications shall contain a stipulation that sworn payroll information, as required by the Department of Labor, be furnished weekly. The Department of Labor shall keep and maintain the sworn payroll information for a period of 6 months from the last day of the work week covered by the payroll.

Bidders are specifically directed to note the Department of Labor's regulations implementing §6960 relating to the effective date of the wage rates, at Part VI., Section C., which in relevant part states:

"Public agencies (covered by the provisions of 29 DeI.C. §6960) are required to use the rates which are in effect on the date of the publication of specifications for a given project. In the event that a contract is not executed within one hundred twenty (120) days from the date the specifications were published, the rates in effect at the time of the execution of the contract shall be the applicable rates for the project."

STATE OF DELAWARE
 DEPARTMENT OF LABOR
 DIVISION OF INDUSTRIAL AFFAIRS
 OFFICE OF LABOR LAW ENFORCEMENT
 PHONE: (302) 451-3423

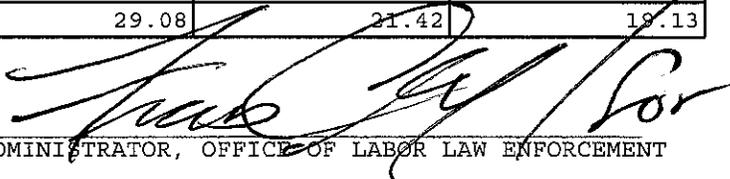
Mailing Address:
 225 CORPORATE BOULEVARD
 SUITE 104
 NEWARK, DE 19702

Located at:
 225 CORPORATE BOULEVARD
 SUITE 104
 NEWARK, DE 19702

PREVAILING WAGES FOR HIGHWAY CONSTRUCTION EFFECTIVE MARCH 15, 2013

CLASSIFICATION	NEW CASTLE	KENT	SUSSEX
BRICKLAYERS	46.83	46.83	14.51
CARPENTERS	42.64	50.06	39.82
CEMENT FINISHERS	28.79	26.13	23.29
ELECTRICAL LINE WORKERS	22.50	43.42	21.25
ELECTRICIANS	60.60	60.60	60.60
IRON WORKERS	42.20	23.87	25.35
LABORERS	28.95	26.97	26.82
MILLWRIGHTS	16.11	15.63	13.49
PAINTERS	58.07	58.07	58.07
PILEDRIVERS	66.42	23.75	26.95
POWER EQUIPMENT OPERATORS	37.00	29.47	27.16
SHEET METAL WORKERS	22.75	20.31	18.40
TRUCK DRIVERS	29.08	21.42	18.13

CERTIFIED: 3/19/13

BY: 
 ADMINISTRATOR, OFFICE OF LABOR LAW ENFORCEMENT

NOTE: THESE RATES ARE PROMULGATED AND ENFORCED PURSUANT TO THE PREVAILING WAGE REGULATIONS ADOPTED BY THE DEPARTMENT OF LABOR ON APRIL 3, 1992.

CLASSIFICATIONS OF WORKERS ARE DETERMINED BY THE DEPARTMENT OF LABOR. FOR ASSISTANCE IN CLASSIFYING WORKERS, OR FOR A COPY OF THE REGULATIONS OR CLASSIFICATIONS, PHONE (302) 451-3423.

NON-REGISTERED APPRENTICES MUST BE PAID THE MECHANIC'S RATE.

PROJECT: Contract No. T201347203.01 BR 3-151 and 3-164 Emergency Repair, Sussex County

**SUPPLEMENTAL SPECIFICATIONS
TO THE
AUGUST 2001
STANDARD SPECIFICATIONS**

**EFFECTIVE AS OF THE ADVERTISEMENT
DATE OF THIS PROPOSAL
AND INCLUDED BY REFERENCE**

**The Supplemental Specifications can be viewed and printed from
the Department's Website.**

To access the Website;

- in your internet browser, enter; <http://www.deldot.gov>
- on the left side of the page under 'INFORMATION', Click; 'Publications'
- scroll down under 'MANUALS' and Click; "Standard Specifications 2001"

The full Website Link is;

http://www.deldot.gov/information/pubs_forms/manuals/standard_specifications/index.shtml

Printed copies of the Supplemental Specifications are available upon request. A printed copy of the above referenced Supplemental Specifications will be included in the final contract documents upon award.

The Contractor shall make himself aware of these revisions and corrections (Supplemental Specifications), and apply them to the applicable item(s) of this contract.

SPECIAL PROVISIONS

CONSTRUCTION ITEM NUMBERS

All construction pay items are assigned a six (6) digit number, shown as Item Number on the Plans and/or in the Special Provisions, and shall be interpreted in accordance with the following:

Standard Item Number:

The first three digits of the construction item numbers indicates the Section number as described in the Standard Specifications, and all applicable requirements of the Section shall remain effective unless otherwise modified by the Special Provisions. The last three digits of the construction item identifies the item by sequential number under that Section. Sequential numbers for all items covered under Standard Specifications range from 000 to 499. A comprehensive list of construction item numbers begins on page 421 of the Standard Specifications. Additions to this list will be made as required.

Special Provisions Item Number:

The first three digits of the construction items, covered under Special Provisions, indicates the applicable Section number of the Standard Specifications, and shall be governed fully by the requirements of the Special Provisions. The last three digit of the items covered under Special Provisions identifies the item by sequential number. Sequential numbers for Special Provision items, range from 500 to 999.

Examples

Standard Item Number - 202000 Excavation and Embankment

202 Indicates Section Number

000 Indicates Sequential Number

Special Provision Item Number - 202500 Grading and Reshaping Roadway

202 Indicates Section Number

500 Indicates Sequential Number

401502 - ASPHALT CEMENT COST ADJUSTMENT

For Sections 304, 401, 402, 403, 404, and 405, payments to the Contractor shall be adjusted to reflect increases or decreases in the Delaware Posted Asphalt Cement Price when compared to the Project Asphalt Cement Base Price, as defined in these Special Provisions.

The Delaware Posted Asphalt Cement Price will be issued monthly by the Department and will be the industry posted price for Asphalt Cement, F.O.B. Philadelphia, Pennsylvania.

The Project Asphalt Cement Base Price will be the anticipated Delaware Posted Asphalt Cement Price expected to be in effect at the time of receipt of bids.

All deviations of the Delaware Posted Asphalt Cement Price from the Project Asphalt Cement Base Price are eligible for cost adjustment. No minimum increases or decreases or corresponding percentages are required to qualify for cost adjustment.

Actual quantity of asphalt cement qualifying for any Asphalt Cement Cost Adjustment will be computed on the basis of weight tickets and asphalt percentage from the approved job mix formula.

For Recycled Hot-Mix the asphalt percentage eligible for cost adjustment shall be only the new asphalt cement added to the mix.

There shall be no separate payment per ton (metric ton) cost of asphalt cement. That cost shall be included in the various unit prices bid per ton (metric ton) for those bid items that contain asphalt cement (mentioned above).

The Asphalt cement cost adjustment will be calculated on grade PG 64-22 asphalt regardless of the actual grade of asphalt used. The Project Asphalt Cement Base Price for the project will be \$535.00 per ton (\$589.74 per metric ton).

If the Contractor exceeds the authorized allotted completion time, the price of asphalt cement on the last authorized allotted work day, shall be the prices used for cost adjustment during the time liquidated damages are assessed. However, if the industry posted price for asphalt cement goes down, the asphalt-cement cost shall be adjusted downward accordingly.

NOTE

Application of Asphalt Cement Cost Adjustment requirements as indicated above shall apply only to those contracts involving items related to bituminous base and pavements, and with bitumen, having a total of 1,000 tons (1,000 metric tons) or more of hot-mix bid quantity in case of Sections 401, 402 and 403; and 15,000 gallons (60 000 liters) or more in case of Sections 304, 404 and 405.

746662 - REPAIR BRIDGE ELECTRICAL SYSTEM

PART I - GENERAL

This work shall consist of the furnishing, refurbishing, installing, testing, and adjusting new and existing portions of the bridge electrical systems, as specified herein, by the Contractor and/or qualified Electrical Subcontractor (refer to Section 1.3.1, Qualifications). Project locations include the Seaford Bridge, a single leaf bascule span carrying Front Street over the Nanticoke River in Seaford, Delaware and the Cedar Creek Bridge, a swing span carrying SR 36 over the Cedar Creek in Sussex County, Delaware.

1.1 Description of Work

The Contractor shall provide all required materials, labor and equipment to complete the work as specified herein. Work items include, but are not necessarily limited to:

Seaford Bridge:

- Refurbish 4 fender pier lights
- Refurbish 2 span navigation lights
- Refurbish receptacles and service lights located in the bascule pit
- Refurbish existing conduit system on the fender system, at the bascule span toe, and in the bascule pit
- Refurbish existing span rotary cam position switch located in bascule pit
- Refurbish existing 6 brake lever arm limit switches, 3 per brake, and 2 fully seated lever arm limit switches
- Refurbish existing junction and terminal boxes located on the fender system, at the bascule span toe, and in the bascule pit
- Replace existing safety switches: one 60 A span motor disconnect switch and two 30 A span brake disconnect switches located in the bascule pit
- Replace all power and control wiring in refurbished conduit system
- Install new span motor (supplied by DelDOT)
- All associated equipment and appurtenances as may be required to complete work related to listed repairs and new equipment
- Removal and disposal of existing equipment and materials
- Testing of bridge electrical system

Cedar Creek Bridge:

- Refurbish 7 fender pier lights
- Refurbish 5 span navigation lights
- Refurbish existing conduit system located on the fender system and the swing span
- Refurbish all existing west end screw jack position lever arm and rotary limit switches
- Refurbish existing junction and terminal boxes located on the fender system and the swing span
- Replace power and control wiring in refurbished conduit system
- Replace fully open and over-travel limit switches
- All associated equipment and appurtenances as may be required to complete work related to listed repairs and new equipment
- Removal and disposal of existing equipment and materials
- Testing of bridge electrical system

1.2 References

All electrical system equipment used for this project shall be constructed and applied in accordance with all applicable UL, NEMA, NFPA, ANSI, ASTM, IEEE, OSHA, and U. S. Coast Guard regulations and standards, and satisfy all applicable NEC and AASHTO requirements. Specifically, the standards, guides and specifications applicable to this project shall include, but not be limited to, the following:

AASHTO LRFD Movable Highway Bridge Design Specification, 2007 with Latest Interims.	
ANSI C80.1	Standard For Rigid Steel Conduit, Zinc Coated
ASTM B8	Standard Specification For Concentric-Lay-Stranded Copper Conductors, Hard, Medium-Hard Or Soft
ASTM B172	Standard Specification For Rope-Lay-Stranded Copper Conductors Having Bunch-Stranded Members For Electrical Conductors
ASTM B174	Standard Specification For Bunch-Stranded Copper Conductors For Electrical Conductors
NECA 1	Standard Practices For Good Workmanship In Electrical Contracting
NEMA 250	Enclosures For Electrical Equipment (1000 Volts Maximum)
NFPA 101	Life Safety Code
NFPA 70	National Electrical Code (NEC)

1.3 Submittals

The Special Provisions depict the general intent of this contract and are not intended to be of sufficient detail to be used in lieu of shop drawings, layout drawings, and wiring diagrams.

Additional detail development which may be necessary to satisfy the requirements of this specification shall be provided by the Contractor at no extra cost.

All submittals required by this section shall be formatted and handled in accordance with the applicable requirements of the 2007 AASHTO LRFD Movable Bridge Design Specifications, these Special Provisions, and the DelDOT Standard Specifications.

Contractor shall field verify all critical dimensions to ensure dimensional compatibility of all equipment prior to submitting the respective shop drawings, catalog cuts, and layout and installation drawings.

1.3.1 Qualifications

Documentation demonstrating that the Electrical Contractor or Subcontractor meets the requirements described in Paragraph 1.4.2 shall be submitted along with the bid documents. Documentation shall include, but not be limited to, the following items:

- Number of years of recent, continuous, relevant experience in performing the type of work required
- List of relevant projects completed. List shall include, but not be limited to, description of projects, dates, description(s) of work performed, and reference contact information.
- Resumes for key personnel such as owners, project managers, foremen, superintendents, and engineers. Resumes shall include, but not be limited to, educational information, number of years of experience, relevant projects completed with documentation as described above, and relevant licensing and/or certification information.

1.3.2 Shop Drawings, Catalog Cuts, Procedures, and Specification Sheets

Shop drawings, catalog cuts, refurbishing procedures, and manufacturer's specification sheets shall be submitted for all new equipment, components, and hardware proposed for installation as required by the AASHTO LRFD Movable Bridge Design Specifications and the Contract Documents. Written Procedures for refurbishing equipment, as required by these Special Provisions, shall be submitted and acceptance shall be obtained prior to commencement of work. Acceptance shall be obtained for all submittals prior to the purchase, delivery to the site, or commitment to this project of the respective equipment or materials. Submittals shall be neat and easily readable, clearly show dimensions and pertinent ratings, and be marked to explicitly identify the intended use of each component on this project. Where a catalog cut sheet is submitted with a table, listing or group of similar items with different catalog numbers and/or options, the specific item(s) being proposed shall be clearly marked.

Specifically, shop drawings, catalog cut sheets, and specification sheets shall be required for, but not limited to the following new components:

- Items related to the installation of the new Span motor (provided by DeIDOT)
- Safety switches
- Receptacles, service light holders, bulbs and related items
- Span and fender navigation light holders, bulbs and related items
- Wire cable, terminal blocks, splicing and connection hardware and related items

Specifically, refurbishing procedures shall be required for, but shall not be limited to, the following components/systems:

- Conduit system, including fittings, pull boxes and related items
- Junction boxes, outlet boxes and related items
- Terminal boxes, cabinets and related items
- Limit switches
- Service light fixtures
- Span and pier navigation light fixtures

Specifically, a work plan for identifying, removing and replacing existing wiring shall be submitted for acceptance before wiring work is begun.

1.3.3 Layout and Installation Drawings

Layout and installation drawings shall be developed to show proposed locations, dimensions, and clearances to floors, walls, ceilings, structural members, and other nearby objects and equipment for all new equipment to be supplied. Layout drawings shall be developed where components are being taken out of service for refurbishing. Component and drawing shall be marked with Manufacturer name and model number and a tag unique to the project. Drawings need not necessarily be to scale, but items must be shown in their proper relative positions and be dimensioned. Drawings shall clearly show the Contractor's proposed method of attachment, mounting details, specific hardware, any and all holes to be drilled or cut in existing steel or masonry, etc. Mounting detail drawings may be in the form of hand drawn details on 8 ½ x 11 inch or 11 x 17 inch sheets where appropriate, but must be clearly titled and include a drawing number.

Conduit layout diagrams shall show each conduit utilized, with all wire numbers installed therein, in tabular or spreadsheet format. Spare conductors, ten percent of control conductors, shall also be assigned with numbers. Underground, concrete encased, in-wall, and exposed conduits shall be distinguished by different symbols. Conduit layout diagrams shall be fully coordinated with the existing field conditions, the existing conduit layout diagrams, wiring diagrams and tabulations required below.

Layout and installation drawings shall be submitted for approval prior to installation or repair of the following: equipment enclosures, conduits, motors, junction boxes, navigation lights, and any components for which mounting provisions have not been detailed on the existing plans or any components for which the Contractor is proposing alternate mounting provisions from those shown on the existing plans.

1.3.4 As-Built Drawings and Documentation

The Contractor shall maintain on site a full-size set of Working Drawings, Installation and Layout Drawings, and Wiring Diagrams and Tabulation, as described above, marked up with changes/revisions in red to reflect the as-built or as-installed condition. Such plans and drawings shall be updated weekly so that no changes or deviations are more than one week old without being correctly recorded on the plans and drawings. Any proposed deviations from the above required drawings, once the drawings have been approved, shall be submitted as revisions for the Engineer's approval prior to installation of the proposed revisions. All drawings affected by such revisions shall be revised by the Contractor. All such as-built or as-installed plans and drawings shall be continuously available for the Engineer's inspection in the Contractor's field office on site, and shall be turned over to the Engineer at the completion of construction.

1.4 Quality Control and Assurance

1.4.1 General

The Contractor shall be responsible for Quality Control of the bridge electrical system throughout construction, including all necessary inspections and tests beyond those required by the Special Provisions. All Quality Control activities shall be at no extra cost in accordance with Part 5, Basis of Payment.

Any materials, fabrication procedures, installation procedure, refurbishing procedures, and completed installations are subject to inspection and testing in the field by the Engineer. If any equipment, materials, and/or installations are found to be defective it shall be the Contractor's responsibility to coordinate repairs or replacement of the defective items(s) at no additional cost. Such inspections and/or tests shall not relieve the Contractor from responsibility to provide a complete, working system in compliance with the Contract requirements.

All dimensions and details shown on the existing drawings shall be verified at the site before proceeding with any work, purchasing any items, or fabrication of any custom components. The Contractor shall bear all costs and/or damages which may result from the ordering or fabrication of any items or materials prior to such verifications.

1.4.2 Qualifications

The Electrical Contractor/Subcontractor shall be primarily and regularly engaged in the installation and maintenance of industrial electrical distribution and control systems. All electrical work shall be performed by persons properly trained and qualified in the installation and maintenance of such systems. The Electrical Contractor/Subcontractor shall employ on-site supervisory personnel who are registered electricians experienced in 240 V and 120/208 V industrial electrical distribution and control systems, and who have been employees of the Contractor/Subcontractor for no less than six months prior to the award of this Contract.

In lieu of using an Electrical Contractor/Subcontractor, personnel satisfying all of the requirements of this paragraph may perform the work covered by this section.

1.4.3 Testing

The Contractor shall be responsible for performing all testing, inspections, and any resulting corrective work required by these Special Provisions. Any delays to the project schedule as a result of these tests and resulting remedial work will be deemed solely the responsibility of the Contractor, and will not be considered cause for a Contract extension or extra payment.

1.4.3.1 General

- Procedures and Equipment – Procedures and equipment used for the testing required by these Special Provisions shall be appropriate for the specific test being performed. Voltmeters, ammeters, etc. shall be true RMS type. All insulation resistance testing shall be performed at 1000 volts DC for a duration of 60 seconds with all equipment and/or loads disconnected. Phase-to-phase, phase-to-ground resistance values shall be measured as appropriate for the circuit or equipment under test.
- Submittals – The results of all tests shall be accurately recorded in a neat and orderly fashion along with time and date of test(s), environmental conditions (temperature, humidity, general weather conditions, etc.), the testing equipment used, conditions of test(s), and the name(s) of persons performing the test(s). All results shall be submitted, with all text in typewritten format, to the Engineer no later than 5 working days from date of test(s). The results of these tests must be acceptable by the Engineer prior to acceptance of the Bridge Electrical System.

1.4.3.2 Electrical Tests

Prior to energizing any circuit or connection of any piece of equipment to any circuit, the following tests shall be performed:

- Measure and record supply voltage and phase rotation and verify that both are correct for the equipment installed
- Verify that all circuits are continuous and free of shorts, opens, or unintentional grounds and that all circuit conductors are properly terminated.
- Measure and record the insulation resistance for all new power and control conductors, with the exception of instrumentation conductors rated less than 600 volts. The minimum acceptable resistance is 100 megohms (at 1000 volts DC)
- Measure and record the insulation resistance of the bus work of refurbished or new safety switches. The minimum acceptable resistance is 100 megohms (at 1000 volts DC)
- Measure and record the resistance from the ground bus of refurbished or new safety switches to their enclosures. The maximum acceptable resistance is 0.1 ohms

At any time the following tests may be made, but should preferably be performed as soon as possible after the equipment involved is installed or refurbished.

- Measure the resistance from the ground bus of the safety switch to true ground. The maximum acceptable resistance is 2 ohms.

At completion of work, the following tests shall be made only after the operating machinery and bridge electrical system repairs and installations are complete, and all final adjustments have been made.

- Measure and record the unloaded and normal load supply voltages at the main circuit breaker
- Measure and record the unloaded and normal load supply voltages at all panelboard mains

All equipment, as well as the complete bridge electrical and control system, shall be subjected to operational, as installed testing. Such testing shall be as required to establish that the item(s) under test meet all specified requirements and are operating in a reliable manner.

The Contractor shall also be prepared to conduct any additional miscellaneous operational demonstrations as may requested by the Engineer to establish that a given piece of equipment, system, or subsystem meets all specified requirements and is operating in a reliable manner.

For all test results which fall outside the stated acceptable values or conditions, the Contractor shall investigate the cause, take appropriate corrective actions, and repeat the test(s).

In addition to the above quantitative tests, the Contractor shall also be responsible for performing all qualitative inspections which may be required to ensure that all electrical system material and components are properly installed. Such inspections shall include, but not be limited to, visual inspection of all electrical connections, visual inspection of all conduit, cable, device, and equipment installations, checking for proper tightening of mechanical lugs and terminals, and checking of all hardware connections.

PART 2 - MATERIALS

2.1 General

In addition to the materials and equipment described herein, all junction boxes, conductors, conduits, fittings, connectors, and appurtenant hardware as may be necessary to provide Repairs to Bridge Electrical System shall be provided.

For the purposes of applying the provisions of the National Electrical Code and the work defined herein, machinery areas, counterweight pit, pier tops, and approaches are defined as wet locations.

Unless otherwise noted, all electrical equipment shall be suitable for use on 60 hertz AC systems.

All stainless steel shall be Type 316 unless the Contractor can demonstrate to the satisfaction of the Engineer that Type 316 is not available for the item in question, in which case Type 304 shall be used.

Unless specifically noted otherwise in these Special Provisions, the following general requirements shall apply to all new materials to be used for the Bridge Electrical System Repairs.

- a) **Corrosion Resistance** – Boxes, cabinets and enclosures shall be NEMA 4X stainless steel, aluminum, hot-dip galvanized steel or malleable iron; hinges and other hardware shall be stainless steel. All threads shall be treated with an approved anti-seize compound. Metal forming strut (unitstrut) shall be stainless steel. Brackets and steel members (angles, channels, etc.) shall be hot-dip galvanized steel or stainless steel. Beam clamps shall be hot-dip galvanized or stainless steel.
- b) **Fasteners** – All bolts, threaded rod, machine screws, nuts, washers, and similar hardware shall be stainless steel. Concrete anchors shall be stainless steel adhesive (epoxy) drop-in type.
- c) **Vibration Resistance** – All bolted connections shall utilize lock washers. Bolted, or other connections which do not permit the use of lock washers, may utilize a threadlocking adhesive or other approved method of vibration proofing.
- d) **General Wiring and Conductors** – All conductors shall be UL listed copper with ASTM B8, Class B stranding. Wire and cable used on power and control circuits shall have UL type XHHW insulation rated 600 volts minimum. All wiring installed in exposed locations

shall be furnished with a UV stabilized jacket, sunlight and weather-resistant. Power conductors shall be 10 AWG. Power conductor Phase A shall be black, Phase B shall be red, and Phase C shall be blue. Control conductors between enclosures and/or external devices shall be 12 AWG. General purpose conductors shall be as manufactured by Southwire, Okonite, or approved equal.

- e) **Grounding Conductors** – Grounding conductors shall be UL listed copper. Equipment grounding conductors and jumpers shall be concentric stranded, insulated (green), or uninsulated. Grounding conductors shall be sized per the NEC.
- f) **Conduit** – All conduits shall be UL listed galvanized rigid metal conduit (RMC). Galvanized rigid metal conduit shall be manufactured from high strength steel and be hot-dip galvanized inside and out per ANSI C80.1. Threads shall be full-cut, $\frac{3}{4}$ inch NPT taper, and be galvanized after cutting. Conduit sizes shall be as required by the NEC, but shall not be smaller than those being replaced. Conduit couplings, connectors, and fittings shall be of a type specifically designed and manufactured for the application and for the conduit used. Galvanized metal conduit shall be as manufactured by Allied or approved equal.
- g) **Flexible Conduit** – Flexible conduit shall be UL listed, liquid tight, galvanized steel (LFMC). Outer jacket shall be a smooth, oil resistant, abrasion resistant, liquid tight polyvinyl-chloride cover. Flexible conduit shall be as manufactured by AFC Cable Systems, or approved equal.
- h) **Conduit Expansion/Deflection Fittings** – Conduit expansion/deflection fittings, if required, shall allow approximately four inches of longitudinal movement (two inches in either direction from nominal), $\frac{3}{4}$ of an inch of parallel misalignment, and 30 degrees of angular misalignment. Expansion fittings shall include internal grounding straps or other provisions to maintain electrical continuity of the conduit system.
- i) **Conduit bodies** – The bodies shall be galvanized cast iron with threaded hubs and integral bushings. Covers shall be fully gasketed, weatherproof galvanized steel or cast iron screw-on type.
- j) **Span Navigation Lights** - Construction is to be rain-tight and fully gasketed. Lamp shall be eight tier LED type, 120Vac powered. Medium base receptacle is to be rated for 250V, 660W and must be porcelain with a nickel-plated brass shell to resist lamp freezing. For maximum efficiency, match the LED color with the fixture lens color; red with red lens and green with green lens. White LED shall be used in fixtures with different color sectors. LED lamps shall be provided by CR Control Systems, B&B Roadway or approved equal.
- k) **Pier Navigation Lights** - Construction is to be rain-tight and fully gasketed. Lamp shall be eight tier LED type, 120Vac powered. Medium base receptacle is to be rated for 250V, 660W and must be porcelain with a nickel-plated brass shell to resist lamp freezing. For maximum efficiency, match the LED color with the fixture lens color; red with red lens and green with green lens. White LED shall be used in fixtures with different color sectors. LED lamps shall be provided by CR Control Systems, B&B Roadway or approved equal.
- l) **Receptacles** - All receptacles shall be 20-ampere, 125-volt, three-wire, ground-fault-indicating type, polarized, duplex, convenience outlets. Each receptacle shall be a heat-resistant melamine body, flush or surface mounted in an outlet box, and shall be provided with a waterproof cover plate. Receptacles shall be specification grade Engineer approved equal to those manufactured by Hubbell, Arrow Hart or Leviton.

- m) Service Lights** - Service lighting fixtures in the bascule pit shall be vaportight marine lighting fixtures. Contractor to provide the 200/300-watt size with new vibration-proof lampholder. Furnish with new 150-watt rough service lamp. All lights shall be controlled from tumbler switches. All tumbler switches shall be specification grade, 20-ampere, 125-volt switches. Switches shall be mounted in waterproof boxes. Switches shall be mounted 4 feet above the adjacent floor or platform. Switches shall be Specification Grade switches manufactured by Hubbell, Arrow Hart, Leviton or approved equal.
- n) Miscellaneous Items** – In addition to the equipment and materials shown in these Special Provisions, it shall be the responsibility of the Contractor to supply and install as additional items required to provide a complete operational bridge electrical and control system. Such items include, but are not limited to, the following: conductor lugs and terminals, conductor tags, conduit tags, fasteners and other mounting hardware.
- o) Main Drive Motor** – The Seaford Bridge main drive motor shall be a marine-grade replacement by Reuland Electric and will be provided by DeIDOT. The motor shall be a crane and hoist duty wound rotor motor. Motor shall be rated 15 HP, 900 RPM (synchronous speed), 240 V, 3 phase, 60 Hz. Both output shaft diameters shall be 2” with ½” square keyways. Contractor shall coordinate the reuse and FN2 fit required with the existing motor pinion and motor brakewheel. Motor output torque shall be limited by motor design to 325% of rated motor torque. Motor insulation shall be rated for operation in 40 degrees Celsius ambient. Motor shall be rated for minimum 60 minute duty, with a service factor of 1.0. Motor shall be cast iron construction, 324U Ribbed Frame, foot mounted, TENV construction, with double shaft extension. Motor shall use ball or roller bearings and include grease fittings and vent plugs. Motor shall include at least one threaded drain hole, with matching plug, per motor. Main drive motor shall be manufactured and tested in accordance with the applicable standards of NEMA MG 1 for “Polyphase Medium Induction Motor”, high-potential tests as defined by NEMA MG 1, and the tests required to provide the submittals required in these Special Provisions.

Span drive motors shall also be provided with the following features in order to meet the marine duty requirements of these Specifications:

- All aluminum parts - chemical film and zinc chromate primer.
- Cadmium plate shaft and hardware (FED-QQ-P-416).
- Double Sealed ball bearings.
- Seal all joints and eye bolt holes.
- Sealed leads in terminal box.
- Shaft seals.
- Removable drain plugs.
- Final coat of epoxy paint.
- Corrosion resistant coating - rotor and stator laminations.
- Stainless steel nameplate.
- Super ‘H’ insulation including protection against fungus growth.
- The motor frame shall be finished with a corrosion-resistant paint or coating. Exposed unpainted metal surfaces shall be of a corrosion-resistant material.

- p) Motor Safety Switches** – The Seaford Bridge main drive motor, motor brake motor and machinery brake motor switches shall be tag out lockable, non-fusible, heavy-duty, safety switches in waterproof, NEMA 4X type 316 stainless steel enclosures. Each safety switch shall be furnished with two no/nc auxiliary contacts and a phenolic nameplate to identify the

corresponding main or brake motor. The main motor safety switch shall be 3-pole switch rated 600 VAC, 60A. The brake motor safety switches shall be 3-pole switches rated 600 VAC, 30 A. The safety switches shall be provided by Square D, or approved equal.

- q) **Lever Type Limit Switches** – The Cedar Creek fully open and over-travel limit switches shall be single pole, rated Navy Marine Harsh Environment Duty, -20 to +90 degrees C. They shall have NEMA 4X watertight enclosures capable of being submerged up to 15 feet for 30 minutes and shall meet or exceed Specification MUL-C-2212F. Provide new stainless steel lever arms to match existing style arms. They shall be as manufactured by Namco Controls Model No. EA780, or Engineer approved equal by Cutler Hammer Products or General Electric.

PART 3 - EXECUTION

3.1 General

The Special Provisions depict the general intent of this contract and are not intended to be of sufficient detail to be used in lieu of shop drawings, layout drawings, and wiring diagrams. It shall be the responsibility of the Contractor to provide additional detailing and coordination as necessary to provide a complete, reliable working system in conformance with the concepts and intent set herein. Any required additional detailing, coordination, labor, and incidental materials shall be furnished at no extra cost.

Any discrepancies between the Special Provisions and the referenced publications shall be brought to the attention of the Engineer for resolution prior to performing the respective work or purchasing the respective equipment.

The Contractor shall be responsible for supplying all tools necessary for installation, refurbishing and testing of all materials and equipment. All tools shall be used in accordance with their intended purpose and shall be appropriate for materials and equipment being installed and/or refurbished. All materials and equipment shall be installed using appropriate methods and in accordance with generally accepted practices of electrical construction and maintenance and manufacturers' recommendations. The Contractor shall bear all costs and damages which may result from the use of inappropriate tools and/or methods.

All work that will result in any obstruction of the roadway and/or waterway shall be in accordance with the Special Provisions for Coast Guard Specific Conditions.

All work shall be carried out in accordance with the requirements of the National Electrical Code and AASHTO guidelines, as well as all applicable UL, NEMA, NFPA, ANSI, IEEE, OSHA, and U.S. Coast Guard regulations and standards.

All work shall be performed in a neat and workmanlike manner per NECA 1. All sharp or rough edges on fabricated items, or created as the result of field cuts, shall be ground or filed down sufficiently to prevent possible injury.

Field cuts to, or drilled holes in, galvanized materials shall be treated with an approved, zinc-rich, cold galvanizing compound prior to installation. Field cuts to, or drilled holes in, structural members shall be treated with a rust inhibiting primer.

New, existing, and temporary work shall be suitably protected from damage by weather and normal construction activities. Where temporary provisions are required to continue or facilitate work and/or keep the bridge systems operational, they shall be provided using appropriate and safe materials and methods.

Adequate lighting shall be maintained in service at all times for access walkways, stairways, ladders, and internal bascule pier areas. Contractor shall provide temporary lighting, if necessary based on sequence of work, to maintain lighting in all such areas.

3.2 Raceways – Refurbishing the conduit system shall include, as a minimum, the following:

- Find the low points in the conduit system and drain any water that remains in the electrical system
- Clear obstructions
- Clean all contaminants with fresh water before drying the system with a blower/heater
- Repair or replace missing mounting hardware, drains, bonding bushings, hubs, bonding jumpers, and fittings

The limits of the refurbished portions of the conduit system are shown on the attached marked up As-Built drawings. The existing As-Built drawings are from a previous project, so Contractor shall field verify information on drawings before starting work. These are intended only as a guide to limits of refurbished conduit and not to show new or reused equipment.

Conduit shall be supported at intervals not to exceed six feet. Metal framing (unistrut) shall not be used to support conduit on any portion of the movable spans. Vertical conduit shall be installed plumb and horizontal conduit shall be installed level, except where otherwise arranged to facilitate drainage.

Conduit shall be installed such that they are electrically continuous from end to end. Insulated throat hubs and bonding jumpers shall be installed wherever conduit enters metal boxes, cabinets, or enclosures. Hubs shall be gasketed and caulked with sealant.

3.3 Boxes, Cabinets, and Enclosures – Refurbishing boxes, cabinets and enclosures shall include, as a minimum, the following:

- Clean all contaminants with fresh water before drying with a blower/heater
- Clear any conduit opening obstructions into the component

Repair or replace missing mounting hardware, drains, bonding bushings, hubs, bonding jumpers, and gaskets.

If removed for cleaning, boxes, enclosures, and cabinets shall be reinstalled plum and level, and in such a manner as to maintain the integrity of the NEMA enclosure ratings, except for drain holds as required. Boxes, enclosures, and cabinets shall have a ¼ inch drain hole drilled and deburred in one corner of the bottom side. Metal framing (unistrut) shall not be used to support conduit on any portion of the movable spans.

3.4 Wiring - Wiring, where practical, shall be bundled and run neatly, plumb or level, parallel to edges of cabinets or at right angles. Wiring shall be handled and installed such that conductors, insulations, and jackets are not damaged due to abrasion, crushing, kinking, excess pulling tension, exposure to extreme heat or other environmental conditions. Excessive damage to any portion of any conductor or cable shall be cause for requiring, at no extra cost, the complete replacement of the damaged item(s). All conductors and terminal blocks shall be labeled using permanently attached plastic bands with machine-printed permanent lettering (hand printing is not acceptable) at every terminal or connection, splice, and tap and in all junction and pull boxes. Conductor identification numbers shall be coordinated for consistency and accuracy with conductor numbers on existing as-built drawings.

All branch and feeder circuits requiring a neutral shall be supplied with a dedicated neutral conductor. Neutrals shall not be shared by two or more phase conductors, except where all conductors are serving a single piece of equipment, or for multiwire branch circuits serving lighting loads where indicated on the as-built plans.

At Cedar Creek, the bridge must remain operational at all times during construction. Any temporary wiring or bypasses shall be the responsibility of the Contractor and incidental to the Repairs to Bridge Electrical System.

Conductors shall not be spliced, except under one of the following conditions:

- When making connection to, or taps at, light fixtures, receptacles, or similar devices
- When making connection, in junction boxes or terminal cabinets, between single conductors in conduit and single or multiconductor cable.
- When making field connections to equipment which is factory supplied with hook-up leads
- When making field connections to terminal blocks in control system equipment enclosures
- With the permission of, and as prescribed by, the Engineer when absolutely required by conditions of installation

Splices and taps for conductors 10 AWG and smaller servicing lighting and receptacle circuits may be made with insulated, pressure type twist on connectors (wire nuts). Such splices shall be fully wrapped with vinyl electrical tape after installation. Splices and/or taps for conductors larger than 10 AWG, and for all power circuits other than lighting and receptacles, shall be made on terminal blocks or with crimp type mechanical connectors. Splices made with crimp type connectors shall be suitably insulated after installation. Splices for flexible loop cables and any control or instrumentation conductor shall be made only on terminal blocks. Terminal blocks shall be heavy duty, insulated, screw type, constructed from corrosion resistant materials. Any splices which may be subject to immersion in water shall be insulated with rubber electrical tape, followed by a layer of vinyl electrical tape, and sealed with an oil and moisture resistant coating such as 3M Scotchkote, or approved equal.

All conduit and cable runs for control circuits shall contain a minimum of 10% spare conductors. Spare conductors shall be suitably labeled and terminated at both ends.

3.5 Grounding - System and structural grounding shall be as described by these Special Provisions and as required by the National Electrical Code. All raceways shall include a grounding conductor, sized in accordance with the National Electrical Code.

3.6 Navigation Lights – Refurbishing the navigation lights shall include, as a minimum, the following:

- Remove lamp holders, bulbs, dual lamp brackets, and transfer relay and relay box
- Clean all contaminants with fresh water before drying with a blower/heater
- Clear any conduit openings obstructions into the component
- Repair or replace missing mounting hardware, drains, bonding bushings, hubs, gaskets and bonding jumpers
- Install new lamp holders and plug opening to relay box
- Install new red LED lamps in Pier Navigation light fixtures
- Install new red LED lamps in Bascule Span Navigation light fixtures having red lens
- Install new green LED lamps in Bascule Span Navigation light fixtures having green lens
- Install new white LED lamps in the Swing Span Navigation light fixtures
- Temporary navigation lights shall be used for any lights taken out of services for repairs. See Special Provisions for Coast Guard Specific Conditions.

3.7 Main Drive Motor – At Seaford, the DelDOT supplied span motor shall be installed with approved sizes and types of wire terminals and splice fittings for the connection of the motors to the circuit wiring. The motor shall be furnished with cast-iron conduit boxes. Connections between the rigid conduit system and the motors shall be made with the flexible conduit sections not exceeding 6 feet in length.

3.8 Switches

3.8.1 Safety Switches – Unfused safety switches for use as motor disconnects at Seaford Bridge shall be installed within range of view of each span motor and each brake motor. The new switches shall directly replace the existing units and as such shall be mounted in the location of the demolished units.

3.8.2 Limit Switches - Refurbishing limit switches shall include, as a minimum, the following:

- Clear obstructions
- Clean all contaminants with fresh water before drying the system with a blower/heater
- Replace any components of the limit switch that have obstructions that cannot be cleaned or are damaged
- Repair or replace missing mounting hardware, drains, bonding bushings, hubs, bonding jumpers, and fittings
- The manufacturer shall be consulted for additional recommendations and assistance

3.8.3 Rotary cam limit switches shall be installed using flexible couplings, and be aligned by millwrights to the precision and accuracy recommended by the coupling manufacturer.

3.8.4 Lever arm limit switches shall be installed and adjusted such that they reliably trip at the points necessary for proper operation of the control system.

3.9 Service Lights - Refurbishing the service lights shall include, as a minimum, the following:

- Remove lamp holders and bulbs
- Clean all contaminants with fresh water before drying with a blower/heater
- Clear any conduit openings obstructions into the component
- Repair or replace missing mounting hardware, drains, bonding bushings, hubs, gaskets and bonding jumpers
- Install new lamp holders and bulbs

3.10 Receptacle/Outlet Boxes - Refurbishing the service receptacles shall include, as a minimum, the following:

- Remove receptacle from outlet box
- Clean all contaminants with fresh water before drying with a blower/heater
- Clear any conduit openings obstructions into the box
- Repair or replace missing mounting hardware, drains, bonding bushings, hubs, gaskets and bonding jumpers
- Install new receptacle or switch into outlet box

3.11 Equipment Labeling – All equipment shall be clearly labeled as to function by engraved white on black plastic nameplates with minimum ¼ inch high letters, permanently attached with stainless steel machine screws. Any equipment in areas which are readily accessible to the public shall also bear permanently attached red and black on white labels marked “DANGER – XXX VOLTS – KEEP OUT” where XXX is the system voltage of the equipment. Any missing labels on refurbished equipment shall be replaced.

3.12 Adjustments – The Contractor shall perform any adjustments and corrections to the bridge electrical system which may be necessary to provide a complete, functional, and reliable system. Such adjustments shall be at no extra cost.

3.13 Removals – Unless otherwise directed by the Department, all removed equipment shall become the Contractors property. All removed equipment and materials shall be disposed of off site in accordance with all applicable laws and regulations.

3.14 Contractor Supervised Span Operation - The Contractor shall provide a designated representative to assist DeIDOT in supervised operation of the bridges during construction and until the bridges are turned back over to DeIDOT at the completion of the project.

The designated representative shall be able to operate the bridge, to supervise operational procedures, and to make adjustments or changes that may be required in the mechanical or electrical equipment as a result of the ongoing repairs to the bridges. The Contractor's representative shall certify to the DeIDOT bridge operator, for each and every bridge operation, that it is safe to operate the bridge, throughout the period that the Contractor has personnel, materials or equipment on site. Contractor's representative shall direct DeIDOT on how to operate the bridge at all times that his activities render the bridge not operable in the normal manner with the existing control system and provide the specific details of any limitations of the bridge controls.

Method of Measurement:

The Repair Bridge Electrical System work will not be measured.

Basis of Payment:

Payment for the Repair Bridge Electrical System will be made at the contract lump sum price bid for Item 746662, Repair Bridge Electrical System, complete and fully functional in place, which price shall include all devices, materials, labor, tools, equipment, Quality Control activities, testing, and incidentals necessary to complete the work in accordance with the Plans and the Special Provisions.

3/4/13

763522 - COAST GUARD SPECIFIC CONDITIONS

Description:

The Contractor shall prosecute his work in accordance with the specific requirements imposed by this Special Provision.

Under this item the contractor will be required to:

1. Prepare and furnish three copies of a plan and schedule for his operations within the waterway, for submission to Commander (AOWB), 5th Coast Guard District, 431 Crawford St., Portsmouth, VA 23704 for approval. The Contractor shall comply with all provisions of the Inland Rules of the Road. The Contractor shall give written notice to the Coast Guard of any planned temporary obstruction to the waterway navigation as well as copies of the plan and schedule of operations at least 30 days in advance of commencement of the work.

The plan and schedule of operations within the waterway shall include:

- a) A sketch of the waterway indicating:
 - 1) Locations of all restrictions that will be placed in the waterway, such as barges, anchors and anchor lines.
 - 2) The location and height above high mean water of any scaffolding or netting.
 - b) A projected set of dates and length of time each operation will take, hours of each operation and whether or not the equipment will be removed at night.
2. Give immediate notice to the Coast Guard and to the Department, of any material, machinery or equipment lost, dumped, thrown overboard, sunk or misplaced during the progress of the work. The Contractor must remove the object with utmost dispatch. Until removal can be effected, the object or objects shall be properly marked in order to protect navigation. Notices to the Coast Guard and to the Department shall give a description and location of any such object and the action taken or being taken to protect navigation.
 3. Furnish and install temporary obstruction lights as may be required by his operation and the proposed repairs to the permanent navigational lights under this contract. Each temporary light shall consist of battery or power operated slow flashing amber light less than 60 flashes per minutes and visible for a range of 4 nautical miles on 90% of the nights of the year. Generally a lamp of 20 candle power will meet these requirements. If necessary to obtain the coverage required, a light or lights on the upstream and downstream sides shall be installed. Bridge piers shall be so marked until the construction has been completed and permanent navigational lights have been installed and determined to be operating satisfactorily. Four copies of Plans showing the proposed temporary lights during construction shall be submitted to the Department for approval before work is commenced. Deviations from the prescribed temporary lights during periods of construction will be permitted only upon written Coast Guard approval.

In the event the Contractor fails to comply with these foregoing requirements and the Federal Government is required to take action in this matter for the protection of navigation, the Department reserves the right to recover costs for such work from the Contractor.

The Federal Government and the Department assume no responsibility for any damage sustained or caused by the Contractor's plant, equipment or barges being anchored or moored at the aforementioned location and approval by either agency shall not act as a waiver of liability for any damage that may result from the Contractor's operation.

The Contractor shall maintain the temporary obstruction lights on permanent construction until permanent navigational lights have been refurbished and made operable in accordance with the Coast Guard requirements.

Basis of Payment:

All work and the Contractor's costs in every respect for compliance with the specific conditions imposed by the Coast Guard Commandant and specific under this item, together with the maintenance and removal of the temporary obstruction lights and all else in connection therewith and incidental thereto which is not provided for under any other stipulated pay item, shall be paid for under "Coast Guard Specific Conditions", which price and payment shall constitute full compensation for furnishing and installing all materials as described herein.

3/4/13

763539 - MECHANICAL REPAIR OF MOVABLE BRIDGE

PART 1 - GENERAL:

This section covers the furnishing, manufacturing, fabrication, rehabilitation, erection, installation, testing and placing into satisfactory service of, the new and existing machinery for operation of the movable span for the Seaford Bridge (BR 3-151), a single-leaf bascule bridge in Seaford, Delaware and the Cedar Creek Bridge (BR 3-164), a swing span over the Cedar Creek in Sussex County, Delaware. For the Seaford Bridge, the machinery work includes the rehabilitation of the motor brake, the machinery brake, the auxiliary drive components, and the span drive machinery components. Work also includes replacement of the main motor. For the Cedar Creek Bridge, the machinery work includes rehabilitation of the end jack machinery components, the turning machinery components, and the balance and bearing wheels.

Layout drawings and details of the machinery for each bridge are located at the end of this Special Provision.

Where not otherwise specified herein, the design, workmanship, materials, fabrication and erection of the bridge operating machinery shall be in accordance with the requirements of the 2007 AASHTO LRFD Movable Highway Bridge Design Specifications with the latest interim revisions.

Work shall comply with all applicable Federal, State, and local rules regulations, and ordinances.

In the event of a conflict between these Special Provisions and the above-mentioned Codes, standards, rules, regulations, and ordinances, the most stringent requirement shall apply.

1.1 Description of Work

The Contractor shall supply all apparatus, tools, devices, materials, and labor to manufacture, paint, ship, install, erect, align, adjust, lubricate, and test the new and rehabilitated machinery for the bascule and swing span in an approved manner as provided herein. Any apparatus, tools, devices, materials and labor, not specifically stated or included, which may be necessary for the work, shall be furnished by the Contractor. Work shall include the furnishing, installing, and adjusting of all new and/or repaired bridge machinery, and making final adjustments to assure proper mechanical operation of the bridge.

The installation and adjustment of all machinery shall be by millwrights experienced in this class of work.

Existing machinery and associated components to be replaced and/or rehabilitated are listed in this Description of Work. Unless otherwise noted, parts that are to be replaced become the property of the Contractor.

Seaford Bridge:

1. Remove and Replace Main Motor:

- a) Electrically and mechanically disconnect existing motor. Remove the motor from the bridge. Contractor to remove and reuse existing motor pinion and motor brakewheel.
- b) Machine existing motor pinion bore, brakewheel bore, and keyway to match new motor shaft. Install the modified motor pinion and modified motor brakewheel on the new motor shaft. Provide new key for the motor pinion and motor brakewheel. The new motor to be provided by DelDOT.

- c) Remove and reinstall steel motor enclosure as needed during construction. Provide new fasteners as needed to reinstall.
- d) Existing motor shall remain property of the Delaware Department of Transportation and shall be delivered to Area 20 – Gravel Hill. Contact Mark Clausen of DelDOT prior to delivery for coordination of delivery.
- e) Install new main motor with modified motor pinion and modified motor brakewheel. Align motor pinion with the mating gear. Electrically connect motor wiring to the bridge control system. Provide shims for aligning and adjusting the new motor and motor brake and provide new turned bolts for the motor and motor brake installation.
- f) Existing motor pinion and brakewheel shall be repainted. Field paint new motor and fasteners after installation.

2. Rehabilitate Motor Brake and Machinery Brake:

- a) Electrically and mechanical disconnect thrusters from the brake frames. Remove the existing motor brake thruster and machinery brake thruster. Existing brake thrusters shall remain property of the Delaware Department of Transportation and shall be delivered to Area 20 – Gravel Hill. Contact Mark Clausen of DelDOT prior to delivery for coordination of delivery.
- b) Install the new motor brake thruster and machinery brake thruster. Electrically connect thruster wiring to the bridge control system. The new thrusters to be provided by DelDOT.
- c) Replace the brake pads on the motor brake and machinery brake.
- d) Disassemble linkages and clean pins and bushings. Reassemble brake linkages.
- e) Clean the braking surface of the motor and machinery brakewheels of contaminants.
- f) After reassembly, adjust the motor brake torque setting to 150 ft-lbs and the machinery brake torque setting to 300 ft-lbs.

3. Rehabilitate Auxiliary Drive System:

- a) Rehabilitate auxiliary air motor by fully disassembling the air motor, cleaning internal components, and replacing the lubricant within the air motor and gear box. Provide shims for the air motor and disconnect coupling lever to align and adjust the air motor during reinstallation. Provide new turned bolts for the air motor. Paint fasteners after reassembly.
- b) Replace auxiliary air motor lubricator oil and air filter located before the directional control valve.
- c) Disassemble the air motor directional control valve and clean internal components.
- d) Before test operating the auxiliary drive system, disconnect hoses from the air motor, directional control valve and air filter to remove debris, water, and obstructions.

4. Maintenance Items:

- a) Clean contaminants from all gear teeth and apply grease to the gear teeth.
- b) Remove water and debris from the internal cavity between the rack support plates.
- c) Replace lubricant at all span drive machinery bearings and trunnion bearings.
- d) Disassemble the span drive machinery flexible coupling, remove existing grease, replace O-rings/seals and gasket, lubricate coupling, and reassemble coupling and repaint fasteners.
- e) Disassemble the auxiliary motor disconnect coupling, remove existing grease, replace gasket, lubricate coupling, and reassemble coupling and repaint fasteners.

Cedar Creek Bridge:

1. Pivot Bearing Work:

- a) Replace lubricant at the pivot bearing and replace purge plug piping and plugs. Paint new components after reassembly.

- b) Collect grease from both purge plugs in a separate sampling container furnished by an approved Testing company. This grease shall be laboratory tested. Testing to be performed for each sample shall include spectrochemical analysis, physical properties analysis, particle count analysis, and a full ferrographic analysis. Report to be submitted to the Engineer.

2. Rehabilitate End Screw Jack Machinery:

- a) Replace lubricant within the end screw jack reducer and both end screw jacks.
- b) Replace gasket at the end screw jack reducer inspection hatch. Repaint fasteners after reassembly.
- c) Replace hygroscopic breather at the end screw jack reducer.

3. Maintenance Items:

- a) Clean contaminants from all rack and pinion gear teeth and apply fresh grease to gear teeth.
- b) Replace lubricant at all turning machinery bearings, bearing wheels, and balance wheels.
- c) Replace lubrication lines, supports, and fittings for the balance wheels and pivot bearing at the pivot pier.
- d) Purge all existing lubricant from the turning machinery flexible coupling at the purge plug. Replace coupling purge plug and grease fitting as needed.
- e) Purge all existing lubricant from the end screw jack machinery couplings at the purge plugs. Replace coupling purge plugs and grease fittings as needed. Check purged grease for water contamination. Notify the Engineer of the result for direction.

1.2 References

Work as described shall comply with, but not be limited to, all applicable requirements of the following codes and standards and their abbreviations used in this Special Provision shall be as shown:

- a) American Association of State Highway and Transportation Officials (AASHTO)
- b) American Gear Manufacturers Association (AGMA)
- c) American Iron and Steel Institute (AISI)
- d) American National Standards Institute (ANSI)
- e) American Society for Testing and Materials (ASTM)
- f) American Welding Society (AWS)
- g) Anti-Friction Bearing Manufacturers Association (AFBMA)
- h) National Lubricating Grease Institute (NLGI)
- i) Society of Automotive Engineers (SAE)
- j) Steel Structures Painting Council (SSPC)
- k) National Electric Code (NEC)
- l) National Electrical Manufacturers Association (NEMA)
- m) Underwriters Laboratory, Inc. (UL)
- n) Delaware Department of Transportation Standard Specifications

The work shall meet the requirements of all other codes and standards as specified elsewhere in these Specifications. Where codes and standards are mentioned for any pay item, it is intended to call particular attention to them; it is not intended that any other codes and standards shall be assumed to be omitted if not mentioned.

1.3 Submittals

1.3.1 Shop Drawings

- a) Manufacturer's data and/or shop drawings shall be submitted for all manufactured and purchased items of machinery.
- b) The Contractor shall coordinate the manufacturer's work of the machinery component at the interface. The Contractor shall review and approve all shop and working drawings prepared by those manufacturers for coordination prior to submittal of shop drawings to the Engineer for review.
- c) Shop drawings shall show all parts completely detailed and dimensioned. Reproduction of the Contract Documents shall be permitted provided all references to the design are removed and independent nomenclature specific to the project is used and coordinated with all other related shop and erection drawings.
- d) Materials and material specifications shall be stated for each part. Where ASTM or the Standard Specifications are used, the applicable numbers of such specifications shall be given.
- e) Required finish machining shall be shown including grade of finish in accordance with ANSI B46.1, Surface Texture, and dimensional tolerances and allowances for specific fits in accordance with ANSI B4.1, Preferred Limits and Fits for Cylindrical Parts.
- f) Shop drawings shall conform to the provisions of the general requirements of the Standard Specifications and the special requirements specified hereinafter. The fits and finishes used shall conform to the requirements for fits and finishes given in the Detail Sheets and to any other requirements given hereinafter in this Special Provision.
- g) Submittals for each manufactured item shall be manufacturer's descriptive literature, drawings, diagrams, performance and characteristic curves, and catalog cuts, and shall include the manufacturer's name, trade name, catalog model or number, nameplate data, size, certified layout dimensions, capacity, specification reference, including ASTM, ANSI, Federal Military Specification and any other applicable references, and all other information necessary to establish Contract compliance.
- h) Complete Shop, Erection, Working and Assembly drawings shall be furnished and show all external dimensions and clearances necessary for installation and operation of all new machinery components. These drawings shall give part numbers, match marks, and essential dimensions for locating each part or assembled unit with respect to the bridge structure.
- i) For all assemblies and parts, the Contractor shall furnish complete assembly drawings or diagrams showing each part contained therein and the manufacturer's part number assigned to each part. The drawings or diagrams shall be sufficient to enable complete disassembly and reassembly of the assemblies covered. In the event that any part is modified in any manner from the way it is described or delivered by its original manufacturer, the Contractor shall furnish a drawing which details each modification and the part shall be assigned a unique part number to assure the furnishing of replacement parts modified in similar fashion.
- j) Certified prints of each manufactured assembly shall be furnished. Certified prints are manufacturer's drawings of proprietary products on which the manufacturer or supplier states mounting dimensions, ratios, speeds, ratings, and any other critical parameters for use on this specific project. In addition to identifying and describing each part, they shall show:
 - 1) Dimensions of all principal parts comprising the assembly.
 - 2) Certified external dimensions affecting clearances and required for installation.
 - 3) Capacity and normal operating ratings.
 - 4) Recommended lubrication, including location of lubrication fittings and provisions for adding, draining and checking the level of lubricants.

- 5) Inspection openings, seals and vents.
- 6) Details or description of all fasteners required to mount the assembly.
- 7) Gross weight.

- k) Certified prints shall be signed by an officer of the manufacturing company.
- l) Complete shop bills of materials shall be made for all machinery parts. If the bills are not shown on the shop drawings, prints of the bills shall be furnished for approval in the same manner as specified for the shop drawings.
- m) The weight of each piece of machinery shall be stated on the shop drawing upon which it is detailed or billed.
- n) Marks or indentations of any type shall be clearly shown and detailed on the drawings. In general, die-stamping or scoring shall be avoided unless otherwise called for on the Detailed Sheets. All components and assemblies shall be detailed separately to assure correct fabrication, assembly, and erection. Use of mirror image or opposite hand erection drawings will not be allowed.
- o) Each shop drawing shall be given a suitable title to describe the parts detailed thereon and shall state any applicable shop assembly or testing procedures to be performed.
- p) Where equipment or materials are specified to conform to requirements of the standards of an organization, such as American Society for Mechanical Engineers (ASME), Underwriters Laboratories (UL), and American Gas Association (AGA), that use a label or listing as method of indicating compliance, proof of such conformance shall be submitted for review by the Engineer. The label or listing of the specified organization will be acceptable evidence. In lieu of the label or listing, the Contractor shall submit a certificate from an independent testing organization adequately equipped and competent to perform such services and approved by the Delaware Department of Transportation, stating that the item has been tested in accordance with the specified organization's test methods and that the item conforms to the specified organization's standard or code.
- q) If any departures from the Contract Documents are deemed necessary by the Contractor, details of such departures and the reasons therefore shall be submitted to the Engineer in writing as soon as practicable for his approval. No departures from Contract Documents shall be made without the Engineer's approval.
- r) If the Contractor has any objection to any feature of the machinery as designed or required by the Contract Documents, he shall state his objection in writing to the Engineer at the time of submitting shop drawings or prior thereto; otherwise his objection will not be considered if offered later as an excuse for malfunctioning, defective or broken machinery or for improper or inadequate operation or functioning of machinery.
- s) It is the Contractor's responsibility to manufacture and install suitable functioning machinery. Review and approval of shop drawings by the Engineer does not relieve the Contractor of this responsibility.

1.3.2 Installation and Alignment Procedures

The Contractor shall submit a detailed rehabilitation procedure for each bridge. The procedure shall include the sequence of the rehabilitation, process, and tolerances used to install and align the machinery components, and testing to be performed. These detailed procedures shall be submitted to the Engineer for approval prior to construction.

1.3.3 Substitutions

Where a particular product is specified by a manufacturer's name and catalog or part number in these Special Provisions or on the Detail Sheets, it is so specified to establish quality, configuration, and arrangement of parts. An equivalent product made by another manufacturer may be substituted for the

specified product subject to the approval of the Engineer; however, all necessary changes required by the substitution in related machinery, structural, architectural and electrical parts, shall be made by the Contractor at no additional cost.

1.4 Quality Control and Quality Assurance

1.4.1 Verification of Dimensions

Contractor shall verify all dimensions in the field prior to fabrication of new components or modification of existing components. Dimensions shown are nominal and are intended for guidance only. All variations from the nominal dimensions shown shall be noted on the shop drawings.

1.4.2 Quality Assurance and Facilities

The Contractor shall use products in the work described to be produced by manufacturers regularly engaged in the manufacture of the specified products. Provide adequate plant facilities and all necessary tools and instruments required for the proper performance of the personnel engaged in the execution of the specified work.

1.4.3 Certified Test Reports

As used herein, certified test reports refer to reports of tests conducted on previously manufactured materials or equipment identical to that proposed for use.

1.4.4 Factory Tests

As used herein, factory tests refer to tests required to be performed on the actual materials or equipment proposed for use. When required, results of the tests shall be submitted to the Engineer for review and acceptance.

1.4.5 Warranty

- a) **Manufacturers' Warranties.**
Manufacturer's warranties or guarantees on equipment, materials or products purchased for use under this Contract which are consistent with those provided as customary trade practice, shall be obtained by the Contractor and, upon acceptance of the Contract, the Contractor shall assign to the Delaware Department of Transportation, all manufacturer's warranties or guarantees on all such equipment, material or products furnished for or installed as part of the Work.
- b) **Contractor's Warranty.**
The requirements of this Special Provision apply to the work of Mechanical Repair of Movable Bridge. This warranty shall extend for a period of one year following the date of final acceptance of the Project.

1.5 Delivery, Storage, and Handling:

1.5.1 Organization

All machinery items and material shall be delivered to the site in accordance with the approved schedule of work. Machinery items shall be properly protected until installation. Prior to shipment from the manufacturer's and/or fabricator's plant or plants, the Contractor shall prepare the various elements of the

mechanical systems for shipment. All large, bulky and/or heavy items shall be securely mounted on skids or pallets of ample size and strength to facilitate loading and unloading. All small parts shall be boxed in sturdy wood or heavy corrugated paperboard boxes. A packing list enclosed in a moisture-proof envelope and indicating the contents of each such box shall be securely attached to the outside of the container. The skid/pallet mounting and boxing shall be done in a manner which will prevent damage to the equipment during loading, shipment, unloading, storage and any associated and/or subsequent handling. Weatherproof covers shall be provided during shipment to protect any and all items shipped in open railway cars, trucks, or barges. Any eyebolts, special slings, strongbacks, skidding attachments or other devices used in loading the equipment at the manufacturer's and/or fabricator's plant or plants shall be furnished for unloading and handling at the destination.

1.5.2 Storage

Material shall be stored so as to permit easy access for inspection and identification. Materials and items shall be protected from the ground by the use of pallets, platforms or other means. Material shall not be stored in a manner that would cause distortion or damage.

1.5.3 Shipment

All machinery, materials and contingent items shall be properly protected for shipment and storage.

1.5.4 Surface Protection

Machined surfaces shall be cleaned of dirt, chips, grit, and all other injurious materials prior to shipping and shall be given a coat of corrosion-inhibiting preservative.

Finished metal surfaces and unpainted metal surfaces that would be damaged by corrosion shall be coated as soon as practicable after finishing with a rust-inhibiting preservative. This coating shall be removed prior to operation and from all surfaces prior to painting after erection.

1.5.5 Assembled Units

Assembled units shall be mounted on skids or otherwise crated for protection during handling and shipment.

1.5.6 Provision for Lifting

All machinery units shall have lifting eye bolts or lifting holes properly sized for safe working loads and located to provide a balanced lift.

PART 2 - MATERIALS:

2.1 General

All materials shall be new and conform to the ASTM and other specifications cited herein, as indicated on the Detailed Sheets, or as may be otherwise applicable.

No item shall be fabricated, machined, welded, cast, or forged without sufficient advance notification to the Engineer to permit scheduling of inspection if requested by the Engineer. The Contractor shall coordinate and provide for the free access at the plant or shop for the inspection of the workmanship.

2.1.1 Standard Products

Materials and equipment shall be essentially the standard catalogued products of manufacturers regularly engaged in production of such materials or equipment and shall be manufacturer's latest standard design that complies with the requirements of this Special Provision. Materials and equipment shall essentially duplicate items that have been in satisfactory commercial or industrial use for at least two years. Where two units of the same class of equipment are required, these units shall be products of a single manufacturer; however, the component parts of the system need not be the products of the same manufacturer. Each major component of equipment shall have the manufacturer's name and address and the model and serial number on a nameplate, securely affixed in a conspicuous place. The nameplate of the distributing agent will not be acceptable.

2.1.2 Manufacturer's Recommendations

Where installation procedures or any part thereof are required to be in accordance with the recommendations of the manufacturer of the material being installed, furnish printed copies of these recommendations to the Engineer prior to installation. Installation of the item will not be allowed to proceed until the recommendations are received. Failure to furnish these recommendations can be cause for rejection of the material. Provide all special machining recommendations and installation requirements of the manufacturer.

2.1.3 Fasteners

Hex cap screws shall meet the requirements of ASTM A449.

The material for the turned shank fasteners shall meet the requirements of ASTM A307, Grade A. Heads and nuts for turned bolts, screw, and studs shall be heavy series.

High-strength turned bolts, turned cap screws and turned stud details shall meet the requirements of ASTM A449. Heads and nuts for turned bolts, screw, and studs shall be heavy series. High-strength bolts shall be installed with a hardened plain washer meeting ASTM F436.

Bolts, studs and threaded rod shall be secured with Heavy Hex nuts meeting the requirements of ASTM A563.

All fasteners shall be of United States manufacture and shall be clearly marked with the manufacturer's designation.

2.1.4 Keys

Unless otherwise specified herein or in the Detail Sheets, replacement keys shall be machined from alloy steel forgings, ASTM A668, Class K.

2.1.5 Shims

Shims shall be Stainless Steel ASTM A666 Type 302. Shims thicker than 3/16" shall meet ASTM A240 Type 316.

2.1.6 Lubricant

For the Seaford Bridge, lubricate the components with the following lubricants:

- Sleeve bearings shall be lubricated with Mobil Mobilux EP-2 or approved equal.

- Roller bearings shall be lubricated with Mobil Mobilgrease XHP 222 or approved equal.
- Open gearing shall be lubricated with Mobil Mobiltac 325 NC or approved equal.
- Flexible couplings shall be lubricated with Mobil Mobilux EP-0 or approved equal.
- Air motor gear box shall be lubricated with Mobil Mobilgear 600 XP 220 or approved equal.
- Air motor rear rotor shaft shall be lubricated with Ingersoll Rand No. 28 grease or approved equal.
- Air motor lubricator oil shall be Ingersoll Rand No. 50 Oil or approved equal.

For the Cedar Creek Bridge, lubricate the components with the following lubricants:

- Pivot bearing, sleeve bearings, balance wheels, and bearing wheels shall be lubricated with Mobil Mobilux EP-2 or approved equal.
- Rack and pinion shall be lubricated with Mobil Mobiltac 325 NC or approved equal.
- Turning machinery coupling shall be lubricated with Falk Long Term Grease or approved equal.
- End jack machinery speed reducer oil shall be Mobil Mobilgear 600 XP 100 or approved equal.
- End jack flexible couplings shall be lubricated with Mobil Mobilux EP-0 or approved equal.
- End screw jacks shall be lubricated with Mobil Mobilux EP-2 or approved equal.

2.1.7 Coatings

Coat the threads of all mounting bolts with anti-seize compound before assembly of the nuts to prevent corrosion or galling and to facilitate future removal if necessary.

Anti-seize compounds shall be as manufactured by the following companies, or approval equal:

- Huron Industries, Port Huron, (MINEolube #1)
- Fel-Pro, Inc., Skokie, IL (#C-670)
- SPS Technologies, Jenkintown, PA (Standard Pressed Steel)

Rust-inhibiting coatings for temporary protection of machined surfaces shall be as manufactured by one of the following companies, or approved equal:

- E.F. Houghton & Co., Valley Forge, PA (Rust Veto 344; Cosmoline 1058)
- Sanchem, Inc., Chicago, IL (No-Ox-Id "A" Special "X")
- A.W. Chesterton, Co., Stoneham, MA (Heavy-Duty RustGuard)
- Texaco, Houston, TX (Protective Metal Oil L)

2.2 Details and Workmanship

2.2.1 Hubs and Bores

At the Seaford bridge, the brakewheel and motor pinion shall be bored concentric with the wheel and with the pitch diameter of the gear, respectively. All hubs shall have an ANSI Class FN2 shrink fit on the shafts, unless otherwise specified. Assembly shall be accomplished by heating the hub and/or cooling the shaft and moving the parts to the correct position without force. The use of liquid nitrogen for cooling is prohibited.

2.2.2 Fasteners

All existing fasteners are to be reused except as noted in the Contract Documents. Any replacement

fastener shall meet the following requirements.

All bolts for connecting machinery parts to each other or to supporting members conform to one of the following types:

- Hex cap screws
- Turned bolts, turned cap screws, and turned studs
- High-strength turned bolts, turned cap screws and turned studs
- High strength bolts
- Hex socket flat countersunk head cap screws

Hex cap screws have finished bodies and regular hexagonal heads. Holes for hex cap screws shall not be more than 0.010-inch larger than the actual diameter of individual screws. Check the clearance with 0.011-inch wire. The hole will be considered too large if the wire can be inserted in the hole together with the bolt. Wherever possible, hex cap screws connecting machinery components to structural elements or to other machinery components comprised of different thickness shall be installed such that the bolt head is adjacent to the connected element with the least thickness.

Turned bolts, turned cap screws, and turned studs shall have turned shanks and cut threads. Turned bolts shall have semi-finished, washer-faced, hexagonal heads and nuts. Turned cap screws shall have finished, washer-faced, hexagonal heads. All finished shanks of turned fasteners shall be 1/16-inch larger in diameter than the diameter of the thread. The shanks of all turned fasteners shall have Class LC3 fit in the finished holes in accordance with ANSI Standard B4.1.

All elements connected by bolts, screws or studs shall be drilled and reamed at assembly to assure accurate alignment of the hole and accurate clearance over the entire length of the bolt within the specified limit.

The dimensions of all bolt heads, nuts, castle nuts, and hexagonal head cap screws shall be in accordance with ANSI Standard B18.2, Square and Hexagon Bolts and Nuts.

The dimensions of hex socket flat countersunk head cap screws shall conform to ANSI Standard B18.3. The screws shall be made of heat treated alloy steel, cadmium plated, and finished with a self-locking nylon pellet embedded in the threaded section. Unless otherwise called for on the drawings or specified herein, set screws shall be of the headless safety type, shall have threads of coarse series, and shall have cup points. Set screws shall neither be used to transmit torsion nor as the fastening or stop for any equipment that contributes to the stability or operation of the bridge.

Threads for bolts, nuts, and cap screws shall conform to the coarse thread series and shall have a Class 2 tolerance for bolts and nuts or Class 2A tolerance for bolts and Class 2B tolerance for nuts in accordance with the ANSI Standard B1.1, Unified Inch Screw Threads.

Bolt holes through unfinished surfaces shall be spotfaced for the head and nut, square with the axis of the hole.

Unless otherwise called for, all bolt holes in machinery parts or connecting these parts to the supporting steel work shall be subdrilled at least 1/8-inch smaller in diameter than the bolt diameter and shall be reamed for the proper fit at assembly or at erection with the steel work after the parts are correctly assembled and aligned.

Holes in shims and fills for machinery parts shall be reamed or drilled to the same tolerances as the connected parts at final assembly.

If double nuts are used, they shall be used for all connections requiring occasional opening or adjustment. If lock washers are used for securing, they shall be made of tempered steel and shall conform to the SAE regular dimensions. The material shall meet the SAE tests for temper and toughness.

For the Seaford Bridge, the motor bolts shall be torqued to 350 ft-lbs with lubricant applied to the threads as specified in Section 2.1.7. The air motor and motor brake frame bolts shall be torqued to 150 ft-lbs with lubricant applied to the threads as specified in Section 2.1.7. The second nut shall be fastened snug tight to the first nut at all locations.

Torques for other bolts shall be proportioned to their strength and shall be indicated on the erection drawings.

The motor brake and machinery brake assembly fasteners and coupling fasteners shall be torqued per the manufacturer's requirements.

2.2.3 Keys and Keyways

Keys and keyways shall conform to the dimensions and tolerances for parallel and tapered keys of ANSI Standard B17.1, Keys and Keyseats, unless otherwise specified. All keys shall be effectively held in place, preferably by setting them into closed-end keyways milled into the shaft. The ends of all such keys shall be rounded to a half circle equal to the width of the key. Keyways shall have a radius in the inside corners. Keyways shall not extend into any bearing. The side fit between key and keyways shall have an ANSI LC3 fit.

2.2.4 Shims

Where shown, all machinery shims required for leveling and alignment of equipment shall be neatly trimmed to the dimensions of the assembled parts. In general, sufficient thicknesses shall be furnished to secure 1/64-inch variations of the shim allowance plus one shim equal to the full allowance. Shims shall be provided without bolt holes and shall be drilled and reamed in the field to the same fit as the other connected components for all bolts that pass through the shims. Holes shall not be punched. Shim stacks greater than 1/2 inch shall include one solid plate of thickness equal to 1/2 inch less than total shim thickness.

Shims shall be shown and fully dimensioned as detailed on the shop drawings. Shims with open side or U-shaped holes for bolts will not be permitted. No shims shall have less than two holes for bolts.

Plastic or other non-metallic shims will not be permitted.

2.3 Inspection and Testing

Provide no less than ten (10) working days notice to the Engineer of the beginning of work at the machine shops so that inspection may be arranged if requested. No materials shall be fabricated or machined before the Engineer has been notified where the orders have been placed.

Furnish all facilities for the inspection of material and workmanship in the machine shop. The Inspector designated by the Engineer shall be allowed free access to necessary parts of the premises. Work done while the Inspector has been refused access or presented in a manner that prevents adequate inspection will automatically be rejected. The Inspector shall have the authority to reject materials or workmanship that does not fulfill the requirements of these Special Provisions.

Inspection at the machine shops is intended as a means of facilitating the work and does not relieve the Contractor of its responsibilities under this Contract.

Furnish the Engineer a copy of all orders covering work performed by subcontractors or suppliers.

Unless otherwise provided, furnish without additional charge, test specimens as required, and all labor, testing machines, tools, and equipment necessary to prepare the specimens and to make the physical tests and chemical analyses required by material specifications. Furnish a copy of all test reports and chemical analyses.

2.4 Field Testing

All mechanical systems shall be tested as described below. Machinery shall be monitored for fluid leaks, noise, interference, excessive vibration, heat, and misalignment. Additional requirements are listed below.

2.4.1 Seaford Bridge

2.4.1.1 Main Drive

After rehabilitation, installation and alignment, the bridge shall be continuously operated through not less than 10 complete cycles using the main motor. During testing, monitor and record the bearing housing temperatures at each location at the beginning, midpoint and end of the testing sequence.

2.4.1.2 Auxiliary Drive

After rehabilitation, installation, and alignment, the bridge shall be operated through not less than 5 complete cycles using the auxiliary drive. Contractor shall coordinate the delivery and use of the air compressor with the Delaware Department of Transportation.

2.4.2 Cedar Creek Bridge

2.4.2.1 Turning Machinery & End Jack Machinery

After the repairs are complete, the swing bridge shall be operated not less than 10 complete cycles using the main turning motor and the end jack machinery motor.

PART 3 - EXECUTION:

3.1 Protection for Shipment

New and rehabilitated components shall be completely protected from damage including weather, dirt, and all other deleterious conditions during manufacture, shipment, and storage.

3.2 Mechanical System Removal for the Seaford Bridge:

Removal of the main motor or brakes shall not occur until all new components are in the Contractor's possession and ready for installation. The Contractor shall keep one sidewalk open to pedestrians at all times during Construction.

The Contractor shall not be permitted to remove or hand release the brakes on the bascule span without first installing temporary steel columns or binding suitable to prevent the span from opening.

The Contractor shall also keep one brake assembly set on its brakewheel at all times during Construction. The temporary bracing shall be designed for a torque of 600 ft-kips about the centerline of the trunnion. The Contractor shall submit for approval their method and associated calculations for preventing the span from opening. This submittal shall be stamped by a Professional Engineer in the State of Delaware.

Prior to the removal of the existing motor, the Contractor shall perform the following:

- a) Measure and record the backlash and tip to root clearance between the motor pinion and mating spur gear at both sides of the gear teeth.
- b) Measure and record the centerline of the motor pinion relative to the centerline of the mating gear as well as relative to the end of the motor shaft prior to removal of the motor.
- c) Submit measurements to the Engineer for review prior to removing the motor. This will be used as the minimum criteria for reinstallation of the new motor and pinion.
- d) Match mark motor pinion and mating spur gear teeth prior to removal of the motor.

3.3 Suggested Construction Procedure

For the Seaford Bridge:

- a) Install temporary steel columns or binding before removal of the main motor, motor brake and machinery brake.
- b) Measure and record motor pinion and gear backlash, tip to root clearance, and the motor pinion centerlines as specified in Section 3.2. Match mark mating motor pinion and gear teeth prior to removal.
- c) Disassemble motor brake to permit removal of the main leaf motor.
- d) Remove main motor from the bridge for removal of the motor pinion and brakewheel.
- e) Disassemble motor brake linkages and clean brake pins and bushings. Replace brake pads and thruster.
- f) Bore existing motor pinion and brakewheel to fit new motor shaft. Machine keyways in pinion and brakewheel for fit with the new motor shaft keyway.
- g) Shop install the modified motor pinion and modified motor brakewheel to the new motor shaft.
- h) Disassemble disconnect coupling.
- i) Remove auxiliary air motor for disassembly and rehabilitation.
- j) Replace auxiliary air motor filter and lubricator oil.
- k) Disassemble air motor directional control valve and clean internal components. Reassemble directional control valve.
- l) Disconnect air motor hose at the air motor filter. Clean out hose from the roadway through the disconnected hose. Reattach hose to air motor filter.
- m) Disconnect and clean out air motor hose between the air motor lubricator and the directional valve. Reconnect hose to components.
- n) Disconnect and clean out air motor hose between the directional valve and the air motor. Reconnect hose to components.
- o) Clean internal components of disconnect coupling, replace gasket, repack coupling with grease, and reassemble coupling.
- p) Reinstall auxiliary air motor and reconnect to air motor hose.
- q) Field install and align new motor onto the motor pedestal.
- r) Disassemble machinery brake linkages and clean brake pins and bushings. Replace brake pads and thruster.
- s) Remove temporary steel column bracing.

- t) Disassemble flexible coupling, clean internal components, replace gasket and O-ring/seal, repack coupling with grease, and reassemble coupling. Properly collect and dispose of the purged grease.
- u) Purge all bearings of existing grease (23 locations). Properly collect and dispose of existing grease purged from bearings. Sleeve bearing shall be purged at the shaft/bushing interface. The roller bearings shall be purged from the purge plugs located in the bearing housing.
- v) Remove water and debris from within the rack support.
- w) Clean contaminants from all gear teeth and apply grease to the gear teeth.
- x) Paint components after reassembly.
- y) Test operate bridge under the main motor.
- z) Test operate bridge under the auxiliary air motor.

For the Cedar Creek Bridge:

- a) Remove purge plugs and piping from the pivot bearing and purge existing grease from the bearing. Collect grease in sampling jars and send for sampling.
- b) Install new purge plug piping and plugs upon completion of purging lubricant from the pivot bearing.
- c) Purge turning machinery sleeve bearings and bearing wheels of existing grease. Properly collect and dispose of the purged grease.
- d) Purge grease from the turning machinery flexible coupling. Relubricate coupling. Properly collect and dispose of the purged grease.
- e) Purge grease from the end screw jack flexible couplings. Relubricate couplings. Properly collect and dispose of the purged grease.
- f) Replace lubricant within the end screw jack reducer. Replace inspection hatch gasket and hygroscopic breather. Properly collect and dispose of the existing lubricant.
- g) Remove end screw jacks protective boot and remove all grease. Remove purge plugs from the end jack and completely purge grease from the end screw jacks. Properly collect and dispose of grease. Reinstall protective boot.
- h) Remove grease piping between the injection ports at the roadway level and the balance wheels. Install temporary grease fittings at the balance wheel bearings to purge the existing grease.
- i) Install new lubrication piping lines and fittings at all balance wheels. Length of lines shall be adequate to provide for a full opening of the bridge while remaining clear of obstructions and wheels at all times.
- j) Replace lubrication piping supports that run from the roadway level to the balance wheels and pivot bearing at the pivot pier.
- k) Clean contaminants and debris from the rack and pinion gear teeth. Apply new grease to the gear teeth.
- l) Paint components after reassembly.
- m) Test operate bridge using the turning machinery motor and the end screw jack motor.

3.4 Painting

General.

Cleaning and painting of all unfinished surfaces of machinery shall comply with all the applicable requirements of this Special Provision. Submit for review with the working drawings an outline of painting materials and methods. Submit to the Delaware Department of Transportation for approval colors for the top coat of machinery components.

Brake thrustors and replacement motor for the Seaford bridge will be provided by DeIDOT and fully shop painted from the manufacturer. Any damage to the finish coating done by the Contractor shall be repaired as approved by the Engineer at the Contractor's expense.

3.4.2 Field Painting.

Field painting shall be performed for the following items: brakewheel, motor pinion as well as fasteners for couplings and motors.

After erection is complete, all machinery fasteners and surfaces remaining exposed, shall be thoroughly cleaned with an approved high-flash solvent and given an intermediate field coat. The aliphatic acrylic polyurethane, Carbothane 134 HG or approved equal, shall be compatible with the finish coat. The intermediate coat shall be applied by hand brushing, and shall be resistant to abrasion, weathering (marine environment) and free of lead.

After field testing is complete, all machinery fasteners and surfaces remaining exposed, shall be re-cleaned with an approved high-flash solvent and given a finish field coat. Paint for the finish coat shall be high gloss, resistant to weathering and abrasion and conform to OSHA color requirements of the Safety Color Code for Marking Physical Hazards, ANSI Z53.1. The aliphatic acrylic polyurethane, Carbothane 134 HG or approved equal, shall be compatible with the previous coats. The finish coat shall be applied by hand brushing.

The color of the finish coat for the painting at the Seaford Bridge shall match the existing steel. Otherwise, color code the machinery to distinguish between fixed and moving parts. The color for each component shall be indicated on the assembly shop drawings or separate paint drawings. The following colors shall be used at the Cedar Creek Bridge:

FEDERAL SAFETY ORANGE: Except for machinery finished surfaces in sliding contact, for all moving parts of the machinery such as shafting, couplings, and the side of gears and brake wheels.

FEDERAL SAFETY GREEN: For all stationary parts of the machinery. Machinery component fasteners mating with machinery supports shall be painted the same color as the structural steel.

The Contractor shall place cautionary signs in the Control House, which shall explain the color code. Details of the signs giving text, dimensions and materials shall be placed on a shop drawing.

The Contractor shall take special care to avoid painting of machinery surfaces which are in normal rubbing contact including seal surfaces which should be lubricated. All lubrication fittings, nameplates, legend plates, and escutcheons mounted on machinery shall be masked for protection from paint.

Method of Measurement:

The Mechanical Repair of Movable Bridge will not be measured.

Basis of Payment:

Payment for the Mechanical Repair of Movable Bridge will be made at the contract lump sum price bid for Item 763539, Mechanical Repair of Movable Bridge, complete and fully functional in place, which price shall include all devices, materials, labor, tools, equipment, Quality Control activities, and incidentals necessary to complete the work in accordance with the Specifications and Special Provisions.

763643 - MAINTENANCE OF TRAFFIC – ALL INCLUSIVE

Description:

This item shall consist of furnishing, installing, maintaining and/or relocating the necessary temporary traffic control devices used to maintain vehicular, bicycle and pedestrian traffic, including persons with disabilities in accordance with the Americans with Disabilities Act, as amended. All work shall be performed in a manner that will provide reasonably safe passage with the least practicable obstruction to all users, including vehicular, bicycle and pedestrian traffic.

All requirements of the Delaware Manual on Uniform Traffic Control Devices (MUTCD), Part 6, herein referred to as the Delaware MUTCD. (latest edition with all revisions made up to the date of Advertisement of this project) shall apply for all temporary traffic control devices. Any, and all, control, direction, management and maintenance of traffic shall be performed in accordance with the requirements of the Delaware MUTCD, notes on the Plans, this specification, and as directed by the Engineer.

The Contractor shall be aware that the Case Diagrams and safety measures outlined in the Delaware MUTCD are for common construction situations and modifications may be warranted based on the complexity of the job. The Contractor shall submit justification for modifications to the Temporary Traffic Control Plan (TTCP) to the Engineer for approval prior to implementation.

The Department reserves the right to impose additional restrictions, as needed, for the operational movement and safety of the traveling public. The Department reserves the right to suspend the Contractor's operations until compliance with the Engineer's directive for remedial action, based on but not limited to the following reasons:

1. The Contractor's operations are not in compliance with the Delaware MUTCD, the specifications or the Plans.
2. The Contractor's operations have been deemed unsafe by the Traffic Safety Engineer or District Safety Officer.

Materials and Construction Methods:

The Contractor shall submit a Temporary Traffic Control Plan (TTCP) or a Letter of Intent to use the Plan recommended Delaware MUTCD Case Diagram(s) at or prior to the pre-construction meeting. The Contractor shall submit the TTCP for all Contractor and subcontractor work to be performed on the project for the Department's approval before the start of work.

When specified by a note in the Plans, the Contractor shall be required to have an American Traffic Safety Services Association (ATSSA) certified Traffic Control Supervisor on the project. The authorized designee must be assigned adequate authority, by the Contractor, to ensure compliance with the requirements of the Delaware MUTCD and provide remedial action when deemed necessary by the Traffic Safety Engineer or the District Safety Officer. The ATSSA certified Traffic Control Supervisor's sole responsibility shall be the maintenance of traffic throughout the project. This responsibility shall include, but is not limited to, the installation, operations, maintenance and service of temporary traffic control devices. Also required is the daily maintenance of a log to record maintenance of traffic activities, i.e., number and location of temporary traffic control devices; and times of installation, changes and repairs to temporary traffic control devices. The ATSSA Traffic Control Supervisor shall serve as the liaison with the Engineer concerning the Contractor's maintenance of traffic. The name, contact number and certification for the designated Traffic Control

Supervisor shall be submitted at or prior to the pre-construction meeting. The cost of the ATSSA certified Traffic Control Supervisor shall be incidental to this item.

Temporary traffic control devices shall be maintained in good condition in accordance with the brochure entitled "Quality Guidelines for Temporary Traffic Control Devices", published by the American Traffic Safety Services Association (ATSSA). Any temporary traffic control devices that do not meet the quality guidelines shall be removed and replaced with acceptable devices. Failure to comply will result in work stoppage with time charges continuing to be assessed.

Any existing signs that conflict with any temporary or permanent construction signs shall be covered as needed or as directed by the Engineer. The cost for temporarily covering conflicting signs shall be incidental to this item.

Access to all transit stops located within the project limits shall be maintained unless otherwise directed by the Plans or the Engineer. Maintaining access shall include maintaining an area for the transit vehicle and also an accessible path for pedestrians to safely access the transit stop.

The Contractor shall notify the Engineer, in writing, no less than fourteen (14) calendar days prior to the start of any detour(s) and road closures. The Engineer will notify the following entities:

- Local 911 Center
- Local School Districts
- Local Post Offices
- DelDOT's Transportation Management Center (TMC)
- Town Managers
- Local Police
- DelDOT's Public Relations
- Delaware Transit Corporation (DTC)

Immediately prior to the implementation of any lane or road closures, the Engineer shall notify the DelDOT TMC at (302) 659-4600. Notifications shall also be provided when the closures are lifted. The Engineer shall notify TMC and the District Safety Officer if any lane closures cannot be removed prior to the end of the allowable work hours.

The Contractor shall notify the local 911 center if access to a fire hydrant is temporarily restricted. The Contractor shall provide written confirmation to the Engineer that the local 911 center has been notified.

If a detour is required during any part or the entire period of this Contract, an approved detour plan shall be obtained from the Department's Traffic Safety Section. All signs, barricades and other temporary traffic control devices required as part of the approved detour plan shall be installed and maintained by the Contractor on the route that is closed and on the detour route. Road closures without an approved detour plan shall not be allowed. If a road is closed without an approved detour plan, the Contractor's operations shall be stopped immediately.

The Contractor shall provide and maintain ingress and egress for each property abutting the construction area and each property located between the diversion points of any detour and the actual construction site. Construction activities which may temporarily or otherwise interfere with property access shall be coordinated in advance with the affected property owners.

The Contractor shall conduct construction operations in a manner which will minimize delays to traffic, and shall meet the following requirements:

1. If work is being performed within 200 feet in any direction of an intersection that is controlled by a traffic signal, the flagger(s) shall direct the flow of traffic in concert with the traffic signals in construction areas to avoid queuing, unless active work prohibits such action. The flagger shall direct traffic to prevent traffic from queuing through an intersection (i.e., blocking an intersection). Only a Traffic Officer may direct traffic against the operation of a traffic signal and only until the operation occurring within the intersection is completed.
2. When a lane adjacent to an open lane is closed to travel, the temporary traffic control devices shall be set 2 feet (0.61 m) into the closed lane from the edge of the open lane, unless an uncured patch exists or actual work is being performed closer to the open lane with minimum restriction to traffic.
3. Except for “buffer lanes” on high volume and/or high speed roadways, lanes shall not be closed unless construction activity requiring lane closure is taking place, or will take place within the next hour. Lanes shall be reopened immediately upon completion of the work. Moving operations will require the lane closures be shortened as the work progresses and as traffic conditions warrant to minimize the length of the closure. The Contractor shall conduct construction operations in a manner so as to minimize disruption to traffic during peak hours and periods of heavy flow. The Department reserves the right to stop or change the Contractor's operations, if in the opinion of the Engineer, such operations are unnecessary at that time or the operations are unnecessarily impeding traffic.
4. Work in the vicinity of traffic signals, shall be scheduled to minimize the time during which the signal is operated without detectors, and prior approval from the Engineer shall be required. TMC shall be notified in advance of cutting a loop detector, and be immediately notified once the loop detector has been reinstalled. The Contractor shall provide sufficient advance notice of the loop detector work with the Engineer to ensure the aforementioned requirements are met.

It is required that all temporary traffic control work and related items shall either be performed entirely by the Contractor's own organization, or totally subcontracted. Maintenance of equipment shall not be subject to this requirement.

Any deficiencies related to temporary traffic control that are reported to the Contractor in writing shall be corrected within 24 hours or as directed by the Engineer. Failure to comply will result in non-payment for those devices that are found to be deficient for the duration of the deficiency. Serious deficiencies that are not corrected immediately shall result in suspension of work until items identified are brought back into compliance.

At the end of each day's work, the Contractor shall correct all pavement edge drop-offs in accordance with Table 6G-1 in the Delaware MUTCD. This corrective work shall be accomplished with Temporary Roadway Material (TRM) unless an alternate method is specified in the Plans. All ruts and potholes shall be filled with TRM as soon as possible but no later than the end of each work day. Placement and Payment of TRM shall be completed in accordance with Section 402 of the Standard Specifications. If temporary elimination of a drop-off hazard cannot be accomplished, then the area should be properly marked and protected with temporary traffic control devices such as temporary barricades, warning signs, flashing lights, etc. as required by Section 6G.21 of the Delaware MUTCD.

All open trench excavation accessible by vehicular traffic must be backfilled prior to the end of each working day. Steel plates shall not be used except in emergency situations and only with prior written approval from the Engineer unless otherwise directed by the Plans.

The Contractor shall submit, at or prior to the preconstruction meeting, detailed drawings including but not limited to existing striping lengths, lane and shoulder widths, turn lane lengths, locations of stop bars, turn arrows, crosswalks and railroad crossings. The drawings shall depict the existing pavement markings for each project location. These drawings will be reviewed by the Department's Traffic Section to determine the need for modification(s) for compliance with the Delaware MUTCD. Temporary pavement markings, on the final pavement surface, shall match the Plan dimensions and layout or the approved drawings of the permanent markings in compliance with Section 3 of the Delaware MUTCD. All conflicting or errant striping shall be removed as directed by the Engineer in compliance with the specifications for Item 748530 (Removal of Pavement Striping).

At the end of each day's operation and before traffic is returned to unrestricted roadway use, temporary striping shall be utilized when the existing pavement is milled and hot mix will not be placed the same day or more than a single course of hot mix is to be placed or permanent roadway striping cannot be placed on the same day as the placement of the final course of hot mix. Placement of temporary striping shall receive prior approval from the Engineer and the contractor shall apply temporary pavement markings in accordance with the requirements of Section 748 of Delaware Standard specifications and the Delaware MUTCD. Payment for temporary pavement striping shall be made at the unit price bid for item 748 - Temporary Striping. Payment for final striping will be included in the applicable striping item.

The Contractor shall have temporary striping/delineating materials (such as raised markers, tape, and other approved materials) available at the job site for verification by the Department prior to starting the hot-mix paving operation on roads to be immediately opened to traffic. These materials shall be used by the Contractor for temporary markings if he/she fails to apply temporary marking paint, etc., as required by the Delaware MUTCD. No paving operations on roads to be immediately opened to traffic will be allowed unless such verification has been made for the availability of the materials at the job site.

Travel lane and ramp closings on multilane highways and Interstates shall not be permitted during the following holiday periods:

- December 24 through December 27 (Christmas Day)
- December 31 through January 3 (New Years Day)
- Friday prior to Easter through Easter Sunday
- Thursday prior to Memorial Day through the Tuesday following Memorial Day
- Dover International Speedway Race Weekends (Thursday prior to the race event through the day after the race event)
- July 3 through July 5 (Independence Day)
- Thursday prior to Labor Day through the Tuesday following Labor Day
- Wednesday prior to Thanksgiving Day through the Monday following Thanksgiving Day

Additional time restrictions may apply as noted in the project plans or as directed by the Engineer. Any requests to waive any restrictions must be made in writing to the Engineer for review and approval. A copy of the request shall be provided to the District Safety Officer for review.

Certification:

Temporary traffic control devices used on all highways open to the public in this State shall conform to the Delaware MUTCD. All devices shall be crashworthy in accordance with the National Cooperative Highway Research Program (NCHRP) Report 350, the memorandum issued August 28, 1998 by The USDOT Federal Highway Administration, and/or in accordance with the latest edition of the Manual for Assessing Safety Hardware (MASH), published by the American Association of State Highway and Transportation Officials (AASHTO).

The Contractor shall submit certification for temporary traffic control devices or vendors used specifically on this project at or prior to the pre-construction meeting.

Certification of compliance with NCHRP report 350 and/or MASH is required for the following categories of temporary traffic control devices:

Category I contains small and lightweight channelizing and delineating control devices which includes cones, tubular markers, flexible delineator post and drums, all without any accessories or attachments.

Category II includes temporary traffic control devices that are not expected to produce significant vehicular velocity changes to impacting vehicles. These devices which shall weigh 45 kg or less, include Type I, II and III barricades, portable sign supports with signs, and intrusion alarms. Also included are drums, cones, and vertical panels with accessories or attachments.

Category III includes temporary traffic control devices that are expected to cause significant vehicular velocity changes to impacting vehicles. These devices which weigh more than 45 kg include temporary barrier, temporary impact attenuators, and truck-mounted attenuators.

Category IV includes portable or trailer-mounted devices such as arrow panels, variable message signs, temporary traffic signals and temporary area lighting.

For Category I devices, the manufacturer or Contractor may self-certify that the devices meet the NCHRP-350 and/or MASH criteria. The Contractor shall supply the Federal Highway Administration's NCHRP-350 and/or MASH acceptance letter for each type of device that falls under Category II and III devices.

Basis of Payment:

Payment will be made at the Lump Sum price for "Maintenance of Traffic", for which price and payment constitutes full compensation for all maintenance of traffic activities accepted by the Engineer, which shall include the cost of furnishing and relocating permanent and temporary traffic control signs, traffic cones or drums, submission of temporary traffic control plan(s), submission of existing pavement marking drawings, submission of all required certifications, labor, equipment and incidentals necessary to complete the item. Payment to furnish and maintain other temporary traffic control devices including but not limited to Portable P.C.C. Safety Barrier, Truck Mounted Attenuators, Portable Changeable Message Signs, Arrow Panels and Portable Light Assemblies will be made at the contract unit price for each item.

NOTE

If the Contractor does not complete the Contract work within the Contract completion time (including approved extension time), the Contractor shall be responsible for providing the necessary temporary traffic control devices that are required to complete any remaining work. The costs of such temporary traffic control shall be borne by the Contractor. No additional payment will be made to the Contractor to maintain traffic in accordance with the Delaware MUTCD, contract plans and specifications. Temporary traffic control items include, but not be limited to, warning lights, warning signs, barricades, plastic drums, P.C.C. safety barrier, flaggers, traffic officers, arrow panels, message boards, and portable impact attenuators.

6/21/2011



STATE OF DELAWARE
DEPARTMENT OF TRANSPORTATION
800 BAY ROAD
P.O. Box 778
DOVER, DELAWARE 19903

SHAILEN P. BHATT
SECRETARY

UTILITY STATEMENT

STATE CONTRACT No. T201347203
PROJECT I.D. No. 13-03013
BR 3-151 and 3-164 Emergency Repairs

SUSSEX COUNTY

No utility relocation involvement is anticipated, should any conflicts be encountered during construction requiring adjustment and/or relocation to the aforementioned utilities' existing facilities, the necessary relocation work shall be accomplished by the respective agencies, as directed by the District Engineer.

Any adjustments and/ or relocations of municipally owned sewer or water facilities shall be done by the State's contractor in accordance with the respective agencies' standard specifications as directed by the District Engineer.

General Notes

1. The Contractor's attention is directed to Section 105.09 Utilities, Delaware Standard Specifications, August 2001. The Contractor shall contact Miss Utility (1-800-282-8555) two working days prior to any excavation. The Contractor is responsible for the support and protection of all utilities when excavating. The Contractor is responsible for ensuring proper clearances, including safety clearances, from overhead utilities for construction equipment. The Contractor is advised to check the site for access purposes for his equipment and, if necessary, make arrangements directly with the utility companies for field adjustments for adequate clearances.
2. It is understood and agreed that the Contractor has considered in his bid all permanent and temporary utility appurtenances in their present and relocated positions as shown on the plans or described in the Utility Statement or are readily discernible and that no additional compensation will be allowed for any delays, inconvenience, or damage due to any interference from the utility facilities and appurtenances or the operation of moving them, except that the Contractor may be granted an equitable extension of time.

3. Coordination and cooperation among the Utility Companies and the State's Contractor are of prime importance. Therefore, the Contractor is directed to contact the following Utility Company representatives with any questions regarding this work prior to submitting bids and work schedules. Proposed work schedules should reflect the Utility Companies' proposed relocations. The Utility Companies do not work on weekends or legal holidays.

DIVISION OF TRANSPORTATION SOLUTIONS

2.19.13
DATE


UTILITY COORDINATOR

STATE OF DELAWARE
DEPARTMENT OF TRANSPORTATION
PO BOX 778
DOVER, DELAWARE 19903

CERTIFICATE OF RIGHT-OF-WAY STATUS

STATE PROJECT NO. T201347203

F.A.P. No. N/A for R/W

BR 3-151 & 3-164 EMERGENCY REPAIRS ETA

SUSSEX COUNTIES

Certificate of Right-of-Way Status – 100%

As required by 23CFR Part 635, all necessary real property interests have been acquired in accordance with current State/Federal rules and regulations covering the acquisition of real property.

This is to certify that construction activities will occur within existing right-of-way.

It is further certified that there were no individuals or families displaced by this project. Therefore the provisions of 49 CFR Part 24 is not applicable to the project.

There are no improvements to be removed or demolished as part of this project.

REAL ESTATE SECTION



Robert Cunningham
Assistant Director Transportation Solutions
Right of Way

February 5, 2013



STATE OF DELAWARE
DEPARTMENT OF TRANSPORTATION
800 BAY ROAD
P.O. Box 778
DOVER, DELAWARE 19903

SHAILEN P. BHATT
SECRETARY

February 8, 2013

ENVIRONMENTAL REQUIREMENTS

FOR

State Contract No. T201347203

Federal Aid No.: N/A

Contract Title: BR 3-151 and 3-164 Emergency Repairs

In accordance with the procedural provisions for implementing the National Environmental Policy Act of 1969, as amended, the referenced project has been processed through the Department's Environmental Review Procedures and has been classified as a Level D/ Class II Action. As such, a Categorical Exclusion has been prepared to evaluate potential adverse impacts to result from construction of the proposed action (per 23 CFR 771.117 d(3)) and the following special provisions have been developed to mitigate and/or minimize these impacts.

Due to the nature of the proposed construction activities, permits are not required for this project. However, the following construction requirements and special provisions have been developed to minimize and mitigate impact to the surrounding environs. These requirements by DelDOT not specified within the contract, but listed below, are the responsibility of the contractor and is subject to risk of shut down at the contractor's expense if not followed.

SPECIFIC REQUIREMENTS:

Compliance with all requirements of the permits is the responsibility of the contractor will follow all special conditions or requirements as stated within those permits. The contractor will be subject to penalties, fines, and the risk of shut down as mandated by laws governing permitting agencies if such are violated or ignored. Therefore, all special conditions, general requirements, and/or other required provisions specified within the permits must be followed.



Those obligations are indicated or listed within the permit package, which can be obtained from the DelDOT Contract Administration Office.

Additional requirements by DelDOT not specified within the permits, but listed below, is also the responsibility of the contractor and is subject to risk of shut down at the contractor's expense.

1. The contractor shall employ measures during construction to prevent spills of fuels, or lubricants, if a spill should occur, efforts shall be undertaken to prevent its entry into wetlands, aquatic, or drainage areas. Any spills entering wetlands, aquatic, or drainage areas shall be removed immediately. The Division of Water Resources (DNREC), Wetlands & Aquatic Protection Branch, 302-739-4691, shall be notified of any spill(s) within six (6) hours of their occurrence. That office will determine the effectiveness of spill and contamination removal and specify remediation efforts as necessary.
2. All construction debris, excavated material, brush, rocks, and refuse incidental to such work shall be placed either on shore above the influence of flood waters or on some suitable disposal site approved by the department.
3. The disposal of trees, brush, and other debris in any stream corridor, wetland surface water or any drainage ditch is prohibited.
4. There shall be no stockpiling of construction materials or temporary fills in wetlands or subaqueous lands unless otherwise specified on project plans and approved by permitting agencies that govern them. It is the contractor's responsibility to coordinate and secure those additional permits/amendments in deviating from the plan.
5. The effort shall be made to keep construction debris from entering adjacent waterways, wetlands, ground cover, or drainage areas. Any debris that enters these areas shall be removed immediately. Netting, mats, or establishing confined work areas in stages may be necessary to address these issues.
6. If routine maintenance of worker equipment and heavy machinery is necessary during the construction period, refuse material is prohibited from being disposed or deposited onto or into the ground. All used oils and filters must be recycled or disposed of properly.
7. Harmful chemical wash water applied to clean equipment or machinery shall be discouraged. If undertaken, the residue water and/or material must be collected or contained such that it will be disposed of properly. By no means, shall it be deposited or disposed of in waterways, streams, wetlands, or drainage areas.
8. That the fill material shall be free of oil and grease, debris, wood, general refuse, plaster and other pollutants, and shall contain no broken asphalt.

CULTURAL RESOURCE REQUIREMENTS:

The contractor shall pay special attention to the second paragraph under Location and Description within the Project Notes. Any questions or concerns should be addressed to Michael Hahn of DeIDOT Environmental Studies Section at MichaelC.Hahn@state.de.us or 302-760-2264.

NATURAL RESOURCES:

The contractor shall pay special attention to specific construction requirements as indicated in the Project Notes.

1. Please note the environmental requirements as indicated under “Waterway Restriction” in the Project Notes for U.S. Coast Guard 30 day Advance Coordination/Approval. - (coordination to be completed by the contractor)
2. DeIDOT Environmental Studies Section (302) 760-2264 must be notified if there are any changes to the project methods, footprint, materials, or designs, to allow the Department to coordinate with the appropriate resource agencies (COE, DNREC, and SHPO), for approval.

BID PROPOSAL FORMS
CONTRACT T201347203.01
BIDDING

DELAWARE DEPARTMENT OF TRANSPORTATION
SCHEDULE OF ITEMS

PAGE: 1
DATE:

CONTRACT ID: T201347203.01 PROJECT(S): T201347203

All figures must be typewritten.

CONTRACTOR : _____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE DOLLARS CTS	BID AMOUNT DOLLARS CTS
------------	---------------------	----------------------------------	-----------------------------	-----------------------------

SECTION 0001 BR 3-151

0010	743004 FURNISH AND MAINTAIN PORTABLE CHANGEABLE MESSAGE SIGN	200.000 EADY		
0020	743052 FLAGGER, SUSSEX COUNTY, STATE	32.000 HOUR	46.94000	1502.08
0030	743064 FLAGGER, SUSSEX COUNTY, STATE, OVERTIME	16.000 HOUR	68.06000	1088.96
0040	746662 REPAIR BRIDGE ELECTRICAL SYSTEM	LUMP	LUMP	
0050	763000 INITIAL EXPENSE	LUMP	LUMP	
0060	763522 COAST GUARD SPECIFIC CONDITIONS	LUMP	LUMP	
0070	763539 MECHANICAL REPAIR OF MOVABLE BRIDGE	LUMP	LUMP	
0080	763643 MAINTENANCE OF TRAFFIC, ALL INCLUSIVE	LUMP	LUMP	
	SECTION 0001 TOTAL			

SECTION 0002 BR 3-164

DELAWARE DEPARTMENT OF TRANSPORTATION
SCHEDULE OF ITEMS

PAGE: 2
DATE:

CONTRACT ID: T201347203.01 PROJECT(S): T201347203

All figures must be typewritten.

CONTRACTOR : _____

LINE NO	ITEM DESCRIPTION	APPROX. QUANTITY AND UNITS	UNIT PRICE	BID AMOUNT
			DOLLARS CTS	DOLLARS CTS
0090	746662 REPAIR BRIDGE ELECTRICAL SYSTEM	LUMP	LUMP	
0100	763522 COAST GUARD SPECIFIC CONDITIONS	LUMP	LUMP	
0110	763539 MECHANICAL REPAIR OF MOVABLE BRIDGE	LUMP	LUMP	
	SECTION 0002 TOTAL			
	TOTAL BID			

CANNOT BE
USED FOR
BIDDING

CERTIFICATION

Contract No. T201347203.01

The undersigned bidder, _____ whose address is _____
_____ and telephone number is _____

_____ hereby certifies the following:

I/We have carefully examined the location of the proposed work, the proposed plans and specifications, and will be bound, upon award of this contract by the Department of Transportation, to execute in accordance with such award, a contract with necessary surety bond, of which contract this proposal and said plans and specifications shall be a part, to provide all necessary machinery, tools, labor and other means of construction, and to do all the work and to furnish all the materials necessary to perform and complete the said contract within the time and as required in accordance with the requirements of the Department of Transportation, and at the unit prices for the various items as listed on the preceding pages.

The foregoing quantities are considered to be approximate only and are given as the basis for comparison of bids. The Department of Transportation may increase or decrease the amount of any item or portion of the work as may be deemed necessary or expedient. Any such increase or decrease in the quantity for any item will not be regarded as a sufficient ground for an increase or decrease in the unit prices, nor in the time allowed for the completion of the work, except as provided in the contract.

Accompanying this proposal is a surety bond or a security of the bidder assigned to the Department of Transportation, for at least ten (10) percentum of total amount of the proposal, which deposit is to be forfeited as liquidated damages in case this proposal is accepted, and the undersigned shall fail to execute a contract with necessary bond, when required, for the performance of said contract with the Department of Transportation, under the conditions of this proposal, within twenty (20) days after date of official notice of the award of the contract as provided in the requirement and specifications hereto attached; otherwise said deposit is to be returned to the undersigned.

I/We are licensed, or have initiated the license application as required by Section 2502, Chapter 25, Title 30, of the Delaware Code.

By submission of this proposal, each bidder and each person signing on behalf of any bidder, certifies as to its own organization, under penalty of perjury, that to the best of each signer's knowledge and belief:

1. The prices in this proposal have been arrived at independently without collusion, consultation, communication, or Agreement with any other bidder or with any competitor for the purpose of restricting competition.
2. Unless required by law, the prices which have been quoted in this proposal have not been knowingly disclosed and will not knowingly be disclosed by the bidder, directly or indirectly, to any other bidder or competitor prior to the opening of proposals.
3. No attempt has been made or will be made by the bidder to induce any other person, partnership, or corporation to submit or not to submit a proposal for the purpose of restricting competition.

I/We acknowledge receipt and incorporation of addenda to this proposal as follows:

No.	Date								
-----	------	-----	------	-----	------	-----	------	-----	------

(BIDDERS MUST ACKNOWLEDGE RECEIPT OF ALL ADDENDA.)

Sealed and dated this _____ day of _____ in the year of our Lord two thousand and _____
(20__).

Name of Bidder (Organization)

Corporate
Seal

By:

Authorized Signature

Attest _____

Title

SWORN TO AND SUBSCRIBED BEFORE ME this ____ day of _____, 20 ____.

Notary
Seal

Notary

BID BOND

TO ACCOMPANY PROPOSAL
(Not necessary if security is used)

KNOW ALL MEN BY THESE PRESENTS That: _____
_____ of _____ in the County of _____ and State of _____
_____ as **Principal**, and _____ of _____ in the
County of _____ and State of _____ as **Surety**, legally authorized to do business in the State of
Delaware ("**State**"), are held and firmly unto the **State** in the sum of _____
_____ Dollars (\$ _____), or _____ percent not to exceed _____
_____ Dollars (\$ _____) of amount of bid on Contract
No. T201347203.01 __, to be paid to the **State** for the use and benefit of its Department of Transportation
("**DeIDOT**") for which payment well and truly to be made, we do bind ourselves, our and each of our heirs,
executors, administrators, and successors, jointly and severally for and in the whole firmly by these presents.

NOW THE CONDITION OF THIS OBLIGATION IS SUCH That if the above bounden **Principal**
who has submitted to the **DeIDOT** a certain proposal to enter into this contract for the furnishing of certain
materiel and/or services within the **State**, shall be awarded this Contract, and if said **Principal** shall well and
truly enter into and execute this Contract as may be required by the terms of this Contract and approved by
the **DeIDOT**, this Contract to be entered into within twenty days after the date of official notice of the award
thereof in accordance with the terms of said proposal, then this obligation shall be void or else to be and
remain in full force and virtue.

Sealed with _____ seal and dated this _____ day of _____ in the year of our Lord two thousand and
_____ (20__).

SEALED, AND DELIVERED IN THE
presence of

Name of Bidder (Organization)

Corporate
Seal

By: _____
Authorized Signature

Attest _____

Title

Name of **Surety**

Witness: _____

By: _____

Title

